REPAIR CAMPUS STEAM TUNNELS

Project # 695-17-119

For the
Department of Veterans Affairs
Clement J. Zablocki VA Medical Center
5000 W. National Ave.
Milwaukee, WI 53296

PROJECT MANUAL

DIVISIONS 01-32

100% BID SET

1 September 2017

GUIDON DESIGN INC.

RING & DUCHATEAU LLP

CERTIFICATION PAGE

Civil / Site Engineering

Guidon Design Inc.

Structure

Guidon Design Inc.

DEPARTMENT OF VETERANS AFFAIRS
VHA MASTER SPECIFICATIONS

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GENERAL REQUIREMENTS

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SECTION 01 00 00
GENERAL REQUIREMENTS

1.1 SAFETY REQUIREMENTS

Refer to section 01 35 26, SAFETY REQUIREMENTS for safety and infection control requirements.

1.2 GENERAL INTENTION

A. This construction project includes the planned replacement of approximately 60% of the structural supports in the South Steam Tunnel, repair of concrete spalling, crack repair, and installation of waterproof membrane on the exterior of the portions of the concrete steam tunnel to prvent water infiltration.

B. Offices of Guidon Design Inc., as Architect-Engineers, will render certain technical services during construction. Such services shall be considered as advisory to the Government and shall not be construed as expressing or implying a contractual act of the Government without affirmations by Contracting Officer or his duly authorized representative.

C. Contractor shall completely prepare site for building operations, including demolition and furnish labor and materials and perform work for 695-17-119 Repair Campus Steam Tunnels as required by drawings and specifications.

D. Visits to the site by Bidders may be made only as described in the solicitation in accordance with FAR 52.236-27 Site Visit (Construction).

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

F. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access. Refer to the section 01 01 10 SN SPECIAL NOTES

for fingerprint, badging, construction door access and parking requirements.

G. Prior to commencing work, general contractor shall provide proof that a OSHA designated "competent person" (CP) (29 CFR 1926.20(b)(2) will maintain a presence at the work site whenever the general or subcontractors are present.

H. Routine Inspections and Maintenance During Construction

1. Provide routine inspections and maintenance services as prescribed in Operations & Maintenance manuals required under this contract.
2. Provide services during construction and until items below are completed:
   a) VA Inspection Complete
   b) Successful commissioning
   c) Training of VA Maintenance staff
   d) Acceptance by VA of each system described in other specifications related to this contract.
   e) O&M Manual submittals received, reviewed, and approved by VA
3. Systems included in this contract are:
   a) Sanitary
   b) Stormwater
   c) Electrical Systems including Telephone and Fiberoptics

I. Submit with O&M manuals at substantial completion of work phases and update upon completion of final phase one spreadsheet based comprehensive summary schedule of routine inspection and maintenance for systems. List: specification section, article, and paragraph; description of systems/subsystems; O&M manual reference; frequency.

J. Training:

a. All employees of general contractor or subcontractors shall have the 10-hour or 30-hour OSHA Construction Safety course and other relevant competency training, as determined by COR acting as the Construction Safety Officer with input from the facility Construction Safety Committee.
b. Submit training records of all such employees for approval before the start of work.

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

A. All drawings and specifications (contract documents) may be obtained from the FedBizOps website where the solicitation is posted. Printed copies will be the responsibility and expense of the contractor(s).

1.4 CONSTRUCTION SECURITY REQUIREMENTS

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

B. Security Procedures:
   1. General Contractor’s employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.
   2. A Special Agreement SAC form is required for every contract employee. See Special Notes specification for an example of this SAC form which will need to be filled out for each employee and submitted to the COR for signature. Even if the contractor has an active badge, a SAC form is needed for the COR’s records.
   3. Before starting work the General Contractor shall give one week’s notice to the Contracting Officer so that security arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
   4. No photography of VA premises is allowed without written permission of the Contracting Officer.
   5. VA reserves the right to close down or shut down the project site and order General Contractor’s employees off the premises in the

event of a national emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer.

C. 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. These documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.
3. All paper waste or electronic media such as CD’s and diskettes shall be shredded and destroyed in a manner acceptable to the VA.
4. Notify Contracting Officer, COR and Site Security Officer immediately when there is a loss or compromise of “sensitive information”.

D Motor Vehicle Restrictions

1. Vehicle authorization requests shall be required for any vehicle entering the site and such request shall be submitted to the COR per the Special Notes specification.
2. Permits shall be issued for General Contractor and its employees for parking in designated areas only.

1.5 OPERATIONS AND STORAGE AREAS

A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

D. Working space and space available for storing materials shall be as determined by the COR.

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

F. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by 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.
3. Where access by Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.

G. Utilities Services: Where necessary to cut existing pipes, electrical wires, conduits, cables, etc., of utility services, or of fire protection systems or communications systems (except telephone), they shall be cut and capped at suitable places where shown; or, in absence

of such indication, where directed by COR. All such actions shall be coordinated with the COR or Utility Company involved.

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

H. Phasing: The Contractor shall furnish the COR with a schedule of approximate phasing dates based upon the Phasing Plan as shown in the Contract Documents. This plan shall show how the Contractor intends to accomplish work in each specific area of the site, building or portion thereof. In addition, Contractor shall notify the COR two weeks in advance of the proposed date of starting work in each specific area of site, building or portion thereof. Arrange such phasing dates to insure accomplishment of this work in successive phases mutually agreeable to Medical Center Director, COR and Contractor, as follows:

1. Contractor shall take all measures and provide all material necessary for protecting existing equipment and property in affected areas of construction against dust and debris, so that equipment and affected areas to be used in the Medical Center’s operations will not be hindered. Contractor shall permit access to Department of Veterans Affairs personnel through other construction areas which serve as routes of access to such affected areas and equipment. Coordinate alteration work in areas occupied by Department of Veterans Affairs so that Medical Center operations will continue during the construction period.
2. The Steam Tunnel lines within the project scope are vital to the campus. These lines are to remain fully operational and active during the entirety of the project.
3. Immediate areas of alterations not mentioned in preceding Subparagraph 1 will be temporarily vacated while alterations are performed.
4. As start of project, Contractor shall provide and install all temporary site signage to reroute traffic accordingly. Contractor will install construction fence and entry gates to isolate construction area from general population.

5. After all construction barriers and traffic detour signage is constructed, Contractor can begin site work and demolition. Contractor shall excavate areas indicated on drawings and prepare for new construction and repair work.
6. After site preparation and excavation, Contractor shall perform all new construction below grade including repair work. This work includes structural concrete repairs to tunnel roofs and waterproofing of exterior tunnel shell.
7. Contractor can perform steel repair work inside tunnels at the same time as exterior work or after exterior work is complete. Contractor is to provide all new steel supports first before any demolition or repair work occurs. Once all new steel supports have been installed, the VA and AE will review work. Conditions inside of steam tunnels are confined and of higher temperatures due to the active steam lines.
8. Upon completion of all new steel work, contractor will remove old supports and finish repair work and required connections as indicated within documents. Conditions inside of steam tunnels are confined and of higher temperatures due to the active steam lines.
9. Upon completion of all new work below grade and contractor approval, Contractor shall backfill tunnels as indicated on drawings and finish all new site work including grading, asphalt drives, and landscaping.

I. Steam Tunnel between building 112 and the Mausoleum will not be occupied during performance of work.

J. Construction Fence: Before construction operations begin, Contractor shall provide a chain link construction fence, six feet minimum height, around the construction area as indicated on the drawings. Provide two gates for access with necessary hardware, including hasps and padlocks. Fasten fence fabric to terminal posts with tension bands and to line posts and top and bottom rails with tie wires spaced at maximum 375mm (15 inches). Bottom of fences shall extend to 25mm (one inch) above grade. Remove the fence when directed by COR.

K. When construction site is turned over to Contractor, Contractor shall accept responsibility for upkeep and maintenance:

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

1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of COR. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without the Medical Center Director’s prior knowledge and written approval. Refer to specification Sections 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, for additional requirements.
2. Contractor shall submit a request to interrupt any such services to COR, in writing, two (2) weeks in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center. Interruption time approved by Medical Center may occur at other than Contractor's normal working hours.
4. Major interruptions of any system must be requested, in writing, at least 21 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.
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.

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

N. To minimize interference of construction activities with flow of Medical Center traffic, comply with the following:

1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles.
2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the COR.

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

1.6 ALTERATIONS

A. Survey: Before any work is started, the Contractor shall make a thorough survey of the site with the COR. The contractor shall furnish a report with photo documentation of all items and features, signed by both the Contractor and the COR, showing fence, access locations, and:

1. Shall note any discrepancies between drawings and existing conditions at site.
2. Shall designate areas for working space, materials storage and routes of access to areas within the site where alterations occur and which have been agreed upon by the Contractor and the COR.

B. Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of COR to be in such condition that their use is impossible or impractical, shall be furnished and/or replaced by Contractor with new items in accordance with specifications which will be furnished by Government. Provided the contract work is changed by reason of this subparagraph B, the contract will be modified accordingly, under provisions of clause

entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).

C. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and COR together shall make a thorough re-survey of the site. They shall furnish a report on the conditions of the same as noted in first condition survey report:

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

D. Protection: Provide the following protective measures:

1. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.

1.7 DISPOSAL AND RETENTION

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

1. Reserved items which are to remain property of the Government are identified by attached tags as items to be stored. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by COR.

2. Items of portable equipment located in spaces in which work is to be done under this contract shall remain the property of the Government. When 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.

1.8 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.

C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

1.9 RESTORATION

A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the COR. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the COR before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.

B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and

electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.

C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are 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).

1.10 PHYSICAL DATA

A. Government does not guarantee that materials and conditions other than those as indicated on drawings will not be encountered. Bidders are expected to examine site of work; and, after investigation, decide for themselves character of materials and make their bids accordingly. Upon proper application to Department of Veterans Affairs, bidders will be permitted to make subsurface explorations of their own at site.

1.11 PROFESSIONAL SURVEYING SERVICES

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

1.12 LAYOUT OF WORK

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

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

B. Establish and plainly mark such lines and grades that are reasonably necessary to properly assure that location, orientation, and elevations established for each such structure and roads are in accordance with lines and elevations shown on contract drawings.

C. Following completion of general mass excavation and before any other permanent work is performed, establish and plainly mark (through use of appropriate batter boards or other means) sufficient additional survey control points or system of points as may be necessary to assure proper alignment, orientation, and grade of all major features of work. Survey shall include, but not be limited to, location of lines and grades of roads, curbs, sidewalks and major utilities:

   1. Such additional survey control points or system of points thus established shall be checked and certified by a registered land surveyor or registered civil engineer. Furnish such certification to the COR before any work (such as footings, floor slabs, columns, walls, utilities and other major controlling features) is placed.

D. Whenever changes from contract drawings are made in line or grading requiring certificates, record such changes on a reproducible drawing bearing the registered land surveyor or registered civil engineer seal, and forward these drawings upon completion of work to COR.

1.13 AS-BUILT DRAWINGS

A. The contractor shall maintain two full size sets of as-built drawings which will be kept current during construction of the project, to include all contract changes, modifications and clarifications.

B. The contractor will submit on a monthly basis, up-to date as-built drawings in PDF format to Buzzsaw.

C. 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. Upon project completion, Contractor shall deliver one approved completed sets of as-built drawings in the electronic version (scanned PDF) to the AE within 15 calendar days after each completed phase and after the acceptance of the project by the COR.

E. Paragraphs A, B, & C shall also apply to all shop drawings.

F. Contractors shall update (as work is completed) the VA electrical, medical gas, domestic plumbing and mechanical piping master schematic books. These books are located in the FM office.

1.14 USE OF ROADWAYS

A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the COR, such temporary roads which are necessary in the performance of contract work. A haul workplan shall be submitted to the COR for approval. Temporary roads shall be constructed and restoration performed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well-constructed bridges or other adequate protection.

1.15 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT

A. Use of newly installed mechanical and electrical equipment to provide heat, ventilation, plumbing, light and power will be permitted subject to written approval and compliance with the following provisions:

1. Permission to use each unit or system must be given by COR in writing. If the equipment is not installed and maintained in accordance with the written agreement and following provisions, the COR will withdraw permission for use of the equipment.
2. Electrical installations used by the equipment shall be completed in accordance with the drawings and specifications to prevent damage to the equipment and the electrical systems, i.e. transformers, relays, circuit breakers, fuses, conductors, motor controllers and their overload elements shall be properly sized, coordinated and adjusted. Installation of temporary electrical equipment or devices shall be

in accordance with NFPA 70, National Electrical Code, (2014 Edition), Article 590, ***Temporary Installations.*** Voltage supplied to each item of equipment shall be verified to be correct and it shall be determined that motors are not overloaded. The electrical equipment shall be thoroughly cleaned before using it and again immediately before final inspection including vacuum cleaning and wiping clean interior and exterior surfaces.

3. Units shall be properly lubricated, balanced, and aligned. Vibrations must be eliminated.
4. Automatic temperature control systems for preheat coils shall function properly and all safety controls shall function to prevent coil freeze-up damage.
5. The air filtering system utilized shall be that which is designed for the system when complete, and all filter elements shall be replaced at completion of construction and prior to testing and balancing of system.
6. All components of heat production and distribution system, metering equipment, condensate returns, and other auxiliary facilities used in temporary service shall be cleaned prior to use; maintained to prevent corrosion internally and externally during use; and cleaned, maintained and inspected prior to acceptance by the Government. Boilers, pumps, feedwater heaters and auxiliary equipment must be operated as a complete system and be fully maintained by operating personnel. Boiler water must be given complete and continuous chemical treatment.

B. Prior to final inspection, the equipment or parts used which show wear and tear beyond normal, shall be replaced with identical replacements, at no additional cost to the Government.

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

D. Any damage to the equipment or excessive wear due to prolonged use will be repaired replaced by the contractor at the contractor’s expense.

E. All warranties on newly installed mechanical and electrical equipment will not commence until both the contractor has stopped temporary use of the equipment and after final inspection.

1.16 TEMPORARY TOILETS

A. Provide where directed, (for use of all Contractor's workmen) when approved by COR, suitable dry closets where directed. Keep such places clean and free from flies, and all connections and appliances connected therewith are to be removed prior to completion of contract, and premises left perfectly clean.

1.17 AVAILABILITY AND USE OF UTILITY SERVICES

A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The Contractor shall carefully conserve any utilities furnished without charge.

B. The Contractor, at Contractor's expense and in a workmanlike manner, in compliance with code and as satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia and repair restore the infrastructure as required.

C. Heat: Furnish temporary heat necessary to prevent injury to work and materials through dampness and cold. Use of open salamanders or any temporary heating devices which may be fire hazards or may smoke and damage finished work, will not be permitted. Maintain minimum temperatures as specified for various materials.

1. Obtain heat by connecting to Medical Center heating distribution system.
   a. Steam is available at no cost to Contractor.

D. Electricity (for Construction and Testing): Furnish all temporary electric services.

1. Obtain electricity by connecting to the Medical Center electrical distribution system. Electricity is available at no cost to the Contractor.

E. Water (for Construction and Testing):

1. Obtain water by connecting to the Medical Center water distribution system. Provide reduced pressure backflow preventer at each connection as per code. Water is available at no cost to the Contractor.

2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at COR's discretion) of use of water from Medical Center's system.

F. Steam: Furnish steam system for testing required in various sections of specifications.

1. Obtain steam for testing by connecting to the Medical Center steam distribution system. Steam is available at no cost to the Contractor.
2. Maintain connections, pipe, fittings and fixtures and conserve steam-use so none is wasted. Failure to stop leakage or other waste will be cause for revocation (at COR's discretion), of use of steam from the Medical Center's system.

1.18 TESTS

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

B. Conduct final tests required in various sections of specifications in presence of an authorized representative of the Contracting Officer. Contractor shall furnish all labor, materials, equipment, instruments, and forms, to conduct and record such tests.

C. Mechanical and electrical systems shall be balanced, controlled and coordinated. A system is defined as the entire system which must be coordinated to work together during normal operation to produce results for which the system is designed. For example, air conditioning supply air is only one part of entire system which provides comfort conditions for a building. Other related components are return air, exhaust air, steam, chilled water, refrigerant, hot water, controls and electricity, etc. Another example of a system which involves several components of different disciplines is a boiler installation. Efficient and acceptable boiler operation depends upon the coordination and proper operation of fuel, combustion air, controls, steam, feedwater, condensate and other related components.

D. All related components as defined above shall be functioning when any system component is tested. Tests shall be completed within a

reasonably period of time during which operating and environmental conditions remain reasonably constant and are typical of the design conditions.

E. Individual test result of any component, where required, will only be accepted when submitted with the test results of related components and of the entire system.

1.19 INSTRUCTIONS

A. Contractor shall furnish Operations & Maintenance manuals (hard copies and electronic) and verbal instructions when required by the various sections of the specifications and as hereinafter specified.

B. Manuals: Operations & Maintenance manuals (after AE approval, one hard copy submitted digitally via Milwaukee Buzzsaw) for each separate piece of equipment shall be delivered to the COR coincidental with the delivery of the equipment to the job site. Manuals shall be complete, detailed guides for the maintenance and operation of equipment. They shall include complete information necessary for starting, adjusting, maintaining in continuous operation for long periods of time and dismantling and reassembling of the complete units and sub-assembly components. Manuals shall include an index covering all component parts clearly cross-referenced to diagrams and illustrations. Illustrations shall include "exploded" views showing and identifying each separate item. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment, component, accessory and control shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals must reference the exact model, style and size of the piece of equipment and system being furnished. Manuals referencing equipment similar to but of a different model, style, and size than that furnished will not be accepted.

C. Instructions: Contractor shall provide qualified, factory-trained manufacturers' representatives to give detailed instructions to assigned Department of Veterans Affairs personnel in the operation and complete maintenance for each piece of equipment during a formal start-up and training session. All such training will be at the job site. These requirements are more specifically detailed in the various

technical sections. Instructions for different items of equipment that are component parts of a complete system, shall be given in an integrated, progressive manner. All instructors for every piece of component equipment in a system shall be available until instructions for all items included in the system have been completed. This is to assure proper instruction in the operation of inter-related systems. All instruction periods shall be at such times as scheduled by the COR and shall be considered concluded only when the COR is satisfied in regard to complete and thorough coverage. The Department of Veterans Affairs reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the COR, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

1.20 RELOCATED EQUIPMENT

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

B. Perform relocation of such equipment or items at such times and in such a manner as directed by the COR.

C. Suitably cap existing service lines, such as steam, condensate return, water, drain, gas, air, vacuum and/or electrical, at the main whenever such lines are disconnected from equipment to be relocated. Remove abandoned lines in finished areas and cap as specified herein before under paragraph "Abandoned Lines".

D. Provide all mechanical and electrical service connections, fittings, fastenings and any other materials necessary for assembly and installation of relocated equipment; and leave such equipment in proper operating condition.

1.21 CONSTRUCTION SIGN

A. Provide a Construction Sign where directed by the COR. All wood members shall be of framing lumber. Cover sign frame with 0.7 mm (24 gage) galvanized sheet steel nailed securely around edges and on all bearings. Provide three 100 by 100 mm (4 inch by 4 inch) posts (or equivalent round posts) set 1200 mm (four feet) into ground. Set bottom of sign level at 900 mm (three feet) above ground and secure to posts

with through bolts. Make posts full height of sign. Brace posts with 50 x 100 mm (two by four inch) material as directed.

B. Paint all surfaces of sign and posts two coats of white gloss paint. Border and letters shall be of black gloss paint, except project title which shall be blue gloss paint.

C. Maintain sign and remove it when directed by the COR.

D. Detail Drawing of construction sign showing required legend and other characteristics of sign is shown on the drawings.

1.22 SAFETY SIGN

A. Provide a Safety Sign where directed by COR. Face of sign shall be 19 mm (3/4 inch) thick exterior grade plywood. Provide two 100 mm by 100 mm (four by four inch) posts extending full height of sign and 900 mm (three feet) into ground. Set bottom of sign level at 1200 mm (four feet) above ground.

B. Paint all surfaces of Safety Sign and posts with one prime coat and two coats of white gloss paint. Letters and design shall be painted with gloss paint of colors noted.

C. Maintain sign and remove it when directed by COR.

D. Standard Detail Drawing Number SD10000-02(Found on VA TIL) of safety sign showing required legend and other characteristics of sign is shown on the drawings.

E. Post the number of accident free days on a daily basis.

1.23 PHOTOGRAPHIC DOCUMENTATION

A. During the construction period through completion, provide photographic documentation of construction progress and at selected milestones.

B. Photographic documentation elements:

1. Each digital image shall be taken with a professional grade camera with minimum size of 6 megapixels (MP) capable of producing 200x250mm (8 x 10 inch) prints with a minimum of 2272 x 1704 pixels and 400x500mm (16 x 20 inch) prints with a minimum 2592 x 1944 pixels.

2. Documentation shall combine indexing and navigation system designed to capture actual conditions throughout construction and at critical milestones. Photos shall be uploaded weekly with Daily Logs to Buzzsaw.
3. Before construction, the impacted construction areas and site shall be documented during review with the COR and the General Contractor.
4. Construction progress for all trades shall be tracked at reasonable intervals.
5. As-built conditions of mechanical, electrical, plumbing and all other systems shall be documented post-inspection and pre-insulation, sheet rock or dry wall installation. This process shall include all finished systems located in the walls and ceilings of all buildings at the Project.
6. As-built finished conditions of the interior of each building including hoistways, corridor elevations, elevator machine room floors, ceilings and walls shall be documented at certificate of occupancy or equivalent, or just prior to occupancy, or both, as directed by the COR.

C. Coordination of photo shoots is accomplished through COR. Contractor shall also attend construction team meetings as necessary. Contractor’s operations team shall provide regular updates regarding the status of the documentation.

1.24 HISTORIC PRESERVATION

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

1.25 CONSTRUCTION COORDINATION DRAWINGS

A. Prepare and provide coordination drawings showing the location of openings through slabs, the pipe sleeves and hanger inserts, as well as the location and elevation of utility lines, including, but not limited to, conveyor systems, pneumatic tubes, ducts, all existing utilities, and conduits and pipes 50 mm (2 inches) and larger in diameter. Drawings required for all areas being remodeled or new and ancillary areas required by such utility runs. Ancillary area drawings to

include equal space on each side of main runs from main source to final location.

B. These drawings, including plans, elevations, and sections as appropriate shall clearly show the manner in which the utilities fit into the available space and how they relate to each other and to existing building elements and controls for maintenance operations. Drawings shall be of appropriate scale to satisfy the previously stated purposes, but not smaller than 9 mm (3/8 inch) scale. Drawings must be composite (with distinctive colors for the various trades) including but not limited to HVAC equipment, HVAC ductwork, mechanical piping, plumbing, fire protection, electrical, medical gases, telecommunications, etc.

C. The submitted drawings for a given area of the project shall show the work of all trades which will be involved in that particular area. A complete composite drawing set or complete sets of separate reproducible drawings and AutoCAD files shall be received by the Government not less than 20 days prior to the scheduled start of the work in the area illustrated by the drawings, for the purpose of showing the contractor's planned method of installation. The objectives of such drawings are to promote carefully planned work sequence and proper trade coordination, in order to assure the expeditious solutions of problems and the installation of lines and equipment as contemplated by the contract documents while avoiding or minimizing additional costs to the contractor and to the Government.

D. In the event the contractor, in coordinating the various installations and in planning the method of installation, finds a conflict in location or elevation of any of the utilities with themselves, with structural items or with other construction items, the contractor shall bring this conflict to the attention of the contracting officer immediately.

E. In doing so, the contractor shall explain the proposed method of solving the problem or shall request instructions as to how to proceed if adjustments beyond those of usual trades coordination are necessary. Contractor to include initial and two revisions as part of original contract. Utilities installation work will not proceed in any area prior to the submission and completion of the Government review of the

coordinated drawings for that area, nor in any area in which conflicts are disclosed by the coordination drawings until the conflicts have been corrected to the satisfaction of the contracting officer. It is the responsibility of the contractor to submit the required drawings in a timely manner consistent with the requirements to complete the work covered by this contract within the prescribed contract time.

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SECTION 01 01 10 (SN)
SPECIAL NOTES

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies special requirements, processes, procedures, protocols, practices, prohibitions, protections, personnel matters, provisions for unique characteristics of the Milwaukee VAMC, and practical matters pertinent to construction.

1.2 RELATED WORK

A. Section 01 35 26 SAFETY REQUIREMENTS
B. Section 01 00 00 GENERAL REQUIREMENTS.
C. Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.
D. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 ANTE-ROOM CONSTRUTION PRACTICES

A. Coordinate construction of the ante-room with NFPA 241 and the Specification Section 01 35 26 SAFETY REQUIREMENTS.
B. Type “A” and “B” activities are those in which the fire/smoke hazard risks are MINIMAL. Type “C” and “D” activities are those in which the fire/smoke hazard risks are HIGH. The General Contractor is obligated to consider the specified containment measures with the costs included within the various contract items of work. Refer to the Appendix for the **Construction Barrier and Fire Risk Assessment Matrix of Precautions** for more information.
C. Type A (Minimal Fire Risk Activity/Construction): Provide authority to proceed with work in area, includes a ceiling permit as required, when working above ceilings.
D. Type B (Limited Fire Risk Activity/Construction):
    1. Coordinate temporary construction partition installation with Specification Section 01 35 26 SAFETY REQUIREMENTS.
    2. Provide plastic from floor to ceiling above and seal joints and penetrations. All plastic will be labeled with the VA ILSM TEMPORARY BARRIER orange tag once installed indicating the start of the three days. At openings, install z-wall overlapping plastic flap barriers or equivalent.
E. Type C (Moderate Fire Risk Activity/Construction): Coordinate temporary construction partition installation with Specification Section 01 35 26 SAFETY REQUIREMENTS.

1. Ante-room construction (**as part of 1-hour construction barrier**):
   a. Ante-room shall be a 1-hour fire-rated smoke-tight temporary construction partition and shall be full height, extending through suspended ceilings to the floor slab or roof deck above.
   b. Ante-room shall be constructed from one-hour fire-rated 5/8-in type “X” gypsum board both sides of metal stud wall, mudded and taped in accordance with ASTM C840. “Double” gypsum board installation on one side (exterior) of the ante-room is authorized to achieve the 1-hour fire-rated smoke-tight temporary construction partition requirement with prior COR approval.
   c. In this case, the ante-room 1-hour fire-rated smoke-tight temporary construction partition walls will also function as an infection control barrier. Contractor shall add appropriate infection control measures. Refer to 01 35 26 SAFETY REQUIREMENTS for more information.
   d. Ante-room gypsum board walls shall be taped to the existing floors utilizing 2-in wide glass foil tape: 7.3 mil aluminum foil laminated glass cloth silver tape with silicone adhesive backing. Where the ante-room walls meet the existing deck or a 1-hour rated existing wall, the seams shall be firecaulked.
   e. The ante-room must also have a dedicated heat detector installed. See paragraph below for heat detector requirements.
   f. Ante-room outer construction door opening requires a Class C, 45-minute fire rated door with self-closing and self-latching devices.
   g. Ante-room inner door must at least be plastic Z-Type door.

2. Ante-room construction (**for infection control purposes only**):
   a. Ante-room ***need not*** be a 1-hour fire-rated smoke-tight temporary construction partition. Its walls ***do not need*** to go to the concrete deck above, nor is a hard ceiling required. At a minimum, the contractor must tape the top of the ante-room walls to the underside of the existing acoustical tile ceiling to achieve the smoke tight and infection control requirements.
   b. Ante-room shall be constructed from one-hour fire-rated 5/8-in type “X” gypsum board ***one*** side of metal stud wall, mudded and taped in accordance with ASTM C840.

c. Contractor shall add appropriate infection control measures. Refer to 01 35 26 SAFETY REQUIREMENTS for more information.
d. Ante-room gypsum board walls shall be taped to the existing floors, walls or ceilings utilizing 2-in wide glass foil tape: 7.3 mil aluminum foil laminated glass cloth silver tape with silicone adhesive backing. Where the ante-room walls meet the existing deck or a 1-hour rated existing wall, the seams shall be firecaulked.
e. The ante-room ***does not*** require a dedicated heat detector.
f. Ante-room outer construction door opening requires a Class C, 45-minute fire rated door with self-closing and self-latching devices.
g. Ante-room inner construction door opening requires a Class C, 45-minute fire rated door with self-closing and self-latching devices.

3. Provide heat detectors and notification devices (i.e., audio-visual devices) tied into the Building Siemens Pyrotronics System at the rate of one (1) detector per 1000 square foot of clear construction area. Heat detectors to be FTP-11 Addressable, Tri-Color LED, 135°F, Combination Fixed or Rate of Rise. The Contractor shall provide certification documentation once the heat detectors and notification devices (i.e., audio-visual devices) are installed and/or moved and tested prior to any construction work taking place in the space. Inside the construction space, existing units can be used if they are moved to the floor deck above.
4. Other than ante-room, all other temporary construction partitions shall be full height, extending through suspended ceilings to the floor slab or roof deck above and shall be one-hour fire rated 5/8-in type “X” gypsum board both sides of metal stud wall, mudded and taped in accordance with ASTM C840. If sprinklers are installed per a hydraulically calculated stamped and certified system and sprinklers are operational on both sides of the temporary partition and ceilings are fully intact and complete, then the partition indicated above may be permitted to terminate at the ceiling in accordance with NFPA 241.
5. Coordinate with Section 01 01 10-SN Section 3.35 for Card Reader and Physical Access Control System (PACS) requirements at ante-room outer construction door.

D. Type D (Significant Fire Risk Activity/Construction):

1. All requirements for Type C construction activities above are required for Type D construction activities.

2. When required by the project, install one-hour fire-rated temporary construction partitions to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings and other enclosures as required by the current Life Safety Code NFPA 101. This may include new horizontal egress tunnels, exit stairs, etc. Coordinate these activities with the COR.

3.2 ASBESTOS-CONTAINING MATERIALS (ACM)

A. There are both friable and non-friable asbestos-containing materials (ACM) located within hospital complex. Inspection reports are available from Facilities Management.
B. ACM might be unforeseen and potentially discovered during work. Do not disturb ACM. Refer to Specifications Section 010000 for procedures addressing discovery of ACM.
C. See Specification Sections 02 82 11 or 02 82 13 (series) for Traditional or Glovebag Asbestos Abatement details.
D. New work: no ACM allowed in new products.
E. Contractor to provide asbestos costs separately in invoices.

3.3 BADGES

A. All contractors working at Milwaukee VAMC shall be fingerprinted prior to being allowed to work on campus. Contractor ID badges can be obtained from PIV office typically 3-5 days after fingerprints clear. ID badges are required for contractor employees working at VAMC Milwaukee.
B. Contractor
    1. Furnish to each employee and subcontractor employee, regardless of how long they will be on site, and have them fill the form.
    2. When form is legibly completed by hand, scan each form with file name as above then dash then employee name (e.g., 08 SAC FORM – John Doe).
    3. Email form to VA project manager (a.k.a., COR)
B. VA and Requestor
    1. VA COR/project manager signs form, then emails Fingerprinting Office (fingerprinting) and PIV Office (badging) of pending visit from person named, forwarding form as email attachment.
    2. Contractor/Requestor visits Fingerprinting/PIV Office, building 70, E-wing south, ground floor.
    3. VA Fingerprinting Office will check to ensure proper form was received.

C. VA Processing
   1. Fingerprinting begins background check process.
   2. Assuming background check allows, then within 3 to 10 business days, VA should send to Contractor/Requestor notice that they may now obtain their Physical Access Control (PAC) badge.
   3. VA PIV Office staff take photo and issue PAC badge.

D. Badge Usage
   1. Wear badge, readily visible, above waist level, not on head or hard hat, when on grounds doing work.
   2. Lanyards and clips are not included, but may be purchased at Canteen Store.
   3. Superintendent shall inspect personnel badge (should be visible)
   4. Badges allow keyless entry into restricted areas. Names, dates, and times of access are recorded by VA Police.
   5. Badges will be valid for 90 days. The PM will notify PIV office to extend badge access for another 90 days if appropriate.
   6. Badge wearer, not anyone else, must get badge issues taken care of. For example, it is not allowed to hand over badge to superintendent to walk them down to FM or PIV for entering code on back of badge, into SAM box system. Violations may result in suspension or revocation of construction access.

3.4 CONTRACTOR'S IMPACT STATEMENTS

A. These notes will be reviewed at pre-construction meeting and will require signature from Contractor acknowledging responsibilities of contractors working on VAMC campus.

B. All sub-contractors are required to review, acknowledge, sign and submit CONTRACTOR'S IMPACT STATEMENT. It is General Contractor's responsibility to make this specification available to sub-contractors and for training sub-contractors on VAMC Milwaukee requirements herein.

   a. STANDARD POLICY: All outside contractors and sub-contractors will coordinate work within hospital with Facilities Management before beginning work.
   b. PURPOSE: Contractor will ensure that each individual contractor and sub-contractor employee is responsible for complying with established hospital standards, applicable OSHA Safety Requirements, federal, state and local

environmental regulations, wearing prescribed safety equipment, and preventing avoidable accidents.

c. PROCEDURE: Contractor will ensure that each individual contractor and sub-contractor employee review, understand and acknowledge these Special Notes prior to commencement of work scheduled at this facility. Proof of this acknowledgement: CONTRACTOR'S IMPACT STATEMENT. Contractor will forward copies of signed CONTRACTOR'S IMPACT STATEMENT monthly during construction for new contractors and sub-contractors.

3.5 CLEAN-UP

A. All work activity within occupied portions of facility shall be immediately cleaned and restored to its original finished condition upon completion of activity. If activity continues into next workday, area shall be left safe, clean, and presentable.

B. Combustible storage and debris shall be kept to smallest quantity necessary for required daily operations. Construction area shall be kept clean as indicated in general requirements and conditions.

C. Public restrooms are not to be used for cleaning of tools or equipment, i.e., paintbrushes, rollers, finishing tools, etc. Janitor's slop sinks are available for this purpose. If janitor's closets are used, they must be cleaned.

D. Trash, combustible waste, and excess construction materials: Remove daily, dispose regularly to prevent accumulation.

E. All work for area must be confined within that space. Public corridors, stairwells, equipment rooms, and vacant floors are not to be used for storage of materials or as workshop. Tracking of construction dirt into public corridors or stairwells must be prevented. At end of each workday, combustible packaging and crating materials for building products and equipment to be installed shall be removed from occupied building.

F. Provide dampened walk-off mats at entrances and exits from construction area.

G. If smoke detectors are covered during dust-producing activities, they must be uncovered daily.

3.6 COMPRESSED GAS CYLINDERS

A. Contractors who work with compressed gas cylinders must have specific training and must ensure that cylinders are secured properly when in use or in storage.

B. When compressed gas cylinders are not in use, caps must be in place.

3.7 CONFINED SPACE

A. Confined Spaces are clearly marked on campus. NO ENTRY is allowed into areas without prior approval by COR. NO ONE will be allowed to enter these areas without proper qualifications, equipment and training as required by OSHA Standards (29 CFR 1910.147)
B. Storm sewers, underground electrical vaults, and other areas that require confined space permits are identified on Drawings.
C. All hospital personnel that would require entry into these spaces must abide by Confined Space Program Procedure.
D. It is sole responsibility of outside Contractor doing work on VA Medical Center campus to coordinate entry into of these spaces or other marked permit required confined spaces with COR.
E. Anyone entering permit-required confined space must follow Occupational Safety and Health Administration (OSHA) Regulations, 29 CFR 1910.120.
F. Contractor to submit as formal submittal Confined Space Entry program (and CSE Permit if needed).

3.8 CONSTRUCTION BARRICADES & TEMPORARY SIGNAGE

A. The Contractor is responsible to post and erect barricades, temporary signage, construction and safety signs, ILSMs, and new egress routes as they apply. barricades will be erected to restrict areas where hazardous operations are performed. construction and safety signs shall consist of caution signs as determined and approved by VAMC. Egress signs, where egress has been altered for construction, shall be posted and coordinated with approved ILSM and applicable hazardous warning signs. If egress is changed due to construction, provide temporary directional signs for changes as determined by VAMC and for construction of walkways, steps, or overhead protection scaffolding or like as required providing new means of egress. **Emergency egress plan shall be developed by Contractor and submitted for approval by COR before egress routes are altered.**
B. Exit signs inside construction space: Contractor to provide luminescent Exit Signs throughout construction space such that while standing in place within construction space, exit sign is visible and path of egress can be followed.
C. Exit signs outside construction space: Contractor will cover or relocate exit signs impacted due to their construction operations as directed by ILSM and COR.

3.9 CONSTRUCTION BARRIERS

A. Refer to paragraph 3.1 of this specification and the appendix table Construction Barrier and Fire Risk Assessment Matrix for more information.

B. The construction barrier consists of both existing walls and new construction (typically the ante-room) walls. The intent of the barrier is to provide a fire-rated and smoke tight 1-hour construction partition around the construction area meeting the requirements of NFPA 241. Contractor must coordinate the erection of any new walls for construction barriers with the Specification Section 01 35 26 SAFETY REQUIREMENTS and any additional infection control requirements.

C. The construction site must be surrounded by a 1-hour fire-rated gypsum board, smoke tight and fire-stopped construction assembly. Infection control procedures (as may be also required) shall be initiated prior to any other construction activities.

D. All existing walls surround the construction area are to be inspected, repaired, patched and fire-stopped as required to bring them up to current fire-rated and smoke barrier construction requirement per NFPA 241.

E. Penetrations through the construction barriers or any other rated assembly need to be plugged with a fire-resistant mineral wool filling and recorded with an ILSM Firestop Tag (see appendix). All penetrations are to be made temporarily fire and smoke resistant by the end of the construction day; and all penetrations shall be permanently fire-caulked within 30-days of being made.

3.10 CONSTRUCTION SITE PHONE

A. Contractor to run wiring from telephone closet to construction space for installation of VA phone in constitution space. Installation of phone is required prior to construction can begin. VA will provide phone.

3.11 CONTRACTOR TRAINING & CERTIFICATES

A. All employees of Contractor and sub-contractor shall be aware of egress routes from construction areas. It is Contractor's responsibility to ensure employees are aware of fire alarm codes for building they are working in and participate in fire alarm drills and actual fire alarms.

B. Project Site Superintendent shall have30-hour OSHA certified Construction Safety course. This certificate shall be submitted to COR prior to mobilization.

C. All employees of Contractor and sub-contractors shall have10-hour OSHA certified Construction Safety course. These certificates shall be submitted to COR prior to mobilization.

3.12 CRANES & HEAVY LIFTING

A. Refer to Specification Section 01 35 26 Safety Requirements for additional details.
B. Hoisting or lifting heavy materials/items requires prior review by COR.
C. Crane operations require workplans for VA approval and cannot commence without approved permit.

3.13 DELIVERIES

A. All material deliveries at Building 111 loading dock must be coordinated with Receiving Department (Logistics Warehouse) in advance.
B. Deliveries to other project sites/buildings on campus require coordination and approval of COR.

3.14 DRESS CODE

A. All contractor personnel must be appropriately dressed for their work. T-shirts or garments with obscene or suggestive messages are not permitted. Personnel found improperly dressed will be asked to leave facility. Contractors may not remove shirts or other clothing. No articles may include offensive statements/graphics.
B. Personal Protective Equipment is responsibility of Contractor. There are many situations that require specific personal protective equipment for worker safety per OSHA.
C. Contractor to provide four (4) sets of hard hats and safety glasses for each worksite for VA staff use.

3.15 ELEVATOR USAGE

A. Contractors shall not hold or block from use public elevators in building unless authorized by COR.
B. Within Building 111 (Main Hospital), contractors shall use B-bank freight elevators only for delivery and transportation of materials and demolition materials.

3.16 EMERGENCIES AND EMERGENCY SERVICES

A. All offerors, if successful, must be able to respond to contract and Contractor created emergency services resulting from Contractor actions and installations, as determined by VAMC COR, with qualified staff personnel within one (1) hour of verbal

notification during construction stages and warranty period. Bidders must be prepared to show proof, in writing, that they can satisfy this requirement prior to award.

B. First Aid/Medical Aid/Emergency Treatment for workers: Any Contractor who witnesses medical emergency is to pick up nearest VA phone and dial “911” or operator and describe condition of emergency. post emergency phone numbers and treatment facilities if Contractor employees are injured on job, or need medical treatment.

C. Work site injuries must be reported to VA. VA has accident reporting form (form number 2162). Safety or Security and Police Service will initiate2162. Once VA has completed supervisor’s portion injured individual will be required to complete narrative portion of report. service chief responsible for contract is also required to sign report and forward original report to Safety Section.

D. Submit Fire Plan submittal for construction. Within VAMC, note that there is no difference between fire drill and actual fire.

E. Contractor will ensure that each employee on worksite knows where pull stations are in areas of work. VAMC policy for personnel IN THE AREA OF fire:
   (1) **Rescue** anyone from area if necessary
   (2) **Activate** nearest Pull Station
   (3) **Contain** fire by closing doors in area
   (4) **Extinguish** if possible or **Evacuate** area immediately

F. When NOT IN THE AREA OF fire:
   (1) Contractors are to cease activities, stay in place, and wait for further instructions or cancellation of fire drill.
   (2) DO NOT move through hospital. DO NOT use elevators or stairwells.

G. Patients and visitors sometime become anxious or irritated because of their situation. If you are faced with patient or visitor that gets aggressive with you, simply call Ext. 42222 and say “Code Green” and describe situation. Security will respond immediately.

3.17 FIRE/SECURITY ALARM SYSTEMS

A. Cover and protect smoke/heat detectors with paper bags when raising dust or creating smoke in short duration (less than 3 days) ancillary work areas. Facilities Management, Graphics and Fire Marshall shall be notified when bagging smoke detectors. Remove paper bag upon completion of your work and at end of each workday.

B. Advise Graphic Control Center (Graphics) at extension X41010 and VA Police Dispatch Desk at extension X42222 prior to work which might result in Fire Alarm System or Security System being activated. This includes but is no limited to: Smoke Detectors, Water Flow Switches, Pull Stations, Sprinkler Heads, Motion Detectors, Door Contacts, and Security Door Controls. Likewise, have approved outage from Facilities Management.
C. Notification to Graphics/VA Police and having approved outage form does not absolve Contractor from following proper procedures to prevent system from activating. Examples of these best practices include covering smoke heads with paper bags, closing valves, containing dust, monitoring and controlling security devices, etc.
D. If system activates due to Contractor’s failure to notify Graphics, or Contractor’s failure to follow proper procedures, or Contractor’s failure to obtain outage form, Modification/Settlement by Determination deduction of $2,500.00 per alarm/event will be issued to Contractor.
E. If you accidentally trip alarm, notify Graphics and Facilities Management immediately.
F. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.

3.18 HAZARDOUS, FLAMMABLE MATERIALS AND WASTE

A. Caution must be used with flammable materials, i.e., adhesives, thinners, varnishes, etc.
B. All paints shall be low odor latex paint. use odor reducing agents in paints and solvents. Ventilation shall be required if toxic or foul-smelling materials must be applied.
C. A listing of hazardous materials that will be used on job and their material safety data sheets (SDS) shall be made available to VAMC/COR upon request before chemicals are used.
D. SDS are available to Contractor for materials used in Medical Center. Contact COR if you need SDS for VA-owned chemical or material.
E. The VA GEMS Coordinator is responsible for this program and will brief Contractor during construction kickoff.
F. The Contractor may subscribe to online SDS service where SDS data sheets are readily available online in lieu of hard copies on job site.

G. Any excess or used chemicals will be removed from hospital promptly and properly disposed of by Contractor in accordance with federal, state and local regulations.
H. Any hazardous waste generated at facility must be properly contained and labeled and stored in accordance with local, state, federal and hospital regulations.
I. Only one-day supply of paints, oils, and gas cylinders is permitted within facility, unless properly stored in flammable liquid storage container. Do not store flammable materials infacility unless stored in approved non-combustible storage cabinet or prior approval by GEMS Coordinator and COR.
J. Coordinate hazardous materials issues and concerns with COR and GEMS Coordinator.
K. Gasoline powered equipment shall not be used within confines of building on VAMC campus without specific written permission from Chief, Engineering Services.

3.19 HOT WORK PERMITS

A. Hot work permits are required before cutting, soldering or welding operations begin. Before cutting, soldering or welding is conducted, obtain permission from COR through hot work permit. be responsible for obtaining hot work permits from COR.
B. Gas and oxygen canisters shall be properly chained and protected and two 10-pound fire extinguishers shall be present.
C. A fire watch shall be maintained on worksite during hot work operations, and for 30 minutes after hot work is completed.
D. All burn permits will be completed, signed and scanned within 48 hours and posted to Buzzsaw.

3.20 HOURS OF WORK

A. The usual hours of contract work shall be from 7:00am until 4:30pm, which is normal work shift for hospital employees. verify shift or shifts required for construction areas with COR. If Contractor desires to work on “other than normal” or after (off-shift) hours (including federal holidays), they shall be scheduled two days prior to starting with COR. These off-hours will be required to complete project in time allotted for contract at no additional cost to VAMC. Upon approval of VAMC, Contractor will propose scope or extent of off-hour work due to individual Contractor resources available to accomplish this project in time allotted. In addition, these off-hours will be required for utility/service interruptions, and any/other work that may interrupt operation of occupied space, i.e., some road construction, demolition, work in occupied areas, work affecting

occupied areas, etc. Some noise producing demolition operations will be required to be scheduled for off work hours as directed by COR and described on drawings.

B. Certain work items, which require off-hour work, have been identified. These items are indicated on drawings or elsewhere in Contract Documents. Refer to Phasing Notes on Drawings. All drawings shall be reviewed for off-hour work requirements and items creating disturbance to hospital staff or patient care must be performed during off-hour working periods as established and approved by COR.

C. In some construction, buildings, floors, or wards may be occupied during performance of work. In other phases, areas of alterations will be vacated. Refer to Drawings and Contract Documents for details. take measures and provide material necessary for protecting existing equipment and property in affected areas of construction against dust and debris, so that equipment and affected areas to be used in Medical Center’s operations will not be hindered. permit access to VAMC personnel and patients through other construction areas, which serve as routes of access to such affected areas and equipment. Coordinate alteration work in areas occupied by VA so that Medical Center operations will continue during construction period. Contractor may be required to construct 7 feet tall by 5 feet wide metal stud and drywall tunnels through occupied space as deemed necessary by VA for access by Medical Center personnel and maintaining construction operations.

3.21 IDENTIFICATION AND LABELING

A. Identify devices located above ceiling.

(1) Provide markers on removable ceiling and ceiling access panels to indicate locations of valves, dampers, smoke detectors, etc. and other mechanical items that may need servicing or adjustment.

(2) Use access panel markers (colored stickers or metal tack style) for acoustical tile ceilings, or engraved plastic style, 3/4in square, for mounting on panel door or equipment nameplates.

(3) Color code and annotate markers as follows:

(see next page)

Color	Notation
Red	D – Fire Damper V – Valve (sprinkler shutoff) S – Smoke Detector H - Heat Detector
Yellow	V - Valve (steam, radiation, reheat and chilled water)
Gold	V - Valve (HVAC) D - Damper (HVAC)
Blue (valves only)	O - Oxygen V - Vacuum A - Medical Air N – Nitrogen NO – Nitrous Oxide EV – Anesthesia Evacuation T – Temperature control air

(4) Where fire protection devices are located inside ductwork, provide additional tag on duct access door identifying device inside with letter size equal to or greater than 1-1/2 inches high.

3.22 INFECTION CONTROL

A. Refer to Specification Section 01 35 26 SAFETY REQUIREMENTS for additional details.

3.23 INTERIM LIFE SAFETY

A. Any life safety code violations incurred during construction or renovation must be resolved and will result in close coordination with COR and VA Safety to implement hospital’s Interim Life Safety Measures. These measures are required by JCAHO and NFPA.

B. The hospital will document whether and to what extent Interim Life Safety Measures (ILSMs) will be implemented for each project.

C. VA Safety will ensure what ILSMs are required by Contractor to temporarily compensate for hazards posted by existing Life Safety Code (LSC) deficiencies or construction activities in areas of Medical Center.

D. Implementation of ILSMs will be required in or adjacent to construction areas and throughout buildings with existing LSC deficiencies. ILSMs apply to both construction workers and affected hospital employees, and will be implemented upon

construction development and continuously enforced through construction completion.

E. Interim Life Safety Measures will require walkthrough inspections by Contractor's superintendent at daily intervals.
F. Training of workers and affected staff will always be significant part of Interim Life Safety Measures procedures.
G. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.

3.24 INSPECTIONS

A. A list of required inspections by VA personnel is included in Specification Section 01 32 16.15 Project Schedules.
B. Mechanical, plumbing and electrical work shall be inspected by VAMC Facilities Management to include appropriate engineering service shop and COR prior to being put into operation or closing if work will be hidden by walls, ceilings, drop ceilings, cover plates, access panels, etc. notify COR minimum of two days prior to inspection date; times and dates shall be scheduled and agreed upon by VA. Installations will be inspected by VA personnel to verify compliance with State, Federal, Local, Veterans Affairs Codes, regulations and contract requirements. If corrections, alterations, adjustments, or additional new construction are required, VA will be notified within 48 hours of completion of such items. These inspections, corrections, or alterations will be made at no additional time or cost to VA.

3.25 LOCK OUT/TAG OUT

A. Refer to Specification Section 01 35 26 SAFETY REQUIREMENTS for additional details.
B. Lock Out/Tag Out - No contract worker can change status/ position of ANY switch, valve or other energy source without prior approval from COR. All Lock Out/Tag Out activities need approval prior to being implemented. Any activity requiring Lockout/Tagout process must comply with Safety Requirements specification and VAMC policies.
C. Per OSHA Regulation 29 CFR 1910.147, Contractors must comply with OSHA's Safety Lock Out/Tag Out procedures.
D. Coordinate shut downs with Facilities Management and COR.
E. Only VA staff is authorized to shut down utilities unless permission is specifically granted.

3.26 NOISE

A. All drilling, chipping, or pneumatic hammering (typical) operations shall be done at time and day determined by occupants on that floor and floors above and below. coordinate this work via workplan through COR for approval.
B. The patients, visitors, and staff deserve consideration and quiet enjoyment of their premises. Anyone found being loud, rude, or otherwise annoying to patients, their guests, or staff will be asked to leave facility. Use of vulgar language will not be tolerated.
C. All work activity within occupied portions of facility shall be accomplished with minimal disruption to patients, physicians, visitors, and staff.
D. The playing of radios, tapes, and CD players is not permitted in occupied area. “Walk-man” radios/tapes/CD players are not permitted anywhere.
E. The playing of radios, tapes, and CD players is permitted in vacant areas but shall not be heard outside vacant area.
F. In inpatient areas, coordinate construction activities and debris removal with Nurse Manager or Charge Nurse to minimize disruption.

3.27 NON-DISCLOSURE AGREEMENT

A. In conjunction with the VA’s ISO and PSO, the COR may request the contractor fill out and submit a Non-Disclosure Agreement Form (see Appendix) depending upon contractor access to secure areas like IT/data/fiber closets.

3.28 OSHA COMPLIANCE

A. All Contractors are subject to Occupational Safety and Health Administration (OSHA) regulations and are expected to enforce these standards in performance of their work.
B. OSHA regulations can be found in chapter 29 of Code of Federal Regulations (CFR). Failure on part of Contractor to comply with these standards and/or conduct their work in safe fashion will result in interruption in work schedule for which Contractor will be solely responsible.
C. Any Contractor found deviating from regulatory standards or policy will immediately be issued stop work order and will be responsible for contractual conflicts related to work stoppage.
D. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.

3.29 PARKING

A. Contractors may not block fire lanes or other roadways. Contractors may not park in patient, staff or visitor parking lot or structure. Violators will be ticketed. During large construction projects, staging site may be available for parking to Contractors.
B. All Contractors who need parking must contact Facilities Management for parking permit.
C. If special parking is required, permission shall be granted and coordinated through Facilities Management. Until then, Contractors shall park in designated Contractor Parking Lot. Limited loading and unloading will be permitted at loading dock area.

3.30 PATIENT/VISITOR PRIVACY

A. Contractors may not review, acknowledge or move patient information or records.
B. Contractors may not acknowledge patient or visitor unless spoken to - even if individual is known on personal basis.
C. Cell phones are to be used only in designated areas.

3.31 PENETRATIONS

A. All wall, floor and ceiling penetrations created by work on this contract, whether by demolition or new construction, shall be patched by Contractor or as assigned by Contractor. All patching materials shall be of like kind or suitable substitute approved by NFPA or UL. Hilti Firestop products are only approved firestop penetration products at VAMC.
B. Penetrations must be located, marked, and sealed by Contractor responsible for penetration. As penetrations are sealed, COR must be contacted to inspect penetrations for proper sealing. Only one (1) one type of fire sealant is permissible per hole.
C. To ensure that penetrations are sealed, Contractors must obtain Ceiling Access Permit from COR prior to work commencing. permit will be in this person’s possession while inspections and/or work are being performed.
D. When penetration work and fire sealant work is complete, sign and return permit to COR for subsequent inspection and verification.
E. Photo-documentation in lieu of interim inspections can be performed to validate work.
F. At end of each work day and prior to leaving work site, replace ceiling tiles temporarily removed to do work above finished ceilings in corridors.

G. If it is not practical to replace ceiling tiles daily, Contractor is to construct 7 feet tall by 5 feet wide metal stud and drywall tunnels through occupied spaces as deemed necessary by COR for access by VAMC personnel and maintaining construction operations. Upon first incident of Contractor not replacing ceiling tiles, this tunnel construction must commence immediately prior to further construction on project.
H. Reference section 01 01 10 – 1HR for additional information.

3.32 PROTECTION OF WORK & ADJACENT AREAS

A. Refer to Specification Section 01 00 00 GENERAL REQUIREMENTS for additional details.
B. Contractor to provide drop cloths, hard board, plastic, etc. when working in occupied areas to avoid staining or damaging existing carpets or vinyl tile floors.
C. The Contractor is required to preserve and protect structures, equipment, and vegetation on or adjacent to work site, which are not to be removed and which do not unreasonably interfere with work required under contract. Contractor will be required to repair damage to facilities resulting from failure to exercise reasonable care in performing work.
D. Any damage caused by Contractor’s employees is to be reported to COR or Facilities Management Project Section immediately.

3.33 RESTROOM USAGE

A. Contractors are to use public restrooms unless otherwise instructed to specific restrooms or portable facilities.
B. Portable facilities are responsibility of Contractor.

3.34 SCHEDULING OF WORK

A. Refer to Specification Section 01 32 16.15 PROJECT SCHEDULES for additional details.
B. Verbally schedule work areas with COR not less than fifteen (15) calendar days in advance of commencement of work. Verbal notification shall be backed up and verified in writing.
C. The VA shall require detailed workplans from Contractor for evolutions that require review/approval from other entities in VA (i.e., VA Police, Grounds, Logistics, etc.).
D. verbally schedule outages or service interruptions with COR not less than fifteen (15) calendar days in advance of intended commencement of work. Notification does not guarantee date of scheduled outage or service interruption however COR will schedule such dates and inform Contractor. Date will be scheduled with medical center personnel when service interruption

will minimize affect to hospital patients and operations. Contractor to submit VA System Outage Request form to COR not less than fifteen (15) calendar days in advance of intended commencement of outage work. Contractor to attend two (2) weekly pre-outage meetings with Engineering and staff to coordinate actual date of outage, duration, time of outage, phasing, and affected services. In addition, Contractor to attend pre-outage meeting one hour prior to outage to coordinate communications, readiness, pre-outage checklist, document requirements, temporary measures, lock out tag out and other outage requirements and procedures.

E. Contractor to attend weekly construction meetings.

3.35 SECURITY OF CONSTRUCTION SITES

A. All construction sites must be secured to prevent inappropriate access by patients, visitors, and employees. While such security fences, doors, and barricades are temporary, they must be substantially installed to control access to site. Existing security system (Pegasys/P2000 by Johnson Controls) must be extended to each construction access door. Each construction door must be provided with Card Reader and electric strike lock programmed to existing VA security system. Construction sites and security measures must be monitored daily to ensure that security is maintained. COR will alert VA Police about construction project & site. At close of activity daily, before securing site or portions of site, ensure that there are no patients, visitors, or staff in area. If construction site problems arise, Contracting Officer and COR will take appropriate action to correct safety and security conditions up to and including Modification/Settlement by Determination deduction of $2,500.00 per each event (or notice from Police) that construction area was left unsecured.

B. Keys for access to construction/work areas may be issued to Contractor at discretion of COR. Up to three sets of keys will be provided at no cost. All keys will be assigned through SAMS box and Contractor will be given access based on their VA ID Card. Upon completion of work, failure to return issued keys to COR will result in issuance of Settlement by Determination in amount of $100.00 for each outstanding key. In addition, $50.00 fee will be paid to VA for each outstanding key. Keys are to be picked up and returned daily. If keys are not returned by end of day, modification of $50.00/key per day will be assessed against Contractor.

C. VA engineering, safety/fire department, and police staff must have right to access construction site always to perform their assigned responsibilities.
D. Lock up worksite always to prevent patients and other unauthorized people from entering site. Contractors may lock up their tools etc., with personal locks.
E. Materials will be kept secure by Contractor on job site, or in separate COR-authorized storage space. Hallways are not to be used for storage. Contractors will manage their storage areas and assure sites are kept clean and safe (OSHA standards apply).
F. Any shared space(s) must be accessible by Facilities Management. Do not block access to electric panels or fire protection equipment. Any disputes or concerns will be directed to Facilities Management.
G. The need for job site security is much greater when work is being conducted in psychiatric areas to protect safety of patients. All job boxes, tools, etc., must be locked up even when workers are on site unless there’s enough activity to assure that patients cannot access tools or site. Verify that no one is in construction area upon locking up site for evening.
H. Two evacuation routes from worksite must be maintained always.
I. Access is limited to areas such as critical care and surgical units, as well as mechanical/electrical rooms, etc. Access can be obtained through Facilities Management.
J. Access to floors of facility after normally scheduled work hours (Monday-Friday, 7:00am – 4:30pm) must be scheduled in advance with COR. VA Police reserve right to refuse access to anyone without prior authorization and identification.

3.36 SMOKING

A. The smoking policy at VAMC is that smoking is NOT permitted in building or within 50 feet of any building entrance and only in areas designated for smoking. All construction employees must comply with this policy. A copy of hospital smoking policy will be supplied upon request.
B. Violation of smoking policy will result in worker being removed from worksite for duration of project.
C. The Contractor’s supervisor will enforce this no smoking policy.

3.37 STOP WORK

A. VA Safety and COR have Director’s permission and authority to stop work whenever conditions pose imminent threat to life and health or threaten damage to equipment or buildings.

3.38 SUB-CONTRACTORS

A. The Contractor has responsibility to assure that all sub-contractors and their workers are properly trained and follow these specifications. Assistance from VA staff will be providing on case by case basis on technical issues.
B. The VA reserves right to approve of sub-contractor being used to complete project. A full list of sub-contractors working on contract to include names, phone numbers, email address and address shall be provided prior to mobilization.
C. Every sub-contractor is required to be fingerprinted and badged.
D. A worker on-site must be designated “in charge” at times during project.

3.39 SUBMITTALS & SOLE SOURCE ITEMS

A. Refer to Specification Section 01 33 23 Shop Drawings, Product Data & Samples for additional details.
B. Start of Construction: Contractor’s submittals must be forwarded in sufficient time to permit proper consideration and approval by government and be timed to permit adequate lead time for procurement of contract required items. Delivery of submittals to COR or verbal acknowledgement of receipt by COR **does not** constitute approval. Pay attention to fact that pre-construction activities (submittals) are distinct from construction and close-out activities with regards to overall period of performance.
B. Sole Source Items: There will be no substitutions for products and services listed below. Sole source items to be in accordance with VAAR 852.236-90 Restriction on submission and use of equal products. This clause applies to following items:

System / Equipment	Manufacturer and Model
Firestop Systems	HILTI Firestop Systems

3.40 TRAFFIC CONTROL

A. Contractors shall provide trained personnel and/or equipment, signage, barricades etc., to regulate traffic whenever construction operations affect traffic patterns.

3.41 TRENCHING

A. Refer to Specification Section 01 35 26 SAFETY REQUIREMENTS for additional details.
B. OSHA regulations and VA permits/inspections must be followed and requested during trenching operations.

3.42 UNUSUALLY SEVERE WEATHER CONDITIONS

A. The Contractor is expected to understand seasonal conditions affecting work and to consider normal weather variations at site location during planned period of performance. Before determination that Contractor is entitled to additional time extension (excused delay) for unusually severe weather, demonstrate (1) that weather was unforeseeable and unusually severe and (2) that critical path work was delayed by weather. Risk allocation for unusually severe weather conditions is responsibility of Contractor and is not compensable.

3.43 WASTE MANAGEMENT

A. Refer to Specification Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT for additional details.
B. Other specifications have requirements for waste, debris, discarded materials, unsuitable materials, and contaminated soil.

3.44 WORK SITE REQUIREMENTS

A. Contractor to provide list of emergency contacts at entrance to construction site. This list shall include COR, Superintendent and VA Police contact information. See construction door sign template.
B. Contractors are to maintain their work area as clean as possible while working and cleanup thoroughly day.
C. Prior to utilities or critical systems being interrupted, submit outage request in writing (via outage request form) at least two weeks prior to expected outage date. Submit outage request to COR. Only Facilities Management personnel will shut off utility.
D. All Contractors are expected to use courtesy. Loud, vulgar, abusive language, sexual harassment and aggressive behavior will not be tolerated.
E. Contractors working above ceiling are required to replace disturbed ceiling tile by end of each day.
F. Prior to making penetrations in walls, floors or ceilings, it is Contractor’s responsibility to identify affected rated wall systems.
G. All repaired penetrations on rated wall systems must be completed using fire-rated material matching rating of wall system and must inspected by COR before ceiling tiles are replaced or area is concealed.
H. Temporary construction partitions of non-combustible materials shall be installed as required to provide fire rated and smoke tight separation between areas undergoing renovation and/or construction and adjoining areas that are occupied by facility.

I. Exits for occupied areas of building including rooms, suites, corridors and floors shall not be blocked by construction or by construction materials. Exit may be blocked temporarily if it is unavoidable and adequate alternative measures are provided, such as signage, instructions to occupants and approved in advance by COR and VA Safety via ILSM process. ILSMs, if active, require daily inspections by Contractor to COR.

J. Existing fire protection systems including fire alarm systems, smoke detection systems, and sprinkler systems shall not be altered except as required for alteration and/or renovation project. Any alteration to system shall be coordinated with COR. When sprinkler or fire and smoke detector systems are out of service for more than eight hours be responsible to institute Fire Watch till systems are operational.

K. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.

L. Locate existing fire extinguishers and pull stations in areas of work.

M. Fire hazard inspections shall be conducted daily by Contractor once construction starts and until work is turned back over to facility.

N. All temporary electrical wiring and equipment used for construction shall be installed and used in accordance with pertinent provisions of NFPA 70 and National Electrical Code.

O. maintain construction site to permit access by fire department as necessary. Clear building construction areas of obstructions so that portions are accessible for fire department apparatus and permit emergency egress of patients and other personnel.

P. All necessary precautions shall be taken by Contractor to prevent accidental operation of existing smoke detectors by minimizing amount of dust generated in vicinity of smoke detectors. Any activity that may generate dust or smoke shall be reviewed with COR and Infection Control nurse.

Q. Apprentices are authorized to work on projects disciplines providing following requirements are met

(1) Completion of OHSA-10 training and certification turned in as required for other workers.

(2) Apprenticeship documentation turned in to contracting and continued direct supervision by journeyman.

(3) Apprentices are not allowed to work at Clement J Zablocki VA Medical Center on their own nor without continuous direct supervision.

APPENDIX - STANDARD REQUIRED FORMS / TABLES / MATRICES

A. **Contractor's Impact Statement** - Completed and signed by contractor and sub-contractor working on project *prior to start of their construction.* It is Contractor's responsibility to update this list monthly to COR for new sub-contractors working on contract.
B. **Contractor's Checklist** - Completed and signed by General Contractor *prior to start of construction*.
C. **Daily Log of Construction** - Completed daily by Contractor and scanned in and *posted to Buzzsaw weekly*.
D. **Daily Intermediate Life Safety Measures (ILSM) Inspection Form** - Completed daily by Contractor and scanned in and *posted to Buzzsaw weekly (as required)*.
E. **Construction Door Template** – Prepared by Contractor for posting on construction door. Submit to COR for approval prior to posting.
F. **Non-Disclosure Agreement** – This form will be needed for every contractor and sub-contractor that would have access to any data or fiber closet on the campus.
G. **Construction Barrier and Fire Risk Assessment Matrix** – This table lists the descriptions of Type A, B, C and D construction activities and the precautions required for each.
H. **SAC FORM** – Each contractor working on the contract shall have a completed SAC form on file with the COR.
I. **ILSM Temporary Barrier and FIRESTOP Tags** – GC to request when fire-rated assemblies have penetrations.

CONTRACTOR'S IMPACT STATEMENT

System	Possible Interruption	Possible Effect to Patients
Electrical	- Changing position of switches and breakers - Cutting or splicing into wires - Disconnecting wires/terminals - Disturbing Junction Boxes/ Electrical Panels - Core Drilling - Demolition of walls - Excavation	- Electrical Systems provides LIFE SUPPORT (Directly and Indirectly) - Can cause DEATH to critical patients
Water Lines	- Turning valves - Cutting into lines - Demolition & Excavation	- Dialysis, OR, HVAC, ICU, X Ray, etc. - Can cause DEATH to critical patients - Infection Control and Major Cleanup issues
Medical Gases - Oxygen - Air - Vacuum - Nitrous Oxide - Nitrogen	- Cutting or disturbing into lines (labeled, unlabeled) - Changing valve positions - Deactivating alarms - Demolition & Excavation	- Oxygen, vacuum, air, etc. in ICU, OR, Med/Surg. - Can cause DEATH to critical patients
HVAC	- Shutting down - Modifying - Changing controls - Cutting into roof - Producing foul odors near intakes - Cutting into chilled water lines - Obstruct fresh air intake	- Temperature is critical in OR, ICU, etc. - Infection Control and Major Air Quality Issues
Fire Alarm and Sprinklers	- ANY modifications - Covering/removing smoke heads - Demolition & Excavation of utilities - Damage/activate sprinkler heads - Duct work modifications	- Compromising Fire Safety - False Alarms - Floods - Major disruptions and distractions ALL THE ABOVE CAN RESULT IN DEATH
Code Alarms Nurse Call Wander Guard	- Demolition & Excavation - Unplugging - Changing position of switches/breakers	- Lack of communicating system can result in patient death or injury

IF THERE IS ANY QUESTION REGARDING ANY OF THE INFORMATION ON THIS DOCUMENT, IMMEDIATELY CONTACT FACILITY MANAGEMENT OR VA SAFETY OFFICE TO RESOLVE ISSUES PRIOR TO WORK COMMENCEMENT.

Contractor Name _____
Company _____
Signature / Date _____

CONTRACTOR CHECKLIST

This agreement is between _____ and _____
Project Name (ref. #)_____
Project Start _____; Work Allowed Between _____ and _____

Before performing work on facility premises, outside Contractors must read this checklist and comply with local, state, federal and facility safety policies.

1.0 **Life Safety** Will Contractor compromise part during Life Safety System of this facility (ceiling tiles, penetrations in smoke or fire walls, blocking exits, shutting down fire/smoke detection or fire suppression, etc.)?
Y N If yes, describe in detail:

1.1 **ILSM** Are Interim Life Safely Measures necessary?
Y N If yes, provide plan/sketch for review/approval.

2.0 **Services** Will there be compromises to patient services during work performed?
Y N If yes, describe in detail:

2.1 What adjustments need to be implemented to minimize impact to residents, visitors and staff?
Describe:

3.0 **Chemical**: Will hazardous chemicals (liquids or gases) be used on-site?

Y N If yes, what risks do they create for facility staff? Is there chance of exposure?

3.1 Are there facility chemicals being used, stored or handled where Contractor will be working?
Y N If yes, has Contractor been informed by issuing SDS's?

4.0 **Hot Work** Will Contractor use equipment which will generate open flames, sparks or other ignition sources?
Y N If yes, **Fire Watch will** be necessary to be posted during Hot Work activities.
4.1 Will flammable chemicals be in area?
Y N If yes, describe in detail:

5.0 **Confined Spaces** Does work involve entry into confined space?
Y N If yes, retain copy of Contractor's Confined Space Entry program (and CSE Permit if needed).

6.0 **Lockout/Tagout** Does work involve maintenance on energized equipment or systems?
Y N If yes, retain copy of Contractor's LOCKOUT/TAGOUT program.

6.1 Is there impact to residents, visitors, or staff during this procedure?
Y N If yes, describe impact, ways to minimize impact and who has been notified.

7.0 **Unsafe Conditions/ Impact to Residents, Visitors and Staff** Are there unusual or unsafe conditions which need to be addressed and/or communicated to facility staff, visitors or residents?
Y N If yes, describe.

8.0 **List departments/areas** in which you will be working.

8.1 **List potential hazards** to you/your workers in areas in which you are working:

8.2 **List specific problems** that can arise if wrong actions are taken area(s) in which you are working.

9.0 **Safety Officer Contact Person:**
Facility COR:
First Aid Plan:
Fire Plan:
Disaster Plan:
Restricted Access:

10.0 **Restricted Areas** Construction workers are allowed in following areas of hospital.

(Contractor Supt / Safety Officer) (Facility COR)

Date: _____ Date: _____

DAILY LOG OF CONSTRUCTION			M T W Th PROJECT:	
BUILDING / LOCATION			CONTRACT NO. VA69D-	DATE
CONTRACTOR			CONTRACTOR SUPERINTENDENT	
WEATHER *(Rain, Snow, Cloudy, Windy, etc., OR NA if indoors)*	TEMP. High	Low	SITE *CONDITIONS (CLEAN, DEBRIS, DUST, ETC.)*	

NO. CONTRACTOR'S MEN BY JOB CATEGORIES	NO. SUB-CONTRACTOR'S MEN BY JOB CATEGORIES

EQUIPMENT ON JOB Brief description of	No. Units	Working Yes	No	MATERIALS DELIVERED
				OFFICIAL VISITORS TO JOB SITE

STATUS OF WORK

ITEM NO. Brief description of work in progress, questionable performance, unforeseen developments on job etc. Include tests made and samples taken.

STATUS OF INFECTIOUS CONTROL MEASURES (NEGATIVE AIR FLOW, CLEAN WALK OFF MAT, ANTE-ROOM SECURE,…)

NEGATIVE AIR FLOW PRESSURE READING: _____

SAFETY COMMENTS

DIFFICULTIES WITH CONTRACTOR OR REPRESENTATIVE

UNFORESEEN DEVELOPMENTS ON JOB CONTINUED *(Describe conditions, action taken; person contacted, recommended actions)*

SIGNATURE	TITLE PROJECT SUPERINTENDENT

Daily Intermediate Life Safety Measures (ILSM) Inspection Form FORM QCA-01A

INSTRUCTIONS: This form is to be utilized when significant hazards posed by existing NFPA 101 deficiencies or construction activities are in progress. ILSM must be implemented upon project start and continuously enforced through project completion to provide level of life safety comparable to that described in Chapter 1-7, 31 and applicable occupancy chapters of Life Safety Code. WHERE APPLICABLE NOTE EXCEPTIONS ONLY OF AREA IDENTIFIED AS BEING DEFICIENT DURING INSPECTION AND EXPLAIN IN SUFFICIENT DETAIL IN COMMENTS SECTION OF THIS FORM. TURN COMPLETED FORMS INTO THE LHS SAFETY OFFICER.

WEEKLY ILSM FORM **PROJECT:**							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
1. Are exits readily accessible and provide unobstructed egress?							
2. If required, due to inaccessibility of existing, have alternate exits been established?							
3. If alternate exists have been established, are personnel in area informed and aware of their relocation and existence?							
4. Are existing and relocation exits clearly identified and able to be seen in event of emergency or fire?							
5. Are fire evacuation routes posted and do they reflect up-to-date changes and alternate escape routes due to construction deficiencies?							
6. Are written procedures and guidelines posted in immediate and adjacent areas for what to do and who to call in event of fire or emergency?							

WEEKLY ILSM FORM **PROJECT:**							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
7. Are personnel in immediate and adjacent areas aware and informed as to procedures and guidelines to follow in event of fire or emergency?							
8. Do fire alarms, detection, and suppression equipment and systems appear to be operational?							
9. If fire alarm or suppression systems are impaired or temporarily made nonfunctional has fire watch, as required or necessary, of area been established?							
10. If existing fire alarm or suppression systems/equipment are impaired, have measures been taken to provide equivalent equipment/systems for adequate protection? Note date of installation for equivalent measures to right.							
11. If fire alarm or suppression systems are impaired, are temporary equipment/systems being inspected and tested at least monthly?							
12. If temporary fire alarm or suppression systems are installed, are personnel in area aware and informed on how to operate or utilize in event of fire or emergency?							
13. Has “No Smoking” policy been posted, implemented and enforced in construction area?							

WEEKLY ILSM FORM **PROJECT:**							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
14. Are construction/remodel area storage, waste and debris being maintained to minimize potential for fire or safety hazards during daily operations?							
15. Are temporary partitions built to be smoke tight and of noncombustible/fire retardant materials to minimize spread of smoke or fire within building?							
16 Do electrical panels, temporary wiring, extension cords, tools and equipment appear to be installed, utilized, and functioning in safe manner?							
17. In general, are exterior construction site, buildings, and ground free of hazard and potential safety violations?							
18. If there is gas/arc welding or cutting being performed within building or on site, have additional fire safety precautions been taken and necessary equipment provided and utilized?							
19. If there is gas/arc welding or cutting being performed within building or on site, has Plant Operations department been notified?							
20. If there are hand and safety rails required, are they in place and maintained in good condition?							

WEEKLY ILSM FORM **PROJECT:**							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
21. Are extension cords that are being used 3 wire grounded type?							
22. If there are temporary electrical outlets provided, do they have ground fault protection at receptacle or at panel?							
23. I f hazardous chemicals are present and/or being used, are they being limited to amount needed and used daily?							
24. Are MSDS sheets readily available for hazardous chemicals that are present or being used?							
25. Do ladders and scaffolds appear to be in satisfactory condition and being utilized in safe manner?							
26. Is personnel protective equipment, such as safety glasses, hard hats and etc. needed or required and being used?							
27. If infection control is required, are appropriate policies and procedures known and being followed?							
28. If electrical equipment needs to be de-energized, are applicable “Lockout/Tagout” procedures being followed?							
PLACE INITIALS OF PERSON PERFORMING DAILY INSPECTION TO THE RIGHT.							

Inspection Results week of: _____
Project # _____
Contractor: _____
COR _____

CONSTRUCTION DOOR TEMPLATE

Construction Contacts **8.5 x 11 page** **Project Info (Name and Number)** **Contact Names/Numbers:** **COR** **Contractor Supt** **VA Police** **VA Safety**	**Access Control Signs** **8.5 x 11 page** **Area Closed as we improve VA for Veterans** **Under Construction - Do Not Enter** **Hard Hat, Steel Toes & Safety Glasses Required.** **Contact COR for admittance.**
ICRA PERMIT HERE	**ILSM HERE**

NON-DISCLOSURE AGREEMENT

Quotation from USC Title 18, Section 1905:

Whoever, being an officer or employee of the United States or of any department or agency thereof, publishes, divulges, discloses, or makes known in any manner, or to any extent not authorized by law any information coming to him in the course of his employment of official duties or by reason of any examination or investigation made by, or return, report or record made to or filed with, such department or agency or officer or employee thereof, which information concerns or relates to the trade secrets, processes, operation, style of work, or source of key income, profits, losses or expenditures of any person, firm, partnership, corporation or association; or permits any income return of copy thereof or any book containing any abstract or particulars thereof to be seen or examined by any person except as provided by law; shall be fined not more than $1,000 or imprisoned not more than one year, or both; and shall be removed for office of employment.

As a government employee or official Government contractor employee, I certify that I will not disclose, publish, divulge, release, or make known, in any manner or to any extent, to any individual other than an appropriate or authorized government employee, the content of any procurement sensitive information provided during the course of my employment. I understand that for the purpose of this agreement, procurement sensitive information is to include procurement data contract information, plans, and strategies.

I hereby certify that I have read the non-disclosure agreement described above and I am familiar with the directives and policies governing this disclosure of procurement sensitive information. I will fully and completely observe these directives and will not disclose such information to any unauthorized person, or use any information obtained for private use or gain.

Name (Please Print)

Signature

Date

Construction Barrier and Fire Risk Assessment Matrix

TYPE A **Minima Fire Risk**	**Inspection and Non-Invasive Activities**. Includes, but is not limited to: ▪ removal of ceiling tiles for visual inspection limited to 1 tile per 50 square feet ▪ painting (but not sanding) ▪ wall covering, electrical trim work, minor plumbing, and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection. ▪ Removal of floor tile less than 25 square feet, non-ACM and no grinding or dust generating activities
TYPE B **Limited** **Fire Risk**	**Small scale, short duration activities that can be completed within 3 calendar days. Work that requires a moderate level of demolition and does not pose a potential fire hazard. Cutting/burning operations that require a burn permit are prohibited. No electrical corded power tools permitted.** Includes, but is not limited to: ▪ installation of telephone and computer cabling ▪ access to chase spaces ▪ asbestos abatement of flooring tile/mastic removal, glove bag operations, Transite panel removals ▪ duct work, electrical, plumbing, piping work above ceiling within a 50-square foot area. ▪ cutting of walls or ceiling where fire hazard is minimal. ▪ sanding of walls for painting or wall covering ▪ removal of floor coverings, ceiling tiles and casework
TYPE C **Moderate** **Fire Risk**	**Work that requires a moderate to high level of demolition, cutting/burning operations or requires demolition or removal of any fixed building components or assemblies. Power corded tools and work that provides a potential fire hazard.** Includes, but is not limited to: ▪ Removal of building components or elements requiring use of open flame or power chisel ▪ new construction or renovations over 3 days' duration ▪ major duct work, plumbing, piping, or electrical work ▪ soldering or brazing operations ▪ ANY activity that requires a burn permit
TYPE D **Significant Fire** **Risk**	**Major demolition and construction projects involving cutting/burning operations or requires demolition or removal of any fixed building components or assemblies. Power corded tools and work that provides a potential fire hazard.** Includes, but is not limited to: ▪ activities which require consecutive work shifts ▪ requires heavy demolition or removal of a complete building system ▪ new construction or renovations over 3 days' duration

ILSM TEMPORARY BARRIER TAG

PROJECT: _____

PRIME CONTRACTOR: _____

SUB CONTRACTOR: _____

EMERGENCY CONTACT NO. _____

BARRIER INSTALLATION DATE: _____

BARRIER EXPIRATION DATE: _____

(MAX 3 DAYS)

- - - E N D - - -

SAC-SPECIAL AGREEMENT CHECK
For Construction Contractors

NAME: _____
(Last Name) *(First Name)* *(Middle Name/none)*

SSN: _____ DOB: _____

ALIAS/none: _____ RACE: _____ SEX: _____

EYE COLOR: _____ HAIR COLOR: _____ HT: _____ft._____in. WT: _____lbs.

PLACE OF BIRTH: _____
(City / State / Country)

RESIDENT ADDRESS: _____

CITIZENSHIP: _____

SCARS, MARKS, TATTOO(S)/none: _____

TRADE/DISCIPLINE: _____ APPRENTICE / JOURNEYMAN / MASTER / NA
Circle one

Contractor Information

PO#: 695-_____ Contract Expiration Date: _____

Project Name: _____ Contract#: VA69D-_____

Prime Contractor: _____

Prime Address: _____

Employing Sub-Contractor: _____

Sub-Contractor Address: _____

If privately owned vehicle is or will be, even once, parked on grounds
Driver's License#: _____ Plate#: _____(____)___
(state)
Vehicle: Make: _____ Model: _____ Year: _____ Color: _____

Computer Access Required for Contract? __ Y / N __ Construction Door Access Needed? __Y / N __

Location of Construction Door & Construction Door Name/Address:
_____

_____
Printed COR Name / COR Signature / Date

Version 2017.02.01

NON-DISCLOSURE AGREEMENT

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As a government employee or official Government contractor employee, I certify that I will not disclose, publish, divulge, release, or make known, in any manner or to any extent, to any individual other than an appropriate or authorized government employee, the content of any procurement sensitive information provided during the course of my employment. I understand that for the purpose of this agreement, procurement sensitive information is to include procurement data contract information, plans, and strategies.

I hereby certify that I have read the non-disclosure agreement described above and I am familiar with the directives and policies governing this disclosure of procurement sensitive information. I will fully and completely observe these directives and will not disclose such information to any unauthorized person, or use any information obtained for private use or gain.

Name (Please Print)

Signature

Date

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

PART 1- GENERAL

1.1 DESCRIPTION:

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

B. Physical work on contract shall follow CPM submittal approval.

C. For each Construction Progress Meeting, submit 3-Week Short-Interval Production Schedule (SIPS) to show current work in process. SIPS shall reflect trades on sight, days for each trade on site during the period, and list issues/concerns/delays. Milestone dates shall agree with CPM.

1.2 CONTRACTOR'S REPRESENTATIVE:

A. The Contractor shall designate an authorized representative responsible for the Project Schedule including preparation, review and progress reporting with and to the Contracting Officer's Representative (COR).

B. The Contractor's representative shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the requirements of this specification section.

C. Retain outside consultant to complete CPM. Section 1.3 of this specification applies.

D. If the Contractor chooses not to designate an authorized representative responsible for the project schedule and will take those tasks on themselves, they must notify the COR in writing within 10 days of the bid acceptance (See 1.3 below).

1.3 CONTRACTOR'S CONSULTANT:

A. The Contractor shall submit a qualification proposal to the COR, within 10 days of bid acceptance. The qualification proposal shall include:

1. The name and address of the proposed consultant.

2. Information to show that the proposed consultant has the qualifications to meet the requirements specified in the preceding paragraph.

3. A representative sample of prior construction projects, which the proposed consultant has performed complete project scheduling services. These representative samples shall be of similar size and scope.

B. The Contracting Officer has the right to approve or disapprove the proposed consultant, and will notify the Contractor of the VA decision within seven (7) calendar days from receipt of the qualification

proposal. In case of disapproval, the Contractor shall resubmit another consultant within 10 calendar days for renewed consideration. The Contractor shall have their scheduling consultant approved prior to submitting any schedule for approval.

C. Consultants deemed pre-approved by VA: CCS/OS, Chicago, IL; Spire Consulting Group, Austin, TX. Others proposed shall be compared to experience deemed similar to that offered by these entities.

1.4 COMPUTER PRODUCED SCHEDULES

A. The contractor shall provide monthly, to the Department of Veterans Affairs (VA), all computer-produced time/cost schedules and reports generated from monthly project updates. Contractor will also submit an Earned Value report with the monthly schedule update and request for payment. This monthly computer service will include: three copies of up to five different reports (inclusive of all pages) available within the user defined reports of the scheduling software approved by the Contracting Officer; a hard copy listing of all project schedule changes, and associated data, made at the update and an electronic file of this data; and the resulting monthly updated schedule in both PDF and CSV format. These must be submitted with and substantively support the contractor’s monthly payment request and the signed look ahead report. The COR shall identify the five different report formats that the contractor shall provide.

B. The contractor shall be responsible for the correctness and timeliness of the computer-produced reports. The Contractor shall also responsible for the accurate and timely submittal of the updated project schedule and all CPM data necessary to produce the computer reports and payment request that is specified.

C. The VA will report errors in computer-produced reports to the Contractor’s representative within ten calendar days from receipt of reports. The Contractor shall reprocess the computer-produced reports when requested by the COR, to correct errors which affect the payment and schedule for the project.

1.5 THE COMPLETE PROJECT SCHEDULE SUBMITTAL

A. Within 30 calendar days after receipt of Notice to Proceed, the Contractor shall submit for the Contracting Officer's review; digital PDF file (30 x 42 inches), and an electronic file in the previously approved CPM schedule program. The submittal shall also include one copy of a computer-produced activity/event ID schedule showing project duration; phase completion dates; and other data, including event cost. Each activity/event on the computer-produced schedule shall contain as a minimum, but not limited to, activity/event ID, activity/event description, duration, budget amount, early start date, early finish date, late start date, late finish date and total float. Work activity/event relationships shall be restricted to finish-to-start or start-to-start without lead or lag constraints. Activity/event date constraints, not required by the contract, will not be accepted unless submitted to and approved by the Contracting Officer. The contractor shall make a separate written detailed request to the Contracting Officer identifying these date constraints and secure the Contracting Officer’s written approval before incorporating them into the network diagram. The Contracting Officer’s separate approval of the Project Schedule shall not excuse the contractor of this requirement. Logic

events (non-work) will be permitted where necessary to reflect proper logic among work events (i.e. VA inspections), but must have zero duration. The complete working schedule shall reflect the Contractor's approach to scheduling the complete project. **The final Project Schedule in its original form shall contain no contract changes or delays which may have been incurred during the final network diagram development period and shall reflect the entire contract duration as defined in the bid documents.** These changes/delays shall be entered at the first update after the final Project Schedule has been approved. The Contractor should provide their requests for time and supporting time extension analysis for contract time as a result of contract changes/delays, after this update, and in accordance with Article, ADJUSTMENT OF CONTRACT COMPLETION.

B. Within 30 calendar days after receipt of the complete project interim Project Schedule and the complete final Project Schedule, the COR will do one or both of the following:

1. Notify the Contractor concerning his actions, opinions, and objections.

2. A meeting with the Contractor at or near the job site for joint review, correction or adjustment of the proposed plan will be scheduled if required. Within 14 calendar days after the joint review, the Contractor shall revise and shall submit three blue line copies of the revised Project Schedule, three copies of the revised computer-produced activity/event ID schedule and a revised electronic file as specified by the Contracting Officer. The revised submission will be reviewed by the Contracting Officer and, if found to be as previously agreed upon, will be approved.

C. The approved baseline schedule and the computer-produced schedule(s) generated there from shall constitute the approved baseline schedule until subsequently revised in accordance with the requirements of this section.

1.6 WORK ACTIVITY/EVENT COST DATA

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

B. The Contractor shall cost load work activities/events for test, balance and adjust various systems in accordance with the provisions in Article, FAR 52.232 – 5 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS) and VAAR 852.236 – 82 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (WITHOUT NAS)).

C. The Contractor shall cost load work activities/events for all BID ITEMS including ASBESTOS ABATEMENT. The sum of each BID ITEM work shall equal the value of the bid item in the Contractors' bid.

1.7 PROJECT SCHEDULE REQUIREMENTS

A. Show on the project schedule the sequence of work activities/events required for complete performance of all items of work. The Contractor Shall:

1. Show activities/events as:

a. Contractor's time required for submittal of shop drawings, templates, fabrication, delivery and similar pre-construction work.

b. Contracting Officer's and Architect-Engineer's review and approval of shop drawings, equipment schedules, samples, template, or similar items.

c. Interruption of VA Facilities utilities, delivery of Government furnished equipment, and rough-in drawings, project phasing and any other specification requirements.

d. Test, balance and adjust various systems and pieces of equipment, maintenance and operation manuals, instructions and preventive maintenance tasks.

e. VA inspection and acceptance activity/event with a minimum duration of five work days at the end of each phase and immediately preceding any VA move activity/event required by the contract phasing for that phase.

2. Show not only the activities/events for actual construction work for each trade category of the project, but also trade relationships to indicate the movement of trades from one area, floor, or building, to another area, floor, or building, for at least five trades who are performing major work under this contract.

3. Break up the work into activities/events of a duration no longer than 20 work days each or one reporting period, except as to non-construction activities/events (i.e., procurement of materials, delivery of equipment, concrete and asphalt curing) and any other activities/events for which the COR may approve the showing of a longer duration. The duration for VA approval of any required submittal, shop drawing, or other submittals will not be less than 20 work days.

4. Describe work activities/events clearly, so the work is readily identifiable for assessment of completion. Activities/events labeled "start," "continue," or "completion," are not specific and will not be allowed. Lead and lag time activities will not be acceptable.

5. The schedule shall be generally numbered in such a way to reflect either discipline, phase or location of the work.

B. The Contractor shall submit the following supporting data in addition to the project schedule:

1. The appropriate project calendar including working days and holidays.

2. The planned number of shifts per day.

3. The number of hours per shift.

Failure of the Contractor to include this data shall delay the review of the submittal until the Contracting Officer is in receipt of the missing data.

C. To the extent that the Project Schedule or any revised Project Schedule shows anything not jointly agreed upon, it shall not be deemed to have been approved by the COR. Failure to include any element of work required for the performance of this contract shall not excuse the Contractor from completing all work required within any applicable completion date of each phase regardless of the COR's approval of the Project Schedule.

D. The follow are a list of required inspections to be included in the project schedule. These inspections are to be included if the relevant trades are present in the project scope. See attached schedule at end of section.

1. Pre-site inspection of existing conditions.
2. ACM containment
3. Demo Completion
4. After ACM Clearance (prior to tear down)
5. Chalk line
6. Stud wall
7. MEP outlet box
8. MEP & Backing in-wall
9. MEP Insulation
10. Completion of Drywall
11. Wall Hung Items; cabinets, mirrors, handrails
12. Finishes and trim
13. Flooring Seam Layout
14. Hardware
15. Final finishes and flooring
16. Commissioning
17. Pre-Final Inspection (Punchlist)
18. Final Inspection (Punchlist Verification)

1.8 PAYMENT TO THE CONTRACTOR:

A. Monthly, the contractor shall submit the AIA application and certificate for payment documents G702 & G703 reflecting updated schedule activities and cost data in accordance with the provisions of the following Article, PAYMENT AND PROGRESS REPORTING, as the basis upon which progress payments will be made pursuant to Article, FAR 52.232 – 5 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS) and VAAR 852.236 – 82 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (WITHOUT NAS)). The Contractor shall be entitled to a monthly progress payment upon approval of estimates as determined from the currently approved updated project schedule and Earned Value Report. Monthly payment requests shall include: a listing of all agreed upon project schedule changes

and associated data; and an electronic file(s) of the resulting monthly updated schedule.

B. Approval of the Contractor’s monthly Application for Payment shall be contingent, among other factors, on the submittal of a satisfactory monthly update of the project schedule.

1.9 PAYMENT AND PROGRESS REPORTING

A. Monthly schedule update meetings will be held on dates mutually agreed to by the COR and the Contractor. Contractor and their CPM consultant (if applicable) shall attend all monthly schedule update meetings. The Contractor shall accurately update the Project Schedule and all other data required and provide this information to the COR three work days in advance of the schedule update meeting. Job progress will be reviewed to verify:

1. Actual start and/or finish dates for updated/completed activities/events.
2. Remaining duration for each activity/event started, or scheduled to start, but not completed.
3. Logic, time and cost data for change orders, and supplemental agreements that are to be incorporated into the Project Schedule.
4. Changes in activity/event sequence and/or duration which have been made, pursuant to the provisions of following Article, ADJUSTMENT OF CONTRACT COMPLETION.
5. Completion percentage for all completed and partially completed activities/events.
6. Logic and duration revisions required by this section of the specifications.
7. Activity/event duration and percent complete shall be updated independently.

B. After completion of the joint review, the contractor shall generate an updated computer-produced calendar-dated schedule and supply the COR with reports in accordance with the Article, COMPUTER PRODUCED SCHEDULES, specified.

C. After completing the monthly schedule update, the contractor’s representative or scheduling consultant shall rerun all current period contract change(s) against the prior approved monthly project schedule. The analysis shall only include original workday durations and schedule logic agreed upon by the contractor and COR for the contract change(s). When there is a disagreement on logic and/or durations, the Contractor shall use the schedule logic and/or durations provided and approved by the COR. After each rerun update, the resulting electronic project schedule data file shall be appropriately identified and submitted to the VA in accordance to the requirements listed in articles 1.4 and 1.7. This electronic submission is separate from the regular monthly project schedule update requirements and shall be submitted to the COR within 14 calendar days of completing the regular schedule update. **Before inserting the contract changes durations, care must be taken to ensure that only the original durations will be used for the analysis, not the reported durations after progress. In addition, once the final network diagram is approved, the contractor must recreate all manual**

progress payment updates on this approved network diagram and associated reruns for contract changes in each of these update periods as outlined above for regular update periods. This will require detailed record keeping for each of the manual progress payment updates.

D. Following approval of the CPM schedule, the VA, the General Contractor, its approved CPM Consultant, COR, and all subcontractors needed, as determined by the SRE, shall meet to discuss the monthly updated schedule. The main emphasis shall be to address work activities to avoid slippage of project schedule and to identify any necessary actions required to maintain project schedule during the reporting period. The Government representatives and the Contractor should conclude the meeting with a clear understanding of those work and administrative actions necessary to maintain project schedule status during the reporting period. This schedule coordination meeting will occur after each monthly project schedule update meeting utilizing the resulting schedule reports from that schedule update. If the project is behind schedule, discussions should include ways to prevent further slippage as well as ways to improve the project schedule status, when appropriate.

1.10 RESPONSIBILITY FOR COMPLETION

A. If it becomes apparent from the current revised monthly progress schedule that phasing or contract completion dates will not be met, the Contractor shall execute some or all of the following remedial actions:

1. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.

2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.

3. Reschedule the work in conformance with the specification requirements.

B. Prior to proceeding with any of the above actions, the Contractor shall notify and obtain approval from the COR for the proposed schedule changes. If such actions are approved, the representative schedule revisions shall be incorporated by the Contractor into the Project Schedule before the next update, at no additional cost to the Government.

1.11 CHANGES TO THE SCHEDULE

A. Within 30 calendar days after VA acceptance and approval of any updated project schedule, the Contractor shall submit a revised electronic file (s) and a list of any activity/event changes including predecessors and successors for any of the following reasons:

1. Delay in completion of any activity/event or group of activities/events, which may be involved with contract changes, strikes, unusual weather, and other delays will not relieve the Contractor from the requirements specified unless the conditions are shown on the CPM as the direct cause for delaying the project beyond the acceptable limits.

2. Delays in submittals, or deliveries, or work stoppage are encountered which make rescheduling of the work necessary.

3. The schedule does not represent the actual prosecution and progress of the project.

4. When there is, or has been, a substantial revision to the activity/event costs regardless of the cause for these revisions.

B. CPM revisions made under this paragraph which affect the previously approved computer-produced schedules for Government furnished equipment, vacating of areas by the VA Facility, contract phase(s) and sub phase(s), utilities furnished by the Government to the Contractor, or any other previously contracted item, shall be furnished in writing to the Contracting Officer for approval.

C. Contracting Officer's approval for the revised project schedule and all relevant data is contingent upon compliance with all other paragraphs of this section and any other previous agreements by the Contracting Officer or the VA representative.

D. The cost of revisions to the project schedule resulting from contract changes will be included in the proposal for changes in work as specified in FAR 52.243 – 4 (Changes) and VAAR 852.236 – 88 (Changes – Supplemental), and will be based on the complexity of the revision or contract change, man hours expended in analyzing the change, and the total cost of the change.

E. The cost of revisions to the Project Schedule not resulting from contract changes is the responsibility of the Contractor.

1.12 ADJUSTMENT OF CONTRACT COMPLETION

A. The contract completion time will be adjusted only for causes specified in this contract. Request for an extension of the contract completion date by the Contractor shall be supported with a justification, CPM data and supporting evidence as the COR may deem necessary for determination as to whether the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof based on revised activity/event logic, durations (in work days) and costs is obligatory to any approvals. The schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved in this request. The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendar-dated schedule for the time in question and all other relevant information.

B. Actual delays in activities/events which, per the computer- produced calendar-dated schedule, do not affect the extended and predicted contract completion dates shown by the critical path in the network, will not be the basis for a change to the contract completion date. The Contracting Officer will within a reasonable time after receipt of such justification and supporting evidence, review the facts and advise the Contractor in writing of the Contracting Officer's decision.

C. The Contractor shall submit each request for a change in the contract completion date to the Contracting Officer in accordance with the provisions specified under FAR 52.243 – 4 (Changes) and VAAR 852.236 – 88 (Changes – Supplemental). The Contractor shall include, as a part of each change order proposal, a sketch showing all CPM logic revisions, duration (in work days) changes, and cost changes, for work

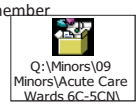
in question and its relationship to other activities on the approved network diagram.

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

1.13 REQUIRED INSPECTIONS

See next page for included inspections appendix.

- - - E N D - - -

#	Inspections	Procedures / Comments	Attendees
1	Pre-site inspection of existing conditions	Inspect and identify what is to be salvaged to be turned over to the VA, demo'd, etc. Equipment to be tagged that will be turned over to the VA. Ensure easily removed items are removed and turned over to the VA.	User, contractor, PM, FM maintenance staff (all shops), FM Div Mgr, EMS Interior Designers
2	ACM containment	Inspect the containment barrier, ensure wall, floor and ceiling penetrations are sealed, decon containment set up, signage is installed, etc.	VA's ACM monitoring persons, contractor, contractor's ACM subcontractor, PM, VA FM A-team member
3	Demo completion	Inspect demolition to ensure no damage to areas/things not to be demolished, penetrations sealed, etc.	Contractor, PM, FM maintenance (all shops)
4	After ACM clearance (prior to tear down)	Inspect the ACM removal to ensure everything has been removed. Identify additional ACM that may require an RFP or the A-team to remove.	VA's ACM monitoring persons, contractor, contractor's ACM subcontractor, PM, VA FM A-team member
5	Chalk line	Contractor has the walls marked in chalk on the floor. Attendees walk around and look at the layout, beds, carts, equipment that may be moved in and out should be brought to ensure the corners are not too tight, etc. Additionally, ensure chases are created only for utilities, not empty spaces.	User, contractor, PM, FM maintenance staff (all shops), FM Div Mgr
6	Stud wall	Inspect for installation of correct materials, location, etc.	Contractor, PM, FM maintenance staff (all shops)
7	MEP outlet box	Contractor and subcontractors walk around with the attendees and identify normal and emergency outlets, phone, data, card readers, push plates for doors, wall phones, etc with the drawings to ensure everything is marked. This includes the height above the floor, location on the wall, quantity, etc. Contractor should have all of these marked on the studs with tape or marker prior to the inspection. These devices can under most circumstances be moved a stud or two at no cost since the conduit is not installed. Additionally, the user may identify additional requirement not know during design and RFP will need to be issued to add these.	User, contractor, PM, FM maintenance staff (all shops), FM Div Mgr
8	MEP & Backing in-wall	Inspect utilities in the walls for seals, joints, etc. Inspect backing for location where items will be hung on the wall.	User, Contractor, PM, FM maintenance staff (all shops)
9	MEP insulation	Inspect pipe and ductwork insulation, floor/ceiling penetrations for fire stopping, labeling, etc.	Contractor, PM, FM maintenance staff (all shops)
10	Completion of Drywall	Inspect installation, mudding/taping, surface preparation/smoothness, etc.	Contractor, PM, FM maintenance staff (all shops)
11	Above Ceiling	Inspect for valve and equipment tags, pipe labeling, junction boxes, pneumatic tube, conduit supports and cable trays, sprinkler piping, etc.	Contractor, PM, FM maintenance staff (all shops)
12	Penetration inspection before ceiling grid	Inspect all smoke and fire walls for sealed penetrations. To identify the penetrations, can abbreviate on the drawing (d=duct, p=pipe, c=conduit, l=label, w=wall, etc.,) Send the inspection to the contractor to correct. Re-inspection is needed.	Contract, PM, FM Maintenance (all shops), A-team member 
13	Wall Hung Items; cabinets, mirrors, handrails,	Inspect for location, installed correctly, level, trims, etc.	User, contractor, PM, FM maintenance staff (all shops)
14	Finishes and Trim		Contractor, PM, FM Arch Shop, EMS Interior Designers, AE
15	Flooring Seam Layout		Contractor, PM, Arch Shop, EMS Interior Designers, AE
16	Hardware	This is after installation. During submittals, there should be a meeting with the AE's hardware person, the contractor's hardware supplied, the user and the PM to review every door and the hardware specified. There are usually changes and an RFP is required, but that is easier that changing hardware after installation.	Contractor, PM, Locksmith, FM maintenance shops (for automatic doors)
17	Final finishes and flooring	Inspect seams, flatness, pattern, etc. for floors, wall smoothness, painting, corner guards, vinyl base, etc.	Contractor, PM, FM maintenance staff, FM Div Mgr
18	Commissioning/Equipment Testing	Contractor should have controls drawings, O&Ms, panel schedules, etc. Additionally, equipment should be reading at Graphics and there needs to be training with the Graphics operators as to where this equipment is, the settings and alarms, etc.	Contractor, PM, FM maintenance staff, EMS Interior Designers, FM Div Mgr
19	Pre-Final Inspection (Punchlist)		AE, user, contractor, PM, FM maintenance staff (all shops), FM Div Mgr
20	Final Inspection (Punchlist Verification)		Contractor, PM, FM maintenance staff (All shops)

Additional Inspection and testing depending on the project

Floor Leveling and Floor Preparation	Prior to full floor leveling, the contractor should be providing elevations and then after the leveling to ensure the leveling is complete and withing the tolerance allowed in the specifications. Also, prior to any floor installation, the floor should be inspected to ensure dust, debris, etc have been removed.	Contractor, PM, Arch Shop
Paint Prime Coat	Inspect the prime coat installed by the contractor prior to the additional paint layers being applied.	Contractor, PM, Arch Shop
Paint Color	Per specification 09 91 00, paragraph 1.6 Mock-up Panel, the constractor is to paint a 10 ft area for each paint color for inspection prior to painting the space. The AE should not be removing this from the specification.	Contractor, PM, Arch Shop
Duct Static Pressure Test	Per specification 23 31 00, paragraph 3.2 Duct Leakage Tests, the contractor is to perform leakage testing of the new ductwork prior to insulation being added. PM should witness this test and the contractor should be submitting a report.	Contractor, PM, AC Shop
Ceiling grid equipment tags	Inspect the ceiling grid for the color coded dots identifying equipment above the ceiling prior to installation of the acoustic ceiling tile. Also, this can be another check for equipment installation and labeling above the ceiling.	Contractor, PM, FM maintenance

SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This specification defines the general requirements and procedures for submittals. A submittal is information submitted for VA review to establish compliance with the contract documents.

B. Detailed submittal requirements are found in the technical sections of the contract specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective technical specifications.

C. VA approval of a submittal does not relieve the Contractor of the responsibility for any error which may exist. The Contractor is responsible for fully complying with all contract requirements and the satisfactory construction of all work, including the need to check, confirm, and coordinate the work of all subcontractors for the project. Non-compliant material incorporated in the work will be removed and replaced at the Contractor's expense.

1.2 DEFINITIONS

A. Preconstruction Submittals: Submittals which are required prior to issuing contract notice to proceed or starting construction. For example, Certificates of insurance; Surety bonds; Site-specific safety plan; Construction progress schedule; Schedule of values; Submittal register; List of proposed subcontractors.

B. Shop Drawings: Drawings, diagrams, and schedules specifically prepared to illustrate some portion of the work. Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be integrated and coordinated.

C. Product Data: Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions, and brochures, which describe and illustrate size, physical appearance, and other characteristics of materials, systems, or equipment for some portion of the work. Samples of warranty language when the contract requires extended product warranties.

D. Samples: Physical examples of materials, equipment, or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project. Field samples and mock-ups constructed to establish standards by which the ensuing work can be judged.

E. Design Data: Calculations, mix designs, analyses, or other data pertaining to a part of work.

F. Test Reports: Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work. Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

G. Certificates: Document required of Contractor, or of a manufacturer, supplier, installer, or subcontractor through Contractor. The purpose is to document procedures, acceptability of methods, or personnel qualifications for a portion of the work.

H. Manufacturer's Instructions: Pre-printed material describing installation of a product, system, or material, including special notices and (MSDS) concerning impedances, hazards, and safety precautions.

I. Manufacturer's Field Reports: Documentation of the testing and verification actions taken by manufacturer's representative at the job site on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must indicate whether the material, product, or system has passed or failed the test.

J. Operation and Maintenance Data: Manufacturer data that is required to operate, maintain, troubleshoot, and repair equipment, including manufacturer's help, parts list, and product line documentation. This data shall be incorporated in an operations and maintenance manual.

K. Closeout Submittals: Documentation necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a phase of construction on a multi-phase contract.

1.3 SUBMITTAL REGISTER

A. The submittal register will list items of equipment and materials for which submittals are required by the specifications. This list may not be all inclusive and additional submittals may be required by the specifications. The Contractor is not relieved from supplying submittals required by the contract documents but which have been omitted from the submittal register.

B. The submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period.

C. The Contractor will provide the initial submittal register in Excel electronic format. Thereafter, the Contractor shall track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the VA. VA will provide example file to Successful Bidder upon receipt of RFI requesting file.

D. The Contractor shall update the submittal register as submittal actions occur and maintain the submittal register at the project site until final acceptance of all work by Contracting Officer.

E. The Contractor shall submit formal monthly updates to the submittal register in electronic format. Each monthly update shall document actual submission and approval dates for each submittal.

1.4 SUBMITTAL SCHEDULING

A. Submittals are to be scheduled, submitted, reviewed, and approved prior to the acquisition of the material or equipment.

B. Coordinate scheduling, sequencing, preparing, and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow time for potential resubmittal.

C. No delay costs or time extensions will be allowed for time lost in late submittals or resubmittals.

1.5 SUBMITTAL PREPARATION

A. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

B. Collect required data for each specific material, product, unit of work, or system into a single submittal. Prominently mark choices, options,

and portions applicable to the submittal. Partial submittals will not be accepted for expedition of construction effort. Submittal will be returned without review if incomplete.

C. If available product data is incomplete, provide Contractor-prepared documentation to supplement product data and satisfy submittal requirements.

D. Provide a transmittal form for each submittal with the following information:

1. Project title and location.
2. Construction contract number.
3. Date of the drawings and revisions.
4. Name, address, and telephone number of subcontractor, supplier, manufacturer, and any other subcontractor associated with the submittal.
5. List paragraph number of the specification section and sheet number of the contract drawings by which the submittal is required.
6. When a resubmission, add alphabetic suffix on submittal description. For example, submittal 18 would become 18A, to indicate resubmission.
7. Product identification and location in project.

E. The Contractor is responsible for reviewing and certifying that all submittals are in compliance with contract requirements before submitting for VA review. Proposed deviations from the contract requirements are to be clearly identified. All deviations submitted must include a side by side comparison of item being proposed against item specified. Failure to point out deviations will result in the VA requiring removal and replacement of such work at the Contractor's expense.

F. Stamp, sign, and date each submittal transmittal form indicating action taken.

G. Stamp used by the Contractor on the submittal transmittal form to certify that the submittal meets contract requirements is to be similar to the following:

CONTRACTOR
(Firm Name)
_____Approved
_____Approved with corrections as noted on submittal data and/or attached sheets(s)
SIGNATURE: _____
TITLE: _____
DATE: _____

1.6 SUBMITTAL FORMAT AND TRANSMISSION

A. Provide submittals in electronic format, with the exception of material samples. Use PDF as the electronic format, unless otherwise specified or directed by the Contracting Officer.

B. Compile the electronic submittal file as a single, complete document. Name the electronic submittal file specifically according to its contents.

C. Electronic files must be of sufficient quality that all information is legible. Generate PDF files from original documents so that the text included in the PDF file is both searchable and can be copied. If documents are scanned, Optical Character Resolution (OCR) routines are required.
D. Provide electronic submittal documents through VAMC Milwaukee's electronic FTP file sharing system (Buzzsaw).
E. Provide hard copies of submittals when requested by the Contracting Officer. Up to 3 additional hard copies of any submittal may be requested at the discretion of the Contracting Officer, at no additional cost to the VA.

1.7 SAMPLES

A. Submit two sets of physical samples showing range of variation, for each required item.
B. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified.
C. When color, texture, or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.
D. Before submitting samples, the Contractor is to ensure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.
E. The VA reserves the right to disapprove any material or equipment which previously has proven unsatisfactory in service.
F. Physical samples supplied maybe requested back for use in the project after reviewed and approved.

1.8 OPERATION AND MAINTENANCE DATA

A. Submit data specified for a given item within 30 calendar days after the item is delivered to the contract site.
B. In the event the Contractor fails to deliver O&M Data within the time limits specified, the Contracting Officer may withhold from progress payments 50 percent of the price of the item with which such O&M Data are applicable.

1.9 TEST REPORTS

SRE may require specific test after work has been installed or completed which could require contractor to repair test area at no additional cost to contract.

1.10 VA REVIEW OF SUBMITTALS AND RFIS

A. The VA will review all submittals for compliance with the technical requirements of the contract documents. The Architect-Engineer for this project will assist the VA in reviewing all submittals and determining contractual compliance. Review will be only for conformance with the applicable codes, standards and contract requirements.

B. Period of review for submittals begins when the A/E receives submittal from the Contractor. A/E reviews and forwards to the VA for review and approval/rejection.

C. Period of review for each resubmittal is the same as for initial submittal.

D. A/E review period is 15 working days for submittals. VA review period is 15 working days for submittals.

E. A/E review period is 10 working days for RFIs. VA review period is 10 working days for RFIs.

F. The VA will return submittals to the Contractor with the following notations:

1. "Approved": authorizes the Contractor to proceed with the work covered.
2. "Conditionally Approved: no re-submittal required": authorizes the Contractor to proceed with the work covered provided the Contractor incorporates the noted comments and makes the noted corrections.
3. “Conditionally Approved: re-submittal required”: Authorizes the contractor to proceed with the work noted in the submittal as approved. Other items in the submittal will be clearly NOT approved and will require re-submittal or approval.
4. "Disapproved, revise and resubmit": indicates noncompliance with the contract requirements or that submittal is incomplete. Resubmit with appropriate changes and corrections. No work shall proceed for this item until resubmittal is approved.
5. "Not reviewed": indicates submittal does not have evidence of being reviewed and approved by Contractor or is not complete. A submittal

marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals after taking appropriate action.

1.11 APPROVED SUBMITTALS

A. The VA approval of submittals is not to be construed as a complete check, and indicates only that the general method of construction, materials, detailing, and other information are satisfactory.

B. VA approval of a submittal does not relieve the Contractor of the responsibility for any error which may exist. The Contractor is responsible for fully complying with all contract requirements and the satisfactory construction of all work, including the need to check, confirm, and coordinate the work of all subcontractors for the project. Non-compliant material incorporated in the work will be removed and replaced at the Contractor's expense.

C. After submittals have been approved, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

D. Retain a copy of all approved submittals at project site, including approved samples.

1.12 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

1.13 INFECTION CONTROL SUBMITTALS

Contractor to provide infection control plan submittal prior to each phase of construction.

- - - E N D - - -

Critical Lift Permit

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A Critical Lift Permit, including all supporting documents, must be submitted to and approved by the Safety Section 14 days prior to the planned lift. Permits must be at the lift site until the lift is complete. Permits must be reissued if conditions (equipment, weather, and/or ground) or scope of work has changed. All lifts must follow 29 CFR 1926 Subpart CC.

A critical lift is defined as any one or more of the following conditions:

Lifts involving hazardous materials
Lifts made with more than one crane or hoist
Hoisting Personnel
Lifts involving submerged loads
Lifts involving multiple or difficult rigging
Lifts with a center of gravity that could change
The crane will "walk" with load
Loads =/> 75% of rated capacity of the load chart
Lifts without the use of outriggers using rubber tire load charts
Lifts outside the crane operator's view

A. GENERAL

Project Name & Number:	**Contracting Officer's Representative:**	**Start Date/Time:**	**Finish Date/Time:**
Crane Owner:	**Crane Lift Location (Area/Building):**	**Qualified Person completing permit:** **Phone:**	
Crane Operator: **Phone:**	**Rigger:** **Phone:**		

B. LIFT DATA

1. Load Weight:	**1a. Describe Load and Enter Total Load Weight:** _____ **Estimated Weight: _____Lbs.** **Actual Weight: _____Lbs.** **1b. Total load weight as a percentage of rated load capacity of crane from load chart: _____%**
2. Rigging weight:	**2a. Main Hoist Block, Auxiliary Boom Head / Headache Ball:_____** **Total Block Weight: _____Lbs.**
	2b. Slings, Shackles, Hardware (list all used): **Total Rigging Weight: _____Lbs.**
	2c. Jib Weight Allowance: _____Lbs. **Check One: Erected (not used): ☐ Erected (in use): ☐ Jib Stowed (on boom): ☐**
3. Total Lift Weight:	**3a. On Sling: 1a + 2b = _____Lbs.** **3b. On Crane: 1a + 2a + 2b + 2c = _____Lbs. Total Lift Weight: _____Lbs** **Example Calculation:** $\frac{TotalLoadWeight}{RatedLoadCapacity} * 100 = \%$ **Example Calculation:** $\frac{50{,}000lbs}{250{,}000lbs} * 100 = 20\%$ ***Note: Contingency = Total Lift Weight Must be =/< 90% of Load Chart Capacity**

Critical Lift Permit

4. Lifting Height:	Height of Load to be not greater than _____ Feet Maximum Height of Crane Boom / Extension Tip _____ Feet ☐ Elevation drawing showing load height relation to crane and any obstructions is attached
5. Operating Radius:	Maximum Radius of Load to be not greater than _____ Feet ☐ Plan view of load location and crane orientation attached

C. CRANE DATA & LIFT SET UP

1. Crane Manufacturer:	Crane Manufacturer: _____ Size: _____ Model Number: _____ Date of Last Annual Inspection: _____ Inspected by: _____

2. Verify manufacturer's load chart indicates lifting capacity at stipulated load radius and boom lengths.

Note: If boom length and/or radius is between the stipulated or posted value on the load chart select the next lesser rating capacity. The next lesser rating capacity may be the next longer or shorter boom length.

3. Counterweight:	☐ Yes Total Weight _____Lbs. Total Crane Weight _____Lbs.
4. Jib / Extension:	Jib Length (as extension): _____ Jib Offset: _____
5. Main Load Block:	Capacity Size: _____ Ton _____ # Sheaves: _____ Weight _____Lbs.
6. Auxiliary Boom Head/Ball:	Capacity Size: _____ Ton _____ # Sheaves: _____ Weight _____Lbs.
7. Outriggers, Pads, and Tires:	☐ An engineering review has determined underground utilities and structures are not at risk ☐ Outriggers Fully Extended and Set Check One: Track ☐ Tires ☐ ☐ Total Outrigger Bearing Pressure has been Calculated and Soil Type, Ground, and Pavement has Capacity to Support the Total Imposed Load ☐ Outrigger Mats are Sized to Reduce Soil Bearing Pressure to Safe PSI Levels ☐ Construction Manager has provided site drawing with crane set up zone identified. ☐ CM escorted utility surveyor and maintained accuracy and potential problematic areas on sketch & provided/discussed with crane firm.

Critical Lift Permit

D. RIGGING DATA

1. Sling(s)/ Shackles	Type of Sling:	Length:	Capacity (per leg):	Basket / Straight / Choker:
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

Size: _____ Capacity (ea.) _____

Spreader Bar: _____Feet _____Lbs. Verify MFG/Eng. Stamp: _____

E. LIFT COMPUTATION

Minimum Boom Angle:	Maximum Boom Length:	Maximum Lift Radius:
_____	_____	_____

Note: Cranes equipped with computers indicating boom length, angle, and radius are *safety devices only* and should not be used in place of the operator's responsibility to actually determine the measurements required to calculate a safe lift.

Note: Accessories, Crane Capacity, Parts of Line and Rope Capacity, and the working quadrant of the crane should be considered when calculating Net Crane Capacities.

1. Crane Capacity: (Load Chart Capacity) _____Lbs.
2. Net Crane Capacity: (Load Chart Capacity - Block, Rigging, and Accessory Weights) = _____Lbs.
3. Load orientation prior to lift: ☐ Front ☐ Side ☐ Rear
4. Swing orientation relative to crane: ☐ Front ☐ Side ☐ Rear

F. SPECIAL PRECAUTIONS

- ☐ Lift will not be conducted over an occupied section of a building
- ☐ Blocked exits and building evacuations require an Interim Life Safety Measure (ILSM)
- ☐ Request ILSM from Safety Section minimum of 3 days prior to planned lift
- ☐ Coordinate road blocks or closures with the police and fire services prior to the lift
- ☐ Signal Person required when swing path takes load out of crane operator's view

G. SUBMITTALS

- ☐ Operator license
- ☐ Rigger qualifications
- ☐ Annual crane inspection
- ☐ Crane maintenance log
- ☐ Crane lift/load chart showing weight lifted, angle and main boom length
- ☐ Elevation drawing showing load height relation to crane and any obstructions
- ☐ Plan view of load location and crane orientation to building(s), swing radius, road closure & barricades.

Critical Lift Permit

H. APPROVALS

I certify the information contained on this standard lift permit is correct.

Qualified Person:

Name: _____ **Signature:** _____ **Date:** _____

Critical Lift Permit

I. LIFT OPERATIONS

Execution of the lift shall be in accordance with OSHA 29 CFR 1926 Subpart CC.

LIFT SUPERVISOR TO COMPLETE THIS CHECKLIST ON THE DAY OF THE LIFT

- ☐ Interim Life Safety Measure (ILSM) obtained from Safety Section as necessary (blocked exits, evacuation, etc.)
- ☐ Lift will not be conducted over an occupied section of a building
- ☐ Crane lift site has traffic and pedestrian controls in place
- ☐ An individual has been designated to observe for obstructions and unauthorized personnel
- ☐ Confirm swing radius has been barricaded and access is limited to authorized personnel
- ☐ Confirm load weight
- ☐ Ensure load hook is directly over the load center of gravity
- ☐ Confirm boom angle, boom length, lift radius, and the crane capacity
- ☐ Ensure outrigger pads are fully extended and blocking is sufficient for the load
- ☐ Ensure tires are clear of the ground and the crane is level
- ☐ Confirm all obstacles and obstructions have been identified
- ☐ Ensure lifts in proximity to power transmission lines comply with OSHA 29 CFR 1926.1407 through 1411
- ☐ Verify a signal method has been determined between the crane operator and the signalman
- ☐ Verify the crane operator meets OSHA qualifications requirements to operate the crane
- ☐ Verify the crane boom is equipped with a safety flag and/or beacon light
- ☐ Verify a "competent person" has inspected all slings, fastenings, and attachments for damage or defects.
- ☐ Verify a "competent person" has inspected all crane safety devices and operational controls prior to and during use to ensure safe operating condition. Any deficiencies shall be repaired prior to continued use
- ☐ Ensure damaged or defective equipment is immediately removed from service
- ☐ Verify all required crane manufacturer operational control procedures are available in the crane cab
- ☐ Verify the all required inspections have been completed.
- ☐ Wind Speed: Crane is equipped with anemometer: ☐ Yes ☐ No
  Lifts when wind speed > 20 mph require reassessment.
  Lifts are not allowed when wind speed exceeds 30 mph

  Wind Speed at time of lift: _____mph.

Critical Lift Permit

An on-site meeting on the day of the planned lift was conducted with the undersigned.

Lift Supervisor:

Name: _____ **Signature:** _____ **Date:** _____

Contracting Officer's Representative:

Name: _____ **Signature:** _____ **Date:** _____

Licensed Crane Operator:

Name: _____ **Signature:** _____ **Date:** _____

Qualified Rigger:

Name: _____ **Signature:** _____ **Date:** _____

Signal Person

Name: _____ **Signature:** _____ **Date:** _____

J. PERMIT DURATION

Start Date/Time:	Finish Date/Time:	Safety Specialist: Name: _____ Signature: _____ Date: _____

SECTION 01 35 26
SAFETY REQUIREMENTS

1.1 APPLICABLE PUBLICATIONS:

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

B. American Society of Safety Engineers (ASSE):

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

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

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

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

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

D. The Facilities Guidelines Institute (FGI):

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

E. National Fire Protection Association (NFPA):

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

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

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

70-2014.....National Electrical Code

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

70E-2015 .....Standard for Electrical Safety in the Workplace

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

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

F. The Joint Commission (TJC)

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

G. U.S. Nuclear Regulatory Commission

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

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

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

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

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

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

I. VHA Directive 2005-007

1.2 DEFINITIONS:

A. Critical Lift. A lift with the hoisted load exceeding 75% of the crane's maximum capacity; lifts made out of the view of the operator (blind picks); lifts involving two or more cranes; personnel being hoisted; and special hazards such as lifts over occupied facilities, loads lifted close to power-lines, and lifts in high winds or where other adverse environmental conditions exist; and any lift which the crane operator believes is critical.

B. 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)).

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

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

E. Accident/Incident Criticality Categories:

No impact – near miss incidents that should be investigated but are not required to be reported to the VA;

Minor incident/impact – incidents that require first aid or result in minor equipment damage (less than $5000). These incidents must be investigated but are not required to be reported to the VA;

Moderate incident/impact – Any work-related injury or illness that results in:

1. Days away from work (any time lost after day of injury/illness onset);
2. Restricted work;
3. Transfer to another job;
4. Medical treatment beyond first aid;
5. Loss of consciousness;
6. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (5) above or,
7. any incident that leads to major equipment damage (greater than $5000).
8. any incident that leads to major equipment damage (greater than $5000).

These incidents must be investigated and are required to be reported to the VA;

Major incident/impact – Any mishap that leads to fatalities, hospitalizations, amputations, and losses of an eye as a result of contractors' activities. Or any incident which leads to major property damage (greater than $20,000) and/or may generate publicity or high visibility. These incidents must be investigated and are required to be reported to the VA as soon as practical, but not later than 2 hours after the incident.

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

1.3 REGULATORY REQUIREMENTS:

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

1.4 ACCIDENT PREVENTION PLAN (APP):

A. The APP (aka Construction Safety & Health Plan) shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and ensure it is site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all worksite safety and health of each subcontractor(s). Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out.

B. The APP shall be prepared as follows:

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

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

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

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

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

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

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

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

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

1) Contractor;

2) Contract number;

3) Project name;

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

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

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

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

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

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

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

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

6) Lines of authority;

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

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

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

2) Safety responsibilities of subcontractors and suppliers.

f. **TRAINING.**

1) Site-specific SOH orientation training at the time of initial hire or assignment to the project for every employee before working on the project site is required.

2) Mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, crane operator, rigger, crane signal person, fall protection, electrical lockout/NFPA 70E, machine/equipment lockout, confined space, etc…) and any requirements for periodic retraining/recertification are required.

3) Procedures for ongoing safety and health training for supervisors and employees shall be established to address changes in site hazards/conditions.

4) OSHA 10-hour training is required for all workers on site and the OSHA 30-hour training is required for 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/INCIDENT INVESTIGATION & REPORTING.** The Contractor shall conduct mishap investigations of all Moderate and Major as well as all High Visibility Incidents. The APP shall include accident/incident investigation procedure and identify person(s) responsible to provide the following to the Contracting Officer Representative:

1) Exposure data (man-hours worked);

2) Accident investigation reports;

3) Project site injury and illness 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, patient, and public safety 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; (AHA review & approval required, see checklist in appendix)

16) Asbestos abatement;

17) Lead abatement;

18) Crane Permits and inspections (see appendix);

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;

28) Public (Mandatory compliance with ANSI/ASSE A10.34-2012).

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

D. Once accepted by the Contracting Officer Representative, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer in accordance with FAR Clause 52.236-13, *Accident Prevention*, until the matter has been rectified.

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

1.5 ACTIVITY HAZARD ANALYSES (AHAS):

A. AHAs are also known as Job Hazard Analyses, Job Safety Analyses, and Activity Safety Analyses. Before beginning each work activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or sub-contractor is to perform the work, the Contractor(s) performing that work activity shall prepare an AHA (Example electronic AHA forms can be found on the US Army Corps of Engineers web site)

B. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.

C. Work shall not begin until the AHA for the work activity has been accepted by the Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.

1. The names of the Competent/Qualified Person(s) shall be identified and included in the AHA. Certification of their competency/qualification shall be submitted to the Government Designated Authority (GDA) for acceptance prior to the start of that work activity.

2. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).

a. If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.

b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in

writing that he or she has reviewed the AHA and is familiar with current site safety issues.

3. Submit AHAs to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES for review at least 15 calendar days prior to the start of each phase. Subsequent AHAs as shall be formatted as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

4. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

5. Develop the activity hazard analyses using the project schedule as the basis for the activities performed. All activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier, or subcontractor and provided to the prime contractor for review and approval and then submitted to the Contracting Officer Representative.

1.6 PRECONSTRUCTION CONFERENCE:

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

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

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

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

A. The Prime Contractor shall designate a minimum of one SSHO at each project site that will be identified as the SSHO to administer the Contractor's safety program and government-accepted Accident Prevention Plan. The Prime Contractor shall designate a minimum of one CP in compliance with 29 CFR 1926.20 (b)(2) that will be identified as a CP to administer their safety programs.

B. These Competent Persons can have collateral duties as the subcontractor's superintendent and/or work crew lead persons.

C. The SSHO or an equally-qualified Designated Representative/alternate will maintain a presence on the site during construction operations in accordance with FAR Clause 52.236-6: *Superintendence by the Contractor*. CPs will maintain presence during their construction activities in accordance with above mentioned clause. A listing of the designated SSHO and the CPs shall be submitted prior to the start of work as part of the APP with the training documentation and/or AHA as listed in Section 1.8 below.

D. The repeated presence of uncontrolled hazards during a contractor's work operations will result in the designated CP as being deemed incompetent and result in the required removal of the employee in accordance with FAR Clause 52.236-5: Material and Workmanship, Paragraph (c).

1.8 TRAINING:

A. The designated Prime Contractor SSHO must meet the requirements of all applicable OSHA standards and be capable (through training, experience, and qualifications) of ensuring that the requirements of 29 CFR 1926.16 and other appropriate Federal, State and local requirements are met for the project. As a minimum the SSHO must have completed the OSHA 30-hour Construction Safety class and have five (5) years of construction industry safety experience or three (3) years if he/she possesses a

Certified Safety Professional (CSP) or certified Construction Safety and Health Technician (CSHT) certification or have a safety and health degree from an accredited university or college.

B. All designated CPs shall have completed the OSHA 30-hour Construction Safety course within the past 5 years.

C. All other construction workers shall have the OSHA 10-hour Construction Safety Outreach course and any necessary safety training to be able to identify hazards within their work environment.

D. Submit training records associated with the above training requirements to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance.

E. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the SSHO or his/her designated representative. As a minimum, this briefing shall include information on the site-specific hazards, construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, emergency procedures, accident reporting etc... Documentation shall be provided to the COR that individuals have undergone contractor’s safety briefing.

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

1.9 INSPECTIONS:

A. The SSHO shall conduct frequent and regular safety inspections (daily) of the site and each of the subcontractors CPs shall conduct frequent and regular safety inspections (daily) of the their work operations as required by 29 CFR 1926.20(b)(2). Each week, the SSHO shall conduct a formal documented inspection of the entire construction areas with the subcontractors present in their work areas. Coordinate with, and report findings and corrective actions weekly to Contracting Officer Representative.

B. A Certified Safety Professional (CSP) with specialized knowledge in construction safety or a certified Construction Safety and Health

Technician (CSHT) shall randomly conduct a monthly site safety inspection. The CSP or CSHT can be a corporate safety professional or independently contracted. The CSP or CSHT will provide their certificate number on the required report for verification as necessary.

1. Results of the inspection will be documented with tracking of the identified hazards to abatement.
2. The Contracting Officer Representative will be notified immediately prior to start of the inspection and invited to accompany the inspection.
3. Identified hazard and controls will be discussed to come to a mutual understanding to ensure abatement and prevent future reoccurrence.
4. A report of the inspection findings with status of abatement will be provided to the Contracting Officer Representative within one week of the onsite inspection.

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

A. The prime contractor shall establish and maintain an accident reporting, recordkeeping, and analysis system to track and analyze all injuries and illnesses, high visibility incidents, and accidental property damage (both government and contractor) that occur on site. Notify the Contracting Officer Representative as soon as practical, but no more than four hours after any accident meeting the definition of a Moderate or Major incidents, High Visibility Incidents, , or any weight handling and hoisting equipment accident. Within notification include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Contracting Officer Representative determine whether a government investigation will be conducted.

B. Conduct an accident investigation for all Minor, Moderate and Major incidents as defined in paragraph DEFINITIONS, and property damage

accidents resulting in at least $20,000 in damages, to establish the root cause(s) of the accident. Complete the VA Form 2162 (or equivalent), and provide the report to the Contracting Officer Representative within 5 calendar days of the accident. The Contracting Officer Representative will provide copies of any required or special forms.

C. A summation of all man-hours worked by the contractor and associated sub-contractors for each month will be reported to the Contracting Officer Representative monthly.

D. A summation of all Minor, Moderate, and Major incidents experienced on site by the contractor and associated sub-contractors for each month will be provided to the Contracting Officer Representative monthly. The contractor and associated sub-contractors' OSHA 300 logs will be made available to the Contracting Officer Representative as requested.

1.11 PERSONAL PROTECTIVE EQUIPMENT (PPE):

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

B. Mandatory PPE includes:

1. Hard Hats – unless written authorization is given by the Contracting Officer Representative in circumstances of work operations that have limited potential for falling object hazards such as during finishing work or minor remodeling. With authorization to relax the requirement of hard hats, if a worker becomes exposed to an overhead falling object hazard, then hard hats would be required in accordance with the OSHA regulations.

2. Safety glasses - unless written authorization is given by the Contracting Officer Representative in circumstances of no eye hazards, appropriate safety glasses meeting the ANSI Z.87.1 standard must be worn by each person on site.

3. Appropriate Safety Shoes – based on the hazards present, safety shoes meeting the requirements of ASTM F2413-11 shall be worn by each person on site unless written authorization is given by the

Contracting Officer Representative in circumstances of no foot hazards.

4. Hearing protection - Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks.

1.12 INFECTION CONTROL

A. Infection Control is critical in VAMC Milwaukee. Interior construction activities causing disturbance of existing dust, or creating new dust, must be conducted within ventilation-controlled areas that minimize the flow of airborne particles into patient areas. Exterior construction activities causing disturbance of soil or creates dust in some other manner must be controlled.

B. An AHA associated with infection control will be performed by VA personnel in accordance with FGI Guidelines (i.e. Infection Control Risk Assessment (ICRA)). The ICRA procedure found on the American Society for Healthcare Engineering (ASHE) website will be utilized. Risk classifications of Class II or lower will require approval by the Contracting Officer Representative before beginning any construction work. Risk classifications of Class III or higher requires one infection control permit before beginning any construction work. Infection Control permits will be issued Infection Control Nurse through 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 II**, 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.

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

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 VA approved tape.

5) Block off and seal air vents.

6) Remove or isolate HVAC system in areas where work is being performed.

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) Obtain permit from the Infection Control Nurse through the COR

2) Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system.

3) Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.

4) Maintain negative air pressure, 0.02 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.

5) Contain construction waste before transport in tightly covered containers.

6) Cover transport receptacles or carts. Tape covering unless solid lid.

b. Upon Completion:

1) Do not remove barriers from work area until completed project is inspected by the Contracting Officer Representative and thoroughly cleaned by the VA Environmental Management Services Department.

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) Obtain permit from the Infection Control Nurse through the Contracting Officer Representative

2) Isolate HVAC system in area where work is being done to prevent contamination of duct system.

3) Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.

4) Maintain negative air pressure, 0.02 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.

5) Seal holes, pipes, conduits, and punctures.

6) 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.

7) 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 inspected by the Contracting Officer Representative with thorough cleaning by the Environmental Management Services Dept.

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

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 VA approved 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 (and an agreement is reached with the Contracting Officer Representative and Medical Center) - Airtight plastic barrier that extends from the floor to ceiling. Seams must be sealed with VA approved 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 per NFPA 241.

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, One-hour fire-rated, solid core wood in steel frame, painted

3. Dust proof one-hour fire-rated drywall

4. High Efficiency Particulate Air-Equipped filtration machine rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. HEPA filters should have ASHRAE 85 or other prefilter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Maintenance of equipment and replacement of the HEPA filters and other filters will be in accordance with manufacturer’s instructions.

5. Exhaust Hoses: Heavy duty, flexible steel reinforced; Ventilation Blower Hose

6. Adhesive Walk-off Mats: Provide minimum size mats of 24 inches x 36 inches

7. Disinfectant: Hospital-approved disinfectant or equivalent product

8. Portable Ceiling Access Module

E. Before any construction on site begins, all contractor personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.

F. A dust control program will be established and maintained as part of the contractor’s infection preventive measures in accordance with the

FGI Guidelines for Design and Construction of Healthcare Facilities. This will be covered at kick-off meeting by VA. Subsequent training is the responsibility of the Contractor. 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 Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

G. Medical Center Infection Control personnel will monitor for airborne disease (e.g. aspergillosis) during construction. A baseline of conditions will be established by the Medical Center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality with safe thresholds established.

H. In general, the following preventive measures shall be adopted during construction to keep down dust and prevent mold.

1. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents, or building openings. HEPA filtration is required where the exhaust dust may reenter the medical center.

2. Exhaust hoses shall be exhausted so that dust is not reintroduced to the medical center.

3. Adhesive Walk-off/Carpet Walk-off Mats shall be used at all interior transitions from the construction area to occupied Medical Center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.

4. Vacuum and wet mop all transition areas from construction to the occupied Medical Center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as it is created. Transport these outside the construction area in containers with tightly fitting lids.

5. The contractor shall not haul debris through patient-care areas without prior approval of the COR. 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 protections carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.

I. Final Cleanup:

1. Upon completion of project, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.

2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions, flooring, etc.

3. All new air ducts shall be cleaned prior to final inspection.

J. Exterior Construction

1. Contractor shall verify that dust will not be introduced into the medical center through intake vents, or building openings. HEPA filtration on intake vents is required where dust may be introduced.

2. Dust created from disturbance of soil such as from vehicle movement will be wetted with use of a water truck as necessary

3. All cutting, drilling, grinding, sanding, or disturbance of materials shall be accomplished with tools equipped with either local exhaust ventilation (i.e. vacuum systems) or wet suppression controls.

1.13 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 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. 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. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).

D. Temporary Construction Partitions:

1. Install and maintain temporary construction partitions to provide smoke-tight separations between construction areas, the areas that are described in phasing requirements and adjoining areas. Construct partitions of gypsum board or treated plywood (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire retardant treated wood or metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Seal joints and penetrations. At door openings, install Class C, ¾ hour fire/smoke rated doors with self-closing devices.

2. Install one-hour, two-hour fire-rated temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.

3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration firestop materials in accordance with Section 07 84 00, FIRESTOPPING.

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

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

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

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

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

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

L. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with Contracting Officer 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 COR.

M. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with Contracting Officer Representative.

N. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Contracting Officer Representative at least 10 days in advance. Designate contractor’s responsible project-site fire prevention program manager to permit hot work.

O. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Contracting Officer Representative.

P. 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.

Q. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.

R. If required, submit documentation to the Contracting Officer Representative that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

1.14 ELECTRICAL

A. All electrical work shall comply with NFPA 70 (NEC), NFPA 70B, NFPA 70E, 29 CFR Part 1910 Subpart J – General Environmental Controls, 29 CFR Part 1910 Subpart S – Electrical, and 29 CFR 1926 Subpart K in addition to other references required by contract.

B. All qualified persons performing electrical work under this contract shall be licensed journeyman or master electricians. All apprentice electricians performing under this contract shall be deemed unqualified persons unless they are working under the immediate supervision of a licensed electrician or master electrician.

C. All electrical work will be accomplished de-energized and in the Electrically Safe Work Condition (refer to NFPA 70E for Work Involving Electrical Hazards, including Exemptions to Work Permit). Any Contractor, subcontractor or temporary worker who fails to fully comply with this requirement is subject to immediate termination in accordance with FAR clause 52.236-5(c). Only in rare circumstance where achieving an electrically safe work condition prior to beginning work would increase or cause additional hazards, or is infeasible due to equipment design or operational limitations is energized work permitted. The Contracting Officer Representative with approval of the Medical Center Director will make the determination if the circumstances would meet

the exception outlined above. An AHA and permit specific to energized work activities will be developed, reviewed, and accepted by the VA prior to the start of that activity.

1. Development of a Hazardous Electrical Energy Control Procedure is required prior to de-energization. A single Simple Lockout/Tagout Procedure for multiple work operations can only be used for work involving qualified person(s) de-energizing one set of conductors or circuit part source. Task specific Complex Lockout/Tagout Procedures are required at all other times.

2. Verification of the absence of voltage after de-energization and lockout/tagout is considered "energized electrical work" (live work) under NFPA 70E, and shall only be performed by qualified persons wearing appropriate shock protective (voltage rated) gloves and arc rate personal protective clothing and equipment, using Underwriters Laboratories (UL) tested and appropriately rated contact electrical testing instruments or equipment appropriate for the environment in which they will be used.

3. Personal Protective Equipment (PPE) and electrical testing instruments will be readily available for inspection by the Contracting Officer Representative.

D. Before beginning any electrical work, an Activity Hazard Analysis (AHA) will be conducted to include Shock Hazard and Arc Flash Hazard analyses (NFPA Tables can be used only as a last alterative and it is strongly suggested a full Arc Flash Hazard Analyses be conducted). Work shall not begin until the AHA for the work activity and permit for energized work has been reviewed and accepted by the Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.

E. Ground-fault circuit interrupters. GFCI protection shall be provided where an employee is operating or using cord- and plug-connected tools related to construction activity supplied by 125-volt, 15-, 20-, or 30-ampere circuits. Where employees operate or use equipment supplied by greater than 125-volt, 15-, 20-, or 30- ampere circuits, GFCI protection or an assured equipment grounding conductor program shall be

implemented in accordance with NFPA 70E - 2015, Chapter 1, Article 110.4(C)(2)..

1.15 FALL PROTECTION

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

1. The use of a Safety Monitoring System (SMS) as a fall protection method is prohibited.

2. The use of Controlled Access Zone (CAZ) as a fall protection method is prohibited.

3. A Warning Line System (WLS) may ONLY be used on floors or flat or low-sloped roofs (between 0 - 18.4 degrees or 4:12 slope) and shall be erected around all sides of the work area (See 29 CFR 1926.502(f) for construction of WLS requirements). Working within the WLS does not require FP. No worker shall be allowed in the area between the roof or floor edge and the WLS without FP. FP is required when working outside the WLS.

4. Fall protection while using a ladder will be governed by the OSHA requirements.

1.16 SCAFFOLDS AND OTHER WORK PLATFORMS

A. All scaffolds and other work platforms construction activities shall comply with 29 CFR 1926 Subpart L.

B. The fall protection (FP) threshold height requirement is 6 ft (1.8 m) as stated in Section 1.16.

C. The following hierarchy and prohibitions shall be followed in selecting appropriate work platforms.

1. Scaffolds, platforms, or temporary floors shall be provided for all work except that can be performed safely from the ground or similar footing.

2. Ladders less than 20 feet may be used as work platforms only when use of small hand tools or handling of light material is involved.

3. Ladder jacks, lean-to, and prop-scaffolds are prohibited.

4. Emergency descent devices shall not be used as working platforms.

D. Contractors shall use a scaffold tagging system in which all scaffolds are tagged by the Competent Person. Tags shall be color-coded: green indicates the scaffold has been inspected and is safe to use; red indicates the scaffold is unsafe to use. Tags shall be readily visible, made of materials that will withstand the environment in which they are used, be legible and shall include:

1. The Competent Person's name and signature;

2. Dates of initial and last inspections.

E. Mast Climbing work platforms: When access ladders, including masts designed as ladders, exceed 20 ft (6 m) in height, positive fall protection shall be used.

1.17 EXCAVATION AND TRENCHES

A. All excavation and trenching work shall comply with 29 CFR 1926 Subpart P. Excavations less than 5 feet in depth require evaluation by the contractor's "Competent Person" (CP) for determination of the necessity of an excavation protective system where kneeing, laying in, or stooping within the excavation is required.

B. All excavations and trenches 24 inches in depth or greater shall require a written trenching and excavation permit (NOTE – some States and other local jurisdictions require separate state/jurisdiction-issued excavation permits). The permit shall have two sections, one section will be completed prior to digging or drilling and the other will be completed prior to personnel entering the excavations greater than 5 feet in depth. Each section of the permit shall be provided to the Contracting Officer Representative prior to proceeding with digging or drilling and prior to proceeding with entering the excavation. After completion of the work and prior to opening a new section of an excavation, the permit shall be closed out and provided to the

Contracting Officer Representative. The permit shall be maintained onsite and the first section of the permit shall include the following:

1. Estimated start time & stop time. Specific location and nature of the work.

3. Indication of the contractor's "Competent Person" (CP) in excavation safety with qualifications and signature. Formal course in excavation safety is required by the contractor's CP.

4. Indication of whether soil or concrete removal to an offsite location is necessary.

5. Indication of whether soil samples are required to determined soil contamination.

6. Indication of coordination with local authority (i.e. "One Call") or contractor's effort to determine utility location with search and survey equipment.

7. Indication of review of site drawings for proximity of utilities to digging/drilling.

The second section of the permit for excavations greater than five feet in depth shall include the following:

1. Determination of OSHA classification of soil. Soil samples will be from freshly dug soil with samples taken from different soil type layers as necessary and placed at a safe distance from the excavation by the excavating equipment. A pocket penetronmeter will be utilized in determination of the unconfined compression strength of the soil for comparison against OSHA table (Less than 0.5 Tons/FT2 – Type C, 0.5 Tons/FT2 to 1.5 Tons/FT2 – Type B, greater than 1.5 Tons/FT2 – Type A without condition to reduce to Type B).

2. Indication of selected protective system (sloping/benching, shoring, shielding). When soil classification is identified as "Type A" or "Solid Rock", only shoring or shielding or Professional Engineer designed systems can be used for protection. A Sloping/Benching system may only be used when classifying the soil as Type B or Type C. Refer to Appendix B of 29 CFR 1926, Subpart P for further information on protective systems designs.

3. Indication of the spoil pile being stored at least 2 feet from the edge of the excavation and safe access being provided within 25 feet of the workers.

4. Indication of assessment for a potential toxic, explosive, or oxygen deficient atmosphere where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist. Internal combustion engine equipment is not allowed in an excavation without providing force air ventilation to lower the concentration to below OSHA PELs, providing sufficient oxygen levels, and atmospheric testing as necessary to ensure safe levels are maintained.

C. As required by OSHA 29 CFR 1926.651(b)(1), the estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

1. The planned dig site will be outlined/marked in white prior to locating the utilities.

2. Used of the American Public Works Association Uniform Color Code is required for the marking of the proposed excavation and located utilities.

3. 811 will be called two business days before digging on all local or State lands and public Right-of Ways.

4. Digging will not commence until all known utilities are marked.

5. Utility markings will be maintained

D. Excavations will be hand dug or excavated by other similar safe and acceptable means as excavation operations approach within 3 to 5 feet of identified underground utilities. Exploratory bar or other detection equipment will be utilized as necessary to further identify the location of underground utilities.

E. Excavations greater than 20 feet in depth require a Professional Engineer designed excavation protective system.

1.18 CRANES

A. All crane work shall comply with 29 CFR 1926 Subpart CC.

B. Prior to operating a crane, the operator must be licensed, qualified or certified to operate the crane. Thus, all the provisions contained with Subpart CC are effective and there is no "Phase In" date.

C. A detailed lift plan for all lifts shall be submitted to the Contracting Officer Representative 14 days prior to the scheduled lift complete with route for truck carrying load, crane load analysis, siting of crane and path of swing and all other elements of a critical lift plan where the lift meets the definition of a critical lift. Critical lifts require a more comprehensive lift plan to minimize the potential of crane failure and/or catastrophic loss. The plan must be reviewed and accepted by the General Contractor before being submitted to the VA for review. The lift will not be allowed to proceed without prior acceptance of this document.

D. Crane operators shall not carry loads

1. over the general public or VAMC personnel

2. over any occupied building unless

a. the top two floors are vacated

b. or overhead protection with a design live load of 300 psf is provided

1.19 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

A. All installation, maintenance, and servicing of equipment or machinery shall comply with 29 CFR 1910.147 except for specifically referenced operations in 29 CFR 1926 such as concrete & masonry equipment [1926.702(j)], heavy machinery & equipment [1926.600(a)(3)(i)], and process safety management of highly hazardous chemicals (1926.64). Control of hazardous electrical energy during the installation, maintenance, or servicing of electrical equipment shall comply with Section 1.15 to include NFPA 70E and other VA specific requirements discussed in the section.

1.20 CONFINED SPACE ENTRY

A. All confined space entry shall comply with 29 CFR 1926, Subpart AA 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.

1.21 WELDING AND CUTTING

As specified in section 1.14, Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Contracting Officer Representative. Obtain permits from Contracting Officer Representative at least 10 days in advance.

1.22 LADDERS

A. All Ladder use shall comply with 29 CFR 1926 Subpart X.

B. All portable ladders shall be of sufficient length and shall be placed so that workers will not stretch or assume a hazardous position.

C. Manufacturer safety labels shall be in place on ladders

D. Step Ladders shall not be used in the closed position

E. Top steps or cap of step ladders shall not be used as a step

F. Portable ladders, used as temporary access, shall extend at least 3 ft (0.9 m) above the upper landing surface.

1. When a 3 ft (0.9-m) extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.

2. In no case shall the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.

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

1.23 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. 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.

- - - E N D - - -

Standard Lift Permit

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This standard lift permit, including all supporting documents, must be completed by a qualified person and submitted to and approved by the Safety Section 14 days prior to the planned lift. Permits must be at the lift site until the lift is complete. Permits must be reissued if conditions (equipment, weather, and/or ground) or scope of work has changed. All lifts must follow 29 CFR 1926 Subpart CC.

NOTE: If any of the following conditions will be involved with the lift operation, a critical lift permit must be completed:

Lifts involving hazardous materials
Lifts made with more than one crane or hoist
Hoisting Personnel
Lifts involving submerged loads
Lifts involving multiple or difficult rigging
Lifts with a center of gravity that could change
The crane will "walk" with load
Loads =/> 75% of rated capacity of the load chart
Lifts without the use of outriggers using rubber tire load charts
Lifts outside the crane operator's view

A. GENERAL

Project Name & Number:	**Contracting Officer's Representative:**	**Start Date/Time:**	**Finish Date/Time:**
Crane Owner:	**Crane Lift Location (Area/Building):**	**Qualified Person completing permit:** **Phone:**	
Crane Operator: **Phone:**	**Rigger:** **Phone:**		

B. LIFT DATA

1. Load Weight:	**1a. Describe Load and Enter Total Load Weight:** _____ **Estimated Weight: _____Lbs.** **Actual Weight: _____Lbs.** **1b. Total load weight (block, rigging, jib, etc.) as a percentage of rated load capacity of crane from load chart: _____%**
2. Lifting Height:	**Height of Load to be not greater than _____ Feet** **Maximum Height of Crane Boom / Extension Tip _____ Feet**
3. Operating Radius:	**Maximum Radius of Load to be not greater than _____ Feet**

C. CRANE DATA & LIFT SET UP

1. Crane Manufacturer:	**Crane Manufacturer: _____ Size: _____ Model Number: _____** **Date of Last Annual Inspection: _____ Inspected by: _____**

2. Verify manufacturer's load chart indicates lifting capacity at stipulated load radius and boom lengths.

Note: If boom length and/or radius is between the stipulated or posted value on the load chart select the next lesser rating capacity. The next lesser rating capacity may be the next longer or shorter boom length.

Standard Lift Permit

D. SPECIAL PRECAUTIONS

- ☐ Lift will not be conducted over an occupied section of a building
- ☐ Blocked exits and building evacuations require an Interim Life Safety Measure (ILSM)
- ☐ Request ILSM from Safety Section minimum of 3 days prior to planned lift
- ☐ Coordinate road blocks or closures with the police and fire services prior to the lift
- ☐ Signal Person required when swing path takes load out of crane operator's view

E. SUBMITTALS

- ☐ Crane operator license
- ☐ Annual crane inspection
- ☐ Crane lift/load chart showing weight lifted, angle and main boom length
- ☐ Plan view of load location and crane orientation to building(s), swing radius, road closure & barricades.

F. APPROVALS

I certify the information contained on this standard lift permit is correct.

Qualified Person:

Name: _____ **Signature:** _____ **Date:** _____

G. LIFT OPERATIONS

Execution of the lift shall be in accordance with OSHA 29 CFR 1926 Subpart CC.

Standard Lift Permit

LIFT SUPERVISOR TO COMPLETE THIS CHECKLIST ON THE DAY OF THE LIFT

- ☐ Interim Life Safety Measure (ILSM) obtained from Safety Section as necessary (blocked exits, evacuation, etc.)
- ☐ Lift will not be conducted over an occupied section of a building
- ☐ Crane lift site has traffic and pedestrian controls in place
- ☐ An individual has been designated to observe for obstructions and unauthorized personnel
- ☐ Confirm swing radius has been barricaded and access is limited to authorized personnel
- ☐ Confirm load weight
- ☐ Ensure load hook is directly over the load center of gravity
- ☐ Confirm boom angle, boom length, lift radius, and the crane capacity
- ☐ Ensure outrigger pads are fully extended and blocking is sufficient for the load
- ☐ Ensure tires are clear of the ground and the crane is level
- ☐ Confirm all obstacles and obstructions have been identified
- ☐ Ensure lifts in proximity to power transmission lines comply with OSHA 29 CFR 1926.1407 through 1411
- ☐ Verify a signal method has been determined between the crane operator and the signalman
- ☐ Verify the crane operator meets OSHA qualifications requirements to operate the crane
- ☐ Verify the crane boom is equipped with a safety flag and/or beacon light
- ☐ Verify a "competent person" has inspected all slings, fastenings, and attachments for damage or defects.
- ☐ Verify a "competent person" has inspected all crane safety devices and operational controls prior to and during use to ensure safe operating condition. Any deficiencies shall be repaired prior to continued use
- ☐ Ensure damaged or defective equipment is immediately removed from service
- ☐ Verify all required crane manufacturer operational control procedures are available in the crane cab
- ☐ Verify the all required inspections have been completed.
- ☐ Wind Speed: Crane is equipped with anemometer: ☐ Yes ☐ No
  Lifts when wind speed > 20 mph require reassessment.
  Lifts are not allowed when wind speed exceeds 30 mph

  Wind Speed at time of lift: _____mph.

Standard Lift Permit

An on-site meeting on the day of and prior to the planned lift was conducted with the undersigned.

Lift Supervisor:

Name: _____ Signature: _____ Date: _____

Contracting Officer's Representative:

Name: _____ Signature: _____ Date: _____

Licensed Crane Operator:

Name: _____ Signature: _____ Date: _____

Qualified Rigger:

Name: _____ Signature: _____ Date: _____

H. PERMIT DURATION

Start Date/Time:	Finish Date/Time:

AWE Focus Program Review 2016
Construction: Excavation Safety

DATE:		NAME OF REVIEWER:		MET	NOT MET	N/A
REQUIREMENT						
16.6A. Are the estimated locations of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work determined prior to opening an excavation? [OSHA 29 CFR 1926.651(b)(1)]						
16.6B. Are utility companies contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of utility underground installations up to their own meters prior to the start of actual excavation? [OSHA 29 CFR 1926.651(b)(2)]						
16.6C. On VHA property, is the proposed dig site being marked, “as built” drawings reviewed, and visual indicators (manholes, valves, meters, permanent markers, etc…) of the utilities being utilized to establish the location of utility underground installations by in-house VHA personnel or a contracted private locator service? [OSHA 29 CFR 1926.651(b)(2)]						
16.6D. On VHA property, are locations of utility underground installations being marked and maintained by use of stakes, paint, flags, or other clearly identifiable materials to show the field location of underground facilities, in accordance with the current color code standard of the American Public Works Association.? [OSHA 29 CFR 1926.651(b)(2)]						
16.6E. If utility companies or the VHA cannot locate underground utility installations or cannot establish the exact location of these installations, are excavation contractors proceeding with caution and using detection equipment or other acceptable means to locate utility installations (careful hand digging, pot-holing and vacuum excavation, hand tools that use air or water under pressure, exploratory bar, or other)? [OSHA 29 CFR 1926.651(b)(2)]						
16.6F. When excavation operations approach the estimated location (within 2 feet) of underground installations, are the exact location of the installations determined by safe and acceptable means (careful hand digging, pot-holing and vacuum excavation, hand tools that use air or water under pressure , exploratory bar, or other)? [OSHA 29 CFR 1926.651(b)(3)]						
16.6G. While the excavation is open, are underground installations protected, supported or removed (LockOut/Tagout, supports built, etc…) as necessary to safeguard employees? [OSHA 29 CFR 1926.651(b)(4)]						
16.6H. Are Activity Hazard Analyses and excavation permits being completed prior to opening excavations? (FAR 52.236-13, Accident Prevention; VA Master Specs, Div. 01, Section 01 35 26 Safety Requirements, Subtopic 1.5 & 1.18)						
16.6I. Where workers enter an excavation greater than 5 feet in depth, are soils being classified in accordance with OSHA classification system (Solid Rock, Type A, Type B, or Type C)? [OSHA Directive CPL 2-0.124; VHA Directive 2011-036, Subpar. 4(l)(7)] Note: If using an excavation protective system of sloping or benching, then the soil classification cannot be Solid Rock or						

Type A. Thus, the angle of repose cannot be steeper than 1 to 1 (45 degrees) (OSHA 29 CFR 1926.652 & associated Appendix A; VA Master Specs, Div. 01, Section 01 35 26 Safety Requirements, Subtopic 1.18, Par. C)?			
16.6J. Where workers enter an excavation greater than 5 feet in depth, are protective systems being designed in accordance with 29 CFR 1926, Subpart P, Appendices B to E or designed by Professional Engineer [OSHA 29 CFR 1926.652(a)] Note: excavations in excess of 20 feet in depth must be designed by PE and sloping or benching systems cannot have an angle of repose steeper than 1 to 1 (45 degrees) as provided above.			
Reviewer Signature:			

SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.1 DESCRIPTION

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

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

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

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

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

The specifications and standards cited in this solicitation can be examined at the following location:

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

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

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

AA Aluminum Association Inc.
http://www.aluminum.org

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

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

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

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

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

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

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

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

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

ADC Air Diffusion Council
http://flexibleduct.org

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

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

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

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

AIA American Institute of Architects
http://www.aia.org

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

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

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

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

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

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

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

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

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

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

ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers http://www.ashrae.org
ASME	American Society of Mechanical Engineers http://www.asme.org
ASSE	American Society of Sanitary Engineering http://www.asse-plumbing.org
ASTM	American Society for Testing and Materials http://www.astm.org
AWI	Architectural Woodwork Institute http://www.awinet.org
AWS	American Welding Society http://www.aws.org
AWWA	American Water Works Association http://www.awwa.org
BHMA	Builders Hardware Manufacturers Association http://www.buildershardware.com
BIA	Brick Institute of America http://www.bia.org
CAGI	Compressed Air and Gas Institute http://www.cagi.org
CGA	Compressed Gas Association, Inc. http://www.cganet.com
CI	The Chlorine Institute, Inc. http://www.chlorineinstitute.org
CISCA	Ceilings and Interior Systems Construction Association http://www.cisca.org
CISPI	Cast Iron Soil Pipe Institute http://www.cispi.org

CLFMI	Chain Link Fence Manufacturers Institute http://www.chainlinkinfo.org
CPMB	Concrete Plant Manufacturers Bureau http://www.cpmb.org
CRA	California Redwood Association http://www.calredwood.org
CRSI	Concrete Reinforcing Steel Institute http://www.crsi.org
CTI	Cooling Technology Institute http://www.cti.org
DHI	Door and Hardware Institute http://www.dhi.org
EGSA	Electrical Generating Systems Association http://www.egsa.org
EEI	Edison Electric Institute http://www.eei.org
EPA	Environmental Protection Agency http://www.epa.gov
ETL	ETL Testing Laboratories, Inc. http://www.et1.com
FAA	Federal Aviation Administration http://www.faa.gov
FCC	Federal Communications Commission http://www.fcc.gov
FPS	The Forest Products Society http://www.forestprod.org
GANA	Glass Association of North America http://www.cssinfo.com/info/gana.html/
FM	Factory Mutual Insurance http://www.fmglobal.com

GA Gypsum Association
http://www.gypsum.org

GSA General Services Administration
http://www.gsa.gov

HI Hydraulic Institute
http://www.pumps.org

HPVA Hardwood Plywood & Veneer Association
http://www.hpva.org

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

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

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

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

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

IPCEA Insulated Power Cable Engineers Association

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

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

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

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

NBS National Bureau of Standards
See - NIST

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

NEC National Electric Code
See - NFPA National Fire Protection Association

NEMA National Electrical Manufacturers Association
http://www.nema.org

NFPA National Fire Protection Association
http://www.nfpa.org

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

NIH National Institute of Health
http://www.nih.gov

NIST National Institute of Standards and Technology
http://www.nist.gov

NLMA Northeastern Lumber Manufacturers Association, Inc.
http://www.nelma.org

NPA National Particleboard Association
18928 Premiere Court
Gaithersburg, MD 20879
(301) 670-0604

NSF National Sanitation Foundation
http://www.nsf.org

NWWDA Window and Door Manufacturers Association
http://www.nwwda.org

OSHA Occupational Safety and Health Administration
Department of Labor
http://www.osha.gov

PCA Portland Cement Association
http://www.portcement.org

PCI Precast Prestressed Concrete Institute
http://www.pci.org

PPI The Plastic Pipe Institute
http://www.plasticpipe.org

PEI Porcelain Enamel Institute, Inc.
http://www.porcelainenamel.com

PTI Post-Tensioning Institute
http://www.post-tensioning.org

RFCI The Resilient Floor Covering Institute
http://www.rfci.com

RIS Redwood Inspection Service
See - CRA

RMA Rubber Manufacturers Association, Inc.
http://www.rma.org

SCMA Southern Cypress Manufacturers Association
http://www.cypressinfo.org

SDI Steel Door Institute
http://www.steeldoor.org

SOI Secretary of the Interior
http://www.cr.nps.gov/local-law/arch_stnds_8_2.htm

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

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

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

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

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

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

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

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

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

UBC The Uniform Building Code
See ICBO

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

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

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

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

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

- - - E N D - - -

SECTION 01 45 29
TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION:

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

Contractor is responsible for insuring all work meets the specification requirements. Testing services retained by the VA shall not relieve the contractor of providing his own testing services guaranteeing his work meeting these requirements. Testing services retained by the VA shall also not provide conclusive results to substantiate the contractor's work.

1.2 APPLICABLE PUBLICATIONS:

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

B. American Association of State Highway and Transportation Officials (AASHTO):

T27-11.....Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates

T96-02 (R2006).....Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

T99-10.....Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5 Kg (5.5 lb.) Rammer and a 305 mm (12 in.) Drop

T104-99 (R2007).....Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

T180-10.....Standard Method of Test for Moisture-Density Relations of Soils using a 4.54 kg (10 lb.) Rammer and a 457 mm (18 in.) Drop

T191-02(R2006).....Standard Method of Test for Density of Soil In-Place by the Sand-Cone Method

C. American Concrete Institute (ACI):

506.4R-94 (R2004).....Guide for the Evaluation of Shotcrete

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

A325-10.....Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

A370-12.....Standard Test Methods and Definitions for Mechanical Testing of Steel Products

A490-12.....Standard Specification for Heat Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength

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

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

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

C109/C109M-11b.....Standard Test Method for Compressive Strength of Hydraulic Cement Mortars

C136-06.....Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

C138/C138M-10b.....Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

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

C172/C172M-10.....Standard Practice for Sampling Freshly Mixed Concrete

C173/C173M-10b.....Standard Test Method for Air Content of freshly Mixed Concrete by the Volumetric Method

C330/C330M-09.....Standard Specification for Lightweight Aggregates for Structural Concrete

C1019-11.....Standard Test Method for Sampling and Testing Grout

C1064/C1064M-11.....Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete

C1077-11c.....Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation

D422-63(2007).....Standard Test Method for Particle-Size Analysis of Soils

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

D1140-00(2006).....Standard Test Methods for Amount of Material in Soils Finer than No. 200 Sieve

D1188-07e1.....Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples

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

D1557-09.....Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft lbf/ft3 (2,700 KNm/m3))

D2166-06.....Standard Test Method for Unconfined Compressive Strength of Cohesive Soil

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

D2216-10.....Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

D2974-07a.....Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

D3666-11.....Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

D3740-11.....Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction

D6938-10.....Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

E94-04(2010).....Standard Guide for Radiographic Examination

E164-08.....Standard Practice for Contact Ultrasonic Testing of Weldments

E329-11c.....Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

E543-09.....Standard Specification for Agencies Performing Non-Destructive Testing

E605-93(R2011).....Standard Test Methods for Thickness and Density of Sprayed Fire Resistive Material (SFRM) Applied to Structural Members

E709-08.....Standard Guide for Magnetic Particle Examination

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

E. American Welding Society (AWS):

D1.D1.1M-10.....Structural Welding Code-Steel

1.3 REQUIREMENTS:

A. Accreditation Requirements: Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation. The laboratory's scope of accreditation must include the appropriate ASTM standards (i.e.; E329, C1077, D3666, D3740, A880, E543) listed in the technical sections of the specifications. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA. The policy applies to the specific laboratory performing the actual testing, not just the "Corporate Office."

B. Inspection and Testing: Testing laboratory shall inspect materials and workmanship and perform tests described herein and additional tests requested by COR. When it appears materials furnished, or work performed by Contractor fail to meet construction contract requirements, Testing Laboratory shall direct attention of COR to such failure.

C. Written Reports: Testing laboratory shall submit test reports to COR, Contractor, unless other arrangements are agreed to in writing by the COR. Submit reports of tests that fail to meet construction contract requirements on colored paper.

D. Verbal Reports: Give verbal notification to COR immediately of any irregularity.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EARTHWORK:

A. General: The Testing Laboratory shall provide qualified personnel, materials, equipment, and transportation as required to perform the services identified/required herein, within the agreed to schedule and/or time frame. The work to be performed shall be as identified herein and shall include but not be limited to the following:

1. Observe fill and subgrades during proof-rolling to evaluate suitability of surface material to receive fill or base course. Provide recommendations to the COR regarding suitability or unsuitability of areas where proof-rolling was observed. Where unsuitable results are observed, witness excavation of unsuitable material and recommend to COR extent of removal and replacement of unsuitable materials and observe proof-rolling of replaced areas until satisfactory results are obtained.

2. Provide full time observation of fill placement and compaction and field density testing in vault areas and provide part timeobservation of fill placement and compaction and field density testing in pavement areas to verify that earthwork compaction obtained is in accordance with contract documents.
3. Provide supervised geotechnical technician to inspect excavation, subsurface preparation, and backfill for structural fill.

B. Testing Compaction:

1. Determine maximum density and optimum moisture content for each type of fill, backfill and subgrade material used, in compliance with ASTM D698 , D1557, Method A ASTM D698, and/or ASTM D1557.
2. Make field density tests in accordance with the primary testing method following ASTM D6938 wherever possible. Field density tests utilizing ASTM D1556 or ASTM D2167shall be utilized on a case by case basis only if there are problems with the validity of the results from the primary method due to specific site field conditions. Should the testing laboratory propose these alternative methods, they should provide satisfactory explanation to the COR before the tests are conducted.

a. Slab Subgrade: At least one test of subgrade. In each compacted fill layer, perform one test at minimum for overlaying building slab.
b. Foundation Wall Backfill: One test per 30 m (100 feet) of each layer of compacted fill but in no case fewer than two tests.
c. Pavement Subgrade: One test for each 335 m^2 (400 square yards), but in no case fewer than two tests.
d. Curb, Gutter, and Sidewalk: One test for each 90 m (300 feet), but in no case fewer than two tests.
e. Trenches: One test at maximum 30 m (100 foot) intervals per 1200 mm (4 foot) of vertical lift and at changes in required density, but in no case fewer than two tests.

C. Fill and Backfill Material Gradation: One test per 10 cubicyards stockpiled or in-place source material. Gradation of fill and backfill material shall be determined in accordance with ASTM C136, ASTM D422, and ASTM D1140.
D. Testing Materials: Test suitability of on-site and off-site borrow as directed by COR.

3.2 LANDSCAPING:

A. Test topsoil for organic materials, pH, phosphate, potash content, and gradation of particles.
1. Test for organic material by using ASTM D2974.
2. Determine percent of silt, sand, clay, and foreign materials such as rock, roots, and vegetation.

B. Submit laboratory test report of topsoil to COR.

3.3 ASPHALT CONCRETE PAVING:

A. Aggregate Base Course:
1. Determine maximum density and optimum moisture content for aggregate base material in accordance with ASTM D1557, Method D.
2. Make a minimum of three field density tests on each day's final compaction on each aggregate course in accordance with ASTM D1556.
3. Sample and test aggregate as necessary to insure compliance with specification requirements for gradation, wear, and soundness as specified in the applicable state highway standards and specifications.

B. Asphalt Concrete:

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

3.4 SITE WORK CONCRETE:

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

3.5 CONCRETE:

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

B. Field Inspection and Materials Testing:
   1. Provide a technician at site of placement at all times to perform concrete sampling and testing.

2. Review the delivery tickets of the ready-mix concrete trucks arriving on-site. Notify the Contractor if the concrete cannot be placed within the specified time limits or if the type of concrete delivered is incorrect. Reject any loads that do not comply with the Specification requirements. Rejected loads are to be removed from the site at the Contractor’s expense. Any rejected concrete that is placed will be subject to removal.
3. Take concrete samples at point of placement in accordance with ASTM C172. Mold and cure compression test cylinders in accordance with ASTM C31. Make at least three cylinders for each 40 m^3 (50 cubic yards) or less of each concrete type, and at least three cylinders for any one day's pour for each concrete type. Label each cylinder with an identification number. COR may require additional cylinders to be molded and cured under job conditions.
4. Perform slump tests in accordance with ASTM C143. Test the first truck each day, and every time test cylinders are made. Test pumped concrete at the hopper and at the discharge end of the hose at the beginning of each day’s pumping operations to determine change in slump.
5. Determine the air content of concrete per ASTM C173. For concrete required to be air-entrained, test the first truck and every 20 m^3 (25 cubic yards) thereafter each day. For concrete not required to be air-entrained, test every 80 m^3 (100 cubic yards) at random. For pumped concrete, initially test concrete at both the hopper and the discharge end of the hose to determine change in air content.
6. If slump or air content fall outside specified limits, make another test immediately from another portion of same batch.
7. Perform unit weight tests in compliance with ASTM C138 for normal weight concrete and ASTM C567 for lightweight concrete. Test the first truck and each time cylinders are made.
8. Notify laboratory technician at batch plant of mix irregularities and request materials and proportioning check.
9. Verify that specified mixing has been accomplished.
10. Environmental Conditions: Determine the temperature per ASTM C1064 for each truckload of concrete during hot weather and cold weather concreting operations:

a. When ambient air temperature falls below 4.4 degrees C (40 degrees F), record maximum and minimum air temperatures in each 24 hour period; record air temperature inside protective enclosure; record minimum temperature of surface of hardened concrete.
b. When ambient air temperature rises above 29.4 degrees C (85 degrees F), record maximum and minimum air temperature in each 24 hour period; record minimum relative humidity; record maximum wind velocity; record maximum temperature of surface of hardened concrete.

11. Inspect the reinforcing steel placement, including bar size, bar spacing, top and bottom concrete cover, proper tie into the chairs, and grade of steel prior to concrete placement. Submit detailed report of observations.
12. Observe conveying, placement, and consolidation of concrete for conformance to specifications.
13. Observe condition of formed surfaces upon removal of formwork prior to repair of surface defects and observe repair of surface defects.
14. Observe curing procedures for conformance with specifications, record dates of concrete placement, start of preliminary curing, start of final curing, end of curing period.
15. Observe preparations for placement of concrete:
    a. Inspect handling, conveying, and placing equipment, inspect vibrating and compaction equipment.
    b. Inspect preparation of construction, expansion, and isolation joints.
16. Observe preparations for protection from hot weather, cold weather, sun, and rain, and preparations for curing.
17. Observe concrete mixing:
    a. Monitor and record amount of water added at project site.
    b. Observe minimum and maximum mixing times.
18. Measure concrete flatwork for levelness and flatness as follows:
    a. Perform Floor Tolerance Measurements F_F and F_L in accordance with ASTM E1155. Calculate the actual overall F- numbers using the inferior/superior area method.
    b. Perform all floor tolerance measurements within 48 hours after slab installation and prior to removal of shoring and formwork.

c. Provide the Contractor and the COR with the results of all profile tests, including a running tabulation of the overall F_F and F_L values for all slabs installed to date, within 72 hours after each slab installation.

C. Laboratory Tests of Field Samples:

1. Test compression test cylinders for strength in accordance with ASTM C39. For each test series, test one cylinder at 7 days and one cylinder at 28 days. Use remaining cylinder as a spare tested as directed by COR. Compile laboratory test reports as follows: Compressive strength test shall be result of one cylinder, except when one cylinder shows evidence of improper sampling, molding or testing, in which case it shall be discarded and strength of spare cylinder shall be used.
2. Make weight tests of hardened lightweight structural concrete in accordance with ASTM C567.
3. Furnish certified compression test reports (duplicate) to COR. In test report, indicate the following information:
   a. Cylinder identification number and date cast.
   b. Specific location at which test samples were taken.
   c. Type of concrete, slump, and percent air.
   d. Compressive strength of concrete in MPa (psi).
   e. Weight of lightweight structural concrete in kg/m^3 (pounds per cubic feet).
   f. Weather conditions during placing.
   g. Temperature of concrete in each test cylinder when test cylinder was molded.
   h. Maximum and minimum ambient temperature during placing.
   i. Ambient temperature when concrete sample in test cylinder was taken.
   j. Date delivered to laboratory and date tested.

3.6 REINFORCEMENT:

A. Review mill test reports furnished by Contractor.

3.7 TYPE OF TEST:

Approximate Number of Tests Required

A. Earthwork:

Laboratory Compaction Test, Soils:	
(ASTM D1557) (ASTM D698)	10
Field Density, Soils (AASHTO T191, T205, or T238)	5
Penetration Test, Soils	5

B. Landscaping:

Topsoil Test	2

C. Aggregate Base:

Laboratory Compaction, (ASTM D1557)	5
Field Density, (ASTM D1556)	2
Aggregate, Base Course Gradation (AASHTO T27)	1
Wear (AASHTO T96)	1
Soundness (AASHTO T104)	1

D. Asphalt Concrete:

Field Density, (AASHTO T230 5	
Aggregate, Asphalt Concrete Gradation (AASHTO T27)	2
Wear (AASHTO T96)	1
Soundness (AASHTO T104)	1

E. Concrete:

Making and Curing Concrete Test Cylinders (ASTM C31)	4
Compressive Strength, Test Cylinders (ASTM C39)	12
Concrete Slump Test (ASTM C143)	5
Concrete Air Content Test (ASTM C173)	5
Unit Weight, Lightweight Concrete (ASTM C567)	1
Aggregate, Normal Weight: Gradation (ASTM C33)	1
Deleterious Substances (ASTM C33)	1
Soundness (ASTM C33)	1
Abrasion (ASTM C33)	1
Aggregate, Lightweight Gradation (ASTM C330)	1
Deleterious Substances (ASTM C330)	1
Unit Weight (ASTM C330)	4
Flatness and Levelness Readings (ASTM E1155) (number of days)	2

L. Inspection:

Technical Personnel (Man-days)	40

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SECTION 01 57 19
TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies the control of environmental pollution and damage that the Contractor must consider for air, water, and land resources. It includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.

B. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:
   1. Adversely effect human health or welfare,
   2. Unfavorably alter ecological balances of importance to human life,
   3. Effect other species of importance to humankind, or;
   4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.

C. Definitions of Pollutants:
   1. Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. It is a solid waste that possesses at least one of four characteristics (ignitability, corrosivity, reactivity and toxicity), or appears on special DNR or EPA lists. The regulatory definition of hazardous waste is found in s. NR 661, Wis. Adm. Code.
   2. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
   3. Sediment: Means settleable solid material that is transported by runoff, suspended within runoff or deposited by runoff away from its original location.
   4. Solid Waste: Solid waste is any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded or salvageable materials, including solid, liquid, semisolid or contained gaseous materials resulting from industrial, commercial, mining and agricultural operations, and from community activities. Wastes excluded from this

definition are solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under ch. 283, Wis. Stats., or source, special nuclear or by-products material as defined under s. 254.31, Wis. Stats.5. Surface Discharge: The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "water of the United States" and would require a permit to discharge water from the governing agency.

6. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, and tin cans. Reference SECTION 01 74 19 – "CONSTRUCTION WASTE MANAGEMENT".
7. Sludge: Any solid, semi-solid or liquid waste generated from a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant or air pollution control facility, exclusive of any of the treated effluent from a wastewater treatment plant.
8. Air Pollution: Means the presence in the atmosphere of one or more air contaminants in such quantities and of such duration as is or tends to be injurious to human health or welfare, animal or plant life, or property, or would unreasonably interfere with the enjoyment of life or property.
9. Sanitary Wastes:
   a. Sewage: Means the water-carried wastes created in and to be conducted away from residences, industrial establishments, and public buildings as defined in s. 101.01 (12), with such surface water or groundwater as may be present.
   b. Garbage: Means discarded materials resulting from the handling, processing, storage and consumption of food.

1.2 QUALITY CONTROL

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

1.3 REFERENCES

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

B. U.S. National Archives and Records Administration (NARA):

33 CFR 328.....Definitions

C. Wisconsin DNR Definitions webpage:

http://dnr.wi.gov/topic/Waste/Definitions.html

D. Wisconsin DNR Legislations NR 141, NR 400, NR 500, NR 660, and NR 661.

E. Wisconsin Statute Ch. 289

F. Wisconsin DNR Solid and Hazardous Waste Codes and Statutes webpage:

http://dnr.wi.gov/topic/Waste/Laws.html

1.4 SUBMITTALS

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

1. Environmental Protection Plan: After the contract is awarded and prior to the commencement of the work, the Contractor shall meet with the COR to discuss the proposed Environmental Protection Plan and to develop mutual understanding relative to details of environmental protection. Not more than 20 days after the meeting, the Contractor shall prepare and submit to the COR and the Contracting Officer for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:

a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, noise control and abatement that are applicable to the

Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

f. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.

g. Procedures to provide the environmental protection that comply with the applicable laws and regulations. Describe the procedures to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures as described in the Environmental Protection Plan.

h. Permits, licenses, and the location of the solid waste disposal area.

i. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Include as part of an Erosion Control Plan approved by the District Office of the U.S. Soil Conservation Service and the Department of Veterans Affairs.

j. Environmental Monitoring Plans for the job site including land, water, air, and noise.

k. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas. This plan may be incorporated within the Erosion Control Plan.

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

1.5 PROTECTION OF ENVIRONMENTAL RESOURCES

A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.

B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs,

vines, grasses, top soil, and land forms without permission from the COR. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or where special emergency use is permitted.

1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.
2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.
   a. Box and protect from damage existing trees and shrubs to remain on the construction site.
   b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
   c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.
3. Reduction of Exposure of Unprotected Erodible Soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.
4. Temporary Protection of Disturbed Areas: Construct diversion ditches, benches, and berms to retard and divert runoff from the construction site to protected drainage areas approved under paragraph 208 of the Clean Water Act. Wisconsin DNR has storm water technical standards, models, and best management practices (BMPs) available on their website: http://dnr.wi.gov/topic/stormwater/standards/. Use the technical standards to plan, design, install, and maintain erosion/sediment control and storm water management practices to assist in complying with s. NR 151, Wis. Adm. Code.

a. Reuse or conserve the collected topsoil sediment as directed by the COR. Topsoil use and requirements are specified in Section 31 20 00, EARTH MOVING.

b. Institute effluent quality monitoring programs as required by Federal, State, and local environmental agencies.

5. Erosion and Sedimentation Control Devices: The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's activities. Construct or install all temporary and permanent erosion and sedimentation control features. Maintain temporary erosion and sediment control measures such as berms, dikes, drains, sedimentation basins, grassing, and mulching, until permanent drainage and erosion control facilities are completed and operative. Utilize informational guidance provided by the Wisconsin DNR on their webpage (http://dnr.wi.gov/topic/stormwater/standards/) regarding storm water technical standards, models, and BMPs. Use the technical standards to plan, design, install, and maintain erosion/sediment control and storm water management practices to assist in complying with s. NR 151, Wis. Adm. Code.
6. Manage borrow areas on Government property to minimize erosion and to prevent sediment from entering nearby water courses or lakes.
7. Manage and control spoil areas on and off Government property to limit spoil and prevent erosion of soil or sediment from entering nearby water courses or lakes.
8. Protect adjacent areas from despoilment by temporary excavations and embankments.
9. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off Government property and dispose of waste in compliance with Federal, State, and local requirements. Reference specification 017419 for waste management requirements.
10. Store hazardous waste away from the work areas in containers compatible with the waste and dispose of waste in accordance with Federal, State, and local regulations. Hazardous waste must be labeled according to 40 CFR 262.15.

11. Handle discarded materials other than those included in the solid waste category as directed by the COR.

C. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to control water pollution by the listed construction activities that are included in this contract.
   1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.
   2. Control movement of materials and equipment at stream crossings during construction to prevent violation of water pollution control standards of the Federal government, Wisconsin DNR, and/or City of Milwaukee.
   3. Monitor water areas affected by construction.

D. Protection of Fish and Wildlife Resources: Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife. Prior to beginning construction operations, list species that require specific attention along with measures for their protection. Utilize FWS.gov to research threatened and endangered species in the area.

E. Protection of Air Resources: Consult with the COR regarding the facility Air Permit restrictions. It is important to make sure the facility does not exceed air emission limitations as described within the permit. Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Wisconsin and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency and Wisconsin DNR, for those construction operations and activities specified.
   1. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at

all times, including weekends, holidays, and hours when work is not in progress.

2. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods are permitted to control particulates in the work area.
3. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal, Wisconsin DNR and facility air permit allowable limits.
4. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.

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

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

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

2. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this contract, consisting of, but not limited to, the following:
   a. Use shields or other physical barriers to restrict noise transmission.
   b. Provide soundproof housings or enclosures for noise-producing machinery.
   c. Use efficient silencers on equipment air intakes.

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

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

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

G. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no additional cost to the Government. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.

H. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the COR. Cleaning shall include off the station disposal of all items and materials not required to be salvaged, as well as all debris and rubbish resulting from demolition and new work operations.

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SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.

B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.

C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:

1. Waste Management Plan development and implementation. Reference 017419A for a sample Construction Waste Management Plan.
2. Techniques to minimize waste generation.
3. Sorting and separating of waste materials.
4. Salvage of existing materials and items for reuse or resale.
5. Recycling of materials that cannot be reused or sold.

D. At a minimum the following waste categories shall be diverted from landfills:

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

F. The following regulated wastes require special handling, storage and disposal and must be segregated:

1. Hazardous Waste (including oil-based paint, cleaning chemicals, other miscellaneous chemicals, etc.)
2. Used Oil
3. Electronical Waste (E-waste)
4. Universal Wastes:
   a. Antifreeze
   b. Batteries
   c. Lamps
   d. Mercury-containing Equipment
   e. Pesticides
5. Polychlorinated biphenyl (PCB) ballasts and non-PCB ballasts
6. Latex Paint; must be dried out prior to disposal

1.2 RELATED WORK

A. Section 02 41 00, DEMOLITION.
B. Section 01 00 00, GENERAL REQUIREMENTS.
C. SECTION 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.
D. Lead Paint: Section 02 83 33.13, LEAD BASED PAINT REMOVAL AND DISPOSAL.

1.3 QUALITY ASSURANCE

A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed to ensure the generation of as little waste as possible. Construction Demolition waste includes products of the following:
   1. Excess or unusable construction materials.
   2. Packaging used for construction products.
   3. Poor planning and/or layout.
   4. Construction error.
   5. Over ordering.
   6. Weather damage.
   7. Contamination.
   8. Mishandling.
   9. Breakage.
B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.

C. Contractor shall develop and implement procedures to recycle construction and demolition waste to a minimum of 50 percent.

D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.

E. Contractor shall provide all demolition, removal and legal disposal of materials and regulated wastes. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by the State of Wisconsin. The Whole Building Design Guide website http://www.wbdg.org/tools/cwm.php provides a Construction Waste Management Database that contains information on companies that haul, collect, and process recyclable debris from construction projects.

F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.

G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.

H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

1.4 TERMINOLOGY

A.Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.

B.Construction and Demolition Waste: Means solid waste resulting from the construction, demolition or razing of buildings, roads and other structures.C.Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.

D.Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).

E. EPA Subtitle C Landfill: Landfills are those landfills which are authorized under the Resource Conservation and Recovery Act (RCRA) to accept hazardous waste for disposal.

F. EPA Subtitle D Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.

G. Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. It is a solid waste that possesses at least one of four characteristics (ignitability, corrosivity, reactivity and toxicity), or appears on special DNR or EPA lists. The regulatory definition of hazardous waste is found in s. NR 661, Wis. Adm. Code. Examples of hazardous waste include, but are not limited to: xylene, mineral Oils, toluene, acetone, kerosene, and petroleum distillates.

H. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.

I. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.

J. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.

K. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.

L. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.

M. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

N. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

1. On-site Recycling – Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.

2. Off-site Recycling – Materials hauled to a location and used in an altered form in the manufacture of new products.

M. Recycling Facility: Means a facility that can legally accept wastes to recycle and may include a facility where waste has been generated. N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.

O. Return: To give back reusable items or unused products to vendors for credit.

P. Salvage: To remove waste materials from the site for resale or re-use by a third party.

Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.

R. Solid Waste: Means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded or salvageable materials, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include solids or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Wisconsin Statute Chapter 283, or source material, as defined in s. 254.31 (10), special nuclear material, as defined in s. 254.31 (11), or byproduct material, as defined in s.254.31 (1).

S. Transfer Facility: Means a solid waste facility at which transferring of solid waste from one vehicle or container to another, generally of larger capacity, occurs prior to transporting to the point of processing or disposal.

1.5 SUBMITTALS

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

B. Prepare and submit to the 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 waste 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 Subtitle D landfill.
c. List of each regulated waste item and quantity proposed to be taken to a Subtitle C landfill.

4. Detailed description of the Means/Methods to be used for material handling.
   a. On site: Material separation, labeling, storage, protection where applicable.
   b. Off site: Transportation means and destination. Include list of materials.
      1) Description of materials to be site-separated and self-hauled to designated facilities.
      2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
   c. The names and locations of mixed debris reuse and recycling facilities or sites.
   d. The names and locations of trash disposal landfill facilities or sites.
   e. Documentation that the facilities or sites are approved to receive the materials.

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

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

1.6 APPLICABLE PUBLICATIONS

A Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. In the event that criteria requirements conflict, the most stringent requirements shall be met.

B. U.S. Green Building Council (USGBC):
LEED Green Building Rating System for New Construction

1.7 RECORDS

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

B. Separate out materials and recycle them. Submit report from construction and demolition "recycle" facility. One such facility that can/has been used is the Waste Management C&D Recycling facility (formerly City Wide Recycling), 10700 West Brown Deer Road, Milwaukee, WI, 53224. Phone number is (414) 355 – 6500. Plant manager is Mike Miller. This Waste Management facility will give contractor estimated weight of recycled materials including LEED report identifying drywall, inert materials (bricks, concrete, etc.), metals, old cardboard, wood recycled and the approximate amount of materials that cannot be recycled --- which is then landfilled. Other facilities offering similar reporting and methods can be proposed by Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

A. List of each material and quantity to be salvaged, recycled, reused.

B. List of each material and quantity proposed to be taken to a landfill.

C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

PART 3 - EXECUTION

3.1 COLLECTION

A. Provide all necessary containers, bins and storage areas to facilitate effective waste management. GC is responsible for providing a dumpster for the project. Coordinate location of dumpster with the COR prior to mobilization and indicate location on Debris Management Plan.

B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.

C. Hazardous wastes shall be separated, stored, disposed of according to the City of Milwaukee Solid Waste Regulations Chapter 79, Wisconsin Department of Natural Resources Chapters NR 660-679, and Title 40 of the Code of Federal Regulations parts 239-282.

3.2 DISPOSAL

A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.

B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

3.3 REPORT

A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.

B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.

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

D. Submit a copy of all hazardous waste and special waste manifests to the COR.

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Attachment A – Sample Construction Waste Management Plan

Introduction.

This site-based **Construction Waste Management Plan** has been developed to manage the non-hazardous building construction and demolition waste by diverting waste from the landfills through salvaging, recycling, or reusing building materials for the Department of Veterans Affairs during construction activities. The Construction Waste Management Plan has been designed to establish records to quantify construction and demolition debris diversion and disposal. Based on the work that is scheduled to be part of the contract and the engineering practices to be implemented in conjunction with the work, every effort is being made to protect the people, assets, and the environment of the Department of Veterans Affairs.

Contents.

A. ORGANIZATION AND RESPONSIBILITIES

This construction project has been authorized by and is under the supervision of the Department of Veterans Affairs, Milwaukee, WI.

- **Job Site Superintendent:** ***[Superintendent Name]*** will be the on-site employee responsible for the implementation and enforcement of the Construction Waste Management Plan and is so delegated by ***[Prime Contractor Name].***

- **Prime Contractor:** ***[Prime Contractor Name]*** will oversee the work of all construction staff and subcontractors. The Contractor will be responsible for instituting the measures as outlined in this Construction Waste Management Plan and ensuring their effectiveness.

- **All Other On-site Personnel:** All other on-site construction personnel, including all subcontractors, will be responsible for adhering to the Construction Waste Management Plan as established by ***[Prime Contractor Name]*** as well as any additional practices, laws, and regulations for ensuring a safe work environment.

- **Construction/Renovation Area:** The work will take place at the Department of Veterans Affairs Medical Center, Milwaukee Wisconsin. The main construction area is contained at the ***[Contract Location]*** as shown on the drawings.

B. SITE DESCRIPTION

[Edit as necessary] The worksite is an enclosed steel, concrete and masonry building structure.

C. PERSONNEL

As required in Specification Section 01 74 19 Construction Waste Management, all construction workers will be aware of the Construction Waste Management Plan through the project's Pre-Construction Meeting as well as the Project Kick-Off Meeting conducted by ***[Prime Contractor Name].*** The meetings will consist of the information contained in this Construction Waste Management Plan, including, but not limited to the construction limits, waste management goals, plan implementation, oversight and enforcement, meetings and communication, documentation, site assessment-expected wastes, disposal and handling, trade contractor waste management plan, waste management progress report, and work area limits, as well as the safety guidelines of the VA. Upon completing this briefing ***[Superintendent Name]*** will enforce the Construction Waste Management Plan throughout the life of the project. Weekly contractor meetings will include the Construction Waste Management Plan as well as the Environmental Protection Plan in specification section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS to ensure new and all workers onsite are aware of the requirements and procedures.

D. WASTE MANAGEMENT GOALS

This Construction Waste Management Plan is the responsibility of the Prime Contractor and to be enforced for all subcontractors by the Prime Contractor. By effectively managing this Construction Waste Management Plan, ***[Prime***

Contractor Name] will recycle or salvage (for reuse) all feasible materials to a minimum of **50 percent by weight.**

The Waste Management Plan outlines the expected wastes to be confronted on site, means of disposal and handling methods, and required documentation. The ***[Prime Contractor Name]*** will provide non-hazardous waste manifest identifying weight of all waste generated per delivery (dumpster).

This Construction Waste Management Plan is in conjunction with specification section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.

E. PLAN IMPLEMENTATION, OVERSIGHT & ENFORCEMENT

[Prime Contractor Name] will monitor, implement, and document this plan throughout the construction of this project. Monitoring of on-site compliance with this plan will be performed by the ***[Prime Contractor Name]*** Superintendent(s) daily. During demolition, the demolition contractor will provide one metal scrap dumpster and one mixed waste dumpster that will be used for all materials. The metal dumpster will be taken by ***[Demolition Subcontractor Name, Address]*** for recycling. The mixed waste dumpster will be taken to ***[Company 1 Name, address]***, where it will be sorted and separated for recycling. Any non-recyclable material will be sent to landfill. Recyclable material will be weighed and recorded by ***[Company 1 Name, address]***. During reconstruction, there will be one dumpster provided for mixed waste. The mixed waste dumpster will be taken to ***[Company 2 Name]***, where it will be sorted and separated for recycling. Records will be provided in accordance with LEED Reference Guide and LEED Template. The reports will be submitted monthly.

F. MEETINGS AND COMMUNICATION

Every trade contractor and subcontractor will be required to attend a Pre-Construction Meeting and Project Kick-Off Meeting. New construction personnel that are unable to attend are required to attend a brief safety meeting that will include a construction waste training session before being allowed to work on the site. Further, the Demolition Debris Management Plan will be on the agenda at regular construction meetings to update the project team on the status of ***[Prime Contractor Name]*** goals for diverted waste and what measures may need to be implemented if these goals are not being met.

G. SITE ASSESSMENT: DISPOSAL & HANDLING

Contractor to provide dumpsters for processing recyclables and waste. Examples include 1) Concrete materials, 2) Metal, and 3) mixed waste. These to be sorted at landfill site or recycling facility.

Upon approval, ***[Prime Contractor Name]*** will use the VA-provided cardboard dumpster for all cardboard materials.

The following table lists expected wastes on this project, their disposal method, and handling procedures:

Hauler:
[Company Name, Contact, Address]

Recycling:
[Company Name, Contact, Address]

Item	Disposal method	Handling Procedure	Destination/Recipient
Masonry	Recycle	Concrete dumpster	[ACME WASTE, INC.]
Concrete	Recycle	Concrete dumpster	[ACME WASTE, INC.]
Scrap Metals	Recycle	Metal dumpster	[ACME WASTE, INC.]
Cardboard	Recycle or reuse	Cardboard dumpster	VA-provided cardboard dumpster (permission required)
Drywall	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Wood (clean)	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Plumbing Fixtures	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Glass	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Plastics (noncontaminated)	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Plastics (contaminated)	Landfill	Mixed dumpster	[ACME WASTE, INC.]
Ceiling Tile	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Wiring	Recycle/Salvage	Reuse, salvage or recycle	[Subcontractor Name]
Light Fixtures	Recycle/Salvage	Reuse, salvage or recycle	[Subcontractor Name]
Lamps (Universal Waste)	Recycle/Salvage	Reuse, salvage or recycle	[Subcontractor Name]
Ballasts	Recycle/Salvage	Reuse, salvage or recycle	[Subcontractor Name]
Carpet	Recycle	Mixed dumpster or recycle	[Company Name]
Inert Mat'ls	Recycle	Concrete dumpster	[Company Name]
Clean Soil	Reuse	Reuse throughout project	[Contractor Name]
Contaminated Soil	Licensed Landfill	Dumpster or Pile with runoff prevention	[Contractor Name]
Hazardous wastes	Subtitle C Landfill	Store in compatible containers with proper labeling	[Contractor Name]
All Other Non-hazardous Wastes	Landfill	Reduce waste where possible, research recycling or reuse opportunities	[Company Name]

H. WASTE AUDITING

All subcontractors are responsible for daily site cleanup and ensuring that all recycling containers are kept free of contamination. ***[Prime Contractor Name]*** representatives shall be responsible for daily checks of trash and recycling containers to check for and ensure the removal of contamination. Violators will be required to re-sort any misplaced waste and, if the problem continues, pay the cost of ***[Prime Contractor Name]*** time to sort recyclables from the trash. ***[Prime Contractor Name]*** representatives shall be responsible for contacting haulers for collection service.

I. DOCUMENTATION

Documentation of the waste management plan will consist of the following:

1. Records will be provided in accordance with LEED Reference Guide and LEED Template.
2. Records will include the amount of material salvaged, recycled and re-used.
3. Records will include a list of materials taken to the landfill.
4. Material tracking data shall be provided indicating receiving parties, dates, weight tickets, tipping fees, manifests and the total resulting cost or savings.

The quantities in the report will be updated by ***[Prime Contractor Name]*** based on information provided by each Trade Contractor and the independent hauler under contract to provide the metal dumpsters. Each Trade Contractor shall be responsible for providing the following documentation for any waste generated on site that is not deposited in the dumpsters provided by ***[Prime Contractor Name].***

1. A record of the type and quantity (by weight) of each material salvaged, reused, recycled, or disposed in a manner other than that provided by ***[Prime Contractor Name]*** through their independent hauler.
2. Disposal receipts: Provide copies of all receipts issued by a disposal facility for CDL waste that is disposed in a landfill.
3. Recycling Receipts: Provide copies of all receipts issued by an approved recycling facility.
4. Salvaged materials document: Types and quantities (by weight) for materials salvaged for reuse on site, sold, or donated to a third party.

This documentation will then be compiled by ***[Prime Contractor Name]*** in monthly waste tracking reports.

Project Name:_____ Location:_____ Project Contractor:_____
COR:_____
Date:_____

Material Being Reused/Recycled	Reused/Recycled	Quantity (lbs or cubic yards	Recycler/Location	Comments
Masonry				
Concrete				
Scrap Metals				
Packaging				
Drywall				
Wood				
Plumbing Fixtures				
Glass				
Plastics (noncontaminated)				
Acoustical Ceiling Tile				
Wire				
Light Fixtures				
Lamps				
Ballasts				
Carpeting				

Project Name:_____ Location:_____ Project Contractor:_____
COR:_____
Date:_____

KEY:
(R) = Recycled Content
(ES) = Energy Star
(BP) = Biobased Product
(FEMP) = FEMP-Designated Product

Product: What specific product was purchased?
"Green" Content: What makes it green? % recycled, biobased, energy star, etc.

Material	Product	"Green" Content	Manufacturer	Comments
Appliances (R)				
Bathroom Fixtures (R)				
Building Insulation (R,ES)				
Cement and Concrete (R)				
Composite panels (BP)				
Doors and skylights (ES)				
Floor tiles (R)				
Laminated paperboard (R)				
Structural fiberboard				
Roofing materials (R, BP, ES)				
Windows (ES)				
Office furniture				
Carpet (R)				
Carpet cushion (R)				
Compact fluorescent lamps (CFLs) (ES)				
Decorative light strings (ES)				
Downlight luminaires (FEMP)				
Fluorescent ballasts (FEMP)				
Fluorescent luminaires (FEMP)				
Fluorescent tube lamps (FEMP)				
LED lighting				
Light fixtures (ES)				
Lighting controls (FEMP)				
Mats (R)				
Paint -- consolidated latex paint (R)				
Paint -- reprocessed latex paint (R)				
Bike racks (R)				
Plastic fencing (R)				
Signage (R)				
Adhesive and Mastic Removers (BP)				
Carpet and Upholstery Cleaners - General Purpose (BP)				
Carpet and Upholstery Cleaners - Spot Removers (BP)				
Dust Suppressants (BP)				
Floor Strippers (BP)				
Graffiti and Grease Removers (BP)				
Sorbents (BP)				
Mats (R)				
Wood and concrete sealers (BP)				

SECTION 02 41 00
DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies demolition and removal of buildings, portions of buildings, utilities, other structures and debris from trash dumps shown.

1.2 RELATED WORK:

A. Safety Requirements: Section 01 35 26 Safety Requirements Article, ACCIDENT PREVENTION PLAN (APP).

B. Disconnecting utility services prior to demolition: Section 01 00 00, GENERAL REQUIREMENTS.

C. Reserved items that are to remain the property of the Government: Section 01 00 00, GENERAL REQUIREMENTS.

E. Environmental Protection: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

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

G. Infectious Control: Section 01 00 00, GENERAL REQUIREMENTS, Article 1.7, INFECTION PREVENTION MEASURES.

1.3 PROTECTION:

A. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures. Comply with requirements of GENERAL CONDITIONS Article, ACCIDENT PREVENTION.

B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations. Comply with requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS.

C. Provide enclosed dust chutes with control gates from each floor to carry debris to truck beds and govern flow of material into truck. Provide overhead bridges of tight board or prefabricated metal

construction at dust chutes to protect persons and property from falling debris.

D. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum and dust the work area daily.

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

2. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.

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

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

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

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

1.4 UTILITY SERVICES:

A. Demolish and remove outside utility service lines shown to be removed.

B. Remove abandoned outside utility lines that would interfere with installation of new utility lines and new construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 DEMOLITION:

A. Debris, including brick, concrete, stone, metals and similar materials shall become property of Contractor and shall be disposed of by him daily, off the Medical Center to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the COR. Break up concrete slabs below grade that do not require removal from present location into pieces not exceeding 600 mm (24 inches) square to permit drainage. Contractor shall dispose debris in compliance with applicable federal, state or local permits, rules and/or regulations.

B. Remove and legally dispose of all materials, other than earth to remain as part of project work, from any trash dumps shown. Materials removed shall become property of contractor and shall be disposed of in compliance with applicable federal, state or local permits, rules and/or regulations . All materials in the indicated trash dump areas, including above surrounding grade and extending to a depth of 1500mm (5feet) below surrounding grade, shall be included as part of the lump sum compensation for the work of this section. Materials that are located beneath the surface of the surrounding ground more than 1500 mm (5 feet), or materials that are discovered to be hazardous, shall be handled as unforeseen. The removal of hazardous material shall be referred to Hazardous Materials specifications.

E. Remove existing utilities as indicated or uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the COR. When Utility lines are encountered that are not indicated on the drawings, the COR shall be notified prior to further work in that area.

3.2 CLEAN-UP:

On completion of work of this section and after removal of all debris, leave site in clean condition satisfactory to COR. Clean-up shall include off the Medical Center disposal of all items and materials not

required to remain property of the Government as well as all debris and rubbish resulting from demolition operations.

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SECTION 02 42 00
CUTTING, REMOVAL, DEMOLITION, RESTORATION AND PATCHING

11/2015

PART 1 GENERAL

1.1 SCOPE:

A. Refer to SECTION 01 00 00 for special requirements, protection, constraints, timing of work, scheduling of work, enclosures and similar requirements relating to this section.

B. This section covers cutting, demolition, removal work, patching, leveling and restoration work as necessary to accomplish and complete all work under this contract, including any relocation or reuse of existing materials, equipment, systems, or other work, as well as the disposition of salvaged materials or debris. This Section applies to all work under this contract, including general construction, mechanical and electrical work.

C. Contractor and his subcontractors shall examine the spaces/work site themselves to determine the actual conditions and requirements. All removals, demolition, cutting, restoration, new installations and other work shall be accomplished to transform the existing spaces and conditions to the new conditions required under the Contract, as well as to accomplish all tie-in work of new to existing.

D. It is the intent that, unless specifically shown on the schedules, or is inherent in the work to be accomplished under the general construction work of the area, that each contractor shall perform the demolition, cutting, removals, relocations, patching and leveling, and restoration as will be required to accomplish the work under their contracts. All work indicated on the schedules shall be accomplished by the General Contractor.

E. Except for general demolition of entire areas, it is the intent that at each area or space the contractor and each subcontractor shall make removals, perform cutting or demolition and accomplish relocations of work normal to his trade (i.e., Mechanical Contractor removes or relocates piping, ductwork and similar. At areas of general demolition of entire area spaces, the Mechanical Contractor shall make removals normal to their trade or may be called for, for reuse or relocation, make any relocations and cutoffs, terminate, or otherwise discontinue services that will be abandoned, shall be removed to the nearest active main. The general contractor shall then demolish or remove all unwanted electrical or mechanical materials, items or elements in the area.

F. Contractor is required to restore all finishes, surfaces, items, & materials as required to accommodate new finishes. For example, if wall paper, vinyl wall covering, ceramic wall tile, etc. is existing on wall, and new wall finish calls for wall to be painted, contractor is required to remove existing wall paper, vinyl wall covering, ceramic wall tile, etc. to accommodate new painted finish. These surfaces are required to be verified prior to bid, as no change to contract will be provided after award if existing finishes are clearly present.

PART 2: MATERIALS

2.1 SALVAGEABLE MATERIALS TO BE STORED BY OWNER (VA):

A. The owner shall mark or tag existing materials, equipment or other items that are to be retained during a pre-demolition walk through. Salvageable materials and items designated or marked to remain the property of the government shall be carefully removed by applicable trades, protected from damage and stored adjacent to the removal area as directed.

B. Consult the Project Manager concerning any possible salvageable items prior to demolition thereof. Carefully remove and salvage any materials designated to be retained.

C. Any materials not wanted by the government shall be removed from the site by the contractor, without additional cost to the government.

D. Removal from the area and the site to the government's storage area shall be by the contractor.

PART 3 EXECUTION:

3.1 TEMPORARY PROTECTION:

A. Provide temporary bracing, shoring, needling and support during demolition, cutting, remodeling and related new construction necessary for the execution of the work and the protection of persons and property. Perform all work with appropriate supports, protection and methods to prevent collapse, settling or damage to property or persons. Provide adequate supports for the loads to be carried, with loads properly distributed, and including to lower levels and sound bearing, if necessary.

B Provide protective covering and enclosures necessary to prevent damage to existing spaces and materials to remain.

C. Provide dust proof temporary enclosures (including above ceilings) separating areas under demolition and remodeling from the remainder of the buildings as well as temporary filters at ductwork. If work produces fumes or odors that impact patient care or staff operations, granulated active carbon filters shall be provided for all HVAC intake units where operations provide these odors or fumes. Provide temporary hinged doors in temporary enclosures where necessary. Temporary and permanent doors shall be completely sealed with tape or other suitable material during demolition work and shall remain sealed until dust has settled.

3.2 MECHANICAL AND ELECTRICAL WORK EXPOSED

A. Where unknown mechanical piping, ductwork or electrical conduit is exposed during removal of partitions, walls, floors and ceilings, the removal or re-routing shall be by the Mechanical or Electrical Contractor as applicable. The contractor is to provide at minimum labor and materials required for one journeyman electrician or plumber 40-manhours to relocate these utilities. Re-routed piping shall be located where directed and shall be re-connected to maintain all functions in proper operation. Abandoned piping may be left in place where it is

disconnected from its source and capped or as directed by Project Manager. There shall be no"dead end" water, sewer, medical gas, or vent piping existing in the completed work.

B. Removals, capping or otherwise terminating services which are abandoned or need to be abandoned, shall be accomplished without additional cost to the government, whether shown or noted on drawings or otherwise encountered.

C. Contractor is to remove all old abandoned oval pneumatic tube lines, transfer boxes, and related equipment and components exposed within the construction area. The contractor is to provide at minimum labor and materials required for one electrician or laborer 40-manhours for removal.

3.3 WORK OF EACH CONTRACT

A. The contractor and each subcontractor shall carefully review the contract documents, including those primarily for other trades, with respect to the coordination of demolition, removal and remodeling work and perform such removals normal to their respective trade as may be shown, noted, or otherwise required. Cutting and patching incidental to demolition, removal and/or remodeling of general construction work shall be construed as the work of the general contractor when shown or indicated on the general construction drawings or schedules or specifically noted or called for on documents primarily for other trades as being accomplished by the general contractor. Other contractors shall perform such other cutting, demolition, patching, replacement and restoration as may be required to accomplish their part of the work.

3.4 PAINTING

A. Any painting to match adjacent or surrounding areas.

3.5 LEVELING OF FLOORS

A. Contractor shall submit for approval - brand of latex, floor leveler to be used. Leveler shall include additive for waterproofing.

3.6 PATCHING

A. Contractor shall be responsible for all patching required as a result of installation of new work.

B. Contractor shall furnish all related components, trims, etc. required to complete the work.

- - -END- - -

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies cast-in-place structural concrete and materials and mixes for other concrete.

1.2 RELATED WORK:

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

1.3 TESTING AGENCY FOR CONCRETE MIX DESIGN:

A. Testing agency for the trial concrete mix design retained and reimbursed by the Contractor and approved by Contracting Officer's Representative (COR). For all other testing, refer to Section 01 45 29 Testing Laboratory Services.

B. Testing agency maintaining active participation in Program of Cement and Concrete Reference Laboratory (CCRL) of National Institute of Standards and Technology. Accompany request for approval of testing agency with a copy of Report of Latest Inspection of Laboratory Facilities by CCRL.

C. Testing agency shall furnish equipment and qualified technicians to establish proportions of ingredients for concrete mixes.

1.4 TOLERANCES:

A. Formwork: ACI 117, except the elevation tolerance of formed surfaces before removal of shores is +0 mm (+0 inch) and -20 mm (-3/4 inch).

B. Reinforcement Fabricating and Placing: ACI 117, except that fabrication tolerance for bar sizes Nos. 10, 13, and 16 (Nos. 3, 4, and 5) (Tolerance Symbol 1 in Fig. 2.1(a), ACI, 117) used as column ties or stirrups is +0 mm (+0 inch) and -13 mm (-1/2 inch) where gross bar length is less than 3600 mm (12 feet), or +0 mm (+0 inch) and -20 mm (-3/4 inch) where gross bar length is 3600 mm (12 feet) or more.

C. Cross-Sectional Dimension: ACI 117, except tolerance for thickness of slabs 12 inches or less is +20 mm (+3/4 inch) and - 6 mm (-1/4 inch). Tolerance of thickness of beams more than 300 mm (12 inch) but less than 900 mm (3 feet) is +20 mm (+3/4 inch) and -10 mm (-3/8 inch).

D. Slab Finishes: ACI 117, Section 4.5.6, F-number method in accordance with ASTM E1155, except as follows:

1. Test entire slab surface, including those areas within 600 mm (2 feet) of construction joints and vertical elements that project through slab surface.
2. Maximum elevation change which may occur within 600 mm (2 feet) of any column or wall element is 6 mm (0.25 inches).
3. Allow sample measurement lines that are perpendicular to construction joints to extend past joint into previous placement no further than 1500 mm (5 feet).

1.5 REGULATORY REQUIREMENTS:

A. ACI SP-66 – ACI Detailing Manual.

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

C. ACI 301 – Standard Specifications for Structural Concrete.

1.6 SUBMITTALS:

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

B. Shop Drawings: Reinforcing steel: Complete shop drawings

C. Mill Test Reports:

1. Reinforcing Steel.
2. Cement.

D. Manufacturer's Certificates:

1. Abrasive aggregate.
2. Lightweight aggregate for structural concrete.
3. Air-entraining admixture.
4. Chemical admixtures, including chloride ion content.
5. Waterproof paper for curing concrete.
6. Liquid membrane-forming compounds for curing concrete.
7. Non-shrinking grout.
8. Liquid hardener.
9. Waterstops.
10. Expansion joint filler.
11. Adhesive binder.

E. Testing Agency for Concrete Mix Design: Approval request including qualifications of principals and technicians and evidence of active participation in program of Cement and Concrete Reference Laboratory (CCRL) of National Institute of Standards and Technology and copy of report of latest CCRL, Inspection of Laboratory.

F. Test Report for Concrete Mix Designs: Trial mixes including water-cement fly ash ratio curves, concrete mix ingredients, and admixtures.

G. Shoring and Reshoring Sequence: Submit for approval a shoring and reshoring sequence for flat slab/flat plate portions, prepared by a registered Professional Engineer. As a minimum, include timing of form stripping, reshoring, number of floors to be re-shored and timing of re-shore removal to serve as an initial outline of procedures subject to modification as construction progresses. Submit revisions to sequence, whether initiated by COR (see FORMWORK) or Contractor.

H. Test reports on splitting tensile strength (Fct) of lightweight concrete.

1.7 DELIVERY, STORAGE, AND HANDLING:

A. Conform to ACI 304. Store aggregate separately for each kind or grade, to prevent segregation of sizes and avoid inclusion of dirt and other materials.

B. Deliver cement in original sealed containers bearing name of brand and manufacturer, and marked with net weight of contents. Store in suitable watertight building in which floor is raised at least 300 mm (1 foot) above ground. Store bulk cement and fly ash in separate suitable bins.

C. Deliver other packaged materials for use in concrete in original sealed containers, plainly marked with manufacturer's name and brand, and protect from damage until used.

1.8 PRE-CONCRETE CONFERENCE:

A. General: At least 15 days prior to submittal of design mixes, conduct a meeting to review proposed methods of concrete construction to achieve the required results.

B. Agenda: Includes but is not limited to:

1. Submittals.
2. Coordination of work.
3. Availability of material.
4. Concrete mix design including admixtures.
5. Methods of placing, finishing, and curing.
6. Finish criteria required to obtain required flatness and levelness.
7. Timing of floor finish measurements.

8. Material inspection and testing.

C. Attendees: Include but not limited to representatives of Contractor; subcontractors involved in supplying, conveying, placing, finishing, and curing concrete; lightweight aggregate manufacturer; admixture manufacturers; COR; Consulting Engineer; Department of Veterans Affairs retained testing laboratories for concrete testing and finish (F-number) verification.

D. Minutes of the meeting: Contractor shall take minutes and type and distribute the minutes to attendees within five days of the meeting.

1.9 APPLICABLE PUBLICATIONS:

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

B. American Concrete Institute (ACI):

117-10.....Specifications for Tolerances for Concrete Construction and Materials and Commentary

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

214R-11.....Guide to Evaluation of Strength Test Results of Concrete

301-10.....Standard Practice for Structural Concrete

304R-00(R2009).....Guide for Measuring, Mixing, Transporting, and Placing Concrete

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

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

308.1-11.....Specification for Curing Concrete

309R-05.....Guide for Consolidation of Concrete

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

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

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

C. American National Standards Institute and American Hardboard Association (ANSI/AHA):

A135.4-2004.....Basic Hardboard

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

A82/A82M-07.....Standard Specification for Steel Wire, Plain, for Concrete Reinforcement

A185/185M-07.....Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

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

A653/A653M-11.....Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process

A706/A706M-09.....Standard Specification for Low Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

A767/A767M-09.....Standard Specification for Zinc Coated (Galvanized) Steel Bars for Concrete Reinforcement

A775/A775M-07.....Standard Specification for Epoxy Coated Reinforcing Steel Bars

A820-11.....Standard Specification for Steel Fibers for Fiber Reinforced Concrete

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

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

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

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

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

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

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

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

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

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

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

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

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

C309-11.....Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete

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

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

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

C666/C666M-03(R2008)....Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing

C881/C881M-10.....Standard Specification for Epoxy Resin Base Bonding Systems for Concrete

C1107/1107M-11.....Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)

C1315-11.....Standard Specification for Liquid Membrane Forming Compounds Having Special Properties for Curing and Sealing Concrete

D6-95(R2011).....Standard Test Method for Loss on Heating of Oil and Asphaltic Compounds

D297-93(R2006).....Standard Methods for Rubber Products Chemical Analysis

D412—06AE2.....Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension

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

D4263-83(2012).....Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.

D4397-10.....Standard Specification for Polyethylene Sheeting for Construction, Industrial and Agricultural Applications
E1155-96(R2008).....Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers
F1869-11.....Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

E. American Welding Society (AWS):
D1.4/D1.4M-11.....Structural Welding Code - Reinforcing Steel
F. Concrete Reinforcing Steel Institute (CRSI):
Handbook 2008
G. National Cooperative Highway Research Program (NCHRP):
Report On.....Concrete Sealers for the Protection of Bridge Structures
H. U. S. Department of Commerce Product Standard (PS):
PS 1.....Construction and Industrial Plywood
PS 20.....American Softwood Lumber
I. U. S. Army Corps of Engineers Handbook for Concrete and Cement:
CRD C513.....Rubber Waterstops
CRD C572.....Polyvinyl Chloride Waterstops

PART 2 - PRODUCTS:

2.1 FORMS:

A. Wood: PS 20 free from loose knots and suitable to facilitate finishing concrete surface specified; tongue and grooved.
B. Plywood: PS-1 Exterior Grade B-B (concrete-form) 16 mm (5/8 inch), or 20 mm (3/4 inch) thick for unlined contact form. B-B High Density Concrete Form Overlay optional.
C. Form Lining:
1. Hardboard: ANSI/AHA A135.4, Class 2 with one (S1S) smooth side)
2. Plywood: Grade B-B Exterior (concrete-form) not less than 6 mm (1/4 inch) thick.
3. Plastic, fiberglass, or elastomeric capable of reproducing the desired pattern or texture.
D. Concrete products shall comply with following standards for biobased materials:

Material Type	Percent by Weight
Concrete Penetrating Liquid	79 percent biobased material
Concrete form Release Agent	87 percent biobased material
Concrete Sealer	11 percent biobased material

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

E. Form Ties: Develop a minimum working strength of 13.35 kN (3000 pounds) when fully assembled. Ties shall be adjustable in length to permit tightening of forms and not have any lugs, cones, washers to act as spreader within form, nor leave a hole larger than 20 mm (3/4 inch) diameter, or a depression in exposed concrete surface, or leave metal closer than 40 mm (1 1/2 inches) to concrete surface. Wire ties not permitted. Cutting ties back from concrete face not permitted.

2.2 MATERIALS:

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

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

C. Coarse Aggregate: ASTM C33.

1. Size 67 or Size 467 may be used for footings and walls over 300 mm (12 inches) thick.
2. Coarse aggregate for applied topping, encasement of steel columns, and metal pan stair fill shall be Size 7.
3. Maximum size of coarse aggregates not more than one-fifth of narrowest dimension between sides of forms, one-third of depth of slabs, nor three-fourth of minimum clear spacing between reinforcing bars.

of freezing and thawing when tested in accordance with ASTM C666.

D. Fine Aggregate: ASTM C33. Fine aggregate for applied concrete floor topping shall pass a 4.75 mm (No. 4) sieve, 10 percent maximum shall pass a 150 µm (No. 100) sieve.

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

F. Admixtures:

1. Water Reducing Admixture: ASTM C494, Type A and not contain more chloride ions than are present in municipal drinking water.

2. Water Reducing, Retarding Admixture: ASTM C494, Type D and not contain more chloride ions than are present in municipal drinking water.
3. High-Range Water-Reducing Admixture (Superplasticizer): ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water.
4. Non-Corrosive, Non-Chloride Accelerator: ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water. Admixture manufacturer must have long-term non-corrosive test data from an independent testing laboratory of at least one year duration using an acceptable accelerated corrosion test method such as that using electrical potential measures.
5. Air Entraining Admixture: ASTM C260.
6. Microsilica: Use only with prior review and acceptance of the COR. Use only in conjunction with high range water reducer.
7. Calcium Nitrite corrosion inhibitor: ASTM C494 Type C.
8. Prohibited Admixtures: Calcium chloride, thiocyanate or admixtures containing more than 0.05 percent chloride ions are not permitted.
9. Certification: Written conformance to the requirements above and the chloride ion content of the admixture prior to mix design review.

G. Vapor Barrier: ASTM D4397, 0.38 mm (15 mil).
H. Reinforcing Steel: ASTM A615, or ASTM A996, deformed, grade as shown. All reinforcing steel to be epoxy-coated.
I. Welded Wire Fabric: ASTM A185. All reinforcing steel to be epoxy-coated.
J. All Reinforcing Bars to be Welded: ASTM A706. All reinforcing steel to be epoxy-coated.
K. Epoxy Coated Reinforcing Bars: ASTM A775.
L. Supports, Spacers, and Chairs: Types which will hold reinforcement in position shown in accordance with requirements of ACI 318 except as specified.
M. Expansion Joint Filler: ASTM D1751.
N. Sheet Materials for Curing Concrete: ASTM C171.
O. Liquid Membrane-forming Compounds for Curing Concrete: ASTM C309, Type I, with fugitive dye, and shall meet the requirements of ASTM C1315.Compound shall be compatible with scheduled surface treatment,

such as paint and resilient tile, and shall not discolor concrete surface.

P. Liquid Hardener and Dustproofer: Fluosilicate solution of magnesium fluosilicate or zinc fluosilicate. Magnesium and zinc may be used separately or in combination as recommended by manufacturer. Use only on exposed slab. Do not use where floor is covered with resilient flooring, paint or other finish coating.

Q. Moisture Vapor Emissions & Alkalinity Control Sealer: 100% active colorless aqueous siliconate solution concrete surface.

1. ASTM C1315 Type 1 Class A, and ASTM C309 Type 1 Class A, penetrating product to have no less than 34% solid content, leaving no sheen, volatile organic compound (VOC) content rating as required to suite regulatory requirements. The product shall have at least a five (5) year documented history in controlling moisture vapor emission from damaging floor covering, compatible with all finish materials.
2. MVE 15-Year Warranty:
   a. When a floor covering is installed on a below grade, on grade, or above grade concrete slab treated with Moisture Vapor Emissions & Alkalinity Control Sealer according to manufacturer's instruction, sealer manufacturer shall warrant the floor covering system against failure due to moisture vapor migration or moisture-born contaminates for a period of fifteen (15) years from the date of original installation. The warranty shall cover all labor and materials needed to replace all floor covering that fails due to moisture vapor emission & moisture born contaminates.

R. Penetrating Sealer: For use on parking garage ramps and decks. High penetration silane sealer providing minimum 95 percent screening per National Cooperative Highway Research Program (NCHRP) No. 244 standards for chloride ion penetration resistance. Requires moist (non-membrane) curing of slab.

S. Non-Shrink Grout:

1. ASTM C1107, pre-mixed, produce a compressive strength of at least 18 MPa at three days and 35 MPa (5000 psi) at 28 days. Furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95 percent bearing under a 1200 mm x 1200 mm (4 foot by 4 foot) base plate.

2. Where high fluidity or increased placing time is required, furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95 percent under an 450 mm x 900 mm (18 inch by 36 inch) base plate.

T. Adhesive Binder: ASTM C881.

U. Waterstops:.

1. Polyvinyl Chloride Waterstop: CRD C572.
2. Rubber Waterstops: CRD C513.
3. Bentonite Waterstop: Flexible strip of bentonite 25 mm x 20 mm (1 inch by 3/4 inch), weighing 8.7 kg/m (5.85 lbs. per foot) composed of Butyl Rubber Hydrocarbon (ASTM D297), Bentonite (SS-S-210-A) and Volatile Matter (ASTM D6).
4. Non-Metallic Hydrophilic: Swellable strip type compound of polymer modified chloroprene rubber that swells upon contact with water shall conform to ASTM D412 as follows: Tensile strength 420 psi minimum; ultimate elongation 600 percent minimum. Hardness shall be 50 minimum on the type A durameter and the volumetric expansion ratio in in 70 deg water shall be 3 to 1 minimum.

V. Porous Backfill: Crushed stone or gravel graded from 25 mm to 20 mm (1 inch to 3/4 inch).

W. Fibers:

1. Synthetic Fibers: Monofilament or fibrillated polypropylene fibers for secondary reinforcing of concrete members. Use appropriate length and 0.9 kg/m^3 (1.5 lb. per cubic yard). Product shall have a UL rating.
2. Steel Fibers: ASTM A820, Type I cold drawn, high tensile steel wire for use as primary reinforcing in slab-on-grade. Minimum dosage rate 18 kg/m^3 (30 lb. per cubic yard).

X. Epoxy Joint Filler: Two component, 100 percent solids compound, with a minimum shore D hardness of 50.

Y. Bonding Admixture: Non-rewettable, polymer modified, bonding compound.

2.3 CONCRETE MIXES:

A. Mix Designs: Proportioned in accordance with Section 5.3, "Proportioning on the Basis of Field Experience and/or Trial Mixtures" of ACI 318.

1. If trial mixes are used, make a set of at least 6 cylinders in accordance with ASTM C192 for test purposes from each trial mix; test three for compressive strength at 7 days and three at 28 days.
2. Submit a report of results of each test series, include a detailed listing of the proportions of trial mix or mixes, including cement, fly ash, admixtures, weight of fine and coarse aggregate per m^3 (cubic yard) measured dry rodded and damp loose, specific gravity, fineness modulus, percentage of moisture, air content, water-cement -fly ash ratio, and consistency of each cylinder in terms of slump. 3. Prepare a curve showing relationship between water-cement -fly ash ratio at 7-day and 28-day compressive strengths. Plot each curve using at least three specimens.
4. If the field experience method is used, submit complete standard deviation analysis.

B. Fly Ash Testing: Submit certificate verifying conformance with ASTM 618 initially with mix design and for each truck load of fly ash delivered from source. Submit test results performed within 6 months of submittal date. Notify COR immediately when change in source is anticipated.
   1. Testing Laboratory used for fly ash certification/testing shall participate in the Cement and Concrete Reference Laboratory (CCRL) program. Submit most recent CCRL inspection report.

C. After approval of mixes no substitution in material or change in proportions of approval mixes may be made without additional tests and approval of COR or as specified. Making and testing of preliminary test cylinders may be carried on pending approval of cement and fly ash, providing Contractor and manufacturer certify that ingredients used in making test cylinders are the same. COR may allow Contractor to proceed with depositing concrete for certain portions of work, pending final approval of cement and fly ash and approval of design mix.

D. Cement Factor: Maintain minimum cement factors in Table I regardless of compressive strength developed above minimums. Use Fly Ash as an admixture with 20% replacement by weight in all structural work. Increase this replacement to 40% for mass concrete.

TABLE I - CEMENT AND WATER FACTORS FOR CONCRETE

Concrete Strength	Non-Air-Entrained	Air-Entrained

Min. 28 Day Comp. Str. MPa (psi)	Min. Cement kg/m^3 (lbs/c. yd)	Max. Water Cement Ratio	Min. Cement kg/m^3 (lbs/c. yd)	Max. Water Cement Ratio
35 (5000)[1,3]	375 (630)	0.45	385 (650)	0.40
30 (4000)[1,3]	325 (550)	0.55	340 (570)	0.50
25 (3000)[1,3]	280 (470)	0.65	290 (490)	0.55
25 (3000)[1,2]	300 (500)	*	310 (520)	*

1. If trial mixes are used, the proposed mix design shall achieve a compressive strength 8.3 MPa (1200 psi) in excess of f'c. For concrete strengths above 35 Mpa (5000 psi), the proposed mix design shall achieve a compressive strength 9.7 MPa (1400 psi) in excess of f'c.
2. For concrete exposed to high sulfate content soils maximum water cement ratio is 0.44.
3. Determined by Laboratory in accordance with ACI 211.1 for normal concrete or ACI 211.2 for lightweight structural concrete.

E. Maximum Slump: Maximum slump, as determined by ASTM C143 with tolerances as established by ASTM C94, for concrete to be vibrated shall be as shown in Table II.

TABLE II - MAXIMUM SLUMP, MM (INCHES)*

Type of Construction	Normal Weight Concrete
Slabs and Reinforced Walls	100 mm (4 inches)

F. Slump may be increased by the use of the approved high-range water-reducing admixture (superplasticizer). Tolerances as established by ASTM C94. Concrete containing the high-range-water-reducing admixture may have a maximum slump of 225 mm (9 inches). The concrete shall arrive at the job site at a slump of 50 mm to 75 mm (2 inches to 3 inches), and 75 mm to 100 mm (3 inches to 4 inches) for lightweight concrete. This should be verified, and then the high-range-water-reducing admixture added to increase the slump to the approved level.

G. Air-Entrainment: Air-entrainment of normal weight concrete shall conform with Table III. Determine air content by either ASTM C173 or ASTM C231.

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

Nominal Maximum Size of Coarse Aggregate, mm (Inches) / Total Air Content Percentage by Volume	
10 mm (3/8 in).6 to 10	13 mm (1/2 in).5 to 9
20 mm (3/4 in).4 to 8	25 mm (1 in).3-1/2 to 6-1/2
40 mm (1 1/2 in).3 to 6	

H. Concrete slabs placed at air temperatures below 10 degrees C (50 degrees Fahrenheit) use non-corrosive, non-chloride accelerator. Concrete required to be air entrained use approved air entraining admixture. Pumped concrete, synthetic fiber concrete, architectural concrete, concrete required to be watertight, and concrete with a water/cement ratio below 0.50 use high-range water-reducing admixture (superplasticizer).

I. Durability: Use air entrainment for exterior exposed concrete subjected to freezing and thawing and other concrete shown or specified. For air content requirements see Table III or Table IV.

J. Enforcing Strength Requirements: Test as specified in Section 01 45 29, TESTING LABORATORY SERVICES, during the progress of the work. Seven-day tests may be used as indicators of 28-day strength. Average of any three 28-day consecutive strength tests of laboratory-cured specimens representing each type of concrete shall be equal to or greater than specified strength. No single test shall be more than 3.5 MPa (500 psi) below specified strength. Interpret field test results in accordance with ACI 214. Should strengths shown by test specimens fall below required values, COR may require any one or any combination of the following corrective actions, at no additional cost to the Government:

1. Require changes in mix proportions by selecting one of the other appropriate trial mixes or changing proportions, including cement content, of approved trial mix.
2. Require additional curing and protection.
3. If five consecutive tests fall below 95 percent of minimum values given in Table I or if test results are so low as to raise a question as to the safety of the structure, Resident Engineer may direct Contractor to take cores from portions of the structure. Use

results from cores tested by the Contractor retained testing agency to analyze structure.

4. If strength of core drilled specimens falls below 85 percent of minimum value given in Table I, COR may order load tests, made by Contractor retained testing agency, on portions of building so affected. Load tests in accordance with ACI 318 and criteria of acceptability of concrete under test as given therein.
5. Concrete work, judged inadequate by structural analysis, by results of load test, or for any reason, shall be reinforced with additional construction or replaced, if directed by the COR.

2.4 BATCHING AND MIXING:

A. General: Concrete shall be "Ready-Mixed" and comply with ACI 318 and ASTM C94, except as specified. Batch mixing at the site is permitted. Mixing process and equipment must be approved by COR. With each batch of concrete, furnish certified delivery tickets listing information in Paragraph 16.1 and 16.2 of ASTM C94. Maximum delivery temperature of concrete is 38^0C (100 degrees Fahrenheit). Minimum delivery temperature as follows:

Atmospheric Temperature	Minimum Concrete Temperature
-1. degrees to 4.4 degrees C (30 degrees to 40 degrees F)	15.6 degrees C (60 degrees F.)
-17 degrees C to -1.1 degrees C (0 degrees to 30 degrees F.)	21 degrees C (70 degrees F.)

PART 3 - EXECUTION

3.1 FORMWORK:

A. General: Design in accordance with ACI 347 is the responsibility of the Contractor. The Contractor shall retain a registered Professional Engineer to design the formwork, shores, and reshores.

1. Form boards and plywood forms may be reused for contact surfaces of exposed concrete only if thoroughly cleaned, patched, and repaired and COR approves their reuse.
2. Provide forms for concrete footings unless COR determines forms are not necessary.

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

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

C. Unlined Forms: Use plywood forms to obtain a smooth finish for concrete surfaces. Tightly butt edges of sheets to prevent leakage. Back up all vertical joints solidly and nail edges of adjacent sheets to same stud with 6d box nails spaced not over 150 mm (6 inches) apart.

D. Lined Forms: May be used in lieu of unlined plywood forms. Back up form lining solidly with square edge board lumber securely nailed to studs with all edges in close contact to prevent bulging of lining. No joints in lining and backing may coincide. Nail abutted edges of sheets to same backing board. Nail lining at not over 200 mm (8 inches) on center along edges and with at least one nail to each square foot of surface area; nails to be 3d blued shingle or similar nails with thin flatheads.

E. Wall Form Ties: Locate wall form ties in symmetrically level horizontal rows at each line of wales and in plumb vertical tiers. Space ties to maintain true, plumb surfaces. Provide one row of ties within 150 mm (6 inches) above each construction joint. Space through-ties adjacent to horizontal and vertical construction joints not over 450 mm (18 inches) on center.

1. Tighten row of ties at bottom of form just before placing concrete and, if necessary, during placing of concrete to prevent seepage of concrete and to obtain a clean line. Ties to be entirely removed shall be loosened 24 hours after concrete is placed and shall be pulled from least important face when removed.
2. Coat surfaces of all metal that is to be removed with paraffin, cup grease or a suitable compound to facilitate removal.

F. Inserts, Sleeves, and Similar Items: Flashing reglets, steel strips, masonry ties, anchors, wood blocks, nailing strips, grounds, inserts, wire hangers, sleeves, drains, guard angles, forms for floor hinge boxes, inserts or bond blocks for elevator guide rails and supports, and other items specified as furnished under this and other sections of

specifications and required to be in their final position at time concrete is placed shall be properly located, accurately positioned, and built into construction, and maintained securely in place.

1. Locate inserts or hanger wires for furred and suspended ceilings only in bottom of concrete joists, or similar concrete member of overhead concrete joist construction.
2. Install sleeves, inserts and similar items for mechanical services in accordance with drawings prepared specially for mechanical services. Contractor is responsible for accuracy and completeness of drawings and shall coordinate requirements for mechanical services and equipment.
3. Do not install sleeves in beams, joists or columns except where shown or permitted by COR. Install sleeves in beams, joists, or columns that are not shown, but are permitted by the COR, and require no structural changes, at no additional cost to the Government.
4. Minimum clear distance of embedded items such as conduit and pipe is at least three times diameter of conduit or pipe, except at stub-ups and other similar locations.
5. Provide recesses and blockouts in floor slabs for door closers and other hardware as necessary in accordance with manufacturer's instructions.

G. Construction Tolerances:

1. Set and maintain concrete formwork to assure erection of completed work within tolerances specified and to accommodate installation of other rough and finish materials. Accomplish remedial work necessary for correcting excessive tolerances. Erected work that exceeds specified tolerance limits shall be remedied or removed and replaced, at no additional cost to the Government.
2. Permissible surface irregularities for various classes of materials are defined as "finishes" in specification sections covering individual materials. They are to be distinguished from tolerances specified which are applicable to surface irregularities of structural elements.

3.2 PLACING REINFORCEMENT:

A. General: Details of concrete reinforcement in accordance with ACI 318 unless otherwise shown.

B. Placing: Place reinforcement conforming to CRSI DA4, unless otherwise shown.
   1. Place reinforcing bars accurately and tie securely at intersections and splices with 1.6 mm (16 gauge) black annealed wire. Use epoxy-coated tie wire with epoxy-coated reinforcing. Secure reinforcing bars against displacement during the placing of concrete by spacers, chairs, or other similar supports. Portions of supports, spacers, and chairs in contact with formwork shall be made of plastic in areas that will be exposed when building is occupied. Type, number, and spacing of supports conform to ACI 318. Where concrete slabs are placed on ground, use concrete blocks or other non-corrodible material of proper height, for support of reinforcement. Use of brick or stone supports will not be permitted.
   2. Lap welded wire fabric at least 1 1/2 mesh panels plus end extension of wires not less than 300 mm (12 inches) in structural slabs. Lap welded wire fabric at least 1/2 mesh panels plus end extension of wires not less than 150 mm (6 inches) in slabs on grade.
   3. Splice column steel at no points other than at footings and floor levels unless otherwise shown.

C. Spacing: Minimum clear distances between parallel bars, except in columns and multiple layers of bars in beams shall be equal to nominal diameter of bars. Minimum clear spacing is 25 mm (1 inch) or 1-1/3 times maximum size of coarse aggregate.

D. Splicing: Splices of reinforcement made only as required or shown or specified. Accomplish splicing as follows:
   1. Lap splices: Do not use lap splices for bars larger than Number 36 (Number 11). Minimum lengths of lap as shown.
   2. Welded splices: Splicing by butt-welding of reinforcement permitted providing the weld develops in tension at least 125 percent of the yield strength (fy) for the bars. Welding conform to the requirements of AWS D1.4. Welded reinforcing steel conform to the chemical analysis requirements of AWS D1.4.
      a. Submit test reports indicating the chemical analysis to establish weldability of reinforcing steel.
      b. Submit a field quality control procedure to insure proper inspection, materials and welding procedure for welded splices.

c. Department of Veterans Affairs retained testing agency shall test a minimum of three splices, for compliance, locations selected by COR.

3. Mechanical Splices: Develop in tension and compression at least 125 percent of the yield strength (fy) of the bars. Stresses of transition splices between two reinforcing bar sizes based on area of smaller bar. Provide mechanical splices at locations indicated. Use approved exothermic, tapered threaded coupling, or swaged and threaded sleeve. Exposed threads and swaging in the field not permitted.
   a. Initial qualification: In the presence of COR, make three test mechanical splices of each bar size proposed to be spliced. Department of Veterans Affairs retained testing laboratory will perform load test.
   b. During installation: Furnish, at no additional cost to the Government, one companion (sister) splice for every 50 splices for load testing. Department of Veterans Affairs retained testing laboratory will perform the load test.

E. Bending: Bend bars cold, unless otherwise approved. Do not field bend bars partially embedded in concrete, except when approved by Resident Engineer.

F. Cleaning: Metal reinforcement, at time concrete is placed, shall be free from loose flaky rust, mud, oil, or similar coatings that will reduce bond.

G. Future Bonding: Protect exposed reinforcement bars intended for bonding with future work by wrapping with felt and coating felt with a bituminous compound unless otherwise shown.

3.3 VAPOR BARRIER:

A. Except where membrane waterproofing is required, interior concrete slab on grade shall be placed on a continuous vapor barrier.
   1. Place 100 mm (4 inches) of fine granular fill over the vapor barrier to act as a blotter for concrete slab.
   2. Vapor barrier joints lapped 150 mm (6 inches) and sealed with compatible waterproof pressure-sensitive tape.
   3. Patch punctures and tears.

3.4 SLABS RECEIVING RESILIENT COVERING

A. Slab shall be allowed to cure for 6 weeks minimum prior to placing resilient covering. After curing, slab shall be tested by the Contractor for moisture in accordance with ASTM D4263 or ASTM F1869. Moisture content shall be less than 3 pounds per 1000 sf prior to placing covering.

B. In lieu of curing for 6 weeks, Contractor has the option, at his own cost, to utilize the Moisture Vapor Emissions & Alkalinity Control Sealer as follows:

1. Sealer is applied on the day of the concrete pour or as soon as harsh weather permits, prior to any other chemical treatments for concrete slabs either on grade, below grade or above grade receiving resilient flooring, such as, sheet vinyl, vinyl composition tile, rubber, wood flooring, epoxy coatings and overlays.
2. Manufacturer's representative will be on the site the day of concrete pour to install or train its application and document. He shall return on every application thereafter to verify that proper procedures are followed.
   a. Apply Sealer to concrete slabs as soon as final finishing operations are complete and the concrete has hardened sufficiently to sustain floor traffic without damage.
   b. Spray apply Sealer at the rate of 20 m^2 (200 square feet) per gallon. Lightly broom product evenly over the substrate and product has completely penetrated the surface.
   c. If within two (2) hours after initial application areas are subjected to heavy rainfall and puddling occurs, reapply Sealer product to these areas as soon as weather condition permits.

3.5 CONSTRUCTION JOINTS:

A. Unless otherwise shown, location of construction joints to limit individual placement shall not exceed 24,000 mm (80 feet) in any horizontal direction, except slabs on grade which shall have construction joints shown. Allow 48 hours to elapse between pouring adjacent sections unless this requirement is waived by COR.

B. Locate construction joints in suspended floors near the quarter-point of spans for slabs, beams or girders, unless a beam intersects a girder at center, in which case joint in girder shall be offset a distance

equal to twice width of beam. Provide keys and inclined dowels as shown. Provide longitudinal keys as shown.

C. Place concrete for columns slowly and in one operation between joints. Install joints in concrete columns at underside of deepest beam or girder framing into column.

D. Allow 2 hours to elapse after column is cast before concrete of supported beam, girder or slab is placed. Place girders, beams, grade beams, column capitals, brackets, and haunches at the same time as slab unless otherwise shown.

E. Install polyvinyl chloride or rubber water seals, as shown in accordance with manufacturer's instructions, to form continuous watertight seal.

3.6 EXPANSION JOINTS AND CONTRACTION JOINTS:

A. Clean expansion joint surfaces before installing premolded filler and placing adjacent concrete.

B. Install polyvinyl chloride or rubber water seals, as shown in accordance with manufacturer's instructions, to form continuous watertight seal.

C. Provide contraction (control) joints in floor slabs as indicated on the contract drawings. Joints shall be either formed or saw cut, to the indicated depth after the surface has been finished. Complete saw joints within 4 to 12 hours after concrete placement. Protect joints from intrusion of foreign matter.

3.7 PLACING CONCRETE:

A. Preparation:

1. Remove hardened concrete, wood chips, shavings and other debris from forms.
2. Remove hardened concrete and foreign materials from interior surfaces of mixing and conveying equipment.
3. Have forms and reinforcement inspected and approved by COR before depositing concrete.
4. Provide runways for wheeling equipment to convey concrete to point of deposit. Keep equipment on runways which are not supported by or bear on reinforcement. Provide similar runways for protection of vapor barrier on coarse fill.

B. Bonding: Before depositing new concrete on or against concrete which has been set, thoroughly roughen and clean existing surfaces of laitance, foreign matter, and loose particles.
   1. Preparing surface for applied topping:
      a. Remove laitance, mortar, oil, grease, paint, or other foreign material by sand blasting. Clean with vacuum type equipment to remove sand and other loose material.
      b. Broom clean and keep base slab wet for at least four hours before topping is applied.
      c. Use a thin coat of one part Portland cement, 1.5 parts fine sand, bonding admixture; and water at a 50: 50 ratio and mix to achieve the consistency of thick paint. Apply to a damp base slab by scrubbing with a stiff fiber brush. New concrete shall be placed while the bonding grout is still tacky.

C. Conveying Concrete: Convey concrete from mixer to final place of deposit by a method which will prevent segregation. Method of conveying concrete is subject to approval of COR.

D. Placing: For special requirements see Paragraphs, HOT WEATHER and COLD WEATHER.
   1. Do not place concrete when weather conditions prevent proper placement and consolidation, or when concrete has attained its initial set, or has contained its water or cement content more than 1 1/2 hours.
   2. Deposit concrete in forms as near as practicable in its final position. Prevent splashing of forms or reinforcement with concrete in advance of placing concrete.
   3. Do not drop concrete freely more than 3000 mm (10 feet) for concrete containing the high-range water-reducing admixture (superplasticizer) or 1500 mm (5 feet) for conventional concrete. Where greater drops are required, use a tremie or flexible spout (canvas elephant trunk), attached to a suitable hopper.
   4. Discharge contents of tremies or flexible spouts in horizontal layers not exceeding 500 mm (20 inches) in thickness, and space tremies such as to provide a minimum of lateral movement of concrete.
   5. Continuously place concrete until an entire unit between construction joints is placed. Rate and method of placing concrete

shall be such that no concrete between construction joints will be deposited upon or against partly set concrete, after its initial set has taken place, or after 45 minutes of elapsed time during concrete placement.

6. On bottom of members with severe congestion of reinforcement, deposit 25 mm (1 inch) layer of flowing concrete containing the specified high-range water-reducing admixture (superplasticizer). Successive concrete lifts may be a continuation of this concrete or concrete with a conventional slump.

E. Consolidation: Conform to ACI 309. Immediately after depositing, spade concrete next to forms, work around reinforcement and into angles of forms, tamp lightly by hand, and compact with mechanical vibrator applied directly into concrete at approximately 450 mm (18 inch) intervals. Mechanical vibrator shall be power driven, hand operated type with minimum frequency of 5000 cycles per minute having an intensity sufficient to cause flow or settlement of concrete into place. Vibrate concrete to produce thorough compaction, complete embedment of reinforcement and concrete of uniform and maximum density without segregation of mix. Do not transport concrete in forms by vibration.

1. Use of form vibration shall be approved only when concrete sections are too thin or too inaccessible for use of internal vibration.
2. Carry on vibration continuously with placing of concrete. Do not insert vibrator into concrete that has begun to set.

3.8 HOT WEATHER:

Follow the recommendations of ACI 305 or as specified to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete. Methods proposed for cooling materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by COR.

3.9 COLD WEATHER:

Follow the recommendations of ACI 306 or as specified to prevent freezing of concrete and to permit concrete to gain strength properly. Use only the specified non-corrosive, non-chloride accelerator. Do not use calcium chloride, thiocyantes or admixtures containing more than 0.05 percent chloride ions. Methods proposed for heating materials and

arrangements for protecting concrete shall be made in advance of concrete placement and approved by COR.

3.10 PROTECTION AND CURING:

A. Conform to ACI 308: Initial curing shall immediately follow the finishing operation. Protect exposed surfaces of concrete from premature drying, wash by rain and running water, wind, mechanical injury, and excessively hot or cold temperatures. Keep concrete not covered with membrane or other curing material continuously wet for at least 7 days after placing, except wet curing period for high-early-strength concrete shall be not less than 3 days. Keep wood forms continuously wet to prevent moisture loss until forms are removed. Cure exposed concrete surfaces as described below. Other curing methods may be used if approved by COR.

1. Liquid curing and sealing compounds: Apply by power-driven spray or roller in accordance with the manufacturer's instructions. Apply immediately after finishing. Maximum coverage $10m^2/L$ (400 square feet per gallon) on steel troweled surfaces and $7.5m^2/L$ (300 square feet per gallon) on floated or broomed surfaces for the curing/sealing compound.
2. Plastic sheets: Apply as soon as concrete has hardened sufficiently to prevent surface damage. Utilize widest practical width sheet and overlap adjacent sheets 50 mm (2 inches). Tightly seal joints with tape.
3. Paper: Utilize widest practical width paper and overlap adjacent sheets 50 mm (2 inches). Tightly seal joints with sand, wood planks, pressure-sensitive tape, mastic or glue.

3.11 REMOVAL OF FORMS:

A. Remove in a manner to assure complete safety of structure after the following conditions have been met.

1. Where structure as a whole is supported on shores, forms for beams and girder sides, columns, and similar vertical structural members may be removed after 24 hours, provided concrete has hardened sufficiently to prevent surface damage and curing is continued without any lapse in time as specified for exposed surfaces.
2. Take particular care in removing forms of architectural exposed concrete to insure surfaces are not marred or gouged, and that corners and arises are true, sharp and unbroken.

B. Control Test: Use to determine if the concrete has attained sufficient strength and curing to permit removal of supporting forms. Cylinders required for control tests taken in accordance with ASTM C172, molded in accordance with ASTM C31, and tested in accordance with ASTM C39. Control cylinders cured and protected in the same manner as the structure they represent. Supporting forms or shoring not removed until strength of control test cylinders have attained at least 70 percent of minimum 28-day compressive strength specified. Exercise care to assure that newly unsupported portions of structure are not subjected to heavy construction or material loading.

C. Reshoring: Reshoring is required if superimposed load plus dead load of the floor exceeds the capacity of the floor at the time of loading. In addition, for flat slab/plate, reshoring is required immediately after stripping operations are complete and not later than the end of the same day. Reshoring accomplished in accordance with ACI 347 at no additional cost to the Government.

3.12 CONCRETE SURFACE PREPARATION:

A. Metal Removal: Unnecessary metal items cut back flush with face of concrete members.

B. Patching: Maintain curing and start patching as soon as forms are removed. Do not apply curing compounds to concrete surfaces requiring patching until patching is completed. Use cement mortar for patching of same composition as that used in concrete. Use white or gray Portland cement as necessary to obtain finish color matching surrounding concrete. Thoroughly clean areas to be patched. Cut out honeycombed or otherwise defective areas to solid concrete to a depth of not less than 25 mm (1 inch). Cut edge perpendicular to surface of concrete. Saturate with water area to be patched, and at least 150 mm (6 inches) surrounding before placing patching mortar. Give area to be patched a brush coat of cement grout followed immediately by patching mortar. Cement grout composed of one part Portland cement, 1.5 parts fine sand, bonding admixture, and water at a 50:50 ratio, mix to achieve consistency of thick paint. Mix patching mortar approximately 1 hour before placing and remix occasionally during this period without addition of water. Compact mortar into place and screed slightly higher than surrounding surface. After initial shrinkage has occurred, finish to match color and texture of adjoining surfaces. Cure patches as

specified for other concrete. Fill form tie holes which extend entirely through walls from unexposed face by means of a pressure gun or other suitable device to force mortar through wall. Wipe excess mortar off exposed face with a cloth.

C. Upon removal of forms, clean vertical concrete surface that is to receive bonded applied cementitious application with wire brushes or by sand blasting to remove unset material, laitance, and loose particles to expose aggregates to provide a clean, firm, granular surface for bond of applied finish.

3.13 CONCRETE FINISHES:

A. Vertical and Overhead Surface Finishes:

1. Unfinished areas: Vertical and overhead concrete surfaces exposed in pipe basements, elevator and dumbwaiter shafts, pipe spaces, pipe trenches, above suspended ceilings, manholes, and other unfinished areas will not require additional finishing.
2. Interior and exterior exposed areas finished: Give a grout finish of uniform color and smooth finish treated as follows:
   a. After concrete has hardened and laitance, fins and burrs removed, scrub concrete with wire brushes. Clean stained concrete surfaces by use of a hone stone.
   b. Apply grout composed of one part of Portland cement, one part fine sand, smaller than a 600 µm (No. 30) sieve. Work grout into surface of concrete with cork floats or fiber brushes until all pits, and honeycombs are filled.
   c. After grout has hardened slightly, but while still plastic, scrape grout off with a sponge rubber float and, about 1 hour later, rub concrete vigorously with burlap to remove any excess grout remaining on surfaces.
   d. In hot, dry weather use a fog spray to keep grout wet during setting period. Complete finish of area in same day. Make limits of finished areas at natural breaks in wall surface. Leave no grout on concrete surface overnight.
4. Textured: Finish as specified. Maximum quantity of patched area 0.2 m^2 (2 square feet) in each 93 m^2 (1000 square feet) of textured surface.

B. Slab Finishes:

1. Monitoring and Adjustment: Provide continuous cycle of placement, measurement, evaluation and adjustment of procedures to produce slabs within specified tolerances. Monitor elevations of structural steel in key locations before and after concrete placement to establish typical deflection patterns for the structural steel. Determine elevations of cast-in-place slab soffits prior to removal of shores. Provide information to COR and floor consultant for evaluation and recommendations for subsequent placements.
2. Set perimeter forms to serve as screed using either optical or laser instruments. For slabs on grade, wet screeds may be used to establish initial grade during strike-off, unless COR determines that the method is proving insufficient to meet required finish tolerances and directs use of rigid screed guides. Where wet screeds are allowed, they shall be placed using grade stakes set by optical or laser instruments. Use rigid screed guides, as opposed to wet screeds, to control strike-off elevation for all types of elevated (non slab-on-grade) slabs. Divide bays into halves or thirds by hard screeds. Adjust as necessary where monitoring of previous placements indicates unshored structural steel deflections to other than a level profile.
3. Place slabs monolithically. Once slab placement commences, complete finishing operations within same day. Slope finished slab to floor drains where they occur, whether shown or not.
4. Use straightedges specifically made for screeding, such as hollow magnesium straightedges or power strike-offs. Do not use pieces of dimensioned lumber. Strike off and screed slab to a true surface at required elevations. Use optical or laser instruments to check concrete finished surface grade after strike-off. Repeat strike-off as necessary. Complete screeding before any excess moisture or bleeding water is present on surface. Do not sprinkle dry cement on the surface.
5. Immediately following screeding, and before any bleed water appears, use a 3000 mm (10 foot) wide highway straightedge in a cutting and filling operation to achieve surface flatness. Do not use bull floats or darbys, except that darbying may be allowed for narrow slabs and restricted spaces.

6. Wait until water sheen disappears and surface stiffens before proceeding further. Do not perform subsequent operations until concrete will sustain foot pressure with maximum of 6 mm (1/4 inch) indentation.
7. Scratch Finish: Finish base slab to receive a bonded applied cementitious application as indicated above, except that bull floats and darbys may be used. Thoroughly coarse wire broom within two hours after placing to roughen slab surface to insure a permanent bond between base slab and applied materials.
8. Float Finish: Slabs to receive unbonded toppings, steel trowel finish, fill, mortar setting beds, or a built-up roof, and ramps, stair treads, platforms (interior and exterior), and equipment pads shall be floated to a smooth, dense uniform, sandy textured finish. During floating, while surface is still soft, check surface for flatness using a 3000 mm (10 foot) highway straightedge. Correct high spots by cutting down and correct low spots by filling in with material of same composition as floor finish. Remove any surface projections and re-float to a uniform texture.
9. Steel Trowel Finish: Concrete surfaces to receive resilient floor covering or carpet, monolithic floor slabs to be exposed to view in finished work, future floor roof slabs, applied toppings, and other interior surfaces for which no other finish is indicated. Steel trowel immediately following floating. During final troweling, tilt steel trowel at a slight angle and exert heavy pressure to compact cement paste and form a dense, smooth surface. Finished surface shall be smooth, free of trowel marks, and uniform in texture and appearance.
10. Broom Finish: Finish exterior slabs, ramps, and stair treads with a bristle brush moistened with clear water after surfaces have been floated. Brush in a direction transverse to main traffic. Match texture approved by COR from sample panel.
11. Finished slab flatness (FF) and levelness (FL) values comply with the following minimum requirements:
    a. Areas covered with carpeting, or not specified otherwise in b. below:
        1) Slab on Grade:
            a) Specified overall value F_F 25/F_L 20

b) Minimum local value F_F 17/F_L 15

2) Level suspended slabs (shored until after testing) and topping slabs:

a) Specified overall value FF 25/FL 20

b) Minimum local value FF 17/FL 15

3) Unshored suspended slabs:

a) Specified overall value FF 25

b) Minimum local value FF 17

4) Level tolerance such that 80 percent of all points fall within a 20 mm (3/4 inch) envelope +10 mm, -10 mm (+3/8 inch, -3/8 inch) from the design elevation.

b. Areas that will be exposed, receive thin-set tile or resilient flooring, or roof areas designed as future floors:

1) Slab on grade:

a) Specified overall value FF 36/FL 20

b) Minimum local value FF 24/FL 15

2) Level suspended slabs (shored until after testing) and topping slabs

a) Specified overall value FF 30/FL 20

b) Minimum local value FF 24/FL 15

3) Unshored suspended slabs:

a) Specified overall value FF 30

b) Minimum local value FF 24

4) Level tolerance such that 80 percent of all points fall within a 20 mm (3/4 inch) envelope +10 mm, -10 mm (+3/8 inch, -3/8 inch) from the design elevation.

c. "Specified overall value" is based on the composite of all measured values in a placement derived in accordance with ASTM E1155.

d. "Minimum local value" (MLV) describes the flatness or levelness below which repair or replacement is required. MLV is based on the results of an individual placement and applies to a minimum local area. Minimum local area boundaries may not cross a construction joint or expansion joint. A minimum local area will be bounded by construction and/or control joints, or by column lines and/or half-column lines, whichever is smaller.

12. Measurements

a. Contractor retained laboratory will take measurements as directed by COR, to verify compliance with FF, FL, and other finish requirements. Measurements will occur within 72 hours after completion of concrete placement (weekends and holidays excluded). Make measurements before shores or forms are removed to insure the "as-built" levelness is accurately assessed. Profile data for above characteristics may be collected using a laser level or any Type II apparatus (ASTM E1155, "profileograph" or "dipstick"). Contractor's surveyor shall establish reference elevations to be used by Department of Veterans Affairs retained testing laboratory.

b. Contractor not experienced in using FF and FL criteria is encouraged to retain the services of a floor consultant to assist with recommendations concerning adjustments to slab thicknesses, finishing techniques, and procedures on measurements of the finish as it progresses in order to achieve the specific flatness and levelness numbers.

13. Acceptance/ Rejection:

a. If individual slab section measures less than either of specified minimum local F_F/F_L numbers, that section shall be rejected and remedial measures shall be required. Sectional boundaries may be set at construction and contraction (control) joints, and not smaller than one-half bay.

b. If composite value of entire slab installation, combination of all local results, measures less than either of specified overall F_F/F_L numbers, then whole slab shall be rejected and remedial measures shall be required.

14. Remedial Measures for Rejected Slabs: Correct rejected slab areas by grinding, planing, surface repair with underlayment compound or repair topping, retopping, or removal and replacement of entire rejected slab areas, as directed by COR, until a slab finish constructed within specified tolerances is accepted.

3.14 SURFACE TREATMENTS:

A. Use on exposed concrete floors and concrete floors to receive carpeting except those specified to receive non-slip finish.

B. Liquid Densifier/Sealer: Apply in accordance with manufacturer's directions just prior to completion of construction.

C. Non-Slip Finish: Except where safety nosing and tread coverings are shown, apply non-slip abrasive aggregate to treads and platforms of concrete steps and stairs, and to surfaces of exterior concrete ramps and platforms. Broadcast aggregate uniformly over concrete surface at rate of application of 8% per 1/10th m^2 (7.5 percent per square foot) of area. Trowel concrete surface to smooth dense finish. After curing, rub treated surface with abrasive brick and water to slightly expose abrasive aggregate.

3.15 RESURFACING FLOORS:

Remove existing flooring areas to receive resurfacing to expose existing structural slab and extend not less than 25 mm (1 inch) below new finished floor level. Prepare exposed structural slab surface by roughening, broom cleaning, and dampening. Apply specified bonding grout. Place topping while the bonding grout is still tacky.

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SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Structural steel shapes, plates, and bars.
   2. Structural pipe.
   3. Bolts, nuts, and washers.

1.2 RELATED REQUIREMENTS

A. Materials Testing And Inspection During Construction: Section 01 45 29, TESTING LABORATORY SERVICES.

1.3 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.
B. American Institute of Steel Construction (AISC):
   1. AISC Manual - Steel Construction Manual, 14th Ed.
   2. 303-10 - Code of Structural Steel Buildings and Bridges.
   3. 360-10: Specification for Structural Steel Buildings.
C. The American Society of Mechanical Engineers (ASME):
   1. B18.22.1-09 - Washers: Helical Spring-Lock, Tooth Lock, and Plain Washers.
D. American Welding Society (AWS):
   1. D1.1/D1.1M-15 - Structural Welding Code - Steel.
E. ASTM International (ASTM):
   1. A6/A6M-14 - General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
   2. A36/A36M-14 - Carbon Structural Steel.
   3. A53/A53M-12 - Pipe, Steel, Black and Hot-Dip, Zinc-Coated, Welded and Seamless.
   4. A123/A123M-15 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   5. A242/A242M-13 - High-Strength Low-Alloy Structural Steel.
   6. A283/A283M-13 - Low and Intermediate Tensile Strength Carbon Steel Plates.
   7. A307-14 - Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.

8. A325-14 - Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
9. A490-14a - Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
10. A500/A500M-13 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing and Rounds and Shapes.
11. A501/A501M-14 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing and Rounds and Shapes.
12. A572/A572M-15 - High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
13. A992/A992M-15 - Structural Shapes.
14. F2329/F2329M-15 - Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy steel Bolts, Screws, washers, Nuts, and Special Threaded Fasteners.

F. Master Painters Institute (MPI):
1. No. 18 - Primer, Zinc Rich, Organic.

G. Military Specifications (Mil. Spec.):
1. MIL-P-21035 - Paint, High Zinc Dust Content, Galvanizing, Repair.

H. Occupational Safety and Health Administration (OSHA):
1. 29 CFR 1926.752(e) - Guidelines For Establishing The Components Of A Site-Specific Erection Plan.
2. 29 CFR 1926-2001 - Safety Standards for Steel Erection.

I. Research Council on Structural Connections (RCSC) of The Engineering Foundation:
1. Specification for Structural Joints Using ASTM A325 or A490 Bolts.

J. International Code Council:
1. International Building Code, 2012.

K. National Fire Protection Agency

1.4 SUBMITTALS

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

B. Submittal Drawings:
1. Show size, configuration, and fabrication and installation details.
2. Show layout of construction scaffolding, signed and stamped by a registered Professional Engineer.

C. Sustainable Construction Submittals:
   1. Recycled Content: Identify post-consumer and pre-consumer recycled content percentage by weight.
D. Test Reports: Certify products comply with specifications.
   1. Welders' qualifying tests.
E. Certificates: Certify each product complies with specifications.
   1. Structural steel.
   2. Steel connections.
   3. Welding materials.
   4. Shop coat primer paint.
F. Qualifications: Substantiate qualifications comply with specifications.
   1. Fabricator with project experience list .
   2. Installer with project experience list .
   3. Welders and welding procedures.
G. Delegated Design Drawings and Calculations: Signed and sealed by responsible Architect/Engineer.
   1. Connection calculations.
H. Record Surveys: Signed and sealed by responsible surveyor or engineer.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: AISC Quality Certification participant designated as AISC Certified Plant, Category STD.
   1. Regularly fabricates specified products.
   2. Fabricated specified products with satisfactory service on five similar installations for minimum five years.
      a. Project Experience List: Provide contact names and addresses for completed projects.
B. Installer Qualifications: AISC Quality Certification Program participant designated as AISC-Certified Erector, Category ACSE.
   1. Regularly installs specified products.
   2. Installed specified products with satisfactory service on five similar installations for minimum five years.
      a. Project Experience List: Provide contact names and addresses for completed projects.
C. Before commencement of Work, ensure steel erector provides written notification required by OSHA 29 CFR 1926.752(e). Submit a copy of the notification to Contracting Officer's Representative.

D. Welders and Welding Procedures Qualifications: AWS D1.1/D1.1M.

1.6 WARRANTY

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

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

A. Delegated Design: Prepare submittal documents including design calculations and drawings signed and sealed by registered design professional, licensed in state where project is located.

B. Design structural steel framing connections complying with specified performance:

1. Load Capacity: Resist loads indicated on drawings. Account for connection and member loads and eccentricities.
   a. Request additional design criteria when necessary to complete connection design.
2. Configuration: Design and detail all connections for each member size, steel grade and connection type to resist the loads and reactions indicated on the drawings or specified herein. Use details consistent with details shown on drawings, supplementing where necessary. The details shown on drawings are conceptual and do not indicate the required weld sizes or number of bolts unless specifically noted. Use rational engineering design and standard practice in detailing, accounting for all loads and eccentricities in both the connection and the members. Promptly notify the Contracting Officer Representative of any location where the connection design criteria is not clearly indicated. The design of all connections is subject to the review and acceptance of the Contracting Officer's Representative. Submit structural calculations prepared and sealed by a qualified engineer registered in the state where the project is located. Submit calculations for review before preparation of detail drawings.

2.2 MATERIALS

A. W-Shapes:

1. ASTM A992/A992M.

2. ASTM A572/A572M; Grade 50 .
3. ASTM A529; Grade 50 .

B. Channel and Angles:
1. ASTM A36/A36M.
2. ASTM A572/A572M; Grade 50.
3. ASTM A529; Grade 50

C. Plates and Bars:
1. ASTM A36/A36M.
2. ASTM A572/A572M; Grade 50.
3. ASTM A529; Grade 50 .

D. Hollow Structural Sections:
1. ASTM A500/A500M.
2. ASTM A501/A501M.

E. Structural Pipe: ASTM A53/A53M, Grade B.

F. Bolts, Nuts and Washers: Galvanized for galvanized framing .
1. High-strength bolts, including nuts and washers: ASTM A325 .
2. Bolts and nuts, other than high-strength: ASTM A307, Grade A.
3. Plain washers, other than those in contact with high-strength bolt heads and nuts: ASME B18.22.1.

G. Welding Materials: AWS D1.1, type to suit application.

2.3 PRODUCTS - GENERAL

A. Basis of Design: Section 09 06 00, SCHEDULE FOR FINISHES.

B. Sustainable Construction Requirements:
1. Steel Recycled Content: 30 percent total recycled content, minimum.
2. Low Pollutant-Emitting Materials: Comply with VOC limits specified in Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS for the following products:
a. Paints and coatings.

2.4 FABRICATION

A. Fabricate structural steel according to Chapter M, AISC 360.

B. Shop and Field Connections:
1. Weld connections according to AWS D1.1/D1.1M. Welds shall be made only by welders and welding operators who have been previously qualified by tests as prescribed in AWS D1.1 to perform type of work required.

2. High-Strength Bolts: High-strength bolts tightened to a bolt tension minimum 70 percent of their minimum tensile strength. Tightening done with properly calibrated wrenches, by turn-of-nut method or by use of direct tension indicators (bolts or washers). Tighten bolts in connections identified as slip-critical using Direct Tension Indicators. Twist-off torque bolts are not an acceptable alternate fastener for slip critical connections.

2.5 FINISHES

A. Shop Priming:
   1. Prime paint structural steel according to AISC 303, Section 6.
      a. Interstitial Space Structural Steel: Prime paint, unless indicated to receive sprayed on fireproofing.
B. Shop Finish Painting: Apply primer and finish paint as specified in Section 09 91 00, PAINTING.
C. Do not paint:
   1. Surfaces within 50 mm (2 inches) of field welded joints.
   2. Surfaces indicated to be encased in concrete.
   3. Surfaces receiving sprayed on fireproofing.
   4. Beam top flanges receiving shear connector studs applied.
D. Structural Steel Galvanizing: ASTM A123/A123M, hot dipped, after fabrication. Touch-up after erection: Clean and wire brush any abraded and other spots worn through zinc coating, including threaded portions of bolts and welds and touch-up with galvanizing repair paint.
   1. Galvanize structural steel framing installed at exterior locations.
E. Bolts, Nuts, and Washers Galvanizing: ASTM F2329, hot-dipped.
F. Provide fireproofing for all steel requiring it per code.

2.6 ACCESSORIES

A. General: Shop paint steel according to AISC 303, Section 6.
B. Finish Paint System: Primer and finish as specified in Section 09 91 00, PAINTING.
C. Galvanizing Repair Paint: MPI No. 18.

PART 3 - EXECUTION

3.1 ERECTION

A. Erect structural steel according to AISC 303 and AISC 360.

B. Set structural steel accurately at locations and elevations indicated on drawings.

C. Maintain erection tolerances of structural steel within AISC 303 requirements.

1. Pour Stop Elevation Tolerance: 6 mm (1/4 inch), maximum, before concrete placement.

D. Weld and bolt connections as specified for shop connections.

3.2 FIELD PAINTING

A. After welding, clean and prime weld areas to match adjacent finish.

B. Touch-up primer damaged by construction operations.

C. Apply galvanizing repair paint to galvanized coatings damaged by construction operations.

D. Finish Painting: As specified in Section 09 91 00, PAINTING.

3.3 FIELD QUALITY CONTROL

A. Record Survey:

1. Engage registered land surveyor or registered civil engineer as specified in Section 01 00 00, GENERAL REQUIREMENTS to perform survey.

2. Measure and record structural steel framing plumbness, level, and alignment after completing bolting and welding and before installation of work supported by structural steel.

3. Identify deviations from allowable tolerances specified in AISC Manual.

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SECTION 07 13 52
MODIFIED BITUMINOUS SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Modified bituminous sheet material used for exterior below grade waterproofing and split slab waterproofing.

1.2 APPLICABLE PUBLICATIONS

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

B. Federal Specifications (Fed. Spec.):

1. UU-B-790A Notice 2- Building Paper, Vegetable Fiber: (Kraft, Waterproofed, Water Repellent, and Fire Resistant).

C. ASTM International (ASTM):

1. C578-15b - Rigid, Cellular Polystyrene Thermal Insulation.
2. D41/D41M-11 - Asphalt Primer Used in Roofing, Dampproofing and Waterproofing.
3. D4586/D4586M-07(2012)e1 - Asphalt Roof Cement, Asbestos-Free.
4. D6380/D6380M-03(2012)e1 - Asphalt Roll Roofing (Organic Felt).

D. American Hardboard Association (AHA):

1. A135.4-2012 - Basic Hardboard.

1.3 PREINSTALLATION MEETINGS

A. Conduct preinstallation meeting at project site minimum 30 days before beginning Work of this section.

1. Required Participants:
   a. Contracting Officer's Representative.
   b. Inspection and Testing Agency.
   c. Contractor.
   d. Installer.
   e. Manufacturer's field representative.
   f. Other installers responsible for adjacent and intersecting work, including substrate and flashing installers.
2. Meeting Agenda: Distribute agenda to participants minimum 3 days before meeting.
   a. Installation schedule.
   b. Installation sequence.
   c. Preparatory work.

d. Protection before, during, and after installation.

e. Installation.

f. Terminations.

g. Transitions and connections to other work.

h. Inspecting and testing.

i. Other items affecting successful completion.

3. Document and distribute meeting minutes to participants to record decisions affecting installation.

1.4 SUBMITTALS

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

B. Submittal Drawings:

1. Show size, configuration, and installation details.

C. Manufacturer's Literature and Data:

1. Description of each product.
2. Installation instructions.
3. Warranty.

D. Samples:

1. Waterproofing and Flashing Sheet: 200 mm (8 inch) square, each type and color.
2. Insulation: 200 mm (8 inch) square.

E. Test reports: Certify products comply with specifications.

F. Certificates: Certify products comply with specifications.

G. Qualifications: Substantiate qualifications comply with specifications.

1. Installer with project experience list.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Regularly installs specified products.
2. Installed specified products with satisfactory service on five similar installations for minimum five years.
   a. Project Experience List: Provide contact names and addresses for completed projects.

1.6 DELIVERY

A. Deliver products in manufacturer's original sealed packaging.

B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, production run number, and manufacture date.

C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

A. Store products indoors in dry, weathertight conditioned facility.

B. Protect products from damage during handling and construction operations.

1.8 FIELD CONDITIONS

A. Environment:

1. Product Temperature: Minimum 4 degrees C (40 degrees F) for minimum 48 hours before installation.
2. Weather Limitations: Install waterproofing only during dry current and forecasted weather conditions.

1.9 WARRANTY

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

B. Manufacturer's Warranty: Warrant waterproofing system against material and manufacturing defects and agree to repair any leak caused by a defect in the waterproofing system materials or workmanship of the installer.

1. Warranty Period: 10 years.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Waterproofing System: Modified bituminous sheet material for exterior below grade and split slab waterproofing.

2.2 PRODUCTS - GENERAL

A. Provide each product from one manufacturer.

B. Sustainable Construction Requirements:

1. Insulation Recycled Content:
   a. Rigid Foam: 9 percent total recycled content, minimum.

2.3 BITUMINOUS SHEET

A. Cold applied waterproofing membrane composed primarily of modified bituminous material prefabricated in sheet form designed for below grade exterior and split slab waterproofing. Sheet reinforced with fibers at manufacturer's option.

B. Thickness: 1.5 mm (60 mils), plus or minus 0.13 mm (5 mils), and bonded to 0.1 mm (4 mil) thick plastic sheet.

C. Provide release sheet to prevent bonding of bituminous sheet to itself.

2.4 PROTECTION MATERIAL

A. Polystyrene Insulation: ASTM C578, Type I or VIII, 13 mm (1/2 inch) minimum thickness.

B. Hardboard: AHA A135.4, Service Type, 6 mm (1/4 inch) thick.

C. Waterproofed Building Paper: Fed. Spec. UU-B-790A Notice 2, Type I, Grade C.

D. Roll Roofing: ASTM D6380/D6380M, Class S (smooth), Type III with minimum net mass per unit area of roofing, 2495 g/sq. m (51 lbs./100 sq. ft.).

2.5 ACCESSORIES

A. Patching Compound: Factory-prepared, non-shrinking, fast-setting, cementitious adhesive compound containing no ferrous metal or oxide.

B. Primer: ASTM D41/D41M.

C. Roof Cement: ASTM D4586/D4586M.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine and verify substrate suitability for product installation.

1. Concrete surfaces cured minimum time recommended by waterproofing manufacturer.
2. Substrate to be dry as recommended by waterproofing manufacturer.

B. Protect existing construction and completed work from damage.

C. Correct substrate deficiencies.

1. Fill voids, joints, and cracks with patching compound.

D. Clean substrates. Remove contaminants capable of preventing full adhesion.

E. Priming:

1. Prime concrete and masonry surfaces.
2. Application method, amount of primer and condition or primer before installation of bituminous sheet as recommended by primer manufacturer.
3. Reprime when required according to manufacturer's instructions.

3.2 INSTALLATION - GENERAL

A. Install products according to manufacturer's instructions and approved submittal drawings.
   1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.

3.3 WATERPROOFING INSTALLATION

A. Bituminous Sheet Installation:
   1. Remove release sheet before application.
   2. Lay bituminous sheet from low point to high point so laps shed water.
   3. Treat expansion, construction and control joints and evident working cracks as expansion joints. Apply bituminous sheet in double thickness over joint by first applying a strip of bituminous sheet minimum 200 mm (8 inches) wide, centered over joint.
   4. Lap seams minimum 50 mm (2 inches).
   5. Lay succeeding sheet with laps, and roll or press into place.
   6. Repair misaligned or inadequately lapped seams according to manufacturer’s instructions.
   7. Seal seams and terminations according to sheet manufacturer’s instructions.

B. Corner Treatment:
   1. At inside and outside corners, apply double cover using an initial strip minimum 280 mm (11 inches) wide, centered along axis of corner.
   2. Cover each strip completely by the regular application of bituminous sheet.
   3. Provide a fillet or cant on inside corners.
   4. Form cants using patching compound.
   5. Do not use wood, fiber, and insulating materials for cants.

C. Projection Treatment:
   1. Apply a double layer of bituminous sheet around pipes and similar projections at least 150 mm (6 inches) wide.
   2. At drains, apply a bead of roof cement over a double layer of bituminous sheet under clamping rings.

D. Patching:

1. Repair tears, punctures, air blisters, and inadequately lapped seams, according to manufacturer’s instructions before protection course is applied.

E. Permanent Protection:
   1. Vertical Surfaces:
      a. Install hardboard, polystyrene insulation, or roll roofing protection material.
      b. Extend protection full height from footing to top of backfill.
      c. If graded backfill is used, use roll roofing or hardboard.

F. Horizontal Surfaces:
   1. Install roll roofing protection under concrete wearing courses.
   2. Install roll roofing, hardboard, or polystyrene insulation under earth backfill.
   3. Where no concrete wearing course occurs or when surfaces will bear heavy traffic and will not immediately be covered with a wearing course, use protection specified for vertical surfaces.

G. Temporary Protection:
   1. When waterproofing materials are subjected to damage by sunlight and cannot be immediately protected as specified, protect waterproofing materials by waterproof building paper or suitable coating approved by manufacturer of waterproofing system used.

3.4 FIELD QUALITY CONTROL

A. Field Tests: Performed by testing laboratory specified in Section 01 45 29, TESTING LABORATORY SERVICES.

B. Testing:
   1. Before any protection or wearing course is applied, test all horizontal applications of waterproofing with a minimum of 25 mm (1 inch) head of water above highest point and leave for 24 hours.
   2. Mark leaks and repair when waterproofing is dry.
   3. Certify, to Contracting Officer's Representative, that water tests have been made and that areas tested were found watertight.

C. Inspection:
   1. Do not cover waterproofed surfaces by other materials or backfill until work is approved by Contracting Officer's Representative.

3.5 CLEANING

A. Remove excess adhesive before adhesive sets.

B. Clean exposed waterproofing surfaces. Remove contaminants and stains.

3.6 PROTECTION

A. Protect waterproofing from construction operations.

B. Remove protective materials immediately before acceptance.

C. Repair damage.

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SECTION 07 84 00
FIRESTOPPING

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Provide UL or equivalent approved firestopping system for the closures of openings in walls, floors, and roof decks against penetration of flame, heat, and smoke or gases in fire resistant rated construction.

B. Provide UL or equivalent approved firestopping system for the closure of openings in walls against penetration of gases or smoke in smoke partitions.

1.2 RELATED WORK:

A. Sealants and application: Section 07 92 00, JOINT SEALANTS.

1.3 SUBMITTALS:

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

B. Installer qualifications.

C. Inspector qualifications.

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

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

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

G. Submit certificates from manufacturer attesting that firestopping materials comply with the specified requirements.

1.4 DELIVERY AND STORAGE:

A. Deliver materials in their original unopened containers with manufacturer’s name and product identification.

B. Store in a location providing protection from damage and exposure to the elements.

1.5 QUALITY ASSURANCE:

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

B. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991 or been evaluated by UL and found to comply with UL’s “Qualified Firestop Contractor Program Requirements.” Submit qualification data.

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

1.6 APPLICABLE PUBLICATIONS

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

B. ASTM International (ASTM):

E84-14.....Surface Burning Characteristics of Building Materials

E699-09.....Standard Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components

E814-13a.....Fire Tests of Through-Penetration Fire Stops

E2174-14.....Standard Practice for On-Site Inspection of Installed Firestops

E2393-10a.....Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers

C. FM Global (FM):

Annual Issue Approval Guide Building Materials

4991-13.....Approval of Firestop Contractors

D. Underwriters Laboratories, Inc. (UL):

Annual Issue Building Materials Directory

Annual Issue Fire Resistance Directory

723-10(2008).....Standard for Test for Surface Burning Characteristics of Building Materials

1479-04(R2014).....Fire Tests of Through-Penetration Firestops

E. Intertek Testing Services - Warnock Hersey (ITS-WH):

Annual Issue Certification Listings

F. Environmental Protection Agency (EPA):

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

PART 2 - PRODUCTS

2.1 FIRESTOP SYSTEMS:

A. Firestop Systems to be HILTI Products only. Refer to Sole Source Documents and General Requirements 01 00 00.

B. Provide either factory built (Firestop Devices) or field erected (through-Penetration Firestop Systems) to form a specific building system maintaining required integrity of the fire barrier and stop the passage of gases or smoke. Firestop systems to accommodate building movements without impairing their integrity.

C. Through-penetration firestop systems and firestop devices tested in accordance with ASTM E814 or UL 1479 using the "F" or "T" rating to maintain the same rating and integrity as the fire barrier being sealed. "T" ratings are not required for penetrations smaller than or equal to 101 mm (4 in.) nominal pipe or 0.01 sq. m (16 sq. in.) in overall cross sectional area.

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

1. Contain no flammable or toxic solvents.
2. Release no dangerous or flammable out gassing during the drying or curing of products.
3. Water-resistant after drying or curing and unaffected by high humidity, condensation or transient water exposure.
4. When installed in exposed areas, capable of being sanded and finished with similar surface treatments as used on the surrounding wall or floor surface.
5. VOC Content: Firestopping sealants and sealant primers to comply with the following limits for VOC content when calculated according to 40 CFR 59, (EPA Method 24):
   a. Sealants: 250 g/L.
   b. Sealant Primers for Nonporous Substrates: 250 g/L.
   c. Sealant Primers for Porous Substrates: 775 g/L.

E. Firestopping system or devices used for penetrations by glass pipe, plastic pipe or conduits, unenclosed cables, or other non-metallic materials to have following properties:

1. Classified for use with the particular type of penetrating material used.
2. Penetrations containing loose electrical cables, computer data cables, and communications cables protected using firestopping systems that allow unrestricted cable changes without damage to the seal.

F. Maximum flame spread of 25 and smoke development of 50 when tested in accordance with ASTM E84 or UL 723. Material to be an approved firestopping material as listed in UL Fire Resistance Directory or by a nationally recognized testing laboratory.

G. FM, UL, or WH rated or tested by an approved laboratory in accordance with ASTM E814.

H. Materials to be nontoxic and noncarcinogen at all stages of application or during fire conditions and to not contain hazardous chemicals. Provide firestop material that is free from Ethylene Glycol, PCB, MEK, and asbestos.

I. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
   1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
   2. For floor penetrations with annular spaces exceeding 101 mm (4 in.) or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means acceptable to the firestop manufacturer.
   3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

J. Refer to the Hilti Firestop Selection Chart at the end of this specification.

K. For situations where custom drawings for firestopping assembles are required to accommodate particular conditions/applications not identified in the HILTI Firestop Systems Installers Guide U.S. Volume 12, contractor to complete documentation requested in the guide to request and engineering judgement from HILTI. Completed form(s) to be faxed to 918-254-1679.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Submit product data and installation instructions, as required by article, submittals, after an on-site examination of areas to receive firestopping.

B. Examine substrates and conditions with installer present for compliance with requirements for opening configuration, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION:

A. Remove dirt, grease, oil, laitance and form-release agents from concrete, loose materials, or other substances that prevent adherence and bonding or application of the firestopping or smoke stopping materials.

B. Remove insulation on insulated pipe for a distance of 150 mm (6 inches) on each side of the fire rated assembly prior to applying the firestopping materials unless the firestopping materials are tested and approved for use on insulated pipes.

C. Prime substrates where required by joint firestopping system manufacturer using that manufacturer’s recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

D. Masking Tape: Apply masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing seal of firestopping with substrates.

3.3 INSTALLATION:

A. Do not begin firestopping work until the specified material data and installation instructions of the proposed firestopping systems have been submitted and approved.

B. Install firestopping systems with smoke stopping in accordance with FM, UL, WH, or other approved system details and installation instructions.

C. Install smoke stopping seals in smoke partitions.

3.4 CLEAN-UP:

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

B. Clean up spills of liquid type materials.

C. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

D. Protect firestopping during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to provide firestopping complying with specified requirements.

3.5 INSPECTIONS AND ACCEPTANCE OF WORK:

A. Do not conceal or enclose firestop assemblies until inspection is complete and approved by the Contracting Officer Representative (COR).

B. Furnish service of approved inspector to inspect firestopping in accordance with ASTM E2393 and ASTM E2174 for firestop inspection, and document inspection results. Submit written reports indicating locations of and types of penetrations and type of firestopping used at each location; type is to be recorded by UL listed printed numbers.

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SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION:

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

1.2 QUALITY ASSURANCE:

A. Installer Qualifications: An experienced installer with a minimum of three (3) years' experience and who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance. Submit qualification.

B. Source Limitations: Obtain each type of joint sealant through one (1) source from a single manufacturer.

C. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
3. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

D. Lab Tests: Submit samples of materials that will be in contact or affect joint sealants to joint sealant manufacturers for tests as follows:

1. Adhesion Testing: Before installing elastomeric sealants, test their adhesion to protect joint substrates according to the method in ASTM C794 to determine if primer or other specific joint preparation techniques are required.
2. Compatibility Testing: Before installing elastomeric sealants, determine compatibility when in contact with glazing and gasket materials.
3. Stain Testing: Perform testing per ASTM C1248 on interior and exterior sealants to determine if sealants or primers will stain adjacent surfaces. No sealant work is to start until results of

these tests have been submitted to the Contracting Officer Representative (COR) and the COR has given written approval to proceed with the work.

1.4 CERTIFICATION:

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

1.5 SUBMITTALS:

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

B. Installer qualifications.

C. Contractor certification.

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

E. Cured samples of exposed sealants for each color.

F. Manufacturer's Literature and Data:

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

G. Manufacturer warranty.

1.6 PROJECT CONDITIONS:

A. Environmental Limitations:

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

B. Joint-Width Conditions:

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

C. Joint-Substrate Conditions:

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

1.7 DELIVERY, HANDLING, AND STORAGE:

A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.

B. Carefully handle and store to prevent inclusion of foreign materials.

C. Do not subject to sustained temperatures exceeding 32 degrees C (90 degrees F) or less than 5 degrees C (40 degrees F).

1.8 DEFINITIONS:

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

B. Backing Rod: A type of sealant backing.

C. Bond Breakers: A type of sealant backing.

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

1.9 WARRANTY:

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

B. Manufacturer Warranty: Manufacturer shall warranty their sealant for a minimum of five (5) years from the date of installation and final acceptance by the Government. Submit manufacturer warranty.

1.10 APPLICABLE PUBLICATIONS:

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

B. ASTM International (ASTM):

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

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

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

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

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

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

C920-14a.....Elastomeric Joint Sealants.
C1021-08(R2014).....Laboratories Engaged in Testing of Building Sealants
C1193-13.....Standard Guide for Use of Joint Sealants.
C1248-08(R2012).....Test Method for Staining of Porous Substrate by Joint Sealants
C1330-02(R2013).....Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants
C1521-13.....Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints
D217-10.....Test Methods for Cone Penetration of Lubricating Grease
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:

A. Exterior Sealants:
1. Vertical surfaces, provide non-staining ASTM C920, Type S or M, Grade NS, Class 25, Use NT.
2. Horizontal surfaces, provide ASTM C920, Type S or M, Grade P, Class 25, Use T.
3. Provide location(s) of exterior sealant as follows:
A. Metal to metal.
b. Voids where items penetrate exterior walls.

B. Floor Joint Sealant:
1. ASTM C920, Type S or M, Grade P, Class 25, ,Use T.
2. Provide location(s) of floor joint sealant as follows.
a. Seats of metal thresholds exterior doors.

b. Control and expansion joints in floors, and slabs.

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, Use NT.
3. Provide location(s) of interior sealant as follows:
   a. Typical narrow joint 6 mm, (1/4 inch) or less at walls and adjacent components.
   b. Perimeter of doors, windows, access panels which adjoin concrete or masonry surfaces.
   c. Interior surfaces of exterior wall penetrations.

2.2 COLOR:

A. 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.

2.4 FILLER:

A. Mineral fiberboard: ASTM C612, Class 1.

B. Thickness same as joint width.

C. Depth to fill void completely behind back-up rod.

2.5 PRIMER:

A. As recommended by manufacturer of caulking or sealant material.

B. Stain free type.

2.6 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.
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.

B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise. Take all necessary steps to prevent three-sided adhesion of sealants.

3.6 FIELD QUALITY CONTROL:

A. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.

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.

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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.

in contact with concrete, masonry or other moisture areas.

6. Painting pipes, pipe coverings, conduit, ducts, insulation, hangers, supports and other mechanical and electrical items and equipment exposed to view.
7. Painting surfaces above, behind or below grilles, gratings, diffusers, louvers lighting fixtures, and the like, which are exposed to view through these items.
8. Incidental painting and touching up as required to produce proper finish for painted surfaces, including touching up of factory finished items.
9. Painting of any surface not specifically mentioned to be painted herein or on construction documents, but for which painting is obviously necessary to complete the job, or work which comes within the intent of these specifications, is to be included as though specified.

1.2 RELATED WORK:

A. Activity Hazard Analysis: Section 01 35 26, SAFETY REQUIREMENTS.

B. Shop prime painting of steel and ferrous metals: Division 05 - METALS, Division 21 – FIRE SUPPRESSION; Division 22 - PLUMBING; Division 23 – HEATING; VENTILATION AND AIR-CONDITIONING; Division 26 - ELECTRICAL; Division 27 - COMMUNICATIONS; and Division 28 – ELECTRONIC SAFETY AND SECURITY sections.

C. Asphalt and concrete pavement marking: Section 32 17 23, PAVEMENT MARKINGS.

1.3 SUBMITTALS:

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

B. Painter qualifications.

C. Manufacturer's Literature and Data:

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

D. Sample Panels:

1. After painters' materials have been approved and before work is started submit sample panels showing each type of finish and color specified.
2. Panels to Show Color: Composition board, 100 x 250 mm (4 x 10 inch).
3. Panel to Show Transparent Finishes: Wood of same species and grain pattern as wood approved for use, 100 x 250 mm (4 x 10 inch face) minimum, and where both flat and edge grain will be exposed, 250 mm (10 inches) long by sufficient size, 50 x 50 mm (2 x 2 inch) minimum or actual wood member to show complete finish.
4. Attach labels to panel stating the following:
   a. Federal Specification Number or manufacturers name and product number of paints used.
   b. Specification code number specified in Section 09 06 00, SCHEDULE FOR FINISHES.
   c. Product type and color.
   d. Name of project.
5. Strips showing not less than 50 mm (2 inch) wide strips of undercoats and 100 mm (4 inch) wide strip of finish coat.

F. Sample of identity markers if used.

G. Manufacturers' Certificates indicating compliance with specified requirements:
   1. Manufacturer's paint substituted for Federal Specification paints meets or exceeds performance of paint specified.
   2. High temperature aluminum paint.
   3. Epoxy coating.
   4. Intumescent clear coating or fire retardant paint.
   5. Plastic floor coating.

H. Provide paint formula for each color to be provided as part of submittal.

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.

1.6 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.

1.7 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 ACGHI-DOC, threshold limit values.

1.8 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):

1.....Aluminum Paint

4.....Interior/ Exterior Latex Block Filler

5.....Exterior Alkyd Wood Primer

7.....Exterior Oil Wood Primer

8.....Exterior Alkyd, Flat MPI Gloss Level 1
9.....Exterior Alkyd Enamel MPI Gloss Level 6
10.....Exterior Latex, Flat
11.....Exterior Latex, Semi-Gloss
18.....Organic Zinc Rich Primer
22.....Aluminum Paint, High Heat (up to 590% - 1100F)
27.....Exterior / Interior Alkyd Floor Enamel, Gloss
31.....Polyurethane, Moisture Cured, Clear Gloss
36.....Knot Sealer
43.....Interior Satin Latex, MPI Gloss Level 4
44.....Interior Low Sheen Latex, MPI Gloss Level 2
45.....Interior Primer Sealer
46.....Interior Enamel Undercoat
47.....Interior Alkyd, Semi-Gloss, MPI Gloss Level 5
48.....Interior Alkyd, Gloss, MPI Gloss Level 6
50.....Interior Latex Primer Sealer
51.....Interior Alkyd, Eggshell, MPI Gloss Level 3
52.....Interior Latex, MPI Gloss Level 3
53.....Interior Latex, Flat, MPI Gloss Level 1
54.....Interior Latex, Semi-Gloss, MPI Gloss Level 5
59.....Interior/Exterior Alkyd Porch & Floor Enamel, Low Gloss
60.....Interior/Exterior Latex Porch & Floor Paint, Low Gloss
66.....Interior Alkyd Fire Retardant, Clear Top-Coat (ULC Approved)
67.....Interior Latex Fire Retardant, Top-Coat (ULC Approved)
68.....Interior/ Exterior Latex Porch & Floor Paint, Gloss
71.....Polyurethane, Moisture Cured, Clear, Flat
77.....Epoxy Cold Cured, Gloss
79.....Marine Alkyd Metal Primer
90.....Interior Wood Stain, Semi-Transparent
91.....Wood Filler Paste
94.....Exterior Alkyd, Semi-Gloss
95.....Fast Drying Metal Primer

98.....High Build Epoxy Coating
101.....Epoxy Anti-Corrosive Metal Primer
108.....High Build Epoxy Coating, Low Gloss
114.....Interior Latex, Gloss
119.....Exterior Latex, High Gloss (acrylic)
134.....Galvanized Water Based Primer
135.....Non-Cementitious Galvanized Primer
138.....Interior High Performance Latex, MPI Gloss Level 2
139.....Interior High Performance Latex, MPI Gloss Level 3
140.....Interior High Performance Latex, MPI Gloss Level 4
141.....Interior High Performance Latex (SG) MPI Gloss Level 5
163.....Exterior Water Based Semi-Gloss Light Industrial Coating, MPI Gloss Level 5

G. Society for Protective Coatings (SSPC):
SSPC SP 1-82(R2004).....Solvent Cleaning
SSPC SP 2-82(R2004).....Hand Tool Cleaning
SSPC SP 3-28(R2004).....Power Tool Cleaning
SSPC SP 10/NACE No.2....Near-White Blast Cleaning
SSPC PA Guide 10.....Guide to Safety and Health Requirements

H. 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.

B. All paint to be Sherwin Williams

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.

2.3 PLASTIC TAPE:

A. Pigmented vinyl plastic film in colors as specified in Section 09 06 00, SCHEDULE FOR FINISHES or specified.

B. Pressure sensitive adhesive back.

2.4 BIOBASED CONTENT

A. Paint products shall comply with following bio-based standards for biobased materials:

Material Type	Percent by Weight
Exterior Paint	20 percent biobased material

B. The minimum-content standards are based on the weight (not the volume) of the material.

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.

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.

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. Ferrous Metals:
1. Remove oil, grease, soil, drawing and cutting compounds, flux and other detrimental foreign matter in accordance with SSPC-SP 1 (Solvent Cleaning).
2. Remove loose mill scale, rust, and paint, by hand or power tool cleaning, as defined in SSPC-SP 2 (Hand Tool Cleaning) and SSPC-SP 3 (Power Tool Cleaning).
3. Fill dents, holes and similar voids and depressions in flat exposed surfaces of hollow steel doors and frames, 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.

D. Zinc-Coated (Galvanized) Metal, Aluminum, Copper and Copper Alloys Surfaces Specified Painted:
   1. Clean surfaces to remove grease, oil and other deterrents to paint adhesion in accordance with SSPC-SP 1 (Solvent Cleaning).
   2. Spot coat abraded and damaged areas of zinc-coating which expose base metal on hot-dip zinc-coated items with MPI 18 (Organic Zinc Rich Coating). Prime or spot prime with MPI 134 (Waterborne Galvanized Primer) or MPI 135 (Non-Cementitious Galvanized Primer) depending on finish coat compatibility.

E. Concrete:
   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. 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.
   5. 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.

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.

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.

E. Metals except boilers, incinerator stacks, and engine exhaust pipes:

1. Steel and iron: MPI 79 (Marine Alkyd Metal Primer) finish is specified.
2. Zinc-coated steel and iron: MPI 134 (Waterborne Galvanized Primer).
3. Aluminum scheduled to be painted: MPI 95 (Fast Drying Metal Primer).

4. Copper and copper alloys scheduled to be painted: MPI 95 (Fast Drying Metal Primer).
5. Metal over 94 degrees C (201 degrees F), Boilers, Incinerator Stacks, and Engine Exhaust Pipes: MPI 22 (High Heat Resistant Coating).

F. Concrete Floors: MPI 99 (Water-based Acrylic Curing and Sealing Compound).

3.8 EXTERIOR FINISHES:

A. Apply following finish coats where specified in Section 09 06 00, SCHEDULE FOR FINISHES.

B. Steel and Ferrous Metal, Including Tern:
1. Two (2) coats of MPI 8 (Exterior Alkyd, Flat) on exposed surfaces, except on surfaces over 94 degrees C (201 degrees F).
2. One (1) coat of MPI 22 (High Heat Resistant Coating) on surfaces over 94 degrees K (290 degrees F).

C. Concrete:
1. General:WRI
a. Mix as specified in manufacturer's printed directions.
b. Do not mix more paint than can be used within four (4) hours after mixing. Discard paint that has started to set.
c. Dampen warm surfaces above 24 degrees C (75 degrees F) with fine mist of water before application of paint. Do not leave free water on surface.
d. Cure paint with a fine mist of water as specified in manufacturer's printed instructions.
2. Use two (2) coats of TT-P-1411 (Paint, Co-polymer-Resin, Cementitious), unless specified otherwise.

3.9 REFINISHING EXISTING PAINTED SURFACES:

A. Clean, patch and repair existing surfaces as specified under “Surface Preparation”. No “telegraphing” of lines, ridges, flakes, etc., through new surfacing is permitted. Where this occurs, sand smooth and re-finish until surface meets with COR’s approval.

B. Remove and reinstall items as specified under “General Workmanship Requirements”.

C. Remove existing finishes or apply separation coats to prevent non compatible coatings from having contact.

D. Patched or Replaced Areas in Surfaces and Components: Apply spot prime and body coats as specified for new work to repaired areas or replaced components.

E. Except where scheduled for complete painting apply finish coat over plane surface to nearest break in plane, such as corner, reveal, or frame.

F. Refinish areas as specified for new work to match adjoining work unless specified or scheduled otherwise.

G. Sand or dull glossy surfaces prior to painting.

H. Sand existing coatings to a feather edge so that transition between new and existing finish will not show in finished work.

3.10 PAINT COLOR:

A. For additional requirements regarding color see Articles, "REFINISHING EXISTING PAINTED SURFACE" and "MECHANICAL AND ELECTRICAL FIELD PAINTING SCHEDULE".

B. Coat Colors:

1. Color of priming coat: Lighter than body coat.
2. Color of body coat: Lighter than finish coat.
3. Color prime and body coats to not show through the finish coat and to mask surface imperfections or contrasts.

C. Painting, Caulking, Closures, and Fillers Adjacent to Casework:

1. Paint to match color of casework where casework has a paint finish.
2. Paint to match color of wall where casework is stainless steel, plastic laminate, or varnished wood.

3.11 MECHANICAL AND ELECTRICAL WORK FIELD PAINTING SCHEDULE:

A. Field painting of mechanical and electrical consists of cleaning, touching-up abraded shop prime coats, and applying prime, body and finish coats to materials and equipment if not factory finished in space scheduled to be finished.

B. Paint various systems specified in Division 02 – EXISTING CONDITIONS, Division 21 – FIRE SUPPRESSION, Division 22 - PLUMBING, Division 23 – HEATING, VENTILATION AND AIR-CONDITIONING, Division 26 - ELECTRICAL, Division 27 - COMMUNICATIONS, and Division 28 – ELECTRONIC SAFETY AND SECURITY.

C. Paint after tests have been completed.

D. All utility piping shall be labeled as to flow if applicable and service on each side of each wall as it penetrates and every 20 feet on center.

E. Omit prime coat from factory prime-coated items.

F. Finish painting of mechanical and electrical equipment is not required when located in interstitial spaces, above suspended ceilings, in concealed areas such as pipe and electric closets, pipe basements, pipe

tunnels, trenches, attics, roof spaces, shafts and furred spaces except on electrical conduit containing feeders 600 volts or more.

G. Omit field painting of items specified in "BUILDING AND STRUCTURAL WORK FIELD PAINTING"; "Building and Structural Work not Painted".

H. Color:

1. Paint items as indicated in this specification except for following:
   a. White: Exterior unfinished surfaces of enameled plumbing fixtures. Insulation coverings on breeching and uptake inside boiler house, drums and drum-heads, oil heaters, condensate tanks and condensate piping.
   b. Gray: Heating, ventilating, air conditioning and refrigeration equipment (except as required to match surrounding surfaces), and water and sewage treatment equipment and sewage ejection equipment.
   c. Aluminum Color: Ferrous metal on outside of boilers and in connection with boiler settings including supporting doors and door frames and fuel oil burning equipment, and steam generation system (bare piping, fittings, hangers, supports, valves, traps and miscellaneous iron work in contact with pipe).
   d. Federal Safety Red: Exposed fire protection piping hydrants, post indicators, electrical conducts containing fire alarm control wiring, and fire alarm equipment.
   e. Federal Safety Orange: Entire lengths of electrical conduits containing feeders 600 volts or more.
   f. Color to match brickwork sheet metal covering on breeching outside of exterior wall of boiler house.

I. Apply paint systems on properly prepared and primed surface as follows:

1. Exterior Locations:
   a. Apply two (2) coats of MPI 8 (Exterior Alkyd, Flat) to the following ferrous metal items:
      Vent and exhaust pipes with temperatures under 94 degrees C(201 degrees F), roof drains, fire hydrants, post indicators, yard hydrants, exposed piping and similar items.
   b. Apply two (2) coats of MPI 10 (Exterior Latex, Flat) to galvanized and zinc-copper alloy metal.
   c. Apply one (1) coat of MPI 22 (High Heat Resistant Coating), 650 degrees C (1200 degrees F) to incinerator stacks, boiler stacks, and engine generator exhaust.

2. Other exposed locations:
   a. Metal surfaces, except aluminum, of cooling towers exposed to view, including connected pipes, rails, and ladders: Two (2) coats of MPI 1 (Aluminum Paint).

3.12 BUILDING AND STRUCTURAL WORK FIELD PAINTING:

A. Painting and finishing of interior and exterior work except as specified here-in-after.
   1. Painting and finishing of new and existing work including colors and gloss of finish as specified in this specification.
   2. Painting of disturbed, damaged and repaired or patched surfaces when entire space is not scheduled for complete repainting or refinishing.
   3. Painting of ferrous metal and galvanized metal.
   4. Painting of wood with fire retardant paint exposed in attics, when used as mechanical equipment space (except shingles).
   5. Identity painting and safety painting.

B. Building and Structural Work not Painted:
   1. Prefinished items:
      a. Casework, doors, elevator entrances and cabs, metal panels, wall covering, and similar items specified factory finished under other sections.
      b. Factory finished equipment and pre-engineered metal building components such as metal roof and wall panels.
   2. Finished surfaces:
      a. Hardware except ferrous metal.
      b. Anodized aluminum, stainless steel, chromium plating, copper, and brass, except as otherwise specified.
      c. Signs, fixtures, and other similar items integrally finished.
   3. Concealed surfaces:
      a. Inside dumbwaiter, elevator and duct shafts, interstitial spaces, pipe basements, crawl spaces, pipe tunnels, above ceilings, attics, except as otherwise specified.
      b. Inside walls or other spaces behind access doors or panels.
      c. Surfaces concealed behind permanently installed casework and equipment.
   4. Moving and operating parts:
      a. Shafts, chains, gears, mechanical and electrical operators, linkages, and sprinkler heads, and sensing devices.

b. Tracks for overhead or coiling doors, shutters, and grilles.

5. Labels:
   a. Code required label, such as Underwriters Laboratories Inc., Intertek Testing Service or Factory Mutual Research Corporation.
   b. Identification plates, instruction plates, performance rating, and nomenclature.
6. Galvanized metal:
   a. Exterior chain link fence and gates, corrugated metal areaways, and gratings.
   b. Gas Storage Racks.
   c. Except where specifically specified to be painted.
7. Metal safety treads and nosings.
8. Gaskets.
9. Concrete curbs, gutters, pavements, retaining walls, exterior exposed foundations walls and interior walls in pipe basements.
10. Structural steel encased in concrete, masonry, or other enclosure.
11. Structural steel to receive sprayed-on fire proofing.
12. Ceilings, walls, columns in interstitial spaces.
13. Ceilings, walls, and columns in pipe basements.

3.13 IDENTITY PAINTING SCHEDULE:

A. Identify designated service in new buildings or projects with extensive remodeling in accordance with ASME A13.1, unless specified otherwise, on exposed piping, piping above removable ceilings, piping in accessible pipe spaces, interstitial spaces, and piping behind access panels. For existing spaces where work is minor match existing.

1. Legend may be identified using snap-on coil plastic markers or by paint stencil applications.
2. Apply legends adjacent to changes in direction, on branches, where pipes pass through walls or floors, adjacent to operating accessories such as valves, regulators, strainers and cleanouts a minimum of 12.2 M (40 feet) apart on straight runs of piping. Identification next to plumbing fixtures is not required.
3. Locate Legends clearly visible from operating position.
4. Use arrow to indicate direction of flow using black stencil paint.
5. Identify pipe contents with sufficient additional details such as temperature, pressure, and contents to identify possible hazard. Insert

working pressure shown on construction documents where asterisk appears for High, Medium, and Low Pressure designations as follows:

a. High Pressure - 414 kPa (60 psig) and above.

b. Medium Pressure - 104 to 413 kPa (15 to 59 psig).

c. Low Pressure - 103 kPa (14 psig) and below.

d. Add Fuel oil grade numbers.

6. Legend name in full or in abbreviated form as follows:

PIPING	COLOR OF EXPOSED PIPING	COLOR OF BACKGROUND	COLOR OF LETTERS	LEGEND ABBREVIATIONS
Blow-off		Green	White	Blow-off
Boiler Feedwater		Green	White	Blr Feed
A/C Condenser Water Supply		Green	White	A/C Cond Wtr Sup
A/C Condenser Water Return		Green	White	A/C Cond Wtr Ret
Chilled Water Supply		Green	White	Ch. Wtr Sup
Chilled Water Return		Green	White	Ch. Wtr Ret
Shop Compressed Air		Blue	White	Shop Air
Air-Instrument Controls		Green	White	Air-Inst Cont
Drain Line		Green	White	Drain
Emergency Shower		Green	White	Emg Shower
High Pressure Steam		Green	White	H.P. _____*
High Pressure Condensate Return		Green	White	H.P. Ret ____*
Medium Pressure Steam		Green	White	M. P. Stm ____*
Medium Pressure Condensate Return		Green	White	M.P. Ret _____*
Low Pressure Steam		Green	White	L.P. Stm _____*
Low Pressure Condensate Return		Green	White	L.P. Ret _____*
High Temperature Water Supply		Green	White	H. Temp Wtr Sup
High Temperature Water Return		Green	White	H. Temp Wtr Ret
Hot Water Heating Supply		Green	White	H. W. Htg Sup
Hot Water Heating Return		Green	White	H. W. Htg Ret
Gravity Condensate Return		Green	White	Gravity Cond Ret
Pumped Condensate Return		Green	White	Pumped Cond Ret
Vacuum Condensate Return		Green	White	Vac Cond Ret
Boiler Water Sampling		Green	White	Sample

Chemical Feed		Green	White	Chem Feed
Continuous Blow-Down		Green	White	Cont. B D
Pumped Condensate		Green	White	Pump Cond
Pump Recirculating		Green	White	Pump-Recirc.
Vent Line		Green	White	Vent
Alkali		Orange	Black	Alk
Bleach		Orange	Black	Bleach
Detergent		Yellow	Black	Det
Liquid Supply		Yellow	Black	Liq Sup
Reuse Water		Yellow	Black	Reuse Wtr
Cold Water (Domestic)	White	Green	White	C.W. Dom
Hot Water (Domestic)				
Supply	White	Yellow	Black	H.W. Dom
Return	White	Yellow	Black	H.W. Dom Ret
Tempered Water	White	Yellow	Black	Temp. Wtr
Ice Water				
Supply	White	Green	White	Ice Wtr
Return	White	Green	White	Ice Wtr Ret
Reagent Grade Water		Green	White	RG
Reverse Osmosis		Green	White	RO
Sanitary Waste		Green	White	San Waste
Sanitary Vent		Green	White	San Vent
Storm Drainage		Green	White	St Drain
Pump Drainage		Green	White	Pump Disch
Chemical Resistant Pipe				
Waste		Orange	Black	Acid Waste
Vent		Orange	Black	Acid Vent
Atmospheric Vent		Green	White	ATV
Silver Recovery		Green	White	Silver Rec
Oral Evacuation		Green	White	Oral Evac
Fuel Gas		Yellow	Black	Gas
Fire Protection Water				
Sprinkler	Red	Red	White	Auto Spr
Standpipe	Red	Red	White	Stand
Sprinkler	Red	Red	White	Drain

All existing and new fire protection lines within the scope of work shall be painted red.

3.14 PROTECTION CLEAN UP, AND TOUCH-UP:

A. Protect work from paint droppings and spattering by use of masking, drop cloths, removal of items or by other approved methods.

B. Upon completion, clean paint from hardware, glass and other surfaces and items not required to be painted of paint drops or smears.

C. Before final inspection, touch-up or refinished in a manner to produce solid even color and finish texture, free from defects in work which was damaged or discolored.

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SECTION 22 05 48
PIPE SUPPORTS

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Work of this Section includes pipe guides and support assemblies used for stabilization of steam and condensate piping.

1.2 RELATED WORK:

A. Activity Hazard Analysis: Section 01 35 26, SAFETY REQUIREMENTS.

B. 02 42 00, CUTTING DEMO RESTORATION AND PATCHING

C. 05 12 00 STRUCTURAL STEEL FRAMING

1.3 SUBMITTALS:

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

B. Manufacturer's Literature and Data:

1. Before work is started, submit manufacturer's literature and technical data, product name and product code as of the date of contract award. Materials will be used to determine compliance with the submittal requirements of this specification.

1.4 DELIVERY AND STORAGE:

A. Deliver materials to site in manufacturer's container marked to show following:

1. Name of manufacturer.
2. Product type.

1.6 SAFETY AND HEALTH

A. Install guide and support assemblies 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.

1.8 APPLICABLE PUBLICATIONS:

A. American National Standards Institute/ American Society of Mechanical Engineers:

1. ANSI/ASME B31.1, “Power Piping.”

B. ASTM International:

1. ASTM A36/ A36M- 14, “Standard Specification for Carbon Structural Steel.”
2. ASTM A307, “Standard Specification for Carbon Steel Bolts.”

3. ASTM A563, "Standard Specification for Carbon and Alloy Steel Nuts."

PART 2 - PRODUCTS

2.1 MATERIALS:

A. All pipe guides/supports' basis of design is Advanced Thermal Systems, Inc. (ATS), Fig. 101M and 201M. Guides/supports are to be supplied by ATS or approved equal, to be submitted to VA for approval.

B. All pipe guides/supports shall be fabricated by a supplier regularly engaged in the manufacture of these items. No work that can be completed by the manufacturer shall be left for completion in the field

2.2 MATERIAL PROPERTIES:

A. Pipe guides/supports shall utilize ½" thick low friction graphite on both the upper and lower backing plates of each assembly. The low friction graphite must have a coefficient of friction of 0.15 or less and a compressive strength of 2000 psi or greater. The guides/supports shall have sufficient contact surface between the upper and lower assemblies to ensure the loading does not exceed 300 psi.

B. Steel components shall be fabricated from ASTM A36 steel or equivalent.

C. Pipe guides/supports shall be furnished with 2" thick nominal of insulation, unless noted otherwise on plans. The insulation shall be calcium silicate having a minimum compressive strength of 160 psi. The insulation shall be furnished complete with both an ASJ vapor resistant jacket and a 0.016 thick aluminum jacket.

D. The pipe guides/supports shall have a minimum load rating sufficient to support Insulated Extra Heavy Wall Pipe filled with water and spaced in accordance with that recommended by ANSI B31.1.

E. Pipe Guides shall be constructed to allow a minimum of ± 4" of axial movement and a maximum of ± 1/16" of lateral and 1/8" vertical up movement. The hold down bars that resist both the lateral and vertical up movement shall be machined from carbon steel bar and be suitable to withstand 5,000 lbs. lifting force and 5,000 lbs. lateral force.

F. Pipe supports shall be constructed to allow a minimum of ± 4" of axial movement and ± 3" of lateral movement.

G. The graphite shall be epoxy bonded to the steel for all application.

H. All carbon steel components shall be painted with one coat of red oxide shop primer (Hot Dipped Galvanized or Epoxy Painted, optional).

PART 3 - EXECUTION

3.1 JOB CONDITIONS:

A. Safety: Observe required safety regulations and manufacturer's warning and instructions for storage, handling and installation of materials.

1. Take necessary precautions to protect personnel and property from hazards due to falls, injuries, fire, explosion, or other harm.

3.2 INSPECTION:

A. Examine the areas and conditions where pipe guides/supports are to be installed 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.

3.4 INSTALLATION:

A. Clean existing insulation on piping to provide smooth surface for pipe guide/support assemblies. Carefully cut and remove any existing insulation only if necessary for installation as recommended by manufacturer.

B. The upper assembly shall be attached to the pipeline by clamping the insulation between two 180° shield using ASTM A307 and ASTM A563 plated bolting and nuts. The lower assembly shall be attached to the support structure by field welding or bolting as shown on the plans.

C. Weld/bolt assembly to steel support frame. See 05 12 00 – STRUCTURAL STEEL FRAMING for further requirements.

3.5 PROTECTION CLEAN UP, AND TOUCH-UP:

A. Before final inspection, clean, touch-up or refinish assembly and surrounding steel and insulation in such a manner to ensure smooth surface, free from defects in work that was damaged.

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SECTION 31 20 00
EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

A. This section specifies the requirements for furnishing all equipment, materials, labor, tools, and techniques for earthwork including, but not limited to, the following:

1. Site preparation.
2. Excavation.
3. Underpinning.
4. Filling and backfilling.
5. Grading.
6. Soil Disposal.
7. Clean Up.

1.2 DEFINITIONS:

A. Unsuitable Materials:

1. Fills: Topsoil; frozen materials; construction materials and materials subject to decomposition; clods of clay and stones larger than 75 mm (3 inches); organic material, including silts, which are unstable; and inorganic materials, including silts, too wet to be stable and any material with a liquid limit and plasticity index exceeding 40 and 15 respectively. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction, as defined by ASTM D698.
2. Existing Subgrade (Except Footing Subgrade): Same materials as 1.2.A.1, that are not capable of direct support of slabs, pavement, and similar items with possible exception of improvement by compaction, proofrolling, or similar methods.
3. Existing Subgrade (Footings Only): Same as paragraph 1, but no fill or backfill. If materials differ from design requirements, excavate to acceptable strata subject to COR's approval.

B. Building Earthwork: Earthwork operations required in area enclosed by a line located 1500 mm (5 feet) outside of principal building perimeter. It also includes earthwork required for auxiliary structures and buildings.

C. Trench Earthwork: Trenchwork required for utility lines.

D. Site Earthwork: Earthwork operations required in area outside of a line located 1500 mm (5 feet) outside of principal building perimeter and within new construction area with exceptions noted above.

E. Degree of compaction: Degree of compaction is expressed as a percentage of maximum density obtained by laboratory test procedure. This percentage of maximum density is obtained through use of data provided from results of field test procedures presented in ASTM D1556, ASTM D2167, and ASTM D6938.

F. Fill: Satisfactory soil materials used to raise existing grades. In the Construction Documents, the term “fill” means fill or backfill as appropriate.

G. Backfill: Soil materials or controlled low strength material used to fill an excavation.

H. Unauthorized excavation: Removal of materials beyond indicated sub-grade elevations or indicated lines and dimensions without written authorization by the COR. No payment will be made for unauthorized excavation or remedial work required to correct unauthorized excavation.

I. Authorized additional excavation: Removal of additional material authorized by the COR based on the determination by the Government’s soils testing agency that unsuitable bearing materials are encountered at required sub-grade elevations. Removal of unsuitable material and its replacement as directed will be paid on basis of Conditions of the Contract relative to changes in work.

J. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular sub-base, drainage fill, or topsoil materials.

K. Structure: Buildings, foundations, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

L. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

M. Drainage course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

N. Bedding course: Layer placed over the excavated sub-grade in a trench before laying pipe. Bedding course shall extend up to the springline of the pipe.

O. Sub-base Course: Layer placed between the sub-grade and base course for asphalt paving or layer placed between the sub-grade and a concrete pavement or walk.

P. Utilities include on-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

Q. Debris: Debris includes all materials located within the designated work area not covered in the other definitions and shall include but not be limited to items like vehicles, equipment, appliances, building materials or remains thereof, tires, any solid or liquid chemicals or products stored or found in containers or spilled on the ground.

R. Contaminated soils: Soil that contains contaminates as defined and determined by the COR or the Government's testing agency.

1.3 RELATED WORK:

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

B. Safety requirements, protection of existing utilities, fire protection services, existing equipment, roads, and pavements: Section 01 00 00, GENERAL REQUIREMENTS.

C. Subsurface Investigation: Section 01 00 00, GENERAL REQUIREMENTS, Article, PHYSICAL DATA.

D. Erosion Control: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, and Section 32 90 00, PLANTING.

E. Site preparation: Section 31 23 19, DEWATERING, Section 02 41 00, DEMOLITION, and Section 02 42 00 CUTTING, REMOVAL, DEMOLITION, RESTORATION, AND PATCHING.

F. Paving sub-grade requirements: Section 32 12 16, ASPHALT PAVING.

1.4 CLASSIFICATION OF EXCAVATION:

A. Unclassified Excavation: Removal and disposal of pavements and other man-made obstructions visible on surface; utilities, and other items including underground structures indicated to be demolished and removed; together with any type of materials regardless of character of material and obstructions encountered.

1.5 SUBMITTALS:

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

B. Furnish to COR:

1. Contactor shall furnish resumes with all personnel involved in the project including Project Manager, Superintendent, and on-site Engineer. Project Manager and Superintendent should have at least 3 years of experience on projects of similar size.
2. Soil samples.
   a. Classification in accordance with ASTM D2487 for each on-site or borrow soil material proposed for fill, backfill, engineered fill, or structural fill.
   b. Laboratory compaction curve in accordance with ASTM D698 for each on site or borrow soil material proposed for fill, backfill, engineered fill, or structural fill.
   c. Test reports for compliance with ASTM D2940 requirements for subbase material.
   d. Pre-excavation photographs and videotape in the vicinity of the existing structures to document existing site features, including surfaces finishes, cracks, or other structural blemishes that might be misconstrued as damage caused by earthwork operations.
3. Contractor shall submit procedure and location for disposal of unused satisfactory material. Proposed source of borrow material. Notification of encountering rock in the project. Advance notice on the opening of excavation or borrow areas. Advance notice on shoulder construction for rigid pavements.

1.6 APPLICABLE PUBLICATIONS:

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

B. American Association of State Highway and Transportation Officials (AASHTO):

T99-10.....Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5 kg (5.5 lb) Rammer and a 305 mm (12 inch) Drop

T180-10.....Standard Method of Test for Moisture-Density Relations of Soils using a 4.54 kg (10 lb) Rammer and a 457 mm (18 inch) Drop

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

C33-03.....Concrete Aggregate

D448-08.....Standard Classification for Sizes of Aggregate for Road and Bridge Construction

D698-07e1.....Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft. lbf/ft^3 (600 kN m/m^3))

D1140-00.....Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve

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

D1557-09.....Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN m/m^3))

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

D2487-11.....Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)

D2940-09.....Standard Specifications for Graded Aggregate Material for Bases or Subbases for Highways or Airports

D6938-10.....Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth

D. Society of Automotive Engineers (SAE):

J732-07.....Specification Definitions - Loaders

J1179-08.....Hydraulic Excavator and Backhoe Digging Forces

PART 2 - PRODUCTS

2.1 MATERIALS:

A. General: Provide borrow soil material when sufficient satisfactory soil materials are not available from excavations.

B. Fills: Material in compliance with ASTM D2487 Soil Classification Groups GW, GP, GM, SW, SP, SM, SC, and ML, or any combination of these groups; free of rock or gravel larger than 75 mm (3 inches) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Material approved from on site or off site sources

having a minimum dry density of 1760 kg/m3 (110 pcf), a maximum Plasticity Index of 15, and a maximum Liquid Limit of 40.

C. Engineered Fill: Naturally or artificially graded mixture of compliance with ASTM D2487 Soil Classification Groups GW, GP, GM, SW, SP, SM, SC, and ML, or any combination of these groups, or as approved by the Engineer or material with at least 90 percent passing a 37.5-mm (1 1/2-inch) sieve and not more than 12 percent passing a 75-µm (No. 200) sieve, per ASTM D2940;.

D. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; except with 100 percent passing a 25 mm (1 inch) sieve and not more than 8 percent passing a 75-µm (No. 200) sieve.

E. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 37.5 mm (1 1/2-inch) sieve and 0 to 5 percent passing a 2.36 mm (No. 8) sieve.

F. Granular Fill:

2. Bedding for sanitary and storm sewer pipe, crushed stone or gravel graded from 13 mm (1/2 inch) to 4.75 mm (No 4), per ASTM D2940.

G. Requirements for Offsite Soils: Offsite soils brought in for use as backfill shall be tested for TPH, BTEX and full TCLP including ignitability, corrosivity and reactivity. Backfill shall contain less than 100 parts per million (ppm) of total hydrocarbons (TPH) and less than 10 ppm of the sum of Benzene, Toleune, Ethyl Benzene, and Xylene (BTEX) and shall not fail the TCLP test. TPH concentrations shall be determined by using EPA 600/4-79/020 Method 418.1. BTEX concentrations shall be determined by using EPA SW-846.3-3a Method 5030/8020. TCLP shall be performed in accordance with EPA SW-846.3-3a Method 1311. Provide Borrow Site Testing for TPH, BTEX and TCLP from a composite sample of material from the borrow site, with at least one test from each borrow site.

H. Buried Warning and Identification Tape: Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specific below for the intended utility with warning and identification imprinted in bold black letters

continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, Unaffected by moisture or soil. Warning tape color codes:

Red:	Electric
Blue:	Water Systems
Green:	Sewer Systems
White:	Steam Systems

I. Warning Tape for Metallic Piping: Acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 0.076 mm (0.003 inch). Tape shall have a minimum strength of 10.3 MPa (1500 psi) lengthwise, and 8.6 MPa (1250 psi) crosswise, with a maximum 350 percent elongation.

J. Detectable Warning Tape for Non-Metallic Piping: Polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of the tape shall be 0.102 mm (0.004 inch). Tape shall have a minimum strength of 10.3 MPa (1500 psi) lengthwise and 8.6 MPa (1250 psi) crosswise. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 0.9 m (3 feet) deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

K. Detection Wire For Non-Metallic Piping: Detection wire shall be Insulated single strand, solid copper with a minimum of 12 AWG.

PART 3 - EXECUTION

3.1 SITE PREPARATION:

A. Clearing: Clear within limits of earthwork operations as shown. Work includes removal of trees, shrubs, fences, foundations, incidental structures, paving, debris, trash, and other obstructions. Remove materials from Medical Center Property.

B. Grubbing: Remove stumps and roots 75 mm (3 inch) and larger diameter. Undisturbed sound stumps, roots up to 75 mm (3 inch) diameter, and nonperishable solid objects a minimum of 900 mm (3 feet) below subgrade or finished embankment may be left.

C. Trees and Shrubs: Trees and shrubs, not shown for removal, may be removed from areas within 4500 mm (15 feet) of new construction and 2250 mm (7.5 feet) of utility lines when removal is approved in advance by COR. Remove materials from Medical Center Property. Box, and otherwise protect from damage, existing trees and shrubs which are not shown to be removed in construction area. Immediately repair damage to existing trees and shrubs by trimming, cleaning and painting damaged areas, including roots, in accordance with standard industry horticultural practice for the geographic area and plant species. Do not store building materials closer to trees and shrubs, that are to remain, than farthest extension of their limbs.

D. Stripping Topsoil: Strip topsoil from within limits of earthwork operations as specified. Topsoil shall be a fertile, friable, natural topsoil of loamy character and characteristic of locality. Topsoil shall be capable of growing healthy horticultural crops of grasses. Stockpile topsoil and protect as directed by COR. Eliminate foreign materials, such as weeds, roots, stones, subsoil, frozen clods, and similar foreign materials larger than 0.014 m3 (1/2 cubic foot) in volume, from soil as it is stockpiled. Retain topsoil on station. Remove foreign materials larger than 50 mm (2 inches) in any dimension from topsoil used in final grading. Topsoil work, such as stripping, stockpiling, and similar topsoil work shall not, under any circumstances, be carried out when soil is wet so that the composition of the soil will be destroyed.

E. Concrete Slabs and Paving: Score deeply or saw cut to insure a neat, straight cut, sections of existing concrete slabs and paving to be removed where excavation or trenching occurs. Extend pavement section to be removed a minimum of 300 mm (12 inches) on each side of widest part of trench excavation and insure final score lines are approximately parallel unless otherwise indicated. Remove material from Medical Center Property.

F. Lines and Grades: Registered Professional Land Surveyor or Registered Civil Engineer, specified in Section 01 00 00, GENERAL REQUIREMENTS, shall establish lines and grades.

1. Grades shall conform to elevations indicated on plans within the tolerances herein specified. Generally grades shall be established to provide a smooth surface, free from irregular surface changes.

Grading shall comply with compaction requirements and grade cross sections, lines, and elevations indicated. Where spot grades are indicated the grade shall be established based on interpolation of the elevations between the spot grades while maintaining appropriate transition at structures and paving and uninterrupted drainage flow into inlets.

2. Locations of existing elevations indicated on plans are from a site survey that measured spot elevations and subsequently generated existing contours and spot elevations. Proposed spot elevations shall match existing elevations for restoration work. Contractor is responsible to notify COR of any differences between existing elevations shown on plans and those encountered on site by Surveyor/Engineer described above. Notify COR of any differences between existing or constructed grades, as compared to those shown on the plans.
3. Subsequent to establishment of lines and grades, Contractor will be responsible for any additional cut and/or fill required to ensure that site is graded to conform to elevations indicated on plans.
4. Finish grading is specified in Section 32 90 00, PLANTING.

G. Disposal: All materials removed from the property shall be disposed of at a legally approved site, for the specific materials, and all removals shall be in accordance with all applicable Federal, State and local regulations. No burning of materials is permitted onsite.

3.2 EXCAVATION:

A. Shoring, Sheeting and Bracing: Shore, brace, or slope, its angle of repose or to an angle considered acceptable by the COR, banks of excavations to protect workmen, banks, adjacent paving, structures, and utilities.

1. Design of the temporary support of excavation system is the responsibility of the Contractor. The Contractor shall submit a Shoring and Sheeting plan for approval 15 days prior to starting work. Submit drawings and calculations, certified by a registered professional engineer, describing the methods for shoring and sheeting of excavations. Shoring, including sheet piling, shall be furnished and installed as necessary to protect workmen, banks, adjacent paving, structures, and utilities. Shoring, bracing, and

sheeting shall be removed as excavations are backfilled, in a manner to prevent caving.

2. Construction of the support of excavation system shall not interfere with the permanent structure and may begin only after a review by the COR.
3. Extend shoring and bracing to a minimum of 1500 mm (5 feet) below the bottom of excavation. Shore excavations that are carried below elevations of adjacent existing foundations.
4. If bearing material of any foundation is disturbed by excavating, improper shoring or removal of existing or temporary shoring, placing of backfill, and similar operations, the Contractor shall provide a concrete fill support in compliance with specifications Section 31 23 23.33, FLOWABLE FILL, under disturbed foundations, as directed by COR, at no additional cost to the Government. Do not remove shoring until permanent work in excavation has been inspected and approved by COR.
5. The Contractor is required to hire a Professional Geotechnical Engineer to provide inspection of excavations and soil/groundwater conditions throughout construction. The Geotechnical Engineer shall be responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. The Geotechnical Engineer shall update the excavation, sheeting and dewatering plans as construction progresses to reflect changing conditions and shall submit an updated plan if necessary. A written report shall be submitted, at least monthly, informing the Contractor and COR of the status of the plan and an accounting of the Contractor's adherence to the plan addressing any present or potential problems. The Geotechnical Engineer shall be available to meet with the COR at any time throughout the contract duration.

B. Subgrade Protection: Protect subgrades from softening, undermining, washout, or damage by rain or water accumulation. Reroute surface water runoff from excavated areas and not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches. When subgrade for foundations has been disturbed by water, remove disturbed material to firm undisturbed material after water is brought under control. Replace disturbed subgrade in trenches with concrete or material approved by the COR.

C. Trench Earthwork:

1. Utility trenches (except sanitary and storm sewer):

a. Excavate to a width as necessary for sheeting and bracing and proper performance of the work.

b. Grade bottom of trenches with bell holes scooped out to provide a uniform bearing.

c. Support piping on suitable undisturbed earth unless a mechanical support is shown. Unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 150 mm (6 inches) loose thickness.

d. Length of open trench in advance of piping laying shall not be greater than is authorized by COR.

e. Provide buried utility lines with utility identification tape. Bury tape 300 mm (12 inches) below finished grade; under pavements and slabs, bury tape 150 mm (6 inches) below top of subgrade

f. Bury detection wire directly above non-metallic piping at a distance not to exceed 300 mm (12 inches) above the top of pipe. The wire shall extend continuously and unbroken, from manhole to manhole. The ends of the wire shall terminate inside the manholes at each end of the pipe, with a minimum of 0.9 m (3 feet) of wire, coiled, remaining accessible in each manhole. The wire shall remain insulated over its entire length. The wire shall enter manholes between the top of the corbel and the frame, and extend up through the chimney seal between the frame and the chimney seal. For force mains, the wire shall terminate in the valve pit at the pump station end of the pipe.

g. Initial backfill material shall be placed and compacted with approved tampers to a height of at least one foot above the utility pipe or conduit. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe. Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Backfill to top of pipe shall be compacted to 95 percent of ASTM

D 698 maximum density. Plastic piping shall have bedding to spring line of pipe. Provide materials as follows:

1) Class II: Coarse sands and gravels with maximum particle size of 40 mm (1.5 inches), including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class as specified in ASTM D2487.

2. Storm sewer trenches:

a. Trench width below a point 150 mm (6 inches) above top of pipe shall be 600 mm (24 inches) maximum for pipe up to and including 300 mm (12 inches) diameter, and four-thirds diameter of pipe plus 200 mm (8 inches) for pipe larger than 300 mm (12 inches). Width of trench above that level shall be as necessary for sheeting and bracing and proper performance of the work.

1) Bed bottom quadrant of pipe on suitable undisturbed soil or granular fill. Unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 150 mm (6 inches) loose thickness.1) Undisturbed: Bell holes shall be no larger than necessary for jointing. Backfill up to a point 300 mm (12 inches) above top of pipe shall be clean earth placed and tamped by hand.

2) Granular Fill: Depth of fill shall be a minimum of 75 mm (3 inches) plus one sixth of pipe diameter below pipe to 300 mm (12 inches) above top of pipe. Place and tamp fill material by hand.

b. Place and compact as specified remainder of backfill using acceptable excavated materials. Do not use unsuitable materials.

c. Use granular fill for bedding where rock or rocky materials are excavated.

d. Provide buried utility lines with utility identification tape. Bury tape 300 mm (12 inches) below finished grade; under pavements and slabs, bury tape 150 mm (6 inches) below top of subgrade

e. Bury detection wire directly above non-metallic piping at a distance not to exceed 300 mm (12 inches) above the top of pipe.

The wire shall extend continuously and unbroken, from manhole to manhole. The ends of the wire shall terminate inside the manholes at each end of the pipe, with a minimum of 0.9 m (3 feet) of wire, coiled, remaining accessible in each manhole. The wire shall remain insulated over it's entire length. The wire shall enter manholes between the top of the corbel and the frame, and extend up through the chimney seal between the frame and the chimney seal. For force mains, the wire shall terminate in the valve pit at the pump station end of the pipe.

f. Initial backfill material shall be placed and compacted with approved tampers to a height of at least one foot above the utility pipe or conduit. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe. Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Backfill to top of pipe shall be compacted to 95 percent of ASTM D698 maximum density. Plastic piping shall have bedding to spring line of pipe. Provide materials as follows:

1) Class I: Angular, 6 to 40 mm (0.25 to 1.5 inches), graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.

D. Site Earthwork: Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation. Excavation shall be accomplished as required by drawings and specifications. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 25 mm (1 inch). Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, complying with OSHA requirements, and for inspections. Remove subgrade materials that are determined by COR as unsuitable, and replace with acceptable material. If there is a question as to whether material is unsuitable or not, the contractor shall obtain samples of the material, under the

direction of the COR, and the materials shall be examined by an independent testing laboratory for soil classification to determine whether it is unsuitable or not. When unsuitable material is encountered and removed, contract price and time will be adjusted in accordance with Articles, DIFFERING SITE CONDITIONS, CHANGES and CHANGES-SUPPLEMENT of the GENERAL CONDITIONS as applicable. Adjustments to be based on volume in cut section only.

1. Site Grading:
   a. Provide a smooth transition between adjacent existing grades and new grades.
   b. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
   c. Slope grades to direct water away from buildings and to prevent ponds from forming where not designed. Finish subgrades to required elevations within the following tolerances:
      1) Lawn or Unpaved Areas: Plus or minus 25 mm (1 inch).
      2) Walks: Plus or minus 6 mm (1/4 inch).
      3) Pavements: Plus or minus 6 mm (1/4 inch).

3.3 UNDERPINNING:

A. Design of the underpinning system is the responsibility of the Contractor and should be designed by a registered professional engineer and is subject to review and approval by the COR. Underpinning of existing building foundations, as indicated on structural drawings, or where excavation undermines existing foundations, shall be accomplished in the following manner:

1. Make general excavation for new construction, where new foundations are to be below existing foundations, to elevation of new foundations (or sized stone subbase), maintaining a 45 degree sloped berm.
2. For underpinning pits, underpin existing wall foundations by excavating 1200 mm (4 feet) wide pits to depth shown on drawings skipping 3 sections at any one time so as to maintain support for wall at all times.
3. Underpin intervening sections one at a time; no adjacent sections shall be underpinned until concrete in adjacent sections shall have reached 20 MPa (2500 psi) strength and have been dry packed with non-shrink grout to obtain positive bearing. Sheet and brace

underpinning pits if soil will not stand on a vertical cut during this operation, or as required for safety of workmen. Repack any voids behind sheeting to prevent sloughing which could cause settlement of existing foundations. Contractor performing this portion of work shall have been prequalified by COR as having previously performed successfully this type of work or will demonstrate his capability for successfully performing this work. It shall be sole responsibility of the Contractor to guard against objectionable movement or settlement and to preserve integrity of existing structures.

4. The tip elevation of the underpinning pits shall be a minimum of 900 mm (3 feet) below the adjacent excavation elevation.
5. Subgrades at the tip of the underpinning pit shall be clean, dry, and free of debris and shall be observed by the COR prior to concrete placement.
6. Concrete shall not be free fall greater than 3000 mm (10 feet) into the pit.

3.4 FILLING AND BACKFILLING:

A. General: Do not fill or backfill until all debris, water, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from excavation. For fill and backfill, use excavated materials and borrow meeting the criteria specified herein, as applicable. Borrow will be supplied at no additional cost to the Government. Do not use unsuitable excavated materials. Do not backfill until foundation walls have been completed above grade and adequately braced, waterproofing or dampproofing applied, foundation drainage, and pipes coming in contact with backfill have been installed and work inspected and approved by COR.

B. Placing: Place materials in horizontal layers not exceeding 200 mm (8 inches) in loose depth for material compacted by heavy compaction equipment, and not more than 100 mm (4 inches) in loose depth for material compacted by hand-operated tampers and then compacted. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure. Place no material on surfaces that are muddy, frozen, or contain frost.

C. Compaction: Compact with approved tamping rollers, sheepsfoot rollers, pneumatic tired rollers, steel wheeled rollers, vibrator compactors, or other approved equipment (hand or mechanized) well suited to soil being compacted. Do not operate mechanized vibratory compaction equipment within 3000 mm (10 feet) of new or existing building walls without prior approval of COR. Moisten or aerate material as necessary to provide moisture content that will readily facilitate obtaining specified compaction with equipment used. Backfill adjacent to any and all types of structures shall be placed and compacted to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials to prevent wedging action or eccentric loading upon or against the structure. Compact soil to not less than the following percentages of maximum dry density, according to ASTM D698 or ASTM D1557 as specified below:

1. Fills, Embankments, and Backfill
   a. Under proposed structures, building slabs, steps, and paved areas, scarify and recompact top 300 mm (12 inches) of existing subgrade and each layer of backfill or fill material in accordance with ASTM D698 95 percent.
   b. Curbs, curbs and gutters, ASTM D698 95 percent.
   c. Under Sidewalks, scarify and recompact top 150 mm (6 inches) below subgrade and compact each layer of backfill or fill material in accordance with ASTM D698 95 percent.
   d. Landscaped areas, top 400 mm (16 inches), ASTM D698 85 percent.
   e. Landscaped areas, below 400 mm (16 inches) of finished grade, ASTM D698 90 percent.

D. Borrow Material: Borrow material shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Borrow material shall be obtained from the borrow areas from approved private sources. Unless otherwise provided in the contract, the Contractor shall obtain from the owners the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources, including rights-of-way for hauling. Borrow material from approved sources on Government-controlled land may be obtained without payment of royalties. Unless specifically provided, no borrow shall be obtained within the limits of the project site without prior written approval. Necessary clearing,

grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon shall be considered related operations to the borrow excavation.

E. Opening and Drainage of Excavation and Borrow Pits: The Contractor shall notify the COR sufficiently in advance of the opening of any excavation or borrow pit to permit elevations and measurements of the undisturbed ground surface to be taken. Except as otherwise permitted, borrow pits and other excavation areas shall be excavated providing adequate drainage. Overburden and other spoil material shall be transported to designated spoil areas or otherwise disposed of as directed. Borrow pits shall be neatly trimmed and drained after the excavation is completed. The Contractor shall ensure that excavation of any area, operation of borrow pits, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.5 GRADING:

A. General: Uniformly grade the areas within the limits of this section, including adjacent transition areas. Smooth the finished surface within specified tolerance. Provide uniform levels or slopes between points where elevations are indicated, or between such points and existing finished grades. Provide a smooth transition between abrupt changes in slope.

B. Cut rough or sloping rock to level beds for foundations. In pipe spaces or other unfinished areas, fill low spots and level off with coarse sand or fine gravel.

C. Slope backfill outside building away from building walls for a minimum distance of 1800 mm (6 feet).

D. Finish grade earth floors in pipe basements as shown to a level, uniform slope and leave clean.

E. Finished grade shall be at least 150 mm (6 inches) below bottom line of window or other building wall openings unless greater depth is shown.

F. Place crushed stone or gravel fill under concrete slabs on grade, tamped, and leveled. Thickness of fill shall be 150 mm (6 inches) unless otherwise shown.

G. Finish subgrade in a condition acceptable to COR at least one day in advance of paving operations. Maintain finished subgrade in a smooth and compacted condition until succeeding operation has been

accomplished. Scarify, compact, and grade subgrade prior to further construction when approved compacted subgrade is disturbed by Contractor's subsequent operations or adverse weather.

H. Grading for Paved Areas: Provide final grades for both subgrade and base course to +/- 6 mm (0.25 inches) of indicated grades.

3.6 DISPOSAL OF UNSUITABLE AND EXCESS EXCAVATED MATERIAL:

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Medical Center property.

B. Place excess excavated materials suitable for fill and/or backfill on site where directed.

C. Remove from site and dispose of any excess excavated materials after all fill and backfill operations have been completed.

D. Segregate all excavated contaminated soil designated by the COR from all other excavated soils, and stockpile on site on two 0.15 mm (6 mil) polyethylene sheets with a polyethylene cover. A designated area shall be selected for this purpose. Dispose of excavated contaminated material in accordance with State and Local requirements.

E. Where excavated spoils are not re-used as sod, backfill, or graded in place, dispose of soils as daily cover at Orchard Ridge Landfill, sign forms, and pay all fees for transportation, handling, and disposal.
   a. Soils excavated are typically fill contaminated with low levels of petroleum hydrocarbons. Fill may include concrete, brick, and other miscellaneous debris.
   b. Entire VA site is under Wisconsin BRRTS # 02-41-563846.

F. Orchard Ridge Waste Profile is #DCV127991WI. Obtain copy from COR. Estimate quantity to be disposed of, and fill in remaining blanks in waste profile form.

G. Report disposal per construction waste management plan.

H. Contractor may at their own expense retain services for soil sampling, laboratory analytical testing, reporting, interpretation of results, and coordinate directly with Wisconsin Department of Natural Resources to obtain permission to dispose of soils at a different site under conditions:
   a. Meet contract schedule
   b. No added cost to government
   c. Furnish per truckload weight tickets from certified scale

d. No on-site treatment or relocation of spoils at VA site allowed.

3.7 CLEAN UP:

Upon completion of earthwork operations, clean areas within contract limits, remove tools, and equipment. Provide site clear, clean, free of debris, and suitable for subsequent construction operations. Remove all debris, rubbish, and excess material from Medical Center Property.

----- E N D -----

SECTION 32 12 16
ASPHALT PAVING

PART 1 - GENERAL

1.1 DESCRIPTION

This work shall cover the composition, mixing, construction upon the prepared subgrade, and the protection of hot asphalt concrete pavement. The hot asphalt concrete pavement shall consist of an aggregate or asphalt base course and asphalt surface course constructed in conformity with the lines, grades, thickness, and cross sections as shown. Each course shall be constructed to the depth, section, or elevation required by the drawings and shall be rolled, finished, and approved before the placement of the next course.

1.2 RELATED WORK

A. Laboratory and field testing requirements: Section 01 45 29, TESTING LABORATORY SERVICES.

B. Subgrade Preparation: Paragraph 3.3 and Section 31 20 00, EARTH MOVING.

C. Pavement Markings: Section 32 17 23, PAVEMENT MARKINGS.

1.3 INSPECTION OF PLANT AND EQUIPMENT

The COR shall have access at all times to all parts of the material producing plants for checking the mixing operations and materials and the adequacy of the equipment in use.

1.4 ALIGNMENT AND GRADE CONTROL

The Contractor’s Registered Professional Land Surveyor shall establish and control the pavement (aggregate or asphalt base course and asphalt surface course) alignments, grades, elevations, and cross sections as shown on the Drawings.

1.5 SUBMITTALS

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

B. Data and Test Reports:

1. Aggregate Base Course: Sources, gradation, liquid limit, plasticity index, percentage of wear, and other tests required by State Highway Department.
2. Asphalt Base/Surface Course: Aggregate source, gradation, soundness loss, percentage of wear, and other tests required by State Highway Department.
3. Job-mix formula.

C. Certifications:
   1. Asphalt prime and tack coat material certificate of conformance to State Highway Department requirements.
   2. Asphalt cement certificate of conformance to State Highway Department requirements.
   3. Job-mix certification - Submit plant mix certification that mix equals or exceeds the State Highway Specification.

D. Provide MSDS (Material Safety Data Sheets) for all chemicals used on ground.

PART 2 - PRODUCTS

2.1 GENERAL

A. Aggregate base and asphalt concrete materials shall conform to the requirements of the following and other appropriate sections of the latest version of the State Highway Material Specifications, including amendments, addenda and errata. Where the term "Engineer" or "Commission" is referenced in the State Highway Specifications, it shall mean the VA COR or VA Contracting Officer.

2.2 AGGREGATES

A. Provide aggregates consisting of crushed stone, gravel, sand, or other sound, durable mineral materials processed and blended, and naturally combined.

B. Subbase aggregate (where required) maximum size: 38mm(1-1/2").

C. Base aggregate maximum size:
   1. Base course over 152mm(6") thick: 38mm(1-1/2");
   2. Other base courses: 19mm(3/4").

D. Asphaltic base course:
   1. Maximum particle size not to exceed 25.4mm(1”).
   2. Where conflicts arise between this specification and the requirements in the latest version of the State Highway Specifications, the State Specifications shall control.

E. Aggregates for asphaltic concrete paving: Provide a mixture of sand, mineral aggregate, and liquid asphalt mixed in such proportions that the percentage by weight will be within comply with Wisconsin DOT specifications.

2.3 ASPHALTS

A. Comply with provisions of Asphalt Institute Specification SS2:
   1. Asphalt cement: Penetration grade 50/60

2. Prime coat: Cut-back type, grade MC-250
3. Tack coat: Uniformly emulsified, grade SS-1H

B. Wearing course to consist of appropriate proportions of recycled asphaltic materials per WisDOT Standard Specifications.

C. Surface course to consist of virgin material only.

2.4 SEALER

A. Provide a sealer consisting of suitable fibrated chemical type asphalt base binders and fillers having a container consistency suitable for troweling after thorough stirring, and containing no clay or other deleterious substance.

B. Where conflicts arise between this specification and the requirements in the latest version of the State Highway Specifications, the State Specifications shall control.

PART 3 - EXECUTION

3.1 GENERAL

The Asphalt Concrete Paving equipment, weather limitations, job-mix formula, mixing, construction methods, compaction, finishing, tolerance, and protection shall conform to the requirements of the appropriate sections of the State Highway Specifications for the type of material specified.

3.2 MIXING ASPHALTIC CONCRETE MATERIALS

A. Provide hot plant-mixed asphaltic concrete paving materials.

1. Temperature leaving the plant: 143 degrees C (290 degrees F) minimum, 160 degrees C (320 degrees F) maximum.
2. Temperature at time of placing: 138 degrees C (280 degrees F) minimum.

3.3 SUBGRADE

A. Shape to line and grade and compact with self-propelled rollers.

B. All depressions that develop under rolling shall be filled with acceptable material and the area re-rolled.

C. Soft areas shall be removed and filled with acceptable materials and the area re-rolled.

D. Should the subgrade become rutted or displaced prior to the placing of the subbase, it shall be reworked to bring to line and grade.

E. Proof-roll the subgrade with maximum 45 tonne (50 ton) gross weight dump truck as directed by VA COR or VA Contracting Officer. If

pumping, pushing, or other movement is observed, rework the area to provide a stable and compacted subgrade.

3.4 BASE COURSES

A. Subbase (when required)
   1. Spread and compact to the thickness shown on the drawings.
   2. Rolling shall begin at the sides and continue toward the center and shall continue until there is no movement ahead of the roller.
   3. After completion of the subbase rolling there shall be no hauling over the subbase other than the delivery of material for the top course.

B. Base
   1. Spread and compact to the thickness shown on the drawings.
   2. Rolling shall begin at the sides and continue toward the center and shall continue until there is no movement ahead of the roller.
   3. After completion of the base rolling there shall be no hauling over the base other than the delivery of material for the top course.

C. Thickness tolerance: Provide the compacted thicknesses shown on the Drawings within a tolerance of minus 0.0mm (0.0") to plus 12.7mm (0.5").

D. Smoothness tolerance: Provide the lines and grades shown on the Drawings within a tolerance of 5mm in 3m (3/16 inch in ten feet).

E. Moisture content: Use only the amount of moisture needed to achieve the specified compaction.

3.5 PLACEMENT OF ASPHALTIC CONCRETE PAVING

A. Remove all loose materials from the compacted base.

B. Apply the specified prime coat, and tack coat where required, and allow to dry in accordance with the manufacturer’s recommendations as approved by the Architect or Engineer.

C. Receipt of asphaltic concrete materials:
   1. Do not accept material unless it is covered with a tarpaulin until unloaded, and unless the material has a temperature of not less than 130 degrees C(280 degrees F).
   2. Do not commence placement of asphaltic concrete materials when the atmospheric temperature is below 10 degrees C (50 degrees F), not during fog, rain, or other unsuitable conditions.

D. Spreading:
   1. Spread material in a manner that requires the least handling.

2. Where thickness of finished paving will be 76mm (3") or less, spread in one layer.

E. Rolling:

1. After the material has been spread to the proper depth, roll until the surface is hard, smooth, unyielding, and true to the thickness and elevations shown own the drawings.
2. Roll in at least two directions until no roller marks are visible.
3. Finished paving smoothness tolerance:
   a. No depressions which will retain standing water.
   b. No deviation greater than 3mm in 1.8m (1/8" in six feet).

3.6 APPLICATION OF SEAL COAT

A. Prepare the surfaces, mix the seal coat material, and apply in accordance with the manufacturer's recommendations as approved by the Architect or Engineer.

B. Achieve a finished surface seal which, when dry and thoroughly set, is smooth, tough, resilient, of uniform black color, and free from coarse textured areas, lap marks, ridges, and other surface irregularities.

C. When sealing new asphalt paving wait an entire year to allow for the expansion and contraction of a year's cycle of both warm and cool temperatures. This allows for the asphalt's oils to properly cure and begin oxidation before applying a seal coat.

D. When seal coating in less than a year apply two coats, spray applied. This application method is preferred for less than a year application when there is still plenty of asphalt cement present for the seal coat to bond to.

E. When seal coating existing paving that has new asphalt patches, apply two coats sprayed to the existing asphalt and a single lighter coat on new patch work, just enough to make the color of the new patches match the rest of the reseal coated paving.

F. When resealing existing paving 5, 10, 15 years and older, that is oxidized and is very light in color, squeegee apply the first coat of seal coat and spray on a second coat. Two coats are preferred in older paving when the asphalt cement has oxidized leaving the seal coat with nothing to bond to other than the aggregate that in many cases has polished over time leaving less than a desirable surface to bond to.

3.7 PROTECTION

Protect the asphaltic concrete paved areas from traffic until the sealer is set and cured and does not pick up under foot or wheeled traffic.

3.8 FINAL CLEAN-UP

Remove all debris, rubbish, and excess material from the work area.

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