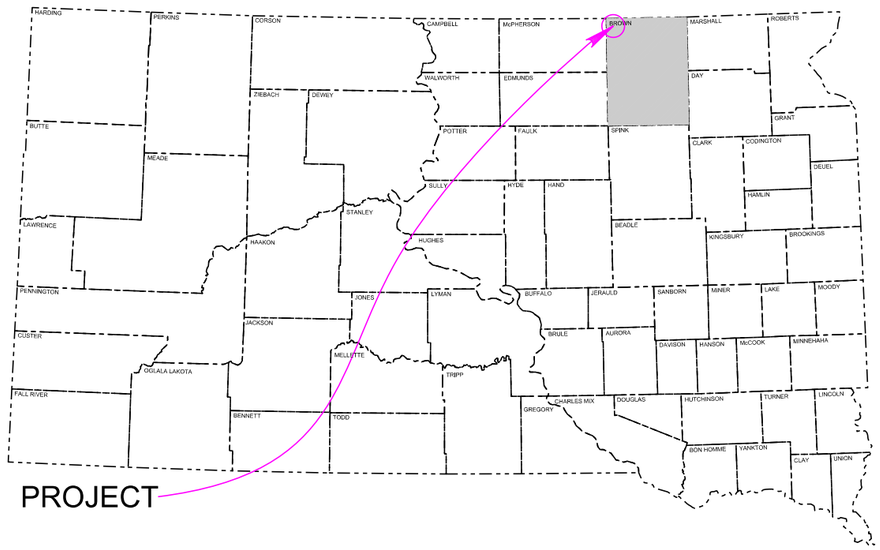


STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8007(212)	1	64

Plotting Date: 7/17/2023

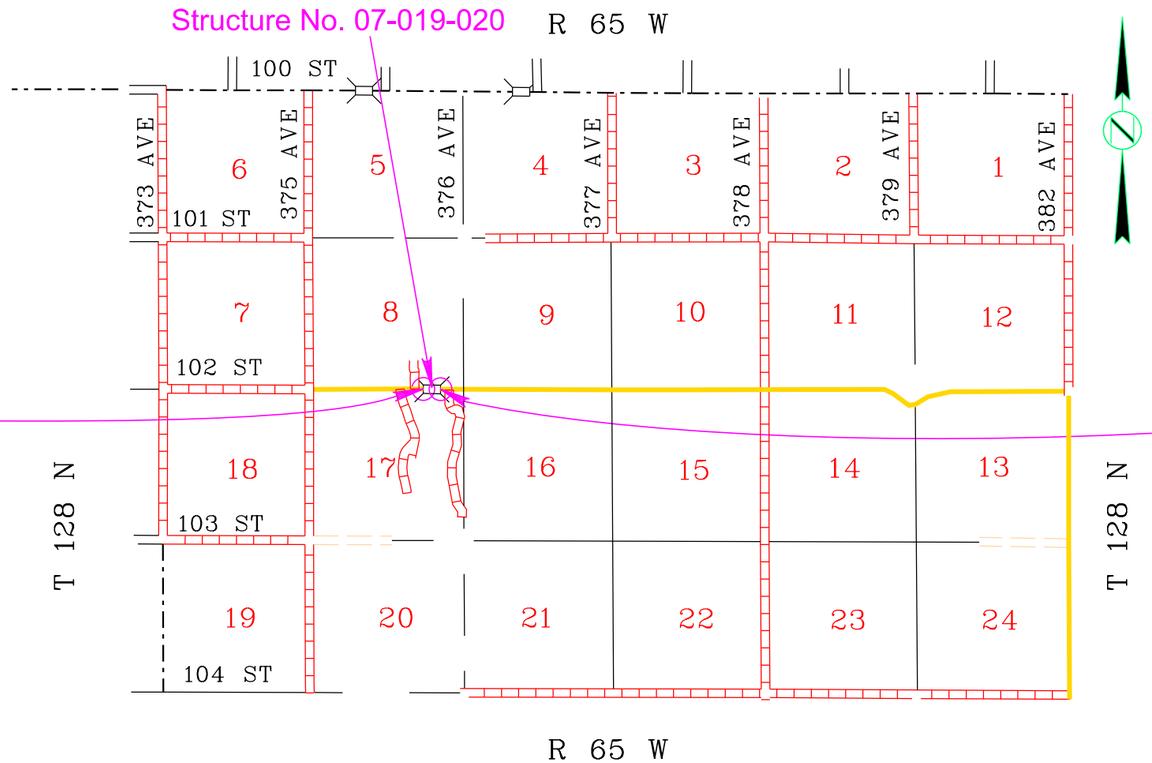
PROJECT BRO-B 8007(212)
102nd STREET
BROWN COUNTY

APPROACH GRADING AND STRUCTURE REPLACEMENT OVER ELM LAKE

PCN 084J

HRGreen

INDEX OF SHEETS



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

AADT (2019)	125
AADT (2039)	166
DHV	25
D	50%
DHV T%	3.5%
AADT 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

2

July 16, 2025

Plot Scale - 1:200
Plotted From - bahlers
File - ...\02_BRWN\084J\strip\map084J.dgn

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

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://sdleastwanted.com/maps/default.aspx>

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

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/13/2023

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_CGPAppendixCCA2018Fillable.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.

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

Rev 12/13/2023 BRA

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.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 14659
BLAKE R. AHLERS
SOUTH DAKOTA
12/13/2023

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.

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

					Grade Staking						
Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Length (Mile)	Lane Factor	*Sets of Stakes	**Grade Staking Quantity (Mile)	Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Structure Staking Quantity (Each)
102nd 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)

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/13/2023

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	Inslope	0.1
	Total:	0.1

FOR BIDDING PURPOSES ONLY

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
☐ Natural Buffers (within 50 ft of Waters of State)	
☒ Silt Fence	
☒ Erosion Control Wattles	
☐ Temporary Berm / Windrow	
☒ Floating Silt Curtain	
☐ Stabilized Construction Entrances	
☐ Entrance/Exit Equipment Tire Wash	
☐ Other:	

Structural Erosion and Sediment Controls

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

Dust Controls

Description	Estimated Start Date
☐ Tarps & Wind impervious fabrics	
☐ Watering	
☐ Stockpile location/orientation	
☐ Dust Control Chlorides	
☐ Other	

Dewatering BMPs

Description	Estimated Start Date
☐ Sediment Basins	
☐ Dewatering bags	
☐ Weir tanks	
☐ Temporary Diversion Channel	
☐ 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
☐ Vegetation Buffer Strips	
☐ Temporary Seeding (Cover Crop Seeding)	
☒ Permanent Seeding	
☐ Sodding	
☐ Planting (Woody Vegetation for Soil Stabilization)	
☒ Mulching (Grass Hay or Straw)	
☐ Fiber Mulching (Wood Fiber Mulch)	
☐ Soil Stabilizer	
☐ Bonded Fiber Matrix	
☐ Fiber Reinforced Matrix	
☐ Erosion Control Blankets	
☒ Surface Roughening (e.g. tracking)	
☐ 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 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 ½ 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, de-greasing 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.

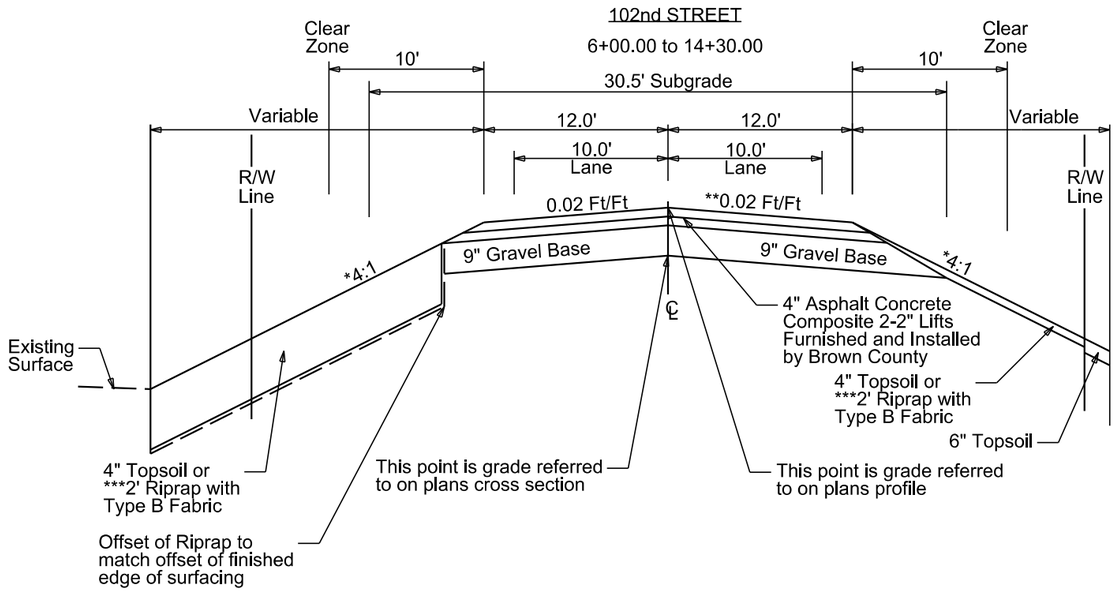
When modifications as described above occur, the SWPPP will be modified to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP using the DOT 298 form and drawings on the plan will be modified to reflect the 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.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8007(212)	15	64

Plotting Date: 7/17/2023

FOR BIDDING PURPOSES ONLY

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

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/17/2023

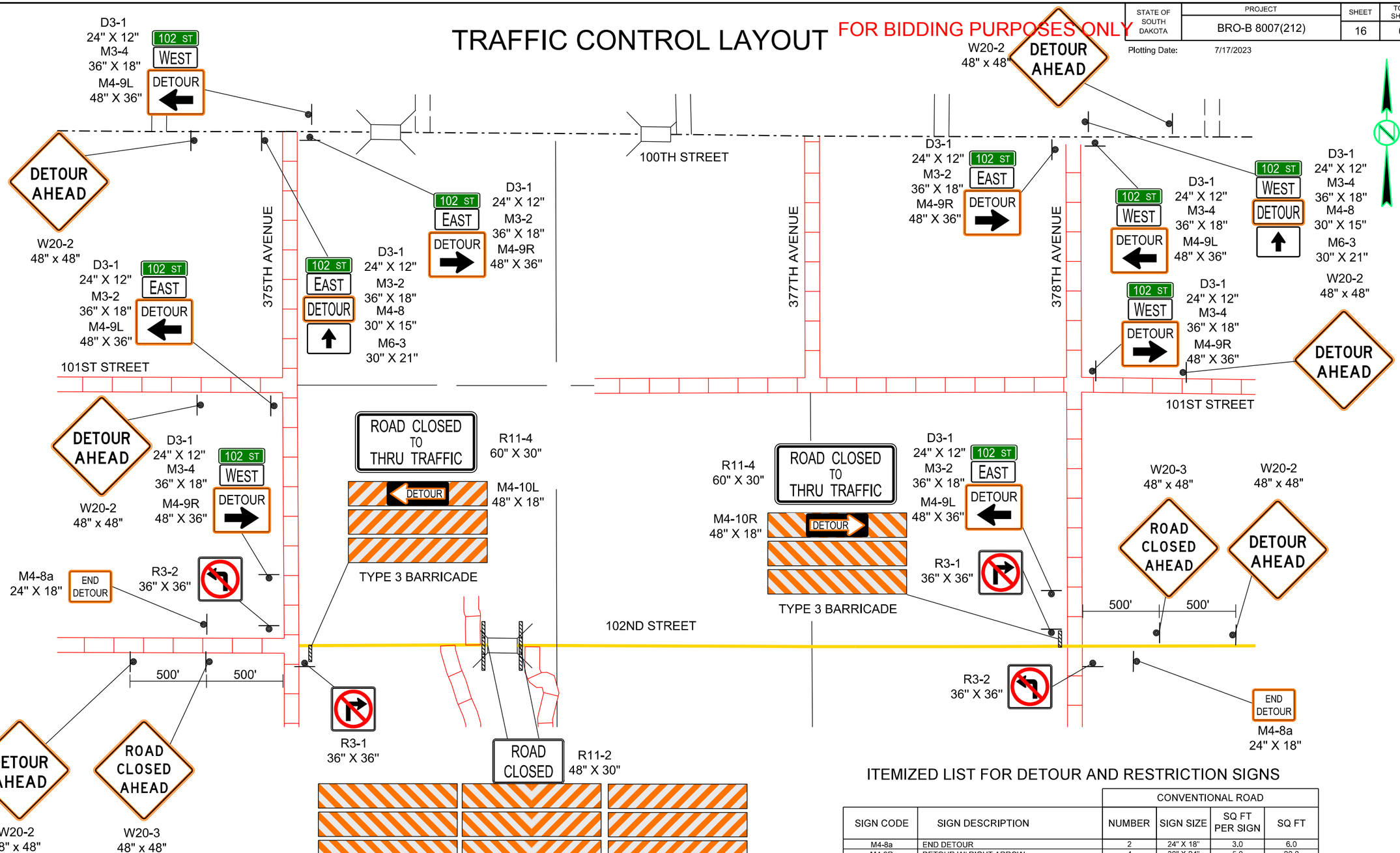
HRGreen

TRAFFIC CONTROL LAYOUT

FOR BIDDING PURPOSES ONLY

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 SQ FT				77.0

ITEMIZED LIST FOR DETOUR AND RESTRICTION SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	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 SQ FT				275.0

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/17/2023

HRGreen

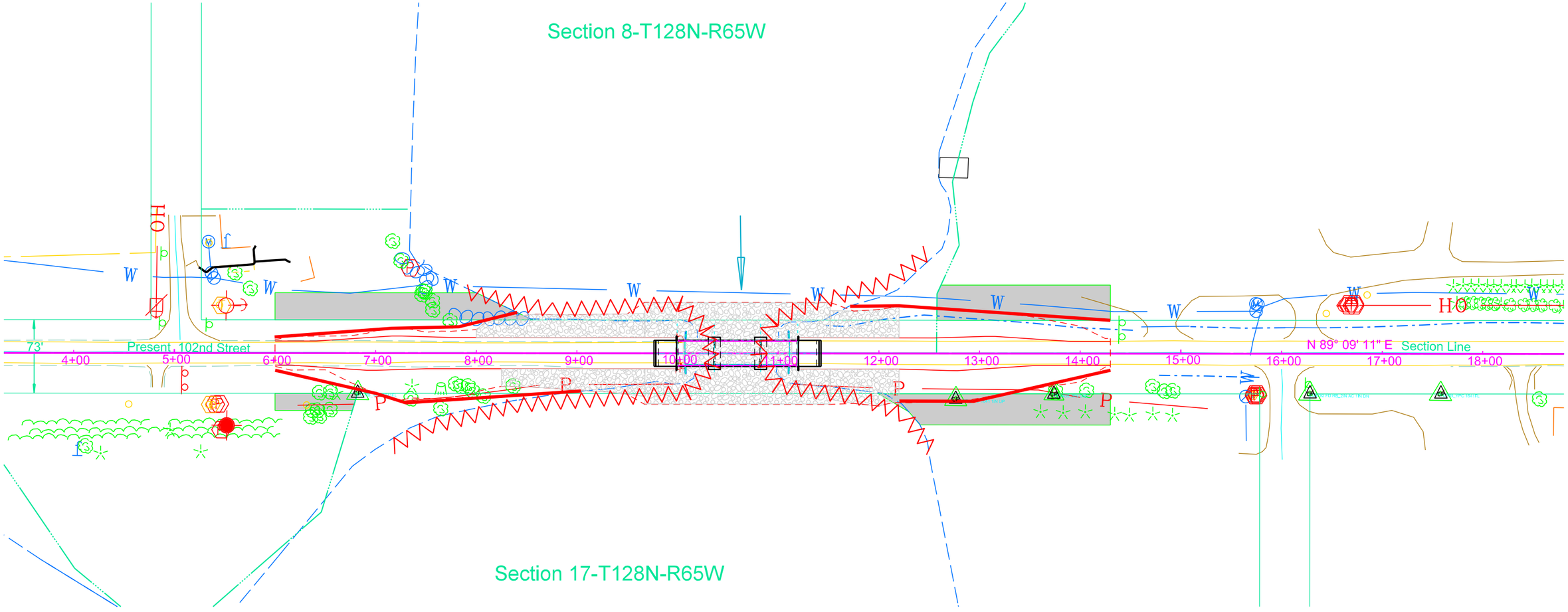
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8007(212)	17	64

FOR BIDDING PURPOSES ONLY

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.



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

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 14659
BLAKE R. ALBERS
SOUTH DAKOTA
07/17/2023

HRGreen

HORIZONTAL ALIGNMENT DATA & CONTROL DATA

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.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 14659
BLAKE R. AHLERS
NORTH DAKOTA
07/17/2023

HRGreen

LEGEND

FOR BIDDING PURPOSES ONLY

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

Plotting Date: 7/17/2023

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

- State and National Line
- County Line
- Section Line (APPROX. SEC. LINE)
- Quarter Line
- Sixteenth Line
- Property Line
- Construction Line
- ROW Line
- New ROW Line
- Cut and Fill Limits
- Control of Access
- New Control of Access
- Proposed ROW (After Property Disposal)

- Drainage Arrow

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/17/2023

HRGreen

Plot Scale - 1:200

Plotted From - bahlers

File - ...\CAD\02_BRWN084J\Legend.dgn

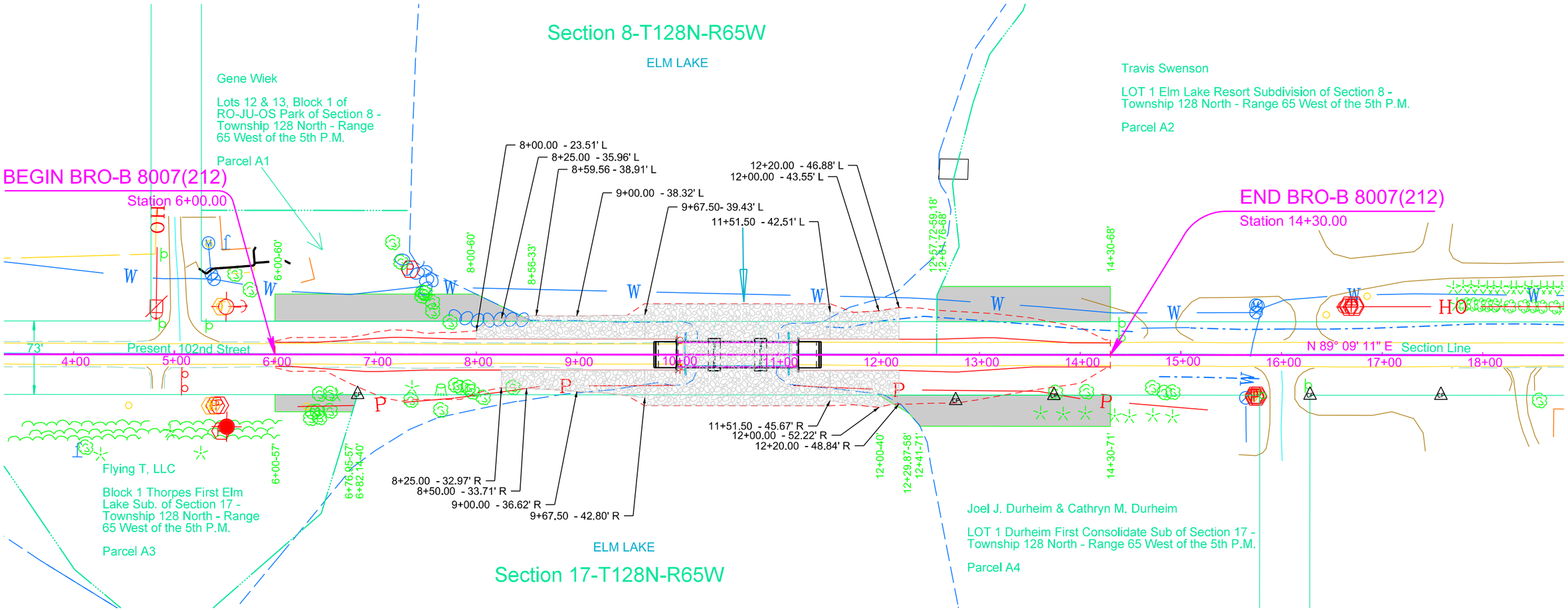
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8007(212)	20	64

FOR BIDDING PURPOSES ONLY

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)



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

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/17/2023

HRGreen

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8007(212)	21	64

FOR BIDDING PURPOSES ONLY

Plotting Date: 7/17/2023

6+00
Begin Work

14+30
End 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 8+11.08
Elev 1,470.01

PVI 13+02.38
Elev 1,471.24

PVI 14+30
Elev 1,478.00

-3.6000%

+0.2500%

+0.2500%

+5.3000%

	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

CP6
12+76.57-45.46' R
Elev 1461.41

CP5
13+74.10-40.36' R
Elev 1468.04

CP2
16+28.26-39.9' R
Elev 1488.72

CP7
17+58.13-39.94' R
Elev 1492.14

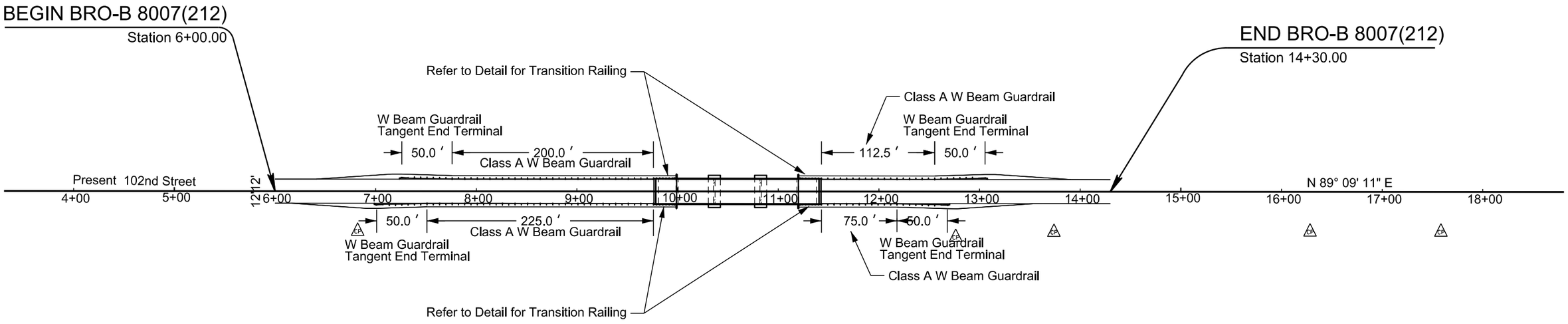
REGISTERED PROFESSIONAL ENGINEER
14659
BLAKE R. AHLERS
07/13/2023

HRGreen

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

FOR BIDDING PURPOSES ONLY

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



REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R. AHLERS
SOUTH DAKOTA
12/13/2023

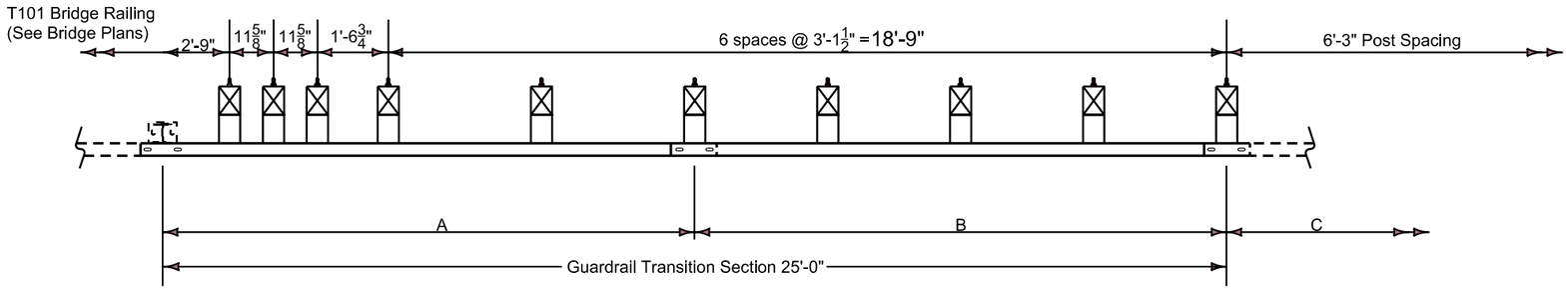
HRGreen.

GUARDRAIL TRANSITION DETAIL

FOR BIDDING PURPOSES ONLY

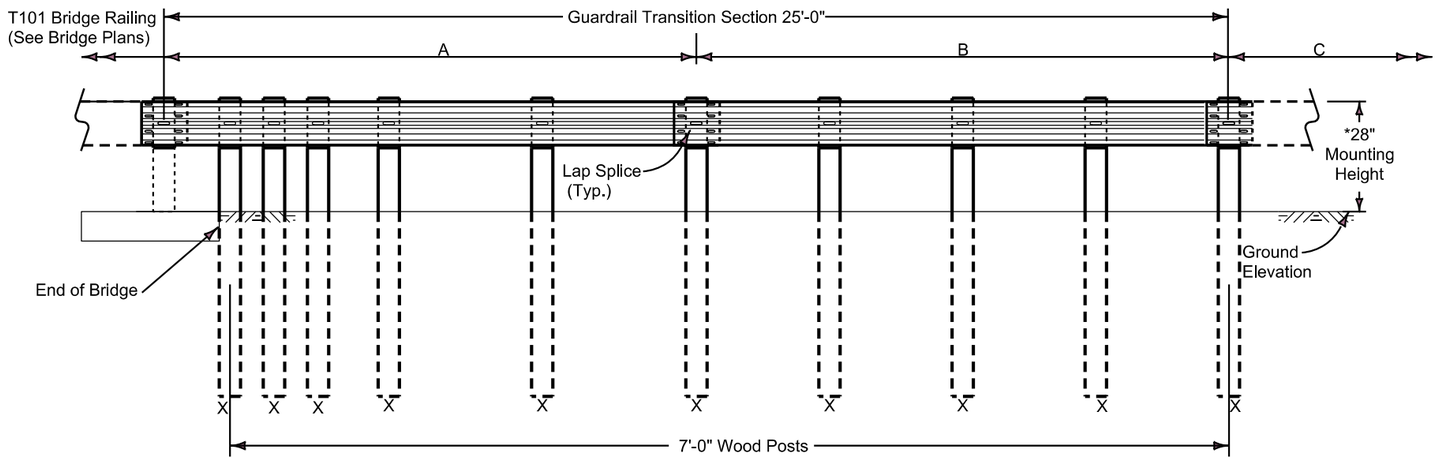
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8007(212)	23	64

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.



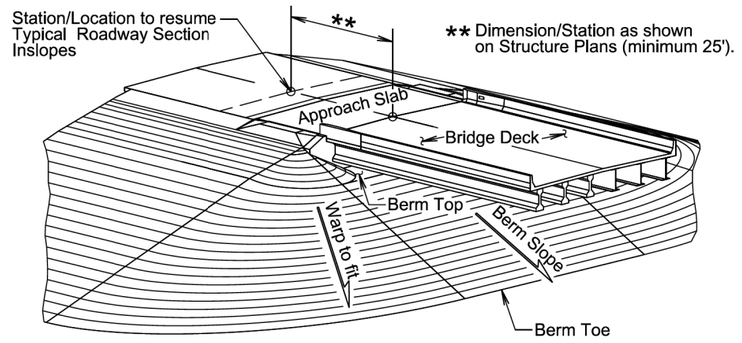
ELEVATION VIEW

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

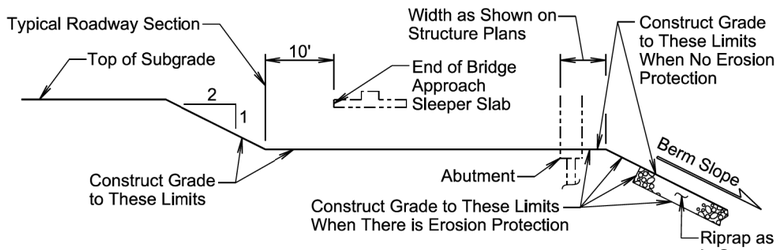
*See standard plate 630.99

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/17/2023

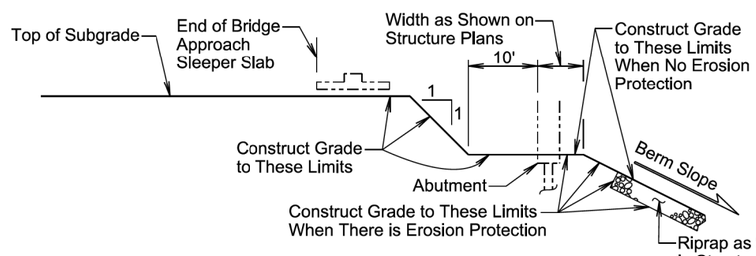
HRGreen.



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



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



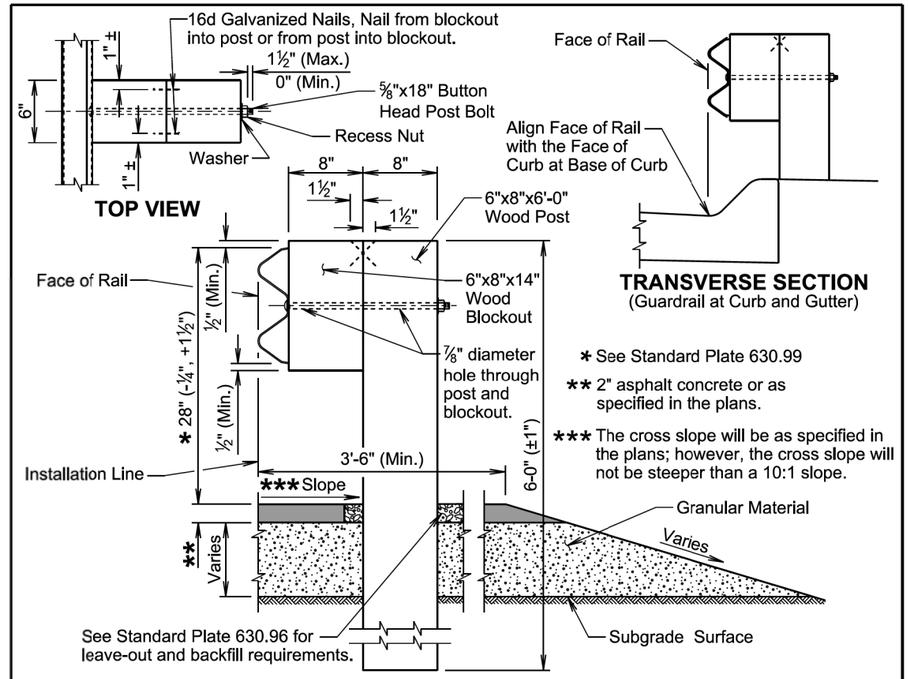
TYPICAL GRADING PROFILE AT BRIDGE BERM
(Normal to ℄ Abutment at ℄ Roadway)

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	SDDOT	**BRIDGE BERM (PROJECTING EMBANKMENT)**	PLATE NUMBER 120.11 Sheet 1 of 1



* See Standard Plate 630.99

** 2" asphalt concrete or as specified in the plans.

*** The cross slope will be as specified in the plans; however, the cross slope will not be steeper than a 10:1 slope.

TRANSVERSE SECTION

GENERAL NOTES:

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.

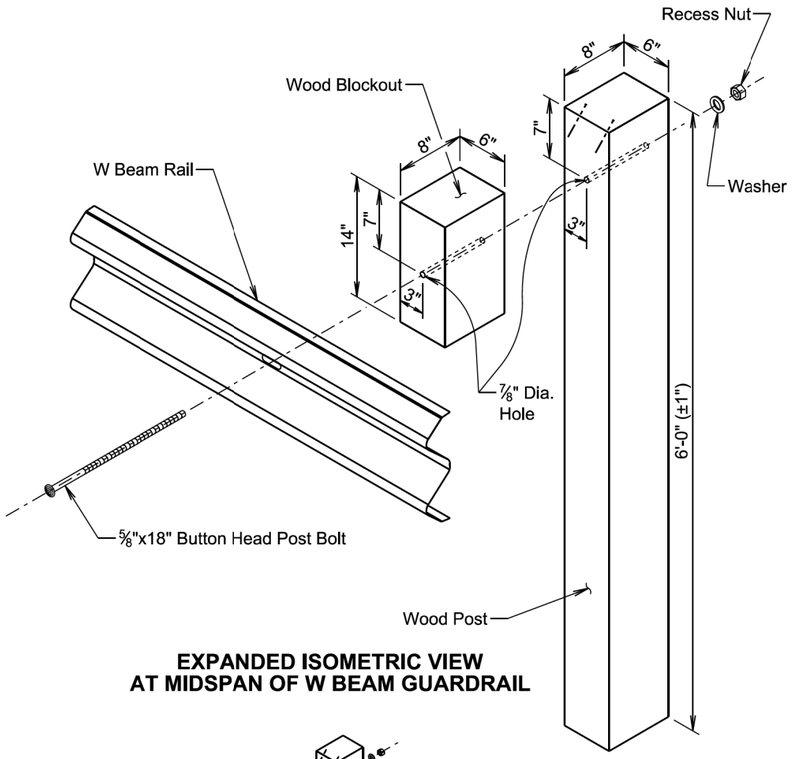
Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or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

The top of post and top of block will have a true square cut. The top of block will be a maximum of ± ½ inch from the top of the post.

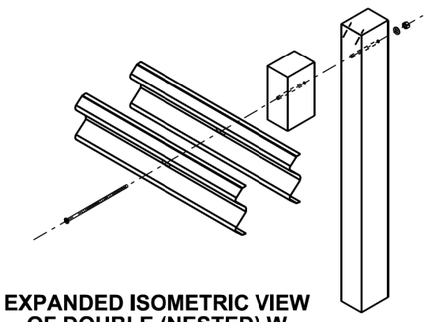
September 14, 2019

Published Date: 2024	SDDOT	**W BEAM GUARDRAIL**	PLATE NUMBER 630.10 Sheet 1 of 5

HRGreen.



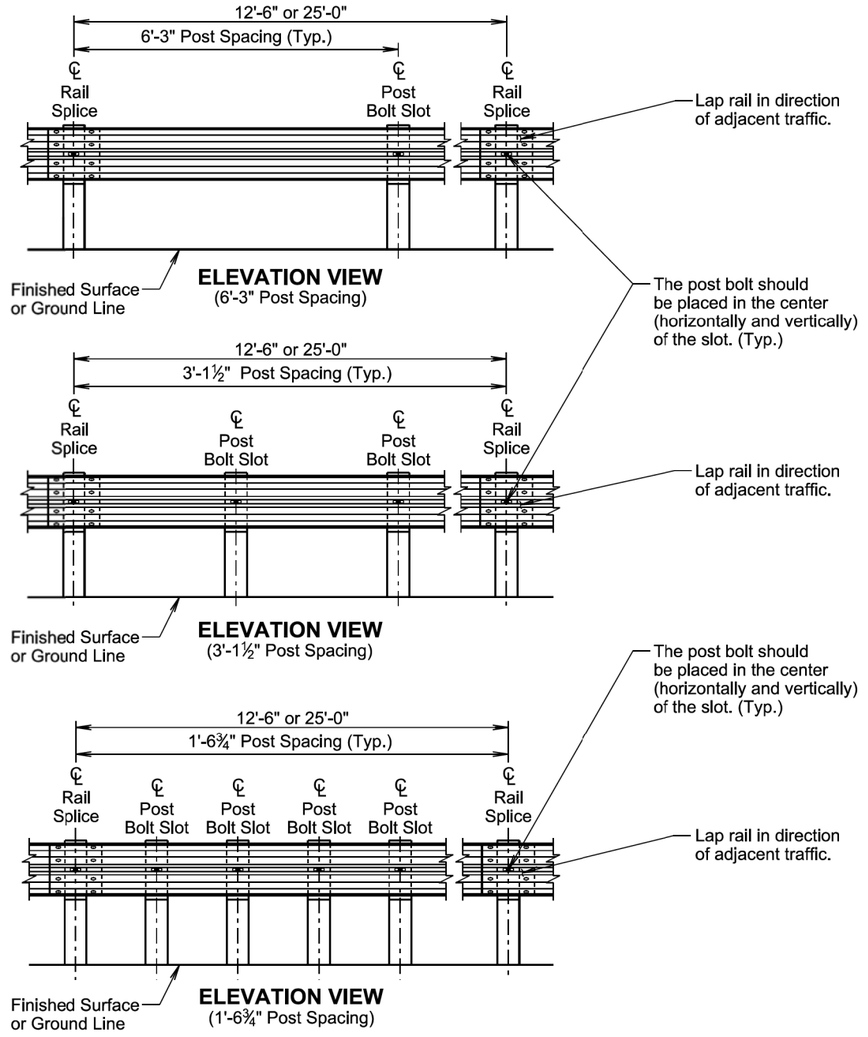
EXPANDED ISOMETRIC VIEW AT MIDSPAN OF W BEAM GUARDRAIL



EXPANDED ISOMETRIC VIEW OF DOUBLE (NESTED) W BEAM GUARDRAIL AT MIDSPAN
(For Information Only, Not to Scale)

September 14, 2019

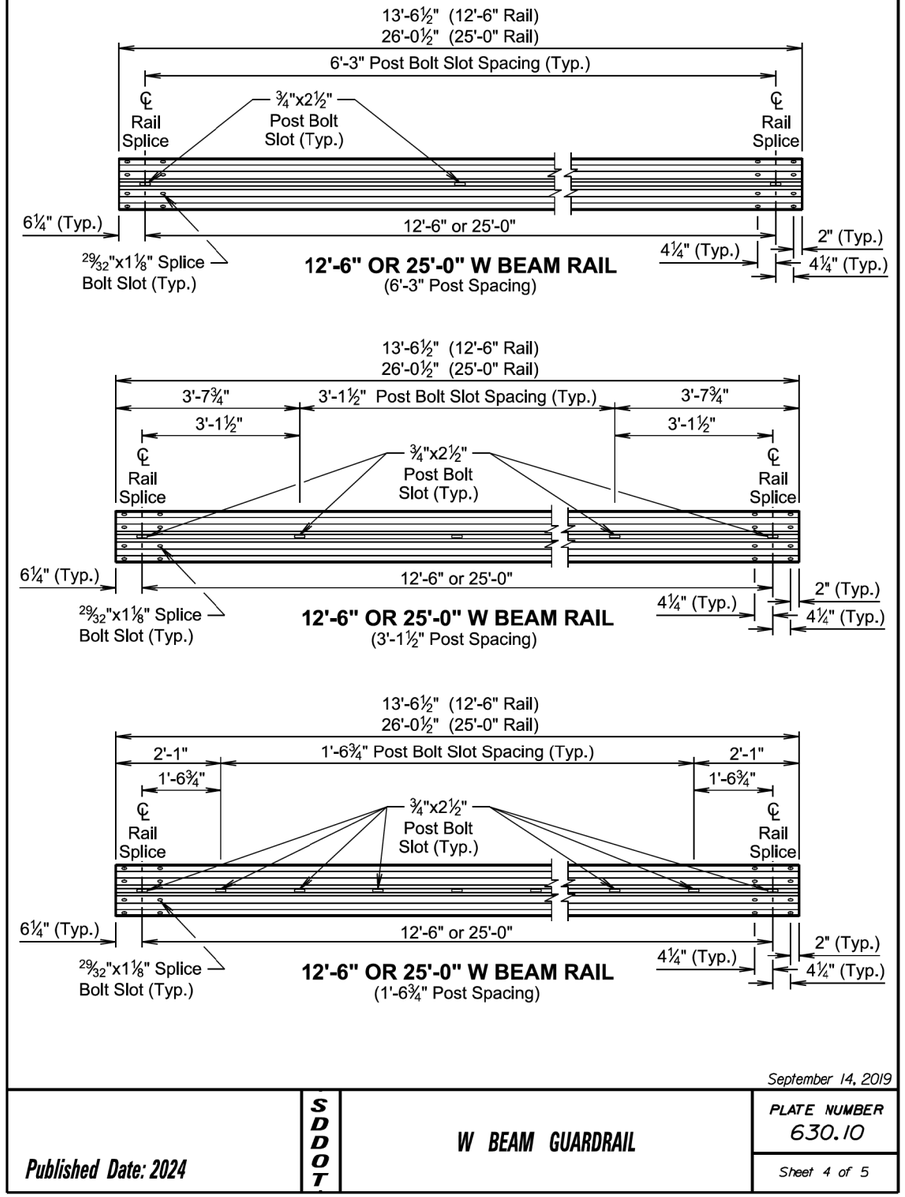
Published Date: 2024	SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 2 of 5



September 14, 2019

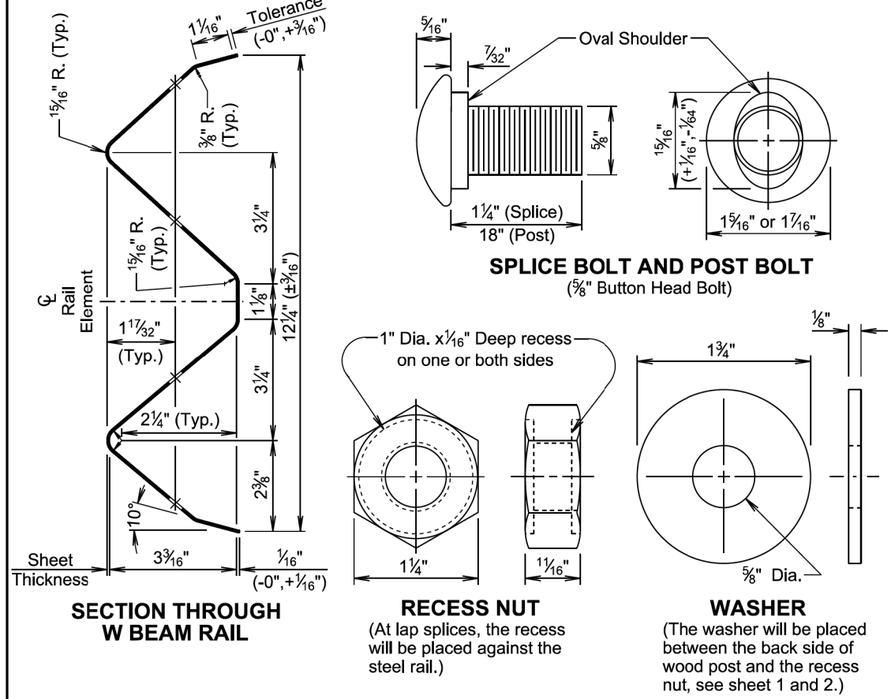
Published Date: 2024	SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 3 of 5

HRGreen.



September 14, 2019

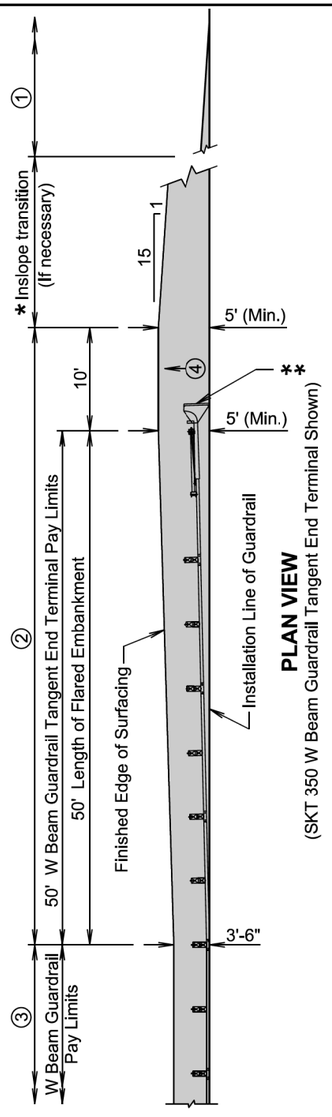
Published Date: 2024	SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 4 of 5



September 14, 2019

Published Date: 2024	SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 5 of 5

HRGreen.



PLAN VIEW

(SKT 350 W Beam Guardrail Tangent End Terminal Shown)

** See standard plate 632.40 for delineation.

□ 2" Asphalt concrete surfacing with variable thickness granular material or as specified in the plans.

① Same inslope as mainline inslope or as specified in the plans.

② 4:1 inslope or as specified in the plans.

③ Inslope as specified in the plans.

④ Same slope as roadway cross slope or as specified in the plans. Slope will not be steeper than a 10:1 slope.

GENERAL NOTES:

The tangent guardrail end terminal above is for illustrative purpose only.

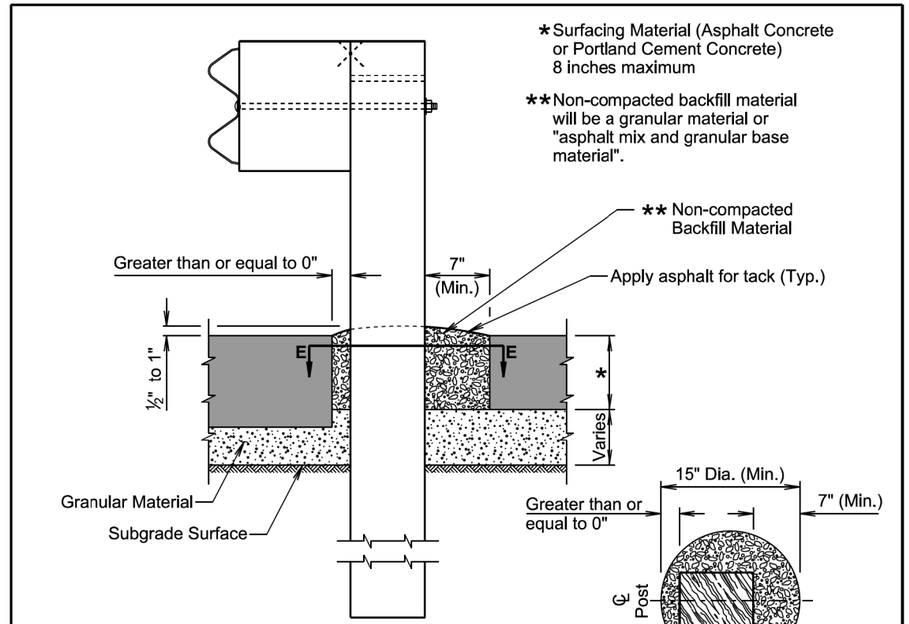
* The length of inslope transition varies with the amount of change between inslopes. The length of the transition will change 100' for every whole number change in the inslope. For Example: If the inslope changes from a 5:1 to a 4:1 the length of the inslope transition would be 100'. If the inslope changes from a 6:1 to a 4:1 the length of the inslope transition would be 200'.

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.

November 14, 2018

Published Date: 2024	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR W BEAM GUARDRAIL TANGENT END TERMINAL	PLATE NUMBER 630.88 Sheet 1 of 1

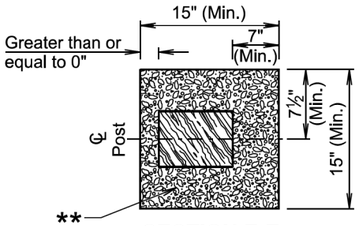


TRANSVERSE SECTION

(Wood post shown for illustrative purpose only)

SECTION E-E

(Round option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)



SECTION E-E

(Square option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

GENERAL NOTES:

The leave-out limits may be increased to accommodate construction equipment and tolerances.

When posts are installed in augured or dug holes, the backfill material will be compacted to the bottom of the pavement surfacing material to the satisfaction of the Engineer. The backfill material for the thickness of the pavement surfacing material will be non-compacted.

The backfill material will be mounded ½ inch to 1 inch above the top of the adjacent surfacing as illustrated above.

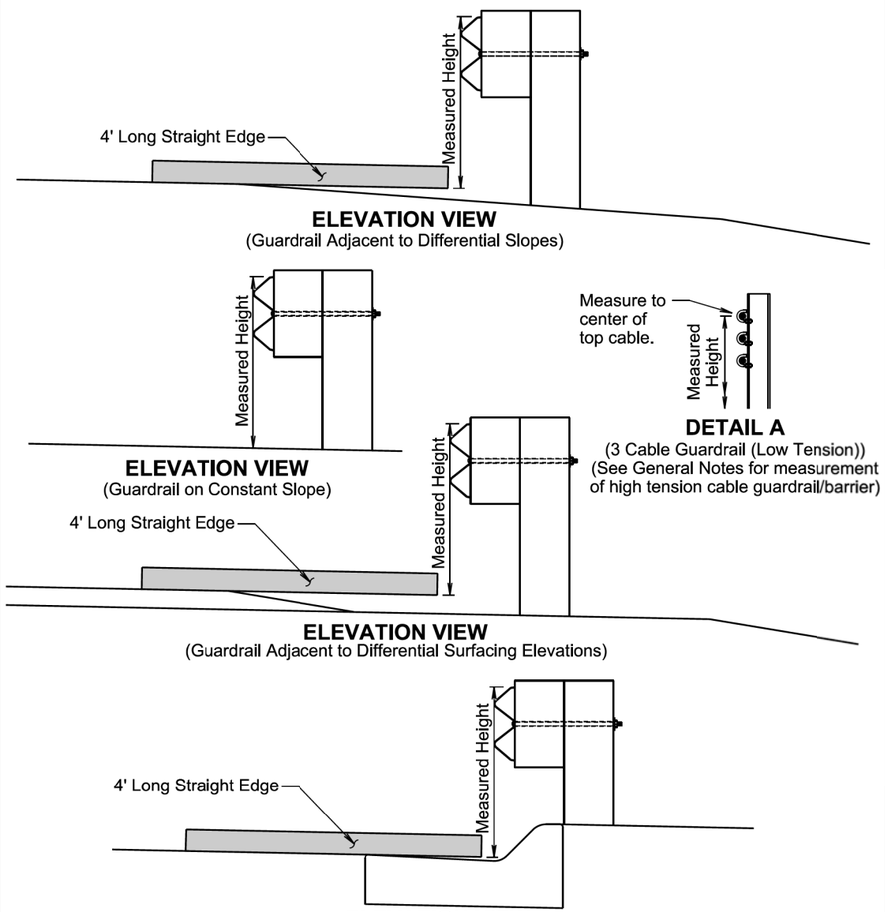
Asphalt for tack will be applied to the surface of the backfill material at the rate of 0.15 to 0.20 gallons per square yard.

All costs for constructing the leave-out including labor, equipment, and materials which includes the backfill material and tack coat will be incidental to the contract unit price for the respective guardrail contract item.

November 19, 2021

Published Date: 2024	SDDOT	GUARDRAIL POST INSTALLED IN ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE	PLATE NUMBER 630.96 Sheet 1 of 1

HRGreen.



GENERAL NOTES:

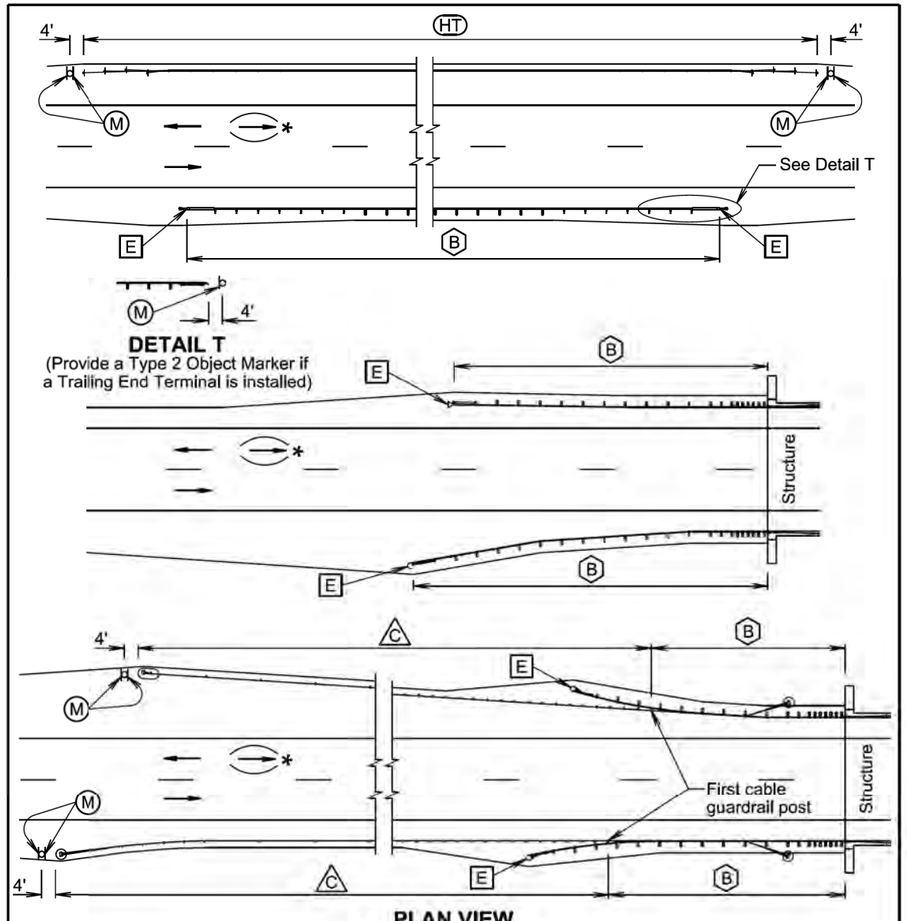
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier will be measured in accordance with this standard plate.

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	SDDOT	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

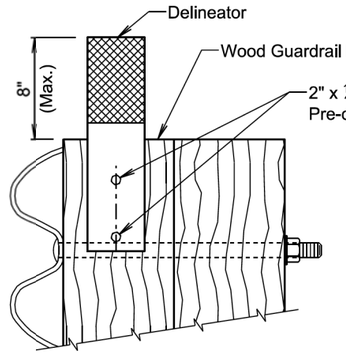
M Type 2 Object Marker

*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.

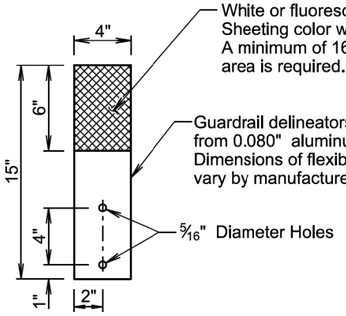
December 23, 2019

Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40 Sheet 1 of 4

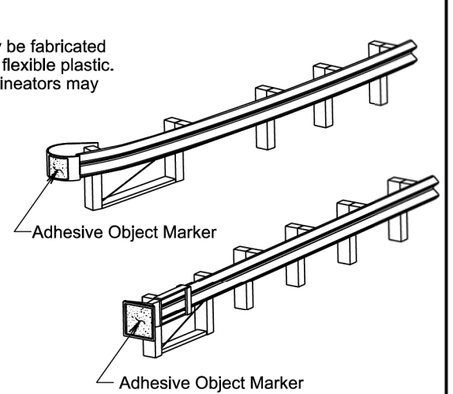
HRGreen.



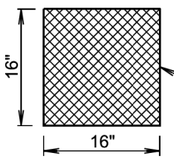
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



(E) GUARDRAIL END TERMINAL OBJECT MARKER

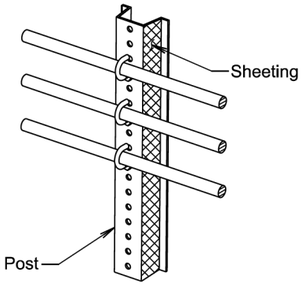


ADHESIVE OBJECT MARKER

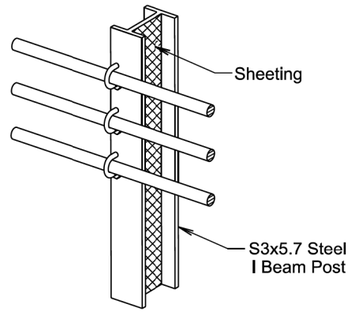
Adhesive object marker dimensions may vary due to shape of terminal end. A minimum of 256 square inches of object marker sheeting area is required. The sheeting will be fluorescent yellow.

December 23, 2019

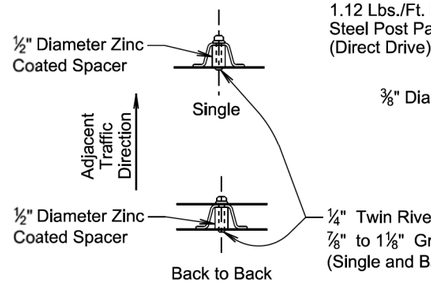
Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 2 of 4



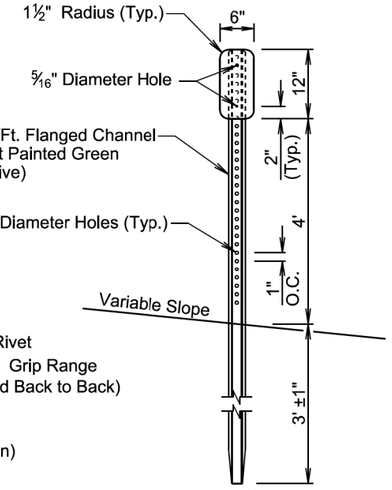
(C) 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



(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	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 3 of 4

HRGreen.

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".

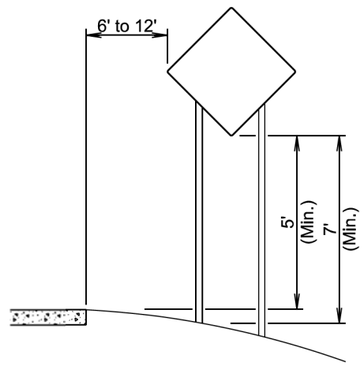
All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail will be incidental to the respective high tension cable guardrail contract item.

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.

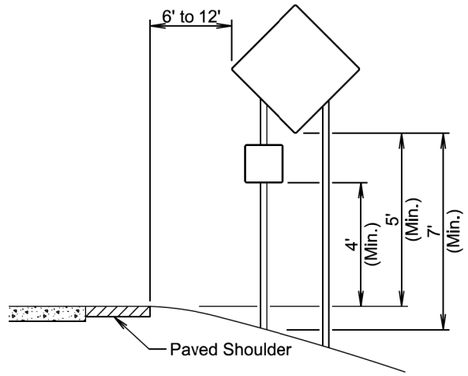
A type 2 object marker will be placed adjacent to the 3 cable guardrail (low tension) anchor, high tension cable guardrail anchor, and trailing end terminal at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") will have fluorescent yellow type XI sheeting in conformance 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

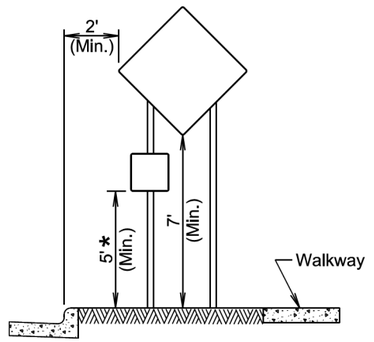
Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 4 of 4



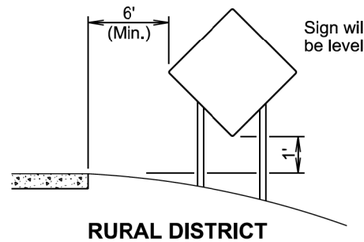
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT



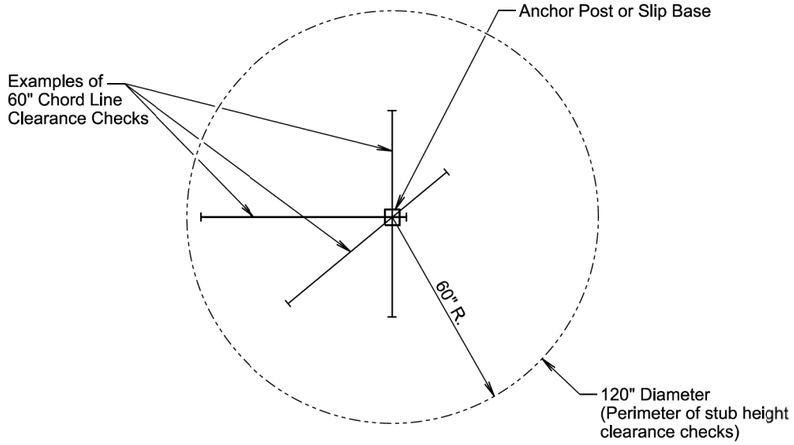
RURAL DISTRICT 3 DAY MAXIMUM
(Not applicable to regulatory signs)

* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

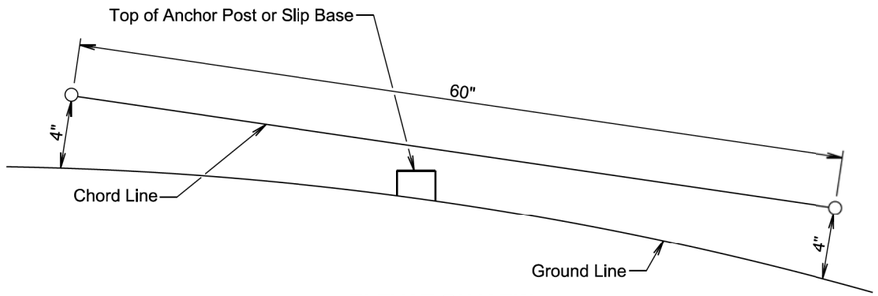
January 22, 2021

Published Date: 2024	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1

HRGreen.



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.

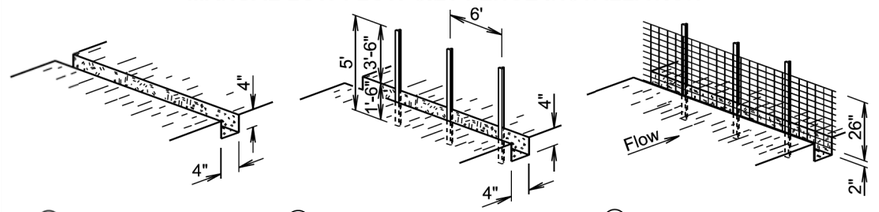
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

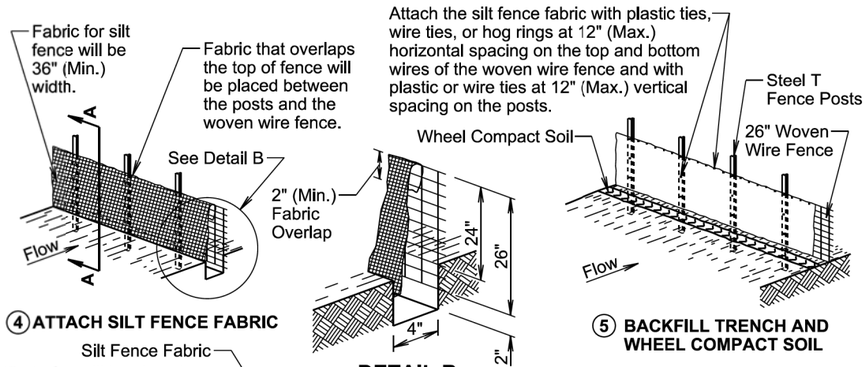
January 22, 2021

Published Date: 2024	SDDOT	*BREAKAWAY SUPPORT STUB CLEARANCE*	*PLATE NUMBER* 634.99
			Sheet 1 of 1

MANUAL LOW FLOW SILT FENCE INSTALLATION

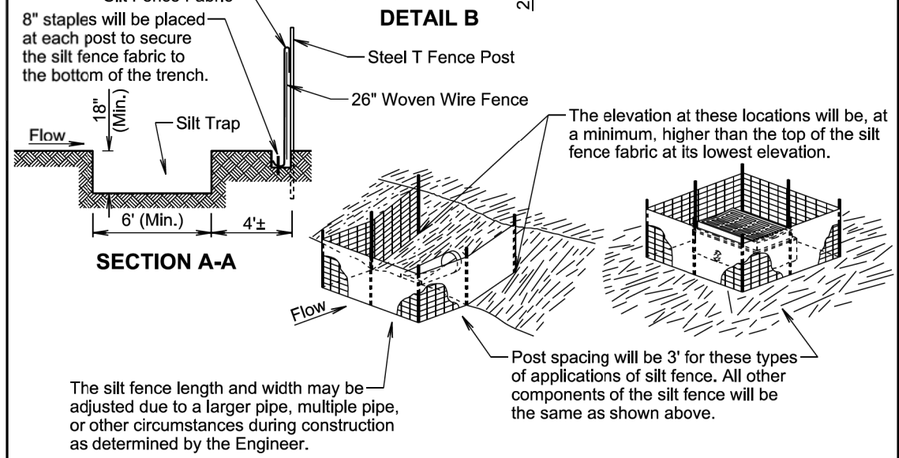


① EXCAVATE TRENCH ② DRIVE STEEL T FENCE POSTS ③ ATTACH 26" WOVEN WIRE FENCE TO POSTS



④ ATTACH SILT FENCE FABRIC ⑤ BACKFILL TRENCH AND WHEEL COMPACT SOIL

DETAIL B



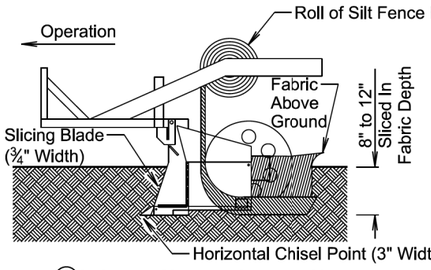
SECTION A-A

February 14, 2020

Published Date: 2024	SDDOT	*LOW FLOW SILT FENCE AND SILT TRAP*	*PLATE NUMBER* 734.04
			Sheet 1 of 2

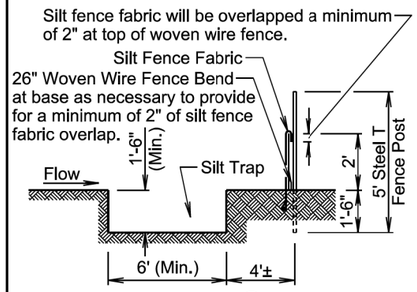
HRGreen.

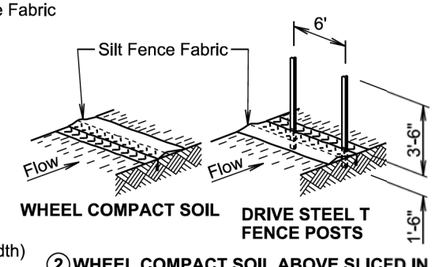
MACHINE SLICED LOW FLOW SILT FENCE INSTALLATION



(1) INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

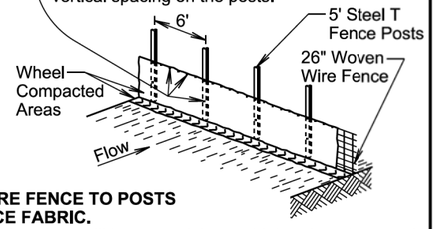
Silt fence fabric will be overlapped a minimum of 2" at top of woven wire fence.





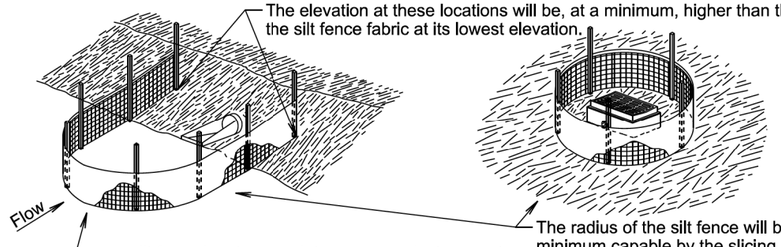
(2) WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.

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 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.

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.

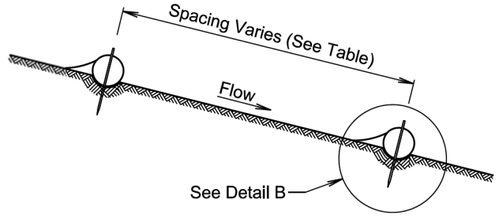
GENERAL NOTES:

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

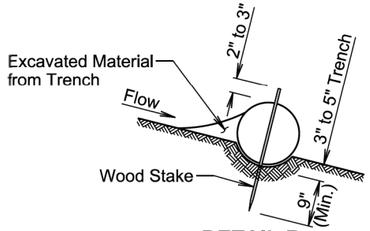
Published Date: 2024	SDDOT	LOW FLOW SILT FENCE AND SILT TRAP	PLATE NUMBER 734.04
			Sheet 2 of 2



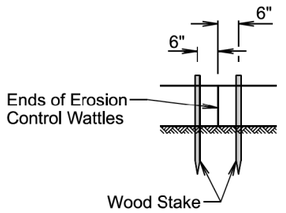
ELEVATION VIEW
(Cut or Fill Slope Installation)

CUT OR FILL SLOPE INSTALLATION

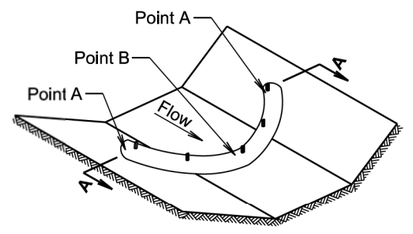
Slope	Spacing (Ft.)
1:1	10
2:1	20
3:1	30
4:1	40



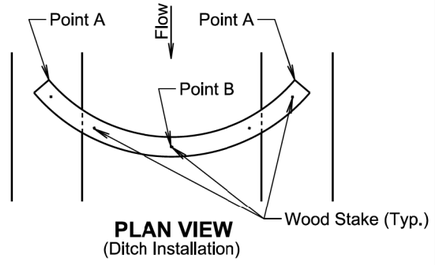
DETAIL B
(Typical of All Installations)



DETAIL C
(See General Notes)



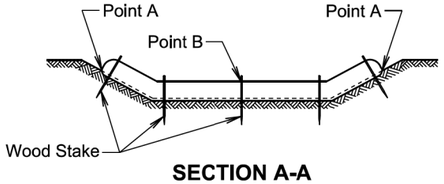
ISOMETRIC VIEW
(Ditch Installation)



PLAN VIEW
(Ditch Installation)

DITCH INSTALLATION

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



SECTION A-A

February 14, 2020

Published Date: 2024	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

HRGreen.

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.

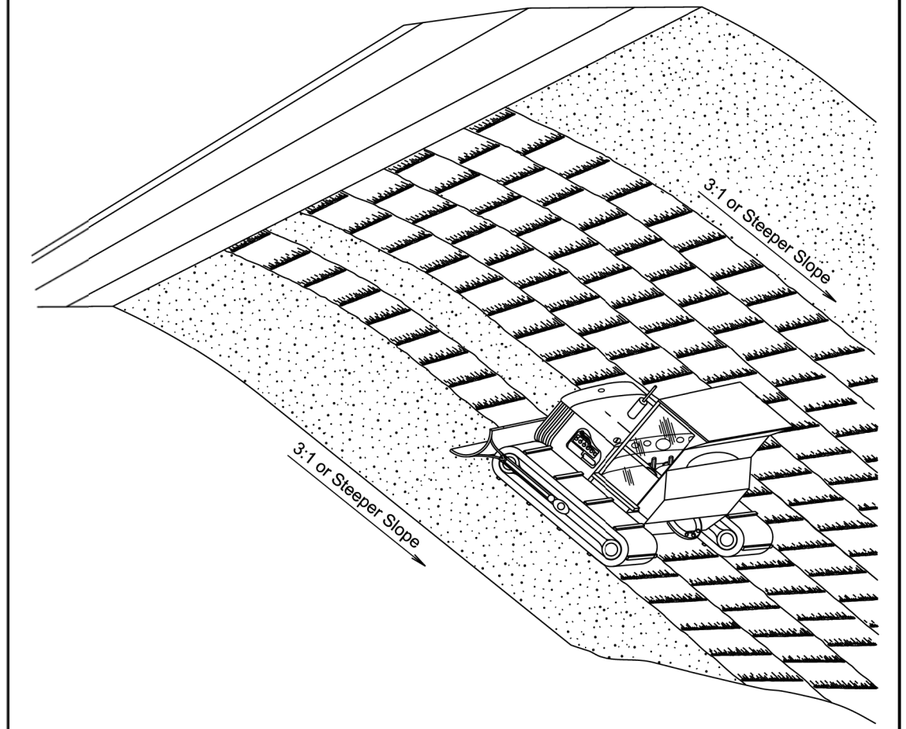
Sediment removal, disposal, or necessary shaping will be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping will be incidental to the contract unit price per cubic yard for "Remove Sediment".

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

Published Date: 2024	SDDOT	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

Published Date: 2024	SDDOT	SURFACE ROUGHENING	PLATE NUMBER 734.25
			Sheet 1 of 1

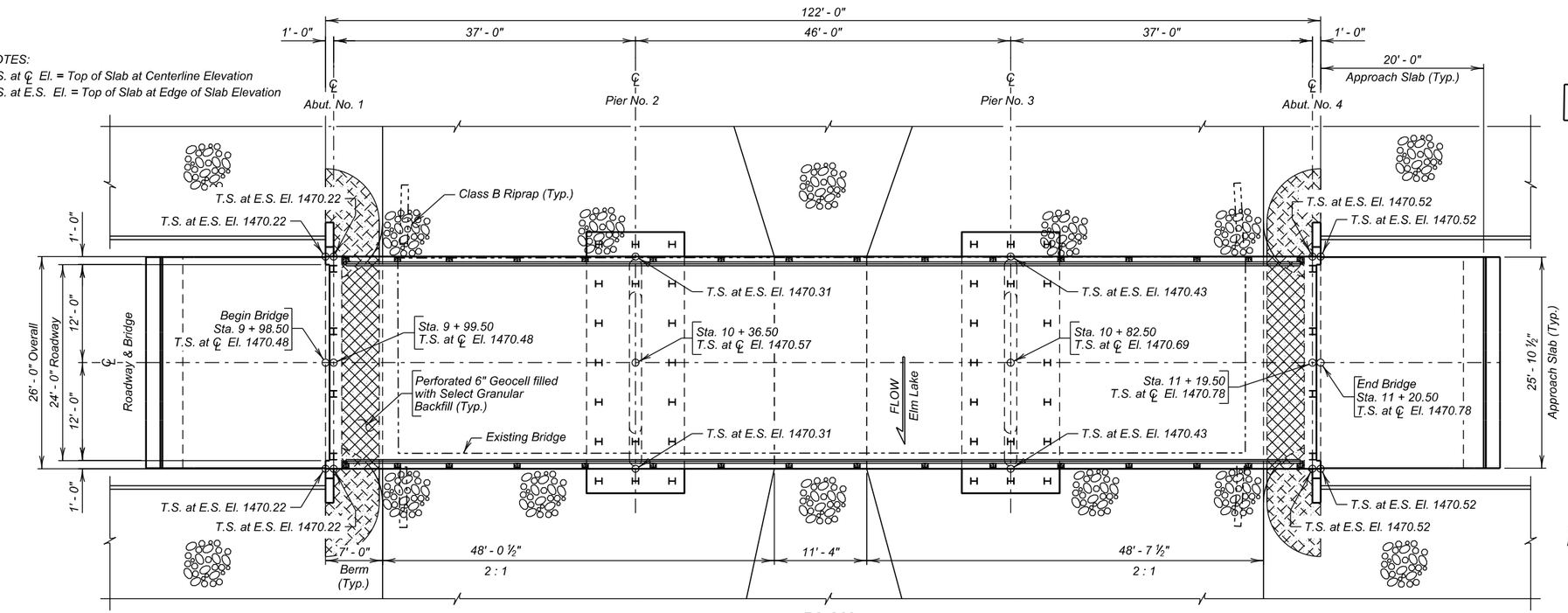
HRGreen.

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

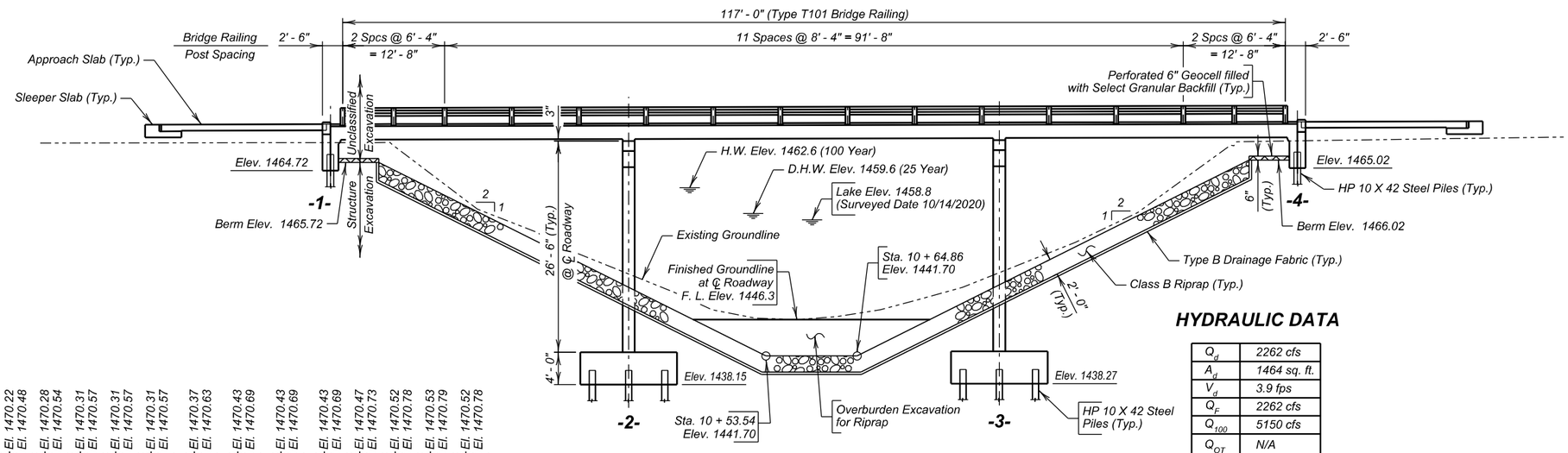
FOR BIDDING PURPOSES ONLY

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

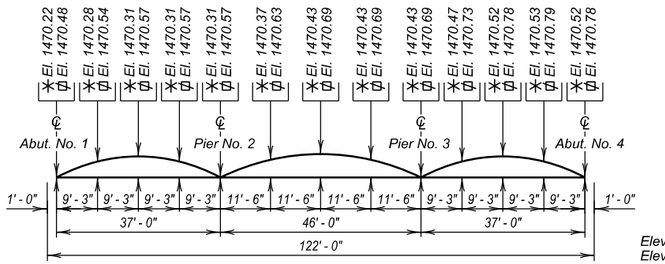
NOTES:
T.S. at ℄ El. = Top of Slab at Centerline Elevation
T.S. at E.S. El. = Top of Slab at Edge of Slab Elevation



PLAN



ELEVATION



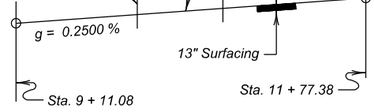
EDGE OF SLAB AND CENTERLINE ELEVATIONS

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.

-X020-
INDEX OF BRIDGE SHEETS -

P. I. Sta. 9 + 11.08
Elev. = 1470.26 (Finished)

P. I. Sta. 11 + 77.38
Elev. = 1470.92 (Finished)



GRADELINE DATA

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

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.*

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 13592
CHRISTOPHER T. HERSINGER
SOUTH DAKOTA
07/27/2023

GENERAL DRAWING
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
PCN 084J

BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION

-X020- JULY 2023 (1) OF (19)

PLANS BY: HRGreen

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

FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO-B 8007(212)	35	64

Rev 12/13/2023 CTH

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

1. Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.
2. 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

1. AASHTO HL-93.
2. 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)	fy = 60,000 psi
Piling (ASTM A572 Grade 50)	fy = 50,000 psi

GENERAL CONSTRUCTION

1. All lap splices shown are contact lap splices unless noted otherwise.
2. All exposed concrete corners and edges will be chamfered 3/4-inch unless noted otherwise.
3. Use 2-inch clear cover on all reinforcing steel except as shown.
4. Contractor will imprint on the structure the date of new construction as specified and detailed on Standard Plate 460.02.
5. Bridge railings will be built perpendicular to the roadway grade line.
6. 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.
7. 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.
8. The elevation of the bridge deck is 13 inches above subgrade elevation.

INCIDENTAL WORK, STRUCTURE

1. 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.
2. 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.
3. 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.
4. 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

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

ABUTMENTS

1. Preboring piling at each abutment is required to whichever is greater, ten feet or to natural ground.
2. 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.
3. One test pile will be driven at each abutment and will become part of the pile group.
4. The Contractor will have sufficient pile splice material on hand before pile driving is started. See Standard Plate 510.40.
5. 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.
6. Each finished abutment will include a Bridge Survey Marker. See Standard Plate 460.05.
7. 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

1. 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

2. 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.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 13592
CHRISTOPHER T. HERSINGER
STATE OF SOUTH DAKOTA
12/13/2023

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

STR. NO. 07-019-020
JUNE 2023

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

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.

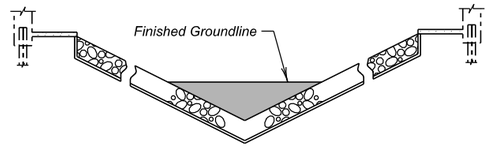
2. The 4-inch diameter Perforated PVC Drain Pipe will be SDR 35 Solvent Weld PVC Pipe conforming to ASTM D3034 and ASTM F758. The 2-inch and 4-inch diameter PVC Outlet Pipe will be Schedule 40 PVC Pipe conforming to ASTM D1785 designated as PVC 1120, PVC 1220, or PVC 2120. Pipe sections will be connected 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 or 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.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 13592
CHRISTOPHER T. HERSINGER
SOUTH DAKOTA
05/19/2023

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

STR. NO. 07-019-020

JUNE 2023

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

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.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 13592
CHRISTOPHER T. HERSINGER
SOUTH DAKOTA
09/13/2023

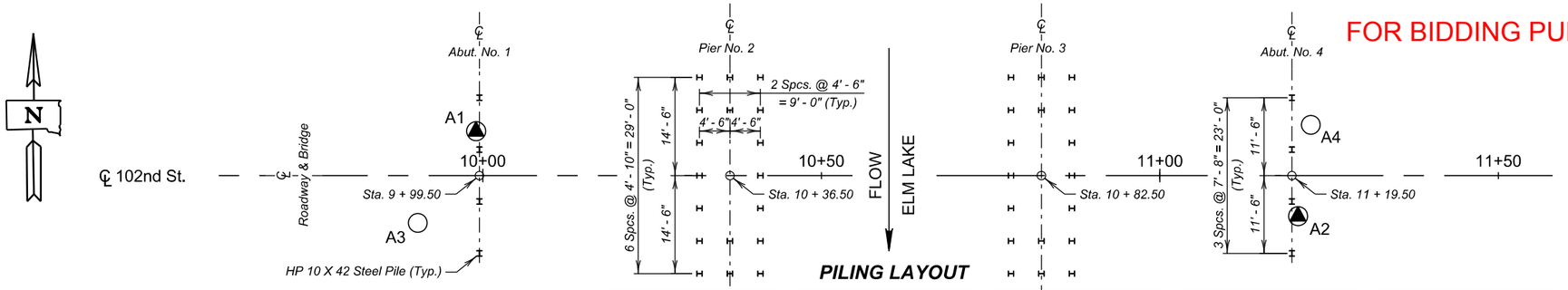
NOTES (CONTINUED)
FOR
122' - 0" CONT. CONCRETE BRIDGE

STR. NO. 07-019-020
JUNE 2023

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

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO-B 8007(212)	38	64

FOR BIDDING PURPOSES ONLY



Hole Number	A3	
Station	9+40	
Depth	15.0	ft
Soil Color	Dark Brown	
Classification	Sandy Clay	
Strength (Qu)	No Test	psf
Dry Density	52.7	pcf
Wet Density	68.7	pcf
Moisture	30.4	%
Pass No. 10	97.3	%
Pass No. 40	87.2	%
Pass No. 200	62.8	%
Sand Content	34.6	%
Silt Content	32.2	%
Clay Content	30.6	%

Hole Number	A3	
Station	9+40	
Depth	35.0	ft
Soil Color	Dark Gray	
Classifcation	Silt Clay	
Strength (Qu)	584	psf
Dry Density	78.0	pcf
Wet Density	108.2	pcf
Moisture	38.8	%
Pass No. 10	99.4	%
Pass No. 40	89.6	%
Pass No. 200	81.1	%
Sand Content	18.3	%
Silt Content	42.9	%
Clay Content	38.2	%

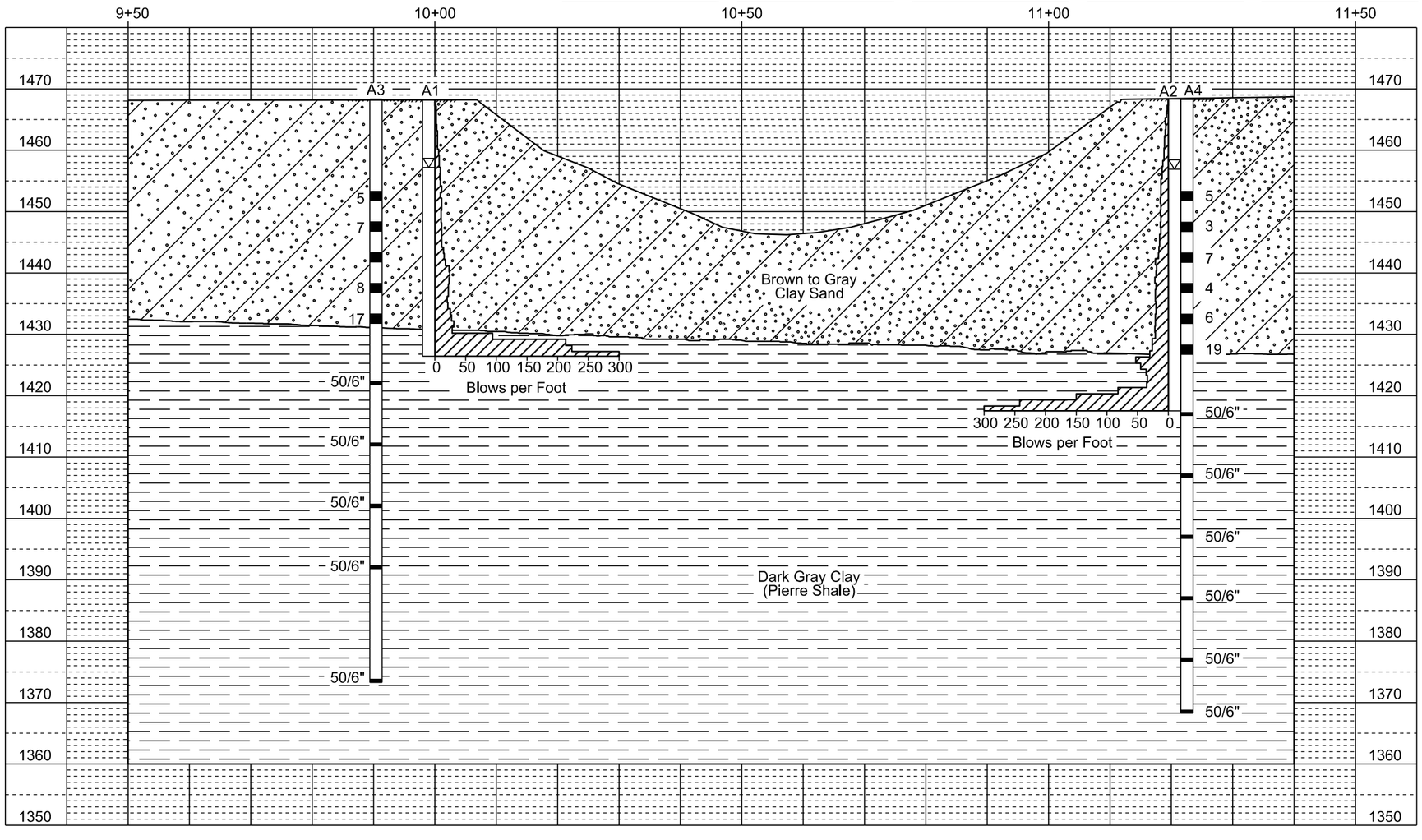
Hole Number	A3	
Station	9+40	
Depth	55.0	ft
Soil Color	Dark Gray	
Classification	Silt Clay	
Strength (Qu)	1,922	psf
Dry Density	78.8	pcf
Wet Density	105.1	pcf
Moisture	33.3	%
Pass No. 10	91.9	%
Pass No. 40	91.8	%
Pass No. 200	82.4	%
Sand Content	9.5	%
Silt Content	36.1	%
Clay Content	46.3	%

Hole Number	A4	
Station	11+22	
Depth	25.0	ft
Soil Color	Brown	
Classification	Clay Sand	
Strength (Qu)	710	psf
Dry Density	84.3	pcf
Wet Density	113.8	pcf
Moisture	34.9	%
Pass No. 10	100.0	%
Pass No. 40	99.6	%
Pass No. 200	58.8	%
Sand Content	41.2	%
Silt Content	33.8	%
Clay Content	25.0	%

Hole Number	A4	
Station	11+22	
Depth	80.0	ft
Soil Color	Gray	
Classification	Clay	
Strength (Qu)	1,086	psf
Dry Density	72.3	pcf
Wet Density	103.5	pcf
Moisture	43.1	%
Pass No. 10	93.4	%
Pass No. 40	93.4	%
Pass No. 200	91.8	%
Sand Content	1.6	%
Silt Content	37.3	%
Clay Content	54.5	%

COFFERDAM SOIL PARAMETERS

	Friction Angle (Φ)	Cohesion (c)	Wet Unit Weight (γw)
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 2⅞ inch drill stem to measure the resistance to penetration of the soil.

Penetration test holes are drilled with a 6⅝ 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

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 13592
CHRISTOPHER T. HERSINGER
SOUTH DAKOTA
07/13/2023

SUBSURFACE INVESTIGATION & PILING LAYOUT
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

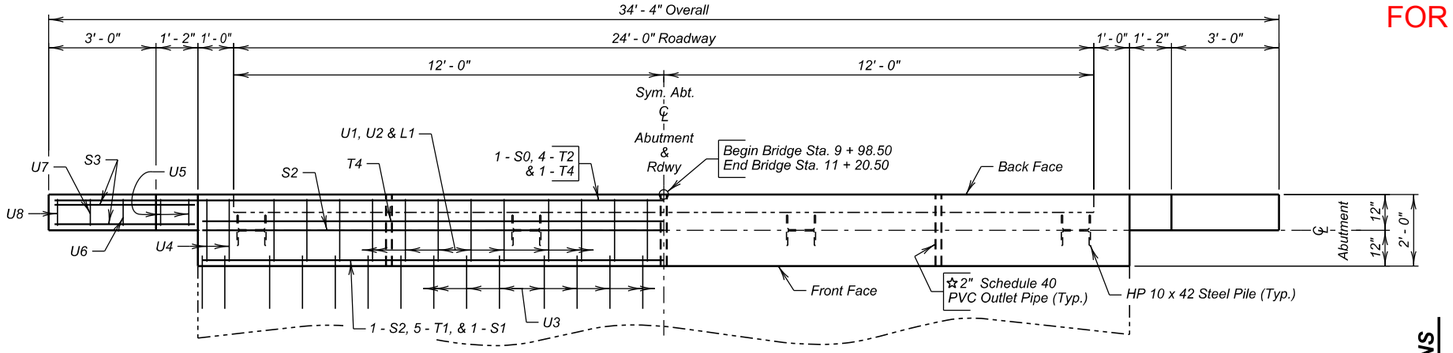
BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2023

5 OF 19

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

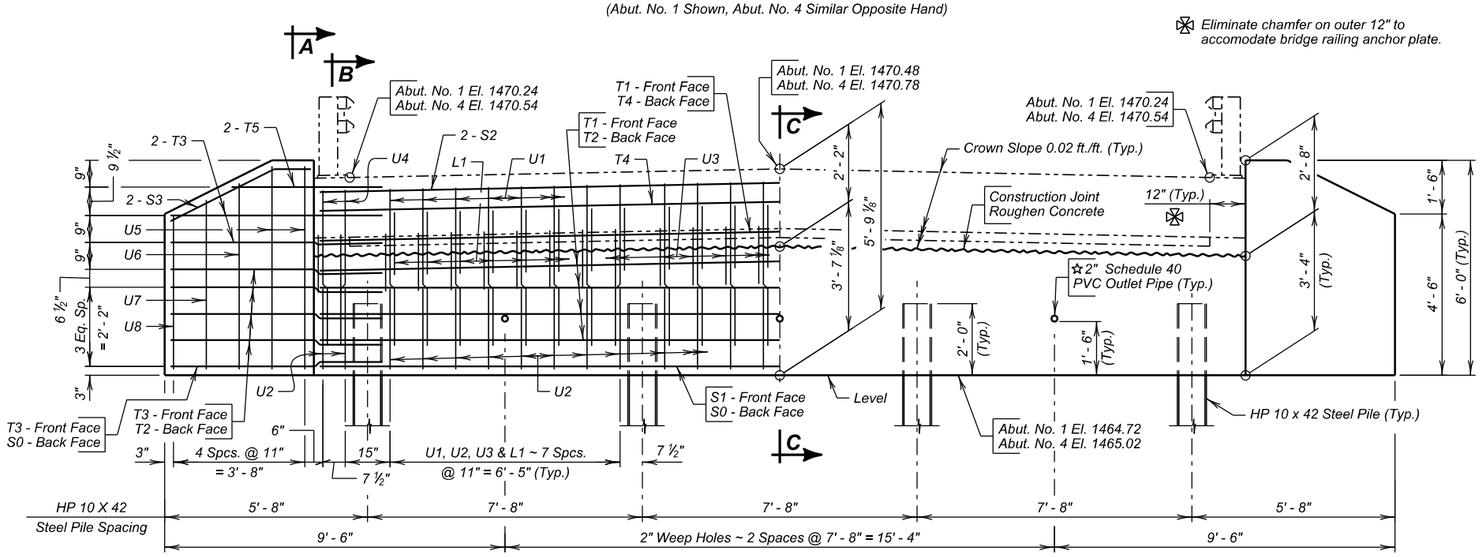
FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO-B 8007(212)	39	64



PLAN

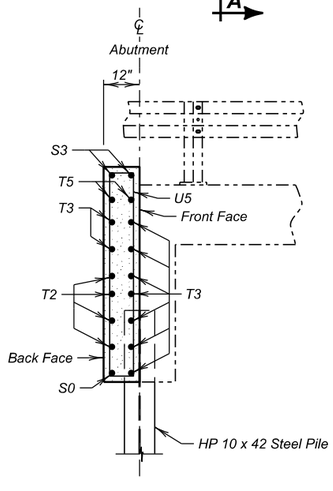
(Abut. No. 1 Shown, Abut. No. 4 Similar Opposite Hand)



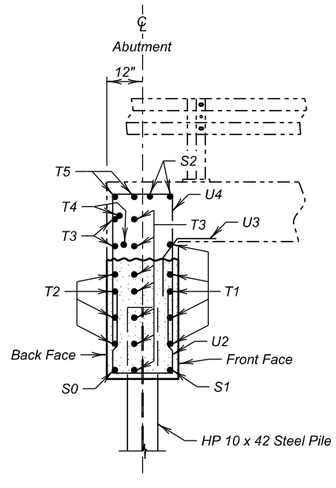
ELEVATION

INCREASING STATIONS
Abut. No. 1

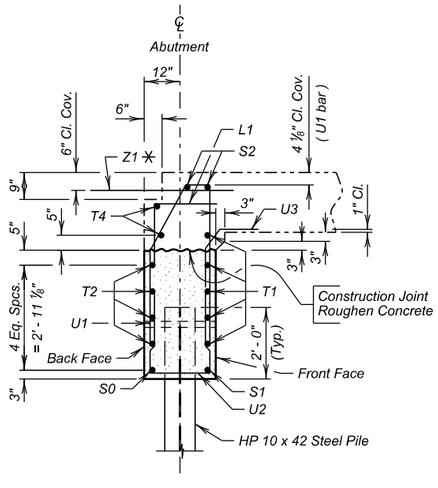
INCREASING STATIONS
Abut. No. 4



SEC. A - A



SEC. B - B



SEC. C - C

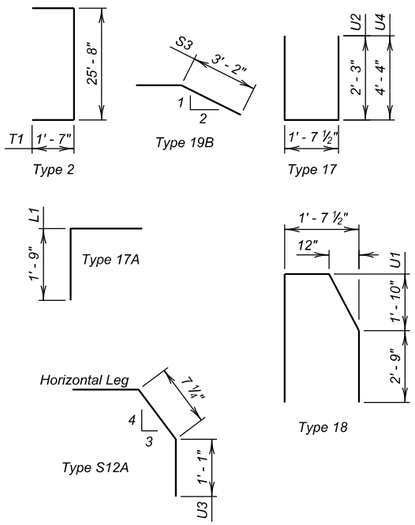
✳ *Quantity of Z1 bars are included on SUPERSTRUCTURE DETAILS Sheet.*

REINFORCING SCHEDULE

(For One Abutment)

	Mk.	No.	Size	Length	Type
△	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.
	T3	18	5	5' - 11"	Str.
≠ △	T4	2	5	25' - 8"	Str.
	T5	4	5	4' - 3"	Str.
△	U1	24	6	10' - 1"	18
	U2	28	4	6' - 2"	17
△	U3	28	4	2' - 10"	S12A
△	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

Bending Details



NOTES:
All dimensions are out to out of bars.
△ 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.*

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
13592
CHRISTOPHER T.
HERSINGER
SOUTH DAKOTA
07/17/2023

ABUTMENT DETAILS
FOR
122' - 0" CONT. CONCRETE BRIDGE

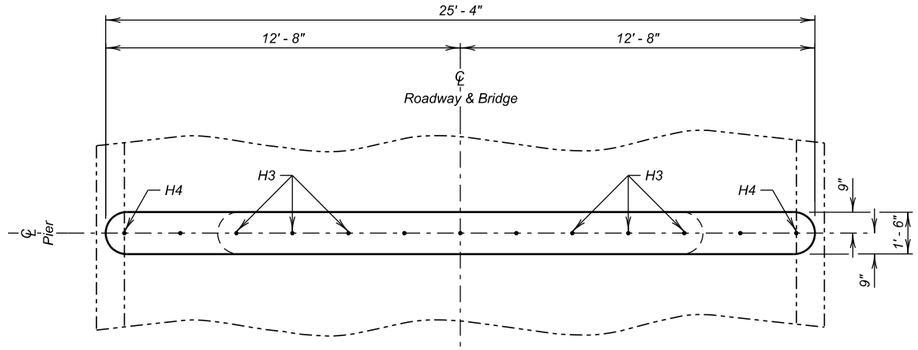
24' - 0" ROADWAY — 0° SKEW
OVER ELM LAKE — SEC. 8/17-T128N-R65W
STA. 9 + 98.50 TO 11 + 20.50 — BRO-B 8007(212)
STR. NO. 07-019-020 — HL-93

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

6 OF 19

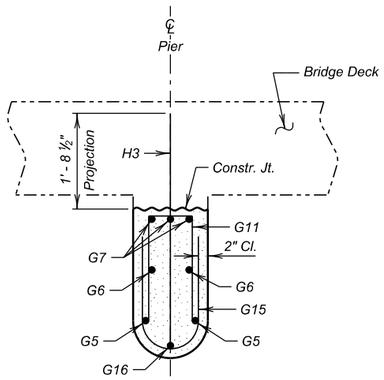
DESIGNED BY	CK. DES. BY	DRAFTED BY	
EM	EW	EM	BRIDGE ENGINEER

FOR BIDDING PURPOSES ONLY

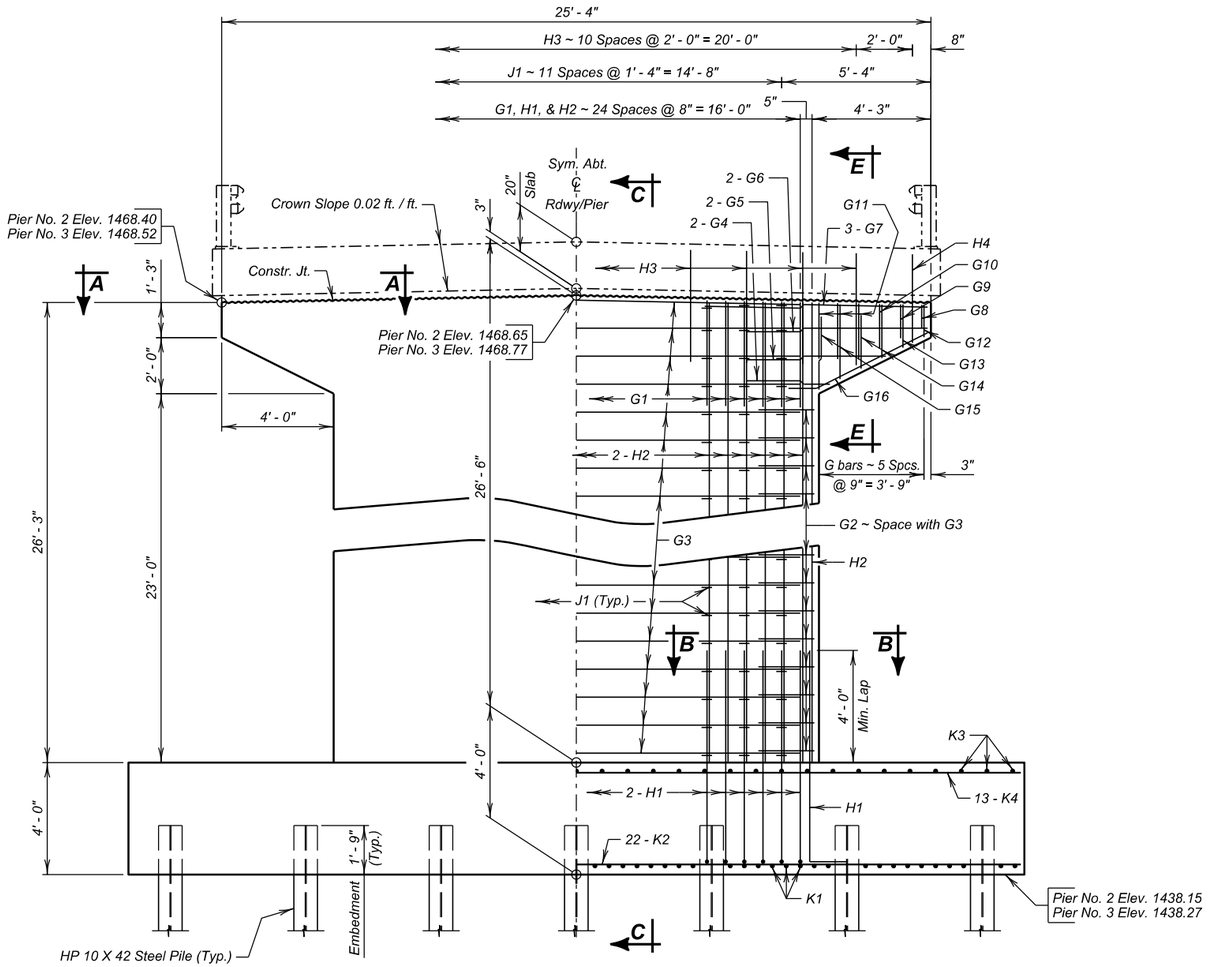


PLAN
(Footing not shown)

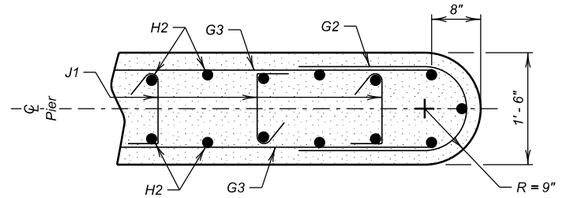
INCREASING STATIONS



SEC. E - E



ELEVATION



SEC. B - B

PIER DETAILS (A)

FOR

122' - 0" CONT. CONCRETE BRIDGE

24' - 0" ROADWAY — 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

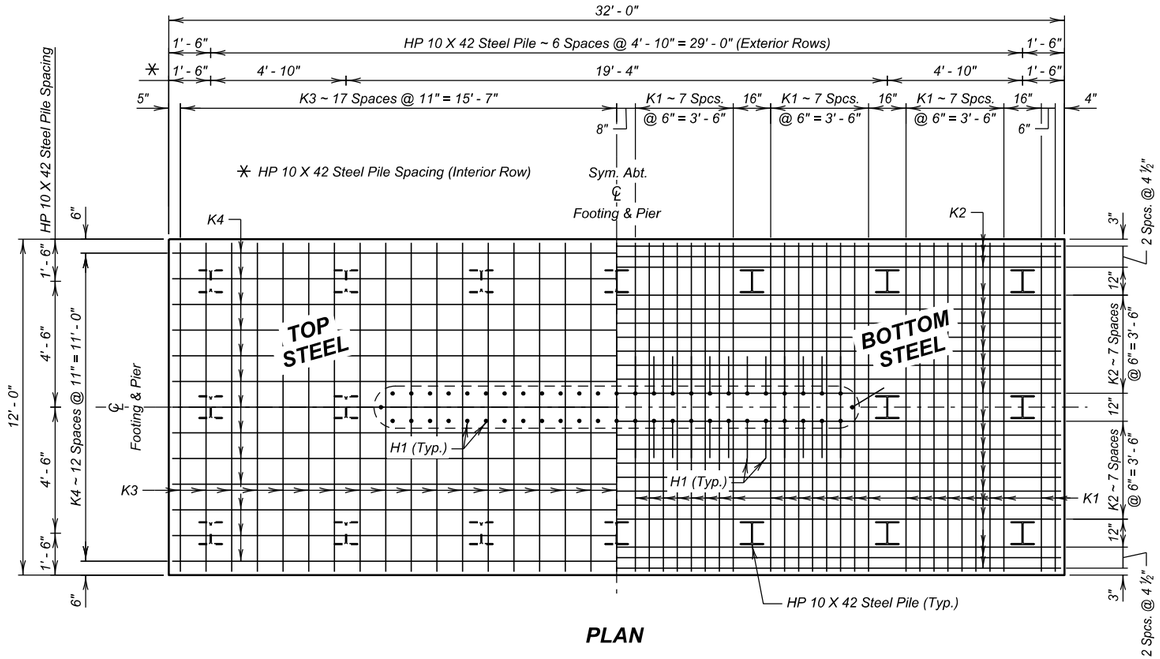
BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2023

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

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

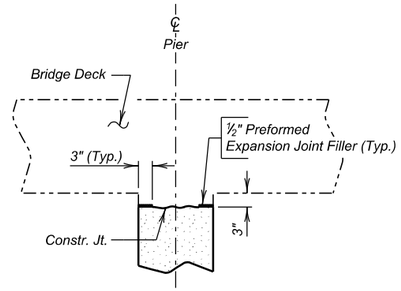
FOR BIDDING PURPOSES ONLY

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO-B 8007(212)	41	64



PLAN

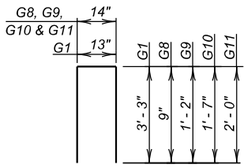
NOTE:
H1 and H2 bars may be adjusted slightly to clear HP 10 X 42 Steel Pile.



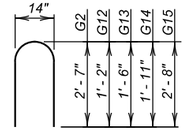
DETAIL "Y"
(Resteel not shown)

REINFORCING SCHEDULE
(For One Pier - 2 Required)

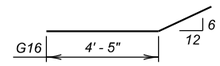
	Mk.	No.	Size	Length	Type	Bending Details
	G1	25	8	7' - 7"	17	
	G2	46	4	5' - 10"	S11	
	G3	54	4	15' - 10"	Str.	
	G4	4	4	3' - 0"	Str.	
	G5	4	4	5' - 0"	Str.	
	G6	4	4	6' - 6"	Str.	
	G7	6	9	8' - 0"	Str.	
	G8	2	5	2' - 8"	17	
	G9	2	5	3' - 6"	17	
	G10	2	5	4' - 4"	17	
	G11	6	5	5' - 2"	17	
	G12	2	5	3' - 0"	S11	
	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.	



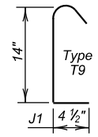
Type 17

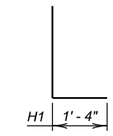


Type S11



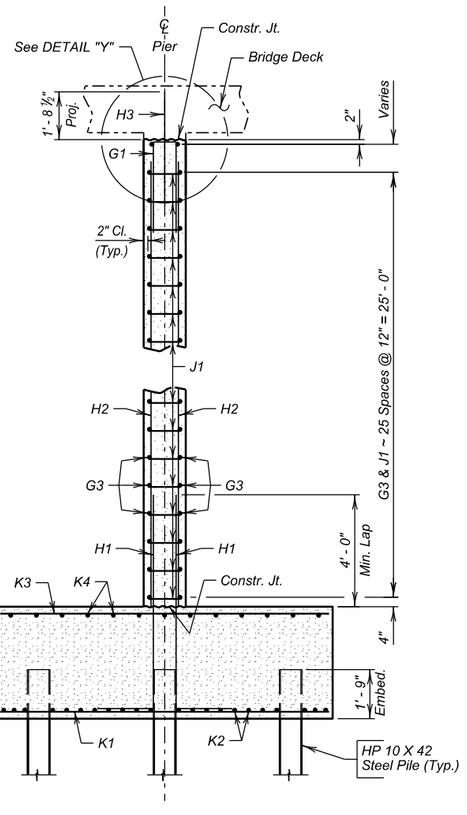
Type 19B



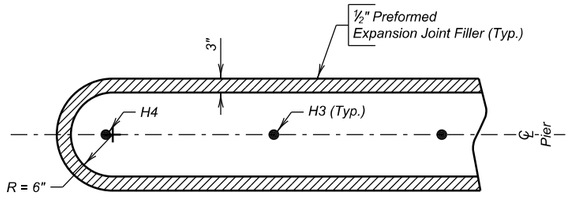


Type 17A

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



SEC. C - C



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

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'

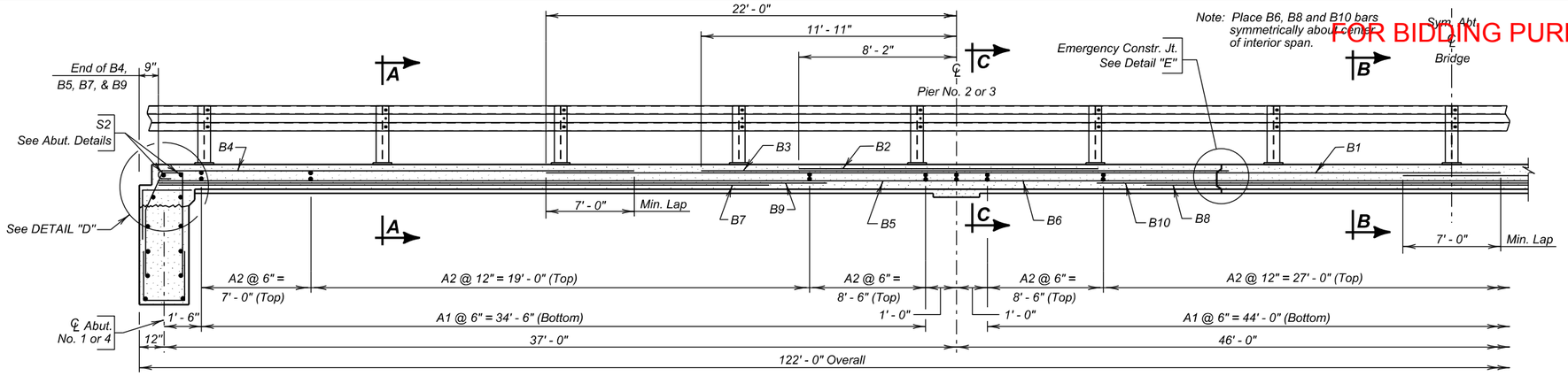
PIER DETAILS (B)
FOR
122' - 0" CONT. CONCRETE BRIDGE

24' - 0" ROADWAY — 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

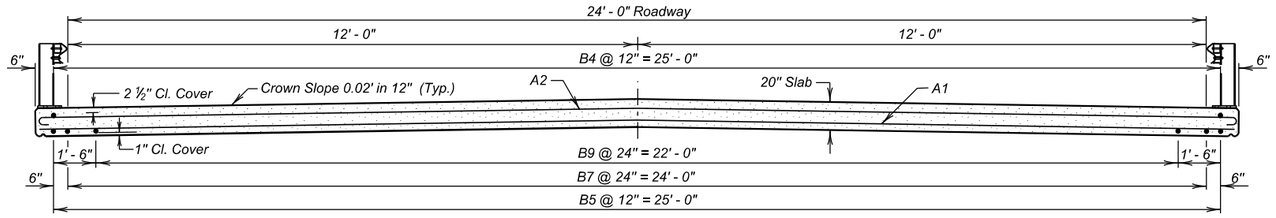
BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2023

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

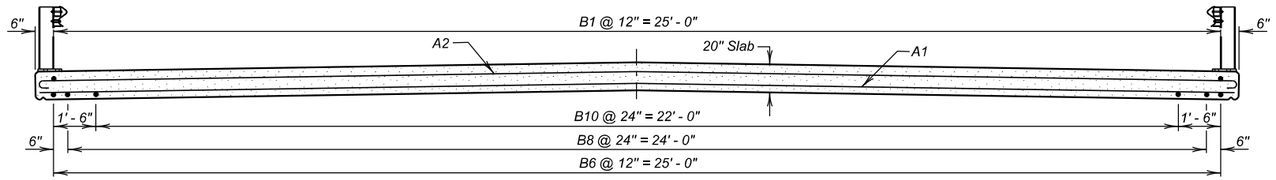
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO-B 8007(212)	42	64



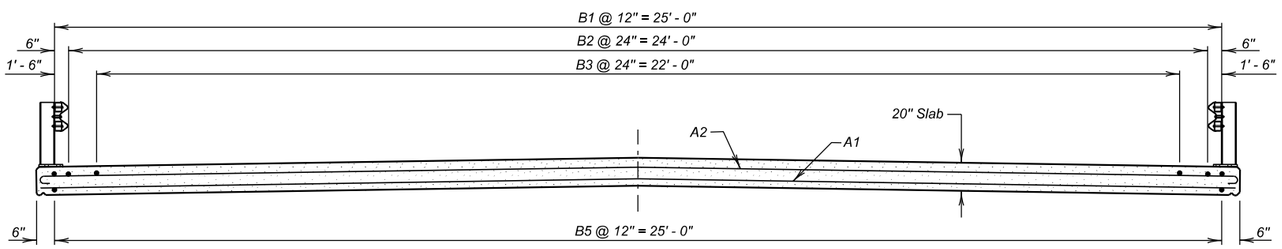
HALF LONGITUDINAL SECTIONAL VIEW



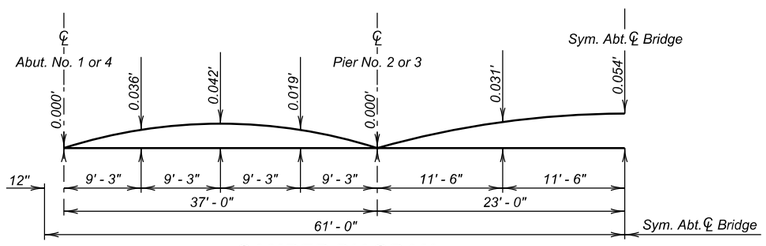
SEC. A - A



SEC. B - B

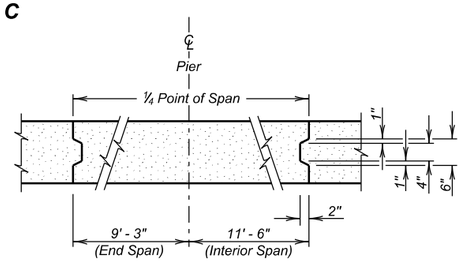


SEC. C - C

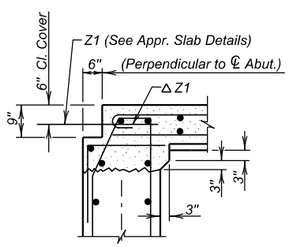


CAMBER DIAGRAM

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"



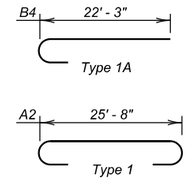
DETAIL "D"

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

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

REINFORCING SCHEDULE

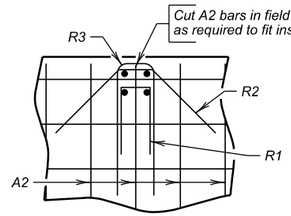
Mk.	No.	Size	Length	Type	Bending Details
A1	231	5	25' - 8"	Str.	
A2	166	5	26' - 10"	1	
B1	52	10	48' - 6"	Str.	
B2	26	10	16' - 1"	Str.	
B3	24	10	24' - 4"	Str.	
B4	52	10	23' - 8"	1A	
B5	52	9	37' - 3"	Str.	
B6	26	9	46' - 0"	Str.	
B7	26	9	27' - 11"	Str.	
B8	13	9	23' - 10"	Str.	
B9	24	9	33' - 11"	Str.	
B10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



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



TYPICAL BRIDGE RAILING POST REINFORCEMENT

NOTES:

1. The cut ends of the A2 bars will be coated with an epoxy repair coating to the satisfaction of the Engineer.

2. R1 and R2 will be placed beneath the A1 and A2 bars; R3 will be placed in same layer as A2 bars with 1½" clear cover to edge of slab.

3. 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.

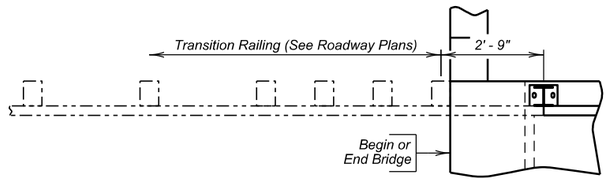
SUPERSTRUCTURE DETAILS
FOR
122' - 0" CONT. CONCRETE BRIDGE

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

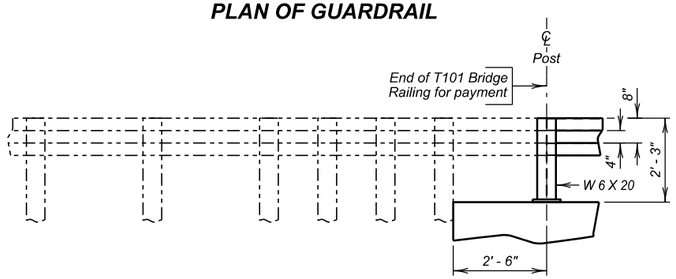
BROWN COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2023

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

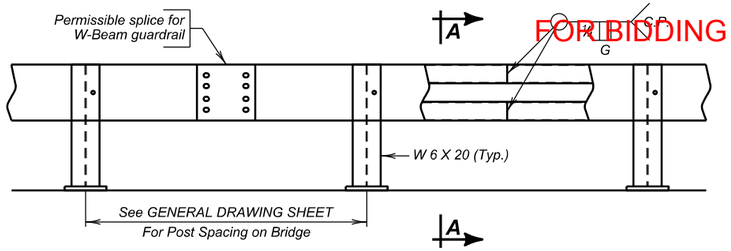
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO-B 8007(212)	43	64

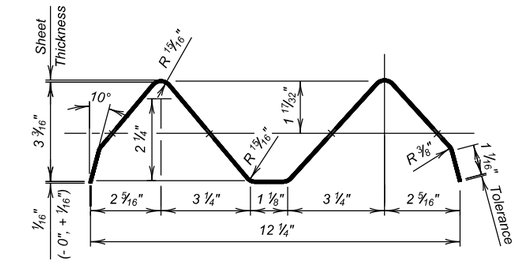


PLAN OF GUARDRAIL



ELEVATION OF GUARDRAIL





RAIL MEMBER

GENERAL NOTES:

1. Rail posts will be perpendicular to centerline of roadway.

2. 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.

3. Post bolts will be ¾" diameter ASTM F3125 Grade A325 or Grade A490. Each bolt will have one hardened and one 2" X 2" X 5⁄16" ASTM A36 plate washer. Nuts will be ASTM A563.

4. 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.

5. 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.

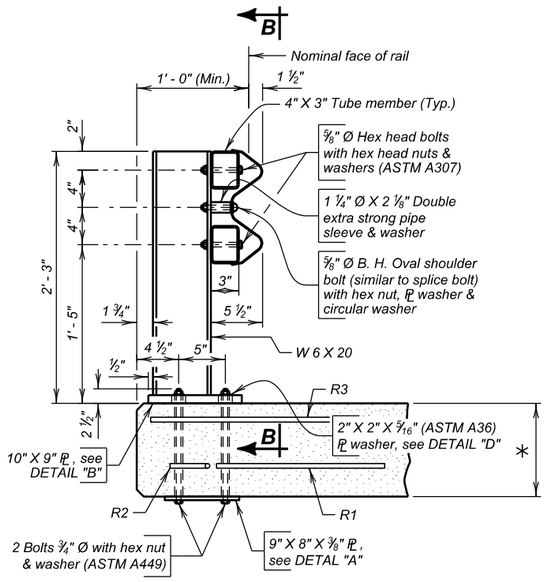
6. All structural steel parts for the Type T101 Bridge Railing will conform to ASTM A709 Grade 36. Tubes will conform to ASTM A500 Grade B.

7. Provide 1 ½" drain holes in the tubes near ends of rail and near splices.

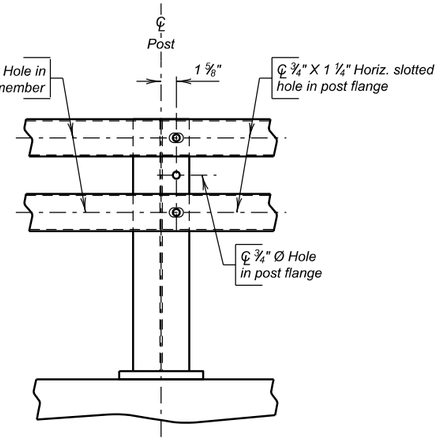
8. All reinforcing steel will conform to ASTM A615, Grade 60.

9. 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.

10. Measurements for payment will be from center of end post to center of end post for each side of the bridge.

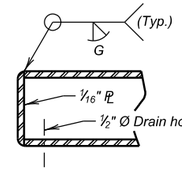


SECTION A - A

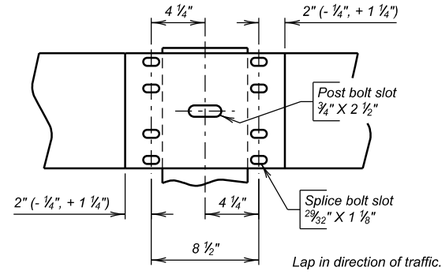


SECTION B - B

(W-Beam not shown)



TUBE CAP

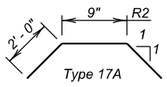


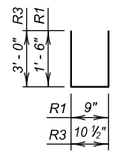
RAIL SPLICE

REINFORCING SCHEDULE

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

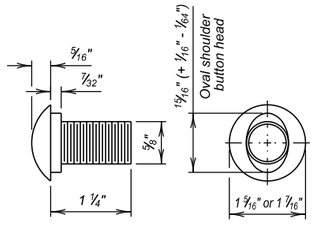
NOTE:
All dimensions are out to out of bars.



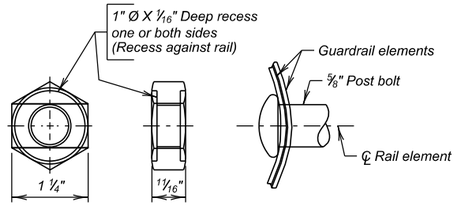


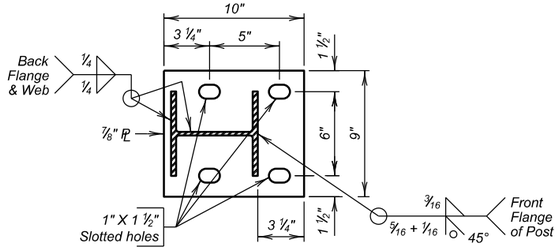
ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Type T101Bridge Railing	Ft.	234

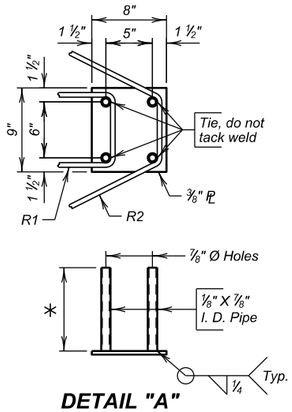


SPLICE BOLT

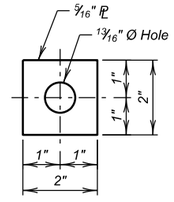




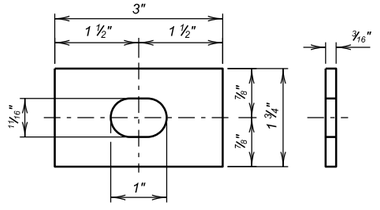
DETAIL "B"



DETAIL "A"



DETAIL "D"



RECTANGULAR PLATE WASHER

TYPE T101 BRIDGE RAILING DETAILS
FOR
122' - 0" CONT. CONCRETE BRIDGE

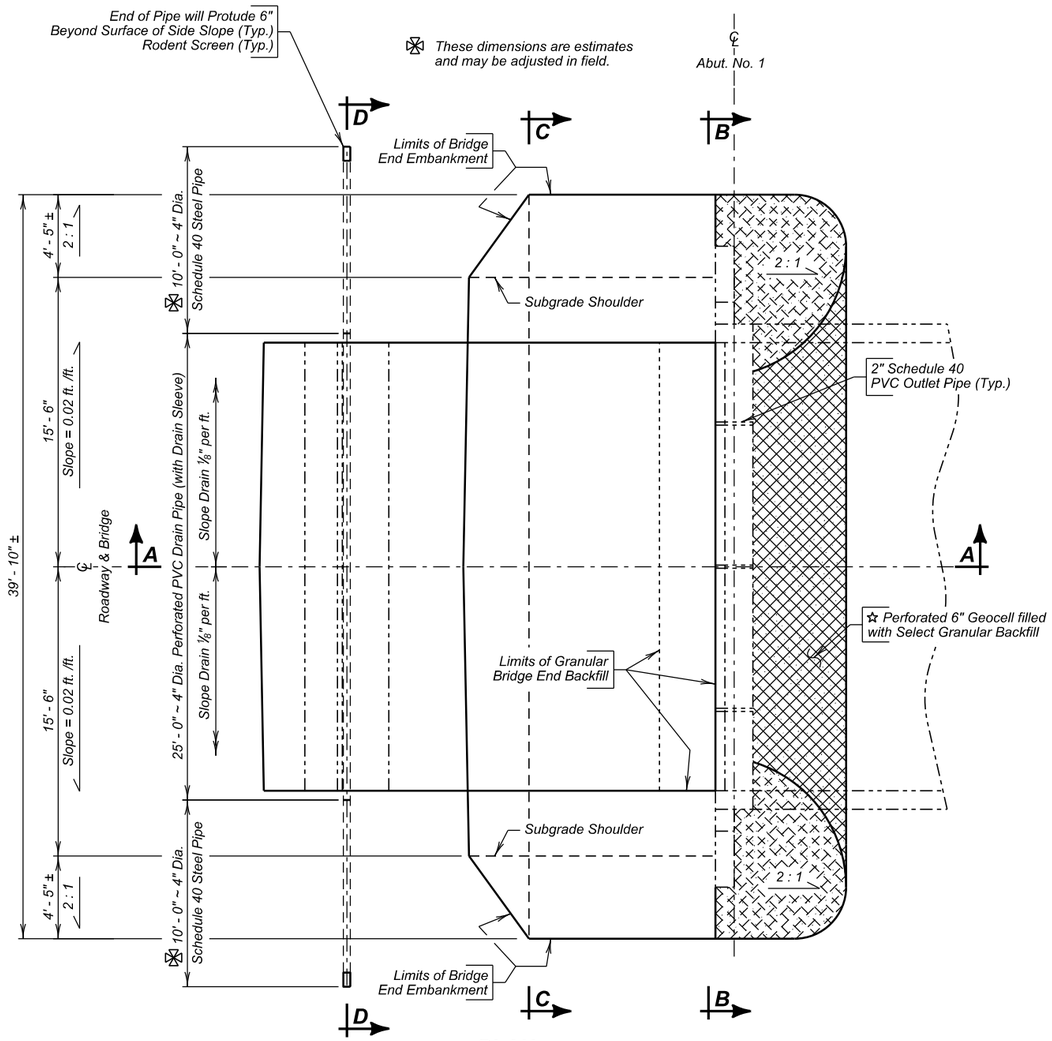
24' - 0" ROADWAY — 0° SKEW
OVER ELM LAKE — SEC. 8/17-T128N-R65W
STA. 9 + 98.50 TO 11 + 20.50 — BRO-B 8007(212)
STR. NO. 07-019-020 — HL-93

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

10 OF 19

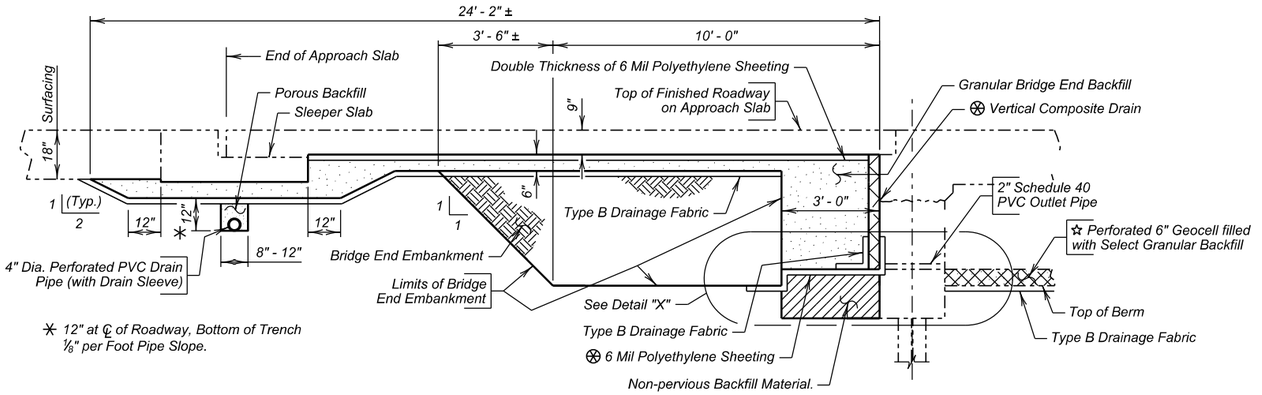
DESIGNED BY	CK. DES. BY	DRAFTED BY	
EM	EW	EM	BRIDGE ENGINEER

FOR BIDDING PURPOSES ONLY



PLAN

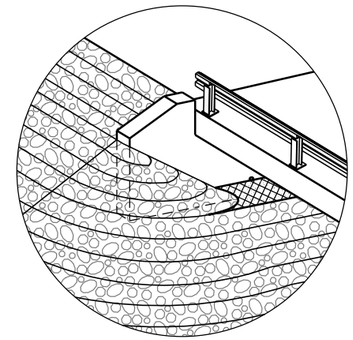
(Bridge End Backfill shown adjacent to Abut. No. 1 Abut. No. 4 similar opposite hand except as shown.)



⚹ 12" at ℄ of Roadway, Bottom of Trench
⅛" per Foot Pipe Slope.

SEC. A - A

(at ℄ Roadway)



SPILL CONE DETAIL AT EMBANKMENT

⊛ *Provide hole in vertical composite drain and 6 mil polyethylene sheeting to provide drainage through weel holes.*

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

1. 50 ft. 4" dia. Perforated PVC Drain Pipe (with Drain Sleeve).
2. 16 ft. 5" dia. Schedule 40 Steel Pipe.
3. 12 ft. 2" dia. Schedule 40 PVC Outlet Pipe.
4. 40 ft. 4" dia. Schedule 40 Steel Outlet Pipe with Rodent Screens.
5. 169 sq. ft. Vertical Composite Drain.

Items 1 thru 5 are approximate quantities contained in the 4" Underdrain Pipe and are for information only.

6. 1,944 sq. ft. 6 mil Polyethylene Sheeting, not including laps.
7. 177 sq. yd. Type B Drainage Fabric.

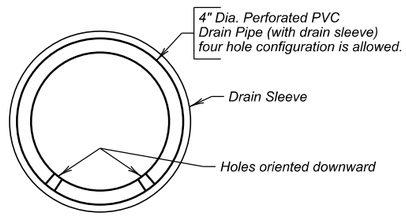
Items 6 thru 7 are approximate quantities contained in the Granular Bridge End Backfill and are for information only.

⧫ *For estimating purpose only, a factor of 1.89 tons/cu. yd. was used to convert cu. yds. to tons.*

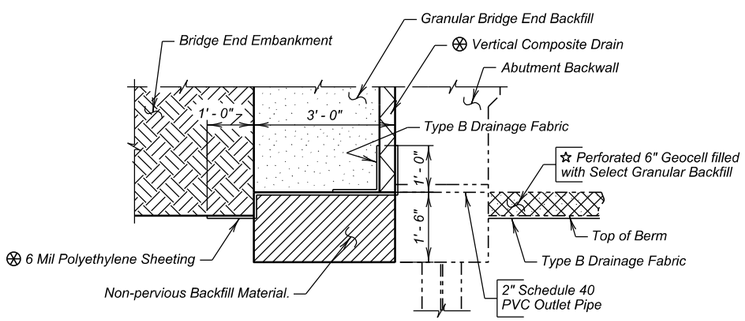
⚹ *Shrinkage Factor of 1.25 Used.*

⧫ *Quantity based on a 12" wide trench.*

☆ *See PERFORATED GEOCELL notes for payment information.*



DRAIN DETAIL



DETAIL "X"

NOTE:

1. *Perforated Geocell to be installed as shown in PLAN view. The embankment spill cone will spill onto the top of the perforated geocell.*
2. *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.*

REGISTERED PROFESSIONAL ENGINEER
13592
CHRISTOPHER T. HERSINGER
SIGNED WITH DATE
12/13/2023

DETAILS OF BRIDGE END BACKFILL (A)
FOR
122' - 0" CONT. CONCRETE BRIDGE

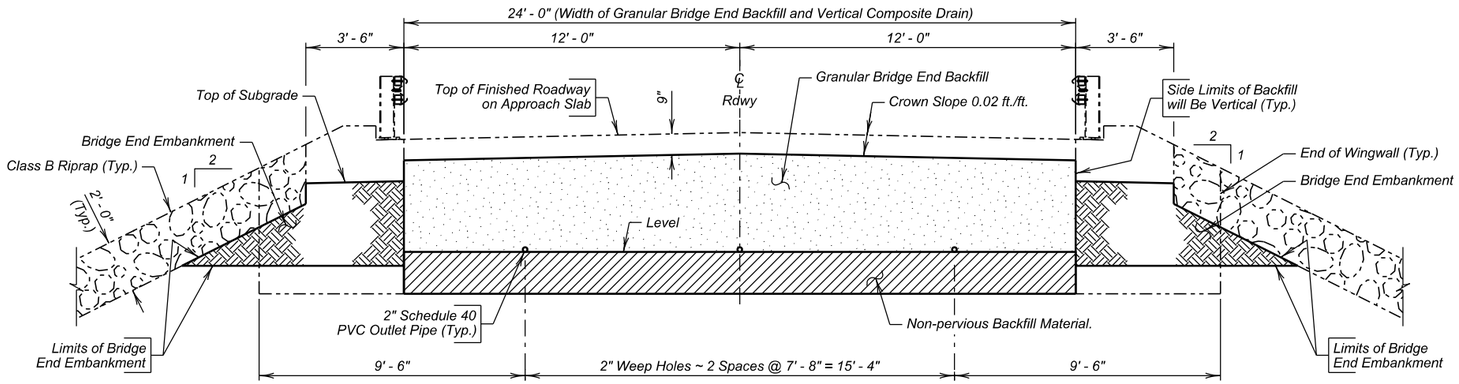
24' - 0" ROADWAY — 0° SKEW
OVER ELM LAKE — SEC. 8/17-T128N-R65W
STA. 9 + 98.50 TO 11 + 20.50 — BRO-B 8007(212)
STR. NO. 07-019-020 — HL-93

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

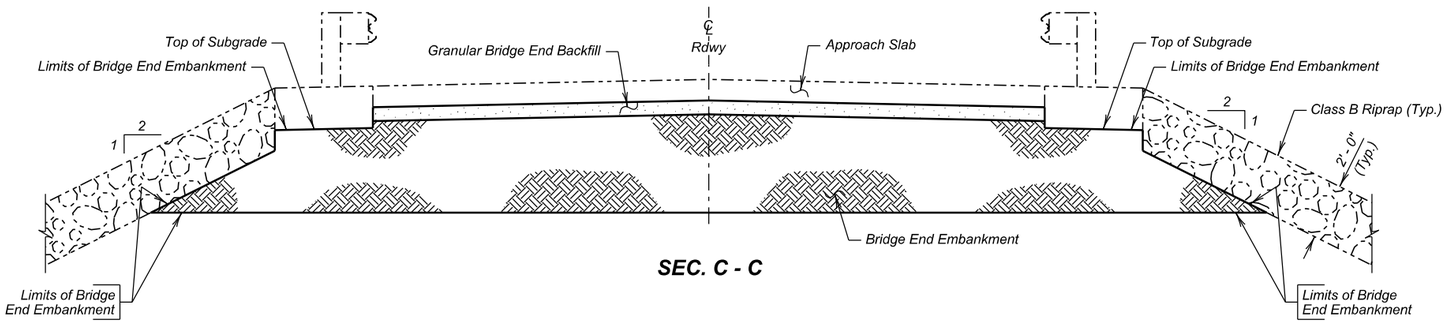
DESIGNED BY	CK. DES. BY	DRAFTED BY	
EM	EW	EM	BRIDGE ENGINEER

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

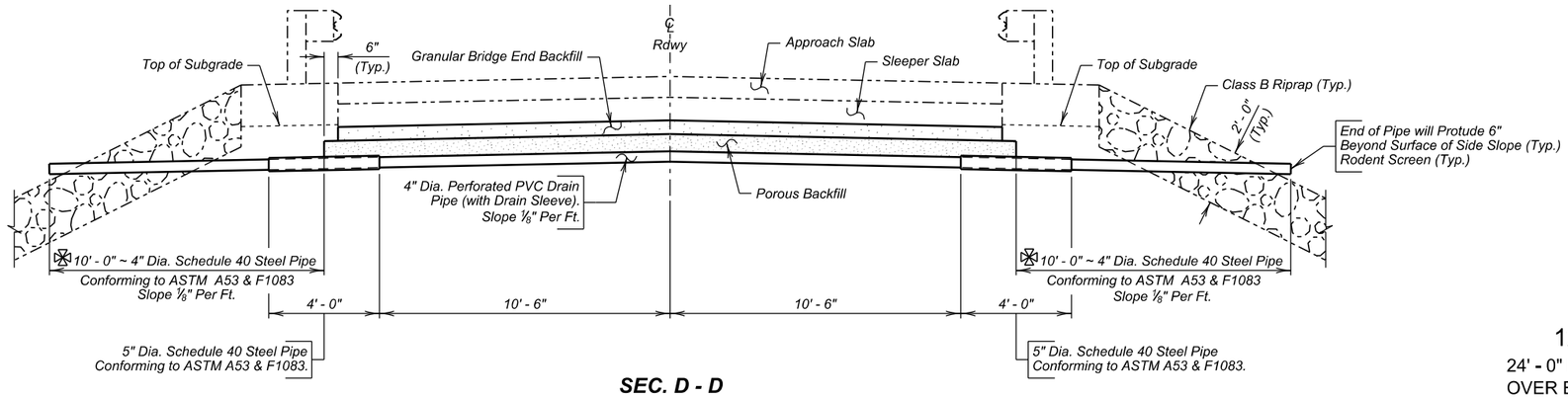
FOR BIDDING PURPOSES ONLY



SEC. B - B



SEC. C - C



SEC. D - D

✠ *These dimensions are estimates and may be adjusted in field.*

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 13592
CHRISTOPHER T. HERSINGER
STATE OF SOUTH DAKOTA
07/31/2023

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

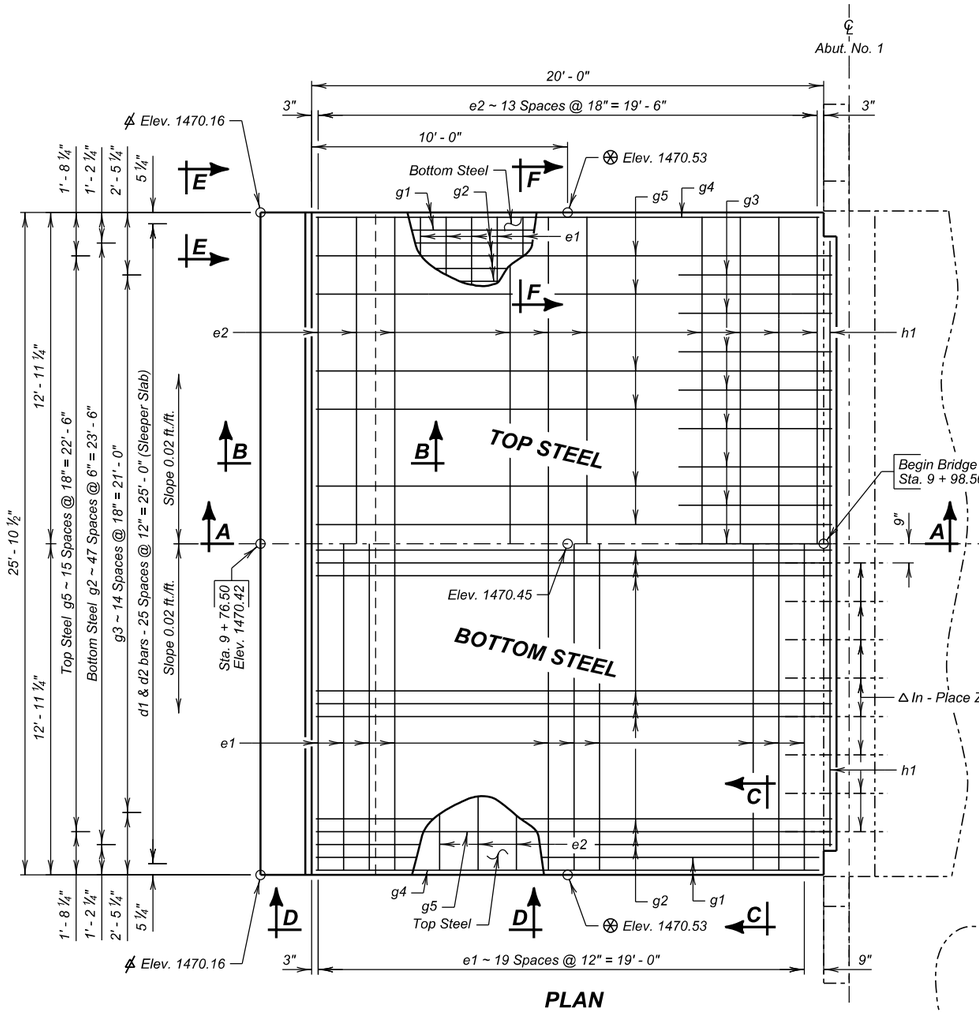
JULY 2023

12 OF 19

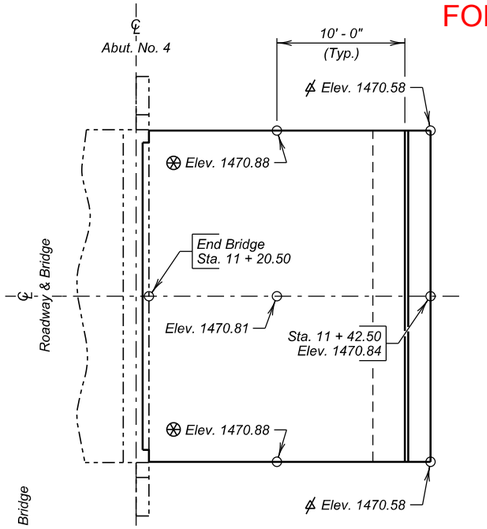
DESIGNED BY	CK. DES. BY	DRAFTED BY	
EM	EW	EM	BRIDGE ENGINEER

FOR BIDDING PURPOSES ONLY

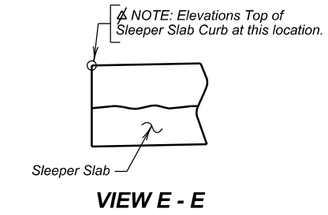
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	BRO-B 8007(212)	46	64



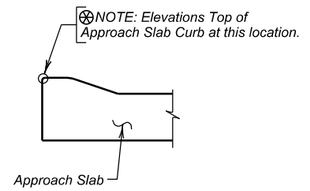
PLAN
(Shown adj. to Abut. No. 1, Abut. No. 4 similar by rotation except as shown.)



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



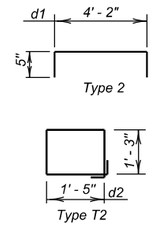
VIEW E - E



SEC. F - F

REINFORCING SCHEDULE
(For Two Approach Slabs and Two Sleeper Slabs)

Mk.	No.	Size	Length	Type	Bending Details
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.	



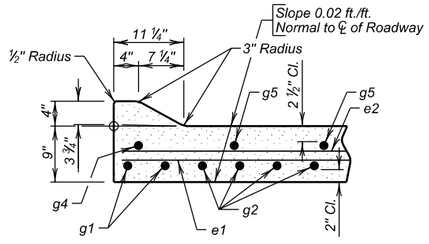
NOTES:
All bars to be epoxy coated.
All dimensions are out to out of bars.

ESTIMATED QUANTITIES
(For Two Approach Slabs and Two Sleeper Slabs)

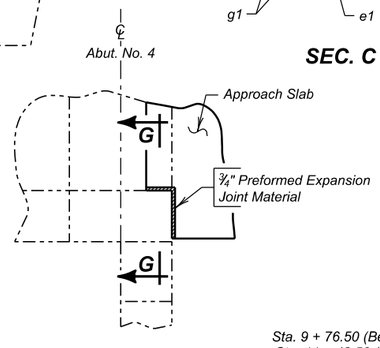
ITEM	UNIT	QUANTITY
Concrete Approach Slab for Bridge	Sq. Yd.	117.7
Concrete Approach Sleeper Slab for Bridge	Sq. Yd.	25.9

1. 29.9 Cu. Yds. Concrete in Approach Slab.
2. 8,367 Lbs. Epoxy Coated Re-Steel in Approach Slab.
3. 9.3 Cu. Yds. Concrete in Sleeper Slab.
4. 1,412 Lbs. Epoxy Coated Re-Steel in Sleeper Slab.
5. 12.9 Sq. Ft. of 2" Polystyrene Insulation Board.

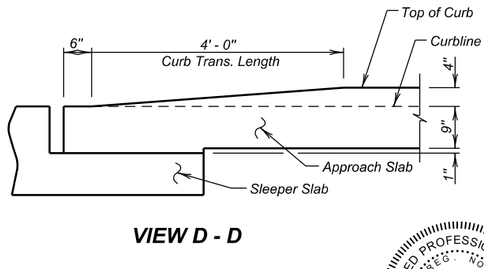
Items 1 thru 5 are approximate quantities contained in the above bid items and are for information only.



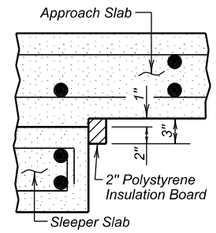
SEC. C - C



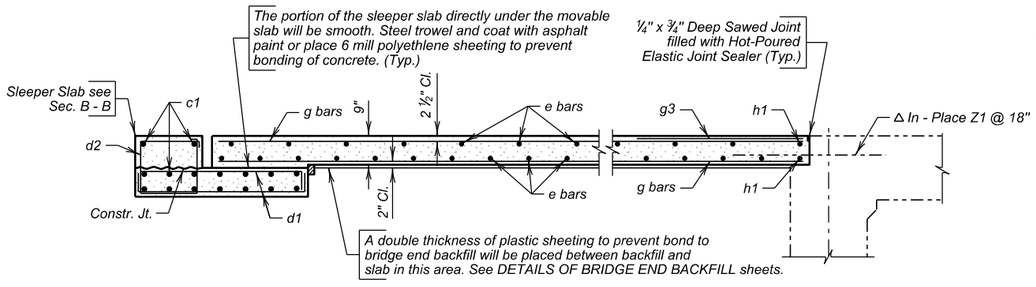
DETAIL "X"



VIEW D - D

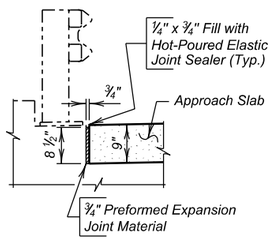


DETAIL "Q"

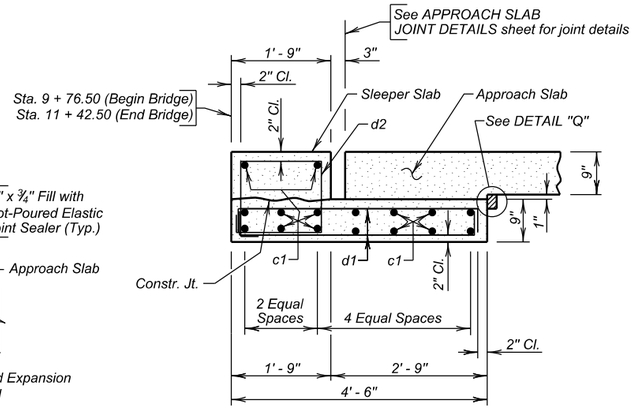


△ In - Place Z1 bars are listed and included in superstructure quantities. See SUPERSTRUCTURE DETAILS (B) sheet.

SEC. A - A



SEC. G - G



SEC. B - B
(Sleeper Slab)

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 13592
CHRISTOPHER T. HERSINGER
SOUTH DAKOTA
07/13/2023

DETAILS OF APPROACH SLAB ADJACENT TO BRIDGE
FOR
122' - 0" CONT. CONCRETE BRIDGE

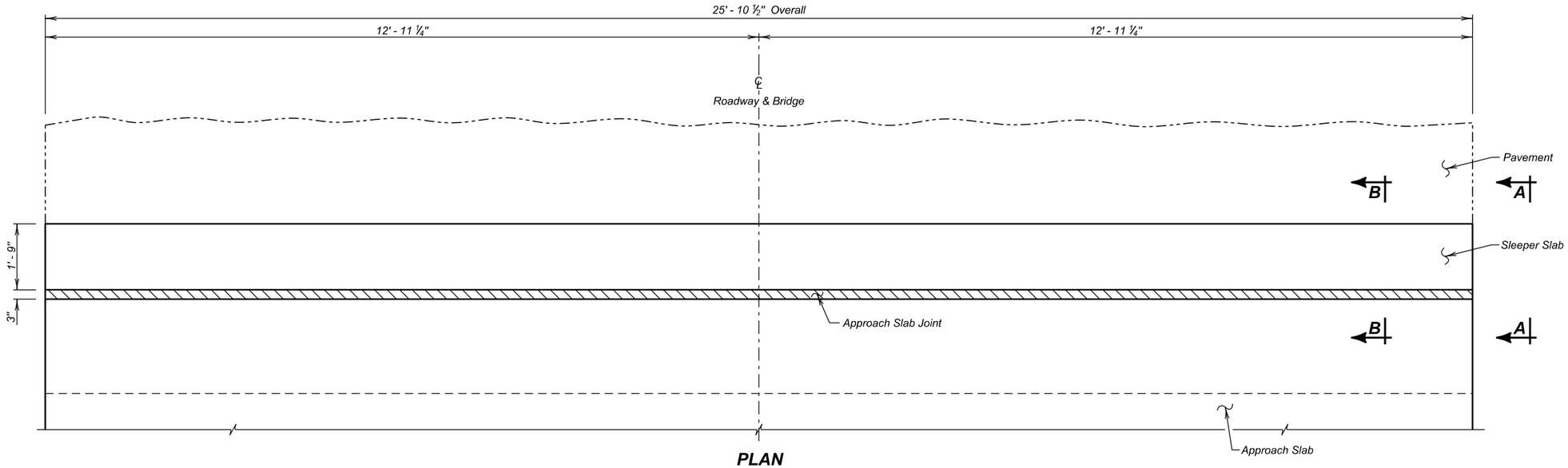
24' - 0" ROADWAY	0° SKEW
OVER ELM LAKE	SEC. 8/17-T128N-R65W
STA. 9 + 98.50 TO 11 + 20.50	BRO-B 8007(212)
STR. NO. 07-019-020	HL-93

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

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

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

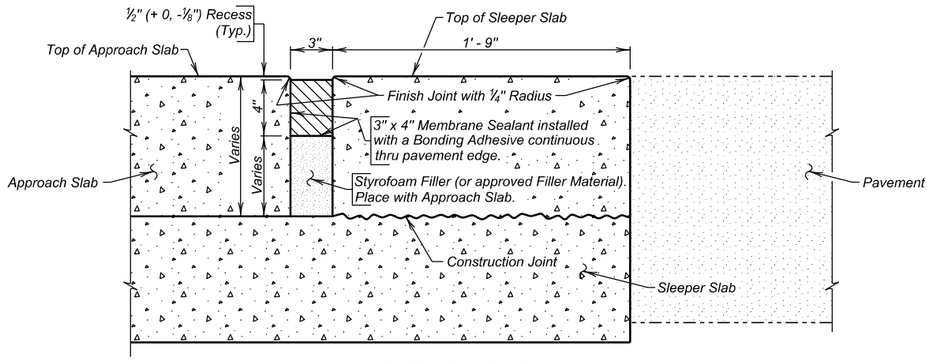
FOR BIDDING PURPOSES ONLY



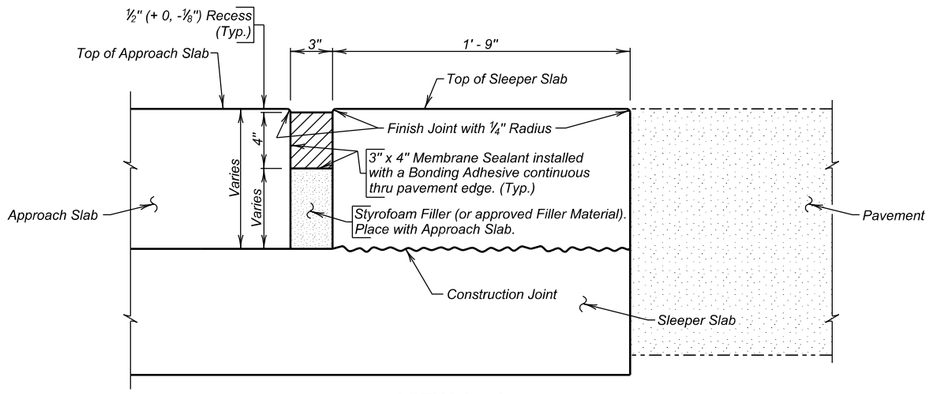
PLAN

GENERAL NOTES

1. The Membrane Sealant will be on the approved product list for Membrane Sealant Expansion Joints.
2. 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.
3. The membrane sealant will provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension.
4. 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.
5. The bonding adhesive used to attach the membrane sealant to the adjacent concrete will be approved by the membrane sealant manufacturer.
6. Adhesive used to join adjacent pieces of the membrane sealant will be as recommended by the manufacturer.
7. If styrofoam filler material is used in the construction, it will be closed cell and water-tight as approved by the Engineer.
8. The minimum ambient air temperature at the time of joint installation and adhesive curing will be 40° F.
9. 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.
10. 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.
11. 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.
12. 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.
13. Traffic will not be allowed on the joint until the bonding adhesive has had time to cure, as recommended by the manufacturer.
14. 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.
15. 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

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 13592
CHRISTOPHER T. HERSINGER
SOUTH DAKOTA
07/13/2023

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 — 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

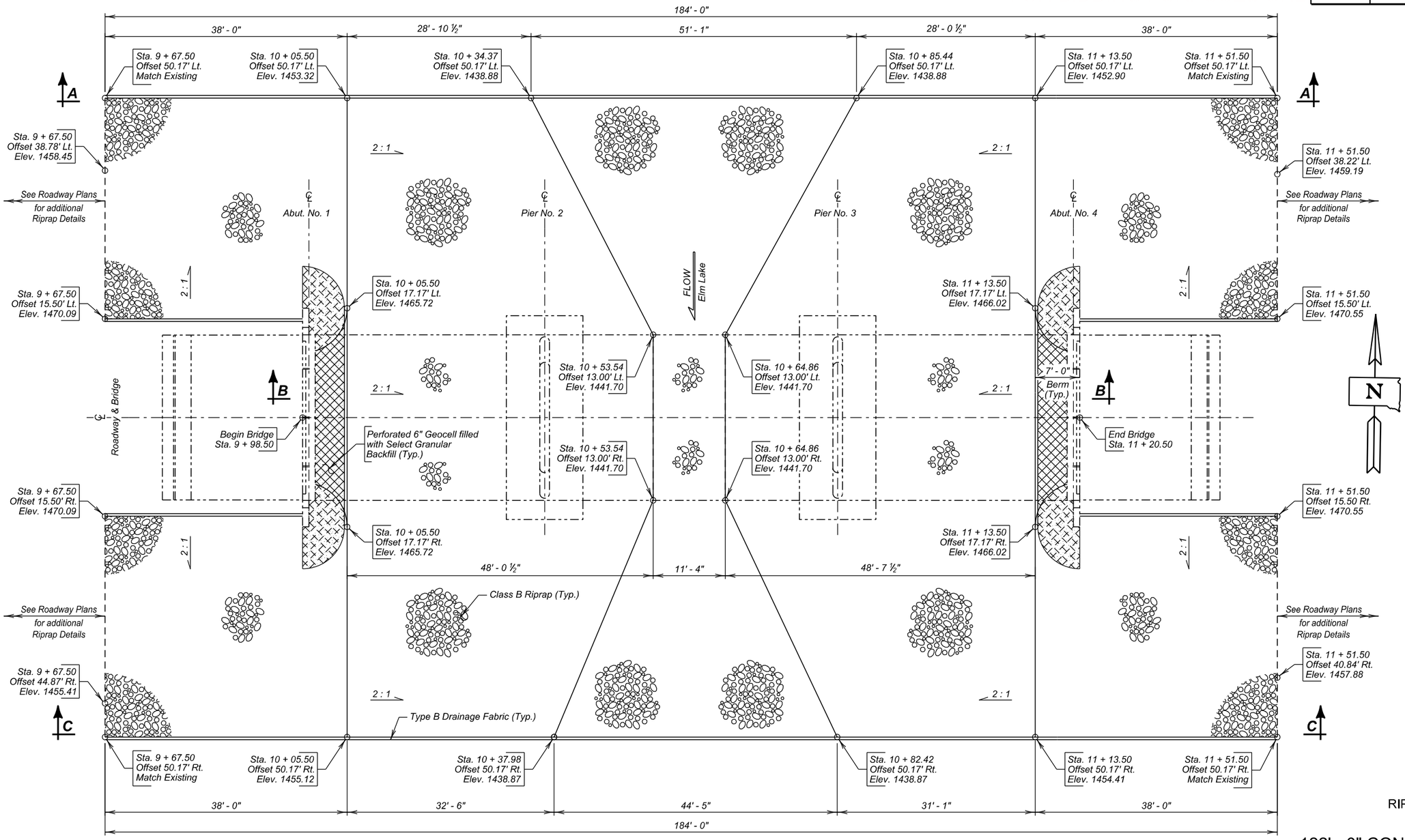
14 OF 19

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

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 13592
CHRISTOPHER T. HERSINGER
STATE OF SOUTH DAKOTA
03/15/2023

RIPRAP DETAILS (A)
FOR
122' - 0" CONT. CONCRETE BRIDGE

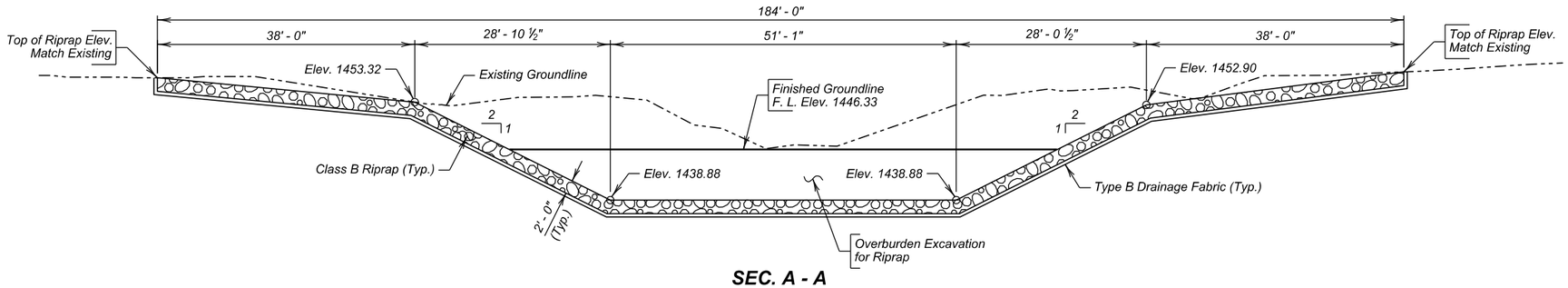
24' - 0" ROADWAY — 0° SKEW
OVER ELM LAKE — SEC. 8/17-T128N-R65W
STA. 9 + 98.50 TO 11 + 20.50 — BRO-B 8007(212)
STR. NO. 07-019-020 — HL-93

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

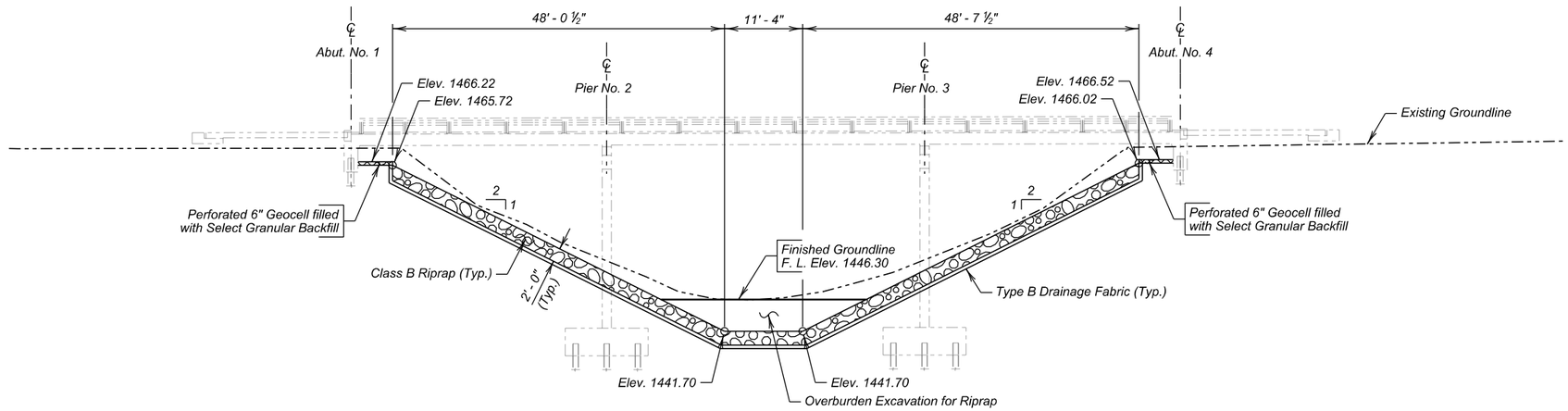
DESIGNED BY	CK. DES. BY	DRAFTED BY	
EM	EW	EM	BRIDGE ENGINEER

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

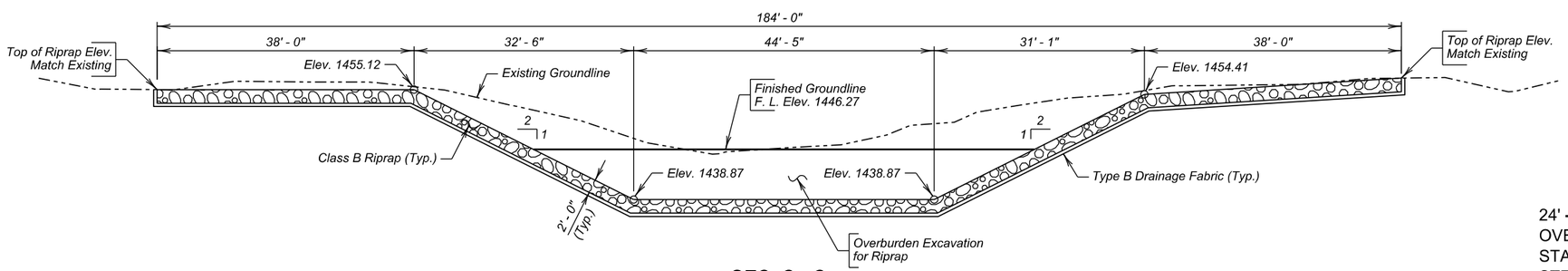
FOR BIDDING PURPOSES ONLY



SEC. A - A



SEC. B - B



SEC. C - C

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

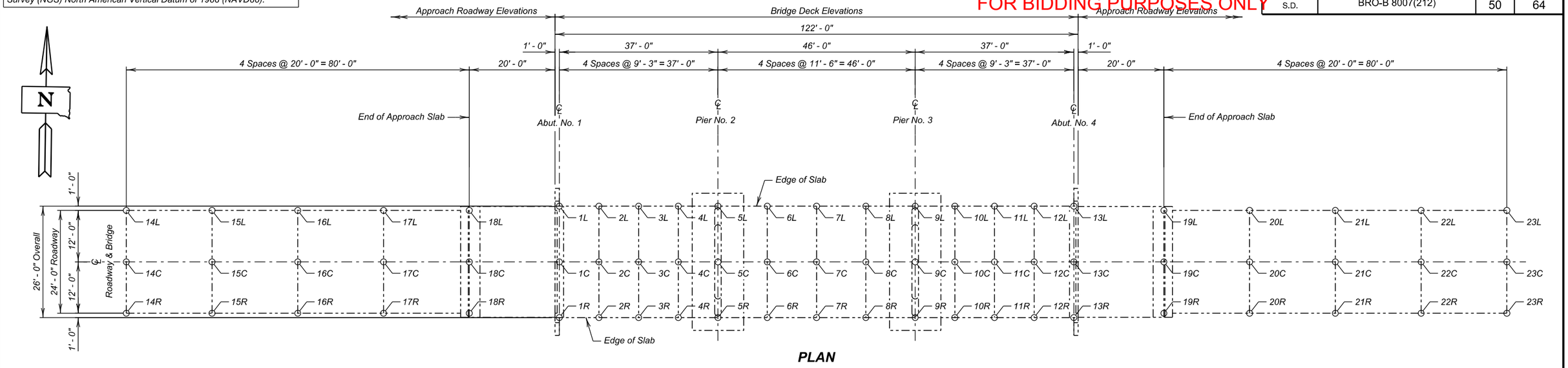
16 OF 19

DESIGNED BY	CK. DES. BY	DRAFTED BY	
EM	EW	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)	50	64



PLAN

Table of As-Built Elevations - Bridge Deck					
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	

Table of As-Built Elevations - Approach Roadway					
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	

Table of Elevations - Bridge Survey Markers		
Location	Station - Offset	Elevation
Begin Bridge		
End Bridge		

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Bridge Elevation Survey	L.S.	Lump Sum

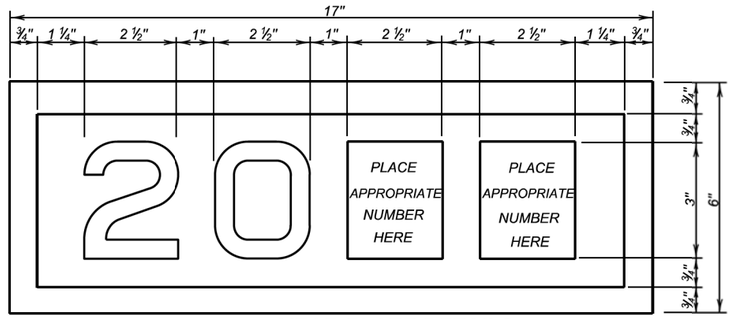
NOTE -
The Contractor will be responsible for producing the As - Built Elevation Survey soon after construction is complete and before the bridge is opened to traffic. The As - Built Elevations of the Bridge will be taken and recorded at the locations shown by the table on this sheet. The completed table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

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 13592
CHRISTOPHER T. HERSINGER
SOUTH DAKOTA
07/13/2023

AS-BUILT ELEVATION SURVEY
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	CK. DES. BY	DRAFTED BY	
EM	EW	EM	BRIDGE ENGINEER



YEAR PLATE DETAILS

GENERAL NOTES:

1. 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.

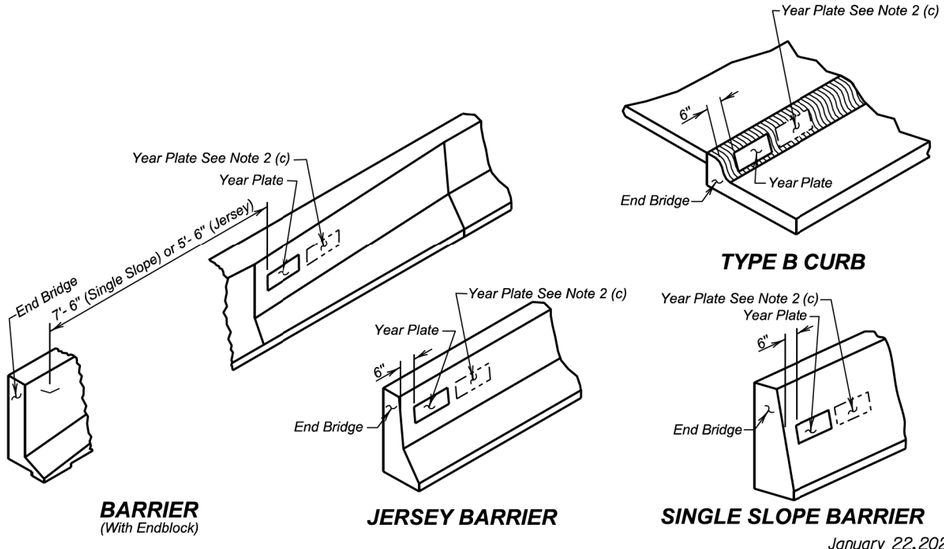
2. Year plates will be located on structure(s) as follows:

   a. On cast-in-place box culverts the year plates will be four and one - half (4 ½) 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.

   b. 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.

   c. 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.

3. 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.



BARRIER
(With Endblock)

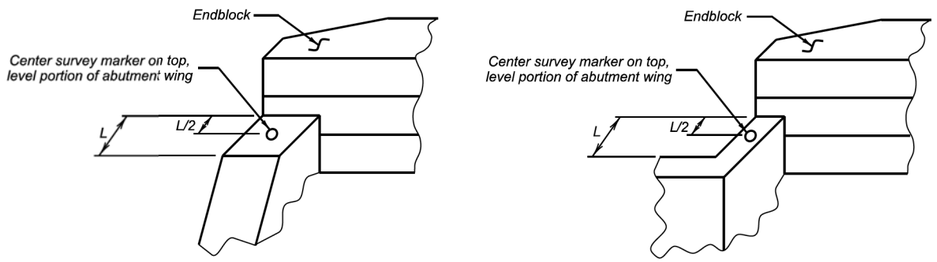
TYPE B CURB

JERSEY BARRIER

SINGLE SLOPE BARRIER

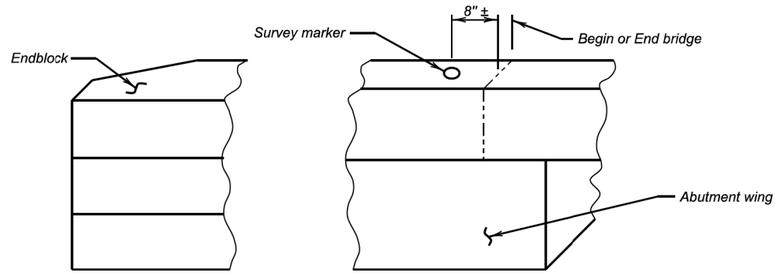
January 22,2021

Published Date: 2024	SDDOT	YEAR PLATE DETAILS	PLATE NUMBER 460.02
			Sheet 1 Of 1



ABUTMENT WITH "STRAIGHT" WINGS

ABUTMENT WITH "SWEPT BACK" WINGS



ABUTMENT WITH "SWEPT BACK" WINGS
(Endblock on top of wings)

GENERAL NOTES:

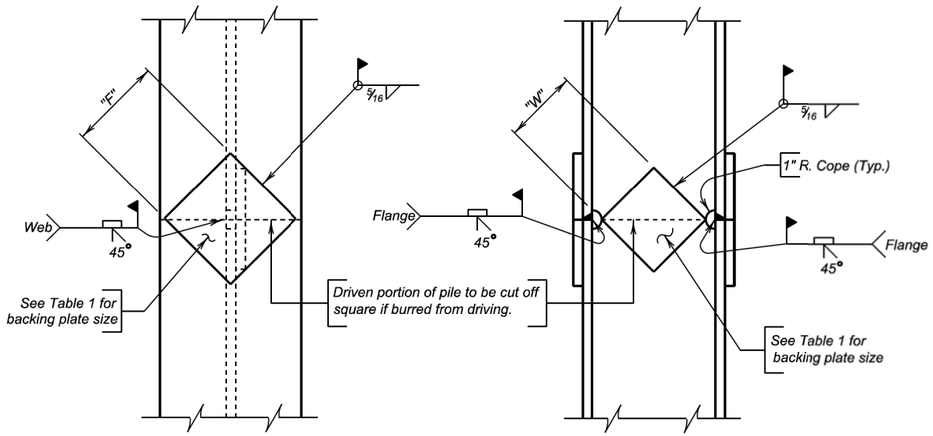
1. Survey markers shall be located at each abutment on the same side of the bridge as the year plate. Place survey markers on abutment wings as shown. Two survey markers will be required at each bridge.

2. 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 ¾" X 2" long ribbed shank), or a US Army Corps of Engineers Type C Disc with a 3 ½" top diameter.

3. 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

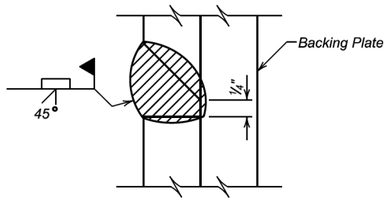
Published Date: 2024	SDDOT	BRIDGE SURVEY MARKER	PLATE NUMBER 460.05
			Sheet 1 of 1



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:

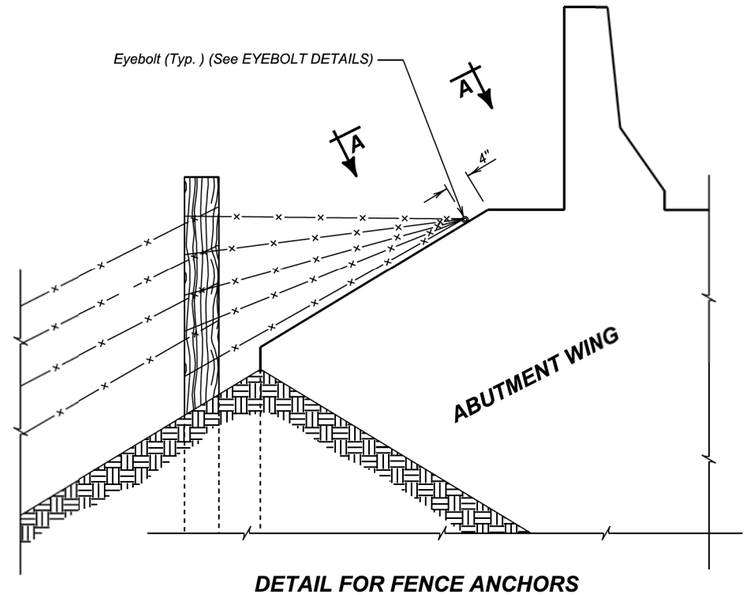
1. Steel for backing plates shall conform to ASTM A709 Grade 50.
2. Welding and weld inspection shall be in conformance with AWS D1.5 (Current Year) Bridge Welding Code - Steel.
3. Welder must be certified and registered with the SDDOT.
4. Backing plate shall at a minimum be as thick as the web of the 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.

TABLE 1
(BACKING PLATES)

PILE	10"	12"	14"
"F" FLANGE	6 ½"	8"	10"
"W" WEB	4 ¾"	6 ¼"	7 ½"

December 23,2012

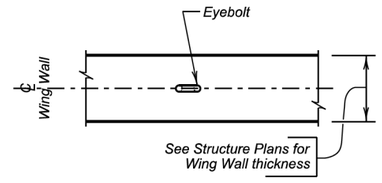
Published Date: 2024	SDDOT	STEEL PILE SPLICE DETAILS	PLATE NUMBER 510.40
			Sheet 1 of 1



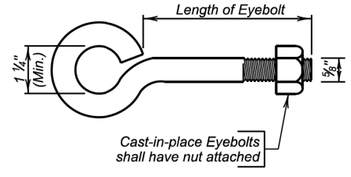
DETAIL FOR FENCE ANCHORS

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 ⅝ 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 ½ 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 ⅝ 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

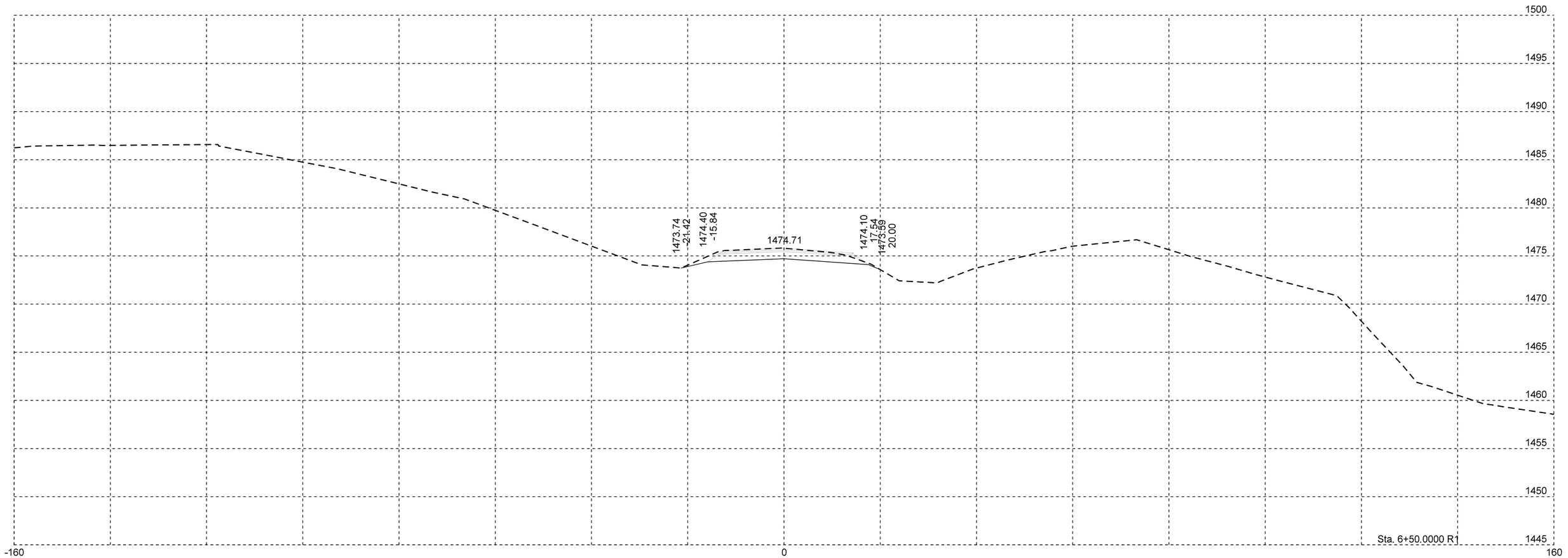
December 23,2012

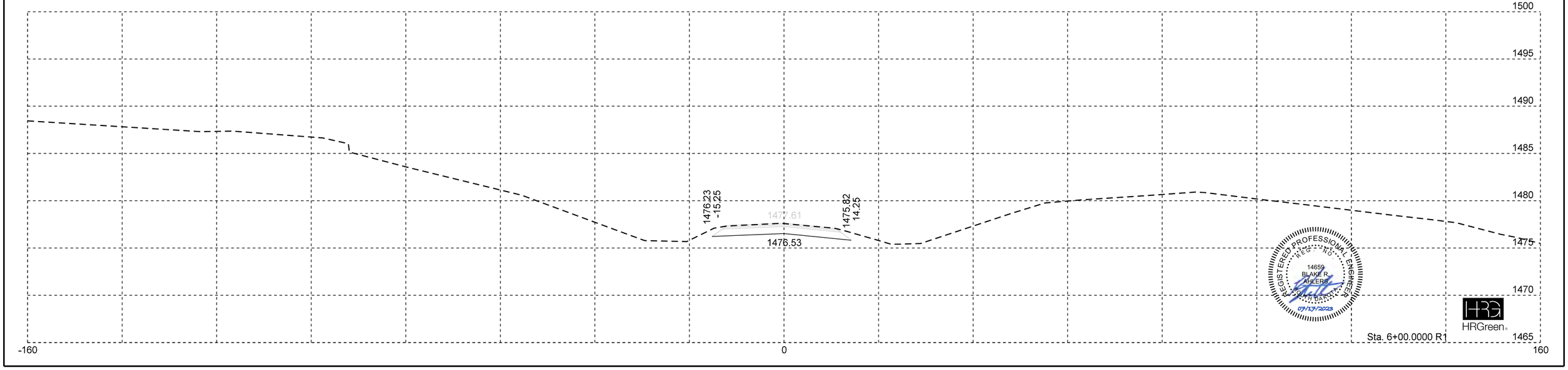
Published Date: 2024	SDDOT	FENCE ANCHORS FOR BRIDGE ABUTMENT WINGS (WINGS 6' AND SHORTER)	PLATE NUMBER 620.18
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8007(212)	53	64

FOR BIDDING PURPOSES ONLY

Plotting Date: 7/17/2023





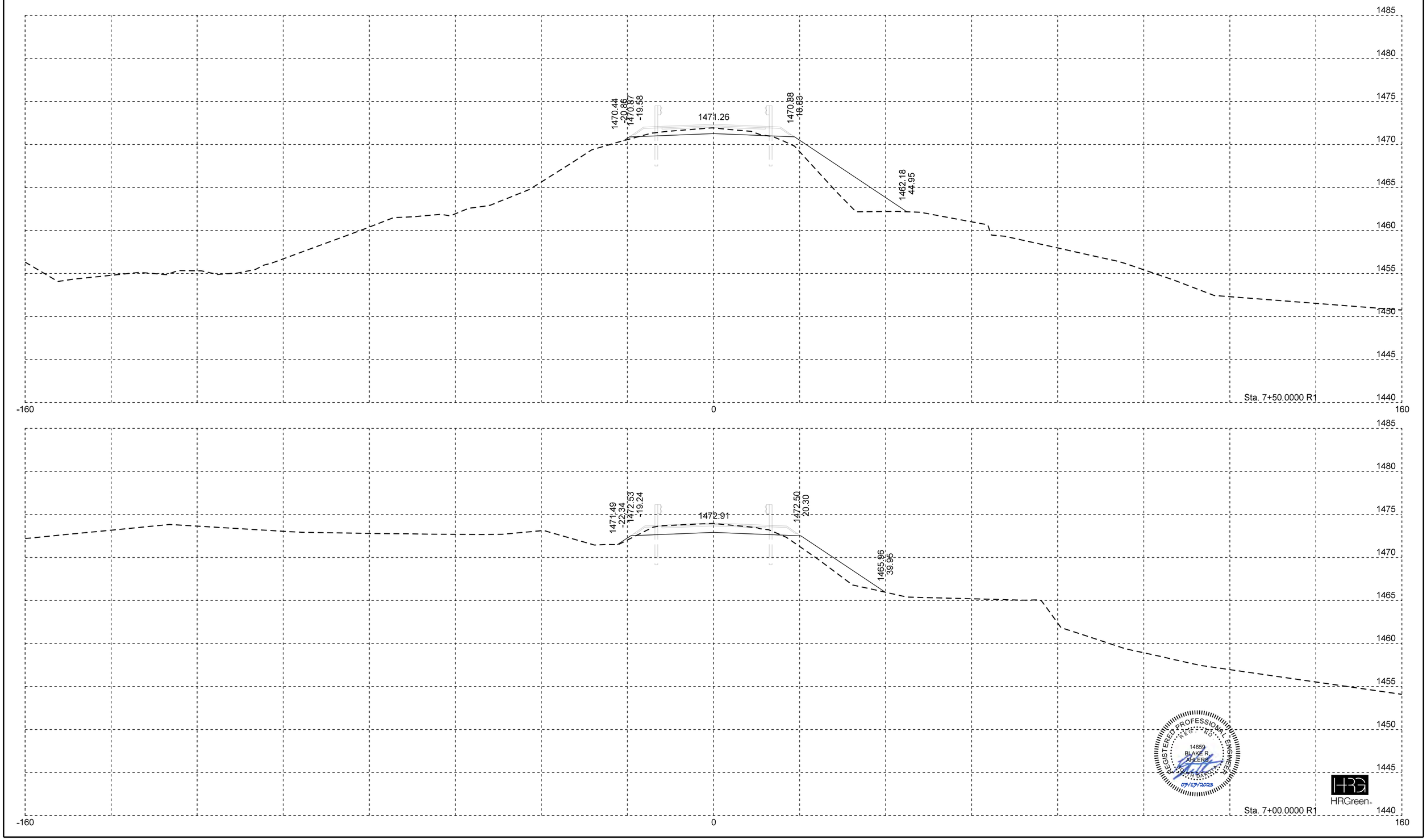
REGISTERED PROFESSIONAL ENGINEER
14659
BLAKE R. AHLERS
07/17/2023

HRGreen

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

FOR BIDDING PURPOSES ONLY

Plotting Date: 7/17/2023



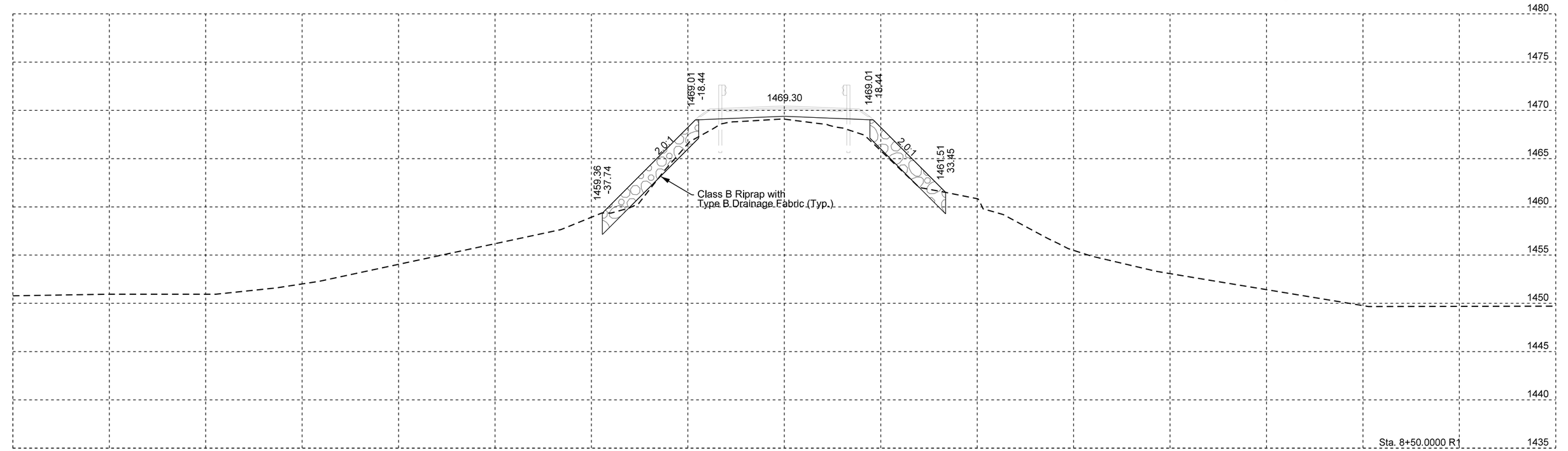
REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/17/2023

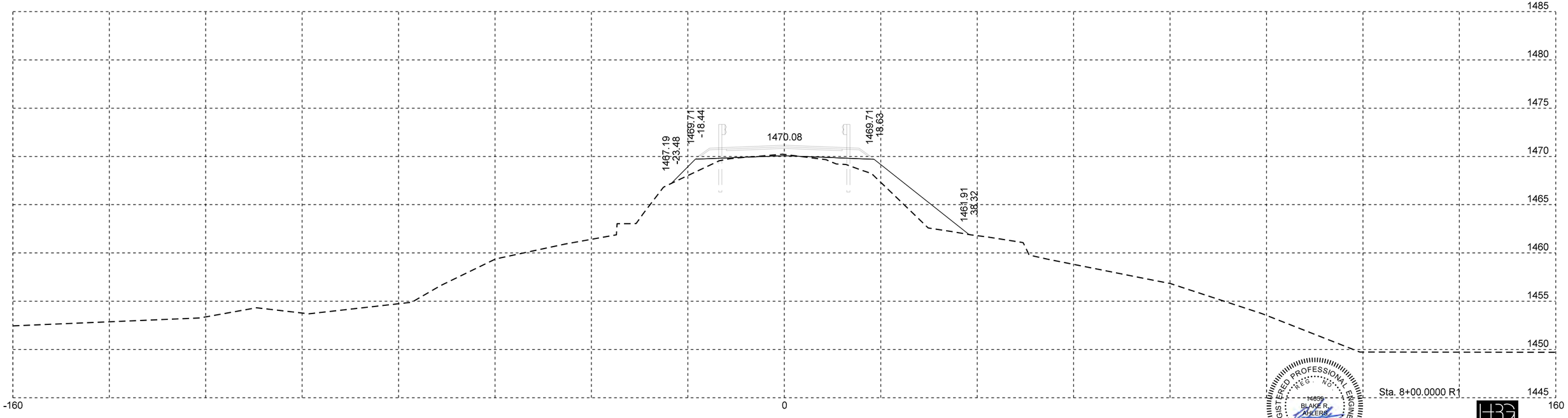
HRGreen

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8007(212)	55	64

FOR BIDDING PURPOSES ONLY

Plotting Date: 7/17/2023





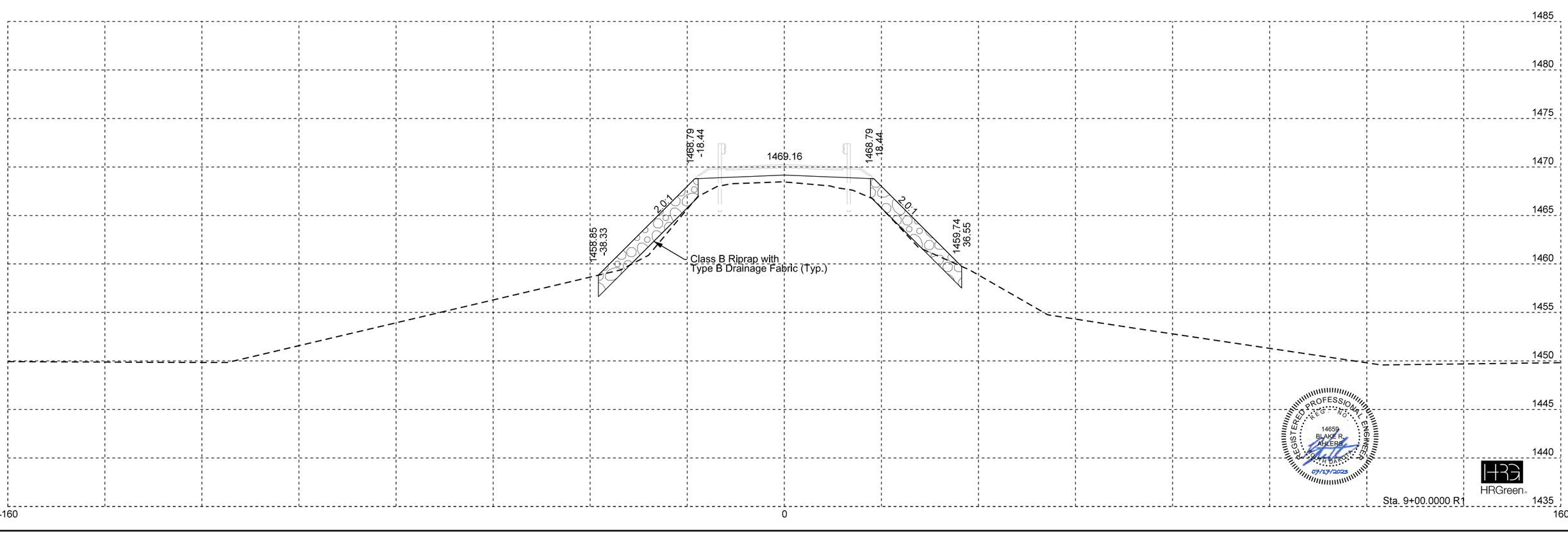
REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14859
BLAKE R.
AHLERS
SOUTH DAKOTA
07/17/2023

HRGreen

FOR BIDDING PURPOSES ONLY

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

Plotting Date: 7/17/2023



REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R.
AHLERS
SOUTH DAKOTA
07/17/2023

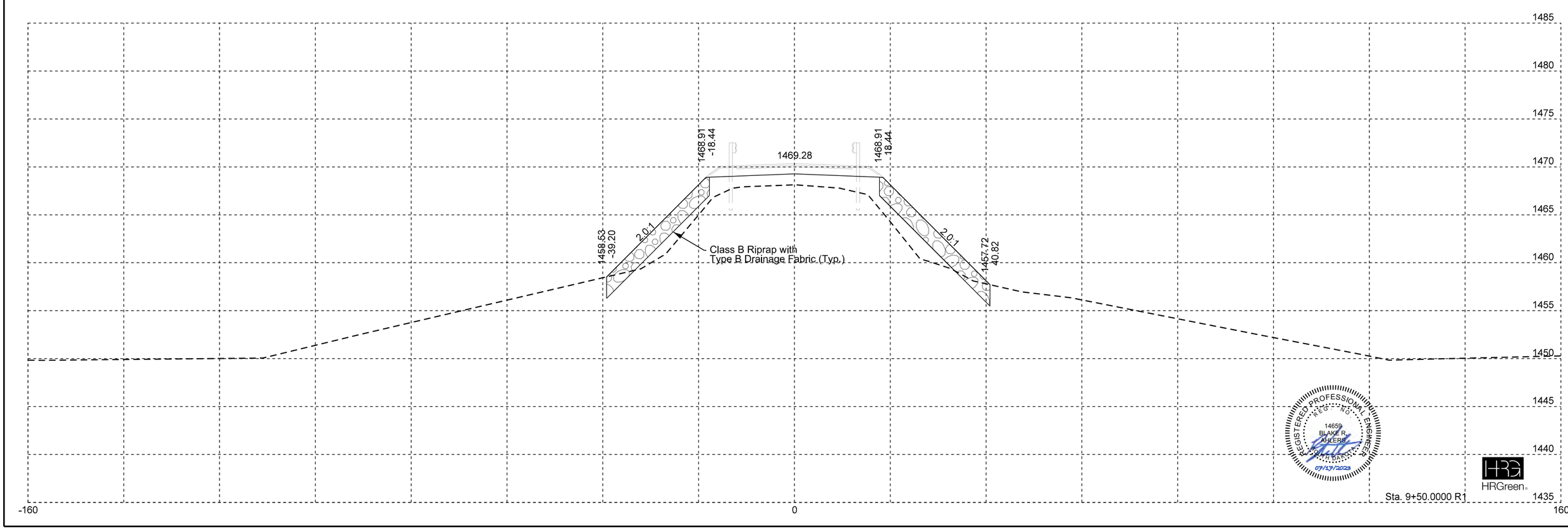
HRGreen

Sta. 9+00.0000 R1

FOR BIDDING PURPOSES ONLY

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

Plotting Date: 7/17/2023



REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R.
AHLERS
SOUTH DAKOTA
07/17/2023

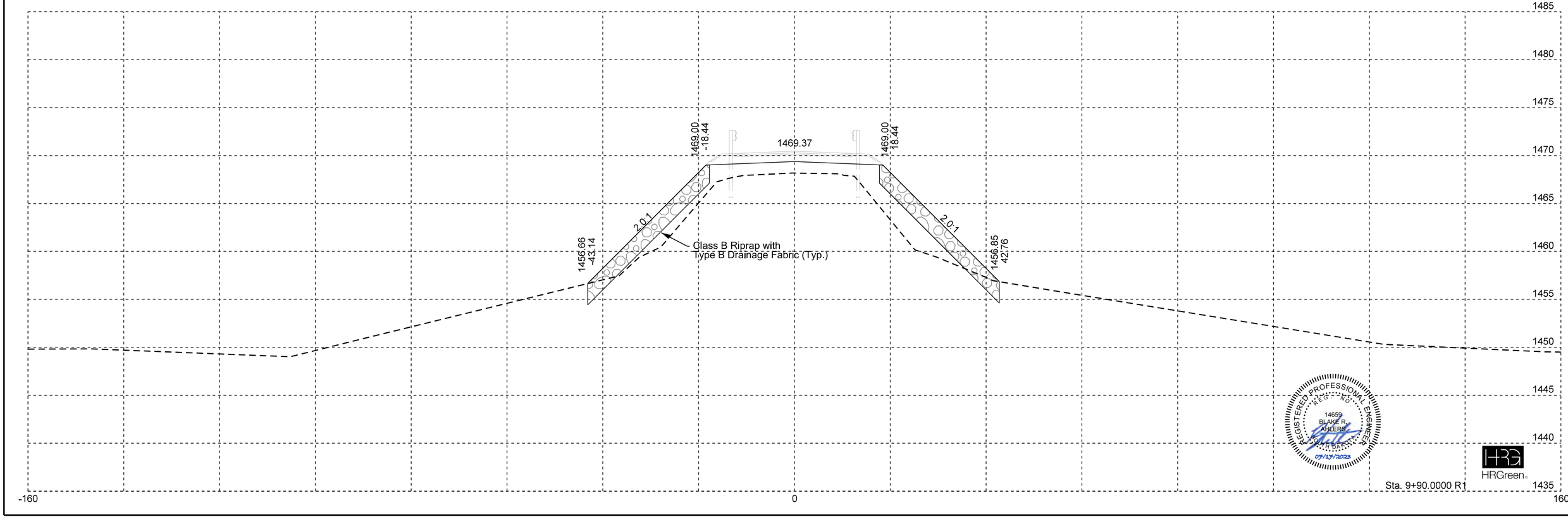
HRGreen

Sta. 9+50.0000 R1

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8007(212)	58	64

Plotting Date: 7/17/2023



REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R.
AHLERS
SOUTH DAKOTA
07/17/2023

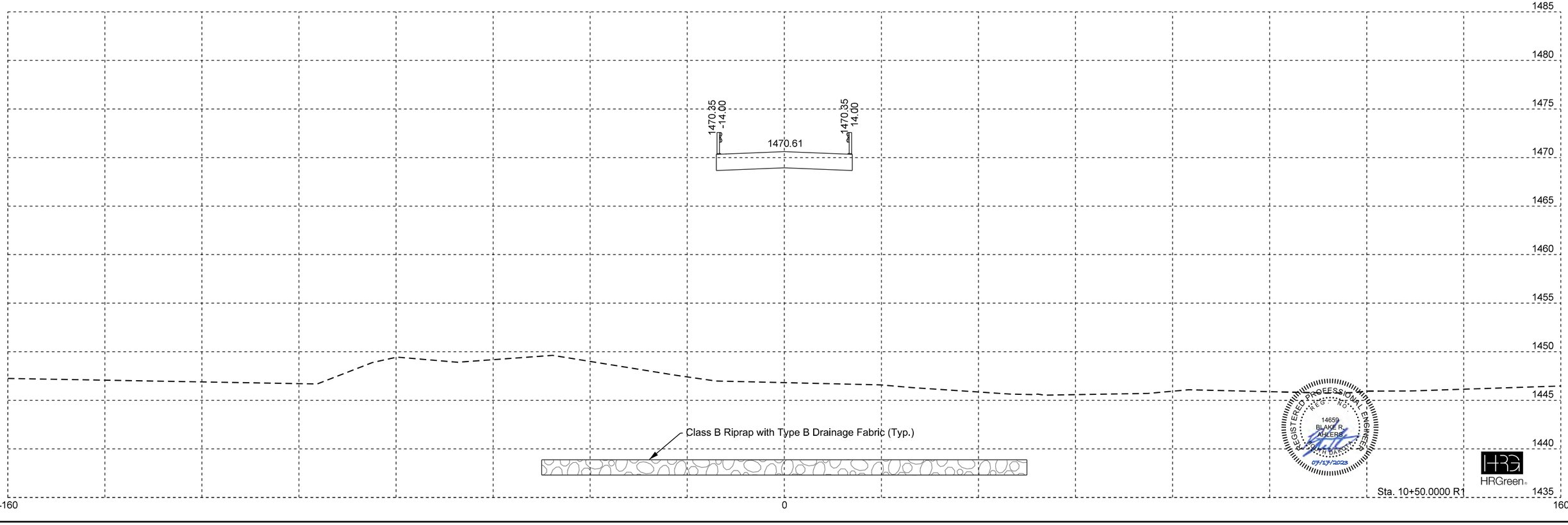
HRGreen

Sta. 9+90.0000 R1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8007(212)	59	64

FOR BIDDING PURPOSES ONLY

Plotting Date: 7/17/2023



REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R.
AHLERS
SOUTH DAKOTA
07/17/2023

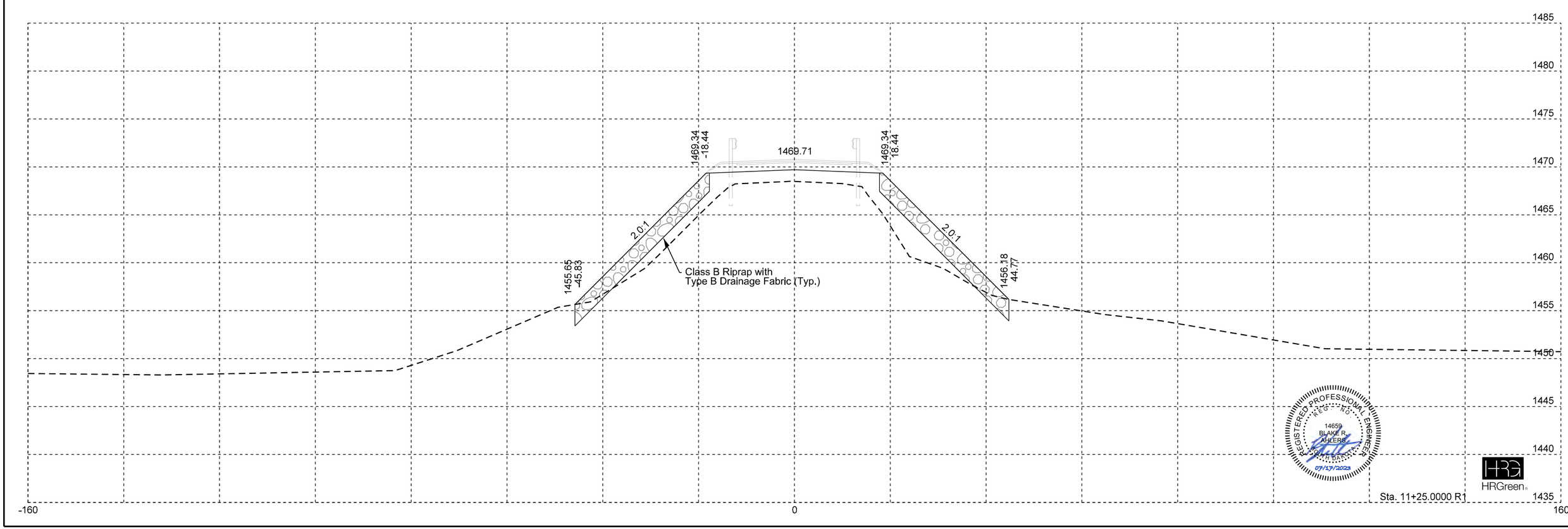
HRGreen

Sta. 10+50.0000 R1

FOR BIDDING PURPOSES ONLY

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

Plotting Date: 7/17/2023



REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/17/2023

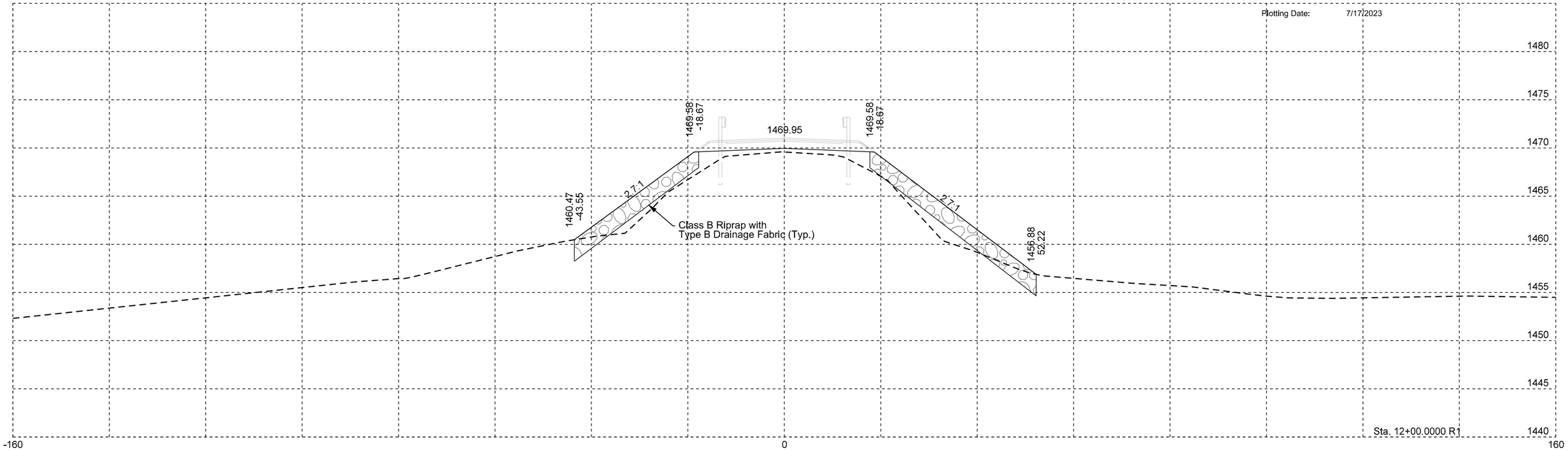
HRGreen

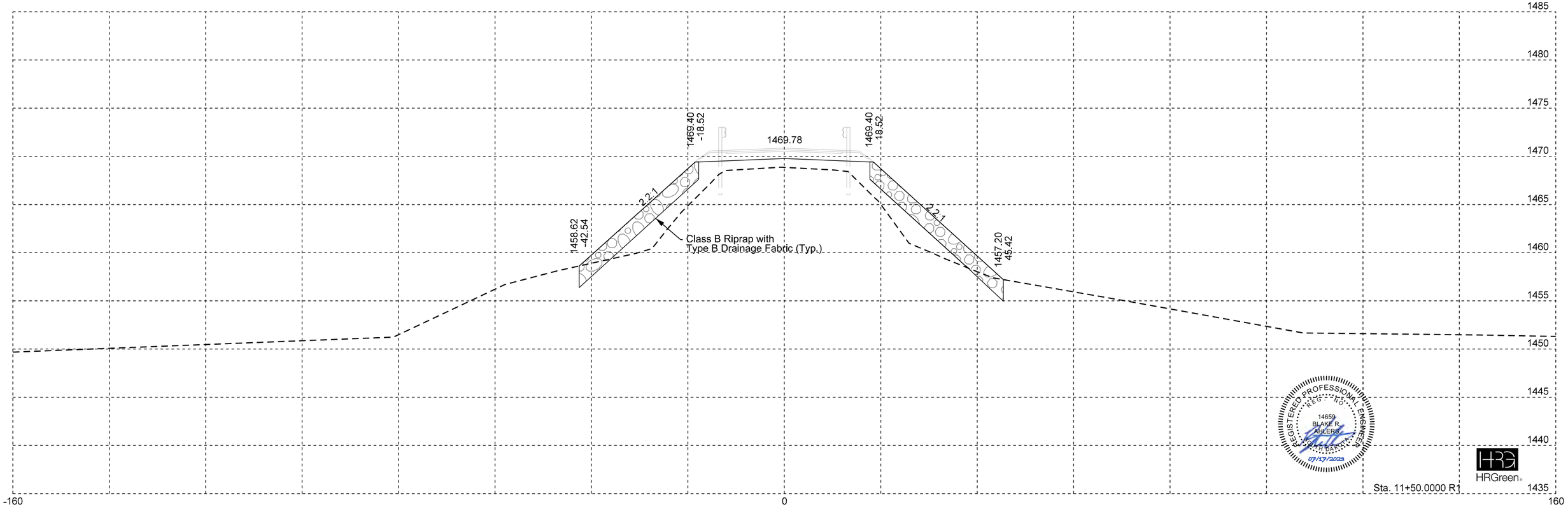
Sta. 11+25.0000 R1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8007(212)	61	64

FOR BIDDING PURPOSES ONLY

Plotting Date: 7/17/2023





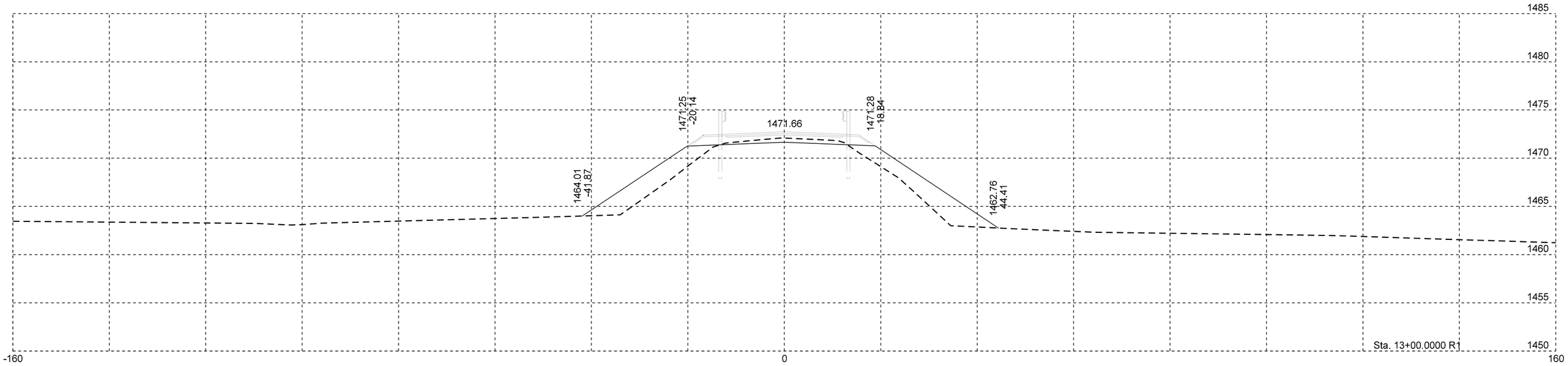
REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R.
AHLERS
SOUTH DAKOTA
07/17/2023

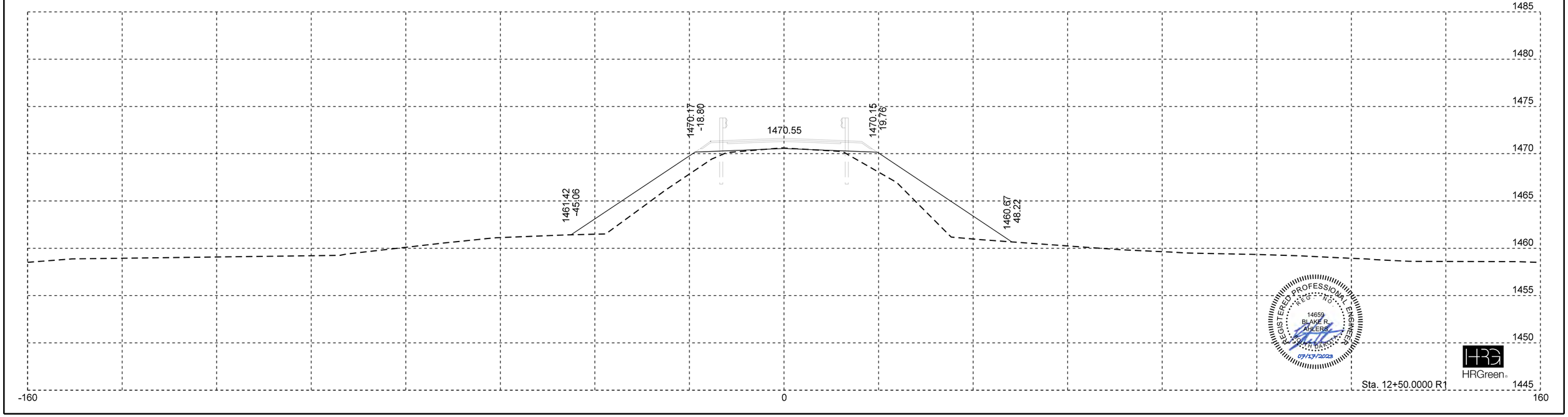
HRGreen

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO 8007(212)	62	64

FOR BIDDING PURPOSES ONLY

Plotting Date: 7/17/2023





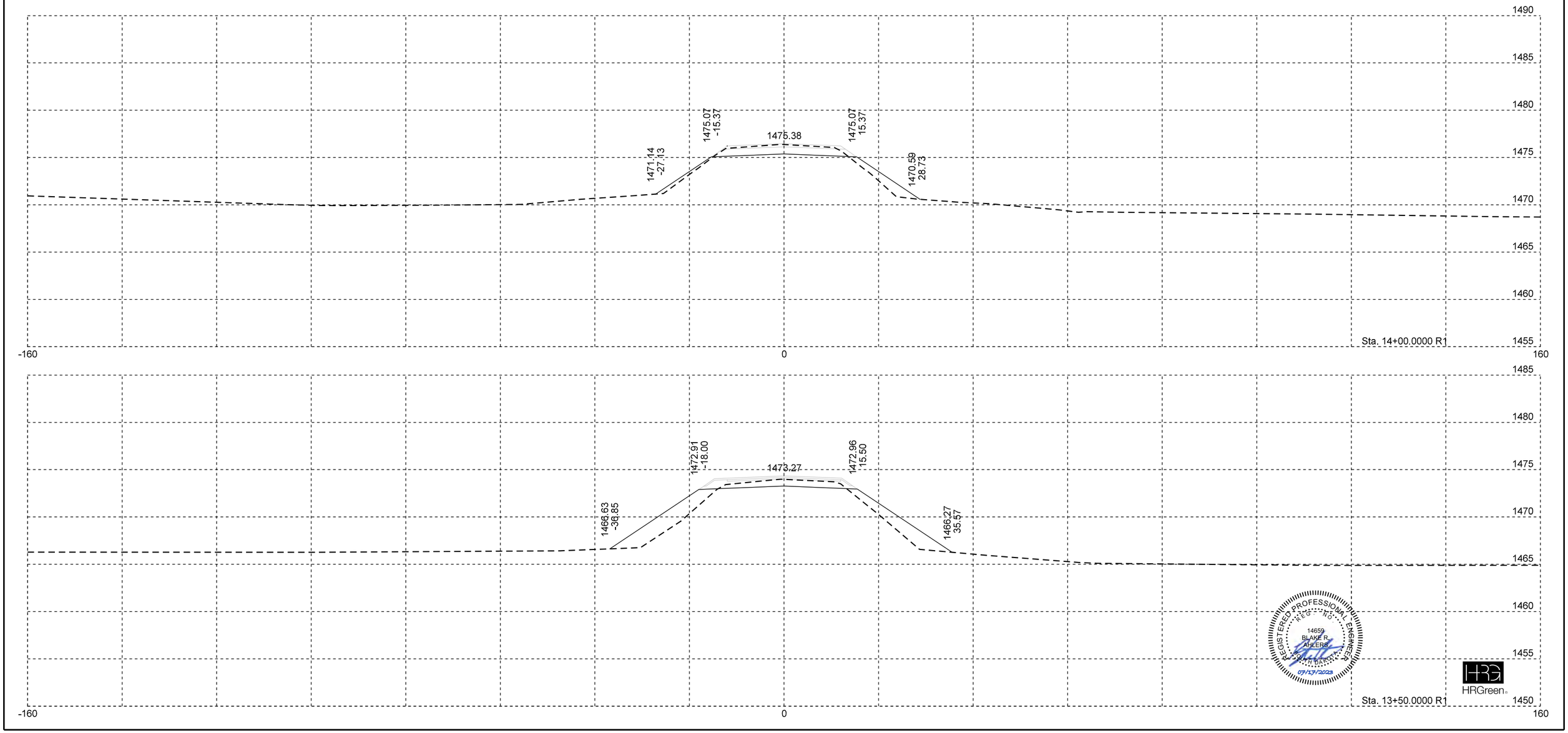
REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/17/2023

HRGreen

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

FOR BIDDING PURPOSES ONLY

Plotting Date: 7/17/2023



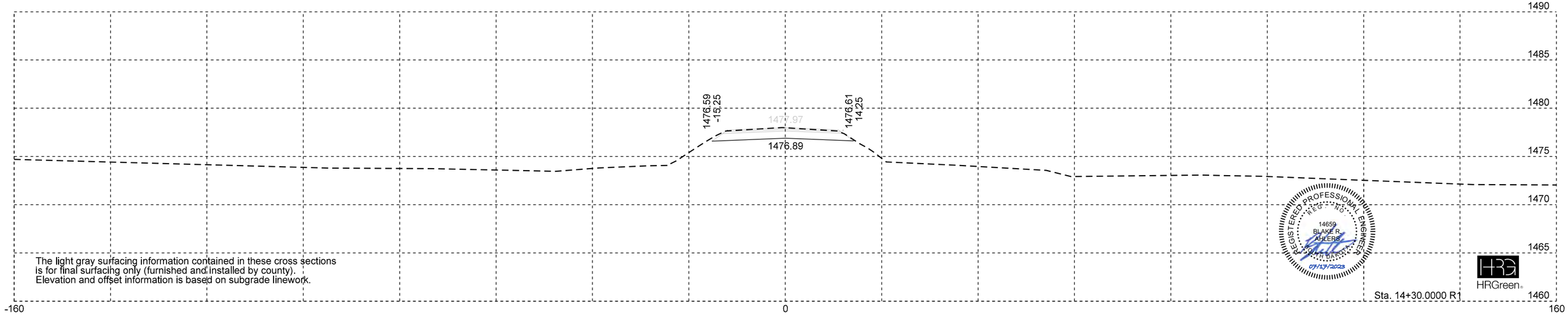
REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R. AHLERS
NORTH DAKOTA
07/17/2023

HRGreen

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.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
14659
BLAKE R. AHLERS
SOUTH DAKOTA
07/17/2023

HRGreen

Sta. 14+30.0000 R1