

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 2009	Pass: 1300	Trucks: 175	Total: 1475	150
Forecast 2029	Pass: 2265	Trucks: 305	Total: 2570	260
Clear Zone Distance: 30'		Design Speed: 55		
Minimum Sight Dist. for Stopping: 495'		Bridges: HL-93		
Minimum Sight Dist. for Safe Passing: 1985'				
Sight Dist. for No Passing Zone: 900'				
Pavement Design Life 20 (years)				

# JOB# 10 NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	17713	1	1

SS-1-094(123)912

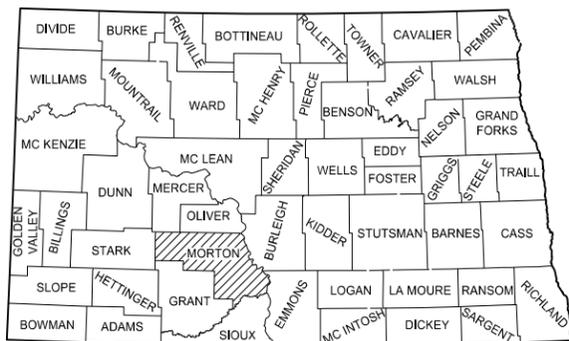
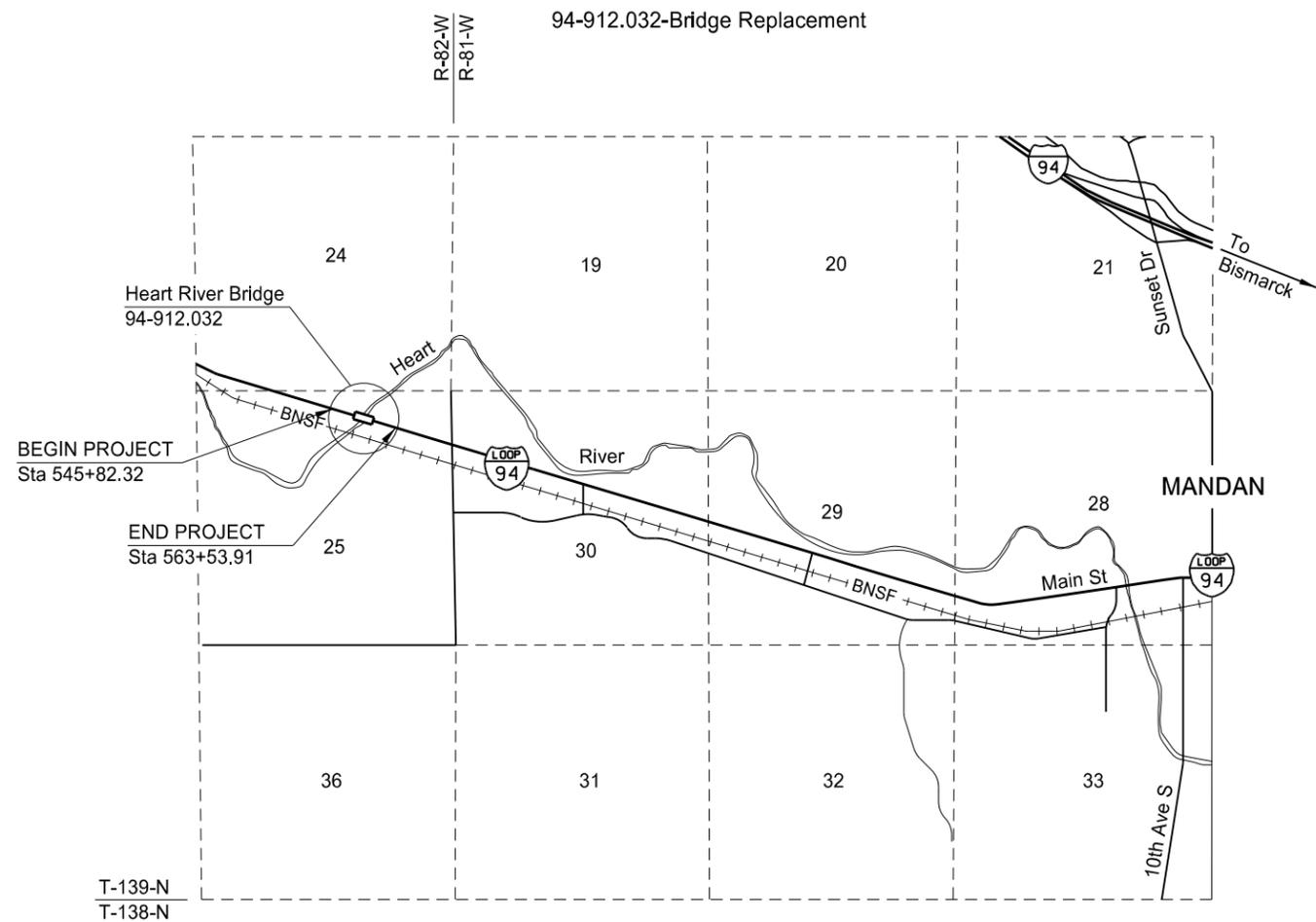
Morton County  
Heart River Bridge  
4 Miles West of Mandan

94-912.032-Bridge Replacement

**GOVERNING SPECIFICATIONS:**

Standard Specifications adopted by the North Dakota Department of Transportation October 2008; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SS-1-094(123)912	0.336	0.336



STATE COUNTY MAP

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 2/22/11

Terrence R. Udland  
NDDOT BRIDGE DIVISION

This document was originally issued and sealed by Terrence R. Udland, Registration Number PE- 2674, on 2/22/11 and the original document is stored at the North Dakota Department of Transportation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	2	1

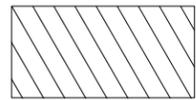
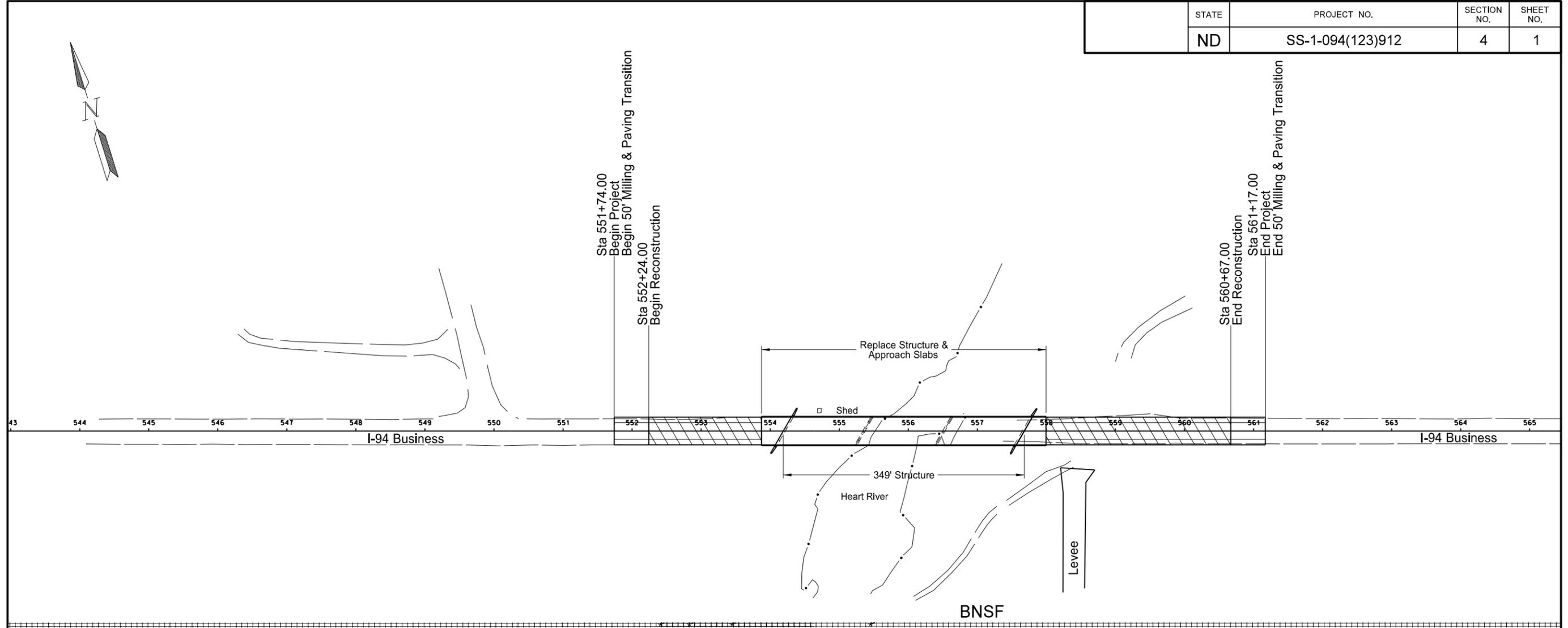
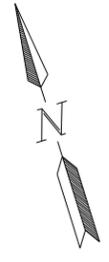
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D-900-1	Bridge Bench Marks

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	4	1



Reconstruction

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 Brandon Beise  
 Registration Number  
 PE-5941,  
 on 2/14/11 and the original document is stored at the  
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 of Transportation

Scope of Work

**NOTES**

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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105-200 UTILITY COORDINATION: The Contractor shall arrange a Post Bid Utility Coordination Meeting with affected Utility Companies, NDDOT District Office, and the Project Engineer. This meeting shall be in addition to the preconstruction meeting. The Post Bid Utility Coordination Meeting shall be held near the project area or at the District office and shall be held no later than two weeks after the Department and the Contractor have executed the contract, as approved by the Engineer. The contractor shall provide an agenda for the meeting, and be prepared to discuss the items on it. Items to discuss shall include, but not be limited to; plan for constructing the project, work schedule, utility adjustment/relocates needed prior to project start, utility adjustment/relocates that can be done concurrent with project, utility locates and site access. The contractor shall publish meeting minutes and distribute the minutes to all attendees and the NDDOT Utilities Engineer within one week after the meeting.

107-P01 HAUL ROADS: No paved roads off the state system will be used as haul roads unless the contractor obtains written approval from the local government agency or agencies and the engineer. The engineer will determine what government agency or agencies approvals are appropriate.

200-P01 SHRINKAGE: 25% additional volume is included for shrinkage in earth embankment.

202-P01 ABUTTING PAVEMENT: Where the new pavement will abut existing pavement, a full depth vertical saw cut shall be made along the entire length of the joint. The material to be removed shall then be removed without disturbing the material that is designated to remain. The sawed edge shall be reasonably free of frays or spalls. The new pavement shall be placed to match the existing pavement and to provide a satisfactory surface profile. Any intermediate saw cuts performed to aid in the removal of pavements shall not be paid for separately. Sawing shall be paid as "Saw Bituminous Surfacing – Full Depth."

The contractor has the option to make coultter cuts instead of saw cut. If a coultter cut is performed, it shall also be paid for as "Saw Bituminous Surfacing – Full Depth."

202-P02 REMOVAL OF BITUMINOUS SURFACING: Existing typical sections are based on old grading and paving plans. Actual thickness might vary due to previous construction methods or intermittent patching. No additional payment will made for unforeseen pavement thickness. All pavement removals shall be paid for as "Removal of Bituminous Surfacing."

203-P01 BORROW: All borrow needed for this project shall be obtained by the contractor from a source outside of the highway right of way.

203-P02 COMPACTION AND DENSITY CONTROL: Moisture and density controls shall be in accordance with Section 203.02 G of the Standard Specifications.

203-P03 TOPSOIL: Removal and replacement of topsoil is based on a 4" depth. Measurement shall be according to Section 203.03 G of the Standard Specifications (Contract Quantity Payment).

203-P04 COMMON EXCAVATION: The existing aggregate base to be removed is not required to be salvaged and shall be paid for as "Common Excavation – Type A".

408-P01 HOT BITUMINOUS PAVEMENT CL 31: The 5.5" hot bituminous pavement shall be paver laid in three approximate equal lifts. The hot bituminous pavement shall be placed and accepted according to Section 408 with the following revisions:

- Compaction shall meet the requirements of Section 408.04 I.2 "Ordinary Compaction".
- The pay factor for the hot bituminous pavement based on aggregate tolerances will be as specified in Section 408.05 A.1. No adjustment will be made to the pay factor for average daily air voids. The requirements of Section 408.05 C (field marshall density, maximum theoretical density, coring, and compaction payment schedule) will not apply.
- The bitumen uniformity testing specified in Section 408.05 B.2 will not apply.
- The mix design shall meet Section 409.04 B. A contractor mix design shall be provided on this project.

408-P02 HOT BITUMINOUS PAVEMENT CL 31: The asphalt cement, prime, and tack required for the HBP pavement will not be measured for payment but shall be included in the price bid for "Hot Bituminous Pavement Class 31."

411-P01 MILLING SECTIONS: At the beginning and end of the milling sections, the existing bituminous material shall be removed to form a straight vertical edge to allow placement of the full depth of surfacing. All material removed in these operations shall become the property of the contractor and shall be disposed of off the right of way.

704-P01 TRAFFIC CONTROL DEVICES: Traffic control for the existing structure removal and the proposed structure construction shall consist of a detour route. Traffic Control Devices shall comply with the following Standard Drawings:

D-704-7, 8, 9, 10, 11, 12, 12A, 13, and 14 are applicable.

D-704-21 Layout Type I for the detour route.

D-704-22, Layouts Type K & Type L for construction trucks entering from a borrow site, aggregate source, or a contractor jobsite.

D-704-28: For pavement marking operations.

The required traffic control signs and devices are included in the "Traffic Control Devices List" and will be measured and paid for at the Contract Unit price for each device. Additional devices required to accommodate the Contractor's operation shall be the Contractor's responsibility.

708-P01 MULCHING: All disturbed earth shall be stabilized with seed and straw mulch punched after the completion of the earth moving operation.

752-P01 GATE - VEHICLE: This pay item shall include the removal of the existing steel gate and the installation of a new steel 14' utility tube gate. The installation shall include post, gate, and hinges. The gate shall have a minimum of 6 horizontal tubes and at least 19-gauge steel. The gate shall be painted or galvanized. The gate shall accommodate the placement of a padlock on the locking device. The padlock shall be furnished by the Contractor and 5 sets of keys shall be furnished to the engineer in the field.

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## NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	6	2

### SECTION 110

754-P01 BREAKAWAY BASES FOR SIGN SUPPORTS: The plans show two types of breakaway bases and the contractor may choose either system. Standard Drawing D-754-24 shows the breakaway base requirements for perforated tube supports. Breakaway coupler system details for perforated tube supports have been provided in the plans. The contractor may choose either system but the system chosen shall be used throughout the project. Breakaway bases shall not be paid for separately, but shall be included in the prices bid for the items "Steel Galv Posts - Telescoping Perforated Tube."

### SECTION 130

748-P01 CURB & GUTTER – TYPE 1 SPECIAL: Twenty lineal feet of curb and gutter is required along each side of the roadway at the ends of the bridge approach slabs, at the Heart River Bridge, as shown in the plans.

The curb and gutter shall be Type 1 as shown on Standard Drawing D-748-1, except the last 3 feet of curb and gutter, at the end nearest the approach slab, shall be transitioned to match the shape of the jersey barrier and the end of the curb furthest from the bridge approach slab shall be tapered from a 6" curb height to 0" curb height in 3 feet, as shown on Standard Drawing D-764-3.

All costs for constructing the curb and gutter as described above, shall be included in the price bid for the item "Curb & Gutter – Type 1 Special."

764-850 REMOVE W-BEAM GUARDRAIL & POSTS: The removed W-beam guardrail and posts that are not reset shall become the property of the contractor and shall be disposed of outside the highway right of way.

The item "Remove W-Beam Guardrail & Posts" shall be measured by the linear foot of guardrail removed.

The cost of removing the guardrail and posts, and disposing of these materials shall be included in the price bid for the item "Remove W-Beam Guardrail & Posts."

764-P01 RESET W-BEAM GUARDRAIL END TERMINAL: Four existing W-Beam guardrail end terminals shall be removed and reset, as shown in the plans.

The existing end terminals are FLEATs (Flared Energy Absorbing Terminals), manufactured by Road Systems, Inc. of Big Spring, Texas. These devices were originally installed in the year 2004.

All cost for storing, transporting, and resetting the end terminals shall be included in the price bid for the item "Reset W-Beam Guardrail End Terminal."

This document was originally issued and sealed by Douglas A Schumaker, Registration Number PE-5047, on 2/14/11 and the original document is stored at the North Dakota Department of Transportation.

## ENVIRONMENTAL COMMITMENTS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	6	3

**ENVIRONMENTAL COMMITMENTS:** The North Dakota Department of Transportation and the Federal Highway Administration have made several environmental commitments to various agencies and the public to secure approval of this project. The environmental commitments are as follows:

**Commitment No. 1:** Approximately **0.18 acres** of wetlands will be temporarily impacted resulting from demolition of the existing structure and construction of the proposed structure. Approximately **0.64** acres of wetlands will be permanently impacted because of the placement of riprap along the bridge. Impacts to riverine systems do not require mitigation; therefore, no mitigation is proposed onsite or at a wetland mitigation bank.

Action taken/required: Temporary impacts will not be mitigated. The original waterway will be reestablished after construction of the new structure.

**Commitment No. 6:** The bridge is considered a historic property and the demolition of the structure is considered an adverse effect (SHPO #09-1771).

Action taken/required: The FHWA and the Advisory Council on Historic Preservation have been notified of the adverse effect and resolution of adverse effect will take place through a Memorandum of Agreement with the State Historic Preservation Office and FHWA.

**PERMITS REQUIRED:**

- USACE Section 404 Permit (US Army Corps of Engineers)
- Floodplain Permit and Floodway Authorization (City of Mandan)
- Sovereign Lands Permit (ND State Water Commission)

Wetland Number	Location	LONG / LAT (Dec. Deg.)	Cowardin Classification	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands*	Wetland Impacts (acres)	
								Temp.	Perm.
1	Sec.25, T139N, R82W	-100.973639W 46.833702 N	R2UBG	Natural	1.56	Riverine	X	0.15	0.51
2E	Sec.25, T139N, R82W	-100.973950 W 46.833232 N	R2US2	Natural	0.08	Riverine	X	0.01	0.01
2W	Sec.25, T139N, R82W	-100.974716 W 46.833472 N	R2US2	Natural	0.31	Riverine	X	0.02	0.12
<b>TOTALS</b>					<b>1.95</b>			<b>0.18</b>	<b>0.64</b>

\* A wetland jurisdictional determination was issued by the USACE on July 31, 2009; NWO-2009-01792-BIS

**Commitment No. 2:** No construction or demolition activities are to take place in the Heart River channel from April 15 to June 1 unless methods to avoid, minimize, or mitigate impacts to fish during migration/spawning are incorporated.

Action taken/required: No work will take place in the channel from April 15 to June 1 unless the contractor installs and maintains floating turbidity barriers to isolate the construction site from the main channel of the Heart River.

**Commitment No. 3:** A structure will be demolished as a part of this project. SFN 17987 Asbestos Notification of Demolition and Renovation is required.

Action taken/required: The contractor will complete and submit SFN 17987 to the North Dakota Department of Health 10 days prior to beginning the activity.

**Commitment No. 4:** The contractor shall provide the ND Game & Fish Department a reasonable opportunity to inspect all vessels, motors, trailers, and construction equipment prior to these items being launched or placed into the waters of the state.

Action taken/required: A minimum of 72 hours notice must be provided for scheduling an inspection. The department's Special Project Biologist, Lynn Schlueter, can be contacted at 701-662-3617 for equipment inspections or any additional information regarding Aquatic Nuisance Species prevention protocols.

**Commitment No. 5:** The removal of the structure shall not take place until after July 15 to allow migratory birds to complete their nesting cycle.

Action taken/required: The structure shall not be removed before July 15 unless the contractor uses alternative measures to prevent migratory birds from using nests prior to construction.

# ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
<b>ND</b>	SS-1-094(123)912	<b>8</b>	<b>1</b>

SPEC CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
-----	-----	-----	-----	-----
103	0100 CONTRACT BOND	L SUM	1	1
201	0330 CLEARING & GRUBBING	L SUM	1	1
202	0105 REMOVAL OF STRUCTURE	L SUM	1	1
202	0132 REMOVAL OF BITUMINOUS SURFACING	SY	2,411	2,411
202	0153 SAW BITUMINOUS SURFACING-FULL DEPTH	LF	112	112
203	0101 COMMON EXCAVATION-TYPE A	CY	777	777
203	0109 TOPSOIL	CY	945	945
203	0140 BORROW-EXCAVATION	CY	1,303	1,303
210	0101 CLASS I EXCAVATION	L SUM	1	1
210	0111 CLASS 2 EXCAVATION	L SUM	1	1
210	0201 FOUNDATION PREPARATION	EA	1	1
216	0100 WATER	M GAL	88	88
302	0100 SALVAGED BASE COURSE	TON	2,503.1	2,503.1
408	0188 HOT BITUMINOUS PAVEMENT CL 31	TON	692.4	692.4
411	0105 MILLING PAVEMENT SURFACE	SY	444.4	444.4
550	0215 CONCRETE BRIDGE APPROACH SLAB	SY	298	298
602	0130 CLASS AAE-3 CONCRETE	CY	562.6	562.6
602	1130 CLASS AE-3 CONCRETE	CY	442.2	442.2
602	1250 PENETRATING WATER REPELLENT TREATMENT	SY	1,551	1,551
604	9920 PRESTRESSED I-BEAM-63IN	LF	1,720	1,720
612	0115 REINFORCING STEEL-GRADE 60	LBS	38,053	38,053
612	0116 REINFORCING STEEL-GRADE 60-EPOXY COATED	LBS	117,031	117,031
616	0364 STRUCTURAL STEEL M270-GRADE 36	LBS	1,122	1,122
622	0040 STEEL PILING HP 12 X 53	LF	1,680	1,680
622	0070 STEEL PILING HP 14 X 102	LF	1,600	1,600
702	0100 MOBILIZATION	L SUM	1	1
704	1000 TRAFFIC CONTROL SIGNS	UNIT	1,109	1,109
704	1052 TYPE III BARRICADE	EA	6	6
708	1020 RIPRAP-LOOSE ROCK	CY	3,628	3,628
708	1375 FLOTATION SILT CURTAIN	LF	383	383
708	1430 FIBER ROLLS 12IN	LF	1,066	1,066
708	2240 SEEDING-TYPE B-CL II	ACRE	1.757	1.757
708	2260 SEEDING-TYPE B-CL IV	ACRE	1.757	1.757

# ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
<b>ND</b>	SS-1-094(123)912	<b>8</b>	<b>2</b>

SPEC CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
-----	-----	-----	-----	-----
708 5500	MULCHING	ACRE	1.757	1.757
708 5660	TRM TYPE 1	SY	177	177
708 8500	STABILIZED CONSTRUCTION ACCESS	EA	1	1
709 0600	GEOTEXTILE FABRIC-TYPE RR	SY	5,442	5,442
748 0141	CURB & GUTTER-TYPE 1 SPECIAL	LF	80	80
752 2100	GATE-VEHICLE	EA	1	1
754 0117	FLAT SHEET FOR SIGNS-TYPE 3A REFL SHEETING	SF	24	24
754 0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	48	48
754 0563	REFERENCE MARKER-TYPE C	EA	1	1
754 0592	RESET SIGN PANEL	EA	1	1
762 0430	SHORT TERM 4IN LINE-TYPE NR	LF	660	660
762 1104	PVMT MK PAINTED 4IN LINE	LF	5,940	5,940
764 0131	W-BEAM GUARDRAIL	LF	132	132
764 0151	REMOVE W-BEAM GUARDRAIL & POSTS	LF	483	483
764 1050	RESET W-BEAM GUARDRAIL	LF	125	125
764 1059	RESET W-BEAM GUARDRAIL END TERMINAL	EA	4	4
764 2081	REMOVE END TREATMENT & TRANSITION	EA	4	4
930 3000	BRIDGE BENCH MARKS	SET	1	1
930 9536	ABUTMENT UNDERDRAIN SYSTEM	L SUM	1	1

## BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	10	1

### Materials

Salvaged Base Course @ 1.875 Ton/CY

Hot Bituminous Pavement Class 31 @ 2 Ton/CY

PG 64-28 Asphalt Cement @ 6.0%

(Not a pay item – to be Included in the price bid for “Hot Bituminous Pavement Class 31”).

MC-70 or 250 Liquid Asphalt @ 0.35 Gal/SY

(Not a pay item – to be Included in the price bid for “Hot Bituminous Pavement Class 31”).

SS1H or CSS1H or MS1 Emulsified Asphalt @ 0.05 Gal/SY

(Not a pay item – to be Included in the price bid for “Hot Bituminous Pavement Class 31”).

Water @ 10 Gals / Ton Salvaged Base Course

Water @ 10 Gals / CY Borrow

**50 MGal** for dust control

### Short Term 4In Line - Type NR

I-94 Business:

Assumed Length of Temporary Striping = 2,640 Feet = 0.5 Mile

0.5 Mile (10' Line, 30' Skip) x 1,320 LF/Mile = **660 LF**

- 1,320 LF/Mile for 10' Line, 30' Skip

### Pavement MK Painted 4 In Line

I-94 Business

Assumed Length of Permanent Striping = 2,640 Feet = 0.5 Mile

0.5 Mile (10' Line, 30' Skip) x 1,320 LF/Mile = **660 LF**

- 1,320 LF/Mile for 10' Line, 30' Skip

2,640 Feet (Length of Striping) x 2 Edge Lines= **5,280 LF**

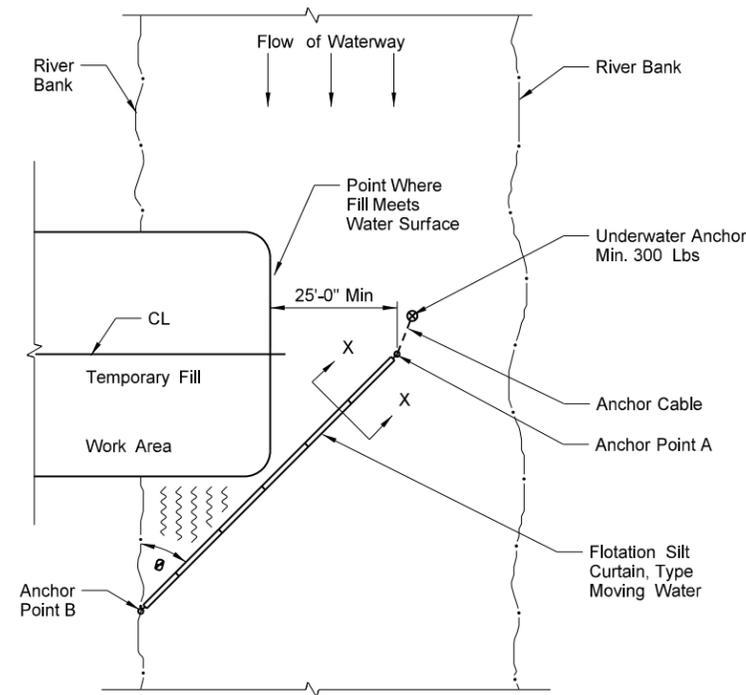
- 5280 LF/Mile for Outside Edge Lines

### Seeding & Mulching:

The entire area outside the paved roadway disturbed by construction of this project shall be seeded and mulched, including guardrail embankment and footprint of the temporary bypass. The exact limits for mulching and seeding shall be determined by the engineer in the field.

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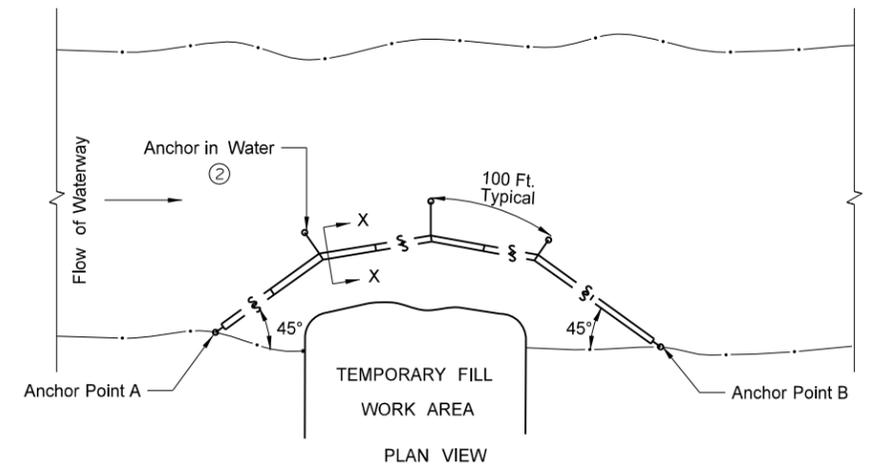
Basis of Estimate



$\angle \theta$	RIVER VELOCITY
45°	SLOW, LESS THAN 3 FT./SEC.
35°	MODERATE, 3 - 5 FT./SEC.

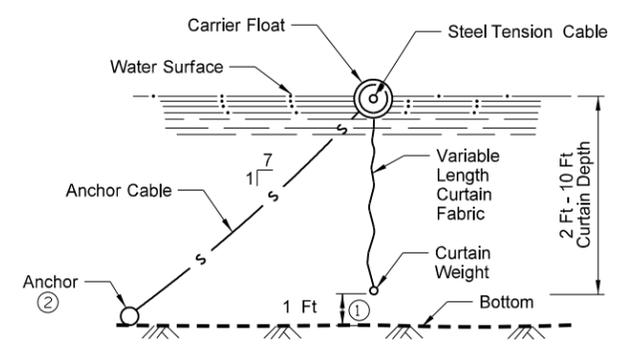
PLAN VIEW  
FLOTATION SILT CURTAIN - TYPE MOVING WATER

DESIGN GUIDELINES:  
 MAXIMUM WATER DEPTH: 11 FT. ①  
 MINIMUM WATER DEPTH: 3 FT.  
 MAXIMUM WATER VELOCITY: 5 FT./SEC.



PLAN VIEW  
FLOTATION SILT CURTAIN - TYPE WORK AREA

DESIGN GUIDELINES:  
 MAXIMUM WATER VELOCITY: 5 FT./SEC.  
 MAXIMUM WATER DEPTH: 11 FT.



SECTION X-X  
FLOTATION SILT CURTAINS

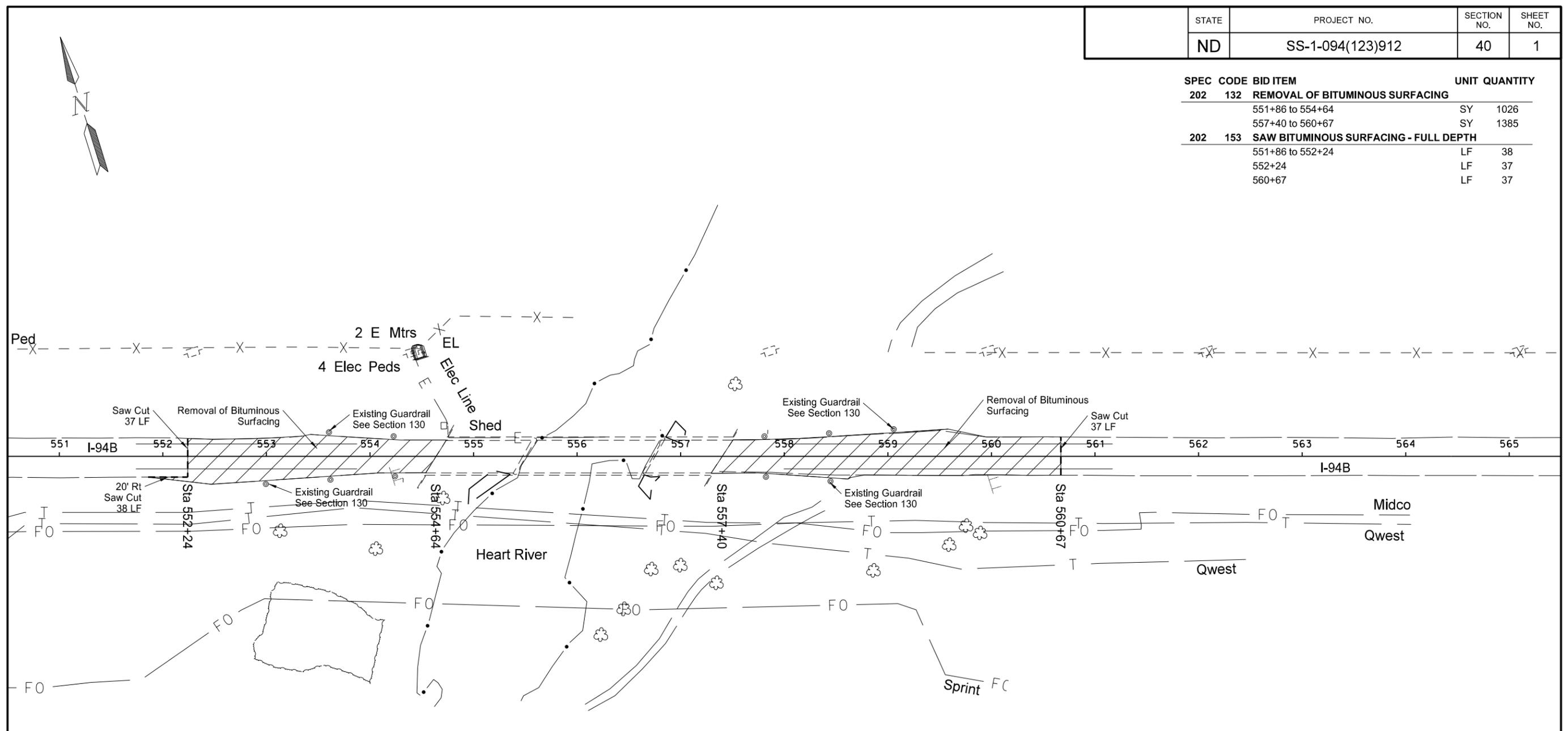
- Notes:
- ① Curtain 1 FT from Bottom
  - ② Use enough Anchors to Hold Silt Curtain in Place

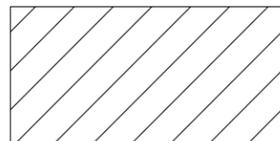
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Flotation Silt Curtain

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	40	1

SPEC CODE	BID ITEM	UNIT	QUANTITY
202 132	REMOVAL OF BITUMINOUS SURFACING		
	551+86 to 554+64	SY	1026
	557+40 to 560+67	SY	1385
202 153	SAW BITUMINOUS SURFACING - FULL DEPTH		
	551+86 to 552+24	LF	38
	552+24	LF	37
	560+67	LF	37



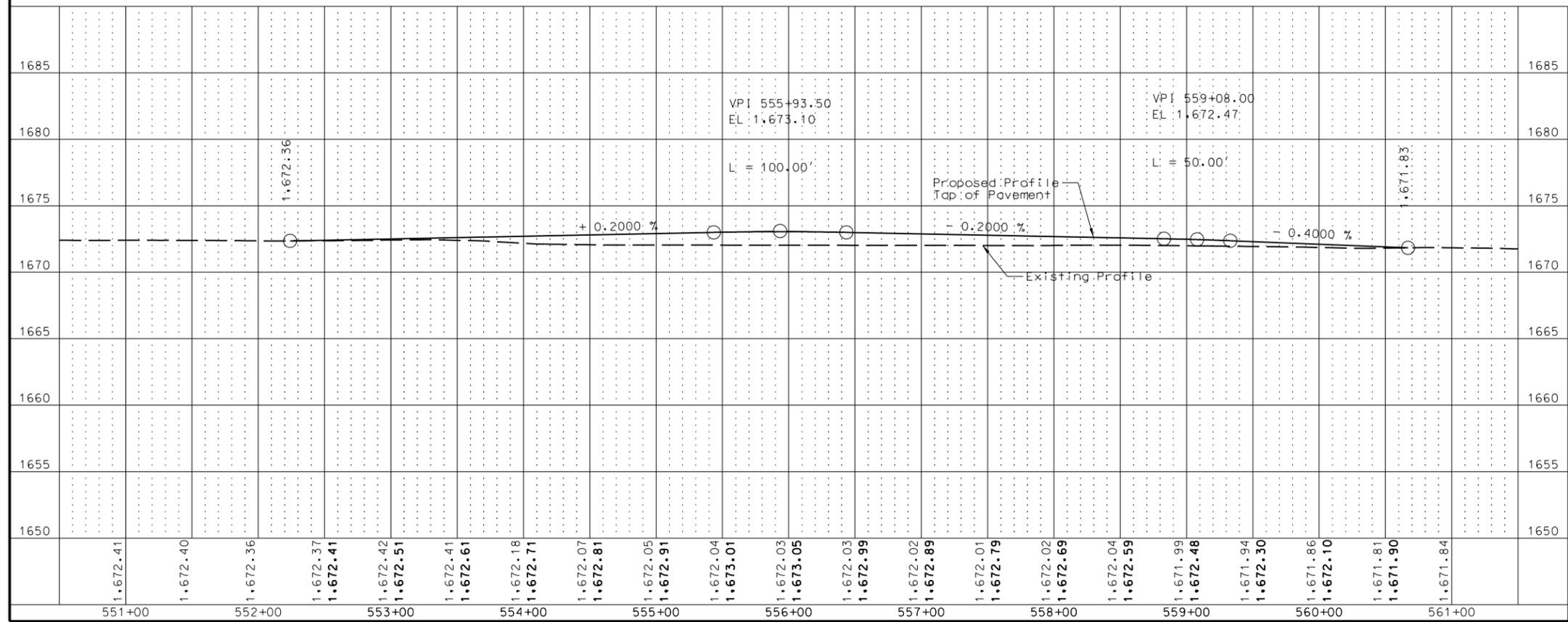
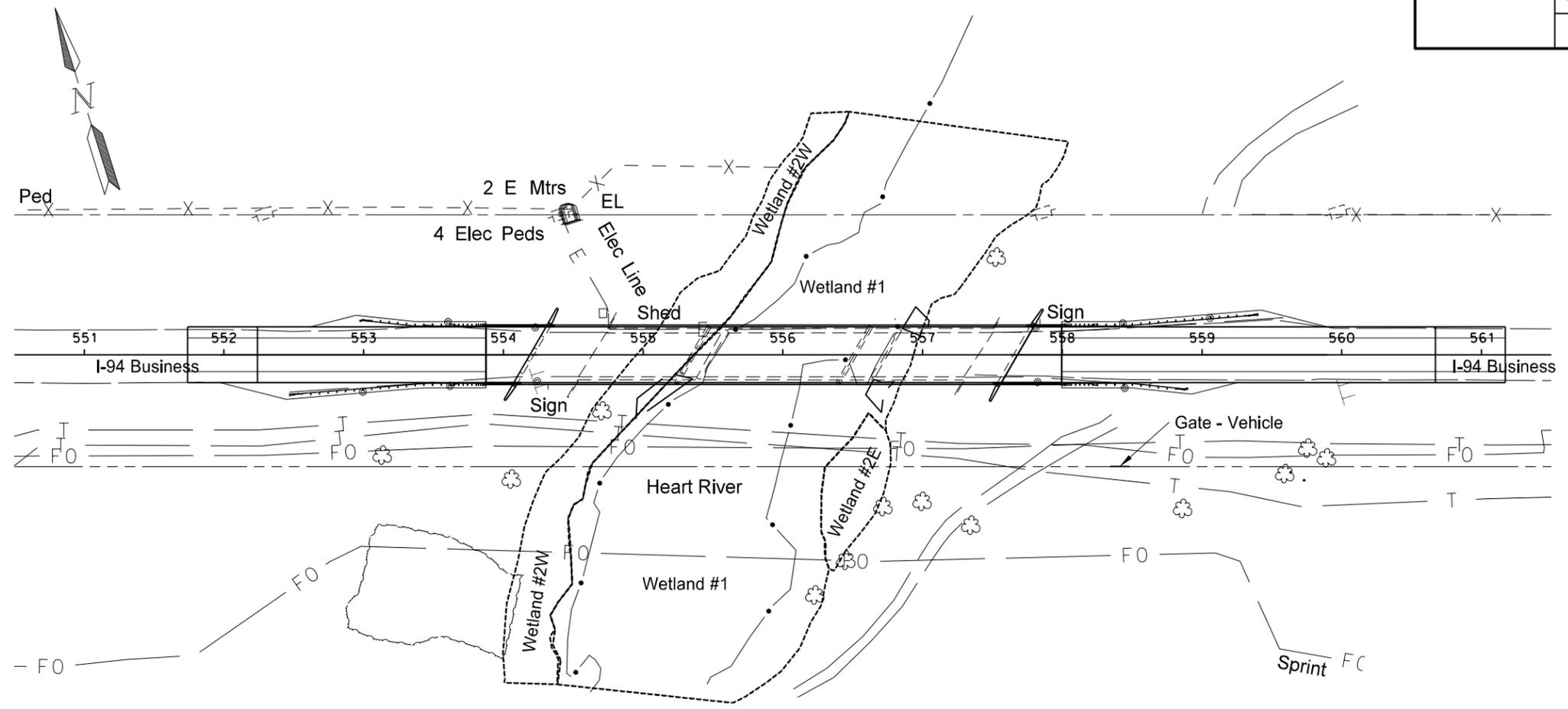

 Removal of Bituminous Surfacing  
 (Approx. 4.5" existing surfacing)

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Pavement Removal  
 I-94 Business

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	60	1

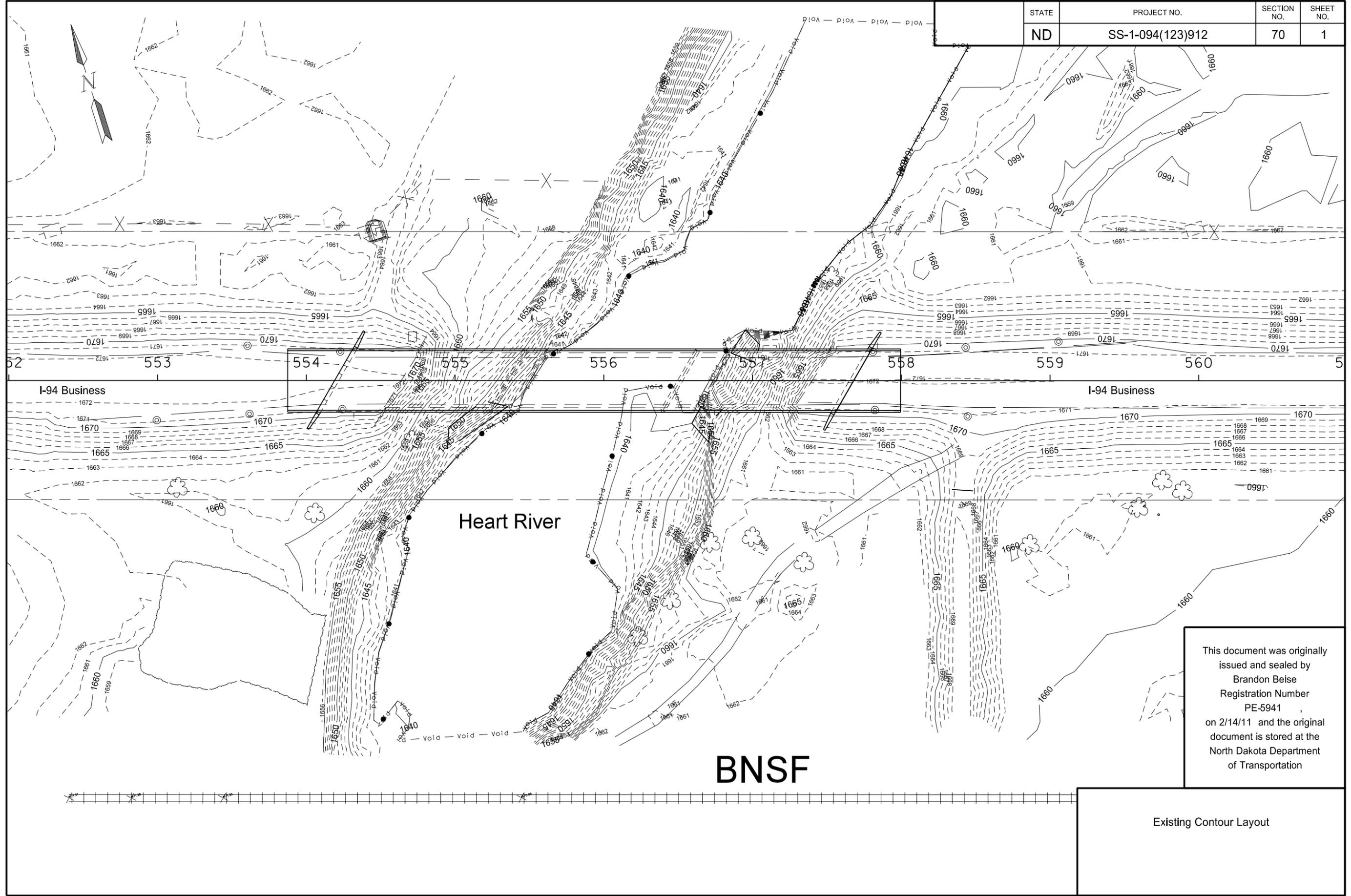
SPEC CODE	BID ITEM	UNIT	QUANTITY
752	2100 GATE-VEHICLE	EA	1
	558+41Rt		



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Plan & Profile  
I-94 Business

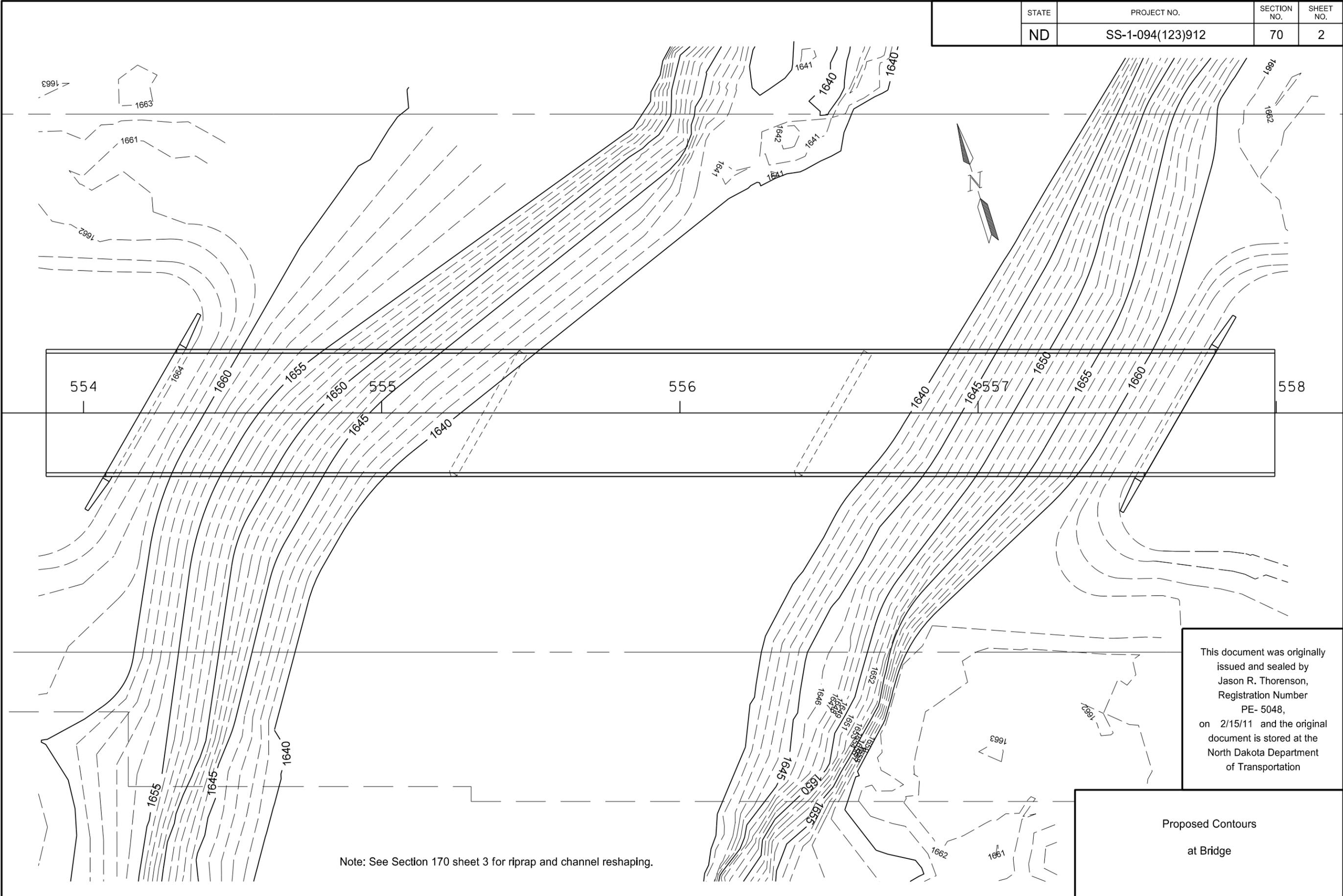
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	70	1



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Existing Contour Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	70	2



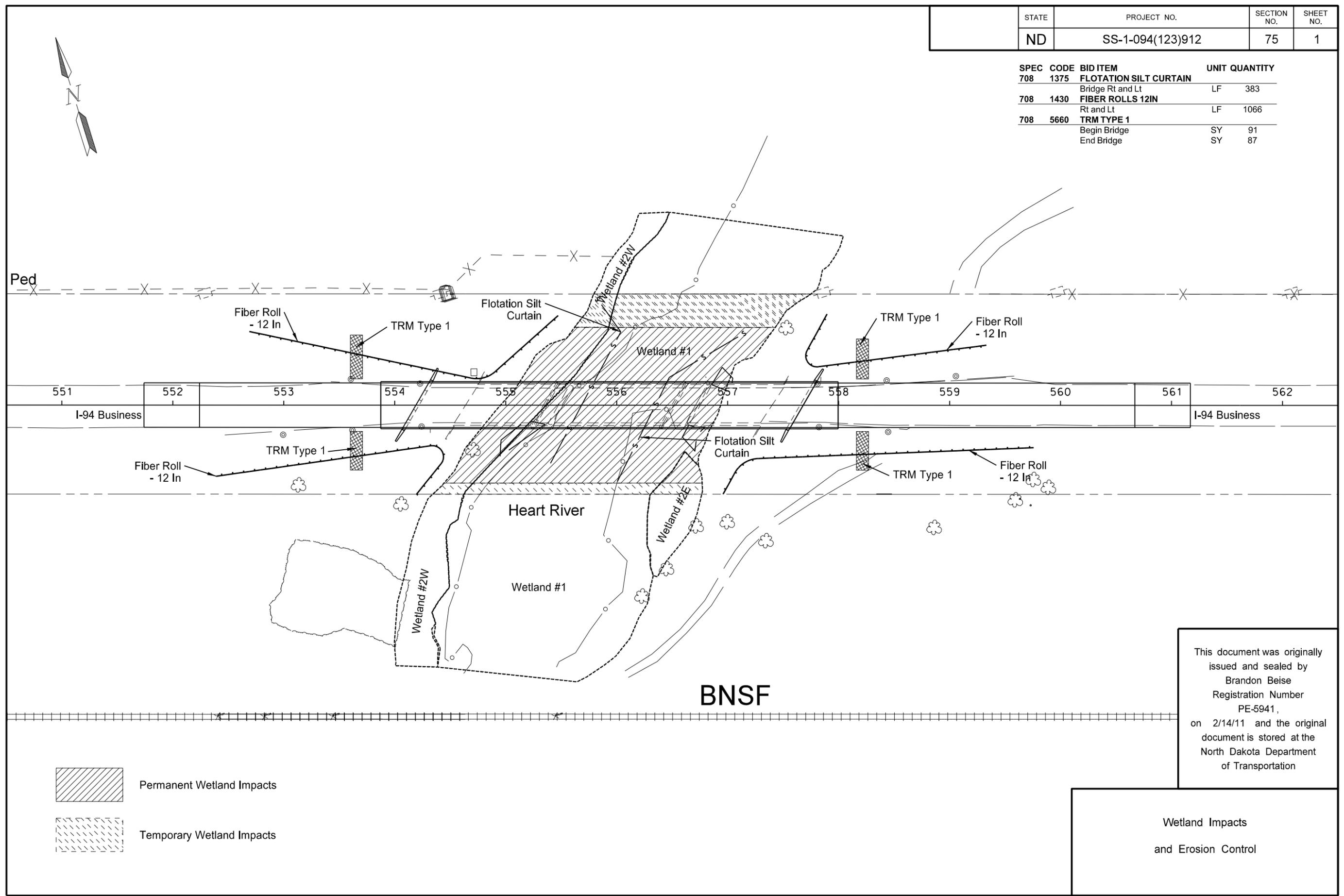
Note: See Section 170 sheet 3 for riprap and channel reshaping.

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Proposed Contours  
at Bridge

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	75	1

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1375	FLOTATION SILT CURTAIN		
		Bridge Rt and Lt	LF	383
708	1430	FIBER ROLLS 12IN		
		Rt and Lt	LF	1066
708	5660	TRM TYPE 1		
		Begin Bridge	SY	91
		End Bridge	SY	87

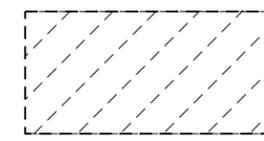
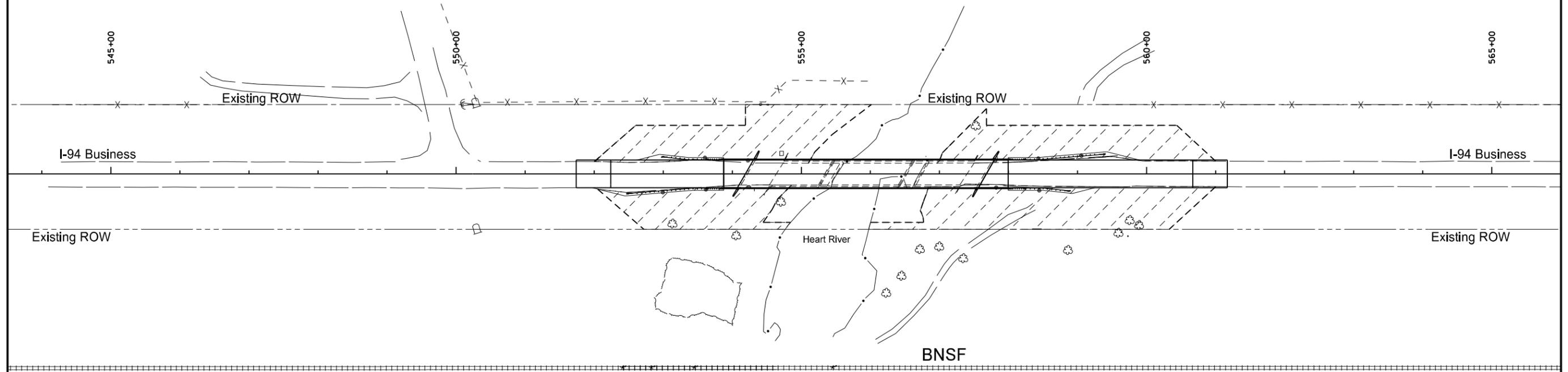


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Wetland Impacts  
 and Erosion Control

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	75	2

SPEC	CODE	BID ITEM	UNIT	QUANTITY
203	109	TOPSOIL	CY	945
708	2240	SEEDING - TYPE B - CL II	ACRE	1.757
708	2260	SEEDING - TYPE B - CL IV	ACRE	1.757
708	5500	MULCHING	ACRE	1.757



Area of Topsoil, Mulching, and Seeding

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Topsail, Mulching, and Seeding Layout



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	170	2

## NOTES

- 100 SCOPE OF WORK: This project consists of building a new 3-span prestressed concrete I-girder bridge with an overall length of 349'-0" and a clear roadway width of 40'-0".
- 100 GENERAL: The cost of furnishing and placing preformed expansion joint filler, concrete inserts, silicone sealant, rebar couplers and other miscellaneous items shall be included in the price bid for Class AE-3 and AAE-3 concrete.
- 107 HAZARDOUS MATERIAL: The existing structural steel is painted with lead-based paint. Certain Contractor operations could expose employees to hazardous levels of lead. The Contractor shall plan accordingly and shall inform employees of the hazards of lead-based paint. Any loose and peeling paint found on the existing structural steel shall be removed, contained, and disposed of properly, prior to the removal of the existing structure.
- 202 REMOVAL OF STRUCTURE: The existing structure is a 3-span steel girder bridge, 277'-0" long with a clear roadway width of 32'-0". The abutments and piers are reinforced concrete supported by timber piling. In addition, there are existing piling that are exposed in the channel. The abutment, pier, footings, and any existing piling shall be completely removed 2 feet below the channel bottom.
- In accordance with the Federal Migratory Bird Act, measures to prevent birds from building new nests or using old nests for active nesting must be incorporated into the project. The Contractor shall remove all nesting sites on the existing bridge. The Contractor shall remove any new bird nests on a weekly basis. These measures shall be maintained until the existing bridge has been removed.
- The lump sum bid item, "Removal of Structure", shall include all costs associated with the removal of bird nests, the existing bridge and all existing piling that are exposed in the channel. All labor, equipment, and materials required for the completion of this work shall be included in the price bid for "Removal of Structure."
- 202 USGS STREAM GAGE REMOVAL: There is a wire weight gage mounted to the existing bridge railing. In addition, a gage house is located at the northwest corner of the existing structure that will need to be relocated. The Engineer shall contact Brad Sether of the U.S. Geological Survey, 701-250-7420, basether@usgs.gov, two weeks prior to the Contractor's removal of the existing bridge to coordinate this work. The USGS will remove the gage from the existing bridge and relocate the gage house.
- 210 FOUNDATION PREPARATION: The existing riprap at the site contains both field stone that may be reused and broken concrete that shall be disposed of properly. The cost to complete this work shall be incidental to the lump sum bid item "Foundation Preparation."
- 210 EXCAVATION: The excavation at the abutments, as shown, shall be included in the lump sum bid item, "Class 1 Excavation." The excavation at the piers shall be included in the lump sum bid item, "Class 2 Excavation."

- 210 SELECT BACKFILL: Select backfill shall meet the requirements of Section 816.03, Class 3. The backfill shall be placed in layers of not more than 6 inches, moistened or dried as required, and thoroughly compacted with mechanical tamping equipment. Moisture and density controls shall be in accordance with Section 203.02G of the Standard Specifications and compacted to 90% of maximum dry density as determined by AASHTO T-180. The work and material needed for placing the select backfill shall not be bid separately but shall be included in the pay item, "Abutment Underdrain System." Salvaged aggregate base course may be used in place of select backfill.
- 550 BRIDGE APPROACH SLABS: Mechanical finishing of the approach slabs shall be required. A fine finish shall be applied using the deck tining requirements. Tining shall start 6" from the beginning and end of the approach slabs. A surface tolerance of 3/16" in 10 feet is also required.
- 602 ENDWALLS: If the endwall concrete is placed before the deck concrete, the concrete shall cure for at least 72 hours before deck placement.
- 602 DIAPHRAGMS: The intermediate diaphragm concrete shall be placed before the deck concrete and shall cure for at least 72 hours before deck placement. The pier diaphragm concrete shall be placed at the same time as the deck concrete.
- 602 DECK PLACEMENT: The deck concrete shall be placed at a minimum rate of 55 CY per hour.
- 602 SURFACE FINISH "D": Surface Finish "D" shall be required for the inside and top surfaces of the barriers. This work shall be included in the price bid for "Class AAE-3 Concrete."
- 602 PENETRATING WATER REPELLENT TREATMENT: Penetrating water repellent shall be applied to the driving surface of the concrete deck after Surface Finish D has been applied to the barrier.
- 602 DECK CONCRETE: Beams have slight variations in the anticipated camber. To build the deck to the designated thickness will require slight adjustments in deck elevation and/or riser dimensions. These adjustments result in minor concrete quantity discrepancies. The Contractor shall consider this quantity discrepancy when bidding the unit price for Class AAE-3 concrete. The Department will pay plan quantity of "Class AAE-3 concrete."

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## NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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602 CONCRETE DECK & APPROACH SLAB CURING: The bridge deck and approach slabs shall be cured by the wet-cure method. Covering the concrete with a waterproof material such as polyethylene or the use of curing compounds will not be allowed. If more than 10% fly ash by weight is used in the mix, the wet cure time shall be increased from 7 to 10 days.

No work shall be done on the bridge deck or approach slabs while the wet cure is in progress, including forming the barriers.

No vehicles or equipment not required in the curing process shall be on the bridge deck or approach slabs.

616 STRUCTURAL STEEL: Structural Steel shall be AASHTO M 270, Grade 36T2, except the requirement for the Charpy V-Notch test is waived.

622 PILING: Piling shall be driven with a steam, air, or diesel hammer with a rated energy and ram weight not less than 178,140 foot-pound-tons, as computed by the formula  $W(E-26,950) + 1.322E$ , where  $W$  is the weight of the ram in tons and  $E$  is the rated hammer energy. In no case shall the ram weight be less than 5,500 pounds.

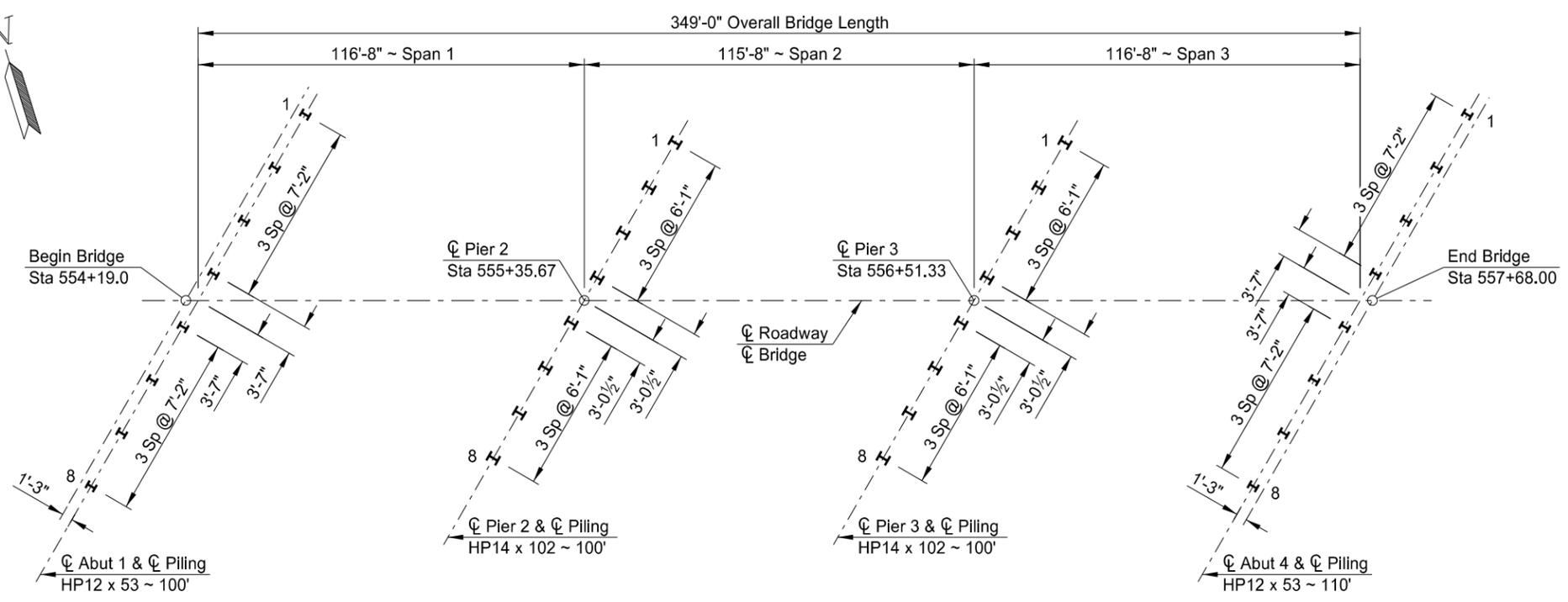
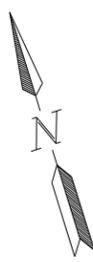
708 RIPRAP – LOOSE ROCK: The existing channel contains debris from previous structures and shall be removed to an elevation two feet below the channel bottom. The existing channel shall be transitioned to the proposed channel section as shown in the plans. Any excavation and shaping required to complete this work shall be included in the price bid for "Riprap – Loose Rock."

900 ELEVATION CHECK POINTS: Eight carriage bolts need to be placed on the top of the barrier to serve as elevation check points. The cost for this item shall be included in the unit price bid for "Bridge Bench Marks."

SHOP DRAWINGS: The Contractor shall submit the following shop drawings to the Engineer for review.

1. Prestressed Concrete I-Beams

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HP12 x 53 Pile shall be driven to 130 tons.  
 HP14 x 102 Pile shall be driven to 250 tons.

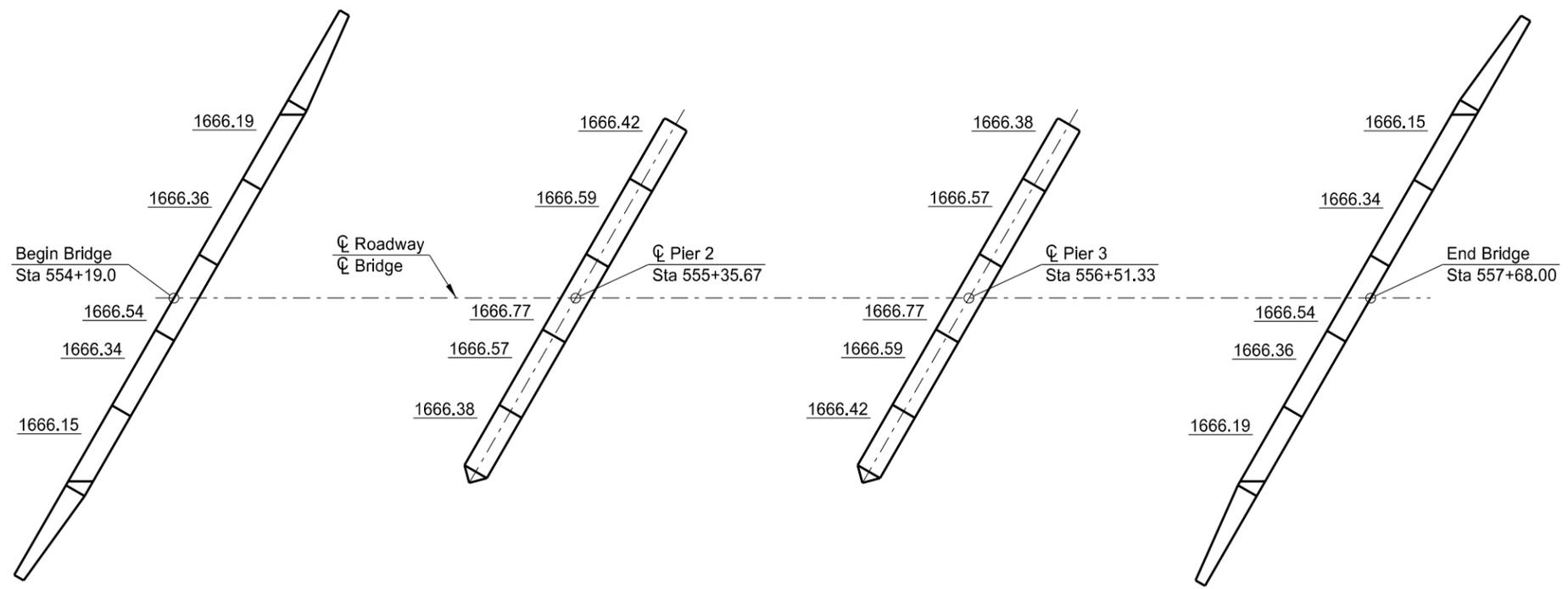
**PILING LAYOUT**

PILE COORDINATES			
	PILE	NORTHING	EASTING
ABUT 1	1	426,055.93	1,850,007.45
	8	426,021.91	1,849,970.58
PIER 2	1	426,019.09	1,850,114.67
	8	425,990.21	1,850,083.38
PIER 3	1	425,984.68	1,850,225.10
	8	425,955.81	1,850,193.81
ABUT 4	1	425,952.98	1,850,337.90
	8	425,918.96	1,850,301.03

**NOTE:**

For double acting or single acting diesel hammers, the safe bearing value of piles shall be determined by the following formula:

$$P = \frac{4.5E}{S + 0.2} \times \frac{W + 0.2M}{W + M}$$



Elevations shown are to top of finished concrete.

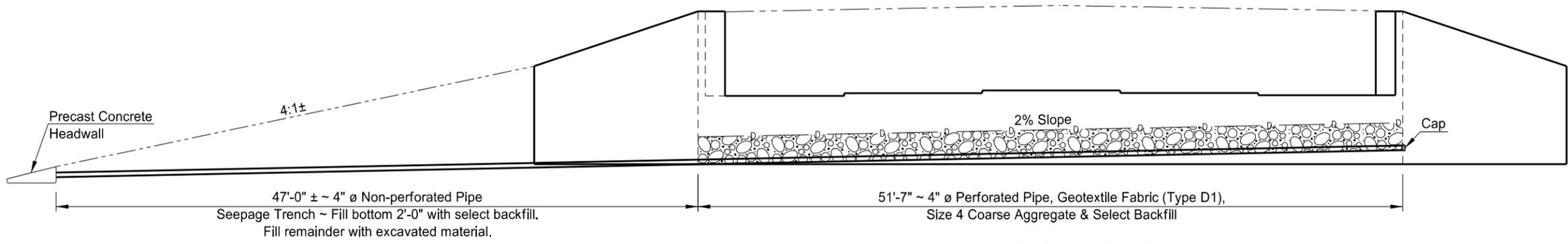
**BEARING ELEVATIONS**

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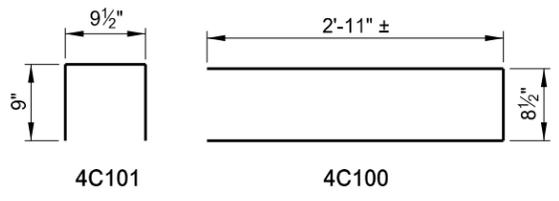
**HEART RIVER BRIDGE  
 4 MILES W OF MANDAN**

**PILING LAYOUT &  
 BEARING ELEVATIONS**

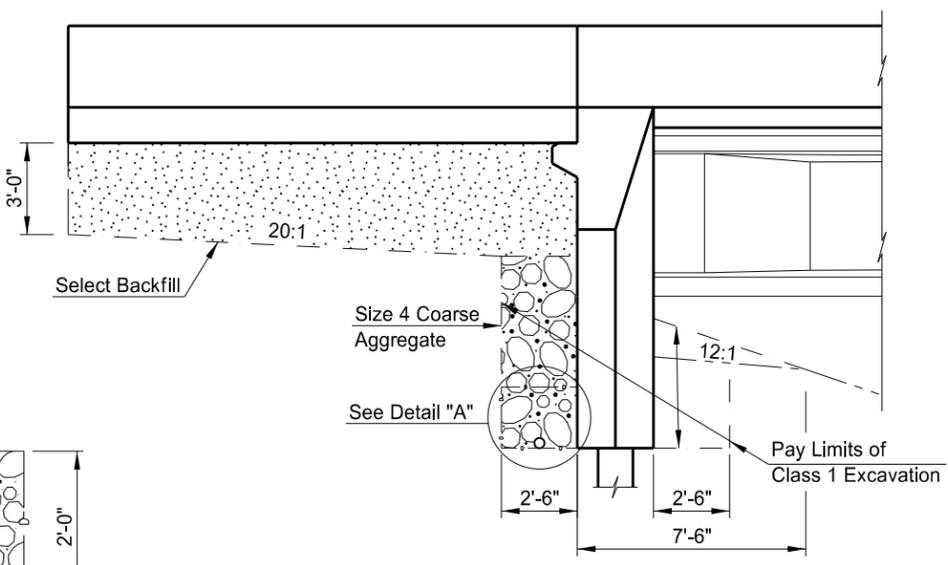
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
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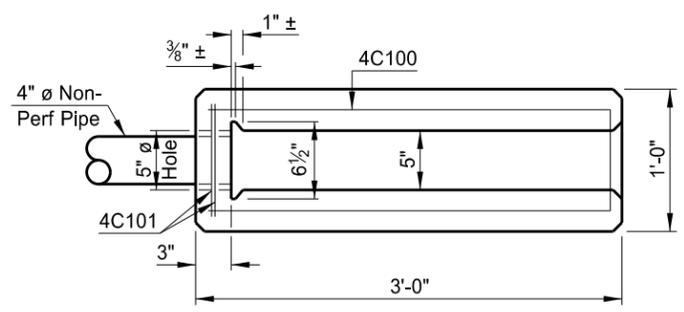
**BACK FACE OF ABUTMENT**  
(Abutment 1 shown)



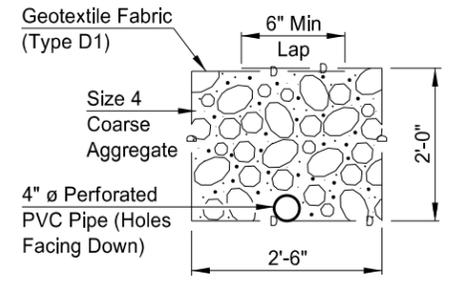
**BENT BAR DETAILS**



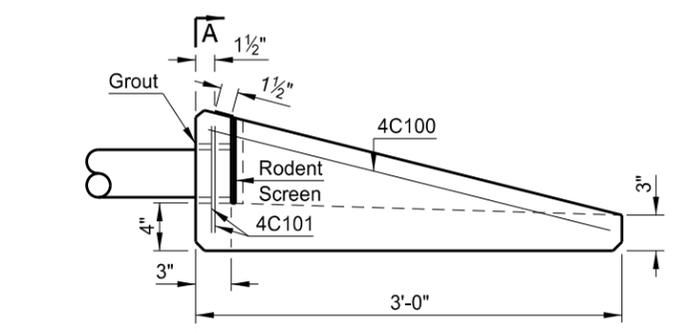
**DETAIL AT ABUTMENT**



**PLAN**

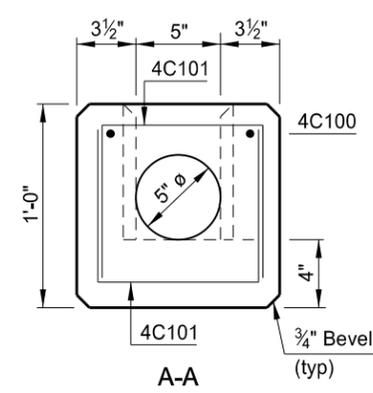


**DETAIL "A"**

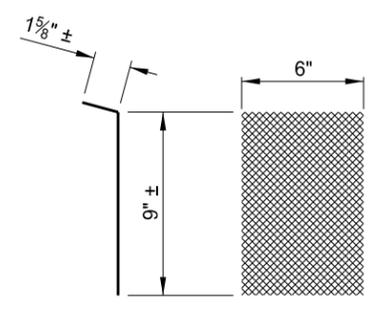


**ELEVATION**

**PRECAST CONCRETE HEADWALL DETAILS**



**A-A**



**RODENT SCREEN DETAILS**

**NOTES:**

The dimensions for the rodent screen are approximate to allow for bending and a snug fit into the slot in the headwall.

The rodent screen shall be fabricated from flattened, expanded metal with screen openings of approximately 0.25 square inches. The screen shall be 16 gage metal and be hot dip galvanized after fabrication.

The cost to furnish and place the select backfill, coarse aggregate, geotextile fabric, perforated pipe, non-perforated pipe, headwalls and rodent screens shall be included in the pay item "Abutment Underdrain System."

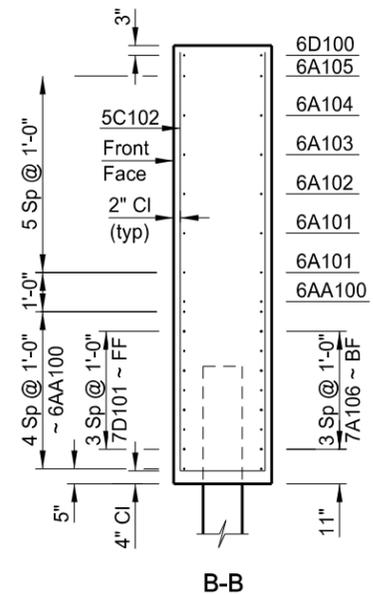
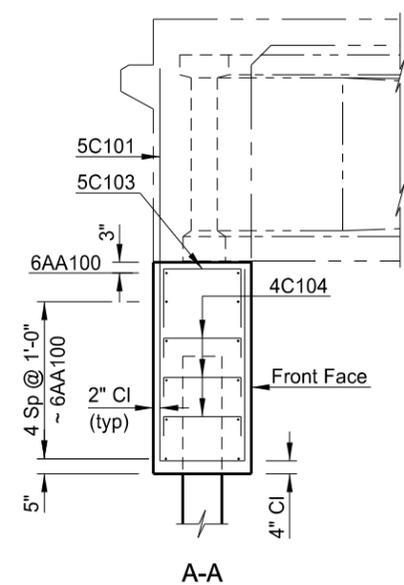
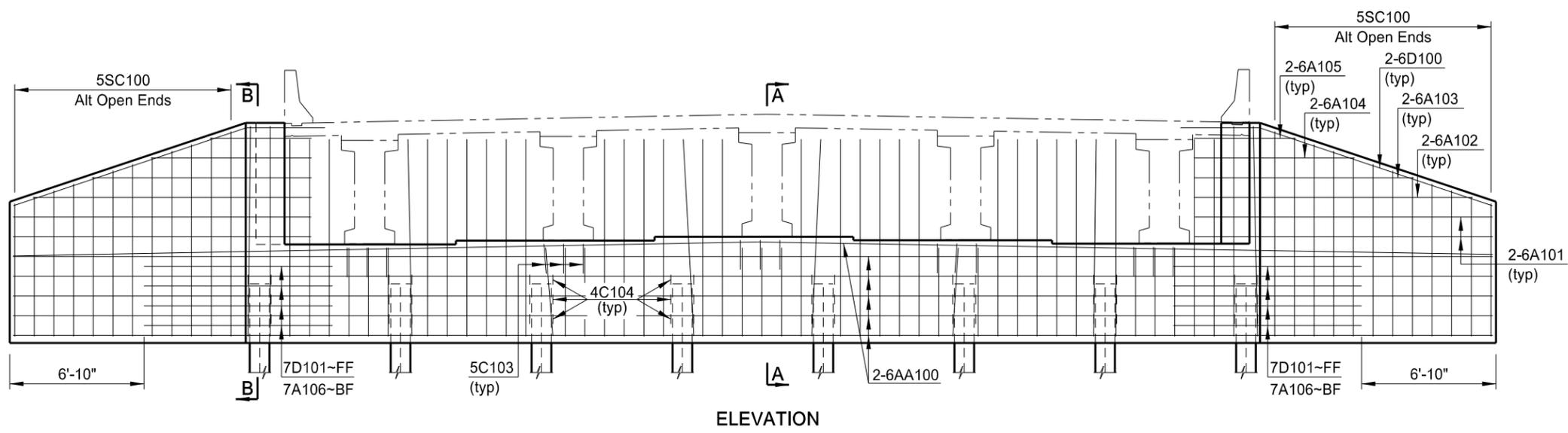
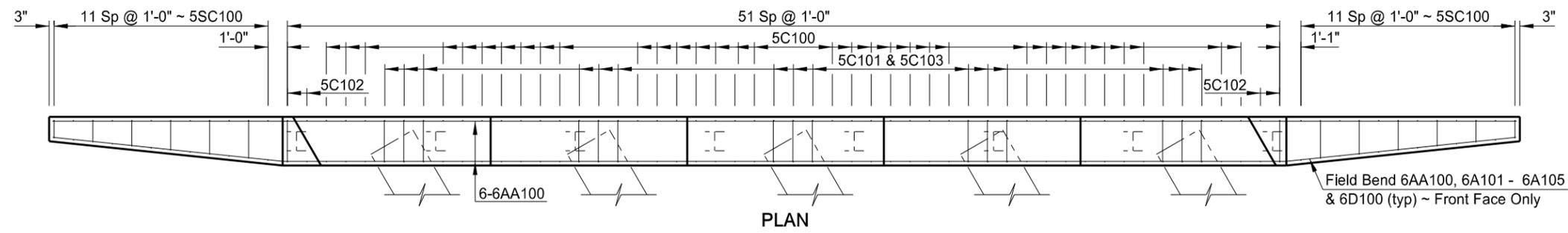
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**HEART RIVER BRIDGE  
4 MILES W OF MANDAN**

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**ABUTMENT UNDERDRAIN &  
EXCAVATION DETAILS**

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
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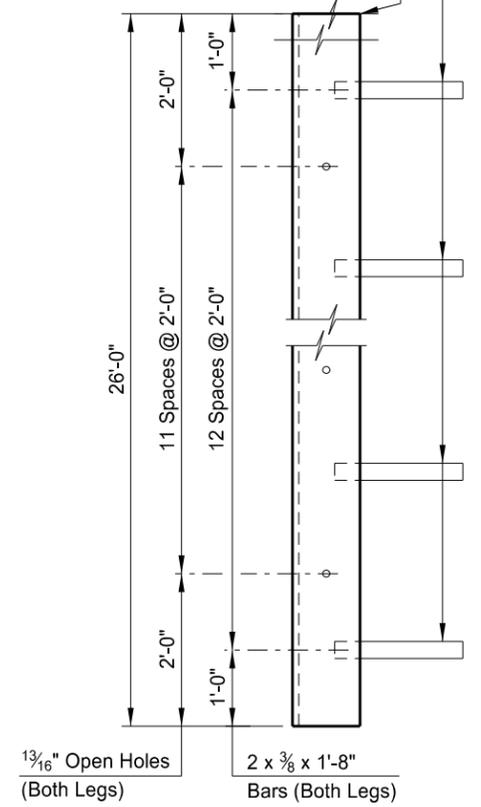
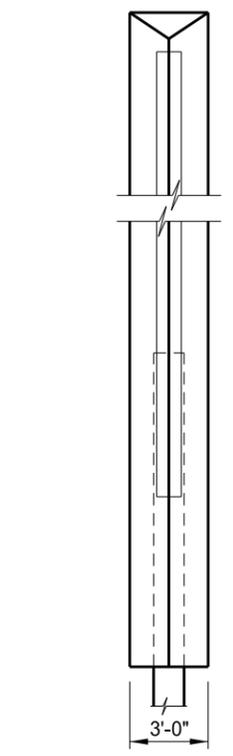
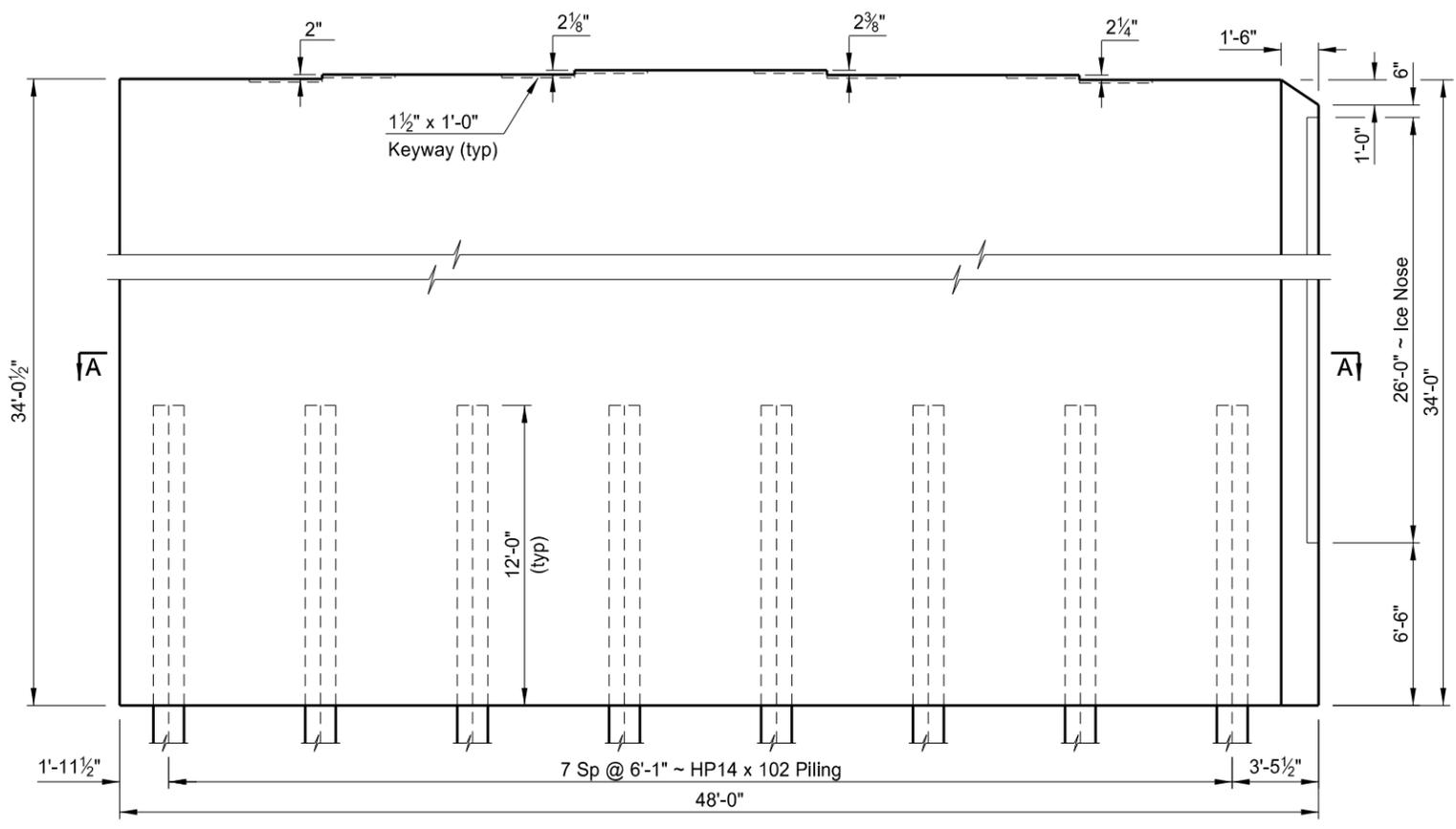
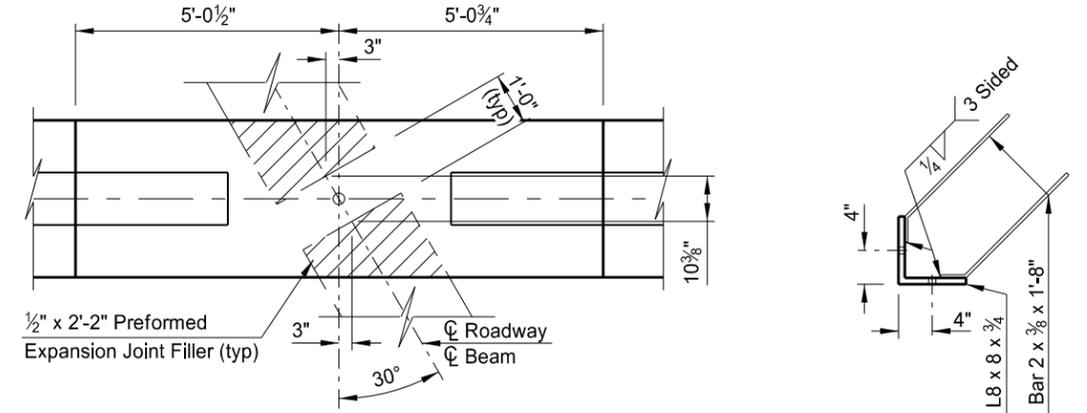
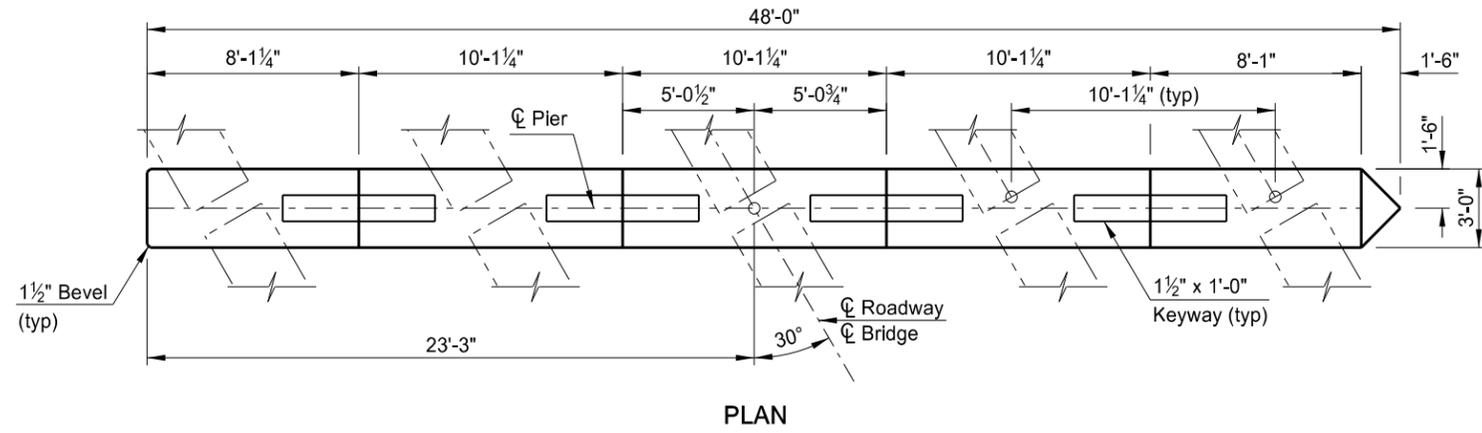


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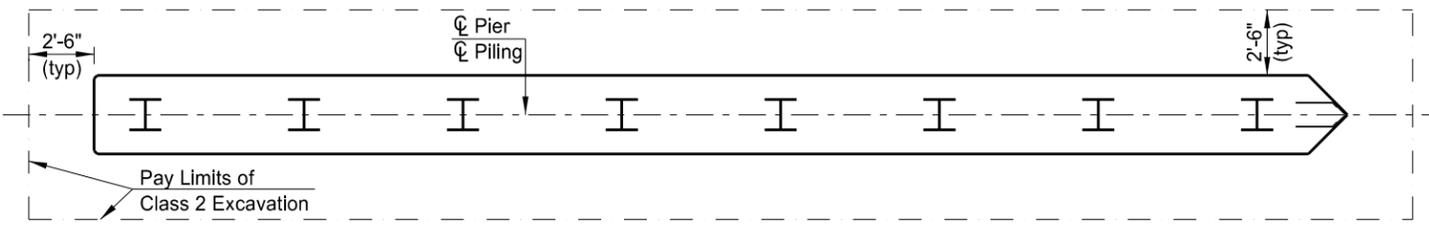
QUANTITIES	(ONE ABUTMENT)
CLASS AE-3 CONCRETE	41.7 CY
REINFORCING STEEL	4,033 LBS

HEART RIVER BRIDGE  
4 MILES W OF MANDAN  
  
(SHOWING REINFORCING)  
ABUTMENT DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
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Galvanize in accordance with AASHTO M 111 after fabrication.



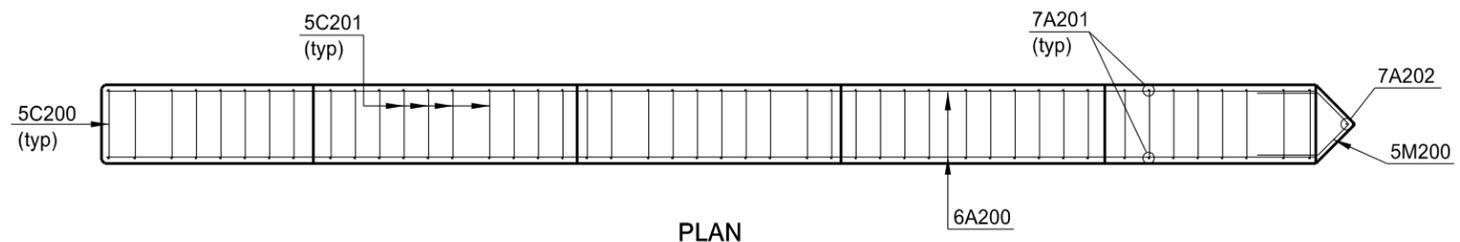
END VIEW

ICE NOSE DETAIL

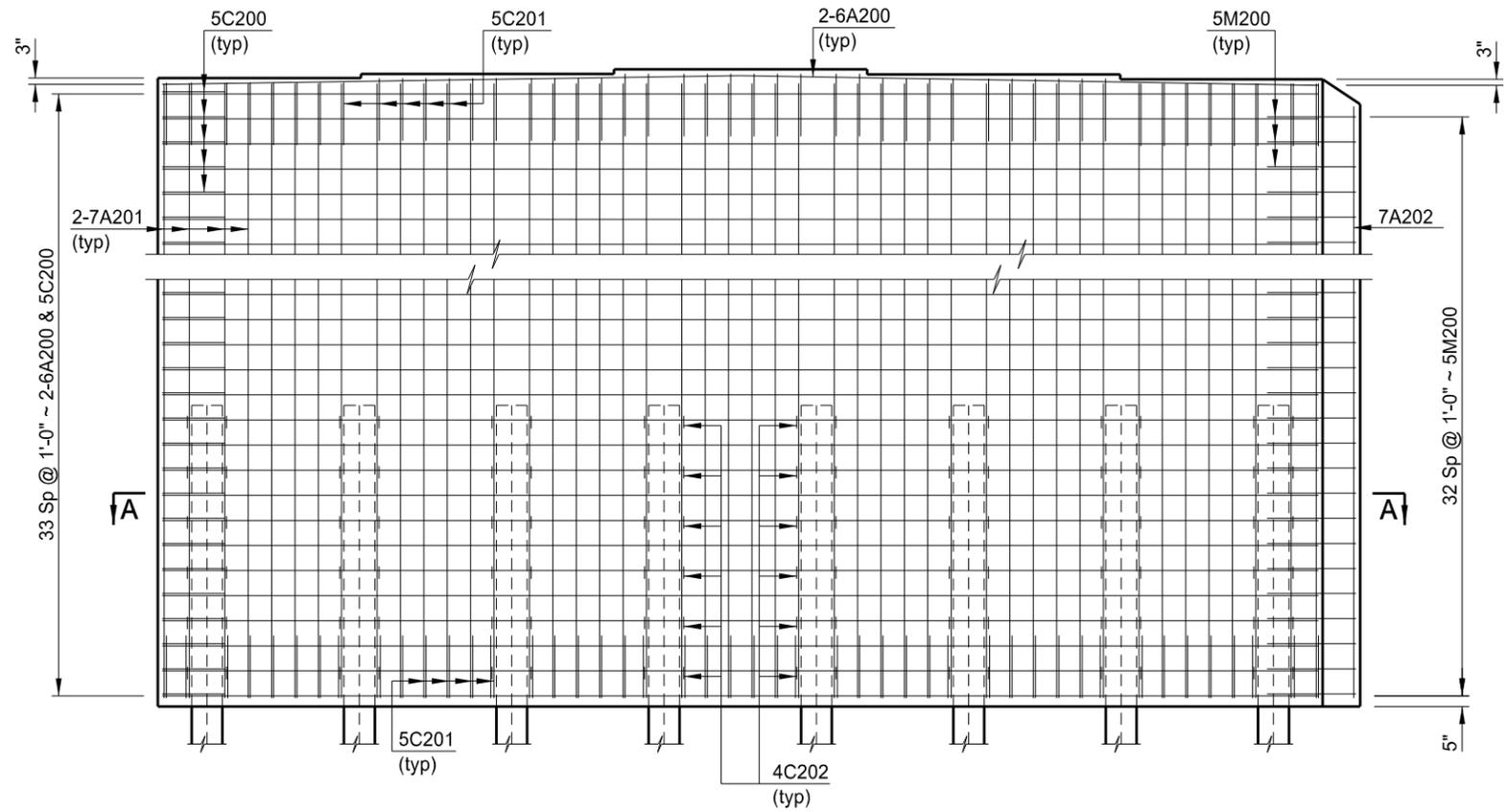
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<b>QUANTITIES</b>
SEE DWG 94-912.032-10
<b>HEART RIVER BRIDGE 4 MILES W OF MANDAN</b>
(SHOWING DIMENSIONS)
<b>PIER DETAILS</b>

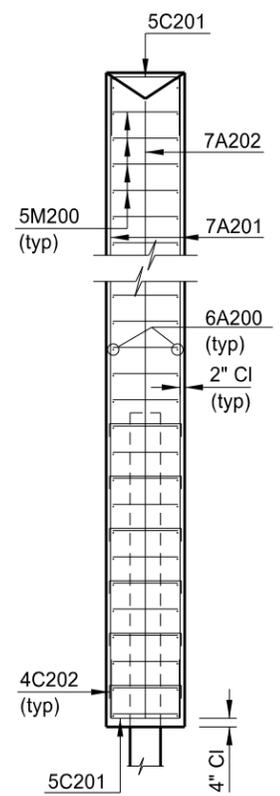
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	170	10



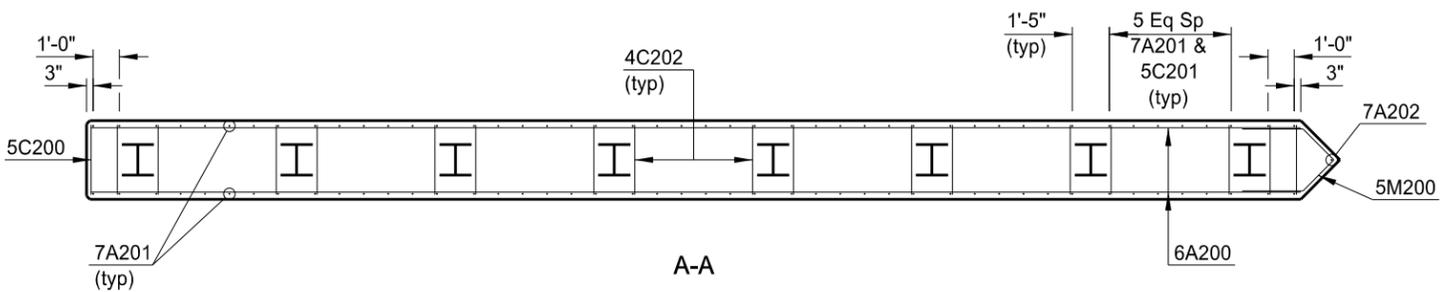
PLAN



ELEVATION



END VIEW



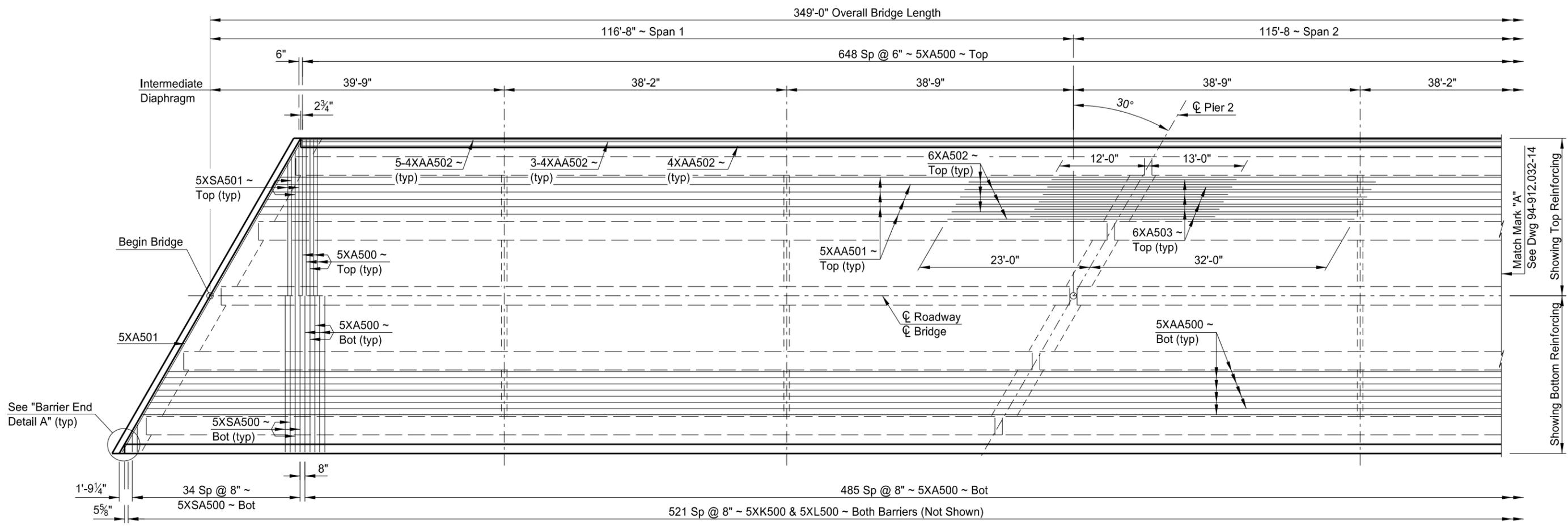
A-A

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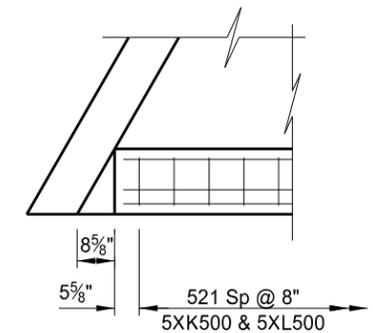
QUANTITIES	(ONE PIER)
CLASS AE-3 CONCRETE	179.4 CY
REINFORCING STEEL	12,600 LBS
STRUCTURAL STEEL	1,122 LBS

HEART RIVER BRIDGE  
4 MILES W OF MANDAN  
  
(SHOWING REINFORCING)  
PIER DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
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PLAN

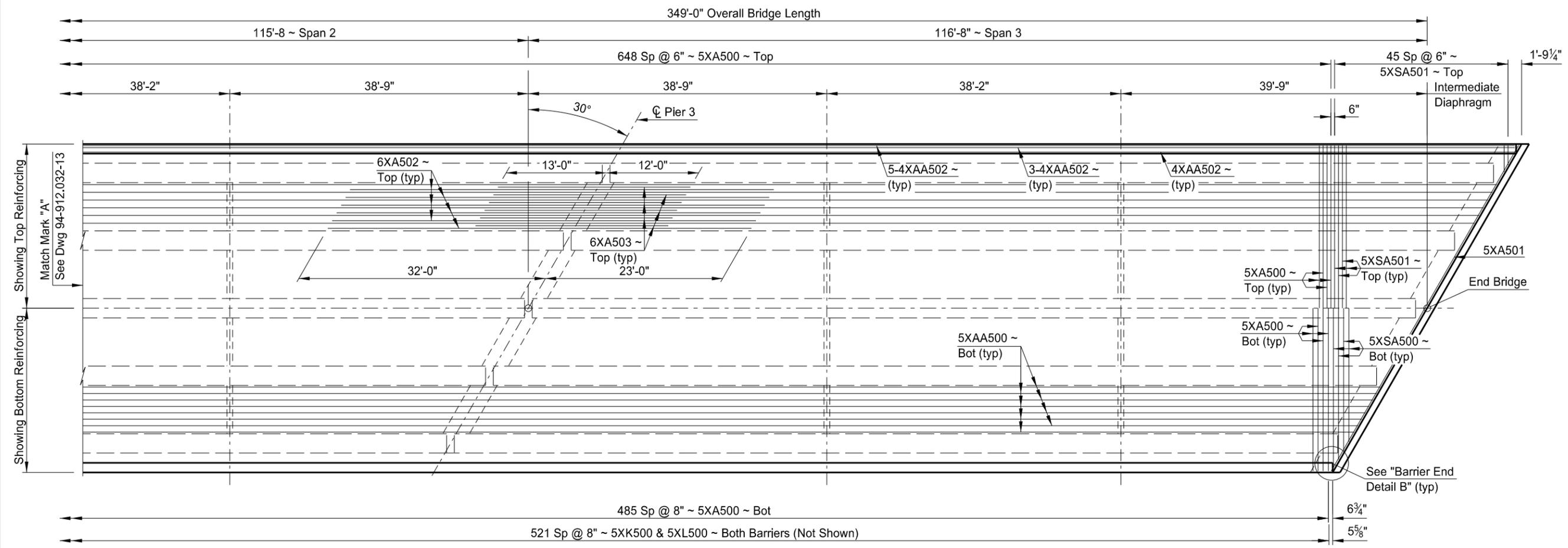


PLAN  
BARRIER END DETAIL A

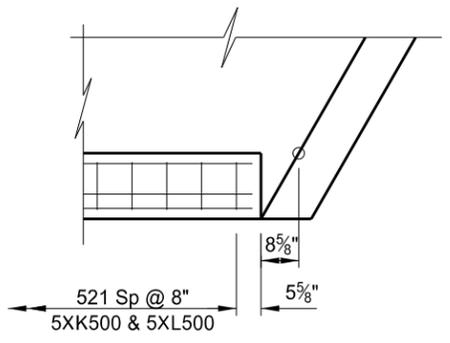
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<b>QUANTITIES</b>
SEE DWG 94-912.032-18
<b>HEART RIVER BRIDGE 4 MILES W OF MANDAN</b>
<b>HALF SLAB LAYOUT</b>

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PLAN

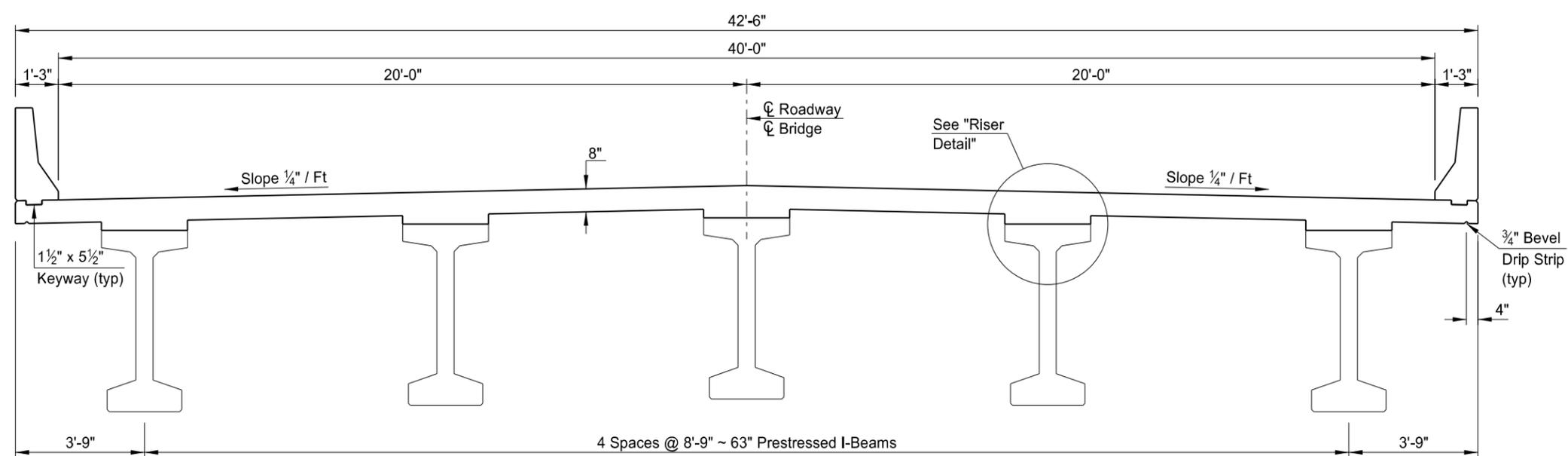


PLAN BARRIER END DETAIL B

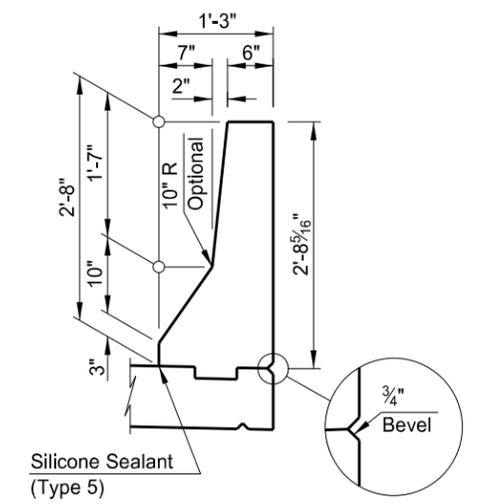
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<b>QUANTITIES</b>
SEE DWG 94-912.032-18
<b>HEART RIVER BRIDGE 4 MILES W OF MANDAN</b>
<b>HALF SLAB LAYOUT</b>

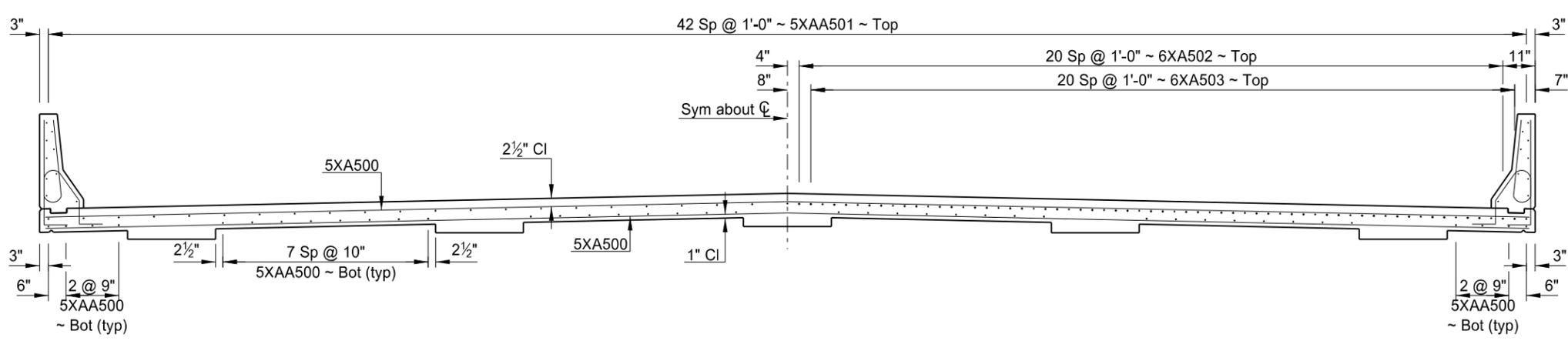
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
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(SHOWING DIMENSIONS)  
SLAB SECTION



SHOWING DIMENSIONS

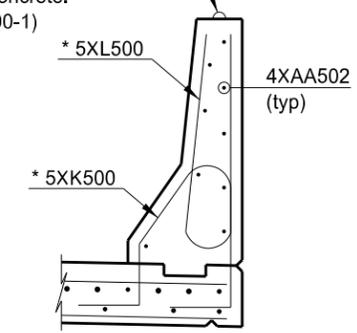


(SHOWING REINFORCING BETWEEN SUPPORTS)

SLAB SECTION

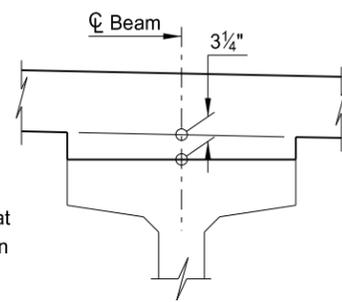
(SHOWING REINFORCING OVER PIER)

3/8"  $\phi$  x 3" Galv Carriage Bolt ~  
Top of head is 1/8" above  
finished concrete.  
(See D-900-1)



\* Barrier reinforcing shall  
have a 1 1/2" clearance.

SHOWING REINFORCING  
BARRIER DETAIL



RISER DETAIL

The 3 1/4" dimension shown is located at the supports. The anticipated midspan riser is 1/2" in spans 1 & 3 and 1 1/4" in span 2. The riser shall be adjusted to maintain the 8" slab thickness.

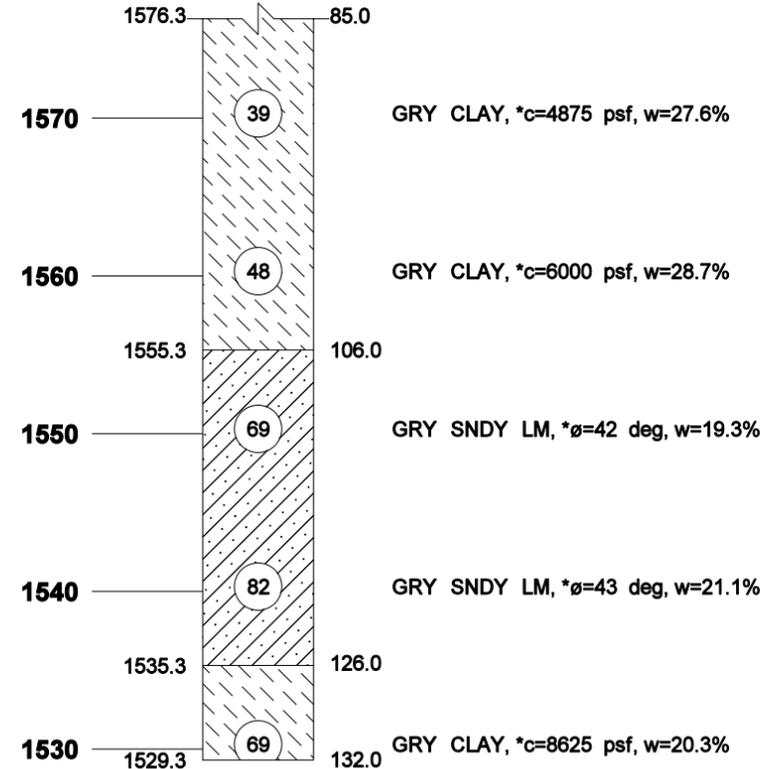
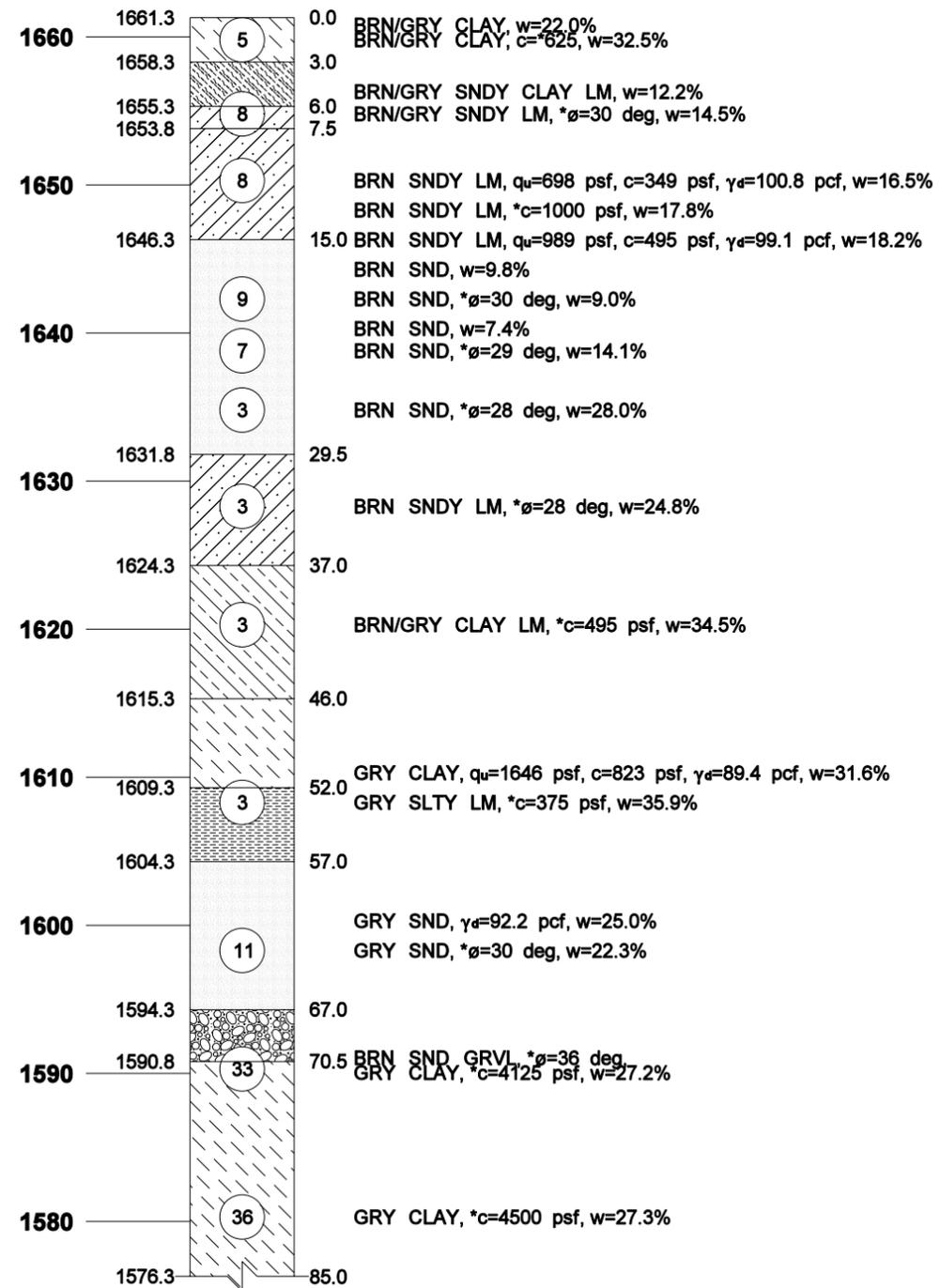
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QUANTITIES	
CLASS AAE-3 CONCRETE	562.6 CY
REINFORCING STEEL	4,787 LBS
REINFORCING STEEL (EPOXY)	117,031 LBS

HEART RIVER BRIDGE  
4 MILES W OF MANDAN

SLAB SECTION

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	175	1



**NOTES:**

THE ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 POUND AUTOMATIC HAMMER FROM A HEIGHT OF 30 INCHES TO DRIVE A 2 INCH O.D. SPLIT-BARREL SAMPLER 1 FOOT.

THE BORING DATA SHOWN IS FOR NORTH DAKOTA DEPARTMENT OF TRANSPORTATION'S (NDDOT) DESIGN AND ESTIMATING PURPOSES ONLY. THE BORING LOGS ARE ONLY REPRESENTATIVE OF THE EXACT LOCATION FROM WHICH THE SAMPLES WERE TAKEN AND INTERPRETATION BETWEEN THE SAMPLE LOCATIONS IS DISCOURAGED. THE NDDOT ASSUMES NO RESPONSIBILITY IF THE SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN. FURTHER SOIL INFORMATION MAY BE AVAILABLE AT:

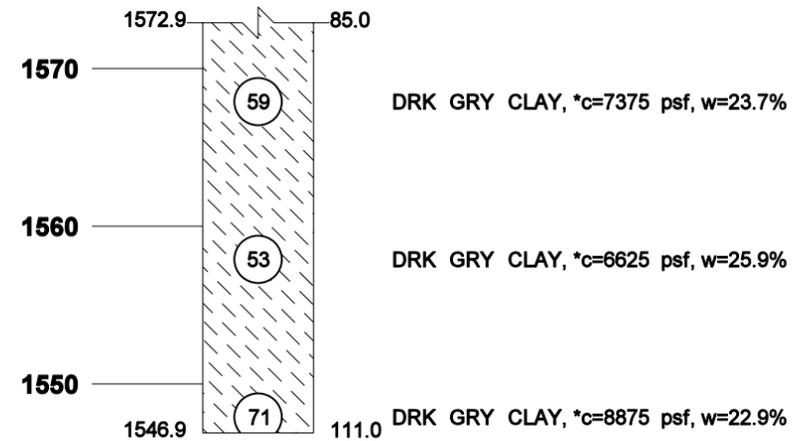
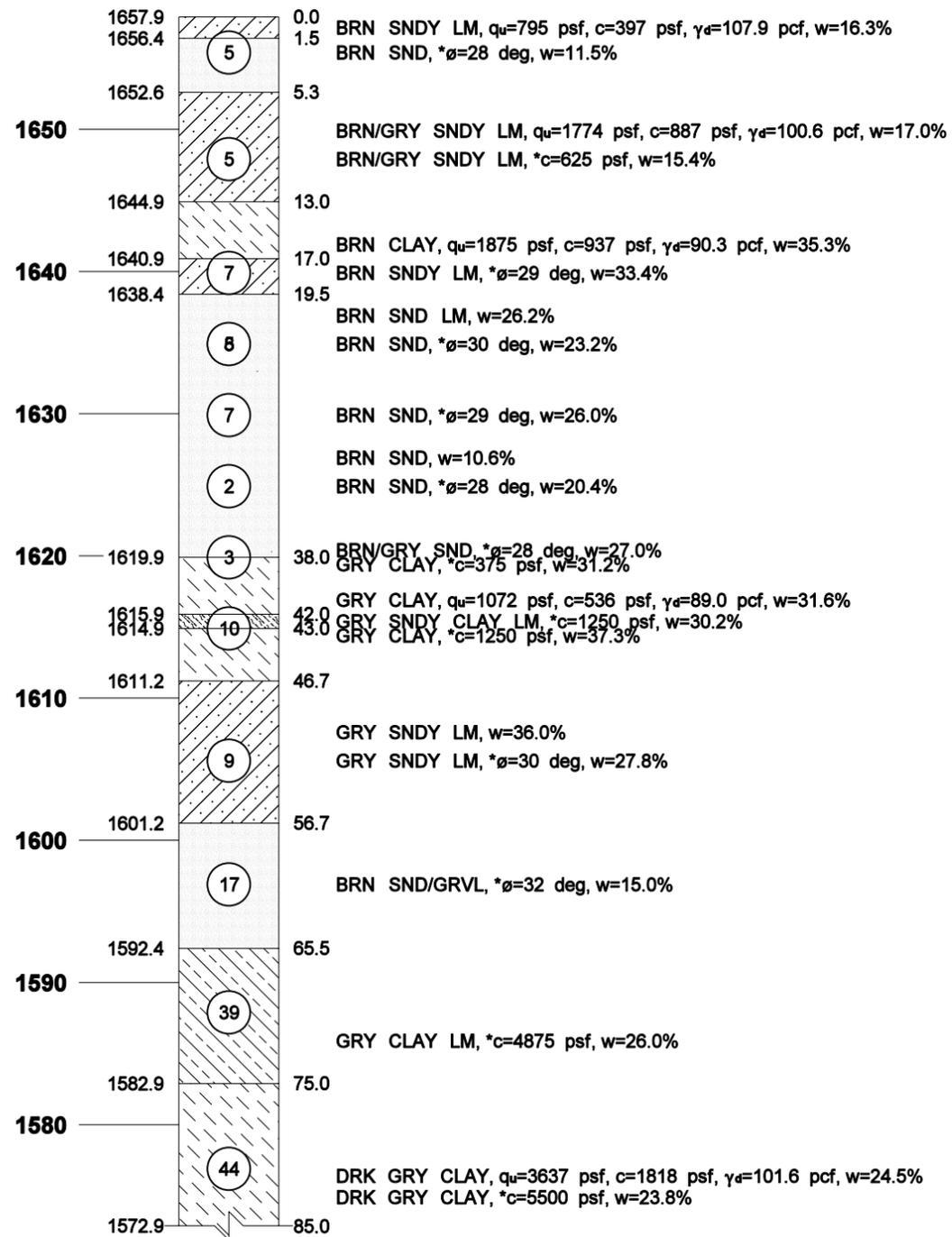
NDDOT  
MATERIALS & RESEARCH DIVISION  
30 AIRPORT ROAD  
BISMARCK, NORTH DAKOTA 58504-6005  
PHONE (701)328-6900

qu=Unconfined Compressive Strength (psf)  
w=Moisture Content (%)  
phi=Friction Angle (deg)  
c=Cohesion (psf)  
gamma=Dry Density (pcf)  
\*These cohesive values and friction angles are estimated from blow counts

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**BORING NO. 1**  
STA 912+0260 offset 47 ft left  
DRILLED On 6/15/09 to 6/17/09

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	175	2



**NOTES:**

THE ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 POUND AUTOMATIC HAMMER FROM A HEIGHT OF 30 INCHES TO DRIVE A 2 INCH O.D. SPLIT-BARREL SAMPLER 1 FOOT.

THE BORING DATA SHOWN IS FOR NORTH DAKOTA DEPARTMENT OF TRANSPORTATION'S (NDDOT) DESIGN AND ESTIMATING PURPOSES ONLY. THE BORING LOGS ARE ONLY REPRESENTATIVE OF THE EXACT LOCATION FROM WHICH THE SAMPLES WERE TAKEN AND INTERPRETATION BETWEEN THE SAMPLE LOCATIONS IS DISCOURAGED. THE NDDOT ASSUMES NO RESPONSIBILITY IF THE SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN. FURTHER SOIL INFORMATION MAY BE AVAILABLE AT:

NDDOT  
 MATERIALS & RESEARCH DIVISION  
 30 AIRPORT ROAD  
 BISMARCK, NORTH DAKOTA 58504-6005  
 PHONE (701)328-6900

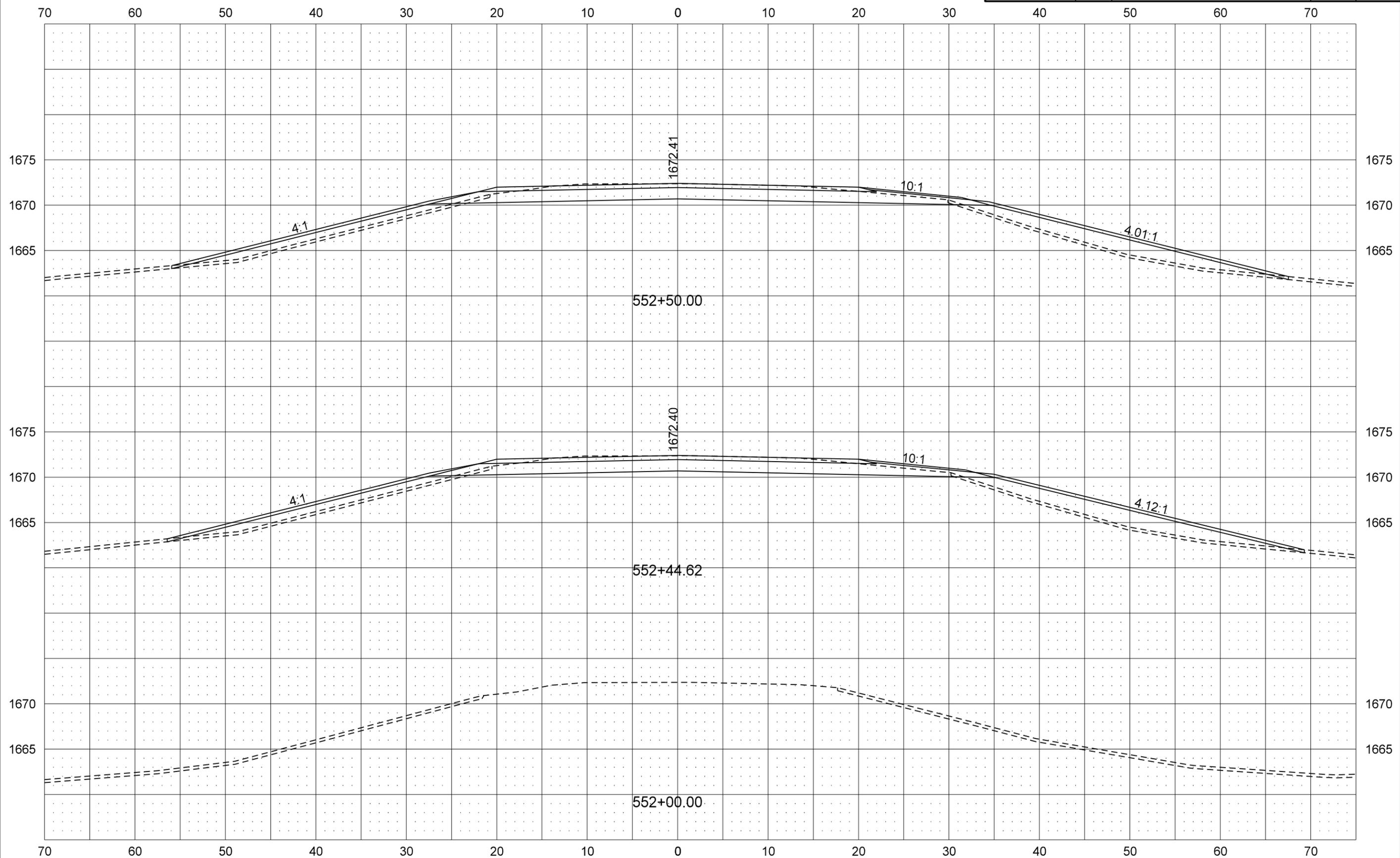
$q_u$ =Unconfined Compressive Strength (psf)  
 $w$ =Moisture Content (%)  
 $\phi$ =Friction Angle (deg)  
 $c$ =Cohesion (psf)  
 $\gamma_d$ =Dry Density (pcf)  
 \*=These cohesive values and friction angles are estimated from blow counts

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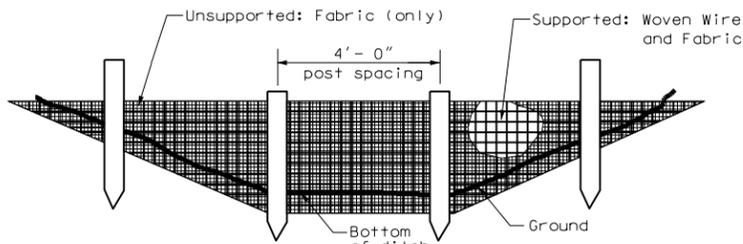
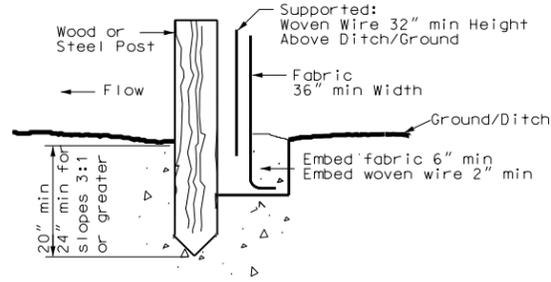
BORING NO. 2  
 RP 912+0012 offset 57 ft Right of  $\mathcal{C}$   
 DRILLED 6/17/09 to 6/18/09

I-94 Business

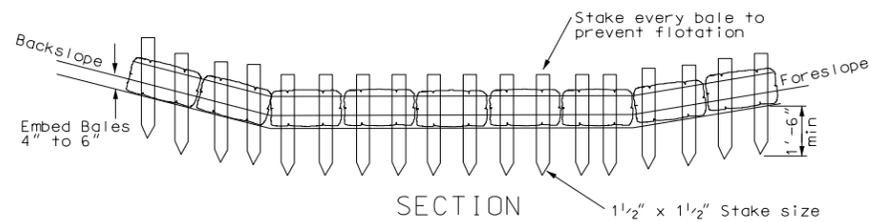
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-094(123)912	200	1



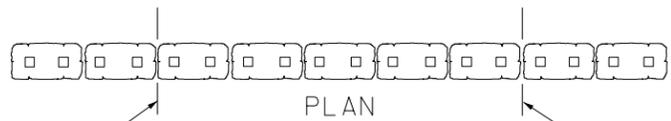
# EROSION AND SILTATION CONTROLS



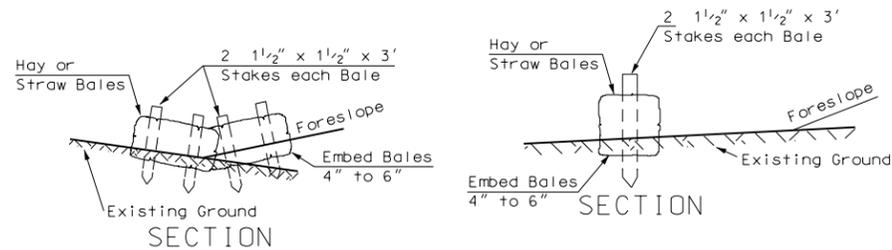
**SILT FENCE**  
Supported and Unsupported



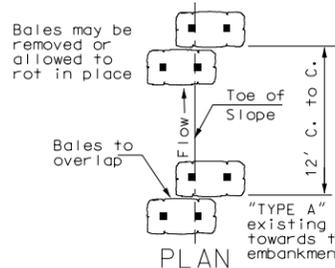
SECTION



"TYPE A"

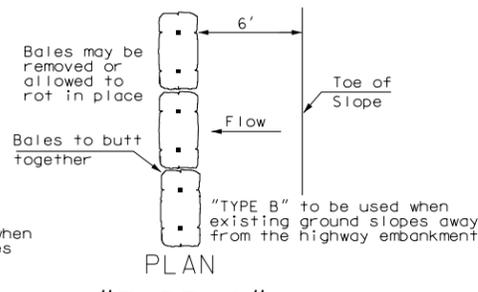


SECTION



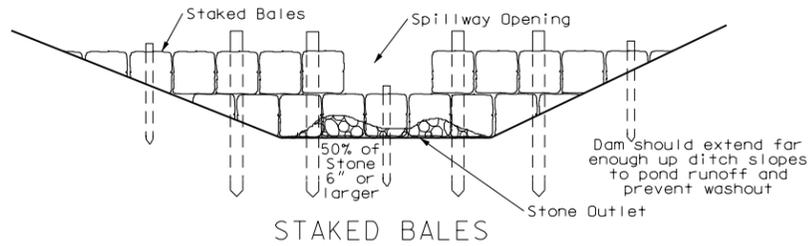
PLAN

"TYPE B"  
BALED HAY OR STRAW EROSION CHECKS

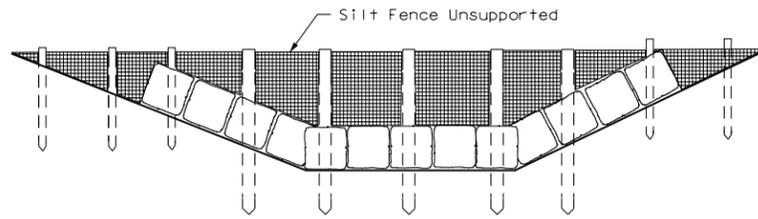


PLAN

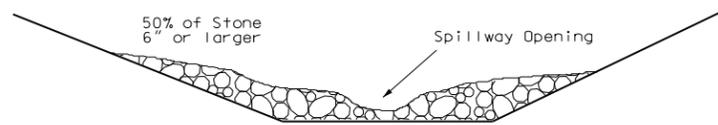
"TYPE C"



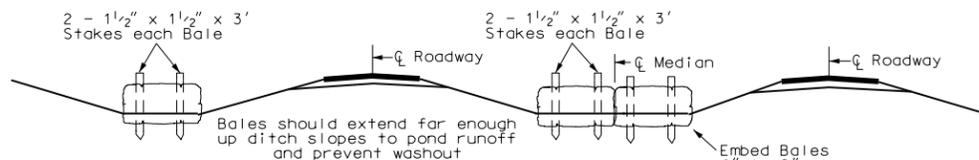
STAKED BALES



FENCE-BACKED BALES

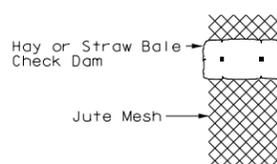


GRADED STONE  
DITCH EROSION DAMS

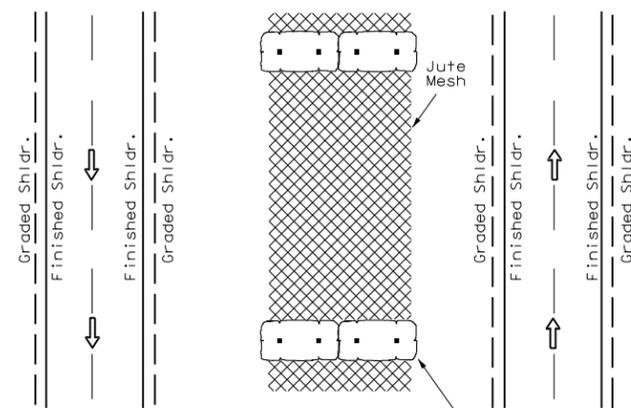


SECTION

MEDIAN OR DITCH PROTECTION  
AT STREAM CROSSING



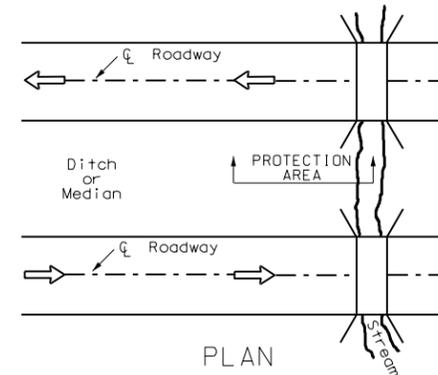
ROADSIDE DITCH



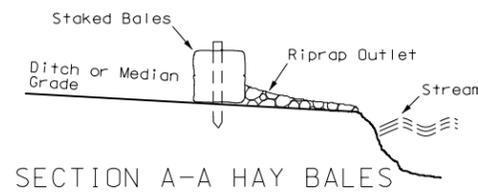
PLAN

MEDIAN DITCH

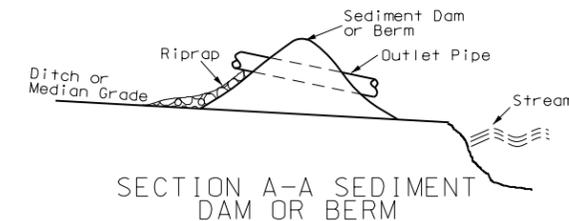
STONE, JUTE, MESH, OR SOD  
DITCH & MEDIAN EROSION CONTROL



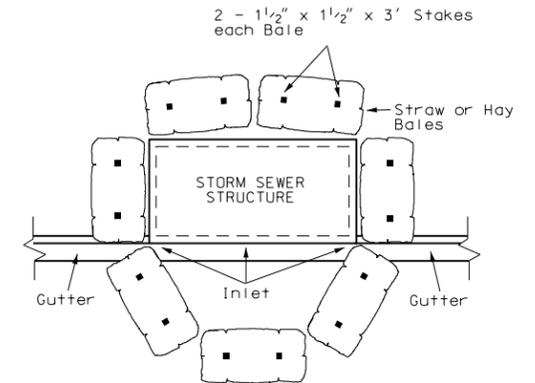
PLAN



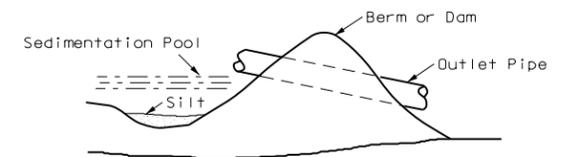
SECTION A-A HAY BALES



SECTION A-A SEDIMENT  
DAM OR BERM



STORM SEWER INLET  
EROSION & SILTATION  
BARRIER



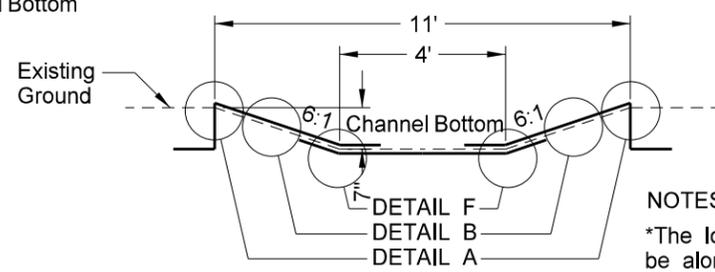
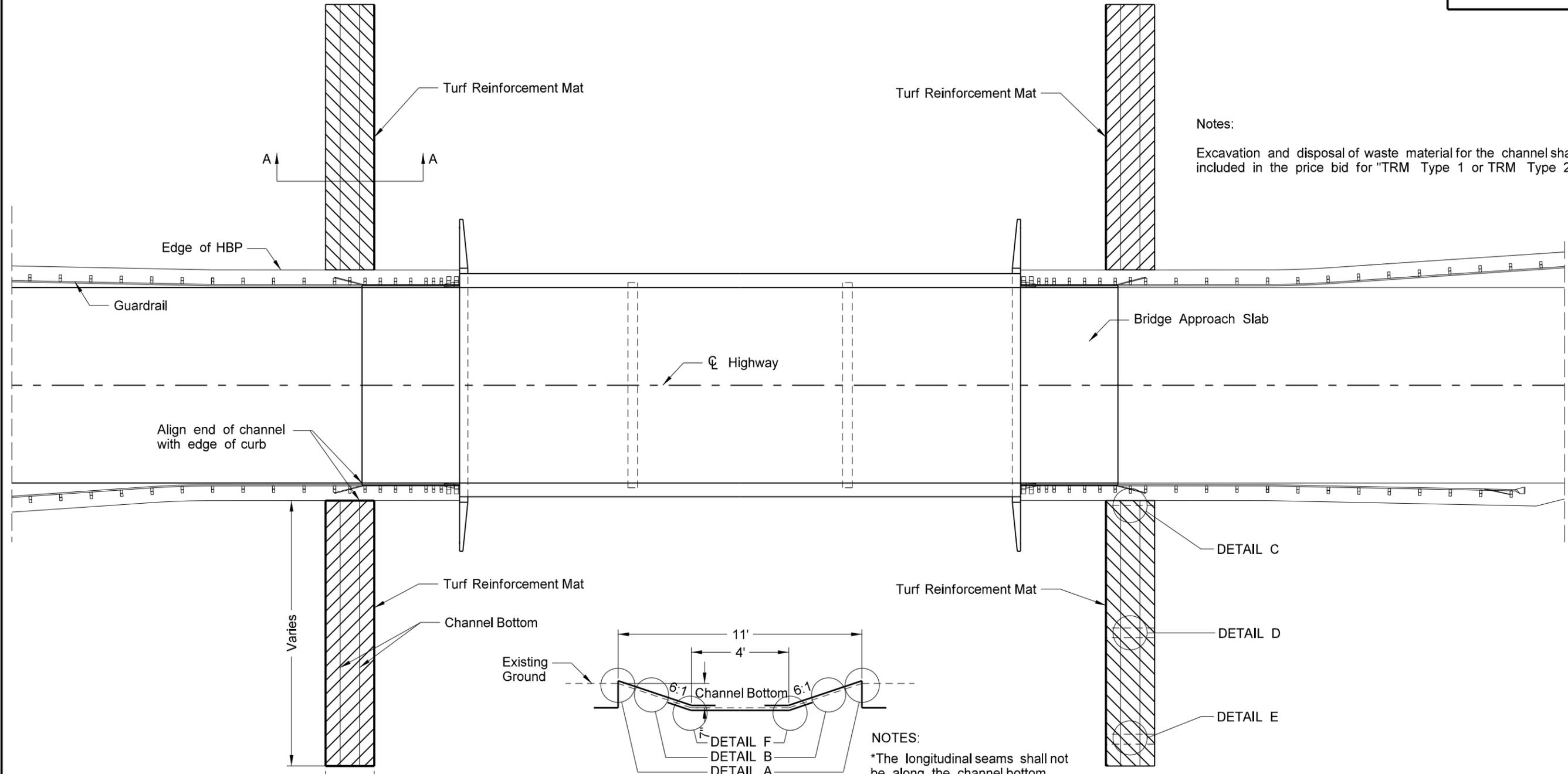
SMALL SEDIMENT DAM OR BERM

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
09-04-92	Ditch check
09-16-92	Sediment cont. fencing
01-31-95	General revisions
10-09-02	Sediment fence
01-24-04	Silt fence
02-06-04	Rev silt fence details
12-01-04	PE Stamp added

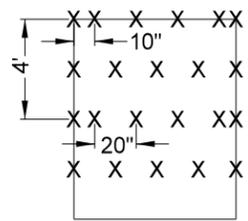
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BRIDGE APPROACH SLAB DRAINAGE DETAIL

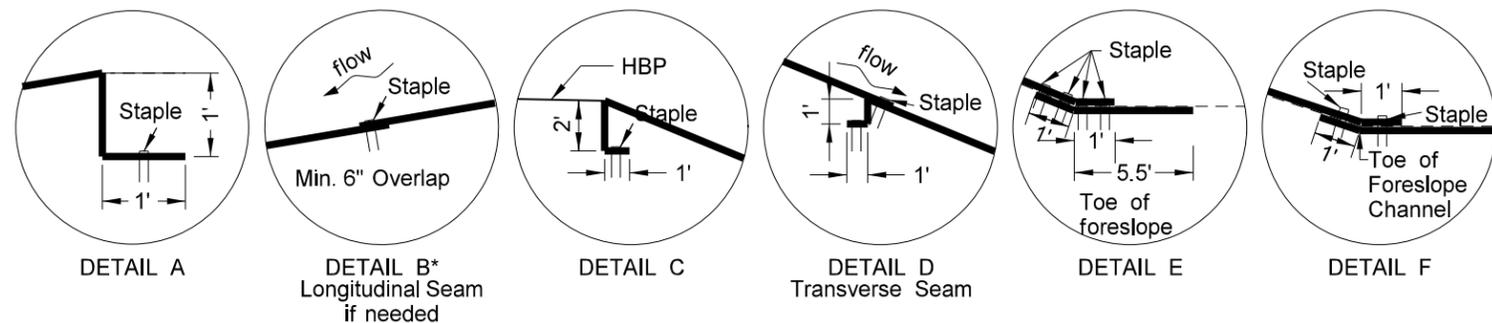
D-708-4



NOTES:  
 \*The longitudinal seams shall not be along the channel bottom.  
 \*Top seam must be minimum 0.5' above the channel bottom.



STAPLE PATTERN: 3.8 staples per square yard.

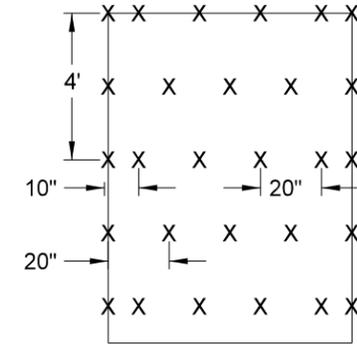
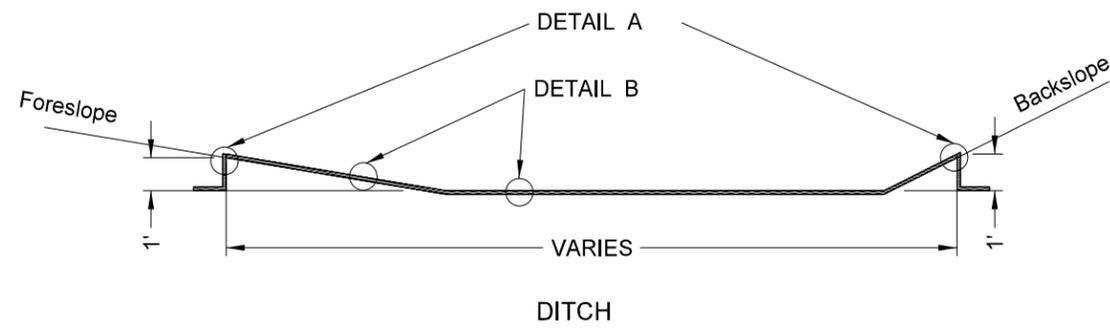


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE

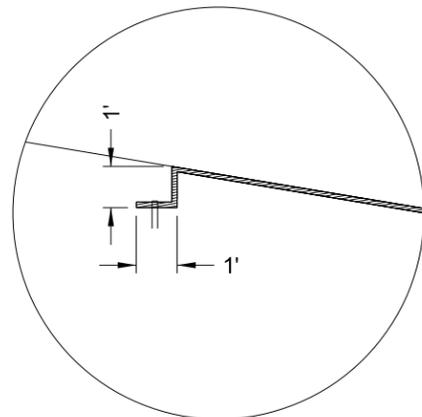
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EROSION AND SILTATION CONTROL  
BLANKET INSTALLATION

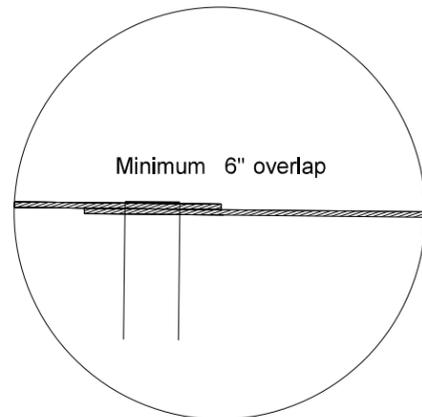
D-708-5



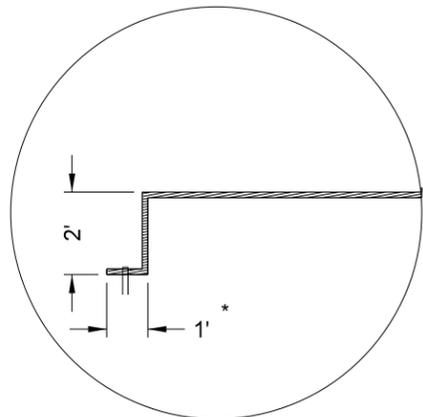
STAPLE PATTERN: 3.8 staples per square yard using 8-inch 11 gauge wire "u" staples.



DETAIL A

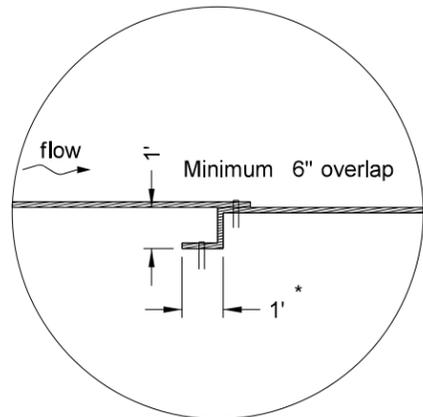


DETAIL B

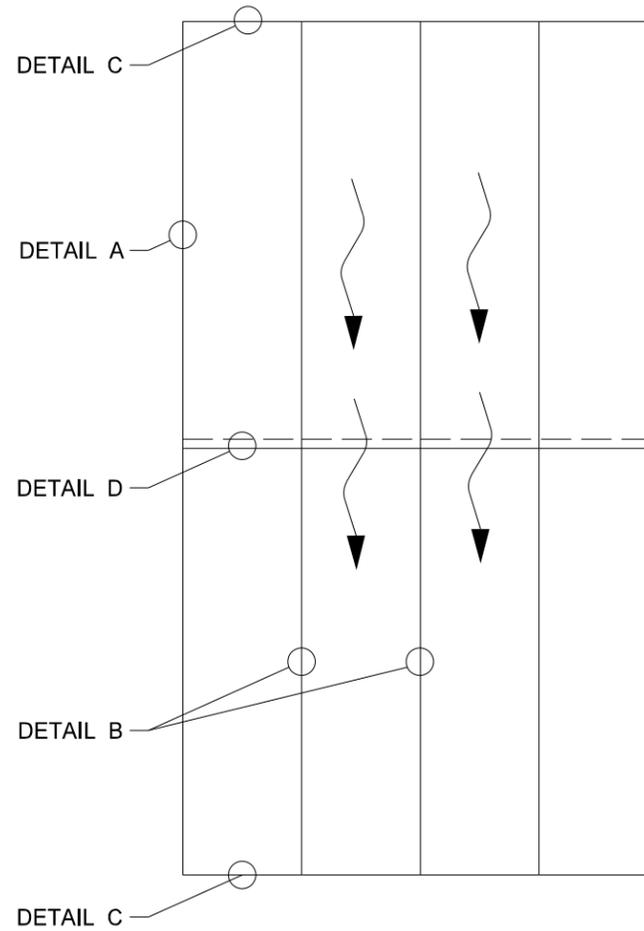


DETAIL C

\* This tie may be placed ahead or back.

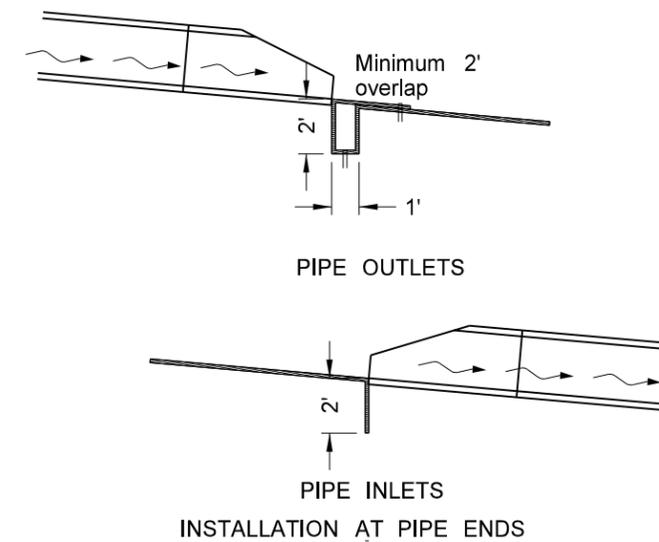


DETAIL D



BLANKET LAYOUT

Note: Beginning and ending of erosion control blanket areas shall be installed as DETAIL C.



PIPE OUTLETS

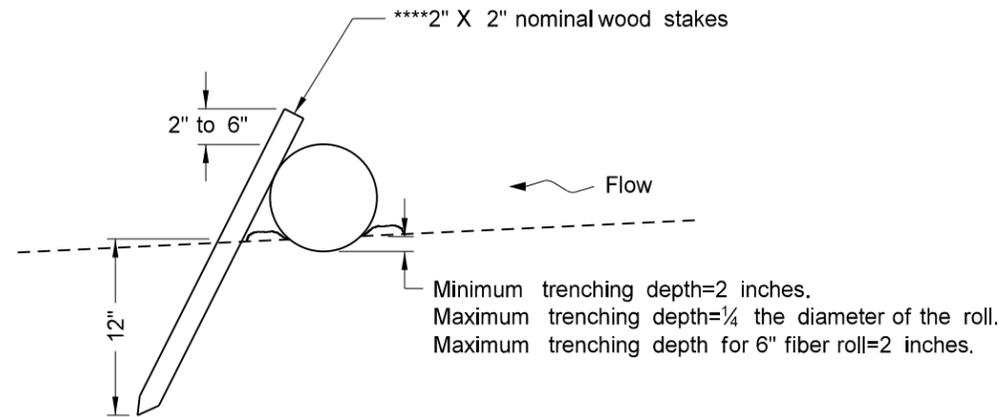
PIPE INLETS  
INSTALLATION AT PIPE ENDS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-13-06	
REVISIONS	
DATE	CHANGE

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Registration Number  
PE- 4518 ,  
on 12/13/06 and the original document is stored at the  
North Dakota Department  
of Transportation

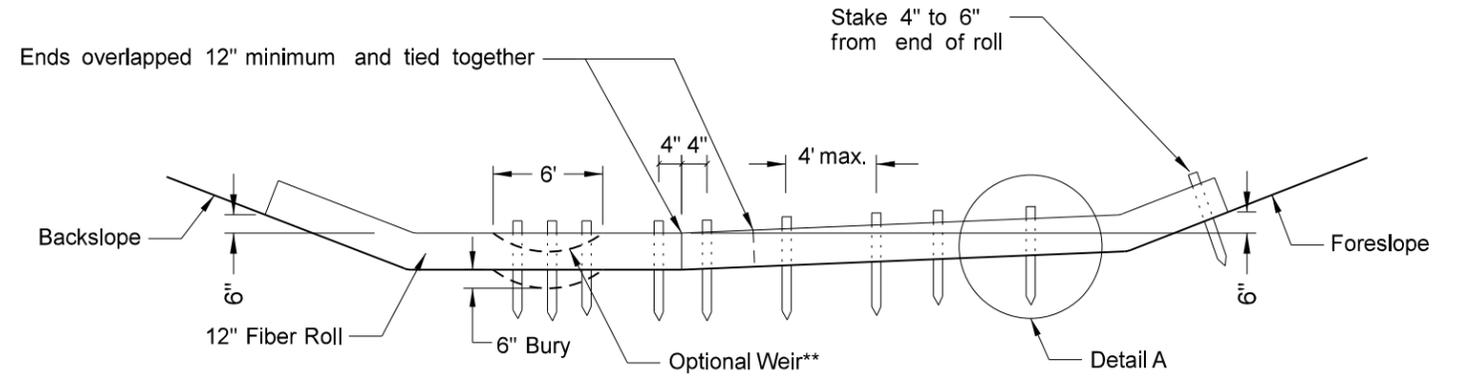
EROSION CONTROL  
FIBER ROLL STAKING DETAILS

D-708-7



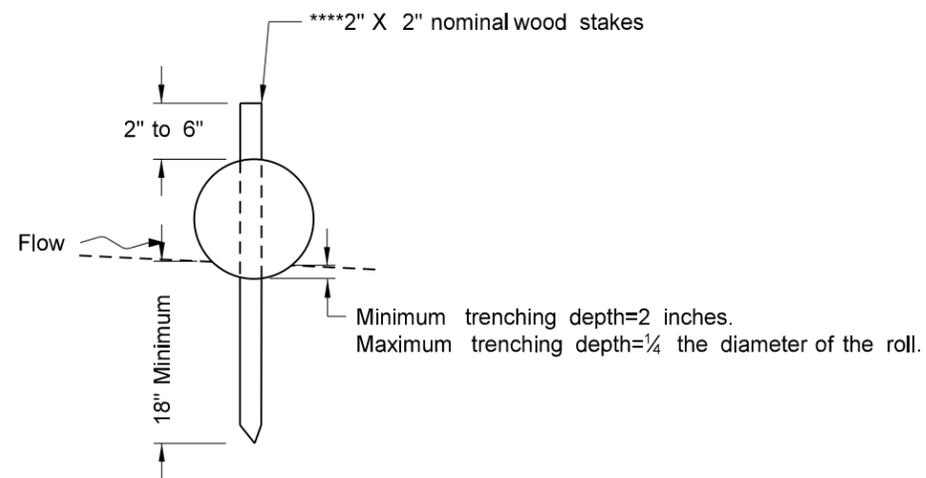
**\*DETAIL A**  
**6" or 12" Fiber Roll Staking Detail**

\*Manufacturer may require stake through center of fiber roll.  
\*\*\*\*Stakes spaced every 3-4 feet.

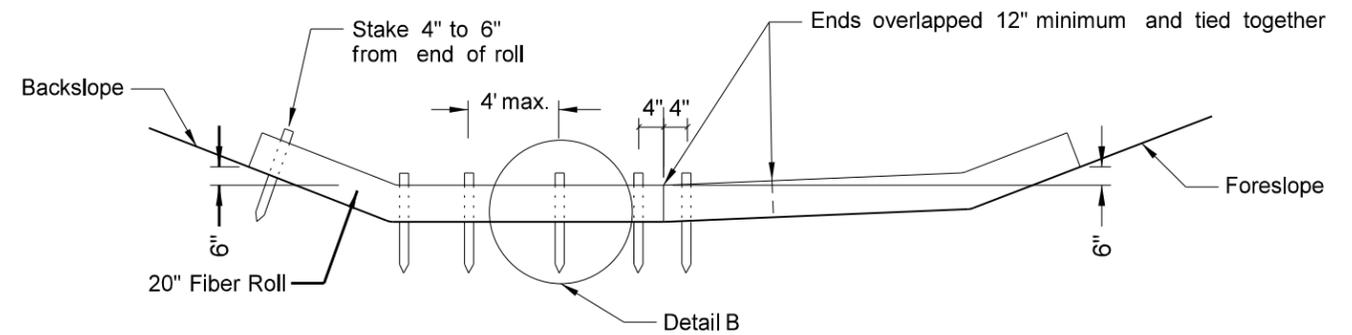


\*\*Optional Weir. Use in flat areas, such as the Red River Valley, where there is potential for water to back up on adjacent property. Lower fiber roll enough to prevent water from backing up on adjacent property.

**12 INCH FIBER ROLL - DITCH BOTTOM**



**DETAIL B**  
**20" Fiber Roll Staking Detail**



**\*\*\*20 INCH FIBER ROLL - DITCH BOTTOM**

\*\*\*Do not use 20-inch fiber rolls in flat areas where there is potential for water to back up on adjacent property.

NOTE: Runoff must not be allowed to run under or around roll.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-18-10	
REVISIONS	
DATE	CHANGE

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