

BADLANDS National Park
Interior, South Dakota

REHABILITATE ASPHALT PULLOUTS FOR WILDLIFE VIEWING AND
VISITOR ENJOYMENT ALONG THE LOOP ROAD

BADL

PMIS NO. 245016

PROJECT SPECIFICATIONS
Issued for Bid



NATIONAL PARK SERVICE
MIDWEST REGION
February 15, 2023

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00 01 07 - SEALS AND SIGNATURES

	<p>I hereby certify that the portion of the Specifications described below was prepared by me or under my direct supervision and that I am a duly registered Professional Engineer under the laws of the State of South Dakota.</p> <hr/> <p>CHRISTOPHER BAILEY, P-11323 02/15/2023 Pages or Specifications divisions or sections covered by this seal: Divisions: All Sections: All</p>
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END OF SEALS AND SIGNATURES

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DIVISION 01

GENERAL REQUIREMENTS



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SECTION 01 10 00

DIVISION 1 SHORT FORM GENERAL REQUIREMENTS

PART 1 – GENERAL

ITEM 1 - DESCRIPTION OF WORK

- 1.1 Background: The Badlands National Park has operated the existing roadways and pullouts in their current configuration. The pullout expansion and resurfacing project is intended to expand potential parking areas for more visitors while maintaining appropriate areas for access. This project will work to mitigate unsanctioned parking areas.
- 1.2 Work Covered by the Contract Documents:
 - A. Project Location: Badlands National Park, South Dakota.
Work consists of: The installation of pullouts at eight (8) separate locations as indicated on the provided plan sets 6 locations with asphalt paving and 2 with gravel surfacing. The work will require site grading and surfacing placement in each area for visitor parking expansion. This will require placement, compaction, and finishing of the new surfacing to achieve appropriate final grade. In those sites where asphalt placement is required, the contractor shall place specified asphalt to the extents indicated on each plan sheet with curb and gutter as indicated Culvert extensions are required in two locations.
 - B. All work will be performed under a single contract.
 - C. Period of performance: Work shall be completed within *120* calendar days of the start date provided on the Notice to Proceed. The period of performance is inclusive of 7 weather days.

ITEM 2 – PROTECTING EXISTING UTILITIES

- 2.1 Protecting Existing Utilities: Notify Contracting Officer (CO), Contracting Officer’s Representative (COR) and utility companies as required to request location services prior to and to coordinate any excavation/digging operations, and/or for demolition if within Scope of Work.
- 2.2 Contractor shall be responsible for locating and preventing damage to known utilities on site or indoors. If contractor damage occurs, alert CO and COR as soon as safely possible, and repair utility at no additional expense to the Government. If damage occurs to an unknown utility, contact CO and COR as soon as safely possible.
- 2.3 Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Government or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated below:
 - A. Notify CO and COR not less than two business days in advance of proposed utility interruptions.
 - B. Hours for Utility Shutdowns: Shutdowns shall not exceed 2 to 3 hours. Temporary provisions will be needed by the Contractor for periods longer than stated allowance or if required for critical systems as determined by COR.

ITEM 3 - CONTRACTOR'S USE OF PREMISES

- 3.1 Conduct of Operations: At all times the contractor shall conduct his operations in conformance with the rules and regulations promulgated by the Secretary of the Interior for the National Park Service, and applicable park rules and regulations prescribed by the Park Superintendent.
<https://www.nps.gov/badl/learn/management/superintendent-s-compendium.htm>
- A. No signs or advertisements (except those specified herein and as required for safety) shall be displayed on the construction site or within the park unless approved by the Contracting Officer.
 - B. Smoking is not permitted within any Federal building or within 25 feet of entrances, operable windows, or outdoor air intakes.
 - C. Public Use of Site: Contractor shall at all times conduct operations to ensure the least inconvenience to the public. *Contractor shall maintain traffic on the adjacent roadways at all times. Flagging and/or pilot car may be necessary during work hours.*
- 3.2 On-site work hours: Work shall be generally performed during normal business working hours of 8 a.m. to 5 p.m., Monday through Friday, except when otherwise indicated.
- A. Work on Saturdays, Sundays, Federal holidays, early morning, or at night may not be performed without prior consent from the CO and COR. Submit requests for work outside of the stated normal business hours to the CO and COR for approval at least 48 hours in advance of the work.
- The following Federal holidays are observed by the National Park Service:
New Year Day
Martin Luther King, Jr's Birthday
Washington's Birthday
Memorial Day
Juneteenth National Independence Day
Independence Day
Labor Day
Columbus Day
Veterans Day
Thanksgiving Day
Christmas Day
- B. Note: Any of the above holidays falling on a Saturday will be observed on the preceding Friday; holidays falling on Sunday will be observed on the following Monday. The specific day that each holiday is recognized for each year can be found at the following site: [Federal Holidays \(opm.gov\)](https://www.opm.gov).
- 3.3 Contractor Use of Site:
- A. General: Contractor shall have limited use of the site for construction operations. Limit use of premises to construction area as shown on site plan Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - B. Driveways and Entrances: Keep driveways, access roads, and entrances serving premises clear and available to Government, Government's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize use of driveways and entrances.
 - C. Define site disturbance area, including earthwork and clearing of vegetation, to:
 - 1. 15 feet beyond primary roadway curbs and main utility branch trenches.

2. 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, storm water detention facilities, and fields) that require additional staging areas to limit compaction in the constructed area.
- D. Utilities:
1. General: Cost or use charges for temporary facilities shall be included in the Contract Sum as required.
 2. Water Service: Water from existing water system *is not* available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations without any additional permit costs. Use resources wisely and minimize waste of water.
 3. Electric Power Service: Electric power from existing system *is not* available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations without any additional permit costs. Power may or may not meet your construction power tool requirements, provide generators if questionable. Use power in a resourceful manner and avoid excess power waste.
 4. Waste Operation:
 - a. Toilets: Contractor provided for contractor personnel, sufficiently lighted and ventilated toilet facilities in weatherproof, sight proof, handicap accessible (if required), sturdy enclosures with privacy locks. Handicap accessibility to toilets and exterior locks may be necessary if determined by the contractor. Coordinate with COR for approved location if not shown on attached site plan.
 - b. Waste Removal / Recycling: Contractor is responsible for removing all waste created by the project. Contractor shall recycle to the highest degree possible and empty dumpsters as necessary to avoid debris on site. Locate as shown on site plan or coordinated with COR.
- A. Security and Protection facilities:
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with state and federal environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Cleaning of Equipment: The Contractor shall ensure that prior to moving on to the Project Area, all equipment, is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Ensure that all equipment has been pressure washed and is free of exotic species prior to start-up of operations and moving of equipment to Project Area. Equipment shall be considered free of soil, seeds, and other debris when a visual inspection does not disclose such material. Disassembly of equipment components or specialized inspection tools are not required.
- D. Tree and Plant Protection: N/A.
- E. Provide temporary barriers to protect existing trees and plants and root zones.
- F. Do not remove, injure, or destroy trees or other plants without prior approval. Consult with Contracting Officer Representative and remove agreed-on roots and branches that interfere with construction.
- G. Do not fasten ropes, cables, or guys to trees.
- H. Carefully supervise excavating, grading, filling, and other construction operations near trees to prevent damage.

- I. Pest Control: Follow best practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at project completion. Perform control operations lawfully, using environmentally safe materials.
- J. Temporary Enclosures: Provide temporary enclosures such as snow fence as required for protection of construction in progress and completed, from access by visitors or staff, other construction operations, and similar activities.
- K. Security Enclosure and Lockup: N/A
- L. 3.4 Storage - Staging Areas:
 - A. Confine Storage of materials and equipment to the project staging area noted on the plans/aerial. Specific storage and staging area's may be discussed at the preconstruction briefing. One bay and the parking lot will be available for storage. Limits of use and control shall be subject to Contracting Officer's approval. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- 3.5 Preservation of Natural Features: N/A
- 3.6 Hauling Restrictions: Contractor to verify path to site and meet state and county road requirements and height restrictions for all park work/access. The contractor is required to obtain and maintain any hauling permits required by local, county, state, and federal authorities.
- 3.7 Housekeeping:
 - A. Keep project neat, orderly, and in a safe condition at all times.
 - 1. Dispose of waste materials and recycling legally outside the park. The contractor shall not use park dumpsters
 - 2. Address Recycling: Government goal is to salvage and recycle as much nonhazardous construction waste as possible. Use sustainable methods to extent possible during this project, recycling material as is probable with local means. Maintain accurate documentary records for submittal of all recycled materials used including fly ash and slag cement.
- 3.8 Occupancy Requirements for Buildings:
- Existing Buildings: N/A
- 3.9 Photo Documentation:
 - A. Contractor must provide existing condition, progress, and completion photos. All photos shall be in focus, show maximum range of depth of field general photo and then close up detail photo as needed. Shall be in JPEG digital form and submitted electronically by email or via CD-R Archival Gold or DVD-R Archival Gold media with printed labels and 8 mega pixels minimum within 7 days from time of taken or as approved by COR.
 - B. Existing Condition Images:
 - 1. Before starting construction, take color, dated, digital images of project site and adjacent property/roads/etc. that may be impacted by construction activity/traffic. Include existing items to remain or be salvaged from different vantage points and with context for location identification.

C. Construction Progress Images:

1. Document all sub-surface work/ trenches etc. prior to backfill with photos covering enough overall field view to show location and then zoom in for details. (Locations and dimensions shall also be noted on as built drawing set.)
2. Maintain organized index for photos with date, description, etc.
3. Additional images as needed when questions or emergency situations occur. Submit within 24 hours.

D. Completion Images:

1. Document all completed work within scope of work.
2. Maintain organized index for photos with date, description, etc.
3. Additional images as needed when questions or emergency situations occur. Submit within 24 hours.

3.10 Fire and Life Safety:

- M. As a minimum, conduct one weekly 15 minute "toolbox" safety meetings. These meetings shall be conducted by a foreman or supervisor and attended by all construction personnel at the worksite. Topics need to coincide with work scheduled for the following week. Document and submit meeting minutes to the CO and COR within one day after the meeting and document the meetings on the daily reports.
- N. Comply with the requirements of NFPA 241 (Standard for Safeguarding Construction, Alteration, and Demolition Operations). Take all necessary precautions to prevent fire during construction. Provide adequate ventilation during use of volatile or noxious substances.
- O. Store and handle hazardous materials in accordance with manufacturers and OSHA 29CFR1926 Subpart D requirements 1926 | Occupational Safety and Health Administration (osha.gov). Maintain readily available, on site, MSDS/Safety Data Sheets (SDS) for each chemical.
1. Immediately report all spills of hazardous materials to the CO, COR, and park.
 2. Maintain a spill emergency response kit.
 3. Train employees how to respond to a spill and use the emergency response kit.

3.11 Noise and Acoustics Management N/A

ITEM 4 - COMMENCEMENT, PROSECUTION, AND COMPLETION

- 4.1 The Contractor shall commence work in accordance with the terms and conditions of the contract. Contractor shall coordinate and incorporate long lead and delivery time items within the schedule.

ITEM 5 - EXAMINATION OF THE SITE

- 5.1 All bidders are urged to visit the job site and examine existing conditions before submitting bids. Contractors will be accountable for understanding existing conditions. No cost changes for items viewable during site visit will be allowed.

ITEM 6 - ABBREVIATIONS

- 6.1 The list of abbreviations, standards and organizations which may be used in/referred within the Construction Specifications or Special Provisions, may be found linked from the listed page below. On the home page, follow the link under **“Contracting and Procurement”** labeled **“NPS Reference Standards.”** <https://www.nps.gov/orgs/1671/do-business-with-us.htm>

ITEM 7 - ACCIDENT PREVENTION

- 7.1 Description: The work of this section consists of establishing and implementing an effective accident prevention program (APP) and providing a safe environment for all personnel and visitors.
- 7.2 Submittals:
- A. Accident Prevention (Safety) Plan (APP): Submit a **site-specific** accident prevention (safety) plan. The Plan shall be written to comply with OSHA and project requirements (a generic plan is not acceptable) including but not limited to the following:
 - 1. Name and qualifications of responsible supervisor to carry out the program.
 - 2. First aid and rescue procedures.
 - 3. Training, both initial and continuing.
 - 4. Outline of each phase of the work, the hazards associated with each major phase, and the methods proposed to provide for property protection and safety of the public, National Park Service personnel, and Contractor's employees. Identify the work included under each phase, with a Job Hazard Analysis (JHA)/Job Safety Analysis (JSA), etc. A sample JHA template may be provided upon request.
 - 5. Planning for possible emergency situations, such as animal encounters, snake bites, insect bites, earth movements, blizzards, cave-ins, explosions, fires, floods, power outages, slides, and windstorms. Such planning shall take into consideration the nature of construction, site conditions, and degree of exposure of persons and property.
 - 6. Contractor to identify nearest location of medical facility for emergencies, 9am-5pm clinic is available in Wall, SD, closest full emergency room is in Rapid City, SD.
 - 7. Recognition that works will be performed in remote areas with limited communication or cell phone coverage if applicable.
 - 8. Supplemental hazard specific plans may be required IAW 29 CFR 1926 or 1910.
 - B. Meeting and Inspection Reports: Safety Meetings: As a minimum, conduct 15 minute "toolbox" safety meetings. These meetings shall be conducted by a foreman and attended by all construction personnel at the worksite. Submit a report of safety meetings and inspections to CO and COR within one day after the meeting and document the meetings on the daily reports.
- 7.3 Qualification of Employees:
- A. Ensure that employees are physically qualified to perform their assigned duties in a safe manner to include operators of vehicles and equipment. Provide operating instructions for all equipment.
 - B. Do not allow employees to work whose ability or alertness is impaired because of drugs, fatigue, illness, intoxication, or other conditions that may expose themselves or others to injury.
- 7.4 Accident Reporting: The Contractor shall report all accidents to the CO and COR as soon as safely possible and assist the CO and COR and other officials as required in the investigation of the accident.
- 7.5 First Aid Facilities: Provide access to facilities for the number of employees and appropriate to the hazards associated with the types of ongoing construction work at the site.
- 7.6 Emergency Instructions: Post telephone numbers and reporting instructions for ambulance, physician, hospital, fire department, and police in conspicuous locations at the work site.
- 7.7 Personal Protective Equipment (PPE): It is the Contractor's responsibility to require all those working on or visiting the site to wear necessary protective equipment at all times.

- A. PPE must meet requirements of applicable ANSI standards. Selection shall conform to OSHA 29CFR 1926 Subpart E.
 - B. A hard hat use area shall be designated by the Contractor. The hard hat area shall be posted by the Contractor in a manner satisfactory to the Contracting Officer.
 - C. All PPE will be serviceable at all times. At a minimum, maintain four sets of PPE including hard hats and all other Accident Prevention Plan required equipment.
- 7.8 Hazardous Materials: It shall be the responsibility of all operators and contractors, functioning within the park to properly cleanup, mitigate and remediate if necessary, all unauthorized discharges of hazardous materials or non-hazardous chemical and biological products released from fleet and/or other support vehicles or stationary sources. Response shall be consistent with guidelines established by federal, state, and local regulations, and as outlined within the operator's Safety or Hazardous Materials Business Plan.
- A. If a spill, leak, or other release occurs, the operator shall as soon as possible, without impeding cleanup, notify the National Park Service Emergency Dispatch.

ITEM 8 - PRECONSTRUCTION CONFERENCE

- 8.1 A preconstruction conference will be required for this project, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date, time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed. See Item 9.1C below.

ITEM 9 - SUBMITTALS

- 9.1 General Contracting Submittal Procedures:
 - A. General: Prepare and submit submittals required by individual Technical Specification Sections. Types of submittals are indicated in individual specific sections.
 - 1. CM-16 Transmittal Form: All submittals shall be transmitted via electronic email using National Park Service form CM-16 form. The form will be provided by the Contracting Officer. No action will be taken on a submittal item unless accompanied by the CM-16 transmittal form. Submit completed CM-16 forms to the CO and the COR.
 - B. Submittal List: Administrative required submittals are listed below in 9.1.C and does not include technical section submittal requirements included in each technical section.
 - C. Preconstruction Conference Submittal: Satisfactory evidence of liability insurance coverage and workman's compensation, and any applicable bonds, must be submitted within 10 calendar days of Notice of Award. The following items shall be submitted a minimum of one week prior to the Preconstruction Conference. If all of these documents have not been received one week prior to the scheduled Pre-Construction Conference date, the conference will be cancelled, Notice to Proceed may not be issued, and the Contracting Officer will consider other contractual remedies. Work shall not commence until written Notice to Proceed has been issued. Contracting Officer will notify Contractor of tentative date for the Pre-Construction Conference:
 - 1. Letter designating Project Superintendent.
 - 2. Construction Schedule. (Must include shop drawings, procurement time including long lead time items, mobilization, trade work progression and completion at minimum.)
 - 3. A comprehensive breakdown of the Schedule of Values.
 - 4. Accident Prevention (Safety) Plan (see section 7 of this document).
 - 5. A list of Subcontractors for this project.
 - 6. Written statements from subcontractors certifying compliance with applicable labor.

- i. standard clauses (SF1413).
 - 7. Quality Control Plan.
 - 8. Temporary Storm Water Pollution Prevention Plan (SWPP or UPPP) Submitted to AHJ (Authority Having Jurisdiction - National Park Service & SDDANR).
- 9.2 Project Shop Drawings, Product Data, and Samples: Contracting Officer will provide sample cover sheet and a list of required submittals is included in each technical specification or attached at the end of this document.
- A. Shop Drawings: Indicate all coordinating materials and work impacting the installation coordination, connection details, anchorage requirements, hardware locations, and installation details and locations.
 - 1. Submit Shop Drawings according to Part 9.1 of this section to include one digital file (.PDF or .TIF) and two full size hardcopy documents to COR.
 - B. Product Data: Provide component construction and specification data sheets, anchorage requirements and any other product specific data.
 - 1. Submit Product Data according to Part 9.1 of this section to include one digital file (.PDF or .TIF) to COR.
 - C. Samples: Submit 2 color samples 4” x 6” minimum in size for all color and product selections. Paint samples shall be actual paint finish drawdown for all project colors.
 - 1. Submit Samples CM-16 Transmittal Form according to Part 9.1 of this section to include one digital file (.PDF or .TIF) and physical samples of actual material to COR.
 - D. For submittals specified above, forward submittals to Contracting Officer and COR at least 15 days before need for approval.
 - E. After approving submittals, Contracting Officer and/or COR will return one copy to the Contractor. If submittals are not approved, Contracting Officer will return all copies to Contractor with reasons for rejection. Resubmit, identifying changes. Any work done before approval shall be at Contractor's own risk.
- 9.3 Approved Equals: If an item in this solicitation is identified as “brand name or equal” or lists more than 1 manufacturer, the description of the proposed item must reflect the characteristics and level of quality that will satisfy the Government’s needs as demonstrated by the salient physical, functional, or performance characteristics that “equal” products must meet and/or exceed that as specified in the solicitation or relevant specification.
- A. For each item proposed as an “approved equal,” submit supporting data, including:
 - 1. Drawings and samples as appropriate.
 - 2. Comparison of the characteristics of the proposed item with that specified and with the salient characteristics provided.
 - 3. Changes required in other elements of the work because of the substitution.
 - 4. Name, address, and telephone number of vendor.
 - 5. Manufacturer’s literature regarding installation, operation, and maintenance, including schematics for electrical and hydraulic systems, lubrication requirements, and parts lists. Describe availability of maintenance service, and state source of replacement materials.
 - B. A request for approval constitutes a representation that Contractor:
 - 1. Has investigated the proposed item and determined that it is equal or superior in all respects to that specified.

2. Will provide the same warranties for the proposed item as for the item specified.
 3. Has determined that the proposed item is compatible with interfacing items.
 4. Will coordinate the installation of an approved item and make all changes required in other elements of the work because of the substitution.
 5. Waives all claims for additional expenses that may be incurred as a result of the substitution.
- C. Approved Equals will be evaluated and approved/disapproved during the submittal process.
- 9.4 Schedule of Values: Submit the Schedule of Values a minimum of one week prior to the Preconstruction Conference for COR review. Schedule of Values shall include defined work line items with cost break downs including labor, material, and equipment for COR approval.
- 9.5 Progress Reporting: The initial Construction Schedule and Schedule of Values are required a minimum of one week prior to the Preconstruction Conference. After the Notice to Proceed is issued and after on-site work begins, progress will be documented via daily logs and by providing an updated Construction Schedule and Schedule of Values when requested, but minimally with each pay application. As determined by the CO, weekly/bi-weekly progress meetings will be scheduled. Contractor shall provide agendas with the following outline: 1) Safety, 2) Submittals, 3) RFI's, 4) Schedules, 5) Other Issues. Submit digital copy electronically (PDF preferred) of all required documents. Construction Schedules are normally in bar chart form and indicate estimated starting and completion dates for each part of the work. For a pay application to be reviewed and processed in a timely manner, the following information must either be submitted prior to or accompany submission of the pay application:
- A. Daily/weekly progress reports during construction as part of the administration process.
 - B. Updated Schedule of Values: Breakdown each lump-sum item into component work activities used in the schedule, for which progress payments may be requested. The Schedule of Values will form the basis for payment. The work activities broken out within the schedule of values shall be integrated into and made a logical part of the construction baseline schedule submitted under this specification. The total costs for the component work activities shall equal the contract price for that lump-sum item. The Contracting Officer may request data to verify accuracy of dollar values. A sample Schedule of Values format may be provided upon request.

ITEM 10 – TEMPORARY SERVICES

- 10.1 It is the Contractor's responsibility to provide temporary services, equipment, tools, and skilled labor as required for the chosen means and methods to perform the work in accomplishing this Contract.

ITEM 11 - PROJECT CLOSEOUT

- 11.1 Description: The work of this section consists of final cleanup, closeout submittals, final inspection procedures working toward Final Acceptance.
- 11.2 Cleaning: Remove all tools, equipment, surplus materials, and rubbish. Move attic stock to location coordinated with COR. At time of final inspection, project shall be thoroughly clean and ready for intended use. Inspector holds the right to reschedule if project is not ready for inspection.
- 11.3 Completion and Final Inspection: Contractor shall submit written certification of project completion and request a final inspection to the Contracting Officer and COR. The Contracting Officer or designee will make an inspection within 10 days of receipt of request or at a mutually agreeable time.
- A. If the work is determined to be complete following the final inspection with minor comments, the COR will prepare and provide the Contractor a Punch List noting outstanding items to be addressed.

- B. If the work is not determined to be complete following the final inspection, the Contracting Officer will notify Contractor in writing, stating reasons. Contractor, after completing the work according to the Contract Documents, shall resubmit completion and request a new final inspection. Re-inspection costs may be charged against the Contractor in accordance with the Inspection of Construction contract clause.
 - C. Contractor shall complete the Punch List within 30 calendar days, or a time directed by the CO.
 - D. Once Contractor completes all items of work on the Punch List and all contractually required items are accepted, Contracting Officer will issue Letter of Final Acceptance of Work and request the final pay application.
 - E. If the Contractor fails to complete the work within the time frame, the Contracting Officer may correct the work with an appropriate reduction in contract price or charge for re-inspection costs in accordance with the Inspection of Construction contract clause.
 - F. Disposition of any permits and warranties required by the specifications in this section.
- 11.4 Final Acceptance of the Work: After all punch list deficiencies have been corrected, a Letter of Final Acceptance will be issued. A Release of Claims document must be executed and submitted to the Contracting Officer before final payment can occur.
- 11.5 Warranties
- A. Construction Warranty shall be based on date of final acceptance of the work and remain in effect for one year.
 - B. Provide all manufacturer warranty information of products installed organized by Division. All contact information, extent of coverage and conditions shall be clearly noted as well as date of overall final acceptance.
 - C. Information shall include operation and maintenance manuals for each warranted product.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION



DIVISION 02

EXISTING CONDITIONS



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SECTION 02 41 00 - DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. General provisions applicable to all demolition and removals.
2. Civil/site demolition and removals.
3. Disposal of demolition debris, materials, and equipment.

B. Scope:

1. Contractor shall provide all labor, materials, equipment, tools, and incidentals as shown, specified and required for demolition, removals, and disposal Work.
2. The Work under this Specifications section includes, but is not necessarily limited to:
 - a. Demolition and removal of existing materials and equipment as shown or indicated in the Contract Documents. The Work includes demolition of pavement, curbs, sidewalks, gutters, fencing and similar existing materials, and items.
3. Demolitions and removals indicated in other Specifications Sections shall comply with requirements of this Specifications Section.
4. Perform demolition Work within areas shown or indicated.
5. Pay all costs associated with transporting and, as applicable, disposing of materials and equipment resulting from demolition and removals Work.

C. Related Requirements:

1. Division 31 – Earthwork.

1.2 QUALITY ASSURANCE

A. Referenced Standards:

1. National Fire Protection Association (NFPA):
 - a. 241, Safeguarding Construction, Alteration, and Demolition Operations.

B. Regulatory Requirements:

1. Demolition, removals, and disposal Work shall be in accordance with 29 CFR 1926.850 through 29 CFR 1926.860 (Subpart T – Demolition), and all other Laws and Regulations.
2. Comply with requirements of authorities having jurisdiction.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Review procedures under this and other Specifications sections and coordinate the Work that will be performed with or before demolition and removals.

1.4 SUBMITTALS

A. Informational Submittals: Submit the following:

1. Procedure Submittals:

- a. Demolition and Removal Plan: Not less than ten days prior to starting demolition Work, submit acceptable plan for demolition and removal Work, including:

- 1) Plan for coordinating shut-offs, capping, temporary services, and continuing utility services.
- 2) Other proposed procedures as applicable.
- 3) Equipment proposed for use in demolition operations.
- 4) Recycling/disposal facility(ies) proposed, including facility owner, facility name, location, and processes. Include copy of appropriate permits and licenses, and compliance status.
- 5) Planned demolition operating sequences.
- 6) Detailed schedule of demolition Work in accordance with the Schedule accepted by Engineer.

2. Notification of Intended Demolition Start: Submit in accordance with Paragraph 3.1.A of this Specifications Section.

1.5 SITE CONDITIONS

- #### A. Owner makes no representation of condition or structural integrity of area(s) to be demolished or where removals are required by the Contract Documents.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION

A. Notification:

1. Not less than 48 HRS prior to commencing demolition or removal, advise Contracting Officer in writing of planned start of demolition Work. Do not start removals without permission of Contracting Officer.

2. Where demolition or removals has potential to affect adjacent properties, occupants, streets, or other public thoroughfare, transportation facilities, and utilities, furnish required notices to owners and occupants of properties, buildings, and structures that may be affected by the demolition of removal.
3. In accordance with Laws and Regulations, furnish to authorities having jurisdiction, including emergency services as necessary, appropriate notices of planned demolition and removals.
4. Submit to Contracting Officer copies of notices furnished to adjacent property owners, occupants, and authorities having jurisdiction.

B. Protection of Adjacent Areas and Facilities:

1. Perform demolition and removal Work in manner that prevents damage and injury to property, structures, occupants, the public, and facilities. Do not interfere with use of, and free and safe access to and from, structures and properties unless allowed by the Contract Documents otherwise allowed in writing by Owner.
2. Closing or obstructing of roads, drives, sidewalks, and passageways adjacent to the Work is not allowed unless indicated otherwise in the Contract Documents. Conduct the Work with minimum interference to vehicular and pedestrian traffic.
3. Repair damage to facilities that are to remain which such damages results from Contractor's operations.

C. Existing Utilities: In addition to requirements of the General Conditions, Supplementary Conditions, and Division 01 Specifications, perform the following:

1. Should unforeseen, unknown, or incorrectly shown or indicated Underground Facilities be encountered, Contractor responsibilities shall be in accordance with the General Conditions as may be modified by the Supplementary Conditions. Cooperate with utility owners in keeping adjacent services and facilities in operation.
2. Storm Water Sewerage: Existing storm water system shall remain in place until demolition of existing building or structure is complete. Upon completing demolition, cut and cap storm sewerage at locations shown on the Drawings. Remove existing storm water piping and related structures between points of cutting, and backfill, restore to grade, and stabilize the area over the removed facilities in accordance with the Contract Documents.
3. Shutdown of utility services shall be coordinated by Contractor, assisted by Owner as required relative to contacting utility owners.

D. Remediation:

1. If unanticipated Hazardous Environmental Condition is believed to be encountered during demolition and removals, comply with requirements of the General Conditions, as may be modified by the Supplementary Conditions.

3.2 DEMOLITION - GENERAL

- A. Locate construction equipment used for demolition Work and remove demolished materials and equipment to avoid imposing excessive loading on supporting and adjacent walls, floors, framing, facilities, and Underground Facilities.
- B. Pollution Controls:
 - 1. Use water sprinkling, temporary enclosures, and other suitable methods to limit emissions of dust and dirt to lowest practical level. Comply with Laws and Regulations.
 - 2. Do not use water when water may create hazardous or objectionable conditions such as icing, flooding, or pollution.
 - 3. Clean adjacent structures, facilities, properties, and improvements of dust, dirt, and debris caused by demolition Work, in accordance with the General Conditions.
- C. Explosives:
 - 1. Explosives are not allowed at the Site. Do not use explosives for demolition and removal Work.

3.3 DEMOLITION OF SITE IMPROVEMENTS

- A. Pavement, Sidewalks, Curbs, and Gutters:
 - 1. Demolition of asphalt or concrete pavement, sidewalks, curbs, and gutters, as applicable, shall terminate at cut edges. Edges shall be linear and have a vertical cut face.
 - 2. To cut pavement, sidewalks, curbs, and gutters, use machinery or tools that provides a smooth-cut edge, appropriate for the required. Where cut edges are not smooth, repair the cut edge to remain to provide a smooth, even appearance.
- B. Fencing, Guardrails, and Bollards:
 - 1. Remove to the limits shown or indicated on the Drawings.
 - 2. Completely remove below-grade posts and concrete.
- C. Manholes, Vaults, Chambers, and Handholes:
 - 1. Remove to the limits shown or indicated on the Drawings.
 - 2. If not shown or indicated on the Drawings, remove to not less than three feet below finished grade indicated on the Drawings.
- D. Underground Facilities Other than Manholes, Vaults, Chambers, and Handholes:
 - 1. Remove to the extent shown or indicated on the Drawings.
 - 2. Unless otherwise shown or indicated, cap ends of piping to remain in place in accordance with the “Mechanical Removals” Article in this Specifications section.

- E. Other Site Improvements: When the Contract Documents require removal of other site improvements not addressed above, copy with Contract requirements for removal of buildings or structures.

3.4 DISPOSAL OF DEMOLITION DEBRIS

A. Disposal – General:

1. Promptly remove from the Site all debris, waste, rubbish, material, and equipment resulting from demolition and removal operations. Promptly upon completion of demolition and removal operations, remove from the Site construction equipment used in demolition Work.
2. Do not sell at the Site demolition materials or removed equipment. If materials, equipment or debris will be sold by Contractor, remove the items from the Site and perform the sale or transaction elsewhere, in accordance with Laws and Regulations.

B. Transportation and Disposal:

1. Non-Hazardous Materials, Equipment, and Debris: Properly transport and dispose of non-hazardous demolition materials, equipment, and debris at appropriate landfill or other suitable location, in accordance with Laws and Regulations. Non-hazardous material does not contain Constituents of Concern such as (but not limited to) asbestos, PCBs, petroleum, hazardous waste, radioactive material, or other material designated as hazardous in Laws or Regulations.
2. Hazardous Materials, Equipment, and Debris: When handling and disposal of items containing Constituents of Concern is included in the Work, properly transport and dispose of such items in accordance with the Contract Documents and Laws and Regulations.

- C. Submit to Contracting Officer information required in this Specification Section on proposed facility(ies) where demolition materials, equipment, and debris will be recycled. Upon request, Engineer or Owner, shall be allowed to visit recycling facility(ies) to verify adequacy and compliance status. During such visits, recycling facility operator shall cooperate and assist Engineer and Owner.

END OF SECTION

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DIVISION 31

EARTHWORK



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SECTION 31 23 00 - EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Earthwork - excavation, backfilling, grading, compaction, disposal of waste and surplus materials, placing crushed stone, construction of berms, sheeting, bracing, dewatering and other Earthwork related work.
- B. Related Specification Sections include but are not necessarily limited to:

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. ASTM International (ASTM):
 - a. C33/C33M, Standard Specification for Concrete Aggregates.
 - b. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 FT-LBF/FT³).
 - c. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 FT-LBF/FT³(2,700 kN-M/M³)).
 - d. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - e. D3786, Standard Test Method for Bursting Strength of Textile Fabrics-- Diaphragm Bursting Strength Tester Method.
 - f. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 - g. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
 - h. D4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 - 2. Occupational Safety and Health Administration (OSHA):
 - a. 29 CFR Part 1926.650, Safety and Health Regulations for Construction - Excavations, referred to herein as OSHA Standards.

1.3 DEFINITIONS

- A. Excavation:
 - 1. Consists of removal of material encountered to subgrade elevations required or indicated.

2. Includes excavation of soils; pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; boulders; and rock.
- B. Foundations: Footings, base slabs, foundation walls, mat foundations, grade beams, piers and any other support placed directly on soil or rock.
 - C. Non-Structural Fill/Backfill: Soil materials placed and compacted to achieve finish grade elevations that do NOT support foundations, slabs, paving, or other flatwork.
 - D. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.
 - E. Subgrade: The earth or soil layer immediately below foundation bearing elevation, subbase material, fill material, backfill material, or topsoil materials.
 - F. Unauthorized Excavation:
 1. Consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Contracting Officer.
 - a. Unauthorized excavation, as well as associated remedial work as directed by Contracting Officer, shall be at Contractor's expense.
 2. Unsuitable Soil Materials: Soil materials encountered at or below subgrade elevation of insufficient strength and stiffness to support construction as determined by the Contracting Officer or Representative (COR).

1.4 SUBMITTALS

- A. Shop Drawings:
 1. Product technical data including:
 - a. Contractor shall submit (for COR approval) all data necessary to demonstrate compliance with all specified requirements.
 - b. Manufacturer's installation instructions.
- B. Samples:
 1. Coordinate samples and testing for approval of off-site materials with the COR.
 2. Test reports.
 - a. Report and certification of aggregate fill and drainage fill.
 - b. Test reports on borrow material.
 - c. Field reports; in-place soil density and moisture tests.
 - d. One optimum moisture-maximum density curve for each type of soil encountered.

1.5 PROJECT CONDITIONS

- A. Dispose of waste materials, legally, off site.
 - 1. Burning, as a means of waste disposal, is not permitted.
- B. Site Information:
 - 1. Data in subsurface investigation reports was used for the basis of the design.
 - a. Conditions are not intended as representations or warranties of accuracy or continuity between soil borings.
 - b. The Owner or Engineer will not be responsible for interpretations or conclusions drawn from this data by Contractor.
 - 2. Additional test borings and other exploratory operations may be performed by Contractor, at the Contractor’s option; however, no change in the Contract Sum will be authorized for such additional exploration.
 - 3. Site data provided is not contractual and shall be considered “for information only.”

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fill and Backfill:
 - 1. Selected material approved by COR from site excavation or from off-site borrow.
 - 2. Structural Fill:
 - a. May be low volume change cohesive or granular soil at Contractor’s option.
 - b. Free of organic matter, frozen material and debris.
 - c. Low volume change cohesive soil:
 - 1) ASTM D2487 classification: CL-ML or CL.
 - 2) Liquid limit: Less than 45.
 - 3) Maximum plasticity index: 20.
 - d. Granular soil:
 - 1) ASTM D2487 classification: GW, GP, GM, GC, SW, SP, SM or SC.
 - 3. Non-Structural Fill:
 - a. ASTM D2487 classification: GW, GP, GM, GC, SC, SW, SP, SM, CL-ML or CL.
 - b. Liquid limit: Less than 45.
 - c. Maximum plasticity index: 20.

- B. Base Course Material: Meeting the Base Course requirements as defined in Section 260 and 882 of SDDOT Standard Specifications for Roads and Bridges.

https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292

- C. Geotextile Filter Fabric:

- 1. Mirafi RS380i or approved equal.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Erosion Control:

- 1. See Plan notes and project specifications.
 - 2. Clean paved roadways daily of any spillage of dirt, rocks or debris from vehicles and equipment entering or leaving site.
 - 3. Conduct work to minimize erosion of site. Remove eroded material washed off site.
 - a. If necessary or requested by COR, construct stilling areas to settle and detain eroded material.

- B. Protect existing surface and subsurface features on-site and adjacent to site as follows:

- 1. Provide barricades, coverings, or other types of protection necessary to prevent damage to existing items indicated to remain in place.
 - 2. Protect and maintain benchmarks, monuments or other established reference points and property corners.
 - a. If disturbed or destroyed, replace at own expense to full satisfaction of Owner and controlling agency.
 - 3. Verify location of utilities.
 - a. Contractor shall call 811 for utility locates prior to commencing any earthwork on site.
 - b. Omission or inclusion of utility items does not constitute nonexistence or definite location.
 - c. Take necessary precautions to protect existing utilities from damage due to any construction activity.
 - 1) If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
 - 2) Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by Owner and then only after acceptable temporary utility services have been provided.

- 3) Obtain Owner's approval prior to disconnecting any utility service.
 - d. Repair damages to utility items at own expense.
 - e. In case of damage, notify COR at once so required protective measures may be taken.
- 4. Maintain free of damage, existing sidewalks, structures, and pavement, not indicated to be removed.
 - a. Protect new and existing structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 - b. Any item known or unknown or not properly located that is inadvertently damaged shall be repaired to original condition.
 - c. All repairs to be made and paid for by Contractor.
- 5. Provide full access to public and private premises, fire hydrants, street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.
- 6. Maintain stockpiles and excavations in such a manner to prevent inconvenience or damage to structures on-site or on adjoining property.
- 7. Avoid surcharge or excavation procedures which can result in heaving, caving, or slides.

3.2 SITE EXCAVATION AND GRADING

- A. The site excavation and grading work includes the offsite disposition of all material:
 - 1. That exceed quantities required for earthwork on the project.
 - 2. That is classified as unclassified excavation.
 - 3. That is classified as unacceptable.
 - 4. That is classified as potentially contaminated.
- B. Excavation and Grading:
 - 1. Perform as required by the Contract Drawings.
 - 2. Contract Drawings may indicate both existing grade and finished grade required for construction of Project.
 - a. Stake all units, structures, piping, roads, parking areas and walks and establish their elevations.
 - b. Perform other layout work required.
 - c. Replace property corner markers to original location if disturbed or destroyed.
 - 3. Preparation of ground surface for embankments or fills:
 - a. Before fill is started, scarify to a minimum depth of 8 IN in all proposed embankment and fill areas.

- b. Where ground surface is steeper than one vertical to three horizontal, plow surface in a manner to bench and break up surface so that fill material will bind with existing surface.
 - 4. Protection of finish grade:
 - a. During construction, shape and drain embankment and excavations.
 - b. Maintain ditches and drains to provide drainage at all times.
 - c. Protect graded areas against action of elements prior to acceptance of work.
 - d. Reestablish grade where settlement or erosion occurs.
- C. Borrow:
 - 1. Provide necessary amount of approved fill compacted to density equal to that indicated in this Specification.
 - 2. Include cost of all borrow material in original proposal.
 - 3. Fill material to be approved by COR prior to placement.
- D. Construct embankments and fills as required by the Contract Drawings:
 - 1. Construct embankments and fills at locations and to lines of grade indicated.
 - a. Completed fill shall correspond to shape of typical cross section or contour indicated regardless of method used to show shape, size, and extent of line and grade of completed work.
 - 2. Provide approved fill material which is free from roots, organic matter, trash, frozen material, and stones having maximum dimension greater than 3 IN.
 - a. Ensure that stones larger than 3 IN are not placed in upper 6 IN of fill or embankment.
 - b. Do not place material in layers greater than 8 IN loose thickness.
 - c. Place layers horizontally and compact each layer prior to placing additional fill.
 - 3. Compact soils as required to obtain specified density. Selection of appropriate equipment is the Contractor's responsibility.
 - a. In general, compact cohesive soils by sheepsfoot, and granular soils by pneumatic rollers, vibrators, or by other equipment as required to obtain specified density.
 - b. Control moisture for each layer necessary to meet requirements of compaction.
- E. Grading Tolerances: 0.1 ±IN As shown on Drawings.

3.3 USE OF EXPLOSIVES

- A. Blasting with any type of explosive is prohibited.

3.4 COMPACTION DENSITY REQUIREMENTS

- A. Obtain approval from COR with regard to suitability of soils and acceptable subgrade prior to subsequent operations. Proofrolling will be required for all subgrade and must be approved by testing agency and COR prior to placing aggregate base course.
- B. Provide dewatering system necessary to successfully complete compaction and construction requirements.
- C. Remove frozen, loose, wet, or soft material and replace with approved material as directed by COR.
- D. Stabilize subgrade with well graded granular materials as directed by COR.
- E. Assure by results of testing that compaction densities comply with the following requirements:
 - 1. Sitework:

LOCATION	COMPACTION DENSITY	MOISTURE CONTENT
Under Paved Areas, Sidewalks and Piping:		
Cohesive soils	95% per ASTM D698	-1 to +3% of optimum
Unpaved Areas:		
Cohesive soils	95% of ASTM D698	-1 to +3% of optimum

3.5 EXCAVATION, FILLING, AND BACKFILLING FOR STRUCTURES

- A. General:
 - 1. In general, work includes, but is not necessarily limited to, excavation for structures and retaining walls, removal of underground obstructions and undesirable material, backfilling, filling, and fill, backfill, and subgrade compaction.
 - 2. Obtain fill and backfill material necessary to produce grades required.
 - a. Materials and source to be approved by COR.
 - b. Excavated material approved by COR may also be used for fill and backfill.
 - 3. In the paragraphs of this Specification Section, the word "soil" also includes any type of rock subgrade that may be present at or below existing subgrade levels.
- B. Backfilling Outside of Structures Under Piping or Paving:

1. When backfilling outside of structures requires placing backfill material under piping or paving, the material shall be placed from bottom of excavation to underside of piping or paving at the density required for fill under piping or paving as indicated in this Specification Section.
2. This compacted material shall extend transversely to the centerline of piping or paving a horizontal distance each side of the exterior edges of piping or paving equal to the depth of backfill measured from bottom of excavation to underside of piping or paving.
3. Provide special compacted bedding or compacted subgrade material under piping or paving as required by other Specification Sections for the Project.

3.6 FIELD QUALITY CONTROL

- A. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA Standards, and state requirements. Where conflict between OSHA and state regulations exists, the more stringent requirements shall apply.
- B. Special Inspection and Testing:
 1. See Below.
- C. Responsibilities of Testing Agency for Site Excavation and Grading:
 1. All testing, observation and work indicated as being performed by the Engineer in other than Article 3.5 of this Specification Section.
 2. Services will include verification and documentation of satisfactory soil materials, subgrade quality, subgrade approval via observation of proofrolling, sampling, placement, moisture conditioning, compaction and testing of proposed soil materials, and field testing for quality control.
 3. Moisture density relations, to be established by the Testing Agency required for all materials to be compacted.
 4. Extent of compaction testing will be as necessary to assure compliance with specifications. Proofrolling will be required for all subgrade prior to placement of aggregate base course.
 5. Prepare and submit inspection and test reports to Contracting Officer.
 6. Test reports to include the following:
 - a. Report and certification of aggregate fill and drainage fill.
 - b. Test reports on borrow material.
 - c. Verification of suitability of subgrade material, in accordance with specified requirements, and observation of proofrolling.
 - d. Field reports; in-place soil density and moisture tests.
 - e. One optimum moisture-maximum density curve for each type of soil encountered.
 - f. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.
 - g. Other documentation necessary for Contracting Officer to approve earthwork.
 - h. Assist Contracting Officer to determine corrective measures necessary for defective work.

END OF SECTION

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SECTION 31 32 19.13 - GEOGRID SOIL STABILIZATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Furnishing and installing structural geogrid as veneer reinforcement in the protective cover soil layer.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Section 31 23 00 - Earthwork.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. ASTM International (ASTM):
 - a. D1388, Standard Test Method for Stiffness of Fabrics.
 - b. D4873, Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.
 - 2. Geosynthetic Research Institute (GRI):
 - a. GG-4(a), Standard Practice for Determination of the Long-Term Design Strength of Stiff Geogrids.
 - b. GG-4(b), Standard Practice for Determination of the Long-Term Design Strength of Flexible Geogrids.
- B. Qualifications:
 - 1. Each manufacturing firm shall demonstrate five years continuous experience, including a minimum of 1,000,000 SQFT of geogrid installation in the past three years.
 - 2. Installer shall attend pre-installation conference.

1.3 DEFINITIONS

- A. Manufacturer: Manufacturer producing geogrid material from resin and additives.
- B. Installer: The Installers are the individuals actually performing the hands-on work in the field.

C. Geogrids:

1. A geogrid is a synthetic planar structure formed by a regular network of tensile strength elements with apertures of sufficiently large size to allow for interlocking with the surrounding soil so as to perform the primary function of reinforcement.
2. Stiff geogrids have a stiffness of 1000 G-CM or higher, when tested in accordance with ASTM D1388.
3. Flexible geogrids have a stiffness of less than 1000 G-CM, when tested in accordance with ASTM D1388.

D. Partial Factor of Safety:

1. Partial factors of safety are applied to the ultimate strength of the geogrid to account for site specific long term environmental and stress conditions.
 - a. FSCR: Partial Factor of Safety for creep deformation.
 - b. FSID: Partial Factor of Safety for installation damage.
 - c. FSCD: Partial Factor of Safety for potential chemical degradation.
 - d. FSBD: Partial Factor of Safety for potential biological degradation.
 - e. FSJCT:
 - 1) Partial Factor of Safety for junction strength to account for the difference between rib and through-the-junction strengths used to determine the ultimate strength and other partial factors of safety of a stiff geogrid.
 - 2) Not applicable to flexible geogrids.
 - f. FSJNT: Partial Factor of Safety for connection strength between multiple geogrid panels.

1.4 SUBMITTALS

A. Shop Drawings for Engineer's approval:

1. Manufacturer's certification that raw materials and roll materials comply with required geogrid physical properties.
2. Manufacturer quality control manuals.
3. Original test results for resins and roll material at frequency specified in respective quality control manuals.
4. Documentation of Partial Factors of Safety in accordance with GRI GG-4.
5. Geogrid layout plan with proposed size, number, position and sequencing of geogrid rolls and direction of all field joints.
6. Proposed details of anchor trench if different than included in the Contract Drawings.
7. Manufacturer's certification of Base Course Improvement/Reduction Factor of 1.3 or higher.
8. Proposed method of placing protective cover soil on side slopes.
 - a. Include documentation that equipment will not damage geogrid.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Geogrids shall be labeled, handled, and stored in accordance with ASTM D4873 and as specified herein.
 - 1. Each roll shall be wrapped in an opaque and waterproof layer of plastic during shipment and storage.
 - 2. The plastic wrapping shall not be removed until deployment.
- B. Each roll shall be labeled with the manufacturer's name, geogrid type, lot number, roll number, and roll dimensions (length, width, gross weight).
 - 1. Geogrid or plastic wrapping damaged as a result of storage or handling shall be repaired or replaced, as directed.
 - 2. Geogrid shall not be exposed to temperatures in excess of 60 DEGC (140 DEGF) or less if recommended by the manufacturer.
- C. No hooks, tongs or other sharp instruments shall be used for handling geogrids.
 - 1. Rolls shall not be lifted by use of cables or chains in contact with the geogrids.
 - 2. Geogrids shall not be dragged along the ground.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
 - 1. Huesker, Inc., 11107-A South Commerce Blvd., Charlotte, NC 28241.
 - 2. Nicolon/Mirafi Group, USA, 365 S. Holland Dr., Pendergrass, GA 30567.
 - 3. The Tensar Corp., 5775-B Glenridge Dr., Atlanta, GA 30328.

2.2 MATERIALS

- A. The geogrid shall be a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the protective cover soil.
 - 1. Mirafi RS380i or approved equal. If or equal is submitted documentation of the Base Course Reduction factor of 1.3 or greater must be submitted for review.
 - 2. The geogrid structure shall be dimensionally stable and able to retain its geometry under construction stresses and shall have high resistance to damage during construction, to ultraviolet degradation, and to all forms of chemical and biological degradation encountered in the soil being reinforced.
- B. The geogrid physical properties shall meet or exceed the minimum values listed below:
 - 1. Long-term allowable: GRI GG-4, >3,100.

2. Design strength (LTDS), LBS/FT: 1200.
- C. The partial Factors of Safety used in the computation of the Long Term Allowable Design Strength shall be in accordance with the following:

STIFF GEOGRIDS						
Value	FSCR	FSID	FSCD	FTBD	FSJCT2	FSJNT
Minimum	1.7	1.2	1.1	1.1	1.0	1.2
Default	NA1	1.4	1.4	1.3	3.0	2.0

FLEXIBLE GEOGRIDS						
Value	FSCR	FSID	FSCD	FTBD	FSJCT2	FSJNT
Minimum	1.7	1.2	1.1	1.1	NA3	1.0
Default	NA1	1.4	1.4	1.3	NA3	2.0

1. Default values shall be used in the absence of test information and documentation.
2. Notes:

a. Default values for determination of FSCR are not permitted.

b. Values for FSJCT may be 1.0 if through the junction testing was used to determine the ultimate strength and other partial factors of safety.

c. FSJCT is not applicable for flexible geogrids.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Care shall be taken to keep the geogrid clean and free from debris prior to installation.
1. If the underlying drainage geocomposite is not free from debris before installation of the geogrid, it shall be cleaned just prior to installation.

3.2 INSTALLATION

- A. Anchor Trenches:

1. Excavate anchor trenches at the locations and to the dimensions shown on the Drawings.

2. Backfill anchor trenches prior to placement of protective cover soil in accordance with Specification Section 31 23 00.

B. Geogrid:

1. The geogrid shall be anchored into a trench as detailed on the Contract Drawings.
2. Adjacent rolls of geogrid shall be abutted tightly and secured by plastic ties approximately every 5 FT along the roll length.
 - a. New geogrids shall be abutted to the existing geogrid in the same manner.
 - b. End splices of rolls and splices on slopes shall not be permitted.
 - c. Plastic ties shall be white or some other bright color for easy inspection.
 - d. Metallic ties shall not be allowed.
3. Handle all geogrid rolls in such a manner as to ensure they are not damaged in any way and the following shall be complied with:
 - a. The geogrid shall be positioned by hand if necessary after being unrolled to minimize wrinklers.
 - b. In the presence of wind, all geogrid in place shall be weighted with sandbags to preclude wind damage to the liner materials below the geogrid.
 - 1) Such sandbags shall be installed during placement and shall remain until protective cover is installed.
4. Geogrids may be temporarily secured in the anchor trenches with sandbags.

C. Protective Soil Cover: See Specification Section 31 23 00.

3.3 FIELD QUALITY CONTROL

- A. Conduct test section to demonstrate that the proposed protective cover soil placement techniques will not damage the geogrid or underlying geosynthetics.

END OF SECTION

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DIVISION 32

EXTERIOR IMPROVEMENTS



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SECTION 32 12 16 - ASPHALTIC CONCRETE VEHICULAR PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Asphaltic concrete vehicular paving.
 - 2. Line painting.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. Federal Specifications (FS):
 - a. TT-P-1952F, Paint, Traffic and Airfield Marking, Waterborne.
 - 2. Construction standards: State of South Dakota, Department of Transportation, "2015", as amended to date.

1.3 SUBMITTALS

- A. Shop Drawings:
 - 1. Product technical data including:
 - a. Contractor shall submit (for COR approval) all data necessary to demonstrate compliance with all specified requirements..
 - b. Manufacturer's installation instructions.
 - c. Asphalt design mix.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Asphaltic Concrete: Per SDDOT Standard Specifications for Roads and Bridges, Class E-1.

https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292

- B. Line Paint:
 - 1. Nonreflective.
 - 2. White.
 - 3. Per SDDOT Standard Specifications for Roads and Bridges Section 633, 980, 981.

2.2 MIXES

- A. Comply with mix design category E-1, SDDOT Specifications Section 320, 321.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Construct to line, grade and section as shown on Drawings and in accordance with referenced State Specifications.
- B. Install an 8 IN compacted layer of aggregate base course, per SDDOT Specification for aggregate base course, in accordance with Section 260 & 882 of the referenced State Specifications.
- C. Install a 5 IN compacted layer of Asphalt Paving in accordance with Section 320, 321 of the referenced State Specifications.

3.2 LINE PAINTING:

- A. Thoroughly clean surfaces which are to receive paint.
- B. Dry completely before paint is applied.
- C. Do not paint until minimum of five days has elapsed from time surface is completed.
 - 1. A longer period may be required if directed by Engineer.
- D. Do not apply paint over wet surfaces, during wet or damp weather, or when temperature is below 40 DEGF.
- E. Lay out markings and striping in accordance with Drawings.
 - 1. Width of painted lines: 4 IN.

END OF SECTION

SECTION 32 15 40 - CRUSHED STONE SURFACING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Crushed Stone surfacing.
 - a. Installed in pull-off areas along Rim Road.
 - b. Other areas indicated and shown on the Drawings.

B. Related Specification Sections include but are not necessarily limited to:

1. Section 31 23 00 – Earthwork.

1.2 QUALITY ASSURANCE

A. Referenced Standards:

1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. T2, Sampling Stone, Slag, Gravel, Sand and Stone Block for Use as Highway materials.
2. ASTM International (ASTM):
 - a. C29, Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate.
 - b. C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - c. D75, Standard Practice for Sampling Aggregates.
 - d. D5821, Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.
3. SDDOT Standard Specifications for Roads and Bridges, 2015 Edition.

1.3 SUBMITTALS

A. Product Data:

1. Contractor shall submit (for COR approval) all data necessary to demonstrate compliance with all specified requirements.
2. Sieve analysis reports on all granular materials.

3. Source tests: submit certified test reports and service records to determine acceptability and application of stone materials.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Crushed Stone Surfacing:
 1. Meet the Requirements of SDDOT Standard Specifications for Roads and Bridges Section 260, 882.

2.2 SOURCE QUALITY CONTROL

- A. Furnish material from a single source.
- B. Obtain samples per ASTM D75 from a local quarry that typically provides material to meet the specification requirements.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Trim and dress all areas to required cross sections.
- B. Bring areas that are below allowable minus tolerance limit to grade by filling with material similar to adjacent material.
- C. Compact to density specified for backfill in accordance with Specification Section 31 23 00.
- D. Do not place any stone on soft, muddy, or frozen material.
- E. Prevent contamination of existing surfacing stone during excavation activities.
- F. Do not place any stone material on prepared base prior to approval by COR.
- G. Meet the Requirements of SDDOT Standard Specifications for Roads and Bridges Section 260.

https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292

3.2 PLACING

- A. Place to required thickness and grades:

1. Depth: +/-0.1 IN.
- B. Place to full thickness in a single operation to avoid displacing the underlying material.
- C. Compact material to a firm uniform layer.
- D. Maintain a neat and dust-free finish surface.
- E. Meet the Requirements of SDDOT Standard Specifications for Roads and Bridges Section 260.

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END OF SECTION

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SECTION 32 16 13 - CONCRETE CURB AND GUTTER

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Concrete curb and gutter.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 03 – Concrete.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. M153, Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
 - b. M171, Standard Specification for Sheet Materials for Curing Concrete.
 - c. M182, Burlap Cloth Made from Jute or Kenef.
 - d. M213, Preformed Expansion Joint Fillers for Concrete Paving and Structure Construction (Nonextruding and Resilient Bituminous Types).
 - e. M233, Boiled Linseed Oil Mixture for Treatment of Portland Cement Concrete.
 - 2. American Concrete Institute (ACI):
 - a. 305R, Hot Weather Concreting.
 - b. 306R, Cold Weather Concreting.
 - 3. ASTM International (ASTM):
 - a. A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - b. C33, Standard Specification for Concrete Aggregates.
 - c. C150, Standard Specification for Portland Cement.
 - d. C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - e. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 FT-LB/FT³).
 - f. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 - g. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

4. Federal Specification (FS):
 - a. SS-S-1614, Sealants, Joint, Jet-Fuel-Resistant, Hot-Applied for Portland Cement and Tar Concrete Pavements.

1.3 SUBMITTALS

A. Shop Drawings:

1. Product technical data including:
 - a. Contractor shall submit (for COR approval) all data necessary to demonstrate compliance with all specified requirements.
2. Mix design(s) in accordance with SDDOT Standard Specifications for Roads and Bridges, Class M6.
https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292
3. Drawings detailing all reinforcing.
4. Test reports:
 - a. Concrete cylinder test results from field quality control.

B. Samples:

1. Samples of fabricated jointing materials and devices.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
 1. Chemical admixtures:
 - a. Sika Chemical Corporation.
 - b. Master Builders Solutions.
 - c. Protex Industries.
 - d. W. R. Grace and Company.

2.2 MATERIALS

A. Portland Cement:

1. SDDOT Standard Specifications for Roads and Bridges Section 380.
https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292

- B. Aggregates:
1. SDDOT Standard Specifications for Roads and Bridges Section 380.
https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292
- C. Water: Potable quality.
- D. Admixtures:
1. Comply with SDDOT Standard Specifications for Roads and Bridges Section 380. https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292
- E. Reinforcing Bars: ASTM A615, Grade 60.
- F. Preformed Joint Filler:
1. Nonextruding cork, self-expanding cork, sponge rubber or cork rubber.
 2. AASHTO M153 or AASHTO M213.
- G. Hot-Poured Joint Sealing Material: FS SS-S-1614.
- H. Membrane Curing Compound: ASTM C309.
- I. Cover Materials for Curing:
1. Burlap:
 - a. AASHTO M182.
 - b. Minimum Class 2, 8 OZ material (1 YD x 42 IN).
 2. Polyethylene film, AASHTO M171.
- J. Concrete Treatment:
1. Boiled linseed oil mixture.
 2. AASHTO M233.
- K. Forms:
1. Steel or wood.
 2. Size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment.
 3. Free of distortion and defects.
 4. Full depth.
 5. Metal side forms:
 - a. Minimum 7/32 IN thick.
 - b. Depth equal to edge thickness of concrete.
 - c. Flat or rounded top minimum 1-3/4 IN wide.
 - d. Base 8 IN wide or equal to height, whichever is less.

- e. Maximum deflection 1/8 IN under center load of 1700 LBS.
- f. Use flexible spring steel forms or laminated boards to form radius bends.

2.3 MIXES

- A. Mix design(s) in accordance with SDDOT Standard Specifications for Roads and Bridges, Class M6. https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292

PART 3 - EXECUTION

3.1 PREPARATION

A. Subgrade Preparation:

- 1. Prepare using methods, procedures, and equipment necessary to attain required compaction densities, elevation and section.
- 2. Scarify and recompact top 8 IN of fills and embankments which will be under concrete curb and gutters.
- 3. Remove soft or spongy areas.
 - a. Replace with aggregate material.
- 4. Compact to the following densities:
 - a. Cohesive soils: 95% per ASTM D698.
- 5. Assure moisture content is within limits prescribed to achieve required compaction density.
- 6. Following compaction, trim and roll to exact cross section.
- 7. Check with approved grading template.
- 8. Perform density tests on subgrade to determine that subgrade complies with the specification.

B. Aggregate Course:

- 1. Place material in not more than 6 IN thick layers.
- 2. Spread, shape, and compact all material deposited on the subgrade during the same day.
- 3. Compact to 95% relative per ASTM D4253 and ASTM D4254.

C. Loose and Foreign Material:

- 1. Remove loose and foreign material immediately before application of paving.

D. Appurtenance Preparation:

- 1. Block out or box out curb inlets and curb returns.
- 2. Provide for joint construction as detailed and dimensioned on Drawings.

3. Adjust manholes, inlets, valve boxes and any other utility appurtenances to design grade.
 - a. Secure to elevation with concrete.
 - b. Place concrete up to 5 IN below design grade.
4. Clean and oil forms.

3.2 INSTALLATION

A. Concrete Production:

1. Comply with SDDOT Standard Specifications for Roads and Bridges.
https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292

B. Forms:

1. Form support:
 - a. Compact soil foundation and cut to grade to support forms and superimposed machine loads.
 - b. Use bearing stakes driven flush with bottom of form to supplement support as necessary.
 - c. Do not use earth pedestals.
2. Staking forms:
 - a. Joint forms neatly and tightly.
 - b. Stake and pin securely with at least three pins for each 10 FT section.
3. Clean and oil forms prior to placement of concrete.
4. Set forms sufficiently in advance of work (minimum of 2 HRS) to permit proper inspection.
5. Previously finished pavement or sidewalk contiguous with new work may serve as side form when specifically approved.

C. Reinforcing:

1. Lap nonwelded bars 12 IN minimum.
2. Support:
 - a. Place bars securely on chairs at called-for height.

D. Joints:

1. Hold locations and alignment to within +1/4 IN.
2. Finish concrete surface adjacent to previous section to within +1/8 IN, with tooled radius of 1/4 IN.

3. Expansion joints:
 - a. Locate at 50 FT intervals and at all intersection curb returns.
 - b. Stake in place load transfer device consisting of dowels.
 - c. Supporting and spacing means and premolded joint filler as per Drawing details.
 - d. Provide preformed joint filler at all junctions with existing curb and gutter or other structures.
 4. Contraction joints:
 - a. Locate at 10 FT intervals.
 - b. Use steel template at least 1/4 IN thick, conforming to cross section of curb and gutter.
 - c. Remove template where concrete has set sufficiently to prevent spalling or adhesion of concrete.
 - d. If machine placed, use tooled joint formed in freshly placed concrete.
 - e. Groove dimensions shall be 3/8 IN at surface and 1/4 IN at root.
 5. Install construction joints at end of day's work or wherever concreting must be interrupted for 30 minutes or more.
 6. Thoroughly clean and fill joints with joint sealing material as specified.
 7. Upper surface of filled joint to be flush to 1/8 IN below finished surface.
- E. Place Concrete:
1. Comply with SDDOT Standard Specifications for Roads and Bridges.
https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292
 2. Construct driveway openings, ramps, and other features as per Drawing details.
- F. Cold and Hot Weather Concreting:
1. Cold weather:
 - a. Cease concrete placing when descending air temperature in shade falls below 40 DEGF.
 - b. Do not resume until ambient temperature has risen to 40 DEGF.
 - c. If placing is authorized below 40 DEGF by Engineer, maintain temperature of mix between 60 and 80 DEGF.
 - d. Heat aggregates or water or both.
 - e. Water temperature may not exceed 175 DEGF.
 - f. Aggregate temperature may not exceed 150 DEGF.
 - g. Remove and replace frost-damaged concrete.
 - h. Salt or other antifreeze is not permitted.
 - i. Comply with ACI 306R.
 2. Hot weather:
 - a. Cease concrete placing when plastic mix temperature cannot be maintained under 90 DEGF.

- b. Aggregates or water or both may be cooled.
- c. Cool water with crushed ice.
- d. Cool aggregates by evaporation of water spray.
- e. Never batch cement hotter than 160 DEGF.
- f. Comply with ACI 305R.

G. Finishing:

- 1. Bring combination curb and gutter to grade by running straightedge over steel templates with sawing motion.
- 2. Float surface with a wood float to draw cement to surface.
- 3. Broom finish after floating.
- 4. Tool edges with suitable edger.
- 5. Upon removal of forms, fill honeycombed or unevenly filled sections immediately with cement mortar.
- 6. Assure that expansion joints are cleared of concrete, both at bottom of gutter and back of curb.

H. Curing:

- 1. Apply membrane curing compound complying with ASTM C309, and in accordance with manufacturer's directions but at a minimum rate of 200 SQFT/GAL.
- 2. Apply curing compound within 4 HRS after finishing or as soon as surface moisture has dissipated.
- 3. Cure for 7 days.
- 4. When average daily temperature is below 50 DEGF, provide insulative protection of 12 IN minimum thickness loose dry straw, or equivalent, for 10 days.

I. Protection of Concrete:

- 1. Protect new curb and gutter and its appurtenances from traffic for minimum of 14 days.
- 2. Repair or replace parts of curb and gutter damaged by traffic, or other causes, occurring prior to final acceptance.

J. Opening to Traffic:

- 1. After 14 days, area may, at Owner's discretion, be opened to traffic if job cured test cylinders have attained a compressive strength of 3,000 LBS per square inch when tested in accordance with ASTM standard methods.
- 2. Prior to opening to traffic, clean and refill joints as required with specified filler material.

K. Clean Up:

- 1. Assure clean up work is completed within two weeks after work has been opened to traffic.
- 2. No new work will begin until clean up work has been completed, or is maintained within two weeks after work has been opened to traffic.

3.3 FIELD QUALITY CONTROL

- A. Provide test cylinders in accordance with SDDOT Standard Specifications for Roads and Bridges , one set for each day of paving and an additional set for every 40 CUYD of concrete placed. https://dot.sd.gov/doing-business/contractors/standard-specifications/2015-standard-specifications#listItemLink_1292

END OF SECTION

SECTION 32 91 13 - TOPSOILING AND FINISHED GRADING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Topsoiling and finished grading.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Section 31 23 00 - Earthwork.
 - 2. Section 32 92 19.23 - Native Grasses and Seeding.
- C. Location of Work: All areas within limits of grading and all areas outside limits of grading which are disturbed in the course of the work.

1.2 SUBMITTALS

- A. Shop Drawings:
 - 1. Project Data: Test reports for contractor furnished topsoil.

1.3 SITE CONDITIONS

- A. Verify amount of topsoil stockpiled and determine amount of additional topsoil, if necessary to complete work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Topsoil:
 - 1. Original surface soil typical of the area.
 - 2. Existing topsoil stockpiled on site.
 - 3. Friable, loamy soil capable of supporting native plant growth.

2.2 TOLERANCES

- A. Finish Grading Tolerance: ± 0.1 FT from required elevations.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Correct, adjust and/or repair rough graded areas.
 - 1. Cut off mounds and ridges.
 - 2. Fill gullies and depressions.
 - 3. Perform other necessary repairs.
 - 4. Bring all sub-grades to specified contours, even and properly compacted.
- B. Loosen surface to depth of 2 IN, minimum.
- C. Remove all stones and debris over 2 IN in any dimension.

3.2 ROUGH GRADE REVIEW

- A. Reviewed by COR in Specification Section 31 23 00.

3.3 PLACING TOPSOIL

- A. Do not place when subgrade is wet or frozen enough to cause clodding.
- B. Spread and lightly compact to a depth of 4 IN for all disturbed earth areas.
- C. If topsoil stockpiled is less than amount required for work, furnish additional topsoil at no cost to Owner.
- D. Provide finished surface free of stones, sticks, or other material 3/8 IN or more in any dimension.
- E. Provide finished surface smooth and true to required grades.
- F. Restore stockpile area to condition of rest of finished work.

3.4 ACCEPTANCE

- A. Upon completion of topsoiling, obtain COR's acceptance of grade and surface.
- B. Make test holes where directed to verify proper placement and thickness of topsoil.

END OF SECTION

SECTION 32 92 19.23 - NATIVE GRASSES AND SEEDING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil preparation.
 - 2. Native grass seeding.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Section 31 23 00 – Earthwork.
 - 2. Section 32 91 13 - Topsoiling and Finished Grading.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. American Nursery and Landscape Association/American National Standards Institute (ANLA/ANSI):
 - a. Z60.1, American Standard for Nursery Stock.
 - 2. AOAC International (AOAC).
 - 3. United States Department of Agriculture (USDA):
 - a. Federal Seed Act (53 Stat. 1275), Rules and Regulations.
- B. Quality Control:
 - 1. Fertilizer:
 - a. If Contracting Officer determines fertilizer requires sampling and testing to verify quality, testing will be done at Contractor's expense, in accordance with current methods of the AOAC.
 - b. Upon completion of Project, a final check of total quantities of fertilizer used will be made against total area seeded.
 - c. If minimum rates of application have not been met, Contractor will be required to distribute additional quantities to make up minimum application specified.

1.3 SUBMITTALS

A. Shop Drawings:

1. Product technical data including:
 - a. Contractor shall submit (for COR approval) all data necessary to demonstrate compliance with all specified requirements.
 - b. Manufacturer's installation instructions.
 - c. Signed copies of vendor's statement for seed mixture required, stating botanical and common name, place of origin, strain, percentage of purity, percentage of germination, and amount of Pure Live Seed (PLS) per bag.
 - d. Type of herbicide to be used during first growing season to contain annual weeds and application rate.
2. Certification that each container of seed delivered will be labeled in accordance with Federal and State Seed Laws and equals or exceeds Specification requirements.

B. Informational Submittals:

1. Copies of invoices for fertilizer used on Project showing grade furnished, along with certification of quality and warranty.
2. Copies of seed bills for seed mix used on Project as well as invoices showing seed mix furnished with certification of quality and warranty.

C. Furnish seed in sealed standard containers labeled with producer's name and seed analysis.

1. Remove from the site seed which has become wet, moldy, or otherwise damaged in transit.

D. Furnish fertilizer uniform in composition, free flowing and suitable for application with approved equipment, delivered to site in bags or other containers, each fully labeled and bearing the name, and warranty of the producer.

1.4 SEQUENCING AND SCHEDULING

A. Installation Schedule:

1. Show schedule of when grass areas are anticipated to be planted.
2. Indicate seeding schedules in relation to schedule for finish grading and topsoiling.
3. Indicate anticipated dates COR will be required to review installation for initial acceptance and final acceptance.

B. Pre-installation Meeting:

1. Meet with COR and other parties as necessary to discuss schedule and methods, unless otherwise indicated by COR.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND SUPPLIERS

- A. Subject to compliance with the Contract Documents, the manufacturers and suppliers listed in the applicable Articles below are acceptable.

2.2 MATERIALS

- A. Seed Quality:
- 1. Fresh, clean, new-crop seed labeled in accordance with USDA Rules and Regulations under the Federal Seed Act in effect on date of bidding.
 - 2. Provide seed of species, proportions, and minimum percentages of purity, germination and maximum percentage of weed seed as specified.
 - 3. Approval of all seed for use shall be based on the accumulative total of PLS specified for each phase of work.
- B. Native Grass Seeding: Certified seed of locally adapted strains.
- 1. Seed mixture:

GRASSES	PERCENT OF MIX	TOTAL VIABILITY
Buffalograss, Sharps Improved II (KNO3)	39.94%	99.00%
Blue Grama, Bad River	26.36%	97.00%
Western Wheatgrass, Rosana	13.98%	95.00%
Sideoats Grama, Butte	12.58%	85.00%
Seed Total:	92.86%	
Inert %	7.14%	

- 2. Cover crop: Sorghum, soybeans, milo, millet or sudangrass.
- C. Mulch:
- 1. For seeded areas:
 - a. Clean, seed-free, threshed straw of oats, wheat, barley, rye, beans, peanuts, or other locally available mulch material which does not contain an excessive quantity of matured seeds of noxious weeds or other species that will grow or be detrimental to seeding, or provide a menace to surrounding land.
 - b. Do not use material which is fresh or excessively brittle, or which is decomposed and will smother or retard growth of grass.

2. Native grass seeded areas: Weed-free hay, excluding brome or bluegrass hay, used on slopes 4:1 or greater.
- D. Fertilizer:
1. Commercial fertilizer meeting applicable requirements of State and Federal law.
 2. Cyanic compound or hydrated lime not permitted in mixed fertilizers.
 3. For native grass seeding: 16-20-0 analysis.
- E. Asphalt Binder: Emulsified asphalt per State specifications.
- F. Water:
1. Water free from substances harmful to grass or sod growth.
 2. Provide water from source approved prior to use.

PART 3 - EXECUTION

3.1 SOIL PREPARATION

- A. General:
1. Limit preparation to areas which will be planted soon after.
 2. Provide facilities to protect and safeguard all persons on or about premises.
 3. Protect existing trees designated to remain.
 4. Verify location and existence of all underground utilities.
 - a. Take necessary precaution to protect existing utilities from damage due to construction activity.
 - b. Repair all damages to utility items at sole expense.
 5. Provide facilities such as protective fences and/or watchmen to protect work from vandalism.
 - a. Contractor to be responsible for vandalism until acceptance of work in whole or in part.
- B. Preparation for Native Grass Seeding:
1. Seeding without cover crop:
 - a. Plow areas to be seeded to shallow depth as soon as ground can be worked without clodding.
 - b. Leave ground fallow until weeds germinate, approximately 3 to 4 weeks.
 - c. Disc entire area again to turn over weeds.
 - d. Disc at least twice prior to planting.
 - e. Cultipack entire area immediately following final disking.

2. Seeding with cover crop:
 - a. Plant cover crop (4 to 8 LBS per acre in rows not exceeding 42 IN width) over all areas to be seeded (optimum planting time – June 1 through July 15).
 - b. Allow cover crop to mature and harvest completely leaving stubble at least 18 IN in field.
 - c. Field is then ready for seeding of native grasses. Lease surface (seedbed) hard to discourage weed growth and erosion. Ground should be undisturbed and uncultivated.

3.2 INSTALLATION

A. Native Grass Seeding:

1. Do not use seed which is wet, moldy, or otherwise damaged.
2. Planting seasons:
 - a. Warm-season grasses: Late spring or early summer; avoid late summer or fall planting unless other-wise approved by COR.
 - b. Cool-season grasses: Early spring or early fall, before or after hot weather, unless otherwise approved by COR.
3. Employ satisfactory methods of sowing using mechanical power-driven drills or seeders, or mechanical hand seeders, or other approved equipment.
 - a. Operate drill as near to contour as practical (a Nisbet grass drill has been proven to be successful in this operation).
4. Areas of 1 acre or less may be sown by hand-broadcasting, mixing seed with generous amount of damp sand to ensure even distribution.
 - a. Harrow or rake seed into ground following seeding to minimum 1/4 IN and maximum 1 IN depth.
5. Seed grasses and forbs at rates prescribed in previous table. Minimum seeding rate is 20 PLS/SQFT.
6. If area is seeded without cover crop, protect newly seeded areas from erosion by mulching with weed-free straw in a continuous blanket using 2 tons per acre and anchor to ground with rolling coulter or a wheatland land packer.
7. Provide initial watering after installation as appropriate for planting conditions.
8. Stop work when work extends beyond most favorable planting season for species designated, or when satisfactory results cannot be obtained because of drought, high winds excessive moisture, or other factors.
 - a. Resume work only when favorable conditions develop.

9. If hydroseeding is used, machinery must be approved, modern, properly equipped and operated by an experienced operator.
 - a. Seed and fertilize at the rate specified.
 - b. Use appropriate shields to protect adjacent site improvements.

3.3 MAINTENANCE AND REPLACEMENT

A. General:

1. Begin maintenance of planted areas immediately after each portion is planted and continue until final acceptance or for a specific time period as stated below, whichever is the longer.
2. Protection of new materials:
 - a. Provide barricades, coverings or other types of protection necessary to prevent damage to existing improvements indicated to remain.
 - b. Repair and pay for all damaged items.
3. Replace unacceptable materials with materials and methods identical to the original specifications unless otherwise approved by the Engineer.

B. Seeded Areas:

1. Maintain all seeded areas until 70% vegetative cover is established after planting is complete.
2. Do not mow bed native grass.
3. Do not allow weeds to exceed a height of 8 IN.
4. Maintenance period begins at completion of planting or installation of entire area to be seeded.
5. COR will review seeded area after installation for initial acceptance.
6. Unacceptable plantings are those areas that do not meet the quality of the specified material, produce the specified results, or were not installed to the specified methods.
7. Replant bare areas using same materials specified.
8. COR will review final acceptability of installed areas at end of maintenance period.
9. Maintain repaired areas until remainder of maintenance period or approved by COR, whichever is the longer period.

END OF SECTION