

EXTERIOR RESTORATION AND WATERPROOFING SPECIFICATIONS

CHARLIE NORWOOD VETERAN AFFAIRS MEDICAL CENTER
1 FREEDOM WAY
AUGUSTA, GEORGIA 30904

VA PROJECT NO. #509-14-104
REI PROJECT NO. 1352.001

Prepared For
DEPARTMENT OF VETERAN AFFAIRS
VISN 7 NETWORKING CONTRACTING ACTIVITY
501 GREENE STREET
HATCHER BUILDING - SUITE 2
AUGUSTA, GEORGIA 30901

Prepared By
RAYMOND ENGINEERING-GEORGIA, LLC
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12/04/2015



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**DEPARTMENT OF VETERANS AFFAIRS
VHA MASTER SPECIFICATIONS**

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BID FORM

PROJECT INFORMATION: EXTERIOR RESTORATION AND WATERPROOFING
CHARLIE NORWOOD VETERAN AFFAIRS MEDICAL CENTER
1 FREEDOM WAY
AUGUSTA, GEORGIA 30904

CONTRACT IDENTIFICATION AND NUMBER: VA PROJECT NO. #509-14-104
REI Project No. 1352.001

BID PREPARATION DATE: _____

CALENDER DAYS TO COMPLETE CONTRACT:_____

THIS BID IS SUBMITTED TO: COR Representative for the project

- 1.1 The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to furnish all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in the Bid and in accordance with the other terms and conditions of the Contract Documents.
- 1.2 BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for sixty days after the day of Bid opening. BIDDER will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within fifteen days after the date of OWNER'S Notice of Intent to Award.
- 1.3 In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:
- 1.4 BIDDER has examined copies of all Bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

[illegible]

- 1.5 BIDDER had familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

- 1.6 BIDDER has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies which pertain to the physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as BIDDER considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents.
- 1.7 BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- 1.8 BIDDER has given ENGINEER written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolutions thereof by ENGINEER is acceptable to BIDDER.
- 1.9 This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other BIDDER to submit a false or sham BID; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or OWNER.
- 1.10 BIDDER will complete the Work for the following price(s):
- A. BASE BID: _____
(WORDS)
- B. BASE BID.....\$ _____
- 1.11 Alternate No. 1:
- A. (Deduct)ALTERNATE NO.1: _____
(WORDS)
- B. (Deduct)ALTERNATE NO. 1.....\$ _____
- 1.12 Alternate No. 2:
- A. (Deduct)ALTERNATE NO.2: _____
(WORDS)
- B. (Deduct)ALTERNATE NO. 2.....\$ _____
- 1.13 It is the intent of the Owner to issue a Letter of Intent to Award within as stated in the General Conditions.
- 1.14 Construction operations shall be substantially complete as listed in the Conditions of the Contract.

1.15 All specific cash allowances are included in the price(s) set forth above.

1.16 Unit Prices included in the Bid Form:

UNIT PRICE SCHEDULE

<u>NO.</u>	<u>ITEM</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>ALLOWANCE</u>
1.	Small crack repair. Included in Base Bid = (Unit Price x Allowance) =	LF	\$_____	500 LF
2.	Large crack repair. Included in Base Bid = (Unit Price x Allowance) =	LF	\$_____	250 LF
3.	Priming and repair of damaged concrete reinforcement. Included in Bid = (Unit Price x Allowance) =	LF	\$_____	125 LF
4.	Repair spalled concrete. Included in Bid = (Unit Price x Allowance) =	SF	\$_____	1,500 SF
5.	Enlarge control joints. Included in Bid = (Unit Price x Allowance) =	LF	\$_____	4,000 LF

1.17 BIDDER agrees that the Work:

- A. will be substantially complete and completed and ready for final payment in accordance with the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- B. BIDDER acknowledges that there are no provisions for extending the project due to adverse weather conditions, and that the BIDDER will adequately staff the project to overcome possible weather delays.

1.18 BIDDER acknowledges that this project has specific staffing requirements during waterproofing operations and agrees to meet these requirements.

1.19 BIDDER has also provided a letter of intent from the materials manufacturer to provide a guarantee in accordance with the requirements of the Specification.

If BIDDER is:

A Partnership

By _____
(Firm Name)

(SEAL)

(general partner)

Business address: _____

Phone No: _____

A Corporation

By _____
(Corporation name)

(State of Incorporation)

By _____
(name of person authorized to sign)

(Title)

(Corporate Seal)

Attest _____
(Secretary)

Business address: _____

Phone No: _____

A Joint Venture

By _____
(Name)

(Address)

By _____
A. (Name)

B. (Address)

(Each joint venture member must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above.)

END OF SECTION 00 41 00

**SECTION 01 00 00
GENERAL REQUIREMENTS**

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SECTION 01 00 00
GENERAL REQUIREMENTS

1.1 SAFETY REQUIREMENTS

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

1.2 GENERAL INTENTION

- A. Contractor shall completely prepare site for building operations, including demolition and removal of existing structures, and furnish labor and materials and perform work for EXTERIOR RESTORATION AND WATERPROOFING, PROJECT #509-14-104 CHARLIE NORWOOD VAMC, AUGUSTA, GA as required by drawings and specifications.
- B. Visits to the site by Bidders may be made only by appointment with the Medical Center Engineering Officer.
- C. Offices of RAYMOND ENGINEERING-GEORGIA, LLC, as Architect-Engineers, will render certain technical services during construction. Such services shall be considered as advisory to the Government and shall not be construed as expressing or implying a contractual act of the Government without affirmations by Contracting Officer or his duly authorized representative.
- D. Before placement and installation of work subject to tests by testing laboratory retained by Department of Veterans Affairs, the Contractor shall notify the COR in sufficient time to enable testing laboratory personnel to be present at the site in time for proper taking and testing of specimens and field inspection. Such prior notice shall be not less than three work days unless otherwise designated by the COR.
- E. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.

1.3 STATEMENT OF BID ITEM(S)

- A. BASE BID:
1. ITEM I, WATERPROOFING/GENERAL CONSTRUCTION: Work includes all labor, material, equipment and supervision to perform the required waterproofing and miscellaneous work on this project including, but

not limited to, exterior wall restoration, window washing, retaining wall excavation and waterproofing, expansion joint replacement at walls and plazas, guardrail restoration and replacement, and recessed window water stops.

B. ALTERNATE(S):

1. **DEDUCTIVE ALTERNATE NO.1:** Clean the exterior concrete surfaces, including concrete wall panels, retaining walls, concrete beams, and concrete columns as specified herein. Omit the specification requirement to install the silane water repellent existing concrete wall panels as specified herein. Refer to Section 07 19 16 of this specification.
2. **DEDUCTIVE ALTERNATE NO. 2:** Omit the specification requirement to install metal expansion joint covers over the impregnated foam expansion joints.

C. UNIT PRICES:

1. **VARIATION IN ESTIMATED QUANTITY (APR 1984):** If the quantity of a unit-priced item in this contract is an estimated quantity and the actual quantity of the unit-priced item varies more than 15 percent above or below the estimated quantity, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the Contracting Officer within 10 days from the beginning of the delay, or within such further period as may be granted by the Contracting Officer before the date of final settlement of the contract. Upon the receipt of a written request for an extension, the Contracting Officer shall ascertain the facts and make an adjustment for extending the completion date as, in the judgment of the Contracting Officer, is justified.
2. **For a Schedule of Unit Prices and allowances to be included in the Contract, refer to Section 01 22 13 of this specification.**

1.4 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

- A. Drawings and contract documents may be obtained from the website where the solicitation is posted. Additional copies will be at Contractor's expense.

1.5 CONSTRUCTION SECURITY REQUIREMENTS**A. Security Plan:**

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

B. Security Procedures:

1. General Contractor's employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.
2. Before starting work the General Contractor shall give one week's notice to the Contracting Officer so that security arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
3. No photography of VA premises is allowed without written permission of the Contracting Officer.
4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer.

C. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the Contracting officers representative (COR) for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.

D. Document Control:

1. Before starting any work, the General Contractor/Sub Contractors shall submit an electronic security memorandum describing the approach to following goals and maintaining confidentiality of "sensitive information".
2. The General Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared only with those with a specific need to accomplish the project.
3. Certain documents, sketches, videos or photographs and drawings may be marked "Law Enforcement Sensitive" or "Sensitive Unclassified". Secure such information in separate containers and limit the access to only those who will need it for the project. Return the information to the Contracting Officer upon request.
4. These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.
5. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA.
6. Notify Contracting Officer and Site Security Officer immediately when there is a loss or compromise of "sensitive information".
7. All electronic information shall be stored in specified location following VA standards and procedures using an Engineering Document Management Software (EDMS).
 - a. Security, access and maintenance of all project drawings, both scanned and electronic shall be performed and tracked through the EDMS system.
 - b. "Sensitive information" including drawings and other documents may be attached to e-mail provided all VA encryption procedures are followed.

E. Motor Vehicle Restrictions

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours

before the date and time of access. Access shall be restricted to picking up and dropping off materials and supplies.

2. A limited number of (2 to 5) permits shall be issued for General Contractor and its employees for parking in designated areas only.

1.6 OPERATIONS AND STORAGE AREAS

- A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
- B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

(FAR 52.236-10)

- D. Working space and space available for storing materials shall be as determined by the Resident Engineer or COR.
- E. Workmen are subject to rules of Medical Center applicable to their conduct.

F. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by COR where required by limited working space.

1. Do not store materials and equipment in other than assigned areas.
2. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities sufficient for not more than two work days. Provide unobstructed access to Medical Center areas required to remain in operation.
3. Where access by Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.

G. Phasing:

1. The Medical Center must maintain its operation 24 hours a day 7 days a week. Therefore, any interruption in service must be scheduled and coordinated with the COR to ensure that no lapses in operation occur. It is the CONTRACTOR'S responsibility to develop a work plan and schedule detailing, at a minimum, the procedures to be employed, the equipment and materials to be used, the interim life safety measure to be used during the work, and a schedule defining the duration of the work with milestone subtasks.

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

1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of Resident Engineer or COR. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without a detailed work plan, the Medical Center Director's prior knowledge and written approval. Refer to specification Sections 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, 27 05 11 REQUIREMENTS FOR COMMUNICATIONS INSTALLATIONS and 28 05 11, REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY INSTALLATIONS for additional requirements.
 2. Contractor shall submit a request to interrupt any such services to Resident Engineer or COR, in writing, 3 weeks in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
 3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center. Interruption time approved by Medical Center may occur at other than Contractor's normal working hours.
 4. Major interruptions of any system must be requested, in writing, at least 30 calendar days prior to the desired time and shall be performed as directed by the COR.
 5. In case of a contract construction emergency, service will be interrupted on approval of COR. Such approval will be confirmed in writing as soon as practical.
 6. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.
- I. To minimize interference of construction activities with flow of Medical Center traffic, comply with the following:

1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles.
 2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the COR.
- J. Coordinate the work for this contract with other construction operations as directed by COR. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

1.7 ALTERATIONS

- A. Survey: Before any work is started, the Contractor shall make a thorough survey with the COR in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by both to the Contracting Officer. This report shall list by rooms and spaces:
1. Existing condition and types of resilient flooring, doors, windows, walls and other surfaces not required to be altered throughout affected areas of building.
 2. Shall note any discrepancies between drawings and existing conditions at site.
 3. Shall designate areas for working space, materials storage and routes of access to areas within buildings where alterations occur and which have been agreed upon by Contractor and COR.
- B. Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of COR, to be in such condition that their use is impossible or impractical, shall be furnished and/or replaced by Contractor with new items in accordance with specifications which will be furnished by Government. Provided the contract work is changed by reason of this subparagraph B, the contract will be modified accordingly, under provisions of clause entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).
- C. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and COR together shall make a thorough re-survey of the areas of buildings involved. They shall furnish a report on conditions then existing, of resilient flooring, doors, windows, walls

and other surfaces as compared with conditions of same as noted in first condition survey report:

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

D. Protection: Provide the following protective measures:

1. Wherever existing roof surfaces are disturbed they shall be protected against water infiltration. In case of leaks, they shall be repaired immediately upon discovery.
2. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.
3. Protection of interior of existing structures at all times, from damage, dust and weather inclemency. Wherever work is performed, floor surfaces that are to remain in place shall be adequately protected prior to starting work, and this protection shall be maintained intact until all work in the area is completed.

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

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

facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

(FAR 52.236-9)

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

1.9 RESTORATION

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

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

1.10 PHYSICAL DATA

- A. Government does not guarantee that other materials will not be encountered nor that proportions, conditions or character of several materials will not vary from those indicated by explorations. Bidders are expected to examine site of work and logs of borings; and, after investigation, decide for themselves character of materials and make their bids accordingly. Upon proper application to Department of Veterans Affairs, bidders will be permitted to make subsurface explorations of their own at site.

1.11 PROFESSIONAL SURVEYING SERVICES

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

1.12 LAYOUT OF WORK

- A. The Contractor shall lay out the work from Government established base lines and bench marks, indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at Contractor's own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through Contractor's negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

(FAR 52.236-17)

1.13 AS-BUILT DRAWINGS

- A. The contractor shall maintain two full size sets of as-built drawings which will be kept current during construction of the project, to include all contract changes, modifications and clarifications.
- B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, as-built drawings shall be made available for the COR review, as often as requested.
- C. Contractor shall deliver two approved completed sets of as-built drawings to the COR within 15 calendar days after the acceptance of the project by the COR.
- D. Paragraphs A, B, & C shall also apply to all shop drawings.

1.14 USE OF ROADWAYS

- A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the COR, such temporary roads which are necessary in the performance of contract work.

1.15 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Use of electrical outlets to provide heat, ventilation, plumbing, light and power will be permitted subject to written approval and compliance with the following provisions:
 - 1. Permission to use electrical outlets must be given by COR in writing. If the equipment is not installed and maintained in accordance with the written agreement and following provisions, the COR will withdraw permission for use of the equipment.
 - 2. Owner will furnish electricity to the Contractor during this project only at available electrical outlets located on the exterior of the building. Any additional electrical requirements required by the Contractor shall be provided by the Contractor at no additional cost to the Owner.
 - 3. All wiring needed to facilitate construction of the project shall be temporary in nature and shall be furnished and installed by the Contractor at no additional cost to the Owner. Upon completion of the work, the Contractor shall remove all such temporary wiring and restore service to its original condition at no additional cost to the Owner.

4. Electrical installations used by the equipment shall be completed in accordance with the COR direction to prevent damage to the equipment and the electrical systems, i.e. transformers, relays, circuit breakers, fuses, conductors, motor controllers and their overload elements shall be properly sized, coordinated and adjusted. Installation of temporary electrical equipment or devices shall be in accordance with NFPA 70, National Electrical Code, (2014 Edition), Article 590, *Temporary Installations*. Voltage supplied to each item of equipment shall be verified to be correct and it shall be determined that motors are not overloaded. The electrical equipment shall be thoroughly cleaned before using it and again immediately before final inspection including vacuum cleaning and wiping clean interior and exterior surfaces.

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

1.16 TEMPORARY USE OF EXISTING ELEVATORS

A. Use of existing elevators for handling building materials and Contractor's personnel will be permitted subject to following provisions:

1. Contractor makes all arrangements with the COR for use of elevators. The COR will ascertain that elevators are in proper condition. Contractor may use any elevator on the service side. No passenger elevators may be used at any time by the Contractor. Contractor covers and provides maximum protection of following elevator components:

- a. Entrance jambs, heads soffits and threshold plates.
- b. Entrance columns, canopy, return panels and inside surfaces of car enclosure walls.
- c. Finish flooring.

1.17 TEMPORARY TOILETS

A. Provide where directed, (for use of all Contractor's workmen) ample temporary sanitary toilet accommodations with suitable sewer and water connections; or, when approved by COR, provide suitable dry closets where directed. Keep such places clean and free from flies, and all

connections and appliances connected therewith are to be removed prior to completion of contract, and premises left perfectly clean.

- B. Contractor may have for use of Contractor's workmen, such toilet accommodations as may be assigned to Contractor by Medical Center. Contractor shall keep such places clean and be responsible for any damage done thereto by Contractor's workmen. Failure to maintain satisfactory condition in toilets will deprive Contractor of the privilege to use such toilets.

1.18 AVAILABILITY AND USE OF UTILITY SERVICES

- A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The amount to be paid by the Contractor for chargeable electrical services shall be the prevailing rates charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge.
- B. The Contractor, at Contractor's expense and in a workmanlike manner, in compliance with code and as satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of electricity used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia and repair restore the infrastructure as required.
- C. Contractor shall install meters at Contractor's expense and furnish the Medical Center a monthly record of the Contractor's usage of electricity as hereinafter specified.
- D. Heat: Furnish temporary heat necessary to prevent injury to work and materials through dampness and cold. Use of open salamanders or any temporary heating devices which may be fire hazards or may smoke and damage finished work, will not be permitted. Maintain minimum temperatures as specified for various materials:
 - 1. Obtain heat by connecting to Medical Center heating distribution system.

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

1. Obtain electricity by connecting to the Medical Center electrical distribution system. The Contractor shall meter and pay for electricity required for electric cranes and hoisting devices, electrical welding devices and any electrical heating devices providing temporary heat. Electricity for all other uses is available at no cost to the Contractor.

F. Water (for Construction and Testing): Furnish temporary water service.

1. Obtain water by connecting to the Medical Center water distribution system. Provide reduced pressure backflow preventer at each connection as per code. Water is available at no cost to the Contractor.
2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at COR discretion) of use of water from Medical Center's system.

G. Fuel: Natural and LP gas and burner fuel oil required for boiler cleaning, normal initial boiler-burner setup and adjusting, and for performing the specified boiler tests will be furnished by the Government. Fuel required for prolonged boiler-burner setup, adjustments, or modifications due to improper design or operation of boiler, burner, or control devices shall be furnished and paid by the Contractor at Contractor's expense.

1.19 INSTRUCTIONS

- A. Contractor shall furnish Maintenance and Operating manuals (hard copies and electronic) and verbal instructions when required by the various sections of the specifications and as hereinafter specified.
- B. Manuals: Maintenance and operating manuals and one compact disc (four hard copies and one electronic copy each) for each separate piece of equipment shall be delivered to the COR coincidental with the delivery of the equipment to the job site. Manuals shall be complete, detailed guides for the maintenance and operation of equipment. They shall include complete information necessary for starting, adjusting, maintaining in continuous operation for long periods of time and

dismantling and reassembling of the complete units and sub-assembly components. Manuals shall include an index covering all component parts clearly cross-referenced to diagrams and illustrations. Illustrations shall include "exploded" views showing and identifying each separate item. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment, component, accessory and control shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals must reference the exact model, style and size of the piece of equipment and system being furnished. Manuals referencing equipment similar to but of a different model, style, and size than that furnished will not be accepted.

- C. Instructions: Contractor shall provide qualified, factory-trained manufacturers' representatives to give detailed training to assigned Department of Veterans Affairs personnel in the operation and complete maintenance for each piece of equipment. All such training will be at the job site. These requirements are more specifically detailed in the various technical sections. Instructions for different items of equipment that are component parts of a complete system, shall be given in an integrated, progressive manner. All instructors for every piece of component equipment in a system shall be available until instructions for all items included in the system have been completed. This is to assure proper instruction in the operation of inter-related systems. All instruction periods shall be at such times as scheduled by the COR and shall be considered concluded only when the COR is satisfied in regard to complete and thorough coverage. The contractor shall submit a course outline with associated material to the COR for review and approval prior to scheduling training to ensure the subject matter covers the expectations of the VA and the contractual requirements. The Department of Veterans Affairs reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the COR, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

1.20 CONSTRUCTION SIGN

- A. Provide a Construction Sign where directed by the COR. All wood members shall be of framing lumber. Cover sign frame with 0.7 mm (24 gage)

galvanized sheet steel nailed securely around edges and on all bearings. Provide three 100 by 100 mm (4 inch by 4 inch) posts (or equivalent round posts) set 1200 mm (four feet) into ground. Set bottom of sign level at 900 mm (three feet) above ground and secure to posts with through bolts. Make posts full height of sign. Brace posts with 50 x 100 mm (two by four inch) material as directed.

- B. Paint all surfaces of sign and posts two coats of white gloss paint. Border and letters shall be of black gloss paint, except project title which shall be blue gloss paint.
- C. Maintain sign and remove it when directed by the COR.
- D. Detail Drawing of construction sign showing required legend and other characteristics of sign is shown on the drawings.

1.21 SAFETY SIGN

- A. Provide a Safety Sign where directed by COR. Face of sign shall be 19 mm (3/4 inch) thick exterior grade plywood. Provide two 100 mm by 100 mm (four by four inch) posts extending full height of sign and 900 mm (three feet) into ground. Set bottom of sign level at 1200 mm (four feet) above ground.
- B. Paint all surfaces of Safety Sign and posts with one prime coat and two coats of white gloss paint. Letters and design shall be painted with gloss paint of colors noted.
- C. Maintain sign and remove it when directed by COR.
- D. Standard Detail Drawing Number SD10000-02(Found on VA TIL) of safety sign showing required legend.
- E. Post the number of accident free days on a daily basis.

1.22 HISTORIC PRESERVATION

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

- - - E N D - - -

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 Work Covered by Contract Documents

A. Work under this Contract consists of furnishing all labor, materials and equipment necessary to perform the quality exterior restoration and waterproofing of the Charlie Norwood Veteran Affairs Medical Center (VAMC), 1 Freedom Way, Augusta, Georgia 30904, as shown on the drawings listed in Section 00 01 15 of this specification. The work will include, but is not necessarily limited to, the following:

1. Remove the existing guardrails at the loading docks and accessories as indicated on drawings, and discard. See Drawing No. G-101.
2. At the guardrail at the canteen, remove the existing paint and rust from the guardrail as specified herein. See Drawing No. G-101.
3. Remove all existing coating from the retaining wall indicated on drawings and the column adjacent to that retaining wall to a natural break, and discard. The removal of coating/rendering to an intermediate point along the height of the column will not be approved and will grounds for rejection. See Drawing No. G-101.
4. Perform excavation at retaining wall in accordance with applicable section of this specification. All gravel, waterproofing, drainage pipes, and existing materials removed at excavation that cannot be reused shall be discarded. Remove the sidewalk adjacent to the retaining wall to a control joint as necessary to perform the work, and discard. Any sidewalk that is not removed and/or is damaged as a part of the excavation and waterproofing operations at the retaining wall shall be replaced by the Contractor at no additional cost to the Owner. See Drawing No. G-101.
5. Completely remove the built-in gutters at the front entrance skylight canopies, and discard. Remove the storefront windows at the canopies as required to completely remove the built-in gutters, and store for re-use. Existing downspouts shall remain. Remove the abandoned conduit and juncture boxes at the canopies, and discard. Temporarily detach lightning protection as required to remove materials, and reinstall immediately. See Drawing No. G-101.
 - a. Any storefront window components damaged during removal or lost during storage shall be replaced by the Contractor at no additional cost to the government.
6. Remove the existing planter box materials, including mulch, soil, filter fabric, insulation, root barriers, and other materials as necessary to expose the existing roof-to-roof expansion joints at plazas as indicated on drawings, and store for re-use. See Drawing No. G-101.

7. Remove the existing pedestrian traffic materials, including pavers, pedestals, insulation, filter fabric, root barrier, and other material as necessary to expose the roof-to-roof expansion joints at walkable plazas as indicated on drawings, and store for re-use. See Drawing No. G-101.
8. Remove all existing sealant, backings, and filler at the exterior of all precast concrete wall panels and granite wall panel control joints and joints that surround fenestrations and penetrations, and discard.
9. Remove all exiting exterior vertical expansion joints at exterior walls including covers, secondary membrane, sealant, adhesive, fire barriers, and other components present in the joint, and discard.
10. Clean all exterior surfaces to include concrete wall panels, windows (flush and recessed), concrete beams, concrete columns, and retaining walls as specified herein. The use of water alone to clean windows.
11. At all recessed windows, using mechanical cutting equipment, install a continuous 1 inch wide, 1 inch deep reveal across the head of the windows located 2 inches from the exterior face of the wall.
 - a. Coordinate this work with COR and adhere to noise requirements of the Medical Center as specified herein.
12. At concrete wall panels, furnish and install a new silane water repellent as specified herein.
13. (**Deductive Alternate No. 1**) Omit the specification requirement to install the water repellent. Exterior surfaces shall still be cleaned.
14. Furnish and install new guardrails at removed location, as specified herein. Furnish and install new pedestrian traffic coating at the existing sidewalks at new guardrails as specified herein. See Drawing No. G-101.
15. Furnish and install new primer and exterior grade metal paint at guardrails at the canteen, as specified herein. See Drawing No. G-101.
16. Furnish and install new waterproofing membrane, drainage pipe, drainage board, gravel, geotextile fabric, and counter flashing at the excavated retaining wall as specified herein. Reinstall backfill and provide new backfill as specified herein. Furnish and install new top soil, sodding, and plants as specified herein and as listed in the landscape architect report attached to Section 31 20 11 of this specification. Furnish and install new concrete sidewalks at removed locations and a new pedestrian traffic coating at new sidewalk sections. See Drawing No. G-101.
17. Furnish and install new waterproofing coating at the retaining wall and column where the rendering/coating was removed as specified herein. See Drawing No. G-101.

18. Furnish and install new built-up gutter and flashings at the skylight canopies at the front entrances as specified herein. Reinstall the removed storefront windows at removed locations. Reinstall the lightning protection system as specified herein. See Drawing No. G-101.
19. Furnish and install new fire barrier, roof-to-roof and roof-to-wall expansion joint covers at the plazas as specified herein. Reinstall the removed planter box materials and pedestrian traffic materials at removed locations. Tremco Corporation is the holder of the roofing manufacturer guarantee for these areas, and the applicator of the roofing shall be approved in writing by Tremco prior to performing roof repairs associated with new expansion joints. See Drawing No. G-101.
20. Furnish and install new fire barrier, backings, and sealant the exterior of all precast concrete wall panels and granite wall panel control joints and joints with surrounding fenestrations and penetrations as specified herein.
21. Furnish and install new fire barrier (if applicable), foam expansion joints, and metal cover plates at existing exterior wall expansion joints as specified herein. Furnish and install new foam expansion joint between the column and retaining wall as specified herein.
22. (**Deductive Alternate No. 2**) Omit the specification requirement to install metal cover plates at the exterior wall expansion joints.

1.2 Description of the Existing Building Envelope

- A. Information in this Section is provided only to establish general description and is not necessarily accurate. The Contractor is responsible for visiting the site and satisfying himself as to the existing conditions, size of roof areas, etc. before submitting his Bid.
- B. The existing building envelope is primarily precast concrete wall panels with windows (recessed and flush), and exposed coated concrete columns and beams.
- C. The plazas consists of two type of materials. Refer to Drawings.
- D. The building expansion joints are shown to be 2 inches; however, it is the responsibility of the Contractor to verify dimensions and joint movement(s).
- E. The approximate size of each area is as follows:

1.	Control Joints	123,364 LF
2.	Vertical Expansion Joints	1,187 LF
3.	Retaining Wall	1,200 SF
4.	Plaza Expansion Joints	326 LF
5.	Guardrail Restoration	305 LF

6.	Built-In Gutters	492 LF
7.	Windows	50,931 SF
8.	Precast Concrete Wall Panels	356,893 SF

PART 2 - PRODUCTS

2.1 Not used.

PART 3 - EXECUTION

3.1 Not used.

- - - END OF SECTION - - -

SECTION 01 22 13
UNIT PRICES AND ALLOWANCES

PART 1 - GENERAL

1.1 Work Included

- A. All unit prices and allowances as listed in Bid Form.

1.2 Procedures

- A. Bidders shall provide unit prices as listed below. Bidder shall include a cash allowance for the quantities listed below in the base bid. Payment will be made at the net unit price submitted in the Bid Form which includes all overhead and profit. In the event it is necessary to replace a lesser quantity than listed below, the provisions of Paragraph 1.3.c of Section 01 00 00 of this specification shall apply.
- B. Unit prices will be exercised at the option of the Owner.
- C. Modify and coordinate related activities as required to complete the work if, and when, acceptance is designated by the Owner.
- D. In the event unit prices are exercised, applicable sections of this Specification shall govern. Other sections may be modified as required to address the unit price.
- E. Unit price work shall be verified by the Design Professional, and Contractor must supply before and after photographic evidence and materials receipts as documentation to Design Professional and Owner to verify quantities reported.
- F. Contractor shall confirm the need and quantity of unit price work with Design Professional daily, and prior to accomplishing work.
- G. Contractor must report daily quantities of unit price work accomplished in Progress Reports as outlined in section 01 32 26 of the Specification. Failure to do so may result in rejection of unit price work by Owner.

PART 2 - PRODUCTS

See applicable specification sections.

PART 3 - EXECUTION

- 3.1 **UNIT PRICE No. (1):** Quote a separate unit price (per linear foot) for the repair of any small cracks as required by the approved waterproofing system manufacturer. This unit price shall also reflect any power tools, fasteners, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Sections 03 01 40 of this Specification.

Note: The contractor shall include an allowance for the repair of 500 linear feet of small cracks in the Base Bid.

- 3.2 **UNIT PRICE No. (2):** Quote a separate unit price (per linear foot) for the repair of any large cracks as required by the approved waterproofing system manufacturer. This unit price shall also reflect any power tools, fasteners, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Sections 03 01 40 of this Specification.

Note: The contractor shall include an allowance for the repair of 250 linear feet of large cracks in the Base Bid.

- 3.3 **UNIT PRICE No. (3):** Quote a separate unit price (per linear foot) for the priming and repair of any exposed, rusted, and damaged reinforcing steel at concrete wall panels or concrete columns. This unit price shall also reflect any power tools, fasteners, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Sections 03 01 40 of this Specification.

Note: The contractor shall include an allowance for the repair of 125 linear feet of repairing exposed reinforcing steel in the Base Bid.

- 3.4 **UNIT PRICE No. (4):** Quote a separate unit price (per square foot) for the repair of any spalled concrete at concrete wall panels, retaining walls, or columns scheduled for waterproofing as required by the approved waterproofing manufacturer. This unit price shall also reflect any power tools, fasteners, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Sections 03 01 40 of this Specification.

Note: The contractor shall include an allowance for the repair of 1,500 square feet of repairs under this paragraph in the Base Bid.

- 3.5 **UNIT PRICE No. (5)** Quote a separate unit price (per linear foot) to mechanically enlarge control joints to be a minimum of 3/8 inch wide at all locations. Ensure surface roughness inside the joint is as required by the joint sealant manufacturer. This unit price shall also reflect any power tools, fasteners, labor, safety harnesses, interior protections, overhead, and profit associated with accomplishing this work. Refer to Sections 07 92 00 of this Specification.

Note: Contract includes 4,000 linear feet of work under this paragraph in the Base Bid.

END OF SECTION

SECTION 01 32 13
CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.1 Description

- A. To assure adequate planning and execution of the work so as to complete the project within the time period allowed in the Contract and to assist the Engineer in evaluating work progress.
- B. "Day" used throughout the Contract shall mean "Consecutive Calendar Days" unless otherwise stated.

1.2 Schedule Adherence

- A. Should any activity not be completed within 7 days after the scheduled completion date, Owner shall have the right to order the Contractor to expedite completion of work by whatever means the Owner deems appropriate and necessary without additional expense.
- B. Should any activity be 15 or more days behind schedule, the Owner shall have the right to complete the activity or to have the activity completed by whatever means the Owner deems appropriate and necessary.
- C. Any costs incurred by the Owner in connection with expedition of the construction activity under this article shall be reimbursed to the Owner by the Contractor. This may take the form of deductions from payments due Contractor.
- D. Failure by the Owner to exercise the option to either order the Contractor to expedite any activity or to expedite an activity by other means shall not be considered precedent setting for any other activity.
- E. Inclement Weather

- 1. Where the contract includes schedule requirements including, but not limited to, working hours, construction durations, substantial completion date(s), and/or final completion date(s), these requirements shall be graphically shown in the construction schedule. The schedule shall be based on assuming normal inclement weather for each calendar month, and no contract extension shall be considered until the calendar month has experienced inclement weather beyond this normal consideration. Furthermore, the Contractor bears the burden of proof to show inclement weather beyond normal considerations, which shall include documentation from the National Weather Service (NWS), or approved equal prior to bid, that the reported inclement weather was outside of the specified parameters to perform the work of this specification. All inclement weather documentation shall be submitted in writing within the payment period for each occurrence.
- 2. Normal Inclement Weather for each calendar month shall be considered:

a.	<u>Month</u>	<u>Days</u>
b.	January	6
c.	February	5
d.	March	6
e.	April	5
f.	May	5
g.	June	6
h.	July	6
i.	August	6
j.	September	4
k.	October	3
l.	November	3
m.	December	6

3. No consideration or extension shall be allowed for inclement weather days that fall outside any working restrictions.
4. Work under this specification shall be adequately staffed to complete the work of this specification given the specified work restrictions with considerations for normal inclement weather.

1.3 Schedule

- A. Within 7 days after receipt of notice to proceed, the Contractor shall submit one reproducible and two prints of the construction schedule to the Engineer.

1.4 Diagrams

- A. Graphically show the sequence and interdependence of all activities necessary to complete the work and the order in which such activities are to be accomplished as planned by the Contractor and his project field supervisor in coordination with all subcontractors whose work is shown on the diagram. Activities shown on the diagram shall include, but are not limited to:
 1. Submittals and approvals of shop drawings and samples.
 2. Project mobilization
 3. Demolition/Roof preparation
 4. Construction
 5. Sheet Metal
 6. Miscellaneous work
 7. Final Cleanup
 8. Final Inspection
 9. All activities by the Engineer which affects progress, required completion dates, or both, for all and each part of the Work.
- B. The detail of information shall be such that duration times of activities shall normally range from 1 to 30 days. The selection and number of activities shall be subject to approval by the Engineer.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 Construction Schedule

- A. Within 10 days after the effective date of Agreement, the Contractor shall complete the analysis described in Article 1.4 of this Section in preliminary form. Meet with the Engineer to review the contents of the proposed schedule and make all revisions agreed upon. Submit in accordance with Paragraph 1.4.1 of this section.

3.2 Periodic Reports

- A. Periodic reports shall show the following activities:

- 1. Activities completed during the reporting period.
- 2. Percentage of work actually completed and schedule as of the report date.
- 3. Progress along the critical path in terms of days ahead of or behind schedule dates.
- 4. If work is behind schedule, a brief report which shows, but is not limited to:
 - a. A description of problem areas, both current and anticipated.
 - b. Delaying factors and their impact.
 - c. An explanation of corrective actions taken or proposed.

- B. Revisions

- 1. Contractor shall make only those revisions to the construction schedule as are approved in advance by Engineer.

END OF SECTION

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

- A. Refer to Articles titled SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in GENERAL CONDITIONS.
- B. For the purposes of this contract, samples, test reports, certificates, and manufacturers' literature and data shall also be subject to the previously referenced requirements. The following text refers to all items collectively as SUBMITTALS.
- C. Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make will be permitted unless:
1. Satisfactory written evidence is presented to, and approved by Contracting Officer, that manufacturer cannot make scheduled delivery of approved item or;
 2. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
 3. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.
- D. Pre-Construction Submittals
1. Prior to the start of the project, the following items need to be submitted within 7 calendar days after the receipt of signed Contract. The contractor shall fill out the attached Submittal checklist form, ensuring that all items listed in this section, referenced for submittal in the specification, and/or items to be used on this project are properly submitted. Items submitted must conform to the standards and expectations of that material, detail, and/or procedure expressed in this specification. If not, that item may be rejected for use by the Engineer.
 2. The following literature shall be submitted.
 - a. Contractor's Letter of Good Standing with Manufacturer.
 - b. Manufacturer's Sample Warranty
 - c. Contractor's Sample 5 year warranty
 - d. Manufacturer's Application Instructions
 - e. Contractor's Foreman's Statement
 - f. Contractor's Construction Schedule

- g. Contractor's Schedule of Values
- h. Manufacturer's Certificates
 - 1) Submit separate letters from warranting material manufacturers stating he has examined the plans, specifications and details for this project and approves the use of his products and systems on this project and has intent to warrant the work installed by the installer as indicated on plans and specified. Any exceptions must be brought to the attention of the Design Professional prior to bid in accordance with the requirements of Section 01 60 00.
 - 2) If any components are not packaged by the manufacturer, submit a letter from the manufacturer clearly identifying the component and acknowledging approval to use this component on this project.
- 3. Submit all materials as outlined in Part 2 of the Specification sections. Group and label material submittals by Specification Section.
- 4. Submit metal flashing color charts.
- 5. Submit sealant color charts.
- E. Forward submittals in sufficient time to permit proper consideration and approval action by Government. Time submission to assure adequate lead time for procurement of contract - required items. Delays attributable to untimely and rejected submittals will not serve as a basis for extending contract time for completion.
- F. Submittals will be reviewed for compliance with contract requirements by Architect-Engineer, and action thereon will be taken by Resident Engineer on behalf of the Contracting Officer.
- G. Upon receipt of submittals, Architect-Engineer will assign a file number thereto. Contractor, in any subsequent correspondence, shall refer to this file and identification number to expedite replies relative to previously approved or disapproved submittals.
- H. The Government reserves the right to require additional submittals, whether or not particularly mentioned in this contract. If additional submittals beyond those required by the contract are furnished pursuant to request therefor by Contracting Officer, adjustment in contract price and time will be made in accordance with Articles titled CHANGES (FAR

52.243-4) and CHANGES - SUPPLEMENT (VAAR 852.236-88) of the GENERAL CONDITIONS.

- I. Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs and Architect-Engineer. However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer and Architect- Engineer assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items
- J. Submittals must be submitted by Contractor only and shipped prepaid. Contracting Officer assumes no responsibility for checking quantities or exact numbers included in such submittals.
- K. Submit other samples in single units unless otherwise specified. Submit shop drawings, schedules, manufacturers' literature and data, and certificates in quadruplicate, except where a greater number is specified.
- L. Submittals will receive consideration only when covered by a transmittal letter signed by Contractor. Letter shall be sent via first class mail and shall contain the list of items, name of Medical Center, name of Contractor, contract number, applicable specification paragraph numbers, applicable drawing numbers (and other information required for exact identification of location for each item), manufacturer and brand, ASTM or Federal Specification Number (if any) and such additional information as may be required by specifications for particular item being furnished. In addition, catalogs shall be marked to indicate specific items submitted for approval.
 - 1. A copy of letter must be enclosed with items, and any items received without identification letter will be considered "unclaimed goods" and held for a limited time only.
 - 2. Each sample, certificate, manufacturers' literature and data shall be labeled to indicate the name and location of the Medical Center, name of Contractor, manufacturer, brand, contract number and ASTM or Federal Specification Number as applicable and location(s) on project.
 - 3. Required certificates shall be signed by an authorized representative of manufacturer or supplier of material, and by Contractor.
- M. If submittal samples have been disapproved new samples as soon as possible after notification of disapproval. Such new samples shall be

marked "Resubmitted Sample" in addition to containing other previously specified information required on label and in transmittal letter.

- N. Approved samples will be kept on file by the Resident Engineer at the site until completion of contract, at which time such samples will be delivered to Contractor as Contractor's property. Where noted in technical sections of specifications, approved samples in good condition may be used in their proper locations in contract work. At completion of contract, samples that are not approved will be returned to Contractor only upon request and at Contractor's expense. Such request should be made prior to completion of the contract. Disapproved samples that are not requested for return by Contractor will be discarded after completion of contract.
- O. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. These drawings and schedules shall be stamped and signed by Contractor certifying to such check.
1. For each drawing required, submit one legible photographic paper or vellum reproducible.
 2. Reproducible shall be full size.
 3. Each drawing shall have marked thereon, proper descriptive title, including Medical Center location, project number, manufacturer's number, reference to contract drawing number, detail Section Number, and Specification Section Number.
 4. A space 120 mm by 125 mm (4-3/4 by 5 inches) shall be reserved on each drawing to accommodate approval or disapproval stamp.
 5. Submit drawings, ROLLED WITHIN A MAILING TUBE, fully protected for shipment.
 6. One reproducible print of approved or disapproved shop drawings will be forwarded to Contractor.
 7. When work is directly related and involves more than one trade, shop drawings shall be submitted to Architect-Engineer under one cover.
 8. Submit submittal (shop) drawings as necessary to clearly indicate the scope, intent, and extent of the work. Submit shop drawings showing the relationship between specified materials as it will

relate to the work. Submit shop drawing in accordance with notes located within the specification.

- P. Samples, Shop drawings, test reports, certificates and manufacturers' literature and data, shall be submitted for approval to

Raymond Engineering-Georgia, LLC

(Architect-Engineer)

1224 Royal Drive, Suite 100

(A/E P.O. Address)

Conyers, Georgia 30094

(City, State and Zip Code)

- Q. At the time of transmittal to the Architect-Engineer, the Contractor shall also send a copy of the complete submittal directly to the Resident Engineer.

- - - E N D - - -

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SAFETY REQUIREMENTS

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SECTION 01 35 26
Safety REQUIREMENTS

1.1 APPLICABLE PUBLICATIONS:

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

1. American Society of Safety Engineers (ASSE):

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

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

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

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

E84-2013. Surface Burning Characteristics of Building Materials

3. The Facilities Guidelines Institute (FGI):

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

4. National Fire Protection Association (NFPA):

10-2013.. Standard for Portable Fire Extinguishers

30-2012.. Flammable and Combustible Liquids Code

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

70-2014.. National Electrical Code

70B-2013. Recommended Practice for Electrical Equipment Maintenance

70E-2012 Standard for Electrical Safety in the
Workplace

99-2012..Health Care Facilities Code

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

5. The Joint Commission (TJC)

TJC Manual Comprehensive Accreditation and
Certification Manual

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

29 CFR 1904 Reporting and Recording Injuries &
Illnesses

29 CFR 1910 Safety and Health Regulations for General
Industry

FR 1926 .Safety and Health Regulations for Construction
Industry

CPL 2-0.124 Multi-Employer Citation Policy

7. VHA Directive 2005-007

1.2 **DEFINITIONS:**

- A. OSHA "Competent Person" (CP). One who is capable of identifying existing and predictable hazards in the surroundings and working conditions which are unsanitary, hazardous or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them (see 29 CFR 1926.32(f)).
- B. "Qualified Person" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
- C. High Visibility Accident. Any mishap which may generate publicity or high visibility.

- D. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.
- E. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:
 - 1. Death, regardless of the time between the injury and death, or the length of the illness;
 - 2. Days away from work (any time lost after day of injury/illness onset);
 - 3. Restricted work;
 - 4. Transfer to another job;
 - 5. Medical treatment beyond first aid;
 - 6. Loss of consciousness; or
 - 7. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

1.3 REGULATORY REQUIREMENTS:

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

1.4 ACCIDENT PREVENTION PLAN (APP):

- A. The APP (aka Construction Safety & Health Plan) shall interface with the Contractor's overall safety and health program. Include any

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

B. The APP shall be prepared as follows:

1. Written in English by a qualified person who is employed by the Prime Contractor articulating the specific work and hazards pertaining to the contract (model language can be found in ASSE A10.33). Specifically articulating the safety requirements found within these VA contract safety specifications.
2. Address both the Prime Contractors and the subcontractors work operations.
3. State measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.
4. Address all the elements/sub-elements and in order as follows:
 - a. **SIGNATURE SHEET.** Title, signature, and phone number of the following:
 - 1) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience);
 - 2) Plan approver (company/corporate officers authorized to obligate the company);
 - 3) Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional). Provide concurrence of other applicable corporate and project personnel (Contractor).

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

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

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

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

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

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

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

f. **TRAINING.**

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

g. **SAFETY AND HEALTH INSPECTIONS.**

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

h. **ACCIDENT INVESTIGATION & REPORTING.** The Contractor shall conduct mishap investigations of all OSHA Recordable Incidents. The APP shall include accident/incident investigation procedure &

identify person(s) responsible to provide the following to the Project Manager or Contracting Officer Representative or Government Designated Authority:

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

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

- 1) Emergency response;
- 2) Contingency for severe weather;
- 3) Fire Prevention;
- 4) Medical Support;
- 5) Posting of emergency telephone numbers;
- 6) Prevention of alcohol and drug abuse;
- 7) Site sanitation (housekeeping, drinking water, toilets);
- 8) Night operations and lighting;
- 9) Hazard communication program;
- 10) Site-Specific Fall Protection & Prevention;
- 11) Excavation/trenching;
- 12) Crane Critical lift;
- 13) Respiratory protection;
- 14) Health hazard control program;
- 15) Demolition plan (to include engineering survey);
- 16) Formwork and shoring erection and removal;

- C. Submit the APP to the Project Manager or Contracting Officer Representative or Government Designated Authority for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.
- D. Once accepted by the Project Manager or Contracting Officer Representative or Government Designated Authority, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.
- E. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Project Manager or Contracting Officer Representative or Government Designated Authority. Should any severe hazard exposure, i.e. imminent danger, become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34) and the environment.

1.5 **ACTIVITY HAZARD ANALYSES (AHAs):**

- A. AHAs are also known as Job Hazard Analyses, Job Safety Analyses, and Activity Safety Analyses. Before beginning each work activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or sub-contractor is to perform the work, the Contractor(s) performing that work activity shall prepare an AHA (Example electronic AHA forms can be found on the US Army Corps of Engineers web site)
- B. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.

- C. Work shall not begin until the AHA for the work activity has been accepted by the Project Manager or Contracting Officer Representative or Government Designated Authority and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
1. The names of the Competent/Qualified Person(s) required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and/or other State and Local agencies) shall be identified and included in the AHA. Certification of their competency/qualification shall be submitted to the Government Designated Authority (GDA) for acceptance prior to the start of that work activity.
 2. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).
 - a. If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.
 - b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.
 3. Submit AHAs to the Project Manager or Contracting Officer Representative or Government Designated Authority for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES for review at least 15 calendar days prior to the start of each phase. Subsequent AHAs as shall be formatted as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

4. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.
5. Develop the activity hazard analyses using the project schedule as the basis for the activities performed. All activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier, or subcontractor and provided to the prime contractor for review and approval and then submitted to the Contracting Officer Representative.

1.6 PRECONSTRUCTION CONFERENCE:

- A. Contractor representatives who have a responsibility or significant role in implementation of the accident prevention program, as required by 29 CFR 1926.20(b)(1), on the project shall attend the preconstruction conference to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.
- B. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.
- C. Deficiencies in the submitted APP will be brought to the attention of the Contractor within 10 days of submittal, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

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

- A. The Prime Contractor shall designate a minimum of one SSHO at each project site that will be identified as the SSHO to administer the Contractor's safety program and government-accepted Accident Prevention Plan. Each subcontractor shall designate a minimum of one CP in

compliance with 29 CFR 1926.20 (b)(2) that will be identified as a CP to administer their individual safety programs.

- B. Further, all specialized Competent Persons for the work crews will be supplied by the respective contractor as required by 29 CFR 1926 (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).
- C. These Competent Persons can have collateral duties as the subcontractor's superintendent and/or work crew lead persons as well as fill more than one specialized CP role (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).
- D. The SSHO or an equally-qualified Designated Representative/alternate will maintain a presence on the site during construction operations in accordance with FAR Clause 52.236-6: *Superintendence by the Contractor*. CPs will maintain presence during their construction activities in accordance with above mentioned clause. A listing of the designated SSHO and all known CPs shall be submitted prior to the start of work as part of the APP with the training documentation and/or AHA as listed in Section 1.8 below.
- E. The repeated presence of uncontrolled hazards during a contractor's work operations will result in the designated CP as being deemed incompetent and result in the required removal of the employee in accordance with FAR Clause 52.236-5: Material and Workmanship, Paragraph (c).

1.8 TRAINING:

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

and Health Technician (CSHT) certification or have a safety and health degree from an accredited university or college.

- B. All designated CPs shall have completed the OSHA 30-hour Construction Safety course within the past 5 years.
- C. In addition to the OSHA 30 Hour Construction Safety Course, all CPs with high hazard work operations such as operations involving asbestos, electrical, cranes, demolition, work at heights/fall protection, fire safety/life safety, ladder, rigging, scaffolds, and trenches/excavations shall have a specialized formal course in the hazard recognition & control associated with those high hazard work operations. Documented "repeat" deficiencies in the execution of safety requirements will require retaking the requisite formal course.
- D. All other construction workers shall have the OSHA 10-hour Construction Safety Outreach course and any necessary safety training to be able to identify hazards within their work environment.
- E. Submit training records associated with the above training requirements to the Project Manager or Contracting Officer Representative or Government Designated Authority for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance.
- F. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the SSHO or his/her designated representative. As a minimum, this briefing shall include information on the site-specific hazards, construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, emergency procedures, accident reporting etc... Documentation shall be provided to the Resident Engineer that individuals have undergone contractor's safety briefing.
- G. Ongoing safety training will be accomplished in the form of weekly documented safety meeting.

1.9 INSPECTIONS:

- A. The SSHO shall conduct frequent and regular safety inspections (daily) of the site and each of the subcontractors CPs shall conduct frequent and regular safety inspections (daily) of the their work operations as required by 29 CFR 1926.20(b)(2). Each week, the SSHO shall conduct a formal documented inspection of the entire construction areas with the subcontractors' "Trade Safety and Health CPs" present in their work areas. Coordinate with, and report findings and corrective actions weekly to Project Manager or Contracting Officer Representative or Government Designated Authority.
- B. A Certified Safety Professional (CSP) with specialized knowledge in construction safety or a certified Construction Safety and Health Technician (CSHT) shall randomly conduct a monthly site safety inspection. The CSP or CSHT can be a corporate safety professional or independently contracted. The CSP or CSHT will provide their certificate number on the required report for verification as necessary.
 - 1. Results of the inspection will be documented with tracking of the identified hazards to abatement.
 - 2. The Project Manager or Contracting Officer Representative or Government Designated Authority will be notified immediately prior to start of the inspection and invited to accompany the inspection.
 - 3. Identified hazard and controls will be discussed to come to a mutual understanding to ensure abatement and prevent future reoccurrence.
 - 4. A report of the inspection findings with status of abatement will be provided to the Project Manager or Contracting Officer Representative or Government Designated Authority within one week of the onsite inspection.

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

- A. Notify the Project Manager and Contracting Officer Representative and Government Designated Authority as soon as practical, but no more than four hours after any accident meeting the definition of OSHA Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$5,000, or any weight handling equipment accident. Within notification include contractor name; contract title;

type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Project Manager // and Facility Safety and Contracting Officer Representative and Government Designated Authority determine whether a government investigation will be conducted.

- B. Conduct an accident investigation for recordable injuries and illnesses, for Medical Treatment defined in paragraph DEFINITIONS, and property damage accidents resulting in at least \$20,000 in damages, to establish the root cause(s) of the accident. Complete the VA Form 2162, and provide the report to the Project Manager // and Facility Safety // Manager and Contracting Officer Representative and Government Designated Authority within 5 calendar days of the accident. The Project Manager or Contracting Officer Representative or Government Designated Authority will provide copies of any required or special forms.
- C. A summation of all man-hours worked by the contractor and associated sub-contractors for each month will be reported to the Project Manager or Contracting Officer Representative or Government Designated Authority monthly.
- D. A summation of all OSHA recordable accidents experienced on site by the contractor and associated sub-contractors for each month will be provided to the Project Manager and Contracting Officer Representative and Government Designated Authority monthly. The contractor and associated sub-contractors' OSHA 300 logs will be made available to the Project Manager or Contracting Officer Representative or Government Designated Authority as requested.

1.11 PERSONAL PROTECTIVE EQUIPMENT (PPE):

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

B. Mandatory PPE includes:

1. Hard Hats - unless written authorization is given by the Project Manager or Contracting Officer Representative in circumstances of work operations that have limited potential for falling object hazards such as during finishing work or minor remodeling. With authorization to relax the requirement of hard hats, if a worker becomes exposed to an overhead falling object hazard, then hard hats would be required in accordance with the OSHA regulations.
2. Safety glasses - unless written authorization is given by the Project Manager or Contracting Officer Representative appropriate safety glasses meeting the ANSI Z.87.1 standard must be worn by each person on site.
3. Appropriate Safety Shoes - based on the hazards present, safety shoes meeting the requirements of ASTM F2413-11 shall be worn by each person on site unless written authorization is given by the Project Manager or Contracting Officer Representative.
4. Hearing protection - Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks.

1.12 INFECTION CONTROL

- A. Infection Control is critical in all medical center facilities. Interior construction activities causing disturbance of existing dust, or creating new dust, must be conducted within ventilation-controlled areas that minimize the flow of airborne particles into patient areas. Exterior construction activities causing disturbance of soil or creates dust in some other manner must be controlled.
- B. An AHA associated with infection control will be performed by VA personnel in accordance with FGI Guidelines (i.e. Infection Control Risk Assessment (ICRA)). The ICRA procedure found on the American Society for Healthcare Engineering (ASHE) website will be utilized. Risk classifications of Class II or lower will require approval by the Project Manager or Contracting Officer Representative or Government Designated Authority before beginning any construction work. Risk classifications of Class III or higher will require a permit before beginning any construction work. Infection Control permits will be

issued by the Project Engineer. The Infection Control Permits will be posted outside the appropriate construction area. More than one permit may be issued for a construction project if the work is located in separate areas requiring separate classes. The primary project scope area for this project is: **Class I**, however, work outside the primary project scope area may vary. The required infection control precautions with each class are as follows:

1. Class I requirements:

a. During Construction Work:

- 1) Notify the Project Manager or Contracting Officer Representative.
- 2) Execute work by methods to minimize raising dust from construction operations.
- 3) Ceiling tiles: Immediately replace a ceiling tiles displaced for visual inspection.

b. Upon Completion:

- 1) Clean work area upon completion of task
- 2) Notify the Project Manager or Contracting Officer Representative.

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

D. A dust control program will be establish and maintained as part of the contractor's infection preventive measures in accordance with the FGI Guidelines for Design and Construction of Healthcare Facilities. Prior to start of work, prepare a plan detailing project-specific dust protection measures with associated product data, including periodic status reports, and submit to Project Engineer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

E. Medical center Infection Control personnel will monitor for airborne disease (e.g. aspergillosis) during construction. A baseline of

conditions will be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality with safe thresholds established.

F. Final Cleanup:

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

G. Exterior Construction

1. Contractor shall verify that dust will not be introduced into the medical center through intake vents, or building openings. HEPA filtration on intake vents is required where dust may be introduced.
2. Dust created from disturbance of soil such as from vehicle movement will be wetted with use of a water truck as necessary
3. All cutting, drilling, grinding, sanding, or disturbance of materials shall be accomplished with tools equipped with either local exhaust ventilation (i.e. vacuum systems) or wet suppression controls.

1.13 TUBERCULOSIS SCREENING

- A. Contractor shall provide written certification that all contract employees assigned to the work site have had a pre-placement tuberculin screening within 90 days prior to assignment to the worksite and been found have negative TB screening reactions. Contractors shall be required to show documentation of negative TB screening reactions for any additional workers who are added after the 90-day requirement before they will be allowed to work on the work site. NOTE: This can be the Center for Disease Control (CDC) and Prevention and two-step skin testing or a Food and Drug Administration (FDA)-approved blood test.

1. Contract employees manifesting positive screening reactions to the tuberculin shall be examined according to current CDC guidelines prior to working on VHA property.
2. Subsequently, if the employee is found without evidence of active (infectious) pulmonary TB, a statement documenting examination by a physician shall be on file with the employer (construction contractor), noting that the employee with a positive tuberculin screening test is without evidence of active (infectious) pulmonary TB.
3. If the employee is found with evidence of active (infectious) pulmonary TB, the employee shall require treatment with a subsequent statement to the fact on file with the employer before being allowed to return to work on VHA property.

1.14 FIRE SAFETY

- A. Fire Safety Plan: Establish and maintain a site-specific fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to Project Manager // and Facility Safety or Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. This plan may be an element of the Accident Prevention Plan.
- B. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.
- C. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).
- D. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
- E. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Project Manager or Contracting Officer Representative.

- F. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Project Manager or Contracting Officer Representative.
- G. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
- H. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.
- I. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with // Resident Engineer Project Manager or Contracting Officer Representative. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the Resident Engineer.
- J. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Project Manager or Contracting Officer Representative or Government Designated Authority.
- K. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- L. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.

1.15 FALL PROTECTION

- A. The fall protection (FP) threshold height requirement is 6 ft (1.8 m) for ALL WORK, unless specified differently or the OSHA 29 CFR 1926 requirements are more stringent, to include steel erection activities,

systems-engineered activities (prefabricated) metal buildings, residential (wood) construction and scaffolding work.

1. The use of a Safety Monitoring System (SMS) as a fall protection method is prohibited.
2. The use of Controlled Access Zone (CAZ) as a fall protection method is prohibited.
3. A Warning Line System (WLS) may ONLY be used on floors or flat or low-sloped roofs (between 0 - 18.4 degrees or 4:12 slope) and shall be erected around all sides of the work area (See 29 CFR 1926.502(f) for construction of WLS requirements). Working within the WLS does not require FP. No worker shall be allowed in the area between the roof or floor edge and the WLS without FP. FP is required when working outside the WLS.
4. Fall protection while using a ladder will be governed by the OSHA requirements.

1.16 SCAFFOLDS AND OTHER WORK PLATFORMS

- A. All scaffolds and other work platforms construction activities shall comply with 29 CFR 1926 Subpart L.
- B. The fall protection (FP) threshold height requirement is 6 ft (1.8 m) as stated in Section 1.16.
- C. The following hierarchy and prohibitions shall be followed in selecting appropriate work platforms.
 1. Scaffolds, platforms, or temporary floors shall be provided for all work except that can be performed safely from the ground or similar footing.
 2. Ladders less than 20 feet may be used as work platforms only when use of small hand tools or handling of light material is involved.
 3. Ladder jacks, lean-to, and prop-scaffolds are prohibited.
 4. Emergency descent devices shall not be used as working platforms.
- D. Contractors shall use a scaffold tagging system in which all scaffolds are tagged by the Competent Person. Tags shall be color-coded: green indicates the scaffold has been inspected and is safe to use; red

indicates the scaffold is unsafe to use. Tags shall be readily visible, made of materials that will withstand the environment in which they are used, be legible and shall include:

1. The Competent Person's name and signature;
2. Dates of initial and last inspections.

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

1.17 EXCAVATION AND TRENCHES

A. All excavation and trenching work shall comply with 29 CFR 1926 Subpart P.

B. All excavations and trenches 5 feet in depth or greater shall require a written trenching and excavation permit (NOTE - some States and other local jurisdictions require separate state/jurisdiction-issued excavation permits). The permit shall be completed and provided to the Project Manager and/or other Government Designated Authority prior to commencing work for the day. At the end of the day, the permit shall be closed out and provided to the Project Manager and/or other Government Designated Authority. The permit shall be maintained onsite and include the following:

1. Determination of soil classification
2. Indication that utilities have been located and identified. If utilities could not be located after all reasonable attempt, then excavating operations will proceed cautiously.
3. Indication of selected excavation protective system.
4. Indication that the spoil pile will be stored at least 2 feet from the edge of the excavation and safe access provided within 25 feet of the workers.
5. Indication of assessment for a potential toxic, explosive, or oxygen deficient atmosphere.

C. If not using an engineered protective system such as a trench box, shielding, shoring, or other Professional Engineer designed system and using a sloping or benching system, soil classification cannot be Solid

Rock or Type A. All soil will be classified as Type B or Type C and sloped or benched in accordance with Appendix B of 29 CFR 1926.

1.18 LADDERS

- A. All Ladder use shall comply with 29 CFR 1926 Subpart X.
- B. All portable ladders shall be of sufficient length and shall be placed so that workers will not stretch or assume a hazardous position.
- C. Manufacturer safety labels shall be in place on ladders
- D. Step Ladders shall not be used in the closed position
- E. Top steps or cap of step ladders shall not be used as a step
- F. Portable ladders, used as temporary access, shall extend at least 3 ft (0.9 m) above the upper landing surface.
 - 1. When a 3 ft (0.9-m) extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.
 - 2. In no case shall the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.
- G. Ladders shall be inspected for visible defects on a daily basis and after any occurrence that could affect their safe use. Broken or damaged ladders shall be immediately tagged "DO NOT USE," or with similar wording, and withdrawn from service until restored to a condition meeting their original design.

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SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.1 DESCRIPTION

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

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

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

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

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

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

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

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

AA Aluminum Association Inc.

<http://www.aluminum.org>

AABC Associated Air Balance Council

<http://www.aabchq.com>

AAMA American Architectural Manufacturer's Association

<http://www.aamanet.org>

AAN American Nursery and Landscape Association

<http://www.anla.org>

AASHTO American Association of State Highway and Transportation Officials

<http://www.aashto.org>

AATCC American Association of Textile Chemists and Colorists

<http://www.aatcc.org>

ACGIH American Conference of Governmental Industrial Hygienists

<http://www.acgih.org>

ACI American Concrete Institute

<http://www.aci-int.net>

ACPA American Concrete Pipe Association

<http://www.concrete-pipe.org>

ACPPA American Concrete Pressure Pipe Association

<http://www.acppa.org>

ADC Air Diffusion Council

<http://flexibleduct.org>

AGA American Gas Association

<http://www.aga.org>

AGC Associated General Contractors of America

<http://www.agc.org>

AGMA American Gear Manufacturers Association, Inc.

<http://www.agma.org>

AHAM Association of Home Appliance Manufacturers

<http://www.aham.org>

AIA American Institute of Architects

<http://www.aia.org>

AISC American Institute of Steel Construction

<http://www.aisc.org>

AISI American Iron and Steel Institute

<http://www.steel.org>

AITC American Institute of Timber Construction

<http://www.aitc-glulam.org>

AMCA Air Movement and Control Association, Inc.

<http://www.amca.org>

ANLA American Nursery & Landscape Association

<http://www.anla.org>

ANSI American National Standards Institute, Inc.

<http://www.ansi.org>

APA The Engineered Wood Association

<http://www.apawood.org>

ARI Air-Conditioning and Refrigeration Institute

<http://www.ari.org>

ASAE American Society of Agricultural Engineers

<http://www.asae.org>

ASCE American Society of Civil Engineers

<http://www.asce.org>

ASHRAE American Society of Heating, Refrigerating, and
Air-Conditioning Engineers

<http://www.ashrae.org>

ASME American Society of Mechanical Engineers

<http://www.asme.org>

ASSE American Society of Sanitary Engineering

<http://www.asse-plumbing.org>

ASTM American Society for Testing and Materials

<http://www.astm.org>

AWI Architectural Woodwork Institute

<http://www.awinet.org>

AWS American Welding Society

<http://www.aws.org>

AWWA American Water Works Association

<http://www.awwa.org>

BHMA Builders Hardware Manufacturers Association

<http://www.buildershardware.com>

BIA Brick Institute of America

<http://www.bia.org>

CAGI Compressed Air and Gas Institute

<http://www.cagi.org>

CGA Compressed Gas Association, Inc.

<http://www.cganet.com>

CI The Chlorine Institute, Inc.

<http://www.chlorineinstitute.org>

CISCA Ceilings and Interior Systems Construction
Association

<http://www.cisca.org>

CISPI Cast Iron Soil Pipe Institute

<http://www.cispi.org>

CLFMI Chain Link Fence Manufacturers Institute
<http://www.chainlinkinfo.org>

CPMB Concrete Plant Manufacturers Bureau
<http://www.cpmc.org>

CRA California Redwood Association
<http://www.calredwood.org>

CRSI Concrete Reinforcing Steel Institute
<http://www.crsi.org>

CTI Cooling Technology Institute
<http://www.cti.org>

DHI Door and Hardware Institute
<http://www.dhi.org>

EGSA Electrical Generating Systems Association
<http://www.egsa.org>

EEI Edison Electric Institute
<http://www.eei.org>

EPA Environmental Protection Agency
<http://www.epa.gov>

ETL ETL Testing Laboratories, Inc.
<http://www.etl.com>

FAA Federal Aviation Administration
<http://www.faa.gov>

FCC Federal Communications Commission
<http://www.fcc.gov>

FPS The Forest Products Society
<http://www.forestprod.org>

GANa Glass Association of North America
<http://www.cssinfo.com/info/gana.html/>

FM Factory Mutual Insurance
<http://www.fmglobal.com>

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

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

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

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

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

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

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

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

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

IPCEA Insulated Power Cable Engineers Association

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

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

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

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

NBS National Bureau of Standards

See - NIST

NBBPVI National Board of Boiler and Pressure Vessel
Inspectors

<http://www.nationboard.org>

NEC National Electric Code

See - NFPA National Fire Protection Association

NEMA National Electrical Manufacturers Association

<http://www.nema.org>

NFPA National Fire Protection Association

<http://www.nfpa.org>

NHLA National Hardwood Lumber Association

<http://www.natlhardwood.org>

NIH National Institute of Health

<http://www.nih.gov>

NIST National Institute of Standards and Technology

<http://www.nist.gov>

NLMA Northeastern Lumber Manufacturers Association,
Inc.

<http://www.nelma.org>

NPA National Particleboard Association

18928 Premiere Court

Gaithersburg, MD 20879

(301) 670-0604

NSF National Sanitation Foundation

<http://www.nsf.org>

NWWDA Window and Door Manufacturers Association

<http://www.nwwda.org>

OSHA Occupational Safety and Health Administration
Department of Labor

<http://www.osha.gov>

PCA Portland Cement Association

<http://www.portcement.org>

PCI Precast Prestressed Concrete Institute

<http://www.pci.org>

PPI The Plastic Pipe Institute

<http://www.plasticpipe.org>

PEI Porcelain Enamel Institute, Inc.

<http://www.porcelainenamel.com>

PTI Post-Tensioning Institute

<http://www.post-tensioning.org>

RFCI The Resilient Floor Covering Institute

<http://www.rfci.com>

RIS Redwood Inspection Service

See - CRA

RMA Rubber Manufacturers Association, Inc.

<http://www.rma.org>

SCMA Southern Cypress Manufacturers Association

<http://www.cypressinfo.org>

SDI Steel Door Institute

<http://www.steeldoor.org>

IGMA Insulating Glass Manufacturers Alliance

<http://www.igmaonline.org>

SJI Steel Joist Institute

<http://www.steeljoist.org>

SMACNA Sheet Metal and Air-Conditioning Contractors
National Association, Inc.

<http://www.smacna.org>

SSPC The Society for Protective Coatings

<http://www.sspc.org>

STI Steel Tank Institute

<http://www.steeltank.com>

SWI Steel Window Institute

<http://www.steelwindows.com>

TCA Tile Council of America, Inc.

<http://www.tileusa.com>

TEMA Tubular Exchange Manufacturers Association

<http://www.tema.org>

TPI Truss Plate Institute, Inc.

583 D'Onofrio Drive; Suite 200

Madison, WI 53719

(608) 833-5900

UBC The Uniform Building Code

See ICBO

UL Underwriters' Laboratories Incorporated

<http://www.ul.com>

ULC Underwriters' Laboratories of Canada

<http://www.ulc.ca>

WCLIB West Coast Lumber Inspection Bureau

6980 SW Varns Road, P.O. Box 23145

Portland, OR 97223

(503) 639-0651

WRCLA Western Red Cedar Lumber Association

P.O. Box 120786

New Brighton, MN 55112

(612) 633-4334

WWPA Western Wood Products Association

<http://www.wwpa.org>

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SECTION 01 45 29
TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section specifies materials testing activities and inspection services required during project construction to be provided by a Testing Laboratory retained by the Contractor approved by the COR and Design Professional. The Contractor shall include the cost for these testing activities in the Base Bid.

1.2 APPLICABLE PUBLICATIONS:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
- B. American Association of State Highway and Transportation Officials (AASHTO):

-T27-1114 Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates
 -T96-02 (R2015) Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
 -T99-15 Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5 Kg (5.5 lb.) Rammer and a 305 mm (12 in.) Drop
 -T104-99 (R2011) Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
 -T180-15 Standard Method of Test for Moisture-Density Relations of Soils using a 4.54 kg (10 lb.) Rammer and a 457 mm (18 in.) Drop
 -T191-14 Standard Method of Test for Density of Soil In-Place by the Sand-Cone Method
- C. American Society for Testing and Materials (ASTM):
-A416/A416M-12A Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete
 -C39/C39M-12 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
 -C136-14 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

.....C143/C143M-10a	Standard Test Method for Slump of Hydraulic Cement Concrete
.....C172/C172M-10	Standard Practice for Sampling Freshly Mixed Concrete
.....D422-63(2007)e2	Standard Test Method for Particle-Size Analysis of Soils
.....D698-12e2	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
.....D1140-14	Standard Test Methods for Amount of Material in Soils Finer than No. 200 Sieve
.....D1556-15	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
.....D1557-12e1	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft lbf/ft ³ (2,700 KNm/m ³))
.....D2166-13	Standard Test Method for Unconfined Compressive Strength of Cohesive Soil
.....D2167-15	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
.....D2216-10	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
.....D3740-12a	Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction
.....D6938-15	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
.....E329-14a	Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
.....E543-15	Standard Specification for Agencies Performing Non-Destructive Testing

1.3 REQUIREMENTS:

- A. Accreditation Requirements: Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope

of Accreditation. The laboratory's scope of accreditation must include the appropriate ASTM standards (i.e.; E329, C1077, D3666, D3740, A880, E543) listed in the technical sections of the specifications.

Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA. The policy applies to the specific laboratory performing the actual testing, not just the "Corporate Office."

- B. Inspection and Testing: Testing laboratory shall inspect materials and workmanship and perform tests described herein and additional tests requested by Resident Engineer. When it appears materials furnished, or work performed by Contractor fail to meet construction contract requirements, Testing Laboratory shall direct attention of Resident Engineer to such failure.
- C. Written Reports: Testing laboratory shall submit test reports to Resident Engineer, Contractor, unless other arrangements are agreed to in writing by the Resident Engineer. Submit reports of tests that fail to meet construction contract requirements on colored paper.
- D. Verbal Reports: Give verbal notification to Resident Engineer immediately of any irregularity.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EARTHWORK:

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

B. Testing Compaction:

1. Determine maximum density and optimum moisture content for each type of fill, backfill and subgrade material used, in compliance with ASTM D698 Method A.
2. Make field density tests in accordance with the primary testing method following ASTM D6938 wherever possible. Field density tests utilizing ASTM D1556 shall be utilized on a case by case basis only if there are problems with the validity of the results from the primary method due to specific site field conditions. Should the testing laboratory propose these alternative methods, they should provide satisfactory explanation to the Resident Engineer before the tests are conducted.
 - a. One test at maximum 50 foot intervals per 2 foot of vertical lift and at changes in required density, but in no case fewer than one test per 2 foot lift.

C. Fill and Backfill Material Gradation: One test per 75 cubic yards stockpiled or in-place source material. Gradation of fill and backfill material shall be determined in accordance with ASTM C136.

D. Testing Materials: Test suitability of on-site and off-site borrow as directed by Resident Engineer.

3.2 CONCRETE:

A. Field Inspection and Materials Testing:

1. Provide a technician at site of placement at all times to perform concrete sampling and testing.
2. Review the delivery tickets of the ready-mix concrete trucks arriving on-site. Notify the Contractor if the concrete cannot be placed within the specified time limits or if the type of concrete delivered is incorrect. Reject any loads that do not comply with the Specification requirements. Rejected loads are to be removed from the site at the Contractor's expense. Any rejected concrete that is placed will be subject to removal.
3. Take concrete samples at point of placement in accordance with ASTM C172. Mold and cure compression test cylinders in accordance with ASTM C31. Make at least three cylinders from any one day's pour for each concrete type. Label each cylinder with an identification number. Resident Engineer may require additional cylinders to be molded and cured under job conditions.
4. Perform slump tests in accordance with ASTM C143. Test the first truck each day, and every time test cylinders are made. Test pumped concrete at the hopper and at the discharge end of the hose at the

- beginning of each day's pumping operations to determine change in slump.
5. Determine the air content of concrete per ASTM C173. Test every 80 m³ (100 cubic yards) at random. For pumped concrete, initially test concrete at both the hopper and the discharge end of the hose to determine change in air content.
 6. If slump or air content fall outside specified limits, make another test immediately from another portion of same batch.
 7. Perform unit weight tests in compliance with ASTM C138 for normal weight concrete. Test the first truck and each time cylinders are made.
 8. Notify laboratory technician at batch plant of mix irregularities and request materials and proportioning check.
 9. Verify that specified mixing has been accomplished.
 10. Environmental Conditions: Determine the temperature per ASTM C1064 for each truckload of concrete during hot weather and cold weather concreting operations:
 - a. When ambient air temperature falls below 4.4 degrees C (40 degrees F), record maximum and minimum air temperatures in each 24 hour period; record air temperature inside protective enclosure; record minimum temperature of surface of hardened concrete.
 - b. When ambient air temperature rises above 29.4 degrees C (85 degrees F), record maximum and minimum air temperature in each 24 hour period; record minimum relative humidity; record maximum wind velocity; record maximum temperature of surface of hardened concrete.
 11. Inspect the reinforcing steel placement, including bar size, bar spacing, top and bottom concrete cover, proper tie into the chairs, and grade of steel prior to concrete placement. Submit detailed report of observations.
 12. Observe conveying, placement, and consolidation of concrete for conformance to specifications.
 13. Observe condition of formed surfaces upon removal of formwork prior to repair of surface defects and observe repair of surface defects.
 14. Observe curing procedures for conformance with specifications, record dates of concrete placement, start of preliminary curing, start of final curing, end of curing period.
 15. Observe preparations for placement of concrete:
 - a. Inspect handling, conveying, and placing equipment, inspect vibrating and compaction equipment.

- b. Inspect preparation of construction, expansion, and isolation joints.
- 16. Observe preparations for protection from hot weather, cold weather, sun, and rain, and preparations for curing.
- 17. Observe concrete mixing:
 - a. Monitor and record amount of water added at project site.
 - b. Observe minimum and maximum mixing times.
- 18. Measure concrete flatwork for levelness and flatness.
- B. Laboratory Tests of Field Samples:
 - 1. Test compression test cylinders for strength in accordance with ASTM C39. For each test series, test one cylinder at 7 days and one cylinder at 28 days. Use remaining cylinder as a spare tested as directed by Resident Engineer. Compile laboratory test reports as follows: Compressive strength test shall be result of one cylinder, except when one cylinder shows evidence of improper sampling, molding or testing, in which case it shall be discarded and strength of spare cylinder shall be used.
 - 2. Make weight tests of hardened lightweight structural concrete in accordance with ASTM C567.
 - 3. Furnish certified compression test reports (duplicate) to Resident Engineer. In test report, indicate the following information:
 - a. Cylinder identification number and date cast.
 - b. Specific location at which test samples were taken.
 - c. Type of concrete, slump, and percent air.
 - d. Compressive strength of concrete in MPa (psi).
 - e. Weight of lightweight structural concrete in kg/m³ (pounds per cubic feet).
 - f. Weather conditions during placing.
 - g. Temperature of concrete in each test cylinder when test cylinder was molded.
 - h. Maximum and minimum ambient temperature during placing.
 - i. Ambient temperature when concrete sample in test cylinder was taken.
 - j. Date delivered to laboratory and date tested.

3.3 LANDSCAPING:

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

3.4 TYPE OF TEST:

A. Approximate (Minimum) Number of Tests Required

B. Earthwork:

Laboratory Compaction Test:(ASTM D1557)	<u>2</u>
Field Density (ASTM D6938 and/or D1556)	<u>10</u>

C. Concrete:

Making and Curing Concrete Test Cylinders (ASTM C31)	as specified
Compressive Strength, Test Cylinders (ASTM C39)	as specified
Concrete Slump Test (ASTM C143)	as specified
Concrete Air Content Test (ASTM C173)	as specified
Unit Weight, Lightweight Concrete (ASTM C567)	as specified
Flatness and Levelness Readings (ASTM E1155) (number of days)	<u>2</u>

D. Landscaping:

Topsoil Test	<u>4</u>
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E. Inspection:

Technical Personnel (Man-days)	<u>12</u>
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SECTION 01 57 19
TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the control of environmental pollution and damage that the Contractor must consider for air, water, and land resources. It includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.
- B. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:
 - 1. Adversely effect human health or welfare,
 - 2. Unfavorably alter ecological balances of importance to human life,
 - 3. Effect other species of importance to humankind, or;
 - 4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.
- C. Definitions of Pollutants:
 - 1. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
 - 2. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
 - 3. Sediment: Soil and other debris that has been eroded and transported by runoff water.
 - 4. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations and from community activities.
 - 5. Surface Discharge: The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "water of the United States" and would require a permit to discharge water from the governing agency.
 - 6. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, tin cans, and bones.

7. Sanitary Wastes:

- a. Sewage: Domestic sanitary sewage and human and animal waste.
- b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2 QUALITY CONTROL

- A. Establish and maintain quality control for the environmental protection of all items set forth herein.
- B. Record on daily reports any problems in complying with laws, regulations, and ordinances. Note any corrective action taken.

1.3 References

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
- B. U.S. National Archives and Records Administration (NARA):
-33 CFR 328 Definitions

1.4 SUBMITTALS

- A. In accordance with Section, 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:
1. Environmental Protection Plan: After the contract is awarded and prior to the commencement of the work, the Contractor shall meet with the Resident Engineer to discuss the proposed Environmental Protection Plan and to develop mutual understanding relative to details of environmental protection. Not more than 20 days after the meeting, the Contractor shall prepare and submit to the Resident Engineer and the Contracting Officer for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:
 - a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.
 - b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site.
 - c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
 - d. Description of the Contractor's environmental protection personnel training program.
 - e. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, noise control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

- f. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.
- g. Procedures to provide the environmental protection that comply with the applicable laws and regulations. Describe the procedures to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures as described in the Environmental Protection Plan.
- h. Permits, licenses, and the location of the solid waste disposal area.
- i. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Include as part of an Erosion Control Plan approved by the District Office of the U.S. Soil Conservation Service and the Department of Veterans Affairs.
- j. Environmental Monitoring Plans for the job site including land, water, air, and noise.
- k. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas. This plan may be incorporated within the Erosion Control Plan.
- B. Approval of the Contractor's Environmental Protection Plan will not relieve the Contractor of responsibility for adequate and continued control of pollutants and other environmental protection measures.

1.5 PROTECTION OF ENVIRONMENTAL RESOURCES

- A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.
- B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without permission from the Resident Engineer. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or where special emergency use is permitted.
 - 1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence

- isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.
2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.
 - a. Box and protect from damage existing trees and shrubs to remain on the construction site.
 - b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
 - c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.
 3. Reduction of Exposure of Unprotected Erodible Soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.
 4. Temporary Protection of Disturbed Areas: Construct diversion ditches, benches, and berms to retard and divert runoff from the construction site to protected drainage areas approved under paragraph 208 of the Clean Water Act.
 - a. Sediment Basins: Trap sediment from construction areas in temporary or permanent sediment basins that accommodate the runoff of a local 10 (design year) storm. After each storm, pump the basins dry and remove the accumulated sediment. Control overflow/drainage with paved weirs or by vertical overflow pipes, draining from the surface.
 - b. Reuse or conserve the collected topsoil sediment as directed by the Resident Engineer. Topsoil use and requirements are specified in Section 31 20 11, EARTHWORK.
 - c. Institute effluent quality monitoring programs as required by Federal, State, and local environmental agencies.
 5. Erosion and Sedimentation Control Devices: The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's activities. Construct or install all temporary and permanent erosion and sedimentation control features. Maintain temporary erosion and sediment control measures such as berms, dikes,

- drains, sedimentation basins, grassing, and mulching, until permanent drainage and erosion control facilities are completed and operative.
6. Manage borrow areas on and off Government property to minimize erosion and to prevent sediment from entering nearby water courses or lakes.
 7. Protect adjacent areas from despoilment by temporary excavations and embankments.
 8. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off Government property and dispose of waste in compliance with Federal, State, and local requirements.
 9. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.
 10. Handle discarded materials other than those included in the solid waste category as directed by the Resident Engineer.
- C. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to control water pollution by the listed construction activities that are included in this contract.
1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.
 2. Control movement of materials and equipment at stream crossings during construction to prevent violation of water pollution control standards of the Federal, State, or local government.
 3. Monitor water areas affected by construction.
- D. Protection of Fish and Wildlife Resources: Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife. Prior to beginning construction operations, list species that require specific attention along with measures for their protection.
- E. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Georgia, local codes, and Federal emission

and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.

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

Time Duration of Impact Noise	Sound Level in dB
More than 12 minutes in any hour	70
Less than 30 seconds of any hour	85
Less than three minutes of any hour	80
Less than 12 minutes of any hour	75
 2. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this contract, consisting of, but not limited to, the following:
 - a. Maintain maximum permissible construction equipment noise levels at 50 feet (dBA):

EARTHMOVING

FRONT LOADERS	75		
BACKHOES	5		
DOZERS	5	CRANES	5
TRACTORS	5		
SCAPERS	0		
GRADERS	5		
TRUCKS	5		
		PNEUMATIC TOOLS	0
PUMPS	5		
GENERATORS	5	SAWS	5
COMPRESSORS	5	VIBRATORS	5

- b. Use shields or other physical barriers to restrict noise transmission.
 - c. Provide soundproof housings or enclosures for noise-producing machinery.
 - d. Use efficient silencers on equipment air intakes.
 - e. Use efficient intake and exhaust mufflers on internal combustion engines that are maintained so equipment performs below noise levels specified.
 - f. Line hoppers and storage bins with sound deadening material.
 - g. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.
3. Measure sound level for noise exposure due to the construction at least once every five successive working days while work is being performed above 55 dB(A) noise level. Measure noise exposure at the property line or 50 feet from the noise source, whichever is greater. Measure the sound levels on the A weighing network of a General Purpose sound level meter at slow response. To minimize the effect of reflective sound waves at buildings, take measurements at three to six feet in front of any building face. Submit the recorded information to the Resident Engineer noting any problems and the alternatives for mitigating actions.
- G. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no additional cost to the Government. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.

H. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the Resident Engineer. Cleaning shall include off the station disposal of all items and materials not required to be salvaged, as well as all debris and rubbish resulting from demolition and new work operations.

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SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 Summary

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. See Division 01 for submitting warranties for Contract closeout.
- C. See Divisions 02 through 50 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.2 Definitions

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. It may be in certain instances, but is not necessarily the intent of product Specifications to limit the use of product manufacturers and model numbers to those listed by name. As a minimum, all requirements of the Specifications must be met, including but not limited to in regard to appearance, function, quality, durability, and source reliability. Actions and approvals regarding products and product substitutions will occur in a manner that suits and is in the best interest of the Owner
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
- D. All material must comply with specifications and referenced standards as minimum requirements. The latest edition of referenced standards apply, unless specifically stated otherwise.

- E. Do not use materials and equipment removed from the existing structure, except as specifically required or allowed by the Contract documents.

1.3 Submittals

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles. Substitutions under this paragraph shall only be considered when the specified product has become unavailable at no fault of the Contractor.

1. Substitution Request Form: Use CSI Form 13.1A.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
3. Statement indicating why specified material or product cannot be provided, or an explanation why Contractor wishes to provide an alternate material or product.
4. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
5. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
6. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
7. Samples, where applicable or requested.
8. List of similar installations for completed projects with project names and addresses and names and addresses of Design Professionals and owners.
9. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
10. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
11. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
12. Cost information, including a proposal of change, if any, in the Contract Sum.
13. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
14. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results, or because of adverse unforeseen conditions or expenses resulting from the substitution.
15. Design Professional's Action: If necessary, Design Professional will request additional information or documentation for evaluation of a request for substitution. Design Professional will notify Contractor of acceptance or rejection of proposed substitution within 1 day of receipt of request, or 1 day of receipt of additional information or

documentation, whichever is later.

16. Form of Acceptance: Change Order.

17. Use product specified if Design Professional cannot make a decision on use of a proposed substitution within time allocated.

B. Comparable Product Requests: Must be submitted a minimum of 10 days prior to bid. Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number, product data sheets, and title and Drawing numbers and titles.

1. Design Professional's Action: If necessary, Design Professional will request additional information or documentation for evaluation within 48 hours of receipt of a request for substitution. Design Professional will notify all Contractors of acceptance or rejection of proposed substitution within 3 days of receipt of request, or 3 days of receipt of additional information or documentation, whichever is later.

2. Form of Approval: Addendum.

3. Use product specified if Design Professional cannot make a decision on use of a comparable product request within time allocated.

1.4 Quality Assurance

A. Contractor shall be responsible for all aspects of material and equipment transportation, delivery, unloading, handling, storage, etc., necessary to get materials and equipment to the roof.

B. Deliver all materials with manufacturer's labels intact and legible.

1.5 Product Options

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project; product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 Product Delivery, Storage, and Handling

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementations products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.

1.7 Product Warranties

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
 3. Refer to Divisions 2 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. The material manufacturer(s) providing warranties or guarantees as a part of this contract shall provide a letter with the pre-construction submittals stating that they have examined the plans, details, and specifications and have the intent to provide the warranty or guarantee required under this contract. The letter shall also state that the installing contractor is of adequate level and is in good standing to obtain the warranty or guarantee requested.
- D. If the material manufacturer shall have any exceptions to the work as shown or described in the plans, details, or specification, that manufacturer shall provide written documentation to the Design Professional by way of a bidder a minimum of 10 days prior to bid with a list of any work described or shown on the plans, details, or specification that do not meet the

manufacturer(s) minimum requirements to obtain the specified warranty or guarantee, or that do not meet minimum industry standards. No exceptions or modifications to the terms of warranties or guarantees shall be made after the bid.

E. All warranties that are normally available from manufacturers, vendors, Subcontractors, etc. shall be provided to the Owner, even if these warranties are not specifically called for in the Contract Documents.

F. Submittal Time: Comply with requirements in Division 01.

PART 2 - PRODUCTS

2.1 Product Selection Procedures

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Design Professional or Owner will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Design Professional's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures:

1. Product: Where Specification names a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specification names a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Available Products: Where Specification includes a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements, as determined by the Design Professional. Comply with provisions in Part 1 "Comparable Products" Article for consideration of an unnamed product.
4. Available Manufacturers: Where Specification includes a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements, as determined by the Design Professional. Comply with provisions in Part 1 "Comparable Products" Article for consideration of an unnamed product.
5. Product Options: Where Specification indicates that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 1 "Product Substitutions" Article for consideration of an unnamed

- product or system.
6. Basis-of-Design Product: Where Specification names a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specification indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 1 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
 7. Visual Matching Specification: Where Specification requires matching an established Sample, select a product that complies with requirements and matches Design Professional's sample. Design Professional's decision will be final on whether a proposed product matches.
 8. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.
 9. Product: Where Specification names a single product and manufacturer, provide the named product that complies with requirements.
 10. Standard Range: Where Specification includes the phrase "standard range of colors, patterns, textures" or similar phrase, Design Professional will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
 11. Full Range: Where Specification includes the phrase "full range of colors, patterns, textures" or similar phrase, Design Professional will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 Product Substitutions

- A. Timing: Design Professional will consider requests for substitution if received within 5 days after the Proceed Order. Requests received after that time may be considered or rejected at the discretion of the Design Professional.
- B. Conditions: Design Professional will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Design Professional will return requests without action, except to record noncompliance with these requirements:
 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Design Professional for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 2. Requested substitution does not require extensive revisions to the Contract Documents.
 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 4. Substitution request is fully documented and properly submitted.
 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 7. Requested substitution is compatible with other portions of the Work.
 8. Requested substitution has been coordinated with other portions of the Work.

9. Requested substitution provides specified warranty.

- C. Should, subsequent to the approval or implementation of a substitution, there occur a discovery of an unforeseen circumstance or condition that is attributable to the substitution, the Contractor shall be responsible to bear any additional costs or to return to the Owner any cost savings resulting from the discovery.

2.3 Comparable Products

- A. Conditions: Design Professional will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Design Professional will return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents, and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Product data sheets of proposed materials
 3. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 4. Evidence that proposed product provides specified warranty.
 5. List of similar installations for completed projects with project names and addresses and names and addresses of Design Professionals and owners, if requested.
 6. Samples, if requested.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 66 00
STORAGE AND PROTECTION

PART 1 - GENERAL

1.1 Protection

- A. Limit size of work sections to safeguard adjacent materials, structures, etc., and to minimize dust and noise.
- B. Protect existing facilities from damage during work. Do not overload existing paving, curbs, sidewalks, etc. with vehicle traffic. Do not overload new or existing construction with demolition debris, equipment, etc.
- C. The Contractor shall install and maintain temporary fall protection systems for this type of work in accordance with the following standards:
 - 1. 29 CFR 1910 - OSHA
 - 2. 29 CFR 1926 - OSHA
 - 3. ANSI/IWCA I-14.1
 - 4. ANSI/ASSE Z359.0-2007
 - 5. ASME A120.01-2008
- D. Protect existing sidewalk pedestrians, street traffic, and any other persons, buildings, or structure below and above the work by means as required by OSHA and local codes. The use of any temporary covered walkways, swing stages, stage landings, fencing, netting, or other protections required by local jurisdiction shall be borne by the Contractor at no additional cost to the Owner.
- E. The Contractor shall submit a safety plan that shall outline safety precautions that shall be in place to protect workers, buildings, persons, vehicles, structures, and any other items that may be affected or otherwise endangered during the work. This shall list techniques, materials, safety personnel, and precautions that shall be used to achieve a safe working environment. This safety plan shall be submitted with the bids for evaluation as a part of this work.
- F. Protect existing facilities from fire as a result of construction operations. Contractor shall provide suitable and adequate fire extinguishers conveniently located on at staging areas, storage areas and at areas or equipment where an open flame is being used. Competent operators shall be in attendance at all times and shall be properly trained or instructed in fire protection.
 - 1. At each location where an open flame is used, Contractor shall provide a watchman with a suitable fire extinguisher.
- G. Protect people, vehicles, property, and all surfaces not scheduled for repair, sealant, repellant, and/or coatings from product, splash, rinse, residue, fumes, and wind drift. Protect grounds, plants, masonry, and other surfaces that lie below the substrates or in the direct path of solution run-off or mist. Consult local building codes for any special requirements for the disposal of products.

- H. Walls, windows, roof edges, etc., adjacent to lifts, hoists, and staging areas shall be protected using canvas tarpaulins.
- I. Plywood, minimum ¾" thick, or other suitable materials shall be used to protect roof areas from damage that may be caused by concentrated equipment loads and foot traffic.
- J. Roof traffic shall be confined to work areas. Contractor shall be responsible for leaks that develop in traffic areas during and after project completion.
- K. Contractor shall protect interior operations from adverse weather during construction operations.
- L. All tie-ins to existing work shall be a natural building breaks, control joints, or expansion joints. Moisture and debris migrating behind newly installed materials is grounds for rejection of materials, and shall constitute the replacement of the materials with like materials at no additional cost to the Owner.
- M. The Contractor will be held liable for any damages to the building, building contents, its occupancy, grounds or landscaping resulting from work under the Contract. In the event of damage, Contractor will restore property to a condition equivalent to that at the time the project started.
- N. The Contractor shall keep existing drainage facilities at grounds and on existing roofing clear of debris and materials during construction.

1.2 Material Protection

- A. Products shall be transported by methods which avoid damage. Damaged material shall be subject to rejection by the Engineer.
- B. Store materials off of the ground covered with tarps. Factory-applied wrappings are not acceptable.
- C. Wet materials shall be removed from the project site.
- D. Materials that are temperature sensitive are to be stored in strict accord with manufacturer's written instructions.

1.3 Storage

- A. Contractor shall be responsible for proper storage of equipment, materials and devices furnished by himself and/or his subcontractors and suppliers.
- B. To the maximum extent possible, the Contractor shall not store combustible or flammable materials inside the facility.
- C. All storage areas are subject to approval by the Owner or his authorized representative.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - PART 3 - EXECUTION

3.1 Not Used.

- - - END OF SECTION - - -

SECTION 01 73 29
CUTTING AND PATCHING PROCEDURES

PART 1 - GENERAL

1.1 Summary

- A. This Section includes procedural requirements for cutting and patching.
- B. See Divisions 2 through 33 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.2 Submittals

- A. Cutting and Patching Proposal: Contractor shall submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
 - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
 - 7. Design Professional's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.3 Quality Assurance

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying

capacity that results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety.

- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Design Professional's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.4 Warranty

- A. Existing and Projected Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties, or warranties that are set to commence with Material Completion.

PART 2 - PRODUCTS

2.1 Materials

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 Examination

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 Preparation

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or

interruption of free passage to adjoining areas.

3.3 Performance

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - 3. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.

- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.
- B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.
- C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:
 - 1. Waste Management Plan development and implementation.
 - 2. Techniques to minimize waste generation.
 - 3. Sorting and separating of waste materials.
 - 4. Salvage of existing materials and items for reuse or resale.
 - 5. Recycling of materials that cannot be reused or sold.
- D. At a minimum the following waste categories shall be diverted from landfills:
 - 1. Soil.
 - 2. Inerts (eg, concrete, masonry and asphalt).
 - 3. Clean dimensional wood and palette wood.
 - 4. Green waste (biodegradable landscaping materials).
 - 5. Engineered wood products (plywood, particle board and I-joists, etc).
 - 6. Metal products (eg, steel, wire, beverage containers, copper, etc).
 - 7. Cardboard, paper and packaging.
 - 8. Bitumen roofing materials.
 - 9. Plastics (eg, ABS, PVC).
 - 10. Paint.

1.2 RELATED WORK

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

1.3 QUALITY ASSURANCE

- A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed

to ensure the generation of as little waste as possible. Construction /Demolition waste includes products of the following:

1. Excess or unusable construction materials.
 2. Packaging used for construction products.
 3. Poor planning and/or layout.
 4. Construction error.
 5. Over ordering.
 6. Weather damage.
 7. Contamination.
 8. Mishandling.
 9. Breakage.
- B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.
- C. Contractor shall develop and implement procedures to recycle construction and demolition waste.
- D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.
- E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website <http://www.wbdg.org/tools/cwm.php> provides a Construction Waste Management Database that contains information on companies that haul, collect, and process recyclable debris from construction projects.
- F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.
- G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.
- H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

1.4 TERMINOLOGY

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.
- B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.
- C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.
- D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.
- E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).
- F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.
- G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.
- H. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.
- I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.
- K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.
- L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

1. On-site Recycling - Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.
 2. Off-site Recycling - Materials hauled to a location and used in an altered form in the manufacture of new products.
- M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials accepted and operating procedures, a recycling facility may or may not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.
- N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.
- O. Return: To give back reusable items or unused products to vendors for credit.
- P. Salvage: To remove waste materials from the site for resale or re-use by a third party.
- Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.
- R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.
- S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

1.5 SUBMITTALS

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:
- B. Prepare and submit to the Resident Engineer a written demolition debris management plan. The plan shall include, but not be limited to, the following information:
1. Procedures to be used for debris management.
 2. Techniques to be used to minimize waste generation.
 3. Analysis of the estimated job site waste to be generated:
 - a. List of each material and quantity to be salvaged, reused, recycled.
 - b. List of each material and quantity proposed to be taken to a landfill.

4. Detailed description of the Means/Methods to be used for material handling.
 - a. On site: Material separation, storage, protection where applicable.
 - b. Off site: Transportation means and destination. Include list of materials.
 - 1) Description of materials to be site-separated and self-hauled to designated facilities.
 - 2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
 - c. The names and locations of mixed debris reuse and recycling facilities or sites.
 - d. The names and locations of trash disposal landfill facilities or sites.
 - e. Documentation that the facilities or sites are approved to receive the materials.
- C. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.
- D. Monthly summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling.

1.6 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. In the event that criteria requirements conflict, the most stringent requirements shall be met.
- B. U.S. Green Building Council (USGBC):

LEED Green Building Rating System for New Construction

1.7 RECORDS

- A. Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Records shall be kept in accordance with the LEED Reference Guide and LEED Template.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. List of each material and quantity to be salvaged, recycled, reused.
- B. List of each material and quantity proposed to be taken to a landfill.

- C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

PART 3 - EXECUTION

3.1 COLLECTION

- A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.
- B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.
- C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations.

3.2 DISPOSAL

- A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.
- B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

3.3 REPORT

- A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.
- B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.
- C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices. Include the net total costs for each disposal.

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SECTION 01 78 36
WARRANTIES

PART 1 - GENERAL

- 1.1 Upon completion of the work and prior to the final payment, the Contractor shall submit the required contractor's warranty and/or manufacturer's guarantee, as required by this Section.
- 1.2 Submit all items required by this Section as part of project record documents.
- 1.3 Comply with FAR clause 52.246-21 "Warranty of Construction".
- 1.4 General Warranties and Bonds
 - A. Comply with the Contract concerning warranties and bonds. The General Contractor, for work performed by subcontractors, shall agree that the work covered under this Contract shall remain free from any water penetration and physical defects caused by defective workmanship or materials for a period of one (1) year. Warranty shall be executed on Contractor's company letterhead and signed by an authorized officer of the company.
 - B. Comply with the Contract concerning warranties and bonds. The General Contractor, for work self-performed, shall agree that the work covered under this Contract shall remain free from any water penetration and physical defects caused by defective workmanship or materials for a period of two (2) years except for the stripping membrane at plazas. Warranty shall be executed on Contractor's company letterhead and signed by an authorized officer of the company.
 - C. Comply with the Contract concerning warranties and bonds. The appropriate subcontractor shall agree that the work covered under this Contract shall remain free from any water penetration and physical defects caused by defective workmanship or materials for a period of two (2) years except for the stripping membrane at plazas. Warranty shall be executed on Contractor's company letterhead and signed by an authorized officer of the company.
 - D. Comply with the Contract concerning warranties and bonds. The appropriate contractor, for work performed with application of expansion joint covers at plazas, shall agree that the work covered under this Contract shall remain free from any water penetration and physical defects caused by defective workmanship or materials for a period of one (1) year. Warranty shall be executed on Contractor's company letterhead and signed by an authorized officer of the company.
- 1.5 Division 03 - Warranties and Bonds
 - A. Section 03 01 40 - Maintenance of Concrete: Prior to final payment, Contractor shall submit one original and three (3) copies of the repair mortar and steel reinforcing repair material manufacturer's five (5) year premium warranty to the Owner.

1.6 Division 05 - Warranties and Bonds

- A. Section 05 50 00 - Metal Fabrications: Prior to final payment, the contractor shall furnish one original and three copies of the metal paint manufacturer's 10-year finish warranty for applied finishes to the Owner.

1.7 Division 07 - Warranties and Bonds

- A. Section 07 13 52 - Modified Bituminous Sheet Waterproofing: Prior to final payment, Contractor shall submit one original and three copies of the bituminous sheet waterproofing system manufacturer's twenty (20) year without financial limitation guarantee, with flashing endorsement, to the Owner.
- B. Sections 07 19 16 - Silane Water Repellents and 09 97 23 - Coatings for Concrete and Masonry: Prior to final payment, Contractor shall submit one original and three (3) copies of the sealant, water repellent, and wall coating manufacturer's, ten (10) year premium warranty to the Owner.

- 1. Where a problem has arisen with the material performance of a product that has been approved by the waterproofing and sealant manufacturer as a part of the work under this specification, but is not manufactured by the waterproofing or sealant manufacturer, and a product defect or failure occurs, even if the failure/defect does not result in leaks through the waterproofing, sealant, and/or facility, the waterproofing and sealant manufacturer and shall work in concert with the awarded contractor to resolve such issues to the satisfaction of the Owner at no additional cost to the Owner.

- 2. In the event that the waterproofing and sealant manufacturer should supply materials that they do not manufacture, to include such items as repair mortar, primer, and/or cleaning products ; these items shall be included in the Guarantee coverage.

- C. Section 07 92 00 - Joint Sealants: Prior to final payment, Contractor shall submit one original and three (3) copies of the sealant manufacturer's twenty (20) year premium warranty to the Owner.

- 1. Where a problem has arisen with the material performance of a product that has been approved by the waterproofing and sealant manufacturer as a part of the work under this specification, but is not manufactured by the waterproofing or sealant manufacturer, and a product defect or failure occurs, even if the failure/defect does not result in leaks through the waterproofing, sealant, and/or facility, the waterproofing and sealant manufacturer and shall work in concert with the awarded contractor to resolve such issues to the satisfaction of the Owner at no additional cost to the Owner.

- 2. In the event that the waterproofing and sealant manufacturer should supply materials that they do not manufacture, to include such items as repair mortar, primer, and/or cleaning products; these items shall be included in the Guarantee coverage.

D. Section 07 60 00 - Flashing and Sheet Metal: Prior to final payment, the contractor shall furnish one original and three copies of the metal flashing manufacturer's 20-year finish warranty for factory applied finishes top the Owner.

E. Section 07 71 29 - Manufactured Roof Expansion Joints

1. Prior to final payment, the contractor shall furnish one original and three copies of the plaza expansion joint cover manufacturer's five (5) year weathertightness warranty with no financial limitation to the Owner.
2. Prior to final payment, Contractor shall submit one original and three copies, from the roofing system manufacturer at the plaza, that the existing warranty or guarantee currently in effect shall include the stripping membrane work performed under this Contract.

F. Section 07 95 13 - Expansion Joint Assemblies

1. Prior to final payment, the contractor shall furnish one original and three copies of the plaza expansion joint cover manufacturer's five (5) year weathertightness warranty with no financial limitation to the Owner.
2. Prior to final payment, the contractor shall furnish one original and three copies of the metal expansion joint cover plate manufacturer's 20-year finish warranty for factory applied finishes top the Owner.

G. Emergency repairs to defects and leaks shall be performed within 24 hours of receiving notice from Owner. As soon as weather permits, permanent repairs and restoration of affected areas shall be accomplished in a manner in conformance with the original Contract requirements. This work shall be done without additional cost to the Owner, except if it is determined that such leaks and effects were caused by abuse, lightning, hurricane, tornado, hail storm, or other unusual phenomena.

1.8 The warranties shall also state that the Owner has the right, at any time during the Contractors' warranty period to make emergency repairs to protect the contents of the building or the building itself from damage due to leaking. The cost of emergency repairs made during the two year period of the warranty shall be borne by the Contractor and action by the Owner shall not invalidate the warranty.

1.9 Starting dates of all warranties shall be the date of final acceptance of the work by the government.

- - - END OF SECTION - - -

SECTION 02 41 00**DEMOLITION****PART 1 - GENERAL****1.1 DESCRIPTION:**

- A. This section specifies demolition and removal of portions of buildings, utilities, other structures and debris from trash dumps shown.

1.2 RELATED WORK:

- A. Section 01 00 00, General Requirements.
- B. Section 01 22 13, Unit Prices and Allowances.
- C. Section 01 35 26, Safety Requirements, Accident Prevention Plan (APP).
- D. Section 01 57 19, Temporary Environmental Controls.
- E. Section 01 74 19, Construction Waste Management.
- F. Section 02 41 00, Demolition
- G. Section 03 01 40, Maintenance of Precast Concrete.
- H. Section 05 50 00, Metal Fabrications.
- I. Section 07 13 52, Modified Bituminous Sheet Waterproofing.
- J. Section 07 18 13, Pedestrian Traffic Coating
- K. Section 07 19 16, Silane Water Repellent.
- L. Section 07 60 00, Flashing and Sheet Metal.
- M. Section 07 71 29, Manufactured Roof Expansion Joints.
- N. Section 07 92 00, Joint Sealants.
- O. Section 07 95 13, Expansion Joint Assemblies.
- P. Section 08 01 80, Maintenance of Glazing.
- Q. Section 09 97 23, Coatings for Concrete and Masonry.
- R. Section 31 20 11, Earth Moving (Short Form).

1.3 PROTECTION:

- A. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures. Comply with requirements of GENERAL CONDITIONS Article, ACCIDENT PREVENTION.
- B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations. Comply with requirements of Section 01 00 00, GENERAL REQUIREMENTS,

Article PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS.

- C. 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. Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The contractor shall take necessary precautions to avoid damages to existing items to remain in place, to be reused, or to remain the property of the Medical Center; any damaged items shall be repaired or replaced as approved by the Resident Engineer. 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 Resident Engineer's approval.
- G. The work shall comply with the requirements of Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.
- H. The work shall comply with the requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article 1.7 INFECTION PREVENTION MEASURES.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 DEMOLITION:

- A. See Section 01 11 00, Summary of Work for demolitions.

- B. Debris, including brick, concrete, stone, metals, sealants, coatings, backings, and similar materials shall become property of Contractor and shall be disposed of by him daily, off the Medical Center to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Resident Engineer. 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.
- C. Remove and legally dispose of all materials, other than earth to remain as part of project work, from any trash dumps shown. Materials removed shall become property of contractor and shall be disposed of in compliance with applicable federal, state or local permits, rules and/or regulations. All materials in the indicated trash dump areas, including above surrounding grade and extending to a depth of 5 feet below surrounding grade, shall be included as part of the lump sum compensation for the work of this section. Materials that are located beneath the surface of the surrounding ground more than 5 feet), or materials that are discovered to be hazardous, shall be handled as unforeseen. The removal of hazardous material shall be referred to Hazardous Materials specifications.

3.2 CLEAN-UP:

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

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SECTION 03 01 40
MAINTENANCE OF CONCRETE

PART 1 - GENERAL

1.1 Summary

- A. Repairing cracks and spalling in precast concrete wall panels, concrete retaining wall, and the column adjacent to the concrete retaining wall.
- B. Repairs shall be made to concrete wall panels prior to applying water repellent and to concrete retaining wall and column prior to applying coating.

1.2 Related Work Specified Elsewhere

- A. Section 02 41 00, Demolition
- B. Section 05 50 00, Metal Fabrications
- C. Section 07 92 00, Joint Sealants
- D. Section 07 19 16, Silane Water Repellent
- E. Section 09 97 23, Coatings for Concrete and Masonry

1.3 Protection

- A. Refer to Section 01 66 00.

1.4 Environmental Conditions

- A. Material installation shall proceed only when weather conditions are in compliance with manufacturer's recommendations for installation and no precipitation is imminent. Materials installed during adverse weather conditions shall be subject to rejection including removal and replacement at no additional cost to the Owner.
- B. Use manufacturer's standard test method to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of coatings to substrates.

1.5 Submittals

- A. Submit copies of manufacturer's literature for the following:
 - 1. Product Data consisting of coating system manufacturer's product information for components, materials, accessories, and equipment necessary to perform the work.
 - 2. Applicable detail and shop drawings for the work.
 - 3. Samples for initial selection purposes in form of manufacturer's color charts or chips showing full range of colors and textures.
 - 4. Installer certificates signed by coating system manufacturer written certification certifying that the installer complies with requirements included under the "Quality Assurance" section of

the Specification.

5. Operation and Maintenance Data as required by the warranty.
6. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

B. Refer to Section 01 33 00 of Specification.

1.6 Quality Assurance

- A. Contractor: Applicator must be approved, authorized, or licensed in writing by the approved repair product manufacturer and have a minimum of five years' experience as an approved, authorized, or licensed applicator with that manufacturer and be approved at a level capable of providing the specified warranty. The applicator must supply the names, locations and client contact information of five projects of similar size and scope that the applicator has constructed using the manufacturer's repair products submitted for this project within the previous three years.
- B. Manufacturer: Manufacturer shall have a minimum of 10 years of continuous, concurrent experience providing specified materials including the current year. Manufacturer is required, at a minimum, to perform biweekly site inspections to assess the work performed by the Contractor since the previous site inspection and provide written documentation to Owner and Design Professional of findings and resolution of any deficient areas of work or issues.
- C. Mock-Up: Within 3 days of the final submittal approval, the Contractor shall provide a minimum 5' x 5' full-scale mockup of construction techniques and materials to be used at the job site at no additional cost to the Owner. Mockups shall be complete and represent the final product produced by the work under this specification to include cleaning, preparation, and application of construction products in accordance with this specification and manufacturer requirements. To the full extent possible, mockups shall be constructed at the job site at a location agreed upon by the Owner. Mockups shall not be constructed at completed locations or locations not scheduled for the work under this specification. Mockups shall remain in place through the duration of the work. Mock-Up shall be complete at the time of the pre-construction meeting.

1.7 Warranty

- A. Refer to Section 01 78 36 of this specification.

PART 2 - PRODUCTS

2.1 Materials, General

- A. Compatibility: Provide repair products and other related materials that are compatible with one another and with substrates under conditions of service and application, as demonstrated by repair product manufacturer, based on testing and field experience.
- B. Colors of Repair Products: To match existing wall finish as selected by Owner.

2.2 Small Crack Sealant

- A. Sealant for use at small cracks in precast concrete wall panels:
 - 1. For use at cracks in concrete larger than 1/32" but less than 1/4".
 - 2. Products: Subject to compliance with requirements. All listed manufacturers and products are provided as examples of the salient characteristics to be found in the submitted product. Any additional manufacturers not listed must meet the requirements set forth in this specification and be approved prior to bid in accordance with Section 01 60 00. Products that may be incorporated into the Work include, but are not limited to the following:
 - a. BASF Corporation; **MasterProtect FL-748**
 - b. Pecora Corporation; **Dynatrol I-XL**
 - c. Sika Corporation; **Sikaflex 15LM**
 - d. Tremco; **Dymonic**

2.3 Large Crack Sealants - Standard Specification for Elastomeric Joint Sealant

- A. ASTM C 920, Type S or M, Grade NS, Class 25, for use NT, M, A, and O:
 - 1. For use at cracks in concrete larger than 1/4".
 - 2. Products: Subject to compliance with requirements. All listed manufacturers and products are provided as examples of the salient characteristics to be found in the submitted product. Any additional manufacturers not listed must meet the requirements set forth in this specification and be approved prior to bid in accordance with Section 01 60 00. Products that may be incorporated into the Work include, but are not limited to the following:
 - a. BASF Corporation; **MasterSeal NP-1**

- b. Pecora Corporation; ***Dynatrol I-XL***
- c. Sika Corporation; ***SikaFlex 15LM***
- d. Tremco; ***Dymonic***

2.4 Reinforcing Steel Bar Primer

A. Rust inhibiting primer:

- 1. For use at exposed reinforcing steel at concrete wall panels.
- 2. Products: Subject to compliance with requirements. All listed manufacturers and products are provided as examples of the salient characteristics to be found in the submitted product. Any additional manufacturers not listed must meet the requirements set forth in this specification and be approved prior to bid in accordance with Section 01 60 00. Products that may be incorporated into the Work include, but are not limited to the following:
 - a. BASF Corporation; ***Zincrich Rebar Primer***
 - b. Sika Corporation; ***Armtec 100 EpoCem***
 - c. Euclid Chemical; ***Duralprep A.C.***

2.5 Repair Mortar

A. Ready-to-use mortar for vertical and overhead applications:

- 1. For use at spalled concrete locations.
- 2. Products: Subject to compliance with requirements. All listed manufacturers and products are provided as examples of the salient characteristics to be found in the submitted product. Any additional manufacturers not listed must meet the requirements set forth in this specification and be approved prior to bid in accordance with Section 01 60 00. Products that may be incorporated into the Work include, but are not limited to the following:
 - a. BASF Corporation; ***MasterEmaco N425***
 - b. Pecora Corporation; ***Vertical/Overhead Patching Compound***
 - c. Sika Corporation; ***SikaQuick VOH***
 - d. Euclid Chemical; ***Verticoat Supreme***

2.6 Curing Agent: As recommended by approved repair mortar manufacturer to meet ASTM C1315 or ACI 308-11 requirements.

2.7 Reinforcing Steel Splice Coupling: Lenton Lock B-Series, or approved equal prior to bid. Coupling length as required for rebar size.

2.8 Wire Ties: Minimum 16 Gauge annealed galvanized wire as manufactured by A.L. Patterson, Inc., or approved equal prior to bid.

- 2.9 Brush: Nylon brushes only
- 2.10 Roller: High quality ¾" to 1-1/4" nap roller cover.
- 2.11 Trowel: As recommended by the approved repair product manufacturer.

PART 3 - EXECUTION

3.1 Definitions

- A. Small cracks: Cracks in concrete wall panels that are greater than 1/32" thick and less than 1/4" thick.
- B. Large cracks: Cracks in concrete wall panels that are larger than 1/4" thick.
- C. Spalled Concrete: Concrete flaking as a result of water intrusion and/or reinforcing steel corrosion.

3.2 (Unit Price No. 1) Small Crack Repair

- A. Clean and prepare substrate in accordance with manufacturer written instructions.
- B. Remove all debris from crack with oil-free compressed air.
- C. Apply crack filler in two coats. Apply first coat of product into crack to completely fill and remove excess from edges.
- D. Apply second coat of product so that it finishes flush with the surface of the existing concrete on either side of the crack and feather out to approximately to 2 inches wide unless manufacturer has more stringent requirements. Allow each coat to dry a minimum of 4 hours unless manufacturer has more stringent requirements. Follow manufacturer recommendations for temperature limitations and curing requirements.
- E. Apply crack sealer in accordance with this paragraph and manufacturer written requirements, whichever are more stringent.

3.3 (Unit Price No.2) Large Crack Repair

- A. Clean and prepare substrate in accordance with manufacturer written instructions.
- B. Rout crack to a minimum of 1/4" wide by 1/4" depth.
- C. Remove all debris from crack with oil-free compressed air.
- D. Contractor shall make every effort to match the new sealant with the existing wall panels.
- E. Surfaces shall be clean and free of containments in accordance with Section 07 92 00 and manufacturer instructions.
- F. Contractor shall install sealant in accordance with Section 07 92 00, Paragraphs 3.3 through Paragraph 3.5.
- G. Tool sealant to allow for any expansion and contraction.
- H. Apply sealant in accordance with this paragraph and manufacturer

written requirements, whichever are more stringent.

3.4 (Unit Prices Nos. 3) Corroded Reinforcing Steel Preparation

- A. At corroded exposed reinforcing steel, remove all loose and deteriorated concrete around the steel to fully expose the rusted areas to well bonded concrete to the reinforcing.
- B. Prepare rusted steel in accordance with IRCI Guideline No. 03730 (Second Edition) or latest edition equivalent.
- C. Where rust is on the back of reinforcing steel, remove the concrete to provide a minimum clearance of 3/4" behind the steel or 1/4" larger than the largest aggregate in the concrete.
 - a. Note: Care should be taken not to remove sound concrete from reinforcing steel unless necessary to meet primer manufacturer requirements.
 - b. Note: All removed concrete shall be repaired at no additional cost to the Owner.
- D. Scrape all scaling rust from the steel using a wire brush or other techniques as approved and recommended by the rust inhibiting coating manufacturer.
- E. Apply the rust inhibiting coating and allow drying in accordance with coating manufacturer written instructions.
- F. At areas where existing steel is rusted through or damaged, remove the damaged or rusted through portion of the reinforcing steel. Furnish and install new deformed reinforcing steel to match the existing in accordance with ACI 318-11 for a Type I splice. Mechanically splice in accordance with ACI 318-11 requirements using pre-manufactured couplings.
 - 1. The connection shall develop in compression or tension not less than 125 percent of the new reinforcing steel yield strength as determined using ASTM A370.
- G. At locations where existing ties are broken or missing, furnish and install new ties in accordance with ACI 318-11.
 - 1. Install one Figure 8 Tie and one Saddle Tie for each missing or broken tie prior to applying repair mortar utilizing hand tools as recommended by the wire manufacturer.

3.5 (Unit Price No. 4) Spalled Concrete Repair

- A. Remove all loose or deteriorated concrete in accordance with manufacturer recommendations.
- B. Treat any exposed reinforcing steel in accordance with Paragraph 3.4

above.

- C. Cut concrete so that patch area is the minimum rectangular size to patch the spalled area and ensure that concrete is removed to a minimum depth of 1/4".
- D. Prior to mixing repair mortar, wet all tools and mixer to be used for mixing.
- E. Mix mortar and water to a uniform consistency using a low-speed drill and paddle in accordance with manufacturer written requirements.
- F. Ensure that existing concrete is saturated surface dry (SSD) prior to application by dampening with water. Ensure no standing water at location.
- G. Prepare surfaces for new concrete by first applying a light coat (minimum 1/8" thick) of repair mortar and allowing drying.
- H. Apply repair mortar in maximum 2 inch thicknesses unless manufacturer has more stringent requirement. If multiple applications are required, score each application prior to setting.
- I. Work mortar into finish to match the existing concrete wall panels after the initial set.
- J. Utilize water-based curing agent and polypropylene plastic to cover repairs in accordance with ASTM C1315 or ACI 308-11, as required by manufacturer.

3.6 Cleaning

- A. Do not allow repair mortar to cure on substrate and surfaces not scheduled for repairs. Immediately clean mortar from these surfaces using water prior to curing.
- B. Do not allow primer, sealant, or sealer to come in contact with substrates and surfaces not scheduled for repairs. Immediately clean materials from these surfaces prior to drying or curing.
- C. Work area and areas adjacent shall be clean and free of debris during and after application. There shall be no locations of spills identified at any areas.

- - - END OF SECTION - - -

SECTION 03 30 00
CAST IN PLACE CONCRETE

PART 1 - GENERAL

1.1 Work Included:

- A.** This section includes product requirements and installation requirements for the cast in place concrete.
- B.** This section includes the replacement of the sidewalk at the retaining wall.
- C.** Any sidewalk that is not removed and damaged as a part of the excavation and waterproofing operations at the retaining wall shall be replaced by the Contractor at no additional cost to the Owner.

1.2 Related Work Specified Elsewhere

- A.** Selective Demolition and Preparations - Section 02 41 00
- B.** Joint Sealants - Section 07 92 00
- C.** Pedestrian Traffic Coating - Section 07 18 13

1.3 Protection

- A.** Refer to Section 01 66 00 of this specification.

1.4 Submittals

- A.** Refer to this specification.
- B.** Product Data: Provide data form proprietary materials, including admixtures, curing materials, and finishing materials.
- C.** Submit Placement Shop Drawings.
- D.** Samples: As requested by Testing Laboratory. Testing as required by Gwinnett County and the General Conditions of this contract.
- E.** Contractor shall submit curing material.

1.5 Quality Control

- A.** Manufacturer Qualifications: Work of this Section to be executed by manufacturers specializing in the fabrication of the materials specified. Manufacturer shall have a minimum of 10 years of continuous, concurrent experience providing specified materials including the current year.
- B.** Installer Qualifications: Work associated with the installation of new concrete shall be performed by a waterproofing contractor licensed to perform such work in the state of Georgia and shall have a minimum of 5 years of experience in this type of work.

- C. Concrete shall comply with ACI 318 and ACI 301. Adhere to all jurisdictional code requirements for reinforced concrete.
- D. Ready mix concrete shall comply with ASTM C39.
- E. Concrete work shall only proceed if ambient temperature is over 40 degrees F and rising.
- F. All work shall comply with the International Building Code 2012 Edition, with all Georgia Amendments.

PART 2 - PRODUCTS

2.1 Concrete: Minimum 3,000 psi after 30 day cure. ASTM C 928, R-3

- A. Portland cement concrete will ordinarily be accepted on the basis of certification.
- B. Testing as required by Owner.
- C. On-site mixing is permitted.
- D. The CONTRACTOR shall submit for approval the following:
 - 1. The type and sources of aggregates and cement.
 - 2. Scale weights of each aggregate proposed as pounds per cubic yard of concrete.
 - 3. Quantity of water proposed as pounds per cubic yard of concrete.
 - 4. Quantity of cement proposed as pounds per cubic yard of concrete.
 - 5. Air content.
 - 6. Slump.
 - 7. Additives and amounts.
- E. The Engineer may make test cylinders for strength determinations.
- F. Acceptable Manufacturers:
 - 1. Quikrete - Cement and Concrete Products
 - 2. Thomas Concrete
 - 3. Readymix USA

2.2 Forms

- A. Foam fiber joint, ¼" thick.

2.3 Curing Agent

- A. As recommended by the concrete manufacturer, must submit documentation showing the capability with the waterproofing admixture to the engineer prior to construction.

PART 3 - EXECUTION

3.1 Preparations

- A. Installation of new concrete serves as the contractor's acknowledgement that all surfaces have been properly compacted and prepared.

3.2 Mixing

- A. Comply with the written instructions provided by the concrete manufacturer, curing agent manufacturer, and waterproofing additive manufacturer, as applicable, and the following:

- 1. Material shall be mechanically mixed for a minimum 4 minutes using a barrel-type concrete mixer or a standard mortar mixer.

3.3 Placing

- A. At sidewalk, prior to installing concrete, ensure earthwork has been performed and fill has been properly compacted to receive new concrete.
- B. Concrete shall be placed in a single pour.
- C. The pour shall form the new sidewalk at removed locations and shall be a minimum of 3 ½ inches thick at all locations. New #10 mesh wire reinforcing shall be installed the length of this pour. The wire mesh shall be supported off the fill a minimum of 1.75" and not more than 2.25". The slope shall match the existing. Install control joints appropriate for the sidewalk at the intervals of the removed slab.
- D. Use hand floats to smooth concrete and ensure proper thickness throughout the new slab.
- E. Use edgers and rakes to finish the topping slab and provide a consistent appearance throughout the new slab that matches the consistency of the existing.
- F. After the concrete fill has cured, furnish and install new pedestrian traffic coating in accordance with Section 07 18 13 of this specification.
- G. After the new concrete has cured, remove forms from joints.

3.4 Protection and Curing

- A. Protect and cure concrete as specified in ACI 301.
- B. Apply curing compound in accordance with manufacturer's written recommendations.
 - 1. Curing compound shall be uniformly applied using a roller or sprayer in accordance with curing compound manufacturer. A minimum of 2 coats of curing compound shall be applied, the second within 3 hours of the first. Maintain the continuity of the curing compound application and repair any damage incurred during the curing period.
 - 2. Once curing period has elapsed, remove the curing compound

completely without damaging the concrete surfaces as recommended by the curing compound manufacturer.

- a. Note: Curing compound may be left on concrete if compound manufacturer and coating manufacturer certify in writing that the compound will not interfere with the coating.

- - - END OF SECTION - - -

**SECTION 05 50 00
METAL FABRICATIONS**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the guardrail replacement at the loading dock with structural steel shapes and other materials as shown and specified.
- B. This sections specifies the painting of the existing guardrails at the canteen.

1.2 RELATED WORK

- A. Section 02 41 00, SELECTIVE DEMOLITIONS.
- B. Section 07 18 13, PEDESTRIAN TRAFFIC COATINGS

1.3 SUBMITTALS

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

Railings	Guardrails
----------	------------

C. 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.

D. Manufacturer's Certificates:

- 1. Anodized finish as specified.
- 2. Live load designs as specified.

E. Design Calculations for specified live loads including dead loads.

F. 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.

- B. American Society of Mechanical Engineers (ASME):

B18.6.1-97 Wood Screws

B18.2.2-87(R2005) Square and Hex Nuts

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

A36/A36M-12 Structural Steel

A47-99(R2009) Malleable Iron Castings

A48-03(R2012) Gray Iron Castings

A53-12...Pipe, Steel, Black and Hot-Dipped, Zinc-Coated
Welded and Seamless

A123-12..Zinc (Hot-Dip Galvanized) Coatings on Iron and
Steel Products

A240/A240M-14 Standard Specification for Chromium and
Chromium-Nickel Stainless Steel Plate, Sheet and Strip
for Pressure Vessels and for General Applications.

A269-10..Seamless and Welded Austenitic Stainless Steel
Tubing for General Service

A307-12..Carbon Steel Bolts and Studs, 60,000 PSI
Tensile Strength

A391/A391M-07(R2012) Grade 80 Alloy Steel Chain

A786/A786M-09 Rolled Steel Floor Plate

B221-13..Aluminum and Aluminum-Alloy Extruded Bars,
Rods, Wire, Shapes, and Tubes

B456-11..Electrodeposited Coatings of Copper Plus Nickel
 Plus Chromium and Nickel Plus Chromium
 B632-08..Aluminum-Alloy Rolled Tread Plate
 C1107-13.Packaged Dry, Hydraulic-Cement Grout
 (Nonshrink)
 F436-11..Hardened Steel Washers
 F468-06(R2012) Nonferrous Bolts, Hex Cap Screws, Socket
 Head Cap Screws and Studs for General Use
 F593-13..Stainless Steel Bolts, Hex Cap Screws, and
 Studs
 F1667-11.Driven Fasteners: Nails, Spikes and Staples

D. American Welding Society (AWS):

D1.1-10..Structural Welding Code Steel
 D1.2-08..Structural Welding Code Aluminum
 D1.3-08..Structural Welding Code Sheet Steel

E. National Association of Architectural Metal Manufacturers (NAAMM)

AMP 521-01 Pipe Railing Manual
 AMP 500-06 Metal Finishes Manual
 MBG 531-09 Metal Bar Grating Manual
 MBG 532-09 Heavy Duty Metal Bar Grating Manual

F. Structural Steel Painting Council (SSPC)/Society of Protective
 Coatings:

SP 1-04..No. 1, Solvent Cleaning
 SP 2-04..No. 2, Hand Tool Cleaning
 SP 3-04..No. 3, Power Tool Cleaning

G. Federal Specifications (Fed. Spec):

RR-T-650E Treads, Metallic and Nonmetallic, Nonskid

PART 2 - PRODUCTS

1.

2.1 DESIGN CRITERIA

- A. In addition to the dead loads, design fabrications to support the following live loads unless otherwise specified.
- B. Railings and Handrails: 900 N (200 pounds) in any direction at any point.

2.2 MATERIALS

- A. Structural Steel: ASTM A36.
 - 1. Galvanized for exterior locations.
- B. Steel Pipe: ASTM A53.

1. Galvanized for exterior locations.
 2. Type S, Grade A unless specified otherwise.
 3. NPS (inside diameter) as shown.
- C. Primer Paint: As specified in Section 09 91 00, PAINTING.
- D. Grout: ASTM C1107, pourable type.
- E. Primer: rust inhibiting, low VOC, modified phenolic alkyd resin primer such as Sherwin Williams Kem Kromik metal primer, or approved equal.
- F. Paint: Sherwin Williams All Surface Enamel Latex Base.

2.3 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 or stainless is used.
- B. Fasteners:
1. Bolts with Nuts:
 - a. ASME B18.2.2.
 - b. ASTM A307 for 415 MPa (60,000 psi) tensile strength bolts.
 - c. ASTM F468 for nonferrous bolts.
 - d. ASTM F593 for stainless steel.
 2. Screws: ASME B18.6.1.
 3. Washers: ASTM F436, type to suit material and anchorage.
 4. Nails: ASTM F1667, Type I, style 6 or 14 for finish work.

2.4 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.
 2. When size and thickness is not specified or shown for an individual part, use size and thickness not less than that used for the same component on similar standard commercial items or in accordance with established shop methods.

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 and burrs removed.
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 Rivets 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 members 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.
 - b. Welds shall show good fusion, be free from cracks and porosity and accomplish secure and rigid joints in proper alignment.
 - c. Where exposed in the finished work, continuous weld for the full length of the members joined and have depressed areas filled and protruding welds finished smooth and flush with adjacent surfaces.
 - d. Finish welded joints to match finish of adjacent surface.
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. 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 AMP 500 Metal Finishes Manual.
- 2. 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) Items not specified to have other coatings.
 - b) Galvanized surfaces specified to have prime paint.
 - c) Remove all loose mill scale, rust, and paint, by hand or power tool cleaning as defined in SSPC-SP2 and SP3.
 - d) Clean of oil, grease, soil and other detrimental matter by use of solvents or cleaning compounds as defined in SSPC-SP1.
 - e) After cleaning and finishing, prime all railing using and allow to dry.
 - f) Apply two coats of safety yellow paint over all railing.
 - 2) Non ferrous metals: Comply with MAAMM-500 series.

G. Protection:

- 1. 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.

2.5 SUPPORTS

A. General:

- 1. Field connections may be welded or bolted.

2.6 RAILINGS

- A. In addition to the dead load design railing assembly to support live load specified.
- B. Fabrication General:
 - 1. Provide continuous welded joints, dressed smooth and flush.
 - 2. Standard flush fittings, designed to be welded, may be used.
 - 3. Exposed threads will not be approved.
 - 4. Form handrail brackets to size and design shown.
 - 5. Exterior Post Anchors.
 - a. Fabricate tube or pipe sleeves with closed ends or plates as shown.
 - b. Where inserts interfere with reinforcing bars, provide flanged fittings welded or threaded to posts for securing to concrete with expansion bolts.
 - c. Provide heavy pattern sliding flange base plate with set screws at base of pipe or tube posts.
- C. Handrails:
 - 1. Close free ends of rail with flush metal caps welded in place except where flanges for securing to walls with bolts are shown.
 - 2. Make provisions for attaching handrail brackets to wall, posts, and handrail as shown.
- D. Steel Pipe Railings:
 - 1. Fabricate of steel pipe with welded joints.
 - 2. Number and space of rails as shown.
 - 3. Space posts for railings not over 1800 mm (6 feet) on centers between end posts.
 - 4. Form handrail brackets from malleable iron.

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. Field weld in accordance with AWS.
 - 1. Design and finish as specified for shop welding.
 - 2. Use continuous weld unless specified otherwise.
- C. 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.

- D. 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.
- E. Secure escutcheon plate with set screw.

3.2 NEW RAILINGS - AT LOADING DOCK

A. Steel Posts:

- 1. Secure fixed posts to concrete with expansion bolts through flanged fittings.
- 2. Secure sliding flanged fittings to posts at base with set screws.
- 3. Secure fixed flanged fittings to concrete with expansion bolts.
- 4. Secure posts to steel with welds.

B. Anchor to Walls:

- 1. Anchor rails to concrete or solid masonry with machine screws through flanged fitting to steel plate.
 - a. Anchor steel plate to concrete or solid masonry with expansion bolts.

C. Handrails:

- 1. Anchor brackets for metal handrails as detailed.
- 2. Expansion bolt to concrete or solid masonry.

3.3 EXISTING RAILINGS TO REMAIN - AT CANTEEN

- A. In lieu of new guardrails, scrape the scaling rust from the existing guardrails. It may be necessary to mechanically cut or torch the guardrail into manageable sections.
 - 1. Wire brush railing so that all rust and loose paint is removed.
 - 2. Prime all railing using metal primer and allow to dry.
 - 3. Apply two coats of over all railing, and using a color that matches the existing.
 - 4. Apply primer and paint in accordance with manufacturer written recommendations for railing material.

- - - E N D - - -

SECTION 07 13 52
MODIFIED BITUMINOUS SHEET WATERPROOFING

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section specifies modified bituminous sheet material used for exterior below grade waterproofing at the retaining wall at the canteen.

1.2 RELATED WORK:

- A. Section 02 41 00, DEMOLITION.
- B. Section 07 60 00, SHEET METAL AND FLASHINGS.
- C. Section 09 97 23, Coatings for Concrete and Masonry
- D. Section 31 20 11, EARTHWORK (SHORT FORM)

1.3 MANUFACTURER'S QUALIFICATIONS:

- A. Approval by Contracting Officer is required of products and services of proposed manufacturers, and installers, and will be based upon submission by Contractor that:
 - 1. Manufacturer regularly and presently manufactures bituminous sheet waterproofing as one of its principal products.
 - 2. Installer has technical qualifications, experience, trained personnel and facilities to install specified items.
 - 3. Manufacturer's product submitted has been in satisfactory and efficient operation on three similar installations for at least three years.
 - 4. Submit list of installations, include name and location of project and name of owner.

1.4 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 - 1. Bituminous sheet.
 - 2. Primer.
 - 3. Mastic.
 - 4. Protection material, temporary and permanent.
 - 5. Printed installation instructions for conditions specified.
- C. Certificates:
 - 1. Indicating bituminous sheet manufacturer's approval of primer, and roof cement.

2. Indicating bituminous sheet waterproofing manufacturer's qualifications as specified.
3. Approval of installer by bituminous sheet manufacturers.
4. Water test report.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Deliver materials to job in manufacturer's original unopened container.
- B. Do not store material in areas where temperature is lower than 10 degrees C (50 degrees F,) or where prolonged temperature is above 32 degrees C (90 degrees F).

1.6 ENVIRONMENTAL REQUIREMENTS:

- A. Ambient Surface and Material Temperature: Not less than 4 degrees C (40 degrees F), during application of waterproofing.

1.7 WARRANTY:

- A. Warrant bituminous sheet waterproofing installation against moisture leaks and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period for the installer is two years and for the manufacturer is twenty years without financial limitation.

1.8 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced by basic designation only.
- B. Federal Specifications (Fed. Spec.):
 - UU-B-790A Building Paper, Vegetable Fiber: (Kraft, Water-
 - INT AMD 1 Proof, Water Repellent and Fire Resistant)
- C. American Society for Testing and Materials (ASTM):
 - C578-10 Rigid Cellular Polystyrene Thermal Insulation
 - D41-11 Asphalt Primer Used in Roofing, Dampproofing and Waterproofing
 - D1621. Standard Test Method for Compressive Properties Of Rigid Cellular Plastics.
 - D2822-05 Asphalt Roof Cement
 - D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - D4716 Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic

Transmissivity of a Geosynthetic Using a
Constant Head.

D6380-03(R2009) Asphalt Roll Roofing (Organic Felt)

D. American Hardboard Association (AHA):

A135.4-1995 Basic Hardboard

PART 2 - PRODUCTS

2.1 BITUMINOUS SHEET:

- A. Cold applied waterproofing membrane composed primarily of modified bituminous material prefabricated in sheet form designed for below grade exterior and split slab waterproofing. Sheet shall be reinforced with fibers and the type of fiber is the manufacturer's option.
- B. Thickness of Bituminous Sheet: 1.5 mm (60 mils), plus or minus 0.13 mm (5 mils), and bonded to a 0.1 mm (4 mil) thick plastic sheet.
- C. Provide with a release sheet to prevent bonding of bituminous sheet to itself.

2.2 PRIMER AND ROOF CEMENT:

- A. Furnished by manufacturer of bituminous sheet as required for particular application in accordance with sheet manufacturer's instructions.
- B. Primer: ASTM D41.
- C. Roof Cement: ASTM D4586.

2.3 PROTECTION MATERIAL:

- A. Drainage Board: Prefabricated composite board approved by the membrane manufacturer for system to meet the warranty requirements. Minimum compressive strength shall be 15,000 psf when tested by ASTM D 1621. Board shall have polystyrene core of covered with a geotextile filter fabric on one surface to allow water to pass into the drainage core while restricting the movement of soil particles and suitable for use in vertical applications.
- B. Patching Compound: A factory prepared, non-shrinking, fast setting, cementitious adhesive compound containing no ferrous metal or oxide.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Surface Condition:

1. Before applying waterproofing materials, ensure concrete and masonry surfaces are fully cured, smooth, clean, dry, and free from high spots, depressions, loose and foreign particles and other deterrents to adhesion.
2. Fill voids, joints, and cracks with patching compound.

B. Concrete surfaces cured a minimum of seven days, free from release agents, concrete curing agents, and other contaminants.

3.2 APPLICATION:

A. Priming:

1. Prime concrete and masonry surfaces.
2. Application method, amount of primer and condition or primer before installation of bituminous sheet as recommended by primer manufacturer.
3. Reprime when required in accordance with manufacturer's instructions.

B. Bituminous Sheet Installation:

1. Remove release sheet prior to application.
2. Lay bituminous sheet horizontally and from low point to high point so that laps shed water.
3. Treat expansion, construction and control joints and evident working cracks as expansion joints. Apply bituminous sheet in double thickness over joint by first applying a strip of bituminous sheet not less than 9 inches wide, centered over joint.
4. Lap seams not less than 2 inches.
5. Lay succeeding sheet with laps, and roll or press into place.
6. Reinforcement as required by membrane manufacturer such as Tee joints.
7. Repair misaligned or inadequately lapped seams in accordance with manufacturer's instructions.
8. Seal seams and terminations in accordance with sheet manufacturer's instructions.
9. Extend membrane as shown on drawings and a minimum of 6 inches above the top of the new top soil. Secure the top edge with termination bar and appropriate fasteners at spacings not to exceed 8 inches on-

center. Seal top edge of membrane with roofing cement. Install counter flashing as specified in Section 07 60 00.

C. Corner Treatment:

1. At inside and outside corners apply double cover using an initial strip not less than 280 mm (11 inches) wide, centered along axis of corner.
2. Cover each strip completely by the regular application of bituminous sheet.
3. Provide a fillet or cant on inside corners.
4. Form cants using patching compound.
5. Do not use wood, fiber, and insulating materials for cants.

D. Projection Treatment:

1. Apply a double layer of bituminous sheet around pipes and similar projections at least 150 mm (6 inches) wide.
2. At scuppers, apply a bead of roof cement over a double layer of bituminous sheet that extends into the scupper a minimum of 4 inches.

E. Drainage Board

1. Install drainage board after the installation of the horizontal drain pipe, pervious aggregate bed, and filter fabric.
2. Install drainage board with core side against the newly installed, finished, waterproofing membrane.
3. Adhere the drainage board to the waterproofing with mastic approved by the waterproofing and drainage board manufacturers. Mechanically fasten the drainage board with fasteners in accordance with approved shop drawings and seal fasteners to prevent water migration.
4. Start the drainage board within 8 inches of the top of the top soil and extend the drainage board downward to the horizontal filter fabric.
5. Install backfill immediately after the drainage board.

3.3 PROTECTION:

- A. Protect bituminous sheet before backfill or wearing courses are placed.
- B. Install protection material and hold in place in accordance with instructions of manufacturer of waterproofing materials.
- C. Permanent Protection:
 1. Vertical Surfaces:
 - a. Install drainage board as specified.
 - b. Extend protection full height from footing to top of backfill.

D. Temporary Protection:

1. When waterproofing materials are subjected to damage by sunlight and can not be immediately protected as specified, protect waterproofing materials by waterproof building paper or suitable coating approved by manufacturer of waterproofing system used.

3.4 PATCHING:

- A. Repair tears, punctures, air blisters, and inadequately lapped seams, in accordance with manufacturer's instructions before protection course is applied.

3.5 TESTING:

- A. Before any protection or wearing course is applied, test all horizontal applications of waterproofing with a minimum of 25 mm (1-inch) head of water above highest point and leave for 24 hours.
- B. Mark leaks and repair when waterproofing is dry.
- C. Certify, to Resident Engineer, that water tests have been made and that areas tested were found watertight.

3.6 INSPECTION:

- A. Do not cover waterproofed surfaces by other materials or backfill until work is approved by Resident Engineer.

- - E N D - - -

**SECTION 07 18 13
PEDESTRIAN TRAFFIC COATINGS**

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section specifies a surface applied elastomeric and composition waterproofing type membrane suitable for light pedestrian traffic and recreation areas, but not intended for heavy industrial use.
- B. Materials to be applied over the stairs, landings, and sidewalks at the new guardrails at the loading dock.
- C. Materials to be applied over the new sections of sidewalk at the retaining wall.
- D. Apply after the existing stair insets have been filled.

1.2 RELATED WORK:

- A. Section 02 41 00, DEMOLITION.
- B. Section 03 01 40, MAINTENANCE OF CONCRETE
- C. Section 05 50 00, METAL FABRICATIONS.

1.3 TEST AREA:

- A. Before start of general application, apply the elastomeric coating as specified in a representative test area. Provide a test area not less than 5 square feet. The area to be covered by the coating to include all site conditions such as flashings bases, corners and projections through the coating. Provide test area in location determined by the Contracting Officer Representative (COR). After COR approval, area will serve as an example for the remaining work.

1.4 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturers Literature and Data: Each material, indicating compliance with specification requirements.
- C. Samples: Each finish color on 101 by 203 mm (4 by 8 inch) substrate, layered to show each coat and finish.
- D. Installer qualifications.
- E. Manufacturer warranty.

1.5 WARRANTY:

- A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their pedestrian traffic coating for a minimum of five (5) years from the date of

installation and final acceptance by the Government. Submit manufacturer warranty.

1.6 DELIVERY AND STORAGE:

- A. Deliver materials to the site in original sealed containers, clearly marked with manufacturer's name and brand, and type of material.
- B. Store materials in weathertight and dry storage facility. Protect from damage from handling, weather and construction operations before, during and after installation. Store materials at temperatures and under conditions recommended by the manufacturer.

1.7 ENVIRONMENTAL REQUIREMENTS:

- A. Do not proceed with application of materials when ambient temperature is less or greater than that recommended by the coating material manufacturer. Do not apply traffic coatings to damp or wet substrates, when relative humidity exceeds 85 percent, or when temperatures are less than 3 deg C (5 deg F) above dew point.

1.8 SAFETY REQUIREMENTS:

- A. Keep products away from heat, sparks and flame. Do not permit use of spark-producing equipment during application of flammable products or where explosive fumes are present.

1.9 QUALITY ASSURANCE:

- A. Manufacturer's Qualifications: Obtain products from single manufacturer or from sources recommended by manufacturer for use with pedestrian traffic coatings system and incorporated in manufacturer's warranty.
- B. Installer's Qualifications: Work to be performed by installer having three (3) years' experience for work relating to this section and approved in writing by traffic coating manufacturer.

1.10 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. ASTM International (ASTM):
 - C794-10..Adhesion-in-Peel of Elastomeric Joint Sealants
 - D412-06a(R2013) Vulcanized Rubber and Thermoplastic Elastomers-Tension
 - D2240-05(R2010) Rubber Property - Durometer Hardness
 - E96/E96M-13 Water Vapor Transmission of Materials

PART 2 - PRODUCTS**2.1 PRIMER:**

- A. Type required by the elastomeric coating manufacturer.

2.2 REPAIR MORTAR:

- A. Type required by the elastomeric coating manufacturer. Composed of silica and Portland cement with a 28 day compressive strength of 6,500 psi when tested in accordance with ASTM C109.

2.3 ELASTOMERIC BASE AND TOP COAT:

- A. Provide elastomeric base and topcoat materials to meet or exceed the following requirements:

Property	Test Method	Base Coat	Top Coat
Tensile Strength	ASTM D412	2068 kPa (psi)	4136 kPa (600 psi)
Elongation, percent (of original benchmark distance)	ASTM D412	550	200
Hardness, Shore A	ASTM D2240	20	45
Peel Strength (on concrete)	ASTM C794	13.6 kg (30 lb.), 100 percent cohesion	100 percent cohesion to base coat
Permeability	ASTM E96/E 96M	12 metric perms	0.06metric perms

2.4 AGGREGATE:

- A. Thoroughly washed, clean, medium-grained sharp indigenous stone granules, graded between 1 mm (.04 inch) and 4 mm (.16 inch) in size, and having a hardness of 6.5 or greater on the Moh's scale.
- B. It is permissible to use aggregate as a part of the coating.

PART 3 - EXECUTION**3.1 SURFACE PREPARATION:**

- A. Apply to clean, dry surfaces. Smooth rough spots and tool marks.
- B. Fill holes, depressions and cracks with fillers compatible with the coating material and recommended by the coating manufacturer.
- C. Subsurface imperfections that telegraph through the finish coating surface are not acceptable.

- D. Prior to application of traffic coating, remove guardrail penetrations in the concrete walkways at the loading dock. Use a core barrel to completely remove the existing guardrail post inset. Feel the hole with concrete in accordance with Section 03 30 00 of this specification prior to applying the traffic coating. Allow to cure to the satisfaction of the concrete manufacturer to receive the new traffic coating.

3.2 WORK COORDINATION:

- A. To provide a watertight installation, coordinate this work with flashing and drains required to be installed before the coating work begins and be completed after the coating is in place.

3.3 APPLICATION:

- A. Prime surfaces to receive elastomeric waterproofing materials as recommended by the product manufacturer.
- B. Where horizontal surfaces intersect vertical surfaces, provide a sealant type fillet as recommended by the manufacturer.
- C. Apply elastomeric base coat at a rate that will ensure a dry film thickness of not less than 0.9 mm (35 mils).
- D. Uniformly disperse aggregate topping at the rate of 0.5 Kg per sq. m (10 lbs./100 sq. ft.); inter-bond and vulcanize granules within the fluid elastomeric topping in accordance with manufacturer's instructions. It is permissible for aggregate to be a part of the coating.
- E. Apply elastomeric top coat at a rate which will ensure a dry film thickness of 0.4 mm (15 mils) for the top coat and a total combined dry film thickness for the base and top coats of not less than 1.3 mm (50 mils).
- F. Complete the base to a uniform established line as shown.

3.4 CLEANING:

- A. Remove smears of elastomeric material from other work.

3.5 PROTECTION:

- A. Protect the finished coating from traffic until the coating cures and afterward until final acceptance.

- - - E N D - - -

SECTION 07 19 16
SILANE WATER REPELLENTS

PART 1 - GENERAL

1.1 Summary

- A. Cleaning of exterior concrete surfaces, including concrete wall panels, retaining walls, concrete beams, and concrete columns.
- B. Installation of fluid applied water repellent at existing concrete wall panels.
- C. **Deductive Alternate No. 1:** Clean the exterior concrete surfaces, including concrete wall panels, retaining walls, concrete beams, and concrete columns as specified herein. Omit the specification requirement to install the silane water repellent at existing concrete wall panels as specified herein.

1.2 Related Work Specified Elsewhere

- A. Section 02 41 00, Demolitions
- B. Section 03 01 40, Maintenance of Concrete
- C. Section 07 92 00, Joint Sealant
- D. Section 08 01 80, Maintenance of Glazing

1.3 Protection

- A. Refer to Section 01 66 00.

1.4 Environmental Conditions

- A. Material installation shall proceed only when weather conditions are in compliance with manufacturer's recommendations for installation and no precipitation is imminent. Materials installed during adverse weather conditions shall be subject to rejection including removal and replacement at no additional cost to the Owner.
- B. Use manufacturer's standard test method to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of water repellents to substrates.

1.5 Submittals

- A. Submit copies of manufacturer's literature for the following:
 - 1. Product Data consisting of water repellent manufacturer's product information for components, materials, accessories, and equipment necessary to perform the work.
 - 2. Applicable detail and shop drawings for the work.
 - 3. Samples for initial selection purposes in form of manufacturer's color charts or chips showing full range of colors and textures.

4. Installer certificates signed by water repellent manufacturer written certification certifying that the installer complies with requirements included under the "Quality Assurance" section of the Specification.
5. Operation and Maintenance Data as required by the warranty.
6. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

B. Refer to Section 01 33 23 of Specification.

1.6 Quality Assurance

- A. Contractor: Water repellent applicator must be approved, authorized, or licensed in writing by the approved water repellent product manufacturer and have a minimum of five years' experience as an approved, authorized, or licensed applicator with that manufacturer and be approved at a level capable of providing the specified warranty. The applicator must supply the names, locations and client contact information of five projects of similar size and scope that the applicator has constructed using the manufacturer's water repellent products submitted for this project within the previous three years.
- B. Contractor shall perform ritem tube water penetration tests in accordance with repellent manufacturer written recommendations. Test shall be performed by a third party firm licensed in the state of Georgia with a minimum of 5 years experience with material testing. Perform one test for every 50,000 square feet of concrete wall panels. A minimum of 1 test shall be performed for each building primary elevation (E, W, S, N), as shown on drawings. Prepare a report of findings with representative photographs for the Owner and Engineer to review within 24 hours of the test. Any repairs to the water repellent as a result of failure under this paragraph shall be performed by the Contractor at no additional cost to the Owner.
- C. Manufacturer: Manufacturer shall have a minimum of 10 years of continuous, concurrent experience providing specified materials including the current year. Manufacturer is required, at a minimum, to perform biweekly site inspections to assess the work performed by the Contractor since the previous site inspection and provide written documentation to Owner and Design Professional of findings and resolution of any deficient areas of work or issues.
- D. Mock-Up: Within 3 days of the final submittal approval, the Contractor shall provide a minimum 10' x 10' full-scale mockup of construction

techniques and materials to be used at the job site at no additional cost to the Owner. Mockups shall be complete and represent the final product produced by the work under this specification to include cleaning, preparation, and application of construction products in accordance with this specification and manufacturer requirements. To the full extent possible, mockups shall be constructed at the job site at a location agreed upon by the Owner. Mockups shall not be constructed at completed locations or locations not scheduled for the work under this specification. Mockups shall remain in place through the duration of the work. Mock-Up shall be complete at the time of the pre-construction meeting.

1. After the water repellent has set at the mock-up location after 7 days, test the water repellent for water penetration in accordance with manufacturer recommendations.

1.7 Warranty

- A. Refer to Section 01 78 36 of this specification.

PART 2 - PRODUCTS

2.1 Materials, General

- A. Compatibility: Provide water repellents and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by water repellent manufacturer, based on testing and field experience.
- B. Colors of Water Repellent: Clear.

2.2 Water repellent

- A. Water Repellent: Water-based alkylalkoxysilane water repellent with a minimum of 40% content of solids and active ingredients by weight. An average minimum penetration of 0.24 mm. Alberta DOT, Type 1b.
 1. For use at precast concrete wall panels.
 2. Products: Subject to compliance with requirements. All listed manufacturers are provided as examples of the salient manufacturers capable of providing materials to meet specification requirements. Any additional manufacturers not listed must meet the requirements set forth in this specification and be approved prior to bid in accordance with Section 01 60 00. Products that may be incorporated into the Work include, but are not limited to the following:
 - a. BASF Building Systems; MasterProtect H400
 - b. Pecora Corporation; KlereSeal 940-S VOC
 - c. Sika Corporation; Sikagard 740 W

d. Euclid Chemical; Baracade Silane 40

2.3 Preparation Equipment:

- A. Low-Pressure Equipment including booster pump, pressure rated hoses, water jet, 15-45 degree fan spray nozzle tip, and any other equipment as recommend by the approved water repellent manufacturer.
- B. Abrasive (Sand) Blasting equipment including air compressor, blast media hopper, oil/moisture separators, blast nozzle and hoses, and any other equipment as recommended by the approved water repellent manufacturer.
- C. High-Pressure Water Jetting equipment to create water sprayed at pressures between 5,000 and 45,000 PSI including water pump, compressed air source, pressure rated hoses, water jet, nozzle tip, and any other equipment as recommended by the approved water repellent manufacturer.
- D. Any other equipment recommended by manufacturer for preparation of substrate to meet ICRI Guide 310.2 requirements must be submitted for approval prior to the base bid.

2.4 Cleaning Agent:

- A. Sure Klean Custom Masonry Cleaner as manufactured by PROSOCO, Inc., 3741 Greenway Circle, Lawrence, KS 66046. Phone: (800) 255-4255; Fax: (785) 830-9797. E-mail: CustomerCare@prosoco.com
- B. Light Duty Concrete Cleaner as manufactured by PROSOCO, Inc., 3741 Greenway Circle, Lawrence, KS 66046. Phone: (800) 255-4255; Fax: (785) 830-9797. E-mail: CustomerCare@prosoco.com.
- C. Approved equal prior to bid in accordance with Section 01 60 00 of the specification.

2.5 Brush: Nylon brushes only

2.6 Roller: High quality ¾" to 1-1/4" nap roller cover.

PART 3 - EXECUTION

3.1 Preparation

- A. Surfaces shall be clean and free of containments in accordance with manufacturer instructions.
- B. Repair spalls, holes, and cracks, and remove stains in concrete wall panels in accordance with this section and Section 03 01 40 of this Specification. Contractor shall consult manufacturer for compatibility issues with water repellent and sealants used to repair cracks. Manufacturer is required to provide compatible materials.
- C. Ensure that all concrete surfaces and repairs are fully cured.
- D. Complete the application of all sealants and allow to cure in

accordance with manufacturer requirements prior to the application of the water repellent.

- E. Prepare substrate in accordance with water repellent manufacturer's written instructions to degree required by manufacturer per ICRI Guide 310.2 (formerly Guideline No. 03732) by low-pressure water cleaning, abrasive (sand) blasting, or high-pressure water jetting only, as recommended by the manufacturer to apply new water repellent.
 - F. Comply with applicable codes to control runoff as necessary based on recommendations from local jurisdictions based on chemical composition of cleaning products. Contractor shall prepare a workplan describing procedures for runoff protection and submit to the Engineer for review and approval.
 - G. Protect existing sidewalk pedestrians, street traffic, and any other persons, buildings, or structure below and above the work by means as required by OSHA and local codes. The use of any temporary covered walkways, netting, or other protections required by local jurisdiction shall be borne by the Contractor at no additional cost to the Owner. Refer to Section 01 66 00 for additional information.
 - H. Utilize cleaning agent in accordance with cleaning agent manufacturer and water repellent manufacturer recommendations to adequately clean substrate of foreign deposits, grease, curing compounds, surface treatments, oils, coatints, efflorescence, rust stains, and other items that will adversely affect repellent penetration to the substrate.
 - I. Ensure surface is completely dry prior to applying water repellent.
 - J. Do not apply water repellent when temperature is below 40 degree Fahrenheit or shall be below 40 degrees Fahrenheit in the next 24 hours unless manufacturer has more stringent requirements.
 - K. Consult manufacturer and follow written recommendations for application of water repellent at temperatures below 60 degrees Fahrenheit or above 80 degrees Fahrenheit or when there is a 50% or greater humidity.
- 3.2 Application
- A. Product must not be diluted, unless required by manufacturer written instructions.
 - B. To the full extent possible, use spraying equipment to apply water repellent unless area is not accessible using spraying equipment, or risk of injury or damage exists. Otherwise, brushes and rollers may be used.
 - C. Apply water repellent using spray equipment as recommended by water

repellent manufacturer in a single pass starting from the bottom and working upward.

- D. Apply water repellent in one coat to provide coverage in the range of 100 - 125 sq. ft/gal. as required by the manufacturer for repellent penetration.
- E. Allow minimum 72 hours drying time unless manufacturer has more stringent requirements.
- F. Water repellent shall be applied continuously to a logistical building break and ensure a wet edge during application.
- G. Ensure uniform application throughout the water repellent system.
- H. Apply water repellent in accordance with manufacturer written instructions.

3.3 Cleaning

- A. Do not allow water repellent to cure on substrate and surfaces not scheduled for water repellent. Immediately clean water repellent from these surfaces using water prior to curing.
- B. Work area and areas adjacent shall be clean and free of debris during and after application. There shall be no locations of spills identified at any areas.

- - - END OF SECTION - - -

SECTION 07 60 00
FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 Work Included

1.1.1 Includes the fabrication and installation of sheet metal and related accessories associated with roofing membranes, providing physical protection to membrane, base flashings and membrane terminations, as specified herein.

1.2 Related Work

1.2.1 Section 02 41 00, Demolitions

1.2.2 Section 07 13 52, Modified Bituminous Sheet Waterproofing

1.2.3 Section 31 20 11, Earthwork (Short Form)

1.3 Submittals

1.3.1 In accordance with Section 01 33 00 of this Specification

1.4 Environmental Conditions

1.4.1 Material installation shall proceed only when weather conditions are in compliance with the applicable manufacturer's recommendations for installation and no precipitation is imminent. Materials installed during adverse weather conditions shall be subject to removal and replacement with new materials at no additional cost to Owner.

1.5 Warranty

1.5.1 In accordance with Section 01 78 36 of this Specification.

PART 2 - PRODUCTS

2.1 Stainless Steel: Type 316 (16% chromium, 10% nickel, and 2% molybdenum) ASTM A240, mill finished.

2.2 Aluminum-Zinc Coated Steel: ASTM A-792.

2.3 Kynar 500-based finish: Shall be factory applied, oven-finish. Finish and primer shall be applied in strict accordance with the formulator's specifications and shall meet the performance criteria of AAMA 605.2-90 specification. Finish coat thickness shall be a minimum of 1.0 mil. Primer coat thickness shall be a minimum of 0.3 mil. Color to match the existing color to be selected by owner.

2.4 Solder: ASTM D32-66T with 50% lead and 50% tin unless otherwise specified. Follow manufacturer's recommended soldering procedures.

2.5 Non-Shrinking Sealant: ASTM C920, Type S or M, Grade NS, Class 25, for Use

NT, M, A, and O.

- 2.6 Self-adhering Modified Bitumen Membrane: ASTM 1970 minimum 40 mils, W.R. Grace Ice and Water Shield, or approved equal prior to bid.
- 2.7 Screws: ASTM A240, 410 stainless steel, self-drilling minimum #10 stainless steel screw with a nominal head diameter of 0.415 inches and stainless steel bonded neoprene washers. Screws shall be one size larger than the existing.
- 2.8 Masonry Fastener:
- 2.8.1 Masonry Anchor, minimum 1-1/4 inch into substrate, as manufactured by OMG Roofing Products
 - 2.8.2 Tapcon 1/4" x minimum 1-1/4" in the substrate, as manufactured by Buildex.
 - 2.8.3 Roofing Spike, minimum 1-1/4 inch into substrate, as manufactured by Powers Fasteners.
 - 2.8.4 approved equal prior to bid.
- 2.9 MINIMUM ACCEPTABLE METAL WEIGHTS (All metal to be finished with Kynar 500 coating, or approved equal prior to bid unless otherwise specified).
- | | |
|------------------------|--------------------------------------|
| Counterflashing: | 24 ga. aluminum-zinc coated steel |
| Built-In Gutter | 24 ga. stainless steel (mill finish) |
| Built-In Gutter Cleat: | 22 ga. stainless steel (mill finish) |
| Drip Edge Flashing: | 24 ga. aluminum-zinc coated steel |

PART 3 - EXECUTION

3.1 General Installation Requirements

- 3.1.1 Inspect all surfaces to which metal is to be applied. Do not install metal unless surfaces are even, sound, clean, dry and free from defects which might affect the application.
- 3.1.2 Follow recommendations of the Sheet Metal and Air Conditioning Contractors National Association Architectural Sheet Metal Manual (7th Edition) for fabricating in-shop and on-site, and for installation, unless otherwise specified herein.
- 3.1.3 Follow published instructions of the product manufacturer for installation of extruded or proprietary metal products, unless otherwise specified herein.
- 3.1.4 Use nails, screws, bolts, cleats or other fasteners of the same material or of material chemically compatible with the contacted metal.
- 3.1.5 Do not place dissimilar metals in direct contact or in positions where water sheds across both metals.
- 3.1.6 Install metal to be water and weather tight with lines, arises and angles sharp and true and with paint surfaces free of waves and buckles.
- 3.1.7 Install shop-formed metal flashings in 10 foot lengths maximum with a

minimum number of pieces in each straight run.

- 3.1.8 Apply a continuous bead of caulk between any lapped metal sections, with the exception of counter flashing lapped joints. The application of caulk after metal components have been lapped is unacceptable and will be grounds for rejection.

3.2 Built-In Gutter Installation

- 3.2.1 At the built-in gutters at canopies, furnish and install new 24 ga. stainless steel built-in gutter with soldered joints.
- 3.2.2 Prior to installing the gutter, furnish and install new continuous self-adhering modified bitumen membrane over the existing substrates for the full profile of the gutter from behind the drip edge flashing at the window, over the inside surfaces of the gutter, and over the concrete beams down the outside face of the concrete beam a distance to match the gutter drip edge. Prime the substrate and fully adhere the membrane to the substrates. At downspouts, form a sleeve of membrane that extends into the downspouts a minimum of 2 inches.
- 3.2.3 Extend the new gutter beneath the existing/new metal counter flashings a minimum of 2 inches and secure to the counter flashings using two rows of specified fasteners. The bottom row shall be applied at spacings not to exceed 6 inches on-center and a fastener shall be placed at each existing hole. The top row of fasteners shall only be placed at existing fastener holes. Prior to fastening the gutter to the counter flashing, furnish and install a new continuous 1 inch thick double-sided butyl tape centered behind the bottom row of fasteners.
- 3.2.4 Extend the gutter to outside of the beam and form a drip edge that extend down the outside face of the beam a minimum of 2 inches. The drip edge shall engage a continuous cleat. The gutter drip edge shall be folded snugly over the cleat. Cleats shall be secured with specified fasteners at spacings not to exceed 18 inches on center. Fasteners shall be applied along the vertical face of the concrete beam.
- 3.2.5 Lap gutter sections a minimum of 2 inches, rivet 1" on-center using stainless steel pop rivets and solder in accordance with solder manufacturer's written instruction. Do not apply solder at outside vertical edge of the gutter drip edge.
- 3.2.6 Furnish and install gutter outlet tubes in accordance with SMACNA Architectural Sheet Metal Manual Figure No. 1-24C. Rivet and solder outlet tubes to the gutter. The outlet tubes shall extend a minimum of 3 inches into the existing downspouts.
- 3.2.7 Furnish and install stainless steel downspout strainers in accordance with SMACNA Architectural Sheet Metal Manual Figure No. 1-24D.
- 3.2.8 At circular columns, extend the gutter onto the top of the column and hem the end. Furnish and install a preformed one-piece 24 ga. stainless steel cover over the columns that shall engage a continuous preformed radius cleat. Secure the cleat to the column as specified

herein. Crimp the end of the cover to the engage the hemmed gutter. Solder the crimped/hemmed joint.

3.3 Counteflashing Installation

3.3.1 Install new counterflashings at the retaining walls above new waterproofing. Refer to SMACNA Architectural Sheet Metal Manual Figure 4-4D.

3.3.2 Refer to sheet metal schedule for gauge and metal type.

3.3.3 Insert upper edge of counterflashing in raggle. Secure with driven lead wedges and masonry anchors not over 18 inches on center. Fabricate wedges from lead wool.

3.3.4 Notch and lap joints and inside corners. Notch and seam outside corners. Do not rivet or otherwise secure joints and corners.

3.3.5 Fill raggle to full depth with permanent, non-shrinking sealant.

3.3.6 Lap ends of counter flashing 4 inches. Crimp hem of overlapping section around hem of underlapping section.

3.4 Drip Edge Flashing

3.4.1 Form new drip edge flashing at removed storefront windows prior to reinstalling the windows and after installing the built-in gutter. Refer to SMACNA Architectural Sheet Metal Manual Figure No. 3-4A.

3.4.2 Prior to the installation of the flashing, apply a strip of self-adhering membrane across the substrate and extend down the outside and inside faces approximately the length of the vertical sections of the flashing. Use one continuous strip.

3.4.3 Use maximum 10 foot lengths and a minimum number of pieces in each straight run.

3.4.4 Secure the vertical leg of the new flashing in the gutter through the gutter to the substrate using specified fasteners at spacings not to exceed 12 inches on-center through pre-drilled oversized or slotted holes. Prior to fastening the flashing, furnish and install a new continuous 1 inch thick double-sided butyl tape centered behind the row of fasteners.

3.4.5 Lap sections a minimum of 3 inches so that water will run across the lap and set in two continuous beads of sealant.

3.4.6 After the installation of the flashing, reinstall the existing removed storefront windows. Any storefront window components damaged during removal or lost during storage shall be replaced by the Contractor at no additional cost to the government.

- - - END OF SECTION - - -

SECTION 07 71 29

MANUFACTURED ROOF EXPANSION JOINTS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Section specifies pre-manufactured roof expansion joint assemblies at plazas as indicated on drawings.
- B. Types of assemblies:
 - 1. Vulcanized rubber expansion joint cover

1.2 RELATED WORK

- A. Section 01 73 23, Cutting and Patching
- B. Section 02 41 00, Demolitions
- C. Section 07 60 00, Flashing and Sheet Metal
- D. Section 07 92 00, Joint Sealant

1.3 QUALITY ASSURANCE

- A. Project Conditions:
 - 1. Check actual locations of plaza deck and other construction, to which work must fit, by accurate field measurements before fabrication.
 - 2. Show recorded measurements on final shop drawings.
- B. Fire tests performed by Factory Mutual, Underwriters Laboratories, Inc., Warnock Hersey or other approved independent testing laboratory.

1.4 DELIVERY STORAGE AND HANDLING

- A. Take care in handling of materials so as not to injure finished surface and components.
- B. Store materials under cover in a dry and clean location off the ground.
- C. Remove materials which are damaged or otherwise not suitable for installation from job site and replace with acceptable materials.

1.5 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 - 1. Submit copies of manufacturer's current literature and data for each item specified.
 - 2. Clearly indicate movement capability of cover assemblies and suitability of material used in exterior seals for ultraviolet exposure.
- C. Certificates: Material test reports from approved independent testing laboratory indicating and interpreting test results relative to

compliance of fire-rated expansion joint assemblies with requirements specified.

D. Shop Drawings:

1. Showing full extent of expansion joint cover assemblies; include large-scale details indicating profiles of each type of expansion joint cover assembly, splice joints between sections, joiners with other type assemblies, special end conditions, anchorages, fasteners, and relationship to adjoining work and finishes.
2. Include description of materials and finishes and installation instructions.

E. Samples:

1. Samples of each type and color of flexible seal used in work.

1.6 APPLICABLE PUBLICATIONS

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

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

C920-11..Elastomeric Joint Sealants

D2824 Standard Specification for Aluminum-Pigmented Asphalt Roof Coating, Nonfibered and Fibered without Asbestos.

D4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.

D6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

E119-10..Fire Tests of Building Construction and Materials

E814-11..Fire Tests of Through-Penetration Fire Stops

C. Federal Specifications (Fed. Spec):

TT-P-645B Primer, Paint, Zinc-Molybdate, Alkyd Type

D. The National Association of Architectural Metal Manufacturers (NAAMM):

AMP 500 Series Metal Finishes Manual.

E. National Fire Protection Association (NFPA):

251-06...Tests of Fire Endurance of Building Construction and Materials

F. Underwriters Laboratories Inc. (UL):

263-11...Fire Tests of Building Construction and
Materials

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Expansion Joint Cover: flat, vulcanized waterproofing joint integral with the waterproofing membrane to accommodate movements up to: ± 1 " capable of 500% elongation at - 40 °F across its length and at all vulcanized points.
 - 1. Factory fabricated connections formed by vulcanization.
- B. Black Plastic Roof Cement (Asphalt): ASTM D2822-91(1997), Class II cement will be used to apply to the damp or wet surfaces. Approved for use by approved roofing system manufacturer.
- C. Bituminous Adhesive: Rubberized SEBS modified cold bituminous adhesive. Asbestos-free. Minimum viscosity of 40,000 CP when tested in accordance with ASTM D2196 at 77 deg. F.
- D. Styrene-butadiene-styrene (SBS) smooth membrane, glass fiber reinforcement. Torch-grade membrane sheet shall conform to ASTM D6163, Grade S, Type I.
- E. Styrene-butadiene-styrene (SBS) sheet with white mineral granules, glass fiber reinforcement. Torch-grade membrane sheet shall conform to ASTM D6163, Grade G, Type I.
- F. Rubberized Aluminum Coating: ASTM D 2824, Type III. Approved for use by approved roofing system manufacturer.
- G. Fire Barrier:
 - 1. Designed for indicated or required dynamic structural movement without material degradation or fatigue.
 - 2. Tested in maximum joint width condition as a component of an expansion joint cover assembly in accordance with UL 263 NFPA 251, or ASTM E119 and E814, including hose steam test at full-rated period.
 - 3. Can be incorporated within the expansion joint materials or as a separate ancillary system.
 - 4. Approved for use by the expansion joint cover manufacturer.
- H. Accessories:
 - 1. Manufacturer's standard anchors, fasteners, set screws, spaces, flexible secondary water stops or seals and filler materials, drain tubes, adhesive and other accessories as indicated or required for complete installations.

2. Compatible with materials in contact.

2.2 FABRICATION

A. General:

1. Use roof expansion joint as specified.
2. Prove watertight, one and one-half (1-1/2) hour fire rated expansion joint system to provide protection against moisture and water intrusion on vertical surfaces.
 - a. System shall perform waterproofing, fire rating, movement joint functions. The use of ancillary fire-retardant blankets and materials is permissible.
 - 1) RedLINE 40 as manufacturer by Situra.
 - 2) Approved equal prior to bid.
3. Provide expansion joint assemblies of design, basic profile, materials and operation indicated required to accommodate joint size variations in adjacent surfaces, and as required for anticipated structural movement.
4. Deliver to job site ready for use and fabricated in as large sections and assemblies as practical. Assemblies identical to submitted and reviewed shop drawings, samples and certificates.
5. Furnish units in longest practicable lengths to minimize number of end joints. Field splice any necessary joints in accordance with manufacturer written instructions.
6. Include closure materials and transition pieces, tee-joints, corners, curbs, cross-connections and other assemblies.
7. Fire Performance Characteristics:
 - a. Provide expansion joint cover assemblies identical to those of assemblies whose fire resistance has been determined per ASTM E119 and E814, NFPA 251, or UL 263 including hose stream test at full-rated period.
 - b. Fire rating: Not less than rating of adjacent floor construction. Minimum 3 hour rating.
8. Fire Barrier Systems:
 - a. Material to carry label of approved independent testing laboratory, and be subject to follow-up system for quality assurance.
 - b. Include thermal insulation where necessary, in accordance with above tests, with factory cut miters and transitions.

- c. For joint widths up to and including 150 mm (six inches), supply barrier in lengths up to 15000 mm (50 feet) to eliminate field splicing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Manufacturer's representative shall make a thorough examination of surfaces receiving work of this section.
- B. Before starting installation, notify prime contractor of defects which would affect satisfactory completion of work.

3.2 PREPARATION

- A. Verify measurements and dimensions at job site and cooperate in coordination and scheduling of work with work of related trades.
- B. Give particular attention to installation of items embedded in concrete and masonry so as not to delay job progress.
- C. Provide templates to related trade for location of support and anchorage items.

3.3 INSTALLATION

- A. Install in accordance with manufacturers installation instructions unless specified otherwise.
- B. Locate the starting point as indicated on drawings from the manufacturer.
- C. Fire Barriers:
 - 1. Install in compliance with tested assembly.
 - 2. Install in expansion joints.
 - 3. Use fire barrier sealant or caulk supplied with system.
- D. Center the expansion joint cover over the joint and verify site conditions. Back roll the materials as required to install.
- E. Apply the bituminous adhesive on the substrate at the underside of the expansion joint cover in accordance with the expansion joint cover and roofing system manufacturers' written recommendation. At a minimum, applying adhesive at a minimum rate of exceed 2 gallons per 100 square feet of expansion joint cover flange. Embed the expansion joint flange into the adhesive and press to ensure contact with adhesive and saturation of the felt at the expansion joint flange.
- F. Install additional fasteners to mechanically secure the expansion joint cover to the structure as required by the expansion joint cover manufacturer written instructions.

- G. Strip in the flange of the expansion joint cover with two strips of modified bitumen membrane with the bottom strip being smooth membrane and the top strip being granulated cap sheet.
- H. Extend the first ply at least 12 inches beyond the edge of the expansion joint flange and the second ply at least 6 inches beyond the first ply. Adhere each ply using the roofing system manufacturer's bituminous adhesive at a minimum rate of exceed 2 gallons per 100 square feet of ply.
- I. Heat weld all laps and seams of the stripping membranes to adhere. The use of adhesive alone to seal seams will be grounds for rejection.
- J. At the edge of the stripping membrane, furnish and install a trowelling of nominal 1/8 inch thick cement, embed a fiber glass mat, and then cover with another 1/8 inch thick trowelling of cement. Apply cement on either side of the lap a minimum of three (3) inches. Apply a uniform coating of a rubberized aluminum roof coating over all new bituminous flashings and roof cement at laps using not less than 1-½" to 2 gallons per 100 square feet.
- K. At the roof-to-wall expansion joint, extend the base and cap stripping membranes at the wall to the bottom of the granite panels. Fasten the bituminous flashings top edge with nominal ¼" x 1" aluminum termination bar fastened to the substrate with appropriate fasteners at spacings not to exceed six (6) inches on center. In the event that multiple termination bar sections are used, leave a ¼ inch gap between sections. Cover the top edges and fasteners with a nominal 1/8 inch thick trowelling of cement.
- L. At all cap stripping laps, apply a trowelling of nominal 1/8 inch thick cement, embed a fiber glass mat, and then cover with another 1/8 inch thick trowelling of cement. Apply cement on either side of the lap a minimum of three (3) inches. Apply a uniform coating of a fibrated aluminum roof coating over all stripping and laps using not less than 1-½" to 2 gallons per 100 square feet. Allow the roofing cement to properly cure prior to installing the coating.
- M. Perform cutting and fitting required for installation of expansion joint cover assemblies.
- N. Install joint cover assemblies in true alignment and proper relationship to expansion joint opening and adjoining finished surfaces measured from established lines and levels.

- O. Maintain continuity of expansion joint cover assemblies with end joints held to a minimum.

3.4 PROTECTION

- A. Take proper precautions to protect the expansion joint covers from damage after they are in place.
- B. Cover floor joints with plywood where wheel traffic occurs.

- - E N D - - -

SECTION 07 92 00**JOINT SEALANTS****PART 1 - GENERAL****1.1 DESCRIPTION:**

- A. This section covers exterior sealant and their application, wherever required for complete installation of building materials or systems.
- B. Sealant shall be applied at all precast concrete and granite wall panels control joints, both horizontal and vertical, and where other frames, sills, fenestrations, penetrations, etc. intersect the concrete wall panels.
- C. Sealant shall be applied where foam expansion joints shall be sealed at side joints and at splices.
- D. Sealant shall be applied prior to washing walls, windows, and retaining walls, and shall be applied prior to applying water repellent.

1.2 RELATED WORK (Including but not limited to the following):

- A. Section 07 19 16, SILANE WATER REPELLENTS
- B. Section 07 95 13, EXPANSION JOINT COVER ASSEMBLIES

1.3 QUALITY ASSURANCE:

- A. Installer Qualifications: An experienced installer with a minimum of three (3) years' experience and who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance. Submit qualification.
- B. Source Limitations: Obtain each type of joint sealant through one (1) source from a single manufacturer.
- C. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
 - 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
 - 3. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

- D. Lab Tests: Submit samples of materials that will be in contact or affect joint sealants to joint sealant manufacturers for tests as follows:
1. Adhesion Testing: Before installing elastomeric sealants, test their adhesion to protect joint substrates according to the method in ASTM C794 to determine if primer or other specific joint preparation techniques are required.
 2. Compatibility Testing: Before installing elastomeric sealants, determine compatibility when in contact with glazing and gasket materials.
 3. Stain Testing: Perform testing per ASTM C1248 on interior and exterior sealants to determine if sealants or primers will stain adjacent surfaces. No sealant work is to start until results of these tests have been submitted to the Contracting Officer Representative (COR) and the COR has given written approval to proceed with the work.
- E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
1. Locate test joints where indicated in construction documents or, if not indicated, as directed by COR.
 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of non-elastomeric sealant and joint substrate indicated.
 3. Notify COR seven (7) days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
- F. Mockups: Within 3 days of the final submittal approval, the Contractor shall provide a minimum 10' x 10' full-scale mockup of construction techniques and materials to be used at the job site at no additional cost to the Owner. Mockups shall be complete and represent the final product produced by the work under this specification to include cleaning, preparation, and application of construction products in accordance with this specification and manufacturer requirements. To the full extent possible, mockups shall be constructed at the job site

at a location agreed upon by the Owner. Mockups shall not be constructed at completed locations or locations not scheduled for the work under this specification. Mockups shall remain in place through the duration of the work. Mock-Up shall be complete at the time of the pre-construction meeting. Before installing joint sealants, apply elastomeric sealants as follows to verify selections and to demonstrate aesthetic effects and qualities of materials and execution:

1. Joints in mockups of assemblies that are indicated to receive elastomeric joint sealants including, but not limited to, concrete wall panels, granite, marble, and/or fenestrations.

1.4 Certification:

- A. Contractor is to submit to the COR written certification that joints are of the proper size and design, that the materials supplied are compatible with adjacent materials and backing, that the materials will properly perform to provide permanent watertight, airtight or vapor tight seals (as applicable), and that materials supplied meet specified performance requirements.

1.5 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
 1. Installer qualifications.
 2. Contractor certification.
 3. Manufacturer's installation instructions for each product used.
 4. Cured samples of exposed sealants for each color.
 5. Manufacturer's Literature and Data:
 6. Primers
 7. Sealing compound, each type, including compatibility when different sealants are in contact with each other.
 8. Manufacturer warranty.

1.6 PROJECT CONDITIONS:

- A. Environmental Limitations:
 1. Do not proceed with installation of joint sealants under following conditions:
 - a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C (40 degrees F).
 - b. When joint substrates are wet.
- B. Joint-Width Conditions:

1. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions:

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

1.7 DELIVERY, HANDLING, AND STORAGE:

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

1.8 DEFINITIONS:

- A. Definitions of terms in accordance with ASTM C717 and as specified.
- B. Backing Rod: A type of sealant backing.
- C. Bond Breakers: A type of sealant backing.
- D. Filler: A sealant backing used behind a back-up rod.

1.9 WARRANTY:

- A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their sealant for a minimum of twenty (20) years from the date of installation and final acceptance by the Government. Submit manufacturer warranty.

1.10 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. ASTM International (ASTM):
 - C509-06..Elastomeric Cellular Preformed Gasket and Sealing Material
 - C612-14..Mineral Fiber Block and Board Thermal Insulation
 - C717-14a.Standard Terminology of Building Seals and Sealants

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

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

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

C920-14a.Elastomeric Joint Sealants.

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

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

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

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

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

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

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

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

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

C. Sealant, Waterproofing and Restoration Institute (SWRI).

The Professionals' Guide

D. Environmental Protection Agency (EPA):

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

PART 2 - PRODUCTS

2.1 SEALANTS:

A. Exterior Sealants:

1. Vertical surfaces, provide silicone non-sagging, low modulus, non-staining sealant; ASTM C920, Type S or M, Grade NS, Class 50, Use NT, G, M, A, and O.
2. Provide location(s) of exterior sealant as follows:

- a. Concrete wall panels horizontal and vertical control joints to include, but not limited to, joints formed with concrete, marble, and frames.
- b. Joints formed where frames and sills of windows, doors, louvers, and vents adjoin granite, marble, or concrete wall panels. Provide sealant at exterior surfaces of exterior wall penetrations.
- c. Voids where items penetrate exterior concrete walls.
- d. New metal reglets, where flashing is inserted into concrete retaining wall joints.

2.2 COLOR:

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

2.3 JOINT SEALANT BACKING:

- A. General: Provide sealant backings of material and type that are non-staining; 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. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.4 FILLER:

- A. Mineral fiberboard: ASTM C612, Class 1.
- B. Thickness same as joint width and to meet the 3-hour fire rated system tested by UL.
- C. Depth to fill void completely behind backing.

2.5 PRIMER:

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

2.6 CLEANERS-NON POROUS SURFACES:

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

2.7 FIRE PERFORMANCE CHARACTERISTICS:

- A. Provide sealant joint assemblies identical to those of assemblies whose fire resistance has been determined per ASTM E119 and E814, NFPA 251, or UL 263 including hose stream test at full-rated period.
- B. Fire rating: Not less than rating of adjacent wall construction. Minimum 3 hour rating.

2.8 FIRE BARRIER SYSTEM:

- A. Material to carry label of approved independent testing laboratory, and be subject to follow-up system for quality assurance.
- B. Include thermal insulation where necessary, in accordance with above tests, with factory cut miters and transitions.

PART 3 - EXECUTION**3.1 INSPECTION:**

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

3.2 PREPARATIONS:

- A. Prepare joints in accordance with manufacturer's instructions and SWRI (The Professionals' Guide).
- B. Enlarge joints to the minimum width required by the sealant manufacturer prior to applying sealant.
- C. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.
 - 1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.

2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include but are not limited to the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous surfaces include but are not limited to the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- D. Do not cut or damage joint edges.
- E. Apply non-staining masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- F. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions or as indicated by pre-construction joint sealant substrate test.
 1. Apply primer prior to installation of back-up rod or bond breaker tape.
 2. Use brush or other approved means that will reach all parts of joints. Avoid application to or spillage onto adjacent substrate surfaces.

3.3 BACKING INSTALLATION:

- A. Install backing material, to form joints enclosed on three sides as required for specified depth of sealant.
- B. Where deep joints occur or to meet the requirements of the 3-hour fire rated sealant system, install filler to fill space behind the backing and position the backing at proper depth.
- C. Cut fillers installed by others to proper depth for installation of backing and sealants.

- D. Install backing, without puncturing the material, to a uniform depth, within plus or minus 3 mm (1/8 inch) for sealant depths specified.
- E. Where space for backing does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.

3.4 SEALANT DEPTHS AND GEOMETRY:

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

3.5 INSTALLATION:

- A. General:
 - 1. Apply sealants and caulking only when ambient temperature is between
 - a. 40 degrees and 100 degrees F.
 - b. Do not install polysulfide base sealants where sealant may be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials may be present.
 - c. Do not install sealant type listed by manufacturer as not suitable for use in locations specified.
 - 2. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.
 - 3. Avoid dropping or smearing compound on adjacent surfaces.
 - 4. Fill joints solidly with compound and finish compound smooth.
 - 5. Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 5A in ASTM C1193 unless shown or specified otherwise in construction documents. Remove masking tape immediately after tooling of sealant and before sealant face starts to "skin" over. Remove any excess sealant from adjacent surfaces of joint, leaving the working in a clean finished condition.
 - 6. Apply compounds with nozzle size to fit joint width.
 - 7. Test sealants for compatibility with each other and substrate. Use only compatible sealant. Submit test reports.
 - 8. Replace sealant which is damaged during construction process.
- B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise. Take all necessary steps to prevent three-sided adhesion of sealants.

3.6 FIELD QUALITY CONTROL:

- A. Field-Adhesion Testing: Field-test joint-sealant adhesion to joint substrates according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
 - 1. Extent of Testing: Test completed elastomeric sealant joints as follows:
 - a. Perform 10 tests for first 1000 feet of joint length for each type of elastomeric sealant and joint substrate.
 - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
- B. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.
- C. Inspect tested joints and provide written report on following:
 - 1. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
 - 2. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
 - 3. Whether sealants filled joint cavities and are free from voids.
 - 4. Whether sealant dimensions and configurations comply with specified requirements.
- D. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
- E. Repair sealants pulled from test area by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.
- F. Evaluation of Field-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.7 CLEANING:

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

- - - E N D - - -

SECTION 07 95 13
EXPANSION JOINT ASSEMBLIES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Section specifies vertical exterior wall building expansion joint assemblies.
- B. Composition of assembly:
 - 1. Fire Barrier (as required)
 - 2. Impregnated Foam Expansion Joint
 - 3. Metal Cover Plate

1.2 RELATED WORK

- A. Section 07 60 00, FLASHING AND SHEET METAL.
- B. Section 07 92 00, JOINT SEALANT.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer with a minimum of three (3) years' experience and who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance. Submit qualification.
- B. Source Limitations: Obtain each type of joint sealant through one (1) source from a single manufacturer.
- C. Mockups: Within 3 days of the final submittal approval, the Contractor shall provide a minimum 4' length full-scale mockup of construction techniques and materials to be used at the job site at no additional cost to the Owner. Mockups shall be complete and represent the final product produced by the work under this specification to include cleaning, preparation, and application of construction products in accordance with this specification and manufacturer requirements. To the full extent possible, mockups shall be constructed at the job site at a location agreed upon by the Owner. Mockups shall not be constructed at completed locations or locations not scheduled for the work under this specification. Mockups shall remain in place through the duration of the work. Mock-Up shall be complete at the time of the pre-construction meeting.
- D. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1

in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521. Refer to Section 07 92 00 of this specification for additional information concerning this test.

E. Project Conditions:

1. Check actual locations of walls and other construction, to which work must fit, by accurate field measurements before fabrication.
2. Show recorded measurements on final shop drawings.

F. Fire tests performed by Factory Mutual, Underwriters Laboratories, Inc., Warnock Hersey or other approved independent testing laboratory.

1.4 DELIVERY STORAGE AND HANDLING

- A. Take care in handling of materials so as not to injure finished surface and components.
- B. Store materials under cover in a dry and clean location off the ground.
- C. Remove materials which are damaged or otherwise not suitable for installation from job site and replace with acceptable materials.

1.5 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 1. Submit copies of manufacturer's current literature and data for each item specified.
 2. Clearly indicate movement capability of cover assemblies and suitability of material used in exterior seals for ultraviolet exposure.
- C. Certificates: Material test reports from approved independent testing laboratory indicating and interpreting test results relative to compliance of fire-rated expansion joint assemblies with requirements specified.
- D. Shop Drawings:
 1. Showing full extent of expansion joint cover assemblies; include large-scale details indicating profiles of each type of expansion joint cover assembly, splice joints between sections, joiners with other type assemblies, special end conditions, anchorages, fasteners, and relationship to adjoining work and finishes.
 2. Include description of materials and finishes and installation instructions.
- E. Samples:

1. Samples of each type and color of metal finish on metal of same thickness and alloy used in work.
2. Samples of each type and color of flexible seal used in work.

1.6 APPLICABLE PUBLICATIONS

- A. Publications listed form part of this specification to extent referenced. Publications are referred to in text by basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - A240/A240M-14 Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications.
 - B209M-07. Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
 - B221M-08. Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes (Metric)
 - C920-11..Elastomeric Joint Sealants
 - E119-10..Fire Tests of Building Construction and Materials
 - E814-11..Fire Tests of Through-Penetration Fire Stops
- C. Federal Specifications (Fed. Spec):
 - TT-P-645B Primer, Paint, Zinc-Molybdate, Alkyd Type
- D. The National Association of Architectural Metal Manufacturers (NAAMM):
 - AMP 500 Series Metal Finishes Manual.
- E. National Fire Protection Association (NFPA):
 - 251-06...Tests of Fire Endurance of Building Construction and Materials
- F. Underwriters Laboratories Inc. (UL):
 - 263-11...Fire Tests of Building Construction and Materials

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Prove watertight, three (3) hour fire rated expansion joint material composed of impregnated foam with a factory applied waterproofing silicone membrane coating designed to provide protection against moisture and water intrusion on vertical surfaces.

- B. Stainless Steel: ASTM A240, Type 302 or 304. Fasteners only.
- C. Aluminum: (Cover Plate)
 - 1. Extruded: ASTM B221, alloy 6063-T5.
 - 2. Plate and Sheet: ASTM B209, alloy 6061-T6.
- D. Elastomeric Sealant:
 - 1. ASTM C920, silicone.
 - 2. Type: S (Single-Component)
 - 3. Class 25.
 - 4. Grade P or NS.
 - 5. Shore A hardness 25, unless specified otherwise.
- E. Fire Barrier:
 - 1. Designed for indicated or required dynamic structural movement without material degradation or fatigue.
 - 2. Tested in maximum joint width condition as a component of an expansion joint cover assembly in accordance with UL 263 NFPA 251, or ASTM E119 and E814, including hose steam test at full-rated period.
 - 3. Can be incorporated within the expansion joint foam or as a separate ancillary system.
- F. Accessories:
 - 1. Manufacturer's standard anchors, fasteners, set screws, spaces, flexible secondary water stops or seals and filler materials, drain tubes, adhesive and other accessories as indicated or required for complete installations.
 - 2. Compatible with materials in contact.
 - 3. Water stops.

2.2 FABRICATION

- A. General:
 - 1. Use wall expansion joint as specified. Unless shown otherwise.
 - 2. Prove watertight, three (3) hour fire rated expansion joint material composed of impregnated foam with a factory applied waterproofing silicone membrane coating designed to provide protection against moisture and water intrusion on vertical surfaces.
 - a. System shall perform waterproofing, fire rating, movement joint functions as well as add to thermal insulation and sound attenuation as the result of a single installation. The use of ancillary fire-retardant blankets and materials is permissible.
 - 1) EMSHIELD WFR3 as manufacturer by EMSEAL.

- 2) 990 Fire Rated Foam as manufactured by JointMaster.
- 3) WaboFireShield FSV - Vertical as manufacturer by Watson Bowman Acme.
- 4) SIF with Pyro-Flex FIRE BARRIER as manufactured by MM Systems.
- 5) Approved equal prior to bid.
- b. Cover plates shall be installed over the finished expansion joint material but should not be required as a part of the fire rated system. Cover shall be installed without use of anchors that penetrate the expansion joint material.
- 3. Provide expansion joint assemblies of design, basic profile, materials and operation indicated required to accommodate joint size variations in adjacent surfaces, and as required for anticipated structural movement.
- 4. Deliver to job site ready for use and fabricated in as large sections and assemblies as practical. Assemblies identical to submitted and reviewed shop drawings, samples and certificates.
- 5. Furnish units in longest practicable lengths to minimize number of end joints. Provide mitered corners where metal joint cover changes directions or abuts other materials.
- 6. Include closure materials and transition pieces, tee-joints, corners, curbs, cross-connections and other assemblies.
- 7. Fire Performance Characteristics:
 - a. Provide expansion joint cover assemblies identical to those of assemblies whose fire resistance has been determined per ASTM E119 and E814, NFPA 251, or UL 263 including hose stream test at full-rated period.
 - b. Fire rating: Not less than rating of adjacent floor or wall construction. Minimum 3 hour rating.
- 8. Fire Barrier Systems:
 - a. Material to carry label of approved independent testing laboratory, and be subject to follow-up system for quality assurance.
 - b. Include thermal insulation where necessary, in accordance with above tests, with factory cut miters and transitions.
 - c. For joint widths up to and including 150 mm (six inches), supply barrier in lengths up to 15000 mm (50 feet) to eliminate field splicing.

- d. Can be a characteristic of the impregnated foam core and silicone coating, or can be separate materials incorporated into the joint.
- B. Exterior Metal Wall Joint Cover Plate Assemblies:
 - 1. Variable movement with seal designed to cover the expansion joint material.
 - 2. Cover Plate Assemblies:
 - a. Pre-manufactured surface mounted aluminum metal cover with concealed galvanized steel clips fastened to the concrete. The use of shop formed covers shall not be permitted. To be fastened to wall on one side of joint.
 - b. Extend cover to lap each side of joint and to permit free movement of at least one side.
 - c. Use angle cover plate of intersection of walls.
 - d. Color to match existing.

2.3 METAL FINISHES

- A. General:
 - 1. Apply finishes in factory after products are fabricated.
 - 2. Protect finishes on exposed surfaces with protective covering before shipment.
- B. Aluminum Finishes: Fluorocarbon Finish: NAAMM AMP 503 AAMA 605.2, high performance organic coating. Color to be selected by Owner from manufacturer's full range of colors.
- C. Stainless Steel: NAAMM AMP 503, finish No. 2B. Fasteners only.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Manufacturer's representative shall make a thorough examination of surfaces receiving work of this section.
- B. Before starting installation, notify prime contractor of defects which would affect satisfactory completion of work.

3.2 PREPARATION

- A. Verify measurements and dimensions at job site and cooperate in coordination and scheduling of work with work of related trades.
- B. Give particular attention to installation of items embedded in concrete and masonry so as not to delay job progress.
- C. Provide templates to related trade for location of support and anchorage items.

- D. Adjust joint width as required by the expansion joint manufacturer to provide suitable substrate for materials. Modify the surface roughness of the joint as required by the expansion joint manufacturer and sealant manufacturer to ensure proper adhesion.

3.3 INSTALLATION

- A. Install foam expansion joint in accordance with manufacturer's installation instructions unless specified otherwise.
- B. Fire Barriers:
 - 1. Install in compliance with tested assembly.
 - 2. Install in expansion joints.
 - 3. Use fire barrier sealant or caulk supplied with system.
- C. Installation of Foam Core Expansion Joint Materials:
 - 1. For straight sections, provide preformed seals in continuous lengths.
 - 2. Field spliced joints to provide watertight joints using manufacturer's recommended procedures.
- D. Sealants:
 - 1. Install to prevent water and air infiltration.
 - 2. Continuously seal silicone foam coating to wall using specified silicone sealant. Sealant shall be provided in accordance with Section 07 92 00 from a single manufacturer.
- E. Provide anchorage devices and fasteners for securing expansion joint metal cover plates to in-place construction including threaded fasteners with drilled-in fasteners for masonry and concrete. Provide metal fasteners of type and size to suit type of construction indicated and provide for secure attachment of expansion joint cover assemblies.
- F. Perform cutting, drilling and fitting required for installation of expansion joint assemblies.
- G. Install joint assemblies in true alignment and proper relationship to expansion joint opening and adjoining finished surfaces measured from established lines and levels.
- H. Allow for thermal expansion and contraction of metal to avoid buckling.
- I. Locate wall covers in continuous contact with adjacent surfaces. Securely attach in place with required accessories.
- J. Locate anchors at interval recommended by manufacturer, but not less than 3-inches from each ends, and, not more than 24-inches on centers.

- K. Maintain continuity of expansion joint cover assemblies with end joints held to a minimum and metal members aligned mechanically using splice joints.
- L. Cut and fit ends to produce joints that will accommodate thermal expansion and contraction of metal to avoid buckling of frames or plates.
- M. Metal Cover Plates: Install in accordance with manufacturer's written instruction. The secondary membrane barrier is not required.

3.4 PROTECTION

- A. Take proper precautions to protect the expansion joint covers from damage after they are in place.
- B. Cover floor joints with plywood where wheel traffic occurs.

- - - E N D - - -

**SECTION 08 01 80
MAINTENANCE OF GLAZING**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Section specifies cleaning of all exterior glazing and metal frames at all fenestrations.

1.2 RELATED WORK

- A. Section 01 66 00, STORAGE AND PROTECTION
- B. Section 02 41 00, DEMOLITION
- C. Section 07 19 16, SILANE WATER REPELLENT

1.3 QUALITY ASSURANCE

- A. Project Conditions:
 - 1. Check actual locations of walls and other construction, to which work must fit, by accurate field measurements before fabrication.
 - 2. Show recorded measurements on final shop drawings.

1.4 DELIVERY STORAGE AND HANDLING

- A. Take care in handling of materials so as not to injure finished surface and components.
- B. Store materials under cover in a dry and clean location off the ground.
- C. Remove materials which are damaged or otherwise not suitable for installation from job site and replace with acceptable materials.

1.5 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data: Submit copies of manufacturer's current literature and data for each item specified.
- C. Contractor's Cleaning Solution and Cleaning Guide

1.6 APPLICABLE PUBLICATIONS

- A. Publications listed form part of this specification to extent referenced. Publications are referred to in text by basic designation only.
- B. 29 CFR 1910 - Occupational Safety and Health Administration
- C. 29 CFR 1926 - Occupational Safety and Health Administration
- D. American National Standards Institute/International Window Cleaning Association (ANSI/IWCA) I-14.1
- E. American National Standards Institute/American Society of Safety Engineers (ANSI/ASSE) Z359.0-2007
- F. American Society of Mechanical Engineers (ASME) A120.01-2008

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. Cleaning Agent: Active ingredients including water, ammonium lauryl sulfate, ammonium laureth sulfate, and lauramidopropylamine oxide cleaning and foaming agents.
 - 1. Ensure cleaning agent is chemically compatible with the glazing type to be cleaned. Provide proper cleaning agent(s) to accommodate varying glazing surfaces and chemical resistance. Deteriorated glazing as a direct result of chemical incompatibility of products used by the Contractor shall be replaced by the Contractor at no additional cost to the government. The use of water alone is not acceptable.
- B. Potable Water
- C. Strip applicator with long head cloth.
- D. Squeegee
- E. Accessories:
 - 1. Additional materials and equipment necessary to facilitate the cleaning of windows including, but not limited to, cloths, ladders, replaceable metal blade scrapers, etc.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Before starting cleaning, notify prime contractor of defects which would affect satisfactory completion of work.

3.2 PREPARATION

- A. Verify measurements and dimensions at job site and cooperate in coordination and scheduling of work with work of related trades.
- B. Give particular attention to cleaning fenestrations adjacent to concrete and masonry so as to properly protect from overspray or runoff.
- C. Protect people, vehicles, property, and all surfaces not scheduled for cleaning from product, splash, rinse, residue, fumes, and wind drift. Protect grounds, plants, masonry, structure, and other surfaces that lie below the substrates or in the direct path of solution run-off. Consult local building codes for any special requirements for the disposal of products and control of runoff.
- D. Provide templates to related trade for location of support and anchorage items.

3.3 INSTALLATION

- A. Provide temporary anchorages required to allow person(s) to access fenestrations to be cleaned in accordance with applicable safety standards.
- B. Clean all glazing in accordance with applicable practices established by approved organizations.
- C. Clean shall be considered glazing free of all soils (water soluble and water insoluble), dirt, sealer, sealant, streaks, and other foreign materials not integral to the fenestration. Utilize appropriate, additional cleaner to remove solid soil that is compatible with the glazing.
- D. All water and residue shall be cleaned from frames, sills, adjacent construction, and grounds after glazing is cleaned.
- E. All equipment, tools, and materials shall be properly stored and/or removed from the site daily as required by the Project Manager.

3.4 PROTECTION

- A. Take proper precautions to protect the fenestrations from construction related soils after they are cleaned.
- B. Cover roofing with plywood where traffic occurs or where temporary supports, swings stages, beams, or other necessary equipment or materials are stored or installed.

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SECTION 09 97 23
COATINGS FOR CONCRETE AND MASONRY

PART 1 - GENERAL

1.1 Summary

- A. Installation of fluid applied elastomeric coating at existing concrete retaining wall and column adjacent to the retaining wall.

1.2 Related Work Specified Elsewhere

- A. Section 02 41 00, Demolition
- B. Section 03 01 30, Maintenance of Concrete
- C. Section 07 60 00, Flashing and Sheet Metal
- D. Section 07 92 00, Joint Sealants

1.3 Protection

- A. Refer to Section 01 66 00.

1.4 Environmental Conditions

- A. Material installation shall proceed only when weather conditions are in compliance with manufacturer's recommendations for installation and no precipitation is imminent. Materials installed during adverse weather conditions shall be subject to rejection including removal and replacement at no additional cost to the Owner.
- B. Use manufacturer's standard test method to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of coatings to substrates.

1.5 Submittals

- A. Submit copies of manufacturer's literature for the following:
 - 1. Product Data consisting of coating system manufacturer's product information for components, materials, accessories, and equipment necessary to perform the work.
 - 2. Applicable detail and shop drawings for the work.
 - 3. Samples for initial selection purposes in form of manufacturer's color charts or chips showing full range of colors and textures.
 - 4. Installer certificates signed by coating system manufacturer written certification certifying that the installer complies with requirements included under the "Quality Assurance" section of the Specification.
 - 5. Operation and Maintenance Data as required by the warranty.
 - 6. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

B. Refer to Section 01 33 00 of Specification.

1.6 Quality Assurance

- A. Contractor: Coating applicator must be approved, authorized, or licensed in writing by the approved coating product manufacturer and have a minimum of five years' experience as an approved, authorized, or licensed applicator with that manufacturer and be approved at a level capable of providing the specified warranty. The applicator must supply the names, locations and client contact information of five projects of similar size and scope that the applicator has constructed using the manufacturer's coating products submitted for this project within the previous three years.
- B. Contractor shall perform adhesion tape tests in accordance with the latest edition of ASTM C3359 Test Method A. Test shall be performed by a third party firm licensed in the state of Georgia with a minimum of 5 years experience with material testing. Perform one test for every 27,000 square feet of concrete wall panels. A minimum of 3 tests shall be performed for each building elevation, as shown on drawings. Prepare a report of findings with representative photographs for the Owner and Engineer to review within 24 hours of the test. Any repairs to coatings as a result of failure under this paragraph shall be performed by the Contractor at no additional cost to the Owner.
- C. Manufacturer: Manufacturer shall have a minimum of 10 years of continuous, concurrent experience providing specified materials including the current year. Manufacturer is required, at a minimum, to perform biweekly site inspections to assess the work performed by the Contractor since the previous site inspection and provide written documentation to Owner and Design Professional of findings and resolution of any deficient areas of work or issues.
- D. Mock-Up: Within 3 days of the final submittal approval, the Contractor shall provide a minimum 5' x 5' full-scale mockup of construction techniques and materials to be used at the job site at no additional cost to the Owner. Mockups shall be complete and represent the final product produced by the work under this specification to include cleaning, preparation, and application of construction products in accordance with this specification and manufacturer requirements. To the full extent possible, mockups shall be constructed at the job site at a location agreed upon by the Owner. Mockups shall not be constructed at completed locations or locations not scheduled for the

work under this specification. Mockups shall remain in place through the duration of the work. Mock-Up shall be complete at the time of the pre-construction meeting.

1. After the coating has cured at the mock-up location, contractor shall perform an adhesion tape test in accordance with the latest edition of ASTM C3359 Test Method A. Test shall be performed by a third party firm licensed in the state of Georgia with a minimum of 5 years experience with material testing. Prepare a report of findings with representative photographs for the Owner and Engineer to review within 24 hours of the test. Any repairs to coatings as result of failure under this paragraph shall be performed by the Contractor at no additional cost to the Owner.

1.7 Warranty

- A. Refer to Section 01 78 36 of this specification.

PART 2 - PRODUCTS

2.1 Materials, General

- A. Compatibility: Provide coatings and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by coating manufacturer, based on testing and field experience.
- B. Colors of Coating: To match existing wall finish as selected by Owner.

2.2 Coating

- A. Concrete Retaining Wall Coating: Course, water-based coating with a minimum of 12.5 perms (US perms) when tested in accordance with ASTM D1653. Minimum solid content of 68.6% when tested by weight in accordance with ASTM D5201 or ASTM D2369. Minimum dry-film thickness of 16 mils for the system.
 1. For use coating existing concrete retaining wall.
 2. Products: Subject to compliance with requirements. All listed manufacturers and products are provided as examples of the salient characteristics to be found in the submitted product. Any additional manufacturers not listed must meet the requirements set forth in this specification and be approved prior to bid in accordance with Section 01 60 00. Manufacturers that may be incorporated into the Work include, but are not limited to the following:
 - a. BASF Building Systems;
 - b. Dow Corning Corporation

- c. Pecora Corporation;
- d. Sika Corporation;
- e. Euclid Chemical;

2.3 Preparation Equipment:

- A. Low-Pressure Equipment including booster pump, pressure rated hoses, water jet, 15-45 degree fan spray nozzle tip, and any other equipment as recommend by the approved coating manufacturer.
- B. Abrasive (Sand) Blasting equipment including air compressor, blast media hopper, oil/moisture separators, blast nozzle and hoses, and any other equipment as recommended by the approved coating manufacturer.
- C. High-Pressure Water Jetting equipment to create water sprayed at pressures between 5,000 and 45,000 PSI including water pump, compressed air source, pressure rated hoses, water jet, nozzle tip, and any other equipment as recommended by the approved coating manufacturer.
- D. Any other equipment recommended by manufacturer for preparation of substrate to meet ICRI Guide 310.2 requirements must be submitted for approval prior to the base bid.

2.4 Cleaning Agent:

- A. Sure Klean Custom Masonry Cleaner as manufactured by PROSOCO, Inc., 3741 Greenway Circle, Lawrence, KS 66046. Phone: (800) 255-4255; Fax: (785) 830-9797. E-mail: CustomerCare@prosoco.com
- B. Light Duty Concrete Cleaner as manufactured by PROSOCO, Inc., 3741 Greenway Circle, Lawrence, KS 66046. Phone: (800) 255-4255; Fax: (785) 830-9797. E-mail: CustomerCare@prosoco.com.
- C. Approved equal prior to bid.

2.5 Brush: Nylon brushes only

2.6 Roller: High quality ¾" to 1-1/4" nap roller cover.

PART 3 - EXECUTION

3.1 Preparation

- A. Surfaces shall be clean and free of containments in accordance with manufacturer instructions.
- B. Repair damage, spalls, holes, and cracks, and remove stains at wall in accordance with this section and Section 03 01 30 of this Specification. Contractor shall consult manufacturer for compatibility issues with coatings and sealants used to repair cracks. Manufacturer is required to provide compatible materials.
- C. Ensure that all concrete surfaces and repairs are fully cured.
- D. Prepare substrate in accordance with coating manufacturer written

instructions to degree required by coating manufacturer per ICRI Guide 310.2 (formerly Guideline No. 03732) by low-pressure water cleaning, abrasive (sand) blasting, or high-pressure water jetting only, as recommended by the coating manufacturer to apply new coating.

1. Comply with applicable codes to control runoff as necessary based on recommendations from local jurisdictions based on chemical composition of cleaning products. Contractor shall prepare a workplan describing procedures for runoff protection and submit to the Engineer for review and approval.
 2. Protect existing sidewalk pedestrians, street traffic, and any other persons, buildings, or structure below and above the work by means as required by OSHA and local codes. The use of any temporary covered walkways, netting, or other protections required by local jurisdiction shall be borne by the Contractor at no additional cost to the Owner. Refer to Section 01 66 00 for additional information.
- E. Utilize cleaning agent in accordance with cleaning agent manufacturer and coating manufacturer recommendations to adequately clean substrate of foreign deposits, efflorescence, rust stains, and other items that will adversely affect coating curing and adhesion to substrate.
- F. Do not apply coating when temperature is below 40 degree Fahrenheit or shall be below 40 degrees Fahrenheit in the next 24 hours unless manufacturer has more stringent requirements.
- G. Consult manufacturer and follow written recommendations for application of coatings at temperatures below 60 degrees Fahrenheit or above 80 degrees Fahrenheit or when there is a 50% or greater humidity.
- 3.2 Mixing
- A. Slowly mix coating in each pail prior to application using a paddle mixer and drill.
 - B. Where multiple pails shall be used, prior to emptying pail, mix next pail into partially used pail to ensure consistent color throughout coating application.
 - C. Mix coating in accordance with coating manufacturer written instructions.
- 3.3 Application
- A. To the full extent possible, use spraying equipment to apply coating unless area is not accessible using spraying equipment, or risk of

- injury or damage exists. Otherwise, brushes and rollers may be used.
- B. Apply coating using spray equipment as recommended by coating manufacturer.
 - C. Maintain minimum wet-film thickness (WFT) during application to achieve specified dry-film thickness (DFT).
 - D. Apply coating in two (2) equal coats at a minimum DFT of 8 mils per coat. Provide a finished minimum DFT of 16 mils for the system.
 - E. Allow minimum 1-1/2 hours drying to touch and minimum 6 hours drying time to re-coat unless manufacturer has more stringent requirements.
 - F. Coating shall be applied continuously to a logistical building break and ensure a wet edge during application.
 - G. Ensure uniform color, texture, and thickness throughout the coating system.
 - H. Formation of spores or holidays in the coating system after application shall be grounds for rejection.
 - I. Apply coating in accordance with manufacturer written instructions.
- 3.4 Cleaning
- A. Do not allow coating to cure on substrate and surfaces not scheduled for coating. Immediately clean coating from these surfaces using water prior to curing.
 - B. Work area and areas adjacent shall be clean and free of debris during and after application. There shall be no locations of spills identified at any areas.

- - - END OF SECTION - - -

SECTION 31 20 11
Earthwork (SHORT FORM)

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section specifies the requirements for furnishing all equipment, materials, labor and techniques for earthwork including excavation, fill, backfill and site restoration utilizing fertilizer, seed and/or sod.

1.2 DEFINITIONS:

- A. Unsuitable Materials:
1. Fills: Topsoil, frozen materials; construction materials and materials subject to decomposition; clods of clay and stones larger than 3 inches; organic materials, including silts, which are unstable; and inorganic materials, including silts, too wet to be stable.
- B. Earthwork: Earthwork operations required within the new construction area.
- C. Degree of Compaction: Degree of compaction is expressed as a percentage of maximum density obtained by the test procedure presented in ASTM D698.
- D. The term "fill" means fill or backfill as appropriate.

1.3 RELATED WORK:

- A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES
- B. Section 01 35 26, SAFETY REQUIREMENTS
- C. Protection of existing utilities, fire protection services, existing equipment, roads, and pavements: Section 01 00 00, GENERAL REQUIREMENTS
- D. Section 01 00 00, GENERAL REQUIREMENTS, Article, PHYSICAL DATA
- E. Section 07 13 52, MODIFIED BITUMINOUS SHEET WATERPROOFING
- F. Section 07 60 00, FLASHING AND SHEET METAL

1.4 CLASSIFICATION OF EXCAVATION:

- A. Classified Excavation: Removal and disposal of all material not defined as rock.

1.5 MEASUREMENT AND PAYMENT FOR EXCAVATION:

- A. Measurement: The unit of measurement for excavation and borrow will be the cubic yard, computed by the number of truck loads used to remove and deliver material. Quantities should be computed by a Registered Professional Land Surveyor or Registered Civil Engineer. The measurement will include authorized excavation of satisfactory subgrade soil; allowance will be made on the same basis for selected backfill ordered

as replacement. The measurement will not include the volume of any excavation performed prior to taking of elevations and measurements of the undisturbed grade.

1.6 MEASUREMENT AND PAYMENT FOR ROCK EXCAVATION:

- A. Measurement: Truck loads quantities by the Registered Professional Land Surveyor or Registered Civil Engineer, specified in Section 01 00 00, GENERAL REQUIREMENTS. Do not measure quantities beyond the following limits:
 - 1. 7 feet outside the interior face of the concrete retaining wall, except for the heel.
 - 2. 3 feet outside the interior face of the retaining wall heel.
- B. Payment for Differing Site Conditions: When rock excavation, as classified, is encountered, the contract price and time will be adjusted in accordance with Articles, DIFFERING SITE CONDITIONS, CHANGES and CHANGES-SUPPLEMENT of the GENERAL CONDITIONS as applicable.

1.7 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Excavation Report:
 - 1. Certification of quantities excavated.
 - 2. Excavation method.
 - 3. Labor.
 - 4. Equipment.
 - 5. Land Surveyor's or Civil Engineer's name and official registration stamp.
 - 6. Plot plan showing elevations.
- C. Contractor shall submit procedure and location for disposal of unused satisfactory material. Proposed source of borrow material. Notification of encountering rock in the project. Advance notice on the opening of excavation or borrow areas.

1.8 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. American Nursery and Landscape Association (ANLA):
 - 2004 American Standard for Nursery Stock
- C. American Association of State Highway and Transportation Officials (AASHTO):
- D. American Society for Testing and Materials (ASTM):
- E. Standard Specifications of Georgia State Department of Transportation, latest revision.

PART 2 - PRODUCTS**2.1 MATERIALS:**

- A. General Fills: Materials approved from on site and off site sources having a minimum dry density of 100 pcf, a maximum Plasticity Index (PI) of 6, and a maximum Liquid Limit (LL) of 30.
- B. Retaining Wall Backfill: Materials approved from on site or off site sources have a minimum dry density of 110 pcf, percent finer than No. 200 sieve of 35 percent or less, maximum PI of 6 and a maximum LL of 30.
- C. Granular Fill:
 - 1. Bedding for drain pipes and retaining drain tile, ASTM No. 57 crushed stone.
- D. Perforated Drainage Pipe: ASTM F405, minimum 6" diameter wrapped with geotextile fabric meeting ASTM D6707.
- E. Filter Fabric: non-woven geotextile filter fabric to allow water to pass into the granular fill while restricting the movement of soil particles.
- F. Fertilizer: (5-10-5) delivered to site in unopened containers that clearly display the manufacturer's label, indicating the analysis of the contents.
- G. Sod: Comparable species with existing turf. Use State Certified or State Approved sod when available. Deliver sod to site immediately after cutting and in a moist condition. Thickness of cut must be 19 mm to 32 mm (3/4 inch to 1 1/4 inches) excluding top growth. There shall be no broken pads and torn or uneven ends
- H. Requirements For Offsite Soils: Offsite soils brought in for use as backfill shall be tested for TPH, BTEX and full TCLP including ignitability, corrosivity and reactivity. Backfill shall contain less than 100 parts per million (ppm) of total hydrocarbons (TPH) and less than 10 ppm of the sum of Benzene, Toluene, Ethyl Benzene, and Xylene (BTEX) and shall not fail the TCLP test. TPH concentrations shall be determined by using EPA 600/4-79/020 Method 418.1. BTEX concentrations shall be determined by using EPA SW-846.3-3a Method 5030/8020. TCLP shall be performed in accordance with EPA SW-846.3-3a Method 1311. Provide Borrow Site Testing for TPH, BTEX and TCLP from a composite sample of material from the borrow site, with at least one test from each borrow site. Material shall not be brought on site until tests have been approved by the Resident Engineer.
- I. Refer to Landscaping Drawing for additional materials.

PART 3 - EXECUTION**3.1 SITE PREPARATION:**

- A. Clearing: Clearing within the limits of earthwork operations as described or designated by the Resident Engineer. Work includes removal of trees, shrubs, fences, sidewalks, incidental structures, paving, debris, trash and any other obstructions. Remove all cleared materials from the retaining wall area and extending at least 7 feet beyond.
- B. Grubbing: Remove all stumps and roots 3 inches and larger diameter.
- C. Trees and Shrubs: Trees and shrubs, not shown for removal, may be removed from the areas within 15 feet of new construction and 7'-6" of utility lines if such removal is approved in advance by the Resident Engineer. Remove materials from the retaining wall area. Box, and otherwise protect from damage, existing trees and shrubs which are not shown to be removed in the construction area. Repair immediately damage to existing trees and shrubs by trimming, cleaning and painting damaged areas, including the roots, in accordance with standard industry horticultural practice for the geographic area and plant species. Building materials shall not be stored closer to trees and shrubs that are to remain, than the farthest extension of their limbs.
- D. Stripping Topsoil: Unless otherwise indicated on the drawings, the limits of earthwork operations shall extend anywhere the existing grade is filled or cut or where construction operations have compacted or otherwise disturbed the existing grade or turf. Strip topsoil as defined herein from within the limits of earthwork operations as specified above. Topsoil shall be fertile, friable, natural topsoil of loamy character and characteristic of the locality. Topsoil shall be capable of growing healthy horticultural crops of grasses. Stockpile topsoil and protect as directed by the Resident Engineer. Eliminate foreign material, such as weeds, roots, stones, subsoil, frozen clods, and similar foreign materials, larger than 1/2 cubic foot in volume, from soil as it is stockpiled. Retain topsoil on the station. Remove foreign materials larger than 2 inches in any dimension from topsoil used in final grading. Topsoil work, such as stripping, stockpiling, and similar topsoil work, shall not, under any circumstances, be carried out when the soil is wet so that the tilth of the soil will be destroyed.
- E. Stripping Topsoil: Disposal: All materials removed from the property shall be disposed of at a legally approved site, for the specific materials, and all removals shall be in accordance with all applicable Federal, State and local regulations. No burning of materials is permitted onsite.

3.2 EXCAVATION:

- A. Shoring, Sheet piling and Bracing: Shore, brace, or slope to its angle of repose banks of excavations to protect workmen, banks, adjacent paving, structures, and utilities, in compliance with OSHA requirements.
 - 1. Extend shoring and bracing to the bottom of the excavation. Shore excavations that are carried below the elevations of adjacent existing foundations.
 - 2. If the retaining wall is disturbed by excavating, improper shoring or removal of shoring, placing of backfill, and similar operations, provide a concrete fill support at disturbed retaining wall, as directed by Resident Engineer, at no additional cost to the Government. Do not remove shoring until permanent work in excavation has been inspected and approved by Resident Engineer.
 - 3. If the overturning moment of the retaining is disturbed by the removal of earth, install temporary supports at the front of the retaining wall to ensure overturning is avoided. Such cost shall be included in the Base Bid and performed as necessary at no additional cost to the government.
- B. Excavation Drainage: Operate pumping equipment, and/or provide other materials, means and equipment as required, to keep excavations free of water and subgrades dry, firm, and undisturbed until approval of permanent work has been received from Resident Engineer. Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, the water level shall be maintained continuously, at least 3 feet below the working level. Operate dewatering system continuously until construction work below existing water levels is complete. Submit performance records weekly.
- C. Structural Earthwork:
 - 1. Excavation shall be accomplished as required by drawings and specifications.
 - 2. Remove loose or soft material to solid bottom.
 - 3. Fill excess cut under structural footings or foundations with 3000 psi concrete.

4. Sanitary and storm sewer trenches:

- a. Trench width below a point 6 inches above top of the pipe shall be 24 inches for up to and including 12 inches diameter. Width of trench above that level shall be as necessary for sheeting and bracing and proper performance of the work.
 - b. Install a minimum 6 inch diameter perforated drain pipe embedded in Granular Fill (12 inches minimum) continuously wrapped in non-woven geotextile filter fabric adjacent to the heel of the retaining wall. Pipe shall extend from the canteen to the outside the earth a minimum of 12 inches past the end of the retaining wall.
 - c. Prior to applying the pipe or granular fill, install filter fabric of adequately size to complete encase the new granular fill.
 - d. The pipe shall be bedded on suitable granular fill. Unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 6 inches loose thickness.
 - 1) Granular Fill: Depth of fill shall be a minimum of 12 inches below the pipe, 12 inches above and 12 inches beyond both sides of pipe. Place and tamp fill material by hand.
 - 2) Stop the granular fill an appropriate distance to allow the full depth continuation of the initial fill towards the end of the retaining wall.
 - e. Encase the granular fill in the filter fabric previously applied.
 - f. Place and compact as specified the remainder of backfill using acceptable excavated materials. Do not use unsuitable materials.
 - g. Initial backfill material shall be placed and compacted with approved tampers to a height of at least one foot above the new granular fill. The backfill and granular backfill shall be brought up evenly, with drain tile extending full wall height. Care shall be taken to ensure thorough compaction of the fill. Backfill to shall be compacted to at least 95 percent of ASTM D698 maximum density.
 - h. End the backfill and granular fill an appropriate distance to allow the full depth of the top soil to the end of the retaining wall.
- D. Site Earthwork: Excavation shall be accomplished as required by drawings and specifications. Remove subgrade materials that are determined by the Resident Engineer as unsuitable, and replace with acceptable material. When unsuitable material is encountered and removed, the contract price and time will be adjusted in accordance with Articles, DIFFERING SITE

CONDITIONS, CHANGES and CHANGES-SUPPLEMENT of the GENERAL CONDITIONS as applicable. Adjustments to be based on meters (yardage) in cut section only.

E. Finished elevation of subgrade shall be as follows:

1. Planting and Lawn Areas - 4 inches below the finished grade, unless otherwise specified or indicated on the drawings.

3.3 FILLING AND BACKFILLING:

- A. General: Do not fill or backfill until all debris, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from the excavation. Proof-roll exposed subgrades with a fully loaded dump truck or using hand auger/dynamic cone penetrometer testing in inaccessible areas. Use excavated materials or borrow for fill and backfill, as applicable. Do not use unsuitable excavated materials. Do not backfill until retaining wall has been adequately braced, waterproofing applied, and pipes coming in contact with backfill have been installed, and inspected and approved by Resident Engineer.
- B. Placing: Place material in horizontal layers not exceeding 8 inches in loose depth and then compacted. Do not place material on surfaces that are muddy, frozen, or contain frost.
- C. Compaction: Use approved equipment (hand or mechanical) well suited to the type of material being compacted. Do not operate mechanized vibratory compaction equipment within 10 feet of existing building/retaining walls without the prior approval of the Resident Engineer. Moisten or aerate material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Compact each layer to not less than 95 percent of the maximum density determined in accordance with the following test method ASTM D698.
- D. Borrow Material: Borrow material shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Borrow material shall be obtained from the borrow areas from approved private sources. Unless otherwise provided in the contract, the Contractor shall obtain from the owners the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources, including rights-of-way for hauling. Borrow material from approved sources on Government-controlled land may be obtained without payment of royalties. Unless specifically provided, no borrow shall be obtained within the limits of the project site without prior written approval. Necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon shall be considered related operations to the borrow excavation.

- E. Opening and Drainage of Excavation and Borrow Pits: The Contractor shall notify the Resident Engineer sufficiently in advance of the opening of any excavation to permit elevations and measurements of the undisturbed ground surface to be taken. Except as otherwise permitted, borrow pits and other excavation areas shall be excavated providing adequate drainage. Overburden and other spoil material shall be transported to designated spoil areas or otherwise disposed of as directed. Borrow pits shall be neatly trimmed and drained after the excavation is completed. The Contractor shall ensure that excavation of any area, operation of borrow pits, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.4 GRADING:

- A. General: Uniformly grade the areas within the limits of this section, including adjacent transition areas. Smooth the finished surface within specified tolerance. Provide uniform levels or slopes between points where elevations are indicated, or between such points and existing finished grades. Provide a smooth transition between abrupt changes in slope.
- B. Slope backfill outside the building away from the building walls and within the retaining wall backfill zone for a minimum distance of 10 feet at a minimum five percent (5%) slope.
- C. The finished grade shall match this existing.

3.5 LAWN AREAS:

- A. General: Harrow and till to a depth of 4 inches, new or existing lawn areas to remain, which are disturbed during construction. Establish existing or design grades by dragging or similar operations. Do not carry out lawn areas earthwork out when the soil is wet so that the tilth of the soil will be destroyed. Plant bed must be approved by Resident Engineer before seeding or sodding operation begins.
- B. Finished Grading: Begin finish grading after rough grading has had sufficient time for settlement. Scarify subgrade surface in lawn areas to a depth of 4 inches. Apply topsoil so that after normal compaction, dragging and raking operations (to bring surface to indicated finish grades) there will be a minimum of 4 inches of topsoil over all lawn areas; make smooth, even surface and true grades, which will not allow water to stand at any point. Shape top and bottom of banks to form reverse curves in section; make junctions with undisturbed areas to conform to existing topography. Solid lines within grading limits indicate finished contours. Existing contours, indicated by broken lines are believed approximately correct but are not guaranteed.

- C. Fertilizing: Incorporate fertilizer into the soil to a depth of 4 inches at a rate of 25 pounds per 1000 square feet.
 - D. Seeding: Seed at a rate of 4 pounds per 1000 square feet and accomplished only during periods when uniform distribution may be assured. Lightly rake seed into bed immediately after seeding. Roll seeded area immediately with a roller not to exceed 150 pounds per foot of roller width.
 - E. Sodding: Topsoil shall be firmed by rolling and during periods of high temperature the topsoil shall be watered lightly immediately prior to laying sod. Sod strips shall be tightly butted at the ends and staggered in a running bond fashion. Placement on slopes shall be from the bottom to top of slope with sod strips running across slope. Secure sodded slopes by pegging or other approved methods. Roll sodded area with a roller not to exceed 150 pounds per foot of the roller width to improve contact of sod with the soil.
 - F. Watering: The Resident Engineer is responsible for having adequate water available at the site. As sodding is completed in any one section, the entire sodded area shall be thoroughly irrigated by the contractor, to a sufficient depth, that the underside of the new sod pad and soil, immediately below sod, is thoroughly wet. Resident Engineer will be responsible for sod after installation and acceptance.
 - G. Refer to landscaping drawing for additional information.
- 3.6 Disposal of unsuitable and excess excavated material:**
- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Medical Center property.
 - B. Disposal: Transport surplus satisfactory soil to designated storage areas on Medical Center property. Stockpile or spread soil as directed by Resident Engineer.
 - 1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Medical Center property.
 - C. Place excess excavated materials suitable for fill and/or backfill on site where directed.
 - D. Remove from site and dispose of any excess excavated materials after all fill and backfill operations have been completed.
 - E. Segregate all excavated contaminated soil designated by the Resident Engineer from all other excavated soils, and stockpile on site on two 0.15 mm (6 mil) polyethylene sheets with a polyethylene cover. A designated area shall be selected for this purpose. Dispose of excavated contaminated material in accordance with State and Local requirements.

3.7 CLEAN-UP:

- A. Upon completion of earthwork operations, clean areas within contract limits, remove tools, and equipment. Provide site clear, clean, free of debris, and suitable for subsequent construction operations. Remove debris, rubbish, and excess material from the Medical.

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