

STATE OF NORTH DAKOTA
SHOWING COUNTIES

DICKEY COUNTY, NORTH DAKOTA
PLANS FOR FEDERAL AID PROJECT
BRO-0011(021)

EXISTING STRUCTURE #11-123-08.0
NEW STRUCTURE #11-123-08.1

Project Consists of Removal of Existing Bridge, Grading, Gravel Surfacing &
Construction of a 94 foot (Single) Span (Prestressed) Concrete Bridge

	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	23275	1	1

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	1/1/2022
Supplemental Specifications	NONE

PROJECT LENGTH

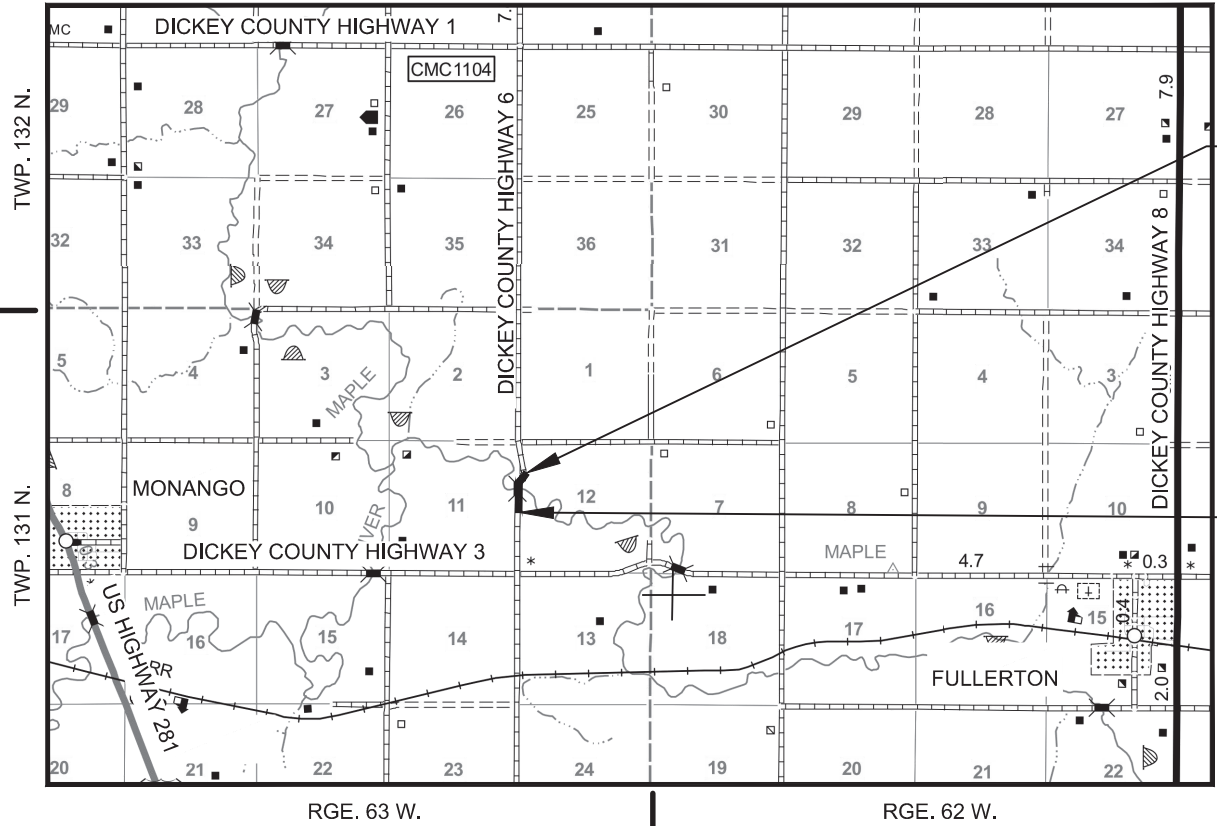
PROJECT	GROSS MILES	NET MILES
BRO-0011(021)	0.133	0.133
TOTAL	0.133	0.133

DESIGN DATA

TRAFFIC ~ BRO-0011(021)		AVERAGE DAILY			EST. 30th MAX. HR.
		PASSENGER	TRUCKS	TOTAL	
CURRENT TRAFFIC	2022	LESS THAN 100 VPD			
TRAFFIC FORECAST	2042				

DESIGN SPEED 35 MPH
MINIMUM SIGHT DISTANCE (STOPPING) 250 FEET
DESIGN LOADS FOR STRUCTURE: HL-93

Project is located approximately 3 miles East
and 0.75 miles North of Monango, ND.



END PROJECT
STA. 20+50 = A POINT APPROXIMATELY
1,429 FEET SOUTH AND 155 FEET EAST OF
THE NORTHEAST CORNER OF SEC. 11,
TWP. 131 N., RGE. 63 W.

BEGIN PROJECT
STA. 13+50 = A POINT APPROXIMATELY
2,088 FEET SOUTH OF THE NORTHEAST
CORNER OF SEC. 11, TWP. 131 N., RGE. 63 W.

PS&E Corrections Made March 2022
Surveyed & Designed Date October 2021 - February 2022

DESIGNER	Aaron Behnke, PE
DESIGNER	Bryan Tykwinski, PE
DESIGNER	Zach Vlaminck
DESIGNER	-
DESIGNER	-



CERTIFICATION
I HEREBY CERTIFY THAT THESE 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 NORTH DAKOTA.

KLJ ENGINEERING LLC

DATE 3/22/2022 REGISTRATION NUMBER 28896

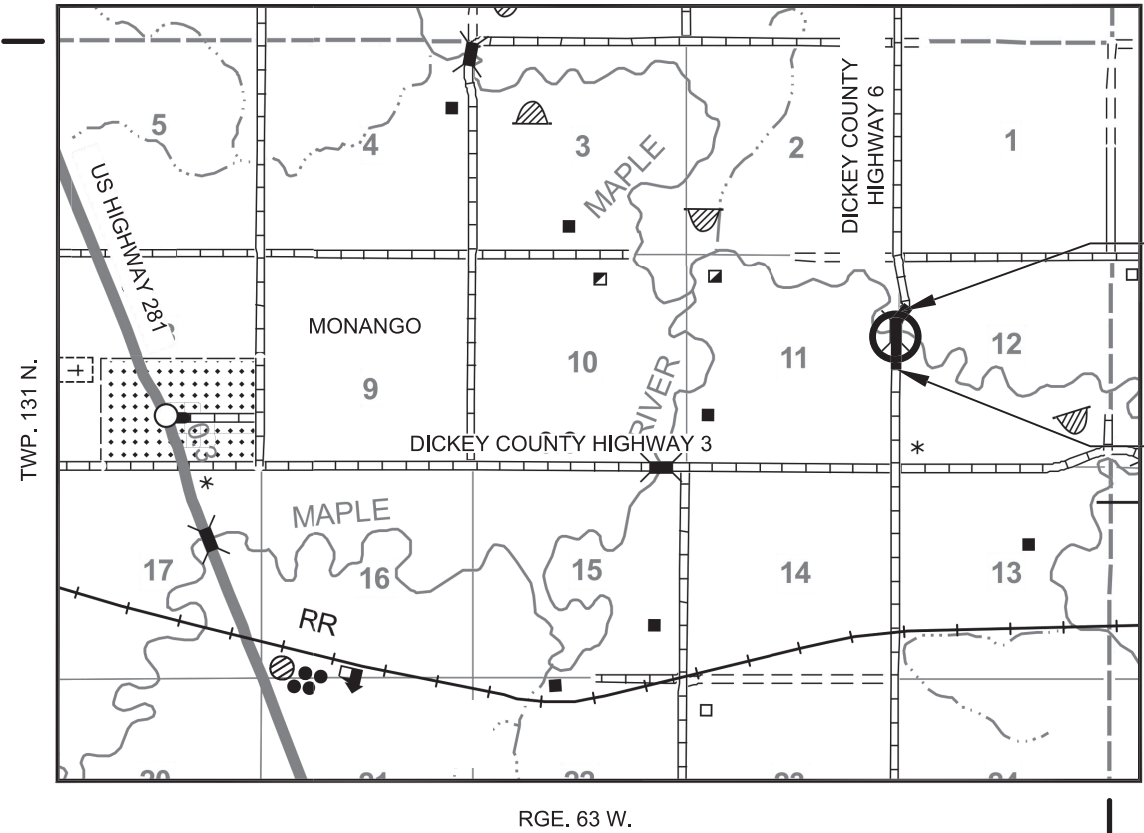


1010 4TH AVENUE SW
VALLEY CITY, ND 58072-0937
(701) 845-4980, FAX (855) 288-8055

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2	1	Table of Contents	D-101-10	NDDOT Utility Company and Organization Abbreviations					
4	1	Scope of Work	D-101-20, 21	Line Styles					
6	1	Notes	D-101-30, 31, 32, 33	Symbols					
6	1	Environmental Notes	D-260-1	Erosion And Siltation Controls - Silt Fence					
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- GRADING & AGGREGATE SURFACING
- STRUCTURE REPLACEMENT



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1,429 FEET SOUTH AND 155 FEET EAST OF
THE NORTHEAST CORNER OF SEC. 11,
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2,088 FEET SOUTH OF THE NORTHEAST
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BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA		
		SCOPE OF WORK
		DRWN. BY ZRV
		CHKD BY BT
		PROJECT NO. 2103-01328

NOTES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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- 100-P01

UTILITIES: Utilities that the Engineer has been made aware of are shown in the plans. Other Utilities may exist that are not shown. The horizontal utility locations shown in the plans and specifications are approximate. Plan locations should not be interpreted as exact for bidding or construction purposes.
- 202-P01

REMOVAL OF STRUCTURE: The existing structure is a 28-foot concrete tee beam bridge, with a deck width of 25 feet.
- 202-P02

REMOVAL OF AGGREGATE MATERIALS: Removal of aggregate material is included in the Excavation quantity in Section 10.
- 203-P01

COMMON EXCAVATION-TYPE B: Include all costs associated with excavating, transporting, and placing the material in the price bid for "COMMON EXCAVATION-TYPE B". "COMMON EXCAVATION-TYPE B" will be paid at plan quantity. Any change to plan quantity must be approved by the Owner or Engineer.
- 203-P02

COMMON EXCAVATION-WASTE: Excess material as listed in the earthwork summary is to be disposed of in accordance with Section 107.17 of the Standard Specifications. Include all costs associated with disposing of excess material in the price bid for "COMMON EXCAVATION-WASTE". "COMMON EXCAVATION-WASTE" will be paid at plan quantity.
- 203-P03

BENCHING ON WIDENING SECTIONS: Bench all inslopes regardless of rate of slope unless directed otherwise. Construct benches deep enough to provide sufficient width to permit placing, spreading and compacting equipment to operate and compact each bench thoroughly before placing additional embankment. Include the cost of benching in the price bid for earthwork items.
- 262-P01

FLOTATION SILT CURTAIN: Install the "FLOTATION SILT CURTAIN" on the water prior to removal of the existing riprap, bridge components and the stripping of any topsoil in the adjacent area (see Sheet 1 Section 20). Place the flotation silt curtain at a distance that allows for sufficient area to construct the project without placing material against the flotation silt curtain. The silt curtain will not be paid for twice.
- 708-P01

SEEDING: Seed all the disturbed areas of the right of way and construction easements, except the roadbed.
- 754-P01


SIGNING: Stockpile existing signs onsite in an accessible location for Dickey County Highway Department to collect.

Existing Signs		
Sign	Quantity	Mounting Style
Type III Barricade	2	Skid Mounted
Bridge Marker	4	Post Mounted
Warning Sign	5	Post Mounted



BRO-0011(021)

DICKEY COUNTY, NORTH DAKOTA



NOTES

DRWN. BY
ZBN

CHKD. BY
BJT

PROJECT NO.
2103-01328

ENVIRONMENTAL NOTES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	6	2

ENVIRONMENTAL NOTES (EN): Dickey County, the North Dakota Department of Transportation and the Federal Highway Administration have made environmental commitments to secure approval of this project. The following environmental notes are requirements to comply with these commitments:

EN-1 SPAWNING RESTRICTION: Do not work within the Maple River from April 15 to June 1.

EN-2 AQUATIC NUISANCE SPECIES (ANS): Equipment that was last used outside of North Dakota or within a Class I infested waterbody (identified on the North Dakota Game and Fish Department (NDGFD) website) requires an inspection by NDGFD. Notify the NDGFD at least 10 business days prior to pumps, watercraft, or any equipment entering a public water to allow the NDGFD sufficient time to inspect any and all such equipment for ANS. Contact the NDGFD ANS Coordinator, Benjamin Holen, at 701-368-9117 for equipment inspections. Supply one of the following to the engineer as proof of compliance prior to work taking place in the water: (1) the NDGFD inspection report, (2) documented NDGFD correspondence (email or signed letter). If an inspection is not required, no follow up documentation is required.

EN-3 TEMPORARY WETLAND IMPACT: Temporary impact areas within wetlands and or other waters are incorporated into the plans for this project. Remove temporary fill placed and sedimentation in wetlands or other waters. Restore these wetlands to preconstruction contours.

EN-4 DEBRIS: Minimize debris falling into the Maple River to the maximum extent practicable. Retrieve any debris that falls into the waterway.

EN-5 WETLAND MITIGATION CREDITS: Prior to beginning any work on the project, purchase exactly 0.17 acre of wetland mitigation credits from Ducks Unlimited to satisfy the Environmental Commitments shown in Section 75 of the plans. No work can begin on the project until a Credit Sales Letter from Ducks Unlimited is submitted to and accepted by the project engineer.

Purchase the wetland mitigation credits from the Missouri River Basin Southern Zone service area. The details are:

Missouri River Basin Southern Zone 0.17 Credits @ \$76,000/credit = \$12,920

The contact information to purchase the wetland mitigation credits from Ducks Unlimited is
Trenton Hieb
Regional Biologist - Ecosystem Services - Mitigation
Ducks Unlimited (Great Plains Region)
2525 River Road
Bismarck, ND 58503
Phone: 701-355-3573
Email: thieb@ducks.org

EN-6 PRE-CONSTRUCTION PHOTOS AND NOTIFICATION: In accordance with the Section 404 Permit issued for the project (see PSP 19(22)), notify the US Army Corps of Engineers (USACE), North Dakota Regulatory Office, of the anticipated start date for the work at least 10 days prior to commencing construction activities within waters of the US (i.e., jurisdictional wetlands and Other Waters as shown in Section 75). At the same time, submit pre-construction site photographs and/or satellite imagery of the waters of the US to the USACE that have been taken no more than one year prior to initiation of construction activities. Photos shall include all major project features and waters of the US, including avoidance areas. Reference Project Number NWO-2022-01182-BIS when contacting the USACE.

EN-7 POST-CONSTRUCTION PHOTOS: In accordance with the Section 404 Permit issued for the project (see PSP 19(22)), provide ground photographs of the completed work within waters of the US to the owner. Identify the camera positions and view-angles of the ground photographs on a map, aerial photograph, or project drawing. Photos shall include all major project features and waters of the US, including avoidance areas. The owner will provide these photos and additional information to the USACE in accordance with the permit.



BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA		
		ENVIRONMENTAL NOTES
DRWN. BY JIM	CHKD. BY MB	PROJECT NO. 2103-01328

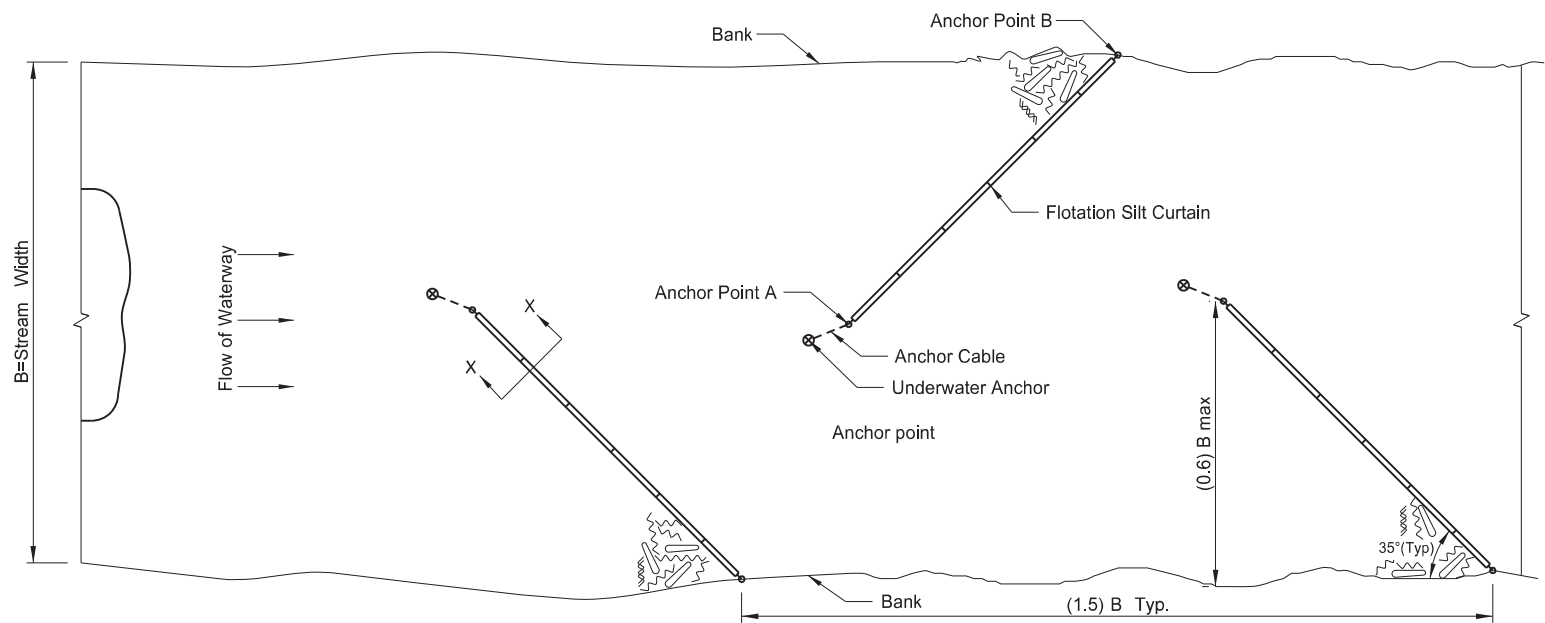
Estimated Quantities

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SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline:	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
202	0105	REMOVAL OF STRUCTURE	L SUM	1	1
203	0102	COMMON EXCAVATION-TYPE B	CY	1261	1261
203	0109	TOPSOIL	CY	351	351
203	0113	COMMON EXCAVATION-WASTE	CY	137	137
210	0099	CLASS 1 EXCAVATION	L SUM	1	1
210	0127	CHANNEL EXCAVATION	L SUM	1	1
210	0201	FOUNDATION PREPARATION	EA	1	1
216	0100	WATER	M GAL	31	31
251	0200	SEEDING CLASS II	ACRE	0.53	0.53
251	2000	TEMPORARY COVER CROP	ACRE	0.53	0.53
253	0101	STRAW MULCH	ACRE	1.06	1.06
256	0200	RIPRAP GRADE II	CY	431	431
260	0200	SILT FENCE SUPPORTED	LF	50	50
260	0201	REMOVE SILT FENCE SUPPORTED	LF	50	50
261	0112	FIBER ROLLS 12IN	LF	1850	1850
261	0113	REMOVE FIBER ROLLS 12IN	LF	915	915
262	0100	FLOTATION SILT CURTAIN	LF	110	110
262	0101	REMOVE FLOTATION SILT CURTAIN	LF	110	110
302	0356	AGGREGATE SURFACE COURSE CL 13	TON	570	570
602	0130	CLASS AAE-3 CONCRETE	CY	100.6	100.6
602	1130	CLASS AE-3 CONCRETE	CY	75	75
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	314	314
604	9900	PRESTRESSED I-BEAM-36IN	LF	455	455
612	0115	REINFORCING STEEL-GRADE 60	LBS	10142	10142
612	0116	REINFORCING STEEL-GRADE 60-EPOXY COATED	LBS	12082	12082
622	0020	STEEL PILING HP 10 X 42	LF	700	700
624	0151	RAILING	LF	188	188
702	0100	MOBILIZATION	L SUM	1	1
704	1000	TRAFFIC CONTROL SIGNS	UNIT	312	312
704	1052	TYPE III BARRICADE	EA	8	8
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	647	647
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	17	17
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	27.6	27.6
764	0131	W-BEAM GUARDRAIL	LF	157	157
764	0145	W-BEAM GUARDRAIL END TERMINAL	EA	4	4
900	2001	WETLAND MITIGATION SITE 1	ACRE	0.17	0.17

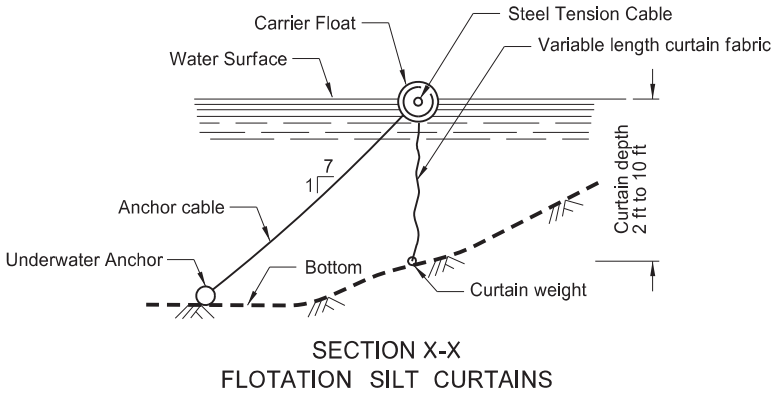
TYPICAL INSTALLATIONS
May vary with conditions

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PLAN VIEW
FLOTATION SILT CURTAIN - TYPE HERRING BONE PATTERN

DESIGN GUIDELINES:
When temporary work encroaches more than 1/3 width of the stream
Or where stream width doesn't allow use of Type Moving Water



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DICKEY COUNTY, NORTH DAKOTA



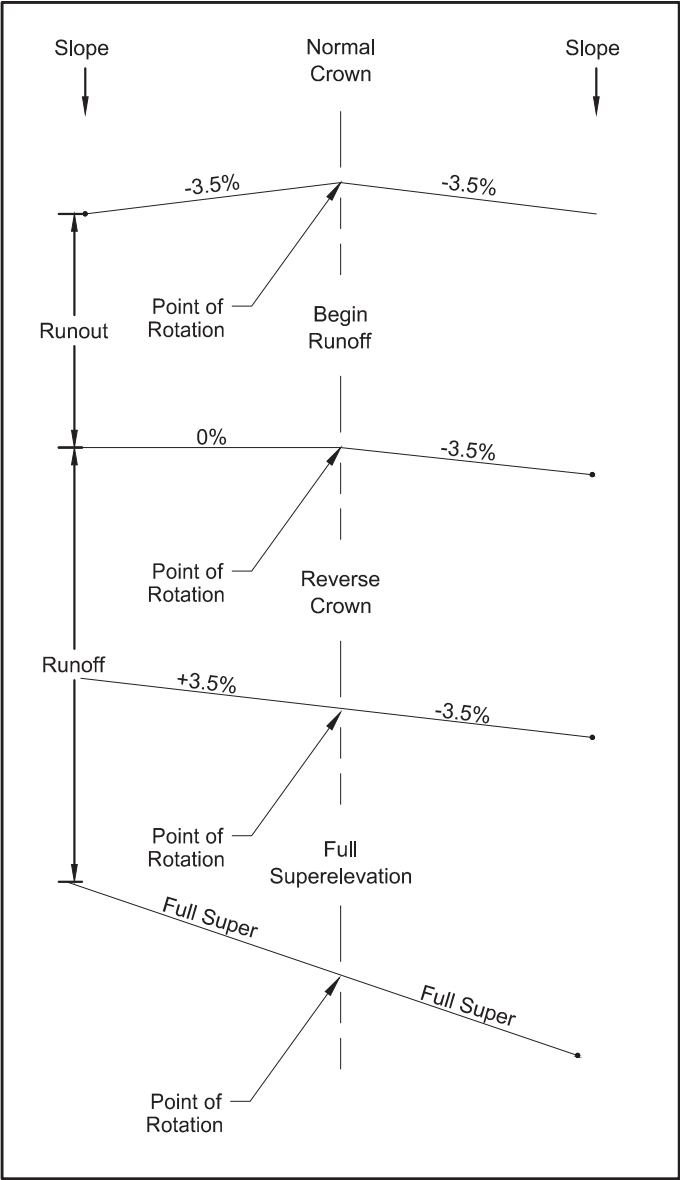
FLOTATION SILT
CURTAIN DETAILS

DRWN. BY ZV	CHKD. BY BT	PROJECT NO. 2103-01328
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	20	2

Curve 1

P.C. Station	16+65.03		
P.I. Station	17+77.63		
Delta =	33°51'02"		
Degree =	00°16'12"		
Tangent =	112.59'		
Length =	218.60'		
Radius =	370.00'		
P.T. Station	18+83.63		
	Station	Left Slope	Right Slope
Begin Runout	13+95.84	-3.5	-3.5
Begin Runoff	14+63.58	0.0	-3.5
Reverse Crown	15+41.00	3.5	-3.5
Reverse Crown	16+55.35	3.5	-3.5
Begin Full Super	17+03.74	6.0	-6.0
End Full Super	18+44.92	6.0	-6.0
Reverse Crown	18+93.31	3.5	-3.5
End Runoff	19+61.05	0.0	-3.5
End Runout	20+28.79	-3.5	-3.5

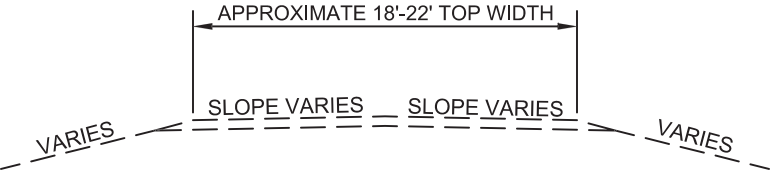


Represents a Right Turning Curve.

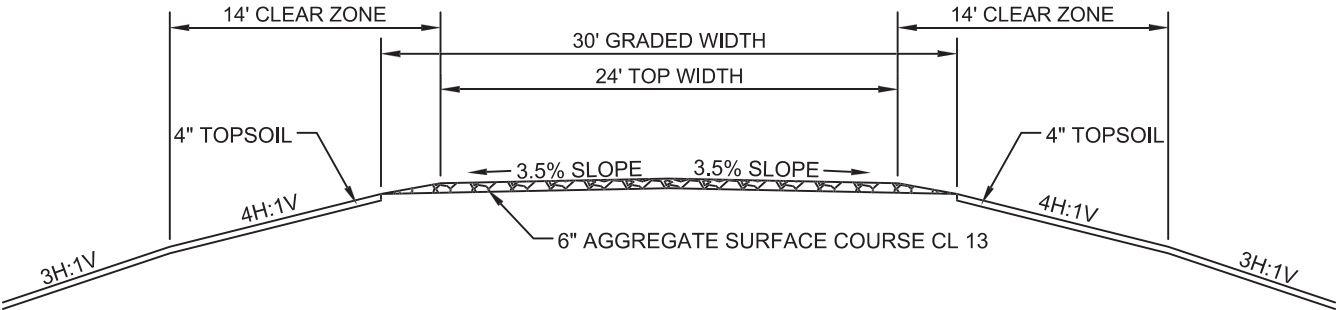


BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA		
KLJ		
SUPERELEVATION TABLE		
DRWN. BY ZRV	CHKD BY BT	PROJECT NO. 2103-01328

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EXISTING TYPICAL SECTION
STA. 13+50 TO 20+50




PROPOSED TYPICAL SECTION
STA. 13+50 TO 20+50

- NOTES
1. TRANSITION EXISTING TO PROPOSED FROM STA. 13+50 TO 14+00 AND STA. 20+00 TO 20+50.



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DICKEY COUNTY, NORTH DAKOTA

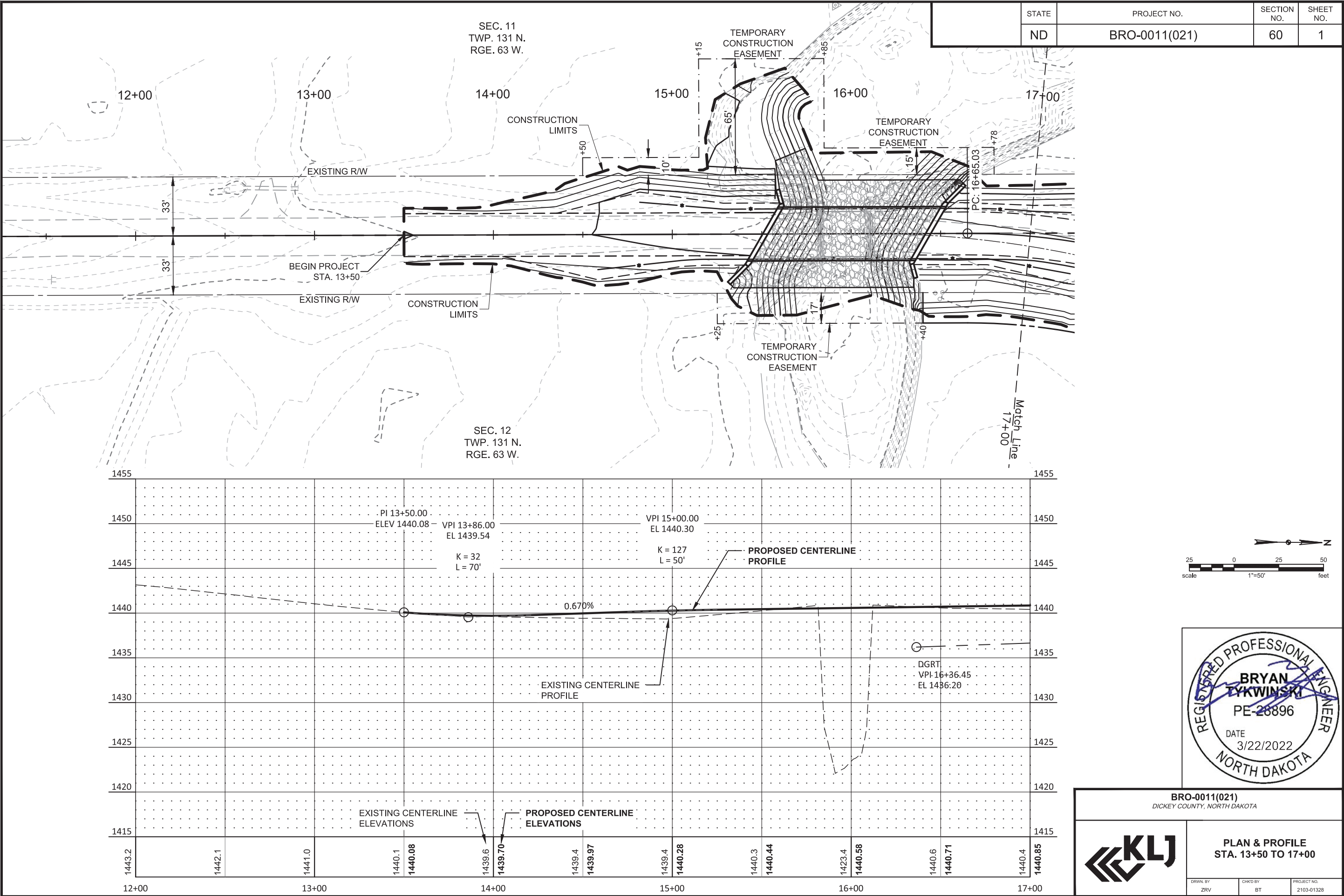


TYPICAL SECTIONS

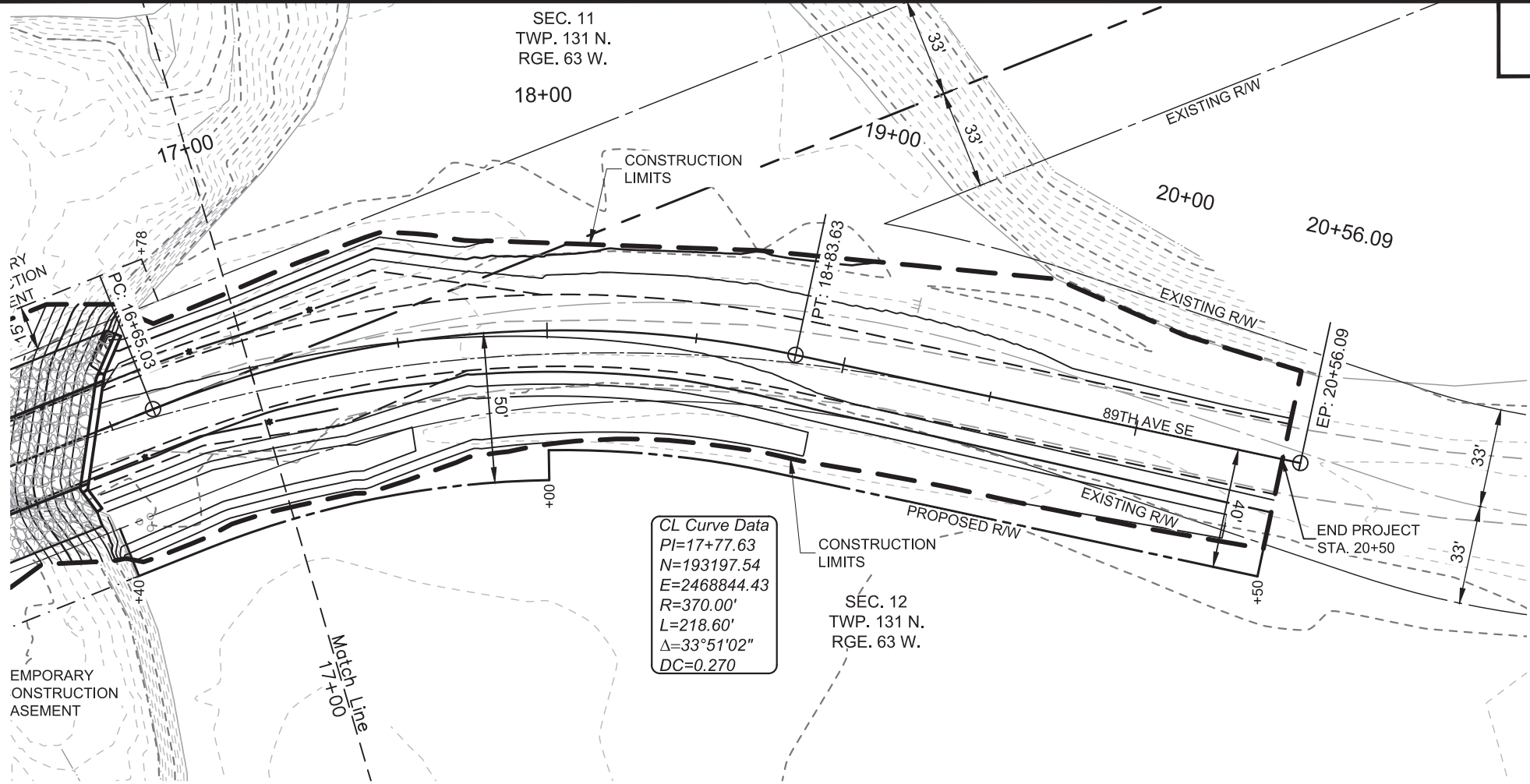
DRWN. BY
ZRV

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BT

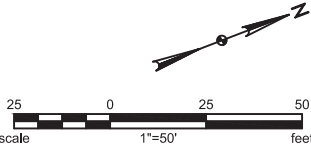
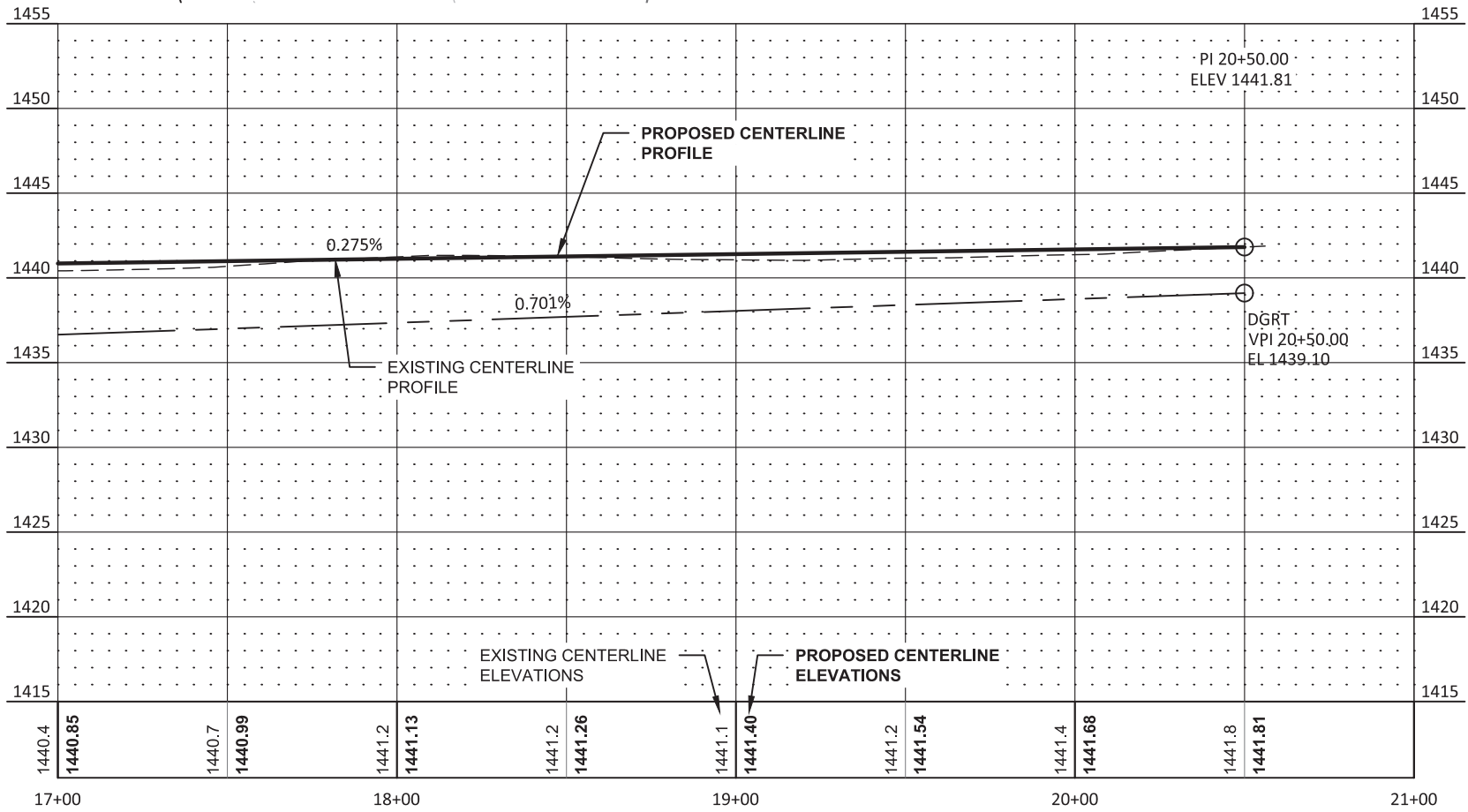
PROJECT NO.
2103-01328




	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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CL Curve Data
PI=17+77.63
N=193197.54
E=2468844.43
R=370.00'
L=218.60'
 $\Delta=33^\circ 51' 02''$
DC=0.270



BRO-0011(021)
DICKEY COUNTY, NORTH DAKOTA



PLAN & PROFILE
STA. 17+00 TO 20+50

DRWN. BY
ZRV

CHKD BY
BT

PROJECT NO.
2103-01328

Wetland Impact Table																
Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands¹	Wetland Impact					Wetland Mitigation						
					Wetland Impacts			Acre(s)		USFWS Easement Impacts Acre(s)		Mitigation Proposed			USACE/11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Location	Acre(s)		
1a	Sec. 11, T131N, R63W	Riverine	Natural	Y	0.014	0.022	-	0	0	Y	Y	-	DU ILF; 2:1	0.044		
1c	Sec. 11 & 12, T131N, R63W	Riverine	Natural	Y	0.002	-	-	0	0	N	N	-	-	-		
				Totals	0.016	0.022	0.000	0.000	0.000					0.044		

Other Waters Impact Table																
OW Number	Location	OW Type	OW Feature	USACE Jurisdictional¹	Impacts to Other Waters						Other Water Mitigation					
					Acres			Linear Feet			Mitigation Proposed			USACE/11990 Bank		
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm. (Fill/Drain)	Perm. (Cut)	EO 11990	USACE	USFWS	Location	Acre(s)	
OW 1b	Sec. 11 & 12, T131N, R63W	River	Natural	Y	0.046	0.176	-	60	150	-	N	Y ²	-	DU ILF; 2:1	0.124	
Totals					0.046	0.176	0.000	60	150	0						0.124

¹ All aquatic resources are assumed to be under USACE jurisdiction.

² Compensatory mitigation not proposed where channel would be riprapped (0.114 acres) because the bottom elevation of the channel would remain the same.

Impact Summary Table			
Permanent		Impact Summary	
		Temporary Impacts and additional information	
Wetland Type	Total Acre(s)	WaterType	Total Acre(s)
Natural/JD (Fill/Drain)	0.022	Temporary Wetland JD	0.016
Natural/Non-JD (Fill/Drain)	-	Non-JD Wetland Temporary	-
Artificial/JD (Fill/Drain)	-		
Artificial /Non-JD (Fill/Drain)	-	Permanent OW	0.176
Total	0.022	Temporary OW	0.046
JD Natural (Cut)	-	Permanent OW-d	-
JD Artificial (Cut)	-	Temporary OW-d	-
Non-JD Natural (Cut)	-		
Non-JD Artificial (Cut)	-		
Total	0.000		

Mitigation Summary Table						
	Location	Ditch Shift Acre(s)	Onsite Acre(s)	11990 Bank Acre(s)	USACE/ 11990 Bank Acre(s)	USFWS Bank Acre(s)
USACE Only	-	-	-		-	
EO 11990 Only	-	-	-	-		
USACE/11990	DU ILF	-	-		0.17	
USFWS	-	-				-
Total		0	0	0	0.17	0



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DICKEY COUNTY, NORTH DAKOTA

WETLAND TABLES

DRWN. BY

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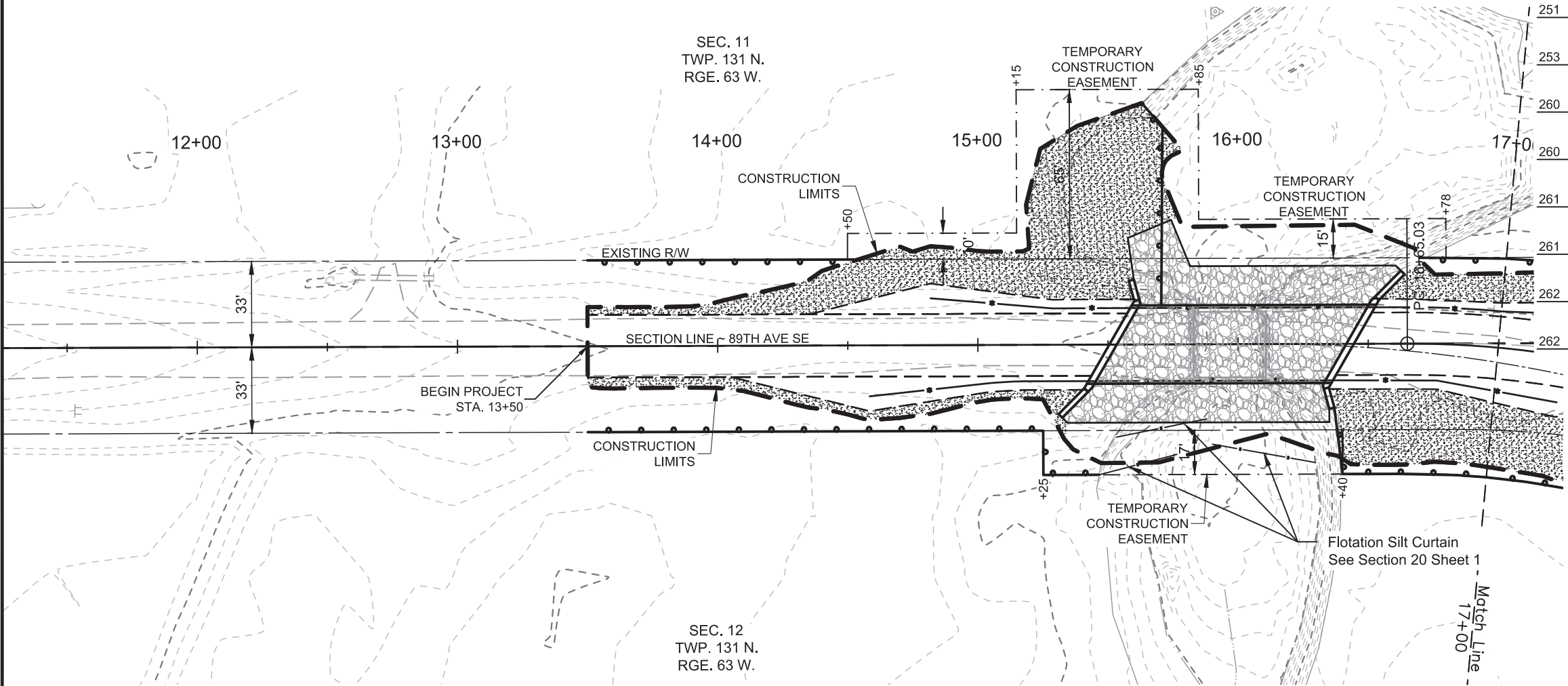
PROJECT NO.

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SPEC CODE BID ITEM QTY UNIT

251	2000	TEMPORARY COVER CROP STA. 13+50 TO 17+00	0.18	ACRE
253	0101	STRAW MULCH STA. 13+50 TO 17+00	0.18	ACRE
260	0200	SILT FENCE SUPPORTED STA. 13+50 TO 17+00	25	LF
260	0201	REMOVE SILT FENCE SUPPORTED STA. 13+50 TO 17+00	25	LF
261	0112	FIBER ROLLS 12IN STA. 13+50 TO 17+00	515	LF
261	0113	REMOVE FIBER ROLLS 12IN STA. 13+50 TO 17+00	515	LF
262	0100	FLOTATION SILT CURTAIN STA. 13+50 TO 17+00	110	LF
262	0101	REMOVE FLOTATION SILT CURTAIN STA. 13+50 TO 17+00	110	LF




NOTE:
1. EROSION CONTROL DEVICE LOCATIONS SHOWN ARE APPROXIMATE. ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD ACCORDING TO CONTRACTOR'S SWPPP.
2. A QUANTITY OF 50 LF OF SILT FENCE SUPPORTED HAS BEEN PROVIDED FOR USE DEPENDING ON SITE CONDITIONS.

- TEMPORARY COVER CROP/STRAW MULCH
- FIBER ROLLS 12IN
- FLOTATION SILT CURTAIN



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DICKEY COUNTY, NORTH DAKOTA



**TEMPORARY
EROSION CONTROL
STA. 13+50 TO 17+00**

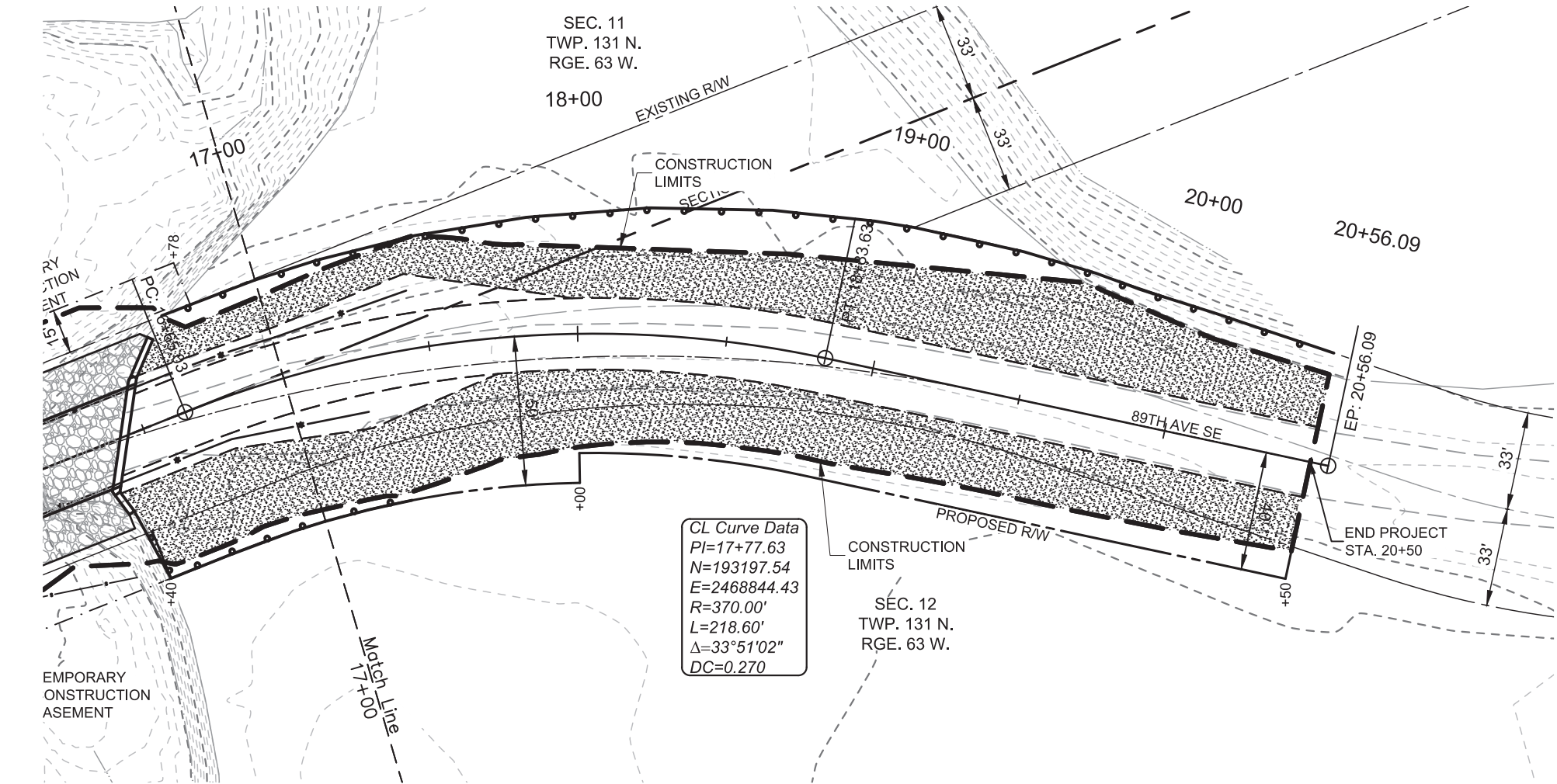
DRWN. BY
ZRV

CHKD BY
BT

PROJECT NO.
2103-01328

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	76	2

SPEC CODE	BID ITEM	QTY	UNIT
251 2000	TEMPORARY COVER CROP STA. 17+00 TO 20+50	0.34	ACRE
253 0101	STRAW MULCH STA. 17+00 TO 20+50	0.34	ACRE
260 0200	SILT FENCE SUPPORTED STA. 17+00 TO 20+50	25	LF
260 0201	REMOVE SILT FENCE SUPPORTED STA. 17+00 TO 20+50	25	LF
261 0112	FIBER ROLLS 12IN STA. 17+00 TO 20+50	400	LF
261 0113	REMOVE FIBER ROLLS 12IN STA. 17+00 TO 20+50	400	LF




NOTE:
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2. A QUANTITY OF 50 LF OF SILT FENCE SUPPORTED HAS BEEN PROVIDED FOR USE DEPENDING ON SITE CONDITIONS.

- TEMPORARY COVER CROP/STRAW MULCH
- FIBER ROLLS 12IN
- FLOTATION SILT CURTAIN



BRO-0011(021)
DICKEY COUNTY, NORTH DAKOTA



**TEMPORARY
EROSION CONTROL
STA. 17+00 TO 20+50**

DRWN. BY
ZRV

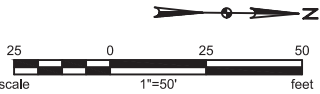
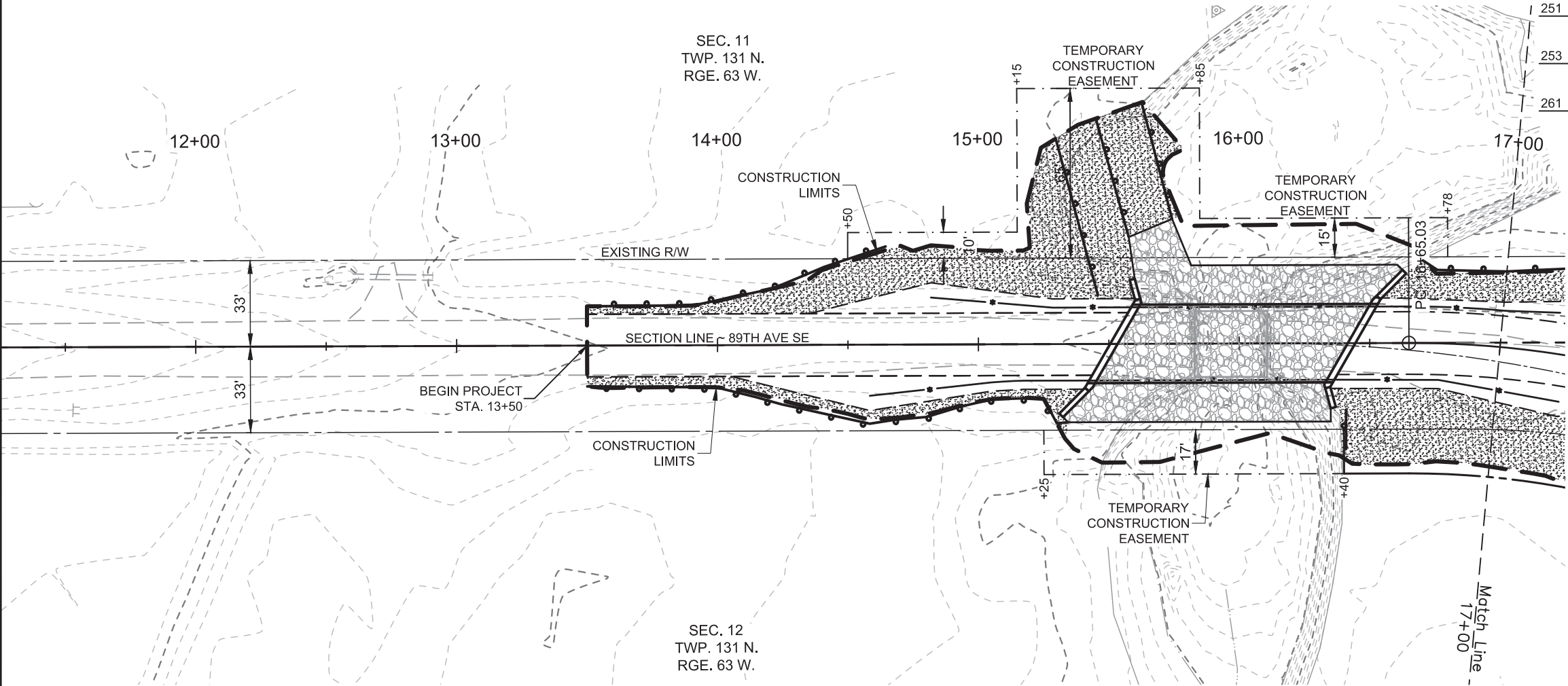
CHKD BY
BT




PROJECT NO.
2103-01328

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	77	1

SPEC CODE BID ITEM QTY UNIT


251	0200	SEEDING CLASS II	
		STA. 13+50 TO 17+00	0.18 ACRE
253	0101	STRAW MULCH	
		STA. 13+50 TO 17+00	0.18 ACRE
261	0112	FIBER ROLLS 12IN	
		STA. 13+50 TO 17+00	525 LF



-  SEEDING CLASS II & STRAW MULCH
-  FIBER ROLLS 12IN
-  RIPRAP GRADE II



BRO-0011(021)
DICKEY COUNTY, NORTH DAKOTA



**PERMANENT
EROSION CONTROL
STA. 13+50 TO 17+00**

DRWN. BY ZRV	CHKD BY BT	PROJECT NO. 2103-01328
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	100	2



I2-5-96
Post Mounted



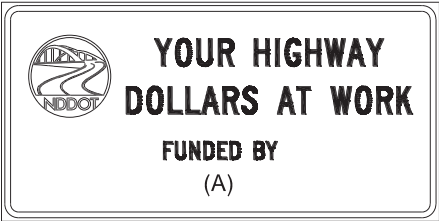
W20-3-48
Post Mounted



W20-3-48
Post Mounted



R11-3a-60
(1) Type III Barricade



I2-5-96
Post Mounted



(1) R11-2-48
(3) Type III Barricade



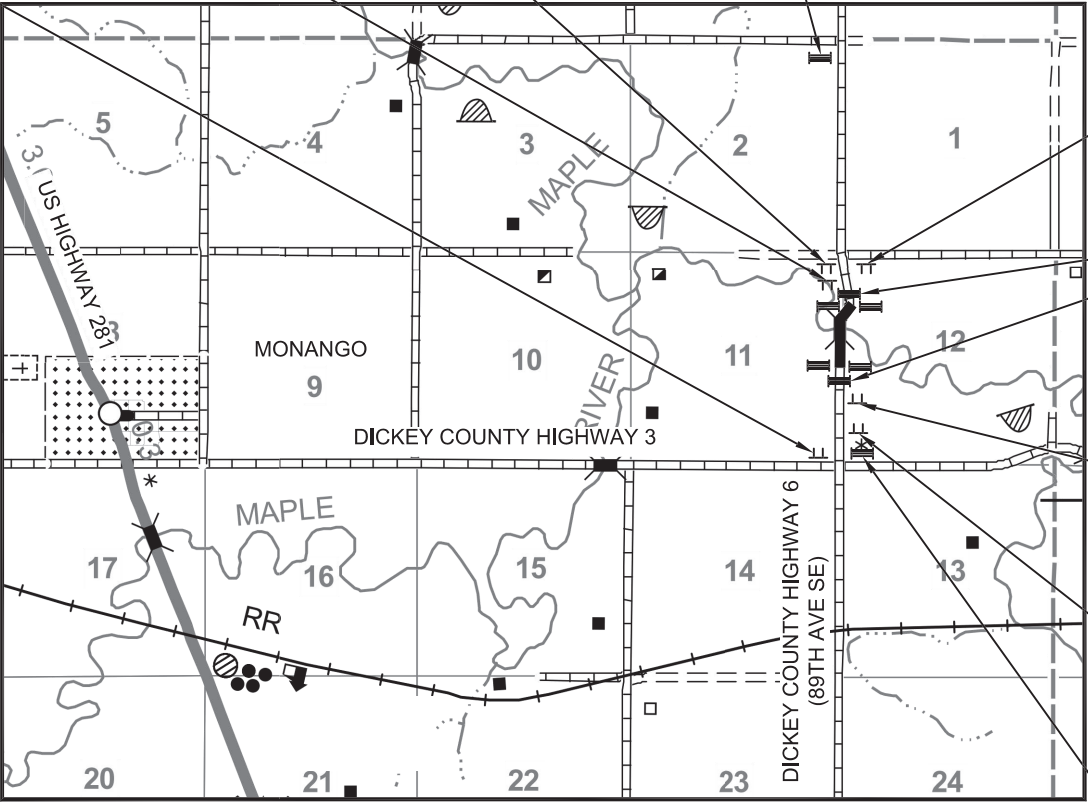
W20-3-48
Post Mounted



W20-3-48
Post Mounted



R11-3a-60
(1) Type III Barricade

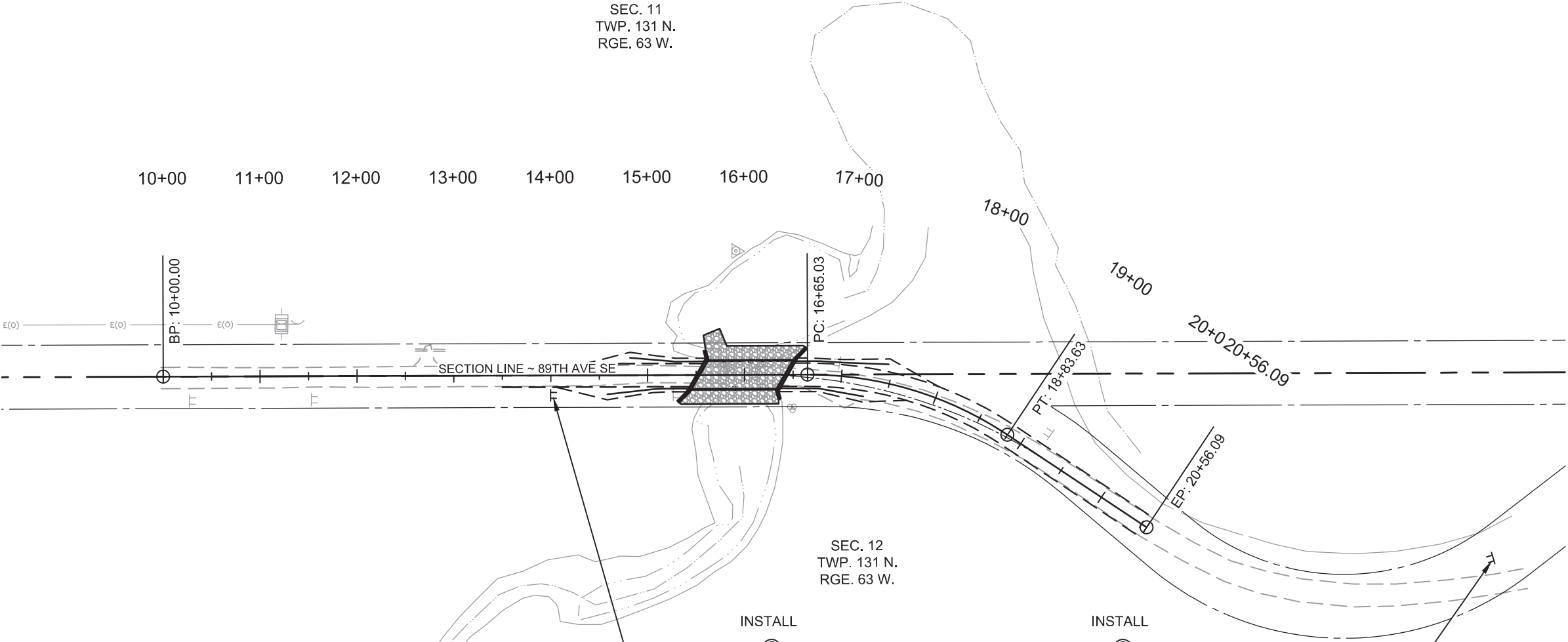


BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA		
KLJ CONSTRUCTION SIGNING LAYOUT		
DRWN. BY ZRV	CHKD BY BT	PROJECT NO. 2103-01328

The sign layout as shown is for general information purposes only. The contractor will be required to conform to MUTCD and the Standard Drawings when installing the traffic control signing.

[illegible]

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	110	2




INSTALL

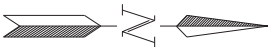
W1-4R-30
W13-1P-18
STA. 14+00

INSTALL

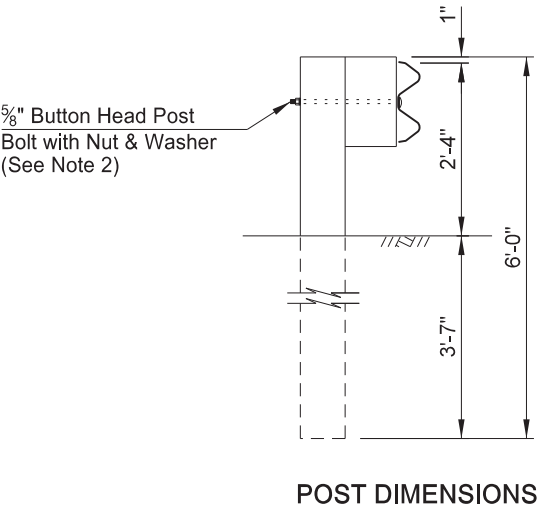
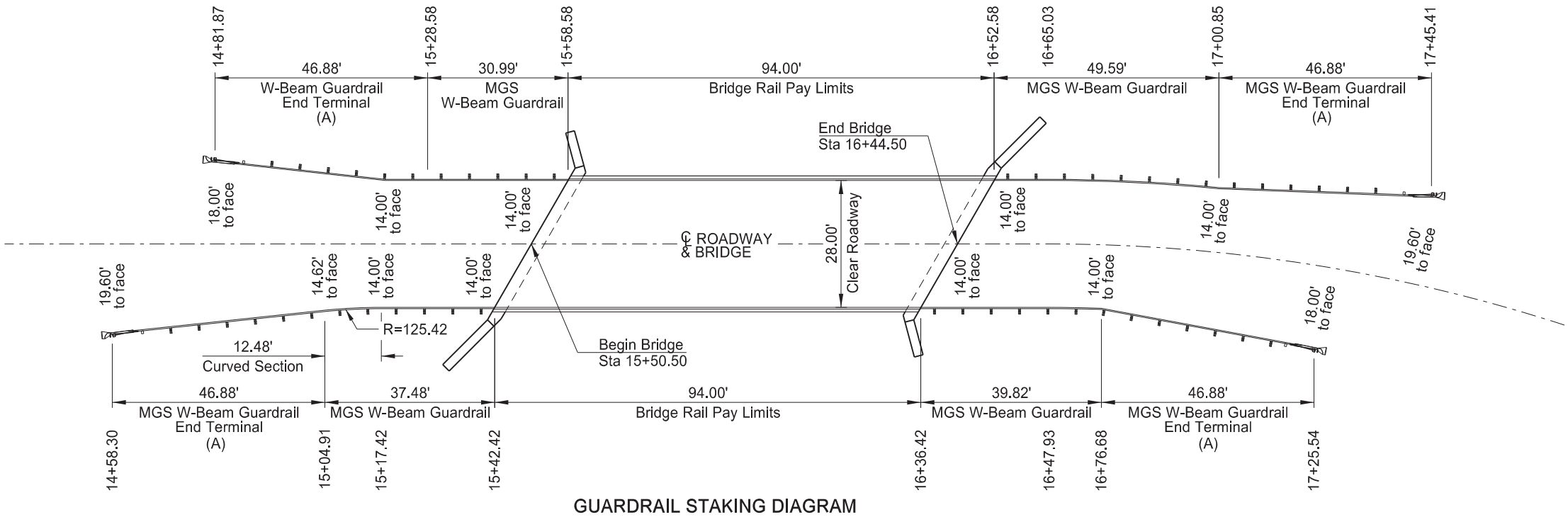
W1-4L-30
W13-1P-18
STA. Determined in Field
By Engineer



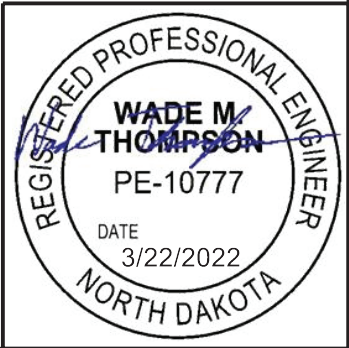
BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA		
 SIGNING LAYOUT		
DRWN. BY ZRV	CHKD BY BT	PROJECT NO. 2103-01328




	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	130	1

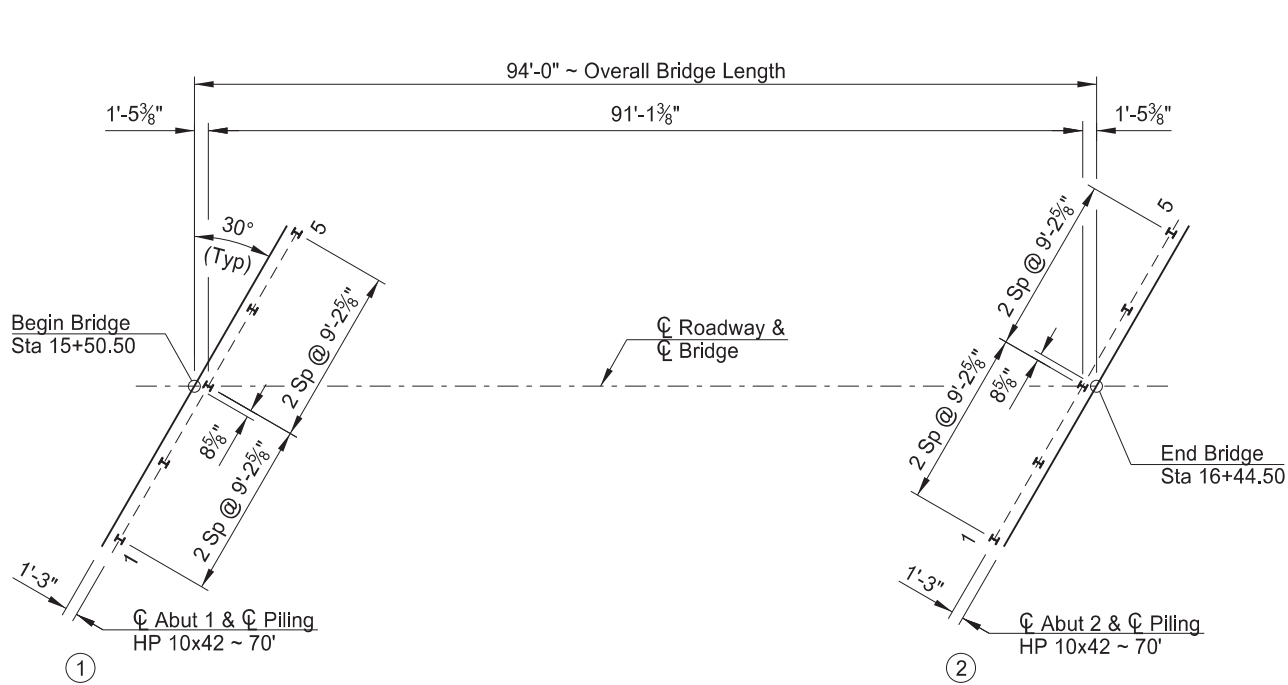


- NOTES:
- A. MGS Flared Energy Absorbing Terminal to be installed at this location.
 - B. Guardrail offsets to face of rail.



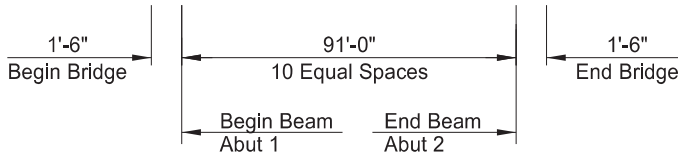
QUANTITIES	
W-BEAM GUARDRAIL END TERMINAL	4 EA
W-BEAM GUARDRAIL	157 LF
BRO-0011(021) DICKY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1	
KLJ	
GUARDRAIL LAYOUT	
DRAWN BY BJJ	PROJECT NO. 2103-01328

		STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
		ND	BRO-0011(021)	170	2
STRUCTURAL NOTES					
100-P01	SCOPE OF WORK: Work at this site consists of removing and replacing an existing 28-foot single span bridge over the Maple River 3-Miles east and 1-Mile north of Monango, North Dakota. The new bridge will be a 94-foot, single span concrete structure with prestressed I-beams having a clear roadway width of 28'-0".				
100-P02	GENERAL: Include the cost of furnishing and placing preformed expansion joint filler and other miscellaneous items in the price bid for "CLASS AE-3 CONCRETE" and "CLASS AAE-3 CONCRETE".				
105-P01	WORK DRAWINGS: Submit the prestressed concrete box beam work drawings to the Engineer for review. Use the following minimum text sizes on all work drawing sheets. Dimensions and Notes = 0.08" Detail Subtitles = 0.09" Detail Titles = 0.10"				
202-P01	REMOVAL OF STRUCTURE: The existing strucuture is a 28-foot long single-span reinforced concrete beam bridge. The abutments are supported by piling. The lump sum bid item, "REMOVAL OF STRUCTURE" includes all work required to remove all existing bridge components and hazard markers in accordance with the Standard Specifications. All materials removed become property of the contractor and will be disposed of properly off the right-of-way. Submit SFN 17987 "Asbestos Notification of Demolition and Renovation" to the North Dakota Department of Health 10 days before beginning removal of concrete.				
210-P01	EXCAVATION: Include the excavation at the abutments, as shown, in the lump sum bid item, "CLASS 1 EXCAVATION".				
210-P02	CHANNEL EXCAVATION: Dispose of any unsuitable or excess channel excavation material at a location outside the right-of-way determined by the contractor and acceptable to the Engineer. Include all costs associated with excavating, hauling, depositing, and leveling the material in the unit price bid for "CHANNEL EXCAVATION".				
602-P01	CONCRETE: Provide aggregate for concrete that meets the requirements of Section 802.01 C.2, "Coarse Aggregate" and Section 802.01 C.3 "Fine Aggregate."				
602-P02	DIAPHRAGMS AND ENDWALLS: Place the intermediate diaphragm concrete at least 72 hours before placing the deck concrete. Place the endwall concrete at the same time as the deck concrete.				
622-P01	PILING: Drive piling with a diesel hammer with a rated energy and ram weight (minimum of 2,750 pounds) of at least 35,946 foot-pound-tons computed by the formula: $W (E-14,553) + 0.49 E$ W = weight of the ram (tons) E = rated hammer energy Run the hammer at an energy that produces a penetration at bearing between ½ inches and 3 inches in the last 10 blows.				
		DESIGN STRENGTH: F'c 4,000 PSI Class AE-3 Concrete (Required Minimum 28 Day Concrete Strength) F'c 4,000 PSI Class AAE-3 Concrete (Required Minimum 28 Day Concrete Strength) Fy 60,000 PSI Grade 60 Reinforced Steel F'c 7,300 PSI Prestressed Girder Concrete Load Resistance and Factor Design (HL-93) 15 PSF Future Wearing Surface WORK DRAWINGS: Submit the following work drawings to the Engineer of Record: Prestressed Concrete I-Beams Bridge Rail			
					
			BRO-0011(021) DICKY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1		
			STRUCTURAL NOTES		
			DRAWN BY BJJ	CHECKED BY A. BEHNKE	PROJECT NO. 2103-01328

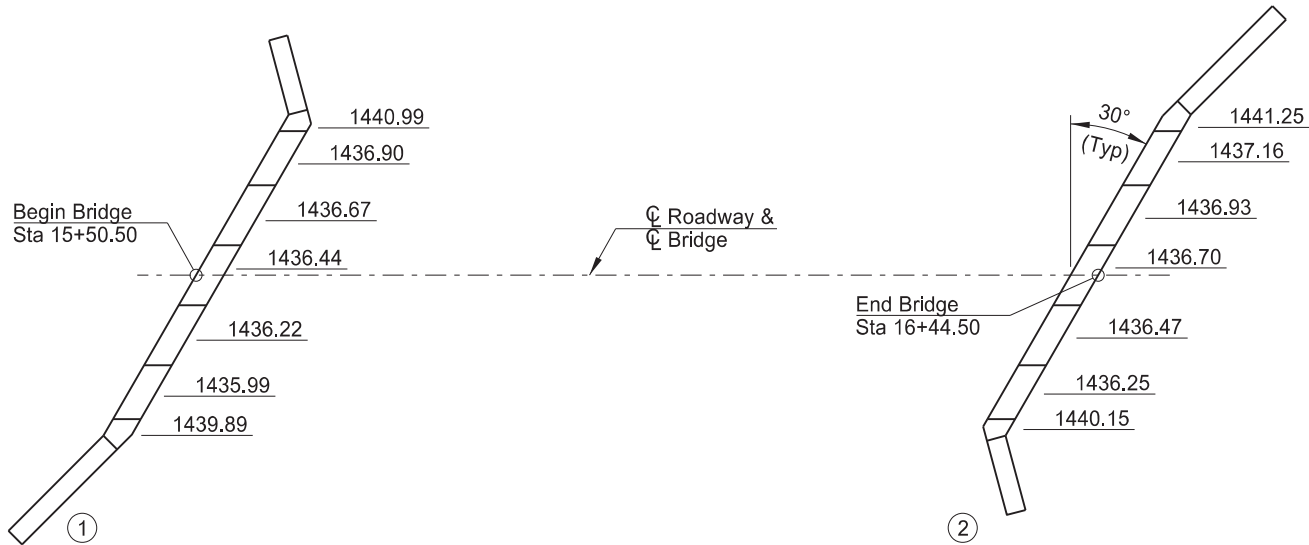
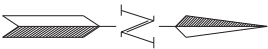


PILING LAYOUT
HP 10x42 piles shall be driven to 105 tons.

	Beam 1	Beam 2	Beam 3	Beam 4	Beam 5
	1440.90	1440.67	1440.44	1440.21	1439.98
	1440.90	1440.67	1440.44	1440.21	1439.99
	1440.98	1440.75	1440.52	1440.30	1440.06
	1441.05	1440.83	1440.60	1440.37	1440.13
	1441.11	1440.89	1440.67	1440.44	1440.20
	1441.16	1440.94	1440.72	1440.49	1440.24
	1441.19	1440.98	1440.75	1440.52	1440.28
	1441.21	1440.99	1440.77	1440.54	1440.29
	1441.21	1440.99	1440.77	1440.54	1440.30
	1441.20	1440.98	1440.75	1440.52	1440.28
	1441.18	1440.95	1440.72	1440.50	1440.26
	1441.15	1440.92	1440.69	1440.46	1440.24
	1441.15	1440.93	1440.70	1440.47	1440.24



SCREED ELEVATIONS



BEARING ELEVATIONS
Elevations shown are to top of finished concrete.

NOTE:

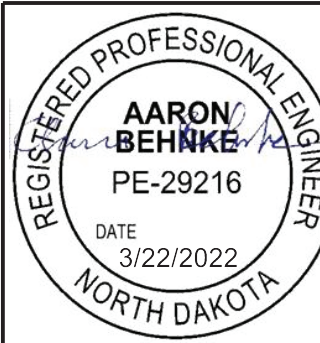
For double acting or single acting diesel hammers, calculate the safe bearing value of piles by the following formula:

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

Where:

P = Safe bearing value, in pounds.
W = Weight of striking parts (ram), in pounds.
M = Weight of parts being driven, in pounds. Includes pile weight, anvil (if any), driving cap, etc.
E = Energy per blow, in foot-pounds.
S = Average penetration of pile in inches per blow for last ten blows.

For single acting hammers, calculate E by multiplying observed stroke (ft) and W (lbs).



BRO-0011(021)

DICKEY COUNTY, NORTH DAKOTA

STRUCTURE #11-123.08.1

PIILING LAYOUT,
BEARING ELEVATIONS &
SCREED ELEVATIONS

DRWN BY

BJJ

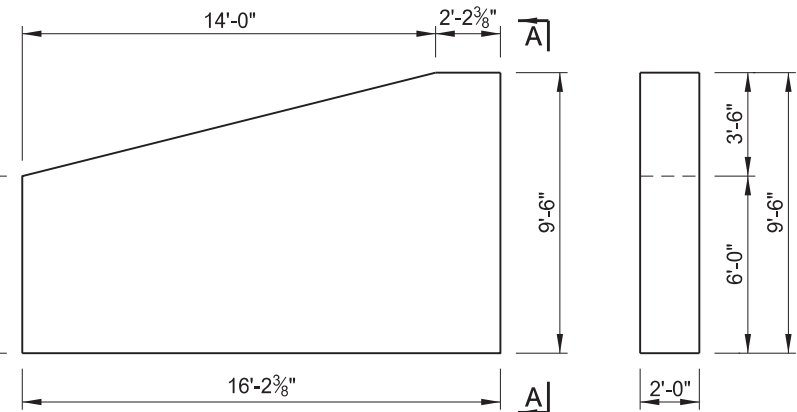
CHKD BY

A. BEHNKE

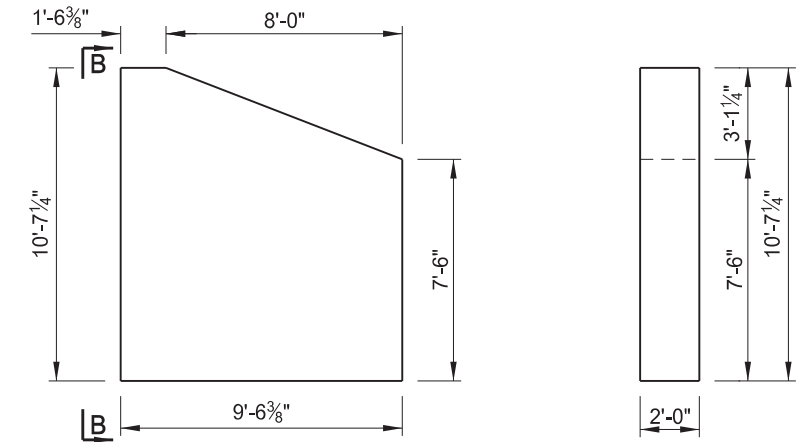
PROJECT NO.

2103-01328

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	170	4



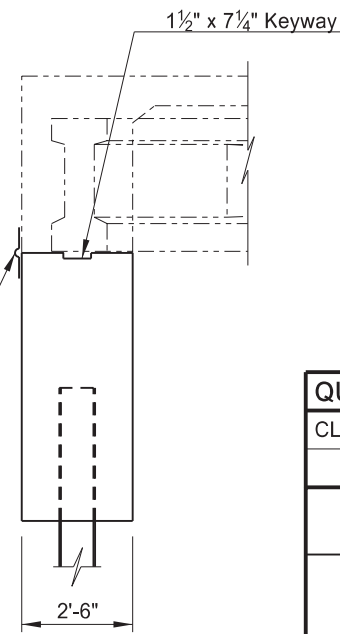
WING A



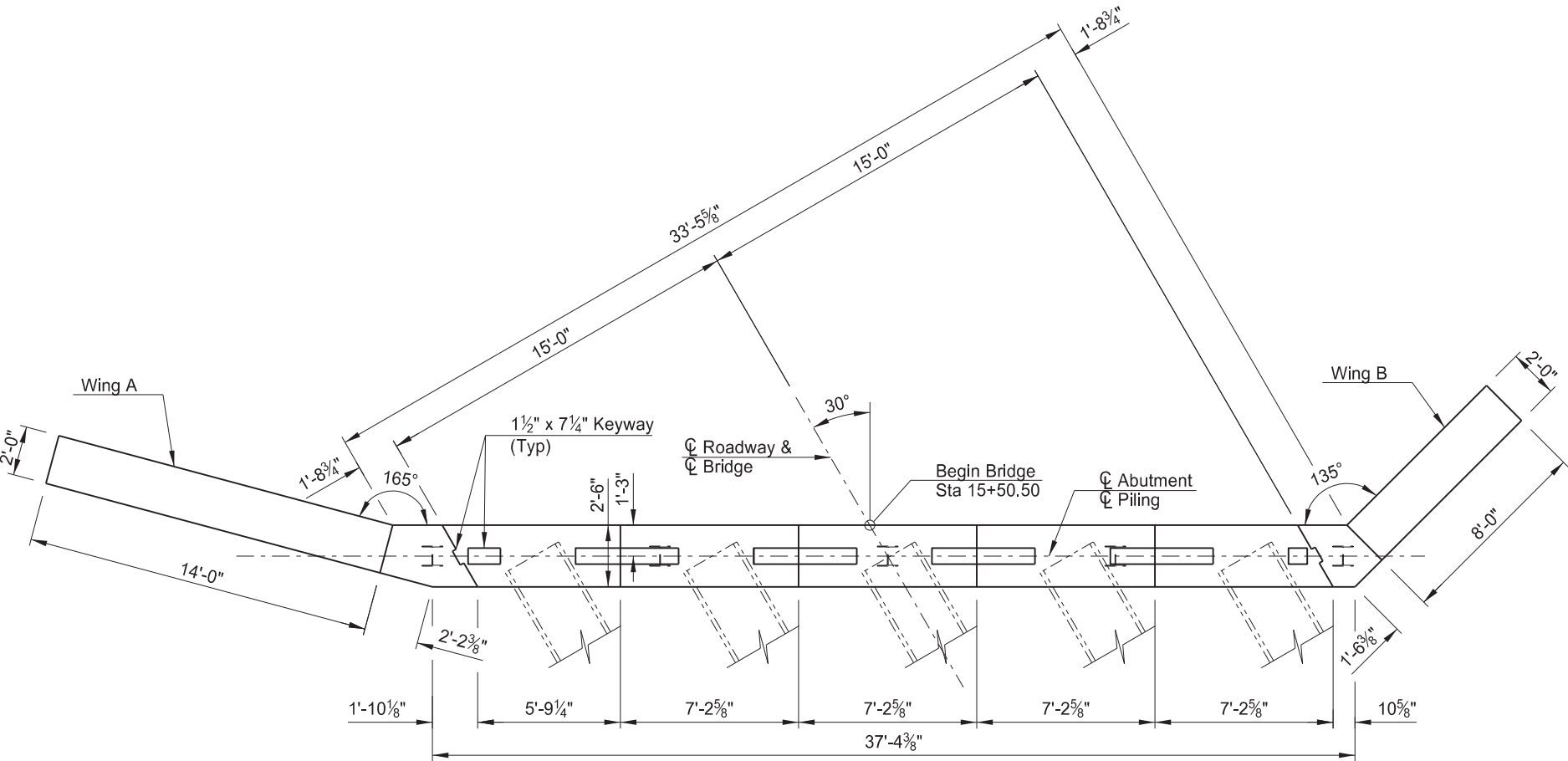
WING B

A-A

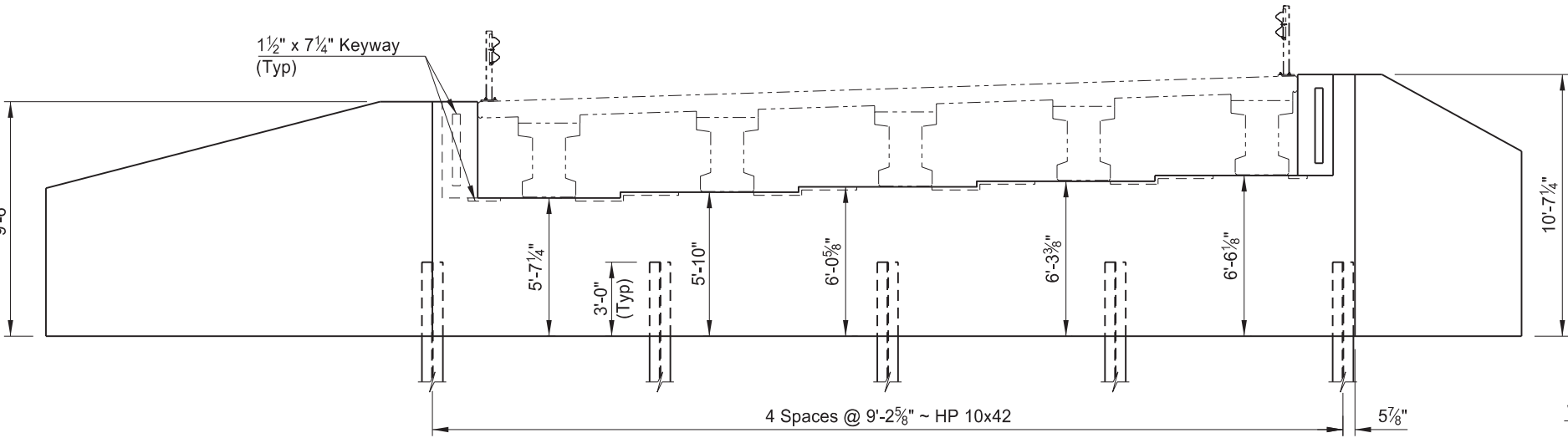
B-B



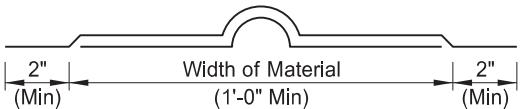
SECTION @ CL BRIDGE



PLAN

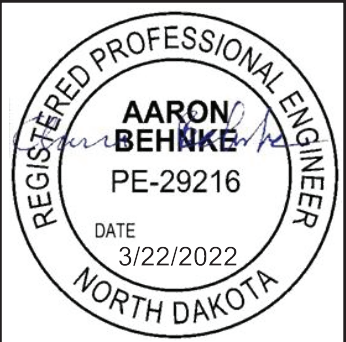


ELEVATION



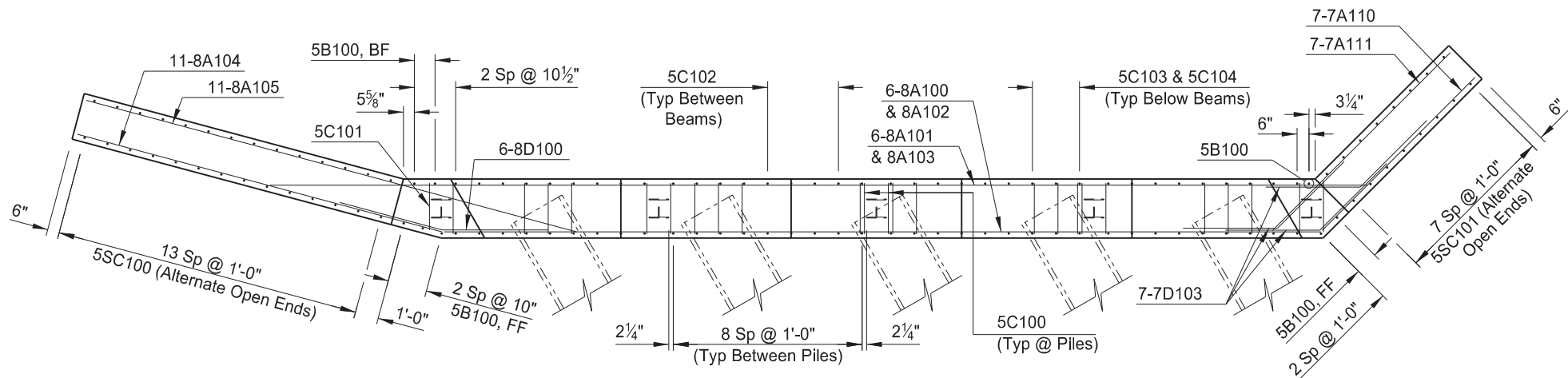
Use waterproof membrane that meets the requirements of Section 602.03 B. Include the cost of the waterproof membrane in the contract unit price for "Class AE-3 Concrete."

WATERPROOF MEMBRANE DETAIL

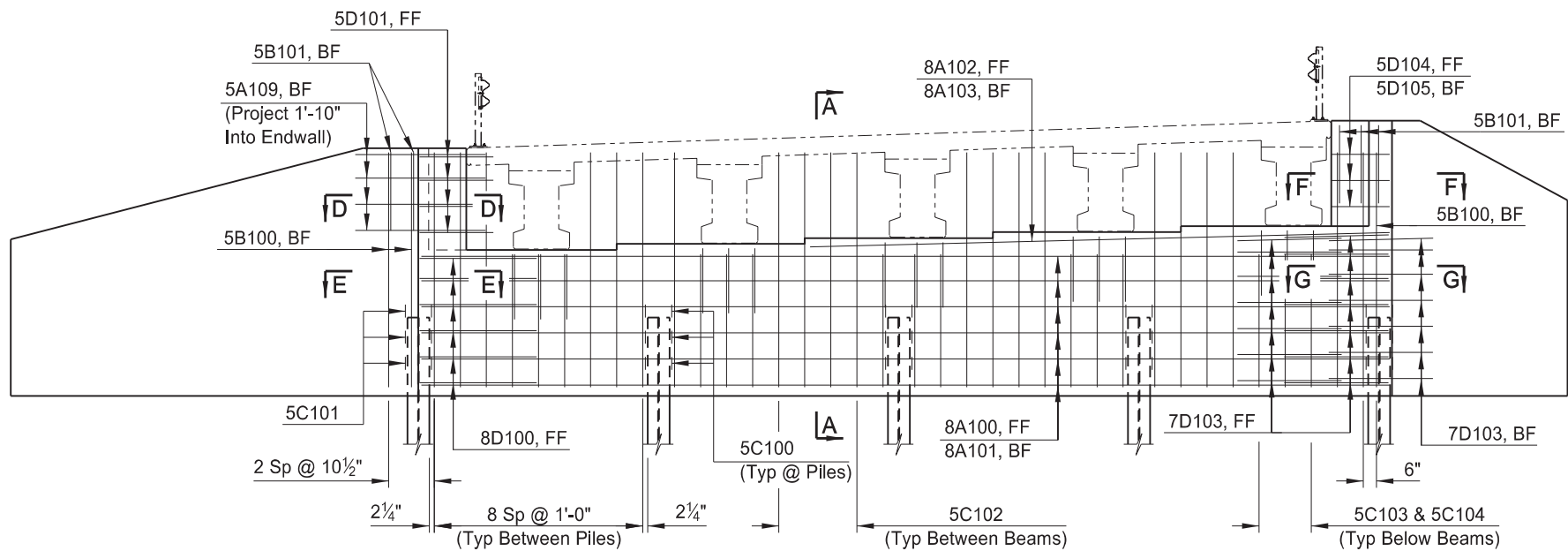


QUANTITIES (ONE ABUTMENT)	
CLASS AE-3 CONCRETE	37.3 CY
BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1	
KLJ	
ABUTMENT 1 DETAILS (Showing Dimensions)	
DRAWN BY BJJ	CHKD BY A. BEHNKE
PROJECT NO. 2103-01328	

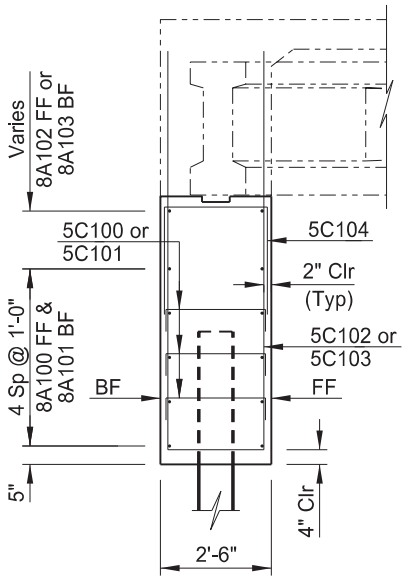
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	BRO-0011(021)	170	5



PLAN



ELEVATION



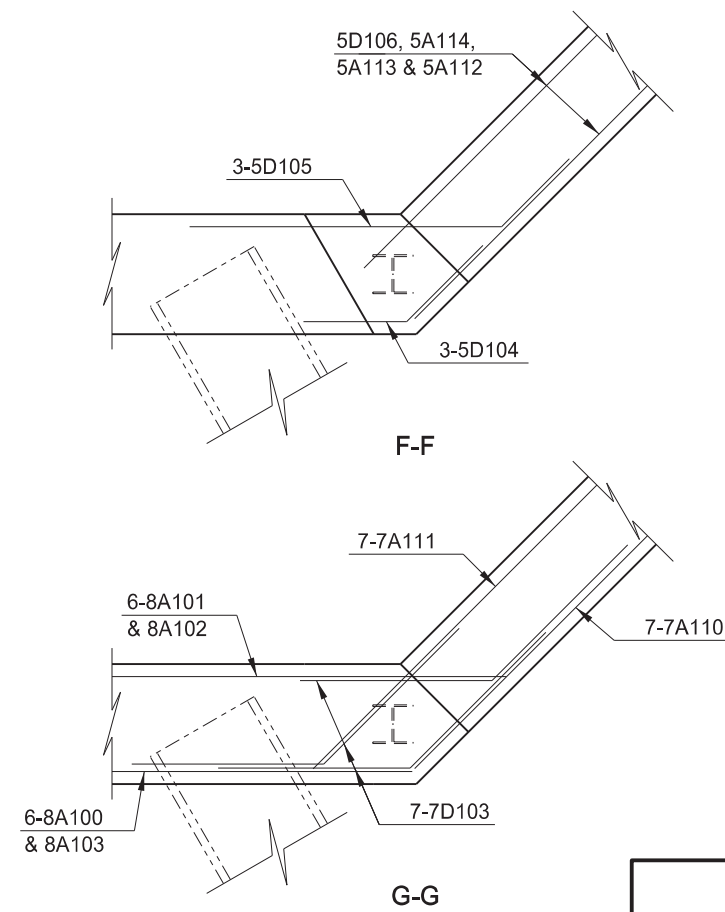
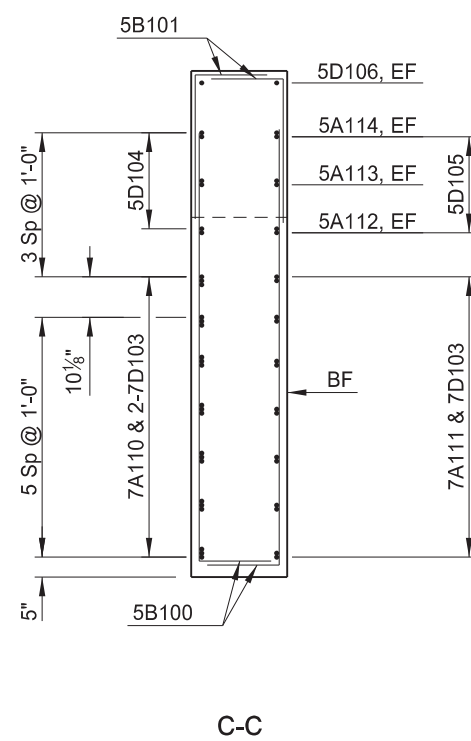
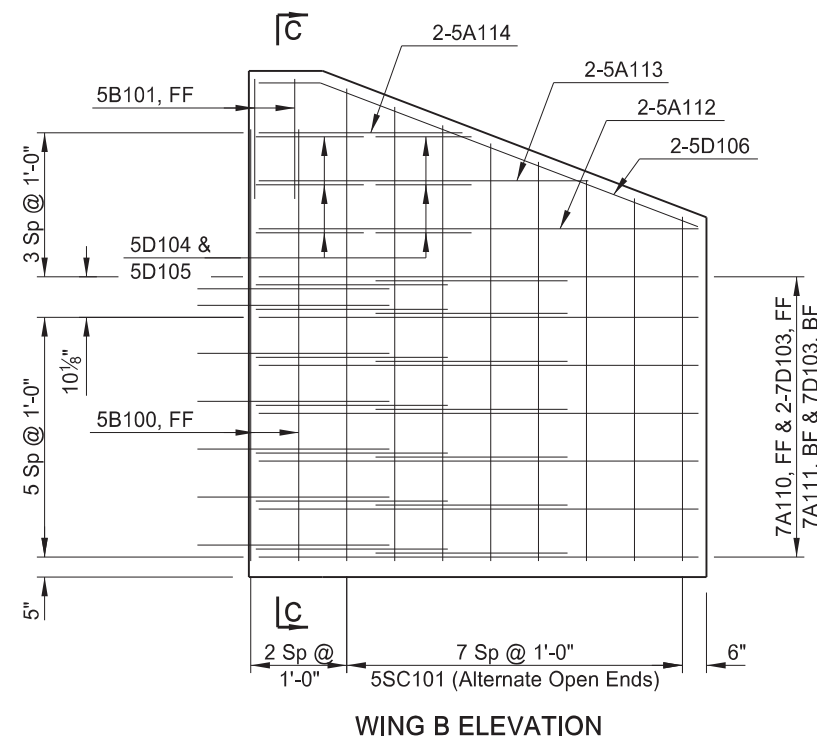
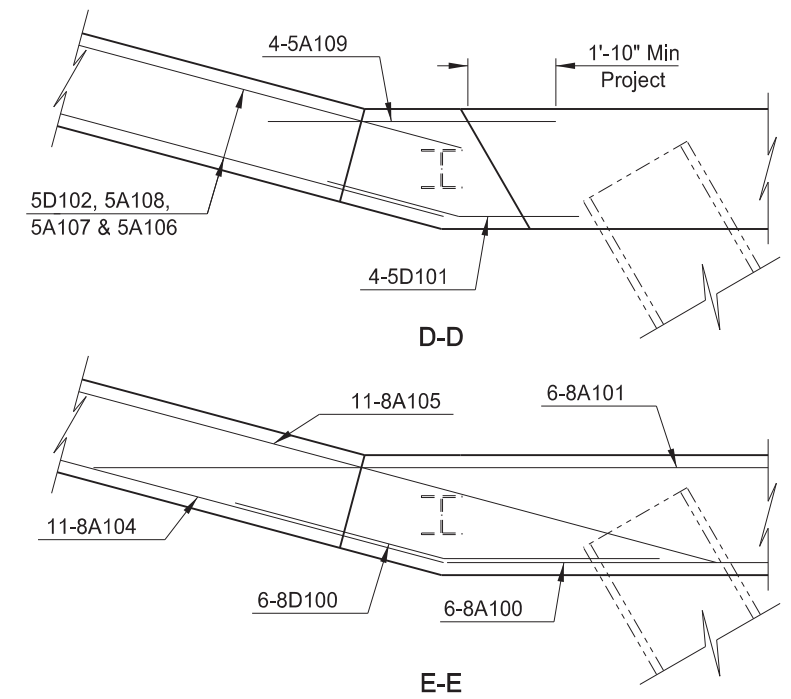
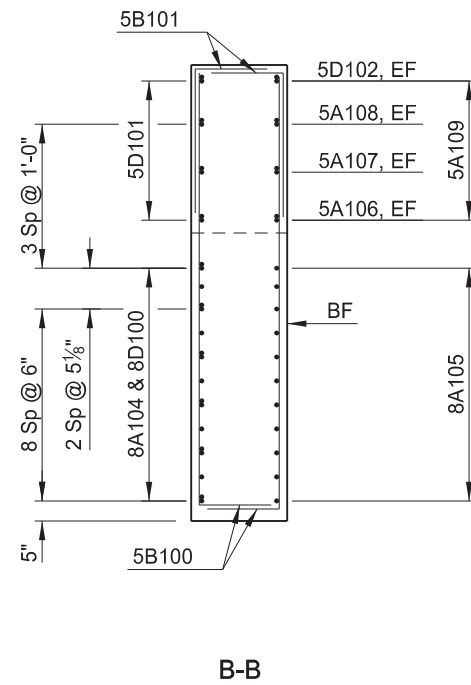
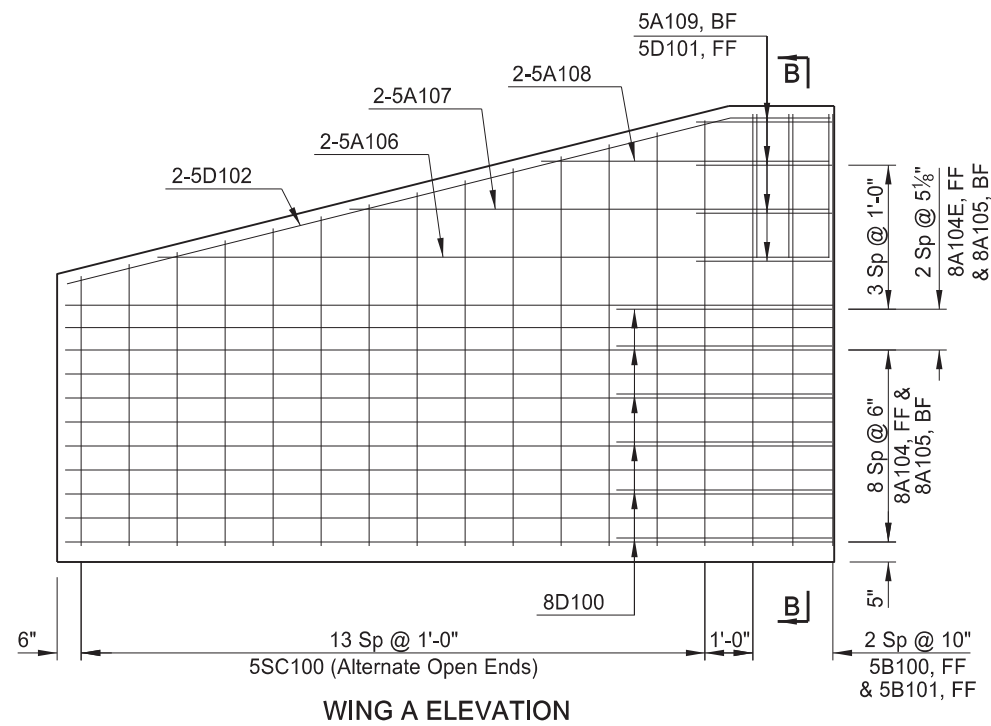
A-A

NOTES:
FF = Front Face
BF = Back Face

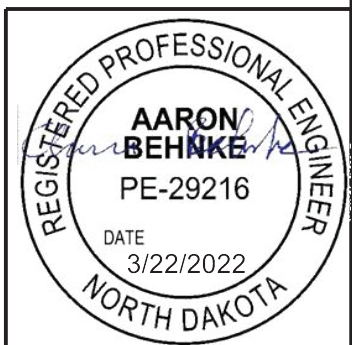


QUANTITIES	
REINFORCING STEEL-GRADE 60	4,993 LB
BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1	
ABUTMENT 1 DETAILS (Showing Reinforcing)	
DRWN BY BJJ	CHKD BY A. BEHNKE
PROJECT NO. 2103-01328	

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	170	6



NOTES:
FF = Front Face
BF = Back Face



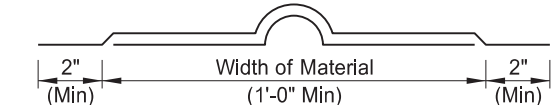
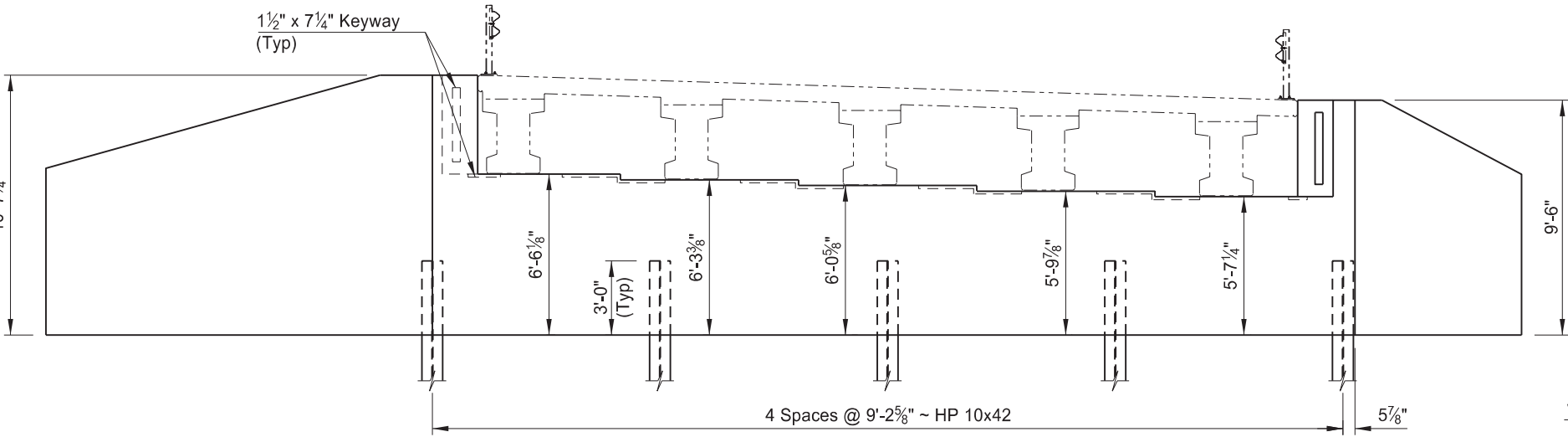
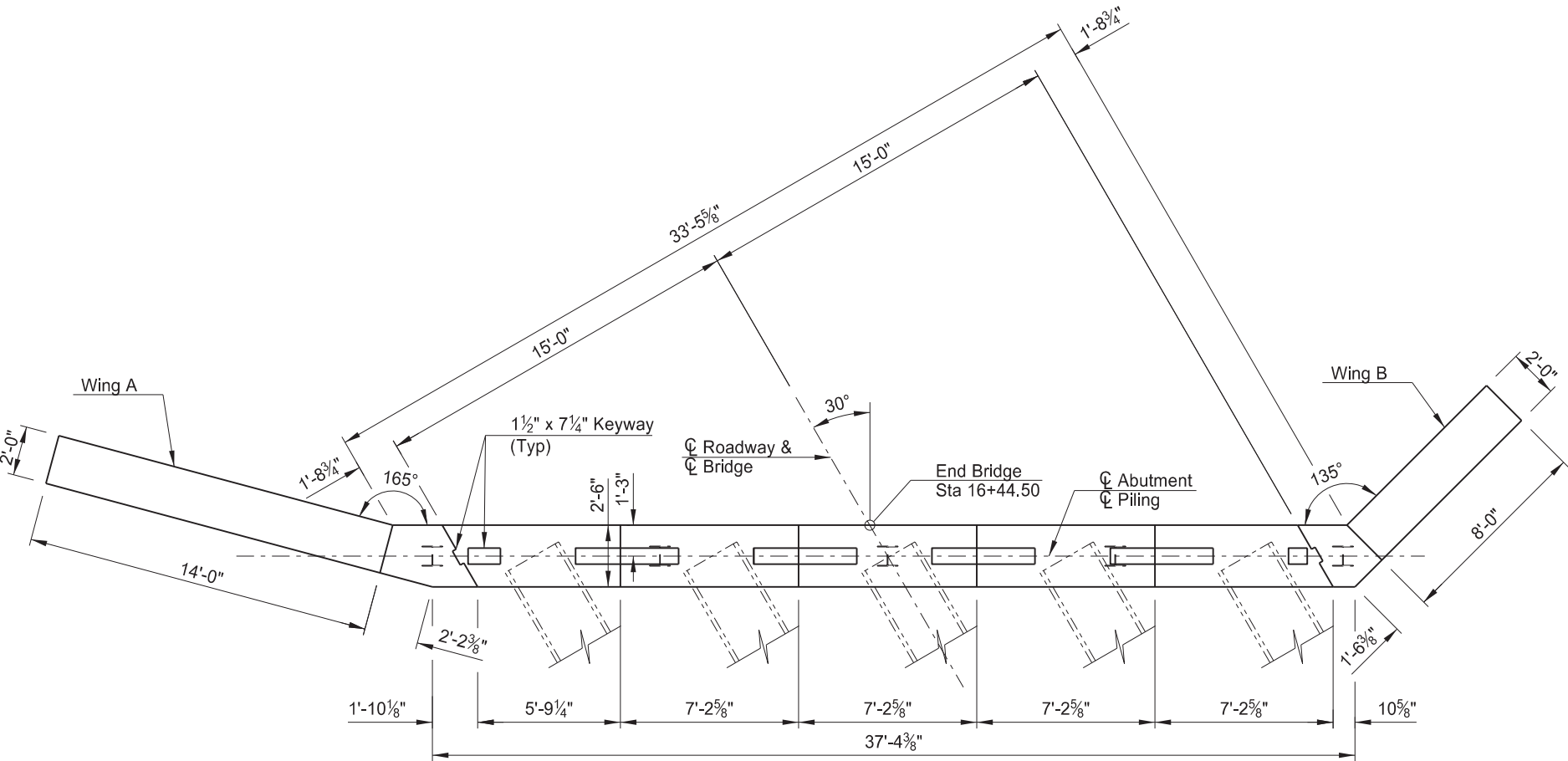
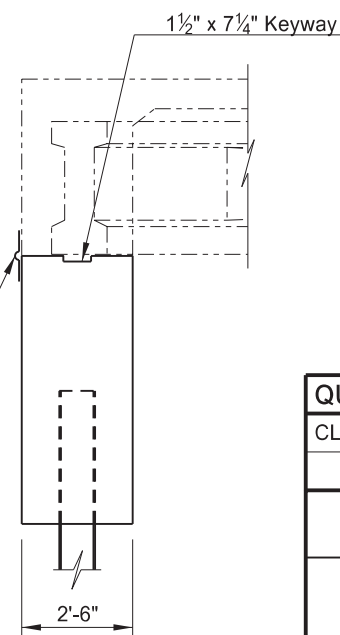
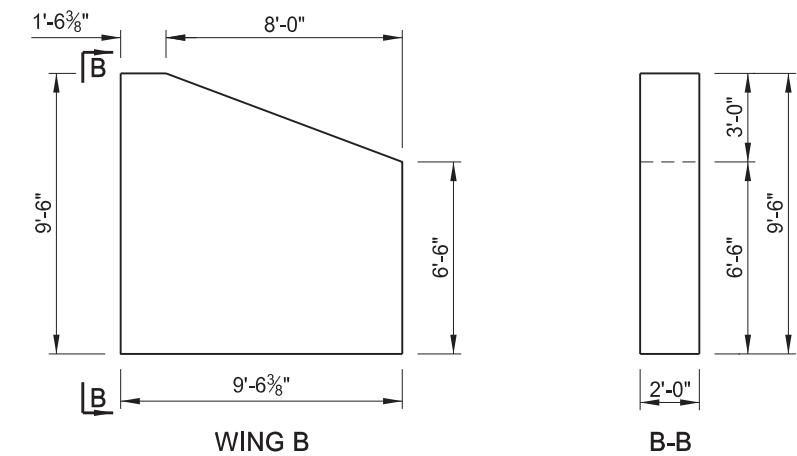
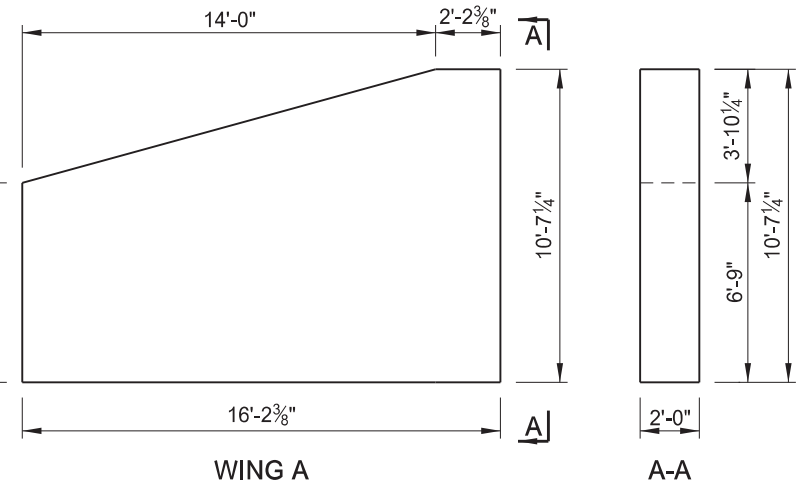
BRO-0011(021)
DICKEY COUNTY, NORTH DAKOTA
STRUCTURE #11-123.08.1

KLJ

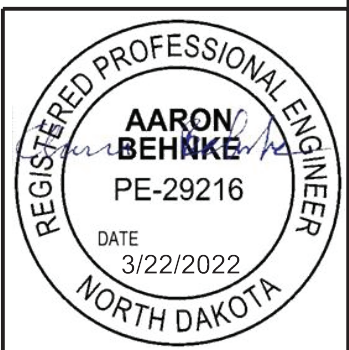
ABUTMENT 1 DETAILS
(Showing Reinforcing)

DRWN BY: BJJ
CHKD BY: A. BEHNKE
PROJECT NO.: 2103-01328

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	170	7

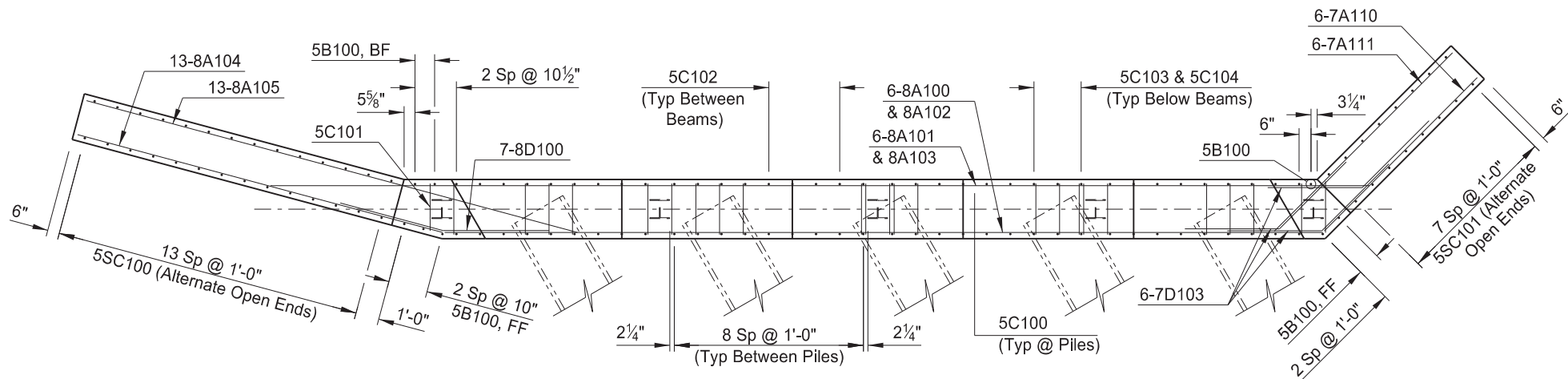


Use waterproof membrane that meets the requirements of Section 602.03 B. Include the cost of the waterproof membrane in the contract unit price for "Class AE-3 Concrete."

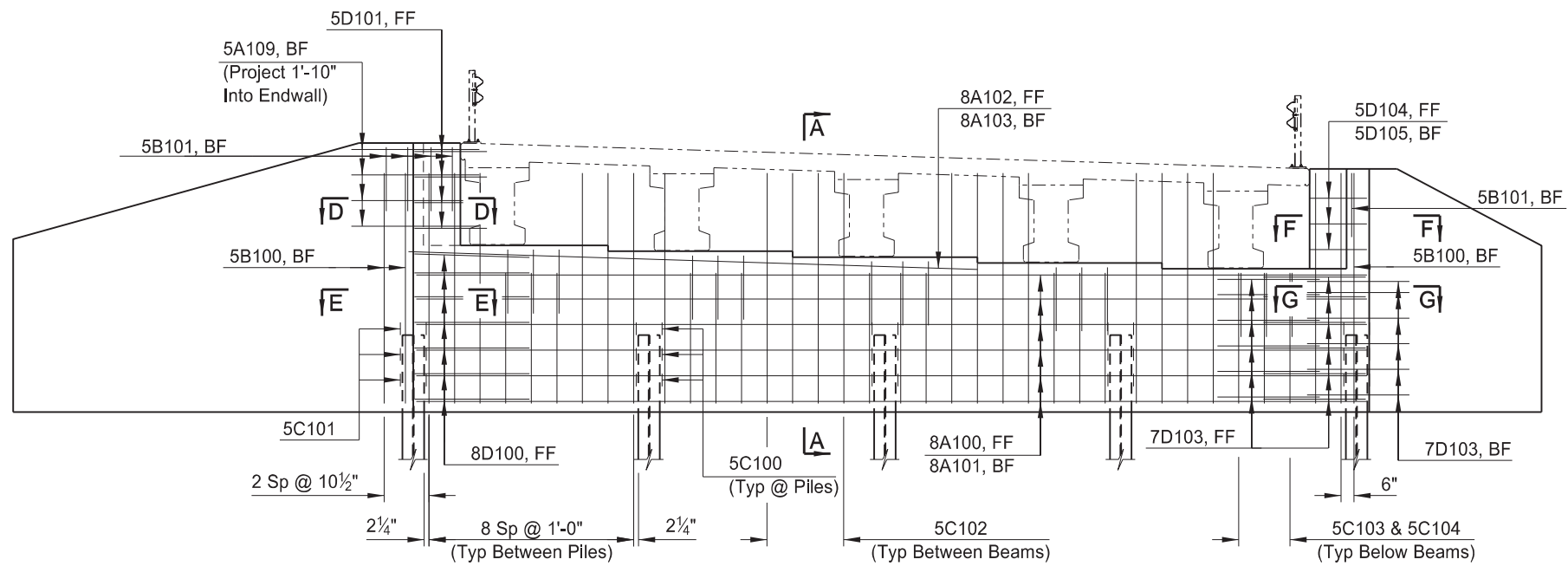


QUANTITIES		(ONE ABUTMENT)
CLASS AE-3 CONCRETE		37.7 CY
BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1		
KLJ		ABUTMENT 2 DETAILS (Showing Dimensions)
DRAWN BY BJJ	CHECKED BY A. BEHNKE	PROJECT NO. 2103-01328

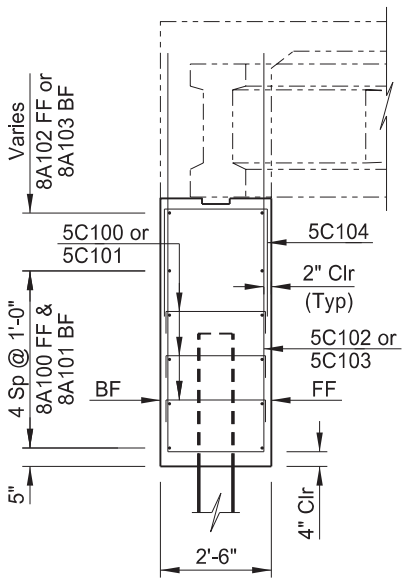
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	BRO-0011(021)	170	8



PLAN



ELEVATION



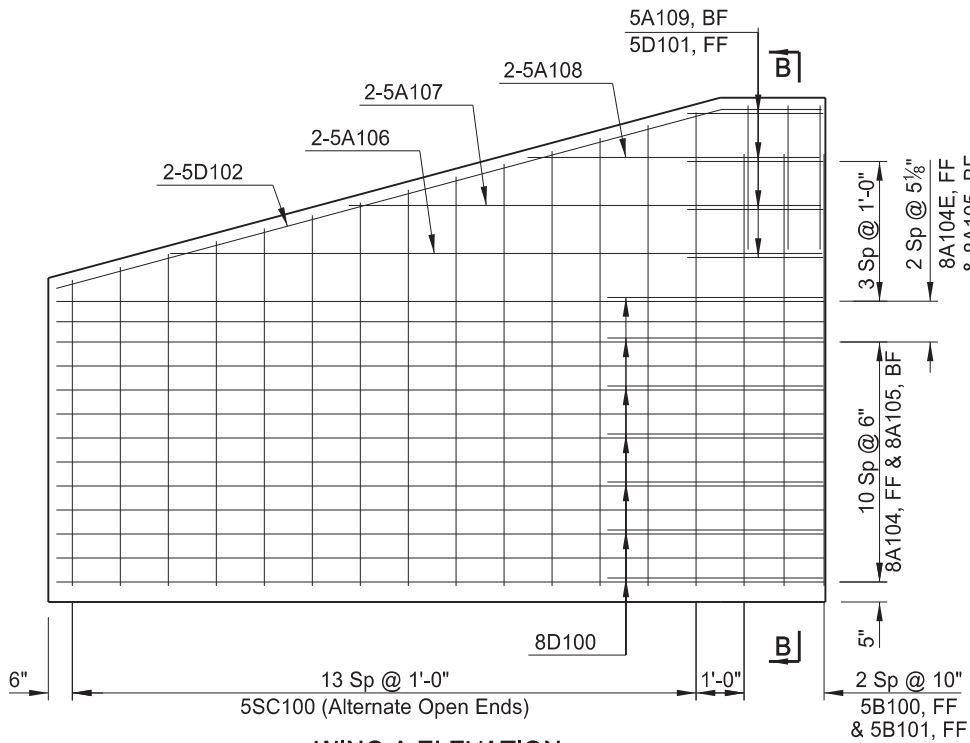
A-A



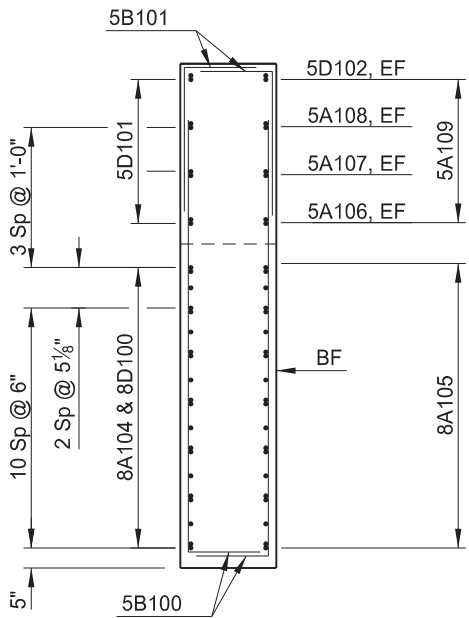
QUANTITIES	
REINFORCING STEEL-GRADE 60	5,150 LB
BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1	
ABUTMENT 2 DETAILS (Showing Reinforcing)	
DRWN BY BJJ	CHKD BY A. BEHNKE
PROJECT NO. 2103-01328	

NOTES:
FF = Front Face
BF = Back Face

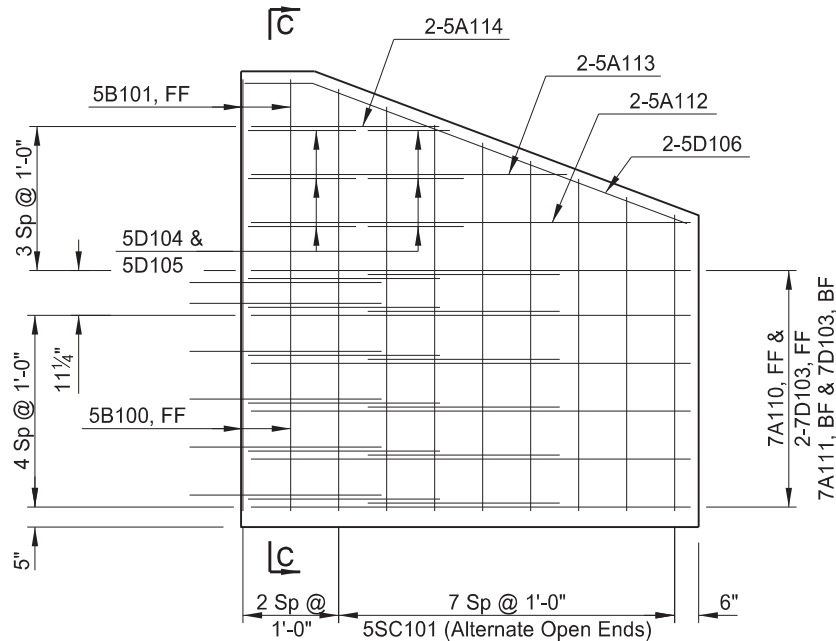
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	170	9



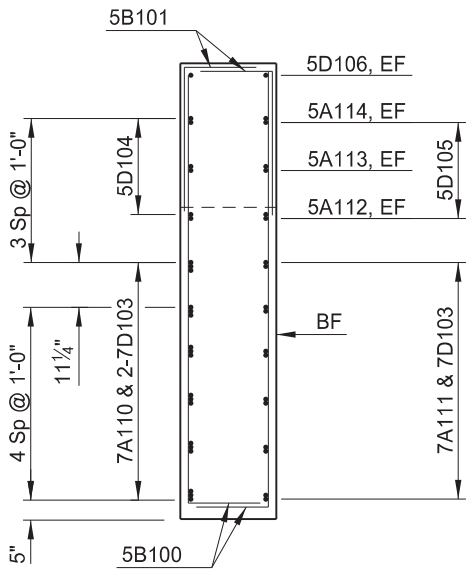
WING A ELEVATION



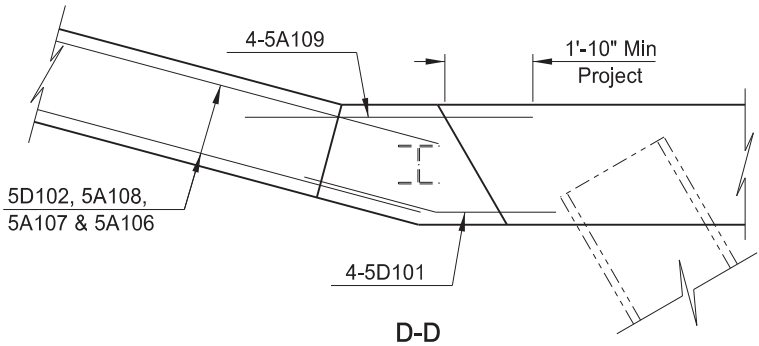
B-B



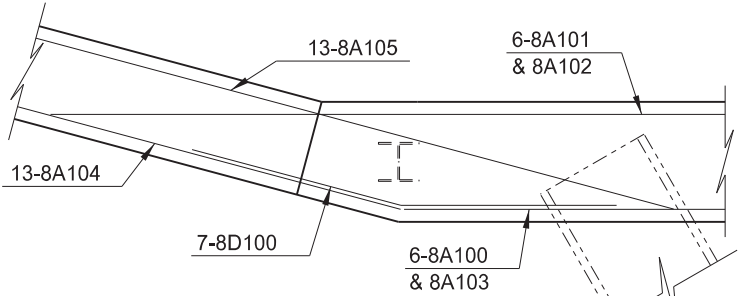
WING B ELEVATION



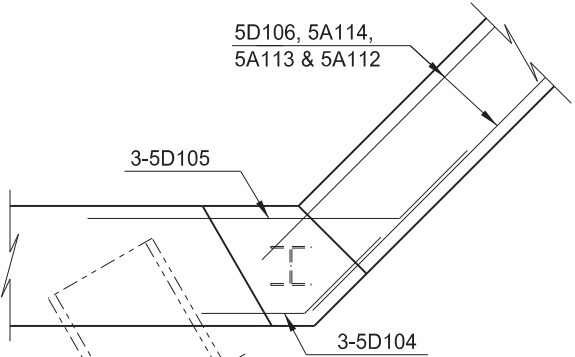
C-C



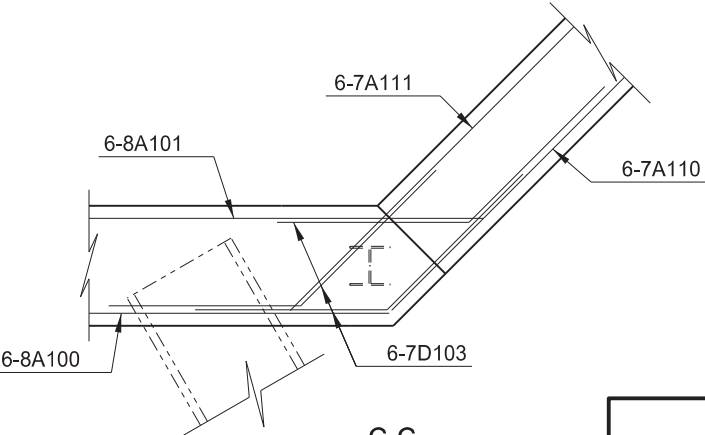
D-D



E-E



F-F



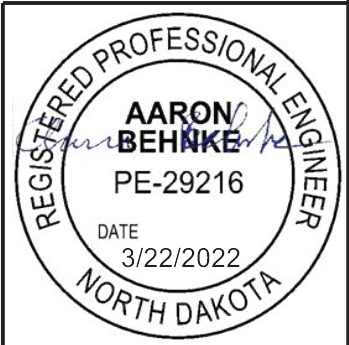
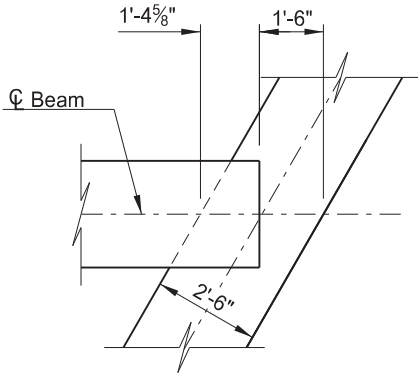
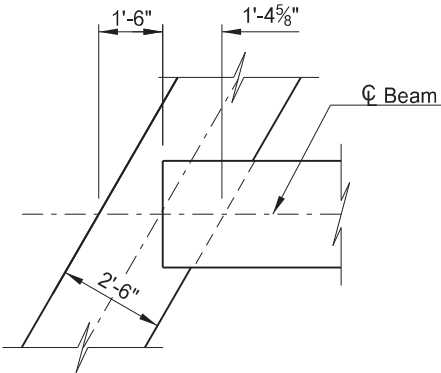
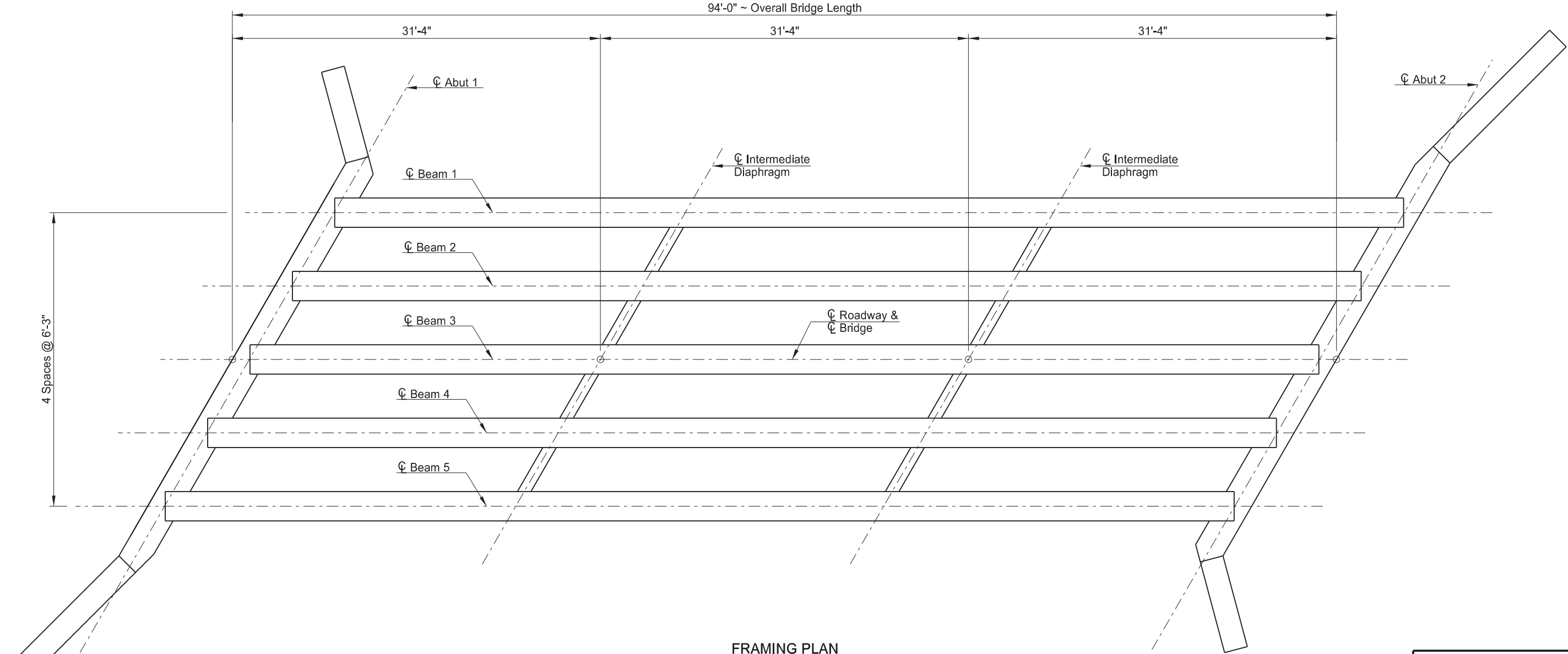
G-G

NOTES:
FF = Front Face
BF = Back Face



BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1		
	ABUTMENT 2 DETAILS (Showing Reinforcing)	
	DRWN BY BJJ	CHKD BY A. BEHNKE
PROJECT NO. 2103-01328		

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	170	10



BRO-0011(021) DICKY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1		
KLJ		
DRAWN BY BJJ	CHECKED BY A. BEHNKE	PROJECT NO. 2103-01328

NOTES:

At least 14 days prior to the forming and pouring of any beams, the Contractor shall submit design figures and work drawings to the Engineer for review. The design figures shall show the total initial prestress force and the losses in the prestress due to elastic shortening, shrinking or creeping of concrete and the relaxation of steel stress as determined by the Contractor for their method of stressing.

Work drawings shall show strand layout, pull down locations, tensioning forces, elongation and any proposed changes in reinforcing steel.

The final prestress force (remaining after all losses have been accounted for) and its corresponding center of gravity, shall be selected from those on a curve determined by the three values shown in the "Prestressing Data" table.

The beams shall be poured in all steel forms.

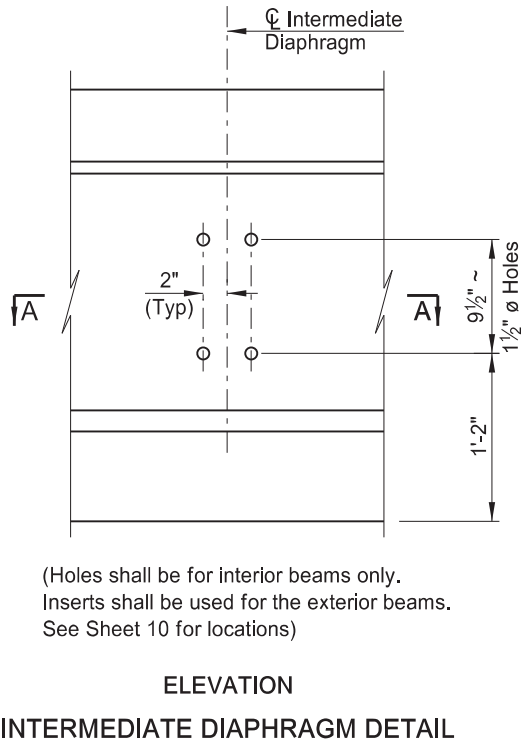
Holes and inserts to accommodate the diaphragm bars shall be provided in the beams at locations as shown.

All reinforcing steel shall have a clearance of 1¼" unless otherwise noted.

Minor changes to the shape of the beam and to reinforcing steel may be made to accommodate the forms of various contractors and their construction methods with the approval of the Engineer.

The tops of the beams shall be rough floated and broomed transversely for bond.

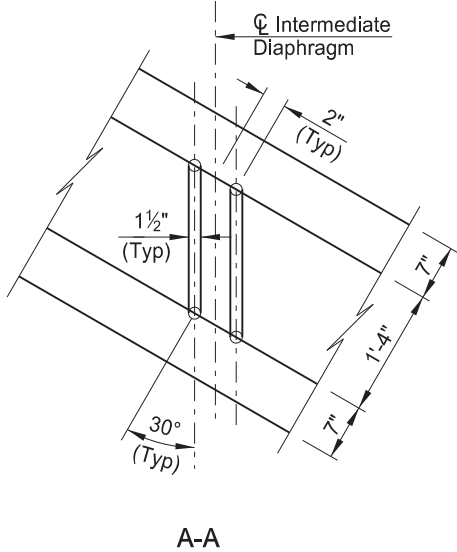
Provide handling hooks or devices as required by the Contractor. Hooks or devices provided will be subject to approval by the Engineer and shall be installed within 4'-0" of the end of beam.



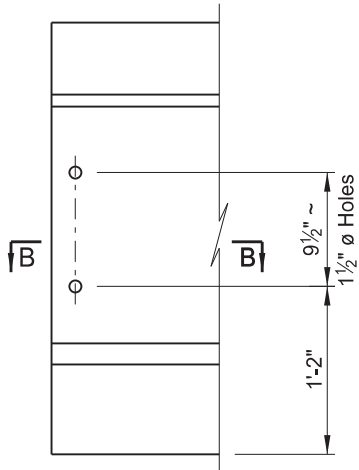
(Holes shall be for interior beams only. Inserts shall be used for the exterior beams. See Sheet 10 for locations)

ELEVATION

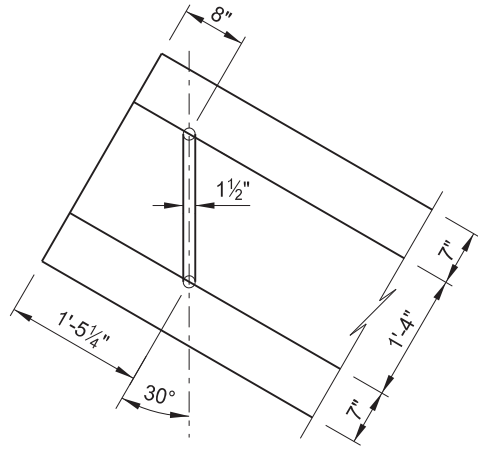
INTERMEDIATE DIAPHRAGM DETAIL



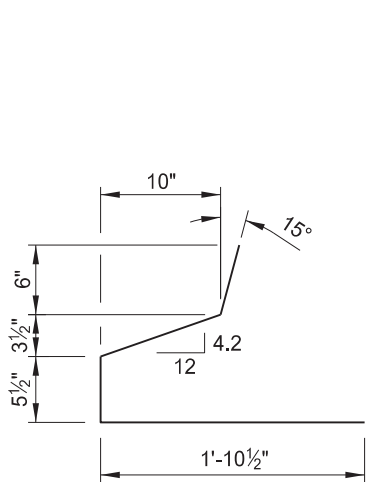
A-A



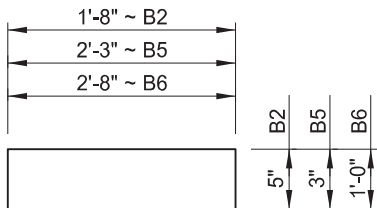
ELEVATION
BEAM END DETAIL



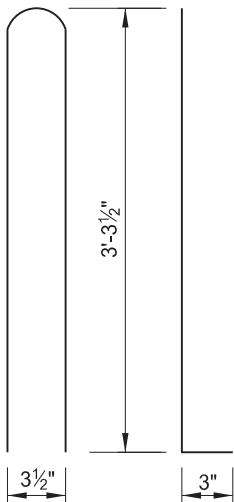
B-B



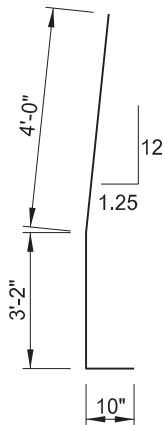
B1



B2, B5 & B6

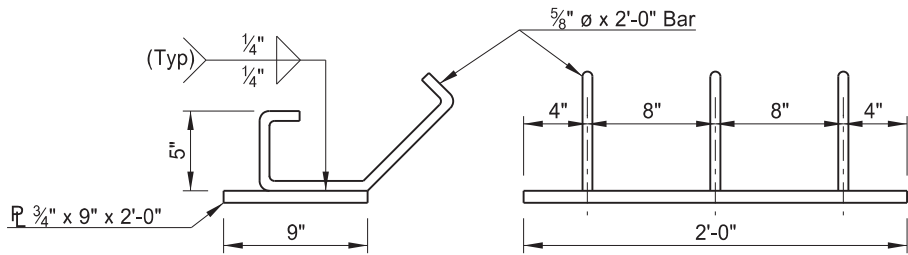


B3



B4

(Dimensions shown are out to out)
BENT BAR DETAILS



(Bearing plate to be Structural Steel M270 Grade 36 hot dipped galvanized, and included in the bid price for the beam.)

BEARING DETAIL

PRESTRESSING DATA					
C.G.	FINAL FORCE	DETENSION STRENGTH	ACCEPTANCE STRENGTH	WEIGHT (TONS)	GIRDER LENGTH
3.25	958.1 K	6,300 psi (Min)	7,300 psi (Min)	28.1	91'-0"
3.50	968.3 K				
3.75	978.7 K				



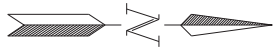
BRO-0011(021)
DICKEY COUNTY, NORTH DAKOTA
STRUCTURE #11-123.08.1

PRE-TENSIONED 36" PRESTRESSED I-BEAM

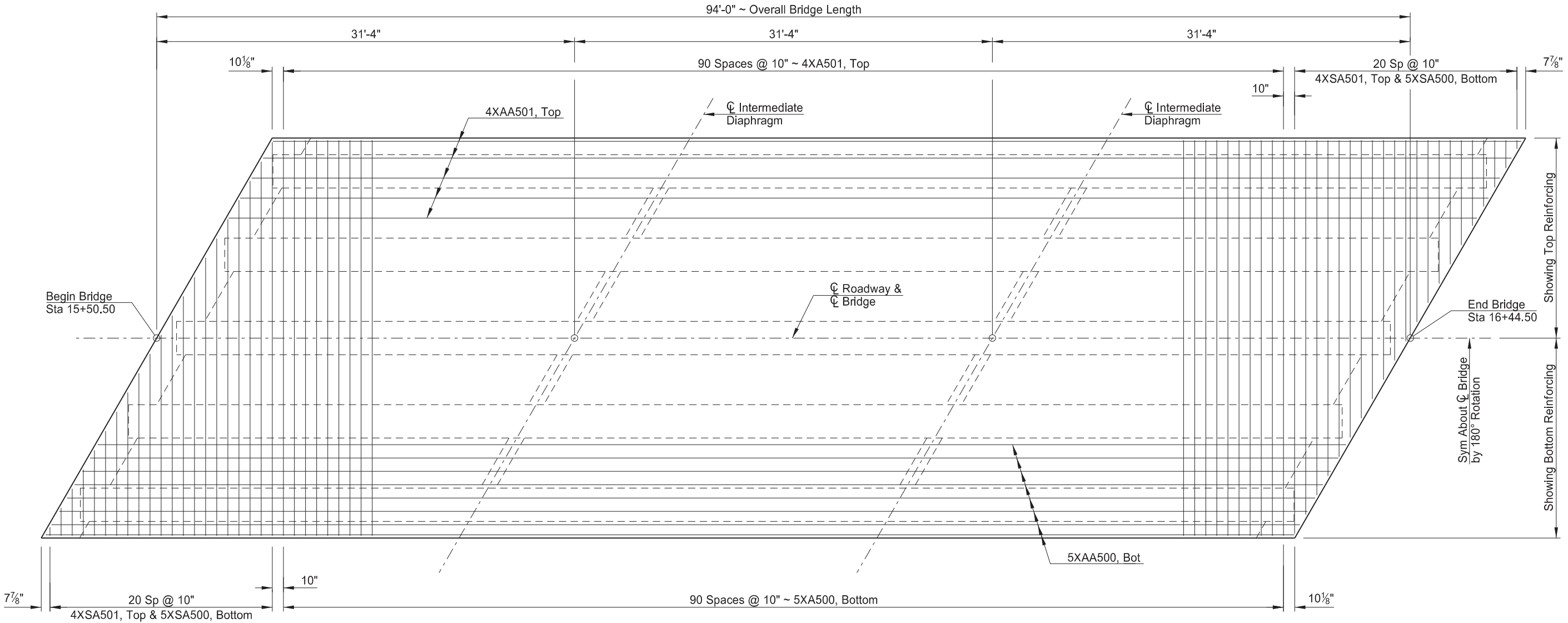
DRWN BY
BJJ

CHKD BY
A. BEHNKE

PROJECT NO.
2103-01328



	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	170	13

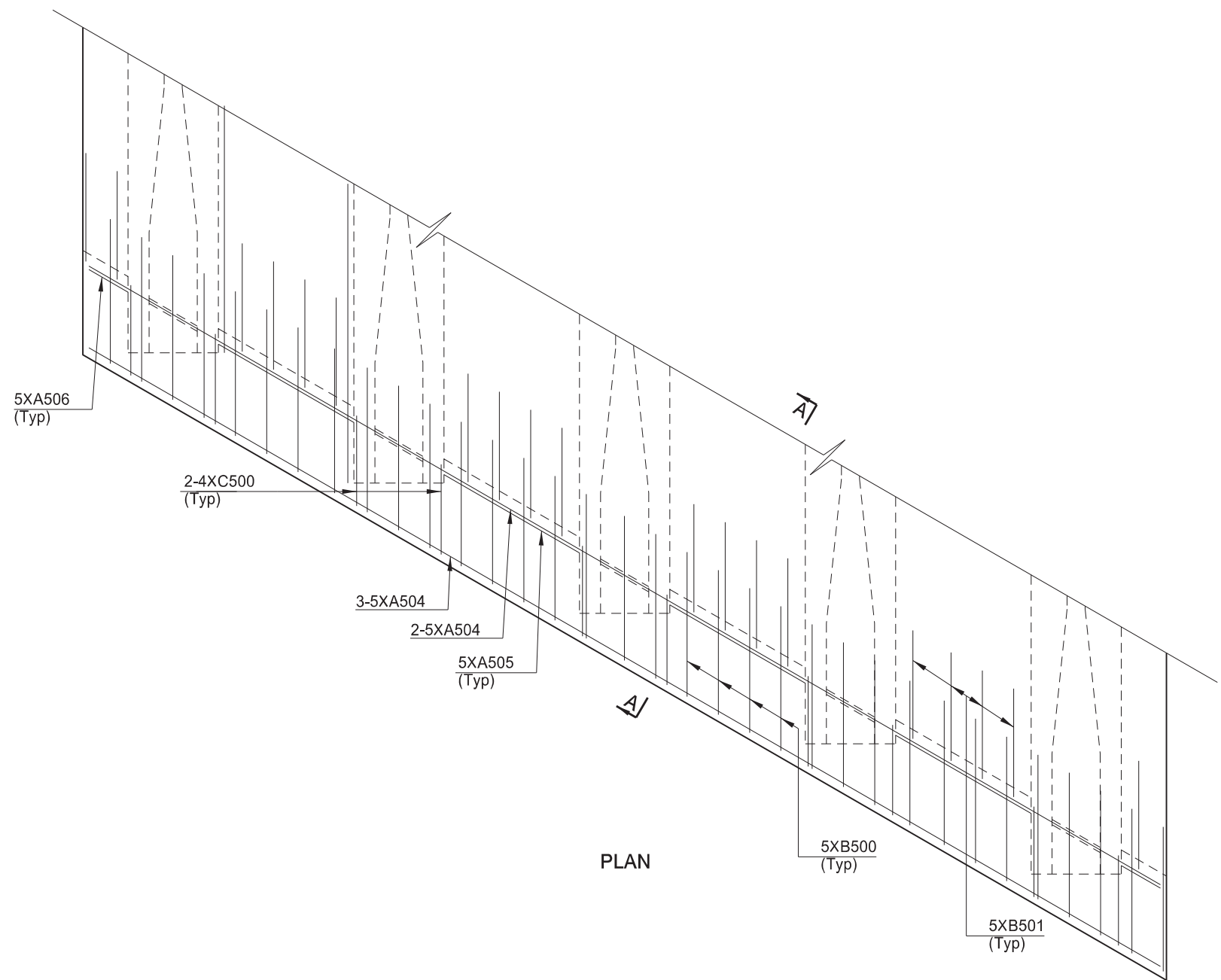


PLAN

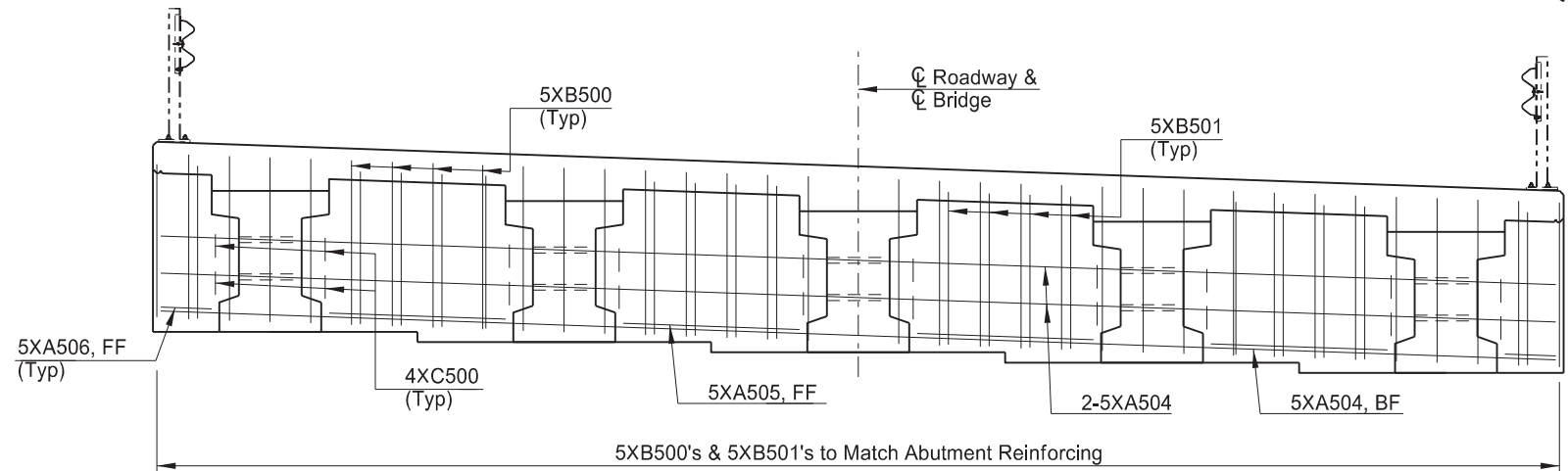


BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1		
SLAB LAYOUT		
DRWN BY BJJ	CHKD BY A. BEHNKE	PROJECT NO. 2103-01328

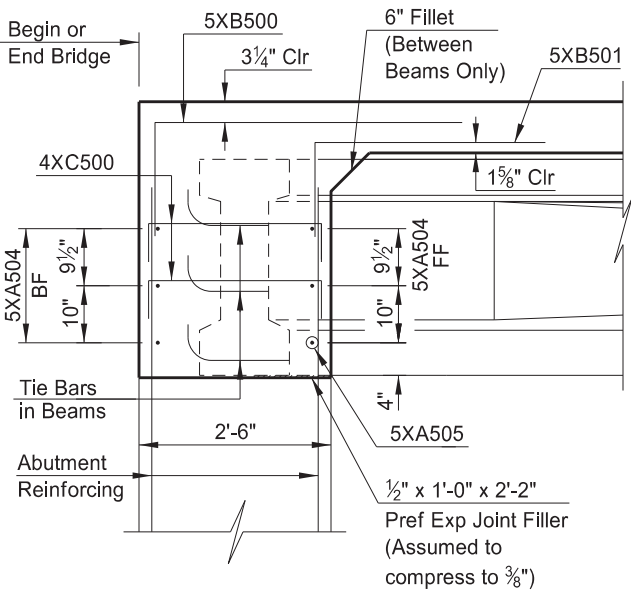
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	170	14



PLAN



ELEVATION



A-A

NOTES:

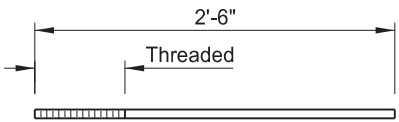
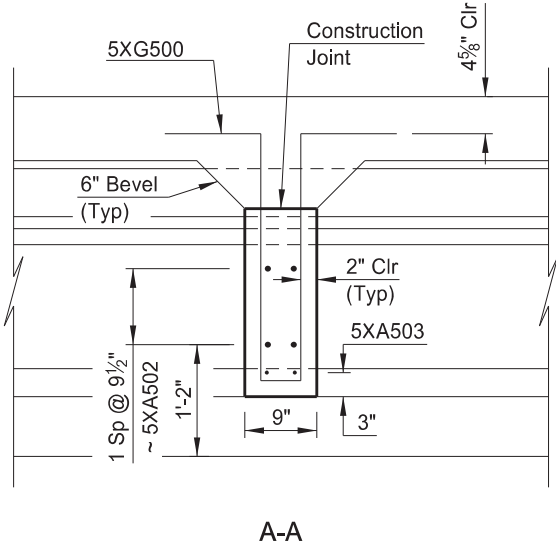
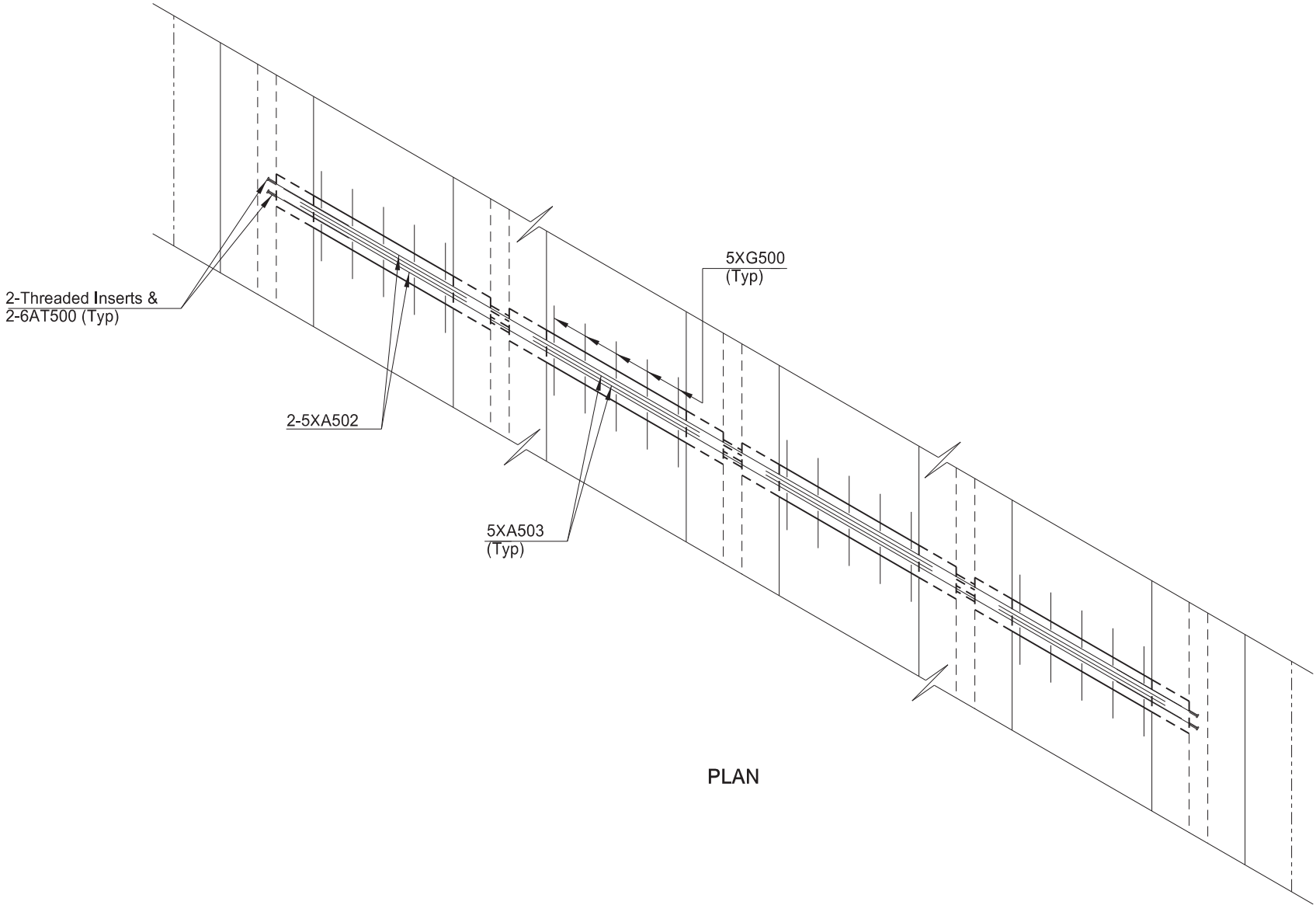
FF = Front Face

BF = Back Face



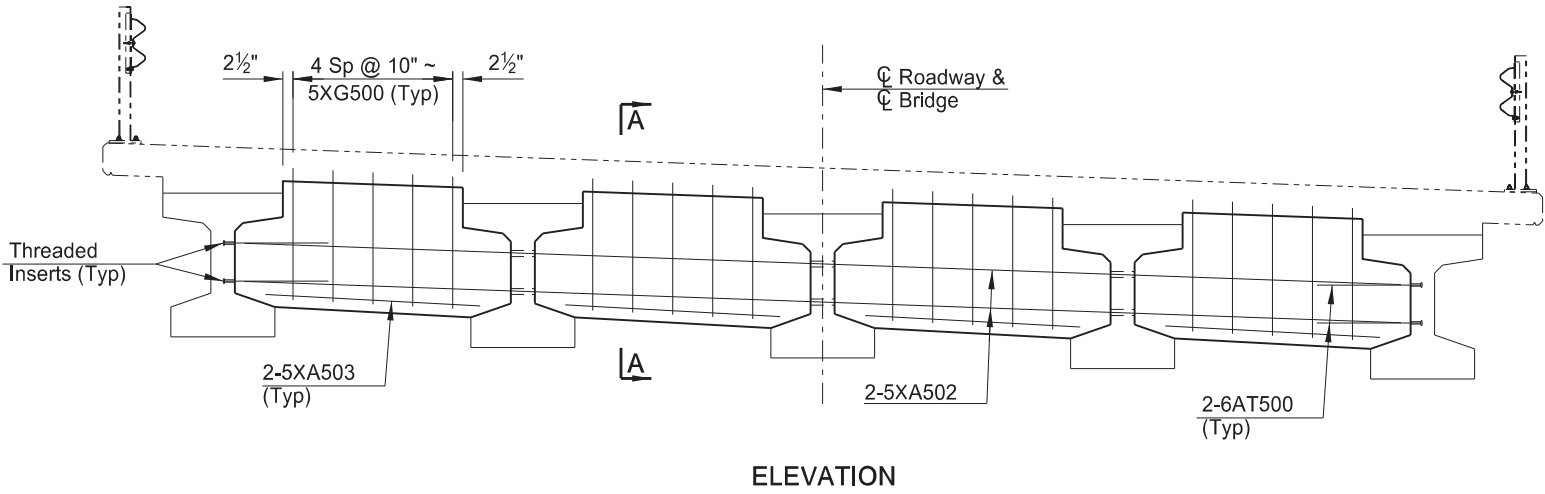
BRO-0011(021) DICKY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1		
ENDWALL DETAILS		
DRWN BY BJJ	CHKD BY A. BEHNKE	PROJECT NO. 2103-01328

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	170	15



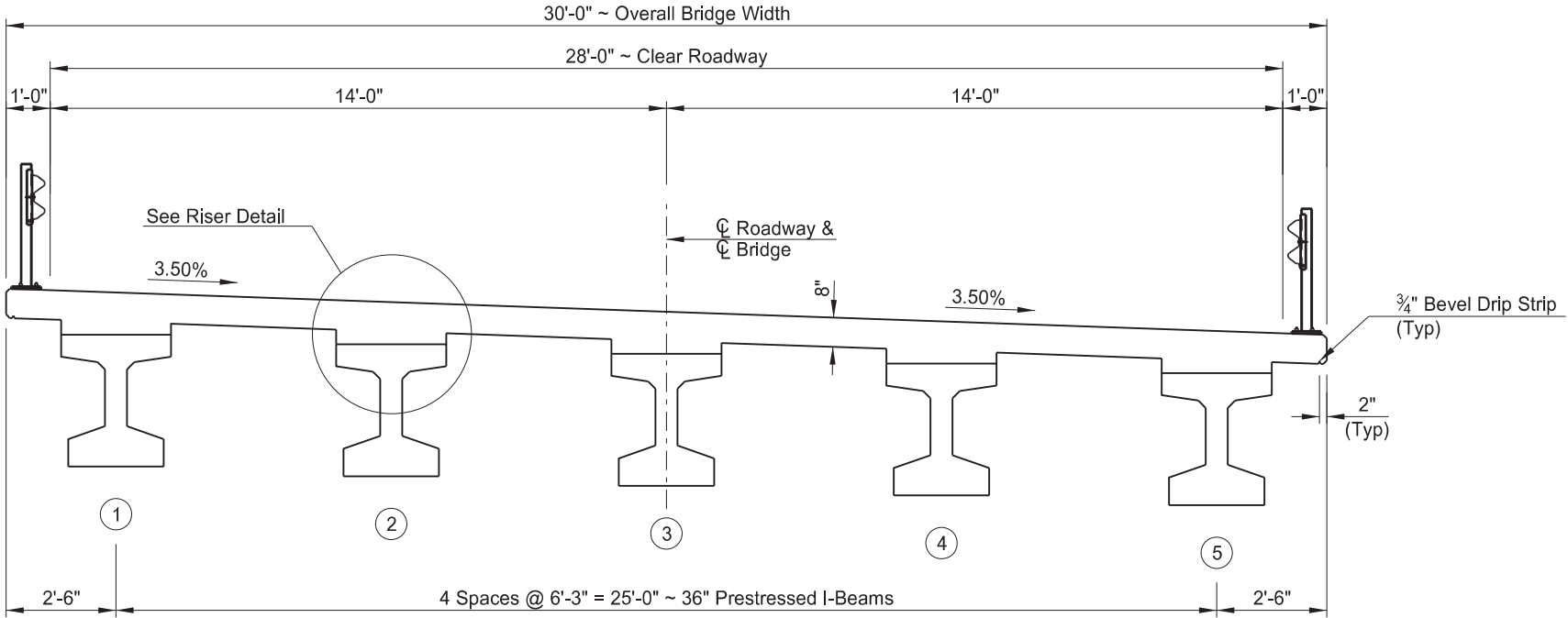
No. 6 Reinforcing Steel ~ Include in the Prestressed Beam bid item.

6AT500 DETAIL

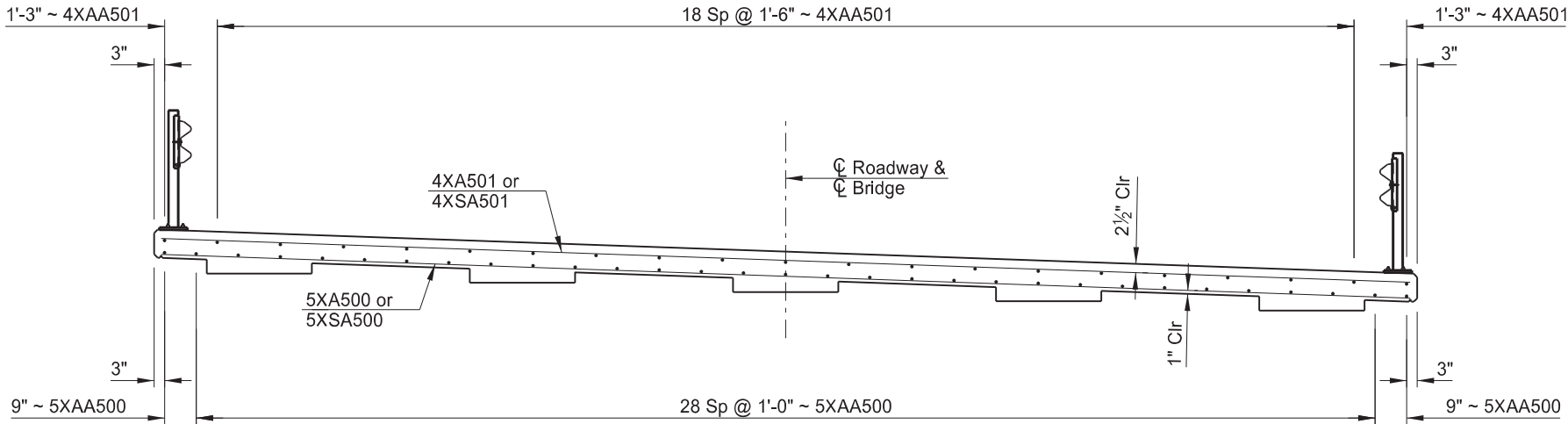


BRO-0011(021) DICKY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1		
		INTERMEDIATE DIAPHRAGM
DRWN BY BJJ	CHKD BY A. BEHNKE	PROJECT NO. 2103-01328

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	BRO-0011(021)	170	16



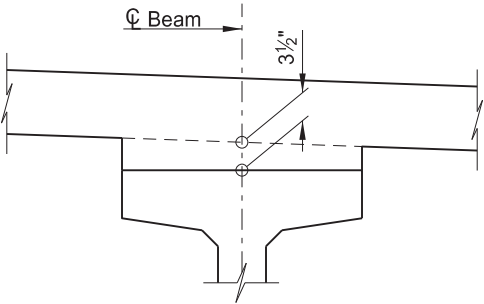
(SHOWING DIMENSIONS)
SLAB SECTION



(SHOWING REINFORCING)
SLAB SECTION

NOTES:

- The 3 1/2" dimension shown on the riser detail is located at the supports. The anticipated midspan riser is 1/2". Adjust the riser to maintain the 8" slab thickness.
- Turn the 5XAA500 & 4XAA501 bars end for end so that the splice locations are staggered.

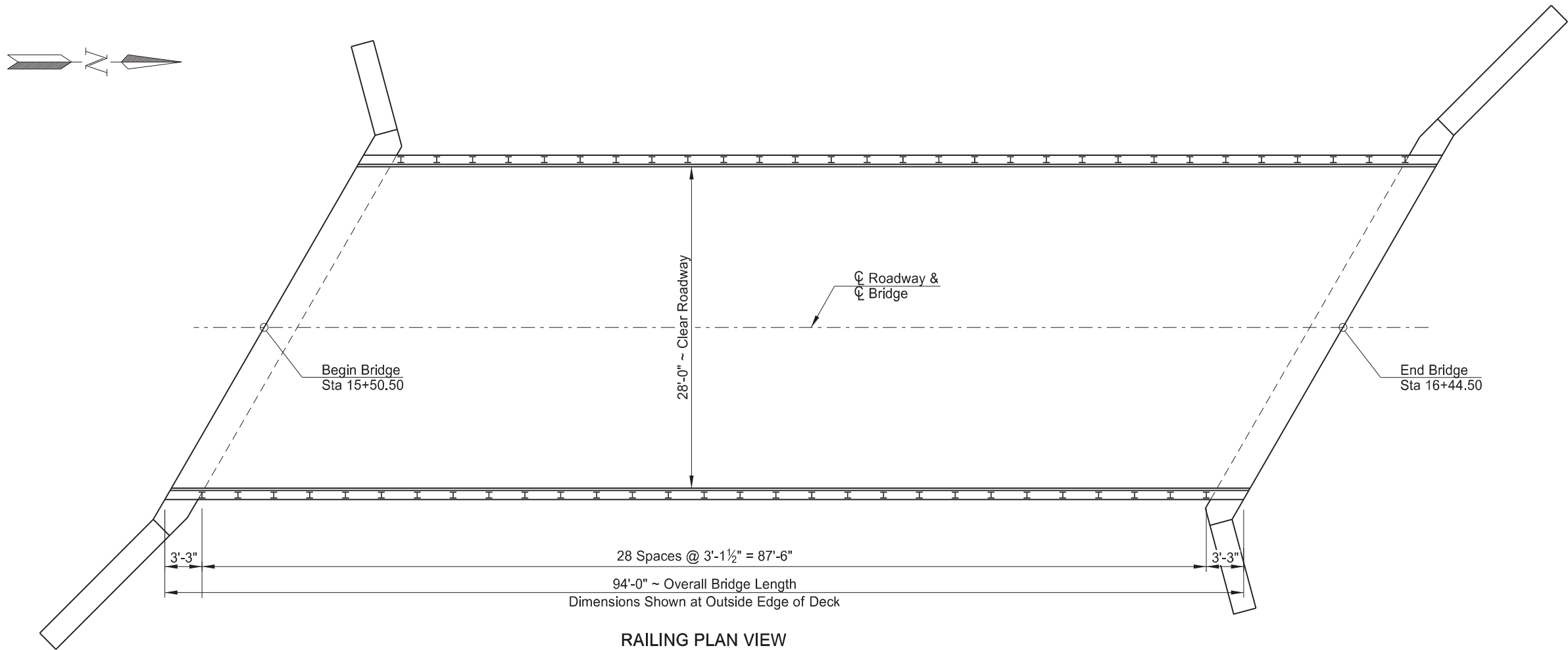


RISER DETAILS

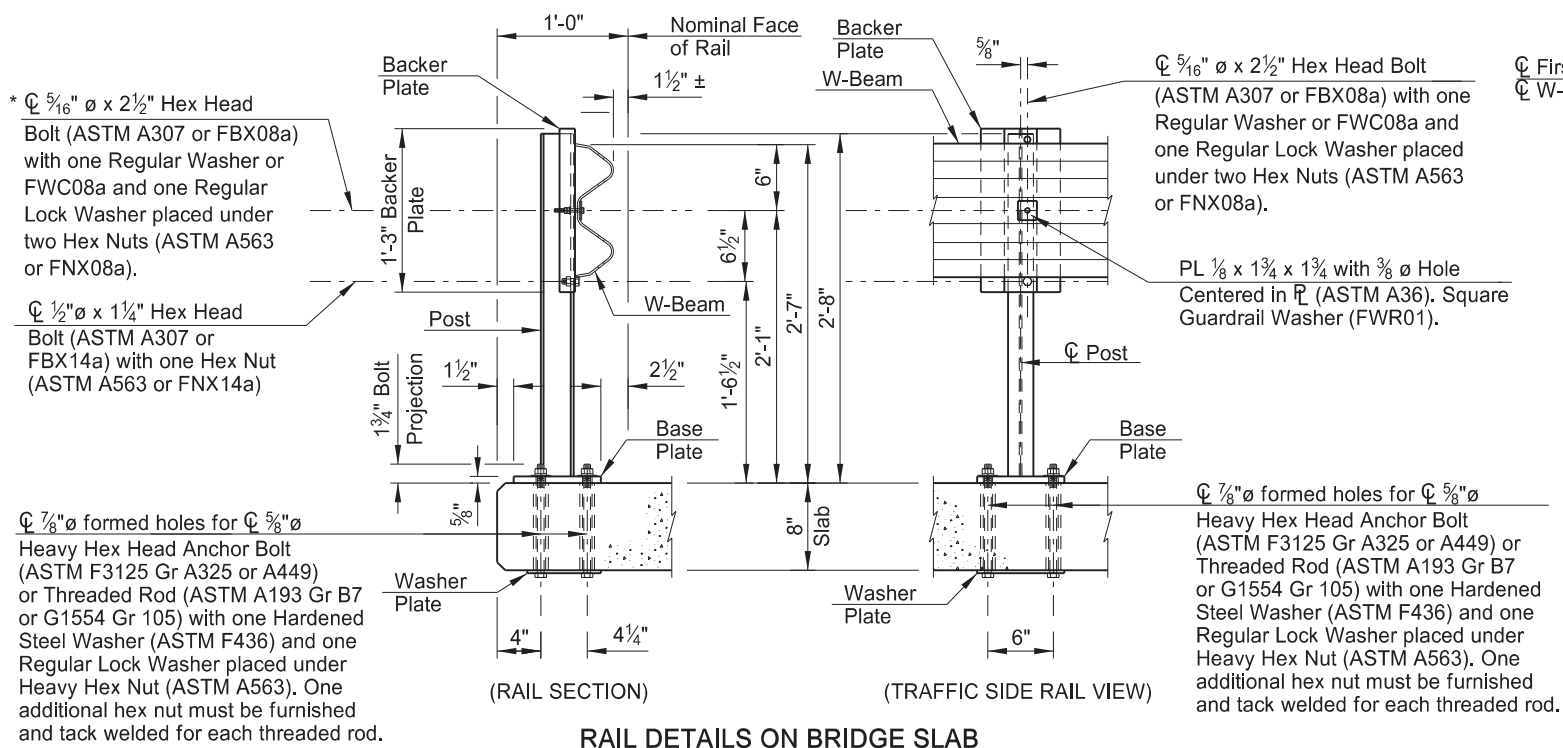


QUANTITIES	
CLASS AAE-3 CONCRETE	100.6 CY
REINFORCING STEEL (EPOXY)	12,082 LBS
BRO-0011(021) DICKY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1	
KLJ	
SLAB SECTION	
DRWN BY BJJ	CHKD BY A. BEHNKE
PROJECT NO. 2103-01328	

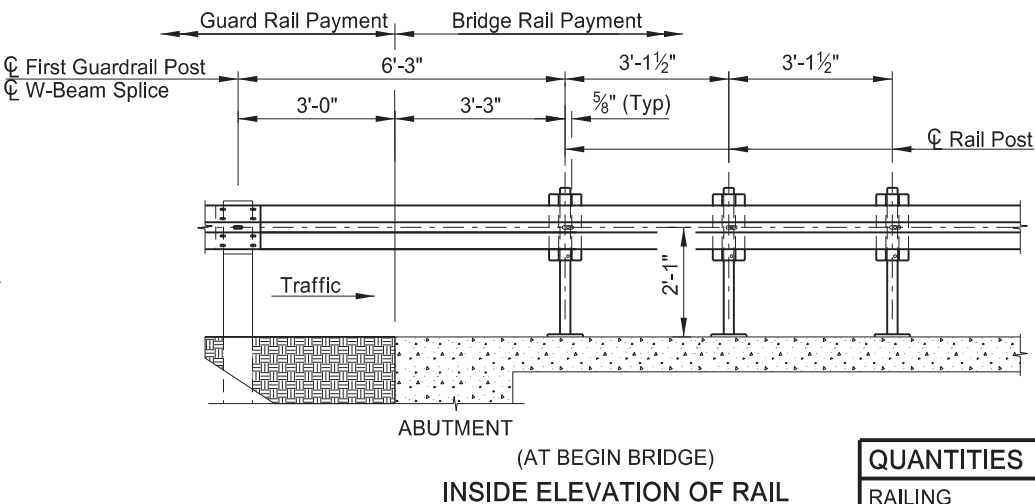
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	170	17



RAILING PLAN VIEW



RAIL DETAILS ON BRIDGE SLAB



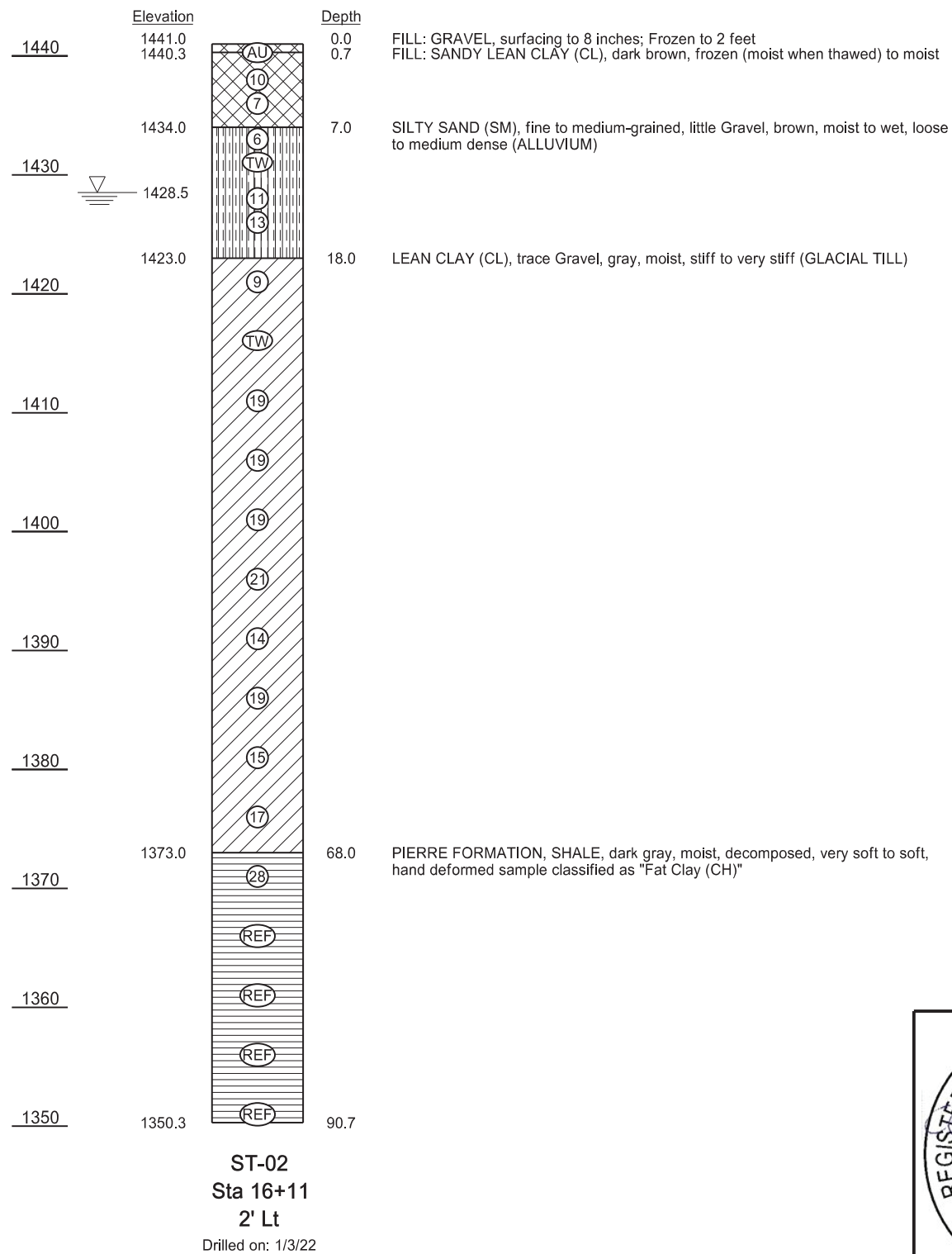
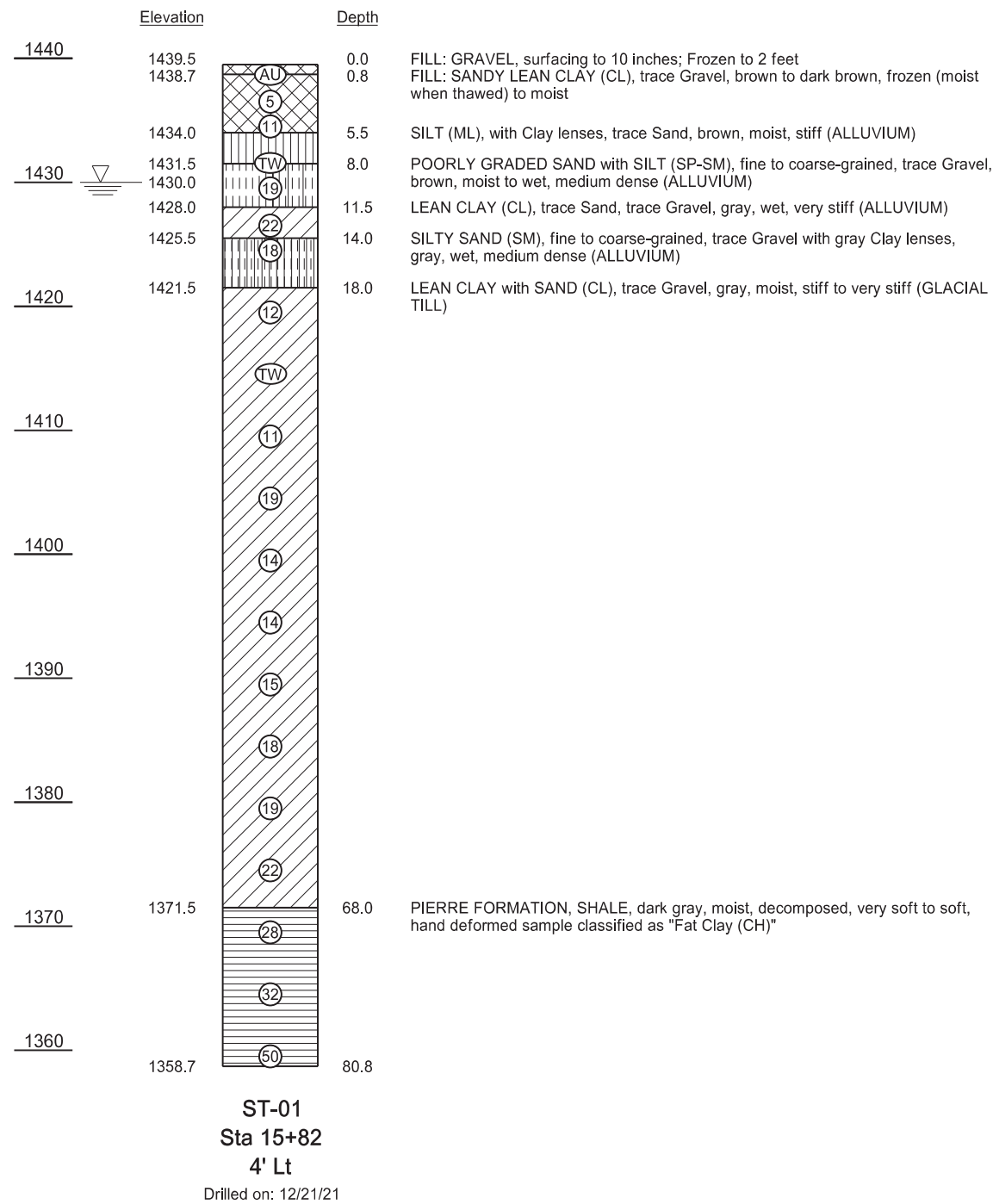
* Tighten the first hex nut by hand until the top and bottom edges of the W-Beam engage the Backer Plate (Backer Plate should be snug against the post). Then tighten hex nut one revolution with wrench and secure with the second hex nut.



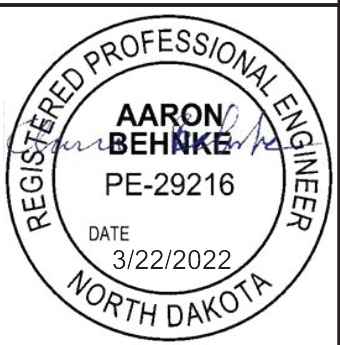
QUANTITIES	
RAILING	188 LF
BRO-0011(021) DICKEY COUNTY, NORTH DAKOTA STRUCTURE #11-123.08.1	
KLJ BRIDGE RAIL I	
DRAWN BY BJJ	PROJECT NO. 2103-01328

3/22/2022 11:38:24 AM brendajohnson K:\Projects\County\ND\Dickey\2103-01328_StructureReplacement\CAD\Bridges\2103-01328_170BR_019_REBAR.dgn

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
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- NOTES:**
- The encircled numbers indicate the number of blows delivered by a 140 lb. automatic hammer from a height of 30" to drive a 2" o.d. split-barrel sampler 1'-0".
 - The boring data shown is for owner's design and estimating purposes only. The boring logs are only representative of the exact location from which the samples were taken and interpretation between sample locations is discouraged. The owner assumes no responsibility if the soil conditions encountered during construction differ from those shown.



BRO-0011(021)
DICKEY COUNTY, NORTH DAKOTA
STRUCTURE #11-123.08.1

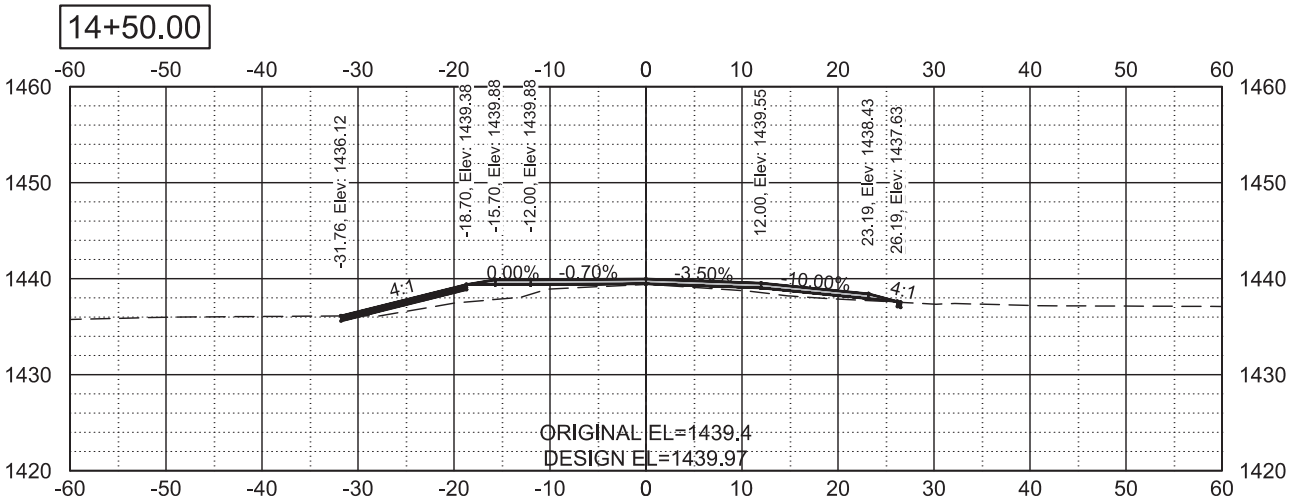
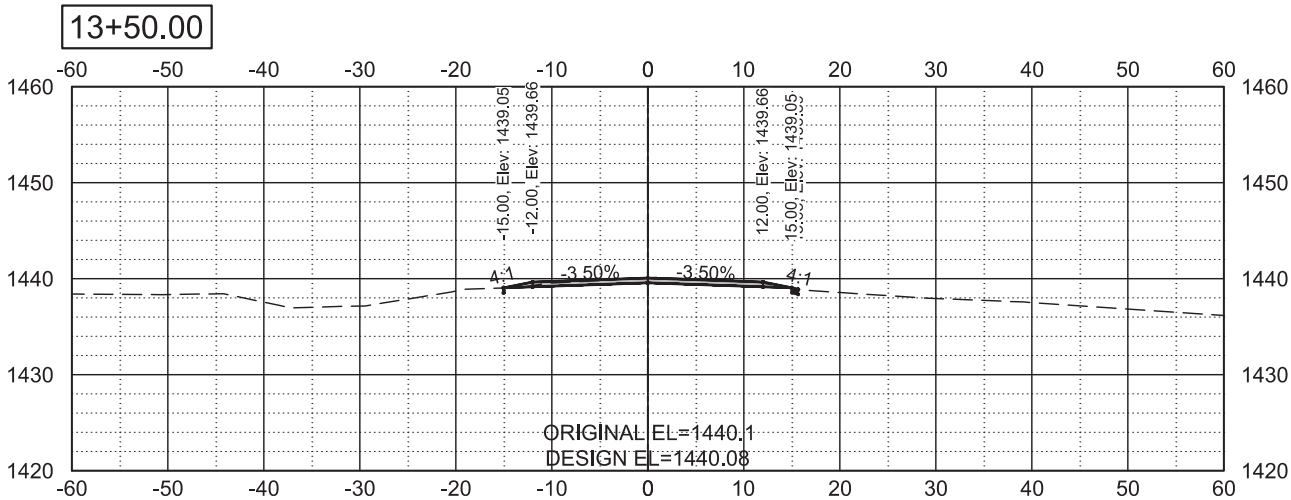
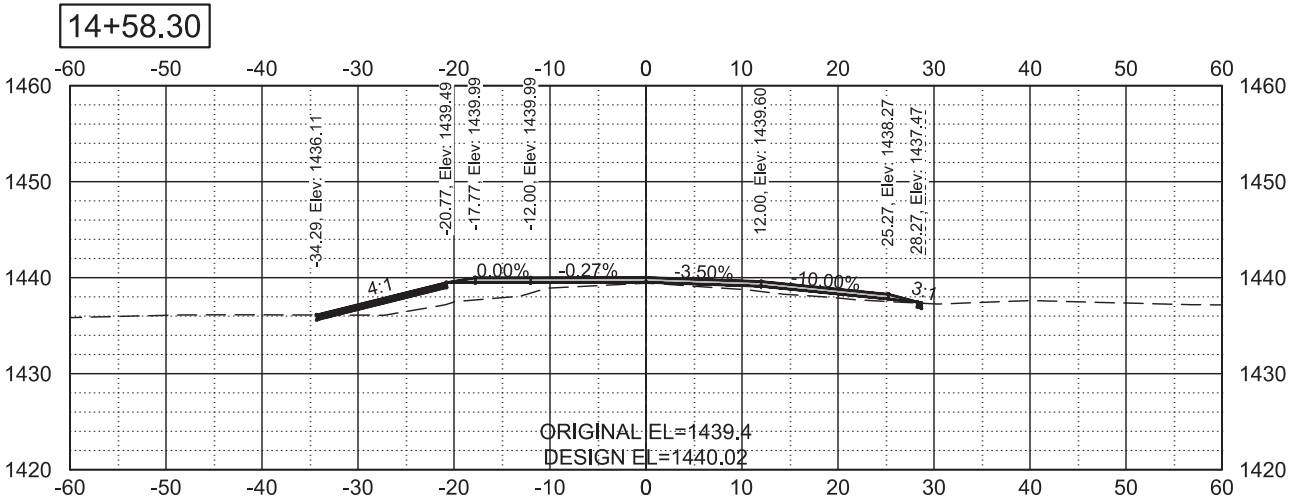
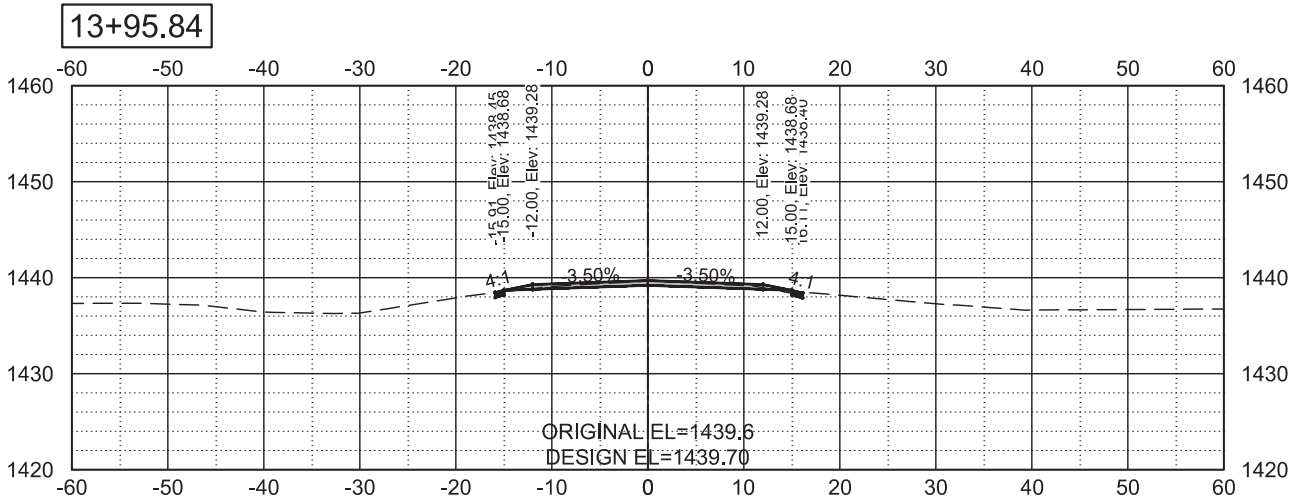
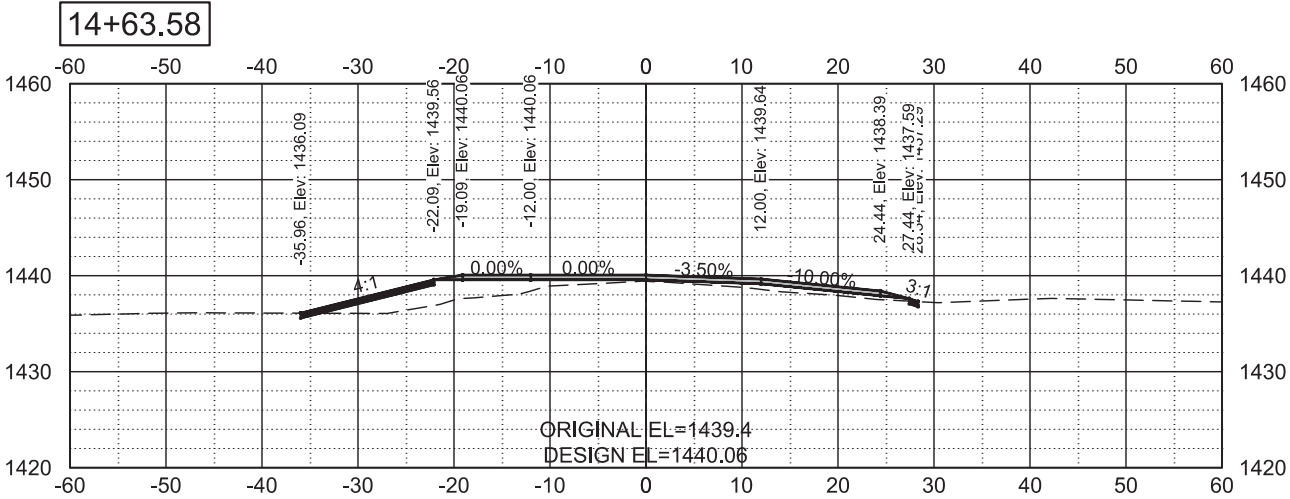
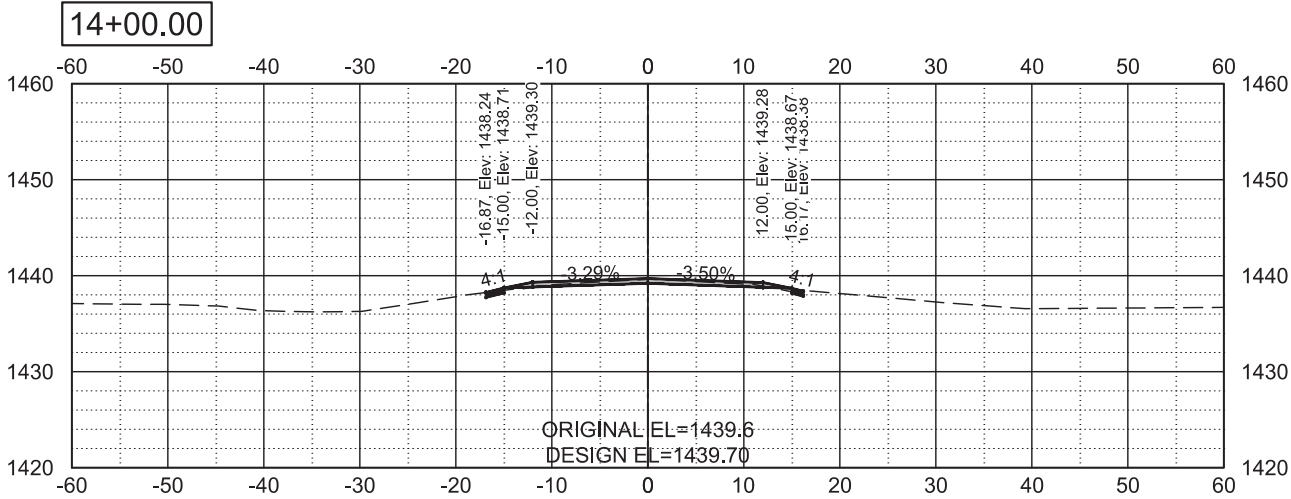
BORING LOGS

DRWN BY BJJ	CHCKD BY A. BEHNKE	PROJECT NO. 2103-01328
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CROSS-SECTIONS



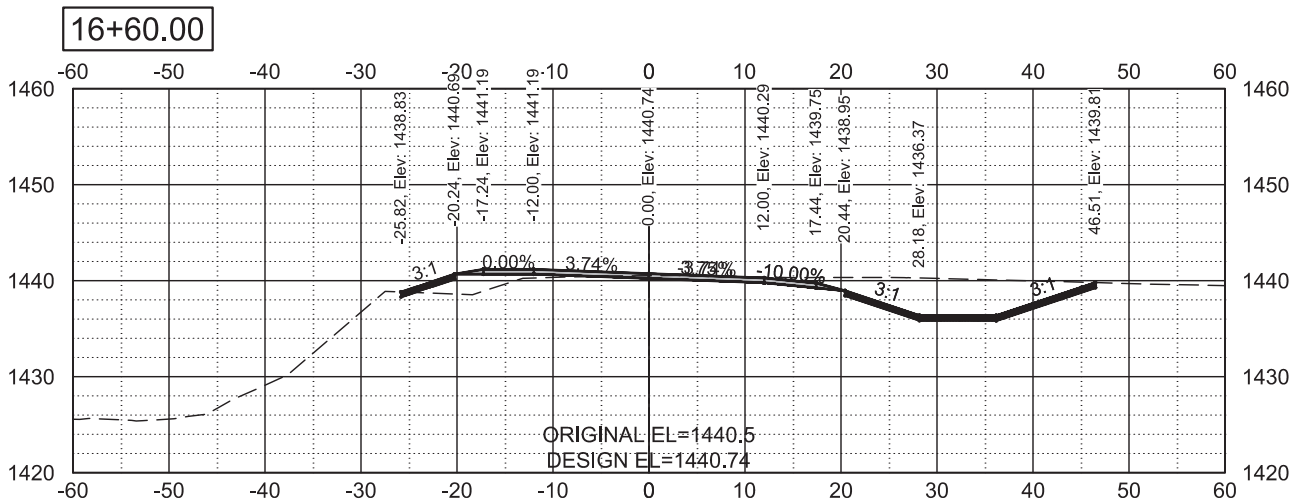
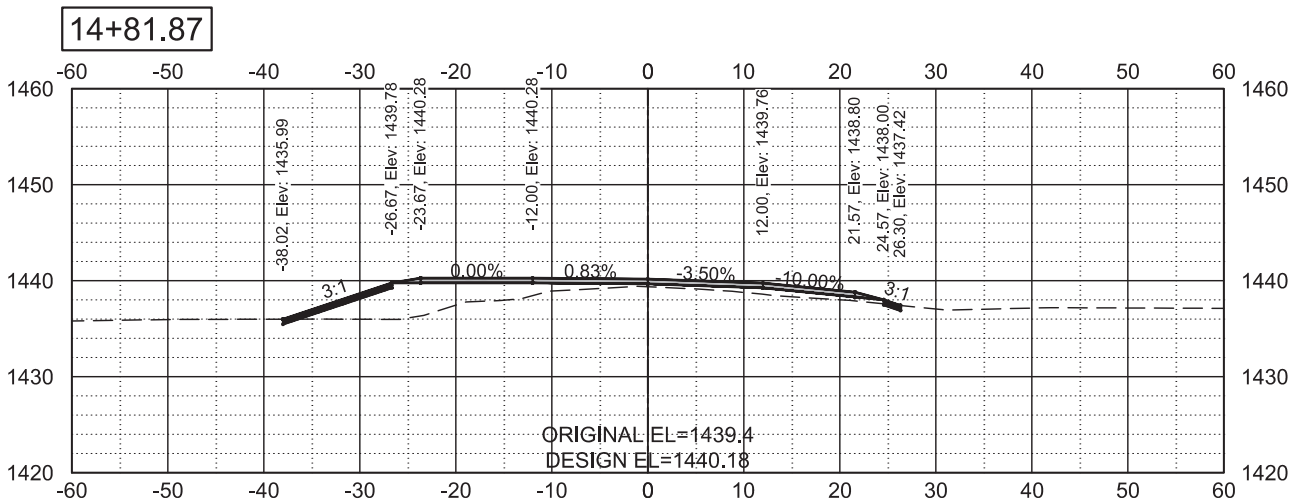
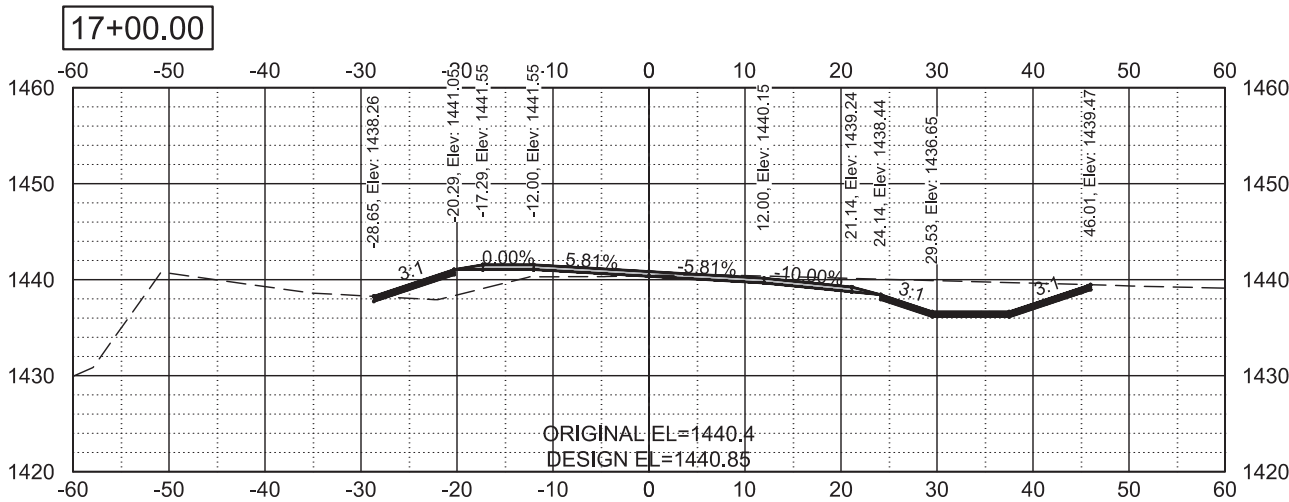
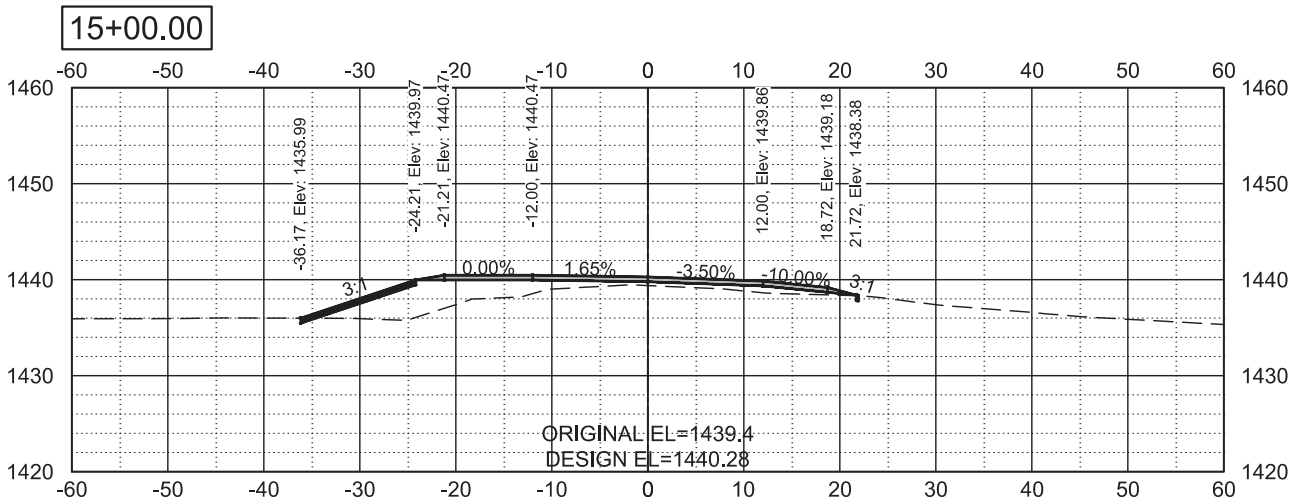
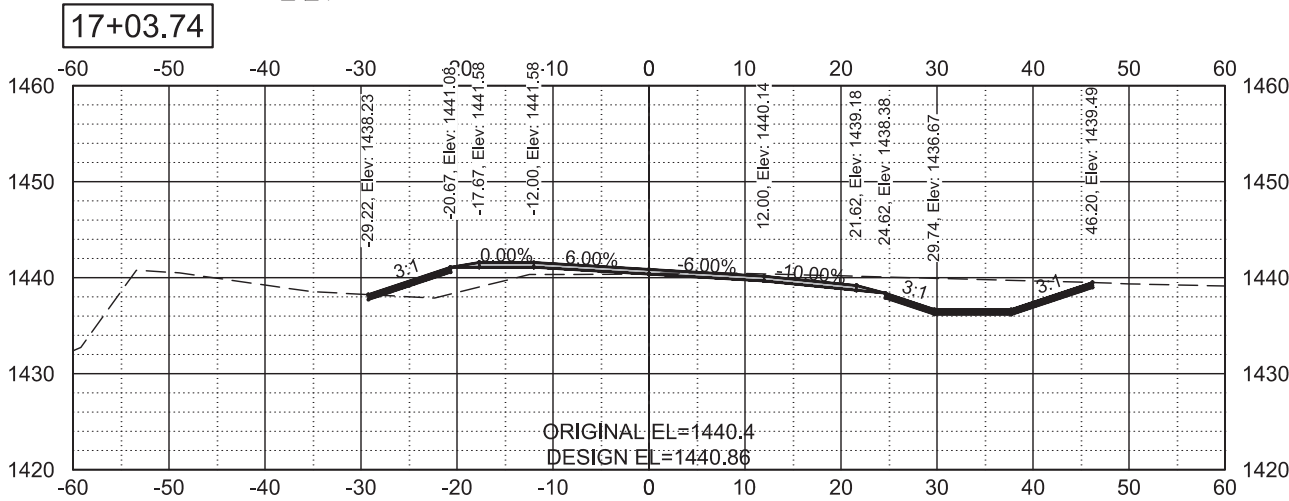
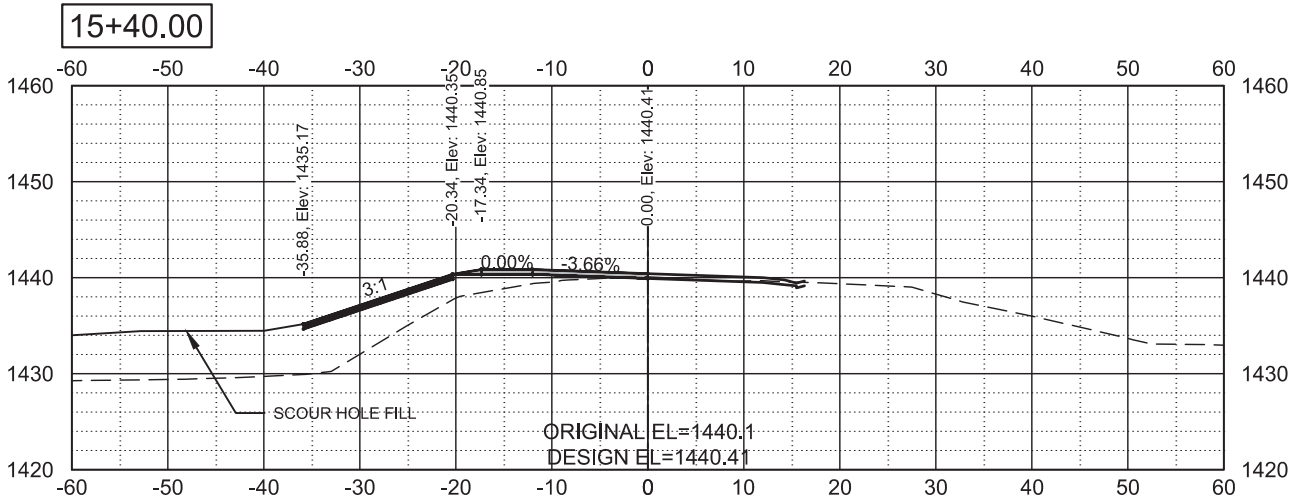
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	200	1



CROSS-SECTIONS



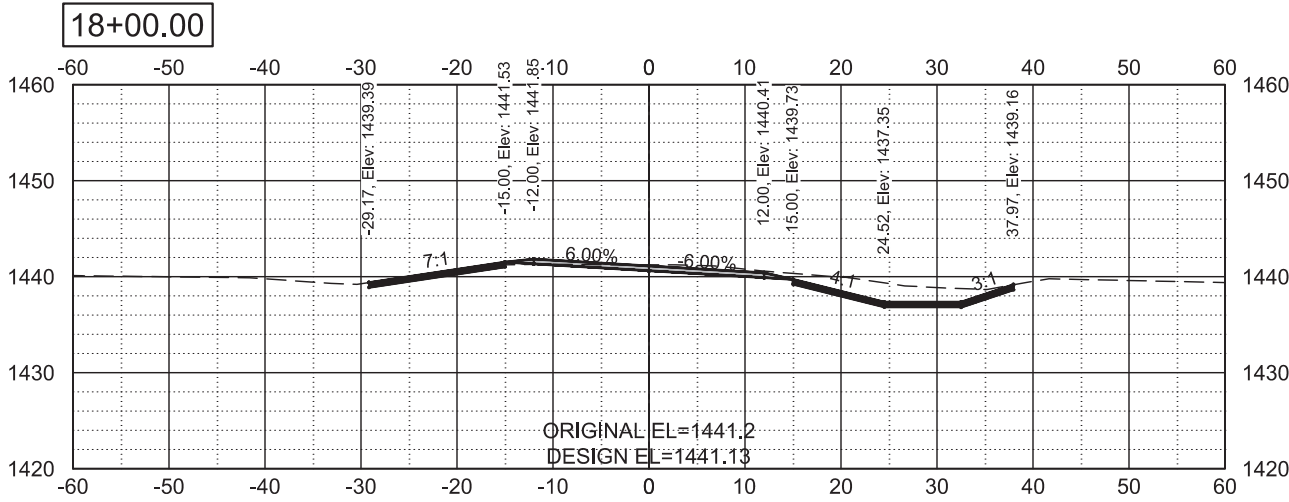
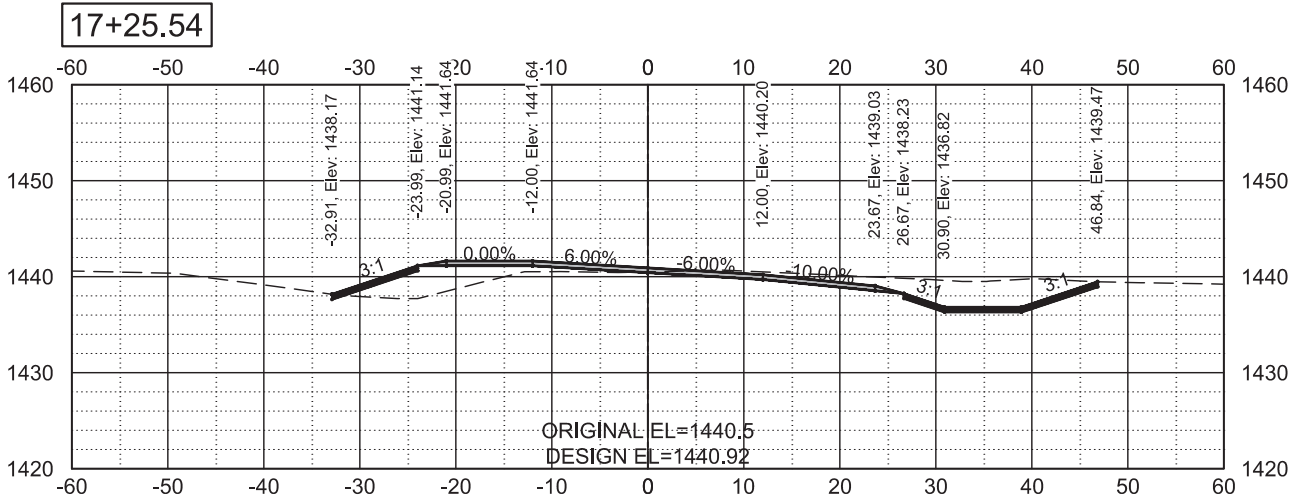
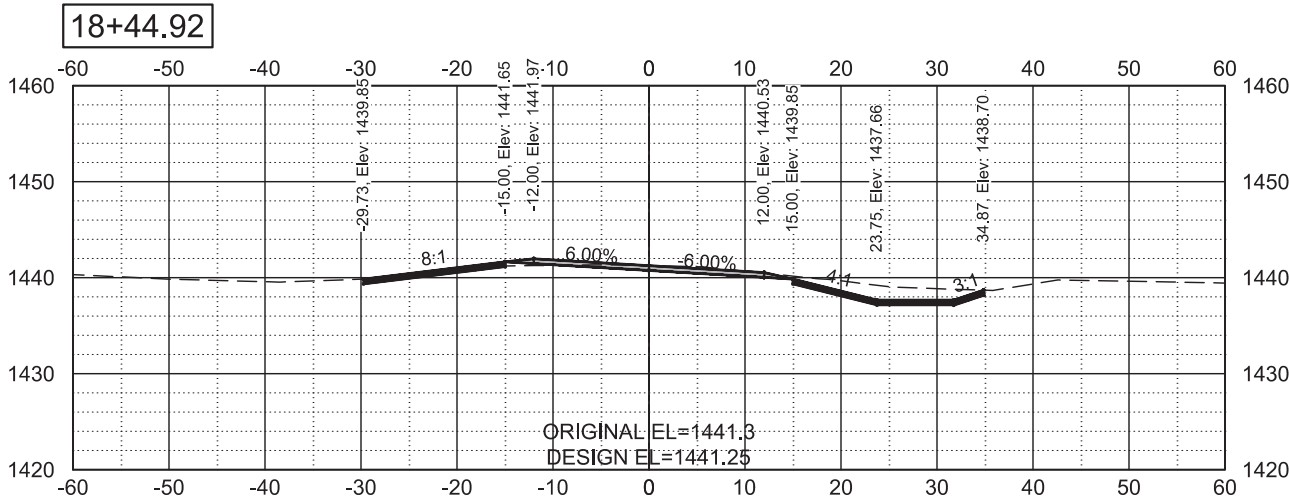
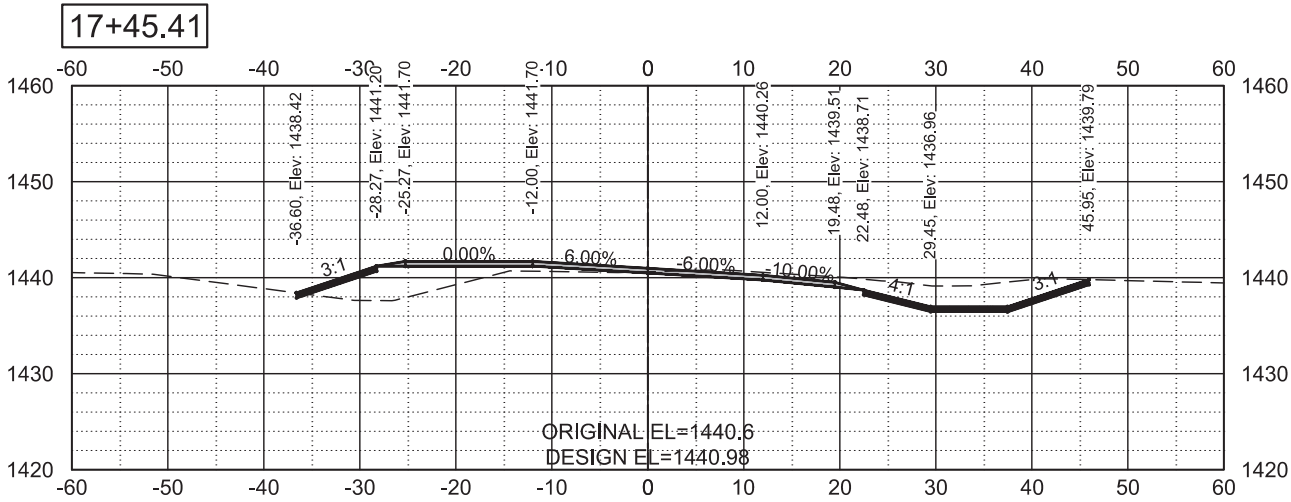
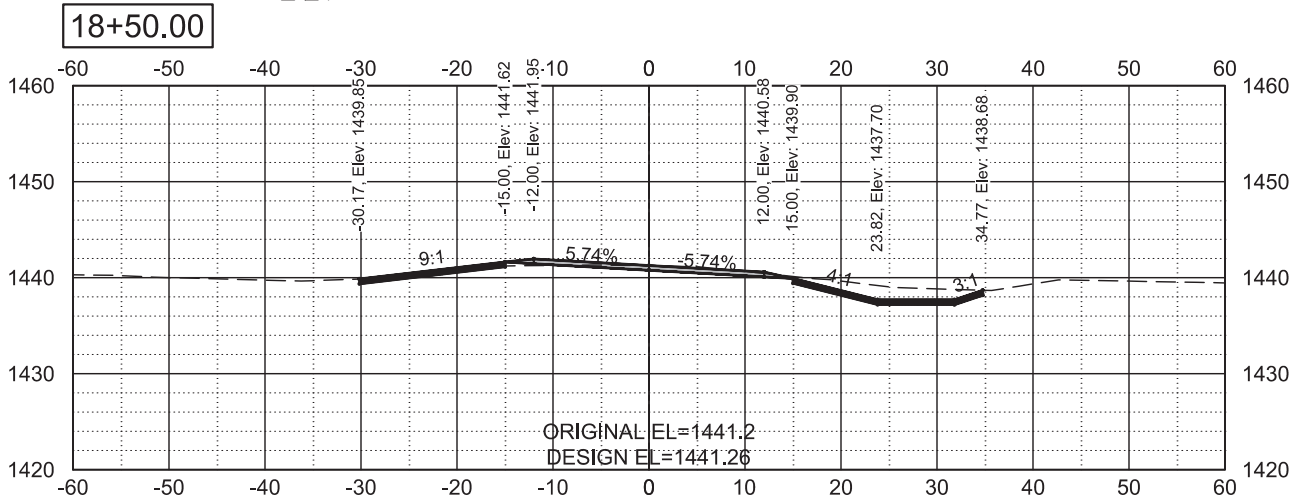
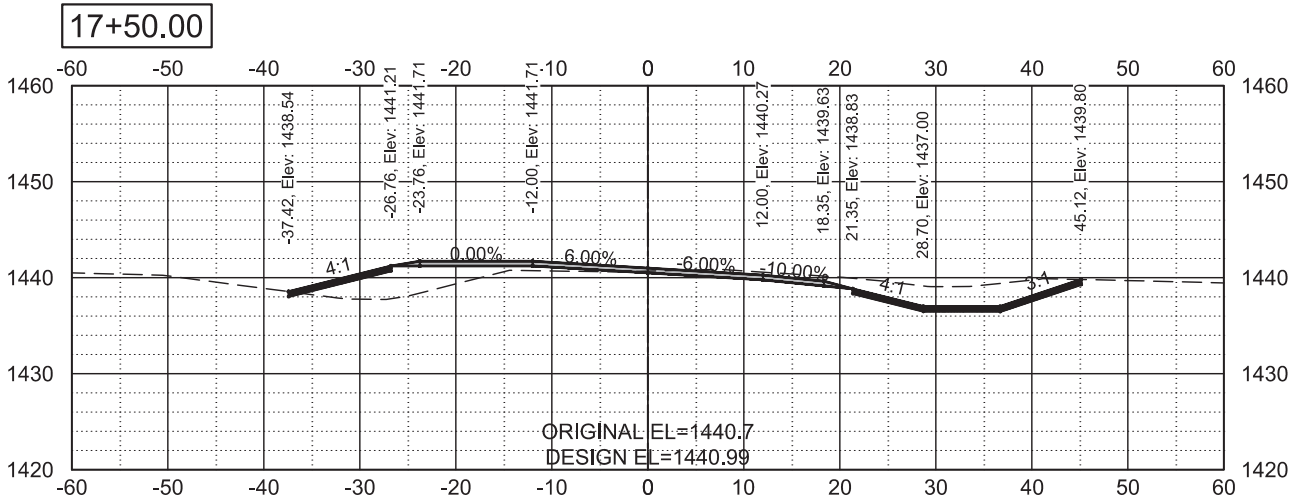
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRO-0011(021)	200	2



CROSS-SECTIONS



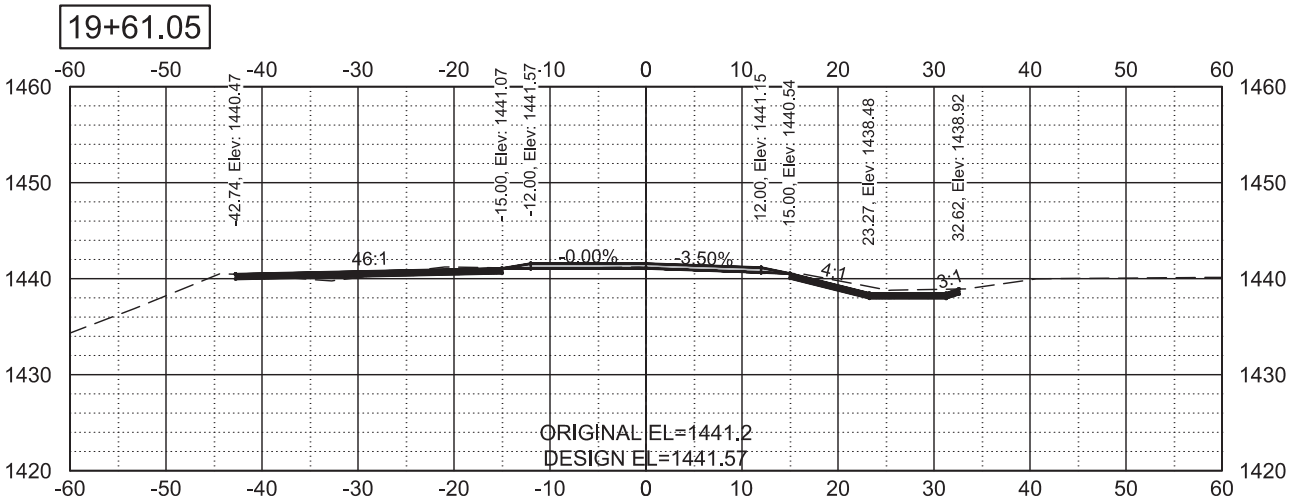
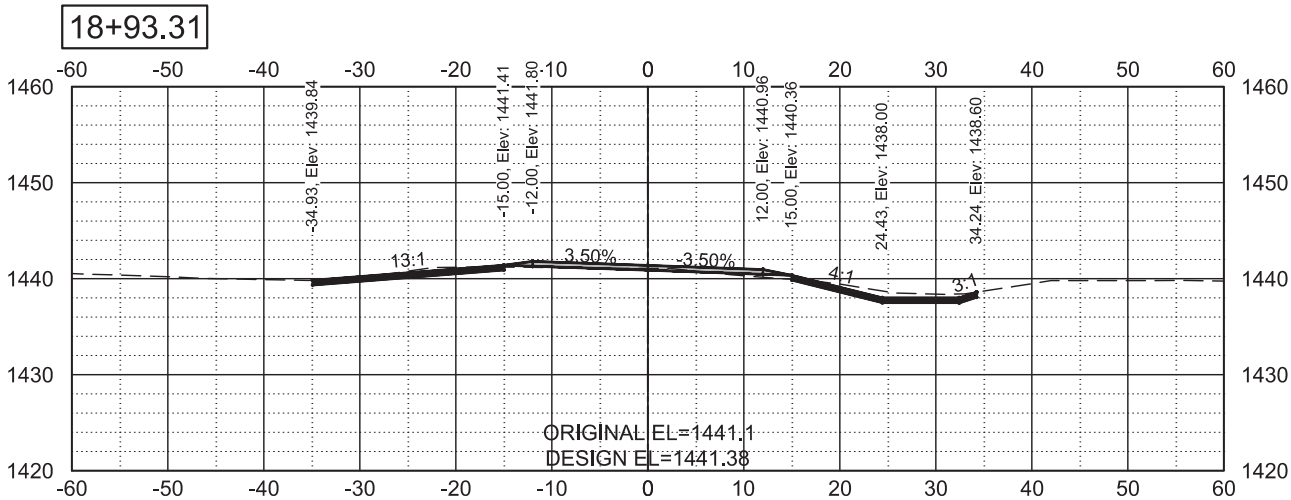
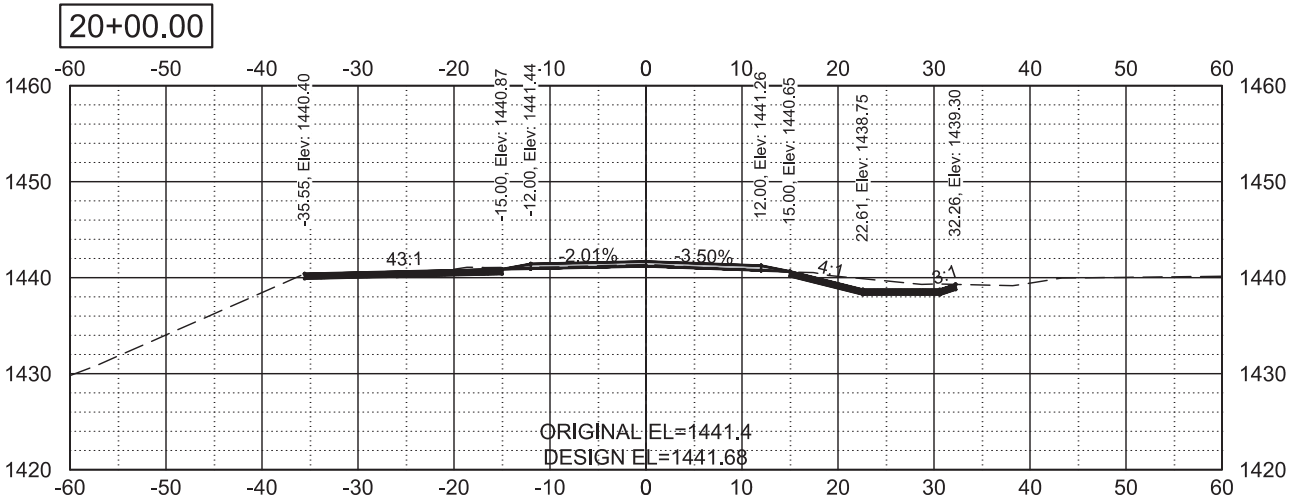
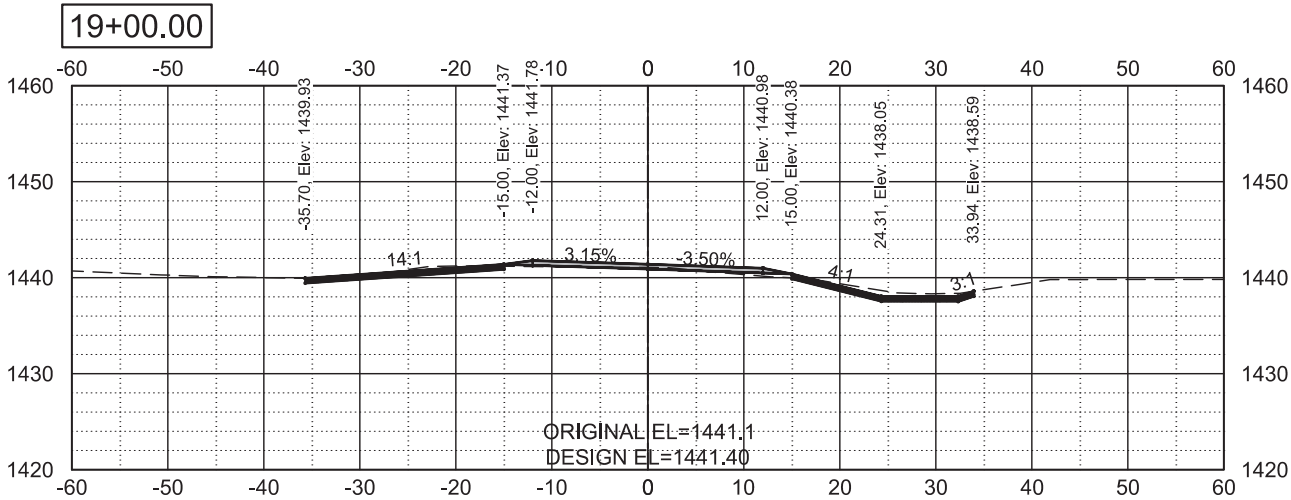
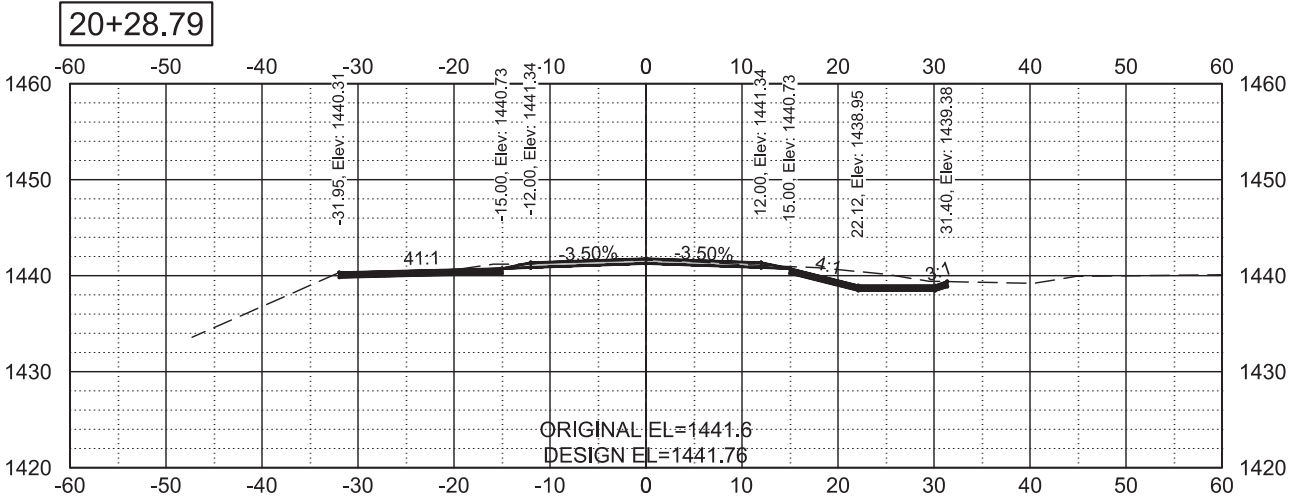
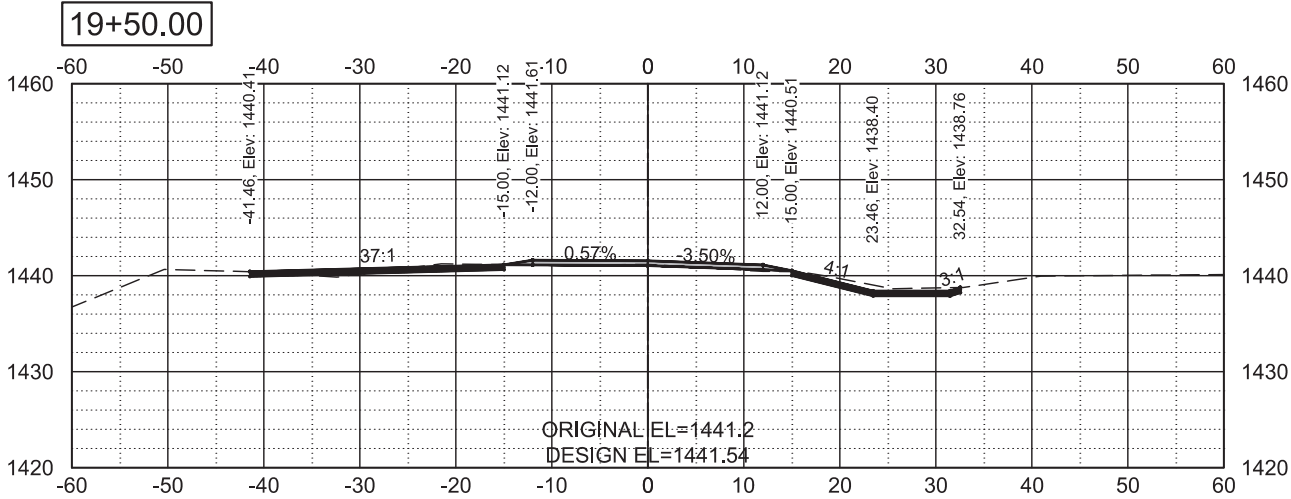
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	ND	BRO-0011(021)	200	3



CROSS-SECTIONS



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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CROSS-SECTIONS



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