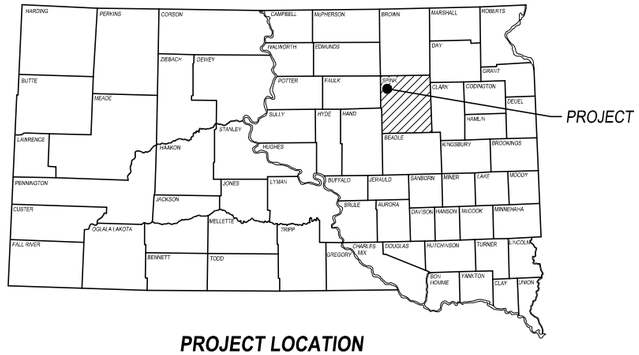
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	1	40



PROJECT LOCATION

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT BRO-B 8058(32)
SPINK COUNTY

STRUCTURE REPLACEMENT, APPROACH GRADING, AND GRAVEL SURFACING
STR. NO. 58-052-070
PCN 08N9

INDEX OF SHEETS

Sheet No. 1	Title Sheet
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Sheet No. 14	Traffic Control Signs
Sheet No. 15	Legend
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Sheet No. 18	Horizontal and Vertical Control Data
Sheet No. 19	Plan and Profile
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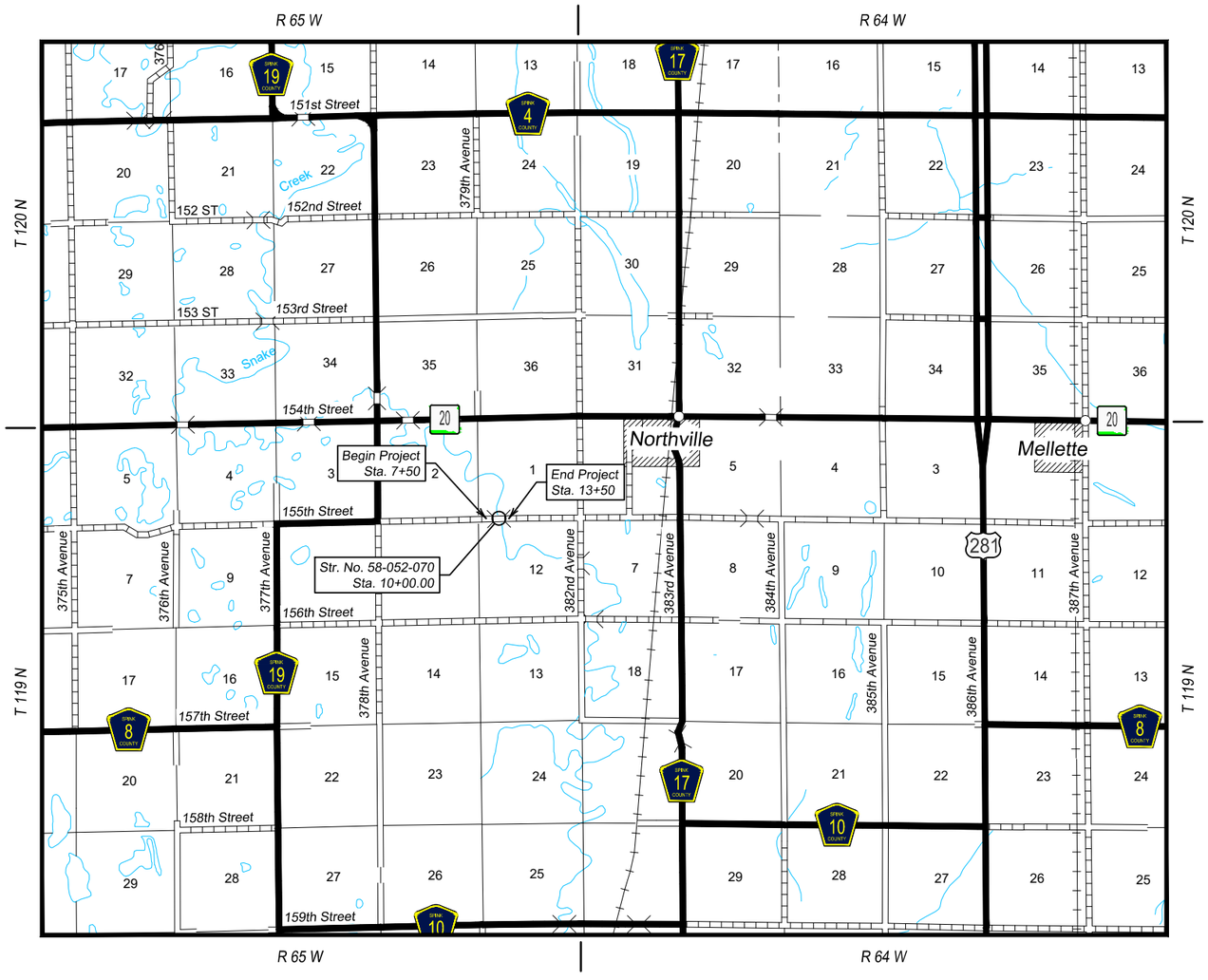
Sheet No. 29 - 37	Details for the Proposed Structure
Sheet No. 38 - 40	Cross Sections

DESIGN DESIGNATION

ADT (2019)	31
ADT (2039)	42
DHV	6
d	50%
T DHV	3.5%
T ADT	7.7%
V	55 mph

STORM WATER PERMIT

Major Stream:	Snake Creek
Area Disturbed:	1.70 Acres
Project Area:	3.11 Acres
Latitude:	N 45.14443°
Longitude:	W -98.61162°



LOCATION MAP

COUNTY OFFICIALS

Highway Superintendent	Jeff Haessig 1518 E 7th Avenue Redfield, SD 57469 Phone: (605) 472-5008
Commissioners	Brett Knox Brian Johnson Kevin Siebrecht Suzanne Smith Dave Albrecht

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24

Know what's **below.**
Call before you dig.

IMEG

November 6, 2024

Plotted on: 4/1/24 9:20:11 AM Plotted by: Joshua R. Prather
\\files\Active\Projects\2021\21003335.00\Design\Civil\C3D\Plot\21003335_Cover, Traffic Control, and Details.dwg

GRADING

	BID ITEM NUMBER	ITEM	QUANTITY	UNIT
	009E0010	Mobilization	Lump Sum	LS
	009E3200	Construction Staking	Lump Sum	LS
	009E3301	Engineer Directed Surveying/Staking	20.0	Hour
	110E0600	Remove Fence	809	Ft
	110E1690	Remove Sediment	1.0	CuYd
	110E1693	Remove Erosion Control Wattle	100	Ft
	110E1700	Remove Silt Fence	550	Ft
	120E0010	Unclassified Excavation	3,793	CuYd
	120E0600	Contractor Furnished Borrow Excavation	321	CuYd
	230E0010	Placing Topsoil	764	CuYd
*	260E3010	Gravel Surfacing	802.4	Ton
*	620E0020	Type 2 Right-of-Way Fence	851	Ft
*	620E0510	Type 1 Temporary Fence	715	Ft
*	620E1020	2 Post Panel	12	Each
	632E2520	Type 2 Object Marker	4	Each
	634E0110	Traffic Control Signs	109.0	SqFt
	634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
	634E0275	Type 3 Barricade	8	Each
	734E0010	Erosion Control	Lump Sum	LS
	734E0102	Type 2 Erosion Control Blanket	6,000	SqYd
	734E0154	12" Diameter Erosion Control Wattle	200	Ft
	734E0165	Remove and Reset Erosion Control Wattle	60	Ft
	734E0510	Shaping for Erosion Control Blanket	1,200	Ft
	734E0604	High Flow Silt Fence	550	Ft
	734E0610	Mucking Silt Fence	38	CuYd
	734E0620	Repair Silt Fence	138	Ft

STR. NO. 58-052-070 (REINFORCED CONCRETE BOX CULVERT)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
250E0030	Incidental Work, Structure	Lump Sum	LS
420E0200	Structure Excavation, Box Culvert	152	CuYd
421E0200	Box Culvert Undercut	418	CuYd
460E0120	Class A45 Concrete, Box Culvert	308.3	CuYd
480E0100	Reinforcing Steel	42,590	Lb
700E0210	Class B Riprap	210.0	Ton
831E0110	Type B Drainage Fabric	236	SqYd
831E0300	Reinforcement Fabric (MSE)	609	SqYd

*Non-participating item

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: AQUATIC RESOURCES

COMMITMENT A1: WETLANDS

All efforts to avoid and minimize wetland impacts from the project have resulted in approximately 0.13 acre(s) of wetlands (includes temporary and permanent) becoming impacted. Refer 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	10+00	0.00	0.02	0.03	0.08	0.13

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 0.02 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 the 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.

COMMITMENT A2: STREAMS

All efforts to avoid and minimize stream impacts from the project have resulted in approximately 0.42 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)
Snake Creek	10+00	0.10	0.04	0.26	0.02	0.42

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 the 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.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
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SOUTH DAKOTA
04/01/24

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.

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:
< https://sdleastwanted.sd.gov/maps/default.aspx >

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

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

The project work will cross Snake Creek, which is classified as warm water, marginal fishery with a total suspended solids standard of less than 150 mg/L 30-day average, less than 263 mg/L daily maximum.

This project may be in the vicinity of multiple streams and wetlands. These waters are considered waters of the state and are protected under Administrative Rules of South Dakota (ARSD) Chapter 74:51. Special construction measures may have to be taken to ensure that this water body is not impacted.

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/OfficeOfWater/SurfaceWaterQuality/swdpermitting/Ereporting.aspx >

COMMITMENT E: STORM WATER

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.

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SOUTH DAKOTA
04/01/24

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) 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 review does not relieve the Contractor of the responsibility 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+00	Snake Creek	1,287.66'

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 M: SECTION 4(f)/6(f) RESOURCES

COMMITMENT M1: SECTION 4(f) PROPERTY

A Section 4(f) Evaluation concluded there are no feasible and prudent alternatives to avoiding Section 4(f) property located within the project.

Station	Section 4(f) Property
10+00	Historic Structure 58-052-070

Action Taken/Required:

The following measures are required to minimize harm to the above Section 4(f) property.

The removal and replacement of structure 58-052-070 has resulted in an Adverse Effect to historic properties. A Memorandum of Agreement was signed and MOA stipulations must be fulfilled prior to construction. The SDDOT Environmental Office will ensure all MOA stipulations (I-III) are completed prior to construction.

A programmatic Section 4(f) Evaluation for Use of Historic Bridge 58-052-070 was approved by FHWA.

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.

REGISTERED PROFESSIONAL ENGINEER
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04/01/24

COUNTY RESPONSIBILITY

Spink County will be responsible for the following at no cost to the Contractor:

1. Right of way and temporary and permanent easements.
2. Coordination of any utility adjustments.
3. Remove silt fence in permanently seeded areas.

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 28.8 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”.

The estimated cubic yards of excavation and/or embankment required to construct outlet ditches, ditch blocks, and approaches are included in the earthwork balance notes.

The excavation and/or embankment quantity required for shaping the waterway channel(s) will be incidental to the contract unit price per cubic yard of “Unclassified Excavation”.

Special ditch grades and other sections of the roadway different than the typical section will be constructed to the limits shown on the cross sections. If significant changes to the cross sections are necessary during construction, the Engineer will contact the Designer for the proposed change.

Generally, all shallow inlet and outlet ditches as noted on the plan sheets will be cut with a 10-foot wide bottom with 5:1 backslopes. However, the Engineer may direct the Contractor to adjust the ditch width for proper alignment with the drainage structure.

Temporary fence and/or permanent fence will be placed ahead of the grading operation unless otherwise directed by the Engineer.

UTILITIES

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 or in the bidding documents.

Northern Electric Cooperative Inc.
39456 133rd Street
Bath, SD 57427
(605) 225-0310

James Valley Telecommunications
234 1st Ave E
Groton, SD 57445
(605) 397-2323

SHRINKAGE FACTOR

Embankment +35%

EARTHWORK BALANCE

RCBC Installation	1,066	CuYd		Embankment	2,085	CuYd
Excavation	1,539	CuYd		35% Shrinkage	730	CuYd
Other Excavation	720	CuYd		Waste	831	CuYd
Contractor Furnished Borrow Excavation	321	CuYd				
Total	3,646	CuYd		Total	3,646	CuYd

Other Excavation includes the sum of the quantities for the following:
Structure Excavation, Box Culvert (152 CuYd)
Box Culvert Undercut (418 CuYd)
Excavation for Riprap (150 CuYd)

These quantities are for information purposes only, compensation for these are accounted for within various bid items.

The Contractor may, at the discretion of the Engineer, use the material from Other Excavation in the inslopes and as sub-base with the condition that said material meets all requirements as set forth in the Specifications.

It is assumed (for the purposes of earthwork balance) that the Contractor will be able to use approximately 75% of the material from RCBC Installation, Excavation, and Other Excavation and will have to waste all of the material at (a) site(s) provided by the Contractor and approved by the Engineer. All costs for labor, materials, and equipment necessary to waste material as well as restoration of the waste site(s) will be incidental to the contract unit price per cubic yard for “Unclassified Excavation”.

TABLE OF UNCLASSIFIED EXCAVATION

Excavation	1,539 CuYd
Topsoil	764 CuYd
RCBC Installation	1,066 CuYd
Gravel Surfacing	424 CuYd
Total	3,793 CuYd

PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

When plan quantities are used for payment, the Unclassified Excavation quantity will be used for final payment and the plans quantity of Topsoil and salvaged surfacing items listed in the Table of Unclassified Excavation will not be adjusted according to field measurements.

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.

EXCAVATION FOR REINFORCED CONCRETE BOX CULVERT INSTALLATION

Included in the quantity of “Unclassified Excavation” are 1,066 cubic yards of excavation for installation of reinforced concrete box culverts.

All work necessary to excavate a trench for installation of reinforced concrete box culverts including labor, equipment, and incidentals will be incidental to the contract unit price per cubic yard for “Unclassified Excavation”. Payment for excavation of reinforced concrete box culverts will be based only on plans quantity and measurement of these excavation quantities during construction will not be performed.

The quantities computed for excavation of the reinforced concrete box culverts are based on the limits shown in the drawing below.

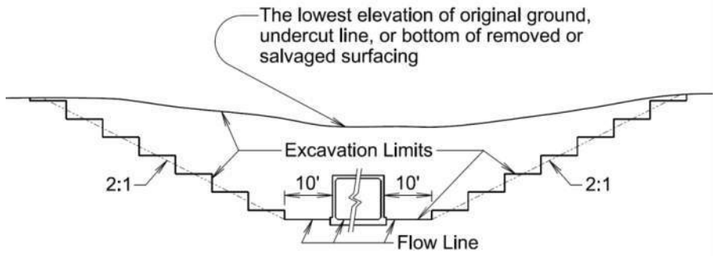

TABLE OF EXCAVATION FOR REINFORCED CONCRETE BOX CULVERT INSTALLATION

Sta.	Quantity (CuYd)
10+00	1,066
Total:	1,066

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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:

Sta.	to	Sta.	Topsoil (CuYd)
7+50		13+50	764
		Total:	764

EROSION CONTROL

The estimated area requiring erosion control is 48,966 square feet. All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, and seeding 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.

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 a minimum 25% the fungal species *Rhizophagus intraradices*. The remaining 75% may include other endomycorrhizal fungal species.

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

Permanent Seeding

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

Type B Permanent Seed Mixture will consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana, Walsh	7
Switchgrass	Dacotah, Forestburg, Nebraska 28, Pathfinder, Summer, Sunburst, Trailblazer	3
Indiangrass	Holt, Tomahawk, Chief, Nebraska 54	3
Big Bluestem	Bison, Bonilla, Champ, Sunnyview, Rountree, Bonanza	3
Canada Wildrye	Mandan	2
	Total:	18

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 until vegetation has been established and then they will be removed in accordance with the Engineer.

An additional 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	Temporary / Permanent	Location	Diameter (Inch)	Quantity (Ft)
7+52 Rt.	Temporary	Project Limits	12	20
7+53 Lt.	Temporary	Project Limits	12	20
9+58 Lt.	Permanent	Inslope	12	20
9+70 Rt.	Permanent	Inslope	12	20
10+30 Lt.	Permanent	Inslope	12	20
10+41 Rt.	Permanent	Inslope	12	20
13+47 Rt.	Temporary	Project Limits	12	20
13+47 Lt.	Temporary	Project Limits	12	20
		Additional Quantity:	12	40
			Total:	200

HIGH FLOW SILT FENCE

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

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

High 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 734.05 for details.

An additional quantity of high flow silt fence has been added to the Estimate of Quantities for temporary sediment control.

TABLE OF HIGH FLOW SILT FENCE

Station	Lt./Rt.	Location	Quantity (Ft)
8+24 to 8+49	Lt.	Project Limits	70
9+24 to 9+45	Rt.	Project Limits	80
10+52 to 11+67	Lt.	Project Limits	150
10+66 to 12+33	Rt.	Project Limits	200
		Additional Quantity:	50
		Total:	550

EROSION CONTROL BLANKET

Erosion control blanket will be installed at the locations noted in the table and at locations determined by the Engineer during construction.

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

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

An additional quantity of Type 2 Erosion Control Blanket has been added to the Estimate of Quantities for temporary erosion control.

TABLE OF EROSION CONTROL BLANKET

Station	Lt./Rt.	Location	Type	Quantity (SqYd)
7+50 to 13+50	Lt.	Inslope	2	2437
7+50 to 13+50	Rt.	Inslope	2	3001
		Additional Quantity:	2	562
		Total Type 2 Erosion Control Blanket:		6000

SHAPING FOR EROSION CONTROL BLANKET

The ditches will be shaped for the erosion control blanket as specified on Standard Plate 734.01.

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 State.

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

All temporary speed limit signs will have a minimum mounting height of 5 feet in rural locations, even when mounted on portable supports.

Portable sign supports will not be located on sidewalks, bicycle facilities, or other areas designated for pedestrian or bicycle traffic.

All construction operations will be conducted in the general direction of traffic movement.

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.

All haul trucks will be equipped with an additional flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights will be incidental to the various related contract items.

TABLE OF FENCE ITEMS

Station	Type 2 Right-of-Way Fence (Ft)	Type 1 Temporary Fence (Ft)	2 Post Panel (Each)	Removal (Ft)
7+50 to 8+91 Lt.	-	-	-	141
7+50 to 13+50 Lt.	-	715	-	-
7+50 to 9+58 Lt.	208	-	5	-
10+21 to 13+50 Lt.	-	-	-	337
10+21 to 13+50 Lt.	-	-	-	331
10+22 to 13+50 Lt.	328	-	5	-
10+35 to 13+50 Rt.	315	-	2	-
Total:	851	715	12	809

TABLE OF CONSTRUCTION STAKING

(See Special Provision for Contractor Staking)

Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Grade Staking: Length (Mile)	Grade Staking: Lane Factor	Grade Staking: *Sets of Stakes	Grade Staking: **Grade Staking Quantity (Mile)	Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	Final Cross Section Survey Quantity (Mile)	Structure Staking Quantity (Each)
155th Street (2 Lanes Gravel Surface)	7+50	13+50	2	600	0.114	1	1	0.114	0.114	0.114	0.114	
Str. 58-052-070 (4 – 12' x 9' Box Culvert)	9+74	10+26										1
							Totals:	0.114	0.114	0.114	0.114	1

* 1 = Blue Top Stakes Only (Asphalt Concrete Pavement)
2 = Blue Top and Paving Hub Stakes (PCC Pavement)

** Grade Staking Quantity = (Length) x (Lane Factor) x (Sets of Stakes)

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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** 3.11 Acres
- **5.3 (3b): Total Area to be Disturbed** 1.70 Acres
- **5.3 (3c): Maximum Area Disturbed at One Time** 1.70 Acres
- **5.3 (3d): Existing Vegetative Cover (%)** 75
- **5.3 (3d): Description of Vegetative Cover** Herbaceous Species
- **5.3 (3e): Soil Properties:** AASHTO Soil Classifications A-6, A-7-6
- **5.3 (3f): Name of Receiving Water Body/Bodies** Snake Creek
- **5.3 (3g): Location of Construction Support Activity Areas** N/A

5.3 (3h): ORDER OF CONSTRUCTION ACTIVITIES

The Contractor will enter the Estimated Start Date.

Description	Estimated Start Date
Install stabilized construction entrance(s).	
Install perimeter protection where runoff may exit site.	
Install perimeter protection around stockpiles.	
Install channel and ditch bottom protection.	
Remove and stockpile topsoil.	
Remove existing structure.	
Stabilize disturbed areas.	
Install proposed structure.	
Final grading.	
Removal of protection devices.	
Reseed areas disturbed by removal activities.	

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 SDDANR.
- 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 SDDANR 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 SDDANR 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 SDDANR 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 SDDANR 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: _____

➢ **SDDANR Contact Spill Reporting**
- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➢ **SDDANR Contact for Hazardous Materials.**
- (605) 773-3153

➢ **National Response Center Hotline**
- (800) 424-8802.

➢ **SDDANR Stormwater Contact Information**
- SDDANR 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, SDDANR, 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.

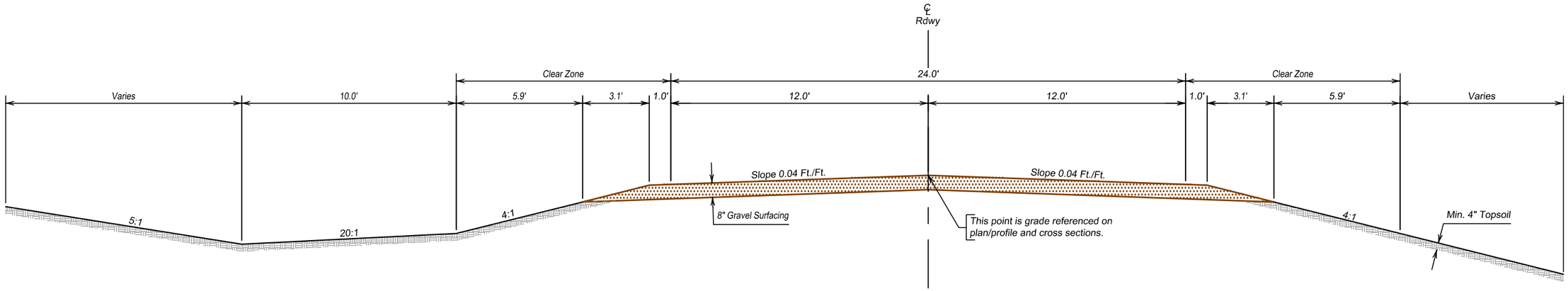
➢ **5.5 (4): Certification Requirements**
All modifications made to the SWPPP must be signed and certified as required in Section 7.4.

➢ **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 8058(32)	13	40

TYPICAL GRADING SECTION
Sta. 8+00 to Sta. 13+00



NOTES:
Sta. 7+50 to Sta. 8+00 transition existing roadway section (roadway width, shoulder, and ditch) to typical roadway section.
Sta. 9+74 to Sta. 10+26 transition roadway in-slope around structure.
Sta. 13+00 to Sta. 13+50 transition typical roadway section to existing roadway section (roadway width, shoulder, and ditch).

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15560
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24

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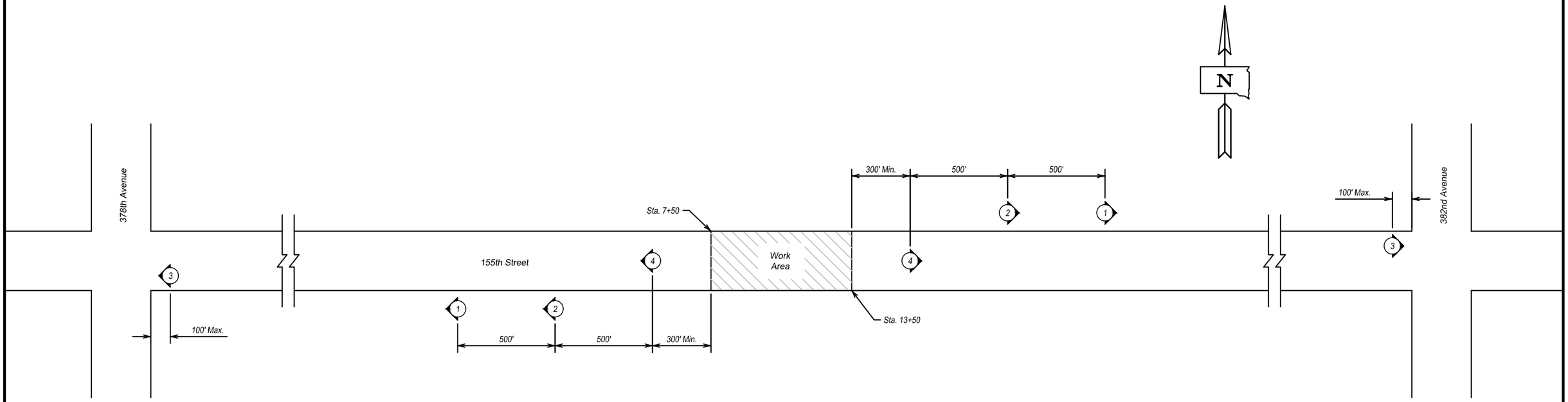
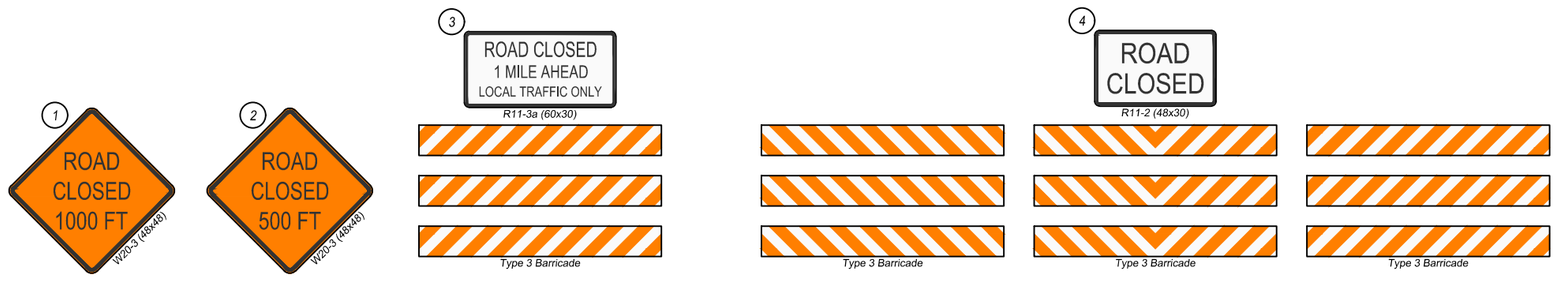
TRAFFIC CONTROL SIGNS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	14	40





ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R11-2	ROAD CLOSED	2	48" x 30"	10.0	20.0
R11-3a	ROAD CLOSED 1 MILE AHEAD LOCAL TRAFFIC ONLY	2	60" x 30"	12.5	25.0
W20-3	ROAD CLOSED 500 FT	2	48" x 48"	16.0	32.0
W20-3	ROAD CLOSED 1000 FT	2	48" x 48"	16.0	32.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			109.0

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24

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LEGEND

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	15	40

CONTROL LEGEND

Benchmark	
Control Point	

SANITARY SEWER LEGEND

Sanitary Manhole	
Sewer Cleanout	
Unknown Manhole	
Force Main	FM
Sanitary Sewer	

STORM SEWER LEGEND

Storm Inlet	
Storm Double Inlet	
Storm Manhole	
Flared End Section	
Downspout - Above Ground	AG
Downspout - Underground	UG
Storm Sewer	
Pipe Underdrain	

WATER LEGEND

Curb Stop	
Fire Hydrant	
Post Indicator Valve	PIV
Sprinkler Head	S
Sprinkler Box	V
Water Meter	W
Water Valve	
Water Well	W
Underground Water	W W

COMMUNICATIONS LEGEND

Fiber Optic Cable	FOC FOC
Telephone Manhole	T
Telephone Pedestal	T
Telephone Pole	
Telephone Line	T T
Cable Television Pedestal	C
Television Line	TV

GAS LEGEND

Gas Meter	G
Gas Valve	
Gas Line	G

GENERIC UTILITY LEGEND

Utility Manhole	U
Utility Marker	
Handhole (Single/Double)	H H H
Utility Line	UT UT

ELECTRIC LEGEND

Air Conditioner/Cooling Unit	A
Guy Pole	
Guy Wire	
Light Pole	
Vapor Light	
Electric Manhole	E
Electric Pedestal/Transformer	E
Electric Meter	E
Power Pole	
Power Pole with Light	
Power Pole with Meter	
Junction Box	J
Traffic Signal	
Traffic Cantilever	
Traffic Signal Controller	
Overhead Electric	OE OE
Underground Electric	E E

FENCING/POST LEGEND

Post/Bollard	P
Wire Fence	
Chain Link Fence	
Woven Wire Fence	
Guardrail	

SIGN/PARK LEGEND

Mail Box	
Single Post Sign	
Double Post Sign	
Flagpole	
ADA Stall	

VEGETATION LEGEND

Bush	
Coniferous Tree	
Deciduous Tree	
Tree Stump	
Edge of Woods	

EROSION CONTROL LEGEND

Erosion Control Blanket	
Erosion Control Wattles	
RipRap	
Silt Curtain	SC SC SC
Silt Fence	SF SF SF
Temporary Diversion Channel	

BOUNDARY

Found Corner	
Set Corner	
Section Line	
Quarter Line	
16th Line	
32nd Line	
Easement Line	
Right of Way Line	

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24

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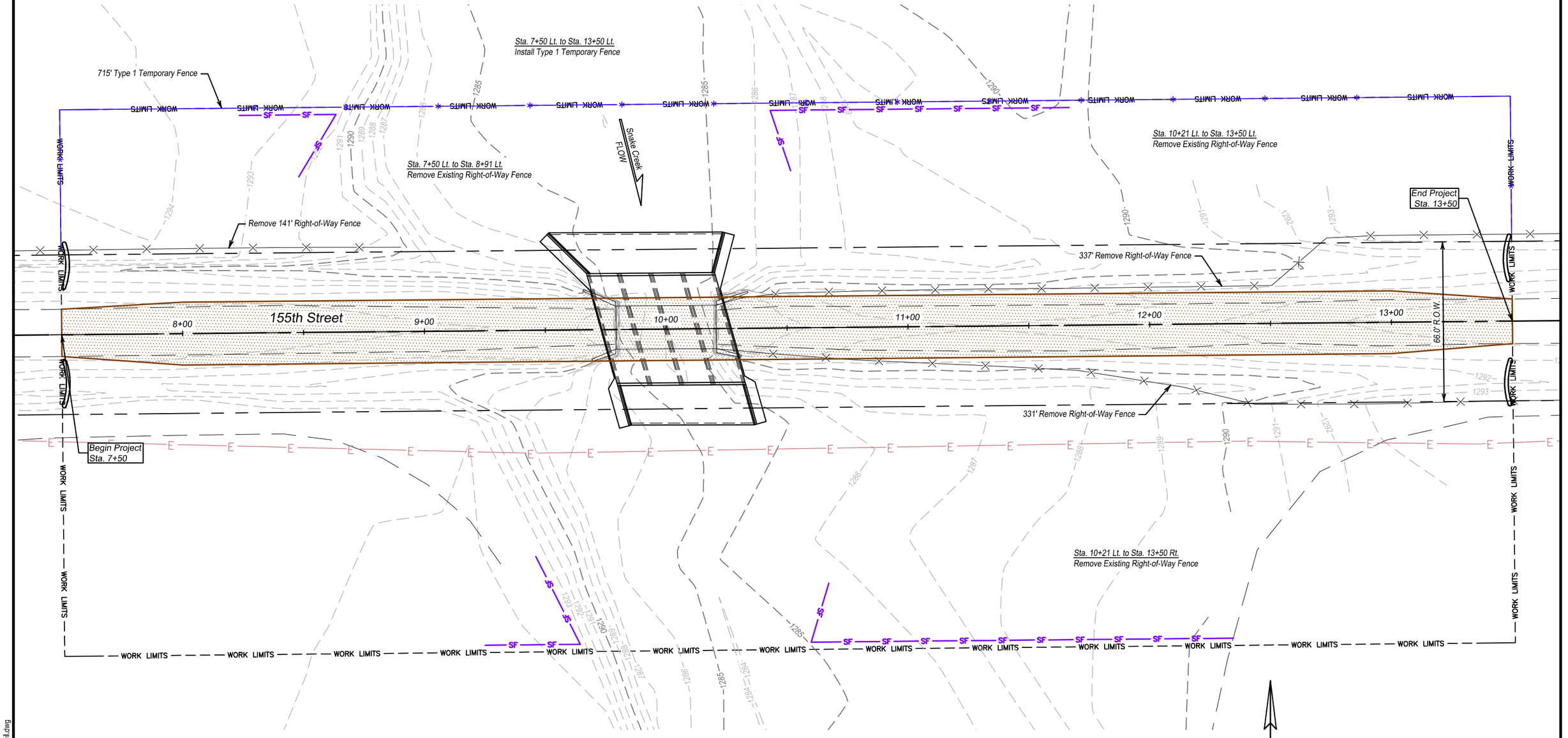
The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

TEMPORARY EROSION AND SEDIMENT CONTROL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	16	40



NOTES:
1. Stockpiles will be 10' from edge of bank.
2. Contractor is responsible for temporary erosion control for stockpiles.
3. Minimize exposed soil.
4. Waters of the United States are regulated by the Corps of Engineers.

EROSION CONTROL LEGEND

Erosion Control Wattle - 20'	
High Flow Silt Fence	SF

HIGH FLOW SILT FENCE

Sta. 8+24 - 90' Lt.	to	Sta. 8+49 - 64' Lt.	70'
Sta. 9+24 - 130' Rt.	to	Sta. 9+45 - 94' Rt.	80'
Sta. 10+52 - 65' Lt.	to	Sta. 11+67 - 90' Lt.	150'
Sta. 10+66 - 106' Rt.	to	Sta. 12+33 - 130' Rt.	200'
		Additional Quantity	50'
		Total	550'

TEMPORARY EROSION CONTROL WATTLES

Sta. 7+52	20' Rt.	20'
Sta. 7+53	28' Lt.	20'
Sta. 13+47	25' Rt.	20'
Sta. 13+47	26' Lt.	20'
	Additional Quantity	20'
	Total	100'

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24

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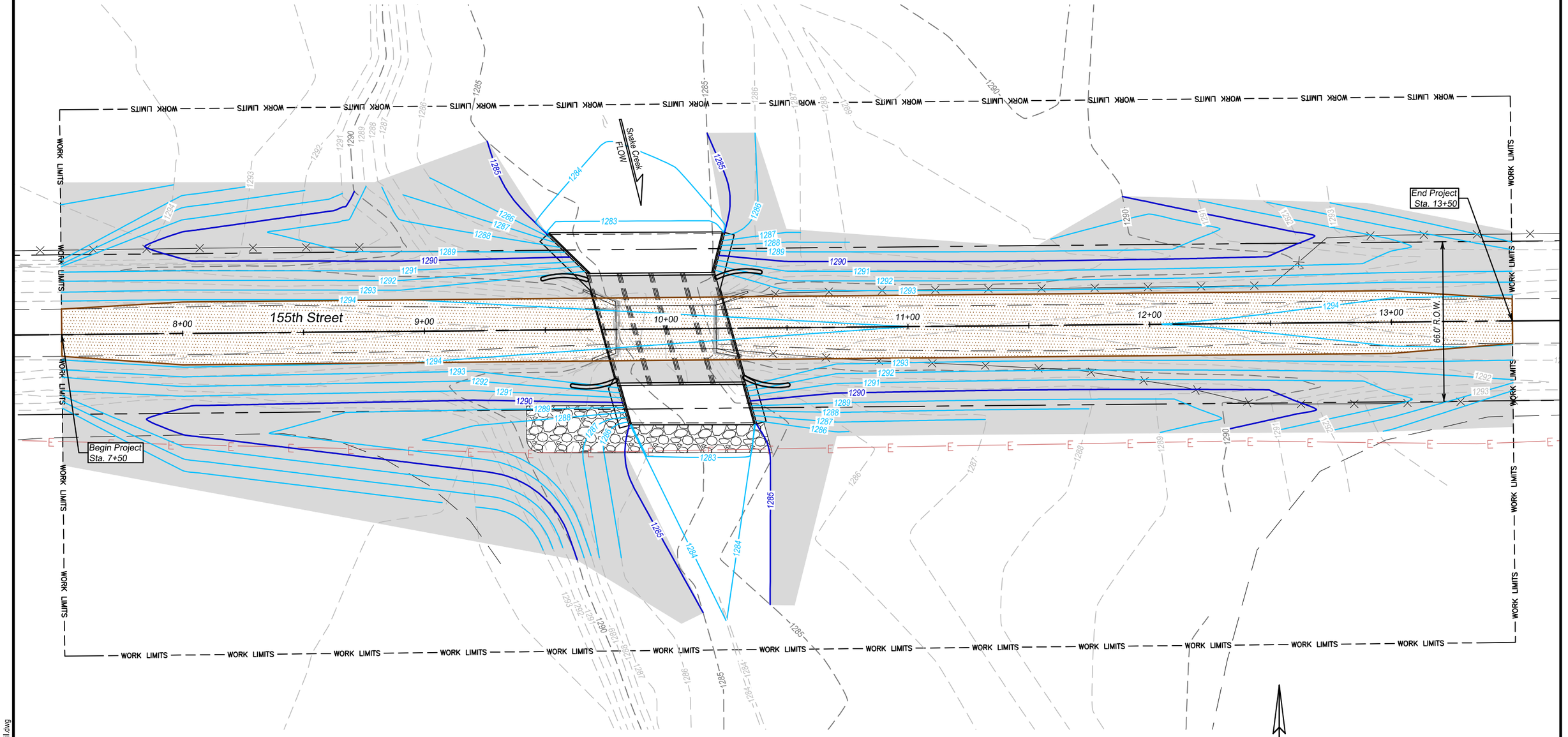
The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

PERMANENT EROSION AND SEDIMENT CONTROL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	17	40



NOTE:
1. Stabilization measures must begin within 24 hours of when earth disturbing activities have ceased.
2. See standard plate 734.30 for removal of temporary fills and temporary diversion channel.

EROSION CONTROL LEGEND

Type 2 Erosion Control Blanket	
Class B Riprap	
Erosion Control Wattle - 20'	

TYPE 2 EROSION CONTROL BLANKET

Sta. 7+50 Lt.	to	Sta. 13+50 Lt.	2437 Sq. Yd.
Sta. 7+50 Rt.	to	Sta. 13+50 Rt.	3001 Sq. Yd.
		Additional Quantity	562 Sq. Yd.
		Total	6000 Sq. Yd.

PERMANENT EROSION CONTROL WATTLES

Sta. 9+58	22' Lt.	20'
Sta. 9+70	24' Rt.	20'
Sta. 10+30	24' Lt.	20'
Sta. 10+41	24' Rt.	20'
	Additional Quantity	20'
	Total	100'

N

0 40'

Scale in Feet

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24

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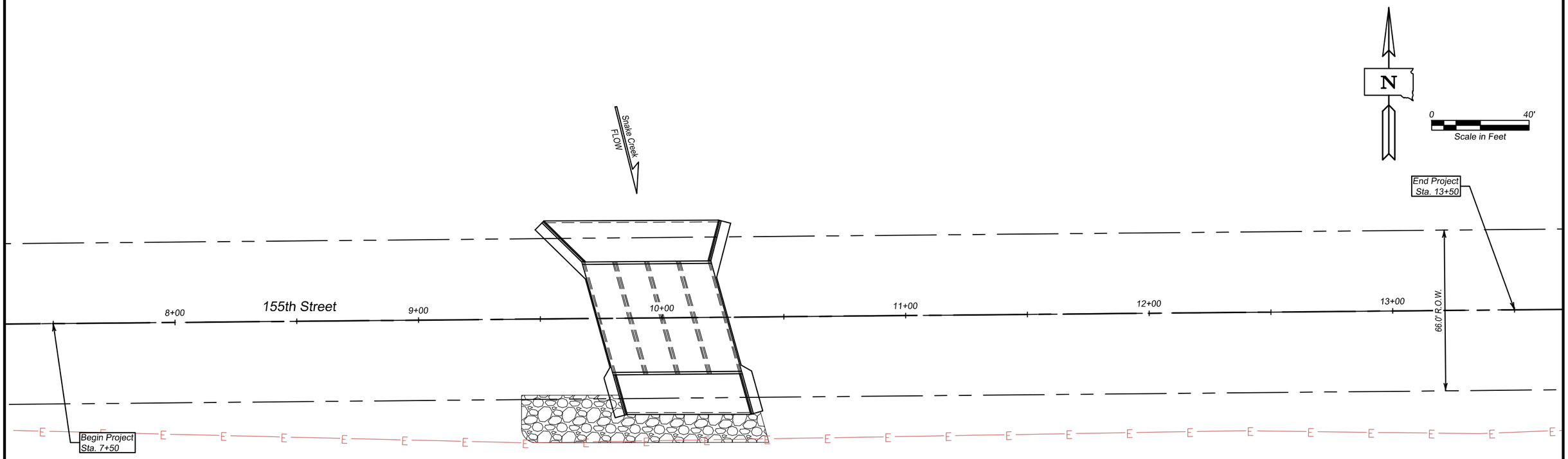
The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

HORIZONTAL AND VERTICAL CONTROL DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	18	40



HORIZONTAL ALIGNMENT DATA

Type	Sta.	Length	Direction	Northing (y)	Easting (x)
PI 1	-0+51.57			481038.61	2325645.81
		2642.48'	N 88°15'34.95" E		
PI 2	25+90.91			481118.86	2328287.07

HORIZONTAL/VERTICAL CONTROL POINTS

Point	Sta.	Offset	Northing (y)	Easting (x)	Elevation (z)	Description
CP 1	15+70.52	33.49' Lt.	481121.35	2327266.14	1293.27	5/8" Rebar
CP 2	4+40.97	35.97' Rt.	481017.61	2326139.21	1293.00	5/8" Rebar

NOTE: Coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System, North Zone (NAD 83/2011)

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15560
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24

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

PLAN AND PROFILE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	19	40

Sta. 7+50 - 35' Lt.
Begin Type 2 Right-of-Way Fence
4 - Two Post Panel

Sta. 9+58 - 33' Lt.
End Type 2 Right-of-Way Fence
Two Post Panel

Sta. 10+00 ℄ DA=349.0 Sq.Mi.
Install 4 - 12' x 9' x 46.4'
Cast-in-Place RCBC

Sta. 9+79 to Sta. 10+21
Remove Existing ±42'
Single Span Steel Pony Truss Bridge
(Incidental Work, Structure)

Install 208' Type 2 Right-of-Way Fence

Snake Creek FLOW

Sta. 10+22 - 33' Lt.
Begin Type 2 Right-of-Way Fence
Two Post Panel

Sta. 13+50 - 36' Lt.
End Type 2 Right-of-Way Fence
4 - Two Post Panel

Install 328' Type 2 Right-of-Way Fence

End Project
Sta. 13+50

155th Street

8+00 9+00 10+00 11+00 12+00 13+00

66.0' R.O.W.

Begin Project
Sta. 7+50

Install 315' Type 2 Right-of-Way Fence

Sta. 10+35 - 33' Rt.
Begin Type 2 Right-of-Way Fence
Two Post Panel

Sta. 13+50 - 33' Rt.
End Type 2 Right-of-Way Fence
Two Post Panel

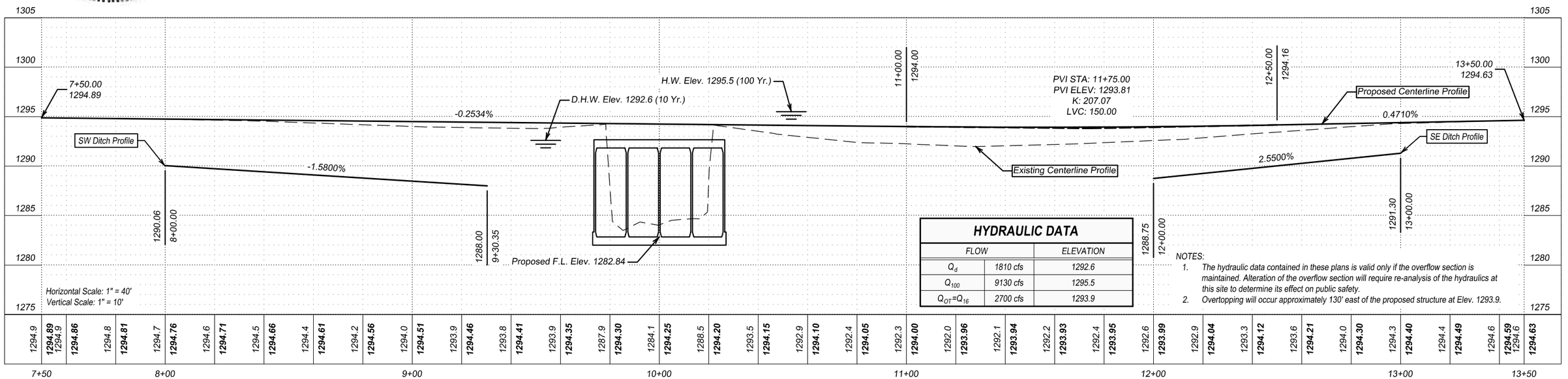
N

0 40'
Scale in Feet

RCBC Install	1066 Cu. Yd.		Embankment	2085 Cu. Yd.
Excavation	1539 Cu. Yd.		+35% Shrinkage	730 Cu. Yd.
Other Excavation	720 Cu. Yd.		Waste	831 Cu. Yd.
Contractor Furnished Borrow Excavation	321 Cu. Yd.			
Total	3646 Cu. Yd.		Total	3646 Cu. Yd.

Gravel Surfacing

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24



HYDRAULIC DATA

FLOW		ELEVATION
Q_d	1810 cfs	1292.6
Q_{100}	9130 cfs	1295.5
$Q_{OT}=Q_{16}$	2700 cfs	1293.9

NOTES:
1. The hydraulic data contained in these plans is valid only if the overflow section is maintained. Alteration of the overflow section will require re-analysis of the hydraulics at this site to determine its effect on public safety.
2. Overtopping will occur approximately 130' east of the proposed structure at Elev. 1293.9.

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

ROW LAYOUT

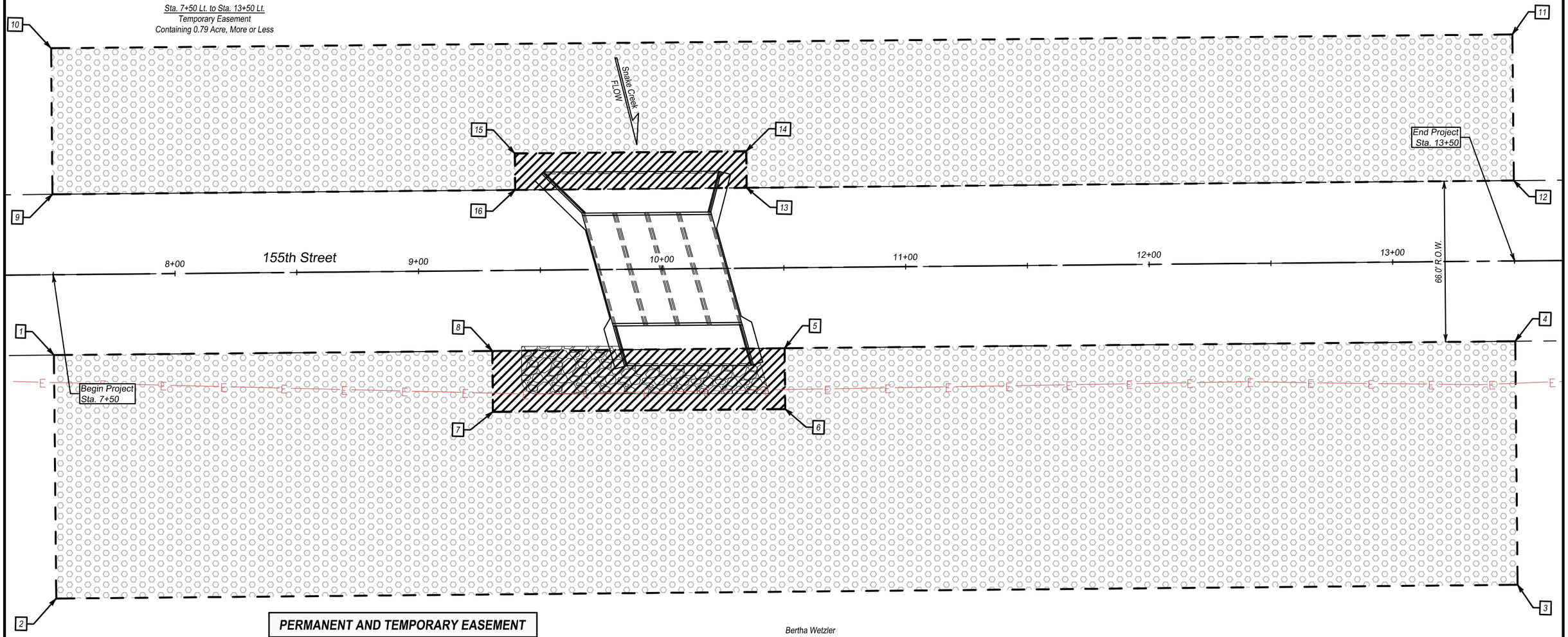
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	20	40

Boekelheide & Sons, Inc.
37938 155th Street
Northville, South Dakota 57465

The SW1/4 of Section 1, Township 119 N, Range 65 W, Spink County, South Dakota

Sta. 9+40 Lt. to Sta. 10+35 Lt.
Permanent Easement
Containing 0.03 Acre, More or Less

Sta. 7+50 Lt. to Sta. 13+50 Lt.
Temporary Easement
Containing 0.79 Acre, More or Less



PERMANENT AND TEMPORARY EASEMENT

	Sta.	Offset	Northing (y)	Easting (x)
1	7+50.00	33.00' Rt.	481029.97	2326448.01
2	7+50.00	133.00' Rt.	480930.02	2326451.05
3	13+50.00	133.00' Rt.	480948.24	2327050.77
4	13+50.00	33.00' Rt.	481048.19	2327047.73
5	10+50.00	33.00' Rt.	481039.08	2326747.87
6	10+50.00	58.00' Rt.	481014.09	2326748.63
7	9+30.00	58.00' Rt.	481010.45	2326628.69
8	9+30.00	33.00' Rt.	481035.44	2326627.93
9	7+50.00	33.00' Lt.	481095.94	2326446.01
10	7+50.00	93.00' Lt.	481155.91	2326444.18
11	13+50.00	93.00' Lt.	481174.14	2327043.91
12	13+50.00	33.00' Lt.	481114.16	2327045.73
13	10+35.00	33.00' Lt.	481104.60	2326730.87
14	10+35.00	48.00' Lt.	481119.59	2326730.42
15	9+40.00	48.00' Lt.	481116.70	2326635.46
16	9+40.00	33.00' Lt.	481101.71	2326635.92

Bertha Wetzler
4475 Laguna Road #312-A
Boulder, Colorado 80303

The N 1/2 of Section 12, Township 119 N, Range 65 W, Spink County, South Dakota

LEGEND

Permanent Easement	
Temporary Easement	

NOTE: Coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System, North Zone (NAD 83/2011)

Sta. 9+30 Rt. to Sta. 10+50 Rt.
Permanent Easement
Containing 0.07 Acre, More or Less

Sta. 7+50 Rt. to Sta. 13+50 Rt.
Temporary Easement
Containing 1.31 Acres, More or Less

Sta. 7+50 to Sta. 13+50
Work limits are within ROW and Easements

N

0 40'
Scale in Feet

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24

Plotted on: 4/1/24 7:52:41 AM Plotted by: Joshua R. Prather
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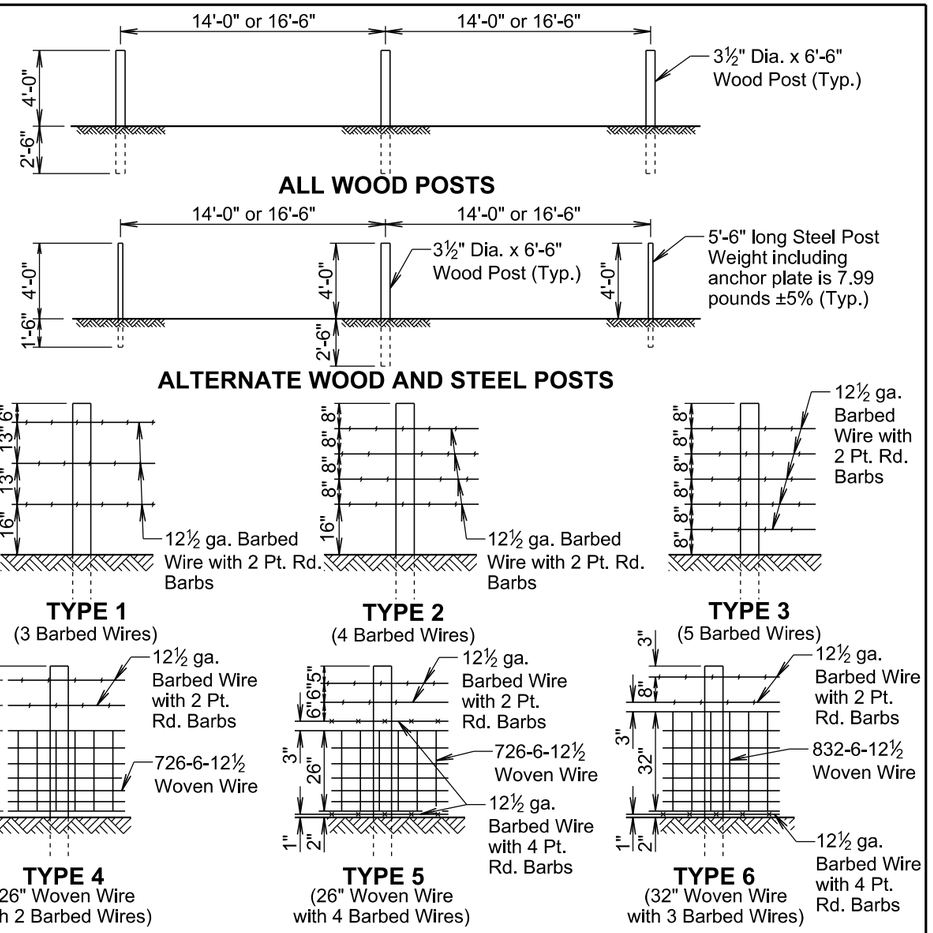


TYPE OF FENCE		LINE POST SPACING	BARBED WIRE		WOVEN WIRE
TYPE	DESCRIPTION		WIRE GAGE	NUMBER AND SHAPE OF BARBS	STYLE OR DESIGN NO.
1	3 Barbed Wires	16'-6"	12½	2 Point Round	—
2	4 Barbed Wires	16'-6"	12½	2 Point Round	—
3	5 Barbed Wires	16'-6"	12½	2 Point Round	—
4	26" Woven Wire with 2 Barbed Wires	14'-0"	12½	2 Point Round	726-6-12½
5	26" Woven Wire with 4 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 2 wires with 4 Pt. Rd.	726-6-12½
6	32" Woven Wire with 3 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 1 wire with 4 Pt. Rd.	832-6-12½

GENERAL NOTES:

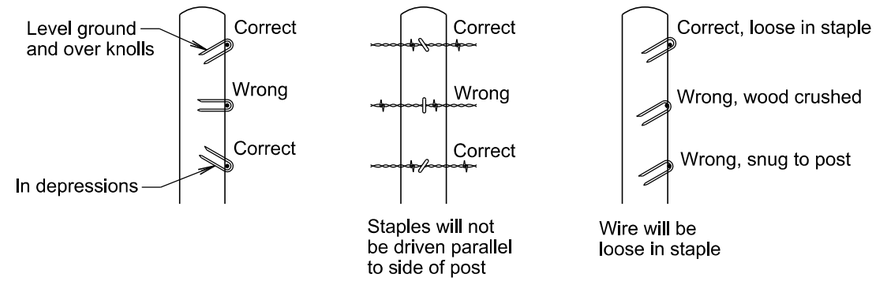
Fence types designated on the plans that are followed by the letter S will have smooth (barbless) wires.

When type 5S or 6S is designated the bottom wire may be barbed, smooth, or left off.

All degrees of curvature stated for fence are at centerline of roadway.

June 26, 2019

Published Date: 2024	SDDOT	*RIGHT-OF-WAY FENCE*	*PLATE NUMBER* 620.01
			Sheet 1 of 1



STAPLE INSTALLATION

GENERAL NOTES:

The Right-of-Way fence will consist of barbed wire or a combination of woven wire and barbed wire. The barbed wire and/or woven wire will be fastened to all wood posts or fastened to alternating wood and steel posts. Only wood posts will be used for brace panels. Gates will be of the type designated in the plans or as otherwise directed by the Engineer. Fence will be constructed conforming to the details on the standard plates and in the plans unless otherwise directed by the Engineer.

Right-of-Way fence on Interstate Projects will be constructed one foot within the Interstate Right-of-Way lines except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

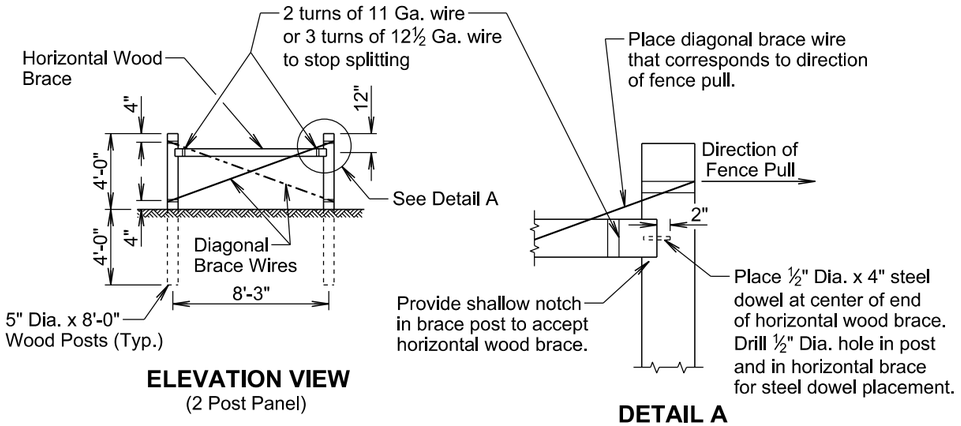
Right-of-Way fence other than on Interstate Projects will be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Barbs will be fabricated from zinc coated 14 ga. wire. Two point barbs will be wrapped twice around one main strand at four-inch spacings and the four point barbs will be interlocked and wrapped around both main strands at five-inch spacings.

The gages of wire and wood post lengths and sizes are the minimum acceptable unless otherwise specified in the plans. The tolerances for steel posts will be as stated in AASHTO M281. Woven wire will conform to design and specifications of ASTM A116 and barbed wire will conform to ASTM A121.

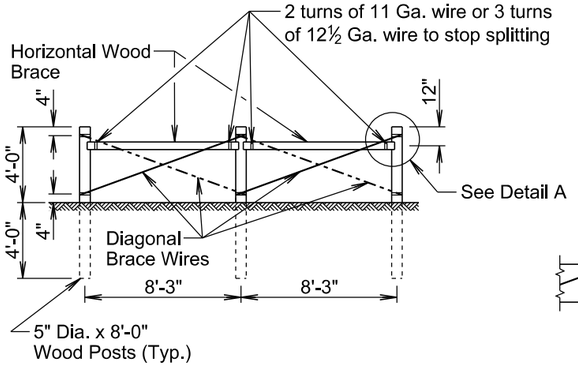
June 26, 2019

Published Date: 2024	SDDOT	*STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES*	*PLATE NUMBER* 620.02
			Sheet 1 of 1

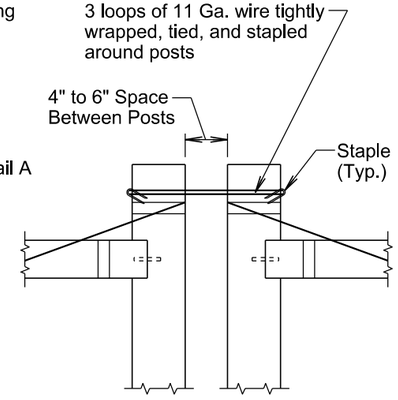


ELEVATION VIEW
(2 Post Panel)

DETAIL A



ELEVATION VIEW
(3 Post Panel)



DETAIL B

GENERAL NOTES:

Two Post Panels will be installed at least every 1320' between corners.

Two Post Panels will be installed at any sharp vertical angle crest points and as directed by the Engineer.

Horizontal wood braces will consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.

Diagonal brace wires will be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires will be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

January 22, 2023

Published Date: 2024	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 1 of 3

SPACING OF 2 POST PANELS WITHIN CURVES	
RADIUS OF CURVE	SPACING OF 2 POST PANEL
Greater than 1800 Ft.	** 1320'
Less than 1800 Ft.	** At P.C., P.T., and at every 1320' between P.C. and P.T.

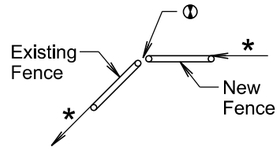
** Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.

① See Detail B on Sheet 1 of 3.

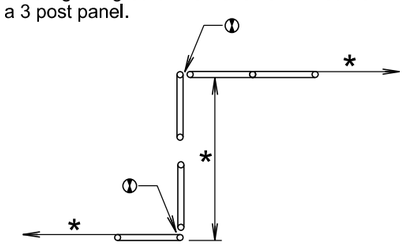
GENERAL NOTE:

All degrees of curvature stated for fence are at centerline of roadway.

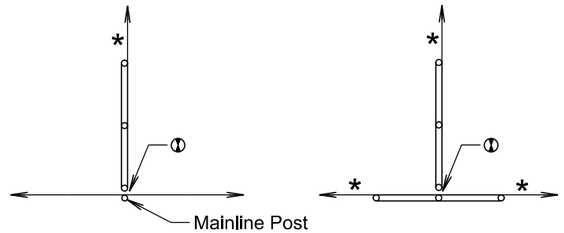
If fence length is less than 600' to next corner use a 2 post panel.
* If fence length is greater than 600' to next corner use a 3 post panel.



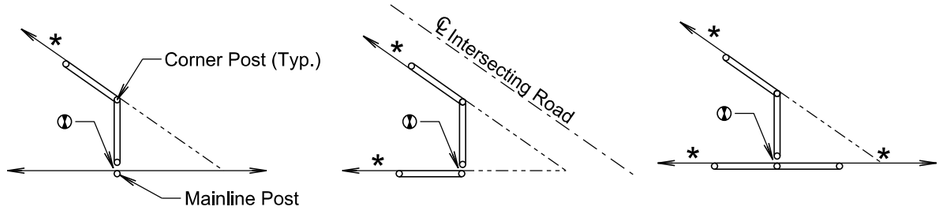
BEGIN OR END FENCE
(Where new fence ties into existing fence)



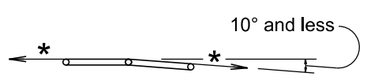
SHORT JOGS IN FENCE



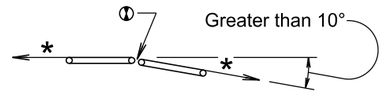
CROSS FENCE



SHARP ANGLES IN CROSS FENCE



Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.



Additional fence panel is required when an angle in the mainline fence is greater than 10°.

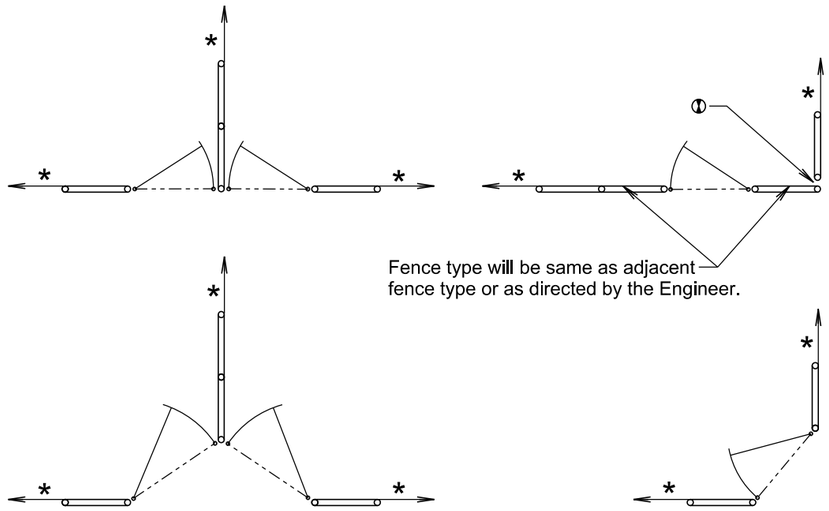
ANGLES IN MAINLINE FENCE

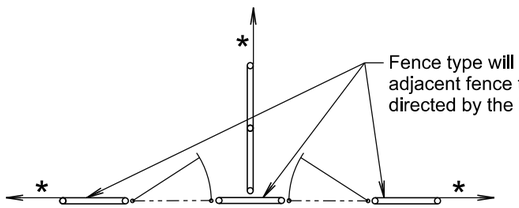
January 22, 2023

Published Date: 2024	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 2 of 3

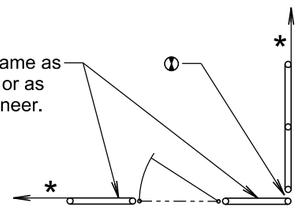
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	23	40

ENTRANCE
(Not on corner)





DOUBLE ENTRANCES



ENTRANCES AT CORNERS

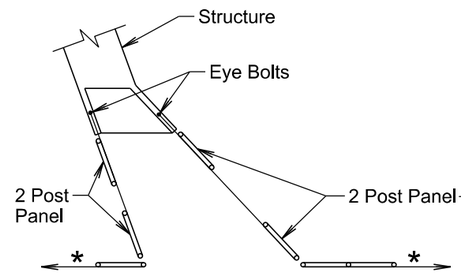
GATES

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

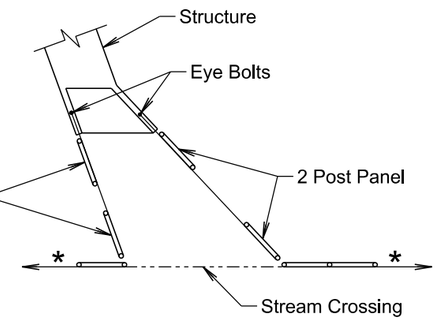
① See Detail B on Sheet 1 of 3.

January 22, 2023

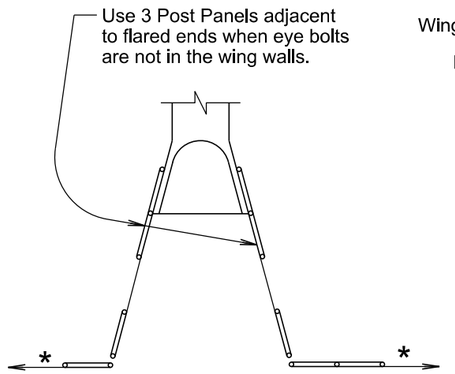
Published Date: 2024	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 3 of 3



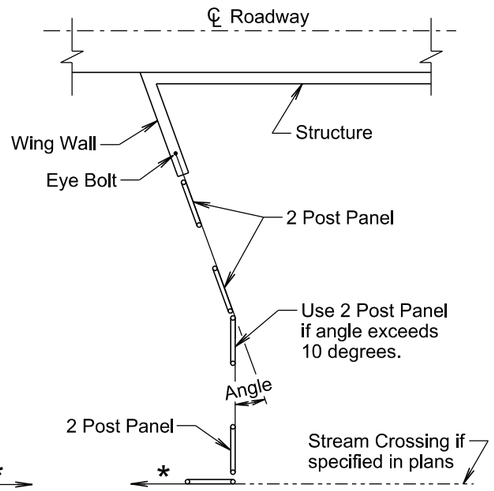
R.C. BOX CULVERT OR CATTLE PASS



STRUCTURE WITH STREAM CROSSING FENCE



R.C. BOX CULVERT OR CATTLE PASS

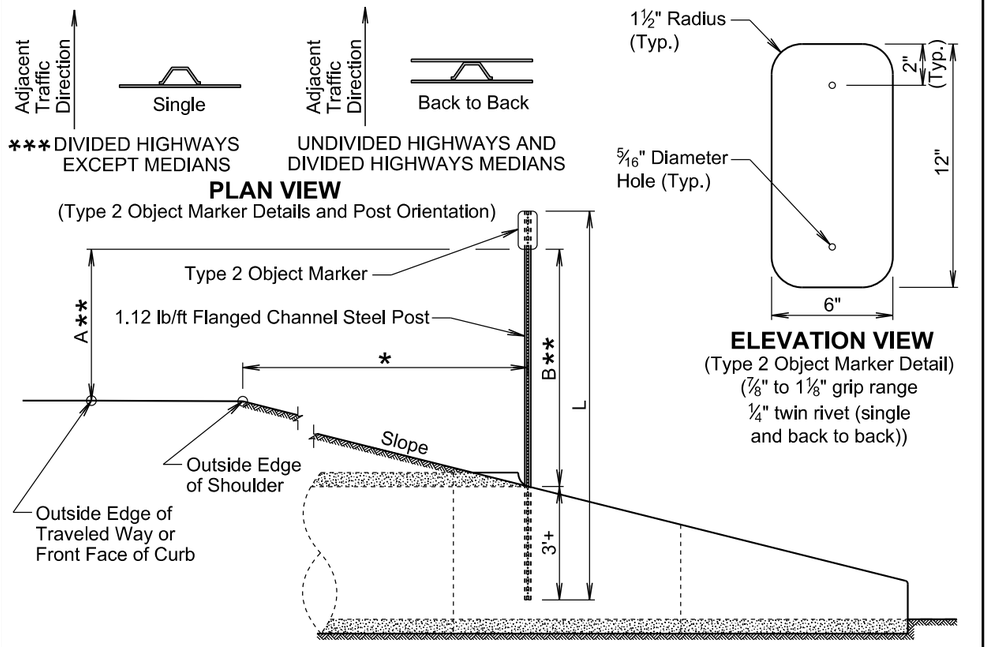


BRIDGE

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' use a 3 post panel.

June 26, 2019

Published Date: 2024	SDDOT	BRACE PANEL APPLICATIONS AT STRUCTURES	PLATE NUMBER 620.04
			Sheet 1 of 1



TYPE 2 OBJECT MARKER POST LENGTHS									
OFFSET (*)		1'	2'	3'	4'	5'	6'	7'	8'	Greater Than 8'
		POST LENGTH (L)								
SLOPE	3:1	8'-6"	8'-9"	9'-3"	9'-6"	9'-9"	10'-3"	10'-6"	10'-9"	8'-0"
	4:1	8'-6"	8'-9"	9'-0"	9'-3"	9'-9"	9'-9"	10'-0"	10'-3"	8'-0"
	5:1	8'-3"	8'-6"	8'-9"	9'-0"	9'-3"	9'-3"	9'-6"	9'-9"	8'-0"
	6:1	8'-3"	8'-6"	8'-9"	8'-9"	9'-0"	9'-3"	9'-3"	9'-6"	8'-0"

GENERAL NOTES:

*** The type 2 object marker may be installed back to back when specified in the plans.

Post Length L was calculated based on a shoulder width of 6 feet at a crosslope of 4 percent and L was rounded up to the nearest 3 inches.

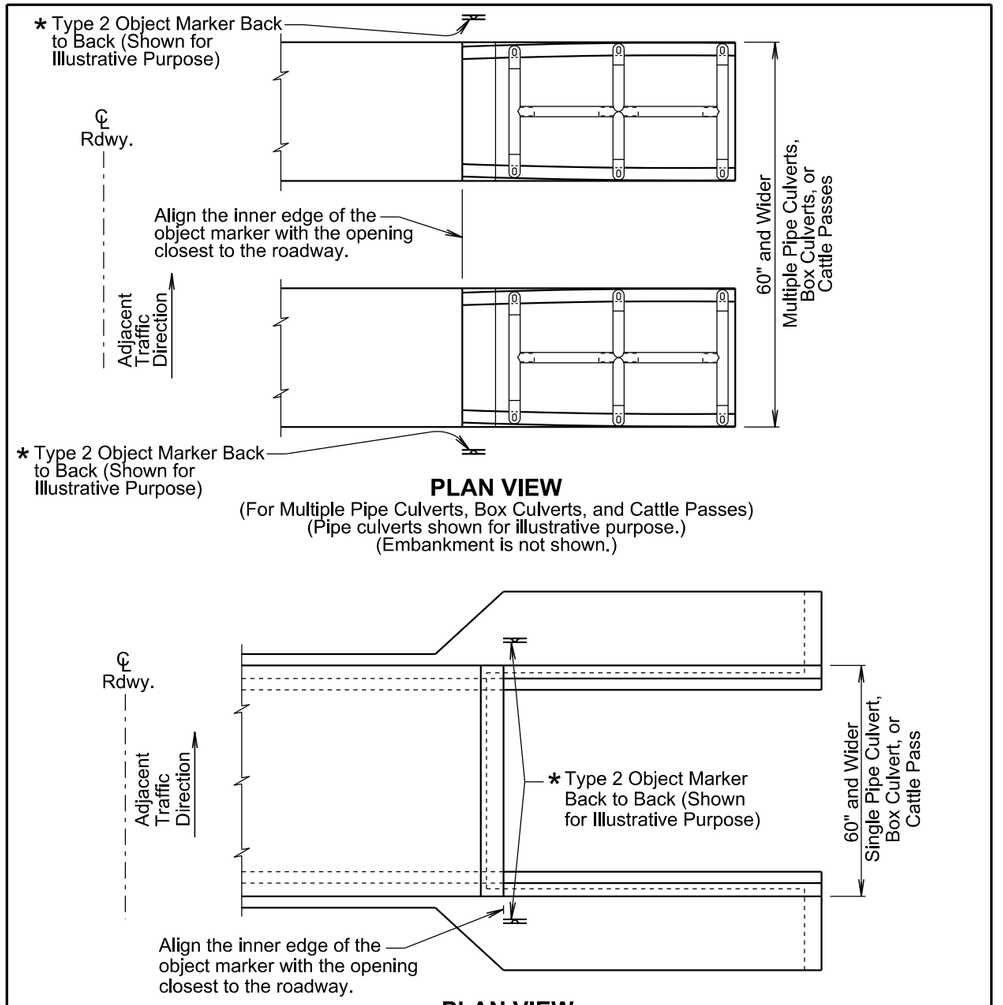
** Dimension A is 4 feet when the Offset * is 8 feet and less. Dimension B is 4 feet when Offset * is greater than 8 feet.

The type 2 object marker and the 1.12 lb/ft flanged channel steel post will be in conformance with Specifications Section 982.2 J.

Payment for the type 2 object marker will be in conformance with Specification Section 632.5 B.

December 23, 2019

Published Date: 2024	SDDOT	TYPE 2 OBJECT MARKER (DIRECT DRIVE)	PLATE NUMBER 632.01 Sheet 1 of 1



GENERAL NOTES:

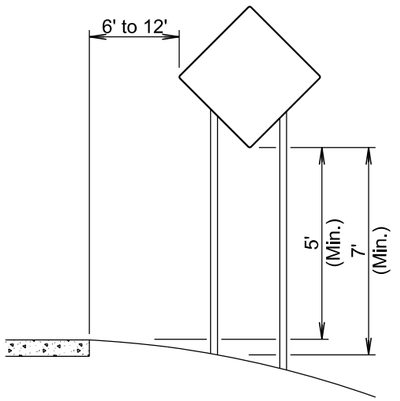
This standard plate will be used in conjunction with standard plate 632.01.

* The type 2 object markers will be installed at the locations shown above. The type 2 object markers, single faced or back to back, will be as specified in the plans.

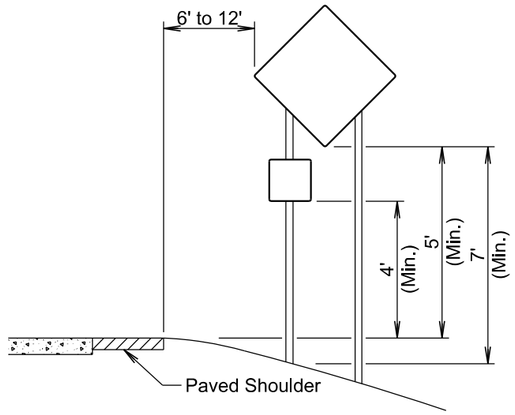
December 23, 2019

Published Date: 2024	SDDOT	TYPE 2 OBJECT MARKER AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES (60" and Greater Overall Width)	PLATE NUMBER 632.04 Sheet 1 of 1

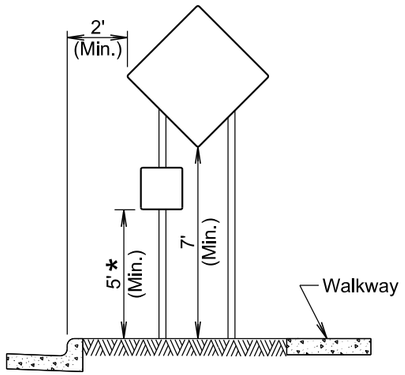
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	25	40



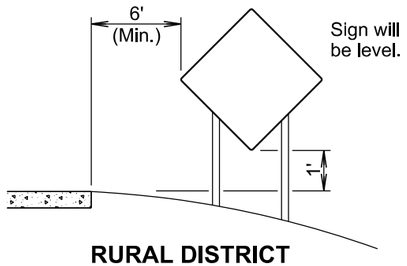
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

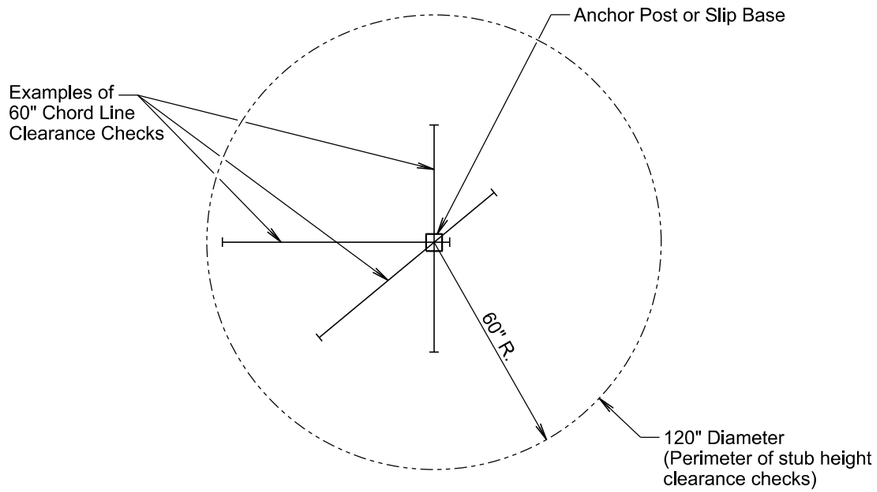


RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

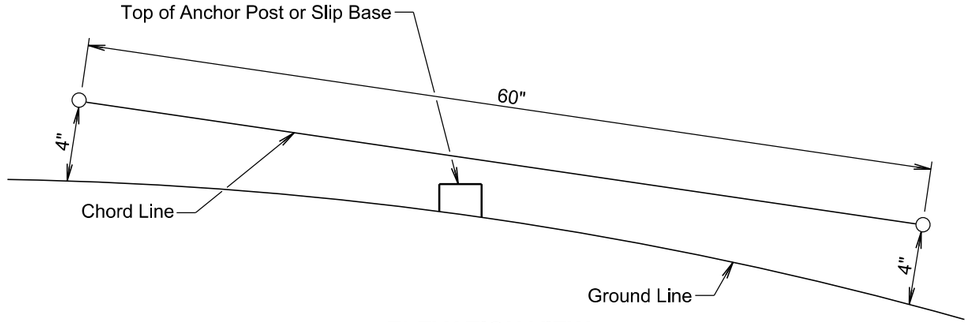
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

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



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

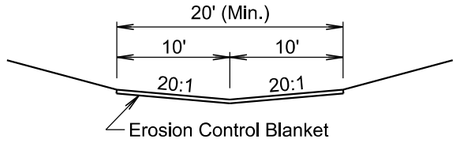
The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

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.

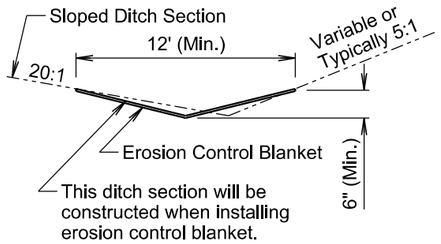
The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

January 22, 2021

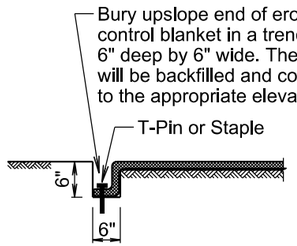
Published Date: 2024	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1



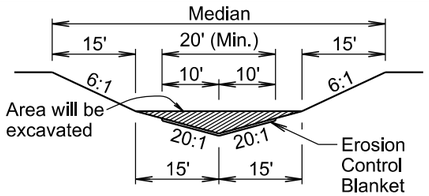
STANDARD DITCH SECTION



SLOPED DITCH SECTION

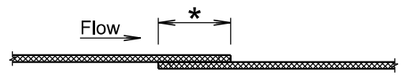


TRENCH DETAIL



The median will be shaped to the limits shown in this detail where the erosion control blanket will be placed.

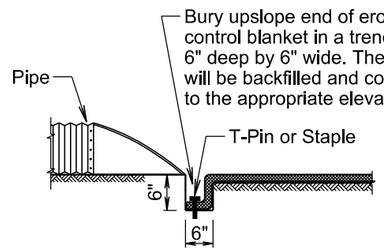
MEDIAN SECTION



* Use a 4" (Min.) overlap wherever two widths of erosion control blanket are applied side by side.

* Use a 6" (Min.) overlap wherever one roll of erosion control blanket ends and another begins.

OVERLAP DETAIL



PIPE END DETAIL

GENERAL NOTES:

Prior to placement of the erosion control blanket, the areas will be properly prepared, shaped, seeded, and fertilized.

Erosion control blanket will be unrolled in the direction of the flow of water when placed in ditches and on slopes. The upslope end of the erosion control blanket will be buried in a trench 6" wide by 6" deep. There will be at least a 6" overlap wherever one roll of erosion control blanket ends and another begins, with the upslope erosion control blanket placed on top of the downslope erosion control blanket.

The erosion control blanket will be pinned to the ground according to the manufacturer's installation recommendations.

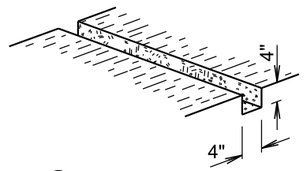
After the placement of the erosion control blanket, the Contractor will fine grade along all edges of the blanket to maintain a uniform slope adjacent to the blanket and level any low spots which might prevent uniform and unrestricted flow of side drainage directly onto the erosion control blanket.

All ditch sections will be shaped when installing the erosion control blanket. All costs for shaping the ditches will be incidental to the contract unit price per foot for "Shaping for Erosion Control Blanket".

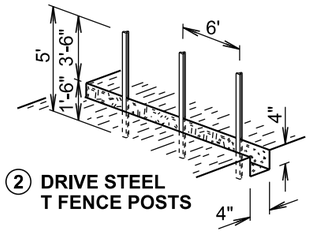
February 14, 2020

Published Date: 2024	SDDOT	EROSION CONTROL BLANKET	PLATE NUMBER 734.01 Sheet 1 of 1

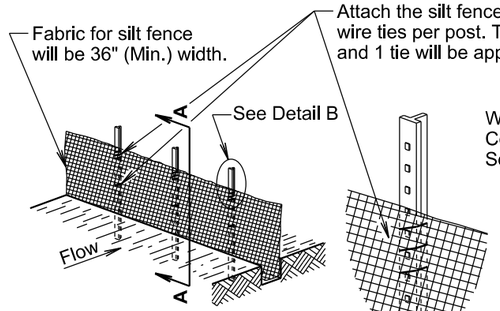
MANUAL HIGH FLOW SILT FENCE INSTALLATION



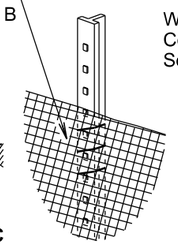
① EXCAVATE TRENCH



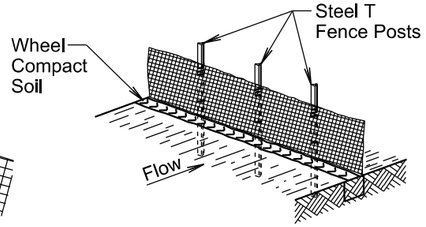
② DRIVE STEEL T FENCE POSTS



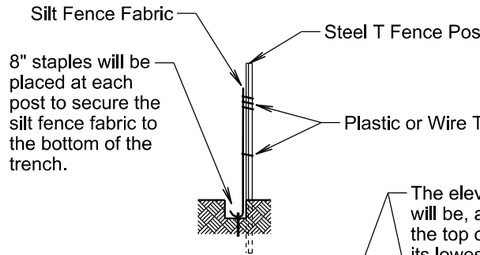
③ ATTACH SILT FENCE FABRIC



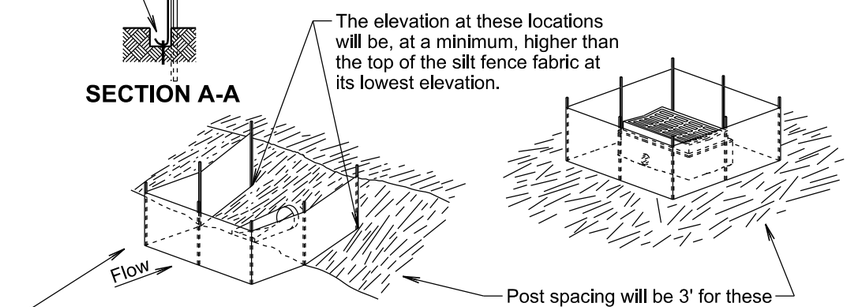
DETAIL B



④ BACKFILL TRENCH AND WHEEL COMPACT SOIL



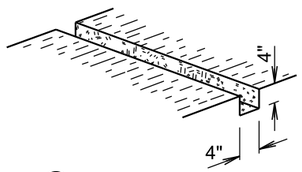
SECTION A-A



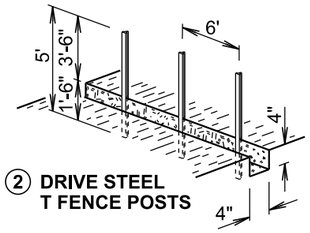
February 14, 2020

Published Date: 2024	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05 Sheet 1 of 2

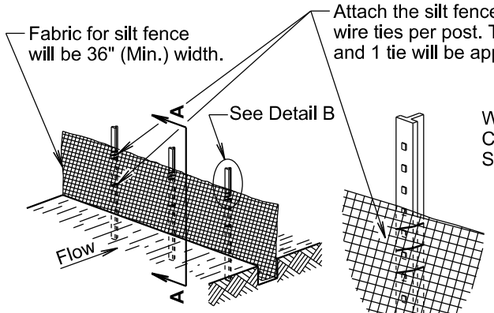
MANUAL HIGH FLOW SILT FENCE INSTALLATION



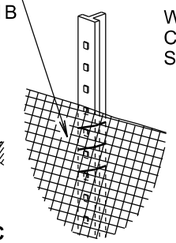
① EXCAVATE TRENCH



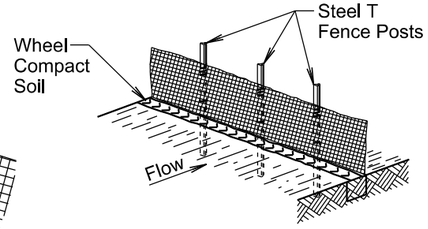
② DRIVE STEEL T FENCE POSTS



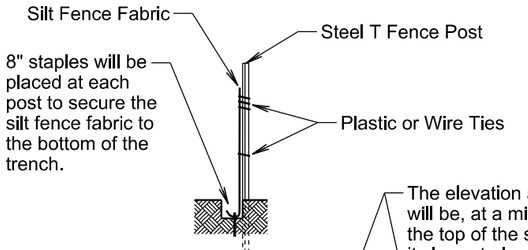
③ ATTACH SILT FENCE FABRIC



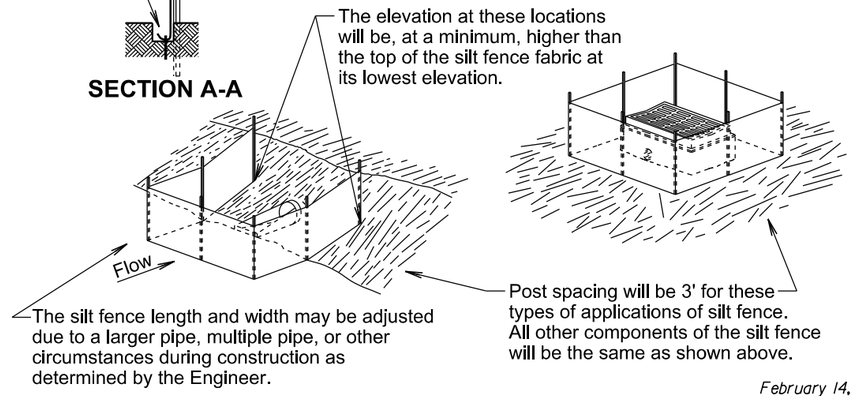
DETAIL B



④ BACKFILL TRENCH AND WHEEL COMPACT SOIL

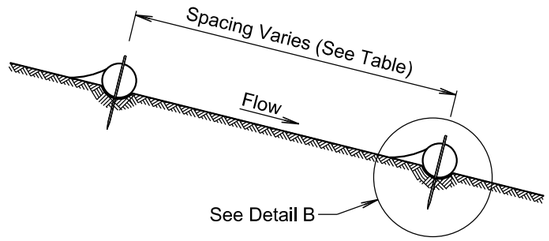


SECTION A-A



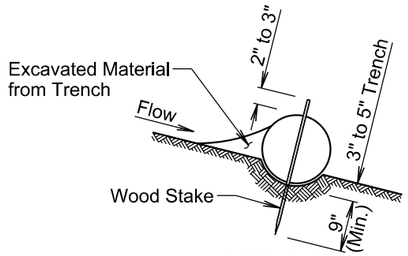
February 14, 2020

Published Date: 2024	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 1 of 2

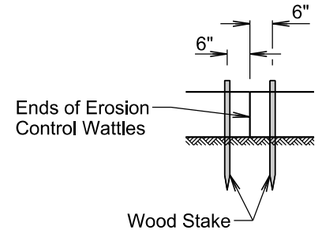


ELEVATION VIEW
(Cut or Fill Slope Installation)

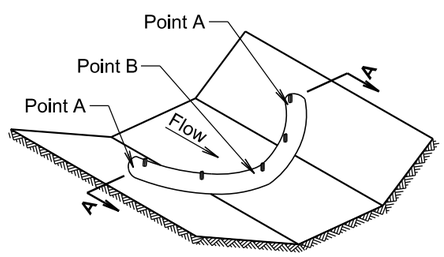
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft.)
1:1	10
2:1	20
3:1	30
4:1	40



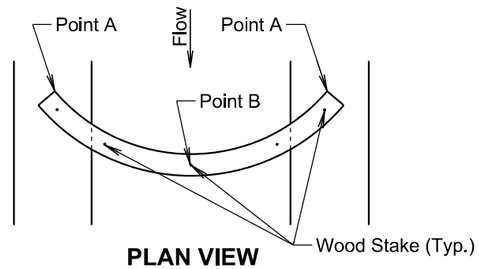
DETAIL B
(Typical of All Installations)



DETAIL C
(See General Notes)

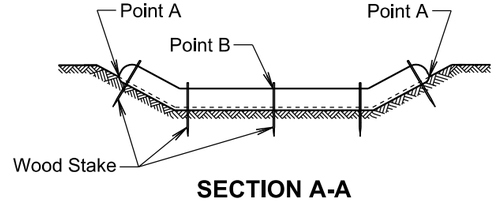


ISOMETRIC VIEW
(Ditch Installation)



PLAN VIEW
(Ditch Installation)

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

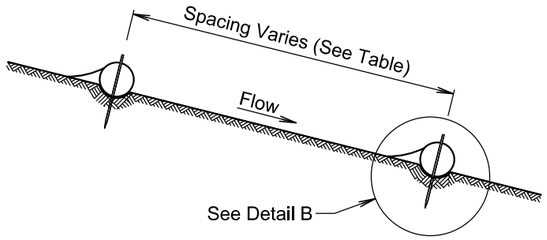


SECTION A-A

February 14, 2020

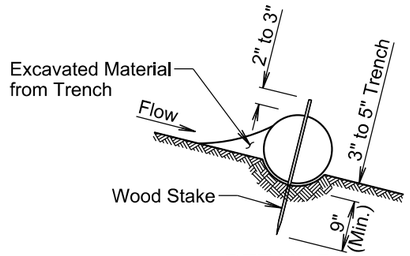
Published Date: 2024	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	28	40

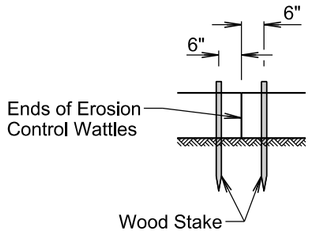


ELEVATION VIEW
(Cut or Fill Slope Installation)

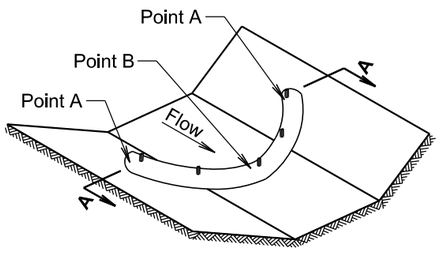
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft.)
1:1	10
2:1	20
3:1	30
4:1	40



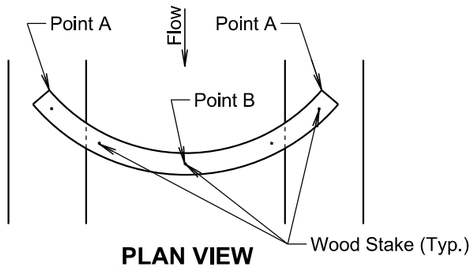
DETAIL B
(Typical of All Installations)



DETAIL C
(See General Notes)

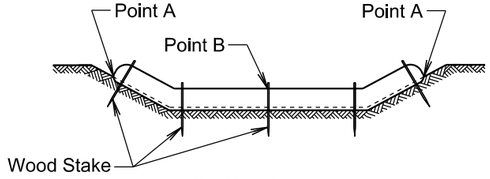


ISOMETRIC VIEW
(Ditch Installation)



PLAN VIEW
(Ditch Installation)

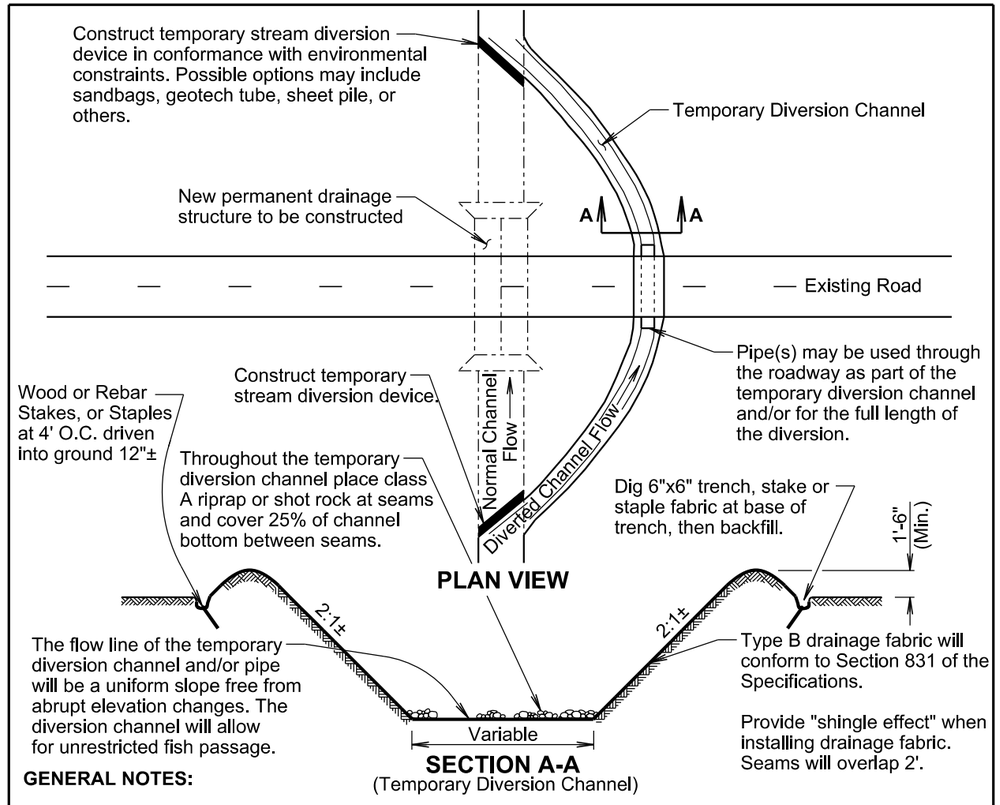
DITCH INSTALLATION	
Grade	Spacing (Ft.)
2%	150
3%	100
4%	75
5%	50



SECTION A-A

February 14, 2020

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



SECTION A-A
(Temporary Diversion Channel)

GENERAL NOTES:

A temporary diversion channel and/or pipe(s) will be used to divert stream or drainage away from a construction area to provide a dry work area for construction. The diversion of streams and waterways is intended to protect the streams and waterways from various construction contaminants and sediment. Disturbing the existing stream channel and riparian zone should be minimized. Equipment will not cross through the stream outside of the work area.

Sizing of the temporary diversion channel and/or pipe(s) will be the Contractor's responsibility.

The method and materials used to construct the stream diversion device will be the Contractor's responsibility, however, earthen berms are not acceptable since their removal causes siltation problems.

The Contractor will restore the original channel bottom to its original condition prior to returning any flows. Upon completion of the new permanent drainage structure, the temporary stream diversion block or device will be removed in a manner that will not cause violation of water quality standards. The temporary diversion channel will then be backfilled and any pipe(s) (if used) will be removed. The entire work area will be cleaned and restored to smooth/even contours.

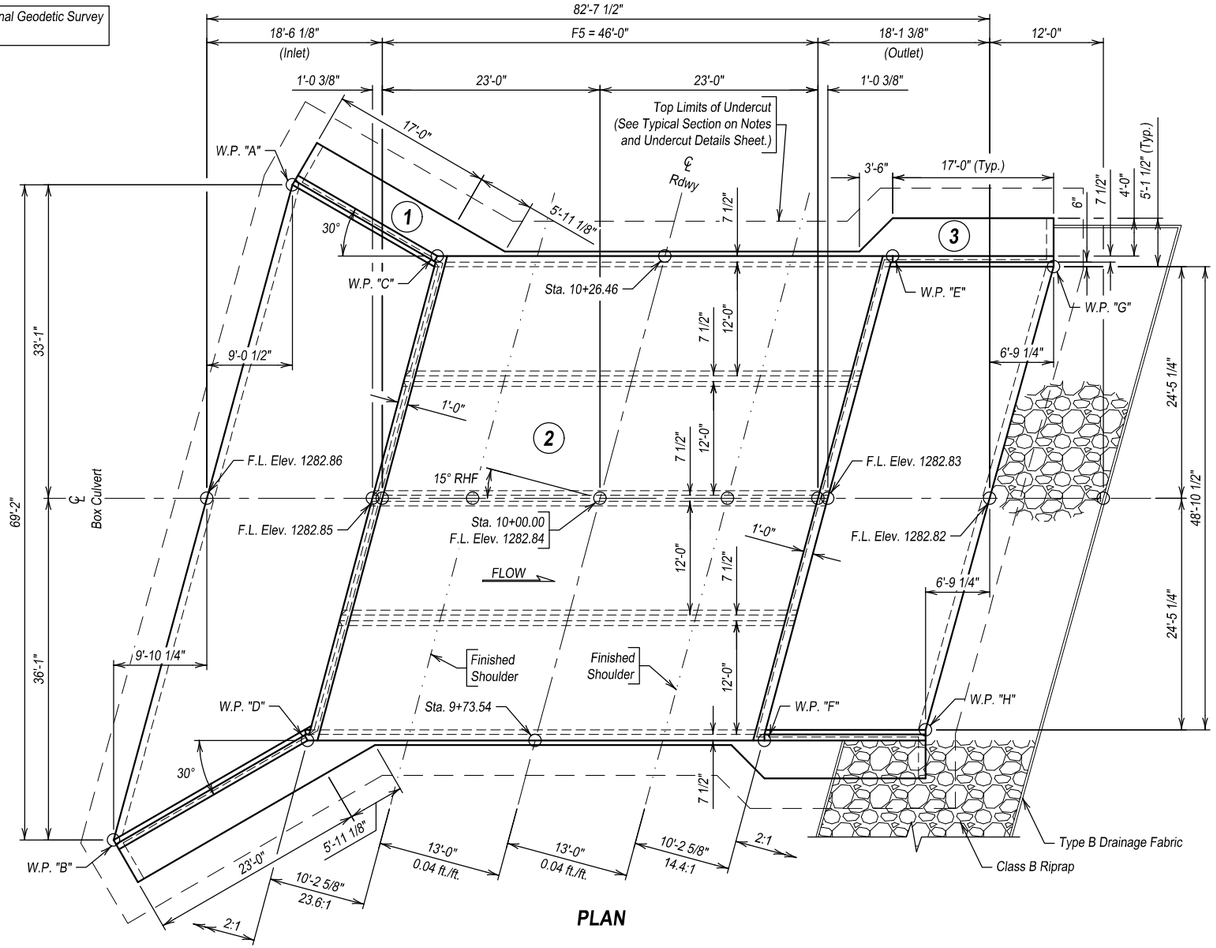
All costs for labor, equipment, materials, and incidentals as indicated on this sheet to complete a satisfactory temporary diversion channel and/or pipe(s) will be incidental to the contract unit price per each for "Temporary Diversion Channel For Fish Passage". "Temporary Diversion Channel For Fish Passage" will be paid for once per structure site regardless of the number of times water is diverted at the individual site.

February 14, 2020

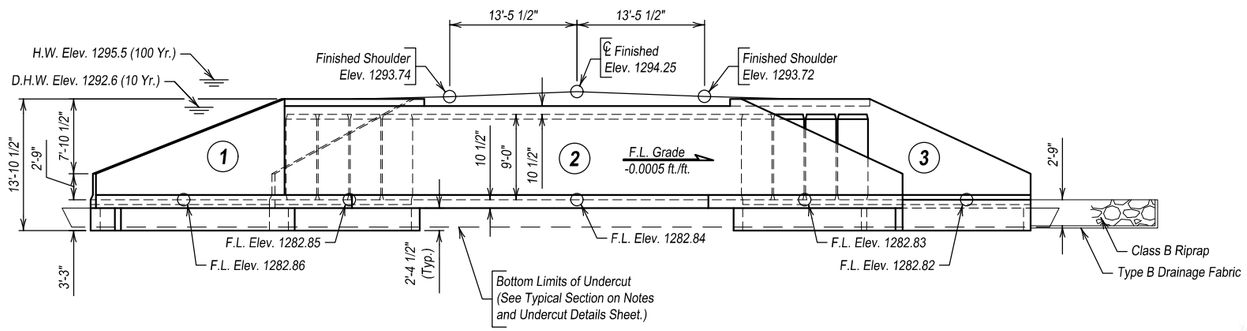
Published Date: 2024	SDDOT	TEMPORARY DIVERSION CHANNEL FOR FISH PASSAGE	PLATE NUMBER 734.30
			Sheet 1 of 1

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	29	40



PLAN



ELEVATION

-X028-

INDEX OF CULVERT SHEETS

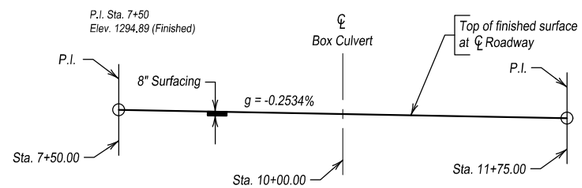
Sheet No. 1 - General Drawing and Quantities
Sheet No. 2 - Notes and Undercut Details
Sheet No. 3 - Inlet Details (A)
Sheet No. 4 - Inlet Details (B)
Sheet No. 5 - Outlet Details (A)
Sheet No. 6 - Outlet Details (B)
Sheet No. 7 - F5 Barrel Section Details (A)
Sheet No. 8 - F5 Barrel Section Details (B)
Sheet No. 9 - Standard Plates No.'s 460.02 and 620.16

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
	Incidental Work, Structure	LS	Lump Sum
	Structure Excavation, Box Culvert	Cu. Yd.	152
ϕ	Box Culvert Undercut	Cu. Yd.	418
	Class A45 Concrete, Box Culvert	Cu. Yd.	308.3
	Reinforcing Steel	Lb.	42590
Δ	Class B Riprap	Ton	210
	Type B Drainage Fabric	Sq. Yd.	236
	Reinforcement Fabric (MSE)	Sq. Yd.	609

ϕ For payment, quantity is based on plan shown undercut dimensions, and will not be measured unless the Engineer orders a change.

Δ For estimating purposes only, a factor of 1.4 Tons/Cu. Yd. was used to convert Cu. Yd. to Tons.



GRADELINE DATA

HYDRAULIC DATA

Q_d	1810 cfs
A_d	384 sq ft
V_d	4.71 fps
Q_F	1810 cfs
Q_{100}	9130 cfs
Q_{OT}	2700 cfs
V_{max}	7.99 fps

Q_d = design discharge for the proposed culvert or bridge based on 10 year frequency. Elev. 1292.6
Q_{OT} = overtopping discharge and frequency 16 year recurrence interval. Elev. 1293.9 Location 130' east of the proposed structure.
Q_F = designated peak discharge for the basin approaching proposed project based on 10 year frequency.
Q_{100} = computed dishcarge for the basin approaching proposed project based on 100 year frequency. Elev. 1295.5
V_{max} = maximum computed outlet velocity for the proposed culvert or bridge, based on a 25 year frequency

The hydraulic data contained in these plans is valid only if the overflow section is maintained. Alteration of the overflow section will require re-analysis of the hydraulics at this site to determine its effect on public safety.

NOTE:
Box Culvert flow line has been depressed 1'-0" below channel flow line to accommodate aquatic organisms. The 1'-0" depression will be allowed to fill in naturally over time.

TABLE OF WORKING POINTS

W.P.	STA.	OFFSET
"A"	10+23.56	39.93' Lt.
"B"	9+51.85	40.28' Lt.
"C"	10+20.24	23.22' Lt.
"D"	9+67.31	23.22' Lt.
"E"	10+32.69	23.22' Rt.
"F"	9+79.80	23.38' Rt.
"G"	10+36.00	39.93' Rt.
"H"	9+85.29	39.51' Rt.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24

PLANS BY: IMEG

GENERAL DRAWING AND QUANTITIES
FOR
4 - 12' X 9' BOX CULVERT

OVER SNAKE CREEK
STA. 10+00.00
STR. NO. 58-052-070
PCN 08N9

15° RHF SKEW
SEC. 1/12-T119N-R65W
BRO-B 8058(32)
HL-93

SPINK COUNTY
S.D. DEPT. OF TRANSPORTATION
FEBRUARY 2023

-X028-

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
JRP	JDF	JMP	BRIDGE ENGINEER

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	30	40

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.*

GENERAL NOTES

1. *Design Live Load: HL-93. No construction loading in excess of legal load was considered.*
2. *The design of the barrel section is based on a minimum fill height of 0 feet and includes all subsequent fill heights up to and including the maximum fill height of 5 feet. (F5).*
3. *Design Material Strengths: Concrete f'c = 4500 p.s.i.*
   Reinforcing Steel fy = 60000 p.s.i.
4. *High sulfate levels are likely to be encountered on this project. All concrete will be Class A45 Concrete, Box Culvert conforming to Section 460 of the Construction Specifications, with the following modifications: the type of cement will be either a Type V or a Type II with 20% to 25% Class F Modified Fly Ash substituted for cement in accordance with Section 605 of the Construction Specifications.*
5. *All reinforcing steel will conform to ASTM A615 Grade 60.*
6. *All lap splices shown are contact lap splices unless noted otherwise.*
7. *All exposed concrete corners and edges will be chamfered 3/4-inch unless noted otherwise in the plans.*
8. *Use 1 inch clear cover on all reinforcing steel EXCEPT as shown.*
9. *The Contractor will imprint on the structure the date of construction as specified and detailed on Standard Plate No. 460.02.*
10. *Care will be taken to establish Working Points (W.P.) as shown on the wings.*
11. *Circled numbers in PLAN and ELEVATION views on the General Drawing are Section I.D. Numbers (see SDDOT Materials Manual).*
12. *Cost of Preformed Expansion Joint Filler used in apron construction will be incidental to the other contract items.*
13. *Compaction of earth embankment and box culvert backfill material will be governed by the Ordinary Compaction Method.*
14. *Soils below the bottom of the proposed RCBC consist of soft dark gray sandy silt.*
15. *Groundwater was encountered in the borings at an elevation of 1286.4 during the subsurface investigation conducted in September 2022. Dewatering will be required to construct the box culvert. All cost associated with dewatering activities will be incidental to other contract bid items.*

INCIDENTAL WORK, STRUCTURE

1. *In place on 155th Street from approximately Sta. 9+79 to Sta. 10+21 is a 42'± Single Span Steel Pony Truss Bridge. The deck consists of steel stringers with timber planks and the abutments consist of reinforced concrete.*
2. *The foregoing is a general description of the in-place structure and will not be construed to be complete in all details. Before preparing a bid, it will be the responsibility of the Contractor to make a visual inspection of the existing structure to verify the extent of the work and material involved.*
3. *The Contractor will remove and dispose of the in-place structure. The in-place structure and all the associated debris will be disposed of by the Contractor as per Environmental Commitment Notes.*
4. *The existing abutments will be removed 1' below the bottom of the undercut.*
5. *Costs associated with the foregoing work will be incidental to the contract lump sum price for "Incidental Work, Structure."*

REINFORCEMENT FABRIC

1. *A layer of Reinforcement Fabric (MSE) will be placed at the bottom of the undercut prior to backfilling with granular material.*

GEOTEXTILE SPECIFICATION

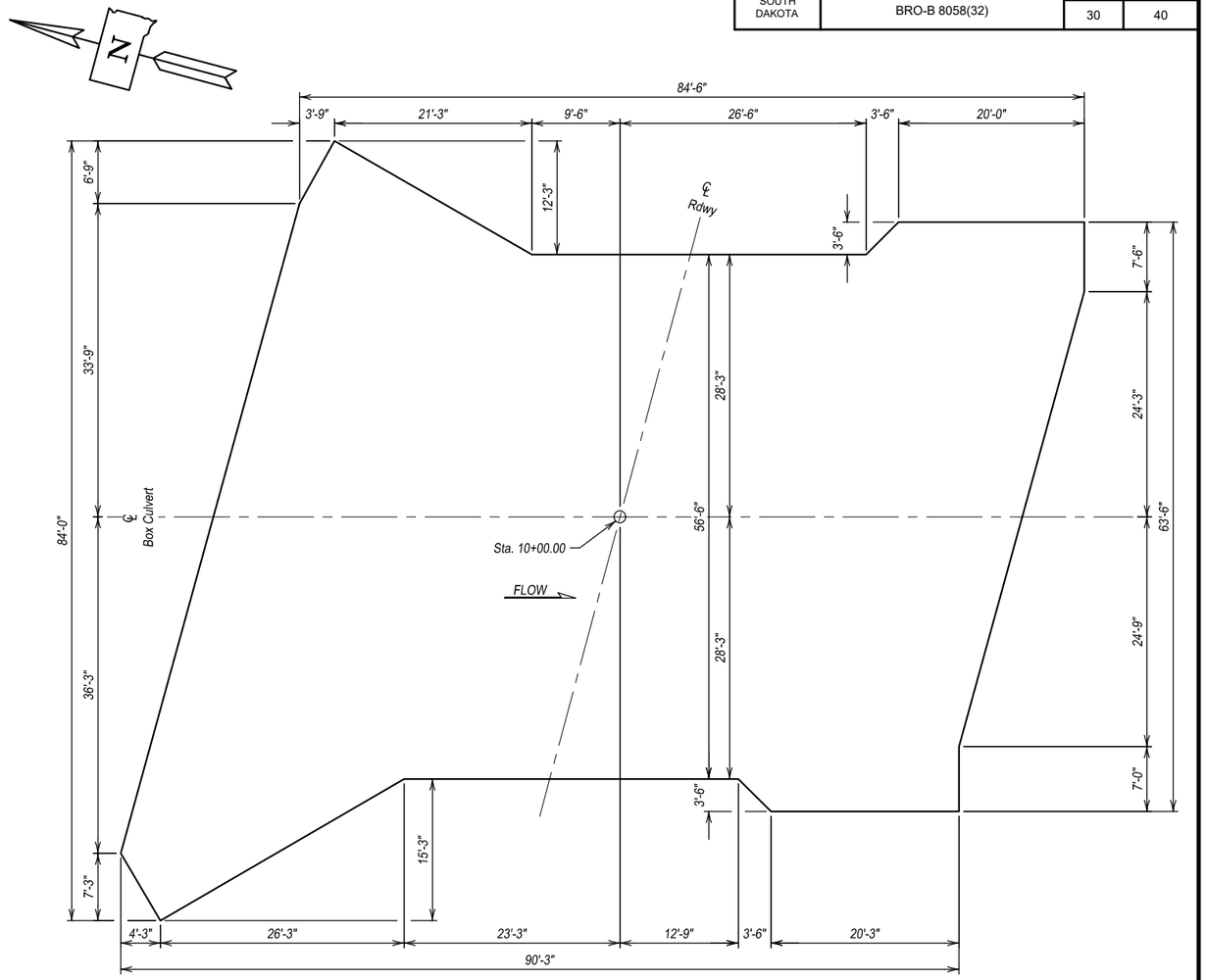
1. *Reinforcement Fabric (MSE) will conform to Section 831. The Reinforcement Fabric (MSE) provided will be on the Approved Products List or will be certified by the supplier to meet this specification prior to installation.*
2. *Reinforcement Fabric (MSE) will be paid for at the contract unit price per square yard for Reinforcement Fabric (MSE). Payment will be full compensation for furnishing and installing the Reinforcement Fabric (MSE) only. Granular backfill materials will be paid for as part of the Box Culvert Undercut bid item.*

INSTALLATION PROCEDURE - GEOTEXTILE

1. *Place the Reinforcement Fabric (MSE) on as level and smooth of surface as possible.*
2. *Any protrusions that might damage the geotextile will be removed prior to placing the geotextile.*
4. *All seams in the geotextile will be stitched in accordance with the seaming procedure and as shown on the detail labeled "Seam Types".*
5. *No equipment will be allowed on the geotextile until the granular backfill material is in place.*
6. *The geotextile will be kept as taut as possible prior to backfilling.*
7. *Granular backfill material will be dumped behind the leading edge of the fill and pushed into place with a loader or dozer.*

SEAMING PROCEDURE

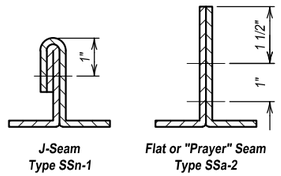
1. *The sewn seams will consist of two parallel rows of stitching ("prayer" seam, Type SSa-2), or a J-seam (Type SSn-1), using a single row of stitching. The stitching will be lock type stitch.*
2. *If the Type SSa-2 seam is used, the two rows of stitching will be 1" apart with a tolerance of plus or minus 1/2" and will not cross, except for restitching. The minimum seam allowance, i.e., the minimum distance from the geotextile edge to the stitch line nearest to that edge, will be 1 1/2".*
3. *If the J-seam (Type SSn-1) is used, the minimum seam allowance will be 1".*
4. *The seam, stitch type, and the equipment used to perform the stitching will be as recommended by the Manufacturer of the geotextile and approved by the Engineer.*
5. *The seams will be sewn in such a manner that the seam can be readily inspected by the Engineer.*
6. *The thread used will be high strength polypropylene, polyester, or Kevlar thread. Nylon threads will not be allowed.*



UNDERCUT LAYOUT
(Bottom Dimensions)

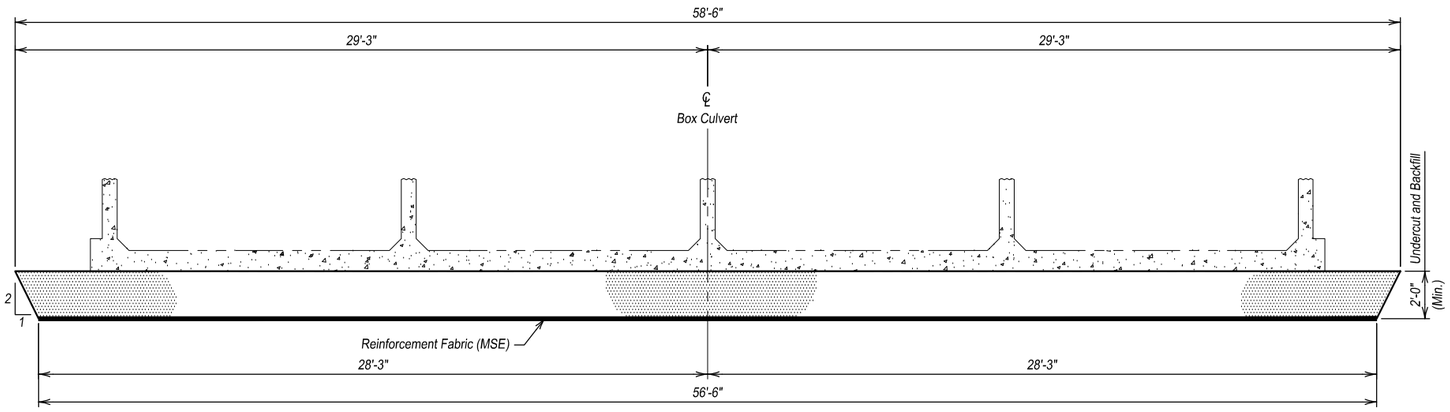
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
ϕ Box Culvert Undercut	Cu. Yd.	418
Reinforcement Fabric (MSE)	Sq. Yd.	609

ϕ *For payment, quantity is based on plan shown undercut dimensions and will not be measured unless the Engineer orders a change.*



J-Seam Type SSn-1 *Flat or "Prayer" Seam Type SSa-2*

SEAM TYPES



TYPICAL SECTION
(For Limits of Undercut)

NOTES AND UNDERCUT DETAILS
FOR
4 - 12' X 9' BOX CULVERT

OVER SNAKE CREEK
STA. 10+00.00
STR. NO. 58-052-070

15° RHF SKEW
SEC. 1/12-T119N-R65W
BRO-B 8058(32)
HL-93

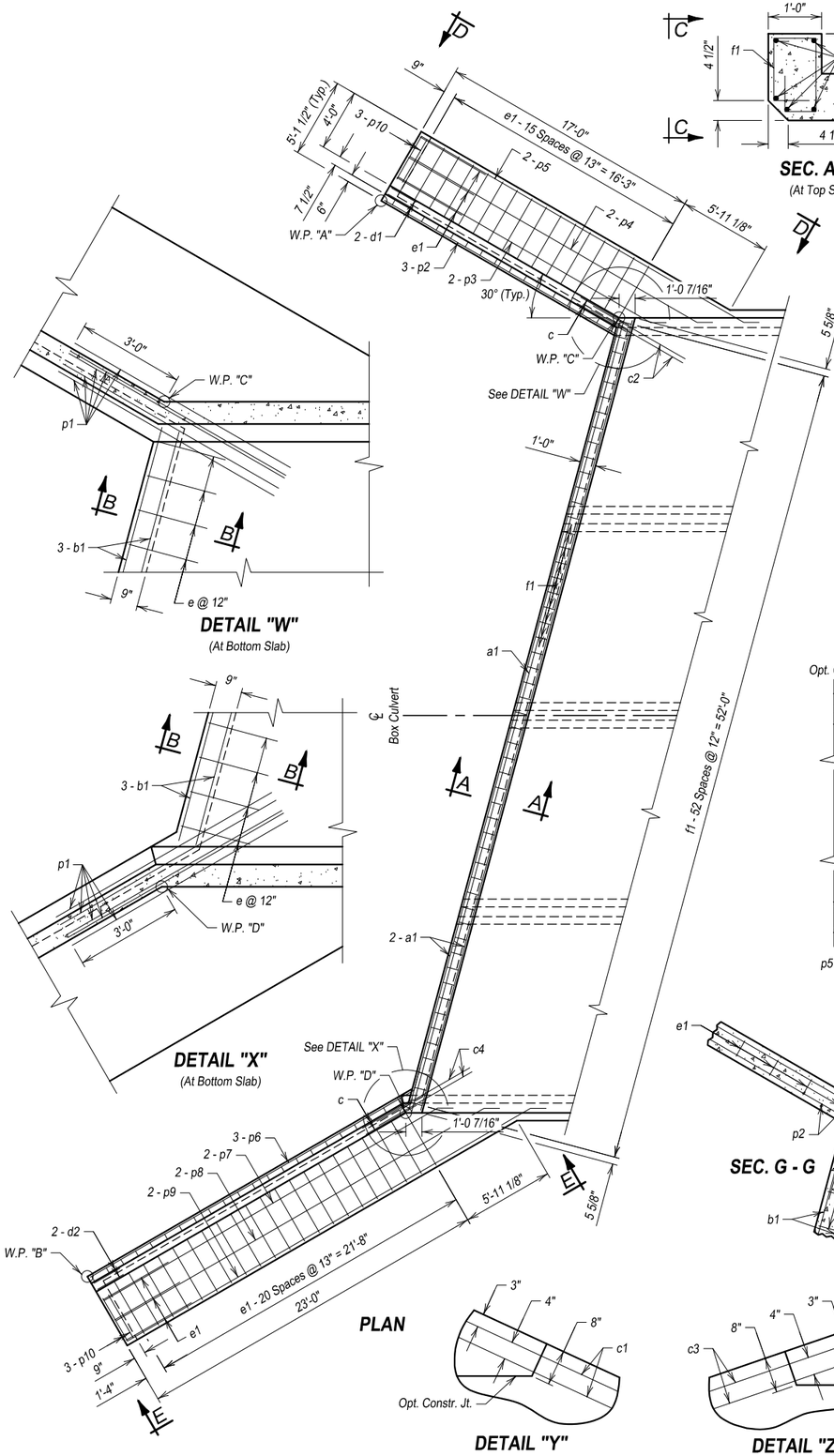
SPINK COUNTY
S.D. DEPT. OF TRANSPORTATION
FEBRUARY 2023

2 OF 9

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
JRP	JDF	JMP	BRIDGE ENGINEER

Plotted on: 4/1/24 9:54:07 AM Plotted by: Joshua R. Prather
\\files\Active\Projects\2021\21003335.00\Design\Civil\C3D\Source\21003335.00_RCBC Structure.dwg

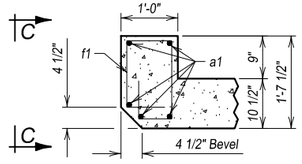
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	31	40



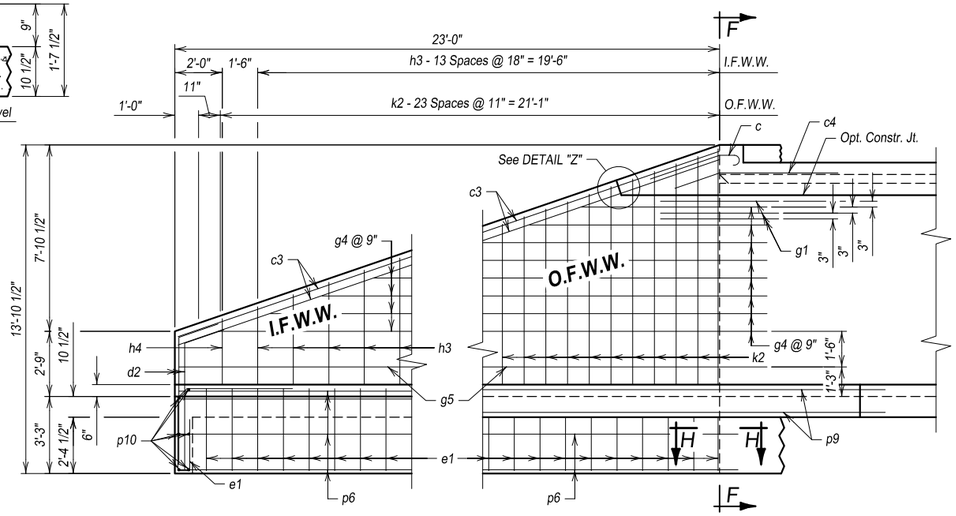
DETAIL "W"
(At Bottom Slab)

DETAIL "X"
(At Bottom Slab)

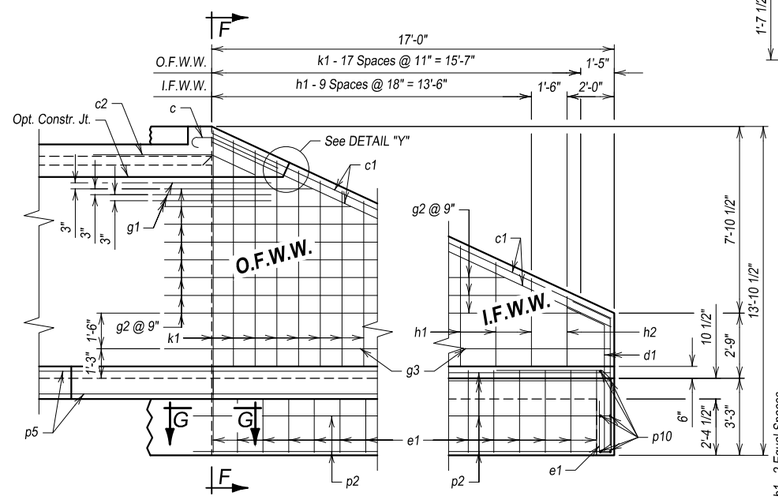
PLAN



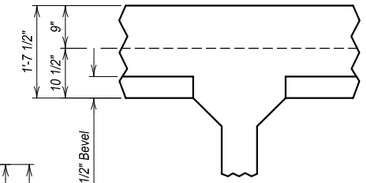
SEC. A - A
(At Top Slab)



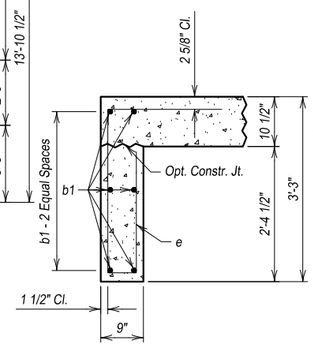
VIEW E - E



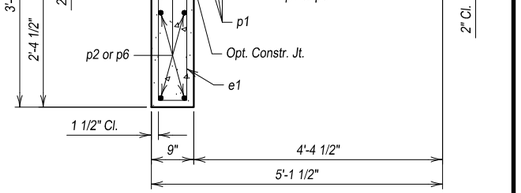
VIEW D - D



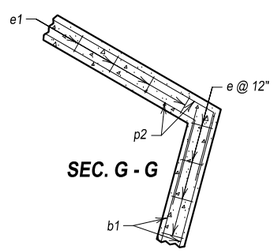
VIEW C - C
(At Interior Wall)



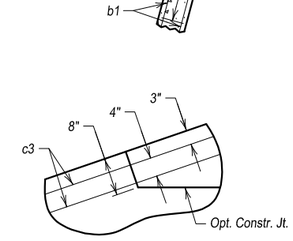
SEC. B - B



SEC. F - F

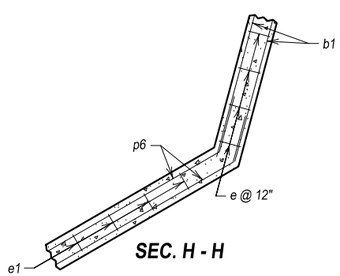


SEC. G - G



DETAIL "Y"
(c, c2, h1, k1, and g2 bars not shown)

DETAIL "Z"
(c, c4, h3, k2, and g4 bars not shown)



SEC. H - H

LEGEND FOR PLACING RE-STEEL
O.F.W.W. - Outside Face Of Wing Wall
I.F.W.W. - Inside Face of Wing Wall

INLET DETAILS (A)
FOR
4 - 12' X 9' BOX CULVERT

OVER SNAKE CREEK
STA. 10+00.00
STR. NO. 58-052-070

15° RHF SKEW
SEC. 1/12-T119N-R65W
BRO-B 8058(32)
HL-93

SPINK COUNTY
S.D. DEPT. OF TRANSPORTATION
FEBRUARY 2023

3 OF 9

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
JRP	JDF	JMP	BRIDGE ENGINEER

Plotted on: 4/1/24 7:54:06 AM
Plotted by: Joshua R. Prather
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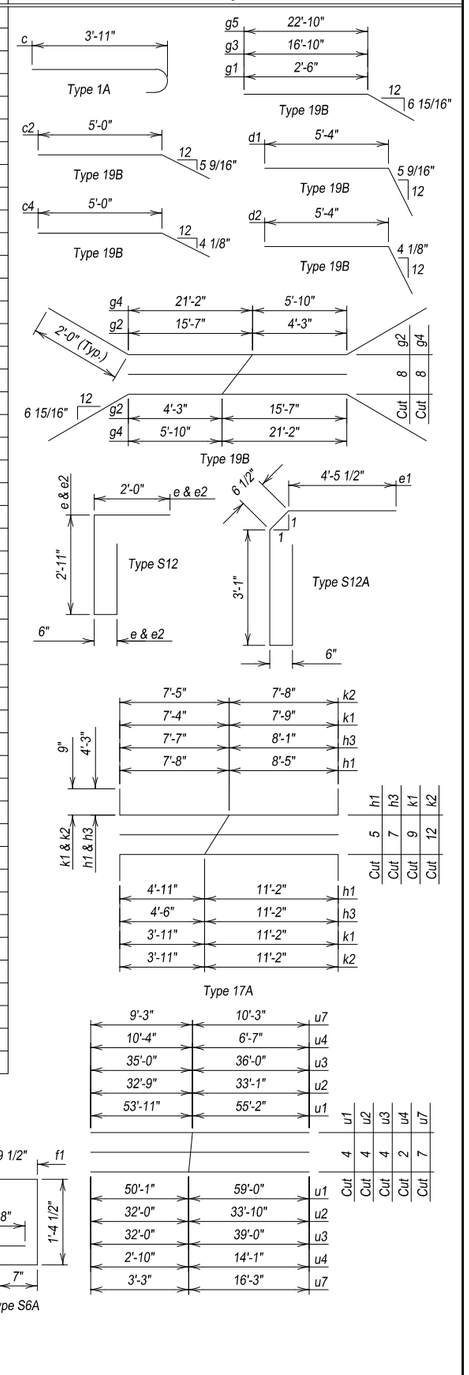
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	32	40

REINFORCING SCHEDULE

	Mk.	No.	Size	Length	Type
	a1	5	6	52'-7"	Str.
	b1	6	6	50'-10"	Str.
Ω	c	4	5	4'-5"	1A
	c1	4	5	18'-7"	Str.
	c2	2	5	7'-0"	19B
	c3	4	5	24'-2"	Str.
	c4	2	5	7'-0"	19B
	d1	4	5	7'-1"	19B
	d2	4	5	7'-1"	19B
	e	51	4	7'-6"	S12
	e1	44	5	10'-9"	S12A
	f1	53	4	5'-3"	S6A
	g1	12	5	5'-0"	19B
≠	g2	8	5	23'-10"	19B
	g3	2	5	18'-10"	19B
≠	g4	8	5	31'-0"	19B
	g5	2	5	24'-10"	19B
≠	h1	5	4	24'-7"	17A
	h2	1	4	8'-5"	17A
≠	h3	7	4	24'-2"	17A
	h4	1	4	8'-3"	17A
≠	k1	9	4	16'-7"	17A
≠	k2	12	4	16'-7"	17A
	k3	1	4	4'-4"	17A
	p1	10	6	7'-0"	Str.
Ω	p2	7	4	19'-6"	Str.
Ω	p3	2	4	19'-9"	Str.
Ω	p4	2	4	22'-4"	Str.
Ω	p5	2	4	24'-11"	Str.
Ω	p6	7	4	25'-6"	Str.
Ω	p7	2	4	25'-9"	Str.
Ω	p8	2	4	28'-4"	Str.
Ω	p9	2	4	30'-11"	Str.
	p10	12	4	3'-2"	Str.
	Inlet Apron				
≠	e2	71	4	8'-0"	Str.
≠	u1	4	4	109'-1"	Str.
≠	u2	4	4	65'-10"	Str.
≠	u3	4	4	71'-0"	Str.
	u4	2	4	16'-11"	Str.
	u5	25	4	16'-5"	Str.
≠	u6	25	4	16'-7"	Str.
	u7	7	4	19'-6"	Str.
	u8	3	4	34'-1"	Str.
	u9	3	4	34'-3"	Str.
	u10	3	4	40'-2"	Str.
	u11	3	4	40'-8"	Str.

Bending Details

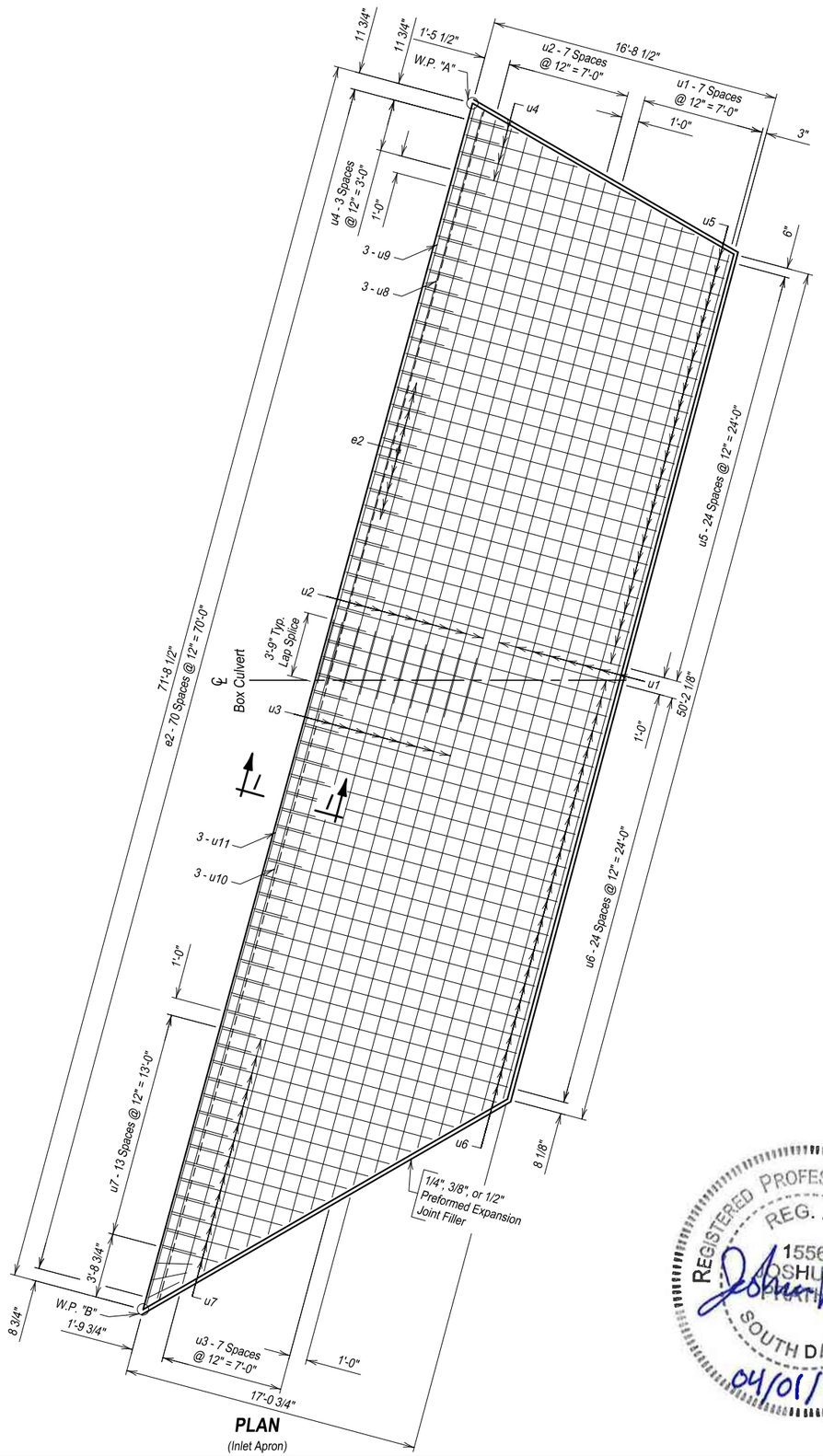


NOTES:

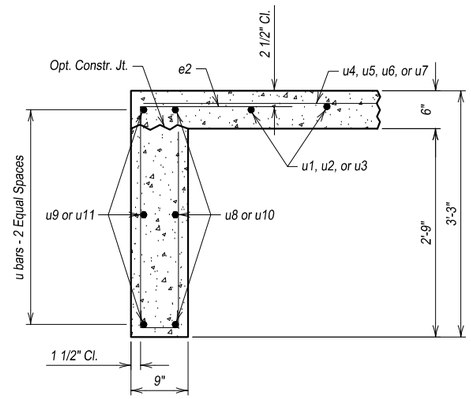
Ω Bend in field as necessary to fit.

≠ See cutting diagram.

All dimensions are out to out of bars.



PLAN
(Inlet Apron)



SEC. I - I

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu. Yd.	Lb.	Cu. Yd.
Inlet	24.8	3670	15
Inlet Apron	24.5	2000	24

INLET DETAILS (B)

FOR

4 - 12' X 9' BOX CULVERT

OVER SNAKE CREEK
STA. 10+00.00
STR. NO. 58-052-070

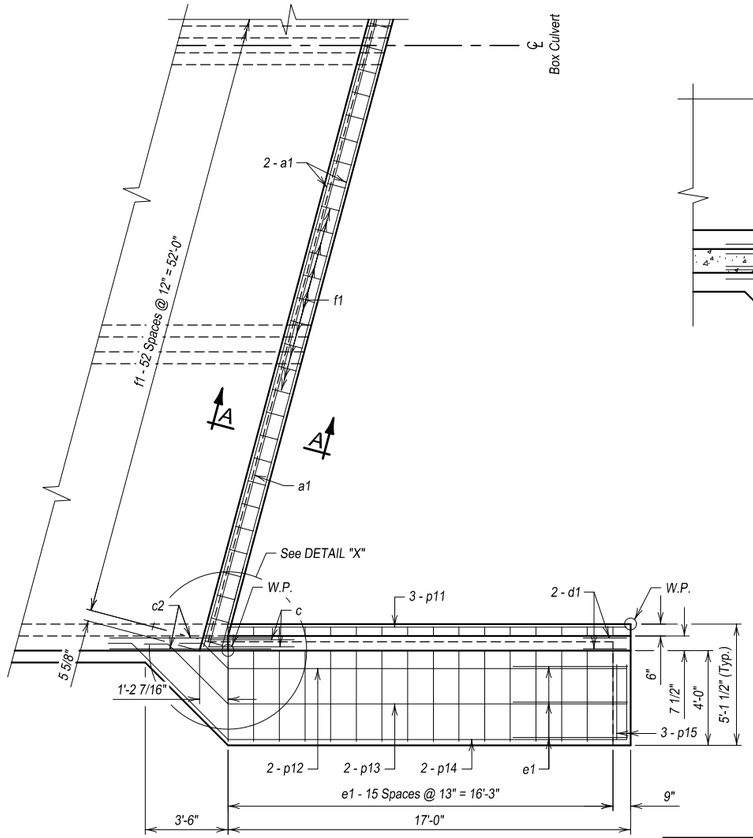
15° RHF SKEW
SEC. 1/12-T119N-R65W
BRO-B 8058(32)
HL-93

SPINK COUNTY
S.D. DEPT. OF TRANSPORTATION
FEBRUARY 2023

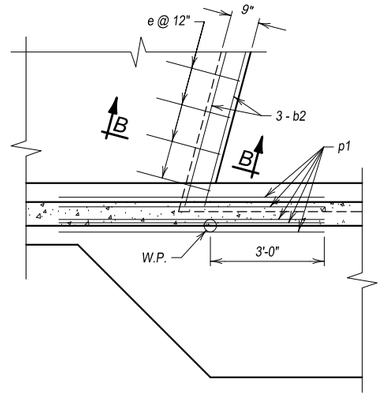
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15560
JOSHUA M. PFAFFER
SOUTH DAKOTA
04/01/24

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
JRP	JDF	JMP	BRIDGE ENGINEER

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	33	40

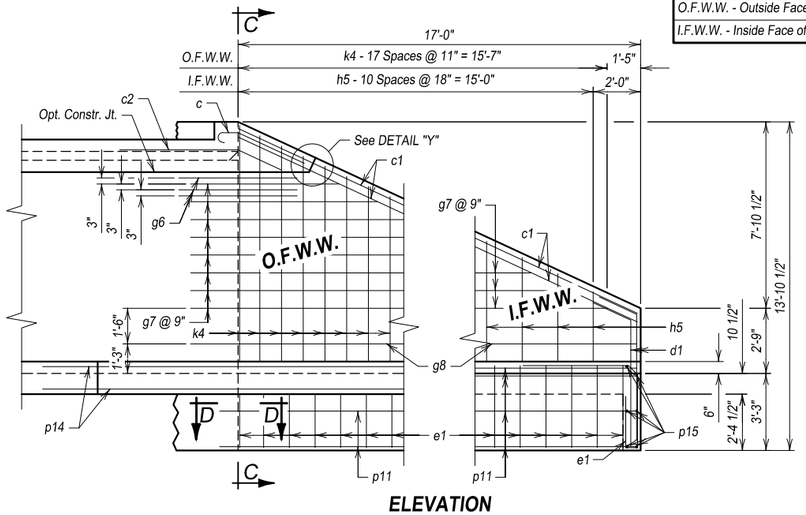


HALF PLAN

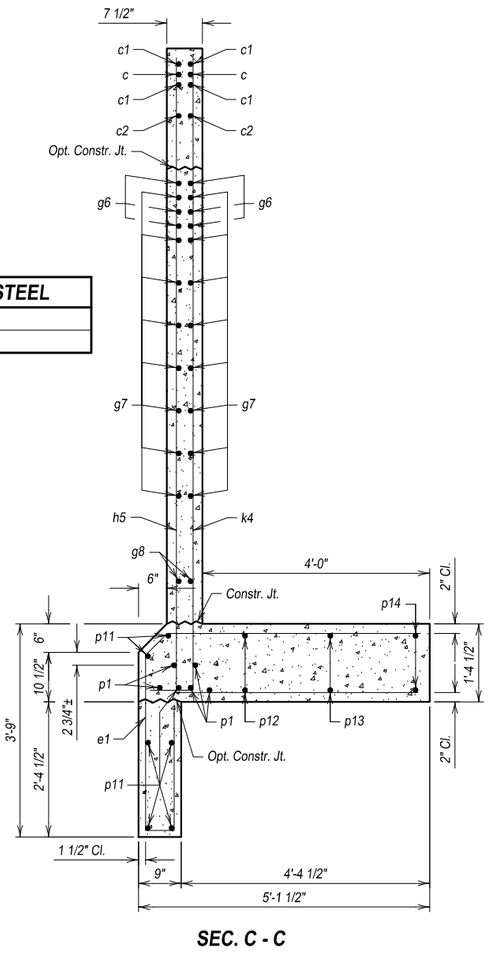


DETAIL "X"
(At Bottom Slab)

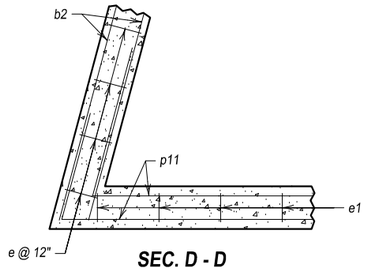
LEGEND FOR PLACING RE-STEEL
O.F.W.W. - Outside Face Of Wing Wall
I.F.W.W. - Inside Face of Wing Wall



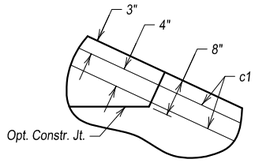
ELEVATION



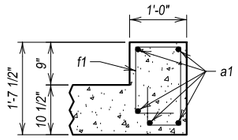
SEC. C - C



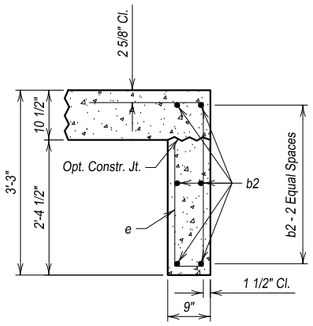
SEC. D - D



DETAIL "Y"
(c, c2, h1, k1, and g2 bars not shown)



SEC. A - A
(At Top Slab)



SEC. B - B

OUTLET DETAILS (A)
FOR
4 - 12' X 9' BOX CULVERT

OVER SNAKE CREEK
STA. 10+00.00
STR. NO. 58-052-070

15° RHF SKEW
SEC. 1/12-T119N-R65W
BRO-B 8058(32)
HL-93

SPINK COUNTY
S.D. DEPT. OF TRANSPORTATION
FEBRUARY 2023

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
JOSHUA M. PRATHER
SOUTH DAKOTA
04/01/24

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
JRP	JDF	JMP	BRIDGE ENGINEER

Plotted on: 4/1/24 7:54:19 AM Plotted by: Joshua R. Prather
G:\2021\21003335.00\Design\Civil\C3D\Source\21003335.00_RCBC Structure.dwg

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	34	40

REINFORCING SCHEDULE

	Mk.	No.	Size	Length	Type
	a1	5	6	52'-7"	Str.
	b2	6	6	51'-10"	Str.
Ω	c	4	5	4'-5"	1A
	c1	8	5	18'-7"	Str.
	c2	4	5	7'-0"	19B
	d1	8	5	7'-1"	19B
	e	52	4	7'-6"	S12
	e1	38	5	10'-9"	S12A
	f1	53	4	5'-3"	S6A
	g6	12	5	5'-0"	Str.
≠	g7	16	5	23'-10"	Str.
	g8	4	5	18'-10"	Str.
≠	h5	11	4	23'-10"	17A
≠	k4	18	4	16'-7"	17A
	p1	10	6	7'-0"	Str.
Ω	p11	14	4	19'-6"	Str.
Ω	p12	4	4	19'-4"	Str.
Ω	p13	4	4	21'-5"	Str.
Ω	p14	4	4	23'-7"	Str.
	p15	12	4	3'-2"	Str.
	Outlet Apron				
	e2	50	4	8'-0"	Str.
	u12	22	4	50'-3"	Str.
	u13	1	4	5'-10"	Str.
	u14	1	4	9'-6"	Str.
	u15	1	4	13'-3"	Str.
	u16	23	4	16'-2"	Str.
≠	u17	23	4	16'-0"	Str.
	u18	2	4	19'-3"	Str.

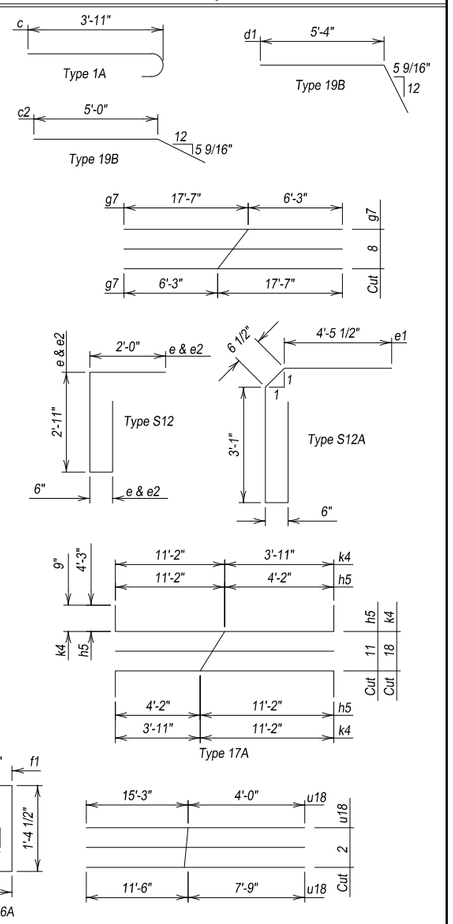
NOTES:

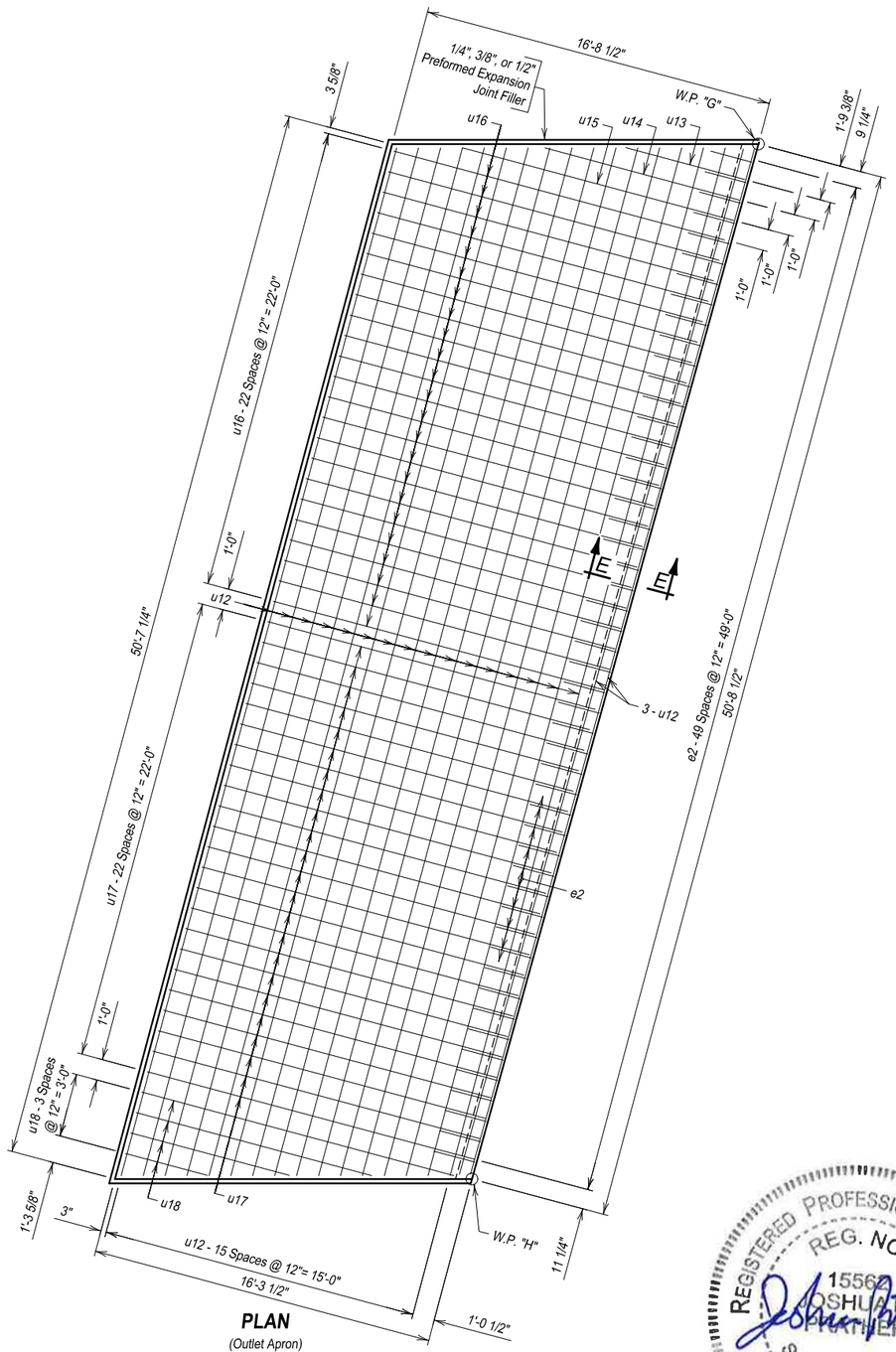
Ω Bend in field as necessary to fit.

≠ See cutting diagram.

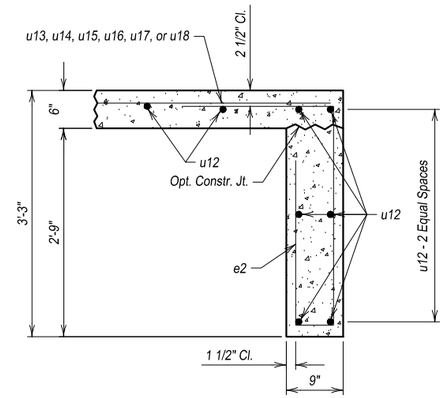
All dimensions are out to out of bars.

Bending Details





PLAN
(Outlet Apron)



SEC. E - E

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu. Yd.	Lb.	Cu. Yd.
Outlet	21.5	3394	13
Outlet Apron	19.3	1545	19

OUTLET DETAILS (B)

FOR

4 - 12' X 9' BOX CULVERT

OVER SNAKE CREEK
STA. 10+00.00
STR. NO. 58-052-070

15° RHF SKEW
SEC. 1/12-T119N-R65W
BRO-B 8058(32)
HL-93

SPINK COUNTY
S.D. DEPT. OF TRANSPORTATION
FEBRUARY 2023

6 OF 9

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
JRP	JDF	JMP	BRIDGE ENGINEER

Plotted on: 4/1/24 7:54:23 AM Plotted by: Joshua R. Prather
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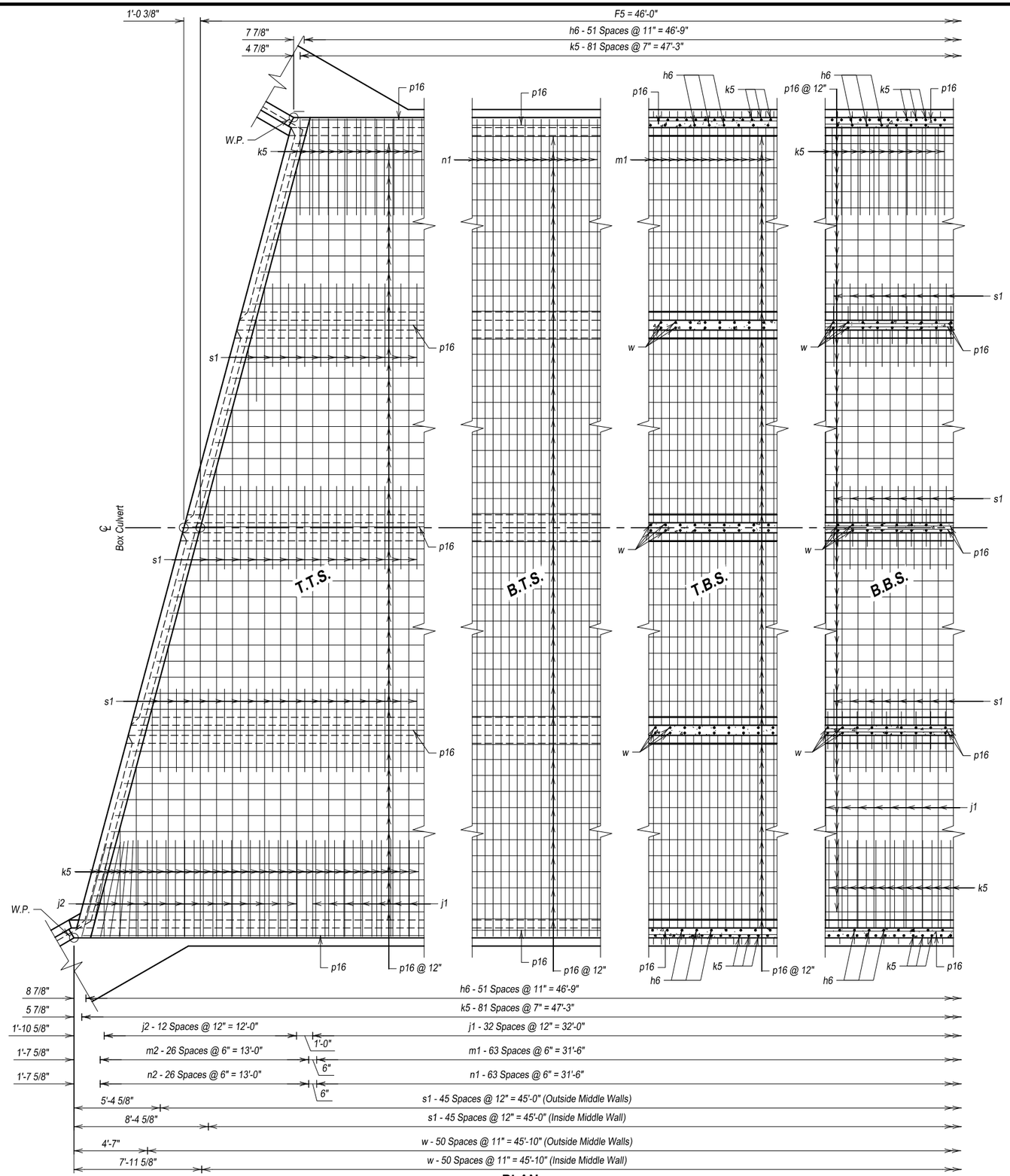
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	35	40



PLAN

(Inlet End shown, Outlet End similar by rotation.)

LEGEND FOR PLACING RE-STEEL
T.T.S. - Top of Top Slab
B.T.S. - Bottom of Top Slab
T.B.S. - Top of Bottom Slab
B.B.S. - Bottom of Bottom Slab

F5 BARREL SECTION DETAILS (A)

FOR

4 - 12' X 9' BOX CULVERT

OVER SNAKE CREEK — 15° RHF SKEW

STA. 10+00.00 — SEC. 1/12-T119N-R65W

STR. NO. 58-052-070 — BRO-B 8058(32)

HL-93

SPINK COUNTY

S.D. DEPT. OF TRANSPORTATION

FEBRUARY 2023

7 OF 9

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
JRP	JDF	JMP	BRIDGE ENGINEER

Plotted on: 4/1/24 7:54:27 AM Plotted by: Joshua R. Pfaffer
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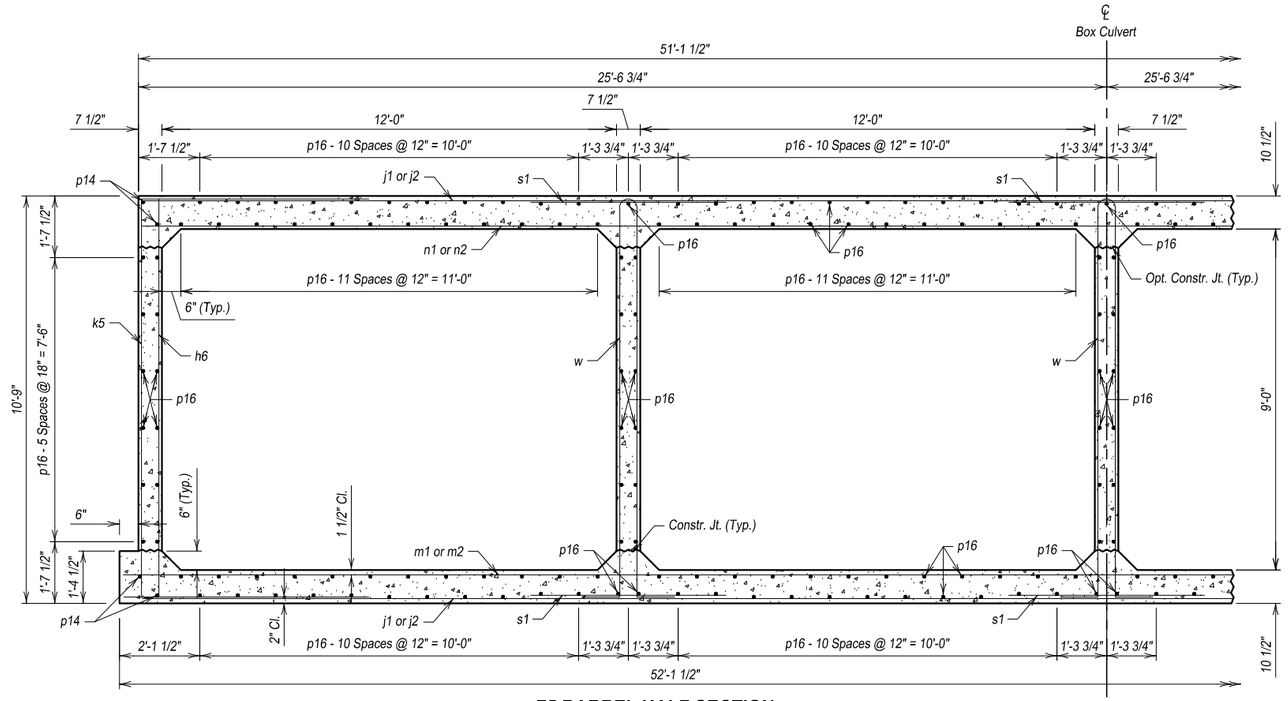
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	36	40



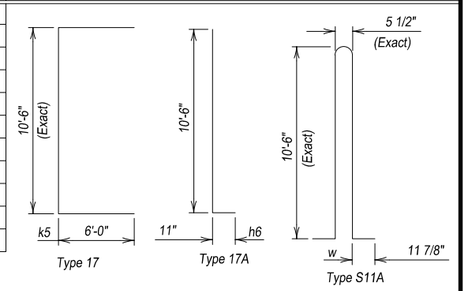
F5 BARREL HALF SECTION

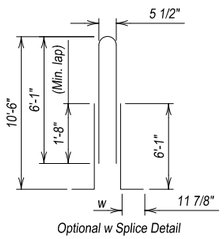
(5'-0" Maximum Fill)

REINFORCING SCHEDULE

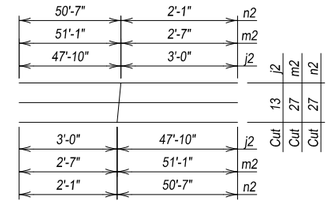
Mk.	No.	Size	Length	Type
h6	104	5	11'-5"	17A
j1	66	5	50'-11"	Str.
j2	26	5	50'-10"	Str.
k5	164	5	22'-6"	17
m1	64	5	51'-11"	Str.
m2	27	5	53'-8"	Str.
n1	64	5	50'-11"	Str.
n2	27	5	52'-8"	Str.
p16	264	4	47'-0"	Str.
s1	276	5	5'-2"	Str.
w	153	4	23'-3"	S11A

Bending Details





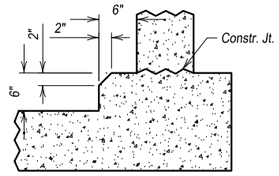
Optional w Splice Detail



Optional k5 or w Splice Detail
Contractor may use optional reinforcing steel splice, as shown. The cost of the additional reinforcing steel will be borne by the Contractor.

NOTES:
See cutting diagram.
All dimensions are out to out of bars.
Request for additional 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.

Optional k5 Splice Detail



OPTIONAL FILLET DETAIL

(At Bottom Slab)

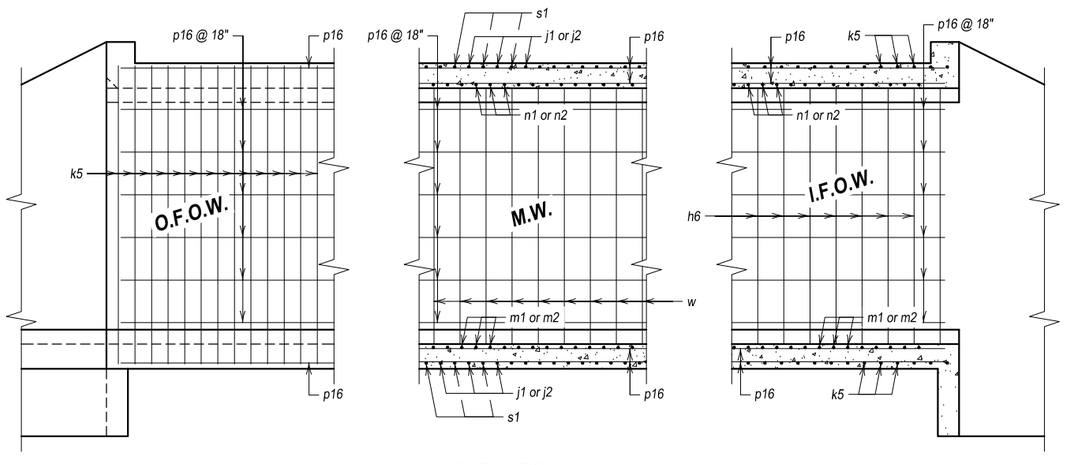
NOTE: Contractor may form the optional full fillet, with 2" chamfer, as detailed. The cost of the additional concrete will be borne by the Contractor.

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu. Yd.	Lb.	Cu. Yd.
F5 Barrel Section @ 46'-0"	218.2	31981	81

LEGEND FOR PLACING RE-STEEL

O.F.O.W. - Outside Face of Outside Wall
M.W. - Middle Wall
I.F.O.W. - Inside Face of Outside Wall



ELEVATION

F5 BARREL SECTION DETAILS (B)

FOR

4 - 12' X 9' BOX CULVERT

OVER SNAKE CREEK
STA. 10+00.00
STR. NO. 58-052-070

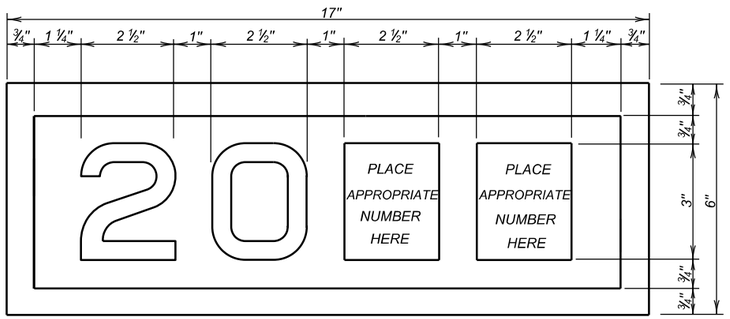
15° RHF SKEW
SEC. 1/12-T119N-R65W
BRO-B 8058(32)
HL-93

SPINK COUNTY
S.D. DEPT. OF TRANSPORTATION
FEBRUARY 2023

8 OF 9

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
JRP	JDF	JMP	BRIDGE ENGINEER

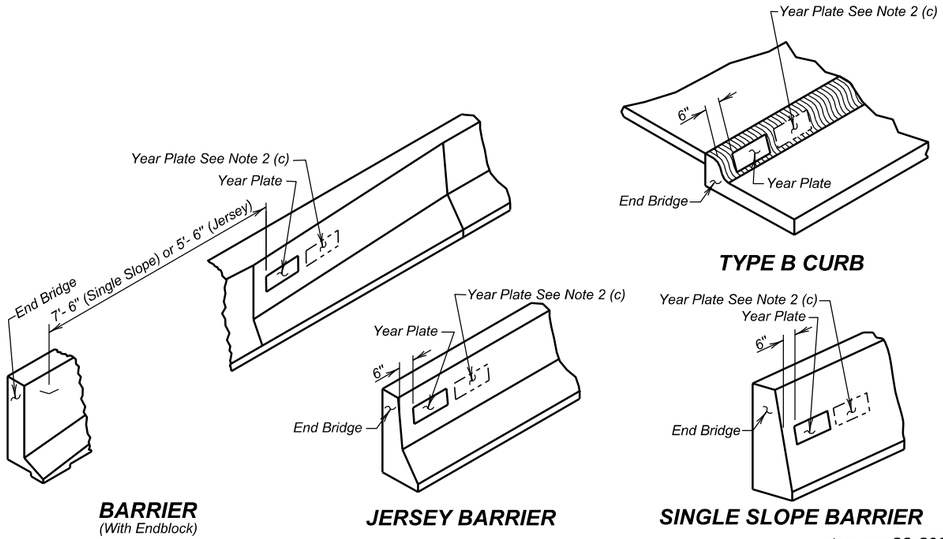
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	37	40



YEAR PLATE DETAILS

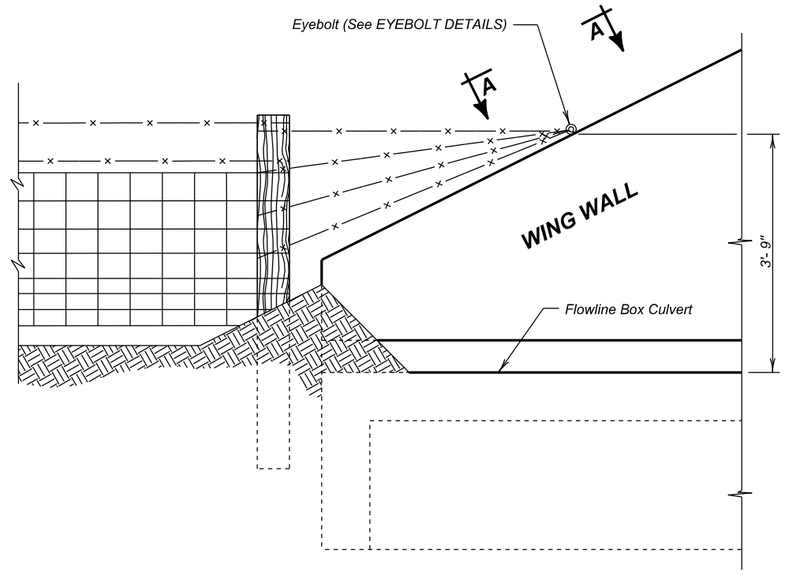
GENERAL NOTES:

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.



January 22,2021

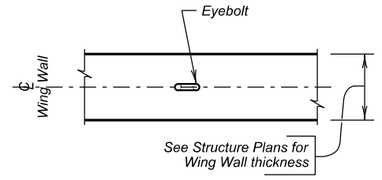
Published Date: 2024	SDDOT	YEAR PLATE DETAILS	PLATE NUMBER 460.02
			Sheet 1 Of 1



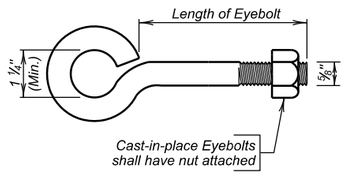
DETAIL FOR FENCE ANCHORS

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 box culvert wing walls.
3. Eyebolts shall be ⅞ 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 ⅞ 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 BOX CULVERT WING WALLS	PLATE NUMBER 620.16
			Sheet 1 of 1

4 - 12' X 9' BOX CULVERT
STR. NO. 58-052-070
FEBRUARY 2023

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

CROSS SECTIONS (1 OF 3)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	38	40

Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 10'

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 15562
JOSHUA R. PRATHER
SOUTH DAKOTA
04/01/24

Plotted on: 4/1/24 7:54:58 AM Plotted by: Joshua R. Prather
G:\2021\21003335.00\Design\Civil\C3D\Source\21003335.00_RCBC Civil.dwg

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

CROSS SECTIONS (2 OF 3)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	39	40

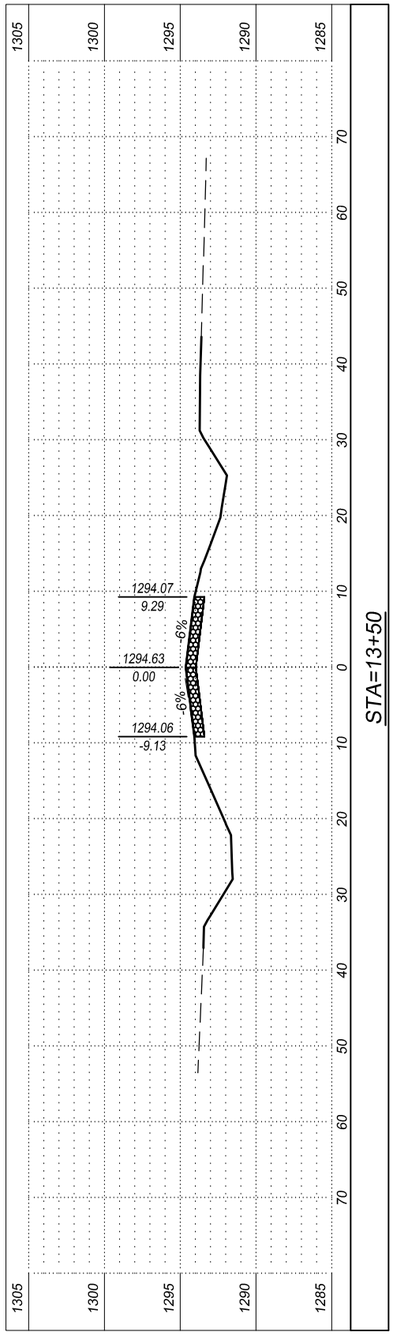
Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 10'

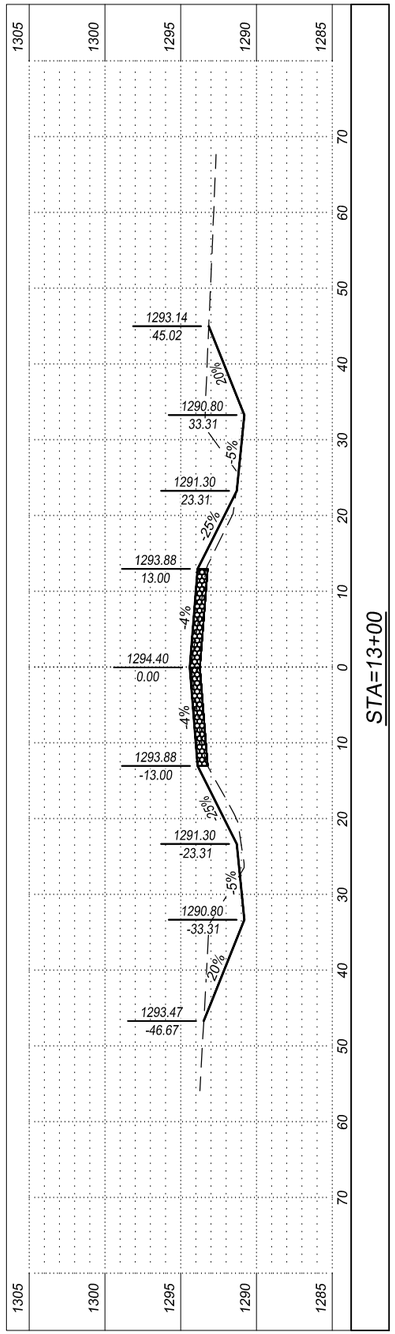
Plotted on: 4/1/24 7:55:03 AM Plotted by: Joshua R. Prather
G:\2021\21003335.00\Design\Civil\C3D\Source\21003335.00_RCBC Civil.dwg

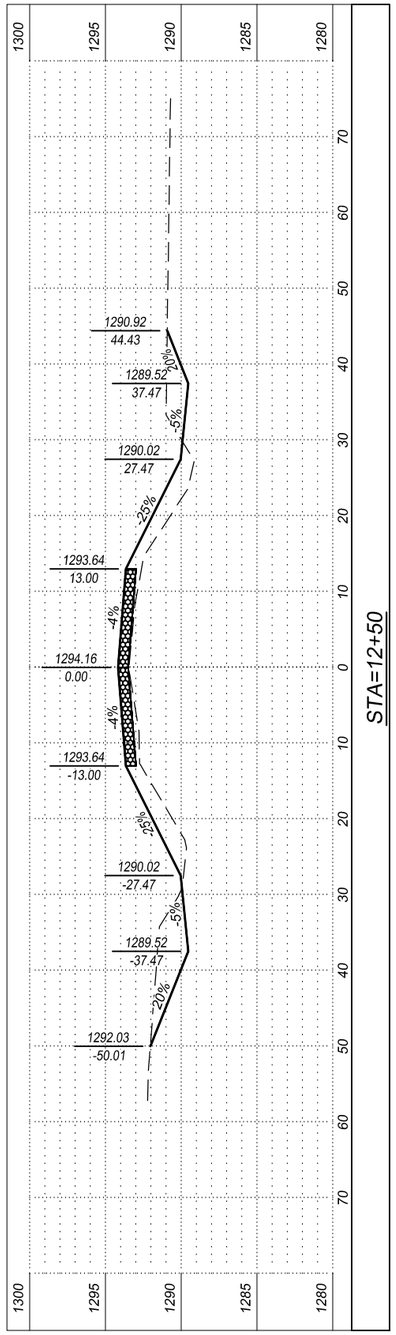
The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

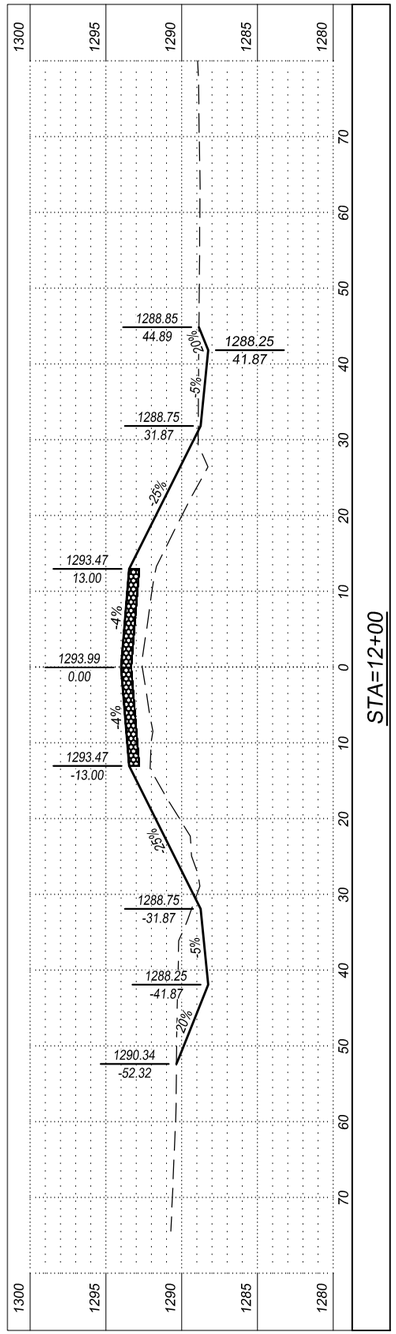
CROSS SECTIONS (3 OF 3)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	BRO-B 8058(32)	40	40









Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 10'

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
15562
JOSHUA R.
PRATHER
SOUTH DAKOTA
04/01/24

Plotted on: 4/1/24 7:55:09 AM Plotted by: Joshua R. Prather
G:\2021\21003335.00\Design\Civil\C3D\Source\21003335.00_RCBC Civil.dwg