DEPARTMENT OF TRANSPORTATION

Planning & Engineering
Office of Project Development
700 E Broadway Avenue
Pierre, South Dakota 57501-2586
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dot.sd.gov

September 13, 2024

**ADDENDUM NO. 1**

**RE: Item #1, October 2, 2024 Letting - NH-PH 0385(50)96, PCN 03VD, Pennington County - Grading, Interim Surfacing, Replace Str (2-13x13 CIP & 12x12 CIP RCBC)**

**TO WHOM IT MAY CONCERN:**

The following addenda to the plans shall be inserted and made a part of your proposal for the referenced project.

**SPECIAL PROVISIONS:** Please remove the Index of Special Provisions and replace with attached Index of Special Provisions revised 9/12/24. "Special Provision for Blasting Operations" dated 9/12/24 was added.

Please add the Special Provision for Blasting Operations" dated 9/12/24 after the "Special Provision for Contract Time", dated 8/30/24.

**SDEBS BID PROPOSAL:** *The electronic bid proposal for this contract has been revised to include the changes associated with this addendum. Bidders must log in to the SDEBS to retrieve and incorporate these changes into their bid.*

**Bid Items were added:**
Bid item 270E0040 "Salvage and Stockpile Asphalt Mix and Granular Base Material"

**Bid Items were removed:**
Bid item 620E1120 "Install Fence Post"

**PLANS:** Please destroy sheets A2, A3, B2, and B3 and replace with the enclosed sheets, dated 9/11/24 & 9/13/24.

**Sheet A2 & B2**: **Bid Items were added:**
Bid item 270E0040 "Salvage and Stockpile Asphalt Mix and Granular Base Material"

**Bid Items were removed:**
Bid item 620E1120 "Install Fence Post"

**Sheet A3 & B3**: Estimate of Quantities placement was adjusted.

Sincerely,

Sam Weisgram
Engineering Supervisor

SW/cj

CC: Todd Seaman, Rapid City Region Engineer
Bruce Schroeder, Custer Area Engineer

**REV 9/12/24**

INDEX OF SPECIAL PROVISIONS

**PROJECT NUMBER(S): NH-PH 0385(50)96 PCN: 03VD**

**TYPE OF WORK: GRADING, INTERIM SURFACING, REPLACE STR (2-13X13 CIP & 12X12 CIP RCBC)**

**COUNTY: PENNINGTON**

The following clauses have been prepared subsequent to the Standard Specifications for Roads and Bridges and refer only to the above described improvement, for which the following Proposal is made.

The Contractor's attention is directed to the need for securing from the Department of Environment & Natural Resources, Foss Building, Pierre, South Dakota, permission to remove water from public sources (lakes, rivers, streams, etc.). The Contractor should make his request as early as possible after receiving his contract, and insofar as possible at least 30 days prior to the date that the water is to be used.

Kara Palmer is the official in charge of the Hot Springs Career Center for Pennington County.

**THE FOLLOWING ITEMS ARE INCLUDED IN THIS PROPOSAL FORM:**

**Special Provision for Contract Time, dated 8/30/24.**

**Special Provision for Blasting Operations, dated 9/12/24.**

**Special Provision for Prosecution and Progress, dated 1/21/21.**

**Special Provision for On-The-Job Training Program, dated 3/10/16.**

**Special Provision Regarding Section 404 of the Clean Water Act, dated 8/29/24.**

**Fact Sheet #23.**

**Special Provision for Fire Plan, dated 5/8/14.**

**Special Provision for Contractor Staking with Machine Control Grading Option, dated 9/29/23.**

**List of Utilities.**

Special Provision for Acknowledgment and Certification Regarding Article 3, Section 12 of the South Dakota Constitution, dated 8/24/23.
Special Provision for Buy America, dated 5/1/24.
Special Provision for Liability Insurance, dated 4/21/22.
Special Provision for Responsibility for Damage Claims, dated 4/21/22.
Special Provision for Restriction of Boycott of Israel, dated 1/31/20.

Special Provision for Contractor Administered Preconstruction Meeting, dated 12/18/19.
Fuel Adjustment Affidavit, DOT form 208 dated 7/15.
Standard Title VI Assurance, dated 3/1/16.
Special Provision For Disadvantaged Business Enterprise, dated 2/9/24.
Special Provision For EEO Affirmative Action Requirements on Federal and Federal-Aid Construction Contracts, dated 2/5/24.
Special Provision For Required Contract Provisions Federal-Aid Construction Contracts, Form FHWA 1273 (Rev. October 23, 2023), dated 10/18/23.
Required Contract Provisions Federal-Aid Construction Contracts, Form FHWA 1273 (Rev. 10/23/23).
Special Provision Regarding Minimum Wage on Federal-Aid Projects, dated 10/24/19.
Wage and Hour Division US Department of Labor Washington DC. - US Dept. of Labor Decision Number SD20230032, dated 3/10/23.
Special Provision for Supplemental Specifications to 2015 Standard Specifications for Roads and Bridges, dated 9/7/22.
Special Provision for Price Schedule for Miscellaneous Items, dated 12/6/23.

Special Provision Regarding Storm Water Discharge, dated 5/8/18.
General Permit for Storm Water Discharges Associated with Construction Activities, dated 4/1/18
https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/stormwater/StormWaterConstruction.aspx

# STATE OF SOUTH DAKOTA
# DEPARTMENT OF TRANSPORTATION

## SPECIAL PROVISION
## FOR
## BLASTING OPERATIONS

## PROJECT NH PH 0385(50)96, PCN 03VD
## PENNINGTON COUNTY

## SEPTEMBER 12, 2024

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**I. Description.**

This work consists of the requirements for blasting operations and the excavation of rock slopes.

The Contractor will conduct blasting operations under the most careful supervision. The Contractor will exercise the utmost care not to endanger life or property while using explosives. Nothing herein will release the Contractor from full responsibility for damage or injury resulting from the use of explosives.

Blasting may be required near homes at locations listed below. These locations are not considered to be a complete listing of areas of concern; also, blasting may not be required near all the listed locations. The Contractor is required to inspect the area and identify structures and other property at risk to blast damage prior to engaging in blasting activities.

| Station | L/R |
|---|---|
| 205+00 | R |
| 215+00-220+00 | L |
| 250+00 | L |
| 425+00 | R |
| 510+00 | R |

**II. Submittals.** The Contractor will submit the following items to the Engineer for the Engineer's review and acceptance:

**A.** Resume of the Blasting Consultant;
**B.** Resume of the Blaster in Charge;
**C.** Resume of the Vibration Specialist;
**D.** Proof of current blasting related insurance;
**E.** Manufacturer's data sheets for all explosives, primers, and initiators to be used;

**F.** Copies of all required permits for storage and use of explosives;
**G.** Pre-blast condition survey info;
**H.** Blasting plans for test, controlled, and production blasts;
**I.** Blasting records for test, controlled, and production blasts;
**J.** Video recordings of blasts;
**K.** Vibration monitoring records; and,
**L.** Scaling Foreman and crew qualifications.

**III.** **Special Regulatory Requirements and Submittals.** Special requirements apply to blasts completed within 1000 feet of Pactola Dam abutments or appurtenant structures. The Contractor will coordinate inspection and blasting activities with the United States Bureau of Reclamation (USBR), Rapid City Field Office prior to commencing blasting near Pactola Dam. The use of loose, bulk explosives or blasting agents will not be allowed. Overnight storage of explosives within 1000 feet of the dam abutments is prohibited. The Contractor will obtain permission from the USBR to transport explosives across the dam embankment. The Contractor will provide the following information to the USBR for review:

**A.** Map outlining any planned blasts within 1000 feet of the Pactola Dam abutments or appurtenant structures such as the Visitor Center or structures at the Boat Launch area.
**B.** Planned schedule of blasting activities for USBR use in performing pre and post blast inspection of instruments, structures, and embankment points to ensure dam safety.
**C.** General Blasting Plan, including safety procedures and manufacturer data sheets for all explosives, primers, and initiators to be employed.
**D.** Individual Blast Plans will be submitted to the USBR a minimum of 2 weeks prior to each blast for review. Drilling or blasting will not commence until the Blast Plans has been reviewed by the USBR.
**E.** Pre-blast survey information including photographic or video observation of existing structures within the delineated 1000-foot area.
**F.** Post-blast survey inspection records including photographic or video observation of existing structures to ensure no damage of USBR structures occurred within the delineated 1000-foot area. If maximum permitted thresholds are exceeded, additional surveys may be ordered by the USBR to assess the impact of such exceedance, if any.
**G.** Vibration monitoring data recorded for each blast. The Contractor will coordinate the placement of instrumentation with the USBR. At a minimum, seismographs will be sited at the Visitors Center and each dam abutment. Airblast and Peak Particle Velocity (PPV) will not exceed the permitted maximums listed in the tables below:

| Flat Response Frequency Range of Instrumentation, Hz | Maximum Level, dB |
|---|---|
| 0.1 to 200 | 134 peak |
| 2 to 200 | 133 peak |
| 6 to 200 | 129 peak |
| C-Weighted, slow response | 105 C |

**Table 02305A- Maximum Peak Particle Velocity Permitted at Structures**

| Structure Type | Vibration frequencies (cycles/second) | Peak particle velocity (inches/second) |
|---|---|---|
| Relatively new residential with drywall walls | Below 40<br>Above 40 | 0.75<br>2.0 |
| Older residential with lath and plaster walls, or other structures in precarious condition, sensitive switches | Below 40<br>Above 40 | 0.5<br>2.0 |
| Industrial (more substantial than residential) | -- | 2.0 |
| Government-owned concrete or steel structures, or grouted or treated foundations | -- | 4.0 |
| Embankment dams | | 4.0 |

**IV.** **Blasting Consultant.** The Contractor will retain a recognized Blasting Consultant to assist in blast design. The blast design will include both controlled and production blasting. The Blasting Consultant will be an expert in the field of drilling and blasting who derives their primary source of income from providing specialized blasting or blasting consultant services or instruction on drilling and blasting at a college or university. The Blasting Consultant will not be an employee of the Contractor, explosives manufacturer, or explosives distributor.

Two weeks prior to the preconstruction meeting, the Contractor will submit a resume of credentials for the proposed Blasting Consultant. The Blasting Consultant will have a minimum of 15 years' experience in highway construction. The resume will include a list of at least 3 large scale highway rock excavation projects of which the Blasting Consultant was primarily responsible for the blast design. The list will include a description of the nature and scope of the projects, and the details of executed blast plans and blast plan modifications made during the project. The resume will include the names and contact information for project owners or their representatives who have sufficient knowledge of project details to verify the credentials of the Blasting Consultant. Drilling or blasting operations will not commence until the Blasting Consultant has been accepted by the Engineer.

**V.** **Blaster in Charge.** Two weeks prior to commencement of drilling and blasting operations, the Contactor will employ and designate a Blaster in Charge. The Blaster in Charge will be licensed and authorized under all applicable federal, state, and local laws or regulations to possess, transport, store, and use the types of explosives required for completion of the project. All loading and blasting operations will be performed under the direct supervision of the Blaster in Charge. The Blaster in Charge will ensure safety procedures are followed and record keeping requirements are met.

The Blaster in Charge will have at least 5 years of experience utilizing controlled blasting techniques to create uniform presplit cut faces in similar rock conditions. The Blaster in Charge will possess an Explosives Permit issued by the Bureau of Alcohol, Tobacco, Firearms, and Explosives and a permit to Purchase, Use, Transport, Sell, or Manufacture Explosives issued by the Office of the State Fire Marshal. The Contractor will submit the resume of the Blaster in Charge to the Engineer. The submittal will detail experience and training, and list licenses and permits held relevant to blasting operations.

**VI.** **Pre-Blast Condition Survey.** The Contractor will arrange for a pre-blast survey of any nearby buildings, structures, or utilities that may be potentially at risk from blasting damage. The survey method used will be at the discretion of the Contractor and their insurance company. The Contractor will be responsible for any damage resulting from blasting. The pre-blast survey records will be submitted to the Engineer for review. Occupants of local buildings will be notified by the Contractor a minimum of 24 hours prior to the commencement of blasting.

**VII.** **Vibration Control and Monitoring.** When blasting near buildings, structures, or utilities which may be subject to damage from blast induced ground vibrations, the ground vibrations will be controlled using properly designed delay sequences and allowable charge weights per delay. Allowable charge weights per delay will be based on vibration levels which will not cause damage and will be established by carrying out trial blasts and measuring vibration levels. The trial blasts will be carried out in conformance with blasting test sections and modified as required to limit ground vibrations to a level which will not cause damage.

Whenever vibration damage to adjacent structures is possible, the Contractor will monitor each blast with an approved seismograph located, as approved, between the blast area and the closest structure subject to blast damage. The seismograph used will be capable of recording particle velocity for the three mutually perpendicular components of vibration in the range generally found with controlled blasting.

Peak particle velocity of each component will not be allowed to exceed the safe limits of the nearest structure subject to vibration damage.

The Contractor will employ a qualified independent Vibration Specialist to establish safe vibration limits and oversee the selection, placement, and operation of the seismograph. The Vibration Specialist will interpret the seismograph records to ensure that the seismograph data will be effectively utilized in the control of blasting operations with respect to existing structures. The Vibration Specialist must have a college degree in science or engineering and a minimum of 10 years' experience in seismic monitoring. The Vibration Specialist will not be an employee of the Contactor, explosives manufacturer, explosives distributor, or any other subcontractor. The Contractor will submit the resume of the Vibration Specialist for review and acceptance by the Engineer.

**A.** Data recorded for each blast will be furnished to the Engineer the following working day and prior to any subsequent blasts. Vibration monitoring records will include the following:

1) Identification of instrument used;
2) Name of qualified observer and interpreter;
3) Blast location, date, and time;
4) Distance and direction of seismic recording station from blast area;
5) Weather and site conditions at recording station;
6) Description of the material on which the instrument is sitting;
7) Maximum particle velocity in each component; and,
8) Dated and signed hardcopy printout of recorded data with waveforms, compliance graph, and sensor checks for each shot.

**VIII.** **Safety.** The Blaster in Charge will perform blasting operations in a manner that ensures the safety of project personnel, adjacent properties, and the public. Prior to commencement of drilling and blasting operations, the Blaster in Charge will conduct a pre-blast safety meeting with the Contractor, Blasting Consultant, Vibration Specialist, and the Engineer to address blasting procedures and related safety issues.

Establish a method of warning all project personnel on site of an impending blast. A warning signal will be sounded 5 minutes prior to the blast and a second signal 1 minute before the blast. After the blast, the Contractor will observe the site for a minimum of 5 minutes to guard against rockfall. The Blaster in Charge will then check the area for misfires. An all-clear signal will be sounded when the site is safe to enter, and normal work operations may resume.

Should a misfire occur, the Blaster in Charge will notify the Contractor and Engineer and restrict access to the blast area to only essential personnel. The Blaster in Charge will follow appropriate procedures to determine the cause of the misfire and the measures required to correct it in a safe manner.

The Engineer has the authority to prohibit or halt the Contractor's blasting operations if it is apparent that, through the methods being employed, the required

slopes are not being obtained in a stable condition, or the safety, convenience, or property of the public is being jeopardized.

**IX.** **Use of Explosives.** All blasting operations, including the storage and handling of explosives and blasting agents, will be performed in accordance with the applicable provisions and all other pertinent federal, state, and local regulations. Blasting will be conducted during daylight hours as approved by the Engineer. All explosives and blasting caps used on the project will be less than one year of age. To ensure accuracy of firing times, blasting caps of the same cap period will come from one lot number. The Contractor will adjust types of explosives or blasting accessories to account for changing hole conditions and to achieve specified results.

**X.** **Blasting Test Sections.** Prior to commencing full-scale blasting operations, the Contractor will demonstrate the adequacy of the proposed blast plan by drilling, blasting, and excavating short test sections up to 100 feet in length, to determine which combination of method, hole spacing, and charge works best for the existing geologic conditions. When field conditions warrant, the Contractor may be ordered to use test section lengths less than 100 feet.

Unless otherwise accepted by the Engineer, the Contractor will begin controlled blasting tests with controlled presplit blastholes spaced 30 inches apart, then adjust if needed, until the Engineer accepts the spacing to be used for full-scale blasting operations.

Do not drill ahead of the test shot area until the test section has been excavated and the results evaluated by the Engineer. If the results of the test shot(s) are unsatisfactory, revise the blasting methods, techniques, and procedures to achieve acceptable results.

If, at any time during the progress of work, the methods of drilling and blasting do not produce acceptable results within the tolerances specified; The Contractor will drill, blast, and excavate additional test sections until a technique is determined that will produce acceptable results.

The Contractor will execute test blast sections in compliance with the requirements for controlled and production blasting covered elsewhere in the specifications.

**XI.** **Blasting Plan.** Not less than 2 weeks prior to commencing drilling and blasting operations, or at any time the Contractor proposes to change the drilling and blasting methods, the Contractor will submit a blasting plan to the Engineer for review. The blasting plan will contain full details of the drilling and blasting patterns and controls the Contractor proposes to use for both controlled and production blasting. Blasthole drilling operations will not begin until the blasting plan is reviewed by the Engineer.

**A.** The blasting plan will contain the following minimum information:

**1)** Station limits of proposed shot;

**2)** Plan and section views of the proposed drill pattern including free face, burden, blasthole spacing, blasthole diameters, blasthole angles, lift height, and subdrill depth;

**3)** Loading diagram showing type and amount of explosive, primers, initiators, and location and depth of stemming;

**4)** Initiation sequence of blastholes including delay times and delay system; and,

**5)** Manufacturer data sheets provided for all explosives, primers, and initiators to be employed.

Review of the blasting plan by the Engineer does not relieve the Contractor of their responsibility for the accuracy and adequacy of the plan when implemented in the field.

**XII.** **Blasting Records.** The Contractor is required to complete and submit a record of blasting operations for each blast completed. A blasting report will be submitted to the Engineer prior to the next workday.

**A.** At a minimum, the blasting report will include the following information:

**1)** Date and time of the blast;

**2)** Station limits of the blast;

**3)** Plan view and section view of each blast indicating free face, burden, hole spacing, hole diameter, height of lift, stemming depth, hole angles, and hole depths including subdrill depth;

**4)** Notes regarding drilling operations and subsurface conditions such as soft or fractured zones, water table, and alignment or caving issues;

**5)** Loading diagram indicating types and amounts of explosive, primers, initiators, and location and depth of stemming;

**6)** Trade names and sizes of all explosives, primers, and initiators employed;

**7)** Initiation sequence of blastholes including delay times and delay system;

**8)** Remarks regarding the execution and results of the shot including damage, misfires, fly rock, rockfalls, discovery of abandoned mine workings or voids, and equipment malfunctions;

**9)** Video recordings of each blast using a proven method accepted by the Engineer during test blasting. Video recordings will be indexed to properly identify each specific blast. Videotapes, film, photographs, or electronic files will become part of the project records; and,

**10)** Signature of the Blaster in Charge.

**XIII.** **Controlled Blasting.** When blasting to establish slopes ¾:1 or steeper the Contractor will use controlled blasting. Controlled blasting will be used to minimize damage to the rock backslope and ensure long-term stability. The Engineer may

require the Contractor to use controlled blasting to form the faces of slopes, even if the main excavation can be ripped.

Controlled blasting refers to the controlled use of explosives and blasting accessories in carefully spaced and aligned drill holes to produce a planar face or shear plane in the rock along the specified excavation backslope. Controlled blasting techniques covered by the provisions include presplitting and cushion (trim) blasting.

When presplitting, the detonation of the holes along the presplit line will occur before the detonation of any production holes.

Cushion blasting requires detonation of the cut face holes after the detonation of the production holes.

**A.** The Contractor will perform controlled blasting in accordance with the following requirements:

**1)** Prior to commencing full-scale blasting operations, the Contractor will demonstrate the adequacy of the proposed blast plan by completing trial blasts in accordance with the provisions of blasting test sections.

**2)** The Contractor will completely remove all overburden, soil, and loose or decomposed rock along the top of the excavation for a distance of at least 30 feet beyond the end of the production hole drilling limits, or the end of the cut, before drilling the presplit holes.

**3)** Potentially dangerous boulders or other unstable material outside of the excavation limits will be removed or stabilized as ordered by the Engineer.

**4)** The presplit drill holes will not be less than 2 ½ inches nor more than 3 inches in diameter.

**5)** The Contractor will control drilling operations using proper equipment and technique to ensure that no hole deviates from the plane of the planned slope by more than 9 inches either parallel or normal to the slope.

**6)** Presplit holes will extend a minimum of 30 feet beyond the limits of the production holes to be detonated, or to the end of the cut as applicable.

**7)** The length of the presplit holes for any individual lift will not exceed 30 feet unless the Contractor can demonstrate to the Engineer the ability to stay within the above tolerances and produce a uniform slope. Upon review and acceptance by the Engineer, the length of the holes may be increased to a maximum of 60 feet. If greater than 5 percent of the presplit holes are misaligned in any one lift, the Contractor will reduce the height of the lifts until the 9-inch alignment tolerance is met.

**8)** When the cut height will require more than one lift, a maximum 2-foot offset between lifts will be permitted to allow for drill equipment clearances. The Contractor will begin the controlled blast hole drilling at a point that will allow for necessary offsets and will adjust, at the start of the lower lifts, to compensate for any drift that may have occurred in the upper lifts.

**9)** Before placing charges, the Contractor will confirm that the hole is free of obstruction for its entire depth. All necessary precautions will be exercised so that the placing of the charges will not cause caving of material from the walls of the holes.

**10)** The maximum diameter of explosives used in presplit holes will not be greater than ½ the diameter of the presplit hole.

**11)** Only standard explosives manufactured especially for presplitting will be used in presplit holes. Bulk ammonium nitrate and fuel oil (ANFO) will not be allowed to be loaded in the presplit holes.

**12)** If fractional portions of standard explosive cartridges are used, they will be firmly affixed to the detonating cord in a manner that the cartridges will not slip down the detonating cord nor bridge across the hole. Spacing of fractional cartridges along the length of the detonating cord will not exceed 30 inches center to center and will be adjusted to give the desired results.

**13)** Continuous column cartridge type of explosives used with detonating cord will be assembled and affixed to the detonating cord in accordance with the explosive manufacturer's instructions, a copy of which will be furnished to the Engineer.

**14)** The bottom charge of a presplit hole may be larger than the line charges but will not be large enough to cause overbreak. The top charge of the presplitting hole will be placed far enough below the collar, and reduced sufficiently, to avoid overbreak and heaving.

**15)** The upper portion of all presplit holes, from the topmost charge to the hole collar, will be stemmed. Stemming materials will be sand or other dry angular material, all of which passes a 3/8-inch sieve.

**16)** Tunneling methods or horizontal blast holes for either production or controlled blasting is prohibited.

**XIV.** **Production Blasting.** The Contractor will take all necessary precautions in performing production blasting to minimize blast damage to the backslope.

The row of production blast holes adjacent to the presplit blast line will be drilled on a plane parallel to the controlled blast line. Production blast holes will not be drilled closer than 6 feet to the controlled blast line, unless approved by the Engineer. The bottom of the production holes will not be lower than the bottom of the controlled blast holes. Production holes will not exceed 6-inches in diameter, unless approved by the Engineer. Detonation of production holes will be on a delay sequence toward a free face. Stemming material used in production holes will be sand or other dry angular material, which passes a 3/8-inch sieve.

**XV.** **Scaling.** The site will be cleared of boulders and debris prior to beginning blasting work. Upon completion of each blast, inspect rock surfaces and scale loose rock and other debris as required. No loose rock will be left on shot or ripped and dozed slopes. Loose or hanging rock which creates a potentially dangerous situation will be removed or stabilized to the satisfaction of the Engineer as the depth of cut progresses. Drilling of the next lift will not be allowed until scaling work is completed on the shot and excavated lift.

Potentially dangerous loose rock, overhangs, or other material beyond the excavation limits will be removed or stabilized as ordered by the Engineer.

Manually scale the slopes using a suitable standard steel mine-scaling rod. Other methods such as machine scaling, hydraulic splitting, or light blasting may be used in lieu of or supplemental to hand scaling as approved by the Engineer.

Manual scaling will be completed by a trained and certified scaling crew. A Scaling crew consists of a working foreman and two scalers clipped onto ropes and working on the slope. Manual scaling will not be allowed when the foreman is absent or with less than 2 scalers. Two weeks prior to beginning scaling operations, the Contractor will provide:

1. Documentation confirming that the foreman is certified as a Level 2 or higher Technician by the Society of Professional Rope Access Technicians (SPRAT) or Level 2 or higher Slope Access Technician by the Professional Climbing Instructors Association (PCIA) or provide documentation that they have acquired the equivalent knowledge, skills, and abilities required for Level 2 certification by SPRAT or the PCIA; and,

2. Documentation confirming that the rock slope scalers are certified as Level 1 or higher Technicians by SPRAT or Level 1 or higher Slope Access Technicians by the PCIA or provide documentation that they have acquired the equivalent knowledge, skills, and abilities required for Level 1 certification by SPRAT or the PCIA.

The Contractor will not begin work until submittals have been reviewed and accepted by the Engineer.

Payment for all methods of scaling excavated slopes will be incidental to the contract unit price for Unclassified/Rock Excavation.

Payment for manual scaling outside of the excavation limits will be by the Crew Hour. If there are more than 1 working foreman and 2 scalers on the slope, the Crew Hours will be prorated based on the number of scalers over the standard 3-person crew.

Manual scaling from a manlift or another piece of equipment will be incidental to the manual scaling items.

Payment for mechanical scaling, blasting, or stabilizing material beyond the excavation limits will be at the negotiated price for each method.

## XVI. Measurement and Payment.

Measurement for blasting operations will be to the nearest cubic yard of Unclassified/Rock Excavation. All costs associated with blasting operations will be incidental to contract unit price per cubic yard for Unclassified/Rock Excavation.

Payment for scaling of slopes within the excavation limits will be incidental to the contract unit price for Unclassified/Rock Excavation.

Measurement and payment for manual scaling outside of the excavation limits will be by the Crew Hour measured to the nearest 0.5 hr.

Measurement and payment for mechanical scaling, blasting, or stabilizing material beyond the excavation limits will be at the negotiated price for each method.

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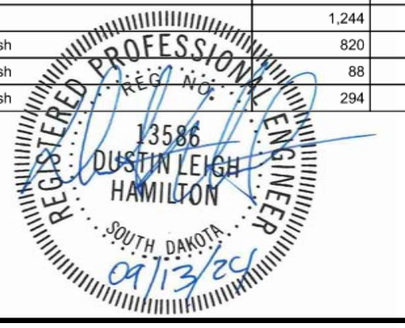
# ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

Rev 7/22/2024 SBS
Rev 9/11/2024 GCE
Rev 9/13/2024 GCE

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|---|---|---|---|
| | NH-PH-B 0385(51)87 | A2 | A9 |

## Section B - Grading

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 004E0030 | Maintenance of Traffic Diversion(s) | Lump Sum | LS |
| 004E0050 | Remove Traffic Diversion(s) | Lump Sum | LS |
| 009E0010 | Mobilization | Lump Sum | LS |
| 009E3220 | Reestablish Right-of-Way and Property Corner | 382 | Each |
| 009E3225 | Reestablish Public Land Survey System Corner | 2 | Each |
| 009E3230 | Grade Staking | 8.990 | Mile |
| 009E3250 | Miscellaneous Staking | 8.462 | Mile |
| 009E3280 | Slope Staking | 8.462 | Mile |
| 009E3290 | Structure Staking | 2 | Each |
| 009E3301 | Engineer Directed Surveying/Staking | 200.0 | Hour |
| 009E4200 | Construction Schedule, Category II | Lump Sum | LS |
| 100E0100 | Clearing | Lump Sum | LS |
| 110E0300 | Remove Concrete Curb and/or Gutter | 1,210 | Ft |
| 110E0400 | Remove Drop Inlet | 15 | Each |
| 110E0550 | Remove Cattle Guard | 1 | Each |
| 110E0600 | Remove Fence | 33,827 | Ft |
| 110E0730 | Remove Beam Guardrail | 17,114.0 | Ft |
| 110E0800 | Remove W Beam Guardrail End Terminal | 50 | Each |
| 110E1050 | Remove Asphalt Concrete Approach Pavement | 6,602.0 | SqYd |
| 120E1000 | Muck Excavation | 21,144 | CuYd |
| 120E1100 | Unclassified/Rock Excavation | 1,498,226 | CuYd |
| 120E2000 | Undercutting | 58,607 | CuYd |
| 120E6100 | Water for Embankment | 12,343.9 | MGal |
| 240E0010 | Obliterate Old Road | 28 | Sta |
| 250E0020 | Incidental Work, Grading | Lump Sum | LS |
| 260E6010 | Granular Material | 200.0 | Ton |
| 270E0040 | Salvage and Stockpile Asphalt Mix and Granular Base Material | 108,754.0 | Ton |
| 421E0100 | Pipe Culvert Undercut | 1,216 | CuYd |
| 450E0122 | 18" RCP Class 2, Furnish | 14 | Ft |
| 450E0130 | 18" RCP, Install | 14 | Ft |
| 450E0142 | 24" RCP Class 2, Furnish | 1,712 | Ft |
| 450E0143 | 24" RCP Class 3, Furnish | 418 | Ft |
| 450E0144 | 24" RCP Class 4, Furnish | 180 | Ft |
| 450E0150 | 24" RCP, Install | 2,310 | Ft |
| 450E0162 | 30" RCP Class 2, Furnish | 910 | Ft |
| 450E0163 | 30" RCP Class 3, Furnish | 66 | Ft |
| 450E0164 | 30" RCP Class 4, Furnish | 152 | Ft |
| 450E0165 | 30" RCP Class 5, Furnish | 116 | Ft |
| 450E0170 | 30" RCP, Install | 1,244 | Ft |
| 450E0182 | 36" RCP Class 2, Furnish | 820 | Ft |
| 450E0183 | 36" RCP Class 3, Furnish | 88 | Ft |
| 450E0184 | 36" RCP Class 4, Furnish | 294 | Ft |




| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 450E0185 | 36" RCP Class 5, Furnish | 84 | Ft |
| 450E0190 | 36" RCP, Install | 1,286 | Ft |
| 450E0202 | 48" RCP Class 2, Furnish | 164 | Ft |
| 450E0210 | 48" RCP, Install | 164 | Ft |
| 450E0212 | 54" RCP Class 2, Furnish | 610 | Ft |
| 450E0220 | 54" RCP, Install | 610 | Ft |
| 450E0223 | 60" RCP Class 3, Furnish | 106 | Ft |
| 450E0224 | 60" RCP Class 4, Furnish | 70 | Ft |
| 450E0230 | 60" RCP, Install | 176 | Ft |
| 450E2016 | 24" RCP Flared End, Furnish | 6 | Each |
| 450E2017 | 24" RCP Flared End, Install | 6 | Each |
| 450E2024 | 30" RCP Flared End, Furnish | 4 | Each |
| 450E2025 | 30" RCP Flared End, Install | 4 | Each |
| 450E2028 | 36" RCP Flared End, Furnish | 13 | Each |
| 450E2029 | 36" RCP Flared End, Install | 13 | Each |
| 450E2036 | 48" RCP Flared End, Furnish | 4 | Each |
| 450E2037 | 48" RCP Flared End, Install | 4 | Each |
| 450E2040 | 54" RCP Flared End, Furnish | 12 | Each |
| 450E2041 | 54" RCP Flared End, Install | 12 | Each |
| 450E2044 | 60" RCP Flared End, Furnish | 2 | Each |
| 450E2045 | 60" RCP Flared End, Install | 2 | Each |
| 450E2200 | 24" RCP Sloped End, Furnish | 27 | Each |
| 450E2201 | 24" RCP Sloped End, Install | 27 | Each |
| 450E2204 | 30" RCP Sloped End, Furnish | 13 | Each |
| 450E2205 | 30" RCP Sloped End, Install | 13 | Each |
| 450E2304 | 18" RCP Safety End, Furnish | 1 | Each |
| 450E2307 | 18" RCP Safety End, Install | 1 | Each |
| 450E3052 | 48" RCP Arch Class 2, Furnish | 384 | Ft |
| 450E3060 | 48" RCP Arch, Install | 384 | Ft |
| 450E4520 | 48" RCP Arch Flared End, Furnish | 6 | Each |
| 450E4521 | 48" RCP Arch Flared End, Install | 6 | Each |
| 450E4759 | 18" CMP 16 Gauge, Furnish | 564 | Ft |
| 450E4760 | 18" CMP, Install | 564 | Ft |
| 450E4769 | 24" CMP 16 Gauge, Furnish | 1,240 | Ft |
| 450E4770 | 24" CMP, Install | 1,240 | Ft |
| 450E4779 | 30" CMP 16 Gauge, Furnish | 520 | Ft |
| 450E4780 | 30" CMP, Install | 520 | Ft |
| 450E4789 | 36" CMP 16 Gauge, Furnish | 952 | Ft |
| 450E4790 | 36" CMP, Install | 952 | Ft |
| 450E5015 | 24" CMP Elbow, Furnish | 24 | Each |
| 450E5016 | 24" CMP Elbow, Install | 24 | Each |
| 450E5020 | 30" CMP Elbow, Furnish | 8 | Each |
| 450E5021 | 30" CMP Elbow, Install | 8 | Each |

**INDEX OF SHEETS**


| | |
|---|---|
| A2 and A4 | Estimate of Quantities for Sections B, C, D, E, F, M, and S |
| A5 to A9 | Environmental Commitments |


| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 450E5025 | 36" CMP Elbow, Furnish | 15 | Each |
| 450E5026 | 36" CMP Elbow, Install | 15 | Each |
| 450E5215 | 24" CMP Flared End, Furnish | 3 | Each |
| 450E5216 | 24" CMP Flared End, Install | 3 | Each |
| 450E5223 | 36" CMP Flared End, Furnish | 10 | Each |
| 450E5224 | 36" CMP Flared End, Install | 10 | Each |
| 450E5306 | 18" CMP Sloped End, Furnish | 11 | Each |
| 450E5307 | 18" CMP Sloped End, Install | 11 | Each |
| 450E5310 | 24" CMP Sloped End, Furnish | 22 | Each |
| 450E5311 | 24" CMP Sloped End, Install | 22 | Each |
| 450E5314 | 30" CMP Sloped End, Furnish | 5 | Each |
| 450E5315 | 30" CMP Sloped End, Install | 5 | Each |
| 450E8014 | 24" RCP to CMP Transition, Furnish | 8 | Each |
| 450E8015 | 24" Pipe Transition, Install | 8 | Each |
| 450E8019 | 30" RCP to CMP Transition, Furnish | 3 | Each |
| 450E8020 | 30" Pipe Transition, Install | 3 | Each |
| 450E8024 | 36" RCP to CMP Transition, Furnish | 7 | Each |
| 450E8025 | 36" Pipe Transition, Install | 7 | Each |
| 462E0100 | Class M6 Concrete | 25.9 | CuYd |
| 464E0100 | Controlled Density Fill | 216.8 | CuYd |
| 480E0100 | Reinforcing Steel | 4,715 | Lb |
| 600E0300 | Type III Field Laboratory | 1 | Each |
| 610E0124 | 24' Cattle Guard with Wings | 1 | Each |
| 610E0424 | 24' Precast Concrete Cattle Guard Foundation | 1 | Each |
| 620E0010 | Type 1 Right-of-Way Fence | 1,112 | Ft |
| 620E0020 | Type 2 Right-of-Way Fence | 31,039 | Ft |
| 620E0030 | Type 3 Right-of-Way Fence | 310 | Ft |
| 620E0120 | Type 2s Right-of-Way Fence | 225 | Ft |
| 620E0520 | Type 2 Temporary Fence | 26,271 | Ft |
| 620E0610 | Type 1s Temporary Fence | 225 | Ft |
| 620E0620 | Type 2s Temporary Fence | 215 | Ft |
| 620E1020 | 2 Post Panel | 174 | Each |
| 620E1030 | 3 Post Panel | 32 | Each |
| 620E2014 | 14' Tubular Gate | 1 | Each |
| 620E2016 | 16' Tubular Gate | 1 | Each |
| 650E0060 | Type B66 Concrete Curb and Gutter | 352 | Ft |
| 650E0360 | Type BL66 Concrete Curb and Gutter | 158 | Ft |
| 650E1060 | Type F66 Concrete Curb and Gutter | 247 | Ft |
| 650E1360 | Type FL66 Concrete Curb and Gutter | 597 | Ft |
| 650E2100 | Special Concrete Curb and Gutter | 30 | Ft |
| 650E6260 | 6" Concrete Valley Gutter | 27.7 | SqYd |
| 670E2200 | Type C Frame and Grate | 1 | Each |
| 671E6007 | Type A7 Manhole Frame and Lid | 2 | Each |

Rev 8/7/2024 SBS
Rev 9/11/2024 GCE

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|---|---|---|---|
| | NH-PH-B 0385(51)87 | A3 | A9 |

## Section B – Grading, Continued

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 700E0210 | Class B Riprap | 521.9 | Ton |
| 700E0410 | Class D Riprap | 417.0 | Ton |
| 720E1015 | Bank and Channel Protection Gabion | 399.0 | CuYd |
| 831E0110 | Type B Drainage Fabric | 5,220 | SqYd |
| 831E0300 | Reinforcement Fabric (MSE) | 300 | SqYd |
| 900E0010 | Refurbish Single Mailbox | 7 | Each |
| 900E0012 | Refurbish Double Mailbox | 6 | Each |
| 900E0015 | Multiple Mailbox Support | 3 | Each |
| 900E1150 | Right of Way Marker | 324 | Each |
| * 900E2030 | Miscellaneous Work | 1 | Site |

* ▪ Denotes Non-Participating

## Section B - Grading - Alternate A

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 120E1100 | Unclassified/Rock Excavation | 73,877 | CuYd |
| 450E0162 | 30" RCP Class 2, Furnish | 32 | Ft |
| 450E0164 | 30" RCP Class 4, Furnish | 72 | Ft |
| 450E0165 | 30" RCP Class 5, Furnish | 122 | Ft |
| 450E0170 | 30" RCP, Install | 226 | Ft |
| 450E0192 | 42" RCP Class 2, Furnish | 58 | Ft |
| 450E0193 | 42" RCP Class 3, Furnish | 90 | Ft |
| 450E0194 | 42" RCP Class 4, Furnish | 128 | Ft |
| 450E0195 | 42" RCP Class 5, Furnish | 166 | Ft |
| 450E0196 | 42" RCP Class 4000D, Furnish | 92 | Ft |
| 450E0198 | 42" RCP Class 5000D, Furnish | 138 | Ft |
| 450E0200 | 42" RCP, Install | 672 | Ft |
| 450E0213 | 54" RCP Class 3, Furnish | 74 | Ft |
| 450E0214 | 54" RCP Class 4, Furnish | 50 | Ft |
| 450E0215 | 54" RCP Class 5, Furnish | 68 | Ft |
| 450E0218 | 54" RCP Class 4500D, Furnish | 136 | Ft |
| 450E0220 | 54" RCP, Install | 328 | Ft |
| 450E2024 | 30" RCP Flared End, Furnish | 2 | Each |
| 450E2025 | 30" RCP Flared End, Install | 2 | Each |
| 450E2032 | 42" RCP Flared End, Furnish | 3 | Each |
| 450E2033 | 42" RCP Flared End, Install | 3 | Each |
| 450E2040 | 54" RCP Flared End, Furnish | 2 | Each |
| 450E2041 | 54" RCP Flared End, Install | 2 | Each |
| 450E4799 | 42" CMP 16 Gauge, Furnish | 100 | Ft |
| 450E4800 | 42" CMP, Install | 100 | Ft |
| 450E5030 | 42" CMP Elbow, Furnish | 2 | Each |
| 450E5031 | 42" CMP Elbow, Install | 2 | Each |
| 450E5227 | 42" CMP Flared End, Furnish | 1 | Each |
| 450E5228 | 42" CMP Flared End, Install | 1 | Each |
| 450E8029 | 42" RCP to CMP Transition, Furnish | 1 | Each |
| 450E8030 | 42" Pipe Transition, Install | 1 | Each |

## Section B - Grading - Alternate B

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 450E0162 | 30" RCP Class 2, Furnish | 32 | Ft |
| 450E0164 | 30" RCP Class 4, Furnish | 48 | Ft |
| 450E0170 | 30" RCP, Install | 80 | Ft |
| 450E0192 | 42" RCP Class 2, Furnish | 58 | Ft |
| 450E0193 | 42" RCP Class 3, Furnish | 58 | Ft |
| 450E0194 | 42" RCP Class 4, Furnish | 102 | Ft |
| 450E0195 | 42" RCP Class 5, Furnish | 56 | Ft |
| 450E0200 | 42" RCP, Install | 274 | Ft |
| 450E0213 | 54" RCP Class 3, Furnish | 74 | Ft |
| 450E0214 | 54" RCP Class 4, Furnish | 54 | Ft |
| 450E0215 | 54" RCP Class 5, Furnish | 24 | Ft |
| 450E0220 | 54" RCP, Install | 152 | Ft |
| 450E2024 | 30" RCP Flared End, Furnish | 1 | Each |
| 450E2025 | 30" RCP Flared End, Install | 1 | Each |
| 450E2032 | 42" RCP Flared End, Furnish | 3 | Each |
| 450E2033 | 42" RCP Flared End, Install | 3 | Each |
| 450E2040 | 54" RCP Flared End, Furnish | 2 | Each |
| 450E2041 | 54" RCP Flared End, Install | 2 | Each |
| 450E4799 | 42" CMP 16 Gauge, Furnish | 156 | Ft |
| 450E4800 | 42" CMP, Install | 156 | Ft |
| 450E5030 | 42" CMP Elbow, Furnish | 2 | Each |
| 450E5031 | 42" CMP Elbow, Install | 2 | Each |
| 450E5219 | 30" CMP Flared End, Furnish | 1 | Each |
| 450E5220 | 30" CMP Flared End, Install | 1 | Each |
| 450E5227 | 42" CMP Flared End, Furnish | 1 | Each |
| 450E5228 | 42" CMP Flared End, Install | 1 | Each |
| 450E7630 | 30" Steel Pipe, Furnish | 146 | Ft |
| 450E7642 | 42" Steel Pipe, Furnish | 346 | Ft |
| 450E7654 | 54" Steel Pipe, Furnish | 176 | Ft |
| 450E8017 | 30" Concrete/Steel Pipe Transition, Furnish | 1 | Each |
| 450E8020 | 30" Pipe Transition, Install | 1 | Each |
| 450E8027 | 42" Concrete/Steel Pipe Transition, Furnish | 3 | Each |
| 450E8030 | 42" Pipe Transition, Install | 3 | Each |
| 450E8037 | 54" Concrete/Steel Pipe Transition, Furnish | 2 | Each |
| 450E8040 | 54" Pipe Transition, Install | 2 | Each |
| 451E5130 | Bore and Jack 30" Pipe | 146 | Ft |
| 451E5142 | Bore and Jack 42" Pipe | 346 | Ft |
| 451E5154 | Bore and Jack 54" Pipe | 176 | Ft |

## Section C - Traffic Control

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 110E7150 | Remove Sign for Reset | 1 | Each |
| 120E6000 | Water for Dust Control | 5,000.0 | MGal |
| 205E0010 | Dust Control Chloride | 107,230 | Lb |
| 260E3500 | Temporary Gravel Surfacing | 9,350.0 | Ton |
| 632E2510 | Type 2 Object Marker Back to Back | 4 | Each |
| 632E3500 | Reset Sign | 1 | Each |
| 634E0010 | Flagging | 20,000.0 | Hour |
| 634E0020 | Pilot Car | 6,000.0 | Hour |
| 634E0110 | Traffic Control Signs | 2,279.2 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 634E0275 | Type 3 Barricade | 42 | Each |
| 634E0525 | Linear Delineation System Panel, Barrier Mounted | 326 | Each |
| 634E0560 | Remove Pavement Marking, 4" or Equivalent | 1,500 | Ft |
| 634E0700 | Traffic Control Movable Concrete Barrier | 326 | Each |
| 634E0705 | Remove and Reset Traffic Control Movable Concrete Barrier | 86 | Each |
| 634E0750 | Temporary Concrete Barrier End Protection | 8 | Each |
| 634E0755 | Remove and Reset Temporary Concrete Barrier End Protection | 4 | Each |
| 634E0760 | Temporary Concrete Barrier End Protection Module Set or Repair Kit | 2 | Each |
| 634E1002 | Detour and Restriction Signing | 2,316.2 | SqFt |
| 634E1215 | Contractor Furnished Portable Changeable Message Sign | 3 | Each |
| 634E2025 | Longitudinal Pedestrian Barrier | 240 | Ft |

Rev 7/22/2024 SBS
Rev 9/11/2024 GCE
Rev 9/13/2024 GCE

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|---|---|---|---|
| | NH-PH-B 0385(51)8 | B2 | B105 |

## SECTION B ESTIMATE OF QUANTITIES

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 004E0030 | Maintenance of Traffic Diversion(s) | Lump Sum | LS |
| 004E0050 | Remove Traffic Diversion(s) | Lump Sum | LS |
| 009E0010 | Mobilization | Lump Sum | LS |
| 009E3220 | Reestablish Right-of-Way and Property Corner | 382 | Each |
| 009E3225 | Reestablish Public Land Survey System Corner | 2 | Each |
| 009E3230 | Grade Staking | 8.990 | Mile |
| 009E3250 | Miscellaneous Staking | 8.462 | Mile |
| 009E3280 | Slope Staking | 8.462 | Mile |
| 009E3290 | Structure Staking | 2 | Each |
| 009E3301 | Engineer Directed Surveying/Staking | 200.0 | Hour |
| 009E4200 | Construction Schedule, Category II | Lump Sum | LS |
| 100E0100 | Clearing | Lump Sum | LS |
| 110E0300 | Remove Concrete Curb and/or Gutter | 1,210 | Ft |
| 110E0400 | Remove Drop Inlet | 15 | Each |
| 110E0550 | Remove Cattle Guard | 1 | Each |
| 110E0600 | Remove Fence | 33,827 | Ft |
| 110E0730 | Remove Beam Guardrail | 17,114.0 | Ft |
| 110E0800 | Remove W Beam Guardrail End Terminal | 50 | Each |
| 110E1050 | Remove Asphalt Concrete Approach Pavement | 6,602.0 | SqYd |
| 120E1000 | Muck Excavation | 21,144 | CuYd |
| 120E1100 | Unclassified/Rock Excavation | 1,498,226 | CuYd |
| 120E2000 | Undercutting | 58,607 | CuYd |
| 120E6100 | Water for Embankment | 12,343.9 | MGal |
| 240E0010 | Obliterate Old Road | 28 | Sta |
| 250E0020 | Incidental Work, Grading | Lump Sum | LS |
| 260E6010 | Granular Material | 200.0 | Ton |
| 270E0040 | Salvage and Stockpile Asphalt Mix and Granular Base Material | 108,754.0 | Ton |
| 421E0100 | Pipe Culvert Undercut | 1,216 | CuYd |
| 450E0122 | 18" RCP Class 2, Furnish | 14 | Ft |
| 450E0130 | 18" RCP, Install | 14 | Ft |
| 450E0142 | 24" RCP Class 2, Furnish | 1,712 | Ft |
| 450E0143 | 24" RCP Class 3, Furnish | 418 | Ft |
| 450E0144 | 24" RCP Class 4, Furnish | 180 | Ft |
| 450E0150 | 24" RCP, Install | 2,310 | Ft |
| 450E0162 | 30" RCP Class 2, Furnish | 910 | Ft |
| 450E0163 | 30" RCP Class 3, Furnish | 66 | Ft |
| 450E0164 | 30" RCP Class 4, Furnish | 152 | Ft |
| 450E0165 | 30" RCP Class 5, Furnish | 116 | Ft |
| 450E0170 | 30" RCP, Install | 1,244 | Ft |
| 450E0182 | 36" RCP Class 2, Furnish | 820 | Ft |
| 450E0183 | 36" RCP Class 3, Furnish | 88 | Ft |
| 450E0184 | 36" RCP Class 4, Furnish | 294 | Ft |

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 450E0185 | 36" RCP Class 5, Furnish | 84 | Ft |
| 450E0190 | 36" RCP, Install | 1,286 | Ft |
| 450E0202 | 48" RCP Class 2, Furnish | 164 | Ft |
| 450E0210 | 48" RCP, Install | 164 | Ft |
| 450E0212 | 54" RCP Class 2, Furnish | 610 | Ft |
| 450E0220 | 54" RCP, Install | 610 | Ft |
| 450E0223 | 60" RCP Class 3, Furnish | 106 | Ft |
| 450E0224 | 60" RCP Class 4, Furnish | 70 | Ft |
| 450E0230 | 60" RCP, Install | 176 | Ft |
| 450E2016 | 24" RCP Flared End, Furnish | 6 | Each |
| 450E2017 | 24" RCP Flared End, Install | 6 | Each |
| 450E2024 | 30" RCP Flared End, Furnish | 4 | Each |
| 450E2025 | 30" RCP Flared End, Install | 4 | Each |
| 450E2028 | 36" RCP Flared End, Furnish | 13 | Each |
| 450E2029 | 36" RCP Flared End, Install | 13 | Each |
| 450E2036 | 48" RCP Flared End, Furnish | 4 | Each |
| 450E2037 | 48" RCP Flared End, Install | 4 | Each |
| 450E2040 | 54" RCP Flared End, Furnish | 12 | Each |
| 450E2041 | 54" RCP Flared End, Install | 12 | Each |
| 450E2044 | 60" RCP Flared End, Furnish | 2 | Each |
| 450E2045 | 60" RCP Flared End, Install | 2 | Each |
| 450E2200 | 24" RCP Sloped End, Furnish | 27 | Each |
| 450E2201 | 24" RCP Sloped End, Install | 27 | Each |
| 450E2204 | 30" RCP Sloped End, Furnish | 13 | Each |
| 450E2205 | 30" RCP Sloped End, Install | 13 | Each |
| 450E2304 | 18" RCP Safety End, Furnish | 1 | Each |
| 450E2307 | 18" RCP Safety End, Install | 1 | Each |
| 450E3052 | 48" RCP Arch Class 2, Furnish | 384 | Ft |
| 450E3060 | 48" RCP Arch, Install | 384 | Ft |
| 450E4520 | 48" RCP Arch Flared End, Furnish | 6 | Each |
| 450E4521 | 48" RCP Arch Flared End, Install | 6 | Each |
| 450E4759 | 18" CMP 16 Gauge, Furnish | 564 | Ft |
| 450E4760 | 18" CMP, Install | 564 | Ft |
| 450E4769 | 24" CMP 16 Gauge, Furnish | 1,240 | Ft |
| 450E4770 | 24" CMP, Install | 1,240 | Ft |
| 450E4779 | 30" CMP 16 Gauge, Furnish | 520 | Ft |
| 450E4780 | 30" CMP, Install | 520 | Ft |
| 450E4789 | 36" CMP 16 Gauge, Furnish | 952 | Ft |
| 450E4790 | 36" CMP, Install | 952 | Ft |
| 450E5015 | 24" CMP Elbow, Furnish | 24 | Each |
| 450E5016 | 24" CMP Elbow, Install | 24 | Each |
| 450E5020 | 30" CMP Elbow, Furnish | 8 | Each |
| 450E5021 | 30" CMP Elbow, Install | 8 | Each |

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 450E5025 | 36" CMP Elbow, Furnish | 15 | Each |
| 450E5026 | 36" CMP Elbow, Install | 15 | Each |
| 450E5215 | 24" CMP Flared End, Furnish | 3 | Each |
| 450E5216 | 24" CMP Flared End, Install | 3 | Each |
| 450E5223 | 36" CMP Flared End, Furnish | 10 | Each |
| 450E5224 | 36" CMP Flared End, Install | 10 | Each |
| 450E5306 | 18" CMP Sloped End, Furnish | 11 | Each |
| 450E5307 | 18" CMP Sloped End, Install | 11 | Each |
| 450E5310 | 24" CMP Sloped End, Furnish | 22 | Each |
| 450E5311 | 24" CMP Sloped End, Install | 22 | Each |
| 450E5314 | 30" CMP Sloped End, Furnish | 5 | Each |
| 450E5315 | 30" CMP Sloped End, Install | 5 | Each |
| 450E8014 | 24" RCP to CMP Transition, Furnish | 8 | Each |
| 450E8015 | 24" Pipe Transition, Install | 8 | Each |
| 450E8019 | 30" RCP to CMP Transition, Furnish | 3 | Each |
| 450E8020 | 30" Pipe Transition, Install | 3 | Each |
| 450E8024 | 36" RCP to CMP Transition, Furnish | 7 | Each |
| 450E8025 | 36" Pipe Transition, Install | 7 | Each |
| 462E0100 | Class M6 Concrete | 25.9 | CuYd |
| 464E0100 | Controlled Density Fill | 216.8 | CuYd |
| 480E0100 | Reinforcing Steel | 4,715 | Lb |
| 600E0300 | Type III Field Laboratory | 1 | Each |
| 610E0124 | 24' Cattle Guard with Wings | 1 | Each |
| 610E0424 | 24' Precast Concrete Cattle Guard Foundation | 1 | Each |
| 620E0010 | Type 1 Right-of-Way Fence | 1,112 | Ft |
| 620E0020 | Type 2 Right-of-Way Fence | 31,039 | Ft |
| 620E0030 | Type 3 Right-of-Way Fence | 310 | Ft |
| 620E0120 | Type 2s Right-of-Way Fence | 225 | Ft |
| 620E0520 | Type 2 Temporary Fence | 26,271 | Ft |
| 620E0610 | Type 1s Temporary Fence | 225 | Ft |
| 620E0620 | Type 2s Temporary Fence | 215 | Ft |
| 620E1020 | 2 Post Panel | 174 | Each |
| 620E1030 | 3 Post Panel | 32 | Each |
| 620E2014 | 14' Tubular Gate | 1 | Each |
| 620E2016 | 16' Tubular Gate | 1 | Each |
| 650E0060 | Type B66 Concrete Curb and Gutter | 352 | Ft |
| 650E0360 | Type BL66 Concrete Curb and Gutter | 158 | Ft |
| 650E1060 | Type F66 Concrete Curb and Gutter | 247 | Ft |
| 650E1360 | Type FL66 Concrete Curb and Gutter | 597 | Ft |
| 650E2100 | Special Concrete Curb and Gutter | 30 | Ft |
| 650E6260 | 6" Concrete Valley Gutter | 27.7 | SqYd |
| 670E2200 | Type C Frame and Grate | 1 | Each |
| 671E6007 | Type A7 Manhole Frame and Lid | 2 | Each |

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
13586
DUSTIN LEIGH HAMILTON
SOUTH DAKOTA
09/13/24

## SECTION B ESTIMATE OF QUANTITIES CONT'D

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 700E0210 | Class B Riprap | 521.9 | Ton |
| 700E0410 | Class D Riprap | 417.0 | Ton |
| 720E1015 | Bank and Channel Protection Gabion | 399.0 | CuYd |
| 831E0110 | Type B Drainage Fabric | 5,220 | SqYd |
| 831E0300 | Reinforcement Fabric (MSE) | 300 | SqYd |
| 900E0010 | Refurbish Single Mailbox | 7 | Each |
| 900E0012 | Refurbish Double Mailbox | 6 | Each |
| 900E0015 | Multiple Mailbox Support | 3 | Each |
| 900E1150 | Right of Way Marker | 324 | Each |
| * 900E2030 | Miscellaneous Work | 1 | Site |

*** - Denotes Non-Participating**

## Alternate A - Deep Excavation Pipe

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 120E1100 | Unclassified/Rock Excavation | 73,877 | CuYd |
| 450E0162 | 30" RCP Class 2, Furnish | 32 | Ft |
| 450E0164 | 30" RCP Class 4, Furnish | 72 | Ft |
| 450E0165 | 30" RCP Class 5, Furnish | 122 | Ft |
| 450E0170 | 30" RCP, Install | 226 | Ft |
| 450E0192 | 42" RCP Class 2, Furnish | 58 | Ft |
| 450E0193 | 42" RCP Class 3, Furnish | 90 | Ft |
| 450E0194 | 42" RCP Class 4, Furnish | 128 | Ft |
| 450E0195 | 42" RCP Class 5, Furnish | 166 | Ft |
| 450E0196 | 42" RCP Class 4000D, Furnish | 92 | Ft |
| 450E0198 | 42" RCP Class 5000D, Furnish | 138 | Ft |
| 450E0200 | 42" RCP, Install | 672 | Ft |
| 450E0213 | 54" RCP Class 3, Furnish | 74 | Ft |
| 450E0214 | 54" RCP Class 4, Furnish | 50 | Ft |
| 450E0215 | 54" RCP Class 5, Furnish | 68 | Ft |
| 450E0218 | 54" RCP Class 4500D, Furnish | 136 | Ft |
| 450E0220 | 54" RCP, Install | 328 | Ft |
| 450E2024 | 30" RCP Flared End, Furnish | 2 | Each |
| 450E2025 | 30" RCP Flared End, Install | 2 | Each |
| 450E2032 | 42" RCP Flared End, Furnish | 3 | Each |
| 450E2033 | 42" RCP Flared End, Install | 3 | Each |
| 450E2040 | 54" RCP Flared End, Furnish | 2 | Each |
| 450E2041 | 54" RCP Flared End, Install | 2 | Each |
| 450E4799 | 42" CMP 16 Gauge, Furnish | 100 | Ft |
| 450E4800 | 42" CMP, Install | 100 | Ft |
| 450E5030 | 42" CMP Elbow, Furnish | 2 | Each |
| 450E5031 | 42" CMP Elbow, Install | 2 | Each |
| 450E5227 | 42" CMP Flared End, Furnish | 1 | Each |
| 450E5228 | 42" CMP Flared End, Install | 1 | Each |
| 450E8029 | 42" RCP to CMP Transition, Furnish | 1 | Each |
| 450E8030 | 42" Pipe Transition, Install | 1 | Each |

## Alternate B - Bore and Jack Steel Pipe

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 450E0162 | 30" RCP Class 2, Furnish | 32 | Ft |
| 450E0164 | 30" RCP Class 4, Furnish | 48 | Ft |
| 450E0170 | 30" RCP, Install | 80 | Ft |
| 450E0192 | 42" RCP Class 2, Furnish | 58 | Ft |
| 450E0193 | 42" RCP Class 3, Furnish | 58 | Ft |
| 450E0194 | 42" RCP Class 4, Furnish | 102 | Ft |
| 450E0195 | 42" RCP Class 5, Furnish | 56 | Ft |
| 450E0200 | 42" RCP, Install | 274 | Ft |
| 450E0213 | 54" RCP Class 3, Furnish | 74 | Ft |
| 450E0214 | 54" RCP Class 4, Furnish | 54 | Ft |
| 450E0215 | 54" RCP Class 5, Furnish | 24 | Ft |
| 450E0220 | 54" RCP, Install | 152 | Ft |
| 450E2024 | 30" RCP Flared End, Furnish | 1 | Each |
| 450E2025 | 30" RCP Flared End, Install | 1 | Each |
| 450E2032 | 42" RCP Flared End, Furnish | 3 | Each |
| 450E2033 | 42" RCP Flared End, Install | 3 | Each |
| 450E2040 | 54" RCP Flared End, Furnish | 2 | Each |
| 450E2041 | 54" RCP Flared End, Install | 2 | Each |
| 450E4799 | 42" CMP 16 Gauge, Furnish | 156 | Ft |
| 450E4800 | 42" CMP, Install | 156 | Ft |
| 450E5030 | 42" CMP Elbow, Furnish | 2 | Each |
| 450E5031 | 42" CMP Elbow, Install | 2 | Each |
| 450E5219 | 30" CMP Flared End, Furnish | 1 | Each |
| 450E5220 | 30" CMP Flared End, Install | 1 | Each |
| 450E5227 | 42" CMP Flared End, Furnish | 1 | Each |
| 450E5228 | 42" CMP Flared End, Install | 1 | Each |
| 450E7630 | 30" Steel Pipe, Furnish | 146 | Ft |
| 450E7642 | 42" Steel Pipe, Furnish | 346 | Ft |
| 450E7654 | 54" Steel Pipe, Furnish | 176 | Ft |
| 450E8017 | 30" Concrete/Steel Pipe Transition, Furnish | 1 | Each |
| 450E8020 | 30" Pipe Transition, Install | 1 | Each |
| 450E8027 | 42" Concrete/Steel Pipe Transition, Furnish | 3 | Each |
| 450E8030 | 42" Pipe Transition, Install | 3 | Each |
| 450E8037 | 54" Concrete/Steel Pipe Transition, Furnish | 2 | Each |
| 450E8040 | 54" Pipe Transition, Install | 2 | Each |
| 451E5130 | Bore and Jack 30" Pipe | 146 | Ft |
| 451E5142 | Bore and Jack 42" Pipe | 346 | Ft |
| 451E5154 | Bore and Jack 54" Pipe | 176 | Ft |