

SECTION 02 41 10
DEMOLITION AND SITE CLEARING

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies all site preparation work, demolition and removal of buildings, portions of buildings, utilities, other structures and debris from trash dumps shown.

1.2 RELATED WORK

- A. Demolition and removal of roads, walks, curbs, and on-grade slabs outside buildings to be demolished: Section 31 20 11, EARTH MOVING (SHORT FORM).
- B. Safety Requirements: GENERAL CONDITIONS Article, ACCIDENT PREVENTION.
- C. Disconnecting utility services prior to demolition: Section 01 00 00, GENERAL REQUIREMENTS.
- D. Reserved items that are to remain the property of the Government: Section 01 00 00, GENERAL REQUIREMENTS.
- E. Asbestos Removal: Section 02 82 11, TRADITIONAL ASBESTOS ABATEMENT.
- F. Lead Paint: Section 02 83 33.13, LEAD-BASED PAINT REMOVAL AND DISPOSAL.
- G. Environmental Protection: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.
- H. Tree protection:
- I. Waste Management: Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT

1.3 PROTECTION

- A. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures. Comply with requirements of GENERAL CONDITIONS Article, ACCIDENT PREVENTION.
- B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations. Comply with requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article 1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS.
- C. Maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.
- D. Provide enclosed dust chutes with control gates from each floor to carry debris to truck beds and govern flow of material into truck. Provide

- overhead bridges of tight board or prefabricated metal construction at dust chutes to protect persons and property from falling debris.
- E. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum and dust the work area daily.
- F. In addition to previously listed fire and safety rules to be observed in performance of work, include following:
1. No wall or part of wall shall be permitted to fall outwardly from structures.
 3. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.
 4. Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 4500 mm (15 feet) of fire hydrants.
- G. Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The contractor shall take necessary precautions to avoid damages to existing items to remain in place, to be reused, or to remain the property of the Cemetery Property; any damaged items shall be repaired or replaced as approved by the CO/COR. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal works. Repairs, reinforcement, or structural replacement must have CO/COR's approval.
- H. The work shall comply with the requirements of Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

1.4 UTILITY SERVICES

- A. Demolish and remove outside utility service lines shown to be removed.
- B. Remove abandoned outside utility lines that would interfere with installation of new utility lines and new construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 SITE CLEARING

- A. General: Remove trees, shrubs, grass, and other vegetation, pavements, improvements, or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots.
 - 1. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
- B. Erosion Control: Contractor shall provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. Contractor shall install silt fence and inlet protection as shown prior to any soil disturbance activities. Provide temporary seeding as required by New York State Standards and Specifications for Erosion and Sediment Control manual.
- C. Maintain site controls in accordance with Sediment Control Plan and repair as directed by COTR. Maintain all records as required by the VA and New York State. Perform inspections as required by the VA and New York State.
- D. Topsoil - On-site: Topsoil is defined as friable clay loam surface soil found in a depth of not less than 6 inches. Satisfactory topsoil is reasonably free and/or screened of subsoil, clay lumps, stones, and other objects over 1 inch in diameter, and without weeds, roots, and other objectionable material.
 - 1. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping.
 - a. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
 - 2. Stockpile topsoil in storage piles in Cemetery spoils area as directed by CO/COR. Construct storage piles to provide free drainage of surface water. Cover storage piles to prevent wind erosion in accordance with the sediment control plan and the New York State Standards and Specifications for Erosion and Sediment Control manual.
 - a. Stockpile shall be contained with erosion and sediment controls (silt fence) and stabilized if undisturbed in accordance with the

New York State Standards and Specifications for Erosion and
Sediment Control manual.

3. Dispose of unsuitable or excess topsoil as specified for disposal of waste material only after approval of the CO/COR.
- E. Clearing and Grubbing: Clear site of trees, shrubs, and other vegetation, except for those indicated to remain.
 1. Completely remove stumps, roots, and other debris protruding through ground surface. Grind out stumps completely to 12 inches below grade.
 2. Use only hand methods for grubbing inside drip line of trees indicated to remain.
 3. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
 - a. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact each layer to a density equal to adjacent original ground.
- F. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction.
- G. Abandonment or removal of certain underground pipe or conduits may be indicated on mechanical or electrical drawings and is included under work of related Sections. Removing abandoned underground piping or conduits interfering with construction is included under this Section, except as indicated to be abandoned in-place.
- H. Continue maintenance of erosion controls in compliance with sediment control plan and the New York State Standards and Specifications for Erosion and Sediment Control manual until the work is completed and the threat of erosion is gone by either around surface stabilizer or lawn "grow-in" is at 85% complete. Temporary erosion control devices shall not be removed until the area is certified as being stabilized by the Qualified Inspector.

3.2 DEMOLITION

- A. Debris, including brick, concrete, stone, metals and similar materials shall become property of Contractor and shall be disposed of by him daily, off the Cemetery Property to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the CO/COR. Break up concrete slabs below grade that do not require removal from present location into pieces not exceeding 600 mm (24 inches) square to permit drainage. Contractor shall dispose debris

in compliance with applicable federal, state or local permits, rules and/or regulations.

- B. Remove existing utilities as indicated or uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the CO/COR. When Utility lines are encountered that are not indicated on the drawings, the CO/COR shall be notified prior to further work in that area.

3.3 CLEAN-UP

On completion of work of this section and after removal of all debris, leave site in clean condition satisfactory to CO/COR. Clean-up shall include off the Cemetery Property disposal of all items and materials not required to remain property of the Government as well as all debris and rubbish resulting from demolition operations.

- - - E N D - - -

SECTION 02 65 00

UNDERGROUND STORAGE TANK REMOVAL

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. The contractor will be responsible for the removal of the following tank system(s):
1. Tank 4 - 1,000 Gallon Heating Oil UST (Administration Building)
 2. Tank 5 - 1,000 Gallon Heating Oil UST (Building 2 / Lodge)
 3. Tank 6 - 1,000 Gallon Heating Oil UST (Maintenance Shop)
 4. Tank 13 - 8,000 Gallon Gasoline UST (Maintenance Shop)
 5. Tank 14 - 8,000 Gallon Diesel UST (Maintenance Shop)
- B. Contractor shall completely remove and dispose of existing underground storage tank systems as specified. Removal work shall include demolition and removal of underground tanks, concrete pads, concrete and asphalt paving, concrete anchors (deadman), overburden soil, riser pipes, manholes, product and vent piping, wiring/conduits, fuel pumps and dispensers, dispenser islands, fire suppression systems, associated oil and petroleum products, and all other incidentals to complete the work as required. Contractor shall remove oil and petroleum contaminated soils as designated by the County. Contractor shall remove all other associated demolition scrap as debris.
- C. Contractor shall remove tank contents including fuel, residues, sludges, and any other solids or liquids whether flammable or not, and whether existing or generated by Contractor's cleaning activities. Contractor shall provide all labor, material, equipment, and services to empty, clean, and transport all tank contents in accordance with Federal, State and local regulations, and in such a manner that contents are not discharged to the local environment. Contractor shall perform pump-out, recovery, removal, legal disposal, and clean-up of all fuel residues remaining in the existing tanks and distribution piping.

- D. Contractor shall be responsible for backfilling excavations and restoring tank removal areas to pre-existing conditions or in accordance with project design documents.
- E. The existing 4-foot x 4-foot fuel shack present on the fuel island shall be retained for future use.
- F. Tank 6 is currently located beneath a wooden deck. Prior to the tank removal, elements of the wooden deck will be removed to facilitate tank removal and then subsequently replaced by the Owner. The Contractor is not responsible for removal or reinstallation of deck components. However, the Contractor shall conduct the tank removal in a manner that limits potential damage to deck elements, to the greatest extent practical.
- G. Contractor shall be responsible for securing all necessary permits related to tank closures.
- H. Report:
 - 1. Written report describing in detail the procedures used to remove the liquid from the underground storage tank, cleaning and removing of the underground storage tank, and disposal of the liquid residues.
 - 2. Photographic documentation of the work, including lab and field results, and receipts from the proper authority for the tank and residue disposal.

1.2 RELATED WORK:

- A. Section 01 45 29, TESTING LABORATORY SERVICES
- B. Section 02 41 00, DEMOLITION
- C. Section 31 20 00, EARTH MOVING

1.3 QUALITY ASSURANCE:

- A. Underground storage tank removal and disposal shall comply with the following:
 - 1. American Petroleum Institute (API) recommended Practice 1604.
 - 2. United States Environmental Protection Agency (EPA), 40 CFR Part 280.

3. United States Environmental Protection Agency (EPA), Test Methods for Petroleum Hydrocarbons, SW-846.
4. OSHA Standards 29 CFR Part 1910 and 1926.
5. Sanitary Code of Suffolk County, Article 12.

1.4 OWNERSHIP AND TITLE:

- A. When waste materials are removed from the project site, ownership and title thereof shall pass from the National Cemeteries Administration (NCA) to the Contractor, who shall at that time assume all incidents of Ownership of said waste materials and bear all liability and responsibility for their safe and lawful transportation, storage, and disposal.

1.5 SUBMITTALS:

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES, furnish the following:
1. Suffolk County Department of Health Services Application for Closure of Underground Storage Tanks.
 2. Documentation of disposal of tank at an approved disposal site.
 3. Documentation of disposal of liquid material to an approved disposal site.
 4. Documentation of disposal of contaminated soil to an approved disposal site.
 5. Certification documents that personnel are qualified for UST closures.
 6. Six copies of Final Closure Report.

1.6 NOTIFICATIONS:

- A. Miss Utility - The Contractor shall call "MISS UTILITY" AT 1-800-272-4480 to obtain utility information at least 48 hours prior to excavation. The Contractor shall also coordinate location of utilities with NCA. The Contractor is responsible for identifying

all underground and aboveground utilities that may be impacted by the tank closures.

- B. The Contractor shall prepare and submit the Suffolk County Department of Health Services (SCDHS) Application for Closure of Underground Storage Tanks Form as well as any necessary supporting documentation no less than thirty (30) days prior to the scheduled tank closures. The Contractor is responsible for all permitting fees.
- C. The Contractor shall verbally notify the SCDHS (631-854-2528) no less than five (5) days prior to the scheduled tank closures. A representative of the SCDHS will be present during tank closures.
- D. If during the tank removal, evidence of a past or ongoing release is discovered, the Contracting Officer must be notified immediately. Additionally, the Suffolk County DHS, and the New York Department of Conservation (DEC) must be notified within 2-hours by calling 631-854-2528 and 800-457-7362, respectively. Appropriate response actions should then be performed in accordance with NYCRR Part 596 and DEC recommendations.

1.7 APPLICABLE PUBLICATIONS:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Petroleum Institute (API):
1604-(2010)Closure of Underground Petroleum Storage
Tanks
- C. American Society of Testing Materials (ASTM):
E1739-95(R2010)e1Standard Guide for Risk-Based Corrective
Action Applied at Petroleum Release Sites
E1912-98(2004)Standard Guide for Accelerated Site
Characterization for Confirmed or Suspected
Petroleum Releases

E1943-98(2010)Guide for Remediation of Ground water by
Natural Attenuation at Petroleum Release
Sites

1.8 PROJECT SITE CONDITIONS:

- A. Do not close or obstruct streets, sidewalks or drives without permission and approval of the Contracting Officer.
- B. Tank 4 - 1,000-Gallon Heating Oil UST (Administration Building):
This tank is currently out-of-service and consists of a 1,000-gallon single-walled UST, approximately 4-foot diameter and 10.5-feet in length. This tank is located in a grass covered area under approximately 2-feet of cover. This tank contains approximately 20-inches of liquid (heating oil and water mixture). The orientation of this tank is currently unknown. This tank is suitable for removal assuming there are no underground utilities in the vicinity of the tank field. If underground utilities are discovered within a 13-foot radius of the fill pipe, additional investigation may be required to determine the orientation and exact location of the tank relative to the utilities. The fill pipe associated with this tank is located approximately 8-feet west of the Administration Building and 41-feet south of the sidewalk that parallels the street north of the Administration Building. Tank removal shall include the tank, all piping and appurtenances. Following removal the area shall be restored to its pre-removal condition.
- C. Tank 5 - 1,000-Gallon Heating Oil UST (Building 2 / Lodge): This tank is currently out of service and consists of a 1,000-gallon single-walled UST, approximately 4-foot diameter and 10.5-feet in length. This tank is located in a grass covered area under approximately 26-inches of cover. This tank contains approximately 4-inches of liquid (heating oil and water mixture). The orientation of this tank is currently unknown. This tank is suitable for removal assuming there are no utilities within the tank field. If underground utilities are discovered within a 13-

foot radius of the fill pipe, additional investigation may be required to determine the orientation and exact location of the tank relative to the utilities. The fill pipe associated with this tank is located approximately 18-feet west of the westernmost sidewalk leading to Building #2 and 12-feet north of the sidewalk that parallels the street. Tank removal shall include the tank, all piping and appurtenances; however, if the underground piping cannot be easily removed the piping shall be cut, flushed, filled and capped with the permission of the SCDHS representative and the Contracting Officer. Following removal the area shall be restored to its pre-removal condition. Care should be taken when excavating as a large tree is located in the vicinity of the tank.

- D. Tank 6 - 1,000-Gallon Heating Oil UST (Maintenance Shop): This tank is currently out of service and consists of a 1,000-gallon single-walled UST, approximately 4-foot diameter and 10.5-feet in length. This tank is located beneath a wooden deck situated east of the existing Maintenance Shop, beneath approximately 4-feet of cover. This tank contains approximately 14-inches of liquid (heating oil and water mixture). The orientation of this tank appears to be in an east-west direction. Tank removal shall include the tank, all piping and appurtenances; however, if the underground piping cannot be easily removed the piping shall be cut, flushed, filled and capped with the permission of the SCDHS representative and the Contracting Officer. Following removal the area shall be restored to its pre-removal condition.
- E. Tank 13 - 8,000-Gallon Gasoline UST / Tank 14 - 8,000-Gallon Diesel UST (Maintenance Shop): These tanks consist of double-walled fiberglass or fiberglass-clad USTs, situated beneath a concrete tank pad / asphalt parking area with approximate dimensions of 10-feet by 58-feet. Each tank is equipped with one containment sump, which houses the submersible turbine pump and fill port; a second sump on each tank contains the connection port for the vent as well as the interstitial space monitoring

port. One 12-inch manhole exists on each tank and houses the probe associated with the Veeder-Root TLS 450 tank monitoring system. Single-walled fiberglass reinforced plastic piping supplies two remote dispensers located on a fuel island, situated approximately 50-feet north of the tank field. The fuel island is approximately 50-feet long and 5-feet wide and is equipped with a fire suppression system. Both tank systems shall be completely removed. Following removal the area shall be restored in accordance with project design documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL:

- A. Verbally, notify the regulating County Agency (SCDHS) at least five days prior to closure of the tanks. Remove tanks only in the presence and/or at the direction of SCDHS representative.
- B. All UST closures shall be conducted in accordance with the latest edition of the American Petroleum Institute (API) Recommended Practice 1604 "Closure of Underground Petroleum Storage Tanks".
- C. Whenever possible do not enter the tank. Perform all work from outside the tank using whatever special equipment is required for disconnecting, cleaning, purging, combustible gas monitoring, etc. If the tank must be entered, all OSHA and local regulatory agency procedures for confined space entry shall be followed, including 29 CFR 1910.146.
- D. Whenever possible do not enter the tank excavation. Perform all work from outside the tank excavation using whatever special equipment is required for disconnecting, cleaning, purging, combustible gas monitoring, etc. If the tank excavation must be entered all personnel working in an excavation shall be protected from cave-ins in accordance with 29 CFR 1926.650-652 and applicable local requirements.

3.2 PREPARATION:

- A. Contractor shall locate and identify the tank to be closed;
Contractor is responsible for determining exact location of underground work.
- B. The Contractor shall make all practicable attempts to plan the tank system closure in such a manner that reduces or eliminates the need for personnel to enter the interior of the tank and tank excavation.
- C. The Contractor shall disconnect all electrical service going to, under, or through the tank, tank appurtenances, and excavation area. All electrical service must be disconnected at the circuit breaker prior to the initiation of any tank closure activities. Proper lock out/ tag out procedures must be followed. The Contractor shall ensure that any electrical power connected to the tank or its ancillary equipment such as pumps has been deactivated prior to beginning work each day.
- D. All electrical conduits and wiring shall be disconnected prior to excavation.
- E. Contractor shall be fully responsible for sampling, testing, and quantifying existing contents of all tanks prior to excavation, in order to determine safe and lawful methods of handling, transport, and disposal.
- F. At the direction of the Contracting Officer, the Contractor shall remove all useable product from the storage tank system prior to the initiation of tank closure activities. This useable product shall be transferred to temporary fueling tanks located at the subject site.
- G. The Contractor shall be responsible for the storage, transfer, and/or disposal of any petroleum products, liquids, sludges, or solids remaining within tanks.
- H. The Contractor shall ensure and document that the disposal facilities proposed have all certifications and permits required by State and Federal regulatory agencies to receive and dispose

of the liquid and solid wastes resulting from the performance of the work.

3.3 UNDERGROUND STORAGE TANK LIQUID REMOVAL:

- A. The Contractor shall drain all product piping back into the tank. The Contractor may use small amounts of water or nitrogen to flush the piping. If water is used the Contractor shall use no more than 0.5-gallons of water for every 10 feet of 1" diameter piping, 1-gallon of water for every 10 feet of 1.5" diameter pipe, or 2-gallons of water for every 10 feet of 2" diameter pipe.
- B. The Contractor shall remove all flammable or combustible liquids, petroleum-impacted liquids, wash water, and/or sludge remaining in the tank. The Contractor is responsible for the collection, transfer, storage, transportation, and disposal of all materials removed from the tank. During the transfer of any combustible and/or flammable liquids, follow electrical grounding procedures set forth by the National Fire Protection Association (NFPA) to prevent fire or explosion due to static electricity.
- C. All flammable or combustible liquids, petroleum-impacted-liquids, and/or sludge removed from the system by the Contractor shall be disposed of by the Contractor in accordance of all applicable Federal, State, and local codes and regulations.
- D. The Contractor shall avoid spilling any oil during the tank removal process. The Contractor is responsible for the cleanup and remediation of any and all releases of oil to the environment that occur during that tank removal process.
- E. Provide documentation of the liquid removal and its disposal in a final report to the Contracting Officer.

3.4 UNDERGROUND STORAGE TANK CLEANING AND REMOVAL:

- A. Perform frequent combustible gas meter readings of the tank interior atmosphere during preparation, cleaning, storage, and cutting. Monitor atmosphere as required to ensure that there is

never the potential for fire or explosion. Prevent vapors from accumulating at ground level. Keep all tanks properly vented until ready to remove them from the excavation.

- B. Remove overburden, asphalt, and/or concrete above tank only to the extent needed to expose the tank or perform subsequent removal of petroleum-impacted soils. The limits of excavation shall be approved by the Contracting Officer. Care shall be taken to protect existing pavement and concrete adjacent to the excavation.
- C. Excavate to the top of the tank. Remove all tank-top equipment including, riser pipes, fill pipes, drop tubes, supply pipes, vapor recovery pipes, automatic tank gauging equipment, vapor recovery piping and equipment, submersible pump turbine and pump head, wiring and electrical conduits, and all other associated underground piping and appurtenances related to the fuel distribution system. Remove all piping and conduit that is accessible and uncovered, except the vent line. Any remaining piping must either be cut and capped or completely filled with concrete or cement. No piping shall be abandoned in place without the permission of the SCDHS and Contracting Officer.
- D. Handle and treat petroleum contaminated items properly to prevent spread of contamination or release of product. Clean petroleum contamination from items as required before disposal.
- E. The vent line must remain connected until the tank is purged. Cap and plug all bungs on tank as tank-top equipment and risers are removed.
- F. Prior to removal of the tank, the Contractor shall either purge the tank of all explosive vapors or inert the tank by removing or displacing the oxygen within the tank. Purge or inert the tank in place with either method below using safeguards and procedures described in the American Petroleum Institute (API) Recommended Practices 1604. DO NOT USE OXYGEN OR COMBUSTIBLE FLAMMABLE, OR EXPLOSIVE GAS TO PURGE TANK.

- 1. CO2 or N2 Flooding

2. Solid CO₂ at 1.5 pounds per 100 gallons of tank capacity.
 3. Ventilate tank with a compressed air eductor or diffused air blower.
- G. After purging the tank, test tank and tank excavation with a combustible gas indicator (CGI) to verify vapor concentrations of 10% of lower explosive limit (or less). Purge until tank interior atmosphere remains continuously at this level or below, even when purging is discontinued. If using a CGI, always test the environment for oxygen content first to be sure you can rely on the instrument. CGI's may be misleading if the tank atmosphere contains less than 5% to 10% by volume oxygen.
- H. If the tank was inerted, use an oxygen indicator to determine the oxygen concentration within the tank is at or below 15%. The tank shall be inerted until the interior atmosphere remains continuously at this level or below, even when inerting is discontinued.
- I. Clean tank interior to prevent further off gassing, as required to maintain vapor concentrations at 10% of lower explosive limit or below. Cleaning shall be performed in accordance with American Petroleum Institute (API) Recommended Practices 2015 and 2016.
- J. After successfully purging / inerting the tank, the vent line shall be removed and a cap or plug shall be installed. The cap/plug shall have a 1/4-inch hole in it to allow additional venting and prevent over pressurization of the tank.
- K. Continue to excavate soils around the tank to permit removal. Petroleum-impacted soils (if encountered) and non-impacted soils must be segregated into separate piles. All excavated materials must be kept a minimum of two (2) feet from the edge of the excavation.
- L. Contractor shall be responsible for the condition of the excavation. All slides and cave-ins shall be removed or corrected by the Contractor. The Contractor shall maintain the excavation

- open, safe, and water free until backfilling is authorized by the regulating agency.
- M. The Contractor shall be responsible for any sheeting, temporary bracing and temporary supports that may be required to protect any structures or utilities outside and inside the limits of excavation and to permit safe entry by personnel to inspect for soil contamination. All excavation, trenching and related sheeting, bracing, and/or supports shall comply with the requirements of OSHA excavation safety standards 29 CFR, Part 1926.650-652.
- N. All excavations shall be shored and drained so that workman may work safely and efficiently. Contractor shall keep all excavations free from water. Dewatering of the excavation will be limited to that necessary to assure adequate access to the USTs and piping and to assure safe excavation. Contractor shall provide for the disposal of the water removed from excavations in accordance with all applicable codes and regulations. Surface water shall be diverted to prevent direct entry into the excavation.
- O. Remove the tank from the tank pit and place in a secure level area on-site. The Contractor must only use equipment capable of safely lifting the tank. The tank shall not be dragged. The Contractor shall render the tank unfit for reuse by cutting holes in both ends, or by cutting the tank into scrap. If holes are cut into each end of the tank the holes must be either squares or triangles with a minimum length of 24-inches. All cutting shall be done in such a way, and using such tools and equipment as to prevent generation of sparks or flame. The tank shall not be removed for the site until it has been inspected by SCDHS personnel.
- P. Remove dismantled tank to an approved disposal facility.
- Q. Obtain disposal facility receipts noting proper tank disposal and provide copies in the Tank Closure Report.

3.5 REMOVED TANK AREA ASSESSMENT:

- A. SCDHS personnel will provide direction regarding presence of subsurface contamination (if any). Assuming that no subsurface petroleum impacts are identified, no subsurface sampling will be required.

3.6 HANDLING AND DISPOSAL OF EXCAVATED MATERIALS:

- A. The removed tank(s) and associated ancillary equipment shall become the property of the Contractor and transportation and disposal shall be in accordance with all Federal, State, and local requirements.
- B. The Contractor shall be responsible for safe and lawful manifesting, transportation, storage, and disposal of all waste materials and debris generated under this contract.
- C. All concrete and asphalt paving removed during the tank removal activities shall be disposed off-site at an approved facility.
- D. The Contractor shall submit to the Contracting Officer copies of all Hazardous and/or Non-hazardous Waste Manifests for all solids and liquids generated during the tank removal activities that require disposal.
- E. All excavated materials and imported fill materials shall be staged in accordance with proper erosion and sediment control practices.
- F. All excavated materials that will not be backfilled by the end of the workday shall be placed on double layers of 6-mil or thicker polyethylene sheeting, at locations to be designated by the Contracting Officer. Cover and securely anchor with polyethylene sheeting all soils at the end of the work day.
- G. The Contractor shall control the grading so that the ground is pitched to prevent water from running to excavated areas, damaging other structures or adjacent properties. The Contractor shall ensure the protection of catch basins and public access

areas from water runoff from the excavation areas of stockpiles, as well as provide erosion control.

- H. Where soil has been softened or eroded by flooding or placement during unfavorable weather, it shall be removed and replaced with suitable material at no cost to the NCA.
- I. The Contractor shall provide appropriate dust control measures, as directed by the Contracting Officer.

3.7 BACKFILL:

- A. All excavations shall be backfilled with suitable materials.
- B. Previously contaminated soils that have been recycled or treated are not suitable backfill unless approved by the Contracting Officer.
- C. By importing and placing fill materials, the Contractor is certifying that the backfill material is "clean" and does not contain contaminants including but not limited to petroleum, heavy metals, poly-chlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), solvents, volatile or semi-volatile organic compounds, or any other contaminant above naturally occurring levels. If any material used as backfill is found to be "contaminated", the Contractor shall excavate and dispose of the material, import and place new clean backfill material, and restore the site to its original condition, at no cost to the NCA.
- D. Ensure that the bottom of the excavation (subgrade) is suitably compacted prior to beginning backfilling activities.
- E. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
- F. The backfill shall be placed, uniformly spread, and compacted to maximum possible density. Maintain optimum moisture content of backfill materials to attain maximum compaction density (do not use water to increase density).

- G. All backfilled materials shall be properly compacted. Place and compact material in continuous layers not exceeding 8-inches compacted depth.
- H. Employ a placement method that does not disturb or damage building foundations and/or utilities in excavation area.
- I. The Contractor shall adhere to design requirements in backfill areas subject to other aspects of this project.
- J. Remove surplus backfill materials from site immediately following completion of backfill activities. All backfill materials staged on-site are subject to erosion and sediment control measures.
- K. Contractor shall take extreme care with backfill operations to ensure compaction to maximum possible density. At the Contracting Officer's discretion, Contractor shall remove and re-install/replace backfill which is suspected of having less than maximum density. All removal and reinstallation/replacement of backfill shall be done at the Contracting Officer's discretion and at no additional cost to the NCA.
- L. Any settling of concrete, asphalt pavement, or earth shall be corrected by the Contractor at no cost to the NCA. All repair work shall be completed within five (5) business days after being notified of the issue.

3.8 SITE RESTORATION:

- A. Restore landscaped areas and grass areas to match adjacent material.
- B. Replace any pavements, sidewalks, and/or curbs to match adjacent material and in accordance with project design documents.
- C. The Contractor is responsible for repairing or replacing items damaged during tank closure activities, at no cost to the NCA.

3.9 PETROLEUM-IMPACTED SOIL:

- A. If during the tank closure, evidence of a past or ongoing release is discovered, the Contracting Officer must be notified immediately. Additionally, the Suffolk County DHS, and the New

York Department of Conservation (DEC) must be notified within 2-hours by calling 631-854-2528 and 800-457-7362, respectively.

Appropriate response actions should then be performed in accordance with NYCRR Part 596 and DEC recommendations.

- B. All petroleum or petroleum saturated soils found in the tank excavation shall be removed and disposed of in accordance with all Federal, State and local regulations and requirements. Contaminated soil or backfill material, as well as any other heavily stained construction rubble, shall be removed off-site for disposal or treatment at an approved facility. Full documentation of thermal treatment or disposal at an approved facility shall be provided to the Contracting Officer.
- C. The extent of contaminated soil removal shall be determined by regulatory agency representatives and the Contracting Officer.
- D. Pending analysis, segregated soils shall be maintained on-site on impermeable plastic sheeting and covered with plastic sheeting so as to prevent run-off or run-on of rainwater. Stockpiled materials shall be inspected daily to assure integrity of the plastic liner and cover.
- E. The Contractor is responsible for the collection, submission, transportation, and analysis of all samples of petroleum-impacted soil. Soils shall be sampled and analyzed as dictated by regulatory officials, the Contracting Officer, and the disposal facility accepting the material. All samples shall be collected in laboratory-supplied containers, immediately placed on ice in a cooler, and delivered promptly to the laboratory for analysis. All chain-of-custody procedures shall be followed. All samples must be delivered to the laboratory within 24-hours of collection.
- F. Contractor shall exercise care to preserve the material below and beyond the limits of excavation. Where excavation is carried out, through error, below indicated grade or beyond the lines of excavation, the Contractor shall backfill to the indicated grade and compact with approved fill at no additional cost to the NCA.

- G. The Contractor shall submit copies to the Contracting Officer of the Certification of acceptance recycling and treatment for cleaning of contaminated soils.

3.10 SAFETY AND PRECAUTION:

- A. The Contractor shall determine the appropriate level of personal protection for all workers associated with work performed under this section to ensure health and safety of all personnel, including subcontractors, engaged in the tank removal activities.
- B. The Contractor shall provide Personal Protective Equipment (protective suits, gloves, boots, hard hats, respiratory equipment etc.) for all workers as required for protection against exposure to contamination. Contractor shall determine the required level of personal protective equipment during each phase of the work. Contractor shall ensure his/her personnel are properly trained to use these items. Contractor shall follow all OSHA requirements.
- C. Personnel working inside and in the general vicinity of the USTs shall be trained and thoroughly familiar with the safety precautions, procedures, and equipment required for controlling the potential hazards associated with this work. Personnel shall use proper protection and safety equipment during work in and around oil storage tanks.
- D. The area surrounding the tank and/or tank excavation shall be secured by temporary fence to protect building occupants, visitors and workers. A temporary fence will only be necessary if the Contractor cannot control access by other means. Alternate methods for access control must be approved in writing by the Contracting Officer.
- E. The Contractor shall eliminate all potential sources of ignition from the area, including but not limited smoking materials, non-explosion proof tools, electrical equipment, and internal combustion equipment.

- F. The Contractor shall provide and maintain adequate supply of fire extinguisher and other required safety equipment in close proximity to all demolition and removal activity. A minimum of two (2) portable twenty (20) pound fire extinguishers must be visibly positioned around the tank excavation. The fire extinguishers must be in working condition, fully charged, and immediately available in the event of a fire.
- G. The Contractor shall prevent vapors from accumulating at ground level and keep all tanks vented at least 12-feet above ground surface until they are ready to be removed. The Contractor shall prevent a discharge of static electricity during venting of tanks by ensuring that all equipment used during venting is grounded to both the tank and the Earth.
- H. The Contractor shall prepare confined space entry permits for all activities where personnel enter confined spaces. If confined spaces must be entered all OSHA procedures for confined space entry shall be followed, including 29 CFR 1910.146.
- I. The Contractor shall test interior UST spaces and surrounding excavation areas to detect dangerous vapor levels until the USTs are removed from the project site.
- J. Prior to ending operations on any work day or at any time the Contractor is not on site, the Contractor shall secure all areas of work in a safe manner to the satisfaction of the Contracting Officer.

- - - END - - -

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

PART 1 - GENERAL

1.1 DESCRIPTION:

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

1.2 RELATED WORK:

- A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES.
- B. Concrete roads, walks, and similar exterior site work: Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.

1.3 TOLERANCES:

- A. ACI 117.
- B. Slab Finishes: ACI 117, F-number method in accordance with ASTM E1155.

1.4 REGULATORY REQUIREMENTS:

- A. ACI SP-66 ACI Detailing Manual
- B. ACI 318 - Building Code Requirements for Reinforced Concrete.

1.5 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Concrete Mix Designs, including strength data and location if more than one mix submittal.
- C. Shop Drawings: Reinforcing steel: Complete shop drawings.
- D. Manufacturer's Certificates: Air-entraining admixture, chemical admixtures, curing compounds.

1.6 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Concrete Institute (ACI):
 - 117RTolerances for Concrete Construction and Materials
 - 211.1-91Proportions for Normal, Heavyweight, and Mass Concrete
 - 301Specification for Structural Concrete
 - 305RHot Weather Concreting
 - 306RCold Weather Concreting
 - SP-66ACI Detailing Manual

318/318R-08	.....Building Code Requirements for Reinforced Concrete
347R-	.....Guide to Formwork for Concrete
C. American Society for Testing And Materials (ASTM):	
A185	.....Steel Welded Wire, Fabric, Plain for Concrete Reinforcement
A615/A615M	.....Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
C31/C31M	.....Making and Curing Concrete Test Specimens in the Field
C33	.....Concrete Aggregates
C39/C39M	.....Compressive Strength of Cylindrical Concrete Specimens
C94/C94M	.....Ready-Mixed Concrete
C143/C143M	.....Standard Test Method for Slump of Hydraulic Cement Concrete
C150	.....Portland Cement
C171	.....Sheet Material for Curing Concrete
C172	.....Sampling Freshly Mixed Concrete
C173	.....Air Content of Freshly Mixed Concrete by the Volumetric Method
C192/C192M	.....Making and Curing Concrete Test Specimens in the Laboratory
C231	.....Air Content of Freshly Mixed Concrete by the Pressure Method
C260	.....Air-Entraining Admixtures for Concrete
C330	.....Lightweight Aggregates for Structural Concrete
C494/C494M	.....Chemical Admixtures for Concrete
C618	.....Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
D1751	.....Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non- extruding and Resilient Bituminous Types)
D4397	.....Polyethylene Sheeting for Construction, Industrial and Agricultural Applications
E1155	.....Determining F _F Floor Flatness and F _L Floor Levelness Numbers

PART 2 - PRODUCTS

2.1 FORMS:

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

2.2 MATERIALS:

- A. Portland Cement: ASTM C150, Type I or II.
- B. Fly Ash: ASTM C618, Class C or F including supplementary optional requirements relating to reactive aggregates and alkalis, and loss on ignition (LOI) not to exceed 5 percent.
- C. Coarse Aggregate: ASTM C33, Size 67. Size 467 may be used for footings and walls over 300 mm (12 inches) thick. Coarse aggregate for applied topping and metal pan stair fill shall be Size 7.
- D. Fine Aggregate: ASTM C33.
- E. Mixing Water: Fresh, clean, and potable.
- F. Air-Entraining Admixture: ASTM C260.
- G. Chemical Admixtures: ASTM C494.
- H. Vapor Barrier: ASTM D4397, 0.25 mm (10 mil).
- I. Reinforcing Steel: ASTM A615 or ASTM A996, deformed. See structural drawings for grade.
- J. Welded Wire Fabric: ASTM A185.
- K. Expansion Joint Filler: ASTM D1751.
- L. Sheet Materials for Curing Concrete: ASTM C171.
- M. Abrasive Aggregates: Aluminum oxide grains or emery grits.
- O. Grout, Non-Shrinking: Premixed ferrous or non-ferrous, mixed and applied in accordance with manufacturer's recommendations. Grout shall show no settlement or vertical drying shrinkage at 3 days or thereafter based on initial measurement made at time of placement, and produce a compressive strength of at least 18mpa (2500 psi) at 3 days and 35mpa (5000 psi) at 28 days.

2.3 CONCRETE MIXES:

- A. Design of concrete mixes using materials specified shall be the responsibility of the Contractor as set forth under Option C of ASTM C94.
- B. Compressive strength at 28 days shall be not less than as indicated.
- C. Establish strength of concrete by testing prior to beginning concreting operation. Test consists of average of three cylinders made and cured in accordance with ASTM C192 and tested in accordance with ASTM C39.
- D. Maximum slump for vibrated concrete is 100 mm (4 inches) tested in accordance with ASTM C143.

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

TABLE I - CEMENT AND WATER FACTORS FOR CONCRETE

Concrete: Strength	Non-Air-Entrained		Air-Entrained	
Min. 28 Day Comp. Str. MPa (psi)	Min. Cement kg/m ³ (lbs/c. yd)	Max. Water Cement Ratio	Min. Cement kg/m ³ (lbs/c. yd)	Max. Water Cement Ratio
35 (5000) ^{1,3}	375 (630)	0.45	385 (650)	0.40
30 (4000) ^{1,3}	325 (550)	0.55	340 (570)	0.50
25 (3000) ^{1,3}	280 (470)	0.65	290 (490)	0.55
25 (3000) ^{1,2}	300 (500)	*	310 (520)	*

1. If trial mixes are used, the proposed mix design shall achieve a compressive strength 8.3 MPa (1200 psi) in excess of f'c. For concrete strengths above 35 Mpa (5000 psi), the proposed mix design shall achieve a compressive strength 9.7 MPa (1400 psi) in excess of f'c.

2. Lightweight Structural Concrete. Pump mixes may require higher cement values.

3. For concrete exposed to high sulfate content soils maximum water cement ratio is 0.44.

* Determined by Laboratory in accordance with ACI 211.1 for normal concrete or ACI 211.2 for lightweight structural concrete.

F. Air-entrainment is required for all exterior concrete and as required for Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS. Air content shall conform with the following table:

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

Nominal Maximum Size of Coarse Aggregate	Total Air Content Percentage by Volume
10 mm (3/8 in)	6 to 10
13 mm (1/2 in)	5 to 9
19 mm (3/4 in)	4 to 8
25 mm (1 in)	3 1/2 to 6 1/2
40 mm (1 1/2 in)	3 to 6

2.4 BATCHING & MIXING:

- A. Store, batch, and mix materials as specified in ASTM C94.
 - 1. Job-Mixed: Concrete mixed at job site shall be mixed in a batch mixer in manner specified for stationary mixers in ASTM C94.
 - 2. Ready-Mixed: Ready-mixed concrete comply with ASTM C94, except use of non-agitating equipment for transporting concrete to the site will not be permitted. With each load of concrete delivered to project, ready-mixed concrete producer shall furnish, in duplicate, certification as required by ASTM C94.

PART 3 - EXECUTION

3.1 FORMWORK:

- A. Installation conform to ACI 347. Sufficiently tight to hold concrete without leakage, sufficiently braced to withstand vibration of concrete, and to carry, without appreciable deflection, all dead and live loads to which they may be subjected.
- B. Treating and Wetting: Treat or wet contact forms as follows:
 - 1. Coat plywood and board forms with non-staining form sealer. In hot weather cool forms by wetting with cool water just before concrete is placed.
 - 2. Clean and coat removable metal forms with light form oil before reinforcement is placed. In hot weather cool metal forms by thoroughly wetting with water just before placing concrete.
 - 3. Use sealer on reused plywood forms as specified for new material.
- C. Inserts, sleeves, and similar items: Flashing reglets, masonry ties, anchors, inserts, wires, hangers, sleeves, boxes for floor hinges and other items specified as furnished under this and other sections of specifications and required to be in their final position at time concrete is placed shall be properly located, accurately positioned and built into construction, and maintained securely in place.
- D. Construction Tolerances:
 - 1. Contractor is responsible for setting and maintaining concrete formwork to assure erection of completed work within tolerances specified to accommodate installation or other rough and finish materials. Remedial work necessary for correcting excessive tolerances is the responsibility of the Contractor. Erected work that exceeds specified tolerance limits shall be remedied or removed and replaced, at no additional cost to the Government.

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

3.2 REINFORCEMENT:

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

3.3 VAPOR BARRIER:

- A Except where membrane waterproofing is required, place interior concrete slabs on a continuous vapor barrier.
- B. Place 100 mm (4 inches) of fine granular fill of thickness specified under the vapor barrier .
- C. Lap joints 150 mm (6 inches) and seal with a compatible pressure-sensitive tape.
- D. Patch punctures and tears.

3.4 PLACING CONCRETE:

- A. Remove water from excavations before concrete is placed. Remove hardened concrete, debris and other foreign materials from interior of forms, and from inside of mixing and conveying equipment. Obtain approval of Resident Engineer before placing concrete. Provide screeds at required elevations for concrete slabs.
- B. Before placing new concrete on or against concrete which has set, existing surfaces shall be roughened and cleaned free from all laitance, foreign matter, and loose particles.
- C. Convey concrete from mixer to final place of deposit by method which will prevent segregation or loss of ingredients. Do not deposit in work concrete that has attained its initial set or has contained its water or cement more than 1 1/2 hours. Do not allow concrete to drop freely more than 1500 mm (5 feet) in unexposed work nor more than 900 mm (3 feet) in exposed work. Place and consolidate concrete in horizontal layers not exceeding 300 mm (12 inches) in thickness. Consolidate concrete by spading, rodding, and mechanical vibrator. Do not secure vibrator to forms or reinforcement. Vibration shall be carried on continuously with placing of concrete.
- D. Hot weather placing of concrete: Follow recommendations of ACI 305R to prevent problems in the manufacturing, placing, and curing of concrete

that can adversely affect the properties and serviceability of the hardened concrete.

- E. Cold weather placing of concrete: Follow recommendations of ACI 306R, to prevent freezing of thin sections less than 300 mm (12 inches) and to permit concrete to gain strength properly, except that use of calcium chloride shall not be permitted without written approval from Resident Engineer.

3.5 PROTECTION AND CURING:

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

3.6 FORM REMOVAL:

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

3.7 SURFACE PREPARATION:

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

3.8 FINISHES:

A. Vertical and Overhead Surface Finishes:

1. Unfinished Areas: Vertical and overhead concrete surfaces exposed in unfinished areas, above suspended ceilings in manholes, and other unfinished areas exposed or concealed will not require additional finishing.
2. Interior and Exterior Exposed Areas (to be painted): Fins, burrs and similar projections on surface shall be knocked off flush by mechanical means approved by Resident Engineer and rubbed lightly with a fine abrasive stone or hone. Use an ample amount of water during rubbing without working up a lather of mortar or changing texture of concrete.
3. Interior and Exterior Exposed Areas (finished): Finished areas, unless otherwise shown, shall be given a grout finish of uniform color and shall have a smooth finish treated as follows:
 - a. After concrete has hardened and laitance, fins and burrs have been removed, scrub concrete with wire brushes. Clean stained concrete surfaces by use of a hone or stone.

- b. Apply grout composed of 1 part portland cement and 1 part clean, fine sand (smaller than 600 micro-m (No. 30) sieve). Work grout into surface of concrete with cork floats or fiber brushes until all pits and honeycomb are filled.
- c. After grout has hardened, but still plastic, remove surplus grout with a sponge rubber float and by rubbing with clean burlap.
- d. In hot, dry weather use a fog spray to keep grout wet during setting period. Complete finish for any area in same day. Confine limits of finished areas to natural breaks in wall surface. Do not leave grout on concrete surface overnight.

B. Slab Finishes:

- 1. Scratch Finish: Slab surfaces to receive a bonded applied cementitious application shall all be thoroughly raked or wire broomed after partial setting (within 2 hours after placing) to roughen surface to insure a permanent bond between base slab and applied cementitious materials.
- 2. Floating: Allow water brought to surface by float used for rough finishing to evaporate before surface is again floated or troweled. Do not sprinkle dry cement on surface to absorb water.
- 3. Float Finish: Ramps, stair treads, and platforms, both interior and exterior, equipment pads, and slabs to receive non-cementitious materials, except as specified, shall be screened and floated to a smooth dense finish. After first floating, while surface is still soft, surfaces shall be checked for alignment using a straightedge or template. Correct high spots by cutting down with a trowel or similar tool and correct low spots by filling in with material of same composition as floor finish. Remove any surface projections on floated finish by rubbing or dry grinding. Refloat the slab to a uniform sandy texture.
- 4. Steel Trowel Finish: Applied toppings, concrete surfaces to receive resilient floor covering or carpet, future floor roof and all monolithic concrete floor slabs exposed in finished work and for which no other finish is shown or specified shall be steel troweled. Final steel troweling to secure a smooth, dense surface shall be delayed as long as possible, generally when the surface can no longer be dented with finger. During final troweling, tilt steel trowel at a slight angle and exert heavy pressure on trowel to compact cement paste and form a dense, smooth surface. Finished surface shall be free of trowel marks, uniform in texture and appearance.

5. Broom Finish: Finish all exterior slabs, ramps, and stair treads with a bristle brush moistened with clear water after the surfaces have been floated.
6. Finished slab flatness (FF) and levelness (FL) values comply with the following minimum requirements:

Slab on grade & Shored suspended slabs	Unshored suspended slabs
Specified overall value F _F 25/F _L 20	Specified overall value F _F 25
Minimum local value F _F 17/F _L 15	Minimum local value F _F 17

3.9 SURFACE TREATMENTS:

- A. Surface treatments shall be mixed and applied in accordance with manufacturer's printed instructions.
- B. Non-Slip Finish: Except where safety nosing and tread coverings are shown, apply non-slip abrasive aggregate to treads and platforms of all concrete steps and stairs, and to surfaces of exterior concrete ramps and platforms. Aggregate shall be broadcast uniformly over concrete surface. Trowel concrete surface to smooth dense finish. After curing, rub the treated surface with abrasive brick and water sufficiently to slightly expose abrasive aggregate.

3.10 APPLIED TOPPING:

- A. Separate concrete topping with thickness and strength shown with only enough water to insure a stiff, workable, plastic mix.
- B. Continuously place applied topping until entire section is complete, struck off with straightedge, compact by rolling or tamping, float and steel trowel to a hard smooth finish.

3.11 RESURFACING FLOORS:

- A Remove existing flooring, in areas to receive resurfacing, to expose existing structural slab and to extend not less than 25 mm (1 inch) below new finished floor level. Prepare exposed structural slab surface by roughening, broom cleaning, wetting, and grouting. Apply topping as specified.

3.12 PRECAST CONCRETE ITEMS:

Precast concrete items, not specified elsewhere, shall be cast using 25 MPa (3000 psi) air-entrained concrete to shapes and dimensions shown. Finish surfaces to match corresponding adjacent concrete surfaces. Reinforce with steel as necessary for safe handling and erection.

- - - E N D - - -

SECTION 04 01 20
UNIT MASONRY REPAIRS and CLEANING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes maintenance of unit masonry consisting of brick clay masonry restoration and cleaning as follows:
1. Cleaning exposed unit masonry surfaces.

1.2 UNIT PRICES

- A. Work of this Section is affected by unit prices specified in Division 01 Section "Unit Prices."

1.3 DEFINITIONS

- A. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.
- B. Medium-Pressure Spray: 400 to 800 psi; 4 to 6 gpm.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For the following:
1. Provisions for expansion joints or other sealant joints.
- C. Samples: For each exposed product and for each color and texture specified.
- D. Preconstruction test reports.

1.5 QUALITY ASSURANCE

- A. Restoration Specialist Qualifications: Engage an experienced masonry restoration and cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience installing standard unit masonry is not sufficient experience for masonry restoration work.
1. At Contractor's option, work may be divided between two specialist firms: one for cleaning work and one for repair work.
 2. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisors on Project site during times that clay masonry restoration and cleaning work is in progress.
 3. Restoration Worker Qualifications: Persons who are experienced in restoration work of types they will be performing.

- B. Mockups: Prepare mockups of restoration and cleaning to demonstrate aesthetic effects and set quality standards for materials and execution and for fabrication and installation.
 - 1. Cleaning: Clean an area 25 sq. ft. for each type of masonry and surface condition.
- C. Preinstallation Conference: Conduct conference at Project site.
- D. All pressure washing and exterior cleaning is to be limited to weekend hours.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS

- A. Water: Potable.
- B. Hot Water: Water heated to a temperature of 140 to 160 deg F.
- C. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 1/2 cup of laundry detergent, and 20 quarts of hot water for every 5 gal. of solution required.
- D. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 5 quarts of 5 percent sodium hypochlorite (bleach), and 15 quarts of hot water for every 5 gal. of solution required.
- E. Nonacidic Liquid Cleaner: Manufacturer's standard mildly alkaline liquid cleaner formulated for removing mold, mildew, and other organic soiling from ordinary building materials, including polished stone, brick, aluminum, plastics, and wood.

2.2 CHEMICAL CLEANING SOLUTIONS

- A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended by chemical-cleaner manufacturer.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.
- B. Comply with chemical-cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical-cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. When no longer needed, promptly remove masking to prevent adhesive staining.
2. Keep wall wet below area being cleaned to prevent streaking from runoff.

3.2 CLEANING MASONRY, GENERAL

- A. Proceed with cleaning in an orderly manner. Ensure that dirty residues and rinse water will not wash over cleaned, dry surfaces.
- B. Use only those cleaning methods indicated for each masonry material and location.
 1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.
 2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.
 - a. Equip units with pressure gages.
 3. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.
 4. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
 5. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F at flow rates indicated.
- C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.
- D. Water-Spray Application Method: Unless otherwise indicated, hold spray nozzle at least six inches from surface of masonry and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.
- E. Chemical-Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical-cleaner manufacturer's written instructions. Do not spray apply at pressures exceeding 50 psi. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.
- F. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.

1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.

3.3 PRELIMINARY CLEANING

- A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil and debris from open masonry joints to whatever depth they occur.
- B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances include paint, calking, asphalt, and tar.
 1. Carefully remove heavy accumulations of material from surface of masonry with a sharp chisel. Do not scratch or chip masonry surface.
 2. Remove paint and calking with alkaline paint remover.
 - a. Comply with requirements in "Paint Removal" Article.
 - b. Repeat application up to two times if needed.
 3. Remove asphalt and tar with solvent-type paint remover.
 - a. Comply with requirements in "Paint Removal" Article.
 - b. Apply paint remover only to asphalt and tar by brush without prewetting.
 - c. Allow paint remover to remain on surface for 10 to 30 minutes.
 - d. Repeat application if needed.

3.4 CLEANING MASONRY

- A. Detergent Cleaning:
 1. Wet masonry with water applied by low-pressure spray.
 2. Scrub masonry with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that masonry surface remains wet.
 3. Rinse with water applied by medium-pressure spray to remove detergent solution and soil.
 4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.
- B. Mold, Mildew, and Algae Removal:
 1. Wet masonry with water applied by low-pressure spray.
 2. Apply mold, mildew, and algae remover by brush or low-pressure spray.
 3. Scrub masonry with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew,

Long Island National Cemetery
Administration / Public Restroom
Renovation and New Equipment Building

VA Project# 815 CM 3038
June 16, 2014

and algae remover often to ensure that adequate fresh cleaner is used and that masonry surface remains wet.

4. Rinse with water applied by medium-pressure spray to remove mold, mildew, and algae remover and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

C. Nonacidic Liquid Chemical Cleaning:

1. Wet masonry with water applied by low-pressure spray.
2. Apply cleaner to masonry. Let cleaner remain on surface for period indicated below:
 - a. As recommended by chemical-cleaner manufacturer.
 - b. As established by mockup.
3. Rinse with water applied by medium-pressure spray to remove chemicals and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once.

END OF SECTION 040120

SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies structural steel shown and classified by Section 2, Code of Standard Practice for Steel Buildings and Bridges.

1.2 RELATED WORK

- A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES.
- B. Painting: Section 09 91 00, PAINTING.
- C. Pre-engineered Metal Building: Section 13 34 19, METAL BUILDING SYSTEMS.
- D. Metal Fabrications: Section 05 50 00, METAL FABRICATIONS.

1.3 QUALITY ASSURANCE

- A. Fabricator and erector shall maintain a program of quality assurance in conformance with Section 8, Code of Standard Practice for Steel Buildings and Bridges. Work shall be fabricated in an AISC certified Category Conventional Steel Structures .
- B. Before authorizing the commencement of steel erection, the controlling contractor shall ensure that the steel erector is provided with the written notification required by 29 CFR 1926.752. Provide copy of this notification to the RE/COTR.

1.4 TOLERANCES

- A. Fabrication tolerances for structural steel shall be held within limits established by ASTM A6, by Section 7, Code of Standard Practice for Buildings and Bridges, and by Standard Mill Practice - General Information (AISC Manual, Thirteenth Edition, except as follows:
 - 1. Elevation tolerance for column splice points at time member is erected is 10 mm (3/8 inch).
 - 2. Elevation tolerance for top surface of steel beams and girders at connections to columns at time floor is erected is 13 mm (1/2 inch).
 - 3. Elevation tolerance for closure plates at the building perimeter and at slab openings prior to concrete placement is 6 mm (1/4 inch).

1.5 DESIGN

- A. Connections: Design and detail all connections for each member size, steel grade and connection type to resist the loads and reactions indicated on the drawings or specified herein. Use details consistent with the details shown on the Drawings, supplementing where necessary. The details shown on the Drawings are conceptual and do not indicate the

required weld sizes or number of bolts unless specifically noted. Use rational engineering design and standard practice in detailing, accounting for all loads and eccentricities in both the connection and the members. Promptly notify the RE/COTR of any location where the connection design criteria is not clearly indicated. The design of all connections is subject to the review and acceptance of the RE/COTR. Submit structural calculations prepared and sealed by a qualified engineer registered in the state where the project is located. Submit calculations for review before preparation of detail drawings.

1.6 REGULATORY REQUIREMENTS

- A. AISC: Specification for Structural Steel Buildings - Allowable Stress Design.
- B. AISC: Code of Standard Practice for Steel Buildings and Bridges.

1.7 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop and Erection Drawings: Submit in accordance with Section 13 34 19, METAL BUILDING SYSTEMS. Certificates:
 - 1. Structural steel.
 - 2. Steel for all connections.
 - 3. Welding materials.
 - 4. Shop coat primer paint.
- D. Test Reports:
 - 1. Welders' qualifying tests.
- E. Record Surveys.

1.8 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Institute of Steel Construction (AISC):
 - 1. Steel Construction Manual (Thirteenth Edition).
 - 2. Code of Standard Practice for Steel Buildings and Bridges (March 2000).
- C. American National Standards Institute (ANSI):
 - B18.22.1 Plain Washers
 - B18.22M Metric Plain Washers
- D. American Society for Testing and Materials (ASTM):

- A6/A6M-Standard Specification for General Requirements
for Rolled Structural Steel Bars, Plates,
Shapes, and Sheet Piling
- A36/A36MStandard Specification for Carbon Structural
Steel
- A53/A53MStandard Specification for Pipe, Steel, Black
and Hot-Dipped, Zinc-Coated Welded and Seamless
- A123/A123MStandard Specification for Zinc (Hot-Dip
Galvanized) Coatings on Iron and Steel Products
- A242/A242MStandard Specification for High-Strength Low-
Alloy Structural Steel
- A283/A283MStandard Specification for Low and Intermediate
Tensile Strength Carbon Steel Plates
- A307Standard Specification for Carbon Steel Bolts
and Studs, 60,000 psi Tensile Strength
- A325Standard Specification for Structural Bolts,
Steel, Heat Treated, 120/105 ksi Minimum Tensile
Strength
- A490Standard Specification for Heat-Treated Steel
Structural Bolts 150 ksi Minimum Tensile
Strength
- A500Standard Specification for Cold Formed Welded
and Seamless Carbon Steel Structural Tubing in
Rounds and Shapes
- A501Standard Specification for Hot-Formed Welded and
Seamless Carbon Steel Structural Tubing
- A572/A572MStandard Specification for High-Strength
Low-Alloy Columbium-Vanadium Structural Steel
- A992/A992MStandard Specification for Structural Steel
Shapes
- E. American Welding Society (AWS):
 - D1.1Structural Welding Code-Steel
- F. Research Council on Structural Connections (RCSC) of The Engineering
Foundation:
 - Specification for Structural Joints Using ASTM A325 or A490 Bolts
- G. Military Specifications (Mil. Spec.):
 - MIL-P-21035Paint, High Zinc Dust Content, Galvanizing,
Repair
- H. Occupational Safety and Health Administration (OSHA):
 - 29 CFR Part 1926Safety Standards for Steel Erection

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Steel Wide Flange Shapes: ASTM A992, Structural Steel Channels, Angles, Plates ASTM A36..
- B. Structural Tubing: ASTM A500, Grade B.
- C. Steel Pipe: ASTM A53, Grade B.
- D. Bolts, Nuts and Washers:
 - 1. High-strength bolts, including nuts and washers: ASTM A325 .
 - 2. Bolts and nuts, other than high-strength: ASTM A307, Grade A.
 - 3. Plain washers, other than those in contact with high-strength bolt heads and nuts: ANSI Standard B18.22.1.
- E. Zinc Coating: ASTM A123.
- F. Galvanizing Repair Paint: Mil. Spec. MIL-P-21035.

PART 3 - EXECUTION

3.1 CONNECTIONS (SHOP AND FIELD)

- A. Welding: Welding in accordance with AWS D1.1. Welds shall be made only by welders and welding operators who have been previously qualified by tests as prescribed in AWS D1.1 to perform type of work required.
- B. High-Strength Bolts: High-strength bolts tightened to a bolt tension not less than proof load given in Specification for Structural Joints Using ASTM A325 or A490 Bolts.

3.2 FABRICATION

Fabrication in accordance with Chapter M, Specification for Steel Buildings - Allowable Stress Design and Plastic Design .

3.3 SHOP PAINTING

- A. General: Shop paint steel with primer in accordance with Section 6, Code of Standard Practice for Steel Buildings and Bridges.
- B. Shop paint for steel surfaces is specified in Section 09 91 00, PAINTING.
- C. Do not apply paint to following:
 - 1. Surfaces within 50 mm (2 inches) of joints to be welded in field.
 - 2. Surfaces which will be encased in concrete.
 - 3. Surfaces which will receive sprayed on fireproofing.
 - 4. Top flange of members which will have shear connector studs applied.
- D. Zinc Coated (Hot Dip Galvanized) per ASTM A123 (after fabrication):
Touch-up after erection: Clean and wire brush any abraded and other spots worn through zinc coating, including threaded portions of bolts and welds and touch-up with galvanizing repair paint.

3.4 ERECTION

- A. General: Erection in accordance with Section 7, Code of Standard Practice for Steel Buildings and Bridges.
- B. Temporary Supports: Temporary support of structural steel frames during erection in accordance with Section 7, Code of Standard Practice for Steel Buildings and Bridges.

3.5 FIELD PAINTING

- A. After erection, touch-up steel surfaces specified to be shop painted. After welding is completed, clean and prime areas not painted due to field welding.
- B. Finish painting of steel surfaces is specified in Section 09 91 00, PAINTING.

3.6 SURVEY

Upon completion of finish bolting or welding on any part of the work, and prior to start of work by other trades that may be supported, attached, or applied to the structural steel work, submit a certified report of survey to RE/COTR for approval. Reports shall be prepared by Registered Land Surveyor or Registered Civil Engineer as specified in Section 01 00 00, GENERAL REQUIREMENTS. Report shall specify that location of structural steel is acceptable for plumbness, level and alignment within specified tolerances specified in the AISC Manual.

- - - E N D - - -

**SECTION 05 50 00
METAL FABRICATIONS**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies items and assemblies fabricated from structural steel shapes and other materials as shown and specified.
- B. Items specified.
 - 1. Support for Wall and Ceiling Mounted Items
 - 2. Loose Lintels
 - 3. Shelf Angles

1.2 RELATED WORK

- A. Colors, finishes, and textures: Section 09 06 00, SCHEDULE FOR FINISHES.
- B. Prime and finish painting: Section 09 91 00, PAINTING.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS AND PRODUCT DATA.
- B. Shop Drawings:
 - 1. Each item specified, showing complete detail, location in the project, material and size of components, method of joining various components and assemblies, finish, and location, size and type of anchors.
 - 2. Mark items requiring field assembly for erection identification and furnish erection drawings and instructions.
 - 3. Provide templates and rough-in measurements as required.
- C. Manufacturer's Certificates:
 - 1. Anodized finish as specified.
 - 2. Live load designs as specified.
- D. Design Calculations for specified assemblies, using live loads, indicated and including dead loads.
- E. Furnish setting drawings and instructions for installation of anchors to be preset into concrete and masonry work, and for the positioning of items having anchors to be built into concrete or masonry construction.

1.4 QUALITY ASSURANCE

- A. Each manufactured product shall meet, as a minimum, the requirements specified, and shall be a standard commercial product of a manufacturer regularly presently manufacturing items of type specified.
- B. Each product type shall be the same and be made by the same manufacturer.
- C. Assembled product to the greatest extent possible before delivery to the site.

- D. Include additional features, which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product.

1.5 APPLICABLE PUBLICATIONS

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

BAmerican Society for Testing and Materials (ASTM):

A36/A36M	.....	Structural Steel Channels, Angles, Plates
A47-99	.....	Malleable Iron Castings
A48-03	.....	Gray Iron Castings
A53	.....	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
A123	.....	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
A269	.....	Seamless and Welded Austenitic Stainless Steel Tubing for General Service
A307	.....	Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
A653/A653M	.....	Steel Sheet, Zinc Coated (Galvanized) or Zinc- Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
A992/A992M	.....	Structural Steel Wide Flanged Shapes
B221	.....	Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
C1107	.....	Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
F436	.....	Hardened Steel Washers
F468	.....	Nonferrous Bolts, Hex Cap Screws, and Studs for General Use
F593-02	.....	Stainless Steel Bolts, Hex Cap Screws, and Studs
F1667	.....	Driven Fasteners: Nails, Spikes and Staples

D. American Welding Society (AWS):

D1.1-04	Structural Welding Code Steel
D1.2-03	.....	Structural Welding Code Aluminum
D1.3-98	.....	Structural Welding Code Sheet Steel

E. National Association of Architectural Metal Manufacturers (NAAMM)

AMP 500-505-1988	Metal Finishes Manual
------------------	-------	-----------------------

F. Structural Steel Painting Council (SSPC):

SP 1-05	.....	No. 1, Solvent Cleaning
SP 2-05	.....	No. 2, Hand Tool Cleaning

SP 3-05No. 3, Power Tool Cleaning

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Steel Wide Flange Shapes : ASTM A992.
- B. Structural Steel Channels, Angles, Plates: ASTM A36
- C. Stainless Steel: ASTM A167, Type 302 or 304.
- D. Aluminum, Extruded: ASTM B221, Alloy 6063-T5 unless otherwise specified.
For structural shapes use alloy 6061-T6 and alloy 6061-T4511.
- E. Cast-Iron: ASTM A48, Class 30, commercial pattern.
- FE. Malleable Iron Castings: ASTM A47.
- G. Primer Paint: As specified in Section 09 91 00, PAINTING.
- H. Modular Channel Units:
 - 1. Factory fabricated, channel shaped, cold formed sheet steel shapes, complete with fittings bolts and nuts required for assembly.
 - 2. Form channel with in turned pyramid shaped clamping ridges on each side.
 - 3. Provide case hardened steel nuts with serrated grooves in the top edges designed to be inserted in the channel at any point and be given a quarter turn so as to engage the channel clamping ridges. Provide each nut with a spring designed to hold the nut in place.
 - 4. Factory finish channels and parts with oven baked primer when exposed to view. Channels fabricated of ASTM A525, G90 galvanized steel may have primer omitted in concealed locations. Finish screws and nuts with zinc coating.
- I. Grout: ASTM C1107, pourable type.

2.2 HARDWARE

- A. Rough Hardware:
 - 1. Furnish rough hardware with a standard plating, applied after punching, forming and assembly of parts; galvanized, cadmium plated, or zinc-coated by electro-galvanizing process. Galvanized G-90 where specified.
 - 2. Use G90 galvanized coating on ferrous metal for exterior work unless non-ferrous metal is used.
- B. Fasteners:
 - 1. Bolts with Nuts:
 - a. ASTM A307 for 415 MPa (60,000 psi) tensile strength bolts.
 - b. ASTM F468 for nonferrous bolts.
 - c. ASTM F593 for stainless steel.
 - 2. Washers: ASTM F436, type to suit material and anchorage.
 - 3. Nails: ASTM F1667, Type I, style 6 or 14 for finish work.

2.3 FABRICATION GENERAL

A. Material

1. Use material as specified. Use material of commercial quality and suitable for intended purpose for material that is not named or its standard of quality not specified.
2. Use material free of defects which could affect the appearance or service ability of the finished product.

B. Size:

1. Size and thickness of members as shown.

C. Connections

1. Except as otherwise specified, connections may be made by welding, riveting or bolting.
2. Field riveting will not be approved.
3. Design size, number and placement of fasteners, to develop a joint strength of not less than the design value.
4. Holes, for rivets and bolts: Accurately punched or drilled undersized and required to final size.
5. Size and shape welds to develop the full design strength of the parts connected by welds and to transmit imposed stresses without permanent deformation or failure when subject to service loadings.
6. Use and bolts of material selected to prevent corrosion (electrolysis) at bimetallic contacts. Plated or coated material will not be approved.
7. Use stainless steel connectors for removable member's machine screws or bolts.

D. Fasteners and Anchors

1. Use methods for fastening or anchoring metal fabrications to building construction as shown or specified.
2. Where fasteners and anchors are not shown, design the type, size, location and spacing to resist the loads imposed without deformation of the members or causing failure of the anchor or fastener, and suit the sequence of installation.
3. Use material and finish of the fasteners compatible with the kinds of materials which are fastened together and their location in the finished work.
4. Fasteners for securing metal fabrications to new construction only, may be by use of threaded or wedge type inserts or by anchors for welding to the metal fabrication for installation before the concrete is placed or as masonry is laid.

5. Fasteners for securing metal fabrication to existing construction or new construction may be expansion bolts, toggle bolts, power actuated drive pins, welding, self drilling and tapping screws or bolts.

E. Workmanship

1. General:

- a. Fabricate items to design shown.
- b. Furnish members in longest lengths commercially available within the limits shown and specified.
- c. Fabricate straight, true, free from warp and twist, and where applicable square and in same plane.
- d. Provide holes, sinkages and reinforcement shown and required for fasteners and anchorage items.
- e. Provide openings, cut-outs, and tapped holes for attachment and clearances required for work of other trades.
- f. Prepare members for the installation and fitting of hardware.
- g. Cut openings in gratings and floor plates for the passage of ducts, sumps, pipes, conduits and similar items. Provide reinforcement to support cut edges.
- h. Fabricate surfaces and edges free from sharp edges, burrs and projections which may cause injury.

2. Welding:

- a. Weld in accordance with AWS standards as listed in article Applicable Publications.

3. Joining:

- a. Miter or butt members at corners.
- b. Where frames members are butted at corners, cut leg of frame member perpendicular to surface, as required for clearance.

4. Anchors:

- a. Provide as indicated.

5. Cutting and Fitting:

- a. Accurately cut, machine and fit joints, corners, copes, and miters.
- b. Fit removable members to be easily removed.
- c. Design and construct field connections in the most practical place for appearance and ease of installation.
- d. Fit pieces together as required.
- e. Fabricate connections for ease of assembly and disassembly without use of special tools.
- f. Joints firm when assembled.
- g. Conceal joining, fitting and welding on exposed work as far as practical.

- h. Do not show rivets and screws prominently on the exposed face.
- i. The fit of components and the alignment of holes shall eliminate the need to modify component or to use exceptional force in the assembly of item and eliminate the need to use other than common tools.

F. Finish:

1. Finish exposed surfaces in accordance with NAAMM Metal Finishes Manual.
2. Aluminum: NAAMM AMP 501.
 - a. Mill finish, AA-M10, as fabricated, use unless specified otherwise.
 - b. Clear anodic coating, AA-C22A41, chemically etched medium matte, with Architectural Class 1, 0.7 mils or thicker.
 - c. Colored anodic coating, AA-C22A42, chemically etched medium matte with Architectural Class 1, 0.7 mils or thicker.
 - d. Painted: AA-C22R10.
3. Steel and Iron: NAAMM AMP 504.
 - a. Zinc coated (Galvanized): ASTM A123, G90 unless noted otherwise.
 - b. Surfaces exposed in the finished work:
 - 1) Finish smooth rough surfaces and remove projections.
 - 2) Fill holes, dents and similar voids and depressions with epoxy type patching compound.
 - c. Shop Prime Painting:
 - 1) Surfaces of Ferrous metal:
 - a) Provide as defined in SSPC-SP2 and SP3.
 - 2) Non ferrous metals: Comply with MAAMM-500 series.

G. Protection:

1. Insulate aluminum surfaces that will come in contact with concrete, masonry, plaster, or metals other than stainless steel, zinc or white bronze by giving a coat of heavy-bodied alkali resisting bituminous paint or other approved paint in shop.
2. Spot prime all abraded and damaged areas of zinc coating which expose the bare metal, using zinc rich paint on hot-dip zinc coat items and zinc dust primer on all other zinc coated items.

2.4 SUPPORTS

A. General:

1. Fabricate structural steel shapes as shown.
2. Use clip angles or make provisions for welding hangers and braces to overhead construction.
3. Field connections may be welded or bolted.

B. For Ceiling Hung Toilet Stall:

1. Use a continuous steel channel above pilasters with hangers centered over pilasters.
2. Make provision for installation of stud bolts in lower flange of channel.
3. Provide a continuous steel angle at wall and channel braces spaced as shown.
4. Use threaded rod hangers.
5. Provide diagonal angle brace where the suspended ceiling over toilet stalls does not extend to side wall of room.

2.5 LOOSE LINTELS

- A. Furnish lintels of sizes shown.
- B. Fabricate lintels with not less than 150 mm (6 inch) bearing at each end for nonbearing masonry walls, and 200 mm (8 inch) bearing at each end for bearing walls.

2.6 SHELF ANGLES

- A. Fabricate from steel angles of size shown.
- B. Attach shelf angle as indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set work accurately, in alignment and where shown, plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.
- B. Items set into concrete or masonry.
 1. Provide temporary bracing for such items until concrete or masonry is set.
 2. Place in accordance with setting drawings and instructions.
 3. Build strap anchors, into masonry as work progresses.
- C. Set frames of gratings, covers, corner guards, trap doors and similar items flush with finish floor or wall surface and, where applicable, flush with side of opening.
- D. Field weld in accordance with AWS.
 1. Design and finish as specified for shop welding.
 2. Use continuous weld unless specified otherwise.
- E. Install anchoring devices and fasteners as shown and as necessary for securing metal fabrications to building construction as specified. Power

actuated drive pins may be used except for removable items and where members would be deformed or substrate damaged by their use.

- F. Spot prime all abraded and damaged areas of zinc coating as specified and all abraded and damaged areas of shop prime coat with same kind of paint used for shop priming.
- G. Isolate aluminum from dissimilar metals and from contact with concrete and masonry materials as required to prevent electrolysis and corrosion.

3.2 INSTALLATION OF SUPPORTS

A. Anchorage to structure.

- 1. Secure angles or channels and clips to overhead structural steel by continuous welding unless bolting is shown.
- 2. Secure supports to concrete inserts by bolting or continuous welding as shown.
- 3. Secure supports to mid height of concrete beams when inserts do not exist with expansion bolts and to slabs, with expansion bolts unless shown otherwise.
- 4. Secure steel plate or hat channels to studs as detailed.

B. Ceiling Hung Toilet Stalls:

- 1. Securely anchor hangers of continuous steel channel above pilasters to structure above.
- 2. Bolt continuous steel angle at wall to masonry or weld to face of each metal stud.
- 3. Secure brace for steel channels over toilet stall pilasters to wall angle supports with bolts at each end spaced as shown.
- 4. Install diagonal angle brace where the suspended ceiling over toilet stalls does not extend to side wall of room.
- 5. Install stud bolts in lower flange of channel before installing furred down ceiling over toilet stalls.
- 6. Install support for ceiling hung pilasters at entrance screen to toilet room similar to toilet stall pilasters.

3.3 STEEL LINTELS

- A. Use lintel sizes and combinations shown or specified unless noted otherwise.
- B. Install lintels with longest leg upstanding.
- C. Install lintels to have not less than 150 mm (6 inch) bearing at each end for nonbearing walls, and 200 mm (8 inch) bearing at each end for bearing walls.

3.4 SHELF ANGLES

- A. Anchor shelf angles with 19 mm (3/4 inch) bolts unless shown otherwise in adjustable malleable iron inserts, set level at elevation shown.

- B. Provide expansion space at end of members.

3.5 STEEL COMPONENTS FOR MILLWORK ITEMS

- A. Coordinate and deliver to Millwork fabricator for assembly where millwork items are secured to metal fabrications.

3.6 CLEANING AND ADJUSTING

- A. Adjust movable parts, including hardware to operate as designed without binding or deformation of the members centered in the opening or frame and, where applicable, contact surfaces fit tight and even without forcing or warping the components.
- B. Clean after installation exposed prefinished and plated items and items fabricated from aluminum and copper alloys, as recommended by the metal manufacture and protected from damage until completion of the project.

- - - E N D - - -

**SECTION 06 10 00
ROUGH CARPENTRY**

PART 1 - GENERAL

1.1 DESCRIPTION

Section specifies wood blocking, sheathing, furring, nailers, and rough hardware.

1.2 RELATED WORK

A. Milled woodwork: Section 06 20 00, FINISH CARPENTRY.

1.3 SUBMITTALS

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

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

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

1.5 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.
- B. American Forest and Paper Association (AF&PA):
National Design Specification for Wood Construction
T10105.....Wood Design Package including NDS
- C. American Institute of Timber Construction (AITC):
A190.1-02.....Structural Glued Laminated Timber
- D. American Society of Mechanical Engineers (ASME):
B18.2.1A-96(R2005).....Square and Hex Bolts and Screws
B18.2.2-87(R2005).....Square and Hex Nuts
B18.6.1-81 (R2008).....Wood Screws
B18.6.4-98(R2005).....Thread Forming and Thread Cutting Tapping Screws
and Metallic Drive Screws

- E. American Plywood Association (APA):
 - E30-07.....Engineered Wood Construction Guide
- F. American Society for Testing and Materials (ASTM):
 - D143-94(R2007).....Small Clear Specimens of Timber, Method of Testing
 - D1760-01.....Pressure Treatment of Timber Products
 - F844-07a.....Washers, Steel, Plan (Flat) Unhardened for General Use
 - F1667-05.....Nails, Spikes, and Staples
- G. Federal Specifications (Fed. Spec.):
 - MM-L-736D-08.....Lumber; Hardwood
- H. Forest Stewardship Council (FSC)
 - FSC STD 01 001.....(2000) Principles and Criteria for Forest Stewardship
- I. Green Seal (GS)
 - GS-36.....(2000) Commercial Adhesives
- J. Commercial Item Description (CID):
 - A-A-55615-95.....Shield, Expansion (Wood Screw and Lag Bolt Self Threading Anchors)
- K. Military Specification (Mil. Spec.):
 - MIL-L-19140E-97.....Lumber and Plywood, Fire-Retardant Treated
- L. South Coast Air Quality Management District (SCAQMD)
 - SCAQMD Rule 1168.....(1989; R2005) Adhesive and Sealant Applications
- M. Truss Plate Institute (TPI):
 - TPI 1-02.....Metal Plate Connected Wood Trusses
- N. U.S. Department of Commerce Product Standard (PS)
 - PS 1-95.....Construction and Industrial Plywood
 - PS 20-05.....American Softwood Lumber Standard

PART 2 - PRODUCTS

2.1 LUMBER

- A. Unless otherwise specified, each piece of lumber shall bear a grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.
 - 1. Identifying marks in accordance with rule or standard under which material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.
 - 2. Inspection agency for lumber approved by the Board of Review, American Lumber Standards Committee, to grade species used.

- B. Structural Members: Species and grade as listed in the AFPA, National Design Specification for Wood Construction having design stresses as shown.
- C. Lumber Other Than Structural:
 - 1. Unless otherwise specified, species graded under the grading rules of an inspection agency approved by Board of Review, American Lumber Standards Committee.
 - 2. Framing lumber: Minimum extreme fiber stress in bending of 1100.
 - 3. Furring, blocking, nailers and similar items 100 mm (4 inches) and narrower Standard Grade; and, members 150 mm (6 inches) and wider, Number 2 Grade.
- D. Sizes:
 - 1. Conforming to Prod. Std., PS20.
 - 2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.
- E. Moisture Content:
 - 1. At time of delivery and maintained at the site.
 - 2. Boards and lumber 50 mm (2 inches) and less in thickness: 19 percent or less.
 - 3. Lumber over 50 mm (2 inches) thick: 25 percent or less.
- F. Preservative Treatment:
 - 1. Do not treat Heart Redwood and Western Red Cedar.
 - 2. Preservative treat by the pressure method complying with ASTM D1760,

2.2 PLYWOOD

- A. Comply with Prod. Std., PS 1 and APA E30
- B. Bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of plywood which identifies compliance by veneer grade, group number, span rating where applicable, and glue type.
- C. Sheathing:
 - 1. APA rated Exposure 1 or Exterior; panel grade CD or better.
 - 2. Wall sheathing:
 - a. Minimum 9 mm (11/32 inch) thick with supports 400 mm (16 inches) on center and 12 mm (15/32 inch) thick with supports 600 mm (24 inches) on center unless specified otherwise.
 - b. Minimum 1200 mm (48 inches) wide at corners without corner bracing of framing.

2.3 ROUGH HARDWARE AND ADHESIVES

A. Washers

1. ASTM F844.
2. Use zinc or cadmium coated steel or cast iron for washers exposed to weather.

B. Screws:

1. Wood to Wood: ANSI B18.6.1 or ASTM C1002.
2. Wood to Steel: ASTM C954, or ASTM C1002.

C. Nails:

1. ASTM F1667:
 - a. Common: Type I, Style 10.
 - b. Concrete: Type I, Style 11.
 - c. Barbed: Type I, Style 26.
 - d. Underlayment: Type I, Style 25.
 - e. Masonry: Type I, Style 27.

2.4 BLOCKING

A. General: Provide miscellaneous lumber as indicated and lumber support or attachment for other construction, including the following:

1. Blocking
2. Nailers
3. Furring

PART 3 - EXECUTION

3.1 INSTALLATION OF FRAMING AND MISCELLANEOUS WOOD MEMBERS

A. Conform to applicable requirements of the following:

1. Comply with APA standards for installation of plywood.

B. Sheathing:

1. Lay panels with joints staggered, with edge and ends 3 mm (1/8 inch) apart and nailed over bearings as specified.
2. Set nails not less than 9 mm (3/8 inch) from edges.
3. Install 50 mm by 100 mm (2 inch by 4 inch) blocking spiked between studs to support edge or end joints of panels.

3.2 PROTECTION

- A. Protect rough carpentry from weather.
- B. If rough carpentry becomes wet, apply EPA-registered borate treatment complying with EPA registered label.

- - - E N D - - -

**SECTION 06 20 00
FINISH CARPENTRY**

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies exterior and interior millwork.

1.2 RELATED WORK

- A. Fabricated Metal brackets, bench supports and countertop legs: Section 05 50 00, METAL FABRICATIONS.
- B. Framing, furring and blocking: Section 06 10 00, ROUGH CARPENTRY.
- C. Wood doors: Section 08 14 00, WOOD DOORS.
- D. Color and texture of finish: Section 09 06 00, SCHEDULE FOR FINISHES.
- E. Stock Casework: Section 12 32 00, MANUFACTURED WOOD CASEWORK.
- F. Electrical light fixtures and duplex outlets: Division 26, ELECTRICAL.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings:
 - 1. Millwork items - Half full size scale for sections and details 1:50 (1/4-inch) for elevations and plans.
 - 2. Show construction and installation.
- C. Samples:

Plastic laminate, finished plywood or particleboard, 150 mm by 300 mm (six by twelve inches).
- D. Certificates:
 - 1. Indicating preservative treatment of materials meet the requirements specified.
 - 2. Indicating moisture content of materials meet the requirements specified.
- E. List of acceptable sealers for fire retardant and preservative treated materials.
- F. Manufacturer's literature and data:
 - 1. Finish hardware
 - 2. Sinks with fittings
 - 3. Electrical components

1.4 DELIVERY, STORAGE AND HANDLING

- A. Protect lumber and millwork from dampness, maintaining moisture content specified both during and after delivery at site.
- B. Store finishing lumber and millwork in weathertight well ventilated structures or in space in existing buildings designated by RE/COTR.

Store at a minimum temperature of 21°C (70°F) for not less than 10 days before installation.

- C. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.

1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society of Testing and Materials (ASTM):
- A36/A36M-08.....Structural Steel
 - A53-07.....Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless
 - A167-99 (R2004).....Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
 - B26/B26M-05.....Aluminum-Alloy Sand Castings
 - B221-08.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
 - E84-08a.....Surface Burning Characteristics of Building Materials
 - F436-07a.....Hardened Steel Washers
- C. American Hardboard Association (AHA):
- A135.4-04.....Basic Hardboard
- D. Builders Hardware Manufacturers Association (BHMA):
- A156.9-03.....Concealed Cabinet Hardware
 - A156.11-04.....Cabinet Locks
 - A156.16-08.....Auxiliary Hardware
 - A156.18-06.....Exposed Cabinet Hardware
- E. Hardwood Plywood and Veneer Association (HPVA):
- HP1-04.....Hardwood and Decorative Plywood
- F. American Society of Mechanical Engineers (ASME):
- B18.2.1-96(R2005).....Square and Hex Bolts and Screws (Inch Series)
- G. American Wood-Preservers' Association (AWPA):
- AWPA C1-03.....All Timber Products - Preservative Treatment by Pressure Processes
- H. Architectural Woodwork Institute (AWI):
- AWI-99.....Architectural Woodwork Quality Standards and Quality Certification Program
- I. National Electrical Manufacturers Association (NEMA):
- LD 3-05.....High-Pressure Decorative Laminates
 - LD 3.1-95.....Application, Fabrication and Installation of High-Pressure Decorative Laminates

J. U.S. Department of Commerce, Product Standard (PS):

PS1-87.....Construction and Industrial Plywood

PS20-07.....American Softwood Lumber Standard

K. Federal Specifications (Fed. Spec.):

A-A-1922A-06.....Shield Expansion

A-A-1936-06.....Contact Adhesive

FF-N-836E-94.....Nut, Square, Hexagon Cap, Slotted, Castle

FF-S-111D-00.....Screw, Wood

MM-L-736D-08.....Lumber, Hardwood

L. American National Standards Institute (ANSI)

Z124.3-05.....Plastic Lavatories

PART 2 - PRODUCTS

2.1 LUMBER

A. Sizes:

1. Lumber Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which product is produced.
2. Millwork, standing and running trim, and rails: Actual size as shown or specified.

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

C. Softwood: PS-20, exposed to view appearance grades:

1. Use C select or D select, vertical grain for transparent finish including stain transparent finish.
2. Use Prime for painted or opaque finish.

2.2 PLYWOOD

A. Softwood Plywood: PS1

1. Prod. Std.
2. Shelving Plywood:
 - a. Interior Type, any species group.
 - b. Veneer Grade: A-B or B-C.
3. Other: As specified for item.

B. Hardwood Plywood:

1. AHA A135.4

2.3 PARTICLEBOARD

A. NPA A208.1 Grade M-2

B. Do not use product with Urea Formaldayhyde.

2.4 PLASTIC LAMINATE

A. NEMA LD-3 Grades as indicated.

B. AWI Section 400

C. Plastic Laminate Work:

1. Factory glued to either a plywood or a particle board core, thickness as shown or specified.
2. Cover exposed edges with plastic laminate, except where aluminum, stainless steel, or plastic molded edge strips are shown or specified. Use plastic molded edge strips on 19 mm (3/4-inch) molded thick or thinner core material.
3. Provide plastic backing sheet on underside of countertops including back splashes and end splashes of countertops.
4. Use backing sheet on concealed large panel surface when decorative face does not occur.

D. Counter or Work Tops:

1. Fabrication with plastic laminate over 32 mm (1-1/4 inch) thick core unless shown otherwise.
 - a. Use decorative laminate for exposed edges of tops 38 mm (1-1/2 inches) wide and on back splash and end splash. Use plastic or metal edges for top edges less than 38 mm (1-1/2 inches) wide.
 - b. Assemble back splash and end splash to counter top.
 - c. Use one piece counters for straight runs.
 - d. Miter corners for field joints with overlapping blocking on underside of joint.

2.5 SOLID SURFACE COUTERTOPS

1. Comply with AWI Section 400 and ANSI and ANSI Z124.3 requirements for counter tops.

2.6 BUILDING BOARD (HARDBOARD)

- A. ANSI/AHA A135.4.

2.7 ADHESIVE

- A. For Plastic Laminate: Fed. Spec. A-A-1936.
- B. For Interior Millwork: Unextended urea resin, unextended melamine resin, phenol resin, or resorcinol resin.
- C. For Exterior Millwork: Unextended melamine resin, phenol resin, or resorcinol resin.

2.8 STAINLESS STEEL

ASTM A167, Type 302 or 304.

2.9 ALUMINUM CAST

ASTM B26

2.10 ALUMINUM EXTRUDED

ASTM B221

2.11 HARDWARE

- A. Rough Hardware:
1. Exposed Hardware: BHMA A156.18

2. Concealed Hardware: BHMA A156.9

3. Fasteners:

- a. Bolts with Nuts: FF-N-836.
- b. Expansion Bolts: A-A-1922A.
- c. Screws: Fed. Spec. FF-S-111.

B. Finish Hardware

1. Cabinet Hardware: ANSI A156.9.

- a. Door/Drawer Pulls: B02011 (Antimicrobial).
- b. Drawer Slides: B05051 for drawers over 150 mm (6 inches) deep, B05052 for drawers 75 mm to 150 mm (3 to 6 inches) deep, and B05053 for drawers less than 75 mm (3 inches) deep.
- c. Sliding Door Tracks: B07063.
- d. Adjustable Shelf Standards: B4061 with shelf rest B04083.
- e. Concealed Hinges: B1601, minimum 110 degree opening.
- f. Butt Hinges: B01361, for flush doors, B01381 for inset lipped doors, and B01521 for overlay doors.
- g. Cabinet Door Catch: B0371 or B03172.
- h. Vertical Slotted Shelf Standard: B04103 with shelf brackets B04113, sized for shelf depth.

2. Cabinet Locks: ANSI A156.11.

- a. Drawers and Hinged Door: E07262.
- b. Sliding Door: E07162.

3. Primers: Manufacturer's standard primer for steel providing baked enamel finish.

2.12 MOISTURE CONTENT

A. Moisture content of lumber and millwork at time of delivery to site.

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

2.13 FABRICATION

A. General:

- 1. Provide interior woodwork complying with referenced quality standard.
- 2. Except as otherwise specified, use AWI Custom Grade for architectural woodwork and interior millwork.
- 3. Finish woodwork shall be free from pitch pockets.
- 4. Except where special profiles are shown, trim shall be standard stock molding and members of the same species.
- 5. Plywood shall be not less than 13 mm (1/2 inch), unless otherwise shown or specified.
- 6. Edges of members in contact with concrete or masonry shall have a square corner caulking rebate.

7. Fabricate members less than 4 m (14 feet) in length from one piece of lumber, back channeled and molded as shown.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL REQUIREMENTS

- A. Maintain work areas and storage areas to a minimum temperature of 21°C (70°F) for not less than 10 days before and during installation of interior millwork.
- B. Do not install finish lumber or millwork in any room or space where wet process systems such as concrete, masonry, or plaster work are not complete and dry.

3.2 INSTALLATION

A. General:

1. Install to comply with AWI 1700.
2. Millwork receiving transparent finish shall be primed and back-painted on concealed surfaces. Set no millwork until primed and back-painted.
3. Secure trim with fine finishing nails, screws, or glue as required.
4. Set nails for putty stopping. Use washers under bolt heads where no other bearing plate occurs.
5. Seal cut edges of preservative and fire retardant treated wood materials with a certified acceptable sealer.
6. Coordinate with plumbing and electrical work for installation of fixtures and service connections in millwork items.
7. Plumb and level items unless shown otherwise.
8. Nail finish at each blocking, lookout, or other nailer and intermediate points; toggle or expansion bolt in place where nails are not suitable.
9. Exterior Work: Joints shall be close fitted, metered, tongue and grooved, rebated, or lapped to exclude water and made up in thick white lead paste in oil.
10. Install woodwork plumb and level to a tolerance of 3mm in 2400 mm (1/8" in 96").

- B. Install with butt joints in straight runs and miter at corners.

- - - E N D - - -

SECTION 07 21 13
THERMAL INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies thermal and acoustical insulation for buildings.
- B. Acoustical insulation is identified by thickness and words "Acoustical Insulation".

1.2 RELATED WORK

- A. Insulation for prefabricated metal buildings: Section 13 34 19, METAL BUILDING SYSTEMS.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 - 1. Insulation, each type used
 - 2. Adhesive, each type used.
 - 3. Tape
- C. Certificates: Stating the type, thickness and "R" value (thermal resistance) of the insulation to be installed.

1.4 STORAGE AND HANDLING

- A. Store insulation materials in weathertight enclosure.
- B. Protect insulation from damage from handling, weather and construction operations before, during, and after installation.

1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - C553-08.....Mineral Fiber Blanket Thermal Insulation for
Commercial and Industrial Applications
 - C578-08b.....Rigid, Cellular Polystyrene Thermal Insulation
 - C591-08.....Unfaced Preformed Rigid Cellular
Polyisocyanurate Thermal Insulation
 - C665-06.....Mineral Fiber Blanket Thermal Insulation for
Light Frame Construction and Manufactured
Housing
 - C954-07.....Steel Drill Screws for the Application of
Gypsum Panel Products or Metal Plaster Base to

Steel Studs From 0.033 (0.84 mm) inch to 0.112
inch (2.84 mm) in thickness

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

D312-00(R2006).....Asphalt Used in Roofing

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

PART 2 - PRODUCTS

2.1 INSULATION - GENERAL

- A. Where thermal resistance ("R" value) is specified or shown for insulation, the thickness shown on the drawings is nominal. Use only insulation with actual thickness that is not less than that required to provide the thermal resistance specified.
- B. Where "R" value is not specified for insulation, use the thickness shown on the drawings.
- C. Insulation Products shall comply with following minimum content standards for recovered materials:

Material Type	Percent by Weight
Polyisocyanurate/polyurethane/polystyrene	
Glass fiber reinforced	6 percent recovered material

2.2 POLYURETHANE AND POLYISOCYANURATE BOARD INSULATION

- A. ASTM C591, Type I, faced with a vapor retarder having a perm rating of not more than 0.5.

2.3 POLYSTYRENE BOARD

- A. ASTM C578, Type X for cavity walls.
- B. ASTM C578, Type IV, V, VI, VII, or IX where covered by soil or concrete.

2.4 GLASS FIBER BATT INSULATION

- A. ASTM 665, Type I, Unfaced
- B. ASTM 665, Type III, Faced
- C. ASTM C553, Type II, Acoustical

2.5 ADHESIVE

- A. As recommended by the manufacturer of the insulation.

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

C. Mortar: ASTM C270, Type 0.

2.6 TAPE

A. Pressure sensitive adhesive on one face.

B. Perm rating of not more than 0.50.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

- A. Install insulation with the vapor barrier facing the heated side, unless specified otherwise.
- B. Install rigid insulating units with joints close and flush, in regular courses and with cross joints broken.
- C. Install batt insulation with tight joints and filling framing void completely. Seal cuts, tears, and unlapped joints with tape.
- D. Fit insulation tight against adjoining construction and penetrations, unless specified otherwise.

3.2 POLYISO OR POLYURETHANE BOARD

- A. Bond polyurethane or polyisocyanurate board, to surfaces with adhesive as recommended by insulation manufacturer.

3.3 POLYSTYRENE BOARD

- A. Vertical insulation:
 - 1. Fill joints of insulation with same material used for bonding.
 - 2. Bond polystyrene board to surfaces with adhesive and applied in accordance with recommendations of insulation manufacturer.

3.4 GLASS FIBER BATT

- A. Pack insulation around door frames and windows and in building expansion joints, door soffits and other voids. Pack behind outlets around pipes, ducts, and services encased in walls. Open voids are not permitted. Hold insulation in place with pressure sensitive tape.
- B. Lap vapor retarder flanges together over face of framing for continuous surface. Seal all penetrations through the insulation.
- C. Fasten blanket insulation between metal studs or framing and exterior wall furring by continuous pressure sensitive tape along flanged edges.
- D. Roof Rafter Insulation or Floor Joist Insulation: Place mineral fiber blankets between framing to provide not less than a 50 mm (two inch) air space between insulation and roof sheathing or subfloor.
- E. Ceiling Insulation and Soffit Insulation:
 - 1. Fasten blanket insulation between wood framing or joist with nails or staples through flanged edges of insulation.

2. At metal framing or ceilings suspension systems, install blanket insulation above suspended ceilings or metal framing at right angles to the main runners or framing. Tape insulation tightly together so no gaps occur and metal framing members are covered by insulation.
3. In areas where suspended ceilings adjoin areas without suspended ceilings, install either blanket, batt, or mineral fiberboard extending from the suspended ceiling to underside of deck or slab above. Secure in place to prevent collapse or separation of hung blanket, batt, or board insulation and maintain in vertical position. Secure blanket or batt with continuous cleats to structure above.

3.5 ACOUSTICAL INSULATION

- A. Fasten blanket insulation between metal studs and wall furring with continuous pressure sensitive tape along edges or adhesive.
- B. Pack insulation around door frames and windows and in cracks, expansion joints, control joints, door soffits and other voids. Pack behind outlets, around pipes, ducts, and services encased in wall or partition. Hold insulation in place with pressure sensitive tape or adhesive.
- C. Do not compress insulation below required thickness except where embedded items prevent required thickness.
- D. Where acoustical insulation is installed above suspended ceilings install blanket at right angles to the main runners or framing. Extend insulation over wall insulation systems not extending to structure above.

- - - E N D - - -

SECTION 07 31 26
SLATE SHINGLES

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies the repair of broken, missing, or loose slate shingles secured to wood or plywood sheathing.

1.2 RELATED WORK

A. Flashing at projections through roof and other flashing: Section 07 60 00, FLASHING AND SHEET METAL.

1.3 INSTALLERS QUALIFICATIONS

Roofer shall be experienced in slate roofing work, and upon request, shall provide the names and addresses of three successfully completed, similar projects.

1.4 SUBMITTALS

A. Certification: Certify that the roofer is experienced in slate roofing work. When required by the Resident Engineer, provide project names as specified in Paragraph, INSTALLERS QUALIFICATIONS.

1.5 WARRANTY

Warranty materials and workmanship are to be free from defects and leaks for two years in accordance with requirements of Article "Warranty of Construction", FAR clause 52.246-21.

1.6 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
- C406-06.....Roofing Slate
 - F1667-05.....Driven Fasteners: Nails, Spikes and Staples

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Slate Match existing if tiles are broken.
- 1. ASTM C406, Grade S-1, unfading having no ribbons exposed to weather. Pre-punched or drilled with two nail holes per slate.
 - 2. Slate shall match existing slate for color, size, exposure and texture.
- B. Nails: ASTM F1667: Hard copper slating nails, 25 mm (one inch) longer than thickness of slate.

Long Island National Cemetery
Administration / Public Restroom
Renovation and New Equipment Building
PART 3 - EXECUTION

VA Project# 815 CM 3038
June 16, 2014

3.1 ROOFING FELT UNDERLAYMENT

- A. Existing to remain

3.2 INSTALLING SLATE

- A. Lay slate with standard three inch head lap, nail each slate with two nails concealed by the head laps.

- - - E N D - - -

**SECTION 07 84 00
FIRESTOPPING**

PART 1 GENERAL

1.1 DESCRIPTION

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

1.2 RELATED WORK

- A. Sealants and application: Section 07 92 00, JOINT SEALANTS.
- B. Fire and smoke damper assemblies in ductwork: Section 23 31 00, HVAC DUCTS AND CASINGS, Section 23 37 00, AIR OUTLETS AND INLETS.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturers literature, data, and installation instructions for types of firestopping and smoke stopping used.
- C. List of FM, UL, or WH classification number of systems installed.
- D. Certified laboratory test reports for ASTM E814 tests for systems not listed by FM, UL, or WH proposed for use.

1.4 DELIVERY AND STORAGE

- A. Deliver materials in their original unopened containers with manufacturer's name and product identification.
- B. Store in a location providing protection from damage and exposure to the elements.

1.5 WARRANTY

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

1.6 QUALITY ASSURANCE

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

1.7 APPLICABLE PUBLICATIONS

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

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

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

E814-08.....Fire Tests of Through-Penetration Fire Stops

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

Annual Issue Approval Guide Building Materials

D. Underwriters Laboratories, Inc. (UL):

Annual Issue Building Materials Directory

Annual Issue Fire Resistance Directory

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

E. Warnock Hersey (WH):

Annual Issue Certification Listings

PART 2 - PRODUCTS

2.1 FIRESTOP SYSTEMS

- A. Use either factory built (Firestop Devices) or field erected (through-Penetration Firestop Systems) to form a specific building system maintaining required integrity of the fire barrier and stop the passage of gases or smoke.
- B. Through-penetration firestop systems and firestop devices tested in accordance with ASTM E814 or UL 1479 using the "F" or "T" rating to maintain the same rating and integrity as the fire barrier being sealed. "T" ratings are not required for penetrations smaller than or equal to 100 mm (4 in) nominal pipe or 0.01 m² (16 sq. in.) in overall cross sectional area.
- C. Products requiring heat activation to seal an opening by its intumescence shall exhibit a demonstrated ability to function as designed to maintain the fire barrier.
- D. Firestop sealants used for firestopping or smoke sealing shall have following properties:
 - 1. Contain no flammable or toxic solvents.
 - 2. Have no dangerous or flammable out gassing during the drying or curing of products.
 - 3. Water-resistant after drying or curing and unaffected by high humidity, condensation or transient water exposure.
 - 4. When used in exposed areas, shall be capable of being sanded and finished with similar surface treatments as used on the surrounding wall or floor surface.

- E. Firestopping system or devices used for penetrations by glass pipe, plastic pipe or conduits, unenclosed cables, or other non-metallic materials shall have following properties:
 - 1. Classified for use with the particular type of penetrating material used.
 - 2. Penetrations containing loose electrical cables, computer data cables, and communications cables protected using firestopping systems that allow unrestricted cable changes without damage to the seal.
 - 3. Intumescent products which would expand to seal the opening and act as fire, smoke, toxic fumes, and, water sealant.
- F. Maximum flame spread of 25 and smoke development of 50 when tested in accordance with ASTM E84.
- G. FM, UL, or WH rated or tested by an approved laboratory in accordance with ASTM E814.
- H. Materials to be asbestos free.

2.2 SMOKE STOPPING IN SMOKE PARTITIONS

- A. Use silicone sealant in smoke partitions as specified in Section 07 92 00, JOINT SEALANTS.
- B. Use mineral fiber filler and bond breaker behind sealant.
- C. Sealants shall have a maximum flame spread of 25 and smoke developed of 50 when tested in accordance with E84.
- D. When used in exposed areas capable of being sanded and finished with similar surface treatments as used on the surrounding wall or floor surface.

PART 3 - EXECUTION

3.1 EXAMINATION

Submit product data and installation instructions, as required by article, submittals, after an on site examination of areas to receive firestopping.

3.2 PREPARATION

- A. Remove dirt, grease, oil, loose materials, or other substances that prevent adherence and bonding or application of the firestopping or smoke stopping materials.
- B. Remove insulation on insulated pipe for a distance of 150 mm (six inches) on either side of the fire rated assembly prior to applying the

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

3.3 INSTALLATION

- A. Do not begin work until the specified material data and installation instructions of the proposed firestopping systems have been submitted and approved.
- B. Install firestopping systems with smoke stopping in accordance with FM, UL, WH, or other approved system details and installation instructions.
- C. Install smoke stopping seals in smoke partitions.

3.4 CLEAN-UP AND ACCEPTANCE OF WORK

- A. As work is completed, remove materials, litter, and debris.
- B. Do not move materials and equipment to the next-scheduled work area until completed work is inspected and accepted by the Resident Engineer.
- C. Clean up spills of liquid type materials.

- - - E N D - - -

SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION:

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

1.2 RELATED WORK:

- A. Sealing of site work concrete paving: Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.
- B. Firestopping penetrations: Section 07 84 00, FIRESTOPPING.
- C. Glazing: Section 08 80 00, GLAZING.
- D. Section 08 41 13, ALUMINUM FRAMED ENTRANCES AND STOREFRONTS.
- E. Sound rated gypsum partitions/sound sealants: Section 09 29 00, GYPSUM BOARD.
- F. Mechanical Work: Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING
Section 23 05 11, COMMON WORK RESULTS FOR HVAC AND STEAM GENERATION.

1.3 QUALITY CONTROL:

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
 - 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
 - 3. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.
- D. VOC: Acrylic latex and Silicon sealants shall have less than 50g/l VOC content.

1.4 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's installation instructions for each product used.
- C. Cured samples of exposed sealants for each color where required to match adjacent material.
- D. Manufacturer's Literature and Data:
 - 1. Caulking compound
 - 2. Primers
 - 3. Sealing compound, each type, including compatibility when different sealants are in contact with each other.

1.5 PROJECT CONDITIONS:

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

1.6 DELIVERY, HANDLING, AND STORAGE:

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

1.7 DEFINITIONS:

- A. Definitions of terms in accordance with ASTM C717 and as specified.
- B. Back-up Rod: A type of sealant backing.

Long Island National Cemetery
Administration / Public Restroom
Renovation and New Equipment Building

VA Project# 815 CM 3038
June 16, 2014

C. Bond Breakers: A type of sealant backing.

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

1.8 WARRANTY:

- A. Warranty exterior sealing against leaks, adhesion, and cohesive failure, and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be extended to two years.
- B. General Warranty: Special warranty specified in this Article shall not deprive Government of other rights Government may have under other provisions of Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of Contract Documents.

1.9 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Society for Testing and Materials (ASTM):
- C509-06.....Elastomeric Cellular Preformed Gasket and Sealing Material.
 - C612-04.....Mineral Fiber Block and Board Thermal Insulation.
 - C717-09.....Standard Terminology of Building Seals and Sealants.
 - C834-05.....Latex Sealants.
 - C919-08.....Use of Sealants in Acoustical Applications.
 - C920-08.....Elastomeric Joint Sealants.
 - C1021-08.....Laboratories Engaged in Testing of Building Sealants.
 - C1193-09.....Standard Guide for Use of Joint Sealants.
 - C1330-02 (R2007).....Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
 - D1056-07.....Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
 - E84-09.....Surface Burning Characteristics of Building Materials.
- C. Sealant, Waterproofing and Restoration Institute (SWRI).
The Professionals' Guide

PART 2 - PRODUCTS

2.1 SEALANTS:

A. S-1:

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

B. S-2:

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

C. S-3:

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

D. S-4:

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

E. S-5:

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

F. S-6:

1. ASTM C920, silicone, neutral cure.
2. Type S.
3. Class: Joint movement range of plus 100 percent to minus 50 percent.
4. Grade NS.

Long Island National Cemetery
Administration / Public Restroom
Renovation and New Equipment Building

VA Project# 815 CM 3038
June 16, 2014

5. Shore A hardness of 15-20.
6. Minimum elongation of 1200 percent.

G. S-7:

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

H. S-8:

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

I. S-9:

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

J. S-10:

1. ASTM C920, coal tar extended fuel resistance polyurethane.
2. Type M/S.
3. Class 25.
4. Grade P/NS.
5. Shore A hardness of 15-20.

K. S-11:

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

L. S-12:

1. ASTM C920, polyurethane.
2. Type M/S.

3. Class 25, joint movement range of plus or minus 50 percent.
4. Grade P/NS.
5. Shore A hardness of 25 to 50.

2.2 CAULKING COMPOUND:

- A. C-1: ASTM C834, acrylic latex.
- B. C-2: One component acoustical caulking, non drying, non hardening, synthetic rubber.

2.3 COLOR:

- A. Sealants used with exposed masonry shall match color of mortar joints.
- B. Sealants used with unpainted concrete shall match color of adjacent concrete.
- C. Color of sealants for other locations shall be light gray or aluminum, unless specified otherwise.
- D. Caulking shall be light gray or white, unless specified otherwise.

2.4 JOINT SEALANT BACKING:

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

2.5 FILLER:

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

2.6 PRIMER:

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

2.7 CLEANERS-NON POURIOUS SURFACES:

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

PART 3 - EXECUTION

3.1 INSPECTION:

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

3.2 PREPARATIONS:

- A. Prepare joints in accordance with manufacturer's instructions and SWRI.
- B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.
 - 1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.
 - 2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.

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

3.3 BACKING INSTALLATION:

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

3.4 SEALANT DEPTHS AND GEOMETRY:

- A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.
- B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm (1/2 inch) maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

3.5 INSTALLATION:

- A. General:
 - 1. Comply with manufacturer's written installation instructions for products and applications indicated.

- B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise.
- C. Where gypsum board partitions are of sound rated, fire rated, or smoke barrier construction, follow requirements of ASTM C919 only to seal all cut-outs and intersections with the adjoining construction unless specified otherwise.
 - 1. Apply a 6 mm (1/4 inch) minimum bead of sealant each side of runners (tracks), including those used at partition intersections with dissimilar wall construction.
 - 2. Coordinate with application of gypsum board to install sealant immediately prior to application of gypsum board.
 - 3. Partition intersections: Seal edges of face layer of gypsum board abutting intersecting partitions, before taping and finishing or application of veneer plaster-joint reinforcing.
 - 4. Openings: Apply a 6 mm (1/4 inch) bead of sealant around all cut-outs to seal openings of electrical boxes, ducts, pipes and similar penetrations. To seal electrical boxes, seal sides and backs.
 - 5. Control Joints: Before control joints are installed, apply sealant in back of control joint to reduce flanking path for sound through control joint.

3.6 CLEANING:

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

3.7 LOCATIONS:

- A. Exterior Building Joints, Horizontal and Vertical:
 - 1. Metal to Metal: Type S-1, S-2
 - 2. Metal to Masonry or Stone: Type S-1
 - 3. Masonry to Masonry or Stone: Type S-1
 - 4. Stone to Stone: Type S-1
 - 5. Cast Stone to Cast Stone: Type S-1
 - 6. Threshold Setting Bed: Type S-1, S-3, S-4
 - 7. Masonry Expansion and Control Joints: Type S-6
 - 8. Wood to Masonry: Type S-1
- B. Metal Reglets and Flashings:
 - 1. Flashings to Wall: Type S-6

Long Island National Cemetery
Administration / Public Restroom
Renovation and New Equipment Building

VA Project# 815 CM 3038
June 16, 2014

2. Metal to Metal: Type S-6

C. Sanitary Joints:

1. Walls to Plumbing Fixtures: Type S-9

2. Counter Tops to Walls: Type S-9

3. Pipe Penetrations: Type S-9

D. Horizontal Traffic Joints:

1. Concrete Paving, Unit Pavers: Type S-11 or S-12

E. Interior Caulking:

1. Typical Narrow Joint 6 mm, (1/4 inch) or less at Walls and Adjacent Components: Types C-1, C-2 and C-3.

2. Perimeter of Doors, Windows, Access Panels which Adjoin Concrete or Masonry Surfaces: Types C-1, C-2 and C-3.

3. Joints at Masonry Walls and Columns, Piers, Concrete Walls or Exterior Walls: Types C-1, C-2 and C-3.

4. Exposed Isolation Joints at Top of Full Height Walls: Types C-1, C-2 and C-3.

5. Exposed Acoustical Joint at Sound Rated Partitions Type C-2.

6. Concealed Acoustic Sealant Type S-4, C-1, C-2 and C-3.

- - - E N D - - -