

Project Number 839-NRM18-06

**ROSTRUM RENOVATION
AND FY2018 SITE IMPROVEMENTS**

at the

Richmond National Cemetery

Technical Specifications

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Jan. 26, 2018

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839-NRM18-06-001	Site Plan / Project Location
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SECTION 01 00 02
GENERAL REQUIREMENTS

1.1 STATEMENT OF BID ITEM(S)

- A. Contractor shall provide all labor, tools, materials, equipment, services, submittals, supervision, approvals, and related work to make noted restorations and improvements for the "Rostrum Renovation and FY2018 Site Improvements" at the Richmond National Cemetery (874). The work includes three (3) unique and separate Projects as outlined below.
- B. The Contractor shall comply with the following General Project Requirements:
1. CONTRACTOR SHALL READ AND COMPLY WITH ALL CONDITIONS OF THIS CONTRACT INCLUDING THE TECHNICAL SPECIFICATION AS IT RELATES TO ALL REQUIREMENTS, PRODUCTS & MATERIALS, SUBMITTALS, TESTING, AND EXECUTION.
 2. CONTRACTOR SHALL HAVE HARD COPIES OF ALL CONTRACT DOCUMENTS, DRAWINGS, TECHNICAL SPECIFICATIONS, AND ALL PERMIT APPROVALS AT THE PROJECT SITE AT ALL TIME.
 3. CONTRACTOR SHALL NOT BEGIN ANY EXCAVATION UNTIL ALL THE APPROPRIATE UNDERGROUND UTILITIES HAVE BEEN LOCATED AND MARKED IN THE FIELD.
 4. CONTRACTOR SHALL MINIMIZE THE NEED FOR RESTORATION TO THE LAWNS, PAVEMENT, OR OTHER FEATURE ALONG THE PATH OF THE WORK.
 5. CONTRACTOR SHALL CONDUCT WORK WITH THE SPECIAL CARE, REVERENCE, DIGNITY, AND RESPECT THAT ACKNOWLEDGE THE CEMETERY AS THE FINAL RESTING PLACE THAT COMMEMORATES THE SERVICE AND SACRIFICE THAT SERVICE MEMBERS, VETERANS AND THEIR FAMILIES MADE FOR OUR NATION.
 6. CONTRACTOR SHALL KEEP THE PROJECT WORK SITE CLEAN AND TIGHTY AT ALL TIME. AT THE END OF EACH WORK DAY, ALL MATERIAL AND EQUIPMENT SHALL BE STORED IN A DESIGNATED PLACE PER THE CEMETARY DIRECTOR.
- C. The Contract Work is for the Contractor to make noted restorations and improvements at the Richmond National Cemetery (874). There are three (3) Project Locations as shown on the Contract Drawings. There is a total of three (3) Projects, one each in each Project Location. The three (3) Projects are identified as **Project "A", Project "B", and Project "C"** on the Drawings and are further described as follows:
- D. **Project "A", "Rostrum Restoration"**: this project is located in the east central portion of the cemetery track of land. The work required for Project "A" includes the repair of the steps rail post, renovation of the cast iron steps, posts, rails, and other metal surfaces, paint removal and painting of the metal surfaces, replacement of the cast stone steps landing, and cleaning, repair, and restoration to brick, cast stone and related mortar throughout the entire Rostrum structure.
- E. **Project "B", "Maintenance Shed Improvements"**: this project is located in the northwest portion of the cemetery track of land. The work required for Project "B" includes the removal of the existing steel door and frame

and installation of a non-metal door. This project also includes the removal of lead paint on the window enclosure on the east side and priming and painting of such enclosure on both interior and exterior sides along with the replacement of all damaged hardware. Paint color to match existing shed trim.

- F. **Project "C", "Cannon Monument Restoration"**: this project is located in the center of the cemetery track of land. The work includes the saw-cutting and removal of one (1) quarter section of a Cannon Monument Base and replacing the damaged base with a similar cast stone of similar thickness, color, and aggregate mix. The monument base repair work includes providing minimum twelve (12) inch stone bedding, subgrade compaction, submittals, testing, and all related work to provide a complete project.

1.2 SPECIFIC WORK ITEMS

The Contractor will be required to perform the following additional tasks as part of his work for this Project:

- A. For **Project "A"**: Contractor shall make exterior repairs and renovation to the existing rostrum structure located in the east central portion of the cemetery as shown on the drawings and as outlined in the specifications as part of Project "A" - "Rostrum Restoration". All work shall be in conformance with the technical specifications including Division 1 - "General Requirements", Division 4 - "Masonry", Division 5 - "Metals", and Division 9 - "Finishes".
- B. For **Project "A"**: Contractor shall obtain the services of an Architect or other Historic Preservation Professional qualified to conduct a "Condition Assessment" to formulate a plan, set priorities, provide guidance, on the restoration work to ensure that the historical integrity of the Rostrum is maintained as part of the work. A thorough assessment of the type and extent of damage should be documented.
- C. For **Project "A"**: Contractor shall submit metal fabrication design to the COR for approval prior to conducting any work associated with the rostrum rail post repair. Such metal fabrication design shall clearly show how the rail post will be cut, the dimensions and thickness of replacement metal, and how the replacement cast iron or other approved metal will be attached to the steps and rails.
- D. For **Project "A"**: Contractor shall make submittal to the COR of methodology to remove all paint from all metal rails, posts, steps, and all iron surface. Once the removal methodology has been allowed for testing, the contractor shall conduct a "test patch" to a small area of the steps, rails, and posts to demonstrate that the methodology can work without damaging the metal features of the historic rostrum. The "test patch" will be inspected and approved by the COR prior to proceeding with the removal of all paint from metal surfaces.
- E. For **Project "A"**: Contractor shall make submittals to COR of all primers, paints, and finishes outlined in the Specification Section 09 91 10 - "Painting of Metals". All loose, flaking, and deteriorated paint must be removed from the iron metal, as well as dirt, salts, oil and grease prior to applying the primer, paints, and finishes.

- F. For **Project "A"**: Contractor shall apply all primers, paints, and finishes by means of brushing. Prior to conducting this work, the Contractor shall make all submittals, conduct a "test patch" for each step of the priming, painting, and finish process. The "Test Patch" will be inspected and approved by the COR prior to proceeding with the painting work.
- G. For **Project "A"**: Prior to conducting any work on the Brick or Cast Stone mortar removal the Contractor shall conduct a mortar analysis. The Contractor shall hire a third-party testing firm certified for conducting "wet chemical" testing. The firm shall conduct a visual examination of the mortar per "The Russack System for Brick & Mortar Description". Contractor shall submit third-party testing results to the COR that documents the color, gradation, and texture of the sand and the proportion of lime and other components in the original mortar.
- H. For **Project "A"**: Contractor shall remove salts and stains from the Brick and Cast Stone surfaces and remove all loose or deteriorated mortar between brick. The mortar removal method shall be by hand chisels and mash hammers to ensure that the Brick and Cast Stone is not damaged in any way. The Contractor shall conform to all submittal and test panel requirements outlined in Division 4 - "Masonry" of the specifications.
- I. For **Project "A"**: Contractor shall restore the entire platform area of the historic rostrum. Prior to any work the Contractor shall determine the aggregate of the Cast Stone and make submittal to the COR on the "cleaning methodology" for approval of conducting the "test patch". The "test patch" will be inspected and approved by the COR prior to proceeding with the cleaning of the surface and mortar replacement.
- J. For **Project "B"**: Contractor shall make exterior / interior door and window repairs to the existing maintenance shed as part of Project "B" - "Maintenance Shed Improvements". All work shall be in conformance with the technical specifications including Division 1 - "General Requirements", Division 8 - "Doors and Windows" and Division 9 - "Finishes".
- K. For **Project "B"**: Includes the removal of the existing steel door and frame as well as providing and installing a new non-metal door with all specified features and hardware; the work includes finishing as outlined in the technical specifications; and labor, tools, materials, and equipment for a complete project.
- L. For **Project "B"**: Includes paint removal, scraping, priming, and painting on the exterior / interior sides of the maintenance shed window enclosure. The work includes the submittal to COR paint samples that match the existing trim color on the shed, providing test patch on the window enclosure, replacing all damaged hardware, and all labor, tools, materials, and equipment for a complete project.
- M. For **Project "C"**: Contractor shall make exterior cast stone repairs located at indicated cannon monuments as part of Project "C" - "Cannon Monument Repair". All work shall be in conformance with the technical specifications Division 1 - "General Requirements" and Division 4 - "Masonry" requirements.

- N. For **Project "C"**: Contractor shall remove a portion of the cannon monument base and replace with cast in place concrete or cast stone of similar color and aggregate in areas indicated on the drawings and as directed by the COR. The work includes all saw cuts, providing subbase, installing forms, making submittals to the COR and all labor, tools, materials, and equipment for a complete project.

1.2 DRAWINGS

- A. The following Drawings are made part of this Contract:

- 1. **839-NRM18-06-001 "Site Plan / Project Location"**
- 2. **839-NRM18-06-002 "Site Improvements Plan"**

1.3 SITE VISIT

- A. Bidders may inspect the site, investigate by observation, and Request Information via (RFI) and responses through the Contracting Office to satisfy their understanding of the work to be done, all general, local and technical conditions that may affect the cost and the feasibility of their proposal.
- B. In no event, shall failure of the Bidder to inspect the site constitute grounds for a claim after Award. Bidders planning to conduct a site visit shall contact the Cemetery Director or Foreman to make arrangements at the following:

Government POC:

Richmond National Cemetery (Station #874)

Janice M. Hill, Cemetery Director

(757)-723-7104

Janice.Hill@va.gov

NCA District Engineer POC:

Ron Horton, P.E., Project Engineer / COR

North Atlantic District (NAD) Project Engineer

(215) 381-3787 (ext. 5799)

Ronald.Horton@va.gov

1.4 SAFETY REQUIREMENTS

- A. Contractor foreman shall be onsite during all work activities and shall have completed OSHA 30-hour training. All other employees and sub-

contractors shall have as a minimum, 10-hour OSHA training. Prior to commencing work, general contractor shall provide proof that an OSHA certified "competent person" (CP) (29 CFR 1926.20(b)(2)) will maintain a presence at the work site whenever the general or subcontractors are present.

- B. Contractor shall 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.
- C. Contractor shall ensure that all Fire and Safety Rules observed in performance of work: Wherever a cutting torch or other equipment that might cause a fire is used, the Contractor shall provide and maintain fire extinguishers nearby ready for immediate use. Contractor shall instruct all possible users in use of fire extinguishers.

1.5 PERFORMANCE DETAILS

- A. Contractor shall complete all work within **90 calendar days** after receipt of Notice to Proceed, subject to all terms, conditions, provisions and schedules of the contract. No cost time extension will be considered for cold weather delays as requested by the Contractor.
- B. Work Hours: Work may be performed between the normal hours of 8:00 a.m. and 4:30 p.m., Monday through Friday. The following conditions also may be applicable:
 - 1. At the Contractor's request; with prior coordination with the Cemetery Director and with the written permission of the COR; work will also be permitted to be scheduled for weekends and/or Holidays, only in the following situations:
 - 2. In emergency situations caused by the Contractor, or when severe adverse weather prohibits work during the week, the Contractor shall arrange to work on weekends and/or holidays to meet the contract performance period.
 - 3. The Government will not compensate the Contractor for any alternate work schedules needed to complete all contract work within the contract performance period.
 - 4. No work will be permitted during Memorial Day or Veteran's Day weekend activities or during any other Federal Holidays.

5. No work will be performed at the immediate site of a scheduled interment or ceremony.
 6. Notwithstanding, if any work under this contract is required outside of the VA's normal working hours (8:00 a.m. to 4:30 p.m. Monday through Friday excluding holidays), the Contractor shall coordinate with the Cemetery Director and COR and request a deviation in writing to the COR at least 72 hours in advance.
- C. When working on a Government site, the Contractor shall coordinate with the Cemetery Director daily, before start of work, the daily work schedule to ensure that no work is being performed at the immediate site of a scheduled interment or ceremony. The Contractor shall note the following:
- 1. Burial activities at a National Cemetery shall take precedence over Contractor activities. Cemetery interment services cannot be disturbed at any time.**
 - 2. To cause the least possible interference with cemetery activities, the Contractor shall cease all work in areas where burials are taking place.**
 - 3. Contractor equipment and personnel are prohibited from passing through the procession or service area during the burial period.**
- D. The Contractor shall execute daily work in such a manner as to interfere as little as possible with work being done by others. Keep roads clear of materials, debris, equipment and vehicles at all times. Materials and equipment shall not be stored in other than assigned areas. At the end of each day the Contractor shall maintain all Contractor and Government property impacted by the Contractor's performance of work in a high standard of quality and cleanliness required for a national shrine.
- E. Contractor personnel are subject to the cemetery rules of conduct. The Contractor is responsible for ensuring that no contract work causes any committal service, ceremony, procession or visitation to be delayed, altered, or otherwise impacted in such a way that the dignity, security, or safety of the event or visit is compromised.
- F. Motor Vehicle Restrictions: Contractor, employees, and Sub-Contractors shall coordinate parking and access with the Cemetery Director.

1.6 OPERATIONS AND STORAGE AREAS

- A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Cemetery Director or COR. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance. Contractor shall coordinate all work and obtain and pay for any required permits necessary for completion of this project.
- B. The Contractor shall use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer Representative. 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 utilities, curbs, sidewalks, roads, or any other site feature.
- C. Construction Fence shall be required only when noted on construction drawings or as directed by the COR. Before construction operations begin, Contractor shall provide a chain link construction fence, seven feet minimum height, around the construction area when indicated on the drawings. Provide gates as required 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 15 inches. Bottom of fences shall extend to one inch above grade. Remove the fence when directed by the COR.
- D. 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 the Cemetery Director and 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 a detailed work plan, and the Cemetery Director's prior knowledge and written approval.
- E. Contractor shall submit a request to interrupt any such utility services to the COR, in writing, 7 days in advance of proposed interruption.

Request shall state reason, date, exact time of, and approximate duration of such interruption.

- F. 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 Cemetery. Interruption time approved by Cemetery may not occur at other than Contractor's normal working hours.
- G. Major interruptions of any other system must be requested, in writing, at least 15 calendar days prior to the desired time and shall be performed as directed by the COR.
- H. Abandoned Lines: All service lines such as wires, cables, conduits, ducts, pipes and the like, and their hangers or supports, which are to be abandoned but are not required to be entirely removed, shall be sealed, capped or plugged at the main, branch or panel they originate from. 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.
- I. The Contractor shall minimize interference of construction activities with flow of Cemetery traffic and 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 coordinated and approved by the Cemetery Director and the COR.
- J. Coordination of Construction with Cemetery Director: The burial activities at a National Cemetery shall take precedence over construction activities. The Contractor shall cooperate and coordinate with the Cemetery Director, through the COR, in arranging construction schedule to cause the least possible interference with cemetery activities in actual burial areas. Construction noise during the interment services shall not disturb the service. Trucks and workmen shall not pass through the service area during this period:
 - 1. The Contractor is required to discontinue his work 24 hours in advance of Easter Sunday, Mother's Day, Father's Day, Memorial Day, Veteran's

Day and/or Federal holidays, to ensure that all areas of operation adjacent to existing burial plots are clean and immaculate before these dates.

2. Daily Cleaning shall include the removal of all equipment, tools, materials and debris and leaving the areas in a clean, safe, and neat condition.
- K. The Contractor shall clean any Government property; including cemetery structures, headstones and monuments; that are soiled or stained because of Contractor's performance. The Contractor shall wash-down with water all soiled or stained structures, headstones and monuments at the end of each workday. Any such cleaning or washing shall be brought to the immediate attention of the COR prior to cleaning or washing. No hazardous chemicals shall be used at any time on Government property.
- L. At the end of each work day, the Contractor shall remove all debris from the cemetery site resulting from the performance of the work. The Contractor shall ensure at all times that rubbish and trash generated by the Contractor is kept clear of vehicular and pedestrian traffic throughout the site. The Government will not provide receptacle(s) for disposal of debris related to this contract. The Contractor will be permitted to place trash receptacle dumpsters in the COR approved staging area at the National Cemetery.

1.7 Contractor Personnel Standards of Behavior (Work on a Government Installation)

A. Dignity Clause:

1. Every action by Contractor personnel at a national cemetery shall be performed with the special care, reverence, dignity, and respect that acknowledge the cemetery as the final resting place that commemorates the service and sacrifice that service members, Veterans and their families made for our Nation. Critically important is the awareness required of the Contractor employees of the remains buried in the grounds where the work is performed. The utmost care shall be given to these remains and the headstones and flat grave markers that mark those gravesites and memorialize the service of individuals.
 2. Contractors shall not walk, stand, lean, sit or jump on headstones or markers. Nor shall they drive over them. Contractor personnel should use tools approved by the Contracting Officer Representative (COR), such as shovels, pry bars or pinch bars to lift flat markers out of the ground; pick axes are not an acceptable tool.
- B. Smoking is prohibited inside any buildings at the cemetery. Possession of weapons is prohibited from any cemetery buildings and grounds. Enclosed containers, including tool kits, shall be subject to search. Violations

of VA regulations may result in citation answerable in the United States (Federal) District Court, not a local district, state, or municipal court

C. Contractor personnel are required to adhere to the following standards of dress, conduct, supervision and training while performing work on a Government Installation. Any violations shall be subject to immediate enforcement action by the Contracting Officer if these standards are not met. Contractor is responsible for training and safety precautions prescribed by OSHA regarding safety equipment and devices. Contractor personnel shall:

- (1) Be fully clothed at all times, to include upper garment to cover body from the waist to the neck and long pants or slacks. Garments, which have a message, slogan or printing of any kind other than the Contractor's business attire, are prohibited. Uniforms are acceptable.
- (2) Maintain a neat and professional appearance throughout its workforce, vehicles, equipment, and maintenance areas. Uniforms are acceptable. If uniforms are used, they must be in unison among all employees.
- (3) Not engage in loud or boisterous behavior, angry outbursts or use profane or abusive language at any time on Government premises. Playing radios and/or electronic games/devices shall only be done at lunchtime and in a designated break area. Due to the sensitive mission of the cemetery, Contractor employees shall come into daily contact with grieving individuals, therefore Contractor employees shall exercise and exhibit absolute decorum, courtesy, and respect while within the cemetery or at its perimeter or entrances. Inquiries from cemetery visitors shall be politely referred to Government cemetery staff. Gratuities of any kind are strictly prohibited.
- (4) Consume food and beverage only within areas designated by the cemetery director (or his/her designated representative). Intoxication, and violence or criminal acts of any kind shall not be tolerated and is cause for immediate removal from a Government Installation. Use or sale of intoxicating beverages and/or drugs is strictly prohibited and use of tobacco products is only allowed in specific areas designated by the Cemetery Director (or his/her designated representative).
- (5) Only take breaks/rest periods, lunch breaks and bathrooms breaks in the Contractor Break Area, designated by the Cemetery Director (or his/her designated representative), not in the field. Misconduct shall form the basis for immediate contract enforcement action, to include immediate removal from the cemetery.
- (6) The Contractor shall ensure that his/her employees (including Contractor Consultants, Sub-Contractors, etc.) are aware of all the terms and conditions set forth in the

contract regarding the "Dignity Clause", their performance, and conduct while at the Cemetery.

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, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those utilities, facilities, or any site condition 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 Representative will have the necessary work performed and charge the cost to the Contractor or withhold from any payments.

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. The Contractor shall do not cut, alter or remove any structural work, disturb any ducts, plumbing, steam, gas, or electric systems 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 in the Contract.
- 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 LAYOUT OF WORK

- A. The Contractor shall lay out the work from Government established base lines and bench marks, when 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 Drawings.
- B. 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 Representative may replace them and deduct the expense of the replacement from any future payment.

1.11 TEMPORARY TOILETS

- A. When necessary, Contractor shall provide temporary sanitary toilet accommodations. Coordinate location with Cemetery Director. Keep such places clean and free from flies. Failure to maintain satisfactory condition of Temporary Toilets will deprive Contractor of the privilege to use such toilets.

1.12 AVAILABILITY AND USE OF UTILITY SERVICES

- A. 120 outlets may be available and shall be coordinated with the Cemetery Director or COR for use if necessary.
- B. Water for Construction: Furnish temporary water service.
 - 1. Contractor may obtain water by connecting to the Cemetery 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 Cemetery's system.

1.13 DISPOSAL AND RETENTION

- A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:
 - 1. Reserved items which are to remain property of the Government are described as such in the scope of work above. 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 not reserved shall become property of the Contractor and be removed by Contractor from the Cemetery.
 - 3. Items of portable equipment and furnishings located in rooms and spaces in which work is to be done under this contract shall remain the property of the Government. When rooms and spaces are vacated by the Department of Veterans Affairs during the alteration period, such items which are NOT required by drawings and specifications to be either relocated or reused will be removed by the Government in advance of work to avoid interfering with Contractor's operation.

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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 Representative (COR) may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective technical specifications at no additional cost to the government.
- 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 VA will provide the initial submittal register in 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.
- 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.
- D. All submittals are required to be approved prior to the start of the specified work activity.

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. All irrelevant or unnecessary data shall be removed from the submittal to facilitate accuracy and timely processing. Submittals that contain the excessive amount of irrelevant or unnecessary data will be returned with review.
- E. Provide a transmittal form for each submittal with the following information:
 - 1. Project title, location and number.

- 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.
- F. 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.
- G. Stamp, sign, and date each submittal transmittal form indicating action taken. 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. E-mail electronic submittal documents smaller than 5MB in size to e-mail addresses as directed by the COR.
- E. Provide electronic documents over 5MB through an electronic FTP file sharing system. Confirm that the electronic FTP file sharing system can be accessed from the VA computer network. The Contractor is responsible for setting up, providing, and maintaining the electronic FTP file sharing system for the construction contract period of performance.
- F. 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 COR, 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

- A. The COR 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 RFI'S

- A. The VA will review all submittals for compliance with the technical requirements of the contract documents. The COR for this project will review all submittals and determining contractual compliance.
- B. Period of review for submittals begins when the COR receives submittal from the Contractor.
- C. Period of review for each resubmittal is the same as for initial submittal.
- D. VA review period is 15 working days for submittals.
- E. 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. "Approved as noted": authorizes the Contractor to proceed with the work covered provided the Contractor incorporates the noted comments and makes the noted corrections.
 - 3. "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.
 - 4. "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

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

- - - E N D - - -

SECTION 01 35 26
SAFETY REQUIREMENTS - NON-ELECTRICAL

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-2015Standard 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 ManualComprehensive Accreditation and Certification
Manual

G. U.S. Nuclear Regulatory Commission

10 CFR 20Standards for Protection Against Radiation

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

29 CFR 1904Reporting and Recording Injuries & Illnesses

29 CFR 1910Safety and Health Regulations for General
Industry

29 CFR 1926Safety 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).

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.

- E. 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

1.4 ACCIDENT PREVENTION PLAN (APP):

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

- B. The APP shall be prepared as follows:

1. Written in English by a qualified person who is employed by the Prime Contractor articulating the specific work and hazards pertaining to the contract (model language can be found in ASSE A10.33). Specifically articulating the safety requirements found within these VA contract safety specifications.
2. Address both the Prime Contractors and the subcontractors work operations.
3. State measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.

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

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

- 1) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience);
- 2) Plan approver (company/corporate officers authorized to obligate the company);
- 3) Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional). Provide concurrence of other applicable corporate and project personnel (Contractor).

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

- 1) Contractor;
- 2) Contract number;
- 3) Project name;
- 4) Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).

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

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

- 1) A statement of the employer's ultimate responsibility for the implementation of his SOH program;
- 2) Identification and accountability of personnel responsible for safety at both corporate and project level. Contracts

specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes.

- 3) The names of Competent and/or Qualified Person(s) and proof of competency/qualification to meet specific OSHA Competent/Qualified Person(s) requirements must be attached.;
 - 4) Requirements that no work shall be performed unless a designated competent person is present on the job site;
 - 5) Requirements for pre-task Activity Hazard Analysis (AHAs);
 - 6) Lines of authority;
 - 7) Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for violation of safety requirements) should be identified;
- e. SUBCONTRACTORS AND SUPPLIERS.** If applicable, provide procedures for coordinating SOH activities with other employers on the job site:
- 1) Identification of subcontractors and suppliers (if known);
 - 2) Safety responsibilities of subcontractors and suppliers.
- f. TRAINING.**
- 1) Site-specific SOH orientation training at the time of initial hire or assignment to the project for every employee before working on the project site is required.
 - 2) Mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, crane operator, rigger, crane signal person, fall protection, electrical lockout/NFPA 70E, machine/equipment lockout, confined space, etc...) and any requirements for periodic retraining/recertification are required.
 - 3) Procedures for ongoing safety and health training for supervisors and employees shall be established to address changes in site hazards/conditions.

- 4) OSHA 10-hour training is required for all workers on site and the OSHA 30-hour training is required for Trade Competent Persons (CPs)

g. SAFETY AND HEALTH INSPECTIONS.

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

h. ACCIDENT/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 // Resident Engineer // Project Manager // and Facility Safety // Manager // Officer // or Contracting Officer Representative // or Government Designated Authority:

- 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;
- 16) Asbestos abatement;
- 17) Lead abatement;
- 18) Crane Critical lift;
- 19) Respiratory protection;
- 20) Health hazard control program;
- 21) Radiation Safety Program;
- 22) Abrasive blasting;
- 23) Heat/Cold Stress Monitoring;
- 24) Crystalline Silica Monitoring (Assessment);
- 25) Demolition plan (to include engineering survey);
- 26) Formwork and shoring erection and removal;
- 27) PreCast Concrete;
- 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) - NOT REQUIRED AS PART OF THIS CONTRACT:

- 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 or Government Designated Authority and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.

1. The names of the Competent/Qualified Person(s) required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and/or other State and Local agencies) shall be identified and included in the AHA. Certification of their competency/qualification shall be submitted to the Government Designated Authority (GDA) for acceptance prior to the start of that work activity.
2. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).
 - a. If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.
 - b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.
3. Submit AHAs to the Contracting Officer Representative or Government Designated Authority 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 or Government Designated Authority.

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.

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. Each subcontractor shall designate a minimum of one CP in compliance with 29 CFR 1926.20 (b)(2) that will be identified as a CP to administer their individual safety programs.
- B. Further, all specialized Competent Persons for the work crews will be supplied by the respective contractor as required by 29 CFR 1926 (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).
- C. These Competent Persons can have collateral duties as the subcontractor's superintendent and/or work crew lead persons as well as fill more than one specialized CP role (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).

- D. The SSHO or an equally-qualified Designated Representative/alternate will maintain a presence on the site during construction operations in accordance with FAR Clause 52.236-6: *Superintendence by the Contractor*. CPs will maintain presence during their construction activities in accordance with above mentioned clause. A listing of the designated SSHO and all known CPs shall be submitted prior to the start of work as part of the APP with the training documentation and/or AHA as listed in Section 1.8 below.
- E. The repeated presence of uncontrolled hazards during a contractor's work operations will result in the designated CP as being deemed incompetent and result in the required removal of the employee in accordance with FAR Clause 52.236-5: *Material and Workmanship, Paragraph (c)*.

1.8 TRAINING:

- A. The designated Prime Contractor SSHO must meet the requirements of all applicable OSHA standards and be capable (through training, experience, and qualifications) of ensuring that the requirements of 29 CFR 1926.16 and other appropriate Federal, State and local requirements are met for the project. As a minimum the SSHO must have completed the OSHA 30-hour Construction Safety class and have five (5) years of construction industry safety experience or three (3) years if he/she possesses a Certified Safety Professional (CSP) or certified Construction Safety and Health Technician (CSHT) certification or have a safety and health degree from an accredited university or college.
- B. All designated CPs shall have completed the OSHA 30-hour Construction Safety course within the past 5 years.
- C. In addition to the OSHA 30 Hour Construction Safety Course, all CPs with high hazard work operations such as operations involving asbestos, electrical, cranes, demolition, work at heights/fall protection, fire safety/life safety, ladder, rigging, scaffolds, and trenches/excavations shall have a specialized formal course in the hazard recognition & control associated with those high hazard work operations. Documented "repeat" deficiencies in the execution of safety requirements will require retaking the requisite formal course.
- D. All other construction workers shall have the OSHA 10-hour Construction Safety Outreach course and any necessary safety training to be able to identify hazards within their work environment.

- E. Submit training records associated with the above training requirements to the Contracting Officer Representative or Government Designated Authority for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance.
- F. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the SSHO or his/her designated representative. As a minimum, this briefing shall include information on the site-specific hazards, construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, emergency procedures, accident reporting etc... Documentation shall be provided to the Resident Engineer that individuals have undergone contractor's safety briefing.
- G. Ongoing safety training will be accomplished in the form of weekly documented safety meeting.

1.9 INSPECTIONS:

- A. The SSHO shall conduct frequent and regular safety inspections (daily) of the site and each of the subcontractors CPs shall conduct frequent and regular safety inspections (daily) of the their work operations as required by 29 CFR 1926.20(b)(2). Each week, the SSHO shall conduct a formal documented inspection of the entire construction areas with the subcontractors' "Trade Safety and Health CPs" present in their work areas. Coordinate with, and report findings and corrective actions weekly to the Contracting Officer Representative or Government Designated Authority.
- 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 or Government Designated Authority 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 or Government Designated Authority 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 or Government Designated Authority 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 or Government Designated Authority 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 or Government Designated Authority within 5 calendar days of the accident. The Contracting Officer Representative or Government Designated Authority 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 or Government Designated Authority 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 or Government Designated Authority monthly. The contractor and associated sub-contractors' OSHA 300 logs will be made available to the Contracting Officer Representative or Government Designated Authority 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 // Resident Engineer Contracting Officer Representative or Government Designated Authority 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 or Government Designated Authority 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 or Government Designated Authority 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 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.

1.13 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.

1.14 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 kneeling, 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 and /or other Government Designated Authority 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 and / or Government Designated Authority. The permit shall be maintained onsite and the first section of the permit shall include the following:
1. Estimated start time & stop time.
 2. 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 determine 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 penetrometer 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.

1.15 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 and / or other Government Designated Authority 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

1.16 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.

1.17 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 and /or other Government Designated Authority.

1.18 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 and/or other Government Designated Authority.

1.19 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
- D. 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.

1.20 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 toe boards 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.

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SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.1 DESCRIPTION

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

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

- A. The GSA Index of Federal Specifications, Standards and Commercial Item Descriptions, FPMR Part 101-29 and copies of specifications, standards, and commercial item descriptions cited in the solicitation may be obtained for a fee by submitting a request to - GSA Federal Supply Service, Specifications Section, Suite 8100, 470 East L'Enfant Plaza, SW, Washington, DC 20407, Telephone (202) 619-8925, Facsimile (202) 619-8978.
- B. If the General Services Administration, Department of Agriculture, or Department of Veterans Affairs issued this solicitation, a single copy of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained free of charge by submitting a request to the addressee in paragraph (a) of this provision. Additional copies will be issued for a fee.

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

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

DEPARTMENT OF VETERANS AFFAIRS

Office of Construction & Facilities Management

Facilities Quality Service (00CFM1A)

425 Eye Street N.W, (sixth floor)

Washington, DC 20001

Telephone Numbers: (202) 632-5249 or (202) 632-5178

Between 9:00 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)

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

AAN American Nursery and Landscape Association

<http://www.anla.org>

AASHTO American Association of State Highway and Transportation Officials

<http://www.aashto.org>

ANLA American Nursery & Landscape Association

<http://www.anla.org>

ANSI American National Standards Institute, Inc.

<http://www.ansi.org>

ASAE American Society of Agricultural Engineers

<http://www.asabe.org>

ASTM American Society for Testing and Materials

<http://www.astm.org>

CSI Cast Stone Institute

<http://www.caststone.org>

EGSA Electrical Generating Systems Association

<http://www.egsa.org>

EEI Edison Electric Institute

<http://www.eei.org>

EPA Environmental Protection Agency

<http://www.epa.gov>

ETL ETL Testing Laboratories, Inc.

<http://www.etl.com>

GSA General Services Administration

<http://www.gsa.gov>

ICEA Insulated Cable Engineers Association Inc.

<http://www.icea.net>

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
<http://www.icea.net/>

NBS National Bureau of Standards
See - NIST

NEC National Electric Code
<http://www.nfpa.org/nec>

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

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

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

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

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

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

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

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SECTION 04 03 01
HISTORIC BRICK MAINTENANCE & REPAIR

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This Section provides general guidance on approaches to the preservation and restoration of Historic Brick found on a National Cemetery.
- B. The Contractor should not hesitate to question the specifications if it appears that the work specified would damage the structure.

1.2 RELATED WORK:

- A. Section 01 00 02 General Requirements.
- B. Section 01 33 23 Shop Drawings, Product Data, and Samples.
- C. Section 01 42 19 Reference Standards.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. It is the Contractor's responsibility to determine the cause of the mortar deterioration and ensure that it is corrected before the masonry is repointed. This includes a visual examination of the Mortar and Masonry Units as described more fully in "*The Russack System for Brick & Mortar Description*". Contractor shall submit his findings in writing to the COR of this visual examination as part of the Submittal Requirements.
- C. Contractor shall obtain a Mortar Analysis performed by a qualified laboratory to determine the sand gradation, shape, and color.
- D. Certificates: Testing laboratory's facilities and qualifications of its technical personnel.
- E. Indicating that following items meet specifications:
 - a. Portland cement.
 - b. Masonry cement.
 - c. Mortar cement.
 - d. Natural Hydraulic lime.
 - e. Fine aggregate (sand).
 - f. Color admixture.
- F. Laboratory Test Reports:
 - 1. Mortar, each type.
 - 2. Admixtures.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver masonry materials in original sealed containers marked with name of manufacturer and identification of contents.
- B. Store masonry materials under waterproof covers on planking clear of ground, and protect damage from handling, dirt, stain, water and wind.
- C. Lime and cement must be protected from rainwater and ground moisture, as water vapor in the air can begin the setting process.

1.5 WARRANTY

- A. Warranty exterior Brick Masonry walls against moisture leaks, any defects and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be five (5) years.

1.6 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - C40-16.....Organic Impurities in Fine Aggregates for Concrete
 - C91-12.....Standard Specification for Masonry Cement
 - C109-16.....Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-MM Cube Specimens)
 - C141-14.....Standard Specification for Hydrated Hydraulic Lime for Structural Purposes
 - C144-11.....Standard Specification for Aggregate for Masonry Mortar
 - C150-17.....Standard Specification for Portland Cement
 - C207-06(2011).....Hydrated Lime for Masonry Purposes
 - C270-14.....Standard Specification for Mortar for Unit Masonry
 - C595-17.....Standard Specification for Blended Hydraulic Cements
 - C780-17.....Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
 - C979-10.....Pigments for Integrally Colored Concrete
 - C1329-16.....Standard Specification for Mortar Cement
 - C1586-11.....Standard Guide for Quality Assurance of Mortars

1.7 QUALITY ASSURANCE

- A. The Manufacturer:

1. Must have five (5) years minimum continuous operating experience and have facilities for manufacturing Bricks as described herein. Manufacturer shall have sufficient plant facilities to produce the shapes, quantities and size of Bricks required in accordance with the project schedule.
 2. Must be a member of the Brick Industry Association.
 3. Manufacturer shall submit a written list of projects similar in nature that was completed no longer than two (2) years ago. Submit contact information for owner, architect and contractor references.
- B. Contractor must have a minimum of 5 years' experience as a Brick Mason.

1.8 MOCK-UP

- A. Provide full size unit(s) for use in construction of sample wall. The mock-up becomes the standard of workmanship for the project.

PART 2 - PRODUCTS

2.1 HYDRAULIC LIME

- A. Pure and natural hydraulic lime. Shall confirm to ASTM C141, Type S, high plasticity, Hydrated Lime for Masonry Purposes.

2.2 PORTLAND CEMENT

- A. ASTM C150, Type I.
- B. Use white Portland cement wherever it is needed to match existing.

2.3 SAND

- A. Free of impurities and conforming to ASTM C144.
- B. Sand color, size, and texture should match the original as closely as possible. Provide a sample of the sand for comparison to the original, and have it approved by COR before finalizing the Mortar Mix.
- C. When possible, use bar sand or beach sand rather than crushed sand for the repointing mortar. Bar sand or beach sand should be washed to remove the salts before using.

2.4 WATER

- A. Potable, free of substances that are detrimental to mortar, masonry, and metal.
- B. Additives: NO antifreeze compounds or other admixture shall be used.

2.5 COLOR ADMIXTURE

- A. Pigments: ASTM C979.
- B. Use mineral pigments only. Organic pigments are not acceptable.
- C. Pigments inert, stable to atmospheric conditions, nonfading, alkali resistant and water insoluble.

PART 3 - EXECUTION**3.1 RESTORATION, GENERAL**

- A. The nature and extent of the Maintenance and Repair to Brick Masonry elements must be well understood before proceeding with the work.
- B. It is the Contractor's responsibility to determine the cause of the mortar deterioration and ensure that it is corrected before the masonry is repointed. This includes a visual examination of the Mortar and Masonry Units as described more fully in "The Russack System for Brick & Mortar Description". Contractor shall submit his findings in writing to the COR of this visual examination as part of the Submittal Requirements.
- B. Contractor shall be knowledgeable of all State and Local environmental regulations that may restrict the options for cleaning methods, as well as the disposal of materials.
- C. Cleaning and restoration techniques are potentially dangerous and shall be carried out only by experienced and qualified workers using proper eye protection, protective clothing, and other workplace safety conditions.
- D. Preliminary research is necessary to ensure that the proposed repointing work is both physically and visually appropriate to the building.
- E. Contractor shall obtain a Mortar Analysis performed by a qualified laboratory to determine the sand gradation, shape, and color.
- F. Contractor shall in creating a repointing mortar that is compatible with the masonry units, the objective is to achieve one that matches the historic mortar as closely as possible.
- G. Contractor shall provide Test Panels on the work area using the same techniques that will be used on the remainder of the project. Usually a 3-foot by 3-foot area is sufficient for brickwork Test Panel.
- H. Modern materials specified for use in repointing mortar should conform to specifications of the American Society for Testing and Materials (ASTM) or comparable federal specifications, and the resulting mortar should conform to ASTM C 270, Mortar for Unit Masonry.
- I. The masonry units should also be examined so that any replacement units will match the historic masonry. Replacement units should blend in with the full range of masonry units rather than a single brick or stone. When

selecting new brick to match appearance of existing brick, use mock-ups or sample panels.

- J. Use solutions specifically manufactured to remove efflorescence from brickwork. Improper cleaning procedures such as insufficient prewetting, insufficient rinsing and strong chemical concentrations may cause additional staining, etched mortar joints and increase moisture penetration in brickwork.
- K. All cleaning procedures should first be identified and submitted to the COR. Once approved, the Contractor shall test at different concentrations in an inconspicuous area to judge their effectiveness and potential harm to the brickwork prior to implementing at full scale.

3.2 JOINT EXAMINATION & PREPARATION

- A. Examine all existing exterior mortar joints. If the answer to any of the following questions is yes, then the joints are deteriorated and need repointing:
 - 1. Are mortar joints eroded back more than 1/4" from the masonry face?
 - 2. Are there cracks running vertically or horizontally through the mortar?
 - 3. Are mortar bonds broken or pulled away from the masonry?
 - 4. Has mortar fallen out of joints?
 - 5. Is mortar excessively soft, powdery or crumbling?
 - 6. Is pointing badly-stained?
- B. Old mortar should be removed to a minimum depth of 2- 1/2 times the width of the joint to ensure an adequate bond and to prevent mortar "pop-outs". Any loose or disintegrated mortar beyond this minimum depth also should be removed.
- C. The traditional manner of removing old mortar with the use of hand chisels and mash hammers shall be used. This method poses the least threat for damage to the historic masonry units and produces the best final product.
- D. Small pneumatically-powered chisels generally can be used safely and effectively to remove mortar on historic buildings if the masons maintain appropriate control over the equipment. Contractor shall seek the approval of the COR prior to the use of such tools.
- E. Mortar should be removed cleanly from the masonry units, leaving square corners at the back of the cut.
- F. Before filling, the joints should be rinsed with a jet of water to remove all loose particles and dust. At the time of filling, the joints should be damp, but with no standing water present.

3.3 MORTAR

- A. To avoid irreparable brick damage, the compressive strength of the repointing mortar must be equal to or lower than the compressive strength of the original mortar. It should be emphasized that using a mortar with higher compressive strength may significantly impair the surrounding brickwork. The new Mortar shall conform to the following criteria:
1. The new mortar must match the historic mortar in color, size, texture and tooling method.
 2. The sand must match the sand in the historic mortar.
 3. The new mortar must have greater vapor permeability and be softer (measured in compressive strength) than the masonry units.
 4. The new mortar must be as vapor permeable and as soft or softer (measured in compressive strength) than the historic mortar.
- B. Stresses within a wall caused by expansion, contraction, moisture migration, or settlement must be accommodated in some manner; in a masonry wall these stresses should be relieved by the mortar rather than by the masonry units.
- C. Historically, mortar acted as a bedding material-not unlike an expansion joint-rather than a "glue" for the masonry units, and moisture can migrate through the mortar joints rather than the masonry units.
- D. If the mortar does not permit moisture or moisture vapor to migrate out of the wall and evaporate, the result will be damage to the masonry units.
- E. Sand is the largest component of mortar and the material that gives mortar its distinctive color, texture and cohesiveness. Sand must be free of impurities, such as salts or clay.
- F. The use of hard Portland cement mortar that is less permeable than the soft bricks shall not be used.
- G. For repointing mortar, rounded or natural sand is preferred for two reasons. It is usually similar to the sand in the historic mortar and provides a better visual match. It also has better working qualities or plasticity and can thus be forced into the joint more easily, forming a good contact with the remaining historic mortar and the surface of the adjacent masonry units.
- H. Since neither historic nor modern sands are always in compliance with ASTM C 144, matching the same particle appearance and gradation usually requires sieving the sand. Contractor shall provide to the COR such sieve analysis by a certified laboratory.
- I. For repointing, sand generally should conform to ASTM C 144 to assure proper gradation and freedom from impurities; some variation may be necessary to match the original size and gradation. Sand color and texture

also should match the original as closely as possible to provide the proper color match without other additives.

- J. For repointing, lime should conform to ASTM C 207, Type S, or Type SA, Hydrated Lime for Masonry Purposes.
- K. For repointing, Portland cement should conform to ASTM C 150. White, non-staining Portland cement may provide a better color match for some historic mortars than the more commonly available grey Portland cement.
- L. The Portland cement should not have more than 0.60 per cent alkali to help avoid efflorescence.
- M. Masonry cement that is a preblended mortar mix commonly found at hardware and home repair stores **SHALL NOT BE USED.**

3.4 MIXING

- A. Unless specified otherwise, measurements or proportions for mortar mixes are always given in the following order: cement-lime-sand. Thus, a Type K mix, for example, would be referred to as 1-3-10, or 1 part cement to 3 parts lime to 10 parts sand. If mixed with higher amounts of Portland cement, a harder mortar is obtained. The more lime that is added, the softer and more plastic the mortar becomes, increasing its workability.
NOTE: in a wall constructed of soft bricks where the masonry unit itself has a relatively high permeability or vapor transmission rate, a soft, high lime mortar is likely necessary to retain sufficient permeability.
- B. Mortar components should be measured and mixed carefully to assure the uniformity of visual and physical characteristics. Mix in a mechanically operated mortar mixer.
- C. Dry ingredients are measured by volume and thoroughly mixed before the addition of any water. Measure ingredients by volume. Measure by use of a container of known capacity. Sand must be added in a damp, loose condition to avoid oversanding.
- D. Water should be potable--clean and free from acids, alkalis, or other dissolved organic materials. Mix water with dry ingredients in sufficient amount to provide a workable mixture which will adhere to vertical surfaces of masonry units.
- E. Mortar should be used within approximately 30 minutes of final mixing, and "re-tempering," or adding more water, shall not be permitted. Discard mortar that has reached its initial set or has not been used within two hours.
- F. Conduct work when temperatures are between 40 and 85 degrees F. Ideally, repointing should be done in shade, away from strong sunlight to slow the drying process, especially during hot weather.

3.5 FILLING THE JOINT

- A. Where existing mortar has been removed to a depth of 1 inch or more, compact the new mortar in several layers.
- B. The back of the entire joint should be filled successively by applying approximately 1/4 inch of mortar, packing it well into the back corners.
- C. As soon as the mortar has reached thumb-print hardness, another 1/4-inch layer of mortar-approximately the same thickness-may be applied.
- D. It is important to allow each layer time to harden before the next layer is applied; most of the mortar shrinkage occurs during the hardening process and layering thus minimizes overall shrinkage.
- E. When the final layer of mortar is thumb-print hard, the joint should be tooled to match the historic joint.
- F. If the old bricks or stones have worn, rounded edges, it is best to recess the final mortar slightly from the face of the masonry. This treatment will help avoid a joint which is visually wider than the actual joint.
- G. After tooling, excess mortar can be removed from the edge of the joint by brushing with a natural bristle or nylon brush. Metal bristle brushes should never be used on historic masonry.
- H. A high lime mortar left to dry out too rapidly can result in chalking, poor adhesion, and poor durability. Periodic wetting of the repointed area after the mortar joints are thumb-print hard and have been finish tooled may significantly accelerate the carbonation process.
- I. Contractor shall ensure that the work is kept moist by misting using a hand sprayer with a fine nozzle or other COR approved method.
- J. Walls should be covered with burlap for the first three days after repointing to keep the walls damp and protects them from direct sunlight.
- K. Further cleaning of the Repointed Masonry is best accomplished with plain water and natural bristle or nylon brushes. Chemical cleaners, particularly acids, should never be used on dry masonry.
- L. Several precautions should be taken if a freshly repointed masonry wall is to be cleaned. First, the mortar should be fully hardened before cleaning. Thirty days is usually sufficient.
- M. On newly repointed masonry walls, only low pressure (80 psi) water washing supplemented by stiff natural bristle or nylon brushes should be used.
- N. Hydrochloric (muriatic) acid, is generally ineffective, and it should not be used to remove efflorescence. It may liberate additional salts, which, in turn, can lead to more efflorescence.

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SECTION 04 72 10
HISTORIC CAST STONE MAINTENABCE & REPAIR

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section provides general guidance on approaches to the preservation and restoration of historic Cast Stone found on a National Cemetery.

1.2 RELATED WORK

- A. Section 01 00 02 General Requirements.
- B. Section 01 33 23 Shop Drawings, Product Data, and Samples.
- C. Section 01 42 19 Reference Standards.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples:
 - 1. Cast stone, sample panel, 4-inch by 12-inch by 12-inches each color and finish.
 - 2. Show finish on two 4-inch edges and on the 12-inch by 12-inch surface.
- C. Shop Drawings:
 - 1. Cast stone showing exposed faces, profiles, cross sections, anchorage, reinforcing, jointing and sizes.
 - 2. Setting drawings with setting mark.
- D. Certificates: Test results indicating that the cast stone meets specification requirements and proof of plant certification.
- E. Submit manufacturers test results of cast stone previously made by manufacturer.
- F. Laboratory Data: Description of testing laboratories facilities and qualifications of its principals and key personnel.
- G. List of jobs furnished by the manufacturer, which were similar in scope and at least three (3) years of age.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store cast stone under waterproof covers on planking clear of ground.
- B. Protect from handling, dirt, stain, and water damage.
- C. Mark production units with the identification marks as shown on the shop drawings.

- D. Package units and protect them from staining or damage during shipping and storage.
- E. Provide an itemized list of product to support the bill of lading.

1.5 WARRANTY

- A. Warranty exterior masonry walls against moisture leaks, any defects and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be five (5) years.

1.6 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
- B. Cast Stone Institute Technical Manual and Cast Stone Institute standard specifications.
- C. American Concrete Institute (**ACI**):
 - ACI 318-14 Building Code Requirements for Structural Concrete and Commentary
- D. American Society for Testing and Materials (**ASTM**):
 - A167-99(R2009).....Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
 - A185-07.....Steel, Welded Wire Fabric, Plain for Concrete
 - A615/A615M-16.....Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - C33-16.....Concrete Aggregates
 - C97-15.....Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone.
 - C119-16.....Standard Terminology Relating to Dimension Stone
 - C150-17.....Portland Cement
 - C173-16.....Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
 - C426-16.....Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units
 - C503-15.....Marble Dimension Stone (Exterior)
 - C568-15.....Limestone Dimension Stone
 - C615-11.....Granite Dimension Stone

C616-15.....Quartz-Based Dimension Stone
C979-16.....Pigments for Integrally Colored Concrete
C1194-11.....Compressive Strength of Architectural Cast
Stone
C1195-11.....Absorption of Architectural Cast Stone
C1364-17.....Architectural Cast Stone.
D2244-16.....Calculation of Color Differences from
Instrumentally Measured Color Coordinates.

1.7 QUALITY ASSURANCE

- A. The Manufacturer:
 - 1. Must have five (5) years minimum continuous operating experience and have facilities for manufacturing cast stone as described herein. Manufacturer shall have sufficient plant facilities to produce the shapes, quantities and size of cast stone required in accordance with the project schedule.
 - 2. Must be a member of the Cast Stone Institute.
 - 3. Must have a certified plant (certification by the Cast Stone Institute).
- B. Stone setter: Must have 5 years' experience setting cast or natural building stone.
- C. Testing: One (1) sample from production units may be selected at random from the field for each 500 cubic feet delivered to the job:
 - 1. Three (3) field cut cube specimens from each of these sample shall have an average minimum compressive strength of not less than 85% with no single specimen testing less than 75% of design strength as specified.
 - 2. Three (3) field cut cube specimens from each of these samples shall have an average maximum cold-water absorption of 6%.
 - 3. Field specimens shall be tested in accordance with ASTM C 1194 and C 1195.
 - 4. Manufacturer shall submit a written list of projects similar and at least three (3) years of age, along with owner, architect and contractor references.

1.8 MANUFACTURING TOLERANCES

- A. Cross section dimensions shall not deviate by more than + 1/8 in. from approved dimension.

- B. Length of units shall not deviate by more than length /360 or + 1/8 in. whichever is greater, not to exceed + 1/4 in. Maximum length of any unit shall not exceed 15 times the average thickness of such unit unless otherwise agreed by the manufacturer.
- C. Warp bow or twist of units shall not exceed length/360 or + 1/8 in., whichever is greater.
- D. Location of dowel holes, anchor slots, flashing grooves, false joints and similar features - On formed sides of unit, 1/8 in, on unformed sides of unit, 3/8 in maximum deviation.

1.9 MOCK-UP

- A. Provide full size unit(s) for use in construction of sample wall. The mock-up becomes the standard of workmanship for the project.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CAST STONE

- A. Comply with ASTM C 1364
- B. Physical properties: Provide the following:
 - 1. Compressive Strength - ASTM C 1194: 6,500 psi minimum for products at 28 days.
 - 2. Absorption - ASTM C 1195: 6% maximum by the cold-water method, or 10% maximum by the boiling method for products as 28 days.
 - 3. Air Content - ASTM C173 or C231, for wet cast product shall be 4-8% for units exposed to freeze-thaw environments. Air entrainment is not required for vibrant dry tamp (VDT) products.
 - 4. Freeze thaw - ASTM C 1364: The cumulative percent weight loss (CPWL) shall be less than 5% after 300 cycles of freezing and thawing.
 - 5. Linear Shrinkage - ASTM C 426: Shrinkage shall not exceed 0.065%.
- C. Job site testing - One (1) sample from production units may be selected at random from the field for each 500 cubic feet delivered to the job site:
 - 1. Three (3) field cut cube specimens from each of these samples shall have an average minimum compressive strength of not less than 85% with no single specimen testing less than 75% of design strength as allowed by ACI 318.
 - 2. Three (3) field cut cube specimens from each of these samples shall have an average maximum cold-water absorption of 6%.

3. Field specimens shall be tested in accordance with ASTM C 1194 and C 1195.

2.2 RAW MATERIALS

- A. Portland cement - Type I or Type III, white and/or grey, ASTM C 150.
- B. Coarse aggregates - Granite, quartz or limestone, ASTM C 33, except for gradation, and are optional for the vibrant dry tamp (VDT) casting method.
- C. Fine aggregates - Manufactured or natural sands, ASTM C 33, except for gradation.
- D. Colors - Inorganic iron oxide pigments, ASTM C 979 except that carbon black pigments shall not be used.
- E. Admixtures- Comply with the following:
 1. ASTM C 260 for air-entraining admixtures.
 2. ASTM C 494/C 495 M Types A-G for water reducing, retarding, accelerating and high range admixtures.
 3. Other admixtures: integral water repellents and other chemicals, for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.
 4. ASTM C 618 mineral admixtures of dark and variable colors shall not be used in surfaces intended to be exposed to view.
 5. ASTM C 989 granulated blast furnace slag may be used to improve physical properties. Tests are required to verify these features.
- F. Water - Potable
- G. Reinforcing bars:
 1. ASTM A 615/A 615M. Grade 40 or 60 steel galvanized or epoxy coated when cover is less than 1.5 in. (37 mm).
 2. Welded Wire Fabric: ASTM A 185 where applicable for wet cast units.
- H. All anchors, dowels and other anchoring devices and shims shall be standard building stone anchors commercially available in a non-corrosive material such as zinc plated, galvanized steel, brass, or stainless steel Type 302 or 304.

2.3 COLOR AND FINISH

- A. Match existing Cast Stone being repaired.
- B. All surfaces intended to be exposed to view shall have a fine-grained texture similar to natural stone, with no air voids in excess of 1/32 in. (0.8 mm) and the density of such voids shall be less than 3 occurrences

per any 1 in² and not obvious under direct daylight illumination at a 5-ft. distance.

- C. Units shall exhibit a texture approximately equal to the approved sample when viewed under direct daylight illumination at a 10-ft. distance.
- D. ASTM D 2244 permissible variation in color between units of comparable age subjected to similar weathering exposure.
 - 1. Total color difference - not greater than 6 units.
 - 2. Total hue difference-not greater than 2 units.

2.4 REINFORCING

- A. Reinforce the units as required by the drawings and for safe handling and structural stress.
- B. Minimum reinforcing shall be 0.25 percent of the cross-section area.
- C. Reinforcement shall be non-corrosive where faces exposed to weather are covered with less than 1.5in. (38 mm) of concrete material. All reinforcement shall have minimum coverage of twice the diameter of the bars.
- D. Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be obvious under direct daylight illumination from a 20-ft (6m) distance.
- E. The occurrence of crazing or efflorescence shall not constitute a cause for rejection.
- F. Remove cement film, if required, from exposed surface prior to packaging for shipment.

2.5 CURING

- A. Cure units in a warm curing chamber 100 F at 95 percent relative humidity for approximately 12-hours, or cure in a 95 percent moist environment at a minimum 70F for 16 hours after casting.
- B. Additional yard curing at 95 percent relative humidity shall be 350-degree-days (i.e. 7 days @ 50F or 5 days @ 70F prior to shipping. Form cured units shall be protected from moisture evaporation with curing blankets or curing compounds after casting.

PART 3 - EXECUTION**3.1 RESTORATION, GENERAL**

- A. The nature and extent of the Maintenance and Repair to the Cast Stone elements must be well understood before proceeding with the work.
- B. Contractor shall be knowledgeable of all State and Local environmental regulations that may restrict the options for cleaning and paint removal methods, as well as the disposal of materials.
- C. Cleaning and restoration techniques are potentially dangerous and shall be carried out only by experienced and qualified workers using proper eye protection, protective clothing, and other workplace safety conditions.
- D. Installing contractor shall check cast stone materials for fit and finish prior to installation. Do not set unacceptable units.

3.2 MAINTENANCE OF CAST STONE INSTALLATIONS

- A. Cast stone installations with marble or limestone aggregates may sometimes be cleaned with the same alkaline pre-wash/ acid after-wash chemical cleaning systems used to clean limestone and marble.
- B. If no marble or limestone aggregates are present, acidic cleaners, such as those used for natural granites and sandstones, may be used.
- C. Some micro-abrasive cleaning techniques used under very controlled circumstances by skilled cleaning personnel can be appropriate for removing tenacious soiling.
- D. Contractor shall submit to the COR such cleaning technique for approval. Once approved, the Contractor shall test the cleaning technique on a small patch and notify the COR for inspection and approval to continue with such technique on the remainder of the Cast Stone cleaning work.
- E. When unusual stains are encountered, the same procedures, which are recommended to clean concrete, will normally clean Cast Stone. The Portland Cement Association publishes a guide for the removal of stains in concrete.
- F. Ordinary sand blasting or wet grit blasting can seriously damage the surface of the cast stone and should not be used.
- G. Metal fiber brushes, rubbing stones and any tool or device that can scar the cast stone shall not be used for cleaning cast stone.
- H. For the best result, follow the manufacturer's recommendations for using their product. Rinse thoroughly all applied cleaners to the Cast Stone to prevent damage or corrosion.

- I. Small "composite " repairs to damaged masonry units can be made with mortar formulated to visually match the original material, and may be successfully undertaken by a competent and sensitive mason.
- J. For repairs to damaged cast stone to be successful, both the cement matrix color and the aggregate size and coloration must match that of the historic unit.
- K. Trade references and guide specifications should be consulted before contracting for replacement of historic cast stone.

3.3 REPOINTING OF CAST STONE - MORTAR

- A. When repointing any historic masonry, it is important to match both the character and color of the sand and color of the cement matrix in the historic mortar.
- B. Joints in historic cast stone installations can be quite thin and the dense mortar thus difficult to remove. Unnecessary repointing can cause significant damage to historic cast stone.
- C. When a hard and tenacious mortar was used in the original installation or a later repointing, the removal of the mortar can easily chip the edges of the cast stone units.
- D. Care must be taken to prevent damage when removing mortar. Hand tools shall be used exclusively for this Project to prevent over cutting of joints and chipping the edges of the Cast Stone.
- E. Mortars used in the setting of Cast Stone should meet the requirements of ASTM C270 and the work shall be in conformance with Bulletin #42 - "Mortars" published by the Cast Stone Institute.
- F. Pointing is usually done in 1 or 2 stages to allow maximum sealing of shrinkage cracking in the mortar. It should not be done in areas exposed to hot sunshine and it is suggested that pointing be accomplished after touch and repair of cast stone and before final wash-down.
- G. Pointing mortar should be softer than the stone so that thermal stress will not cause spalling at the edges of the joints.
- H. Colors added must be natural or synthetic mineral oxides which meet the requirements of ASTM C979 (sun-fast, lime-proof, alkali-resistant) and the dosage must not exceed 10% of the weight of the cement used.
- I. Contractor shall conduct work in general conformance with Bulletin # 44 - "Pointing of Joints" published by the Cast Stone Institute.

3.4 JOINTING

- A. Joint size:
 - 1. Same as existing joint for Maintenance and Repair work.
 - 2. For new Cast Stone work, stone/stone joints 1/8 in. (3 mm).
- B. Joint Materials:
 - 1. Contractor to perform and submit to the COR a Mortar Analysis of the existing Mortar used in the Cast Stone.
 - 2. Mortar Type shall conform to ASTM C 270.
 - 3. Use a full bed of mortar at all bed joints.
 - 4. Flush vertical joints full with mortar.
- C. Location of joints:
 - 1. As shown on shop drawings and or to match existing locations.

3.5 SETTING OF NEW CAST STONE

- A. Drench units with clean water prior to setting.
- B. Fill dowel holes and anchor slots completely with mortar or grout.
- C. Set units in full bed of mortar, unless otherwise detailed.
- D. Rake mortar joints for pointing.
- E. Remove excess mortar from unit faces immediately after setting.
- F. Tuck point unit joints to match existing joint profile.

3.6 SETTING TOLERANCES

- A. Comply with Cast Stone Institute SM Technical Manual.
- B. Set stones 1/16 in. (1.5 mm) or less, within the plane of adjacent units.
- C. Joints, 1/16 in. (1.5 mm).

3.7 INSPECTION AND ACCEPTANCE

- A. Inspection and acceptance of cast stone prior to installation shall conform to requirements outlined in Bulletin #36 published by the Cast Stone Institute.
- B. The on-site COR should be familiar with the project's contract documents, as well as the applicable reference standards. Test reports showing compliance with ASTM C1364, as well as the range of approved sample, should be on file.

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SECTION 05 01 70
HISTORIC METALS MAINTENANCE & REPAIR

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section provides general guidance on approaches to the preservation and restoration of historic cast and wrought iron Decorative Metal stairs, posts, and rails found on a National Cemetery.

1.2 RELATED WORK

- A. Section 01 00 02 General Requirements
- B. Section 01 33 23 Shop Drawings, Product Data, and Samples
- C. Section 01 42 19 Reference Standards
- D. Section 09 91 10 Painting of Metals

1.3 APPLICABLE STANDARDS

- A. "The Maintenance and Repairs of Architectural Cast Iron", U.S. Department of Interior National Park Service Cultural Resources - Preservation Assistance Preservation Brief No. 27.
- B. ASTM A 370-14: Standard Test Methods and Definitions for Mechanical Testing of Steel Products, American Society of Testing Materials.
- C. National Association of Architectural Metal Manufacturers (NAAMM): AMP 500-06-2006 Metal Finishes Manual.
- D. American Welding Society (AWS) D11.2:1989(R2006) "GUIDE FOR WELDING IRON CASTINGS (HISTORICAL)".

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.
- B. Shop Drawings:
 - 1. Indicate each item specified, showing complete detail, location in the project, material and size of components, method of joining various components and assemblies.
 - 2. Mark items requiring field assembly for erection identification and furnish erection drawings and instructions.
 - 3. Provide templates and rough-in measurements as required.
- C. When indicated in Section 01 00 02 "General Requirements", Submit "Condition Assessment" and "Design Calculations" for specified live loads

including dead loads prepared by professional engineer licensed in the state of the Project.

1.5 QUALITY ASSURANCE

- A. Before establishing the appropriate treatment for cast-iron elements in a building or structure, an evaluation (Condition Assessment) shall be made of the property's historical and architectural significance and alterations, along with its present condition.
- B. If the work involves more than routine maintenance, a qualified professional should be engaged to develop a historic structure report which sets forth the historical development of the property, documents its existing condition, identifies problems of repair, and provides a detailed listing of recommended work items with priorities.
- C. To thoroughly assess the condition of the ironwork, a close physical inspection must be undertaken of every section of the iron construction including bolts, fasteners, and brackets.
- D. Removal of select areas of paint may be the only means to determine the exact condition of connections, metal fasteners, and intersections or crevices that might trap water.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Primer and Paintings of Metals: As specified in Section 09 91 10, PAINTING OF METALS.

2.2 HARDWARE

- A. Hardware: Use G90 galvanized coating on ferrous metal for exterior work.
- B. Anchor Bolts: ASTM A307; same material, color, and finish as the metal to which applied when exposed.

2.3 FABRICATION

- A. General: The Contractor shall fabricate in accordance with all outlined Standards and Historical Requirements.

PART 3 - EXECUTION

3.1 RESTORATION, GENERAL

- A. The nature and extent of the problems with the cast-iron / wrought iron elements must be well understood before proceeding with the work.

- B. Contractor shall be knowledgeable of all State and Local environmental regulations that may restrict the options for cleaning and paint removal methods, as well as the disposal of materials.
- C. Cleaning and restoration techniques are potentially dangerous and shall be carried out only by experienced and qualified workers using proper eye protection, protective clothing, and other workplace safety conditions.
- D. Field weld in accordance with American Welding Society (AWS) D11.2:1989(R2006) "GUIDE FOR WELDING IRON CASTINGS (HISTORICAL)".

3.2 CLEANING AND PAINT REMOVAL

- A. When there is extensive failure of the protective coating and / or when heavy corrosion exists, the rust and all the paint must be removed to prepare the surfaces for new protective coatings.
- B. The selection of an appropriate technique depends upon how much paint failure and corrosion has occurred, the fineness of the surface detailing, and the type of new protective coating to be applied.
- C. Before selecting a cleaning process, test panels should be prepared on the iron to be cleaned to determine the relative effectiveness of various techniques.
- D. The following techniques shall be considered in the removal of paint and corrosion from the cast iron / wrought iron metal:
 - 1. Hand scraping, chipping, and wire brushing shall be carried out by only experienced craftsmen.
 - 2. Low-pressure grit blasting can be considered along as dry sand material is used. The use of a very sharp or hard aggregate and / or excessively high pressure (over 100 pounds per square inch) shall be avoided. Adjacent materials, such as brick and stone must be protected to prevent damage.
- E. The following techniques are not allowed in the removal of paint and corrosion from the cast iron / wrought iron metal for this Project:
 - 1. Wet Sandblasting
 - 2. Flame Cleaning
 - 3. Chemical Removal
 - 4. Any Other Method without approval from the COR.

3.3 PAINTING AND COATING SYSTEMS

- A. Thorough surface preparation is necessary for the adhesion of new protective coatings. All loose, flaking, and deteriorated paint must be

removed from the iron, as well as dirt and mud, water-soluble salts, oil, and grease.

- B. For the paint to adhere properly, the metal surfaces must be dry before painting. Paint should not be applied when there is fog, mist, or rain in the air.
- C. Painting shall not take place when the temperature is expected to fall below 50 degrees Fahrenheit within 24 hours or when the relative humidity is above 80 per cent.
- D. Oil based Alkyd rust inhibitive primers shall be used with a minimum of two coats applied to all exposed metal surfaces. Lead based paints and Latex water based paints are not allowed as primer.
- E. Apply minimum of two (2) coats of an Oil based Alkyd Enamel base coat followed by minimum of two (2) coats of a polyurethane enamel finish once the primer has been applied.
- F. The Contractor shall paint with a Historic flat black color paint unless instructed otherwise by Historic Preservation requirements.
- G. All primers, base coats, and finishes shall be applied by brushing. The use of rollers and spray guns is not allowed.

3.4 MECHANICAL REPAIRS

- A. Major cracks can be repaired by brazing or welding with special nickel-alloy welding rods. Brazing or welding of cast iron is very difficult to carry out in the field and should be undertaken only by very experienced welders.
- B. Cast-iron structural elements that have failed must either be reinforced with iron and steel or replaced entirely.
- C. Screws with stripped threads and seriously rusted bolts must be replaced. To compensate for corroded metal around the bolt or screw holes, new stainless steel bolts or screws with a larger diameter need to be used. In extreme cases, new holes may need to be tapped.
- D. Where cast-iron elements have been previously filled with concrete, they need to be taken apart, the concrete and rust removed, and the interior surfaces primed and painted before the elements are reassembled.
- E. Contractor shall replace all cast-iron components outlined in the submitted Condition Assessment. The replacement of cast-iron components is often the only practical solution when such features are missing, severely corroded, or damaged beyond repair, or where repairs would be

only marginally useful in extending the functional life of an iron element.

- F. If it is necessary to dismantle all or part of a cast iron structure during restoration, or if repairs cannot be successfully carried out in place. The Contractor shall dismantle only under the direction of a preservation architect or architectural conservator who is experienced with historic cast iron.
- G. Dismantling should follow the reverse order of construction and re-erection should occur, as much as possible, in the exact order of original assembly. Each piece should be numbered and keyed to record drawings.
- H. Both new castings and reused pieces should be painted with a shop-applied prime coat on all surfaces. All the components should be laid out and preassembled to make sure that the alignment and fit are proper. Many of the original bolts, nuts, and screws may have to be replaced with similar fasteners of stainless steel.
- I. After assembly at the site, joints that were historically caulked should be filled with an architectural-grade polyurethane sealant or the traditional white lead paste.
- J. Every means of repairing deteriorating historic materials or replacing them with identical materials should be examined before turning to substitute materials. Substitute Materials would need to be recommended in the provided Condition Assessment and approved by the COR.

3.5 CALKING AND PATCHING

- A. It is essential to replace deteriorated caulking to prevent water penetration. For good adhesion and performance, an architectural-grade polyurethane sealant or traditional white lead paste is preferred.
- B. It is important that cracks be made weathertight by using caulks or fillers, depending on the width of the crack.
- C. Filler compounds containing iron particles in an epoxy resin binder can be used to patch superficial, non-structural cracks and small defects in cast iron. Concrete shall not be used.
- D. The internal voids of balusters, newel posts, statuary, and other elements should not be filled with concrete; it is an inappropriate treatment that causes further problems.

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SECTION 08 16 13
FIBERGLASS DOORS

PART 1 - GENERAL

1.1 SUMMARY

This section specifies the furnishing, installation, and finishing of exterior Fiberglass Doors in areas shown on the Drawings or as described in Section 01 00 02 General Requirements.

1.2 RELATED REQUIREMENTS

- A. Section 01 00 02 General Requirements
- B. Section 01 33 23 Shop Drawings, Product Data, and Samples
- C. Section 01 42 19 Reference Standards

1.3 APPLICABLE STANDARDS

- A. NFPA 80 - Standard for Fire Doors and Windows; 1999.
- B. NFPA 252 - Standard Methods of Fire Tests for Door Assemblies; 1995.
- C. ANSI/DHI-A115IG-Installation Guide for Doors and Hardware.
- D. International Building Code, Plastics (Chapter 26)

1.4 QUALITY ASSURANCE

- A. Manufacturer shall be ISO 9001 certified and been engaged in the manufacture of FRP door and frame systems for a minimum of five (5) years documented experience prior to the start of this work.
- B. Installer should be qualified to perform the work in this section and able to provide written certification of work history and qualifications as part of the Submittal Requirement.
- C. All Products are inspected prior to shipment and guaranteed against defective workmanship for a period of ten (10) calendar years after the date of purchase.

1.5 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Field Measurements: Verify field conditions affecting overhead coiling door and grille prior to fabrication and installation. Show field measurements on Submittal Drawings.
- C. Submittal Drawings:
 - 1. Show size, configuration, and fabrication and installation details.
 - 2. Show layout, profiles, product components and anchorages.

3. Specifications relating to FRP door thickness, resin type, core material, method of construction, finish color, type of glass and glazing, anchor systems, joint construction and complete warranty information.
 4. Supporting reference drawings pertaining to frame mounting details, door light or louver installation, hardware locations, and factory hardware cutouts and reinforcements.
- D. Manufacturer's Literature and Data:
1. Provide catalog cut of FRP door detailing internal construction and reinforcements, materials used and description of molding process.
 2. Installation Instructions: Provide manufacturer's printed installation instructions.
 3. Certificates: Indicate each product complies with specifications.
 4. Provide Samples that are 18 by 24 inches cut away door samples.
 5. Provide a complete set of available finish colors from the manufacturer for color selection by COR.
 6. Care instructions for each exposed finish product.
- E. Production of FRP doors and frames shall not proceed until final approval of submittals and all necessary manufacturing information is received from customer.

1.6 DELIVERY

- A. Comply with manufacturer's ordering and lead time procedures to ensure timely delivery to avoid construction delays.
- B. Deliver products in manufacturer's original sealed packaging.
- C. Upon receipt of shipment, remove and inspect the doors and frames for damage. Note any damage on the shipping papers prior to accepting. If there is any noted damage, notify Manufacturer immediately.
- D. Return products that are distorted and damaged.

1.7 STORAGE AND HANDLING

- A. Handling and storage of the doors and frames after receipt is the responsibility/liability of the Contractor.
- B. Store Door Products indoors in dry, weathertight environment.
- C. Use care in handling FRP doors and frames to prevent damage to factory finishes.
- D. Wear protective gloves and do not slide or drag doors or frames against one another.

1.8 WARRANTY

- A. Manufacturer's Warranty: All Doors shall be guaranteed against defective workmanship for a period of ten (10) calendar years after the date of purchase.

PART 2 - PRODUCTS**2.1 DOOR CONSTRUCTION GENERAL**

- A. All doors shall be custom and individually manufactured by a manufacturer that has been in business for a minimum of five (5) years.
- B. The panels shall be laminated, using a high-performance adhesive to thermally broken, stiles and rails forming a perimeter to reduce transmission and allow for field preparation of hardware.
- C. The bottom edge shall be manufactured from a moisture-resistant and decay-resistant composite.
- D. FRP is defined as "Fiberglass Reinforced Polyester".

2.2 FBR DOORS

- A. FRP doors shall be of seamless press-molded construction. Laminated FRP face sheets shall be applied while wet and uncured to an internal door stile and rail sub-frame /core assembly and then press-molded under heat and pressure.
- B. The composite door panel must be integrally fused over its entire surface area, not just adhesive-bonded at perimeter stiles and rails. Doors shall remain under pressure during curing for flat, warp-free surfaces.
- C. A high-modulus pultruded FRP square or rectangular tube sub-frame is to be provided within the door. Tubes are to be mitered and joined internally at the corners with solid polymer blocks to yield a one-piece unit that does not require any secondary external sealing.
- D. Provide a tubular mid-rail across width of door at lock height, and additional horizontal rails where specific design conditions dictate.
- E. Doors shall incorporate molded-in FRP edge strips, chemically bonded to the sub-frame stiles, for machining of hardware mortises so as not to cut or otherwise compromise the integrity of the pultruded stiles, nor allow moisture to penetrate the core of the door.
- F. All connections shall be chemically welded. No mechanical fasteners will be allowed. The use or inclusion of aluminum, steel, gypsum or wood into stile and rail construction is not permitted.

- G. Door facings shall utilize a chemical resistant thermosetting polyester resin system with fiber reinforcing layers. Supplier shall furnish door faces as shown on the drawings and in the door elevations.
- H. Chopped strand mat layers shall be used to provide bond integrity between gelcoat, laminated facings and the internal door structure.
- I. Structural reinforcement shall be in the form of a knitted multi-layer material with layers of uni-directional glass fiber oriented in both the vertical and horizontal directions for high stiffness, impact resistance and resistance to warping.
- J. The exposed FRP door faces shall have a 3-4 mils (wet) factory applied two-part aliphatic polyurethane fully cured coating of industrial urethane. Coating shall have a minimum hardness of H to 2H. Finish shall be a slightly textured semi-gloss to minimize the visual effects of wear and tear.

2.3 FBR FRAMES

- A. Design: FRP Door frames furnished under this specification shall utilize a high-modulus pultruded structural FRP shape. The frame section shall be standard double rabbeted 5-3/4" deep x 2" face, 3/16" thick, with integral 5/8" doorstop with 1 15/16" soffits, to match typical hollow metal configurations.
- B. Corner Joints: Frame jambs and header shall be joined at corners via miter connections with hidden FRP angle clips and associated fasteners. Post and beam corners will not be acceptable. Exposed fasteners for miter connections will not be acceptable except for wrap wall applications.
- C. Hardware Reinforcements: FRP reinforcing shall be chemically welded to door frame material at required locations. Minimum screw pullout strength of 1100 lb. per #12 x 1" sheet metal screw is required. Mechanically fastened reinforcements are not permitted.
- D. BOLT-IN ANCHORS: Provide manufacturer's required number of 3/8" diameter x 4" long flat head stainless steel sleeve anchors for masonry openings, 3/8" diameter x 4" machine screw with nut and washers for structural steel openings, #14 x 4" stainless steel flat head sheet metal screws for wood or steel stud openings. Include extra anchors for additional frame height in two foot increments above 8'-0". Provide single bolt anchor at center of all headers over four feet in nominal width. Stainless Steel fasteners shall be furnished by the factory.

- E. GROUT-IN ANCHORS: Provide manufacturer's required number of wire or strap type masonry anchors for installation into block wall. Fill frame cavity with grout.
- F. Finish: Frames shall have a 3-4 mils (wet) factory applied two-part aliphatic polyurethane fully cured coating of industrial urethane. Industrial urethane chemical coating color topcoat, to match the color and sheen of the doors, for superior weatherability. Gelcoat may not be sprayed onto the frame as a secondary coating.

2.4 HARDWARE & FASTENERS

- A. All fasteners for all hardware shall be type 304 CRSS (18-8 series corrosion resistant stainless steel) or Brass. No carbon steel or aluminum components shall be used.
- B. Doors shall be factory mortised and drilled for mortise template butt hinges, with #12 x 2" long stainless steel or Brass screws pre-installed for hinge attachment. Provide 161 cylindrical lock bore, rim deadbolt, ANSI 86 mortise lock edge prep and pocket, or flush bolt cutouts as required.
- C. Frames shall be factory machined and drilled for all hardware requiring mortises, with #12 x 1" long stainless steel screws pre-installed for hinge attachment.
- D. Supplier shall furnish manufacturer's standard templates, installation instructions, or full size approved door and frame preparation instructions as approved by the architect and as required by door and frame manufacturer prior to door and frame factory initiated manufacture.

PART 3 - EXECUTION

3.1 IDENTIFICATION

- A. Factory mark all doors and frames using a chemical resistant plastic tag or indelible marker with identifying number, keyed to shop drawings, prior to shipment.

3.2 INSTALLATION - GENERAL

- A. Frames: Install in strict accordance with manufacturer's printed instructions. Set plumb and square, using shims for bolt-in of existing openings, or wood bracing prior to grouting of jambs. Use at least two 2x6 wood spreaders inside frame to maintain critical opening dimensions during grouting.

- B. Doors: Hang per manufacturer's printed instructions using special screws provided for hinge attachment. Install doors to swing freely and to stand open at any angle. After installation make final adjustments to hardware to allow for proper door operation and latching. All surface applied hardware shall be thru bolted.

3.3 CLEANING

- A. Clean exposed surfaces of FRP doors and frames with a mild, non-abrasive cleaner and water.

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**SECTION 09 91 05
PAINTING OF EXTERIOR WOOD**

PART 1-GENERAL

1.1 DESCRIPTION

- A. Section specifies the preparation and painting of exterior wood surfaces.
- B. Section specifies prime coats which may be applied in shop under other sections.
- C. Painting includes shellacs, stains, varnishes, and coatings specified.

1.2 RELATED WORK

- A. Section 01 00 02, General Requirements
- B. Section 01 33 23, Shop Drawings, Product Data, and Samples
- C. Section 01 35 26, Safety Requirements (Non-Electrical)
- D. Section 01 42 19, Reference Standards

1.3 SUSTAINABILITY REQUIREMENTS (NOT APPLICABLE FOR THIS CONTRACT)

- A. Materials in this section may contribute towards contract compliance with sustainability requirements.
- B. Biobased Material: For products designated by the USDA's BioPreferred® program, provide products that meet or exceed USDA recommendations for biobased content, subject to the products compliance with performance requirements in this Section. For more information regarding the product categories covered by the BioPreferred® program, visit <http://www.biopreferred.gov>.

1.4 REGULATORY REQUIREMENTS FOR RECYCLED CONTENT

- A. Products and Materials with Post-Consumer Content and Recovered Materials Content:
 - 1. Contractor is obligated by contract to satisfy Federal mandates for procurement of products and materials meeting recommendations for post-consumer content and recovered materials content; the list of designated product categories with recommendations has been compiled by the EPA - refer to <http://www.epa.gov/wastes/conserves/tools/cpg/products/>.
 - 2. Materials or products specified by this section may be obligated to satisfy this Federal mandate and Comprehensive Procurement Guidelines program.
 - 3. The EPA website also provides tools such as a Product Supplier Directory search engine and product resource guides.

1.5 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, or sample panels are prepared, submit manufacturer's literature, the current Master Painters Institute (MPI) "Approved Product List" indicating brand label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use subsequent MPI "Approved Product List", however, only one list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI "Approved Product List" where applicable is acceptable.
- C. Samples:
 - 1. After painters' materials have been approved and before work is started submit samples showing each type of finish and color specified.
 - 2. Samples to show color: Composition board, 150 by 150 (6 inch by 6 inch).
 - 3. Panel to show transparent finishes: Wood of same species and grain pattern as wood approved for use, 100 by 250 by 3 mm (4 inch by 10 inch face by 1/4 inch) thick minimum, and where both flat and edge grain will be exposed, 250 mm (10 inches) long by sufficient size, 50 by 50 mm (2 by 2 inch) minimum or actual wood member to show complete finish.
- D. 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.
- E. Manufacturer's letter of recommendation:
 - 1. Provide a letter addressed to the National Cemetery Administration from the manufacturer of the paint/coating, detailing their understanding of the substrate to be painted, preparations required

before painting, the application, and the national shrine aesthetically-pleasing appearance expected of the finished product. This letter shall be signed by a "Paint Specialist" or other approved equal or greater qualifications.

1.6 DELIVERY AND STORAGE

- A. Deliver materials to site in manufacturer's sealed container marked to show following:
 - 1. Name of manufacturer.
 - 2. Product type.
 - 3. Batch number.
 - 4. Instructions for use.
 - 5. Safety precautions.
- B. In addition to manufacturer's label, provide a label legibly printed as following:
 - 1. Federal Specification Number, where applicable, and name of material.
 - 2. Surface upon which material is to be applied.
 - 3. If paint or other coating, state coat types; prime, body or finish.
- C. Maintain space for storage, and handling of painting materials and equipment in a neat and orderly condition to prevent spontaneous combustion from occurring or igniting adjacent items.
- D. Store materials at site at least 24 hours before using, at a temperature between 18 and 30 degrees C (65 and 85 degrees F).

1.7 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
- B. Master Painters Institute (MPI):

No. 4-13	Interior/ Exterior Latex Block Filler
No. 5-13	Exterior Alkyd Wood Primer
No. 7-13	Exterior Oil Wood Primer
No. 8-13	Exterior Alkyd, Flat MPI Gloss Level 1 (EO)
No. 9-13	Exterior Alkyd Enamel MPI Gloss Level 6 (EO)
No. 10-13	Exterior Latex, Flat (AE)
No. 11-13	Exterior Latex, Semi-Gloss (AE)
No. 31-13	Polyurethane, Moisture Cured, Clear Gloss (PV)
No. 36-13	Knot Sealer

No. 68-13	Interior/ Exterior Latex Porch & Floor Paint, Gloss
No. 71-13	Polyurethane, Moisture Cured, Clear, Flat (PV)
No. 94-13	Exterior Alkyd, Semi-Gloss (EO)
No. 95-13	Fast Drying Metal Primer
No. 119-13	Exterior Latex, High Gloss (acrylic) (AE)
No. 134-13	Primer, Galvanized, Water Based
C. Steel Structures Painting Council (SSPC):	
SSPC SP 1-04	Solvent Cleaning
SSPC SP 2-04	Hand Tool Cleaning
SSPC SP 3-04	Power Tool Cleaning

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Wood Sealer: Thinned with thinner recommended by manufacturer at rate of about one part of thinner to four parts of varnish.
- B. Plastic Tape:
 - 1. Pigmented vinyl plastic film in colors as specified.
 - 2. Pressure sensitive adhesive back.
 - 3. Widths as shown.
- C. Interior/Exterior Latex Block Filler: MPI 4.
- D. Exterior Alkyd Wood Primer: MPI 5.
- E. Exterior Oil Wood Primer: MPI 7.
- F. Exterior Alkyd, Flat (EO): MPI 8.
- G. Exterior Alkyd Enamel (EO): MPI 9.
- H. Exterior Latex, Flat (AE): MPI 10.
- I. Exterior Latex, Semi-Gloss (AE): MPI 11.
- J. Polyurethane, Clear Gloss: MPI 31.
- K. Knot Sealer: MPI 36.
- L. Interior/ Exterior Latex Porch & Floor Paint, Low Gloss: MPI 60.
- M. Interior/ Exterior Latex Porch & Floor Paint, gloss: MPI 68.
- N. Polyurethane, Moisture Cured, Clear, Flat (PV): MPI 71.
- O. Exterior Alkyd, Semi-Gloss (EO): MPI 94.
- P. Fast Drying Metal Primer: MPI 95.
- Q. Exterior Latex, High Gloss (acrylic) (AE): MPI 119.

2.2 PAINT PROPERTIES

- A. Use ready-mixed (including colors), except two component epoxies, polyurethanes, polyesters, paints having metallic powders packaged separately and paints requiring specified additives.

- B. Where no requirements are given in the referenced specifications for primers, use primers with pigment and vehicle, compatible with substrate and finish coats specified.

2.3 REGULATORY REQUIREMENTS

- A. Paint materials must conform to the restrictions of the local Environmental and Toxic Control jurisdiction or the requirements of this section, whichever is most stringent.
1. Lead-Based Paint:
 - a. Lead based paint is not permitted to be used.
 2. Asbestos: Materials must not contain asbestos.
 3. Chromate, Cadmium, Mercury, and Silica: Materials must not contain zinc-chromate, strontium-chromate, Cadmium, mercury or mercury compounds or free crystalline silica.
 4. Human Carcinogens: Materials must not contain any of the ACGIH-BKLT and ACGHI-DOC confirmed or suspected human carcinogens.
 5. Use high performance acrylic paints in place of alkyd paints, where possible.
 6. VOC content for solvent-based paints must not exceed specified performance requirement; aromatic hydro carbons contained in solvent-based paints must not exceed one percent by weight.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

- A. Safety: Observe required safety regulations and manufacturer's warning and instructions for storage, handling and application of painting materials.
1. Take necessary precautions to protect personnel and property from hazards due to falls, injuries, toxic fumes, fire, explosion, or other harm.
 2. Deposit soiled cleaning rags and waste materials in metal containers approved for that purpose. Dispose of such items off the site at end of each 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 Contracting Officer and the product manufacturer.
 2. Do not exceed application conditions recommended by the manufacturer.

3. Maintain interior temperatures until paint dries hard.
4. Do no exterior painting when it is windy and dusty.
5. Do not paint in direct sunlight or on surfaces that the sun will soon warm.
6. Apply only on clean, dry and frost free surfaces except as follows:
 - a. Apply water thinned acrylic and cementitious paints to damp (not wet) surfaces where allowed by manufacturer's printed instructions.
 - b. Dampened with a fine mist of water on hot dry days concrete and masonry surfaces to which water thinned acrylic and cementitious paints are applied to prevent excessive suction and to cool surface.
7. Varnishing:
 - a. Apply in clean areas and in still air.
 - b. Before varnishing vacuum and dust area.
 - c. Immediately before varnishing wipe down surfaces with a tack rag.

3.2 SURFACE PREPARATION

- A. Method of surface preparation is optional, provided results of finish painting produce solid even color and texture specified with no overlays.
- B. General:
 1. Remove prefinished items not to be painted such as lighting fixtures, escutcheon plates, hardware, trim, and similar items for reinstallation after paint is dried.
 2. Remove items for reinstallation and complete painting of such items and adjacent areas when item or adjacent surface is not accessible or finish is different.
 3. See other sections of specifications for specified surface conditions and prime coat.
 4. Clean surfaces for painting with materials and methods compatible with substrate and specified finish. Remove any residue remaining from cleaning agents used. Do not use solvents, acid, or steam on concrete and masonry.
- C. Wood:
 1. Sand to a smooth even surface and then dust off.
 2. Sand surfaces showing raised grain smooth between each coat.
 3. Wipe surface with a tack rag prior to applying finish.
 4. Surface painted with an opaque finish:
 - a. Coat knots, sap and pitch streaks with Knot Sealer before applying paint.
 - b. Apply two coats of Knot Sealer over large knots.

5. After application of prime or first coat of stain, fill cracks, nail and screw holes, depressions and similar defects with wood filler paste. Sand the surface to make smooth and finish flush with adjacent surface.
6. Before applying finish coat, reapply wood filler paste if required, and sand surface to remove surface blemishes. Finish flush with adjacent surfaces.
7. Fill open grained wood such as oak, walnut, ash and mahogany with Wood Filler Paste, colored to match wood color.
 - a. Thin filler in accordance with manufacturer's instructions for application.
 - b. Remove excess filler, wipe as clean as possible, dry, and sand as specified.

3.3 PAINT PREPARATION

- A. Thoroughly mix painting materials to ensure uniformity of color, complete dispersion of pigment and uniform composition.
- B. Do not thin unless necessary for application and when finish paint is used for body and prime coats. Use materials and quantities for thinning as specified in manufacturer's printed instructions.
- C. Remove paint skins, then strain paint through commercial paint strainer to remove lumps and other particles.
- D. Mix two component and two part paint and those requiring additives in such a manner as to uniformly blend as specified in manufacturer's printed instructions unless specified otherwise.
- E. For tinting required to produce exact shades specified, use color pigment recommended by the paint manufacturer.

3.4 APPLICATION

- A. All conduit used on this project is to be shop painted prior to delivery to the project site. Limited touch up in the field will be permitted by the VA. Start of surface preparation or painting will be construed as acceptance of the surface as satisfactory for the application of materials.
- B. Unless otherwise specified, apply paint in three coats; prime, body, and finish. When two coats applied to prime coat are the same, first coat applied over primer is body coat and second coat is finish coat.
- C. Apply each coat evenly and cover substrate completely.

- D. Allow not less than 48 hours between application of succeeding coats, except as allowed by manufacturer's printed instructions, and approved by RE/COR.
- E. Finish surfaces to show solid even color, free from runs, lumps, brush marks, laps, holidays, or other defects.
- F. Apply by brush or roller, except as otherwise specified. No spray painting will be permitted at the project location.
- H. Do not paint in closed position operable items such as access doors and panels, window sashes, overhead doors, and similar items except overhead roll-up doors and shutters.

3.5 PRIME PAINTING

- A. After surface preparation, prime surfaces before application of body and finish coats, except as otherwise specified.
- B. Spot prime and apply body coat to damaged and abraded painted surfaces before applying succeeding coats.
- C. Additional field applied prime coats over shop or factory applied prime coats are not required except for exterior exposed steel. Apply an additional prime coat.
- D. Prime rebates for stop and face glazing of wood, and for face glazing of steel.
- E. Wood and Wood Particleboard:
 - 1. Use same kind of primer specified for exposed face surface.
 - a. Exterior wood: MPI 7 (Exterior Oil Wood Primer) for new construction and MPI 5 (Exterior Alkyd Wood Primer) for repainting bare wood primer except where Interior Wood Stain, Semi-Transparent (WS) is scheduled.
 - b. Interior wood except for transparent finish: MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat), thinned if recommended by manufacturer.
 - c. Transparent finishes as specified under Transparent Finishes on Wood.
 - 2. Apply one coat of primer MPI 7 (Exterior Oil Wood Primer) or MPI 5 (Exterior Alkyd Wood Primer) or sealer MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat) as soon as delivered to site to surfaces of unfinished woodwork, except concealed surfaces of shop fabricated or assembled millwork and surfaces specified to have varnish, stain or natural finish.
 - 3. Back prime and seal ends of exterior woodwork, and edges of exterior plywood specified to be finished.

3.6 PAINT COLOR

- A. Color and gloss of finish coats to match existing color.
- B. For additional requirements regarding color see Articles, REFINISHING EXISTING PAINTED SURFACE and MECHANICAL AND ELECTRICAL FIELD PAINTING SCHEDULE.
- C. Coat Colors:
 - 1. Color of priming coat: Lighter than body coat.
 - 2. Color of body coat: Lighter than finish coat.
 - 3. Color prime and body coats to not show through the finish coat and to mask surface imperfections or contrasts.
- D. Painting, Caulking, Closures, and Fillers Adjacent to Casework:
 - 1. Paint to match color of casework where casework has a paint finish.
 - 2. Paint to match color of wall where casework is stainless steel, plastic laminate, or varnished wood.

3.7 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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APPENDIX

Coordinate the following abbreviations used in Section 09 91 00, PAINTING, with other Sections. Use the same abbreviation and terms consistently.

Paint or coating	Abbreviation
Acrylic Emulsion	AE (MPI 10 - flat/MPI 11 - semigloss/MPI 119 - gloss)
Alkyd Gloss Enamel	G (MPI 48)
Alkyd Semigloss Enamel	SG (MPI 47)
Aluminum Paint	AP)
Cementitious Paint	CEP (TT-P-1411)
Exterior Latex	EL?? (MPI 10 / 11 / 119)
Exterior Oil	EO (MPI 9 - gloss/MPI 8 - flat/MPI 94 - semigloss)
Fire Retardant Paint	FR
Fire Retardant Coating (Clear)	FC (intumescent type)
Heat Resistant Paint	HR
Latex Emulsion	LE (MPI 53, flat/MPI 52, eggshell/MPI 54, semigloss/MPI 114, gloss Level 6
Latex Flat	LF (MPI 138)
Latex Gloss	LG (MPI 114)
Latex Semigloss	SG (MPI 141)
Latex Low Luster	LL (MPI 139)
Plastic Floor Coating	PL
Polyurethane Varnish	PV
Rubber Paint	RF (CID-A-A-3120 - Paint for Swimming Pools (RF))
Water Paint, Cement	WPC (CID-A-A-1555 - Water Paint, Powder).
Wood Stain	WS

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**SECTION 09 91 10
PAINTING OF METALS**

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 of Historic Metal rails, fences, and other structures as shown on the Drawings or as outlined in the Contract Documents.
- B. This standard includes general information on primers and paints to be used on exterior wrought iron, cast iron, and steel surfaces.

1.2 RELATED WORK:

- A. Section 01 00 02, General Requirements.
- B. Section 01 33 23, Shop Drawings, Product Data, and Samples.
- C. Section 01 42 19, Reference Standards.
- D. Section 05 01 70, Maintenance & Repair of Decorative Metals.

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.
 - 2. 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.
 - 3. All coats on a particular substrate must be from a single manufacturer.
- 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, 4 x 10 inch.
 - 3. Strips showing not less than 2-inch wide strips of undercoats and 4-inch wide strip of finish coat.

1.4 DELIVERY AND STORAGE:

- A. Deliver materials to site in manufacturer's sealed containers.
- B. 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 45 and 85 degrees F.

1.5 QUALITY ASSURANCE:

- A. Qualification of Painters: Use only qualified Historic Metal Painters for the mixing and application of paint on Historic Metal Surfaces. Submit evidence that key personnel have successfully performed surface preparation and application of coating on a minimum of two (2) 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.
- C. Notify the Contracting Officer Representative (COR) in writing of any anticipated problems using the coating systems as specified with substrates primed by others.

1.6 MOCK-UP PANEL:

- A. In addition to the samples specified herein to be submitted for approval, apply in the field, at a Test Panel location, each type and color of approved paint materials before proceeding with the remainder of the work, for approval by the COR.
- B. Finish and texture of the Test Panel approved by COR will be used as a standard of quality and workmanship for remainder of work.
- C. Repaint individual areas which are not approved, as determined by the COR, until approval is received.

1.7 REGULATORY REQUIREMENTS:

- A. Paint materials are to conform to the restrictions of the local Environmental and Toxic Control jurisdiction.

- B. Lead-Base Paint shall not be used.
- C. Provide materials that do not contain zinc-chromate, strontium-chromate, Cadmium, mercury or mercury compounds or free crystalline silica.
- D. Provide materials that do not contain any of the ACGIH-BKLT and ACGHI-DOC confirmed or suspected human carcinogens.

1.8 SAFETY AND HEALTH

- A. Apply paint materials using safety methods and equipment in accordance with applicable Federal, State, and local laws and regulations.
- 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.

1.9 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to the extent referenced.
- B. Code of Federal Regulation (CFR):
 - 40 CFR 59.....Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coating
- C. Society for Protective Coatings (SSPC):
 - SSPC SP 1-16.....Solvent Cleaning
 - SSPC SP 2-04.....Hand Tool Cleaning
 - SSPC SP 3-04.....Power Tool Cleaning
 - SSPC PA Guide 10-08.....Guide to Safety and Health Requirements for Industrial Painting Projects
 - SSPC Guide 6-15.....Guide for Containing Surface Preparation Debris Generated during Paint Removal Operations
 - SSPC Guide 7-15.....Guide to the Disposal of Lead-Contaminated Surface Preparation Debris

PART 2 - PRODUCTS

2.1 PRIMERS FOR WROUGHT IRON, CAST IRON, AND STEEL

- A. Primary function is adhesion and that the Primer must bond well to substrate and intermediate coat.
- B. Should have enough chemical and weather resistance to protect the substrate before application of next coat.
- C. Use primers with pigment and vehicle, compatible with substrate and finish coats specified.
- D. Oil Based Alkyd rust inhibitive primers shall be used with a minimum of two coats applied to all exposed metal surfaces. MPI # 23 Primer, Metal, Surface Tolerant or COR approved equal.
- E. Lead based paints and Latex water based paints are not allowed as primer.

2.2 PAINTS FOR WROUGHT IRON, CAST IRON, AND STEEL

- A. Apply minimum of two (2) coats of an Oil based Alkyd enamel base coat followed by minimum of two (2) coats of polyurethane enamel finish (MPI # 201 Polyurethane or COR approved equal) once the primer has been applied.
- B. Intermediate coat should uniformly bond the primer with the topcoat and should have enough chemical and weather resistance to protect the primer and iron / steel substrate.
- c. 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 Under-coaters: 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.

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 5 degrees F above dew point.
 - b. Below 50 degrees F or over 85 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.

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 only.
- 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.
- D. 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.
- E. Remove and protect hardware, accessories, 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.
- F. Materials are to be applied under adequate illumination, evenly spread and flowed on smoothly to avoid runs, sags, brush marks, and air bubbles.

- 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.
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.

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).

3.5 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 two (2) 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 by brush only and cover substrate completely.
- D. Allow not less than 48 hours between application of succeeding coats.
- E. Do not paint in closed position operable items such as gates, latches, or any similar items.

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.

3.8 EXTERIOR FINISHES:

- A. Two (2) coats of MPI #8 (Exterior Alkyd, Flat - Black) on all surfaces.

3.9 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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