

UNITED STATES DEPARTMENT OF VETERANS AFFAIRS



PROJECT MANUAL

**VA MEDICAL CENTER
RIVER STREET ENTRANCE SLOPE
STABILIZATION
HOT SPRINGS, SOUTH DAKOTA**

VA PROJECT # 568-14-214

FOR CONSTRUCTION SUBMITTAL

November 08, 2014

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SPECIFICATIONS
BLACK HILLS HEALTHCARE SYSTEM, HOT SPRINGS SD
DEPARTMENT OF VETERANS AFFAIRS
RIVER STREET ENTRANCE SLOPE STABILIZATION
VA# 568-14-214
TABLE OF CONTENTS

BID PROPOSAL

PART 1 - VA REQUIREMENTS

To be provided by the VA

PART 2 - TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

01 00 00	General Requirements
01 01 00	Medical Center Requirements
01 33 23	Shop Drawings, Product Data and Samples
01 33 24	Submittal Register
01 42 19	Reference Standards
01 45 29	Testing Laboratory Services
01 57 00	Environmental Management
01 57 19	Temporary Environmental Controls
01 74 19	Construction Waste Management

DIVISION 2 - EXISTING CONDITIONS

02 41 00	Demolition
----------	------------

DIVISION 31 - EARTHWORK

31 20 11	Earth Moving (Short Form)
31 23 19	Dewatering

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 11 23	Aggregate Base Course
32 12 00	Flexible Pavement
32 13 13	Concrete Paving
32 90 00	Planting
32 91 00	Geogrid Reinforcement

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SECTION 01 00 00
GENERAL REQUIREMENTS

REVISED 11/26/12

1.1 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 the #568-14-214 Hot Springs VA River Street Entrance Slope Stabilization project as required by drawings and specifications.
- B. Visits to the site other than the organized site visit shall be made only by appointment with the Medical Center Contracting Officer Representative (COR).
- C. NOT USED
- D. Before placement and installation of work subject to tests by testing laboratory retained by Department of Veterans Affairs, the Contractor shall notify the VA Project Manager 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 VA Project Manager.
- 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.
- F. Prior to commencing work, general contractor shall provide proof that a OSHA certified "competent person" (CP) (29 CFR 1926.20(b)(2) who has the 30-hour OSHA certification for Construction Safety will maintain a presence at the work site whenever the general or subcontractors are present.
- G. Training:
 - 1. All employees of general contractor or subcontractors shall have the 10-hour OSHA certified Construction Safety course and /or other relevant competency training, as determined by VA CP with input from the ICRA team. Final approval of the equivalent training in lieu of

the 10-Hour OSHA certification will be made by the Engineering Program Manager.

2. Submit training records of all such employees for approval before the start of work.

1.2 STATEMENT OF BID ITEM(S)

A. SCOPE OF WORK

Location: VA Black Hills Health Care System, Hot Springs, SD.

Provide all labor, materials, tools and equipment, necessary for the construction of the River Street Entrance Slope Stabilization project.

- B. Description: The contractor shall excavate the project area and replace with engineered fill and geogrid to stabilize the area. Replace the asphalt, curb and gutter, bollards, and cable fence in the disturbed area. Topsoil and hydro-seed the disturbed slope.

1. Demolition will consist of, but is not limited to: Removal and disposal of all unsuitable material in the excavation. Removal and disposal of concrete curb and gutter and asphalt within the project area. Removal and replacement of bollards and fence material in the project area.
2. New construction will consist of, but is not limited to: earth moving, excavating, backfill and compaction, grading, installing geogrid, concrete curb and gutter, and asphalt paving.

- C. Bidding: Will be for the entire project. A cost for each of the following unit quantities shall be submitted with the bid for unforeseen sight conditions and cost adjustments.

BID ITEM DESCRIPTION	UNIT	EST. QUANTITY	UNIT COSTS
Site Supervision and project manager	DAY	1	
Remove/Dispose of Exist. Concrete Curb and Gutter and replace to match existing	LF	1	
Remove and Replace Bollards and Cable Fence	EA	1	
Remove and Dispose of Block 4	LS	1	
Unspecified excavation	CY	1	
Unspecified rock excavation	CY	1	
Asphalt Remove and replace	SF	1	
Install 1¼" minus engineered fill	CY	1	
Install Geogrid fabric	SF	1	
Hydro seed	SY	1	

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

Contractor is responsible for printing all drawings and specifications from the FedBiz Website. The VA will not provide hard copy plans and specifications.

1.4 CONSTRUCTION SECURITY REQUIREMENTS

A. Security Plan:

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

B. Security Procedures:

1. General Contractor's employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.
2. For working outside the "regular hours" as defined in the contract, The General Contractor shall give three (3) days 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 or VA Project Manager.
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 VA Project Manager 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. The General Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared only with those with a specific need to accomplish the project.
2. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA.

E. Motor Vehicle Restrictions, Parking:

All contractor vehicles shall be parked in general parking areas. At no time shall there be a vehicle parked in patient/visitor only parking, or medical staff only parking except for immediate loading and unloading. No parking is permitted in fire department locations needed for access.

1.5 FIRE SAFETY

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

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

E84-2009.....Surface Burning Characteristics of Building
Materials

2. National Fire Protection Association (NFPA):

10-2010.....Standard for Portable Fire Extinguishers

30-2008.....Flammable and Combustible Liquids Code

51B-2009.....Standard for Fire Prevention During Welding,
Cutting and Other Hot Work

70-2011.....National Electrical Code

241-2009.....Standard for Safeguarding Construction,
Alteration, and Demolition Operations

3. Occupational Safety and Health Administration (OSHA):

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

- B. Fire Safety Plan: Establish and maintain a 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 VA Project Manager for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the general contractor's competent person per OSHA requirements. This briefing shall include information on the construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, etc. Documentation shall be provided to the VA Project Manager that individuals have undergone contractor's safety briefing.
- C. 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.
- D. 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).
- E. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
- F. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with VA Project Manager.
- 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. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas daily. Coordinate with, and report findings and corrective actions daily to VA Project Manager.
- J. 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.

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 VA Project Manager. 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/VA Project Manager and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.
- D. Working space and space available for storing materials shall be as determined by the VA Project Manager.
- 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 VA Project Manager 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. It is the contractor's responsibility to receive delivered materials; VA staff cannot receive items for the contractor. Provide unobstructed access to Medical Center areas required to remain in operation.

G. Phasing: To insure such executions, Contractor shall furnish the VA Project Manager with a schedule of approximate phasing dates on which the Contractor intends to accomplish work in each specific area of site, or portion thereof. In addition, Contractor shall notify the VA Project Manager two weeks in advance of the proposed date of starting work in each specific area of site, building or portion thereof. Arrange such phasing dates to insure accomplishment of this work in successive phases mutually agreeable to VA Project Manager and Contractor.

H. NOT USED

I. NOT USED

J. NOT USED

K. 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 VA Project Manager.

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 VA Project Manager. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without the Medical Center Director's prior knowledge and written approval. Refer

- to specification Sections 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, 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 VA Project Manager, in writing, 48 hours in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
 3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center. Interruption time approved by 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 15 calendar days prior to the desired time and shall be performed as directed by the VA Project Manager.
 5. In case of a contract construction emergency, service will be interrupted on approval of VA Project Manager. Such approval will be confirmed in writing as soon as practical.
 6. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.
- L. 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 VA Project Manager.
- M. Coordinate the work for this contract with other construction operations as directed by VA Project Manager. This includes the scheduling of

traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

1.7 ALTERATIONS

- A. Protection: Provide the following protective measures:
1. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.

1.8 INFECTION PREVENTION MEASURES

- A. Implement the requirements of VAMC's Infection Control Risk Assessment (ICRA) team. ICRA Group may monitor dust in the vicinity of the construction work and require the Contractor to take corrective action immediately if the safe levels are exceeded.
- B. Establish and maintain a dust control program as part of the contractor's infection preventive measures in accordance with the guidelines provided by ICRA Group. Prior to start of work, prepare a plan detailing project-specific dust protection measures, including periodic status reports, and submit to VA Project Manager for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
1. All personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.

1.9 DISPOSAL AND RETENTION

- A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:
1. Reserved items which are to remain property of the Government are noted on drawings or in specifications as items to be stored. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by VA Project Manager.
 2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.

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

- A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.
- B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.
- C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

1.11 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 VA Project Manager. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the VA Project Manager 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 indicated on drawings and which are not scheduled for discontinuance or abandonment.
- D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to contract time and price in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

1.12 PHYSICAL DATA

- A. Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.
- B. Not used
- C. 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.

1.13 PROFESSIONAL SURVEYING SERVICES

A South Dakota registered professional land surveyor 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 is not one who is a regular employee of the

Contractor, and that the land surveyor has no financial interest in this contract.

1.14 LAYOUT OF WORK

- A. The Contractor shall lay out the work from Government established base lines and bench marks, indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at Contractor's own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through Contractor's negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.
- B. Establish and plainly mark centerlines and such other lines and grades that are reasonably necessary to properly assure that location, orientation, and elevations established for each utility and associated structures are in accordance with lines and elevations shown on contract drawings.
- C. Following completion of general mass excavation and before any other permanent work is performed, establish and plainly mark (through use of appropriate batter boards or other means) sufficient additional survey control points or system of points as may be necessary to assure proper alignment, orientation, and grade of all major features of work. Survey shall include, but not be limited to, location of lines and grades of major utilities.
1. Such additional survey control points or system of points thus established shall be checked and certified by a South Dakota registered land surveyor. Furnish such certification to the VA Project Manager before any work (such as utilities and other major controlling features) is placed.
- D. During progress of work, Contractor shall have line grades checked and certified by a registered land surveyor as meeting requirements of contract drawings. Furnish such certification to the VA Project Manager

before any major items of concrete work are placed. In addition, Contractor shall also furnish to the VA Project Manager certificates from a South Dakota registered land surveyor that the following work is complete in every respect as required by contract drawings.

1. Lines and elevations of sewers and of all outside distribution systems.
 2. Lines and elevations of roads, streets and parking lots.
- E. Whenever changes from contract drawings are made in line or grading requiring certificates, record such changes on a reproducible drawing bearing the registered land surveyor or registered civil engineer seal, and forward these drawings upon completion of work to VA Project Manager.
- F. The Contractor shall perform the surveying and layout work of this and other articles and specifications in accordance with the provisions of Article "Professional Surveying Services".

1.15 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 VA Project Manager's review, as often as requested.
- C. Contractor shall deliver two approved completed sets of as-built drawings to the VA Project Manager within 15 calendar days after each completed phase and after the acceptance of the project by the VA Project Manager.
- D. Paragraphs A, B, & C shall also apply to all shop drawings.

1.16 USE OF ROADWAYS

- A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the VA Project Manager, such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well-constructed bridges.

1.17 AVAILABILITY AND USE OF UTILITY SERVICES

- A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The 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 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.
- C. 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.
- D. 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. 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 VA Project Manager's discretion) of use of water from Medical Center's system.

1.18 TESTS

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

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

1.19 NOT USED

1.20 NOT USED

1.21 RELOCATED EQUIPMENT AND ITEMS

- A. Contractor shall disconnect, dismantle as necessary, remove and reinstall in new location, all existing equipment and items indicated by symbol "R" or otherwise shown to be relocated by the Contractor.
- B. Perform relocation of such equipment or items at such times and in such a manner as directed by the VA Project Manager.
- C. Provide all mechanical and electrical service connections, fittings, fastenings and any other materials necessary for assembly and installation of relocated equipment; and leave such equipment in proper operating condition.
- D. All service lines such as noted above for relocated equipment shall be in place at point of relocation ready for use before any existing equipment is disconnected. Make relocated existing equipment ready for operation or use immediately after reinstallation.

1.22 SAFETY AND CONSTRUCTION SIGN(S)

Provide a Safety Sign(s) where directed by VA Project Manager, maintain sign(s) and remove it when directed by VA Project Manager.

1.23 HISTORIC PRESERVATION

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 VA Project Manager verbally, and then with a written follow up.

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**SECTION 010100
MEDICAL CENTER REQUIREMENTS**

PART 1 - GENERAL

1.1 DESCRIPTION

General Intention: This document pertains to station safety, health, and environmental policies for construction projects performed at the VA Black Hills Health Care System in Hot Springs, South Dakota. Safety and health concerns are taken seriously at this facility. Both our staff and yours are expected to strictly adhere to the regulations and requirements. This is exceedingly important, since we must be primarily concerned for the safety of our patients. In this regard, OSHA Standards may protect worker safety and health, but they have minimal benefit for protecting the safety and health of our patients, due primarily to their differing medical conditions. Review this information as orientation with your personnel performing work on site. In addition, construction can have significant impacts to the environment. It is the policy of this organization to minimize impacts in accordance with the facility's integrated Green Environmental Systems (GEMS). Where the requirements as outlined in this and Section 010000 are differing, the more stringent shall apply.

1.2 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Data and Reports:
 - 1. Safety Plan
 - 2. Traffic Control Plan
 - 3. OSHA Cards
- C. All other Submittals as listed in each section of the specifications or as summarized in 01 33 24, SUBMITTAL REGISTER.

2.1 REQUIREMENTS:

- A. Security:
 - 1. Secure all construction areas, especially mechanical and electrical rooms against entry of unauthorized individuals including patients.

2. Notify the Contracting Officer's Representative (COR) for permission to work after hours and weekends. Standard work hours for the medical center are Monday-Friday, 7:00 a.m. to 4:30 p.m.
3. The VA will issue ID tags to contractor personnel. All contractor personnel are required to wear the VA provided ID at all times while working on government property. The Contractor will submit ID requests for each employee (including subcontractor employees) using the request form provided by COR.

B. Key Security:

1. Only a limited number of keys will be issued to the contractor. Key requests shall be made using the request form on provided by COR.
2. If the Contractor loses a key, a charge of \$30 will be billed for a replacement key.
3. Ensure all doors leading to and from construction are either monitored or locked to prevent access to the area from unauthorized persons.

C. Contractor General Safety Program and Training Requirements:

1. The Contractor shall appoint a "Competent Person" (CP) for the project. The CP will have primary responsibility for construction safety, OSHA compliance, and adherence to the Contractor's safety program. The Contractor shall provide for approval, as part of the submittal process, the name of the CP and documentation that the individual has had the necessary training, experience, and has the authority to carry out their responsibilities with respect to safety and health during construction activities. Evidence of training shall include completion of OSHA approved courses or other construction safety training consistent with the scope of the project.
2. The Contractor shall also provide for approval, as part of the submittal process, evidence of a company safety policy that includes, as a minimum, the following components: a) Safety is the first priority and will not be compromised, b) PPE is provided for employees, and the employees are trained in its use, c) Details of regularly scheduled safety training for jobs site employees in regards to OSHA requirements,

construction related impacts, and Life Safety Code requirements. This may be accomplished through documented "tool box talks", or other similar methods.

3. The Contractors CP and primary workers will be required to view a VA provided video tape, "Playing It Safe", approximate viewing time 15 minutes. The video identifies concerns regarding patient safety, privacy, and infection control; and introduces Contractor's workers to the unique safeguards required when working in a hospital environment.
4. Adhere to the following:
 - a. Follow all federal, state and local safety and health regulations.
 - b. Maintain safety in the construction site/area in accordance with the provisions of the contract that includes the Occupational Safety and Health Administration (OSHA) Regulations; National Electrical Codes; National Fire Protection Association (NFPA) 70, National Electric Code; and NFPA 101, Life Safety Code. Work in a safe manner and take all proper precautions while performing your work. Extra precautions shall be taken when working around persons occupying the building during construction.
 - c. Provide Personal Protective Equipment (PPE) for your employees.
 - d. Post appropriate signs in specific hazardous areas.
 - e. Keep tools, ladders, etc., away from patients to prevent injuries.

D. Safety Inspections:

1. The VA professional Occupational Safety and Health staff at this facility will perform safety inspections of all contract operations. Written reports of unsafe practices or conditions will be reported to the COR and Contracting Officer for immediate attention and resolution.
2. The Contractor's superintendent/CP is required to monitor work on a daily basis, including surveillance related to health and safety. The daily inspections are to be documented via the check list provided by COR. Completed Daily Logs should be provided to the COR at the end of each shift, and no later than the next working day.

E. Fire Alarms:

1. The fire alarm system connects all buildings at this facility, and is activated by various heat, duct, manual pull stations and smoke sensors. Manual pull stations are provided at each entrance. Survey the area in which you are working to locate the manual pull stations.
2. In the event of a fire alarm sounding, you are to remain in your area, unless medical center personnel (Safety, Nursing or Engineering) instruct otherwise, or unless a fire situation is in your area, in which case you should immediately evacuate.
3. Any work involving the fire protection systems requires written permission to proceed from the COR. *Do not tamper with or otherwise disturb any fire alarm system components without prior written permission. To do so without written permission will result in an adverse action.*

F. Hazardous Materials:

1. Many of the operations you are scheduled to perform may involve the use of hazardous materials. Prior to locating hazardous materials on site, submit all Material Safety Data Sheets (MSDS) through the COR for evaluation by the facility Safety Officer.
2. Storage of hazardous materials within buildings shall be minimal with only enough on hand to perform daily work tasks. Flammable materials must either be removed from buildings at the end of the work shift or stored in approved flammable storage containers.
3. Care must be taken to ensure adequate ventilation to remove vapors of hazardous materials in use. Many of the patients being cared for in the facility are susceptible to environmental contaminants, even when odors seem minimal. Isolate those areas where vapors are produced, and ventilate to the most extent possible to reduce the number of complaints.

G. Airborne Dust Control During Construction:

1. Generation of dust is of major concern within staff, and especially in patient occupied buildings. Where operations involve the generation of dust, all efforts shall be directed at reducing airborne generated dust to the lowest level

feasible. This may be accomplished by a number of methods. These include misting the area with water, or use of tools attached to high efficiency particulate air (HEPA) filtering vacuums. Where large amounts of materials may be disturbed, resulting in airborne dust, establishment of full ceiling-to-floor barriers shall be required.

2. Classification of Jobs:

- a. CLASS I - Includes, but is not limited to, minor disturbances involving plumbing, electrical, carpentry, ductwork and minor aesthetic improvements.
- b. CLASS II - (projects require barrier precautions) Includes, but is not limited to, construction of new walls, construction of new rooms, major utility changes, major equipment installation, demolition of wallboards, plaster, ceramic tiles or ceiling and floor tiles, removal of windows, removal of casework, etc.

H. Class I Procedures:

1. Mist (with water) work surfaces to control dust while cutting. Alternatively, a high efficiency particulate air vacuum (HEPA) can be used by positioning the vacuum next to the equipment at the use site.
2. Tape doors for activities that produce large amounts of dust, and block off and seal air vents.
3. Cover holes/openings (penetrations), in walls, ceiling, floors or door that cannot be patched or fixed within 4 hours. Only approved fire-rated materials will be used to fill holes in fire/smoke walls.
4. Comply with the OSHA regulations regarding noise and vapor containment.
5. Cleanup and disposal: Construction waste must be contained before transport using plastic bags and/or covered transport receptacle and/or cart and tape covering.
6. Wet mop and/or HEPA vacuum before leaving work area.
7. Place dust mats at entrance and exit of work area, and clean or change daily to prevent tracking of dust into occupied areas.
8. After work completion, remove covering from air vents.

I. Class II (Post Construction Warning Signs):

1. Same procedures as Class I - however, use of a HEPA vacuum is mandatory.
2. Construct all dust barriers before construction begins per the following instructions: For single rooms, seal door/frame with tape and plastic. The sheet should be divided vertically with a knife. Flaps should be taped on either side of the single sheet to create a flapped entrance.

J. Environmental Protection:

1. It may help you to be aware of the seriousness that the environmental protection requirements of each contract are regarded. Adherence to these requirements is subject to continuing scrutiny from the community and backed by severe penalties, such as fines and incarceration. These environmental requirements will be strictly enforced. Contractors are required to abide by all Federal, State, and Local environmental regulations.
2. No hazardous materials will be disposed of on Government property. Haul all waste off-site or dispose in contractor owned and operated waste removal containers.
3. Forward a copy of all waste manifests for special or hazardous wastes to the COR. Environmental requirements will be strictly enforced.

K. Permit Required Confined Spaces:

1. Contractors performing work on this facility shall follow all requirements outlined in OSHA Standards for working in confined spaces. There are numerous permit required confined spaces on this facility. These spaces have been identified. Some spaces have been posted, but the majority have not due to their configuration. A complete listing of these areas is located in the Fire Department.
2. Confined spaces are areas that are large enough to be entered, have limited egress/exit potential and are not designed for permanent human occupancy. If you encounter any space that meets this definition, and if it is a suspected confined space, contact the COR.
3. Contractors performing work in confined spaces are responsible for compliance with all applicable standards and regulations.

L. Housekeeping:

1. Protect patients and VA personnel in occupied areas from the hazards of dust, noise, construction debris and material associated with a construction environment. Keep work area clear, clean and free of loose debris, construction materials and partially installed work that would create a safety hazard or interfere with VA personnel duties and traffic.
2. Wet mop occupied areas clean and remove any accumulation of dust/debris from cutting or drilling from any surface at the end of each workday.
3. Make every effort to keep dust and noise to a minimum at all times. Take special precautions to protect VA equipment from damage including excessive dust.
4. Maintain clear access to mechanical, electrical devices, equipment and main corridors. This will ensure access to existing systems in the event of an emergency.
5. Clean area of all construction debris and dust upon completion of demolition and/or renovation.
6. During construction operations, keep existing finishes protected from damage. Cover and protect all carpets during construction. Any carpets or surfaces damaged as a result of construction activities will be replaced at the contractor expense.

M. Hot Work Permits:

1. Any hot work operations including cutting, welding, thermal welding, brazing, soldering, grinding, thermal spraying, thawing pipes or any other similar activity, require a Hot Work Permit to be obtained by the Contractor from the Fire Department. The Contractor is responsible for conforming to all Medical Center regulations, policies and procedures concerning Hot Work Permits as outlined below:
 - a. Prior to the performance of hot work in patient-occupied buildings, request a Hot Work Permit from the Fire Department.
 - b. The Fire Department will inspect the area and ensure that the requirements of NFPA 241 and OSHA standards have been satisfied. The Hot Work Permit will be granted and must be posted in the immediate area of the work.

- c. The Hot Work Permit will apply only to the location identified on the permit. If additional areas involve hot work, additional permits must be requested.
 - d. Upon completion of all hot work, notify the Fire Department to perform a re-inspection of the area.
2. Do not use any of the extinguishers in the medical center for standby purpose while conducting hot work. Contractors are required to supply their own Class ABC extinguishers. Medical center extinguishers are only to be used in the event of a fire.
- N. Emergency Medical Services: Emergency medical services for stabilization purposes are available for contractors at this facility. For medical emergencies, dial 6911 when inside any building. Report the nature of the emergency and location. The operator will dispatch in-house personnel or coordinate an outside emergency assistance based on the nature of the emergency.
- O. Use of Government-Owned Material and Equipment: Use of Government-owned material and equipment is *prohibited*.
- P. Superintendent Communications: At all times during the performance of this contract, the Contractors Superintendent is to be available by cellular phone. At the beginning of the contract and prior to beginning any construction, supply the COR with the telephone number for the Superintendent.
- Q. Parking: Contractor employees shall be assigned a parking area during the preconstruction meeting.
- R. Traffic:
- 1. Traffic hazards are minimal at this facility. Drivers should be particularly concerned with pedestrian traffic.
 - 2. Seat belt use is mandatory on the station.
 - 3. Federal police officers maintain a 24-hour patrol of the area.
 - 4. Speed limits are to be observed, and are strictly enforced.
- S. Contractor's Trailers: Contractor's trailers shall be located at the area assigned. All utility connections to the trailer shall be installed at the contractor expense. Trailer removal is required upon completion of the contract, unless approved by the COR to leave in place.

- T. Smoking: No smoking is permitted in buildings or around hazardous areas. Any smoking inside a government building is subject to a fine without warning.
- U. Lock out/tag out: Contractors performing work on equipment and systems are responsible for compliance with the facilities lock out/tag out policies.
- V. Road Closures: For any work requiring closure of a road or parking lot, a request for closure shall be made in writing at least 5 days in advance for approval by the COR and Fire Department.

The following forms will be given to the contractor after award by the COR.

- A. Contractor ID Badge Request Form.
- B. Contractor Key Request Form.
- C. Contractor Daily Log Form.

- - - END - - -

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SECTION 01 33 23
SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

- 1.1 Refer to Articles titled SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in Section 01 00 00, GENERAL REQUIREMENTS.
- 1.2 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.
- 1.3 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:
 - A. Satisfactory written evidence is presented to, and approved by COR, that manufacturer cannot make scheduled delivery of approved item or;
 - B. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
 - C. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.
- 1.4 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.
- 1.5 Submittals will be reviewed for compliance with contract requirements by COR, and action thereon will be taken by COR on behalf of the Contracting Officer.
- 1.6 Upon receipt of submittals, COR will assign a file number thereto. Contractor, in any subsequent correspondence, shall refer to this file and identification number to expedite replies relative to previously approved or disapproved submittals.
- 1.7 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 therefore 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.

1.8 Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs and COR. However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer and Architect- COR assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.

1.9 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.

A. Submit samples in single units unless otherwise specified. Submit two (2) copies of shop drawings, schedules, manufacturers' literature and data, and certificates, except where a greater number is specified.

B. 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 Hot Springs VA, 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 Hot Springs VA, 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.
- C. If submittal samples have been disapproved, resubmit new samples as soon as possible after notification of disapproval. Such new samples shall be marked "Resubmitted Sample" in addition to containing other previously specified information required on label and in transmittal letter.
- D. Approved samples will be kept on file by the COR at the site until completion of contract, at which time such samples will be delivered to Contractor as Contractor's property. Where noted in technical sections of specifications, approved samples in good condition may be used in their proper locations in contract work. At completion of contract, samples that are not approved will be returned to Contractor only upon request and at Contractor's expense. Such request should be made prior to completion of the contract. Disapproved samples that are not requested for return by Contractor will be discarded after completion of contract.
- E. 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 and marked neatly as reproducible copy.
 3. Each drawing shall have marked thereon, proper descriptive title, including Hot Springs VA location, project number, manufacturer's number, reference to contract drawing number, detail Section Number, and Specification Section Number.
 4. A space 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 COR under one cover.

1.10 The Contractor shall also submit* the complete submittal directly to the Contracting Officer's Technical Representative (COR), also referred to as the VA Project COR:

VA Black Hills Health Care System
Facility Management Office
500 N. Fifth Street
Hot Springs, South Dakota 57747
ATTN: Wade Lien, VA Project COR
Phone: 605-745-7252

*-Clean digital files may be submitted by email in lieu of hard copies.

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SECTION 01 33 24
SUBMITTAL REGISTER

1.0 General Intention: This document pertains to the submittals pertaining to the submittals section. This section lists by item the submittals that need to be submitted and what types of submittals that are required. This is also used as a planning tool for timely submittals.

2.0 Requirements:

A. Items:

1. This submittal log will be filled out by the designer by item for each submittal. This will list in sequence all parts and components of every section in which a submittal is required.
2. If each item of an assembly is to be certified by submittal together then each part of the assembly does not need to be listed separately.
3. This submittal log may be added to during the course of the project.

SUBMITTAL REGISTER

CONTRACT NO:

TITLE AND LOCATION:
Hot Springs VA

CONTRACTOR:

PROJECT NUMBER:

ITEM NO.	SPEC SECTION NO.	SPEC PARA. NO.	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS				
				DRAWINGS	DETAILS	SECTION CUTS	REPORTS	PERMITS	RECORDS	INFORMATION ONLY	GOVERNMENT APPROVED	REVIEWER	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERNMENT	CODE	DATE						
11	010100	2.1.C.1	Competent Person Appointment				X							X												
12	010100	2.1.C.2	Company Safety Policy				X							X												
13	010100	2.1.F.1	Material Safety Data Sheets	X										X												
14	015719	1.4.A.1	Environmental Protection Plan							X				X												
15	017419	1.5	Demolition Debris Management Plan							X				X												
16	033053	1.5.B	Concrete Mix Design	X										X												
17	033053	1.5.C	Reinforcing Steel	X										X												
18	033053	1.5	Admixtures and Curing Compound	X										X												
19	329100		Geogrid Reinforcement	X						X	X															

SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.1 DESCRIPTION

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

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

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

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

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

DEPARTMENT OF VETERANS AFFAIRS
Office of Construction & Facilities Management
Facilities Quality Service (00CFM1A)
811 Vermont Avenue, NW - Room 462
Washington, DC 20420
Telephone Numbers: (202) 461-8217 or (202) 461-8292
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.

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

AGC Associated General Contractors of America
<http://www.agc.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 Ced 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>

EEl 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>

GANNA Glass Association of North America
<http://www.cssinfo.com/info/ganna.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>

NWDA 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>

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>

1.5 CLAUSES INCLUDED BY REFERENCE

The following Federal Acquisition (FAR) Clauses and Veterans Affairs Acquisition Regulations (VAAR) are contained in the DESIGN BUILD ROAD REPLACEMENT RFP (Solicitation No. VA26310RP0236) documents. They are hereby incorporated into the Design-Build Project Specifications by Reference, as listed in the GENERAL CONDITIONS.

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SECTION 01 45 29
TESTING LABORATORY SERVICES - RETAINED BY OWNER

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section includes the following:
 - 1. Selection and payment.
 - 2. Contractor submittals.
 - 3. Testing Agency/Laboratory responsibilities.
 - 4. Testing Agency/Laboratory reports.
 - 5. Limits on testing agency/laboratory authority.
 - 6. Contractor responsibilities.
 - 7. Schedule of tests.

1.2 RELATED SECTIONS

- A. Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES:
Manufacturer's certificates.
- B. Section 03 30 00 CAST-IN-PLACE CONCRETE.

1.3 REFERENCES

- A. ASTM C 1077 - Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
- B. ASTM D 3740 - Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- C. ASTM E 329 - Use in the Evaluation of Inspection and Testing Agencies as Used in Construction.

1.4 SELECTION AND PAYMENT

- A. Employment and payment for services of an independent testing agency or laboratory to perform specified testing retained by Department of Veterans Affairs (Owner).
- B. Employment of testing agency or laboratory by the Owner in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

1.5 QUALITY ASSURANCE

- A. Comply with requirements of ASTM C 1077, ASTM D 3740, ASTM D 4561, and ASTM E 329.
- B. Laboratory: Authorized to operate in State in which Project is located.
- C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

- D. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.6 CONTRACTOR SUBMITTALS

- A. Prior to start of Work, submit schedule of anticipated testing intervals, for use by the Contracting Officer's Technical Representative and Testing Agency.

1.7 TESTING AGENCY/LABORATORY RESPONSIBILITIES

- A. Test samples of mixes submitted by Contractor.
- B. Provide qualified personnel at site. Cooperate with Contracting Officer's Technical Representative and Contractor in performance of services.
- C. Perform specified sampling and testing of Products in accordance with specified standards.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Contracting Officer's Representative and Contractor of observed irregularities or non-conformance of Work or Products.
- F. Perform additional tests required by Contracting Officer's Technical Representative.
- G. Attend preconstruction meetings and progress meetings, if requested.

1.8 TESTING AGENCY/LABORATORY REPORTS

- A. After each test, promptly submit two copies of report to Contracting Officer's Representative, COR, and to Contractor.
- B. Include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and specifications section.
 - 6. Location in the Project.
 - 7. Type of inspection or test.
 - 8. Date of test.
 - 9. Results of tests.
 - 10. Conformance with Contract Documents.
- C. When requested by Contracting Officer's Representative, provide interpretation of test results.

1.9 LIMITS ON TESTING AGENCY/LABORATORY AUTHORITY

- A. Testing agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Testing agency or laboratory may not approve or accept any portion of the Work.
- C. Testing agency or laboratory may not assume any duties of Contractor.
- D. Testing agency or laboratory has no authority to stop the Work.

1.10 CONTRACTOR RESPONSIBILITIES

- A. Deliver to testing agency/laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
- B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
- C. Provide incidental labor and facilities:
 - 1. To provide access to Work to be tested.
 - 2. To obtain and handle samples at the site or at source of products to be tested.
 - 3. To facilitate tests.
 - 4. To provide storage and curing of test samples.
- D. Notify A/E and laboratory 24 hours prior to expected time for operations requiring testing services.
- E. Employ services of an independent qualified testing laboratory and pay for additional samples and tests required by Contractor beyond specified requirements.

1.11 SCHEDULE OF TESTS

- A. Individual Specification Sections: Tests required and standards for testing. Summary of Test tests shown in Part 3.

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 EARTHWORK:

- A. General: Observe fill and subgrades during proof-rolling to evaluate suitability of surface material to receive fill or base course. Provide recommendations to the COR regarding suitability or unsuitability of areas where proof-rolling was observed. Where unsuitable results are observed, witness excavation of unsuitable

material and recommend to Contracting Officer's Technical Representative the extent of removal and replacement of unsuitable materials and observe proof-rolling of replaced areas until satisfactory results are obtained.

- B. Testing Compaction of scarified, conditioned, and re-worked subgrade:
1. Determine maximum density and optimum moisture content for each type of fill, backfill and subgrade material used, in compliance with ASTM D 698 (Standard Proctor). Perform additional tests of on-site borrow, as directed by the COR, when soil type and consistency change.
 2. Make field density tests in accordance with the primary testing method following ASTM D2922 (Nuclear Methods) wherever possible. Field density tests utilizing ASTM D1556 (sand cone) 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 COR before the tests are conducted.
 3. Pavement Subgrade: One test for each 200 Lineal Feet of roadway but in no case less than five (5) tests per phase.
- C. Testing Materials: Test suitability of on-site borrow as directed by Contracting Officer's Technical Representative.

3.2 CAST-IN-PLACE CONCRETE TESTING:

- A. Compressive Strength: One set of four cylinders from the first 25-cy placed and one set for each 50-cy placed thereafter; being placed each day. Test one cylinder at 7-days, two at 28-days, and retain one "hold" cylinder for future use. Make additional cylinders as needed for determination of early compressive strength.
- B. Slump: Test slump of each load of concrete, after mix adjustment, or as requested by the COR.
- C. Air Content: One test per 25-cy placed and after a mix adjustment is made.
- D. Testing representative shall remain on site throughout the concrete placement.

3.3 TEST TYPE AND ESTIMATED QUANTITY

ESTIMATED NO. OF TESTS

A. Earthwork:

1. Laboratory Compaction Test, Proctor for Moisture-Density Relationship on Materials for Earthwork, Backfill and Granular Subgrades:

a. ASTM D 698: 2

2. Field Density, Soils for Earthwork, Trench Backfill and Road Subgrades:

a. ASTM D2922: As Needed

B. Aggregate Base (Road Base):

1. Laboratory Compaction Test

a. ASTM D698: As Needed

2. Field Density/ Moisture:

a. ASTM D2922 /ASTM D3017: As Needed

C. Concrete Testing:

1. Compressive Strength Cylinder Sets: 3

2. Air Content: 3

3. Slump Tests: 3

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SECTION 01 57 00
ENVIRONMENTAL MANAGEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Special requirements for environmental management during construction operations.
- B. Implementation and maintenance of Storm Water Pollution Prevention Plan prepared for the project (only if project will disturb more than one acre).
- C. Working in and around protected species and associated environment
- D. Slope Protection and Erosion Control practices
- E. Monitoring requirements.
- F. Definitions.
- G. Environmental protection.

1.2 RELATED DOCUMENTS

- A. Storm Water Pollution Prevention Plan (SWPPP) for the Hot Springs VA to be procured by contractor prior to construction from South Dakota Department of Environmental and Natural Resources, for areas where runoff from construction could enter State waters (only if project will disturb more than one acre).

1.3 DEFINITIONS

- A. Environmental Pollution and Damage: Presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances; or degrade utility of environment for aesthetic, cultural, or historical purposes.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 ENVIRONMENTAL PROTECTION

- A. Protection of natural resources: Comply with applicable regulations and these specifications. Preserve the natural resources within the Project boundaries and outside the limits of permanent Work performed under this Contract in their existing condition or restore to an equivalent or improved condition as approved by Owner.
 - 1. Confine demolition and construction activities to work area limits indicated on the Drawings.
 - 2. Disposal operations for demolished and waste materials that are not identified to be salvaged, recycled or reused:
 - a. Remove debris, rubbish, and other waste materials resulting from demolition and construction operations, from site.

- b. No burning permitted.
 - c. Transport materials with appropriate vehicles and dispose off site to areas that are approved for disposal by governing authorities having jurisdiction.
 - d. Avoid spillage by covering and securing loads when hauling on or adjacent to public streets or highways. Remove spillage and sweep, wash, or otherwise clean project site, streets, or highways.
3. Water resources:
- a. Comply with requirements of the National Pollutant Discharge Elimination System (NPDES) and the State Pollutant Discharge Elimination System (SPDES).
 - b. Oily substances: Prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water. Store and service construction equipment at areas designated for collection of oil wastes.
 - c. Mosquito abatement: Prevent ponding of stagnant water conducive to mosquito breeding habitat. Provide positive drainage throughout construction
 - d. Prevent run-off from site during demolition and construction operations.
 - e. Stream Crossings: Equipment will not be permitted to ford live streams
4. Land resources: Prior to construction, identify land resources to be preserved within the Work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and landforms without permission from Owner.
- a. Earthwork: As specified in Division 31 and as follows:
 - 1) Erodible Soils for Earthwork: Plan and conduct earthwork to minimize the duration of exposure of unprotected Soils for Earthwork, except where the constructed feature obscures borrow areas, quarries, and waste material areas. Clear areas in reasonably sized increments only as needed to use the areas developed. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.

- 2) Erosion and sedimentation control devices: Construct or install temporary and permanent erosion and sedimentation control features as required and delineated in the SWPPP (if applicable), and in accordance with Best Management Practices (BMP) of SD DOT.
 - 3) Prevent and eliminate tracking of Soils for Earthwork and loose materials off site through cleaning of vehicle tires and other vehicle surfaces prior to exiting the site. Clean public roads of any material tracked from the site.
5. Air Resources: Develop and comply with IAQ Management Plan, Dust Control Plan, and as follows:
- a. Coordinate and comply with local Air Pollution Control District requirements.
 - b. Prevent creation of dust, air pollution, and odors.
 - c. Sequence construction to avoid disturbance to site to the greatest extent possible.
 - d. Use mulch, water sprinkling, temporary enclosures, and other appropriate methods to limit dust and dirt rising and scattering in air to lowest practical level. Do not use water when it may create hazardous or other adverse conditions such as flooding and pollution.
 - e. Store volatile liquids, including fuels and solvents, in closed containers.
 - f. Properly maintain equipment to reduce gaseous pollutant emissions.
6. Fish and Wildlife Resources: Manage and control construction activities to minimize interference with, disturbance of, and damage to fish and wildlife.
- a. Do not disturb fish and wildlife.
 - b. Do not alter water flows or otherwise significantly disturb the native habitat related to the project and critical to the survival of fish and wildlife, except as indicated or specified.
 - c. Contractor to obtain clearance from Biologist if working within 500 feet of any nesting raptors.

3.2 ARCHEOLOGICAL/HISTORIC RESOURCES

- 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 Contracting Officer's Technical Representative verbally, and then with a written follow up.

3.3 FIELD QUALITY CONTROL

- A. Comply with requirements of agencies having jurisdiction and as specified.

3.4 RECLAMATION AND RE-SEEDING

- A. All disturbed areas resulting from this Project which are not occupied by permanent construction shall be re-claimed to pre-construction conditions. Re-establish turf of a quality and mix to match existing vegetation at the given location.

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- 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.
 - b. Reuse or conserve the collected topsoil sediment as directed by the COR. Topsoil use and requirements are specified in Section 31 20 11, EARTH MOVING.
 - 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 shown. 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.

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 COR. Maintain noise-produced work at or below the decibel levels and within the time periods specified.
1. Perform construction activities involving repetitive, high-level impact noise only between 8:00 a.m. and 5:00 p.m. unless otherwise permitted by local ordinance or the COR. Repetitive impact noise on the property shall not exceed the following dB limitations:

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

EARTHMOVING

MATERIALS HANDLING

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

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SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.
- B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.
- C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:
 - 1. Waste Management Plan development and implementation.
 - 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).

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 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.
- D. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website <http://www.wbdg.org> provides a Construction Waste Management Database that contains information on companies that haul, collect, and process recyclable debris from construction projects.
- E. 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.
- F. 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.
- G. 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 COR a written demolition debris management plan. The plan shall include, but not be limited to, the following information:
 - 1. Procedures to be used for debris management.
 - 2. Proposed storage locations and waste disposal sites
- C. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.
- D. Provide a 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, at project completion.

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.
 - 1. U.S. Green Building Council (USGBC):
 - 2. 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.

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, and invoices. Include the net total costs for each disposal.

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**SECTION 02 41 00
DEMOLITION**

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies demolition and removal of utilities, other structures and debris from temporary construction trash dumps if authorized by the Resident Engineer.

1.2 RELATED WORK:

- A. Demolition and removal of roads, walks, curbs, and on-grade slabs outside buildings to be demolished: Section 31 20 11, EARTH MOVING (SHORT FORM).
- B. Safety Requirements: GENERAL CONDITIONS Article, ACCIDENT PREVENTION.
- C. Disconnecting utility services prior to demolition: Section 01 00 00, GENERAL REQUIREMENTS.
- D. Reserved items that are to remain the property of the Government: Section 01 00 00, GENERAL REQUIREMENTS.
- E. Environmental Protection: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.
- F. Construction Waste Management: Section 017419 CONSTRUCTION WASTE MANAGEMENT.

1.3 PROTECTION:

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

1. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.
 2. Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 4500 mm (15 feet) of fire hydrants.
- 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.

1.4 UTILITY SERVICES:

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 DEMOLITION:

- A. Completely demolish and remove buildings and structures, including all appurtenances related or connected thereto, as noted below:
 1. As required for installation of new utility service lines.
 2. To full depth within an area defined by hypothetical lines located 5 feet outside building lines of new structures.
- B. Debris, including concrete, stone, metals and similar materials shall become property of Contractor and shall be disposed of daily, off the Medical Center property 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 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 existing utilities as indicated or uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Resident Engineer. When utility lines are encountered that are not indicated on the drawings, the Resident Engineer shall be notified prior to further work in that area.
- D. 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 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 31 20 11
EARTH MOVING (SHORT FORM)

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies the requirements for furnishing all equipment, materials, labor and techniques for earthwork including excavation and fill.

The project topography behind the existing curb varies from vegetated slopes (3H:1V) to non-vegetated rocky slopes (0.5H:1V) with conglomerates. The Contractor shall minimize the impact to the existing slopes during the project. Any disturbed areas will need to be reestablished with turf as per Section 32 90 00 Planting.

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.
2. Existing Subgrade (except footings): Same materials as above paragraph, that are not capable of direct support of slabs, pavement, and similar items, with the possible exception of improvement by compaction, proofrolling, or similar methods of improvement.
3. Existing Subgrade (footings only): Same as Paragraph 1, but no fill or backfill. If materials differ from design requirements, excavate to acceptable strata subject to Resident Engineer's approval.

B. Earthwork: Earthwork operations required within the new construction area. It also includes earthwork required for auxiliary structures and buildings and sewer and other trenchwork throughout the job site.

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. Protection of Existing Utilities, Fire Protection Services, Existing Equipment, Roads, and Pavements: Section 01 00 00, GENERAL REQUIREMENTS.

- C. Protection of existing utilities, fire protection services, existing equipment, roads, and pavements: Section 01 00 00, GENERAL REQUIREMENTS.
- D. Subsurface Investigation: Section 01 00 00 GENERAL REQUIREMENTS, Article, PHYSICAL DATA.
- E. Geotechnical Engineering Report by Terracon Consultants, Appendix A.

1.4 CLASSIFICATION OF EXCAVATION

- A. Unclassified Excavation: Removal and disposal of pavements and other man-made obstructions visible on the surface; utilities, and other items including underground structures indicated to be demolished and removed; together with any type of materials regardless of character of material and obstructions encountered.
- B. Rock Excavation:
 1. Solid ledge rock (igneous, metamorphic, and sedimentary rock).
 2. Bedded or conglomerate deposits so cemented as to present characteristics of solid rock which cannot be excavated without blasting; or the use of a modern power excavator (shovel, backhoe, or similar power excavators) of no less than 1 cubic yard capacity, properly used, having adequate power and in good running condition.
 3. Boulders or other detached stones each having a volume of 1/2 cubic yard or more.

1.5 MEASUREMENT AND PAYMENT FOR ROCK EXCAVATION

- A. Measurement: Cross section and measure the uncovered and separated materials, and compute 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. 12 inches outside of the perimeter of formed footings.
 2. 24 inches outside the face of concrete work for which forms are required, except for footings.
 3. 6 inches below the bottom of pipe and not more than the pipe diameter plus 24 inches in width for pipe trenches.
 4. The outside dimensions of concrete work for which no forms are required (trenches, conduits, and similar items not requiring forms).
- B. Payment: No separate payment shall be made for rock excavation quantities shown. The contract price and time will be adjusted for overruns or underruns in accordance with Articles, DIFFERING SITE CONDITIONS, CHANGES and CHANGES-SUPPLEMENT of the GENERAL CONDITIONS as applicable.

1.6 SUBMITTALS

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

- B. Not used
- C. Aggregate Base Course
- D. Type I Backfill

1.7 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. American Nursery and Landscape Association (ANLA):
2004.....American Standard for Nursery Stock
- C. American Association of State Highway & Transportation Officials (AASHTO):
T99-01 (R2004).....Moisture-Density Relations of Soils Using a 5.5 lb Rammer and a 12-inch Drop
T180-01 (2004).....Moisture-Density Relations of Soils Using a 10 lb Rammer and a 18-inch Drop
- D. American Society for Testing and Materials (ASTM):
D698-07.....Laboratory Compaction Characteristics of Soil Using Standard Effort
- E. Standard Specifications for Road and Bridge Construction, South Dakota State Department of Transportation, latest revision.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fills: Materials approved from on site and off site sources having a minimum dry density of 110 pcf, a maximum Plasticity Index of 6, and a maximum Liquid Limit of 30.
- B. Granular Fill:
 - 1. Aggregate Base Course: Under asphalt, sidewalk and curb and/or gutter shall be crushed limestone that meets all of the requirements of Limestone Ledge Rock Base Course as specified in the South Dakota Department of Transportation’s Standard Specifications for Road and Bridge Design
 - 2. Type I Backfill: Shall be crushed limestone rock having a minimum of two fractured faces and meet the following gradation requirements by dry weight:

<u>SIEVE SIZE</u>	<u>% BY WEIGHT PASSING SIEVE</u>
2"	100
1"	60-100
#4	30-70
#8	22-62
#40	10-20
#200	0-10

PART 3 - EXECUTION**3.1 SITE PREPARATION**

- A. System Locates: The Contractor shall be responsible for making arrangements to call for underground locates prior to any clearing or excavation work. Underground utilities including irrigation lines, sprinkler heads and controls disturbed during construction shall be repaired back to the original operating condition.
- B. Clearing: Clearing within the limits of earthwork operations as described or designated by the Resident Engineer. Work includes removal of trees, shrubs, fences, foundations, incidental structures, paving, debris, trash and any other obstructions. Remove materials from the Medical Center property.
- C. Grubbing: Remove stumps and roots 3 inches and larger diameter. Undisturbed sound stumps, roots up to 3 inches diameter, and nonperishable solid objects which will be a minimum of 3 feet below subgrade or finished embankment may be left.
- 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, or as indicated in the geotechnical report if provided, from within the limits of earthwork operations as specified above unless specifically indicated or specified elsewhere in the specifications or shown on the drawings. 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 Medical Center property. 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. Concrete Slabs and Paving: Score deeply or saw cut to insure a neat, straight cut, sections of existing concrete slabs and paving to be removed where excavation or trenching occurs. Extend pavement section to be removed a minimum of 12 inches on each side of widest part of trench excavation and insure final score lines are approximately parallel

unless otherwise indicated. Remove material from the Medical Center Property.

- F. 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 bearing of any foundation is disturbed by excavating, improper shoring or removal of shoring, placing of backfill, and similar operations, provide a concrete fill support in compliance with Specification Section 31 23 23.33, FLOWABLE FILL, under disturbed foundations, 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.
- 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. Approval by the Resident Engineer is also required before placement of the permanent work on all subgrades. When subgrade for foundations has been disturbed by water, remove the disturbed material to firm undisturbed material after the water is brought under control. Replace disturbed subgrade in trenches by mechanically tamped sand or gravel. When removed disturbed material is located where it is not possible to install and properly compact disturbed subgrade material with mechanically compacted sand or gravel, the Resident Engineer should be contacted to consider the use of flowable fill.
- C. Blasting: Blasting shall not be permitted.
- D. Retaining Wall Earthwork:
1. Excavation shall be accomplished as required by drawings and specifications.
 2. Excavate foundation excavations to solid undisturbed subgrade.
 3. Remove loose or soft material to solid bottom.
 4. Fill excess cut under footings or foundations with compacted aggregate base course.

5. Do not tamp earth for backfilling in footing bottoms, except as specified.
- E. 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. If there is a question as to whether material is unsuitable or not, the Contractor shall obtain samples of the material, under the direction of the Resident Engineer, and the materials shall be examined by an independent testing laboratory for soil classification to determine whether it is unsuitable or not. When unsuitable material is encountered and removed, 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 yardage in cut section only.
- F. Finished elevation of subgrade shall be as follows:
1. Pavement Areas: Bottom of the pavement or base course as applicable.
 2. 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. Use excavated materials or borrow for fill and backfill, as applicable. Do not use unsuitable excavated materials. Do not backfill until pipes coming in contact with backfill have been installed, and inspected and approved by Resident Engineer.
- B. Proof-Rolling Existing Subgrade: Proof-roll with a fully loaded dump truck. Make a minimum of one pass in each direction. Remove unstable uncompactable material and replace with granular fill material completed to mix requirements specified.
- C. 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.
- D. 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 new or existing building 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 until there is no evidence of further compaction to not less than 95 percent of the maximum density determined

in accordance with ASTM D698 for structural areas and beneath pavements. Non-structural areas shall be compacted to a minimum of 90 percent at plus or minus 3 percent of optimum moisture content.

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. Cut rough or sloping rock to level beds for foundations. In unfinished areas fill low spots and level off with coarse sand or fine gravel.
- C. Slope backfill outside the building away from the building walls for a minimum distance of 10 feet at a minimum five percent (5%) slope.
- D. The finished grade shall be 6 inches below bottom line of windows or other building wall openings unless greater depth is shown.
- E. Place crushed stone or gravel fill under concrete slabs on grade tamped and leveled. The thickness of the fill shall be 6 inches, unless otherwise indicated.
- F. Finish subgrade in a condition acceptable to the Resident Engineer at least one day in advance of the paving operations. Maintain finished subgrade in a smooth and compacted condition until the succeeding operation has been accomplished. Scarify, compact, and grade the subgrade prior to further construction when approved compacted subgrade is disturbed by contractor's subsequent operations or adverse weather.
- G. Grading for Paved Areas: Provide final grades for both subgrade and base course to +/- 0.25 inches of indicated grades.

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 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.

3.6 DISPOSAL OF UNSUITABLE AND EXCESS EXCAVATED MATERIAL

- A. Disposal: Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Medical Center property.
- B. Place excess excavated topsoil only on Medical Center property where directed.
- C. Remove from the construction site and dispose of any excess excavated materials after all fill and backfill operations have been completed.
- D. Segregate all excavated contaminated soil designated by the Resident Engineer from all other excavated soils, and stockpile on site on two 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

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 Center property.

- - - E N D - - -

SECTION 31 23 19
DEWATERING

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies performance of dewatering required to lower and control ground water table levels and hydrostatic pressures to permit excavation, backfill, and construction to be performed in the dry. Control of surface water shall be considered as part of the work under this specification.

1.2 SUMMARY

- A. The work to be completed by the Contractor includes, but is not necessarily limited to the following:
 - 1. Implementation of the erosion and sedimentation control.
 - 2. Dewater excavations, including seepage and precipitation.
- B. The Contractor shall be responsible for providing all materials, equipment, labor, and services necessary for care of water and erosion control. Excavation work shall not begin before the Erosion and Sedimentation Control Plan is in place.

1.3 REQUIREMENT

- A. Dewatering system shall be of sufficient size and capacity necessary to lower and maintain ground water table to an elevation at least 1 foot below lowest foundation subgrade or bottom of pipe trench and to allow material to be excavated in a reasonably dry condition. Materials to be removed shall be sufficiently dry to permit excavation to grades shown and to stabilize excavation slopes where sheeting is not required. Operate dewatering system continuously until backfill work has been completed.
- B. Reduce hydrostatic head below any excavation to the extent that water level in the construction area is a minimum of 1 foot below prevailing excavation surface.
- C. Prevent loss of fines, seepage, boils, quick conditions or softening of foundation strata.
- D. Maintain stability of sides and bottom of excavation.
- E. Construction operations are performed in the dry.
- F. Control of surface and subsurface water is part of dewatering requirements. Maintain adequate control so that:
 - 1. The stability of excavated and constructed slopes are not adversely affected by saturated soil, including water entering prepared subbase and subgrades where underlying materials are not free draining or are subject to swelling or freeze-thaw action.

2. Erosion is controlled.
 3. Flooding of excavations or damage to structures does not occur.
 4. Surface water drains away from excavations.
 5. Excavations are protected from becoming wet from surface water, or insure excavations are dry before additional work is undertaken.
- G. Permitting Requirements: The contractor shall comply with and obtain the required State and County permits where the work is performed.

1.4 RELATED WORK

- A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES.
- B. Safety Requirements: Section 00 72 00, GENERAL CONDITIONS, Article, ACCIDENT PREVENTION.
- C. Submittal requirements as specified in Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- D. Protection of existing utilities, fire protection services, existing equipment, roads, and pavements: Section 01 00 00, GENERAL REQUIREMENTS.
- E. Excavation, backfilling, site grade and utilities: Section 31 20 11, EARTH MOVING.

1.5 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Drawings and Design Data:
 1. When requested, submit drawings or data showing the method to be employed in dewatering excavated areas 30 days before commencement of excavation.
 2. Material may include location, depth and size of wellpoints, headers, sumps, ditches, size and location of discharge lines, capacities of pumps and standby units, and detailed description of dewatering methods to be employed to convey the water from site to adequate disposal.
 3. If requested, include a written report outlining control procedures to be adopted if dewatering problem arises.
 4. Materials submitted shall be in a format acceptable for inclusion in required permit applications to any and all regulatory agencies for which permits for discharge water from the dewatering system are required due to the discharge reaching regulated bodies of water.
- C. Inspection Reports.
- D. All required permits.

PART 2 - PRODUCTS (NOT USED)**PART 3 - EXECUTION****3.1 INSTALLATION**

- A. Install a dewatering system to lower and control ground surface water in order to permit excavation, construction of structure, and placement of backfill materials to be performed under dry conditions. Make the dewatering system adequate to predrain the waterbearing strata above and below the bottom of structure foundations, utilities and other excavations.
- B. In addition, reduce hydrostatic pressure head in water-bearing strata below structure foundations, utility lines, and other excavations, to extent that water levels in construction area are a minimum of 1 foot below prevailing excavation surface at all times.

3.2 OPERATION

- A. Prior to any excavation below the ground water table, place system into operation to lower water table as required and operate it continuously 24 hours a day, 7 days a week until utilities and structures have been satisfactorily constructed, which includes the placement of backfill materials and dewatering is no longer required.
- B. Place an adequate weight of backfill material to prevent buoyancy prior to discontinuing operation of the system.

3.3 WATER DISPOSAL

- A. Dispose of water removed from the excavations in such a manner as will:
 - 1. Not endanger portions of work under construction or completed.
 - 2. Cause no inconvenience to Government or others working near site.
 - 3. Comply with stipulations of required permits for disposal of water.
 - 4. Control Runoff: The Contractor shall be responsible for control of runoff in all work areas including but not limited to: excavations, access roads, parking areas, laydown, and staging areas. The Contractor shall provide, operate, and maintain all ditches, basins, sumps, culverts, site grading, and pumping facilities to divert, collect, and remove all water from the work areas. All water shall be removed from the immediate work areas and shall be disposed of in accordance with applicable permits.
- B. Excavation Dewatering:
 - 1. The Contractor shall be responsible for providing all facilities required to divert, collect, control, and remove water from all construction work areas and excavations.
 - 2. Drainage features shall have sufficient capacity to avoid flooding of work areas.

3. Drainage features shall be so arranged and altered as required to avoid degradation of the final excavated surface(s).
 4. The Contractor shall utilize all necessary erosion and sediment control measures as described herein to avoid construction related degradation of the natural water quality.
 5. The Contractor shall plan for and make arrangements to divert either surface runoff or groundwater for the purpose of irrigating adjacent grassed or turf areas rather than allow water disposal to water courses or navigable waters via storm sewers or drainage ditches.
- C. Dewatering equipment shall be provided to remove and dispose of all surface and ground water entering excavations, trenches, or other parts of the work during construction. Each excavation shall be kept dry during subgrade preparation and continually thereafter until the structure to be built, or the pipe to be installed therein, is completed to the extent that no damage from hydrostatic pressure, flotation, or other cause will result.

3.4 STANDBY EQUIPMENT

Provide complete standby equipment, installed and available for immediate operation, as may be required to adequately maintain dewatering on a continuous basis and in the event that all or any part of the system may become inadequate or fail.

3.5 CORRECTIVE ACTION

If dewatering requirements are not satisfied due to inadequacy or failure of the dewatering system loosening of the foundation strata, or instability of slopes, or damage to foundations or structures, perform work necessary for reinstatement of foundation soil and damaged structure resulting from such inadequacy or failure by Contractor, at no additional cost to Government.

3.6 DAMAGES

Immediately repair damages to adjacent facilities caused by dewatering operations.

3.7 REMOVAL

Insure compliance with all conditions of regulating permits and provide such information to the Resident Engineer. Obtain written approval from Resident Engineer before discontinuing operation of dewatering system.

----- E N D -----

SECTION 32 11 23
AGGREGATE BASE COURSE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Aggregate base course for concrete structures and flexible paving.

1.2 RELATED SECTIONS

- A. Section 01 45 29 – Testing Laboratory Services – Retained by Owner
- B. Section 31 05 16 – Aggregate for Earthwork.
- C. Section 31 23 23 – Fill: Compacted fill under base course.
- D. Section 32 12 00 – Flexible Pavement: Asphalt binder and wearing/finish courses.

1.3 REFERENCES

- A. ASTM D 1557 - Moisture-Density Relations of Soils for Earthwork and Soil-Aggregate Mixtures Using 10 pound (4.54 Kg) Rammer and an 18 inch (457 mm) Drop.
- B. ASTM D 2922 - Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- C. ASTM D 3017 - Moisture Content of Soil and Soil-Aggregate Mixtures.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aggregate Base for Paving: Aggregate Base Course as specified in Section 31 05 16. Use millings from AC Pavement (maximum 30% by volume) and existing reclaimed base course (maximum 30% by volume), supplemented by imported crushed aggregate base course for new construction.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify substrate has been scarified, recompact, tested, gradients and elevations are correct, and substrate is dry.

3.2 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- B. Do not place fill on soft, muddy, or frozen surfaces.

3.3 AGGREGATE PLACEMENT

- A. Spread Aggregate over prepared substrate to a total compacted thickness of the thicknesses indicated on the Drawings.
- B. Place Aggregate in maximum 8-inch layers and roller compact to specified density.
- C. Level and contour surfaces to elevations and gradients indicated.
- D. Add water to assist compaction. If excess water is apparent, remove Aggregate and aerate to reduce moisture content.
- E. Use hand-operated mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

- A. Scheduled Compacted Thickness: Within ¼-inch.
- B. Variation from Design Elevation: Within ½-inch.

3.5 FIELD QUALITY CONTROL

- A. Compaction testing will be performed in accordance with ASTM D 1557, ASTM D 2922 and ASTM D 3017 (California Test 216 or 231).
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- C. Frequency of Tests: One test for every 50 linear feet of roadway, curb, and sidewalk corridor, and one test for every 2500 square feet in a grid for open hard stands, gravel roadways, and parking areas. See Section 01 45 29 Testing Laboratory Services – for estimated number of tests.

3.6 SCHEDULES

- A. Under Asphalt Pavement: Compact placed Aggregate materials to achieve 95 percent of maximum density.
- B. Under Concrete Pavement and Curbs: Compact placed Aggregate materials where indicated to achieve 95 percent of maximum density.

END OF SECTION

SECTION 32 12 00
FLEXIBLE PAVEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Asphaltic concrete paving: Asphalt concrete binder and wearing courses and Aggregate base course.

1.2 RELATED SECTIONS

- A. Section 01 45 29 – Testing Laboratory Services – Retained by Owner.
- B. Section 32 11 23 - Aggregate Base Course.
- C. Section 31 23 23 - Fill: Compacted subbase for paving.

1.3 REFERENCES

- A. ASTM D 946 - Penetration-Graded Asphalt Cement for Use in Pavement Construction.
- B. ASTM D 3381 - Viscosity Graded Asphalt Cement for Use in Pavement Construction.
- C. ASTM D 2950 – In-Place Densities by Nuclear Method
- D. TAI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.
- E. TAI MS-3 - Asphalt Plant Manual.
- F. TAI MS-8 - Asphalt Paving Manual.
- G. TAI MS-19 - Basic Asphalt Emulsion Manual.
- H. Standard Specifications for Roads and Bridges, 2004 Ed.

1.4 SUBMITTALS

- A. Product Data and Test Reports: Submit product information for all materials, mix design and certifications as required by SD DOT.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with State of South Dakota Department of Transportation's standard.

- B. Mixing Plant: Conform to State of South Dakota Department of Transportation's standard.
- C. Obtain materials from same source throughout.
- D. Asphalt minimum density = 92% with Rice Test.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.
- B. Place bitumen mixture when temperature is not more than 15 degrees F below bitumen suppliers bill of lading and not more than maximum specified temperature.

1.7 TESTING REQUIREMENTS

- A. As delineated in Section 01 45 29: Testing Laboratory Services.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Asphalt Cement (Binder): In accordance with State of South Dakota Department of Transportation standard specification for PG 64-22 and comply with AASHTO Performance Grades Binder Specifications M320:
 - 1. The asphalt binder shall, if necessary, be blended at the terminal with permissible additives styrene-butadiene styrene (SBS) or styrene-butadiene rubber (SBR) necessary to meet the specifications. The type of modifier supplied shall be listed on the certificate of compliance. Air blown asphalts, acid modifiers, and other modifiers will not be allowed.
- B. Aggregate for Binder Course Mix: In accordance with Type A for ¾" maximum Aggregate (coarse) for the intermediate or binder course in accordance with State of South Dakota Department of Transportation Standard Specification:
 - 1. Aggregates shall be clean and free from decomposed materials, organic material and other deleterious substances. Coarse Aggregate is material retained on the 4.75-mm {No. 4} sieve; fine Aggregate is material passing the 4.75-mm {No. 4} sieve; and supplemental fine Aggregate is added fine material passing the 600-µm {No. 30} sieve, including, but not limited to, cement and stored fines from dust collectors.
 - 2. The Aggregate grading of the various types of asphalt concrete shall conform to the following:

Type	Grading
Class D Type1	19-mm {¾ inch} maximum, coarse

3. In the table below, the symbol “X” is the gradation which the Contractor proposes to furnish for the specific sieve. The proposed gradation shall meet the gradation shown in the table under “Limits of Proposed Gradation.” Changes from one mix design to another shall not be made during the progress of the work unless permitted by the Contracting Officer’s Technical Representative. However, changes in proportions to conform to the approved mix design shall not be considered changes in mix design.

19-mm {3/4 inch} Maximum, Coarse

Sieve Sizes	Limits of Proposed Gradation	X
25-mm {1”}	—	
19-mm {3/4”}	—	
9.5-mm {3/8”}	—	
4.75-mm {No. 4}	45-75	
2.36-mm {No. 8}	30-55	
425-µm {No. 40}	10-30	
75-µm {No. 200}	3.0-7.0	

4. Re-cycled AC Pavement millings shall not be used in Binder Course Mix.
5. Binder Content: Plus 50 / 60 penetration grade liquid asphalt at 5 percent to 6 ½ percent of the combined dry aggregates.

- C. Aggregate for Wearing Course Mix: In accordance with Type B for ½” maximum Aggregate (medium) for the finish or wearing course in accordance with State of South Dakota Department of Transportation standard specification:

Type	Grading
Class d Type 2	12.5-mm {1/2 inch} maximum, Medium

1. In the table below, the symbol “X” is the gradation which the Contractor proposes to furnish for the specific sieve. The proposed gradation shall meet the gradation shown in the table under “Limits of Proposed Gradation.” Changes from one mix design to another shall not be made during the progress of the work unless permitted by the Contracting Officer’s Technical Representative. However, changes in proportions to conform to the approved mix design shall not be considered changes in mix design.

12.5-mm {1/2 inch} Maximum, Medium

Sieve Sizes	Limits of Proposed Gradation	X
19-mm {3/4"}}	—	
12.5-mm {1/2"}}	—	
9.5-mm {3/8"}}	—	
4.75-mm {No. 4}	60-80	
2.36-mm {No. 8}	40-60	
425-µm {No. 40}	15-35	
75-µm {No. 200}	4-8	

2. Re-cycled AC Pavement millings shall not be used in Wearing Course Mix.
- D. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter.
 - E. Primer: ASSHTO MC 82. In accordance with State of South Dakota standard specification.
 - F. Tack Coat: ASSHTO SS1H. In accordance with State of South Dakota Department of Transportation standard specification:
 1. The asphaltic emulsion shall be homogeneous. Within 30 days after delivery and provided separation has not been caused by freezing, the asphaltic emulsion shall be homogeneous after thorough mixing. The polymer used in the manufacture of polymer modified asphaltic emulsion shall be, at the option of the Contractor, either neoprene, ethylene vinyl acetate or a blend of butadiene and styrene.
 - G. Use dry material to avoid foaming. Mix uniformly.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify compacted granular base is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 AGGREGATE BASE

- A. See Section 32 11 23 for the construction of the aggregate base.

3.3 PREPARATION - PRIMER

- A. Immediately prior to applying prime coat or paint binder (tack coat), or immediately prior to placing the asphalt concrete or asphalt concrete base when a prime coat or paint binder (tack coat) is not required, the subgrade to receive asphalt concrete or asphalt concrete base shall conform to the compaction requirement and elevation tolerances specified for the material involved and shall be free of loose or extraneous material. If the asphalt concrete or asphalt concrete base is to be placed on an existing base or pavement which was not constructed as part of the contract, the Contractor shall clean the surface by sweeping, flushing or other means to remove all loose particles of paving, all dirt and all other extraneous material immediately before applying the prime coat or paint binder (tack coat).
- B. Apply primer - A prime coat of liquid asphalt shall be applied to the areas to be surfaced when there is a contract item for the work or when the work is required by the special provisions.
- C. Prime coat shall be applied at the approximate total rate of 0.25-gallon per square yard of surface covered.
- D. A paint binder (tack coat) of asphaltic emulsion shall be furnished and shall be applied to all vertical surfaces of existing pavement, curbs, gutters and construction joints in the surfacing against which additional material is to be placed, to a pavement to be surfaced and to other surfaces designated in the special provisions.
- E. Paint binder (tack coat) shall be applied in one application at a rate of from 0.02- to 0.10-gallon per square yard of surface covered.
- F. Prime coat or paint binder (tack coat) shall be applied only so far in advance of placing the surfacing as may be permitted by the Engineer. When asphaltic emulsion is used as a paint binder (tack coat), asphalt concrete shall not be placed until the asphaltic emulsion has cured.
- G. Immediately in advance of placing asphalt concrete or asphalt concrete base, additional prime coat or paint binder (tack coat) shall be applied as directed by the Contracting Officer's Technical Representative to areas where the prime coat or paint binder (tack coat) has been damaged, and loose or extraneous material shall be removed, and no additional compensation will be allowed therefor.
- H. Use clean sand to blot excess primer.

3.4 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

- A. Provide hot plant-mixed asphaltic concrete paving materials.

1. Temperature leaving the plant: 290 degrees F minimum, 320 degrees F maximum.
 2. Temperature at time of placing: 280 degrees F minimum.
- B. Place asphalt binder course within 24 hours of applying primer or tack coat.
 - C. Place binder course over prime coated Aggregate base to the thicknesses indicated. Where shown on the drawings.
 - D. Place wearing course within 24 hours of placing and compacting binder course. If binder course is placed more than 24 hours before placing wearing course, it may become dirty; clean surface and apply tack coat before placing wearing course.
 - E. Place wearing course over binder course where shown on the drawings.
 - F. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment. Shape areas to provide positive drainage.
 - G. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.5 TOLERANCES

- A. Flatness: Maximum variation of ¼-inch measured with 10-foot straight edge.
- B. Scheduled Compacted Thickness: Within ¼-inch.
- C. Variation from True Elevation: Within ½-inch.

3.6 QAULTY ASSURANCE

- A. Positive drainage – In the presence of the Contracting Officer's Technical representative apply water to paved area to demonstrate positive drainage of finished surface.
- B. Correct deficiencies as required.

3.7 PROTECTION OF FINISHED WORK

- A. Immediately after placement, protect pavement from mechanical injury for 24 hours or until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 32 13 13
CONCRETE PAVING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Concrete curb and gutter.
- B. Walkways and pads.

1.2 RELATED SECTIONS

- A. Section 32 11 23 - Aggregate Base Course.
- B. Section 31 23 23 - Fill: Compacted subbase for paving.
- C. Section 03 30 00 – Cast-in-Place Concrete.

1.3 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 304 - Measuring, Mixing, Transporting and Placing Concrete.
- C. ASTM C 33 - Concrete Aggregates.
- D. ASTM C 94 - Ready Mix Concrete.
- E. ASTM C 150 - Portland Cement.
- F. ASTM C 920 – Elastomeric Joint Sealants
- G. ASTM C 309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- H. ASTM C979 - Pigments for Integrally Colored Concrete.
- I. ASTM D 1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.4 SUBMITTALS

- A. Product Data: Submit data on curing compounds.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and requirements of Section 03 30 00
- B. Obtain cementitious materials from same source throughout.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Wood or Steel form material, profiled to suit conditions.
 - 1. Use metal or wood forms that are straight and suitable for the work involved in cross-section, depth, and strength to resist springing during depositing and consolidating the concrete.
 - 2. Do not use forms if they vary from a straight line more than 3 mm (1/8 inch) in any 3000 mm (ten foot) long section in either a horizontal or vertical direction.
 - 3. Wood forms should be at least 50 mm (2 inches) thick (nominal). Wood forms shall also be free from warp, twist, loose knots, splits, or other defects. Use approved flexible or curved forms for radius forming.

2.2 REINFORCEMENT

- A. Reinforcing Steel: ASTM A 615; 40 ksi yield grade; deformed billet steel bars; unfinished finish.
- B. Welded Steel Wire Fabric: Plain type, ASTM A 185; furnish in flat sheets.
- C. Dowels: ASTM A 615; 40 ksi yield grade, plain steel. Paper covered one end.

2.3 CONCRETE MATERIALS

- A. Concrete Materials: Concrete shall be Type C, 4000 psi as 28 Days as specified in Section 03 30 00, CAST-IN-PLACE CONCRETE, with the following exceptions:

<u>TYPE</u>	<u>MAXIMUM SLUMP*</u>
Pedestrian Pavement	4"
Vehicular Pavement	2" (Machine Finished) 4" (Hand Finished)
Utility/Equipment Pad	3" to 4"

* For concrete to be vibrated: Slump as determined by ASTM C143. Tolerances as established by ASTM C94.

2.4 JOINT SEALANTS

- A. Expansion joints shall be sealed with polyurethane elastomeric joint sealant – Sonolastic NP-1 or approved equivalent. Color shall be submitted for approval, and shall generally match or be a shade lighter than the concrete substrate.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 AGGREGATE BASE

- A. See Section 32 11 23 for the installation of aggregate base for this section.

3.3 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Notify Contracting Officer's Technical Representative minimum 24 hours prior to commencement of concreting operations.

3.4 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.5 REINFORCEMENT

- A. Place reinforcement as indicated.
- B. Interrupt reinforcement at expansion joints; use dowels for joint transfer devices.
- C. Provide doweled joints 12 inch on center at interruptions of concrete reinforcement with one end of dowel set in capped sleeve to allow longitudinal movement.

3.6 BATCHING AND MIXING OF CONCRETE

- A. See Section 03 30 00 – Cast in Place Concrete

3.7 PLACING CONCRETE - GENERAL

- A. Place concrete in accordance with ACI 301 and as specified in Section 03 30 00.
- B. Obtain approval of the Contracting Officer's Technical Representative before placing concrete.

- C. Remove debris and other foreign material from between the forms before placing concrete. Obtain approval of the COTR before placing concrete.
- D. Before the concrete is placed, uniformly moisten the subgrade, base or subbase appropriate, avoiding puddles of water.
- E. Convey concrete from mixer to final place of deposit by a method which will prevent segregation or loss of ingredients. Deposit concrete so that it requires as little handling as possible.
- F. While being placed, spade or vibrate and compact the concrete with suitable tools to prevent the formation of voids or honeycomb pockets. Vibrate concrete well against forms and along joints. Over-vibration or manipulation causing segregation will not be permitted. Place concrete continuously between joints without bulkheads.
- G. Install a construction joint whenever the placing of concrete is suspended for more than 30 minutes and at the end of each day's work.
- H. Workmen or construction equipment coated with foreign material shall not be permitted to walk or operate in the concrete during placement and finishing operations.

3.8 PLACING CONCRETE FOR CURB AND GUTTER

- A. Place concrete in the forms in one layer of such thickness that, when compacted and finished, it will conform to the cross section as shown.
- B. Deposit concrete as near to joints as possible without disturbing them but do not dump onto a joint assembly.
- C. After the concrete has been placed in the forms, use a strike-off guided by the side forms to bring the surface to the proper section to be compacted.
- D. Consolidate the concrete thoroughly by tamping and spading, or with approved mechanical finishing equipment.
- E. Finish the surface to grade with a metal float.

3.9 JOINTS

- A. Place expansion joints at 20-foot intervals max. against previously constructed curb and gutters or as shown.
- B. Place joint filler between paving components and building or other fixed appurtenances.
- C. Box out and isolate column footings with expansion joints.
- D. Provide keyed joints as indicated.

- E. Edges at concrete joints shall be edger finished to approximately 3/8-inch radius

3.10 FINISHING

- A. The sequence of operations, unless otherwise indicated, shall be as follows:
 - 1. Consolidating, floating, straight-edging, troweling, texturing, and edging of joints.
 - 2. Maintain finishing equipment and tools in a clean and approved condition.
 - 3. No swirl or wave finishes are permitted.
 - 4. Remove excess concrete from perimeter of forms.
 - a. When appropriate, cut away any concrete that has seeped beyond limits of forms.
- B. Area Paving and Curbs: Light broom
- C. Direction of Curb Texturing: Parallel to curb length.
- D. Place curing compound on exposed concrete surfaces immediately after finishing. Mask adjacent surfaces subject to staining or marking.

3.11 JOINT SEALING

- A. Separate pavement from vertical surfaces with ½ inch thick joint filler.
- B. Place joint filler in pavement pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

3.12 TOLERANCES

- A. Maximum Variation of Surface Flatness: ½ -inch in 10 feet.
- B. Maximum Variation From True Position: ½-inch.

3.13 FIELD QUALITY CONTROL

- A. Three concrete test cylinders will be taken for every 75 or less cubic yards of each class of concrete placed each day.
- B. One additional test cylinder will be taken during cold weather and cured on site under same conditions as concrete it represents.
- C. One slump test will be taken for each set of test cylinders taken.
- D. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.14 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

- B. Do not permit pedestrian vehicular traffic over pavement for 7 days minimum after finishing.
- C. Protect surfaces from construction activities and traffic until final acceptance of project.

END OF SECTION

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**SECTION 32 90 00
PLANTING**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The work in this section consists of furnishing and installing soils, and grasses required as specified in locations shown.

1.2 RELATED WORK

- A. Topsoil Testing: Section 01 45 29, TESTING LABORATORY SERVICES.
B. Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.
C. Stripping Topsoil, Stock Piling and Topsoil Materials: Section 31 20 11, EARTH MOVING.

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
B. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
C. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
D. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
E. Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, turf and grasses, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
F. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
H. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable. Keep seed and other packaged materials in dry storage away from contaminants.
- B. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants. Keep bulk materials in dry storage away from contaminants.
 - 2. Provide erosion control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - 3. Accompany each delivery of bulk fertilizers with appropriate certificates.
- C. All pesticides and herbicides shall be properly labeled and registered with the U.S. Department of Agriculture. Deliver materials in original, unopened containers showing, certified analysis, name and address of manufacturer, product label, manufacturer's application instructions specific to the project and indication of conformance with state and federal laws, as applicable.

1.5 PROJECT CONDITIONS

- A. Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.
- B. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion. Plant during one of the following periods:
 - 1. Spring Planting: April 1 - May 30.
 - 2. Fall Planting: September 1 - October 15.
- C. Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.6 QUALITY ASSURANCE:

A. Products Criteria:

- 1. When two or more units of the same type or class of materials or equipment are required, these units shall be products of one manufacturer.
- 2. A nameplate bearing manufacturer's name or trademark, including model number, shall be securely affixed in a conspicuous place on equipment. In addition, the model number shall be either cast integrally with equipment, stamped, or otherwise permanently marked on each item of equipment.
- 3. Pesticide Applicator: Licensed in state of project, commercial.

1.7 SUBMITTALS

A. Submit product data for each type of product indicated, including soils:

- 1. Include quantities, sizes, quality, and sources for plant materials.

B. Prior to delivery, provide notarized certificates attesting that each type of manufactured product, from the manufacturer, meet the requirements specified and shall be submitted to the Contracting Officer's Representative for approval.

- 1. Seed and Turf Materials notarized certificate of product analysis.
- 2. Manufacturer's certified analysis of standard products.

1.8 TURF ESTABLISHMENT PERIOD

A. The establishment period for turf shall begin immediately after installation, with the approval of the Contracting Officer's Representative, and continue until the date that the Government accepts the project or phase for beneficial use and occupancy. During the Establishment Period the Contractor shall maintain the turf as required in Part 3.

1.9 TURF MAINTENANCE SERVICE

A. See Paragraph 3.6 of this section.

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. American National Standards Institute (ANSI):

Z60.1-04.....Nursery Stock

C. Association of Official Seed Analysts (AOSA): Rules for Testing Seed.

D. American Society For Testing And Materials (ASTM):

D977-05.....Emulsified Asphalt (AASHTO M140)

- E. Hortus Third: A Concise Dictionary of Plants Cultivated in the United States and Canada.
- F. Turfgrass Producers International (TPI): Guideline Specifications to Turfgrass Sodding.
- G. United States Department of Agriculture (USDA): Handbook No. 60 Diagnosis and Improvement of Saline and Alkali Soils; Federal Seed Act Regulations.
- H. National Cemetery Administration (NCA):
 Handbook 3420-08.....Turfgrass Maintenance
 Appendix TL-08.....Cemetery Construction Requirements for
 Turfgrass and Landscape Plant Material
 Installation

1.11 WARRANTY

- A. The Contractor shall remedy any defect due to faulty material or workmanship and pay for any damage to other work resulting therefrom within a period of one year from final acceptance, unless noted otherwise below. Further, the Contractor will provide all manufacturer's and supplier's written guarantees and warranties covering materials and equipment furnished under this Contract.
 - 1. Turf Warranty Periods will begin from the date of Substantial Completion of the project or phase for beneficial use and occupancy.
 - a. Turf: 12 months.
 - 2. The Contractor shall have completed, located, and installed all turf according to the plans and specifications. All plants and turf are expected to be living and in a healthy condition at the time of final inspection.
 - 3. The Contractor will replace any areas void of turf immediately, unless required to plant in the succeeding planting season. Replacement turf warranty will begin on the day the work is completed.
 - 4. The Government will reinspect all turf at the end of the Warranty Period. The Contractor will replace any dead turf immediately. The Warranty Period will end on the date of this inspection provided the Contractor has complied with the warranty work required by this specification. The Contractor shall also comply with the following requirements:
 - a. Complete remedial measures directed by the Contracting Officer's Representative to ensure turf survival.

- b. Repair damage caused while making turf replacements.
- B. Installer agrees to repair or replace turf and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

- A. Turf materials: ANSI Z60.1; will conform to the varieties specified and be true to botanical name as listed in Hortus Third; nursery-grown turf material true to genus, species, variety, and cultivar, free of disease, pests, eggs, larvae, and defects such as sun scald, windburn, injuries, abrasions, and disfigurement.

2.2 TURF FERTILIZERS

- A. Fertilizer: 18-46-0 delivered to site in unopened containers that clearly display the manufacturer's warranted statement of analysis. Granular fertilizer shall be added per recommendations in soil laboratory testing results.

2.3 PLANTING SOILS

- A. Existing Planting Soil: Existing, native surface topsoil formed under natural conditions retained during excavation process and stockpiled on-site. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - 1. Supplement with another specified planting soil when quantities are insufficient.
- B. Imported Planting Soil: Imported topsoil or manufactured topsoil from off-site sources can be used if sufficient topsoil is not available on site to meet the depth as specified herein. The Contractor shall furnish imported topsoil. At least 10 days prior to topsoil delivery, notify the Contracting Officer's Representative of the source(s) from which topsoil is to be furnished. Obtain imported topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from bogs, or marshes.

2.4 MULCH

- A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
 - 1. Type: Salt hay or threshed straw.

- a. Straw for lawn seed bed mulch: Stalks from oats, wheat, rye, barley, or rice that are free from noxious weeds, mold or other objectionable material. Straw shall be in an air dry condition and suitable for placing with blower equipment.

2.5 TACKIFIERS AND ADHESIVES

- A. Asphalt emulsion: ASTM D977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.6 EROSION CONTROL

- A. See plans for requirements.

2.7 WATER

- A. Water shall not contain elements toxic to plant life. Water may be obtained on the VA Medical campus at no cost to the Contractor. Contact the Resident Engineer for location.

2.8 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with "AOSA, Rules for Testing Seed" for purity and germination tolerances. Seed shall be labeled in conformance with U. S. Department of Agriculture rules and regulations under the Federal Seed Act and applicable state seed laws. Wet, moldy, or otherwise damaged seed will not be acceptable. Onsite seed mixing shall be done only in the presence of the Resident Engineer.
- B. Seed Species: Not less than 85 percent germination, not less than 85 percent pure seed, and not more than 2 percent weed seed.

1. Full Sun: A minimum of 3 cultivars.

2. Non-irrigated Seed Mix: Proportioned by weight as follows:

(Common Name)	Percent by Weight
Crested Wheatgrass	40%
Perennial Ryegrass	30%
Hard Fescue	20%
Annual Ryegrass	10%

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive turf for compliance with requirements and conditions affecting installation and performance.
1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.

2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
 5. Special conditions may exist that warrant a variance in the specified planting dates or conditions. Submit a written request to the Contracting Officer's Representative stating the special conditions and proposal variance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Contracting Officer's Representative and replace with new planting soil.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
- B. Install erosion control measures to prevent erosion or displacement of soils and discharge of soil bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION AND GRADING

- A. For newly graded subgrades loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 1. Apply fertilizer directly to subgrade before loosening, at rates recommended by the soils analysis.
 2. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
 3. Spread planting soil to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

- a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.
 - b. Reduce elevation of planting soil to allow for soil thickness of sod.
- B. Finish grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

3.4 SEEDING

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
- 1. Do not use wet seed or seed that is moldy or otherwise damaged.
 - 2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of 2 lb/1000 sq. ft.
- C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.
- 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
 - 2. Bond straw mulch by spraying with asphalt emulsion at a rate of 10 to 13 gal./1000 sq. ft. Take precautions to prevent damage or staining of structures or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.
- E. Protect seeded areas from hot, dry weather or drying winds by applying compost mulch or planting soil within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 3/16 inch, and roll surface smooth.

3.5 TURF RENOVATION

- A. Renovate existing turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
 2. Install new planting soil as required.
- B. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.
 - C. Remove topsoil containing foreign materials such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.
 - D. Mow, dethatch, core aerate, and rake existing turf.
 - E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
 - F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.
 - G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.
 - H. Apply soil amendments and initial fertilizers required for establishing new turf and mix thoroughly into top 4 inches of existing soil. Install new planting soil to fill low spots and meet finish grades.
 - I. Apply seed and protect with straw mulch or sod as required for new turf.
 - J. Water newly planted areas and keep moist until new turf is established.

3.6 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
 1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use IPM (Integrated Pest Management) practices whenever possible to minimize the use of pesticides and reduce hazards.

- B. Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
 - 1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
 - 2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

3.7 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Contracting Officer's Representative:
 - 1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 70 percent over any 10 sq. ft.

3.8 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Contracting Officer's Representative before each application is performed.
- B. Pre-Emergent Herbicides (Selective and Non-Selective): Applied to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.
- C. Post-Emergent Herbicides (Selective and Non-Selective): Applied only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.9 CLEANUP AND PROTECTION

- A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.
- B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- C. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

- D. Erect temporary fencing or barricades and warning signs, as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
- E. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

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Section 32 91 00

Specification for Geogrid Base Reinforcement of Flexible Pavement Structures

1. GENERAL

1.1 SECTION INCLUDES

- A. Geogrid for use as reinforcement of base or subbase layers of flexible pavement structures.

1.2 RELATED SECTIONS

- A. Section 02050 - Basic Site Materials and Methods
- B. Section 02100 - Site Remediation
- C. Section 02200 - Site Preparation
- D. Section 02300 - Earthwork
- E. Section 02700 - Bases, Ballasts, Pavements, and Appurtenances

1.3 UNIT PRICES

- A. Method of Measurement: By the square yard (or square meter - as indicated in contract documents) including seams, overlaps, and wastage.
- B. Basis of Payment: By the square yard (or square meter - as indicated in contract documents) installed.

1.4 REFERENCES

- A. AASHTO Standards
 - 1. T88 - Particle Size Analysis of Soils
 - 2. T90 - Determining the Plastic Limit and Plasticity Index of Soils
 - 3. T99 - The Moisture-Density Relations of Soils Using a 5.5lb (2.5 kg) Rammer and a 12in (305 mm) Drop.
 - 4. AASHTO Guide for Design of Pavement Structures, 1993.
- B. American Society for Testing and Materials (ASTM):
 - 1. D123 - Standard Terminology Relating to Textiles
 - 2. D4354 - Practice for Sampling of Geogrids for Testing
 - 3. D4355 - Test Method for Deterioration of Geogrids from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
 - 4. D4439 – Standard Terminology for Geogrids
 - 5. D4759 - Practice for Determining the Specification Conformance of Geogrids

6. D4873 - Guide for Identification, Storage, and Handling of Geogrid Rolls and Samples
 7. D6637 - Standard Test Method for Determining the Tensile Properties of Geogrids by the Single Rib or Multi-Rib Tensile Method
- C. Federal Highway Administration (FHWA) - Geogrid Design and Construction Guidelines, Publication No. FHWA HI-95-038, May 1995.
 - D. American Association for Laboratory Accreditation (A2LA)
 - E. Geogrid Accreditation Institute (GAI) - Laboratory Accreditation Program (LAP)
 - F. International Standards Organization (ISO) - 9001:2008

1.5 DEFINITIONS

- A. Minimum Average Roll Value (MARV): Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.

1.6 SUBMITTALS

- A. Submit the following:
 1. Certification: The contractor shall provide to the Engineer a certificate stating the name of the manufacturer, product name, style number, and chemical composition and other pertinent information to fully describe the geogrid. The Certification shall state that the furnished geogrid meets MARV requirements of the specification as evaluated under the Manufacturer's quality control program. The Certification shall be attested to by a person having legal authority to bind the Manufacturer.
 2. Quality Standards: The contractor shall provide to the Engineer the Manufacturer's Quality Control Plan along with current A2LA, GAI-LAP, and ISO 9001:2008 certificates.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. The Manufacturer shall have the following credentials:
 - a. Geogrid Accreditation Institute (GAI) - Laboratory Accreditation Program(LAP)
 - b. American Association for Laboratory Accreditation (A2LA)
 - c. ISO 9001:2008 Quality Management System

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Geogrid labeling, shipment, and storage shall follow ASTM D4873. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.
- B. During storage, geogrid rolls shall be elevated off the ground and adequately covered to protect them from the following: site construction damage, precipitation, extended ultraviolet radiation including sunlight, chemicals that are strong acids or strong bases, flames including welding sparks, excess temperatures, and any other environmental conditions that may damage the physical property values of the geogrid.

2. PRODUCTS

2.1 MANUFACTURERS

- A. TenCate Geogrids Americas
365 South Holland Drive
Pendergrass, GA, USA 30567
1-800-685-9990
1-706-693-2226
www.mirafi.com

2.2 MATERIALS

A. Reinforcement Geogrid:

1. Polymers used in the manufacture of geogrids shall consist of long-chain synthetic polymers, composed of at least 95 percent by

weight of polyolefins, polyesters, or polyamides. They shall be formed into a stable network such that the ribs, filaments or yarns retain their dimensioned stability relative to each other, including selvages.

2. The geogrid shall meet the requirements of Table 1. All numeric values in Table 1 represent MARV in the specified direction.

TABLE 1 - FLEXIBLE PAVEMENT REINFORCEMENT GEOGRID

Property	Test Method	Units	Required Value	
Reinforcement Properties			MD	CD
Tensile Strength @ 2% Strain	ASTM D6637	lbs/ft (kN/m)	280 (4.1)	450 (6.6)
Tensile Strength @ 5% Strain	ASTM D6637	lbs/ft (kN/m)	580 (8.5)	920 (13.4)
Survivability Index Values			MD	CD
Ultimate Tensile Strength	ASTM D6637	lbs/ft (kN/m)	830 (12.4)	1300 (19.0)
Ultraviolet Stability (after 500 hrs)	ASTM D4355	%	100	

3. Approved geogrids are as follows:

Mirafi® BXG110 or approved equal

2.3 QUALITY CONTROL

- A. Manufacturing Quality Control: Testing shall be performed at an on-site laboratory accredited by GAI-LAP and A2LA for tests required for the geogrid, at frequency meeting or exceeding ASTM D4354.
- B. Ultraviolet Stability shall be verified by an independent laboratory on the geogrid or a geogrid of similar construction.

3. EXECUTION

- 3.1 See Manufacturer's Installation guidelines provided in the submittal.

END OF SECTION