

STATE OF SOUTH DAKOTA
 DEPARTMENT OF TRANSPORTATION
 PLANS FOR PROPOSED

| | | | |
|--------------------------|-----------------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO-B 8007(212) | 1 | 64 |
| Plotting Date: 7/17/2023 | | | |

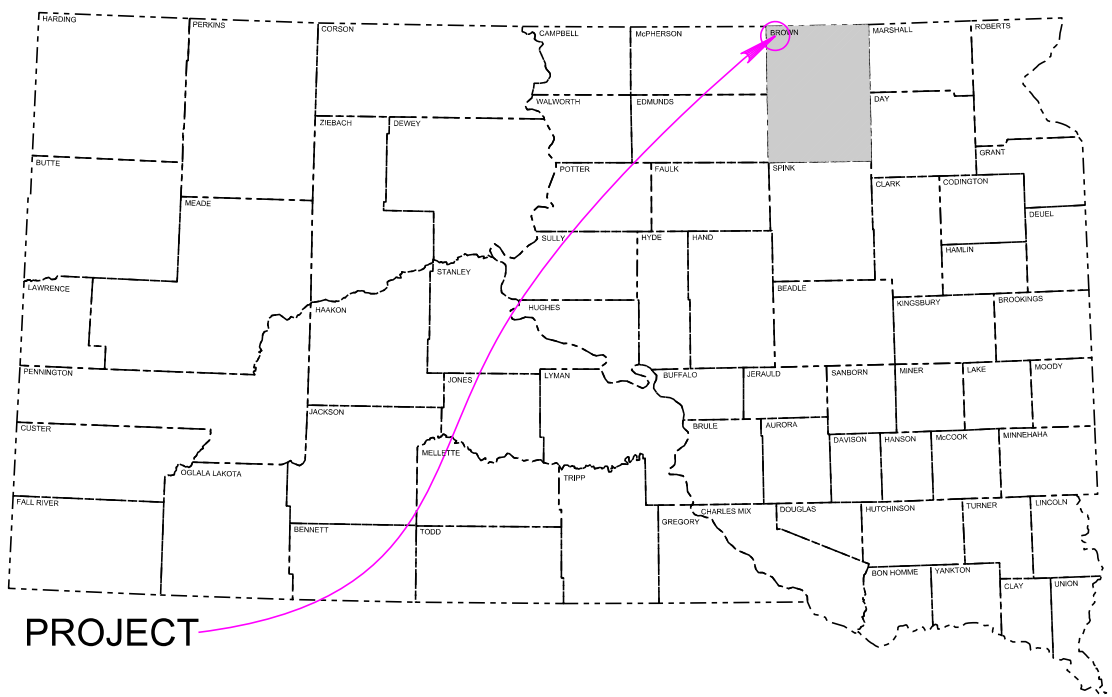


PROJECT BRO-B 8007(212)
102nd STREET
BROWN COUNTY

APPROACH GRADING AND STRUCTURE
 REPLACEMENT OVER ELM LAKE
 PCN 084J

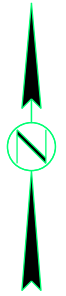
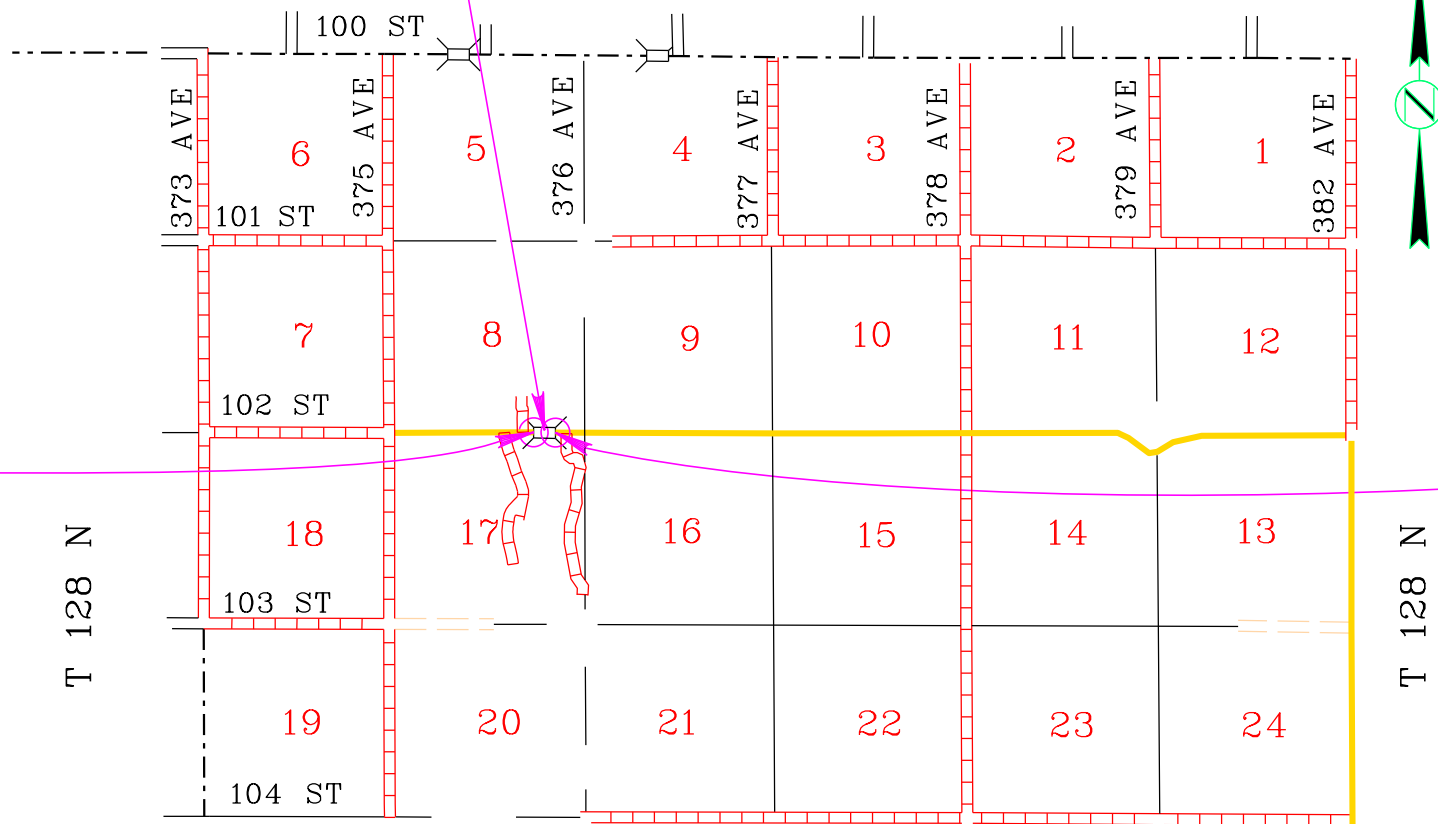
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Plot Scale - 1:200

Structure No. 07-019-020 R 65 W



BEGIN BRO-B 8007(212)
 Station 6+00
 on BRO-B 8007(212). 1,510 feet West of
 The Northeast corner of Section 17 -
 Township 128 North - Range 65 West

END BRO-B 8007(212)
 Station 14+30
 on BRO-B 8007(212). 680 feet West of
 The Northeast corner of Section 17 -
 Township 128 North - Range 65 West

| | |
|------------------|-----------------------|
| AAADT (2019) | 125 |
| AAADT (2039) | 166 |
| DHV | 25 |
| D | 50% |
| DHV T% | 3.5% |
| AAADT T% | 7.7% |
| V | 35 MPH |
| Functional Class | Rural Minor Collector |

STORM WATER PERMIT
 Major Receiving
 Body of Water: Elm Lake
 Area Disturbed: 1.5 Acres
 Total Project Area: 1.5 Acres
 Approx. Begin Lat,Long: 45.9101, -98.6876



6

November 20, 2024

Plotted From - bahlers

File - ...102_BRWN084Jestripmap084J.dgn

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

FOR BIDDING PURPOSES ONLY

| | | | |
|-----------------------|-----------------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO-B 8007(212) | 2 | 64 |

Grading

Structure No. 07-019-020

Rev 12/13/2023 BRA

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|-----------------|--|----------|------|
| 009E0010 | Mobilization | Lump Sum | LS |
| 009E3230 | Grade Staking | 0.157 | Mile |
| 009E3250 | Miscellaneous Staking | 0.157 | Mile |
| 009E3280 | Slope Staking | 0.157 | Mile |
| 009E3290 | Structure Staking | 1 | Each |
| 009E3301 | Engineer Directed Surveying/Staking | 10.0 | Hour |
| 100E0100 | Clearing | Lump Sum | LS |
| 110E1700 | Remove Silt Fence | 200 | Ft |
| 120E0010 | Unclassified Excavation | 298 | CuYd |
| 120E0600 | Contractor Furnished Borrow Excavation | 2,630 | CuYd |
| 230E0010 | Placing Topsoil | 140 | CuYd |
| 630E1010 | Straight Class A W Beam Guardrail with Wood Posts | 612.5 | Ft |
| 630E1050 | Straight Class B W Beam Guardrail with Wood Posts | 50.0 | Ft |
| 630E1150 | Straight Double Class B W Beam Guardrail with Wood Posts | 50.0 | Ft |
| 630E2020 | W Beam Guardrail Tangent End Terminal | 4 | Each |
| 632E2220 | Guardrail Delineator | 23 | Each |
| 634E0110 | Traffic Control Signs | 77.0 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 634E0275 | Type 3 Barricade | 8 | Each |
| 634E1002 | Detour and Restriction Signing | 275.0 | SqFt |
| 700E0210 | Class B Riprap | 1,132.0 | Ton |
| 734E0010 | Erosion Control | Lump Sum | LS |
| 734E0154 | 12" Diameter Erosion Control Wattle | 200 | Ft |
| 734E0165 | Remove and Reset Erosion Control Wattle | 50 | Ft |
| 734E0325 | Surface Roughening | 0.1 | Acre |
| 734E0602 | Low Flow Silt Fence | 1,000 | Ft |
| 734E0610 | Mucking Silt Fence | 56 | CuYd |
| 734E0620 | Repair Silt Fence | 200 | Ft |
| 734E0630 | Floating Silt Curtain | 1,030 | Ft |
| 831E0110 | Type B Drainage Fabric | 1,213 | SqYd |

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|-----------------|--|----------|------|
| 009E3310 | Bridge Elevation Survey | Lump Sum | LS |
| 009E5000 | Concrete Penetrating Sealer | 352.4 | SqYd |
| 120E7000 | Select Granular Backfill | 16.4 | Ton |
| 250E0030 | Incidental Work, Structure | Lump Sum | LS |
| 410E2600 | Membrane Sealant Expansion Joint | 51.8 | Ft |
| 420E0100 | Structure Excavation, Bridge | 337 | CuYd |
| 430E0200 | Bridge End Embankment | 95 | CuYd |
| 430E0300 | Granular Bridge End Backfill | 42.3 | CuYd |
| 430E0510 | Approach Slab Underdrain Excavation | 1.9 | CuYd |
| 460E0030 | Class A45 Concrete, Bridge Deck | 197.9 | CuYd |
| 460E0050 | Class A45 Concrete, Bridge | 182.4 | CuYd |
| 460E0150 | Concrete Approach Slab for Bridge | 117.7 | SqYd |
| 460E0160 | Concrete Approach Sleeper Slab for Bridge | 25.9 | SqYd |
| 470E0420 | Type T101 Bridge Railing | 234 | Ft |
| 480E0100 | Reinforcing Steel | 22,070 | Lb |
| 480E0200 | Epoxy Coated Reinforcing Steel | 51,572 | Lb |
| 510E0300 | Preboring Pile | 80 | Ft |
| 510E3361 | HP 10x42 Steel Test Pile, Furnish and Drive | 195 | Ft |
| 510E3365 | HP 10x42 Steel Bearing Pile, Furnish and Drive | 1,365 | Ft |
| 680E0040 | 4" Underdrain Pipe | 118 | Ft |
| 680E2500 | Porous Backfill | 3.5 | Ton |
| 700E0210 | Class B Riprap | 1,677.3 | Ton |
| 700E1100 | Overburden Excavation for Riprap | 883 | CuYd |
| 831E0110 | Type B Drainage Fabric | 2,151 | SqYd |
| 831E1030 | Perforated Geocell | 468 | SqFt |

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.pdf>

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.



COMMITMENT A: WETLANDS

All efforts to avoid and minimize wetland impacts from the project have resulted in approximately 0.02 acres of wetlands (includes temporary and permanent) becoming impacted. Refer to plans for location and boundaries of the impacted wetlands.

Table of Impacted Wetlands

| Wetland No. | Station | Perm. Impact Left (Acres) | Perm. Impact Right (Acres) | Temp. Impact Left (Acres) | Temp. Impact Right (Acres) | Total Impact (Acres) |
|-------------|---------------|---------------------------|----------------------------|---------------------------|----------------------------|----------------------|
| 1 | 8+50 to 12+40 | 0.01 | 0.01 | 0.00 | 0.01 | 0.02 |

Action Taken/Required:

Mitigation is required in accordance with the "Statewide Finding Regarding Wetlands for South Dakota Federal-Aid Highway Projects (February 2018)". Replacement of 0.01 acres of permanent wetland impacts will be completed through another wetland mitigation opportunity in a manner which considers FHWA's program-wide goal of 'net gain' of wetlands through enhancement, creation, and preservation.

Temporary impacts identified in the Table of Impacted Wetlands will not be mitigated as original contours and elevations will be re-established as designated in plans. Prior to initiating temporary work in wetlands, the Contractor will submit a plan to the Project Engineer in accordance with Section 7.21 D of the Specifications.

The Contractor will notify the Project Engineer if additional easement is needed to complete work adjacent to any wetland. The Project Engineer will obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any wetlands beyond the work limits and easements shown in the plans.

Temporary impacts identified in the Table of Impacted Wetlands will not be mitigated as original contours and elevations will be re-established as designated in plans. Prior to initiating temporary work in wetlands, the Contractor will submit a plan to the Project Engineer in accordance with Section 7.21 D of the Specifications.

COMMITMENT A2: STREAMS

All efforts to avoid and minimize stream impacts from the project have resulted in approximately 0.74 acres of stream (includes temporary and permanent) becoming impacted. Refer to plans for location and boundaries of the impacted streams.

Table of Impacted Streams

| Stream Name | Station | Perm. Impact Left (Acres) | Perm. Impact Right (Acres) | Temp. Impact Left (Acres) | Temp. Impact Right (Acres) | Total Impact (Acres) |
|-------------|---------------|---------------------------|----------------------------|---------------------------|----------------------------|----------------------|
| Elm Creek | 7+80 to 12+60 | 0.16 | 0.20 | 0.19 | 0.19 | 0.74 |

Action Taken/Required:

It has been determined that project impacts do not require mitigation. Temporary impacts identified in the Table of Impacted Streams will not be mitigated as the finished ground under the bridge will be shaped to match the upstream channel and flood plain and the existing low water channel will be maintained as near as practical to the existing location as designated in plans.

The Contractor will notify the Project Engineer if additional easement is needed to complete work adjacent to any stream. The Project Engineer will obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any streams beyond the work limits and easements shown in the plans.

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pits, or staging areas associated with the project, cease construction activities in the affected area until the Whooping Crane departs and immediately contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

The Contractor will not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

Action Taken/Required:

The Contractor will obtain the necessary permits from the regulatory agencies such as the South Dakota Department of Agriculture and Natural Resources (DANR) and the United States Army Corps of Engineers (USACE) prior to water extraction activities.

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at:
<<http://sdeastwanted.com/maps/default.aspx>>

<[South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species: https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04](https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04)>



COMMITMENT D: WATER QUALITY STANDARDS**COMMITMENT D1: SURFACE WATER QUALITY**

Elm Creek is classified as a warm water permanent fishery with a total suspended solids standard of less than 90 mg/L 30-day average, less than 158 mg/L daily maximum.

Action Taken/Required:

The Contractor is advised that the South Dakota Surface Water Quality Standards, administered by the South Dakota Department of Agriculture and Natural Resources (DANR), apply to this project. Special construction measures will be taken to ensure the above standard(s) of the surface waters are maintained and protected.

COMMITMENT D2: SURFACE WATER DISCHARGE

The DANR General Permit for Temporary Discharge is required for temporary dewatering and discharges to waters of the state. The effluent limit for total suspended solids will be 90 mg/L 30-day average. The effluent limit applies to discharges to all waters of the state except discharges to waters classified as cold water permanent fish life propagation waters according to the ARSD 74:51:01:45. For discharges to waters of the state classified as cold water permanent fish life propagation waters, the effluent limit for total suspended solids will be 53 mg/L daily maximum.

The permittee has the option of completing effluent testing or implementing a pollution prevention plan for compliance with this permit. If the permittee develops a pollution prevention plan instead of total suspended solids sampling, the plan must be developed and implemented prior to discontinuing total suspended solids sampling. Refer to Section 4.0 of the permit. If any pollutants are suspected of being discharged, a sample must be taken for those parameters listed in Section 3.4 of the permit.

Refer to Commitment D1: Surface Water Quality for stream classification.

Action Taken/Required:

If construction dewatering is required and this project is not required to be covered under a General Permit for Stormwater Discharges Associated with Construction Activities, the Contractor will obtain the General Permit for Temporary Discharge Activities from the DANR Surface Water Program, 605-773-3351.

<https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_TemporaryDischargeNOI2018Fillable.pdf>

The Contractor will provide a copy of the approved permit or the submitted dewatering information to the Project Engineer prior to proceeding with any dewatering activities. The approved permit or submitted dewatering information must be kept on-site and as part of the project records.

Effluent monitoring, as a result of dewatering activities, will be summarized for each month and recorded on a separate Discharge Monitoring Report (DMR) and submitted to DANR monthly. Additional information can be found at: <<https://danr.sd.gov/Conservation/WatershedProtection/TMDL/default.aspx>>

COMMITMENT E: STORM WATER**Action Taken/Required:**

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

Construction activities constitute 1 acre or more of earth disturbance and/or work in a waterway.

Action Taken/Required:

The DANR General Permit for Stormwater Discharges Associated with Construction Activities is required for construction activity disturbing one or more acres of earth and work in a waterway. The SDDOT is the owner of this permit and will submit the NOI to DANR 15 days prior to project start in order to obtain coverage under the General Permit. Work can begin once the DANR letter of approval is received.

The Contractor must adhere to the "Special Provision Regarding Storm Water Discharges to Waters of the State."

The Contractor will complete the DANR Contractor Certification Form prior to the pre-construction meeting. The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the permit for this project. Work may not begin on this project until this form is signed and submitted to DANR.

The form can be found at:

<https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_CGPApendixCCA2018Fillable.pdf>

The Contractor is advised that permit coverage may also be required for off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

Storm Water Pollution Prevention Plan

The Storm Water Pollution Prevention Plan (SWPPP) will be developed prior to the submittal of the NOI and will be implemented for all construction activities for compliance with the permit. The SWPPP must be kept on-site and updated as site conditions change. Erosion control measures and best management practices will be implemented in accordance with the SWPPP.

The DOT 298 Form will be used for site inspections and to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents and retained for a minimum of three years.

The inspection will include disturbed areas of the construction site that have not been finally stabilized, areas used for storage materials, structural control measures, and locations where vehicles enter or exit the site. These areas will be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the SWPPP will be observed to ensure that they are operating correctly, and sediment is not tracked off the site.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT: <<https://dot.sd.gov/doing-business/environmental/stormwater>>

DANR: <<https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/stormwater/default.aspx>>

EPA: <<https://www.epa.gov/npdes>>

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Agriculture and Natural Resources.

The waste disposal site(s) will not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Environmental Office and the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements will apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with fences, gates, and placement of a sign or signs at the entrance to the site stating, "No Dumping Allowed".

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period not to exceed the duration of the project. Prior to project completion, the waste will be removed from view of the ROW or buried, and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) will be incidental to the various contract items.



COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historic Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require a cultural resource review prior to scheduling the pre-construction meeting. This work includes but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor will arrange and pay for a record search and when necessary, a cultural resource survey. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view in which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 150 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility. The Contractor is responsible for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT J: CONSTRUCTION PRACTICES FOR TEMPORARY WORKS IN WATERWAYS OF THE U.S.

The Contractor is advised that special construction measures must be taken to ensure that the waterways of the U.S. are not impacted.

Action Taken/Required:

Excavation will not occur below the ordinary high-water elevation in waterways outside of caissons, cribs, cofferdams, steel piling, or sheeting. The natural streambed will not be disturbed unless specified by the plans and under the observation of the Project Engineer. Refer to the Table of U.S. Waterways to Protect for ordinary high-water elevations. Any structure work over or within the waterway will be constructed according to Section 7.21 C of the Specifications.

All dredged or excavated materials will be placed at a site above the ordinary high-water elevation in a confined area (not classified as a wetland) that is a minimum of 50 feet away from concentrated flows of storm water, drainage courses, and inlets to prevent return of such material to the waterway.

The construction of temporary work platforms, crossings, or berms below the ordinary high-water elevation will be allowed if all material placed below the ordinary high-water elevation consists of Class B or larger riprap.

All temporary caissons, cribs, cofferdams, steel piling, sheeting, work platforms, crossings, and berms will be removed with minimal disturbance to the streambed. Proper construction practices will be used to minimize increases in suspended solids and turbidity in the waterway.

Bridge berms, wing dams, traffic diversions, channel reconstruction, stream diversions, grading, etc. will be constructed in close conformity with the plans to ensure that the hydraulic capacity of the waterway is not changed.

Temporary waterway crossings required for the Contractor's construction operations will be constructed with an adequate drainage structure size and minimum fill height to reduce the potential for upstream flooding. The Contractor will be responsible for sizing the temporary drainage structure for these crossings.

All temporary works in waterways of the US are required to be covered in the Corp of Engineers 404 Permit. At the time of the preconstruction meeting, the Contractor will submit documentation for all temporary works for the purpose of complying with the 404 Permit requirements in accordance with Section 423.3 A of the Specifications.

Table of U.S. Waterways to Protect

| Station | Waterway | Ordinary High-Water Elevation |
|----------------|----------|-------------------------------|
| 10+05 to 11+10 | Elm Lake | 1459.6 |

Stream channel excavation within "Waters of the US" is subject to USACE regulatory jurisdiction. Stream channel excavation cannot exceed the permitted quantities and/or surface area. The 404 Permit is included in the Special Provisions.

The Contractor will take all precautions necessary to prevent any incidental discharges associated with the excavation and hauling of material from the stream channel. This pertains to any excavation operations such as, foundation, pier, or abutment excavation, channel cleanout, excavation for riprap protection, and removal of any temporary fill associated with construction activities.

COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the USACE for the permanent actions associated with this project.

Action Taken/Required:

The Contractor will comply with all requirements contained in the Section 404 Permit.

The Contractor will also be responsible for obtaining a Section 404 Permit for any dredge, excavation, or fill activities associated with material sources, storage areas, waste sites, and Contractor work sites outside the plan work limits that affect wetlands, floodplains, or waters of the United States.



| | | | |
|-----------------------------|-----------------|-------|-----------------|
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| | BRO-B 8007(212) | 6 | 64 |

COUNTY RESPONSIBILITIES

Brown County will be responsible for the following at no cost to the Contractor.

1. Right of way and temporary and permanent easement acquisition.
2. Coordination of any utility adjustments.
3. Furnish and install final surfacing.
4. Permanent signing and striping will be in accordance with the MUTCD. Remove & reset signs and/or furnish & install signs, as needed.

Brown County and Contractor to coordinate the installation of the surfacing and the installation of the guardrail.

GRADING OPERATIONS

Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste. The estimated quantity of Water for Embankment is 30 MGal. No separate payment will be made for the Water for Embankment and all costs associated will be incidental to the contract unit price per cubic yard of "Unclassified Excavation". Six percent plus or minus moisture will be required at the time of compaction unless otherwise directed by the Engineer.

The estimated excavation required for placing the Granular Bridge End Backfill and/or Bridge End Embankment is listed in the Table of Unclassified Excavation. Overburden Excavation for Riprap is not included in the Unclassified Excavation quantity. Refer to Bridge plans for information regarding the Overburden Excavation for Riprap. The excavated material from the construction of the Bridge Berm(s) and shaping the bridge waterway channel(s) should be disposed of at a site provided by the Contractor and approved by the Engineer.

UTILITIES

Rev 12/13/2023 BRA

The Contractor will contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It will be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

The Contractor will be aware that the existing utilities shown in the plans were surveyed prior to the design of this project and might have been relocated or replaced by a new utility facility prior to construction of this project, might be relocated or replaced by a new utility facility during the construction of this project, or might not require adjustment and may remain in its current location. The Contractor will contact each utility owner and confirm the status of all existing and new utility facilities. The utility contact information is provided below.

Northern Electric Coop
17140 N. US Highway
281 Redfield, SD 57469
Phone: (605) 225-0310

Northwestern Energy
515 N. Main Street
Redfield, SD 57469
Phone: (800) 245-6977

WEB Water Development Association
38456 W. US Hwy 12
Aberdeen, SD 57401
Phone: (605) 229-4749



SHRINKAGE FACTOR: Embankment +30%

TABLE OF EXCAVATION QUANTITIES BY BALANCES

| Station to | Station | Excavation (CuYd) | * Contractor Furnished Borrow Exc. (CuYd) | Total Excavation (CuYd) |
|------------|---------|-------------------|---|-------------------------|
| 6+00 | 6+50 | 2 | -2 | 2 |
| 6+50 | 7+00 | 22 | 12 | 22 |
| 7+00 | 7+50 | 20 | 91 | 111 |
| 7+50 | 8+00 | 6 | 154 | 154 |
| 8+00 | 8+50 | 0 | 115 | 115 |
| 8+50 | 9+00 | 0 | 125 | 125 |
| 9+00 | 9+50 | 0 | 229 | 229 |
| 9+50 | 9+90 | 0 | 225 | 225 |
| 9+90 | 10+50 | 0 | 167 | 167 |
| 10+50 | 11+25 | 0 | 221 | 221 |
| 11+25 | 11+50 | 0 | 160 | 160 |
| 11+50 | 12+00 | 0 | 275 | 275 |
| 12+00 | 12+50 | 0 | 292 | 292 |
| 12+50 | 13+00 | 0 | 340 | 340 |
| 13+00 | 13+50 | 8 | 186 | 194 |
| 13+50 | 14+00 | 25 | 38 | 63 |
| 14+00 | 14+30 | 10 | 2 | 12 |
| Totals: | | 87 | 2630 | 2707 |

* The quantities for these items are in the Estimate of Quantities under their respective contract items.

TABLE OF UNCLASSIFIED EXCAVATION

| | (CuYd) |
|--|------------|
| Excavation | 87 |
| Topsoil | 140 |
| Exc. for Granular Bridge End Backfill and/or Bridge End Embankment | 71 |
| Total | 298 |

PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

Plans quantity will be the basis of payment. The Unclassified Excavation quantity will be used for final payment and the plans quantity of Topsoil listed in the Table of Unclassified Excavation will not be adjusted according to field measurements.

The following paragraphs are general earthwork information and information in regard to computing the Unclassified Excavation quantity when final cross sections are taken in the field:

The quantity of Topsoil from the cuts will be paid for twice as Unclassified Excavation, as it will be in both the Excavation and Topsoil quantities. This will be full compensation for Excavation, which includes necessary undercutting to provide space for placement of topsoil.

The Excavation quantities from individual balances and the Table of Unclassified Excavation have been reduced by the volume of in place surfacing that will be removed and/or salvaged.

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor will provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material will be approved by the Engineer. The plans quantity for "Contractor Furnished Borrow Excavation" as shown in the Estimate of Quantities will be the basis of payment for this item.

Restoration of the Contractor furnished borrow excavation site will be the responsibility of the Contractor.

TABLE OF GUARDRAIL

| Location | Class A W Beam Guardrail (Ft) | *Straight Class B W Beam Guardrail With Wood Posts (Ft) | *Straight Double Class B W Beam Guardrail With Wood Posts (Ft) | W Beam Guardrail Tangent End Terminal (Each) |
|--------------------------|-------------------------------|---|--|--|
| Structure No. 07-019-020 | | | | |
| Begin Bridge Lt. | 200.0 | 12.5 | 12.5 | 1 |
| Begin Bridge Rt. | 225.0 | 12.5 | 12.5 | 1 |
| End Bridge Lt. | 112.5 | 12.5 | 12.5 | 1 |
| End Bridge Rt. | 75.0 | 12.5 | 12.5 | 1 |
| Totals: | 612.5 | 50.0 | 50.0 | 4 |

*Refer to Transition Detail on Sheet 23.



FOR BIDDING PURPOSES ONLY

| | | | |
|-----------------------|-----------------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO-B 8007(212) | 8 | 64 |

TABLE OF CONSTRUCTION STAKING
(See Special Provision for Contractor Staking)

| Roadway and Description | Begin Station | End Station | Number of Lanes | Length (Ft) | Grade Staking | | *Sets of Stakes | **Grade Staking Quantity (Mile) | Miscellaneous Staking Quantity (Mile) | Slope Staking Quantity (Mile) | Structure Staking Quantity (Each) |
|--------------------------|---------------|-------------|-----------------|-------------|---------------|-------------|-----------------|---------------------------------|---------------------------------------|-------------------------------|-----------------------------------|
| | | | | | Length (Mile) | Lane Factor | | | | | |
| 102 nd Street | 6+00 | 14+30 | 2 | 830 | 0.157 | 1 | 1 | 0.157 | 0.157 | 0.157 | |
| Structure No. 07-019-020 | | | | | | | | | | | 1 |
| Totals: | | | | | | | | 0.157 | 0.157 | 0.157 | 1 |

* 1 = Blue Top Stakes Only (Gravel Surfacing)
 ** Grade Staking Quantity = (Length) x (Lane Factor) x (Sets of Stakes)



SEQUENCE OF OPERATIONS

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work.

GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the County.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking.

DETOUR SIGNING

The Contractor will furnish and install the detour signs as shown in these plans. Prior to installing the signs, the Contractor will mark the sign locations and review them with the Engineer. Detour signs will be installed on fixed location, ground mounted, breakaway supports. It will be the responsibility of the Contractor to maintain and reinstall these signs during the project as required by the construction progress. Upon completion of the project, the Contractor will remove the detour signs.

All costs for furnishing the signs, posts, and mounting hardware, and for installing, maintaining, covering, and removing the detour signs will be incidental to the contract unit price per square foot for "Detour and Restriction Signing".

PLACING TOPSOIL

The thickness will be approximately 4 inches within the right-of-way and 6 inches on temporary easements.

The estimated amount of topsoil to be placed is as follows:

| Station | to | Station | Topsoil (CuYd) |
|---------|----|---------|----------------|
| 6+00 | | 14+30 | 140 |
| Total: | | | 140 |

EROSION CONTROL

The estimated area requiring erosion control is 64000 square feet. All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, seeding and mulching will be incidental to the contract lump sum price for "Erosion Control".

The limits of erosion control work will be determined by the Engineer during construction.

Permanent Seeding

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadways and temporary easements under cultivation.

Type C Permanent Seed Mixture will consist of the following:

| Grass Species | Variety | Pure Live Seed (PLS) (Pounds/Acre) |
|--------------------|---|------------------------------------|
| Western Wheatgrass | Arriba, Flintlock, Rodan, Rosana, Walsh | 16 |
| Canada Wildrye | Mandan | 2 |
| Total: | | 18 |

Mulching (Grass Hay or Straw)

If the Contractor uses a no-till drill, mulch may be applied prior to seeding and the mulch can then be punched into the soil by the no-till drill. If the Contractor uses this process, the no-till drill seeding will be completed immediately following the mulch application and the mulch will be punched into the soil at a 3-inch depth.

Mycorrhizal Inoculum

Mycorrhizal inoculum will consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier will provide certification of the fungal species claimed and the live propagule count. The inoculum will include the following fungal species:

- 25% *Glomus intraradices*
- 25% *Glomus aggregatum or deserticol*
- 25% *Glomus mosseae*
- 25% *Glomus etunicatum*

All seed will be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed will be incidental to the contract lump sum price for "Erosion Control".

The mycorrhizal inoculum will be as shown below or an approved equal:

| Product | Manufacturer |
|----------------------------|--|
| MycoApply | Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 www.mycorrhizae.com |
| AM 120 Multi Species Blend | Reforestation Technologies Int. Gilroy, CA Phone: 1-800-784-4769 www.reforest.com |
| LALRISE Prime and Max WP | Lallemand Specialties Inc. Milwaukee, WI Phone: 1-844-590-7781 www.lallemandplantcare.com |

SURFACE ROUGHENING

Surface roughening will be done after topsoil placement and before permanent seeding and mulching applications. Refer to Standard Plate 734.25 for details.

TABLE OF SURFACE ROUGHENING

| Station | Location | Area (Acre) |
|---------------|----------|-------------|
| 6+00 to 12+30 | L/R | 0.1 |
| Total: | | 0.1 |



EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment will be installed at locations noted in the table and at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor will provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles will remain on the project to decompose.

A quantity of 12" Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels and as an alternative to low flow or high flow silt fence at wetland areas adjacent to the highway.

The erosion control wattle provided will be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

<http://apps.sd.gov/HC60ApprovedProducts/main.aspx>

TABLE OF EROSION CONTROL WATTLE

| Station | Location | Diameter (Inch) | Quantity (Ft) |
|-----------------|----------------------|-----------------|---------------|
| TBD by Engineer | Additional Quantity: | 12 | 200 |
| Total: | | | 200 |

LOW FLOW SILT FENCE

The low flow silt fence fabric provided will be from the approved product list. The approved product list for low flow silt fence may be viewed at the following internet site:

<http://apps.sd.gov/HC60ApprovedProducts/main.aspx>

Low flow silt fence will be placed at the locations noted in the table and at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.04 for details.

TABLE OF LOW FLOW SILT FENCE

| Station | Location | Quantity (Ft) |
|--------------------|-------------------|---------------|
| 6+00 L to 8+25 L | Perimeter control | 225 |
| 6+00 L to 9+00 L | Perimeter control | 300 |
| 11+55 R to 14+30 R | Perimeter control | 275 |
| 12+30 R to 14+30 R | Perimeter control | 200 |
| Total: | | 1000 |

FLOATING SILT CURTAIN

Floating silt curtains will be installed at locations noted in the table, if applicable, and at locations determined by the Engineer during construction.

The Contractor will determine the water depth and other waterway characteristics such as stream flow velocity and seek technical advice from the manufacturer before ordering the floating silt curtain so that the floating silt curtain installed is the correct type for the individual sites.

The Contractor will install the floating silt curtain in accordance with the manufacturer's installation instructions or as directed by the Engineer.

The Contractor will maintain the floating silt curtains for the duration of the project to ensure continuous protection of the waterway.

A list of known manufacturers of floating silt curtain is shown below for informational purpose. Contractors may also use Engineer approved floating silt curtain from manufacturers that are not included in the list.

ABASCO, LLC
Humble, TX
Phone: 1-281-466-1500
www.abasco.net

Aer-Flo, Inc.
Bradenton, FL
Phone: 1-800-823-7356
www.aerflo.com

ACME Environmental
Tulsa, OK
Phone: 1-855-563-2666
www.acmeboom.com

ENVIRO-USA, LLC
Cap Canaveral, FL
Phone: 1-321-222-9551
www.enviro-usa.com

Elastec/American Marine, Inc.
Carmi, IL
Phone: 1-618-382-2525
www.turbiditycurtains.com

Geo-Synthetics, LLC (GSI)
Waukesha, WI
Phone: 1-800-444-5523
www.geosynthetics.com

Parker Systems, Inc.
Chesapeake, VA
Phone: 1-866-472-7537
www.parkersystemsinc.com

TABLE OF FLOATING SILT CURTAIN

| Station | Location | Quantity (Ft) |
|-----------------|-----------------|---------------|
| 8+00 – 10+30 L | Along shoreline | 280 |
| 7+15 – 10+30 R | Along shoreline | 340 |
| 11+00 – 12+50 L | Along shoreline | 205 |
| 11+00 – 12+50 R | Along shoreline | 205 |
| Total: | | 1030 |

TABLE OF ROADWAY RIPRAP

| Station | Location | Quantity (TON) |
|----------------------|----------|----------------|
| 8+00.00 to 9+67.50 L | Inslope | 380 |
| 8+25.00 to 9+67.50 R | Inslope | 312 |
| 11+51.50 to 12+20 L | Inslope | 192 |
| 11+51.50 to 12+20 R | Inslope | 242 |
| Total: | | 1132 |

TYPE B DRAINAGE FABRIC

Type B Drainage Fabric will be installed at all locations where Riprap is to be installed. Type B Drainage Fabric will be installed directly under the Riprap. The Type B Drainage Fabric will be held in place with sandbags or other weights determined by the Engineer during construction until riprap is placed.

All costs associated with installing Type B Drainage Fabric including equipment, labor, and materials will be incidental to the contract unit price per SqYd for "Type B Drainage Fabric."



STORMWATER POLLUTION PREVENTION PLAN CHECKLIST

(The numbers left of the title headings are **reference numbers** to the **GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES (Stormwater Permit)**)

5.3 (2): STAFF TRAINING/SWPPP IMPLEMENTATION

To promote stormwater management awareness specific for this project, the Contractor's Erosion Control Supervisor should provide correspondence of how the SWPPP will be implemented. The Contractor's Erosion Control Supervisor is responsible for providing this information at the preconstruction meeting, and subsequently completing an attendance log, which should identify site-specific implementation of the SWPPP and the names of the personnel who attended the preconstruction meeting. Documentation of the preconstruction meeting will be filed with the SWPPP documents.

5.3 (3): DESCRIPTION OF CONSTRUCTION ACTIVITIES

- **5.3 (3a): Project Limits** (See Title Sheet)
- **5.3 (3a): Project Description** (See Title Sheet)
- **5.3 (4): Site Map(s)** (See Title Sheet and Plans)
- **Major Soil Disturbing Activities** (check all that apply)
 - Clearing and grubbing
 - Excavation/borrow
 - Grading and shaping
 - Filling
 - Other (describe):
- **5.3 (3b): Total Project Area** 1.5 acres
- **5.3 (3b): Total Area to be Disturbed** 1.5 acres
- **5.3 (3c): Maximum Area Disturbed at One Time** 1.5 acres
- **5.3 (3d): Existing Vegetative Cover (%)** 25
- **5.3 (3d): Description of Vegetative Cover** Mix of native grasses
- **5.3 (3e): Soil Properties:** USDA-NRCS: Sandy Clay
- **5.3 (3f): Name of Receiving Water Body/Bodies** Elm Lake
- **5.3 (3g): Location of Construction Support Activity Areas** Onsite

5.3 (3h): ORDER OF CONSTRUCTION ACTIVITIES

The Contractor will enter the Estimated Start Date.

| Description | Estimated Start Date |
|--|----------------------|
| Install perimeter protection where runoff may exit site. | |
| Install channel and ditch bottom protection. | |
| Install floating silt curtain | |
| Clearing and grubbing. | |
| Remove and stockpile topsoil. | |
| Stabilize disturbed areas. | |
| Final grading. | |
| Removal of protection devices. | |

5.3 (5): DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES

All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report. Include the technical reasoning for selecting each control. (check all that apply)

Perimeter Controls (See Detail Plan Sheets)

| Description | Estimated Start Date |
|--|----------------------|
| <input type="checkbox"/> Natural Buffers (within 50 ft of Waters of State) | |
| <input checked="" type="checkbox"/> Silt Fence | |
| <input checked="" type="checkbox"/> Erosion Control Wattles | |
| <input type="checkbox"/> Temporary Berm / Windrow | |
| <input checked="" type="checkbox"/> Floating Silt Curtain | |
| <input type="checkbox"/> Stabilized Construction Entrances | |
| <input type="checkbox"/> Entrance/Exit Equipment Tire Wash | |
| <input type="checkbox"/> Other: | |

Structural Erosion and Sediment Controls

| Description | Estimated Start Date |
|--|----------------------|
| <input checked="" type="checkbox"/> Silt Fence | |
| <input type="checkbox"/> Temporary Berm/Windrow | |
| <input checked="" type="checkbox"/> Erosion Control Wattles | |
| <input type="checkbox"/> Temporary Sediment Barriers | |
| <input type="checkbox"/> Erosion Bales | |
| <input type="checkbox"/> Temporary Slope Drain | |
| <input type="checkbox"/> Turf Reinforcement Mat | |
| <input checked="" type="checkbox"/> Riprap | |
| <input type="checkbox"/> Gabions | |
| <input type="checkbox"/> Rock Check Dams | |
| <input type="checkbox"/> Sediment Traps/Basins | |
| <input type="checkbox"/> Culvert Inlet Protection | |
| <input type="checkbox"/> Transition Mats | |
| <input type="checkbox"/> Median/Area Drain Inlet Protection | |
| <input type="checkbox"/> Curb Inlet Protection | |
| <input type="checkbox"/> Interceptor Ditch | |
| <input type="checkbox"/> Concrete Washout Facility | |
| <input type="checkbox"/> Work Platform | |
| <input type="checkbox"/> Temporary Water Barrier | |
| <input type="checkbox"/> Temporary Water Crossing | |
| <input type="checkbox"/> Permanent Stormwater Ponds | |
| <input type="checkbox"/> Permanent Open Vegetated Swales | |
| <input type="checkbox"/> Natural Depressions to allow for Infiltration | |
| <input type="checkbox"/> Sequential Systems that combine several practices | |
| <input type="checkbox"/> Other: | |

Dust Controls

| Description | Estimated Start Date |
|--|----------------------|
| <input type="checkbox"/> Tarps & Wind impervious fabrics | |
| <input type="checkbox"/> Watering | |
| <input type="checkbox"/> Stockpile location/orientation | |
| <input type="checkbox"/> Dust Control Chlorides | |
| <input type="checkbox"/> Other | |

Dewatering BMPs

| Description | Estimated Start Date |
|--|----------------------|
| <input type="checkbox"/> Sediment Basins | |
| <input type="checkbox"/> Dewatering bags | |
| <input type="checkbox"/> Weir tanks | |
| <input type="checkbox"/> Temporary Diversion Channel | |
| <input type="checkbox"/> Other: | |

Stabilization Practices (See Detail Plan Sheets)

(Stabilization measures will begin the following work day whenever earth disturbing activity on any portion of the site has temporarily or permanently ceased. Temporary stabilization will be completed as soon as practicable but no later than 14 days after initiating soil stabilization activities (3.18))

| Description | Estimated Start Date |
|---|----------------------|
| <input type="checkbox"/> Vegetation Buffer Strips | |
| <input type="checkbox"/> Temporary Seeding (Cover Crop Seeding) | |
| <input checked="" type="checkbox"/> Permanent Seeding | |
| <input type="checkbox"/> Sodding | |
| <input type="checkbox"/> Planting (Woody Vegetation for Soil Stabilization) | |
| <input checked="" type="checkbox"/> Mulching (Grass Hay or Straw) | |
| <input type="checkbox"/> Fiber Mulching (Wood Fiber Mulch) | |
| <input type="checkbox"/> Soil Stabilizer | |
| <input type="checkbox"/> Bonded Fiber Matrix | |
| <input type="checkbox"/> Fiber Reinforced Matrix | |
| <input type="checkbox"/> Erosion Control Blankets | |
| <input checked="" type="checkbox"/> Surface Roughening (e.g. tracking) | |
| <input type="checkbox"/> Other: | |

Wetland Avoidance

Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes No If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.

5.3 (6): PROCEDURES FOR INSPECTIONS

- Inspections will be conducted at least once every 7 days.
- All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
- Silt fence will be inspected for depth of sediment and for tears to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches $\frac{1}{3}$ of the height of the silt fence.
- Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
- Check dams will be inspected for stability. Sediment will be removed when depth reaches $\frac{1}{2}$ the height of the dam.
- All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
- Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
- The SDDOT Project Engineer and Contractor's Erosion Control Supervisor are responsible for inspections. Maintenance and repair activities are the responsibility of the Contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

5.3 (7): POST CONSTRUCTION STORMWATER MANAGEMENT

Stormwater management will be handled by temporary controls outlined in "DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES" above, and any permanent controls needed to meet permanent stormwater management needs in the post construction period will be shown in the plans and noted as permanent.

5.3 (8): POLLUTION PREVENTION PROCEDURES**5.3 (8a): Spill Prevention and Response Procedures**➤ **Material Management**▪ Housekeeping

- Only needed products will be stored on-site by the Contractor.
- Except for bulk materials the contractor will store all materials under cover and/or in appropriate containers.
- Products must be stored in original containers and labeled.
- Material mixing will be conducted in accordance with the manufacturer's recommendations.
- When possible, all products will be completely used before properly disposing of the container off-site.
- The manufacturer's directions for disposal of materials and containers will be followed.
- The Contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
- Dust generated will be controlled in an environmentally safe manner.

▪ Hazardous Materials

- Products will be kept in original containers unless the container is not resealable and provide secondary containment as applicable.

- Original labels and material safety data sheets will be retained in a safe place to relay important product information.
- If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
- Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, degreasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
- Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any stormwater system or stormwater treatment system.
- Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of stormwater runoff.

➤ **Spill Control Practices**

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill cleanup will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the Contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for cleanup purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The Contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator.

➤ **Spill Response**

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into stormwater runoff and conveyance systems. If the release has impacted on-site stormwater, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens stormwater or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The Contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.

- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the Contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The Contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to DANR.
- Personnel with primary responsibility for spill response and cleanup will receive training by the Contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

5.3 (8b): WASTE MANAGEMENT PROCEDURES➤ **Waste Disposal**

- All liquid waste materials will be collected and stored in approved sealed containers. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal and notices stating proper practices will be posted. The Contractor is responsible for ensuring waste disposal procedures are followed.

➤ **Hazardous Waste**

- All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the Contractor will be responsible for seeing that these practices are followed.

➤ **Sanitary Waste**

- Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units which must be secured to prevent tipping and serviced in a timely manner by a licensed waste management Contractor or as required by any local regulations.

5.3 (9): CONSTRUCTION SITE POLLUTANTS

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the heading "POLLUTION PREVENTION PROCEDURES" (check all that apply).

- Concrete and Portland Cement
- Detergents
- Paints
- Metals
- Bituminous Materials
- Petroleum Based Products
- Diesel Exhaust Fluid
- Cleaning Solvents
- Wood
- Cure
- Texture
- Chemical Fertilizers
- Other:

Product Specific Practices

- **Petroleum Products**

All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.

- **Fertilizers**

Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to stormwater. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.

- **Paints**

All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.

- **Concrete Trucks**

Contractors will provide designated truck washout facilities on the site. These areas must be self-contained and not connected to any stormwater outlet of the site. Upon completion of construction, the area at the washout facility will be properly stabilized.

5.3 (10): NON-STORMWATER DISCHARGES

The following non-stormwater discharges are anticipated during the course of this project (check all that apply).

- Discharges from water line flushing.
- Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
- Uncontaminated ground water associated with dewatering activities.

5.3 (11): INFEASIBILITY DOCUMENTATION

If it is determined to be infeasible to comply with any of the requirements of the Stormwater Permit, the infeasibility determination must be thoroughly documented in the SWPPP.

7.0: SPILL NOTIFICATION

In the event of a spill, the Contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

- A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to DANR immediately **if any one of the following** conditions exists:
 - The release or spill threatens or is able to threaten waters of the state (surface water or ground water)
 - The release or spill causes an immediate danger to human health or safety
 - The release or spill exceeds 25 gallons
 - The release or spill causes a sheen on surface water
 - The release or spill of any substance that exceeds the ground water quality standards of ARSD Chapter 74:54:01
 - The release or spill of any substance that exceeds the surface water quality standards of ARSD Chapter 74:51:01
 - The release or spill of any substance that harms or threatens to harm wildlife or aquatic life
 - The release or spill is required to be reported according to Superfund Amendments and Reauthorization Act (SARA) Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act, US Environmental Protection Agency.
- To report a release or spill, call DANR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central Standard Time). To report the release after hours, on weekends or holidays, call South Dakota Emergency Management at 605-773-3231. Reporting the release to DANR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, you must also contact local authorities to determine the local reporting requirements for releases. A written report of the unauthorized release of any regulated substance, including quantity discharged, and the location of the discharge will be sent to DANR within 14 days of the discharge.

5.4: SWPPP CERTIFICATIONS

- **Certification of Compliance with Federal, State, and Local Regulations**

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

- **South Dakota Department of Transportation**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Authorized Signature (See the General Permit, Section 7.4 (1))

- **Prime Contractor**

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature

CONTACT INFORMATION

The following personnel are duly authorized representatives and have signatory authority for modifications made to the SWPPP:

➤ **Contractor Information:**

- Prime Contractor Name: _____
- Contractor Contact Name: _____
- Address: _____
- _____
- City: _____ State: _____ Zip: _____
- Office Phone: _____ Field: _____
- Cell Phone: _____ Fax: _____

➤ **Erosion Control Supervisor**

- Name: _____
- Address: _____
- _____
- City: _____ State: _____ Zip: _____
- Office Phone: _____ Field: _____
- Cell Phone: _____ Fax: _____

➤ **SDDOT Project Engineer**

- Name: _____
- Business Address: _____
- Job Office Location: _____
- City: _____ State: _____ Zip: _____
- Office Phone: _____ Field: _____
- Cell Phone: _____ Fax: _____

➤ **DANR Contact Spill Reporting**

- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➤ **DANR Contact for Hazardous Materials.**

- (605) 773-3153

➤ **National Response Center Hotline**

- (800) 424-8802.

➤ **DANR Stormwater Contact Information**

- DANR Stormwater (800) 737-8676
- Surface Water Quality Program (605) 773-3351

5.5: REQUIRED SWPPP MODIFICATIONS

➤ **5.5 (1): Conditions Requiring SWPPP Modification**

The SWPPP must be modified, including the site map(s), in response to any of the following conditions:

- When a new operator responsible for implementation of any part the SWPPP begins work on the site.
- When changes to the construction plans, sediment and erosion control measures, or any best management practices on site that are no longer accurately reflected in the SWPPP. This includes changes made in response to corrective actions triggered by inspections.
- To reflect areas on the site map where operational control has been transferred (including the date of the transfer) or has been covered under a new permit since initiating coverage under this general permit.
- If inspections by site staff, local officials, DANR, or U.S. EPA determine that SWPPP modifications are necessary for compliance with the Stormwater Permit.
- To reflect any revisions to applicable federal, state, or local requirements that affect the control measures implemented at the site.
- If approved by the Secretary, to reflect any changes in chemical water treatment systems or controls, including the use of a different water treatment chemical, age rates, different areas, or methods of application.

➤ **5.5 (2): Deadlines for SWPPP Modification**

Any required revisions to the SWPPP must be completed within 7 calendar days following any of the items listed above.

➤ **5.5 (3): Documentation of Modifications to the Plan**

All SWPPP modification records are required to be maintained showing the dates of when the modification occurred. The records must include the name of the person authorizing each change and a brief summary of all changes.

➤ **5.5 (4): Certification Requirements**

All modifications made to the SWPPP must be signed and certified as required in Section 7.4.

➤ **5.5 (5): Required Notice to Other Operators**

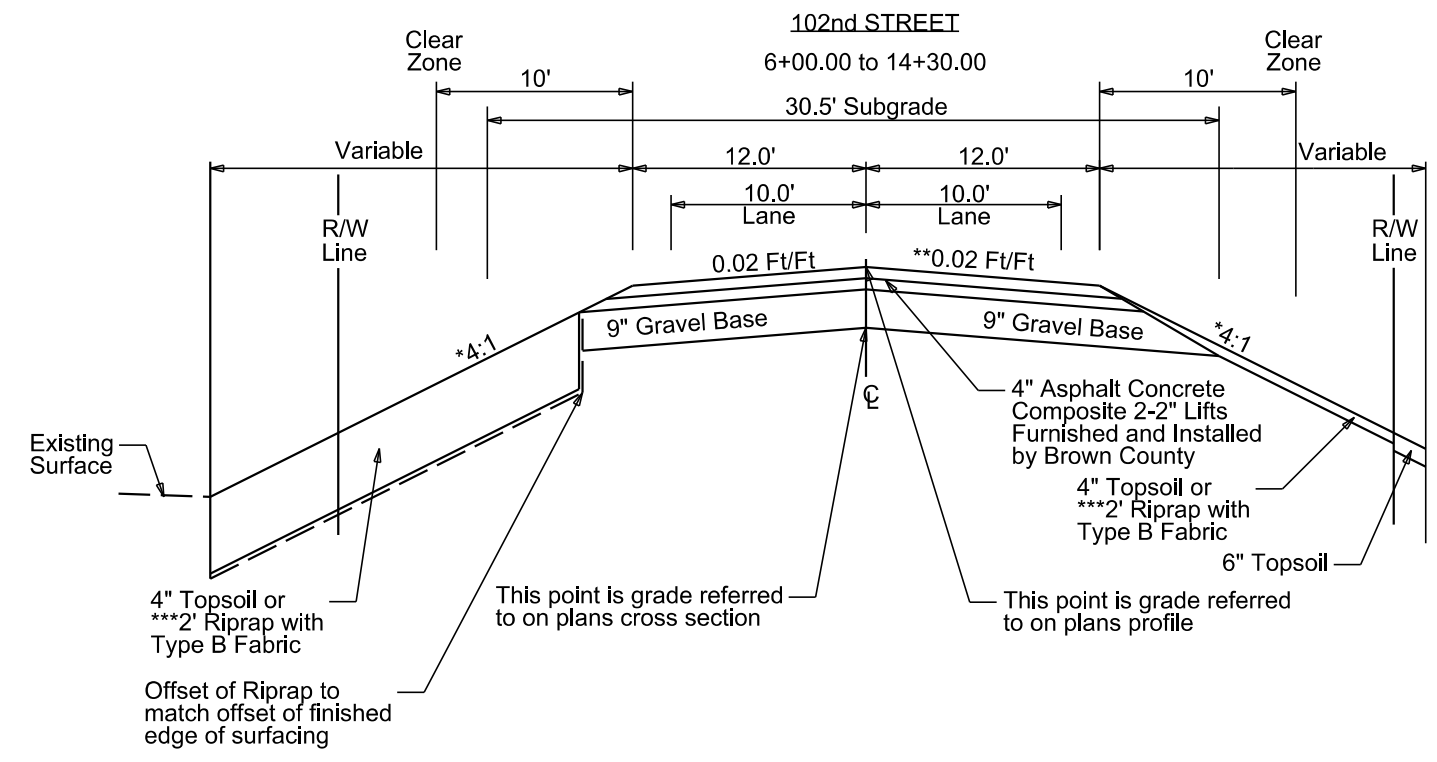
If there are multiple operators at the site, the Contractor's Erosion Control Supervisor must notify each operator that may be impacted by the change to the SWPPP within 24 hours.

When modifications as described above occur, the SWPPP will be modified to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP using the DOT 298 form and drawings on the plan will be modified to reflect the needed changes. Copies of the DOT 298 forms and the SWPPP will be retained on site in a designated place for review throughout the course of the project. A copy of the DOT 298 form will be given to the Contractor Erosion Control Supervisor and a copy will be emailed to the SDDOT Environmental Section in accordance with the DOT 298 Form.

FOR BIDDING PURPOSES ONLY

Plotting Date: 7/17/2023

TYPICAL GRADING SECTION



*Transitions of inslope at the following locations:

- 6+00.00 to 6+25.00 R - Existing to 4:1
- 6+00.00 to 6+25.00 L - Existing to 4:1
- 6+25.00 to 8+25.00 R - 4:1 to 2:1
- 6+25.00 to 8+00.00 L - 4:1 to 2:1
- 8+25.00 to 9+98.50 R - 2:1
- 8+00.00 to 9+98.50 L - 2:1
- 11+19.00 to 12+30.00 R - 2:1 to 3:1
- 11+19.00 to 12+20.00 L - 2:1 to 3:1
- 12+30.00 to 14+30.00 R - 3:1 to Existing
- 12+20.00 to 14+30.00 L - 3:1 to Existing

**Transition of cross slope at the following locations:

- 6+00.00 to 7+00.00 R - Existing to 2%

***Riprap Limits

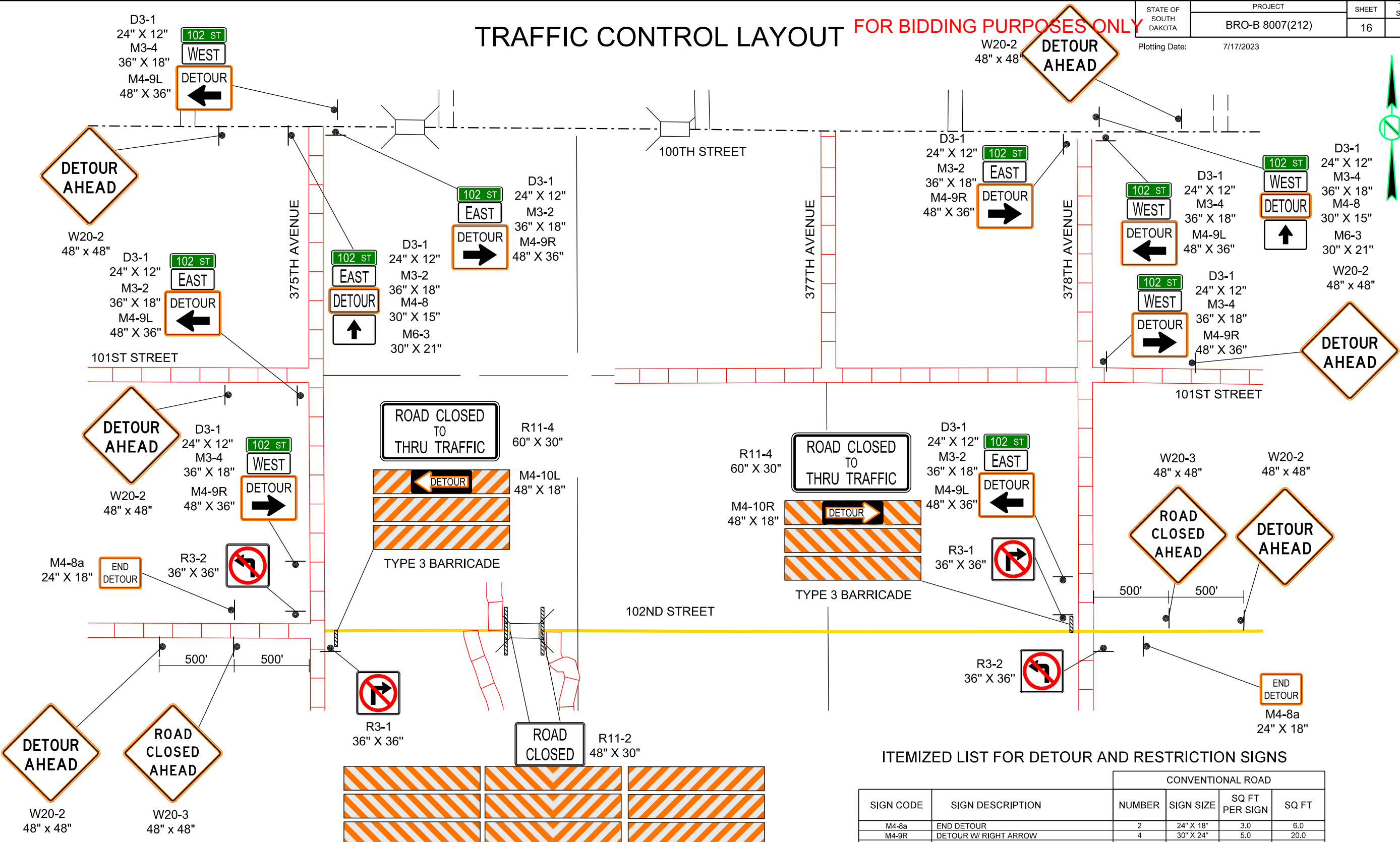
- 8+25.00 to 9+67.50 R
- 8+00.00 to 9+67.50 L
- 9+67.50 to 11+51.50 R (Refer to Structural plans)
- 9+67.50 to 11+51.50 L (Refer to Structural plans)
- 11+51.50 to 12+20.00 R
- 11+51.50 to 12+20.00 L



TRAFFIC CONTROL LAYOUT

FOR BIDDING PURPOSES ONLY

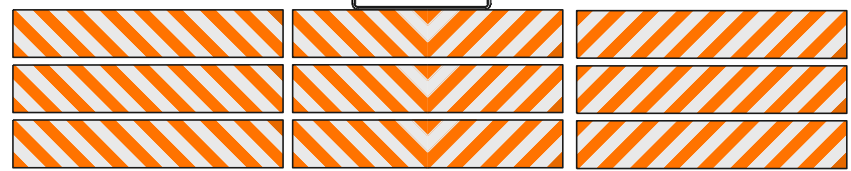
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|--------------------------|-----------------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO-B 8007(212) | 16 | 64 |
| Plotting Date: 7/17/2023 | | | |



ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

| SIGN CODE | SIGN DESCRIPTION | CONVENTIONAL ROAD | | | |
|---|-----------------------------|-------------------|-----------|----------------|-------|
| | | NUMBER | SIGN SIZE | SQ FT PER SIGN | SQ FT |
| R11-2 | ROAD CLOSED | 2 | 48" X 30" | 10.0 | 20.0 |
| R11-4 | ROAD CLOSED TO THRU TRAFFIC | 2 | 60" X 30" | 12.5 | 25.0 |
| W20-3 | ROAD CLOSED AHEAD | 2 | 48" X 48" | 16.0 | 32.0 |
| CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS | | | | | 77.0 |
| SQ FT | | | | | |

TYPE 3 BARRICADE TYPE 3 BARRICADE TYPE 3 BARRICADE



ITEMIZED LIST FOR DETOUR AND RESTRICTION SIGNS

| SIGN CODE | SIGN DESCRIPTION | NUMBER | SIGN SIZE | CONVENTIONAL ROAD | |
|---|---------------------------|--------|-----------|-------------------|-------|
| | | | | SQ FT PER SIGN | SQ FT |
| M4-8a | END DETOUR | 2 | 24" X 18" | 3.0 | 6.0 |
| M4-9R | DETOUR W/ RIGHT ARROW | 4 | 30" X 24" | 5.0 | 20.0 |
| M4-9L | DETOUR W/ LEFT ARROW | 4 | 30" X 24" | 5.0 | 20.0 |
| M4-10R | RIGHT ARROW DETOUR | 1 | 48" X 18" | 6.0 | 6.0 |
| M4-10L | LEFT ARROW DETOUR | 1 | 48" X 18" | 6.0 | 6.0 |
| R3-1 | RIGHT MOVEMENT PROHIBITED | 2 | 36" X 36" | 9.0 | 18.0 |
| R3-2 | LEFT MOVEMENT PROHIBITED | 2 | 36" X 36" | 9.0 | 18.0 |
| D3-1 | STREET NAME | 10 | 30" X 12" | 2.5 | 25.0 |
| M3-2 | EAST | 5 | 36" X 18" | 4.5 | 22.5 |
| M3-4 | WEST | 5 | 36" X 18" | 4.5 | 22.5 |
| M4-8 | DETOUR | 2 | 30" X 15" | 3.1 | 6.2 |
| M6-3 | ARROW | 2 | 30" X 21" | 4.4 | 8.8 |
| W20-2 | DETOUR AHEAD | 6 | 48" X 48" | 16.0 | 96.0 |
| CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS | | | | | 275.0 |
| SQ FT | | | | | |



FOR BIDDING PURPOSES ONLY

| | | | |
|-----------------------|----------------------------|-------------|--------------------|
| STATE OF SOUTH DAKOTA | PROJECT BRO-B 8007(212) | SHEET 17 | TOTAL SHEETS 64 |
|-----------------------|----------------------------|-------------|--------------------|

Plotting Date: 7/17/2023

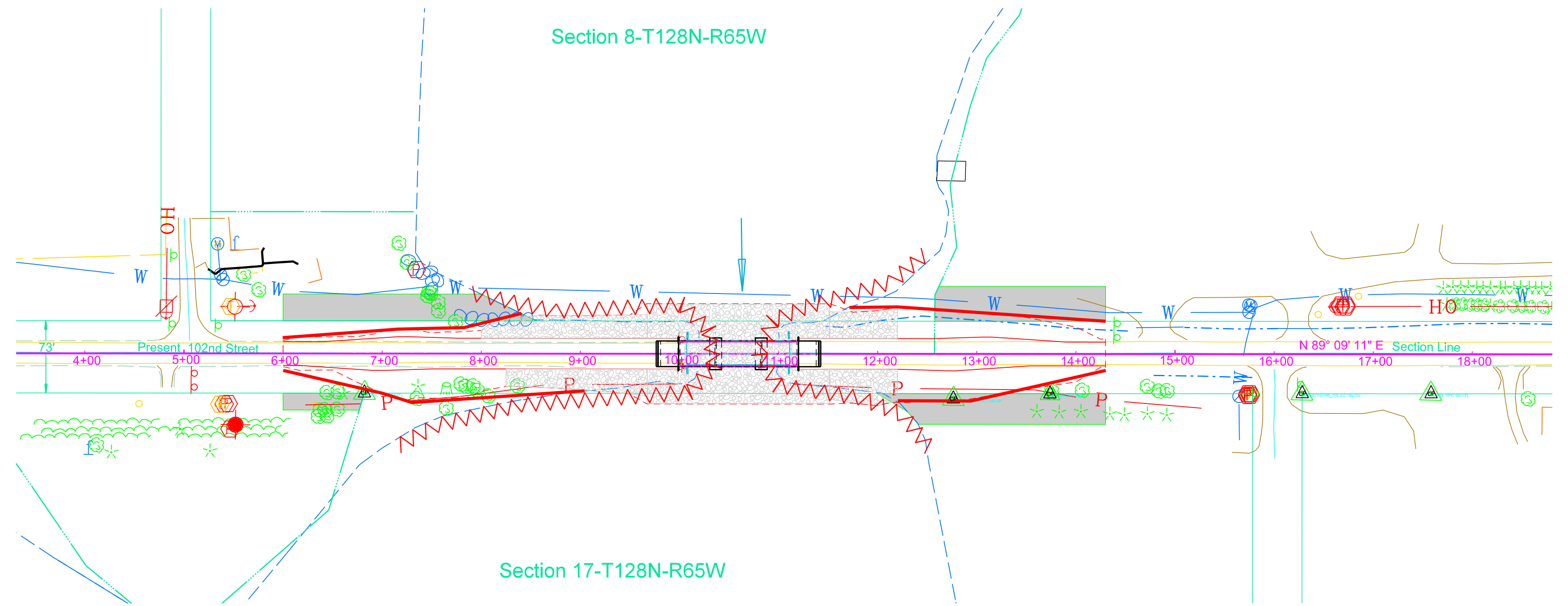


TEMPORARY STABILIZATION

Install 200 Ft of 12" Diameter Erosion Control Wattles at the Bridge at 10+50. Placement will be determined by the engineer during construction.

Section 8-T128N-R65W

Section 17-T128N-R65W



PERIMETER CONTROL

- Install Low Flow Silt Fence at the following locations:
- 6+00 L to 8+25 L Perimeter control 225 Ft
- 6+00 R to 9+00 R Perimeter control 300 Ft
- 11+55 R to 14+30 L Perimeter control 275 Ft
- 12+30 R to 14+30 R Perimeter control 200 Ft

- Install Floating Silt Curtain along the bank of the waterway at the following locations:
- Approximately 8+00-10+30 L along the shoreline under bridge: 280 Ft
- Approximately 7+15-10+30 R along the shoreline under bridge: 340 Ft
- Approximately 11+00-12+50 L along the shoreline under bridge: 205 Ft
- Approximately 11+00-12+50 R along the shoreline under bridge: 205 Ft

- LOW FLOW SILT FENCE
- FLOATING SILT CURTAIN



HORIZONTAL ALIGNMENT DATA & CONTROL DATA

FOR BIDDING PURPOSES ONLY

| | | | |
|-----------------------|-----------------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO-B 8007(212) | 18 | 64 |

Plotting Date: 7/17/2023

MAINLINE

| Type | Station | Northing | Easting |
|------|----------|-------------|--------------|
| POB | 0+00.00 | 759856.8954 | 2301574.9957 |
| POE | 20+40.51 | 759887.0527 | 2303615.2827 |

| HORIZONTAL AND VERTICAL CONTROL POINTS | | | | | | |
|--|----------|--------|-------------|-----------|------------|-----------|
| POINT | STATION | OFFSET | DESCRIPTION | NORTHING | EASTING | ELEVATION |
| CP1 | - | - | REBAR | 759887.27 | 2303630.12 | 1497.55 |
| CP2 | 16+28.26 | 39.9 | BARCAP | 759841.07 | 2303203.67 | 1488.72 |
| CP3 | 15+78.20 | 289.83 | BARCAP | 759590.43 | 2303157.31 | 1481.61 |
| CP4 | 15+78.45 | 415.01 | BARCAP | 759465.26 | 2303159.41 | 1486.01 |
| CP5 | 13+74.10 | 40.36 | REBAR | 759836.85 | 2302949.55 | 1468.04 |
| CP6 | 12+76.57 | 45.46 | BARCAP | 759830.31 | 2302852.09 | 1461.41 |
| CP7 | 17+58.13 | 39.94 | BARCAP | 759842.95 | 2303333.52 | 1492.14 |
| CP8 | 6+82.30 | 39.82 | BARCAP | 759827.17 | 2302257.81 | 1468.83 |
| CP9 | 2+81.79 | 39.75 | BARCAP | 759821.32 | 2301857.34 | 1476.31 |
| CP10 | - | - | BARCAP | 759815.59 | 2301482.72 | 1485.32 |

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone NAD83(2011); epoch 2010 (Opus); Geoid 18. SF = 1.00000000
 The elevations shown on this sheet are based on NAVD 88.



LEGEND

FOR BIDDING PURPOSES ONLY

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|-----------------------|-----------------|-------|--------------|
| | BRO-B 8007(212) | 19 | 64 |

Plotting Date: 7/17/2023

Plot Scale - 1:200

Plotted From - bahlers

| | | | | | | | |
|---|--|-------------------------------|--|--|--|---------------------------|--|
| Anchor | | Mailbox | | Subsurface Utility Exploration Test Hole | | State and National Line | |
| Antenna | | Manhole Electric | | Telephone Fiber Optics | | County Line | |
| Approach | | Manhole Gas | | Telephone Junction Box | | Section Line | |
| Assumed Corner | | Manhole Miscellaneous | | Telephone Pole | | Quarter Line | |
| Azimuth Marker | | Manhole Sanitary Sewer | | Television Cable Jct Box | | Sixteenth Line | |
| BBQ Grill/ Fireplace | | Manhole Storm Sewer | | Television Tower | | Property Line | |
| Bearing Tree | | Manhole Telephone | | Test Wells/Bore Holes | | Construction Line | |
| Bench Mark | | Manhole Water | | Traffic Sign Double Face | | ROW Line | |
| Box Culvert | | Merry-Go-Round | | Traffic Sign One Post | | New ROW Line | |
| Bridge | | Microwave Radio Tower | | Traffic Sign Two Post | | Cut and Fill Limits | |
| Brush/Hedge | | Miscellaneous Line | | Traffic Signal | | Control of Access | |
| Buildings | | Miscellaneous Property Corner | | Trash Barrel | | New Control of Access | |
| Bulk Tank | | Miscellaneous Post | | Tree Belt | | Proposed ROW | |
| Cattle Guard | | Overhang Or Encroachment | | Tree Coniferous | | (After Property Disposal) | |
| Cemetery | | Overhead Utility Line | | Tree Deciduous | | | |
| Centerline | | Parking Meter | | Tree Stumps | | | |
| Cistern | | Pedestrian Push Button Pole | | Triangulation Station | | Drainage Arrow | |
| Clothes Line | | Pipe With End Section | | Underground Electric Line | | | |
| Concrete Symbol | | Pipe With Headwall | | Underground Gas Line | | | |
| Control Point | | Pipe Without End Section | | Underground High Pressure Gas Line | | | |
| Creek Edge | | Playground Slide | | Underground Sanitary Sewer | | | |
| Curb/Gutter | | Playground Swing | | Underground Storm Sewer | | | |
| Curb | | Power And Light Pole | | Underground Tank | | | |
| Dam Grade/Dike/Levee | | Power And Telephone Pole | | Underground Telephone Line | | | |
| Deck Edge | | Power Meter | | Underground Television Cable | | | |
| Ditch Block | | Power Pole | | Underground Water Line | | | |
| Doorway Threshold | | Power Pole And Transformer | | Water Fountain | | | |
| Drainage Profile | | Power Tower Structure | | Water Hydrant | | | |
| Drop Inlet | | Propane Tank | | Water Meter | | | |
| Edge Of Asphalt | | Property Pipe | | Water Tower | | | |
| Edge Of Concrete | | Property Pipe With Cap | | Water Valve | | | |
| Edge Of Gravel | | Property Stone | | Water Well | | | |
| Edge Of Other | | Public Telephone | | Weir Rock | | | |
| Edge Of Shoulder | | Railroad Crossing Signal | | Windmill | | | |
| Electric Transformer/Power Junction Box | | Railroad Milepost Marker | | Wingwall | | | |
| Fence Barbwire | | Railroad Profile | | Witness Corner | | | |
| Fence Chainlink | | Railroad ROW Marker | | | | | |
| Fence Electric | | Railroad Signs | | | | | |
| Fence Miscellaneous | | Railroad Switch | | | | | |
| Fence Rock | | Railroad Track | | | | | |
| Fence Snow | | Railroad Trestle | | | | | |
| Fence Wood | | Rebar | | | | | |
| Fence Woven | | Rebar With Cap | | | | | |
| Fire Hydrant | | Reference Mark | | | | | |
| Flag Pole | | Retaining Wall | | | | | |
| Flower Bed | | Riprap | | | | | |
| Gas Valve Or Meter | | River Edge | | | | | |
| Gas Pump Island | | Rock And Wire Baskets | | | | | |
| Grain Bin | | Rockpiles | | | | | |
| Guardrail | | Satellite Dish | | | | | |
| Gutter | | Septic Tank | | | | | |
| Guy Pole | | Shrub Tree | | | | | |
| Haystack | | Sidewalk | | | | | |
| Highway ROW Marker | | Sign Face | | | | | |
| Interstate Close Gate | | Sign Post | | | | | |
| Iron Pin | | Slough Or Marsh | | | | | |
| Irrigation Ditch | | Spring | | | | | |
| Lake Edge | | Stream Gauge | | | | | |
| Lawn Sprinkler | | Street Marker | | | | | |



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FOR BIDDING PURPOSES ONLY

| | | | |
|-----------------------|----------------------------|-------------|--------------------|
| STATE OF SOUTH DAKOTA | PROJECT BRO-B 8007(212) | SHEET 20 | TOTAL SHEETS 64 |
|-----------------------|----------------------------|-------------|--------------------|

Plotting Date: 7/17/2023



9+98.50 to 11+20.50 (DA=158 sq mi)
Install 122' - 0" Continuous Concrete Bridge
(See Structure Sheets)

10+07.40 to 11+11.40
Remove 104' 3-span Steel Bridge
(Incidental Work, Structure)

Section 8-T128N-R65W

ELM LAKE

Travis Swenson

LOT 1 Elm Lake Resort Subdivision of Section 8 -
Township 128 North - Range 65 West of the 5th P.M.

Parcel A2

Gene Wiek

Lots 12 & 13, Block 1 of
RO-JU-OS Park of Section 8 -
Township 128 North - Range
65 West of the 5th P.M.

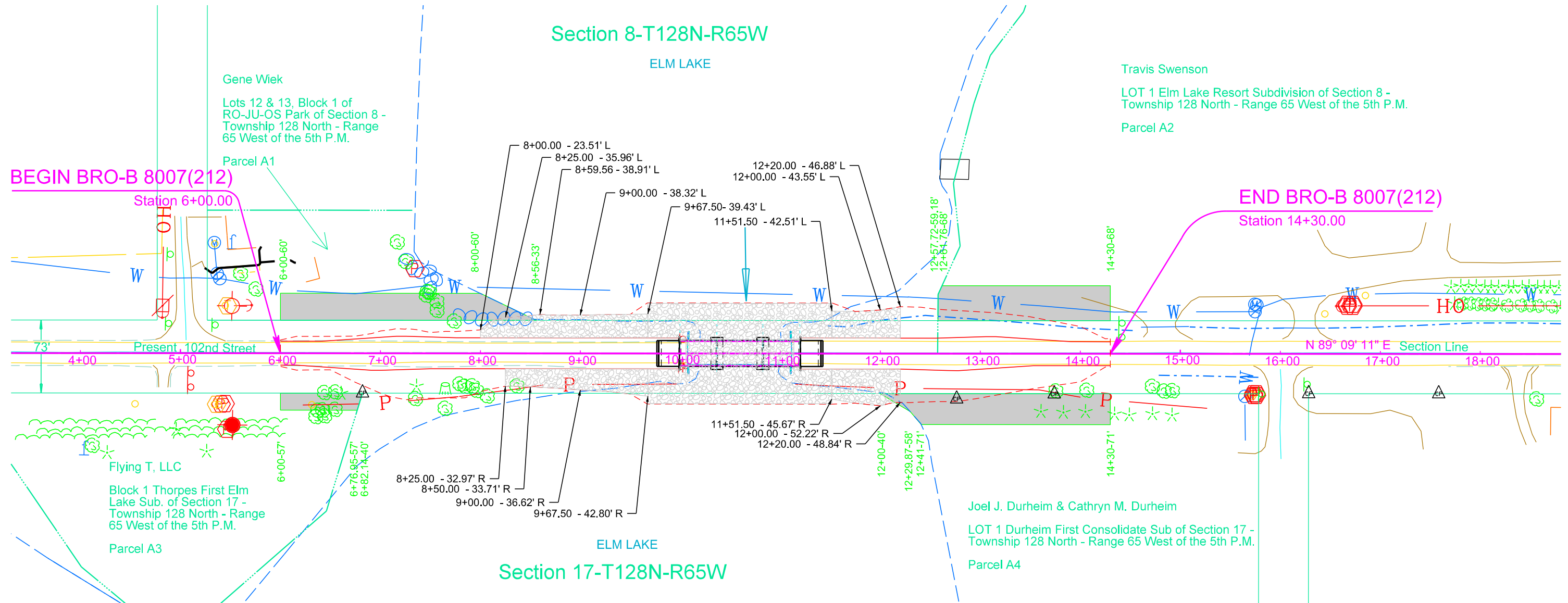
Parcel A1

BEGIN BRO-B 8007(212)

Station 6+00.00

END BRO-B 8007(212)

Station 14+30.00



Parcel A1
6+00.00 to 8+56.00 L
Temporary Easement containing
0.14 ac, more or less

Parcel A2
12+57.72 to 14+30.00 L
Temporary Easement containing
0.14 ac, more or less

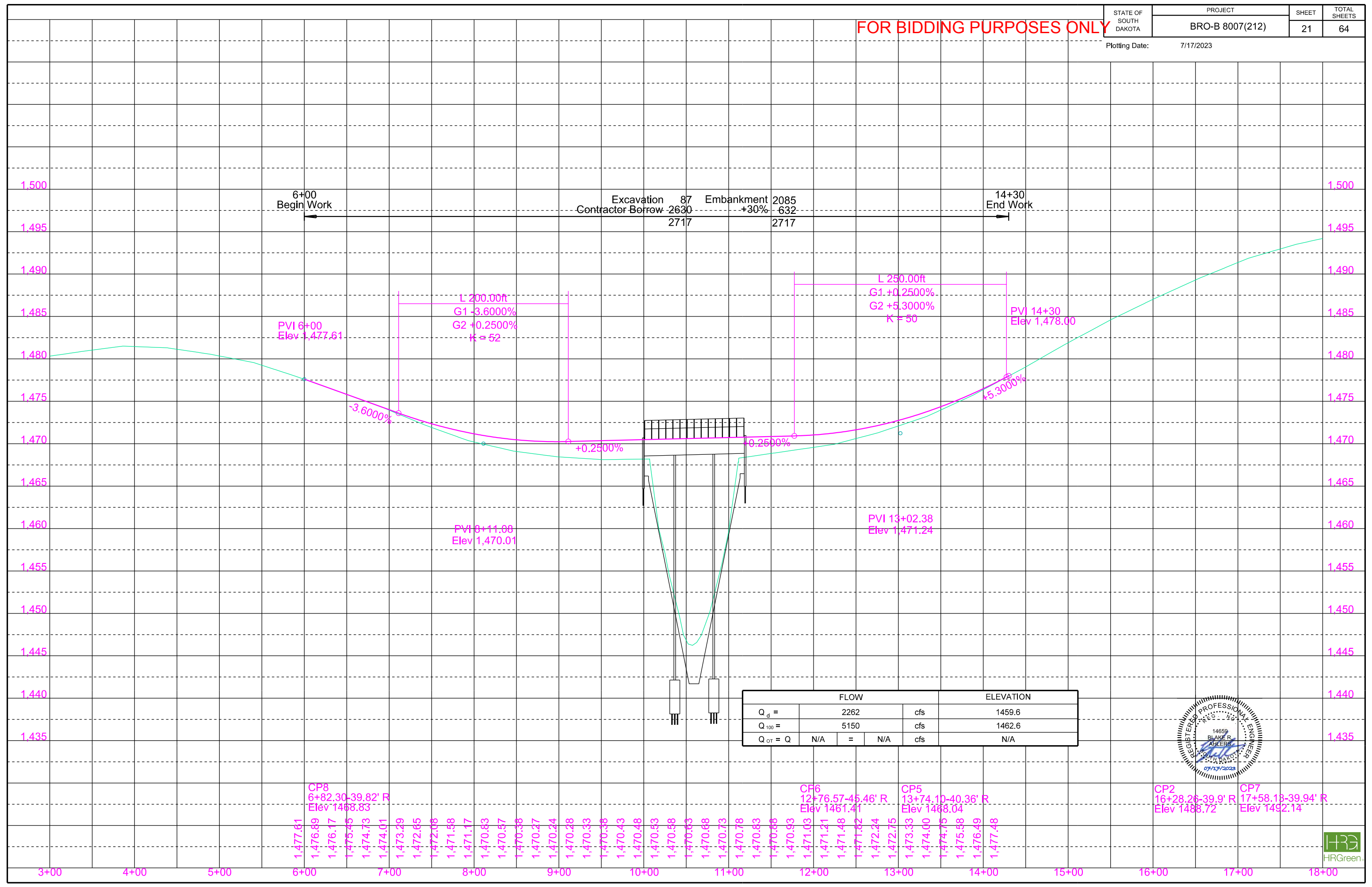
Parcel A3
6+00.00 to 6+82.14 R
Temporary Easement containing
0.03 ac, more or less

Parcel A4
12+00.00 to 14+30.00 R
Temporary Easement containing
0.15 ac, more or less



FOR BIDDING PURPOSES ONLY

| | | | |
|-----------------------------|-----------------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO-B 8007(212) | | |
| Plotting Date: 7/17/2023 | | 21 | 64 |



6+00 Begin Work Excavation 87 Embankment 2085
 Contractor Borrow -2630 +30% -632
 2717 2717

L 200.00ft
 G1 -3.6000%
 G2 +0.2500%
 K = 52

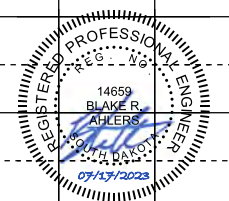
L 250.00ft
 G1 +0.2500%
 G2 +5.3000%
 K = 50

PVI 6+00 Elev 1,477.61 PVI 14+30 Elev 1,478.00

-3.6000% +0.2500% +0.2500% +5.3000%

PVI 8+11.06 Elev 1,470.01 PVI 13+02.38 Elev 1,471.24

| FLOW | | | | ELEVATION | |
|---------------------|------|-----|-----|-----------|-----|
| Q _d = | 2262 | cfs | | 1459.6 | |
| Q ₁₀₀ = | 5150 | cfs | | 1462.6 | |
| Q _{OT} = Q | N/A | = | N/A | cfs | N/A |



CP8 6+82.30-39.82' R Elev 1468.83
 1,477.61
 1,476.89
 1,476.17
 1,475.45
 1,474.73
 1,474.01
 1,473.29
 1,472.65
 1,472.06
 1,471.58
 1,471.17
 1,470.83
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 1,470.53
 1,470.58
 1,470.63
 1,470.68
 1,470.73
 1,470.78
 1,470.83
 1,470.88
 1,470.93
 1,471.03
 1,471.21
 1,471.48
 1,471.82
 1,472.24
 1,472.75
 1,473.33
 1,474.00
 1,474.75
 1,475.58
 1,476.49
 1,477.48

CF6 12+76.57-45.46' R Elev 1461.41
 1,470.88
 1,470.93
 1,471.03
 1,471.21
 1,471.48
 1,471.82
 1,472.24
 1,472.75

CP5 13+74.10-40.36' R Elev 1468.04
 1,473.33
 1,474.00
 1,474.75
 1,475.58
 1,476.49
 1,477.48

CP2 16+28.26-39.9' R Elev 1488.72
 1,488.72

CP7 17+58.13-39.94' R Elev 1492.14
 1,492.14



FOR BIDDING PURPOSES ONLY

| | | | |
|-----------------------|-----------------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO-B 8007(212) | 22 | 64 |

Plotting Date: 12/13/2023 Rev 12/13/2023 BRA

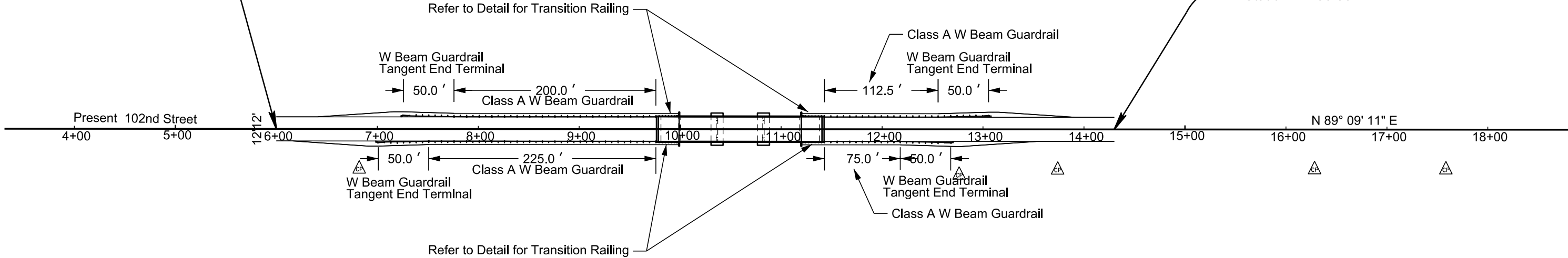


BEGIN BRO-B 8007(212)

Station 6+00.00

END BRO-B 8007(212)

Station 14+30.00

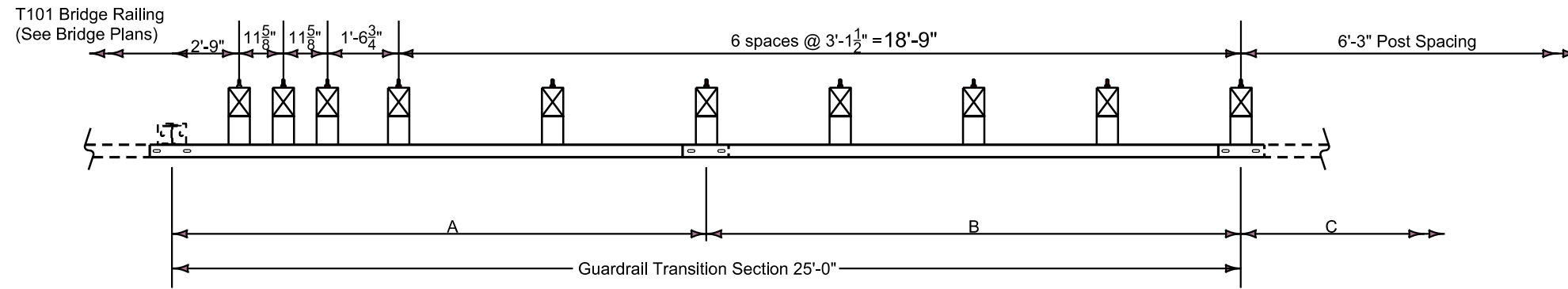


GUARDRAIL TRANSITION DETAIL

FOR BIDDING PURPOSES ONLY

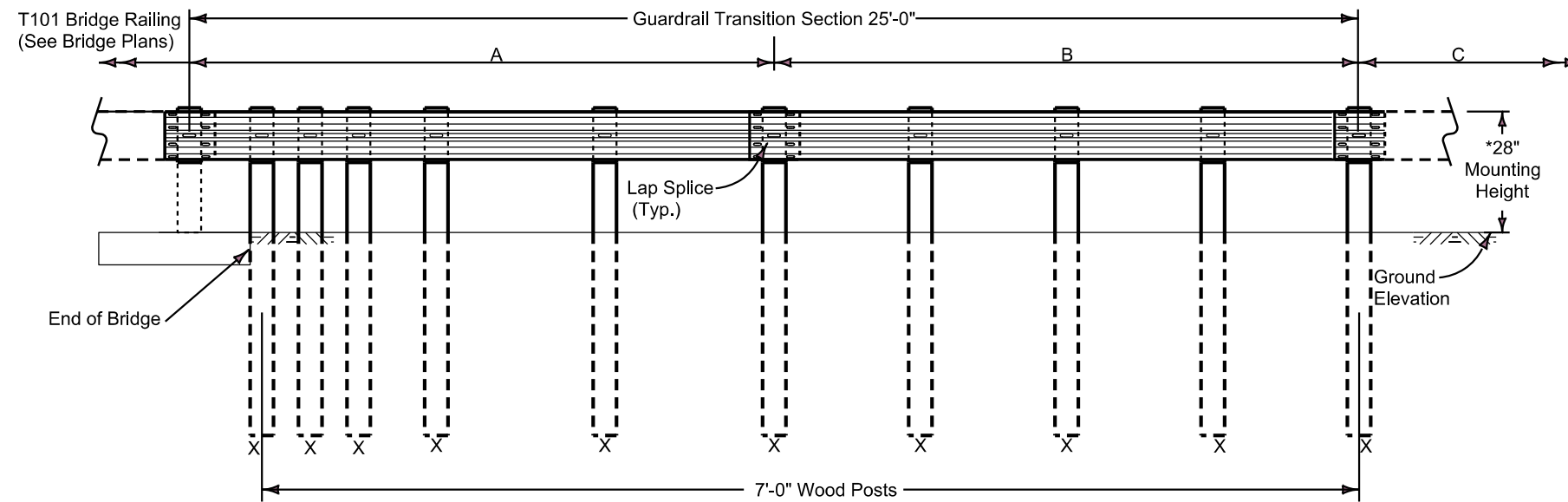
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|-----------------------------|-----------------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO-B 8007(212) | 23 | 64 |

Plotting Date: 7/17/2023



PLAN VIEW

- A: 12'-6" Straight Double (Nested) Class B W Beam Guardrail with Wood Posts (See standard plate 630.10)
- B: 12'-6" Straight Class B W Beam Guardrail with Wood Posts (See standard plate 630.10)
- C: Guardrail as specified in the plans.



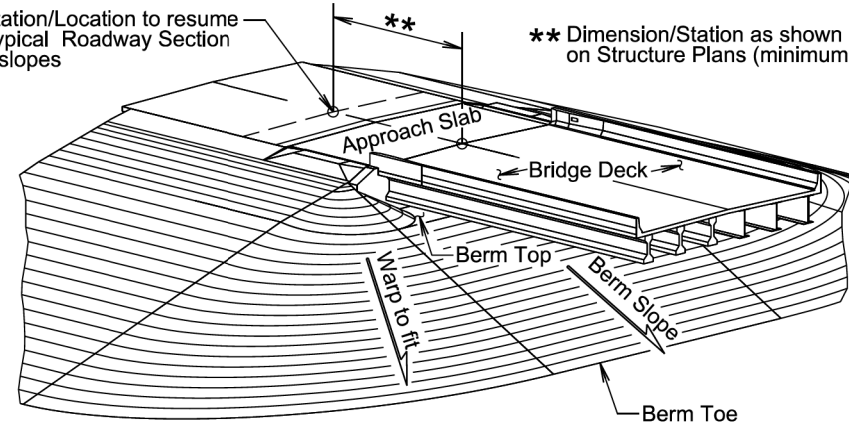
ELEVATION VIEW

X: 6"x8"x7'-0" Wood Post and 6"x8"x14" Wood Blockout

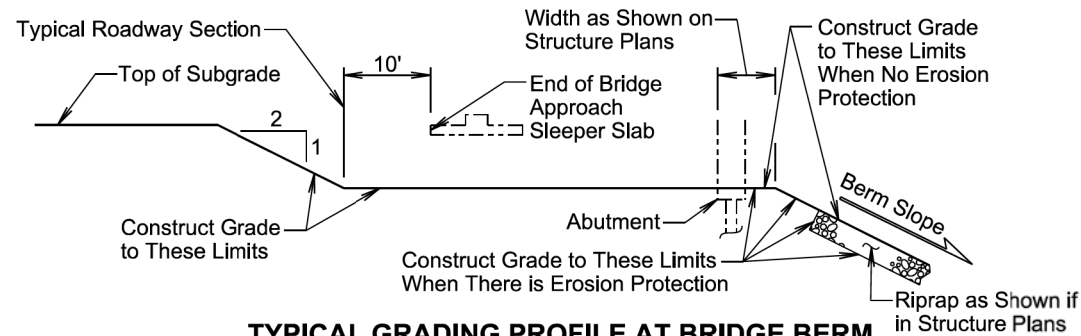
*See standard plate 630.99



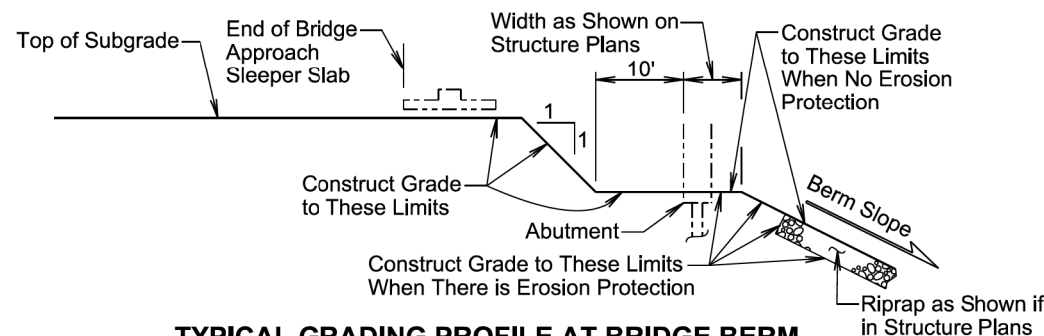
Station/Location to resume Typical Roadway Section Inslopes
 ** Dimension/Station as shown on Structure Plans (minimum 25').



ISOMETRIC VIEW OF BRIDGE BERM
 (Girder Bridge shown, others similar)



TYPICAL GRADING PROFILE AT BRIDGE BERM
 (Normal to Abutment at Centerline Roadway)



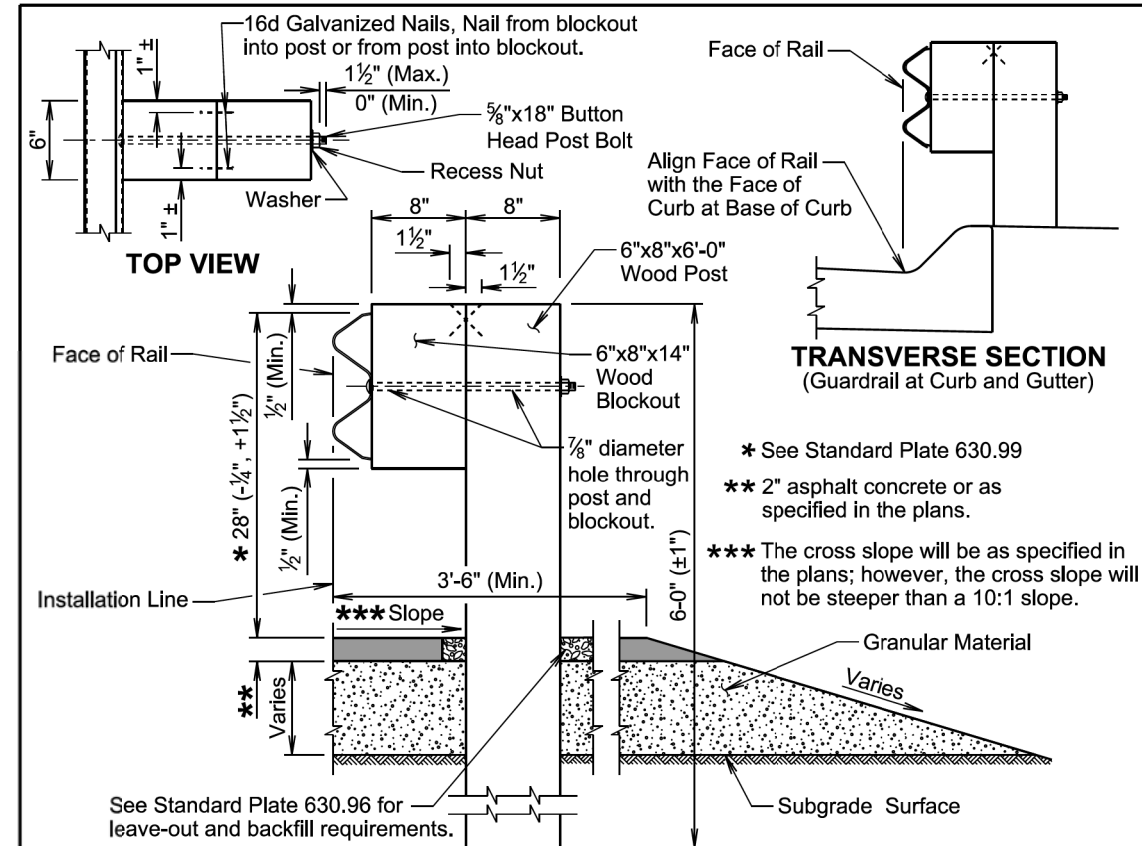
TYPICAL GRADING PROFILE AT BRIDGE BERM
 (Normal to Abutment at Centerline Roadway)

GENERAL NOTES:

The bridge berm elevation and slope will be as shown in the Structure Plans. See Structure Plans to determine which grading profile to use.

January 22, 2021

| | | | |
|----------------------|-----------------------|--|------------------------|
| Published Date: 2024 | S D D O T | BRIDGE BERM (PROJECTING EMBANKMENT) | PLATE NUMBER 120.11 |
| | | | Sheet 1 of 1 |



GENERAL NOTES: TRANSVERSE SECTION

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite".

Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will be placed the same thickness as the mainline surfacing or as specified in the plans.

Topsoil is not shown in the transverse section drawing.

All W beam rail will be Type 1 and Class A (12 Ga.) unless specified otherwise in the plans.

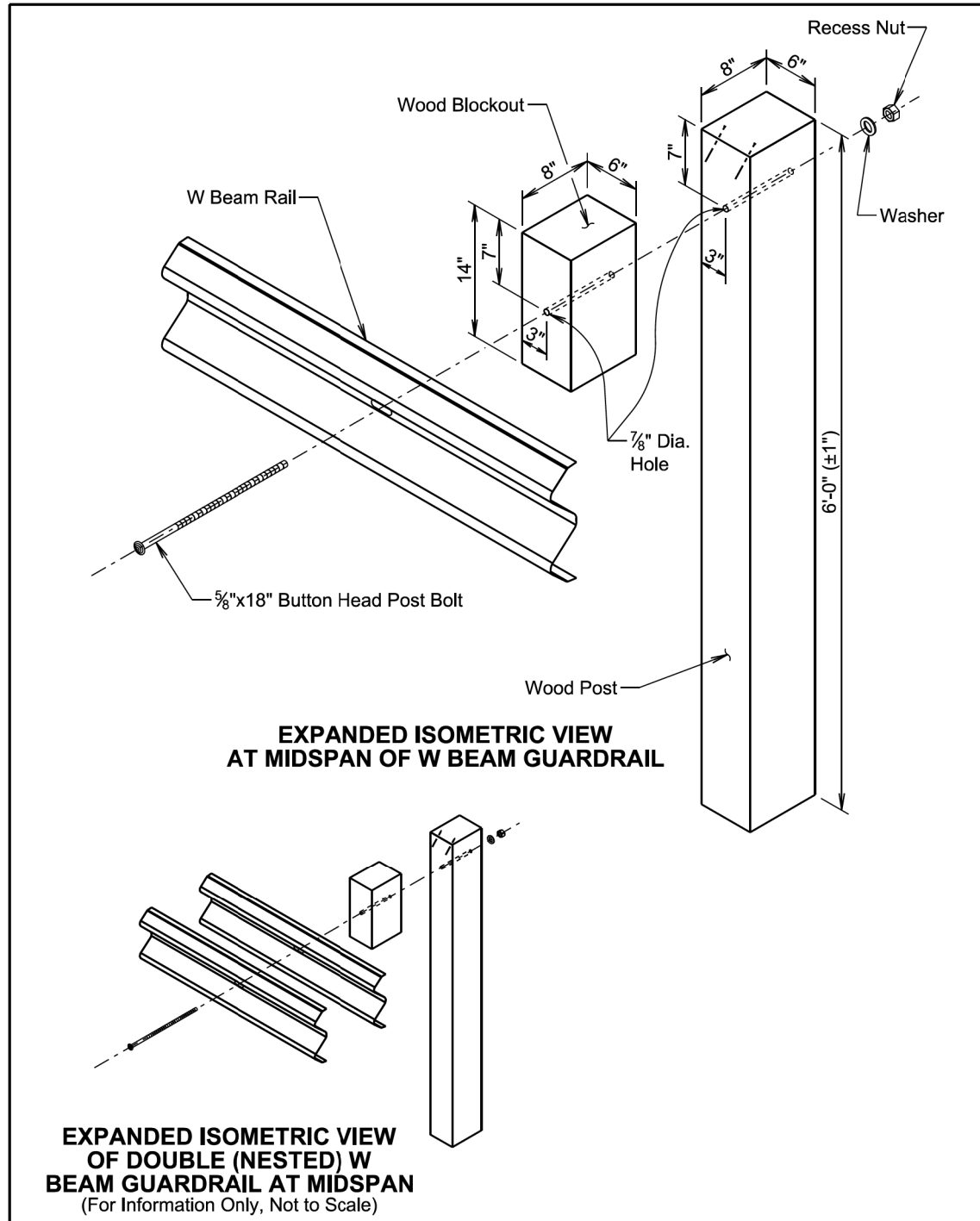
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or notches.

The top of post and top of block will have a true square cut. The top of block will be a maximum of ± 1/2 inch from the top of the post.

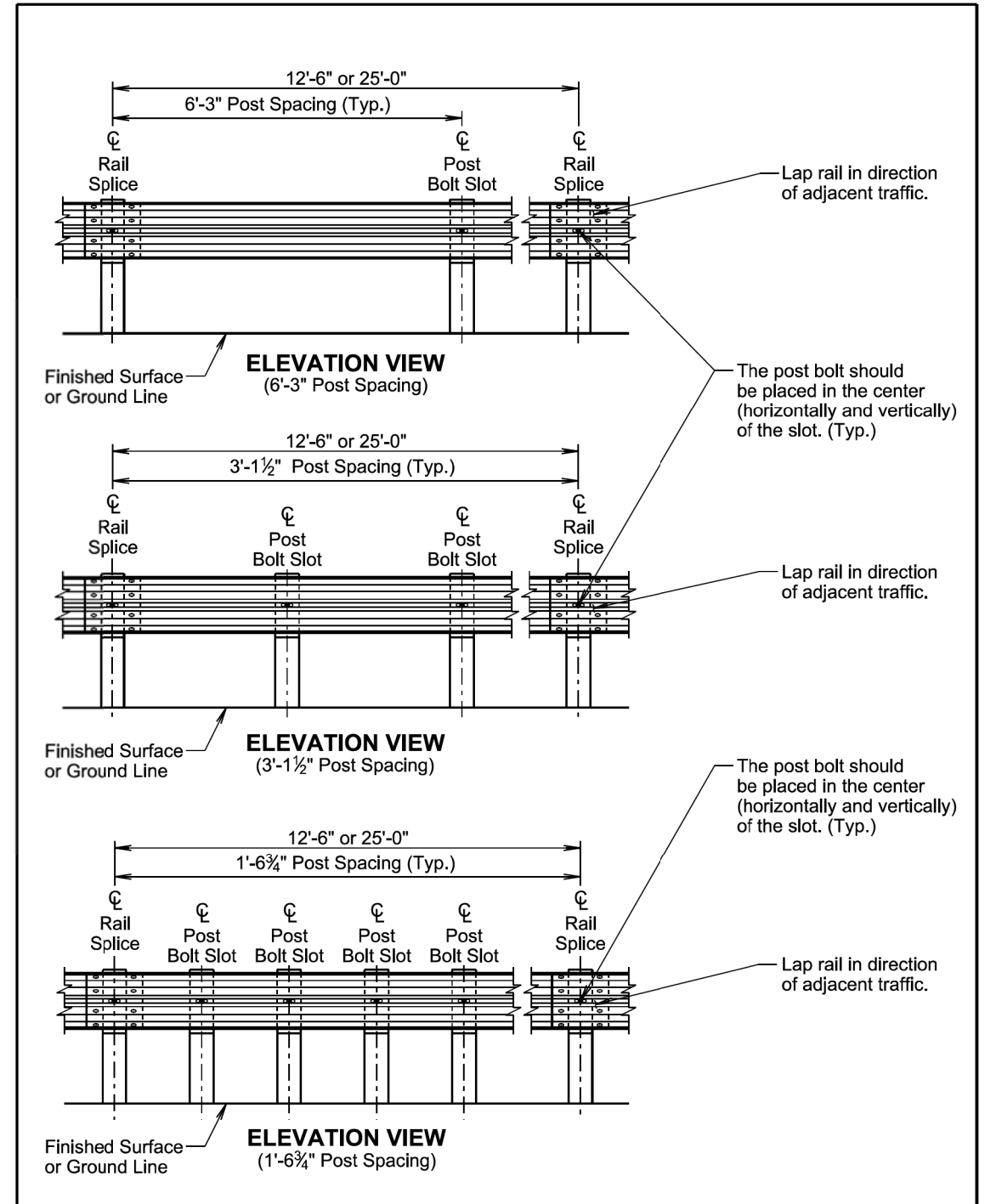
September 14, 2019

| | | | |
|----------------------|-----------------------|------------------|------------------------|
| Published Date: 2024 | S D D O T | W BEAM GUARDRAIL | PLATE NUMBER 630.10 |
| | | | Sheet 1 of 5 |



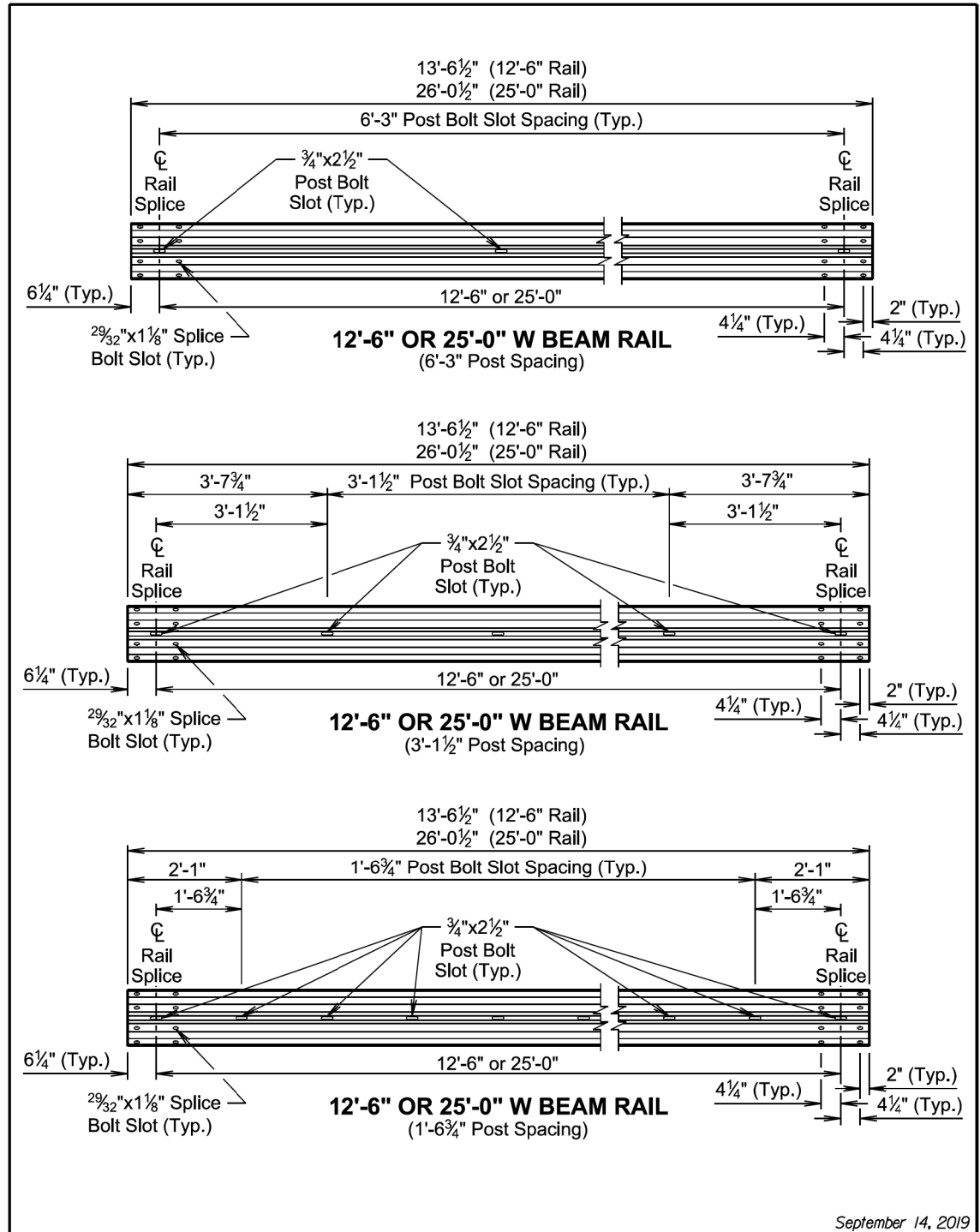
September 14, 2019

| | | | |
|----------------------|-----------------------|------------------|--------------|
| Published Date: 2024 | S D D O T | W BEAM GUARDRAIL | PLATE NUMBER |
| | | | 630.10 |
| | | | Sheet 2 of 5 |



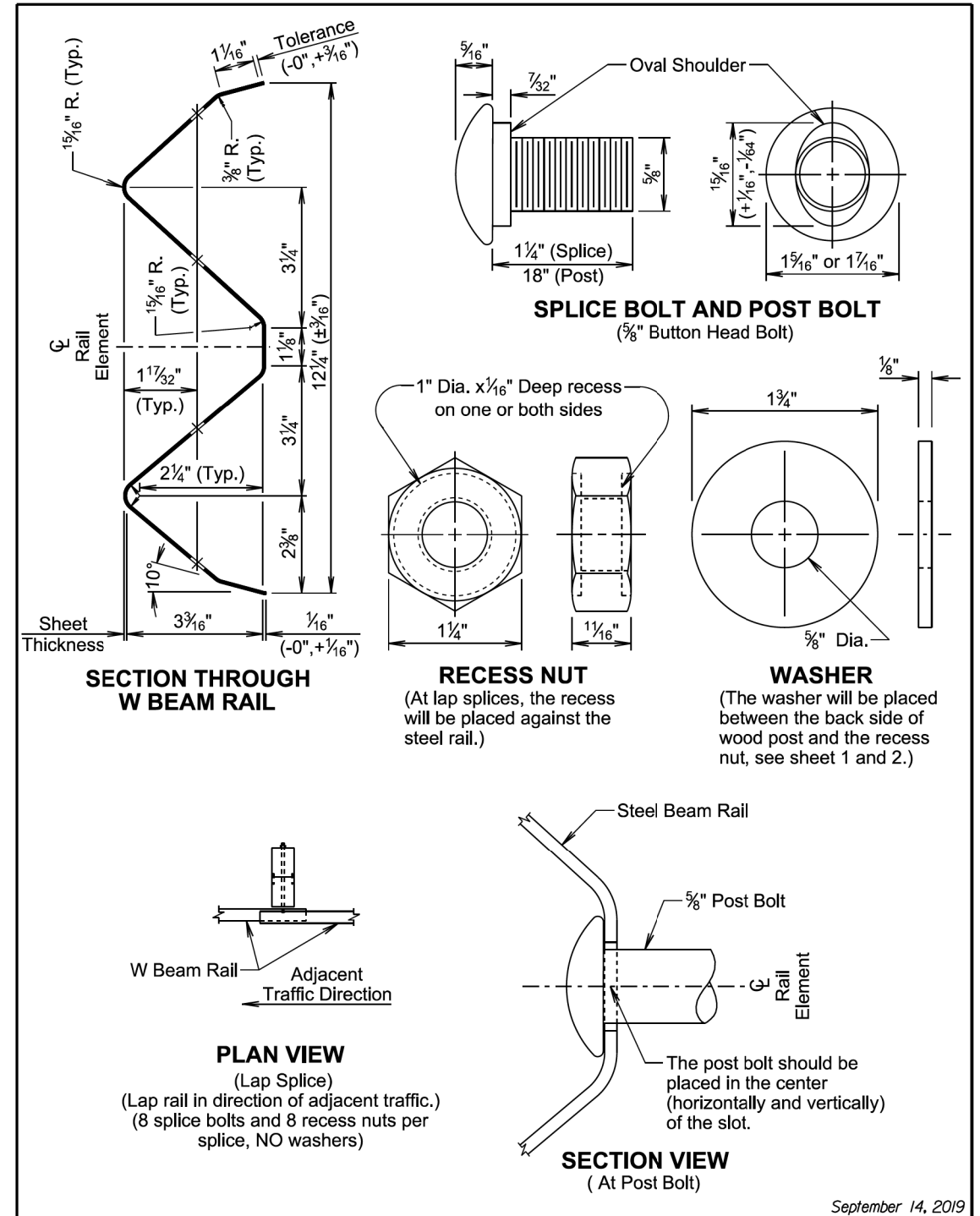
September 14, 2019

| | | | |
|----------------------|-----------------------|------------------|--------------|
| Published Date: 2024 | S D D O T | W BEAM GUARDRAIL | PLATE NUMBER |
| | | | 630.10 |
| | | | Sheet 3 of 5 |



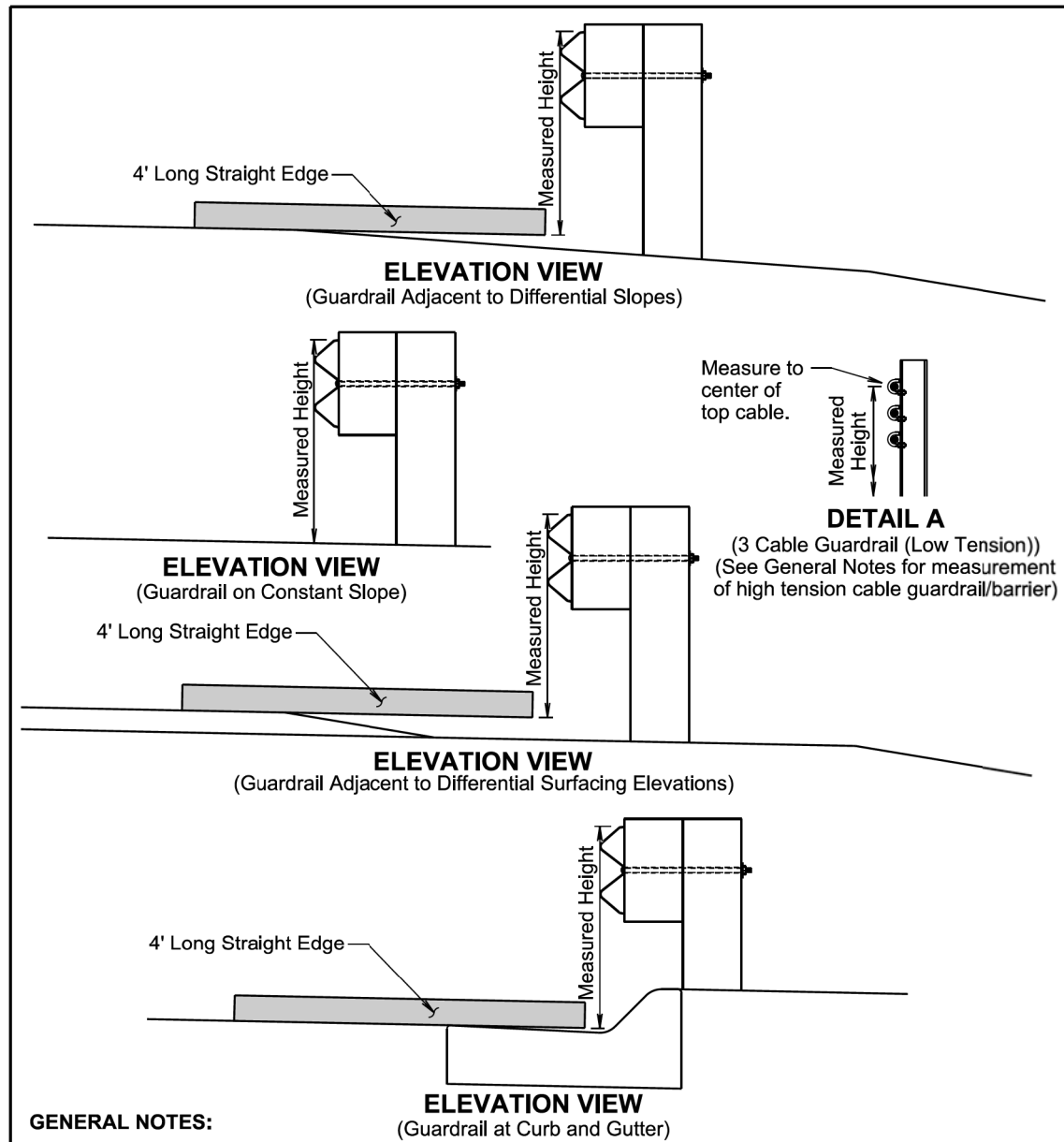
September 14, 2019

| | | | |
|----------------------|-----------------------|------------------|------------------------|
| Published Date: 2024 | S D D O T | W BEAM GUARDRAIL | PLATE NUMBER 630.10 |
| | | | Sheet 4 of 5 |



September 14, 2019

| | | | |
|----------------------|-----------------------|------------------|------------------------|
| Published Date: 2024 | S D D O T | W BEAM GUARDRAIL | PLATE NUMBER 630.10 |
| | | | Sheet 5 of 5 |



GENERAL NOTES:

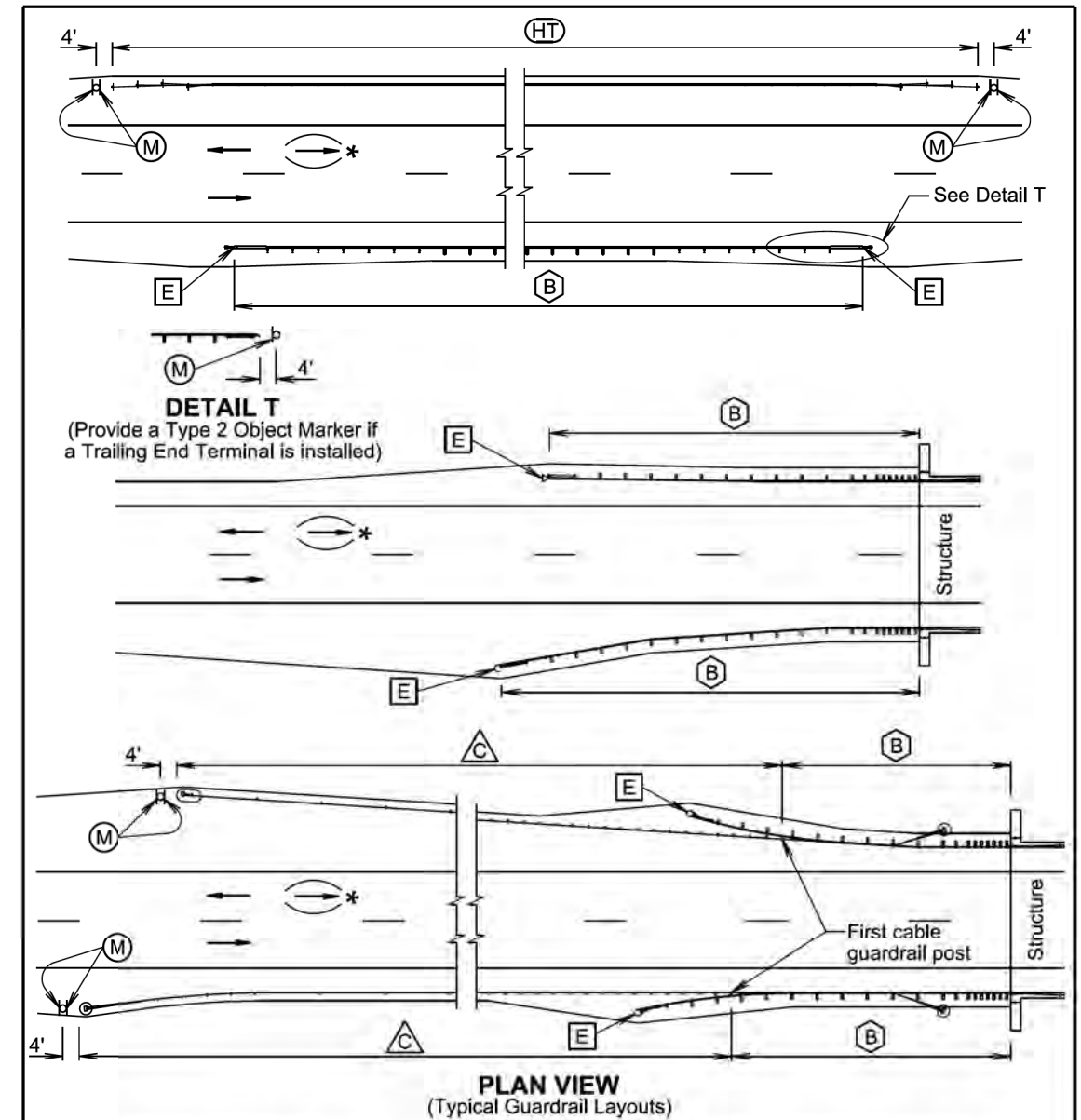
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier will be measured in accordance with this standard plate.

When measuring height of 3 cable guardrail (low tension) the height will be measured to the center of the top cable. See Detail A.

The height of high tension cable guardrail/barrier will be measured in accordance with the Manufacturer's installation instructions.

September 14, 2019

| | | | |
|----------------------|-----------------------|----------------------------|------------------------|
| Published Date: 2024 | S D D O T | MEASURING GUARDRAIL HEIGHT | PLATE NUMBER 630.99 |
| | | | Sheet 1 of 1 |

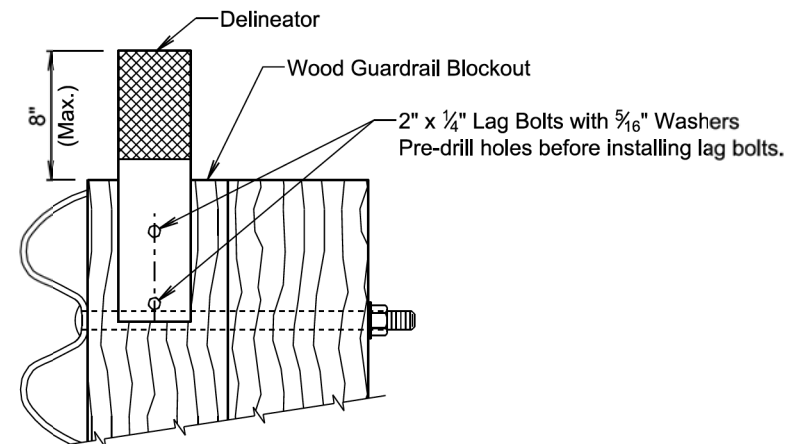


- (B) Steel Beam Guardrail Delineation
- (E) Guardrail End Terminal Object Marker
- (C) 3 Cable Guardrail (Low Tension) Delineation
- (HT) High Tension Cable Guardrail Delineation
- (M) Type 2 Object Marker

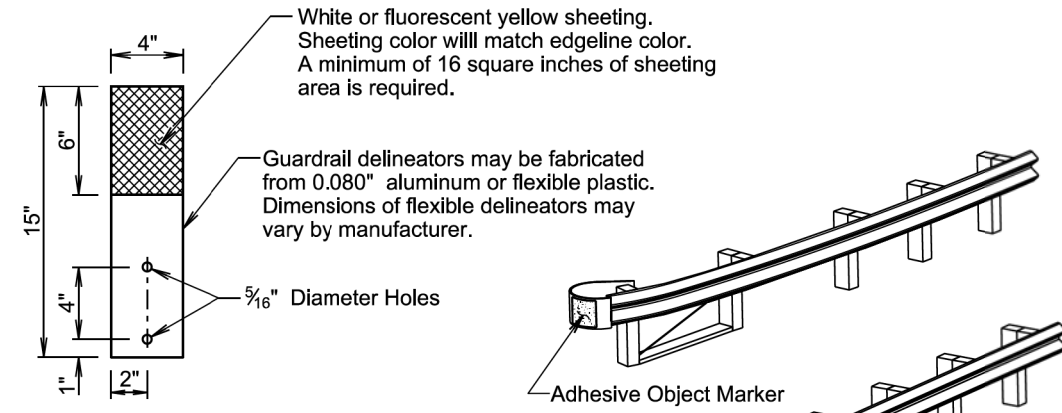
*For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

December 23, 2019

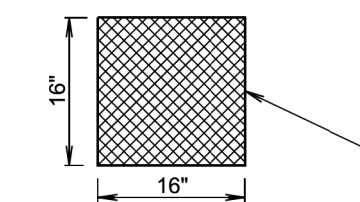
| | | | |
|----------------------|-----------------------|--------------------------|------------------------|
| Published Date: 2024 | S D D O T | DELINEATION OF GUARDRAIL | PLATE NUMBER 632.40 |
| | | | Sheet 1 of 4 |



B STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)

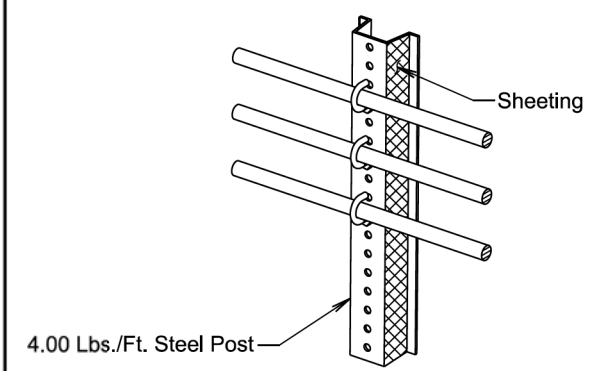


ADHESIVE OBJECT MARKER

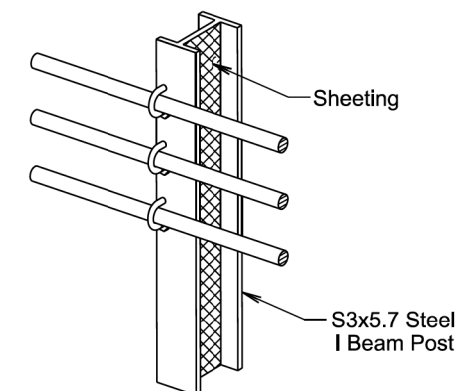
E GUARDRAIL END TERMINAL OBJECT MARKER

December 23, 2019

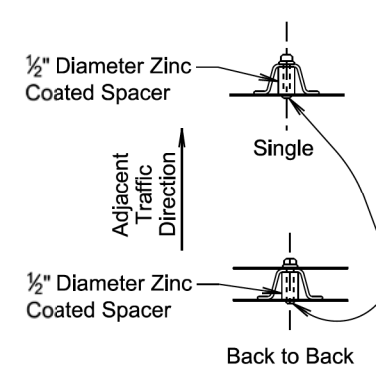
| | | | |
|----------------------|-----------------------|--------------------------|------------------------|
| Published Date: 2024 | S D D O T | DELINEATION OF GUARDRAIL | PLATE NUMBER 632.40 |
| | | | Sheet 2 of 4 |



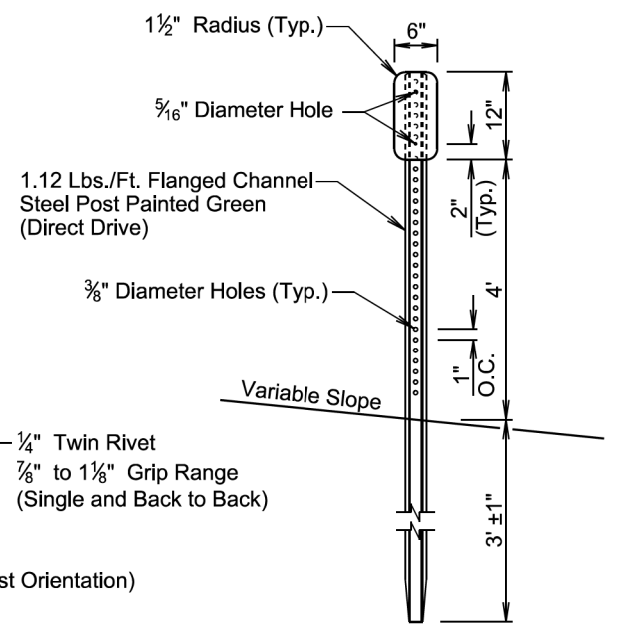
C 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



C 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



PLAN VIEW
(Type 2 Object Marker Details and Post Orientation)



ELEVATION VIEW
M (Type 2 Object Marker)
(For Marking 3 Cable Guardrail (Low Tension) Anchor, High Tension Cable Guardrail Anchor, and Trailing End Terminal)

December 23, 2019

| | | | |
|----------------------|-----------------------|--------------------------|------------------------|
| Published Date: 2024 | S D D O T | DELINEATION OF GUARDRAIL | PLATE NUMBER 632.40 |
| | | | Sheet 3 of 4 |

GENERAL NOTES:

The delineation of high tension cable guardrail will be reflective sheeting placed back to back on every other post cap or cable spacer. The sheeting will be type XI in conformance with ASTM D4956. The color of the reflective sheeting shall be the same as the nearest pavement marking.

The delineators for steel beam guardrail and sheeting on 3 cable guardrail (low tension) posts will be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting will be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting will be on both sides of the delineators and guardrail posts and will be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

When steel beam guardrail is attached to a bridge the first delineator will be attached to the post nearest the bridge.

At bridges with guardrail less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object marker. The spacing between the delineators will be approximately one third of the length of the guardrail.

At bridges with guardrail 200 feet and greater in length, including bridges that have steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

Steel beam guardrail that is not attached to a bridge and is less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object markers. The spacing between the delineators will be approximately one third of the length of the guardrail.

Steel beam guardrail that is not attached to a bridge and is 200 feet and greater in length, including steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation on 3 cable guardrail and steel beam guardrail will be included in the contract unit price per each for "Guardrail Delineator".

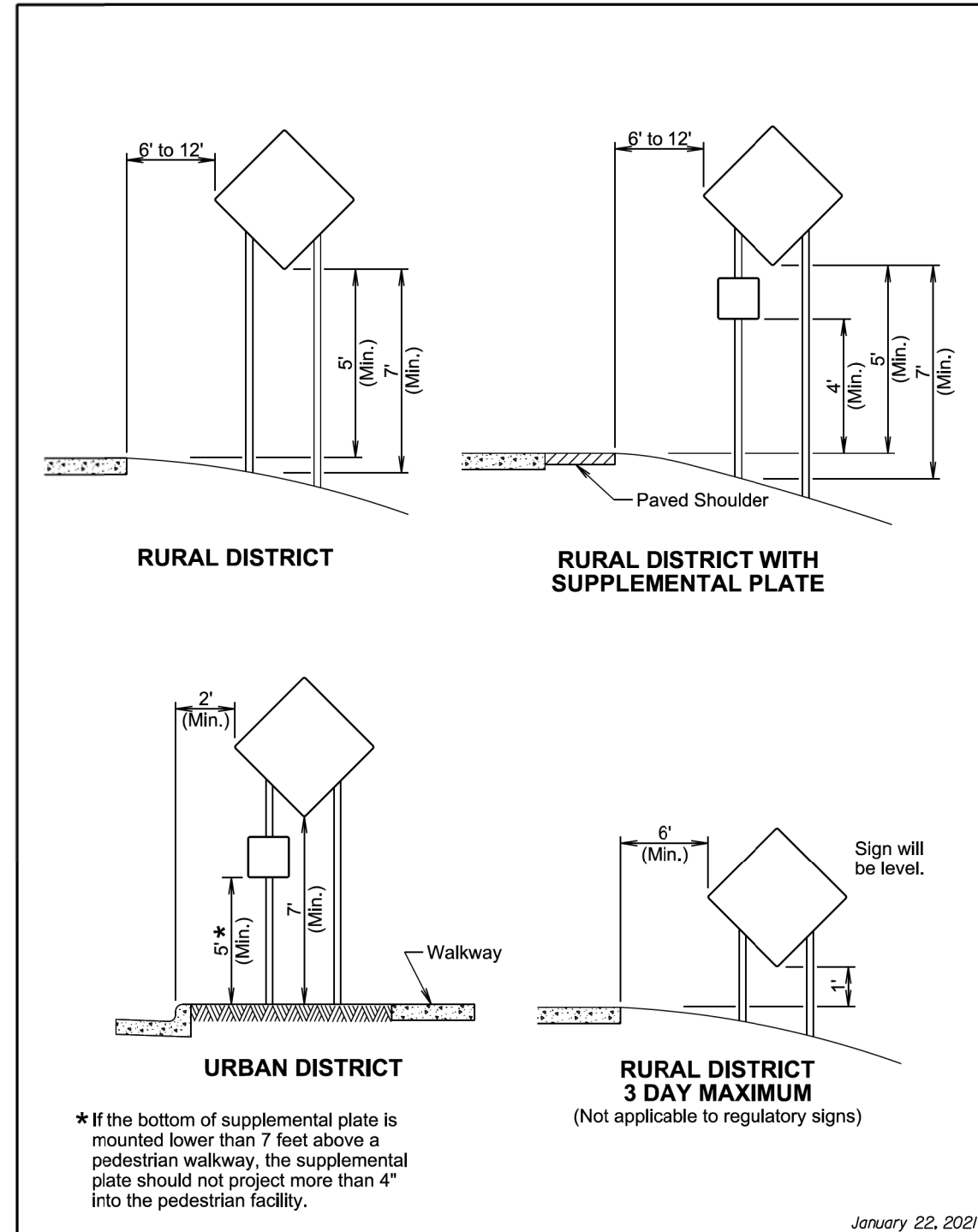
All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail will be incidental to the respective high tension cable guardrail contract item.

An adhesive object marker will be placed on the end of the W beam guardrail or MGS end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting will be fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the adhesive object marker will be incidental to various contract items.

A type 2 object marker will be placed adjacent to the 3 cable guardrail (low tension) anchor, high tension cable guardrail anchor, and trailing end terminal at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") will have fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware will be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

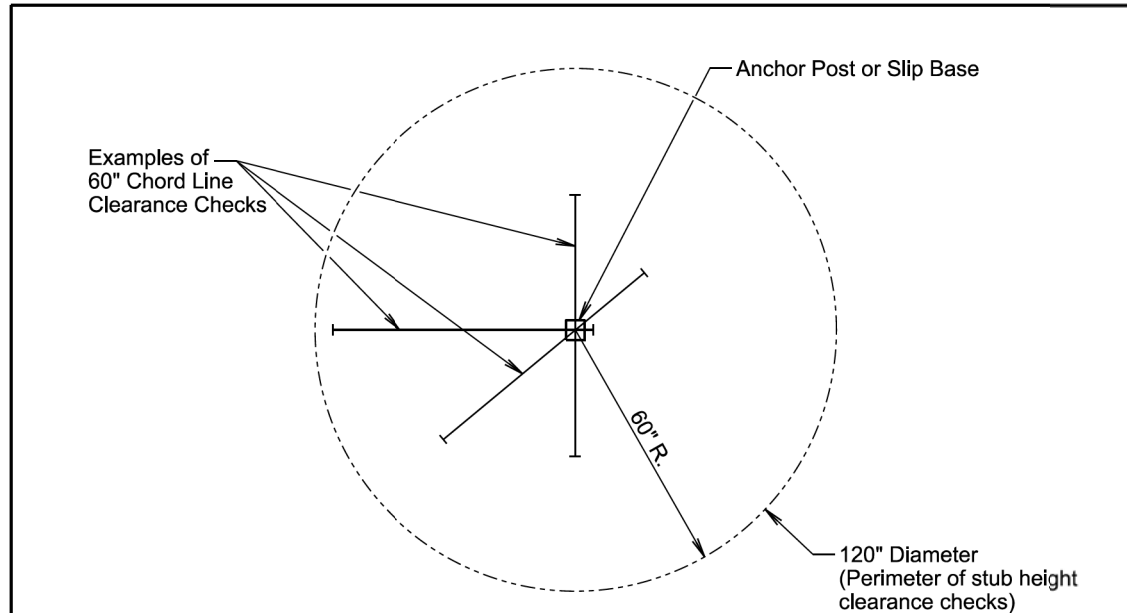
December 23, 2019

| | | | |
|-----------------------------|-----------------------|--|------------------------|
| <i>Published Date: 2024</i> | S D D O T | D E L I N E A T I O N O F G U A R D R A I L | PLATE NUMBER 632.40 |
| | | | Sheet 4 of 4 |

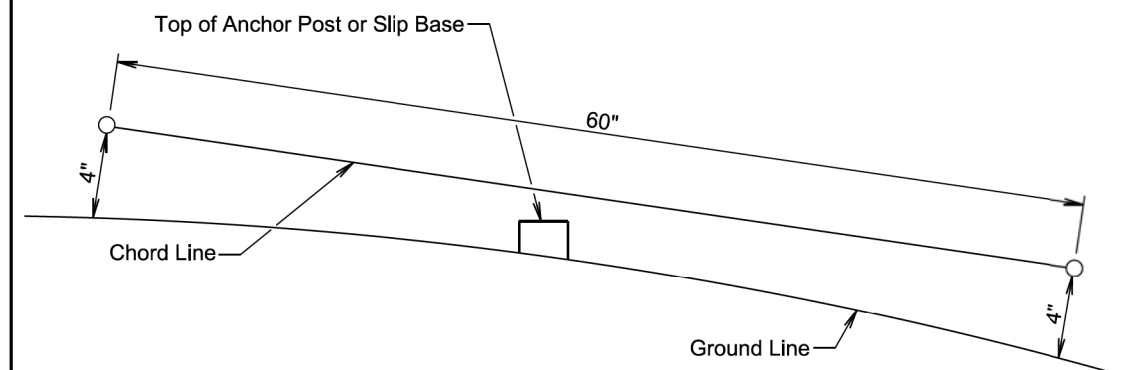


January 22, 2021

| | | | |
|-----------------------------|-----------------------|---|------------------------|
| <i>Published Date: 2024</i> | S D D O T | C R A S H W O R T H Y S I G N S U P P O R T S (Typical Construction Signing) | PLATE NUMBER 634.85 |
| | | | Sheet 1 of 1 |



PLAN VIEW
(Examples of stub height clearance checks)



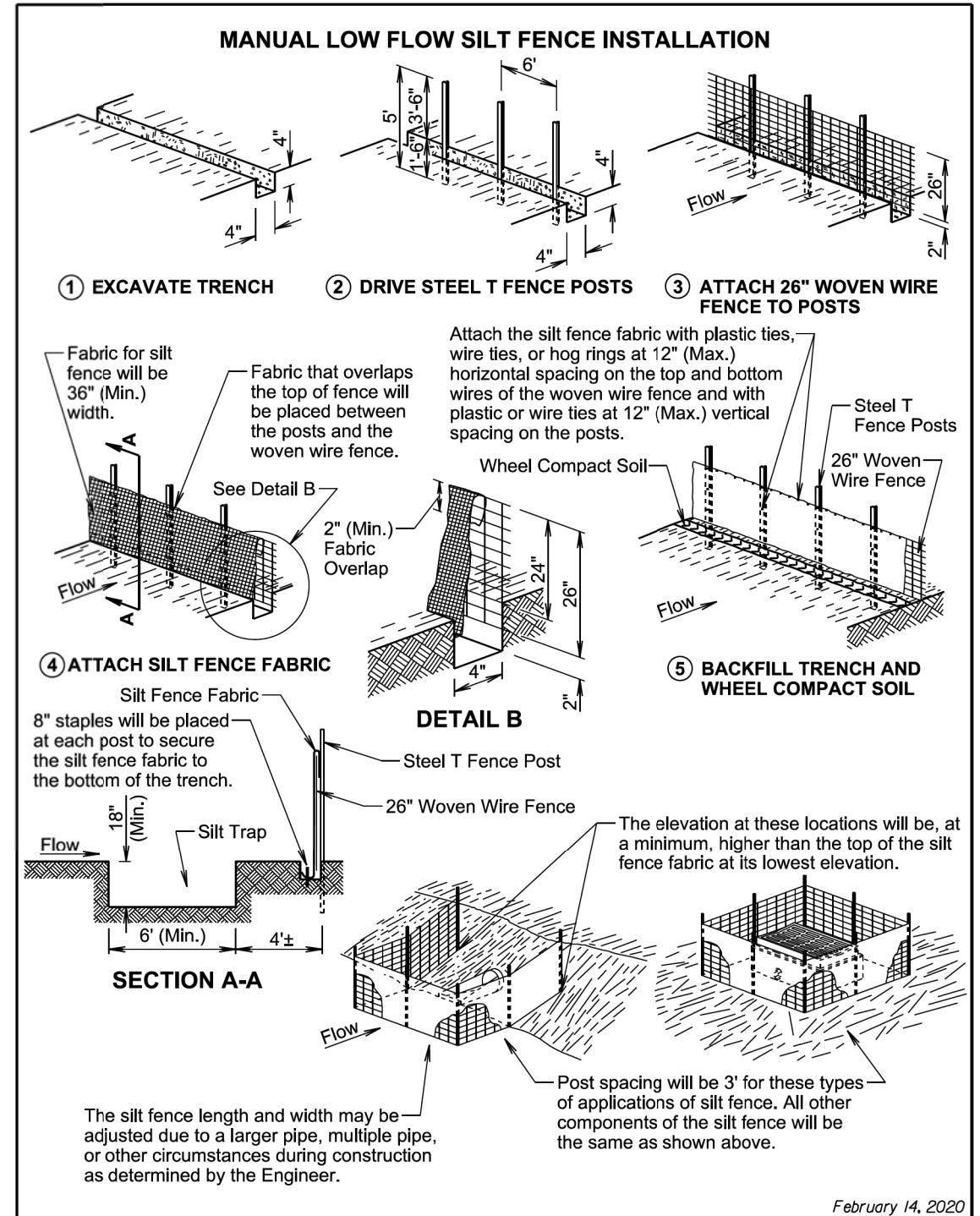
ELEVATION VIEW

GENERAL NOTES:

- The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.
- At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.
- The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

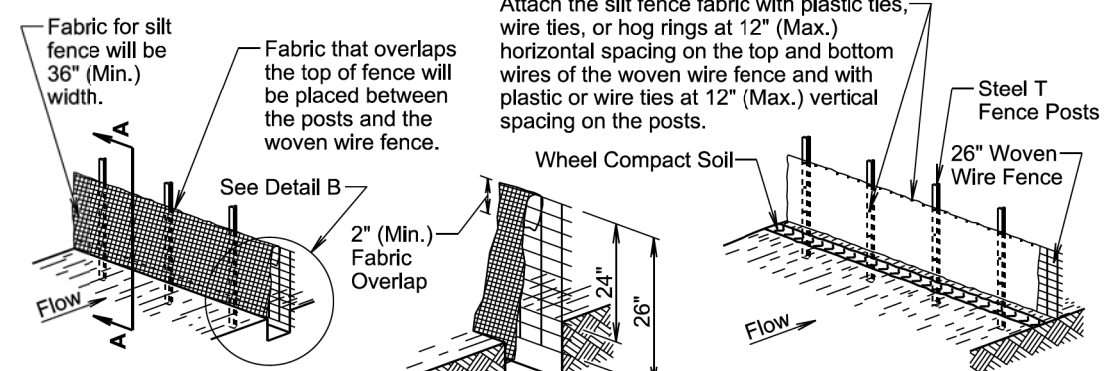
January 22, 2021

| | | | |
|----------------------|-----------------------|----------------------------------|------------------------|
| Published Date: 2024 | S D D O T | BREAKAWAY SUPPORT STUB CLEARANCE | PLATE NUMBER 634.99 |
| | | | Sheet 1 of 1 |

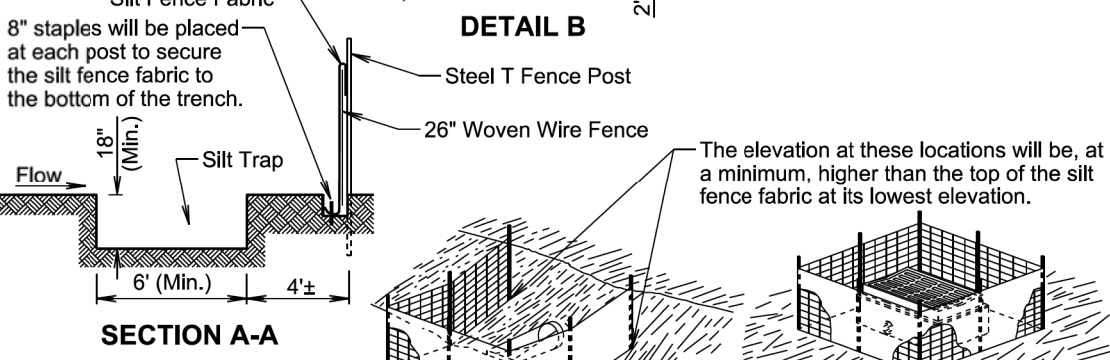


MANUAL LOW FLOW SILT FENCE INSTALLATION

- EXCAVATE TRENCH
- DRIVE STEEL T FENCE POSTS
- ATTACH 26" WOVEN WIRE FENCE TO POSTS



- ATTACH SILT FENCE FABRIC
- BACKFILL TRENCH AND WHEEL COMPACT SOIL



The elevation at these locations will be, at a minimum, higher than the top of the silt fence fabric at its lowest elevation.

The silt fence length and width may be adjusted due to a larger pipe, multiple pipe, or other circumstances during construction as determined by the Engineer.

Post spacing will be 3' for these types of applications of silt fence. All other components of the silt fence will be the same as shown above.

February 14, 2020

| | | | |
|----------------------|-----------------------|-----------------------------------|------------------------|
| Published Date: 2024 | S D D O T | LOW FLOW SILT FENCE AND SILT TRAP | PLATE NUMBER 734.04 |
| | | | Sheet 1 of 2 |

MACHINE SLICED LOW FLOW SILT FENCE INSTALLATION

1 INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.
Silt fence fabric will be overlapped a minimum of 2" at top of woven wire fence.

2 WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.
Attach the silt fence fabric with plastic ties, wire ties, or hog rings at 12" (Max.) horizontal spacing on the top and bottom wires of the woven wire fence and with plastic or wire ties at 12" (Max.) vertical spacing on the posts.

3 ATTACH 26" WOVEN WIRE FENCE TO POSTS AND ATTACH SILT FENCE FABRIC.
The elevation at these locations will be, at a minimum, higher than the top of the silt fence fabric at its lowest elevation.
The radius of the silt fence will be the minimum capable by the slicing machine. The post spacing will be 3' for these types of applications of silt fence. All the other components of the silt fence will be the same as shown above.
The silt fence length and width may be adjusted due to a larger pipe, multiple pipe, or other circumstances during construction as determined by the Engineer.

GENERAL NOTES:
A silt trap will be provided when specified by a plan note. All costs for constructing the silt trap will be incidental to the contract unit price per cubic yard for "Silt Trap".
If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end will be provided on top of the extra length of silt fence fabric to prevent underflow.

February 14, 2020

| | | | |
|----------------------|-----------------------|-----------------------------------|------------------------|
| Published Date: 2024 | S D D O T | LOW FLOW SILT FENCE AND SILT TRAP | PLATE NUMBER 734.04 |
| | | | Sheet 2 of 2 |

Spacing Varies (See Table)

| Slope | Spacing (Ft.) |
|-------|---------------|
| 1:1 | 10 |
| 2:1 | 20 |
| 3:1 | 30 |
| 4:1 | 40 |

ELEVATION VIEW
(Cut or Fill Slope Installation)

See Detail B

Excavated Material from Trench
Flow
2" to 3"
Wood Stake
3" to 5" Trench
9" (Min.)

DETAIL B
(Typical of All Installations)

Ends of Erosion Control Wattles
Wood Stake

DETAIL C
(See General Notes)

Point A
Point B
Point A
Flow
Point A
Point B
Wood Stake (Typ.)

ISOMETRIC VIEW
(Ditch Installation)

PLAN VIEW
(Ditch Installation)

Point A
Point B
Point A
Wood Stake

SECTION A-A

| Grade | Spacing (Ft.) |
|-------|---------------|
| 2% | 150 |
| 3% | 100 |
| 4% | 75 |
| 5% | 50 |

February 14, 2020

| | | | |
|----------------------|-----------------------|------------------------|------------------------|
| Published Date: 2024 | S D D O T | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 |
| | | | Sheet 1 of 2 |

GENERAL NOTES:

At cut or fill slope installations, wattles will be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor will dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes will be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes will be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles will be 3' to 4'.

Where installing running lengths of wattles, the Contractor will butt the second wattle tightly against the first and will not overlap the ends. See Detail C.

The Contractor and Engineer will inspect the erosion control wattles in accordance with the storm water permit. The Contractor will remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

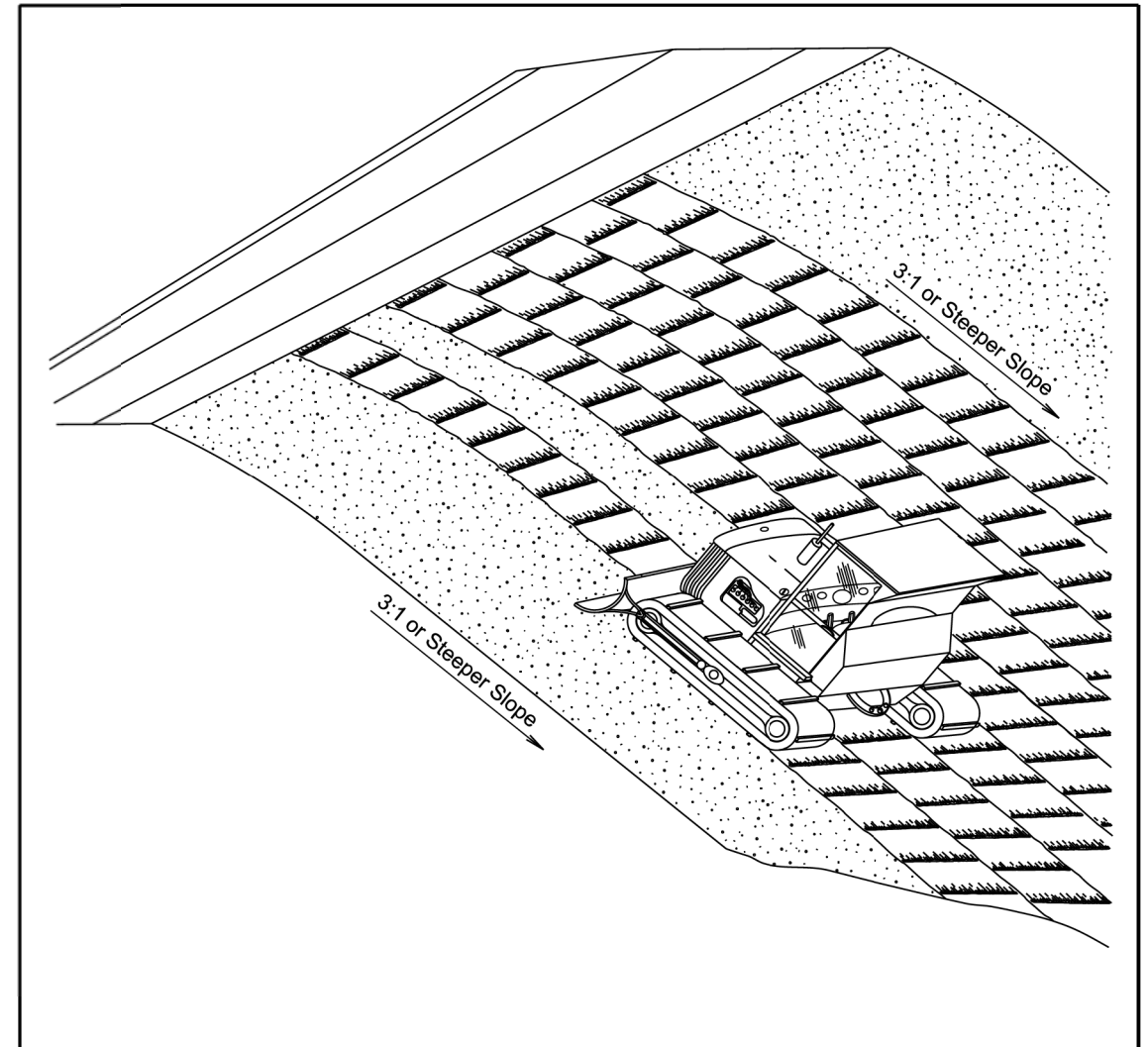
Sediment removal, disposal, or necessary shaping will be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping will be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials will be incidental to the contract unit price per foot for the corresponding erosion control wattle contract item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials will be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

February 14, 2020

| | | | |
|-----------------------------|-----------------------|------------------------|------------------------|
| <i>Published Date: 2024</i> | S D D O T | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 |
| | | | Sheet 2 of 2 |



GENERAL NOTES:

Where practical, surface roughening will be done on slopes 3:1 and steeper and on slopes deemed necessary by the Engineer.

The equipment used for surface roughening will be equipped with tracks that are capable of creating ridges in the soil that are perpendicular to the slope. The final condition of the surface roughening will be approved by the Engineer.

Measurement for surface roughening will be to the nearest tenth of an acre.

All costs associated with surface roughening including labor, equipment, and materials will be incidental to the contract unit price per acre for "Surface Roughening".

February 14, 2020

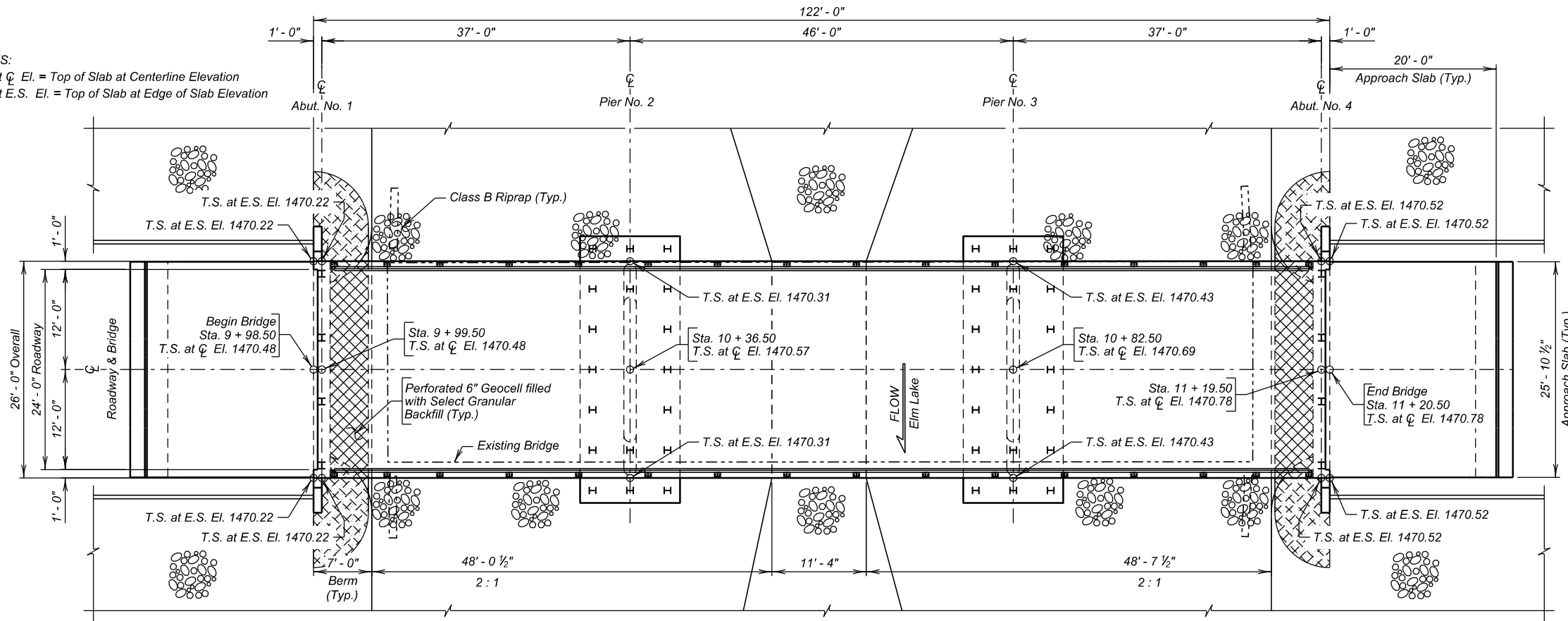
| | | | |
|-----------------------------|-----------------------|--------------------|------------------------|
| <i>Published Date: 2024</i> | S D D O T | SURFACE ROUGHENING | PLATE NUMBER 734.25 |
| | | | Sheet 1 of 1 |

The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

FOR BIDDING PURPOSES ONLY

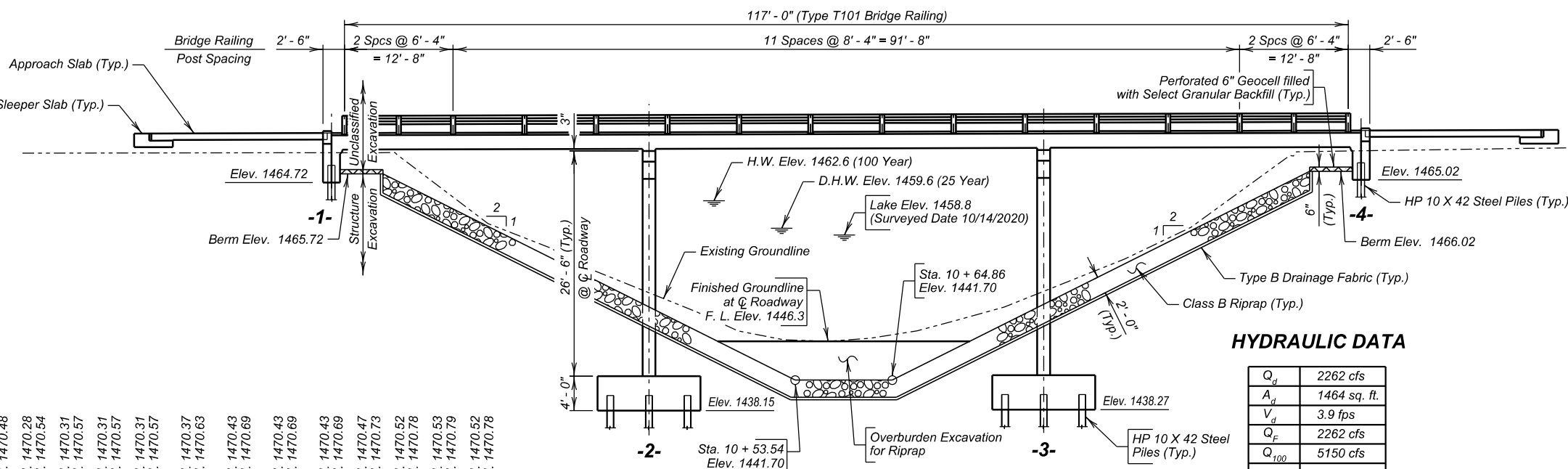
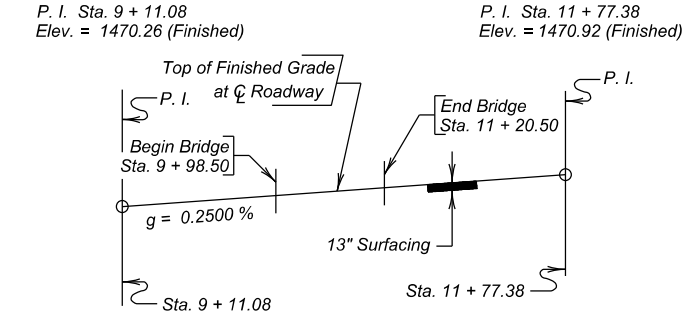
| | | | |
|----------|-----------------|-----------|--------------|
| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
| S.D. | BRO-B 8007(212) | 34 | 64 |

NOTES:
T.S. at C El. = Top of Slab at Centerline Elevation
T.S. at E.S. El. = Top of Slab at Edge of Slab Elevation



-X020- INDEX OF BRIDGE SHEETS -

- Sheet No. 1 - General Drawing
- Sheet No. 2 - Estimate of Structure Quantities & Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - Notes (Continued)
- Sheet No. 5 - Subsurface Investigation and Piling Layout
- Sheet No. 6 - Abutment Details
- Sheet No. 7 - Pier Details (A)
- Sheet No. 8 - Pier Details (B)
- Sheet No. 9 - Superstructure Details
- Sheet No. 10 - Type T101 Bridge Railing Details
- Sheet No. 11 - Details of Bridge End Backfill (A)
- Sheet No. 12 - Details of Bridge End Backfill (B)
- Sheet No. 13 - Details of Approach Slab Adjacent to Bridge
- Sheet No. 14 - Approach Slab Joint Details
- Sheet No. 15 - Riprap Details (A)
- Sheet No. 16 - Riprap Details (B)
- Sheet No. 17 - As - Built Elevations Survey
- Sheet No. 18 - Standard Plate No.'s 460.02 and 460.05
- Sheet No. 19 - Standard Plate No.'s 510.40 and 620.18



HYDRAULIC DATA

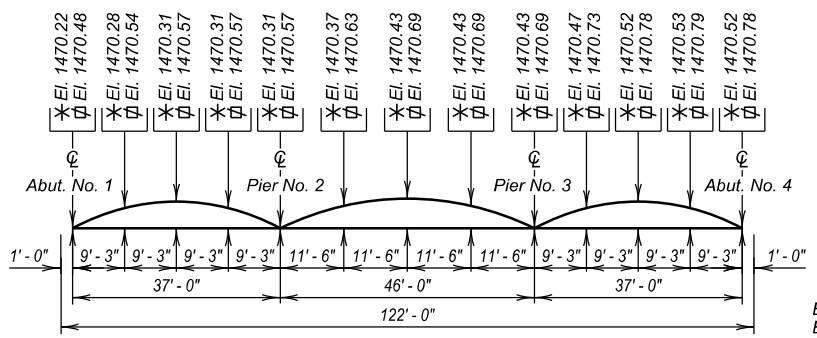
| | |
|-----------|--------------|
| Q_d | 2262 cfs |
| A_d | 1464 sq. ft. |
| V_d | 3.9 fps |
| Q_F | 2262 cfs |
| Q_{100} | 5150 cfs |
| Q_{OT} | N/A |
| V_{max} | 6.6 fps |



GENERAL DRAWING FOR
122' - 0" CONT. CONCRETE BRIDGE
24' - 0" ROADWAY OVER ELM LAKE
0° SKEW
SEC. 8/17-T128N-R65W
STA. 9 + 98.50 TO 11 + 20.50
BRO-B 8007(212)
STR. NO. 07-019-020
PCN 084J
HL-93

BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION

-X020- JULY 2023



Elevations with a * are Top of Finished Slab at Edge of Slab.
Elevations with a □ are Top of Finished Slab at Centerline Roadway.
Camber for Dead Load plus Plastic Flow, shown on SUPERSTRUCTURE DETAILS sheet of the Bridge Plans, have been included in the Elevations shown above.

Q_d = Design discharge for the proposed bridge based on 25 year frequency. El. 1459.6
 Q_{OT} = Overtopping discharge and frequency year recurrence interval.
 Q_F = Designated peak discharge for the basin approaching proposed project based on 25 year frequency.
 Q_{100} = Computed discharge for the basin approaching proposed project based on 100 year frequency. El. 1462.6
 V_{max} = Maximum computed outlet velocity for the proposed bridge, based on a 100 year frequency.

ESTIMATE OF STRUCTURE QUANTITIES

| DESCRIPTION | QUANTITY | UNIT | REMARKS |
|--|----------|---------|-----------------------|
| Bridge Elevation Survey | Lump Sum | LS | |
| Concrete Penetrating Sealer | 352.4 | SqYd | See Special Provision |
| Select Granular Backfill | 16.4 | Ton | |
| Incidental Work, Structure | Lump Sum | LS | |
| Membrane Sealant Expansion Joint | 51.8 | Ft | |
| Structure Excavation, Bridge | 337 | CuYd | |
| Bridge End Embankment | 95 | CuYd | |
| Granular Bridge End Backfill | 42.3 | CuYd | |
| Approach Slab Underdrain Excavation | 1.9 | CuYd | |
| Class A45 Concrete, Bridge Deck | 197.9 | CuYd | |
| Class A45 Concrete, Bridge | 182.4 | CuYd | |
| Concrete Approach Slab for Bridge | 117.7 | SqYd | |
| Concrete Approach Sleeper Slab for Bridge | 25.9 | SqYd | |
| Type T101 Bridge Railing | 234 | Ft | |
| Reinforcing Steel | 22,070 | Lb | |
| Epoxy Coated Reinforcing Steel | 51,572 | Lb | |
| Preboring Pile | 80 | Ft | |
| HP 10x42 Steel Test Pile, Furnish and Drive | 195 | Ft | |
| HP 10x42 Steel Bearing Pile, Furnish and Drive | 1,365 | Ft | |
| 4" Underdrain Pipe | 118 | Ft | |
| Porous Backfill | 3.5 | Ton | |
| Class B Riprap | 1,677.3 | Ton | |
| Overburden Excavation for Riprap | 883 | Cu. Yd. | |
| Type B Drainage Fabric | 2,151 | SqYd | |
| Perforated Geocell | 468 | SqFt | |

BRIDGE SPECIFICATIONS

- Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required provisions, supplemental specifications, and special provisions as included in the proposal.

BRIDGE DESIGN LOADING

- AASHTO HL-93.
- Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS

Class A45 Concrete $f'c = 4,500$ psi
 Reinforcing Steel (ASTM A615, Gr. 60) $f_y = 60,000$ psi
 Piling (ASTM A572 Grade 50) $f_y = 50,000$ psi

GENERAL CONSTRUCTION

- All lap splices shown are contact lap splices unless noted otherwise.
- All exposed concrete corners and edges will be chamfered 3/4-inch unless noted otherwise.
- Use 2-inch clear cover on all reinforcing steel except as shown.
- Contractor will imprint on the structure the date of new construction as specified and detailed on Standard Plate 460.02.
- Bridge railings will be built perpendicular to the roadway grade line.
- Requests for construction joints or reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
- Bridge berms will be constructed to the plans template prior to any pile driving or construction of abutment footings. See Standard Plate 120.11. Berm slopes will not be disturbed after construction. Any alterations to the berm or slopes after berm construction will be submitted to the Bridge Construction Engineer for approval. Allow 30 days for review of proposals.
- The elevation of the bridge deck is 13 inches above subgrade elevation.

INCIDENTAL WORK, STRUCTURE

- In place centerline Sta. 10+07.40 to centerline Sta. 11+11.40 is a 104.0' 3-span steel girder bridge with a 24'-0" clear roadway. The superstructure consists of a reinforced concrete deck on 7 steel girders with concrete pigeon hole railings continuous across the bridge. The deck has been overlaid with 5 inches of asphalt. The substructure consists of 2 column reinforced concrete bents and reinforced concrete vertical abutments.
- Break down and remove the existing bridge, and approach/sleeper slabs if applicable, to 1-foot below finished groundline, or as required to construct the new structure in accordance with Section 110 of the Construction Specifications. Any existing pile that interferes with piling for the new structure will be extracted. All portions of the existing bridge will be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the Environmental Commitments found in the grading plans.
- During demolition of the structure, efforts will be taken to prevent material from falling into the lake. Under no circumstances is asphalt allowed to fall into the lake.
- The foregoing is a general description of the in-place bridge and should not be construed to be complete in all details. Before preparing the bid, it will be the responsibility of the Contractor to make a visual inspection of the structure to verify the extent of the work and materials involved.

NOTICE - LEAD BASED PAINT

Be advised that the paint on the steel surfaces of the existing structure contains lead. The Contractor should plan operations accordingly and inform employees of the hazards of lead exposure

DESIGN MIX OF CONCRETE

- All structural concrete will be Class A45 unless otherwise indicated.
- Type II cement is required.

ABUTMENTS

- Preboring piling at each abutment is required to whichever is greater, ten feet or to natural ground.
- The HP 10x42 Piling were designed using a factored bearing resistance of 77 tons per pile. Piling will develop a field verified nominal bearing resistance of 192 tons per pile.
- One test pile will be driven at each abutment and will become part of the pile group.
- The Contractor will have sufficient pile splice material on hand before pile driving is started. See Standard Plate 510.40.
- Piles will not be driven out of position by more than three inches in the direction parallel to the girder centerline. A pile-driving template will be used to ensure this accuracy.
- Each finished abutment will include a Bridge Survey Marker. See Standard Plate 460.05.
- Abutment pile can be driven to elevation 1430. but not below, prior to splicing. This will prevent setup before full bearing depth is reached and prevent the splice from being located in the bending zone of the integral abutment.

PILE DRIVING

- A drivability analysis was performed using the wave equation analysis program (GRLWEAP). The following pile hammers were evaluated and found to produce acceptable driving stresses:

 Delmag D19-42 MVE M-19 APE D19-42 ICE 42S
- Pile hammers not listed will require evaluation and approval prior to use from the Geotechnical Engineering Activity. Requests for evaluation of hammers not listed will be submitted a minimum of 5 business days prior to installation of piles.

SHOP PLANS

The fabricator will submit shop plans in accordance with the Construction Specifications. Send shop plan submittals to HR Green, Inc., 431 N. Philips Avenue, Sioux Falls, SD 57104 (kbrehm@hrgreen.com). After review, corrections (if necessary), and approval by HR Green, Inc., the Office of Bridge Design will review the submittals, authorize fabrication, arrange for fabrication inspection, and distribute the shop drawings.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES
 FOR
 122' - 0" CONT. CONCRETE BRIDGE

STR. NO. 07-019-020
 JUNE 2023



| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
|-------------------|-------------------|------------------|-----------------|

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| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
| S.D. | BRO-B 8007(212) | 36 | 64 |

FOR BIDDING PURPOSES ONLY

PIERS

1. The HP 10x42 Piling were designed using a factored bearing resistance of 77 tons per pile. Piling will develop a field verified nominal bearing resistance of 192 tons per pile.
2. One test pile will be driven at each pier and will become part of the pile group.
3. The Contractor will have sufficient pile splice material on hand before pile driving is started. See Standard Plate 510.40.
4. It is anticipated that cofferdams will be necessary. Cofferdams will be designed and constructed in accordance with Section 423 of the Construction Specifications.

SUPERSTRUCTURE

1. Preplanned construction joints may be used in accordance with Section 460.3 of the Construction Specifications. Contact the Office of Bridge Design for joint configuration and allowable location. Emergency slab construction joints will be as shown with the superstructure details. If an emergency slab joint is used, contact the Office of Bridge Design before proceeding with deck pour.
2. The use of an approved deck finishing machine will be required during placement of bridge deck concrete. The deck finishing machine will be adjusted and operated in such a manner that the screed or screeds are parallel with the centerline of the bridge. The finish machine and concrete placement will be parallel to the skew of the bridge.
3. Superstructure falsework will not be removed until bridge deck concrete has attained a strength of 2400 psi.
4. The minimum pour rate will be in accordance with Section 460.3 J.2 of the Construction Specifications.
5. See Special Provision for Concrete Penetrating Sealer.

RIPRAP

Riprap gradation and Drainage Fabric will comply with Section 700.2 of Construction Specifications. Placement of Riprap and Drainage Fabric will be in accordance with Section 700.3 of the Construction Specification and conditions must be free of standing water.

APPROACH SLABS

1. Sleeper slab riser will be cast with or later than the approach slab. Care will be taken to ensure the correct grade is maintained across the top of the sleeper slab riser.
2. The portion of the sleeper slab below the construction joint may be precast. If the bottom portion of the sleeper slab is precast, the Contractor will submit proposed lifting and setting plans to the Bridge Construction Engineer for approval. In addition, if reinforcing or other details differ from those shown in the plans, the Contractor will submit proposed alternate details for approval.
3. The use of an approved finishing machine will be required during placement of Class A45 Concrete for the approach slabs. Concrete placement in front of the machine will be kept parallel to the screed.

4. Concrete Approach Sleeper Slab for Bridge, whether cast-in-place or precast, will be paid for at the contract unit price per square yard. This payment will be full compensation for all excavation, furnishing, hauling, and placing all materials including concrete and reinforcing steel; for disposal of all excavated material and surplus materials; and for labor, tools, equipment and any incidentals necessary to complete this item of work.
5. Concrete Approach Slab for Bridge will be paid for at the contract unit price per square yard. This payment will be full compensation for all excavation, furnishing, hauling, and placing all materials including concrete, asphalt paint or 6 mil polyethylene sheeting, elastic joint sealer, and reinforcing steel; for disposal of all excavated material and surplus materials and for labor, tools, equipment and any incidentals necessary to complete this item of work.

AS - BUILT ELEVATION SURVEY

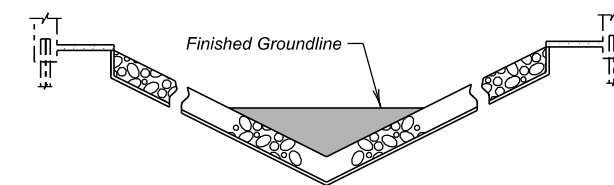
The Contractor will be responsible for producing an as-built elevation survey soon after construction is completed but before the bridge is opened to traffic. The Contractor will be responsible for recording the as-built elevation in the plans. The completed table will be given to the Engineer and copies forwarded to the Office of Bridge Design and the Senior Region Bridge Engineer. The elevations will be based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88). The Engineer will provide the Contractor with a description, elevation, and location of the nearest benchmark that has a NAVD88 established elevation for the Contractor's use. The benchmark shown in the plans has not been tied to the NAVD88. The Contractor will be responsible for establishing a NAVD88 elevation for the benchmark provided in the plans. All cost associated with obtaining the NAVD88 elevations at the locations shown in the table and for the benchmark shown in the plans, including all equipment, labor, and any incidentals required will be incidental to the contractor lump sum price for Bridge Elevation Survey.

APPROACH SLAB UNDERDRAIN SYSTEM

1. An underdrain system will be placed underneath the sleeper slabs and a vertical composite drain behind the abutments as shown in the plans in accordance with Section 435 of the Construction Specifications.
2. The 4-inch diameter Perforated PVC Drain Pipe will be SDR 35 Solvent Weld PVC Pipe conforming to ASTM D3034 and ASTM F758. The 2-inch and 4-inch diameter PVC Outlet Pipe will be Schedule 40 PVC Pipe conforming to ASTM D1785 designated as PVC 1120, PVC 1220, or PVC 2120. Pipe sections will be connected using a PVC Solvent Cement conforming to ASTM D2564. The Drain Sleeve will conform to ASTM D6707.
3. Care will be taken to ensure that the 4-inch diameter Perforated PVC Drain Pipe and the 4-inch diameter PVC Outlet Pipe are not damaged during construction. Sufficient cover material will be placed over the pipes before compaction equipment is allowed over the underdrain system. Any damaged pipes will be replaced by the Contractor at no additional cost to the Department.
4. All labor, tools, equipment, and any incidentals necessary for the Installation of 4-inch diameter Perforated PVC Drain Pipe, 4-inch diameter PVC Outlet Pipe, SDR Solvent Weld PVC Coupling, and PVC Cement will be incidental to the contract unit price per foot for 4" Underdrain Pipe.

OVERBURDEN EXCAVATION FOR RIPRAP

1. This work will consist of the removal and replacement of material between the limits of the finished groundline and the top of the riprap. See diagram below (overburden is in grey).



2. Excavation is to be completed after temporary diversion method is in place, if required, with minimal standing water to create the profile of slope protection specified in plans. It is anticipated that cofferdams will be necessary. Cofferdams will be designed and constructed in accordance with Section 423 of the Construction Specifications.
3. The removed material will be placed on top of the riprap to the natural ground, proposed groundline, or specified shape and elevations shown in plans. When overburden extends into the streambed it will form the channel bottom and profile as specified in plans. The finished ground under the bridge will be shaped to match the upstream and downstream channel and flood plain.
4. The overburden material will be placed on top of the riprap and have a maximum lift depth of 1' - 0" and will be compacted free of flowing water or standing water in excess of four inches above the riprap at the lowest elevation.
5. Compaction effort will produce a surface that does not pump, rut, or otherwise displace when traveled over with construction equipment to the satisfaction of the Engineer. Material may be added to excavated material to facilitate compaction and handling. Importing, stockpiling, blending, and/or wasting of materials will be incidental to the contract unit price per cubic yard for Overburden Excavation for Riprap.
6. Payment for Overburden Excavation for Riprap will be at the contract unit price per cubic yard and will be full compensation for labor, equipment, tools, and incidentals, including furnishing, installing, and removal of any temporary works necessary to complete the work. Payment will be for plans quantity unless measurement is ordered by the Engineer.
7. Before preparing the bid, it is the responsibility of the Contractor to verify existing conditions to determine if a temporary diversion method and/or dewatering will be required. If required, the Contractor must submit the temporary diversion method and/or dewatering for approval to the Construction Engineer 30 days prior to construction.

NOTES (CONTINUED)

FOR

122' - 0" CONT. CONCRETE BRIDGE

STR. NO. 07-019-020

JUNE 2023

3 OF 19



| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
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FOR BIDDING PURPOSES ONLY

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| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
| S.D. | BRO-B 8007(212) | 37 | 64 |

PERFORATED GEOCELL

1. Perforated Geocell will be from the following company or equivalent:

Company: Agtec
 Phone: 1-818-724-7657
 Website: <http://www.agtec.com>

2. Perforated Geocell will be 6 inches tall with Type B Drainage Fabric underlying the perforated Geocell. Installation will adhere to the manufacturer's recommendation.

3. Perforated Geocell will be filled with the Select Granular Backfill in accordance with Section 850 of the Construction Specifications.

4. Perforated Geocell will be paid for at the contract unit price per square foot. Payment will be full compensation for furnishing and installing the Perforated Geocell.

5. Select Granular Backfill will be paid for at the contract unit price per ton of material furnished. Payment will be full compensation for furnishing, loading, hauling, and placing the Select Granular Backfill.

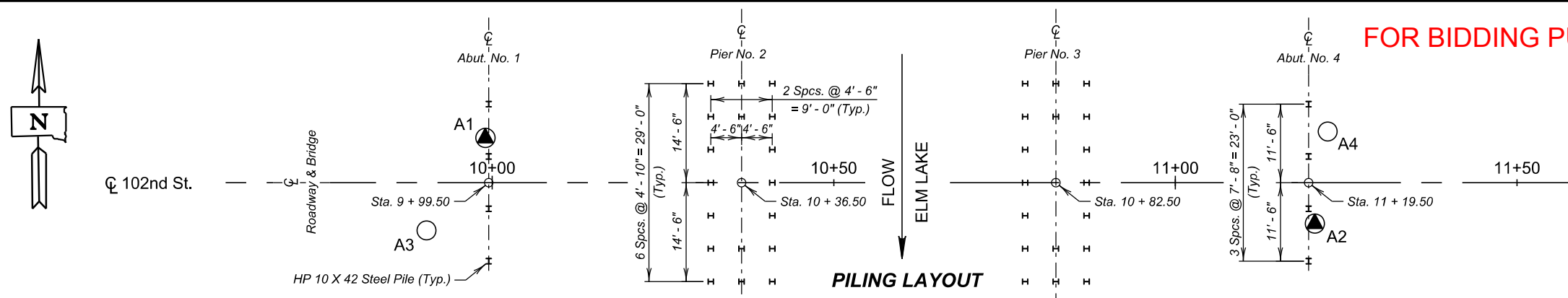


NOTES (CONTINUED)
 FOR
 122' - 0" CONT. CONCRETE BRIDGE

STR. NO. 07-019-020
 JUNE 2023

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| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
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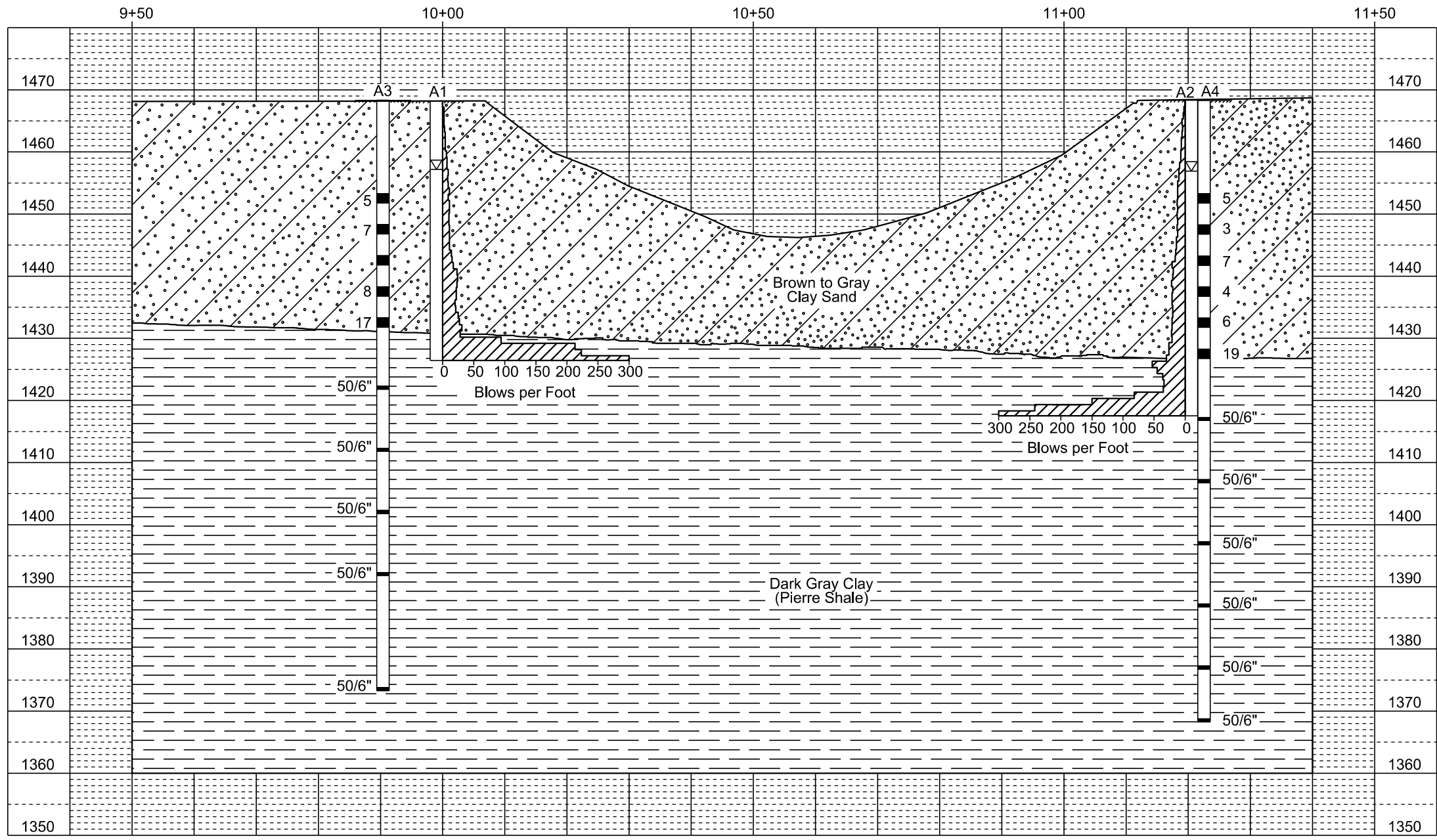
FOR BIDDING PURPOSES ONLY



| Hole Number | Station | Depth | Soil Color | Classification | Strength (Qu) | Dry Density | Wet Density | Moisture | Pass No. 10 | Pass No. 40 | Pass No. 200 | Sand Content | Silt Content | Clay Content |
|-------------|---------|---------|------------|----------------|---------------|-------------|-------------|----------|-------------|-------------|--------------|--------------|--------------|--------------|
| A3 | 9+40 | 15.0 ft | Dark Brown | Sandy Clay | No Test | 52.7 pcf | 68.7 pcf | 30.4 % | 97.3 % | 87.2 % | 62.8 % | 34.6 % | 32.2 % | 30.6 % |
| A3 | 9+40 | 35.0 ft | Dark Gray | Silt Clay | 584 psf | 78.0 pcf | 108.2 pcf | 38.8 % | 99.4 % | 89.6 % | 81.1 % | 18.3 % | 42.9 % | 38.2 % |
| A3 | 9+40 | 55.0 ft | Dark Gray | Silt Clay | 1,922 psf | 78.8 pcf | 105.1 pcf | 33.3 % | 91.9 % | 91.8 % | 82.4 % | 9.5 % | 36.1 % | 46.3 % |
| A4 | 11+22 | 25.0 ft | Brown | Clay Sand | 710 psf | 84.3 pcf | 113.8 pcf | 34.9 % | 100.0 % | 99.6 % | 58.8 % | 41.2 % | 33.8 % | 25.0 % |
| A4 | 11+22 | 80.0 ft | Gray | Clay | 1,086 psf | 72.3 pcf | 103.5 pcf | 43.1 % | 93.4 % | 93.4 % | 91.8 % | 1.6 % | 37.3 % | 54.5 % |

COFFERDAM SOIL PARAMETERS

| | Friction Angle (Φ) | Cohesion (c) | Wet Unit Weight (yw) |
|-------------------------------|--------------------|--------------|----------------------|
| Brown to Gray Clay Sand | 24° | 200 psf | 111 pcf |
| Dark Gray Clay (Pierre Shale) | 16° | 1000 psf | 105 pcf |



Pierre Shale is a marine shale with a textural classification that varies from silt clay to clay silt. Color varies from buff gray to black. The formation may contain concretion zones that are normally thin but occasionally are massive. These zones may be considered hard and dense. Thin zones may be present that are cemented resulting in claystone or siltstone seams. Bentonite zones may be encountered but are normally less than one half inch thick. Nonweathered Pierre Shale is considered to be "Soft Rock".

The Geotechnical Engineering Activity has all of the boring logs and laboratory test results available for review at the Central Office in Pierre.

LEGEND

- Penetration Test
- Drive Test
- ▽ Water
- ⊖ Caved
- ▬ Sample Zone

Drive tests are conducted by dropping a 490 pound hammer 30 inches to drive a 2 7/8 inch drill stem to measure the resistance to penetration of the soil.

Penetration test holes are drilled with a 6 5/8 inch diameter hollow stem auger. Penetration tests are conducted by dropping a 140 pound hammer 30 inches to collect samples and measure the resistance to penetration of the soil. Samples are collected using a lined Modified California Sampler. Penetration test results are listed as uncorrected "N" values in blows per foot. Blows over inches are listed if refusal is achieved, which is 50 blows within one 6 inch set.

GROUNDWATER ELEVATIONS
AUGUST 2021

| | |
|----|--------|
| A1 | 1457.2 |
| A2 | 1456.9 |

MEASURED SKIN FRICTION

| | ELEV. | PSF |
|----|--------|------|
| A1 | 1426.4 | 1640 |
| A2 | 1417.5 | 1037 |



SUBSURFACE INVESTIGATION & PILING LAYOUT FOR

122' - 0" CONT. CONCRETE BRIDGE

24' - 0" ROADWAY OVER ELM LAKE
 0° SKEW
 SEC. 8/17-T128N-R65W
 STA. 9 + 98.50 TO 11 + 20.50
 STR. NO. 07-019-020
 BRO-B 8007(212)
 HL-93

BROWN COUNTY
 S. D. DEPT. OF TRANSPORTATION

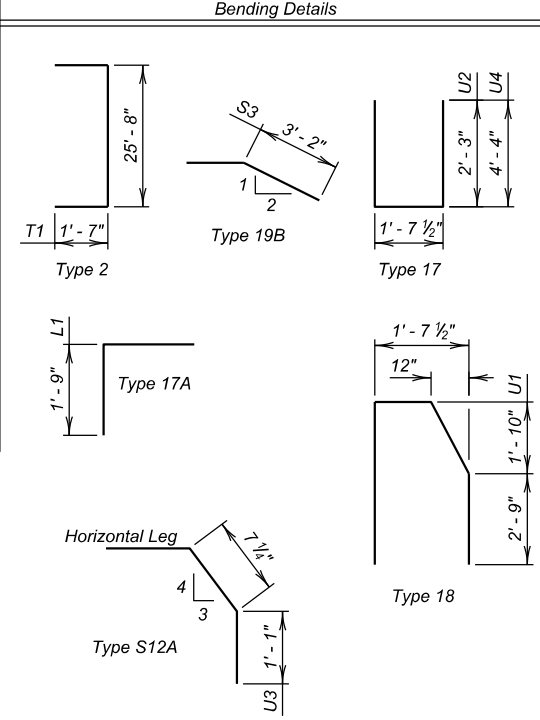
JULY 2023 (5) OF (19)

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|-------------|-------------|------------|-----------------|
| DESIGNED BY | CK. DES. BY | DRAFTED BY | BRIDGE ENGINEER |
| | SH | HK | |

FOR BIDDING PURPOSES ONLY

REINFORCING SCHEDULE
(For One Abutment)

| Mk. | No. | Size | Length | Type | |
|-----|-----|------|--------|---------|------|
| Δ | L1 | 24 | 4 | 3'-6" | 17A |
| | S0 | 1 | 9 | 34'-0" | Str. |
| | S1 | 1 | 9 | 25'-8" | Str. |
| ≠ | S2 | 2 | 9 | 25'-8" | Str. |
| | S3 | 4 | 9 | 4'-3" | 19B |
| ≠ | T1 | 5 | 5 | 28'-10" | 2 |
| | T2 | 4 | 5 | 34'-0" | Str. |
| Δ | T3 | 18 | 5 | 5'-11" | Str. |
| | T4 | 2 | 5 | 25'-8" | Str. |
| Δ | T5 | 4 | 5 | 4'-3" | Str. |
| Δ | U1 | 24 | 6 | 10'-1" | 18 |
| | U2 | 28 | 4 | 6'-2" | 17 |
| Δ | U3 | 28 | 4 | 2'-10" | S12A |
| Δ | U4 | 4 | 6 | 10'-4" | 17 |
| | U5 | 4 | 4 | 13'-4" | T1 |
| | U6 | 2 | 4 | 12'-4" | T1 |
| | U7 | 2 | 4 | 11'-6" | T1 |
| | U8 | 2 | 4 | 10'-6" | T1 |

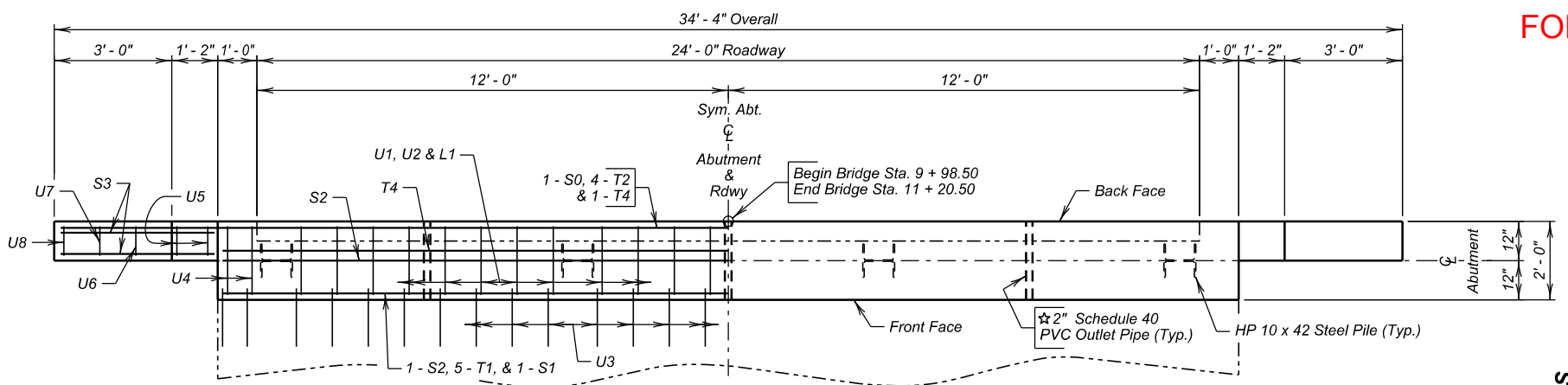


NOTES:
All dimensions are out to out of bars.
Δ Bars to be epoxy coated.
≠ Bend in field as necessary to fit.

ESTIMATED QUANTITIES

| ITEM | UNIT | QUANTITY | |
|--|---------|----------------|----------------|
| | | Abut. No. 1 | Abut. No. 4 |
| Class A45 Concrete, Bridge | Cu. Yd. | 8.4 | 8.4 |
| Reinforcing Steel | Lb. | 878 | 878 |
| Epoxy Coated Reinforcing Steel | Lb. | 763 | 763 |
| Structure Excavation, Bridge | Cu. Yd. | 9.9 | 9.9 |
| HP 10 x 42 Steel Test Pile, Furnish & Drive | Ft. | 1 @ 60' = 60' | 1 @ 65' = 65' |
| HP 10 x 42 Steel Bearing Pile, Furnish & Drive | Ft. | 3 @ 55' = 165' | 3 @ 60' = 180' |
| Preboring Pile | Ft. | 4 @ 10' = 40' | 4 @ 10' = 40' |

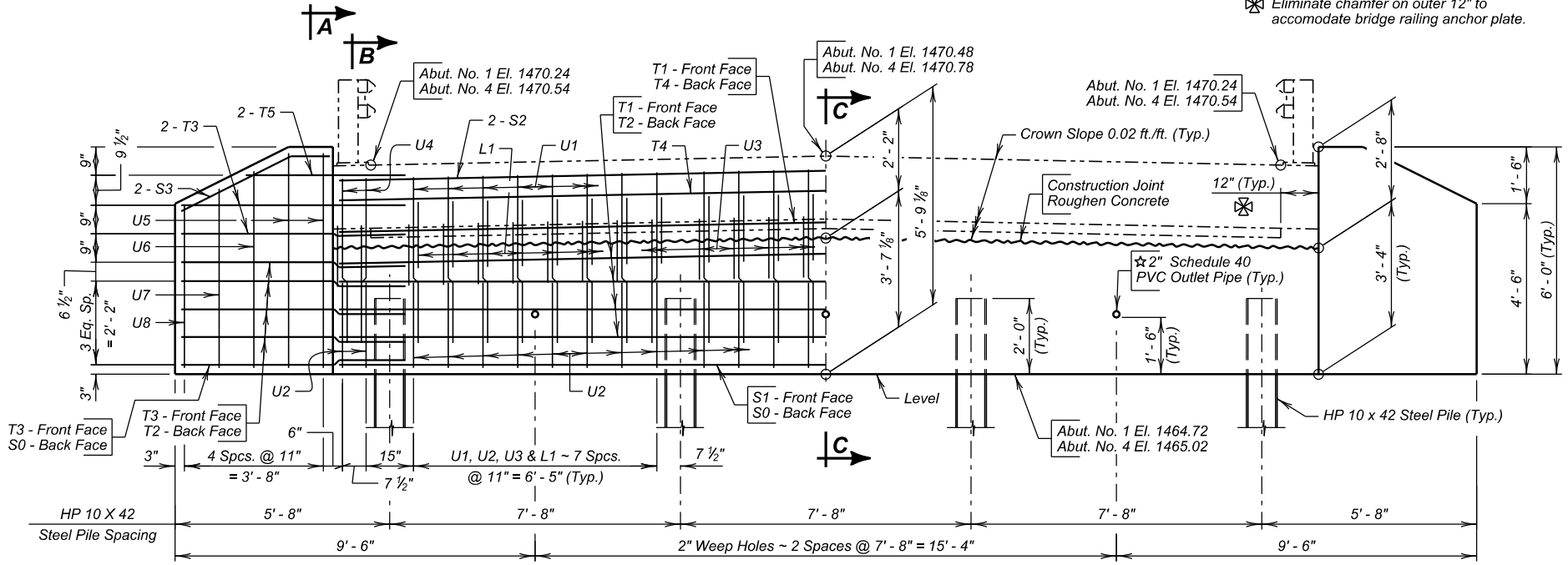
☆ See DETAILS OF BRIDGE END BACKFILL (A) notes for payment and quantity.



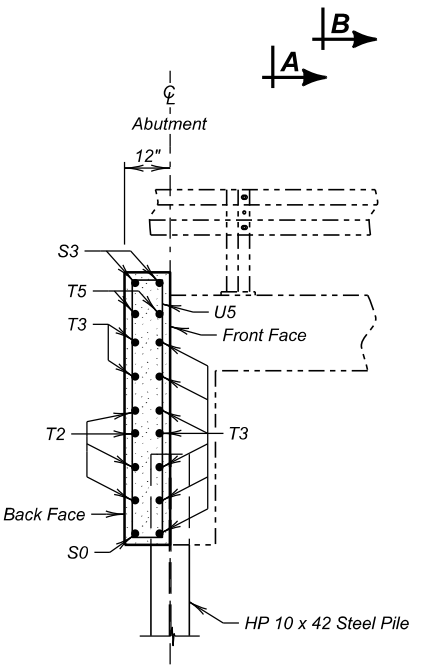
PLAN
(Abut. No. 1 Shown, Abut. No. 4 Similar Opposite Hand)

✗ Eliminate chamfer on outer 12" to accommodate bridge railing anchor plate.

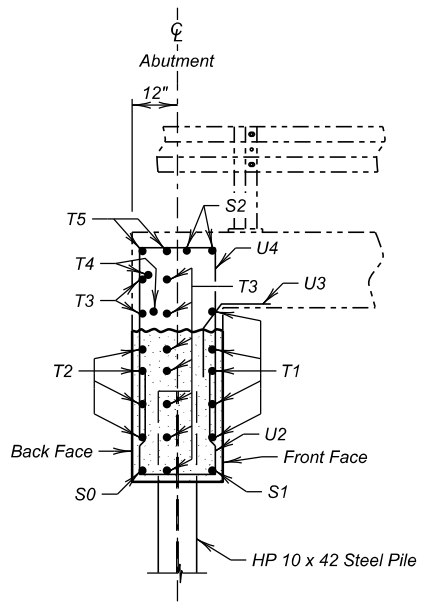
INCREASING STATIONS
Abut. No. 1
INCREASING STATIONS
Abut. No. 4



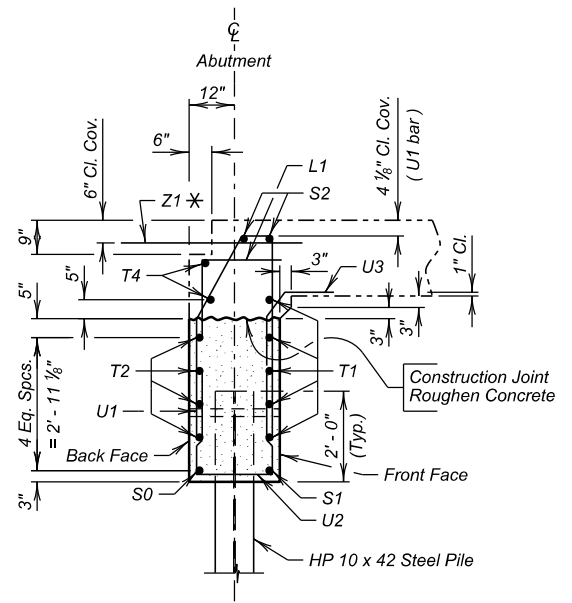
ELEVATION



SEC. A - A



SEC. B - B



SEC. C - C



☆ Quantity of Z1 bars are included on SUPERSTRUCTURE DETAILS Sheet.

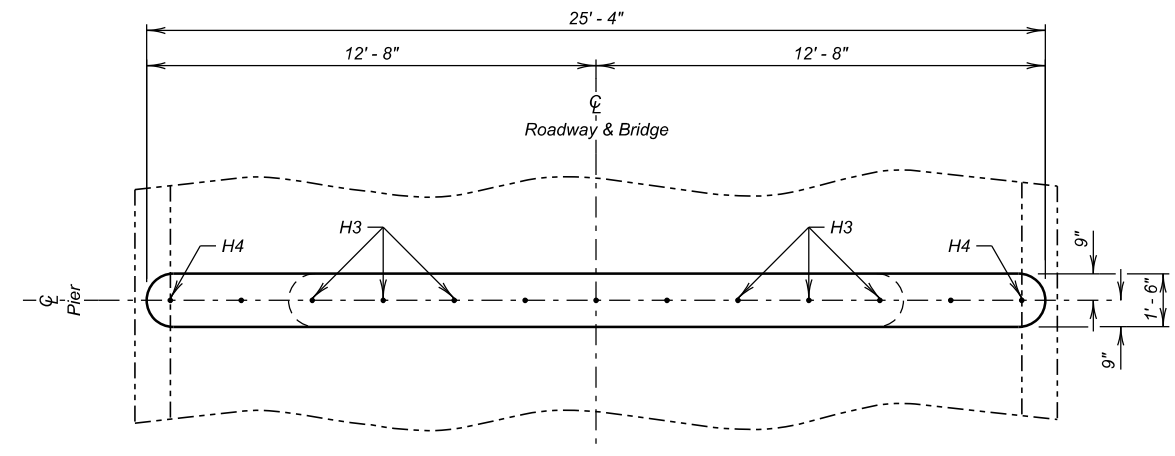
ABUTMENT DETAILS FOR
122' - 0" CONT. CONCRETE BRIDGE
24' - 0" ROADWAY
OVER ELM LAKE
STA. 9 + 98.50 TO 11 + 20.50
STR. NO. 07-019-020

BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2023

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| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
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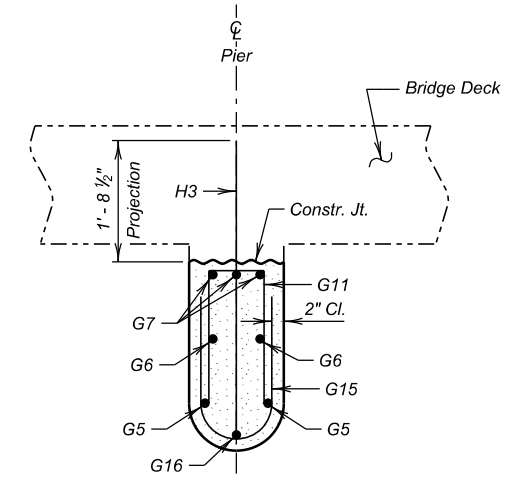
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| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
| S.D. | BRO-B 8007(212) | 40 | 64 |

FOR BIDDING PURPOSES ONLY

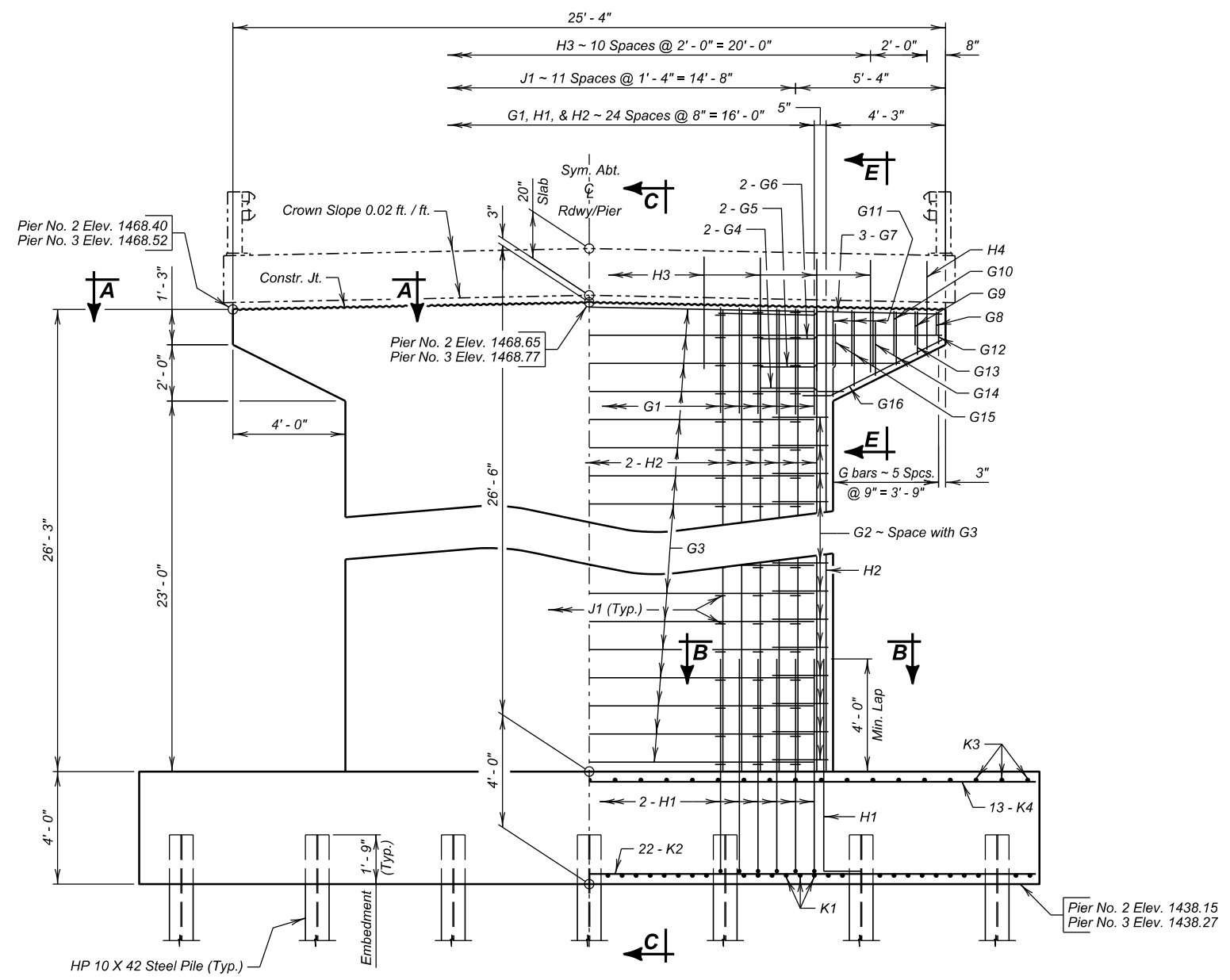


PLAN
(Footing not shown)

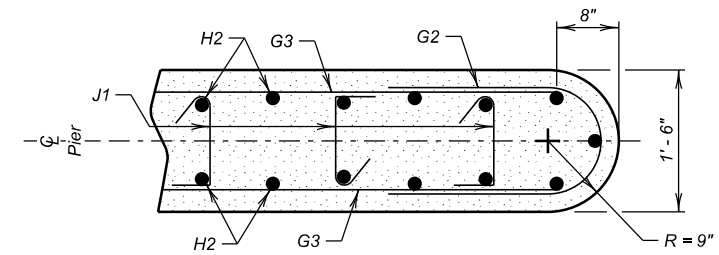
INCREASING STATIONS



SEC. E - E



ELEVATION



SEC. B - B



PIER DETAILS (A)
FOR
122' - 0" CONT. CONCRETE BRIDGE
24' - 0" ROADWAY
OVER ELM LAKE
STA. 9 + 98.50 TO 11 + 20.50
STR. NO. 07-019-020

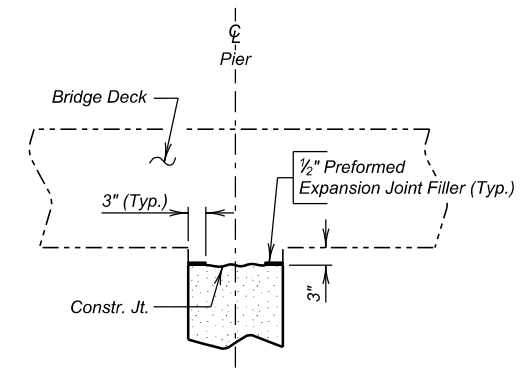
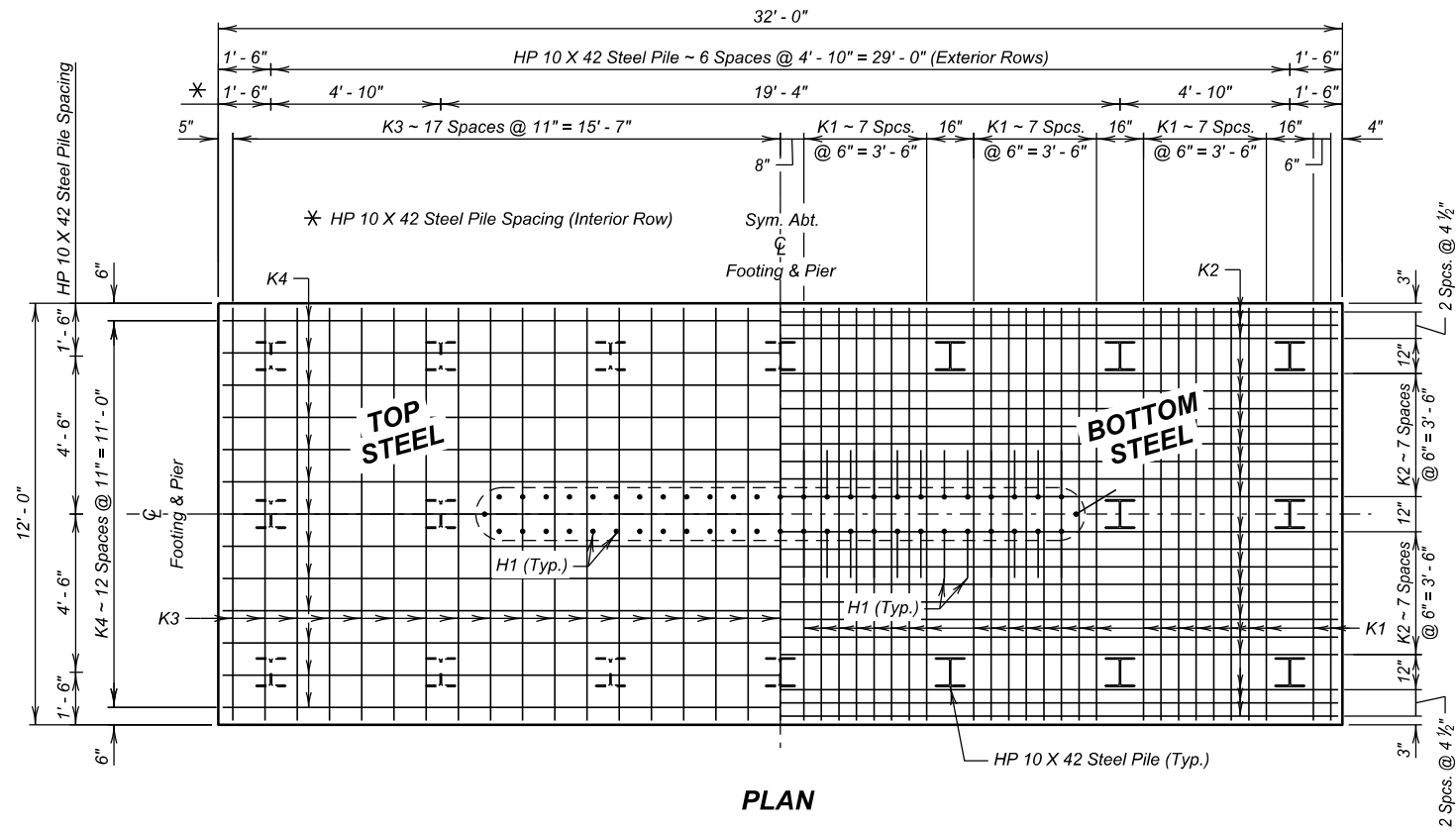
0° SKEW
SEC. 8/17-T128N-R65W
BRO-B 8007(212)
HL-93

BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2023

NOTE:
H1 and H2 bars may be adjusted slightly to clear HP 10 X 42 Steel Pile.

| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
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FOR BIDDING PURPOSES ONLY

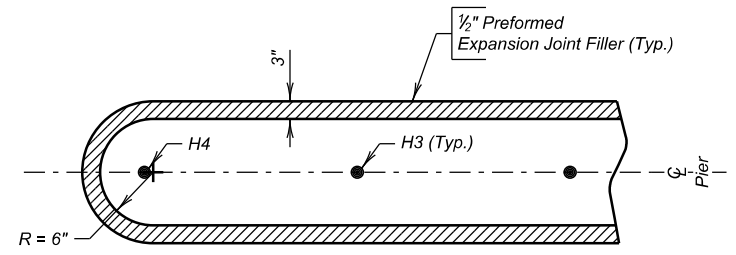


DETAIL "Y"
(Resteel not shown)

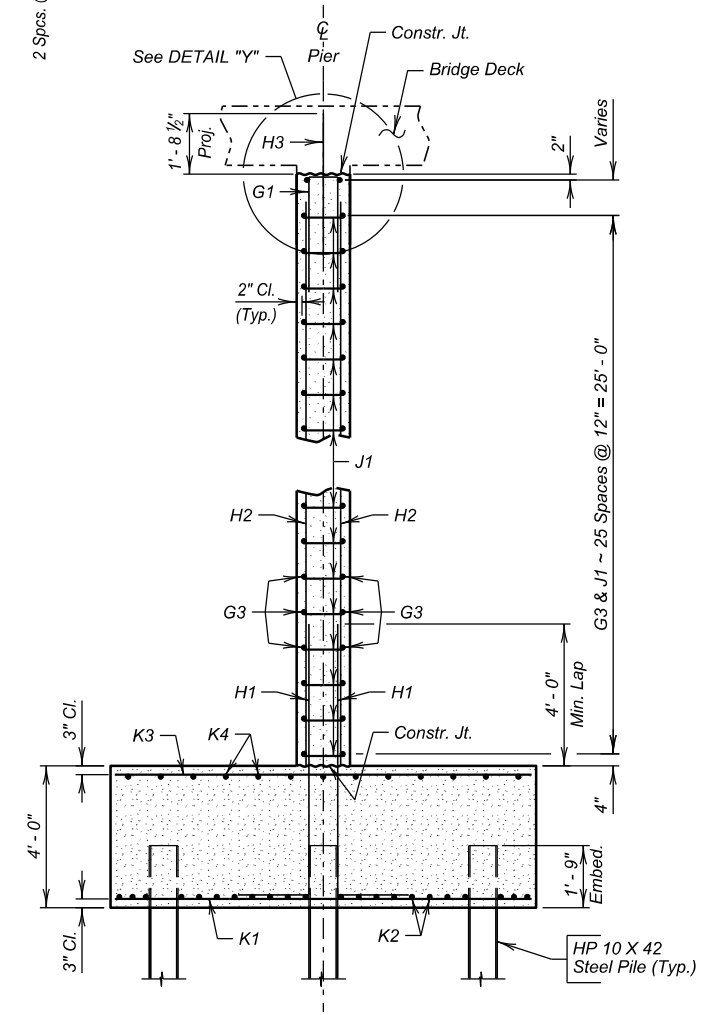
| REINFORCING SCHEDULE | | | | | Bending Details | |
|----------------------|-----|------|---------|------|-----------------|--|
| Mk. | No. | Size | Length | Type | | |
| G1 | 25 | 8 | 7'-7" | 17 | | |
| G2 | 46 | 4 | 5'-10" | S11 | | |
| G3 | 54 | 4 | 15'-10" | Str. | | |
| G4 | 4 | 4 | 3'-0" | Str. | | |
| G5 | 4 | 4 | 5'-0" | Str. | | |
| G6 | 4 | 4 | 6'-6" | Str. | | |
| G7 | 6 | 9 | 8'-0" | Str. | | |
| G8 | 2 | 5 | 2'-8" | 17 | | |
| G9 | 2 | 5 | 3'-6" | 17 | | |
| G10 | 2 | 5 | 4'-4" | 17 | | |
| G11 | 6 | 5 | 5'-2" | 17 | | |
| G12 | 2 | 5 | 3'-0" | S11 | | |
| G13 | 2 | 5 | 3'-8" | S11 | | |
| G14 | 4 | 5 | 4'-6" | S11 | | |
| G15 | 4 | 5 | 6'-0" | S11 | | |
| G16 | 2 | 4 | 5'-5" | 19B | | |
| H1 | 52 | 8 | 9'-1" | 17A | | |
| H2 | 52 | 8 | 26'-2" | Str. | | |
| H3 | 11 | 7 | 4'-0" | Str. | | |
| H4 | 2 | 7 | 3'-2" | Str. | | |
| J1 | 312 | 4 | 1'-11" | T9 | | |
| K1 | 52 | 5 | 11'-8" | Str. | | |
| K2 | 22 | 7 | 31'-8" | Str. | | |
| K3 | 35 | 6 | 11'-8" | Str. | | |
| K4 | 13 | 6 | 31'-8" | Str. | | |

NOTE:
H1 and H2 bars may be adjusted slightly to clear HP 10 X 42 Steel Pile.

NOTES:
All dimensions are out to out of bars.
Δ Bars to be Epoxy Coated.



VIEW A - A
(Resteel and Bridge Deck not shown)



SEC. C - C



| ESTIMATED QUANTITIES | | | |
|--|---------|-----------------|-----------------|
| ITEM | UNIT | QUANTITY | |
| | | Pier No. 2 | Pier No. 3 |
| Class A45 Concrete, Bridge | Cu. Yd. | 82.8 | 82.8 |
| Reinforcing Steel | Lb. | 10,157 | 10,157 |
| Epoxy Coated Reinforcing Steel | Lb. | 103 | 103 |
| Structure Excavation, Bridge | Cu. Yd. | 156.9 | 160.4 |
| HP 10 x 42 Steel Test Pile, Furnish & Drive | Ft. | 1 @ 35' = 35' | 1 @ 35' = 35' |
| HP 10 x 42 Steel Bearing Pile, Furnish & Drive | Ft. | 17 @ 30' = 510' | 17 @ 30' = 510' |

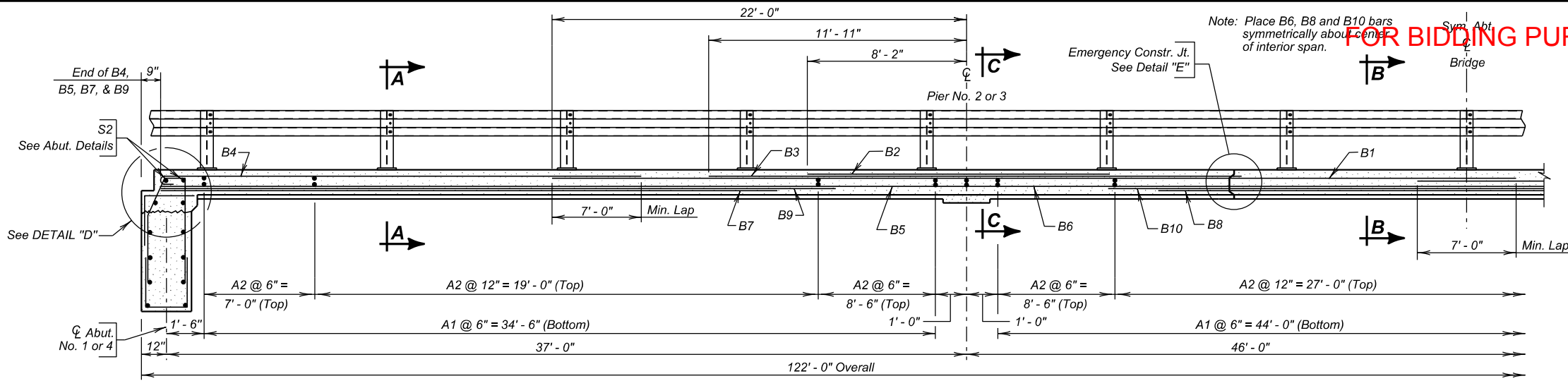
PIER DETAILS (B)
FOR
122' - 0" CONT. CONCRETE BRIDGE
24' - 0" ROADWAY
OVER ELM LAKE
STA. 9 + 98.50 TO 11 + 20.50
STR. NO. 07-019-020

0° SKEW
SEC. 8/17-T128N-R65W
BRO-B 8007(212)
HL-93

BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2023

| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
|-------------------|-------------------|------------------|-----------------|

FOR BIDDING PURPOSES ONLY



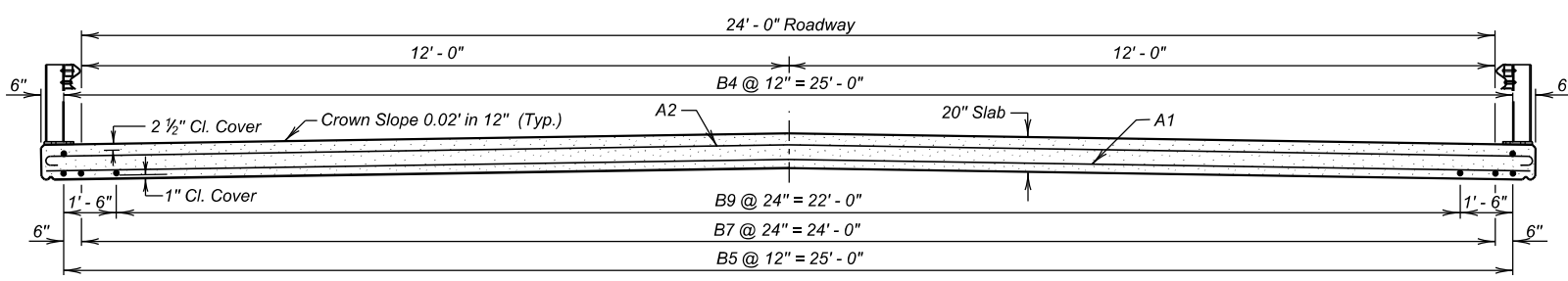
HALF LONGITUDINAL SECTIONAL VIEW

| REINFORCING SCHEDULE | | | | |
|----------------------|-----|------|---------|------|
| Mk. | No. | Size | Length | Type |
| A1 | 231 | 5 | 25'-8" | Str. |
| A2 | 166 | 5 | 26'-10" | 1 |
| B1 | 52 | 10 | 48'-6" | Str. |
| B2 | 26 | 10 | 16'-1" | Str. |
| B3 | 24 | 10 | 24'-4" | Str. |
| B4 | 52 | 10 | 23'-8" | 1A |
| B5 | 52 | 9 | 37'-3" | Str. |
| B6 | 26 | 9 | 46'-0" | Str. |
| B7 | 26 | 9 | 27'-11" | Str. |
| B8 | 13 | 9 | 23'-10" | Str. |
| B9 | 24 | 9 | 33'-11" | Str. |
| B10 | 12 | 9 | 37'-4" | Str. |
| Z1 | 32 | 4 | 4'-0" | Str. |

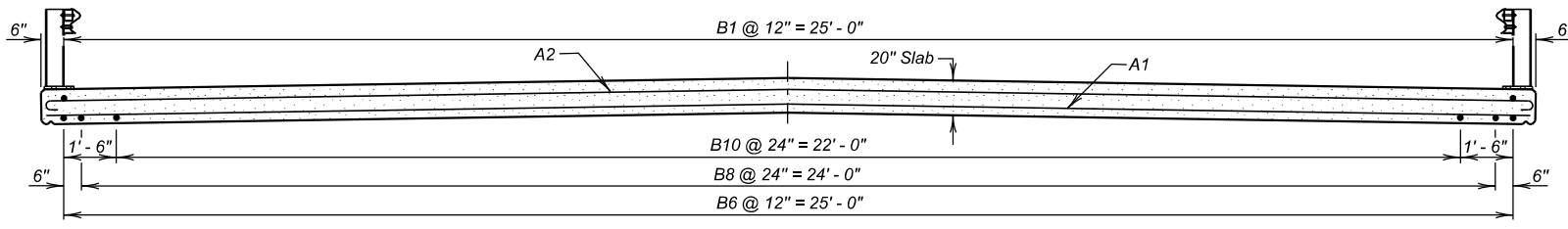
| Bending Details | |
|-----------------|--------|
| B4 | 22'-3" |
| Type 1A | |
| A2 | 25'-8" |
| Type 1 | |

NOTES-
All reinforcing steel will be epoxy coated.
All dimensions are out to out of bars.

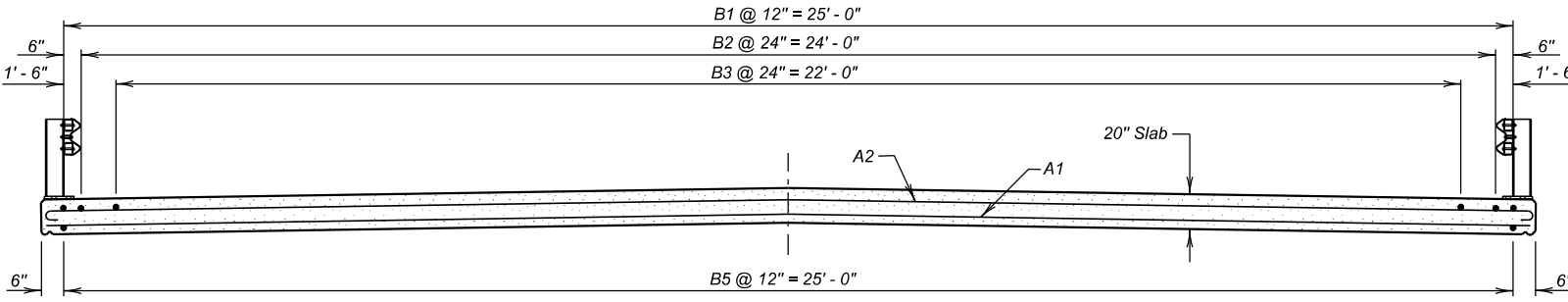
| ESTIMATED QUANTITIES | | |
|---------------------------------|---------|----------|
| ITEM | UNIT | QUANTITY |
| Class A45 Concrete, Bridge Deck | Cu. Yd. | 197.9 |
| Epoxy Coated Reinforcing Steel | Lb. | 49,840 |
| Concrete Penetrating Sealer | Sq. Yd. | 352.4 |



SEC. A - A

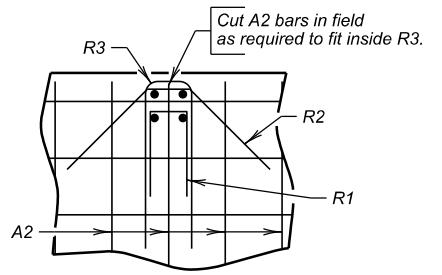


SEC. B - B



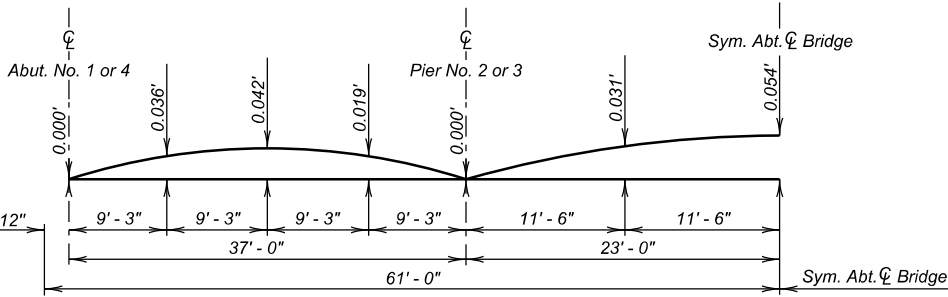
SEC. C - C

NOTE: All bridge railing details shown on TYPE T101 BRIDGE RAILING DETAILS sheet.



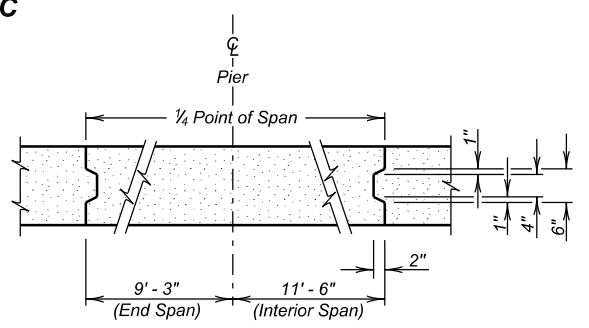
TYPICAL BRIDGE RAILING POST REINFORCEMENT

- NOTES:
- The cut ends of the A2 bars will be coated with an epoxy repair coating to the satisfaction of the Engineer.
 - R1 and R2 will be placed beneath the A1 and A2 bars; R3 will be placed in same layer as A2 bars with 1/2" clear cover to edge of slab.
 - R bars bending details and reinforcing schedule shown on TYPE T101 BRIDGE RAILING DETAILS sheet and will be included in the contract unit price per foot for T101 Bridge Railing.

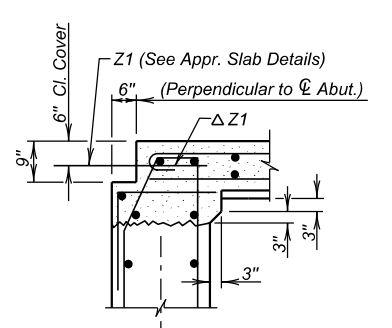


CAMBER DIAGRAM

Camber is calculated for dead load deflection plus plastic flow and will be added to the proposed grade elevations at the respective stations to establish the elevations of the top of the finished roadway slab.



DETAIL "E"



DETAIL "D"

Δ See DETAILS OF APPROACH SLAB ADJACENT TO BRIDGE sheet for location of Z1 bars.

SUPERSTRUCTURE DETAILS
FOR
122' - 0" CONT. CONCRETE BRIDGE
24' - 0" ROADWAY
OVER ELM LAKE
STA. 9 + 98.50 TO 11 + 20.50
STR. NO. 07-019-020

0° SKEW
SEC. 8/17-T128N-R65W
BRO-B 8007(212)
HL-93

BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2023

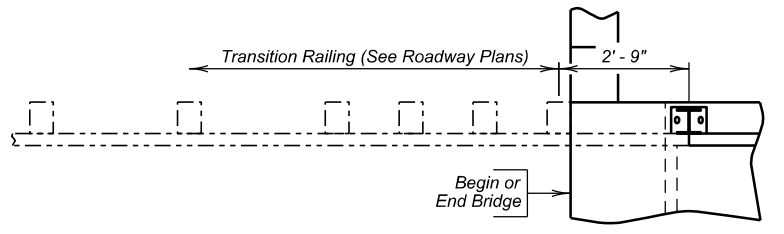
| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
|-------------------|-------------------|------------------|-----------------|

| | | | |
|----------|-----------------|-----------|--------------|
| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
| S.D. | BRO-B 8007(212) | 43 | 64 |

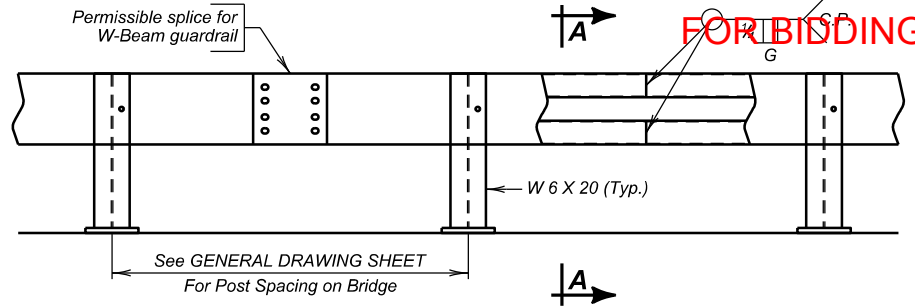
FOR BIDDING PURPOSES ONLY

GENERAL NOTES:

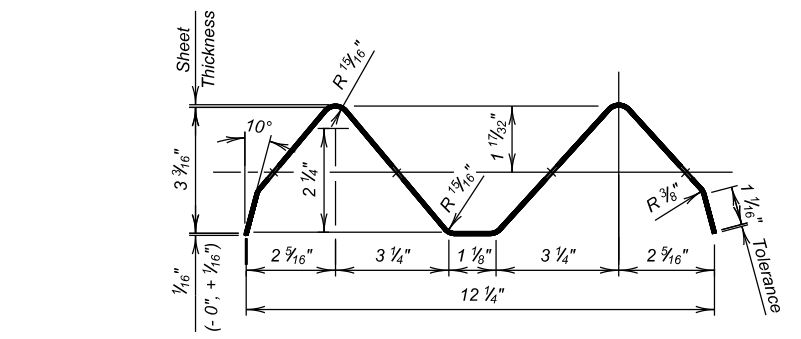
- Rail posts will be perpendicular to centerline of roadway.
- W-Beam guardrail, pipe sleeves nuts, washers, and plate washers that go with these will be galvanized. Bolts, nuts, and washers will be galvanized according to ASTM F2329. Pipe sleeves will be galvanized according to ASTM A123.
- Post bolts will be 3/4" diameter ASTM F3125 Grade A325 or Grade A490. Each bolt will have one hardened and one 2" X 2" X 1/16" ASTM A36 plate washer. Nuts will be ASTM A563.
- Steel W-Beam guardrail will be Class A, Type 1, conforming to AASHTO M180 and will be fabricated from standard 12.5' or 25' nominal W-Beam sections.
- The rail posts, 4" X 3" tube members, base plates and projecting portions of the anchor bolts, nuts, and washers will be satisfactorily painted in accordance with Section 411 of the Specifications. The color of the finish coat will be an approved green, Federal Standard No. 24108. The nuts, bolts, and washers will be galvanized in accordance with ASTM F2329. The rail posts and tube members may be galvanized in accordance with ASTM A123 in substitution for painting. If galvanizing is selected, no paint will be applied over galvanized surfaces.
- All structural steel parts for the Type T101 Bridge Railing will conform to ASTM A709 Grade 36. Tubes will conform to ASTM A500 Grade B.
- Provide 1/2" drain holes in the tubes near ends of rail and near splices.
- All reinforcing steel will conform to ASTM A615, Grade 60.
- All bolts, nuts, washers, posts, plates, pipe sleeves, steel W-Beam guardrail, welding, painting or galvanizing, reinforcing steel and anchor bolts will be included in the contract unit price per foot for T101 Bridge Railing.
- Measurements for payment will be from center of end post to center of end post for each side of the bridge.



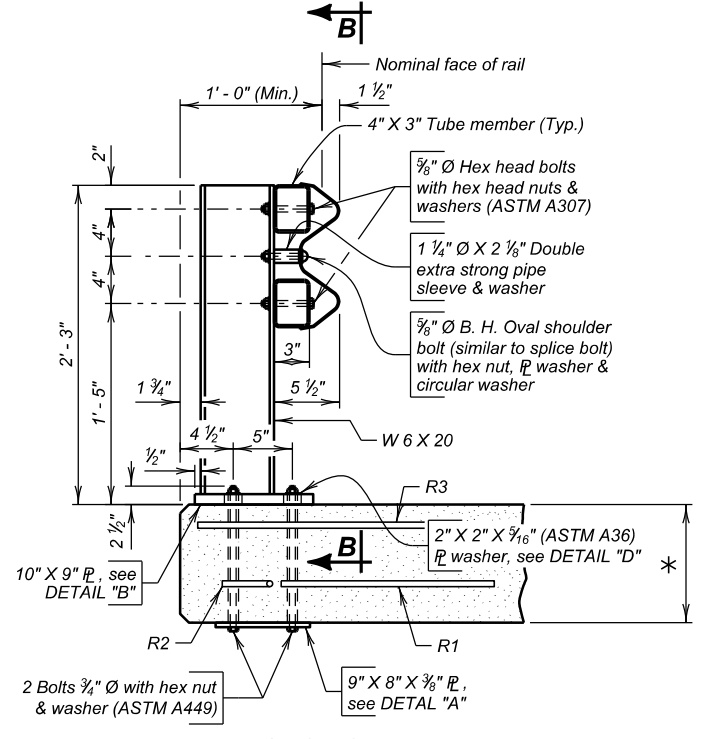
PLAN OF GUARDRAIL



ELEVATION OF GUARDRAIL

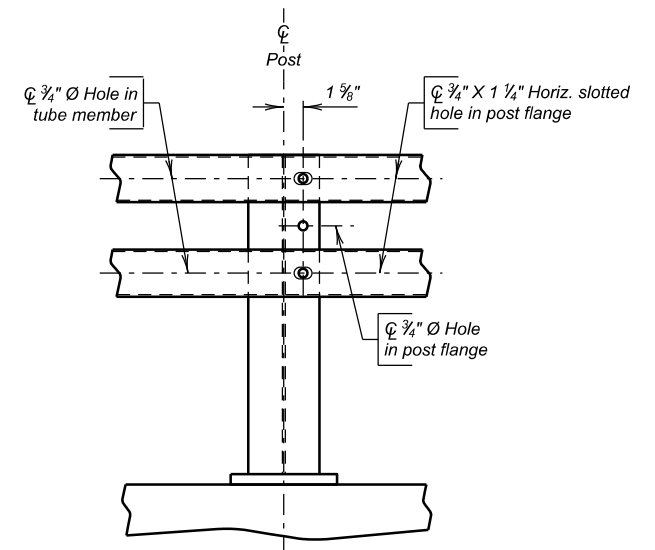


RAIL MEMBER

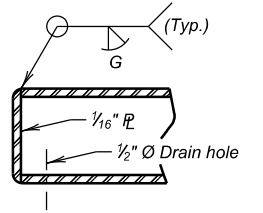


SECTION A - A

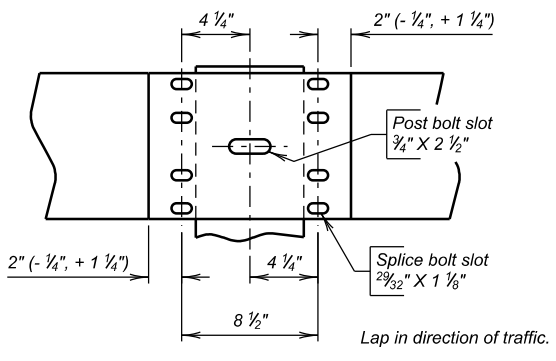
* Slab thickness



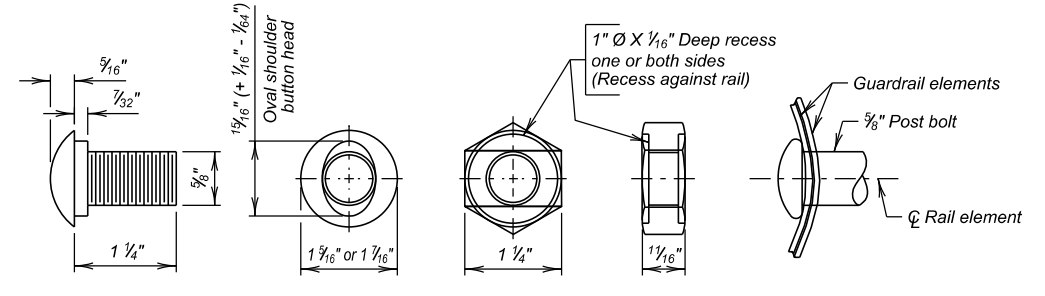
SECTION B - B
(W-Beam not shown)



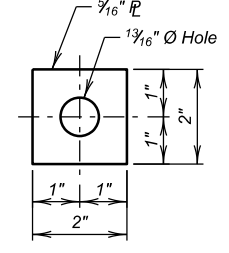
TUBE CAP



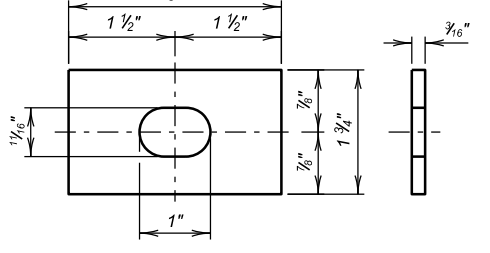
RAIL SPLICE



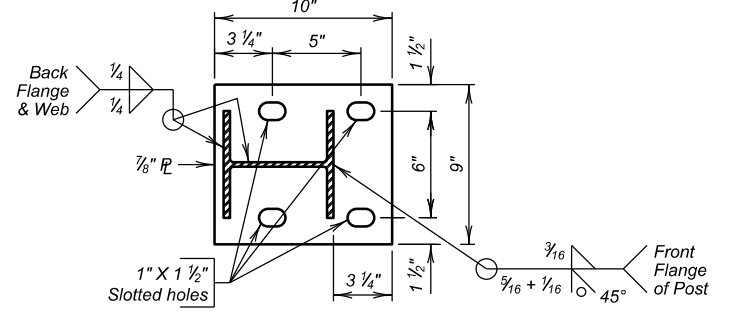
SPLICE BOLT



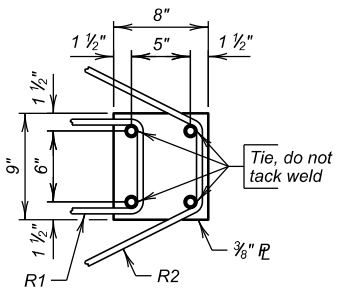
DETAIL "D"



RECTANGULAR PLATE WASHER



DETAIL "B"



DETAIL "A"

| REINFORCING SCHEDULE | | | | |
|----------------------|-----|------|----------|------|
| Mk. | No. | Size | Length | Type |
| R1 | 32 | 4 | 3' - 9" | 17 |
| R2 | 32 | 4 | 4' - 9" | 17A |
| R3 | 32 | 6 | 6' - 11" | 17 |

NOTE: All dimensions are out to out of bars.

| ESTIMATED QUANTITIES | | |
|--------------------------|------|----------|
| ITEM | UNIT | QUANTITY |
| Type T101 Bridge Railing | Ft. | 234 |

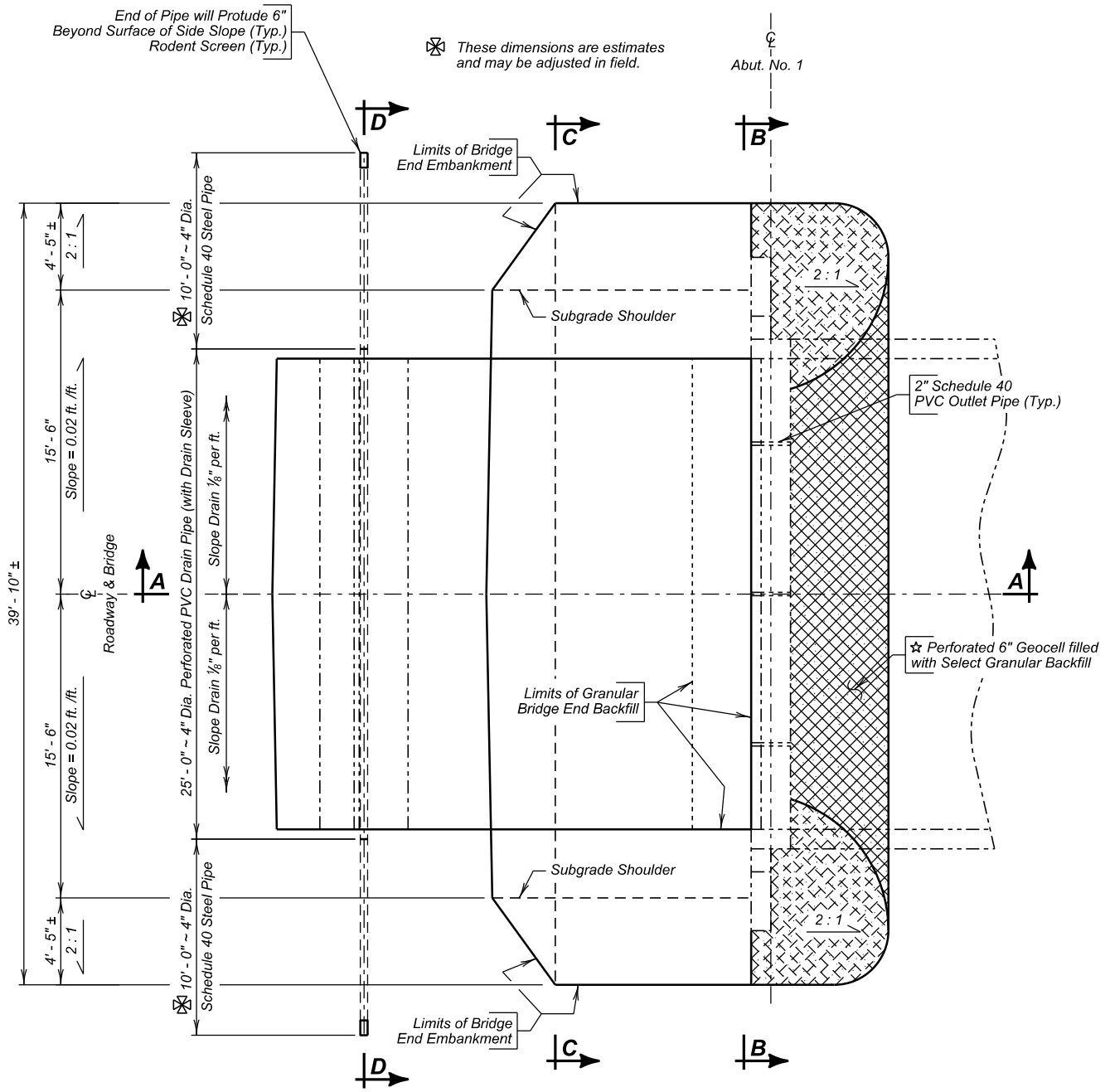
TYPE T101 BRIDGE RAILING DETAILS FOR
122' - 0" CONT. CONCRETE BRIDGE
 24' - 0" ROADWAY OVER ELM LAKE
 STA. 9 + 98.50 TO 11 + 20.50
 STR. NO. 07-019-020

0° SKEW
 SEC. 8/17-T128N-R65W
 BRO-B 8007(212)
 HL-93

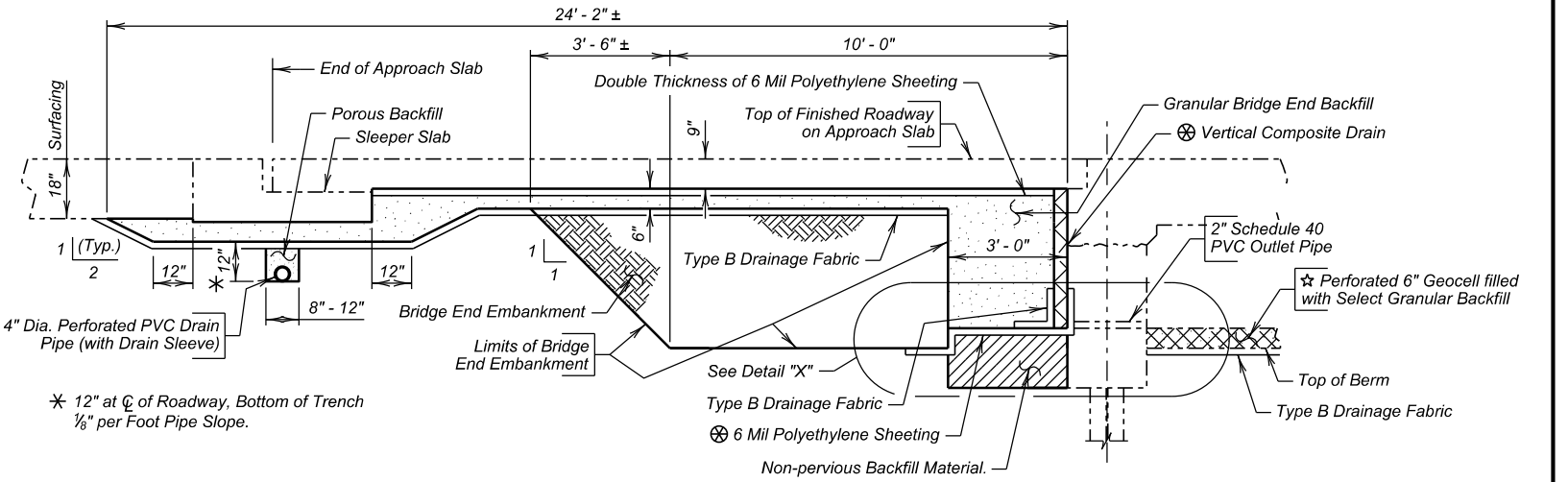
BROWN COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JULY 2023

| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
|-------------------|-------------------|------------------|-----------------|

FOR BIDDING PURPOSES ONLY

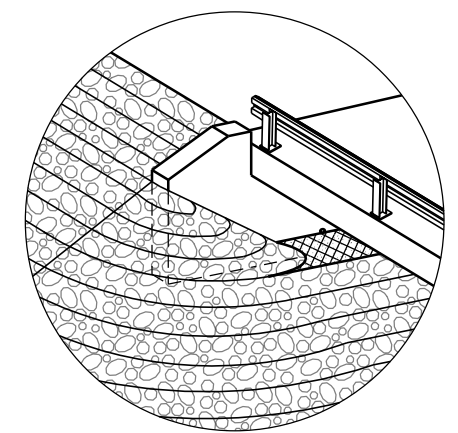


PLAN
(Bridge End Backfill shown adjacent to Abut. No. 1
Abut. No. 4 similar opposite hand except as shown.)



SEC. A - A
(at \bar{C} Roadway)

⊗ Provide hole in vertical composite drain and 6 mil polyethylene sheeting to provide drainage through wheel holes.

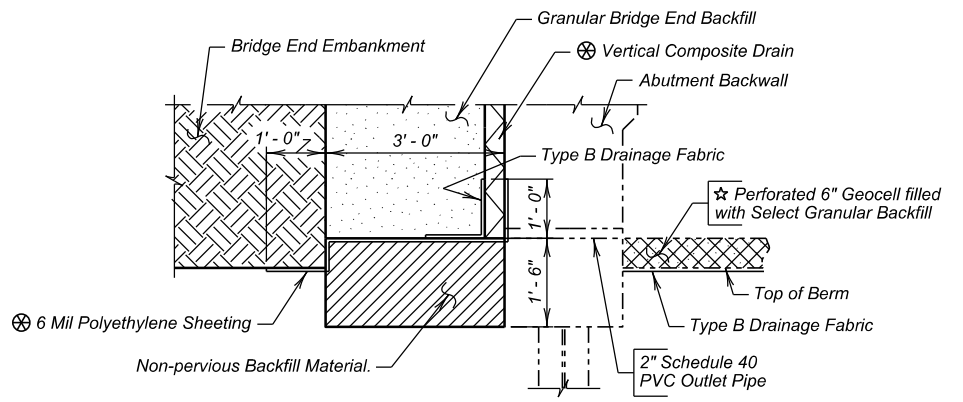


SPILL CONE DETAIL AT EMBANKMENT

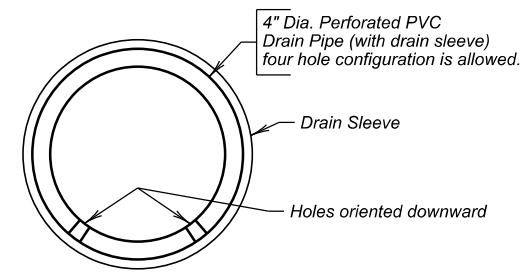
| ESTIMATED QUANTITIES (For Two Abutments) | | |
|---|---------|----------|
| ITEM | UNIT | QUANTITY |
| Granular Bridge End Backfill | Cu. Yd. | 42.3 |
| Bridge End Embankment | Cu. Yd. | 95.4 |
| Select Granular Backfill | Ton | 16.4 |
| Porous Backfill | Ton | 3.5 |
| 4" Underdrain Pipe | Ft. | 118 |
| Approach Slab Underdrain Excavation | Cu. Yd. | 1.9 |
| Perforated Geocell | Sq. Ft. | 468 |

- 50 ft. 4" dia. Perforated PVC Drain Pipe (with Drain Sleeve).
 - 16 ft. 5" dia. Schedule 40 Steel Pipe.
 - 12 ft. 2" dia. Schedule 40 PVC Outlet Pipe.
 - 40 ft. 4" dia. Schedule 40 Steel Outlet Pipe with Rodent Screens.
 - 169 sq. ft. Vertical Composite Drain.
- Items 1 thru 5 are approximate quantities contained in the 4" Underdrain Pipe and are for information only.
- 1,944 sq. ft. 6 mil Polyethylene Sheeting, not including laps.
 - 177 sq. yd. Type B Drainage Fabric.
- Items 6 thru 7 are approximate quantities contained in the Granular Bridge End Backfill and are for information only.

⊘ For estimating purpose only, a factor of 1.89 tons/cu. yd. was used to convert cu. yds. to tons.
 ⚡ Shrinkage Factor of 1.25 Used.
 ⊕ Quantity based on a 12" wide trench.
 ☆ See PERFORATED GEOCELL notes for payment information.



DETAIL "X"



DRAIN DETAIL

- NOTE:
- Perforated Geocell to be installed as shown in PLAN view. The embankment spill cone will spill onto the top of the perforated geocell.
 - The Contractor will ensure the underdrain pipes located at the sleeper slab are not damaged during installation of the guardrail posts. Damaged underdrain pipes will be replaced at the Contractor's expense.

**DETAILS OF BRIDGE END BACKFILL (A)
FOR**

122' - 0" CONT. CONCRETE BRIDGE
 24' - 0" ROADWAY 0° SKEW
 OVER ELM LAKE SEC. 8/17-T128N-R65W
 STA. 9 + 98.50 TO 11 + 20.50 BRO-B 8007(212)
 STR. NO. 07-019-020 HL-93

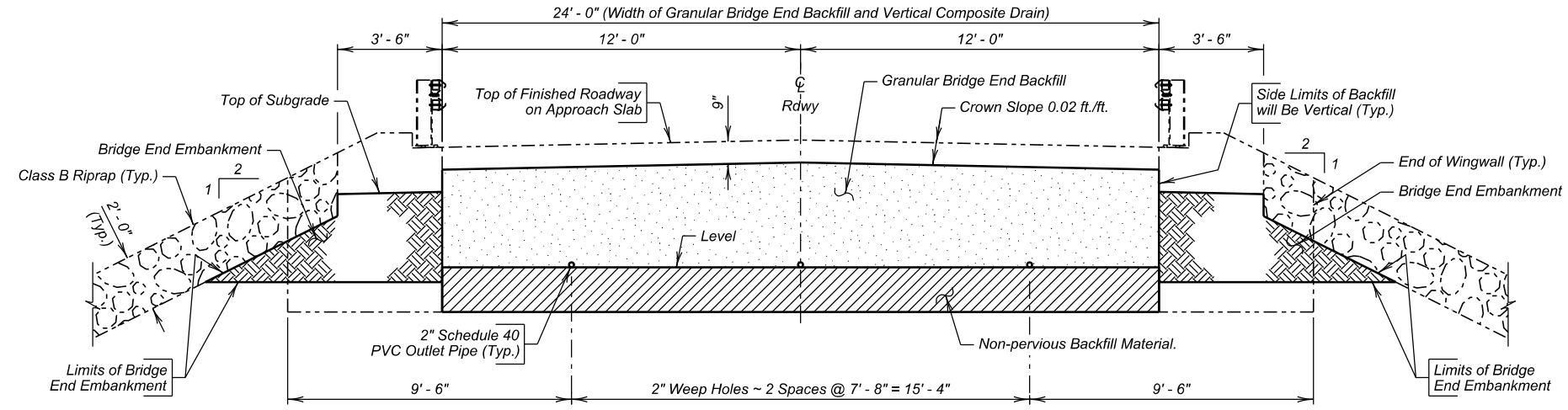
BROWN COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JULY 2023



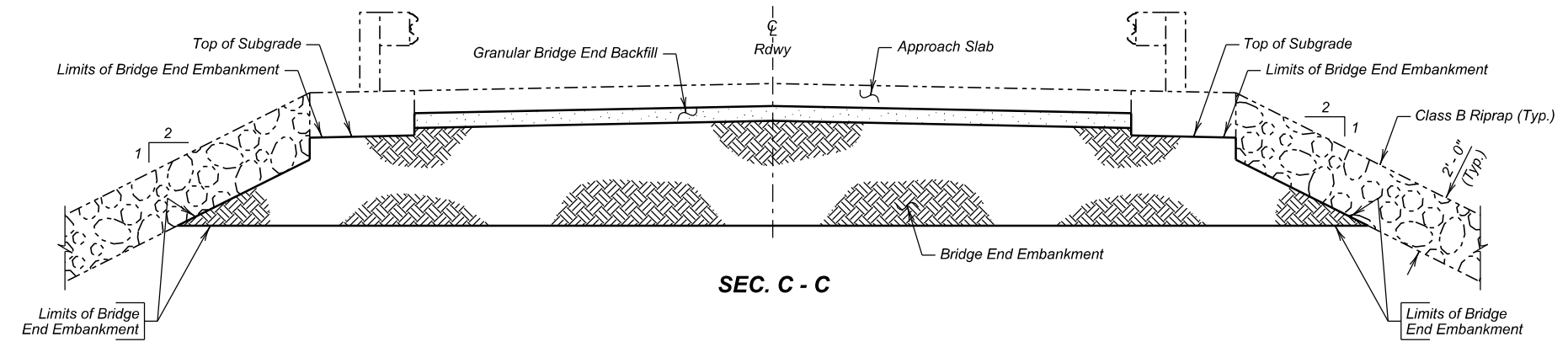
| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
|-------------------|-------------------|------------------|-----------------|

FOR BIDDING PURPOSES ONLY

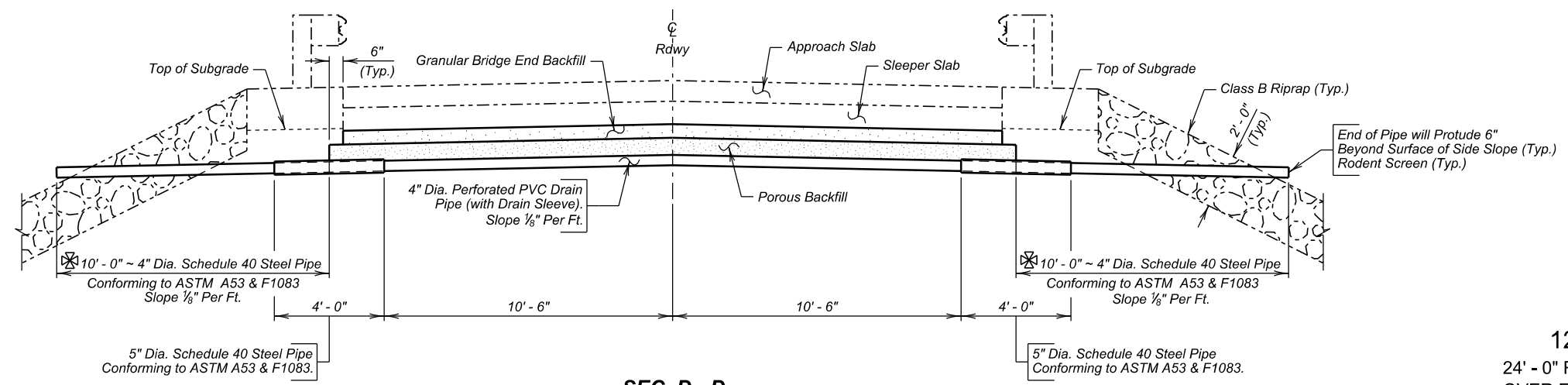
| | | | |
|----------|-----------------|-----------|--------------|
| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
| S.D. | BRO-B 8007(212) | 45 | 64 |



SEC. B - B



SEC. C - C



SEC. D - D

⊗ These dimensions are estimates and may be adjusted in field.

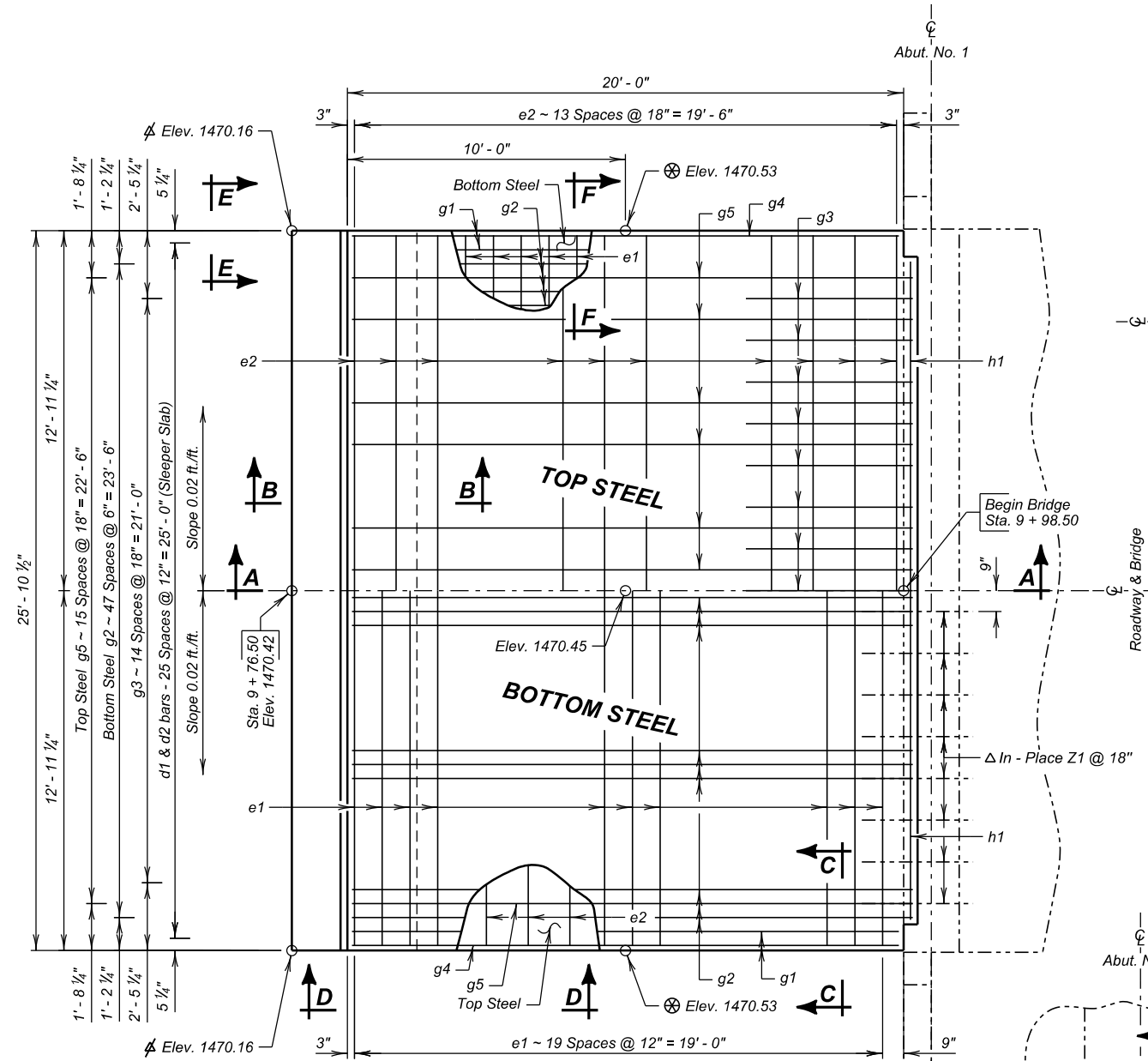


DETAILS OF BRIDGE END BACKFILL (B)
 FOR
122' - 0" CONT. CONCRETE BRIDGE
 24' - 0" ROADWAY 0° SKEW
 OVER ELM LAKE SEC. 8/17-T128N-R65W
 STA. 9 + 98.50 TO 11 + 20.50 BRO-B 8007(212)
 STR. NO. 07-019-020 HL-93

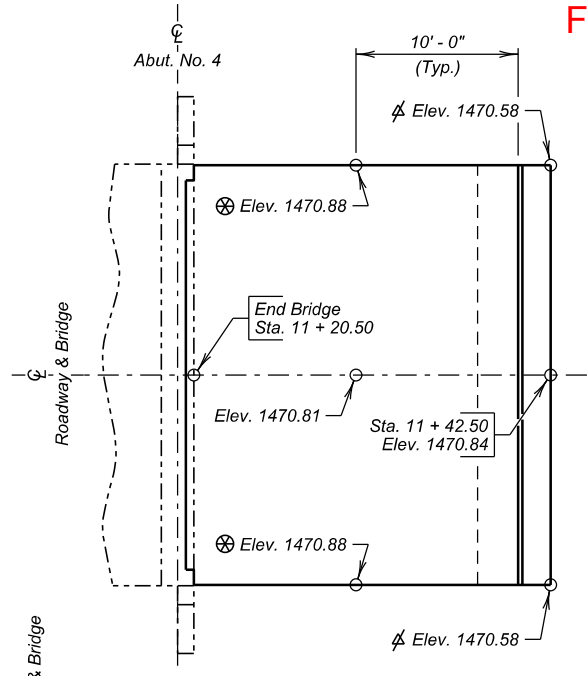
BROWN COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JULY 2023

| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
|-------------------|-------------------|------------------|-----------------|

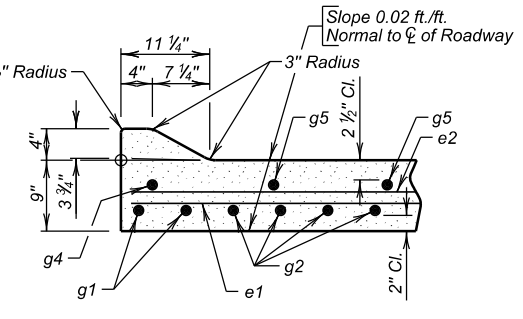
FOR BIDDING PURPOSES ONLY



PLAN
(Shown adj. to Abut. No. 1, Abut. No. 4 similar by rotation except as shown.)

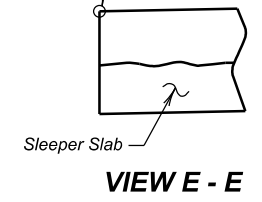


PLAN
(Shown adj. to Abut. No. 4)



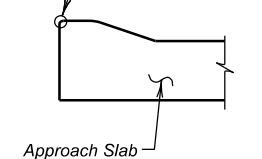
SEC. C - C

NOTE: Elevations Top of Sleeper Slab Curb at this location.

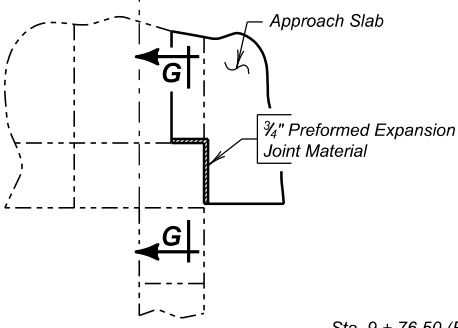


VIEW E - E

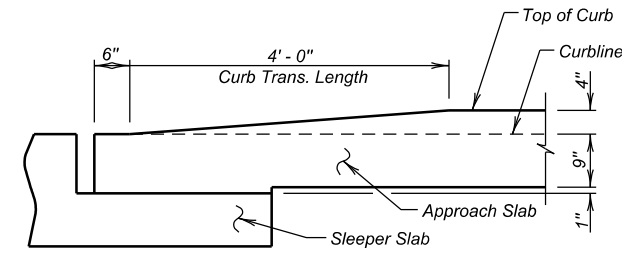
NOTE: Elevations Top of Approach Slab Curb at this location.



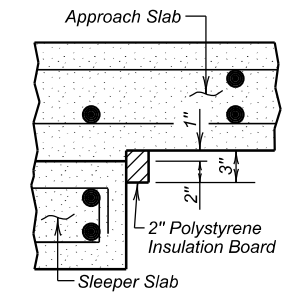
SEC. F - F



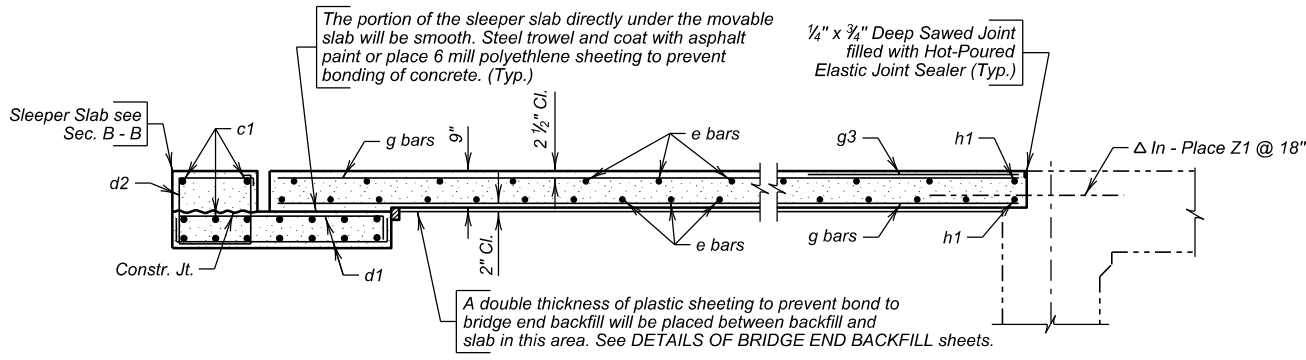
DETAIL 'X'



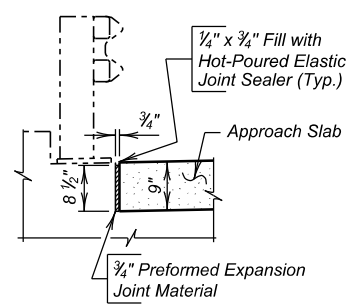
VIEW D - D



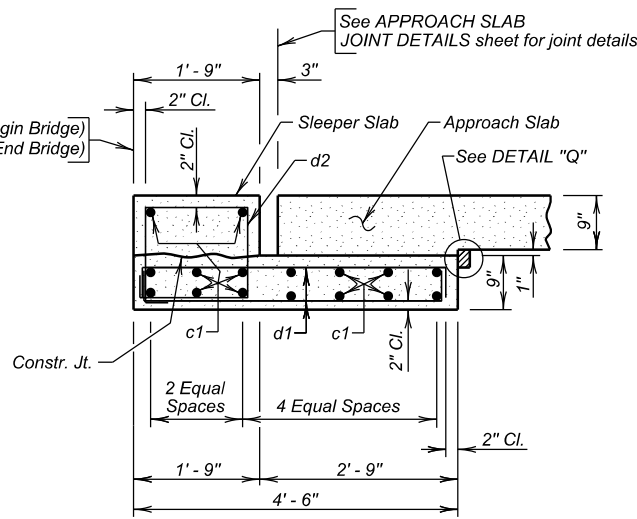
DETAIL 'Q'



SEC. A - A



SEC. G - G



SEC. B - B
(Sleeper Slab)



DETAILS OF APPROACH SLAB ADJACENT TO BRIDGE FOR 122' - 0" CONT. CONCRETE BRIDGE
 24' - 0" ROADWAY OVER ELM LAKE
 0° SKEW
 STA. 9 + 98.50 TO 11 + 20.50
 STR. NO. 07-019-020
 SEC. 8/17-T128N-R65W
 BRO-B 8007(212)
 HL-93

BROWN COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JULY 2023

| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
|-------------------|-------------------|------------------|-----------------|

| REINFORCING SCHEDULE | | | | | Bending Details | |
|--|-----|------|----------|------|-----------------|--|
| (For Two Approach Slabs and Two Sleeper Slabs) | | | | | | |
| Mk. | No. | Size | Length | Type | | |
| Sleeper Slabs | | | | | | |
| c1 | 32 | 5 | 25' - 7" | Str. | | |
| d1 | 104 | 4 | 5' - 0" | 2 | | |
| d2 | 52 | 4 | 6' - 1" | T2 | | |
| Approach Slabs | | | | | | |
| e1 | 40 | 6 | 25' - 7" | Str. | | |
| e2 | 28 | 4 | 25' - 7" | Str. | | |
| g1 | 8 | 8 | 19' - 9" | Str. | | |
| g2 | 96 | 8 | 20' - 3" | Str. | | |
| g3 | 30 | 4 | 5' - 6" | Str. | | |
| g4 | 4 | 4 | 19' - 9" | Str. | | |
| g5 | 32 | 4 | 20' - 3" | Str. | | |
| h1 | 4 | 6 | 23' - 9" | Str. | | |

NOTES:
 All bars to be epoxy coated.
 All dimensions are out to out of bars.

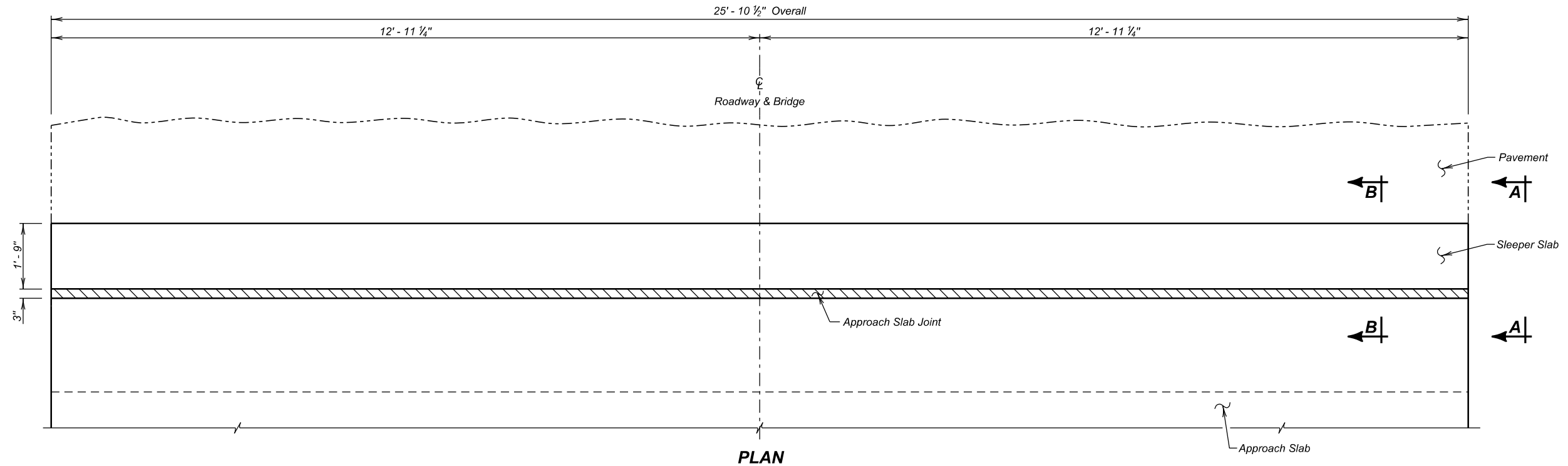
| ESTIMATED QUANTITIES | | |
|--|---------|----------|
| (For Two Approach Slabs and Two Sleeper Slabs) | | |
| ITEM | UNIT | QUANTITY |
| Concrete Approach Slab for Bridge | Sq. Yd. | 117.7 |
| Concrete Approach Sleeper Slab for Bridge | Sq. Yd. | 25.9 |

- 29.9 Cu. Yds. Concrete in Approach Slab.
- 8,367 Lbs. Epoxy Coated Re-Steel in Approach Slab.
- 9.3 Cu. Yds. Concrete in Sleeper Slab.
- 1,412 Lbs. Epoxy Coated Re-Steel in Sleeper Slab.
- 12.9 Sq. Ft. of 2" Polystyrene Insulation Board.

Items 1 thru 5 are approximate quantities contained in the above bid items and are for information only.

FOR BIDDING PURPOSES ONLY

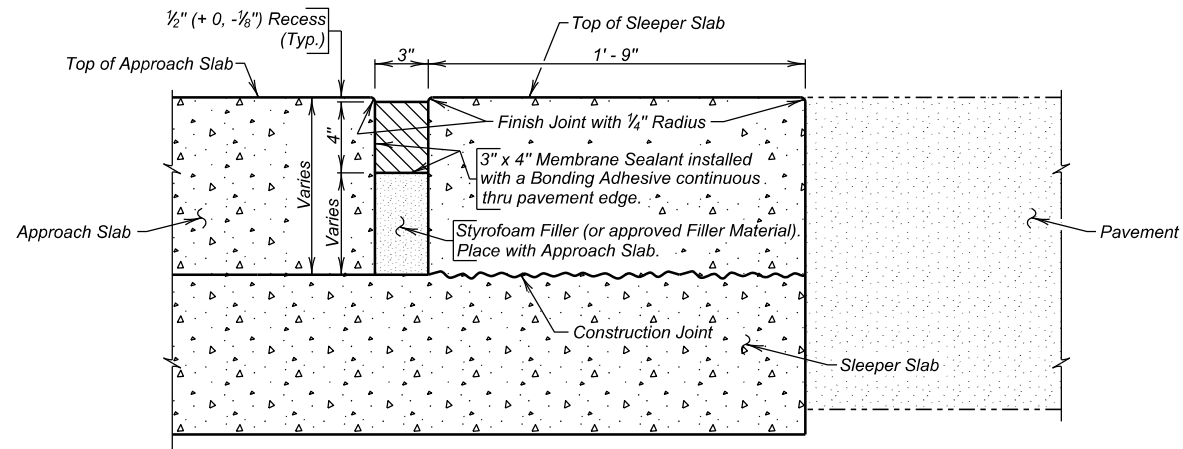
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|----------|-----------------|-----------|--------------|
| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
| S.D. | BRO-B 8007(212) | 47 | 64 |



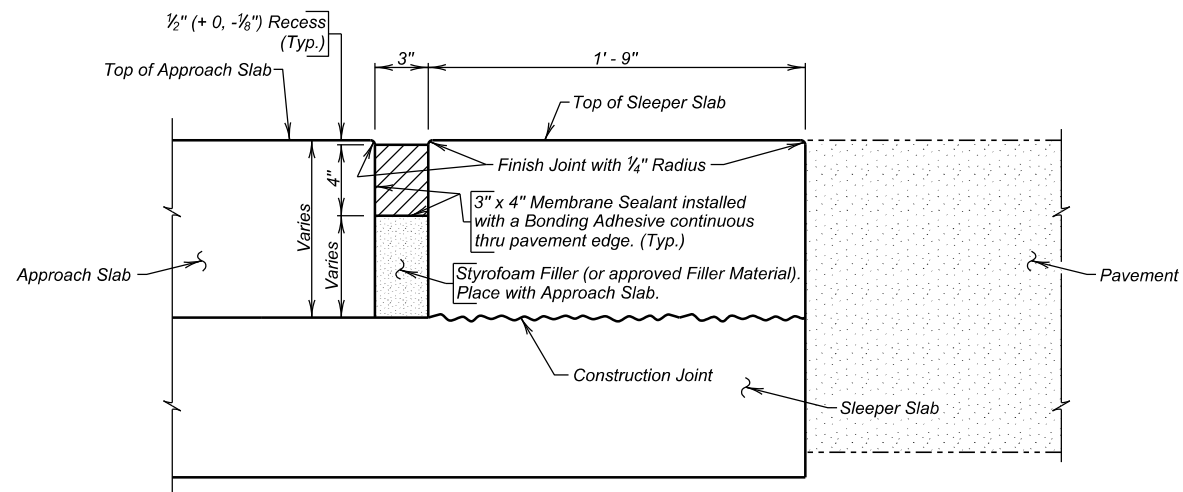
PLAN

GENERAL NOTES

- The Membrane Sealant will be on the approved product list for Membrane Sealant Expansion Joints.
- The manufacturer will supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension will be as recommended by the sealant manufacturer, however, in no case will the precompressed dimension exceed 75% of the joint opening width. The foam sealant will be slowly self expanding to permit workers ample time to install the membrane sealant before the membrane sealant exceeds the joint opening width.
- The membrane sealant will provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension.
- The membrane sealant will be supplied in pieces a minimum of 5 feet in length. The foam sealant will be ultra-violet and ozone resistant.
- The bonding adhesive used to attach the membrane sealant to the adjacent concrete will be approved by the membrane sealant manufacturer.
- Adhesive used to join adjacent pieces of the membrane sealant will be as recommended by the manufacturer.
- If styrofoam filler material is used in the construction, it will be closed cell and water-tight as approved by the Engineer.
- The minimum ambient air temperature at the time of joint installation and adhesive curing will be 40° F.
- A technical representative of the membrane sealant manufacturer will be present at the jobsite during installation. The technical representative will be knowledgeable in the correct procedures for the preparation and installation of the joint material to ensure the Contractor installs the joint to the manufacturer's recommendations.
- Surfaces that will be in contact with the membrane sealant will be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the surface. At a minimum, two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the surface will be required. Cleaning of the surfaces with solvents, wire brushing, or grinding will not be permitted.
- After abrasive blasting, but immediately prior to membrane joint installation, the entire joint contact surface will be air blasted. The air compressor used for joint cleaning will be equipped with trap devices capable of providing moisture-free and oil-free air at a recommended pressure of 90 psi. To obtain complete bonding with the adhesive, the adjacent surfaces must be dry and clean. The contact surfaces for the joint will be visually inspected by the Engineer immediately prior to joint installation to verify the surface is dry and clean.
- Individual spliced sections will be installed as per the manufacturer's recommendations. The membrane joint sealant manufacturer will submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.
- Traffic will not be allowed on the joint until the bonding adhesive has had time to cure, as recommended by the manufacturer.
- Use plywood or other material to protect concrete adjacent to the joint from spalling before any equipment is moved across the joint. Any spall areas will be repaired at the Contractor's expense by breaking out and replacing adjacent concrete, as approved by the Engineer.
- The Membrane Sealant Expansion Joint will be measured in feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Membrane Sealant Expansion Joint will be paid for at the contract unit price per foot complete in place. Payment for this item will be full compensation for furnishing all the required materials in place, including labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.



SECTION B - B



VIEW A - A



| ESTIMATED QUANTITIES (For Two Approach Slabs) | | |
|--|------|----------|
| ITEM | UNIT | QUANTITY |
| Membrane Sealant Expansion Joint | Ft. | 51.8 |

APPROACH SLAB JOINT DETAILS
FOR
122' - 0" CONT. CONCRETE BRIDGE
24' - 0" ROADWAY
OVER ELM LAKE
STA. 9 + 98.50 TO 11 + 20.50
STR. NO. 07-019-020

0° SKEW
SEC. 8/17-T128N-R65W
BRO-B 8007(212)
HL-93

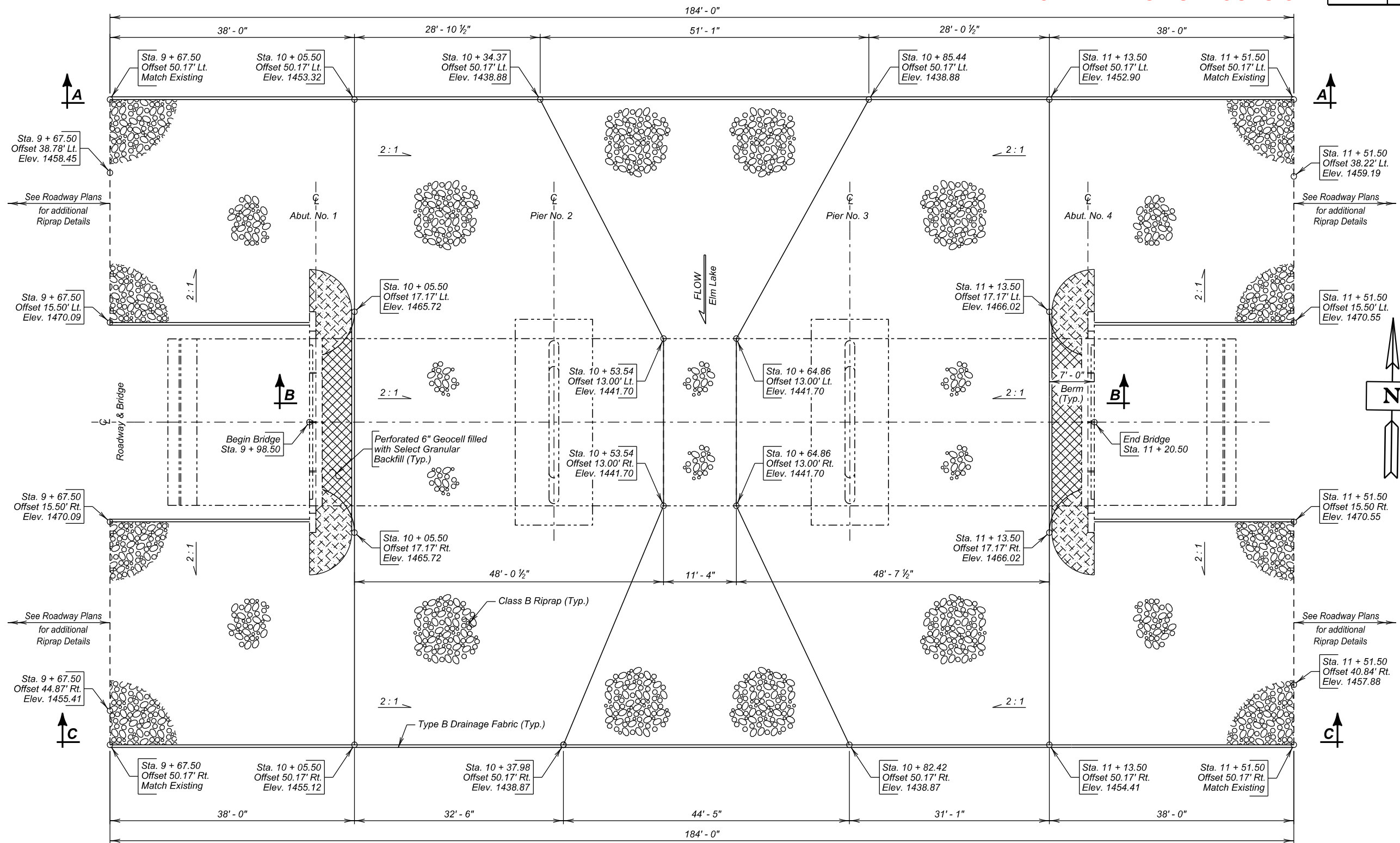
BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2023

| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
|-------------------|-------------------|------------------|-----------------|

The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

FOR BIDDING PURPOSES ONLY

| | | | |
|----------|-----------------|-----------|--------------|
| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
| S.D. | BRO-B 8007(212) | 48 | 64 |



PLAN

| ESTIMATED QUANTITIES | | |
|----------------------------------|---------|----------|
| ITEM | UNIT | QUANTITY |
| Class B Riprap | Ton | 1,677.3 |
| Overburden Excavation for Riprap | Cu. Yd. | 883 |
| Type B Drainage Fabric | Sq. Yd. | 2,151.0 |

* For estimating purposes only, a factor of 1.4 tons/cu.yd. was used to convert Cu. Yds. To Tons.

◆ Quantity includes Riprap limits shown on this sheet only. See Roadway Plans for additional Riprap details and quantities.

RIPRAP DETAILS (A)
FOR
122' - 0" CONT. CONCRETE BRIDGE
 24' - 0" ROADWAY
 OVER ELM LAKE
 STA. 9 + 98.50 TO 11 + 20.50
 STR. NO. 07-019-020

0° SKEW
 SEC. 8/17-T128N-R65W
 BRO-B 8007(212)
 HL-93

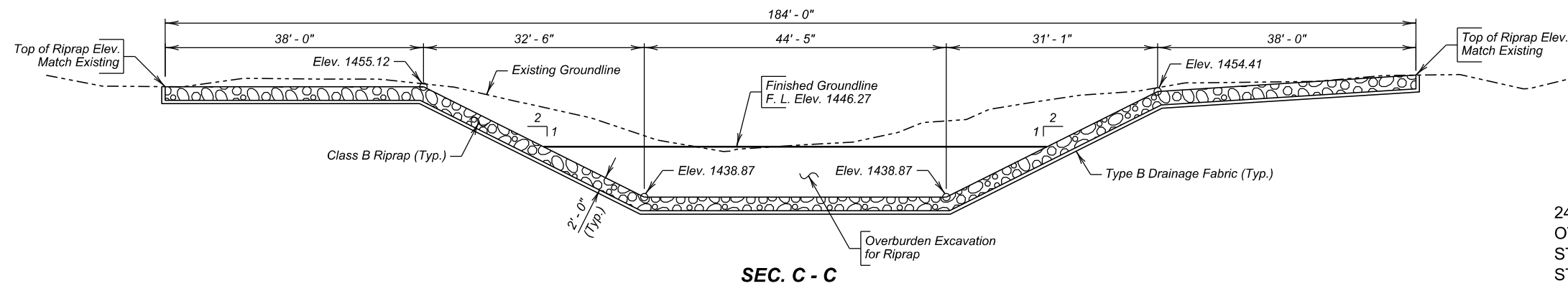
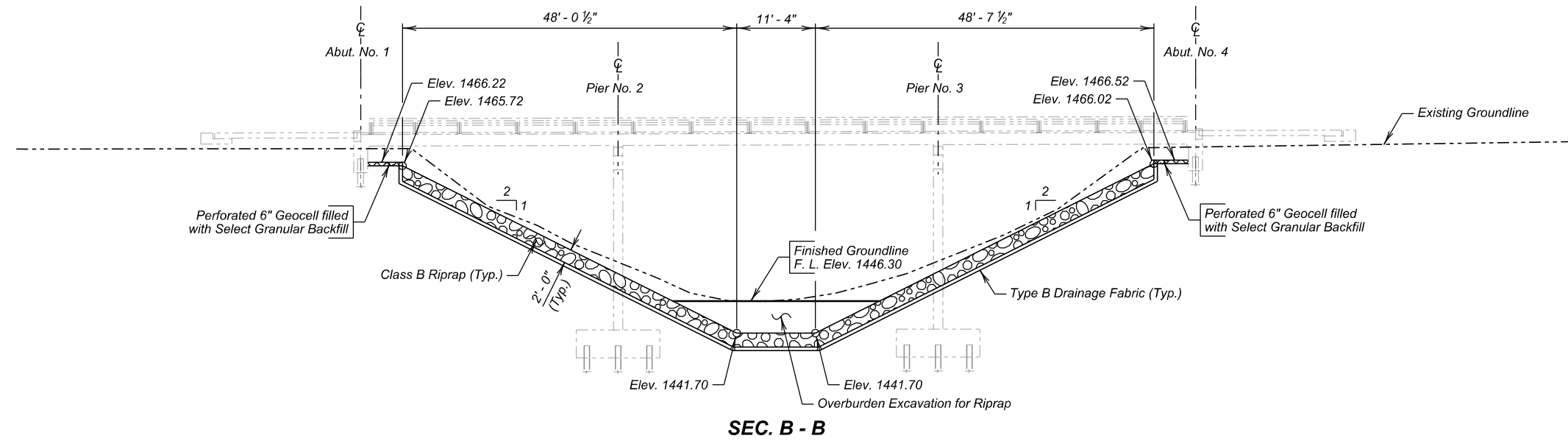
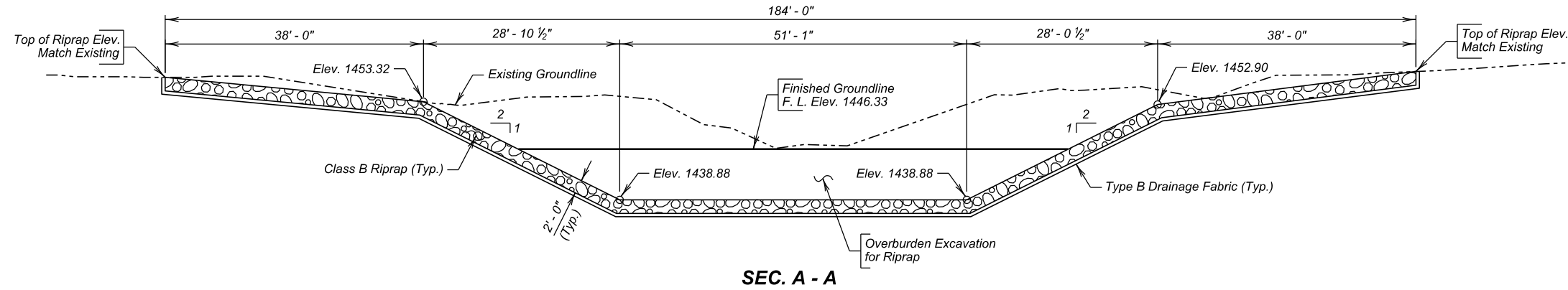
BROWN COUNTY
 S. D. DEPT. OF TRANSPORTATION

JULY 2023

| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
|-------------------|-------------------|------------------|-----------------|

FOR BIDDING PURPOSES ONLY

| | | | |
|----------|-----------------|-----------|--------------|
| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
| S.D. | BRO-B 8007(212) | 49 | 64 |



RIPRAP DETAILS (B)
 FOR
122' - 0" CONT. CONCRETE BRIDGE
 24' - 0" ROADWAY 0° SKEW
 OVER ELM LAKE SEC. 8/17-T128N-R65W
 STA. 9 + 98.50 TO 11 + 20.50 BRO-B 8007(212)
 STR. NO. 07-019-020 HL-93

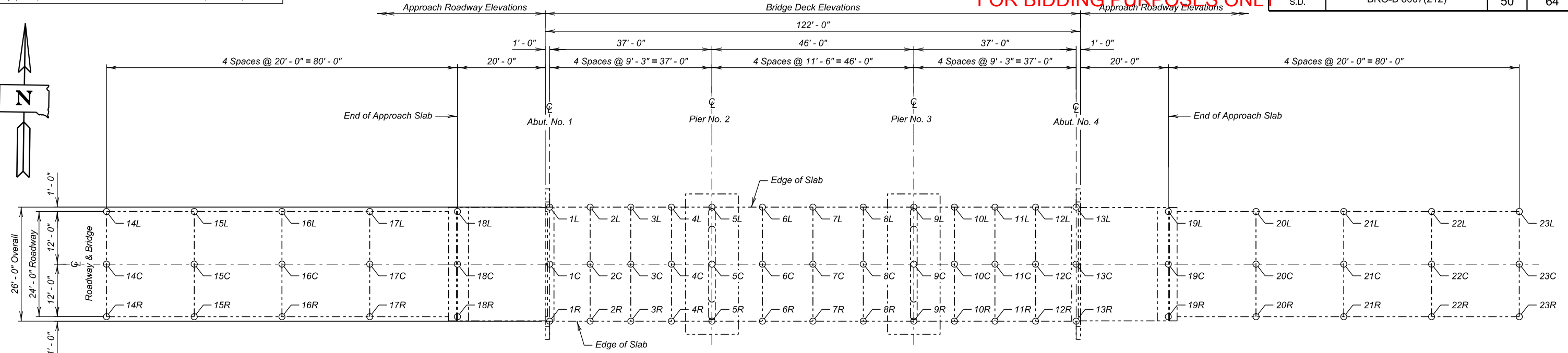
BROWN COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JULY 2023

| | | | |
|-------------------|-------------------|------------------|-----------------|
| DESIGNED BY EM | CK. DES. BY EW | DRAFTED BY EM | BRIDGE ENGINEER |
|-------------------|-------------------|------------------|-----------------|

The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

| | | | |
|----------|-----------------|-----------|--------------|
| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
| S.D. | BRO-B 8007(212) | 50 | 64 |

FOR BIDDING PURPOSES ONLY



PLAN

| Location | Elevation | Location | Elevation | Location | Elevation |
|----------|-----------|----------|-----------|----------|-----------|
| 1L | | 1C | | 1R | |
| 2L | | 2C | | 2R | |
| 3L | | 3C | | 3R | |
| 4L | | 4C | | 4R | |
| 5L | | 5C | | 5R | |
| 6L | | 6C | | 6R | |
| 7L | | 7C | | 7R | |
| 8L | | 8C | | 8R | |
| 9L | | 9C | | 9R | |
| 10L | | 10C | | 10R | |
| 11L | | 11C | | 11R | |
| 12L | | 12C | | 12R | |
| 13L | | 13C | | 13R | |

| Location | Elevation | Location | Elevation | Location | Elevation |
|----------|-----------|----------|-----------|----------|-----------|
| 14L | | 14C | | 14R | |
| 15L | | 15C | | 15R | |
| 16L | | 16C | | 16R | |
| 17L | | 17C | | 17R | |
| 18L | | 18C | | 18R | |
| 19L | | 19C | | 19R | |
| 20L | | 20C | | 20R | |
| 21L | | 21C | | 21R | |
| 22L | | 22C | | 22R | |
| 23L | | 23C | | 23R | |

| Location | Station - Offset | Elevation |
|--------------|------------------|-----------|
| Begin Bridge | | |
| End Bridge | | |

| ITEM | UNIT | QUANTITY |
|-------------------------|------|----------|
| Bridge Elevation Survey | L.S. | Lump Sum |

NOTE -
 The Contractor will be responsible for producing the As - Built Elevation Survey soon after construction is complete and before the bridge is opened to traffic. The As - Built Elevations of the Bridge will be taken and recorded at the locations shown by the table on this sheet. The completed table will be given to the Engineer who will forward a copy to the Office of Bridge Design and the Region Office.



AS-BUILT ELEVATION SURVEY
 FOR
122' - 0" CONT. CONCRETE BRIDGE
 24' - 0" ROADWAY OVER ELM LAKE
 STA. 9 + 98.50 TO 11 + 20.50
 STR. NO. 07-019-020

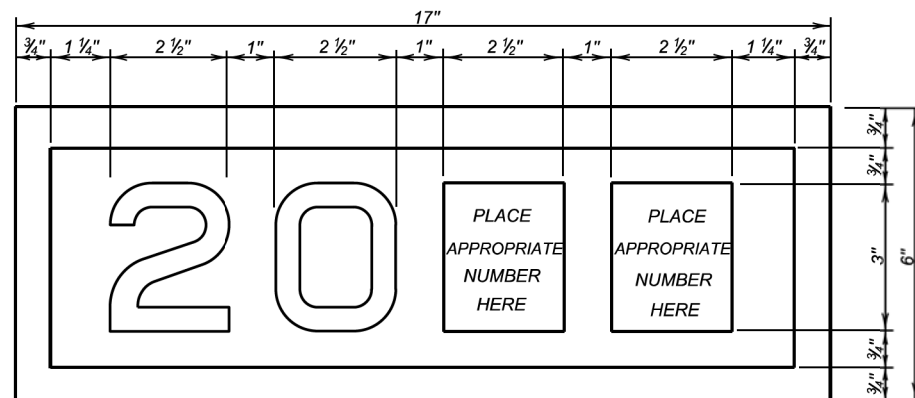
0° SKEW
 SEC. 8/17-T128N-R65W
 BRO-B 8007(212)
 HL-93

BROWN COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JULY 2023

DESIGNED BY: EM
 CK. DES. BY: EW
 DRAFTED BY: EM

BRIDGE ENGINEER

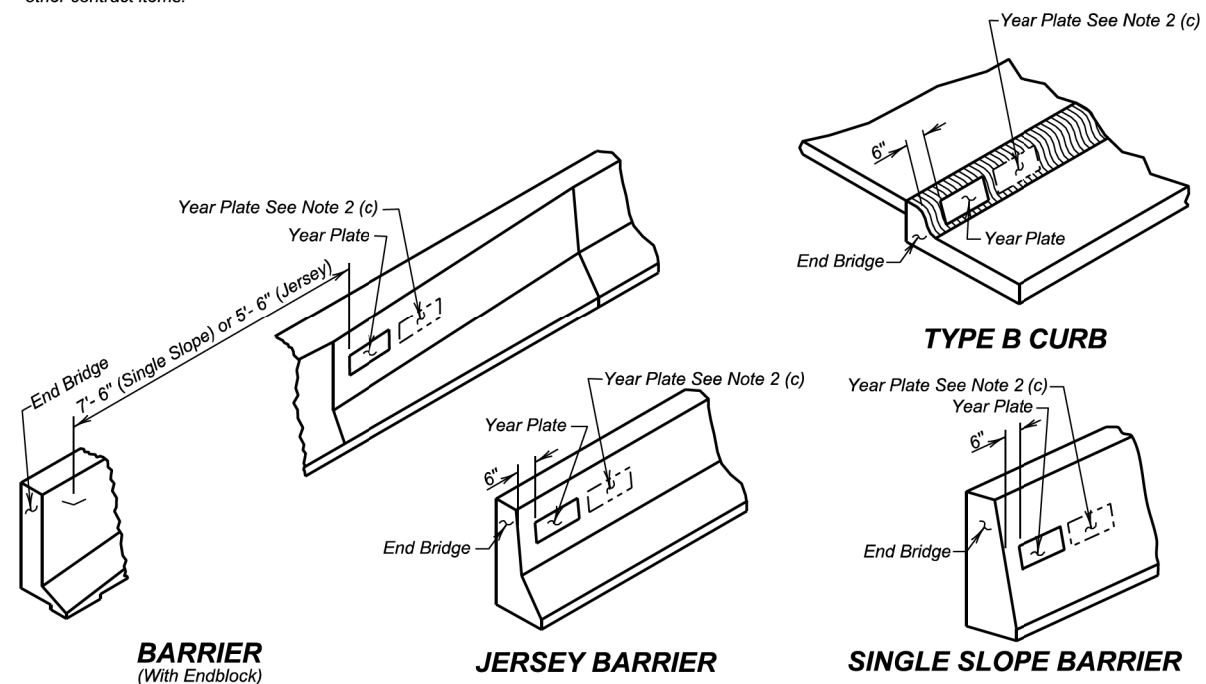
FOR BIDDING PURPOSES ONLY



YEAR PLATE DETAILS

GENERAL NOTES:

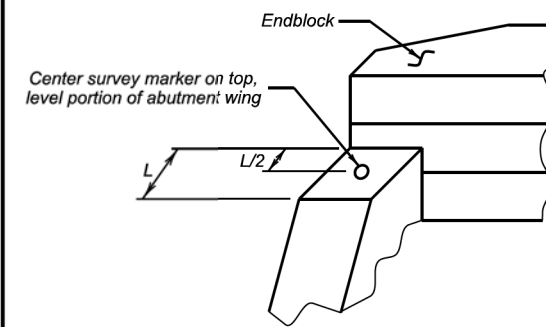
- Year plates of the general dimensions shown will be constructed on all box culverts and bridges. The year plates will be constructed in reverse and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (1/2) inch in depth.
- Year plates will be located on structure(s) as follows:
 - On cast-in-place box culverts the year plates will be four and one-half (4 1/2) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plate will be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with this location, the year plate will be centered in an adjacent barrel.
 - On bridges with six (6) inch curbs, "Jersey" shaped barriers with no endblocks, or "Single Slope" shaped barriers with no endblocks, the year plate will be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with barrier endblocks, the year plate will be centered on the upper sloped portion of the barrier approximately 5'-6" for "Jersey" shaped barriers from the end of the bridge and 7'-6" for "Single Slope" shaped barriers from the end of bridge, or as designated by the Engineer. There will be one year plate at each end of the bridge on opposite sides.
 - When the plans specify that both the original date of construction and the date of reconstruction are to be shown, one date will be placed as listed above and the other located adjacent to it. Both year plates will be shown at each end of the bridge on opposite sides.
- There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work will be incidental to other contract items.



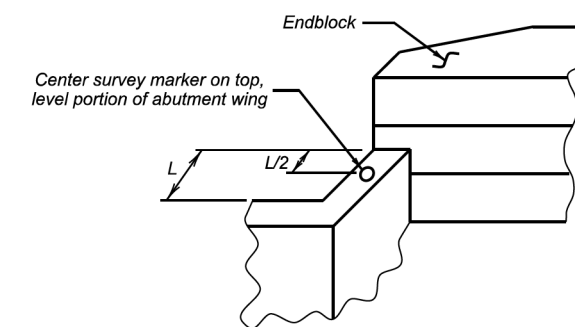
TYPE B CURB

January 22, 2021

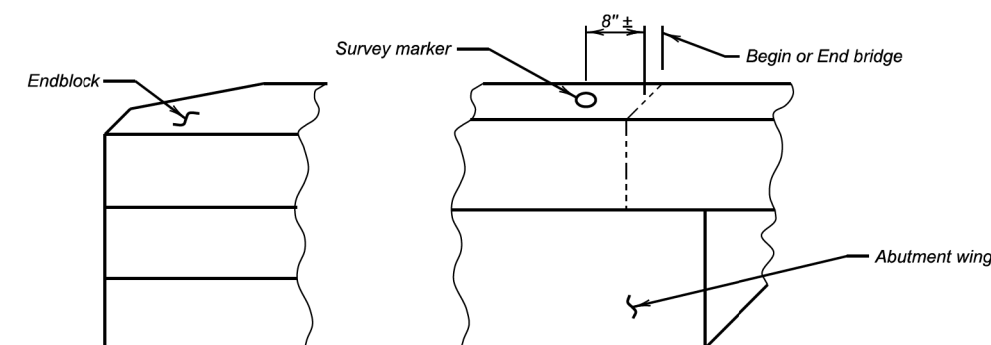
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|----------------------|-----------------------|--------------------|--------------|
| Published Date: 2024 | S D D O T | YEAR PLATE DETAILS | PLATE NUMBER |
| | | | 460.02 |
| | | | Sheet 1 of 1 |



ABUTMENT WITH "STRAIGHT" WINGS



ABUTMENT WITH "SWEEP BACK" WINGS



ABUTMENT WITH "SWEEP BACK" WINGS

(Endblock on top of wings)

GENERAL NOTES:

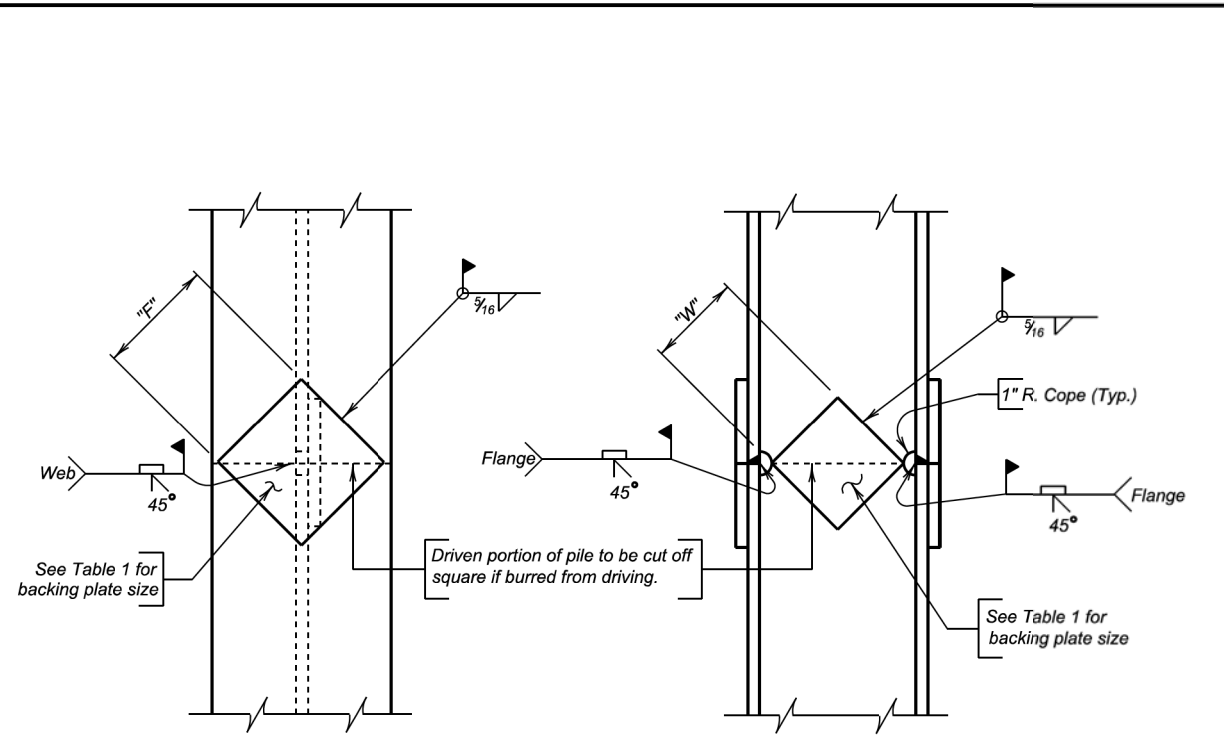
- Survey markers shall be located at each abutment on the same side of the bridge as the year plate. Place survey markers on abutment wings as shown. Two survey markers will be required at each bridge.
- Survey markers shall be of a type intended for installation in concrete, be made of solid brass or bronze, have a domed top and be either a 3" top diameter (with a 3/4" X 2" long ribbed shank), or a US Army Corps of Engineers Type C Disc with a 3 1/2" top diameter.
- There will be no separate measurement or payment made for survey markers. All costs for this work shall be incidental to the other contract items.

June 26, 2012

| | | | |
|----------------------|-----------------------|----------------------|--------------|
| Published Date: 2024 | S D D O T | BRIDGE SURVEY MARKER | PLATE NUMBER |
| | | | 460.05 |
| | | | Sheet 1 of 1 |

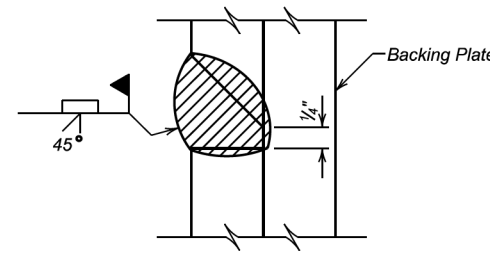
122' - 0" CONT. CONCRETE BRIDGE

STR. NO. 07-019-020
JUNE 2023



NOTE:
Prepare joint surfaces lower end of upper section on the ground and weld on backing plates; then place upper section on lower section and weld.

COMPLETE JOINT PENETRATION WELD DETAIL



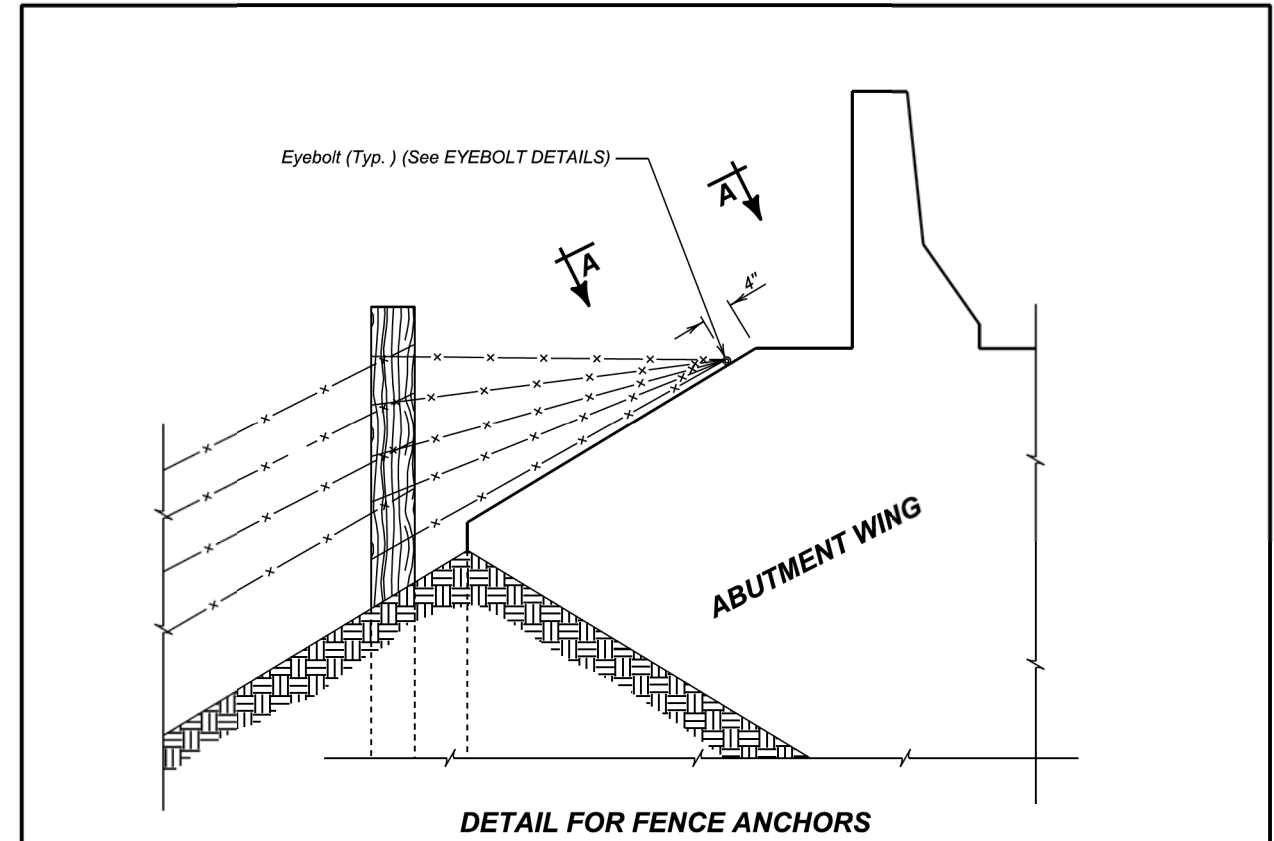
GENERAL NOTES:

1. Steel for backing plates shall conform to ASTM A709 Grade 50.
2. Welding and weld inspection shall be in conformance with AWS D1.5 (Current Year) Bridge Welding Code - Steel.
3. Welder must be certified and registered with the SDDOT.
4. Backing plate shall at a minimum be as thick as the web of the pile being spliced.
5. Web must be coped with 1 inch radius.
6. Submit Welding Procedure Specification (WPS) to Bridge Construction Engineer for approval prior to pile driving.

| PILE | 10" | 12" | 14" |
|------------|--------|--------|--------|
| "F" FLANGE | 6 1/2" | 8" | 10" |
| "W" WEB | 4 3/4" | 6 1/4" | 7 1/2" |

December 23, 2012

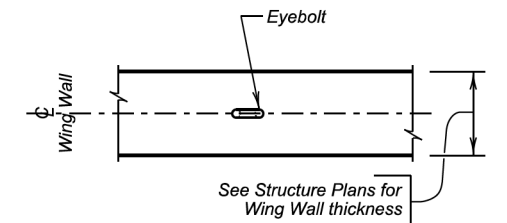
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| Published Date: 2024 | S D D O T | STEEL PILE SPLICE DETAILS | PLATE NUMBER 510.40 |
| | | | Sheet 1 of 1 |



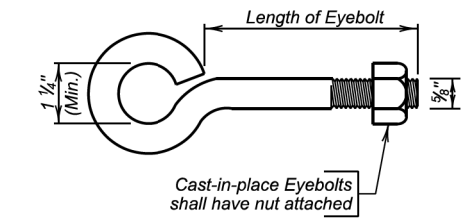
DETAIL FOR FENCE ANCHORS

GENERAL NOTES:

1. The fence and post details shown are for illustrative purpose only. The fence shall be as specified elsewhere in the plans.
2. Eyebolts shall be placed on all of the bridge abutment wings.
3. Eyebolts shall be 5/8 inch diameter and shall conform to ASTM A307.
4. Eyebolts, nuts, and concrete inserts shall be galvanized in accordance with AASHTO M232 (ASTM A153). Concrete inserts of corrosion resistant material need not be galvanized.
5. Cast-in-place eyebolts shall have a nut attached, be 4 1/2 inches (Min.) in length and shall be embedded such that the eye of the bolt is flush with the concrete surface. (See Eyebolt Details) As an alternate, cast-in-place concrete inserts, capable of developing the full strength of the 5/8 inch diameter threaded eyebolt, may be used and shall be set in the concrete in accordance with the manufacturer's recommendations. The eyebolt shall be of sufficient length to develop its full strength. The eye of the eyebolt shall be flush with the concrete surface.
6. The cost for furnishing and installing eyebolts and/or concrete inserts shall be incidental to various contract items.



VIEW A - A



EYEBOLT DETAILS

December 23, 2012

| | | | |
|----------------------|-----------------------|---|------------------------|
| Published Date: 2024 | S D D O T | FENCE ANCHORS FOR BRIDGE ABUTMENT WINGS (WINGS 6' AND SHORTER) | PLATE NUMBER 620.18 |
| | | | Sheet 1 of 1 |

FOR BIDDING PURPOSES ONLY

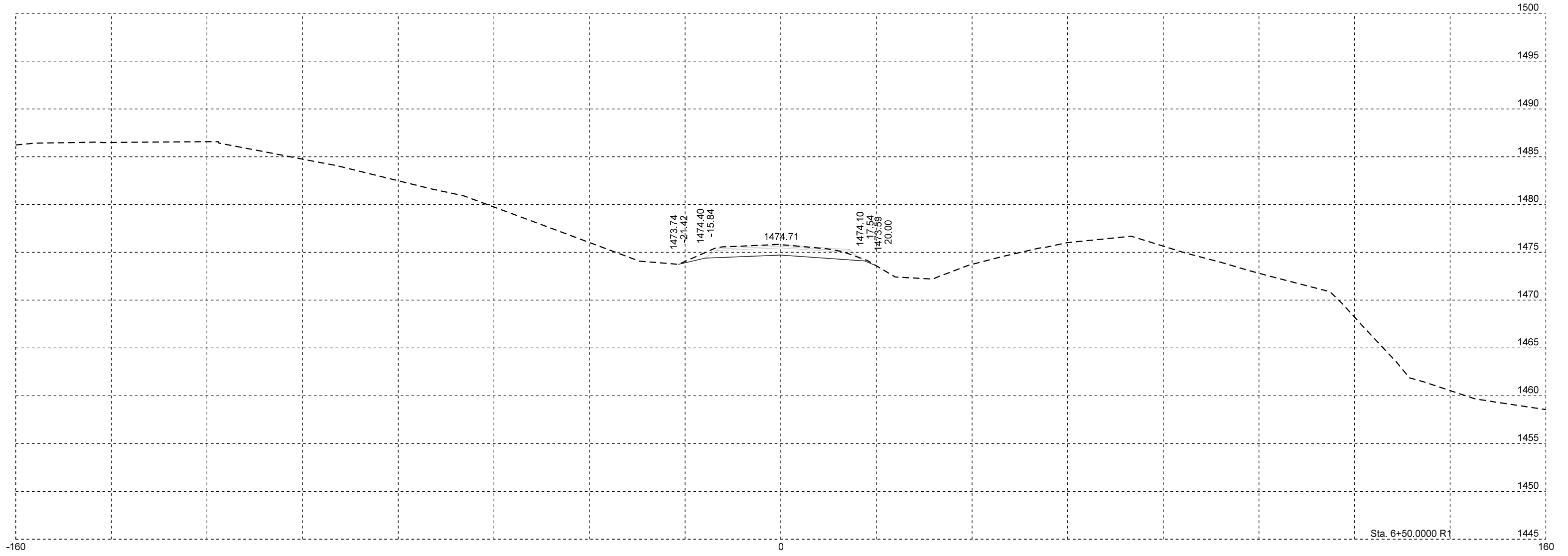
STATE OF SOUTH DAKOTA

PROJECT
BRO 8007(212)

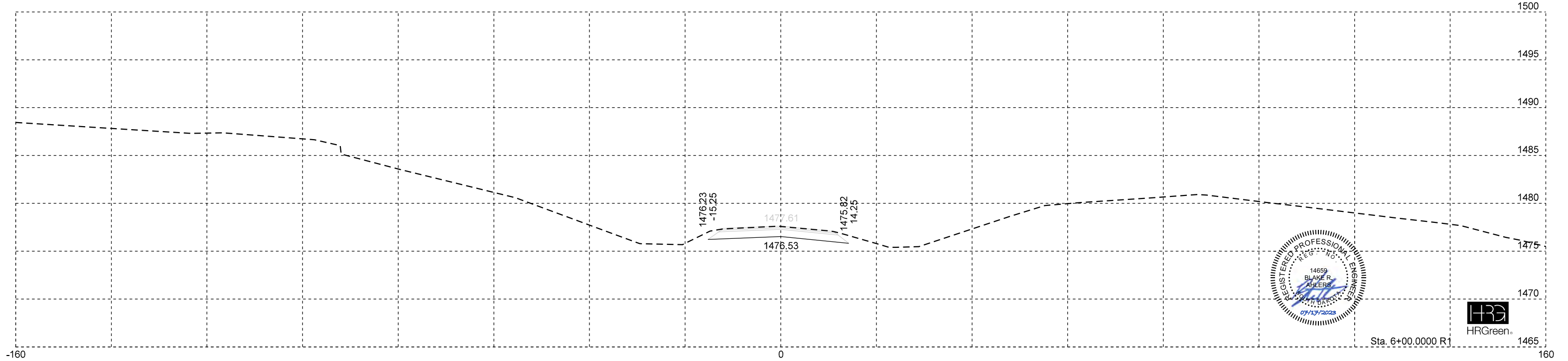
SHEET
53

TOTAL SHEETS
64

Plotting Date: 7/17/2023



Sta. 6+50.0000 R1



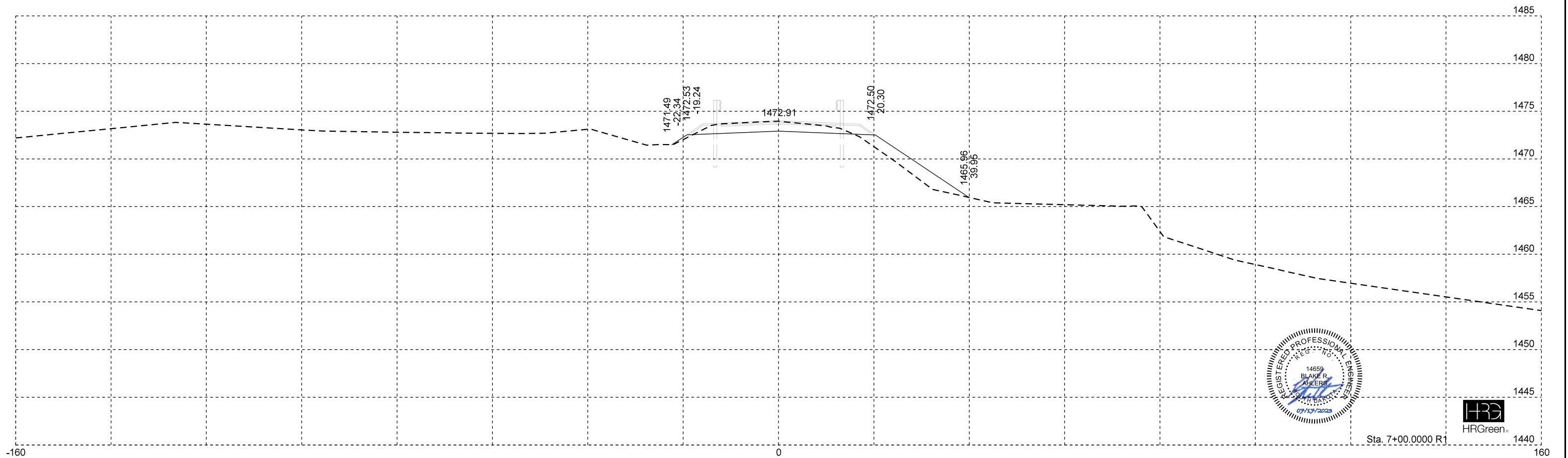
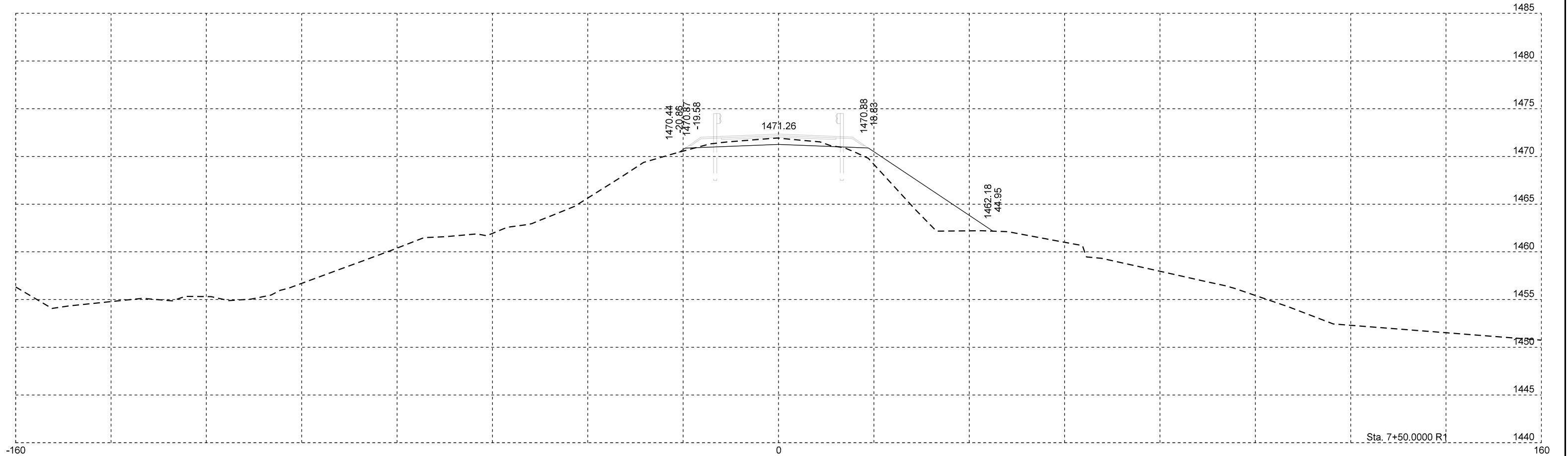
Sta. 6+00.0000 R1



FOR BIDDING PURPOSES ONLY

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| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO 8007(212) | 54 | 64 |

Plotting Date: 7/17/2023



Sta. 7+00.0000 R1

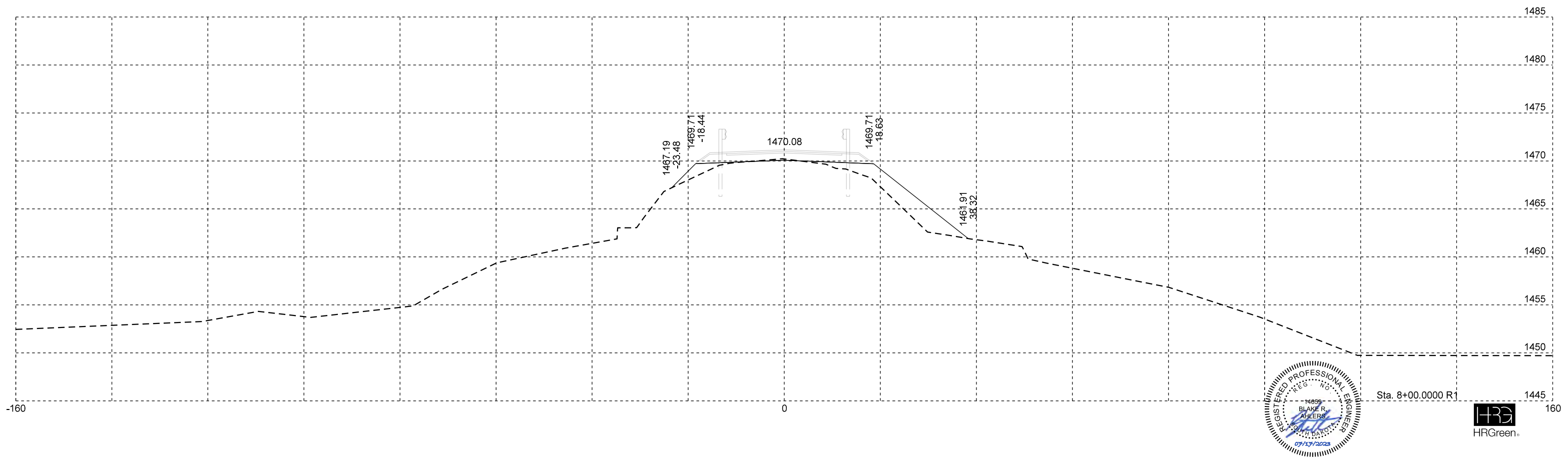
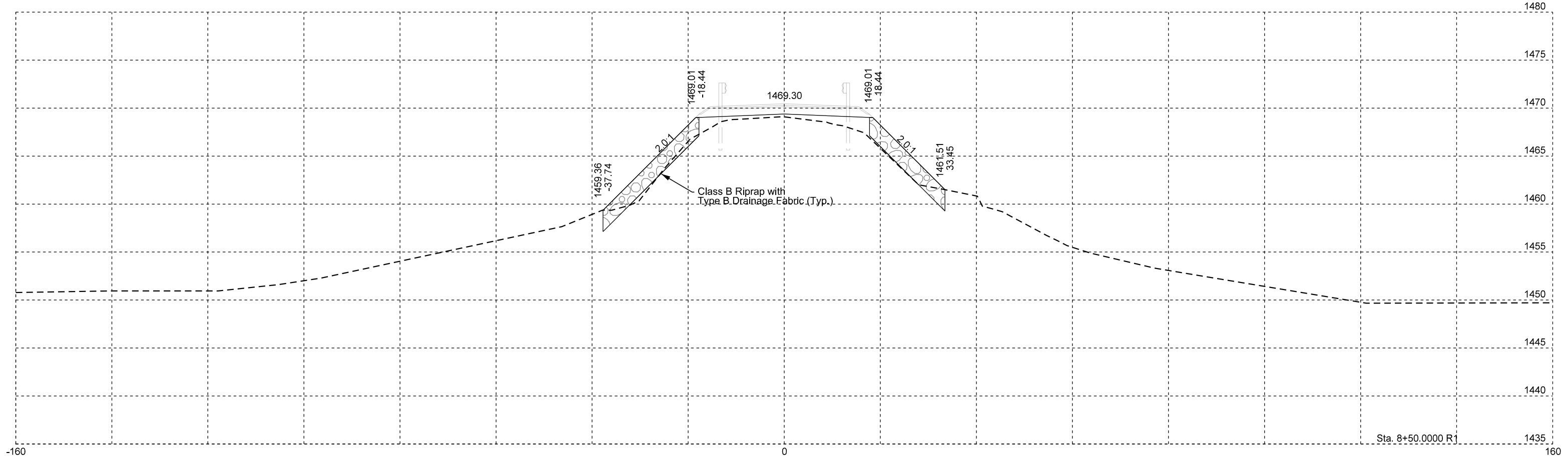
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STATE OF SOUTH DAKOTA

PROJECT
BRO 8007(212)

SHEET
55
TOTAL SHEETS
64

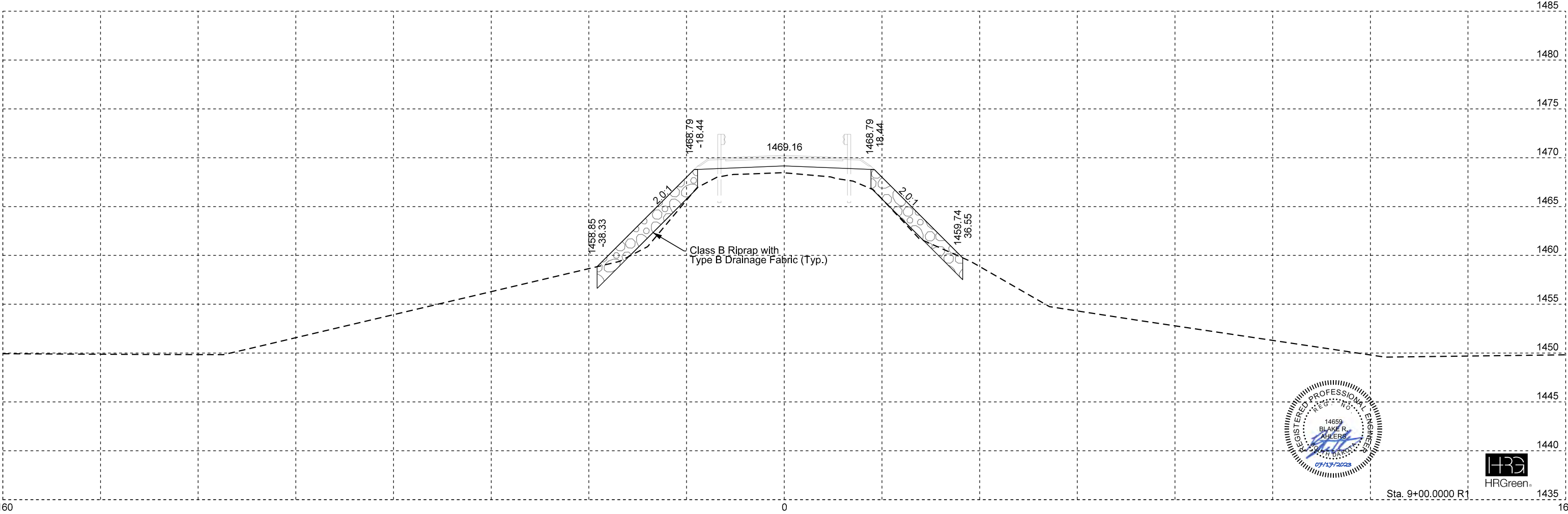
Plotting Date: 7/17/2023



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| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO 8007(212) | 56 | 64 |

Plotting Date: 7/17/2023

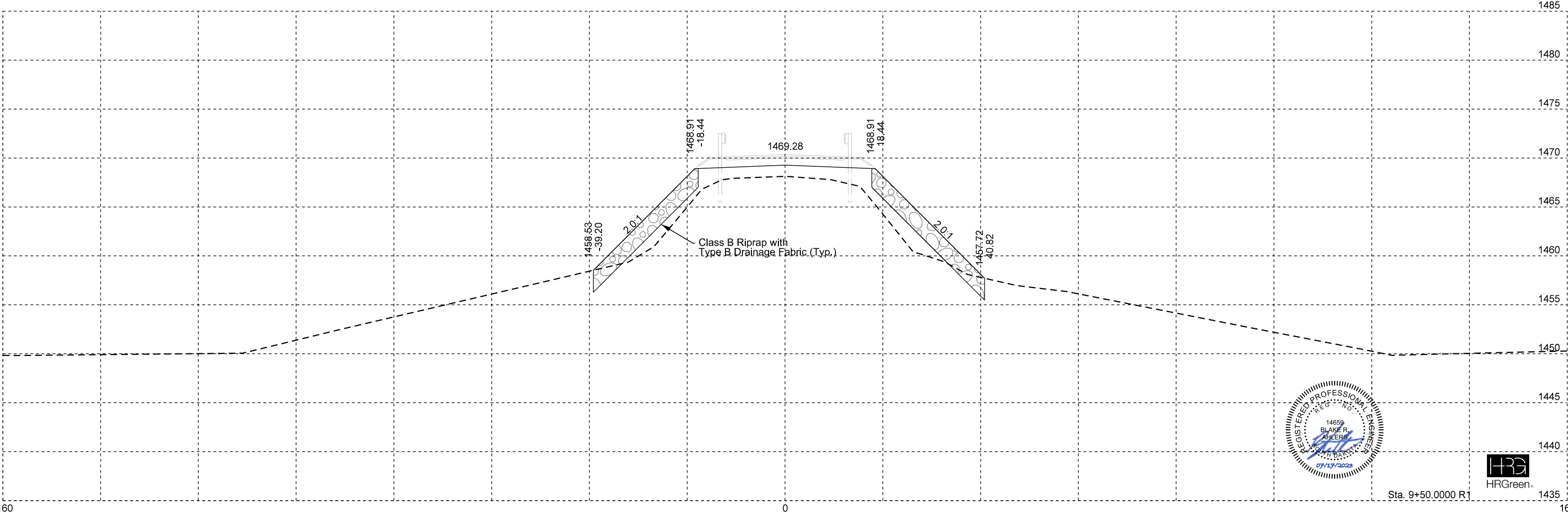


Sta. 9+00.0000 R1

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| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO 8007(212) | 57 | 64 |

Plotting Date: 7/17/2023

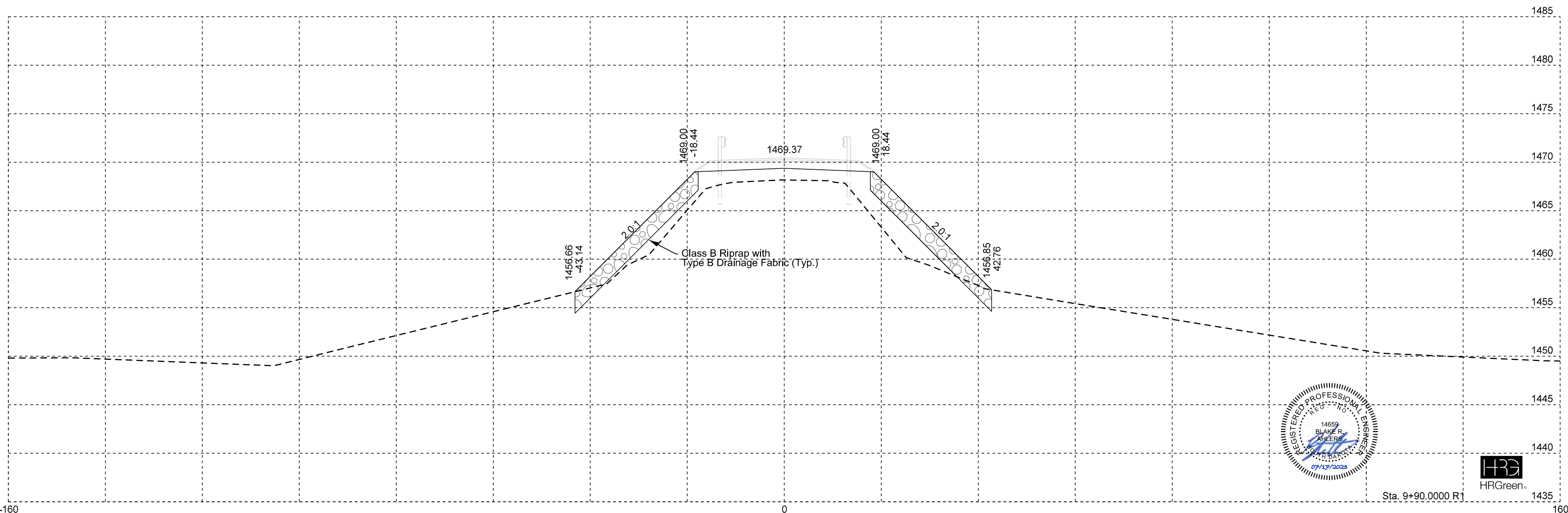


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FOR BIDDING PURPOSES ONLY

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Plotting Date: 7/17/2023

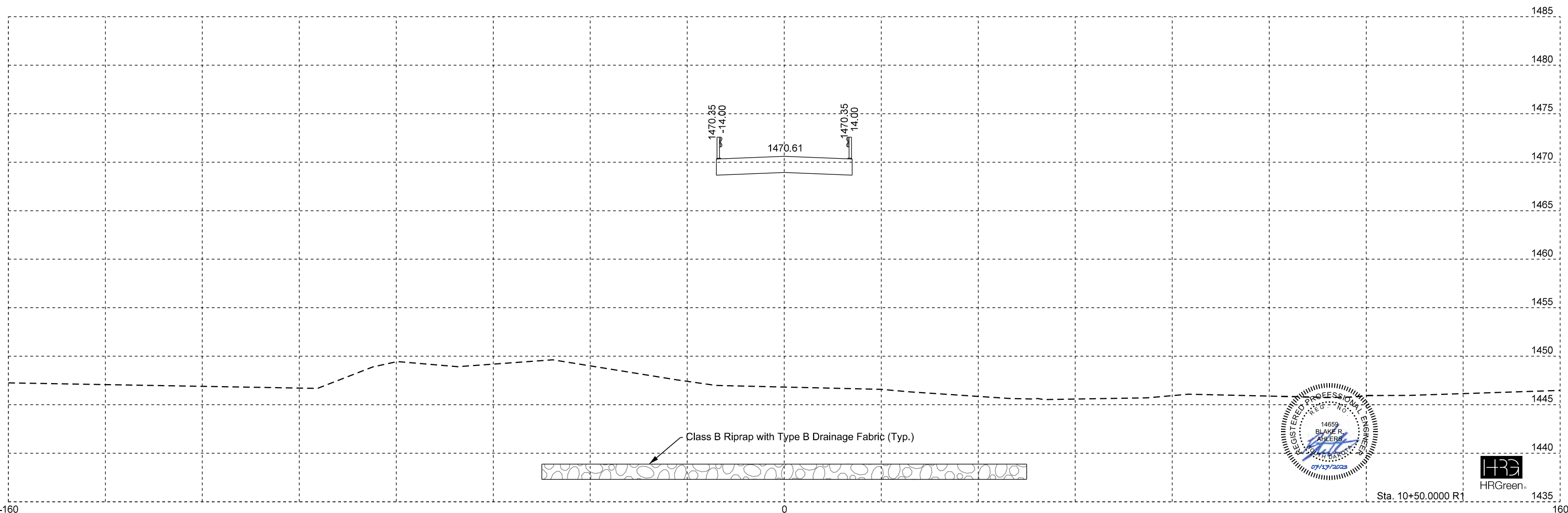


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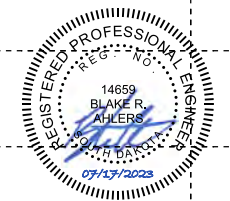
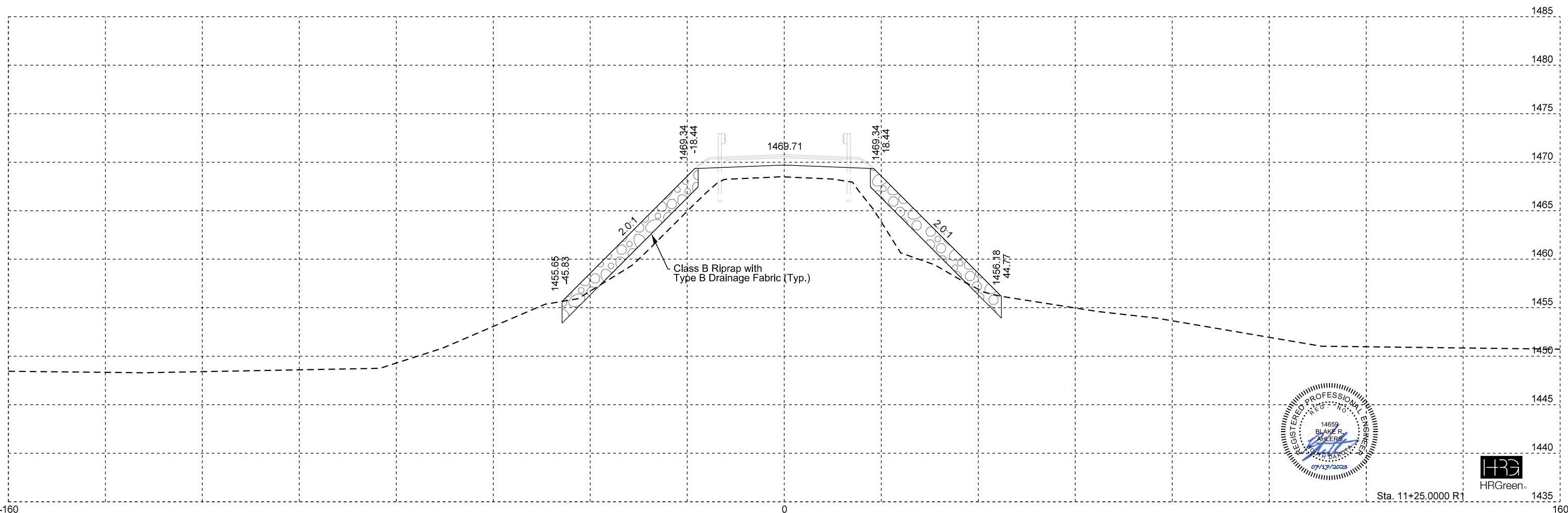
Plotting Date: 7/17/2023



FOR BIDDING PURPOSES ONLY

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|-----------------------------|---------------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO 8007(212) | 60 | 64 |

Plotting Date: 7/17/2023



Sta. 11+25.0000 R1

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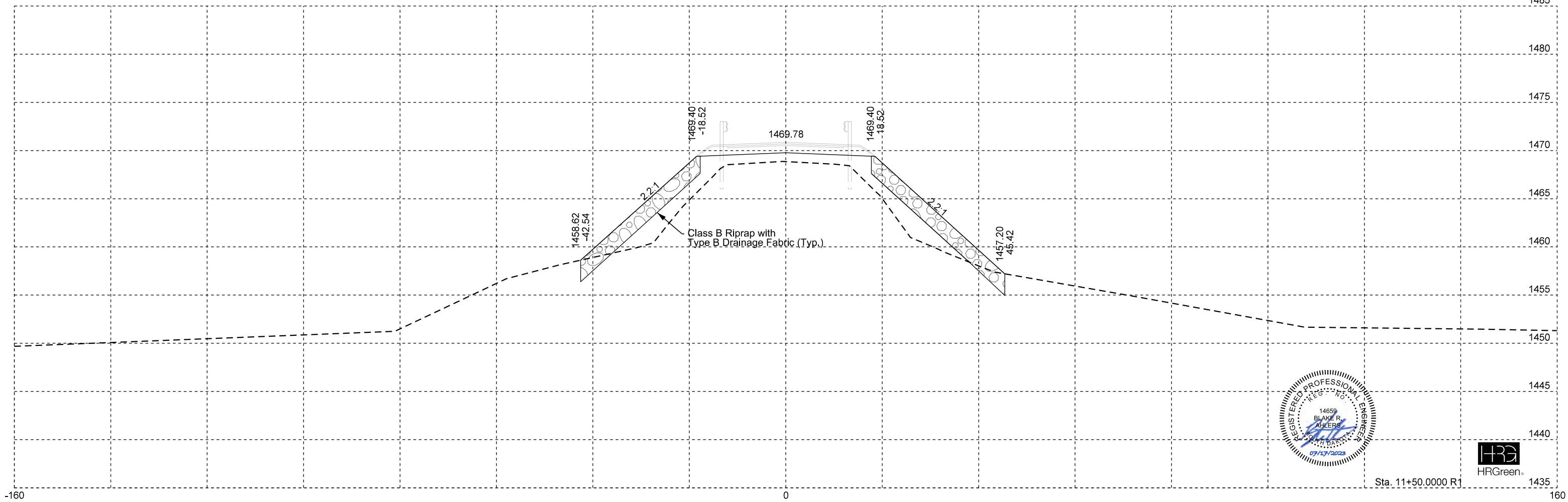
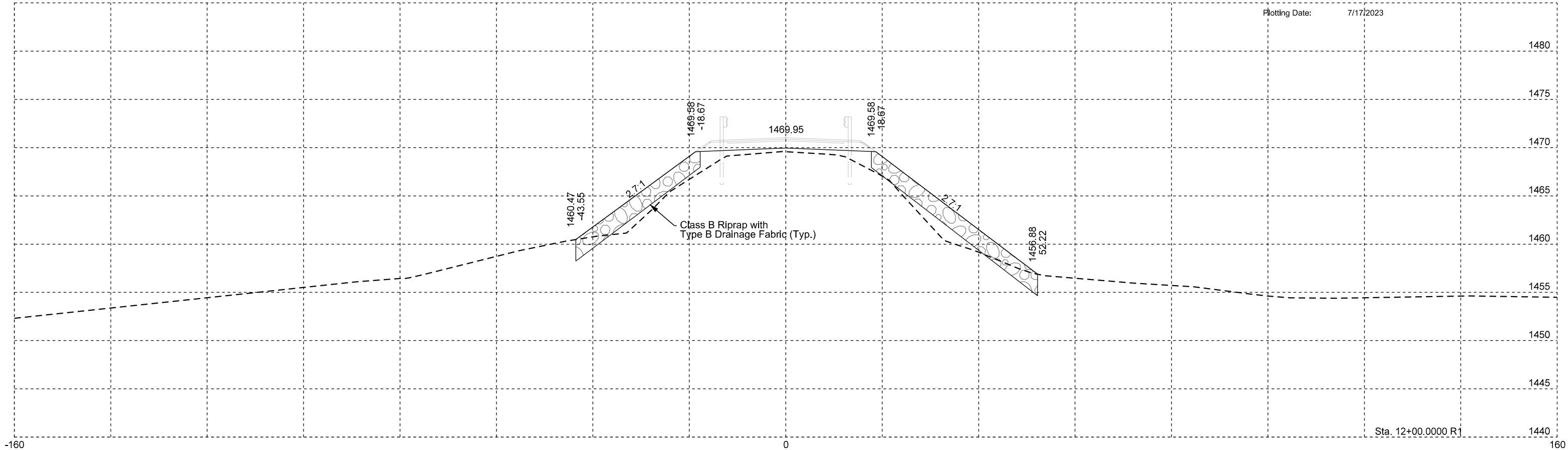
STATE OF SOUTH DAKOTA

PROJECT
BRO 8007(212)

SHEET
61

TOTAL SHEETS
64

Plotting Date: 7/17/2023



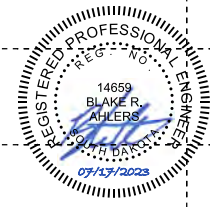
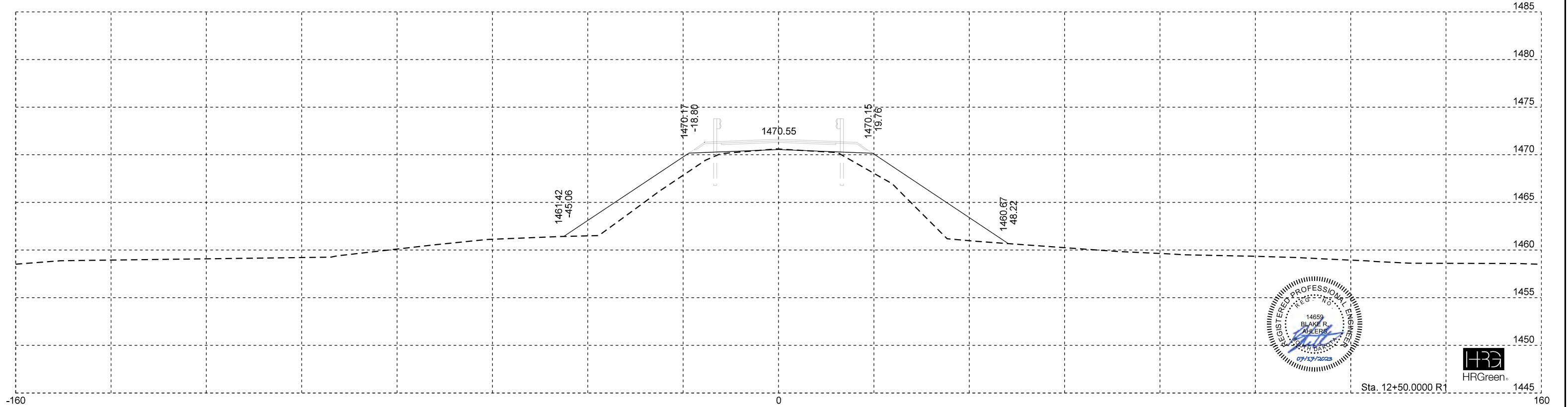
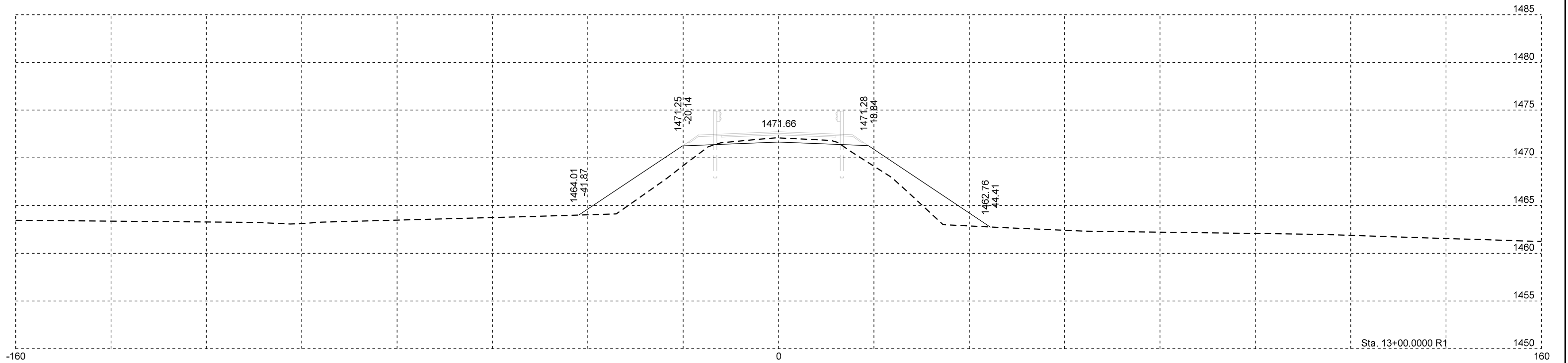
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STATE OF
SOUTH
DAKOTA

PROJECT
BRO 8007(212)

SHEET
62
TOTAL
SHEETS
64

Plotting Date: 7/17/2023



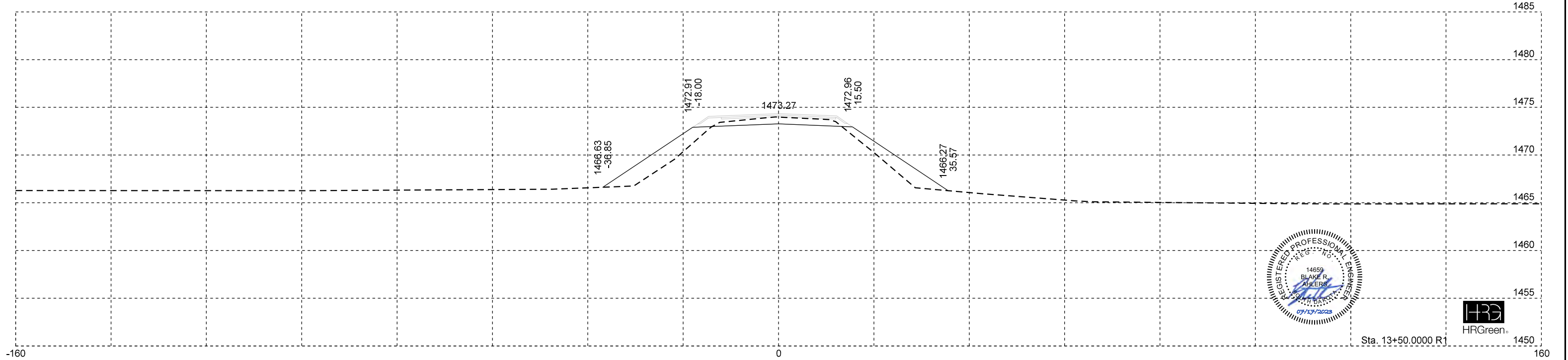
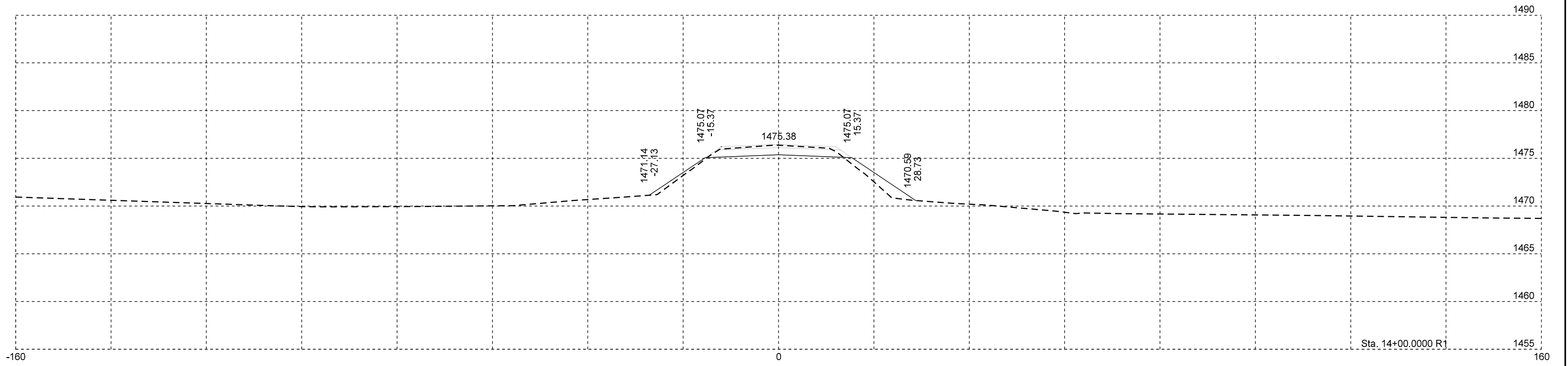
Sta. 12+50.0000 R1

HRGreen

FOR BIDDING PURPOSES ONLY

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|-----------------------------|---------------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO 8007(212) | 63 | 64 |

Plotting Date: 7/17/2023



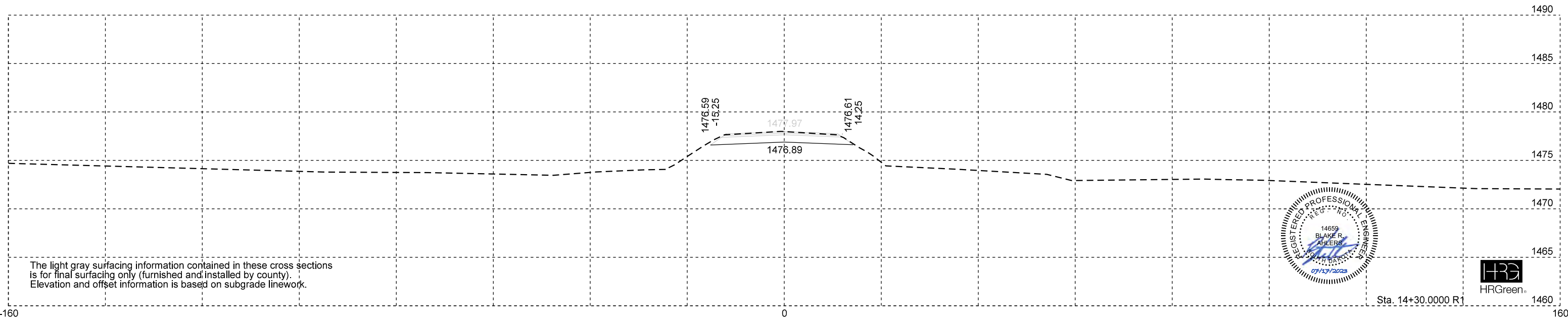
Sta. 13+50.0000 R1

160

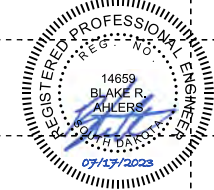
FOR BIDDING PURPOSES ONLY

| | | | |
|-----------------------------|---------------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | BRO 8007(212) | 64 | 64 |

Plotting Date: 7/17/2023



The light gray surfacing information contained in these cross sections is for final surfacing only (furnished and installed by county). Elevation and offset information is based on subgrade linework.



Sta. 14+30.0000 R1