

STATE COUNTY MAP

DESIGN DATA

Traffic ~ CER-0221(079)	Average Daily			Est. 30th Max. Hr.
	Passenger	Trucks	Total	
Current Traffic: 2020	255	15	270	27
Forecast Traffic: 2040	280	15	295	29
Clear Zone Distance: 18'	Design Speed: 55 MPH			
Min. Sight Dist. for Stopping: 495'	Sight Dist. for No Passing Zone: 900'			

JOB #7

PLANS FOR FEDERAL AID

BARNES COUNTY, NORTH DAKOTA

Erosion Control and Incidentals

Barnes County Highway 21

4 Miles North of Kathryn

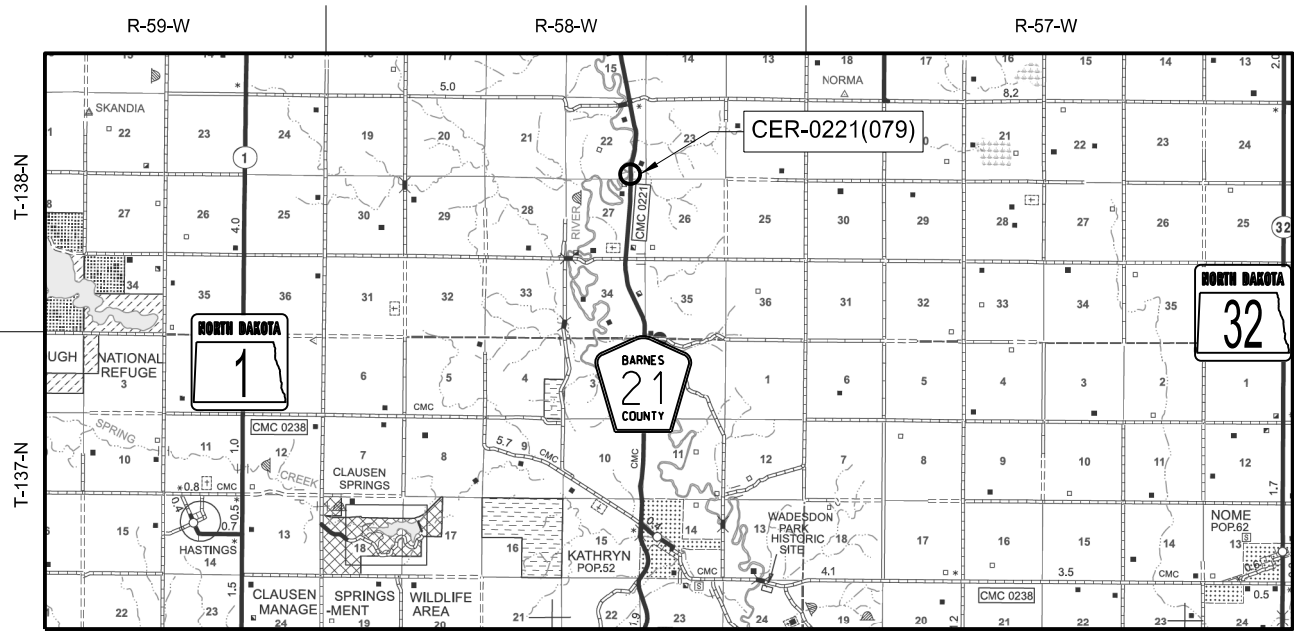
Grading, Erosion Control, Aggregate Base,  
Milling, HMA, Sheet Piling, and Incidentals

GOVERNING SPECIFICATIONS

2020 Standard Specifications adopted by the North Dakota  
Department of Transportation and the Supplemental Specifications  
effective on the date the project is advertised.

PROJECT LENGTH

Project Number / Description	Gross Miles	Net Miles
CER-0221(079) / County Hwy 21	0.136	0.136



Legal Description  
Sec. 22 T. 138 N. R. 58 W.

Survey Date	05/2020
Designed Date	09/2020

DESIGNERS

Taylor Olson, PE

Matt Isley, PE

Austin Chmielewski



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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.

/s/ Matt Lange, PE

KLJ

DATE 09/22/20 REGISTRATION NUMBER 6870

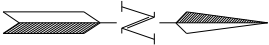
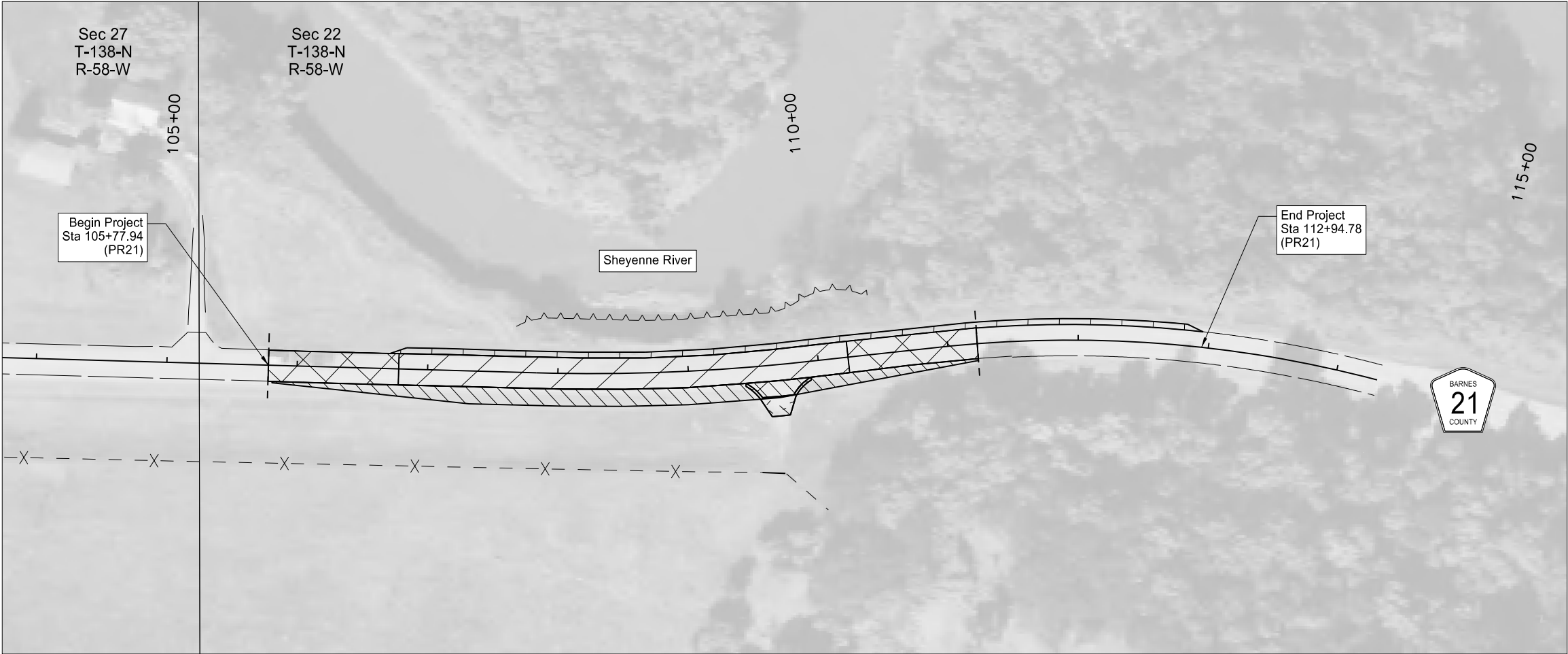


1010 4TH AVENUE SOUTHWEST  
VALLEY CITY, ND 58072-3907  
(701) 845-4980, FAX (855) 288-8055

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			D-762-4	Pavement Marking					
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SPECIAL PROVISIONS									
Number	Description								
PSP 24(20)	Permits and Environmental Considerations								
SP 124(20)	Commercial Grade Asphalt								
SSP 1	Temporary Erosion and Sediment Best Management Practices								

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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LEGEND	
	2" HMA Overlay, Slough Widening, and Incidentals
	Three Cable Guardrail Slough (2" HMA, 6" Aggregate)
	2" Milling Transition with 2" HMA Overlay
	Temporary Bypass Pavement Removal
	Proposed PZC 26 Sheet Piling

COUNTY HWY 21 4 MILES NORTH OF KATHRYN BARNES COUNTY, ND		
		SCOPE OF WORK
DRAWN BY AC	CHKD. BY TO	PROJECT NO. 2003-00293

			STATE	PROJECT NO.	SECTION NO.	SHEET NO.
<b><u>NOTES</u></b>			ND	CER-0221(079)	6	1
100-P01	PROJECT PHASING: Project will consist of three phases listed below:		The requirements of Section 704.04 O, "Traffic Control for Uneven Pavement" apply to drop-offs created by milling or the placement of hot mix asphalt.			
	<u>Phase I – Sheet Piling Installation:</u>		203-010	SHRINKAGE: 35 percent additional volume is included for shrinkage in earth embankment.		
	<ul style="list-style-type: none"><li>• Perform placement of temporary shoring, sheet piling, and riprap.</li><li>• Riprap may be placed in Phase I or Phase II.</li><li>• Remove trees; finish clearing and grubbing.</li><li>• Complete Phase 1 by March 1st, 2021.</li><li>• Liquidated damages as per Section 108.07 of the NDDOT Standard Specifications will be assessed for work not completed by March 1st, 2021.</li></ul>		203-P01	SWELLING: 15 percent reduced volume is included for swelling in controlled density backfill.		
	<u>Phase II – Sheet Piling Backfill</u>		203-P02	COMMON EXCAVATION-TYPE A: A quantity of estimated excess material is quantified within Section 11. Dispose of excess material 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-Type A”.		
	<ul style="list-style-type: none"><li>• Place the foundation fill.</li><li>• Finish grading the west side of the roadway along sheet piling.</li></ul>		203-P03	COMMON EXCAVATION SUBCUT: No subcuts are planned. However, if the Engineer determines an area of the subgrade requires repair due to pavement fatigue, a subcut may be required. A discretionary quantity for subcut has been provided in the plans. Refer to Section 20 for details.		
	<u>Phase III – Bypass Removal &amp; Overlay</u>		203-P04	EARTHWORK ITEMS: Payment for “Common Excavation – Type A”, “Borrow Excavation”, and “Foundation Fill” will be made by plan quantity.		
	<ul style="list-style-type: none"><li>• Perform removal of temporary bypass, grading, HMA overlay, and guardrail.</li><li>• HMA overlay will not be placed prior to backfilling the sheet piling section or the removal of temporary bypass.</li></ul>		216-P01	WATER: Water is incidental to other items. No measurement or payment will be made for water used on the project.		
100-P02	COORDINATION OF PROJECTS: An additional project in the vicinity of this project will be constructed during the 2021 construction season. Coordinate scheduling, work activities and construction traffic control devices between projects. The following project description:		255-P01	CONCRETE EROSION CONTROL BLANKET: Below is a list of suppliers that can supply the “Concrete Erosion Control Blanket”. Other suppliers will also be considered as approved equals.		
	1. Barnes County Route 21 – 1 Mile North of Kathryn	CER-0221(080), PCN 22794				
105-110	PAVEMENT SWEEPING: Sweep paved areas that were used by construction traffic before opening these areas to public traffic.					
	Sweep all newly constructed pavement no more than 24 hours before a scheduled final inspection.		Product: CC 45 Cretex Concrete Products 925 Basin Avenue Bismarck, ND 58504 (701) 223-7178			
105-P01	UTILITIES: The vertical and horizontal utility locations shown in the plans are approximate. Plan locations should not be interpreted as exact for bidding or construction purpose		Product: Class 55 Closed ARMORTEC 9025 Center Point Dr., Suite 400 West Chester, OH 45069 (513) 645-7000			
107-P01	MAINTAINING TRAFFIC – DROP-OFFS: If, at the end of the work-day, drop-offs greater than 2 inches and less than 18 inches or slopes steeper than 4:1 exist between the edge of a traffic lane and the outside edge of the proposed roadway, perform one of the following actions:		Product: UltraFlex M6055 Submar, Inc. P.O. Box 4417 Houma, LA 70361 (800) 978-2627			
	<ul style="list-style-type: none"><li>• Construct a traversable wedge in the area of the drop-off or steep slope; or</li><li>• Close the lane adjacent to the drop-off or steep slope and provide 24-hour flagging or pilot car operations.</li></ul>		Install “Concrete Erosion Control Blanket” based on manufacturer’s requirements.			
	When constructing a wedge, construct a wedge composed of aggregate or earthen materials with a 4:1 or flatter slope along the entire length of the area. Compact materials using Type C compaction, as specified in 203.04 E.4, "Compaction Control Type C".		Include all costs to furnish and install the “Concrete Erosion Control Blanket” in the price bid for “Concrete Erosion Control Blanket”.			
	The Engineer will not measure material used to construct the wedge. Include the cost of materials, equipment, labor, and incidentals required for this operation in the price bid for aggregate pay items.					

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	CER-0221(079)	6	2

**NOTES**

- 430-P01 CORE HOLES: Fill voids from removed back-to-back vertical panel signs that were drilled into existing pavement with “Commercial Grade Hot Mix Asphalt”. Include all costs associated with filling core holes in the price bid “Commercial Grade Hot Mix Asphalt” for other items.
- 622-P01 PILE DRIVING: Do not drive piling between the hours of 10 p.m. and 6 a.m.
- 704-P01 TRAFFIC CONTROL: The traffic control details have been developed based on the premise that traffic control will require 2 phases. The Contractor is responsible for removing and resetting devices for each phase of construction. Flagger controlled traffic control will be used for one lane closure adjacent to construction area according to NDDOT Standard D-704-17. Temporary traffic control devices are included in the unit price of ‘Traffic Control’.
- Phase A – Traffic Utilizing Temporary Bypass:
- In July of 2020, a temporary bypass was installed. Provide traffic control to maintain traffic on the temporary bypass.
  - Maintain 2 lanes of traffic outside of work hours.
- Phase B – Bypass Removal & Overlay
- Provide traffic control to maintain traffic on the existing alignment.
  - Maintain 2 lanes of traffic outside of work hours.
- Quantities for traffic control signs and devices are based on a 25-mph work zone speed limit.
- Existing traffic controls signs and delineators to be removed will be delivered to Barnes County Highway Department.
- 762-050 PAVEMENT MARKING: If the Engineer and Contractor agree, plan quantity will be used as the measurement for payment for pavement marking items.
- 764-P01 REMOVE 3-CABLE GUARDRAIL & POSTS: Salvage and deliver 3-cable guardrail to the Barnes County Highway Department shop at:
- Barnes County Highway Department  
1525 12<sup>th</sup> St NW  
Valley City, ND 58072

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ENVIRONMENTAL NOTES

ENVIRONMENTAL NOTES (EN): Barnes County, in cooperation with 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-01
- SPAWNING RESTRICTION: Do not work within the Sheyenne River from April 15 to June 1.
- EN-02
- 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-03
- NORTHERN LONG-EARED BAT AWARENESS: All operators, employees, and contractors working in areas of known or presumed bat habitat would be made aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable Avoidance and Minimization Measures.
- EN-04
- NORTHERN LONG-EARED BAT: Tree removal must be limited to that specified in the project plans and removal areas must be marked in the field (e.g., install bright colored flagging/fencing) prior to tree clearing to ensure removal remains within clearing limits. Remove trees outside of the active season for the northern long-eared bat, which is from April 1 to October 31. If tree removal cannot occur outside of the active season, limit tree removal to 100 feet from the existing roadway and to 10 or fewer trees; a qualified biologist must conduct a visual emergence survey prior to tree removal during the active season.

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Estimated Quantities

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline: Funding A	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
201	0330	CLEARING & GRUBBING	L SUM	1	1
201	0352	REMOVAL OF TREES & BRUSH	L SUM	1	1
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	988	988
203	0101	COMMON EXCAVATION-TYPE A	CY	347	347
203	0109	TOPSOIL	CY	856	856
203	0138	COMMON EXCAVATION-SUBCUT	CY	89	89
203	0140	BORROW-EXCAVATION	CY	76	76
210	0210	FOUNDATION FILL	CY	597	597
251	0200	SEEDING CLASS II	ACRE	1.06	1.06
251	2000	TEMPORARY COVER CROP	ACRE	1.06	1.06
253	0101	STRAW MULCH	ACRE	2.12	2.12
255	0101	ECB TYPE 1	SY	427	427
255	0300	CONCRETE EROSION CONTROL BLANKET	SY	400	400
256	0200	RIPRAP GRADE II	CY	300	300
260	0200	SILT FENCE SUPPORTED	LF	195	195
260	0201	REMOVE SILT FENCE SUPPORTED	LF	195	195
261	0112	FIBER ROLLS 12IN	LF	185	185
261	0113	REMOVE FIBER ROLLS 12IN	LF	30	30
262	0100	FLOTATION SILT CURTAIN	LF	235	235
262	0101	REMOVE FLOTATION SILT CURTAIN	LF	235	235
302	0120	AGGREGATE BASE COURSE CL 5	TON	411	411
411	0105	MILLING PAVEMENT SURFACE	SY	534	534
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	317	317
622	6760	STEEL SHEET PILING	SF	10058	10058
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	500	500
704	1000	TRAFFIC CONTROL SIGNS	UNIT	764	764
704	1060	DELINEATOR DRUMS	EA	25	25
704	1081	VERTICAL PANELS-BACK TO BACK	EA	18	18
706	0500	AGGREGATE LABORATORY	EA	1	1
709	0151	GEOSYNTHETIC MATERIAL TYPE R1	SY	400	400
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	17	17
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	35.6	35.6
762	0430	SHORT TERM 4IN LINE-TYPE NR	LF	1090	1090
762	1104	PVMT MK PAINTED 4IN LINE	LF	1090	1090
764	0115	3-CABLE GUARDRAIL	LF	700	700
764	2020	REMOVE 3-CABLE GUARDRAIL & POSTS	LF	212	212
920	1000	GEOFOAM	CY	292	292

STATE

PROJECT NO.

SECTION NO.

SHEET NO.

ND

CER-0221(079)

10

1

SPEC CODE

BID ITEM

QTY

UNIT

3020120AGGREGATE BASE COURSE CL 5

244

TON

4300500COMMERCIAL GRADE HOT MIX ASPHALT

228

TON

Water (Incidental)

25 Mgal/Mile for Dust Pallative

20 Gal/Ton for Aggregates

10 Gal/CY for Embankment

Mulching

One application for Temporary Cover Crop

One application for Seeding C-I-I

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COUNTY HWY 21

4 MILES NORTH OF KATHRYN

BARNES COUNTY, ND

KLJ

BASIS OF ESTIMATE

DRAWN BY

AC

CHKD BY

TO

PROJECT NO.

2003-00293

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KLJ 2020



STATE  
ND

PROJECT NO.  
CER-0221(079)

SECTION NO.  
11

SHEET NO.  
1

SPEC CODE

BID ITEM

QTY

UNIT

203

0101

COMMON EXCAVATION-TYPE A

347

CY

203

0109

TOPSOIL

856

CY

203

0140

BORROW-EXCAVATION

76

CY

210

0210

FOUNDATION FILL

597

CY

920

1000

GEOFOAM

292

CY

CONSTRUCTION PHASE	LOCATION	EARTHWORK SUMMARY						TOPSOIL SUMMARY
		Excavation	Embankment ①	203 0101 COMMON EXCAVATION- TYPE A	203 0140 BORROW- EXCAVATION	210 0210 FOUNDATION FILL ②	920 1000 GEOFOAM	203 0109 TOPSOIL
		(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)
		A	B	C = A	D = B - C - E - F	E	F	D
Phase I & II - Sheet Pile Installation & Backfill	Sta 107+35 to 110+57	29	988	29	70	597	292	100
Phase III - Bypass Removal & Overlay	Sta 105+78 to 112+95	318	324	318	6	-	-	756
TOTAL =		347	1311	347	76	597	292	856

Notes:

① Additional 35% volume included for shrinkage

② Reduced 15% volume included for swelling

③ Excess material to be disposed in accordance with Section 107.17 of NDDOT Standard Specifications.

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COUNTY HWY 21

4 MILES NORTH OF KATHRYN

BARNES COUNTY, ND

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EARTHWORK

DRAWN BY  
AC

CHKD. BY  
TO

PROJECT NO.  
2003-00293

9/18/2020

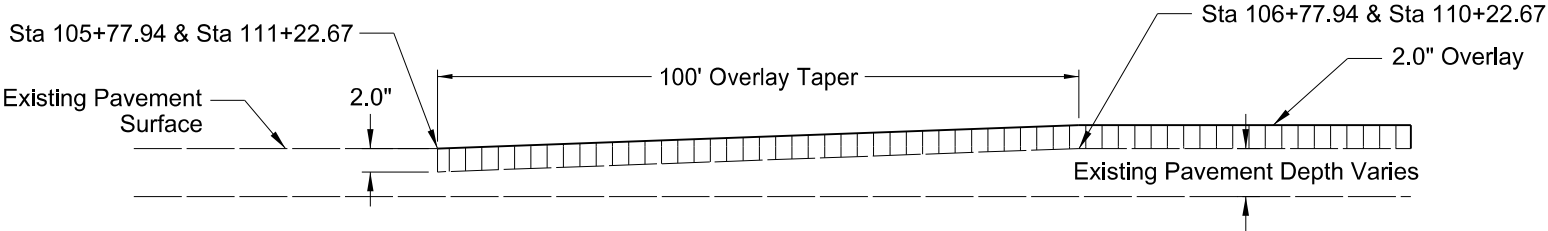
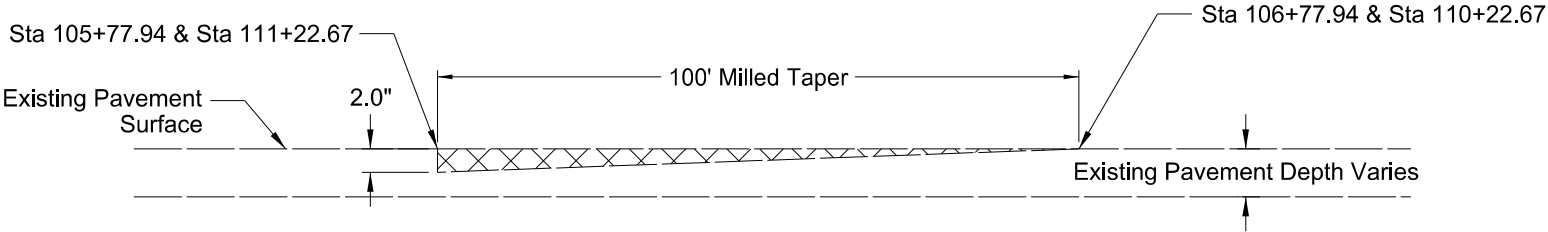
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austinchmielewski

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KLJ 2020

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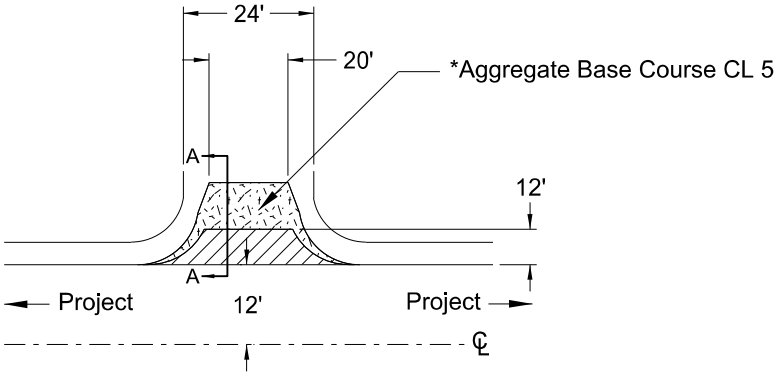


**MILLED TAPER**

Mill the existing pavement and taper as shown above. 25 feet for every 0.5 inch of HMA. Place a wearing course matching the roadway surface elevation at the ends of the project. No extra compensation will be made for the increased milling depth at the taper location.

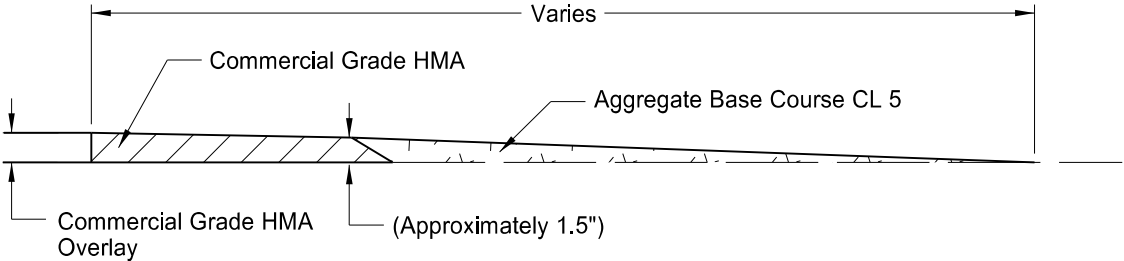
411 0105 MILLING PAVEMENT SURFACE					
Description	Begin Station	End Station	Length	Width	Area / 2
County Route 21 (CMC 0221)	105+77.94	106+77.94	100 LF	24 LF	267 SY
	110+22.67	111+22.67	100 LF	24 LF	267 SY
Total Milling			534 SY		

- Notes:
- 1) Additional thickness milled in tapers are incidental to "MILLING PAVEMENT SURFACE" Bid Item
  - 2) Milling taper is based on the top width of pavement. Sloughs are considered incidental and will not be paid for.



**FIELD DRIVES**

\* Aggregate Base Course CL 5 has been provided to fill in around the drives. This material will be required when sloughs are steeper than a 4:1.



**SECTION A-A**

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COUNTY HWY 21  
4 MILES NORTH OF KATHRYN  
BARNES COUNTY, ND

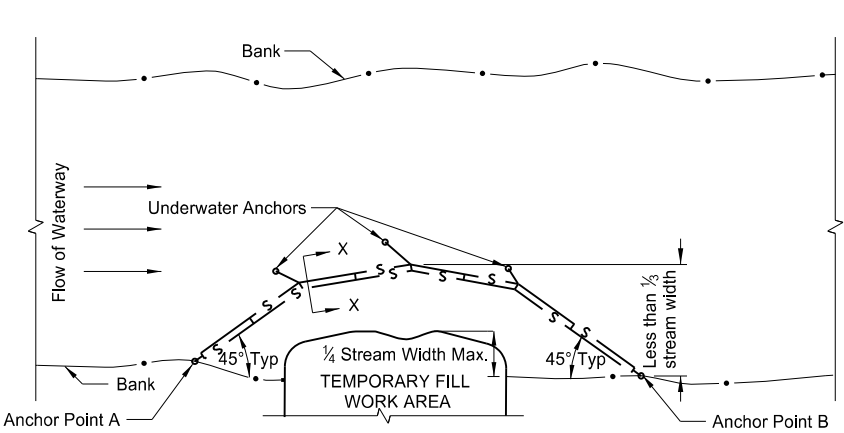


MILL & OVERLAY  
DETAIL

DRWN BY AC	CHKD BY TO	PROJECT NO. 2003-00293
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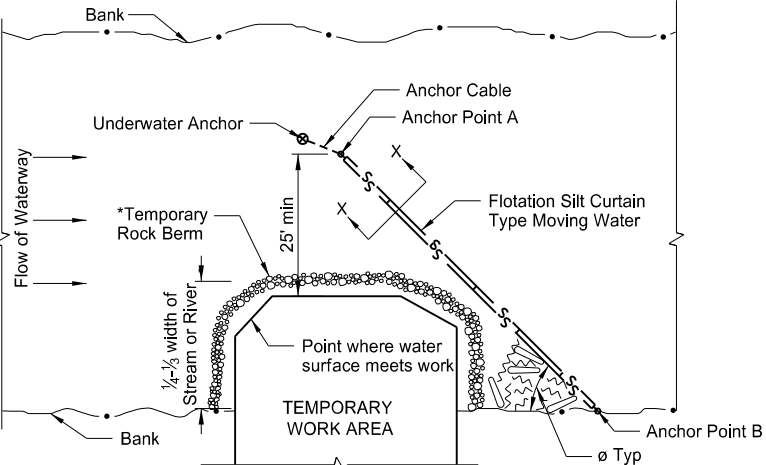
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	20	2

TYPICAL INSTALLATIONS  
May vary with conditions



PLAN VIEW  
FLOTATION SILT CURTAIN - TYPE WORK AREA

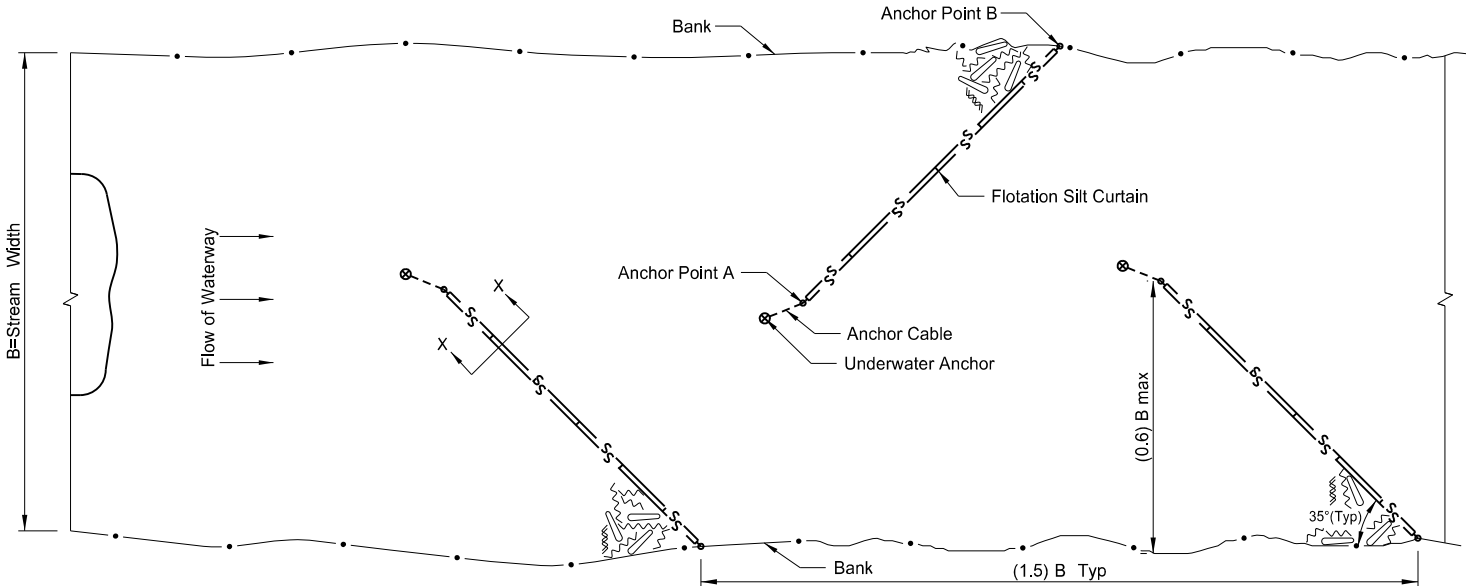
DESIGN GUIDELINES:  
When temporary work encroaches less than 1/4 of the width of stream.



Ø	WATER VELOCITY
45°	slow, less than 3 ft/sec
35°	moderate, 3 - 5 ft/sec

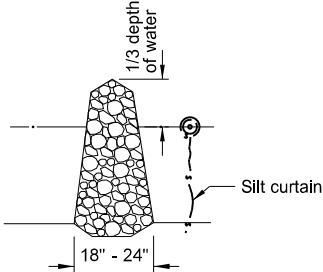
PLAN VIEW  
FLOTATION SILT CURTAIN - TYPE MOVING WATER

DESIGN GUIDELINES:  
When temporary work encroaches more than 1/4 but less than 1/3 width of the stream.  
  
For narrow waterways, the curtain may be placed 1 foot above the bottom of waterway to allow water flow.  
  
\*In areas where the plans call for riprap at the bridge, provide a temporary rock berm. Include all costs for the temporary rock berm in price bid for the "Riprap".

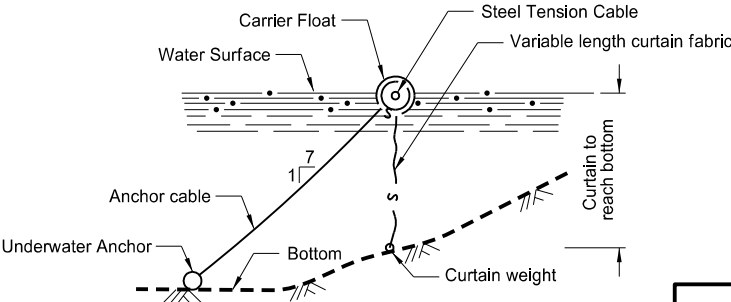


PLAN VIEW  
FLOTATION SILT CURTAIN - TYPE HERRING BONE PATTERN

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



TEMPORARY ROCK BERM



SECTION X-X  
FLOTATION SILT CURTAINS

Note:  
Maximum water velocity for moving water = 5 ft/sec

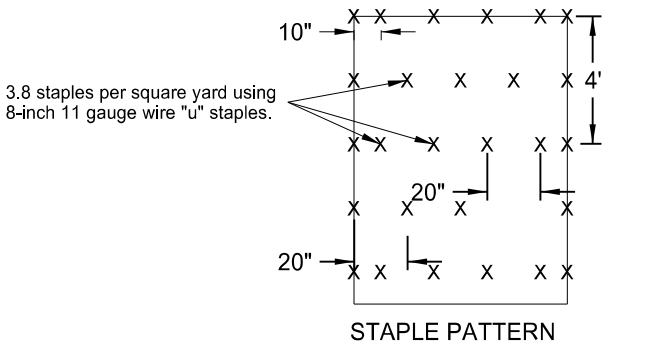
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4 MILES NORTH OF KATHRYN  
BARNES COUNTY, ND

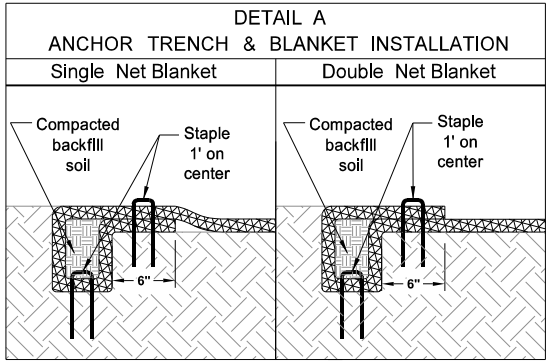
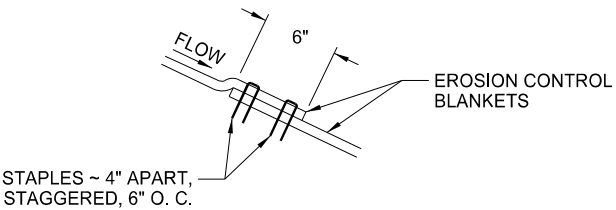


FLOTATION SILT CURTAIN DETAIL

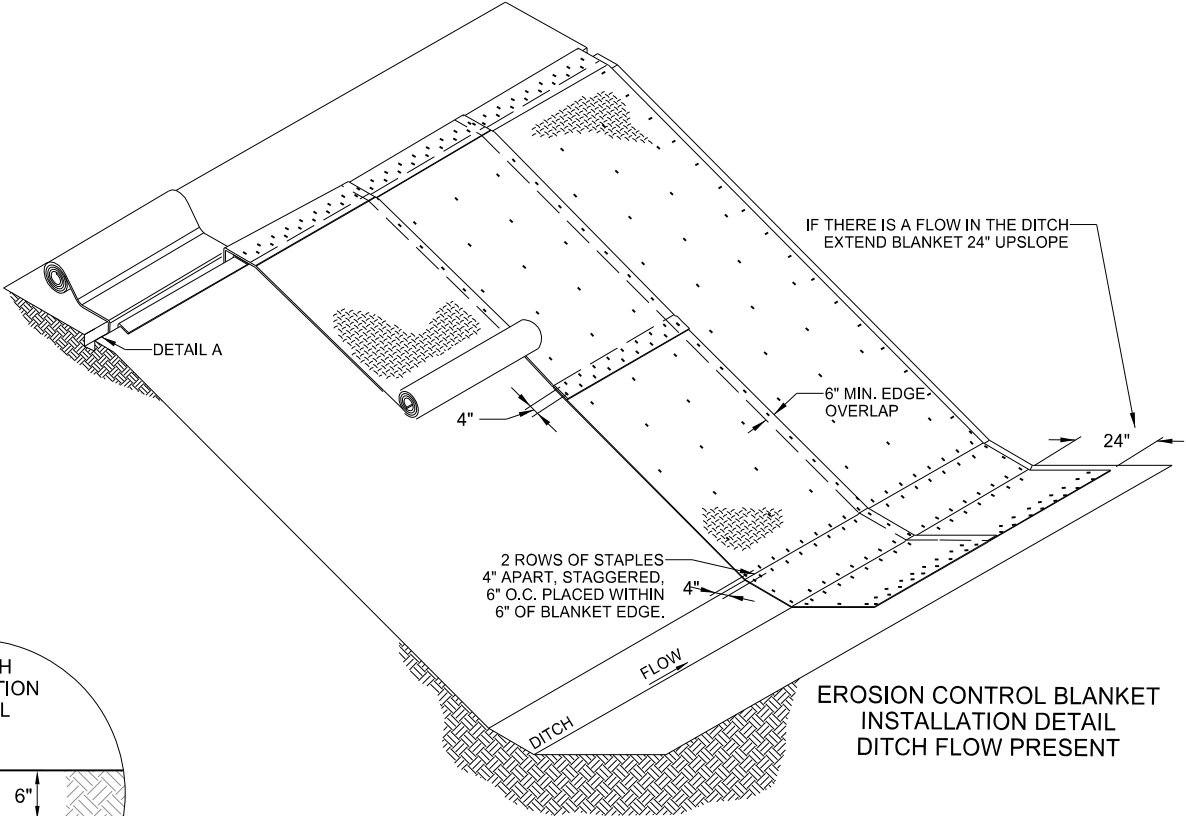
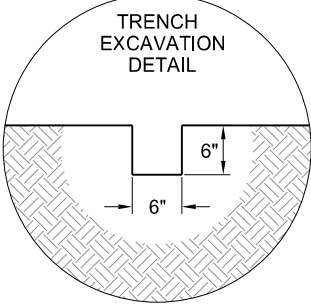
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255 0101 ECB TYPE 1					
Roadway	Location of Surface Area		X	Y	Total Quantity
	Begin Station	Offset	(LF)	(LF)	(SY)
County Route 21 (CMC 0221)	107+50	Lt	15	16	27
	107+64	Lt	30	13	43
	107+94	Lt	30	12	40
	108+24	Lt	45	11	55
	108+70	Lt	105	10	117
	109+76	Lt	15	12	20
	109+91	Lt	15	18	30
	110+06	Lt	15	25	42
	110+21	Lt	30	16	53
TOTAL =					427



NOTE:  
Install Single Net Blanket with netting on top of installed blanket.



INSTALLATION STEPS:

1. Prepare smooth slope per spec. section 255
2. Amend soil and seed, as specified.
3. Dig anchor trench. Set aside native soil removed from trench.
4. Secure blanket in anchor trench, staking or stapling blanket as shown.
5. Replace native soil previously removed from trench.
6. Staple blanket as shown so there are no gaps between the blanket and the soil. Staple while unrolling blanket to minimize walking on blanket.
7. Install splices a minimum 24 inches prior to toe of slope.

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COUNTY HWY 21  
4 MILES NORTH OF KATHRYN  
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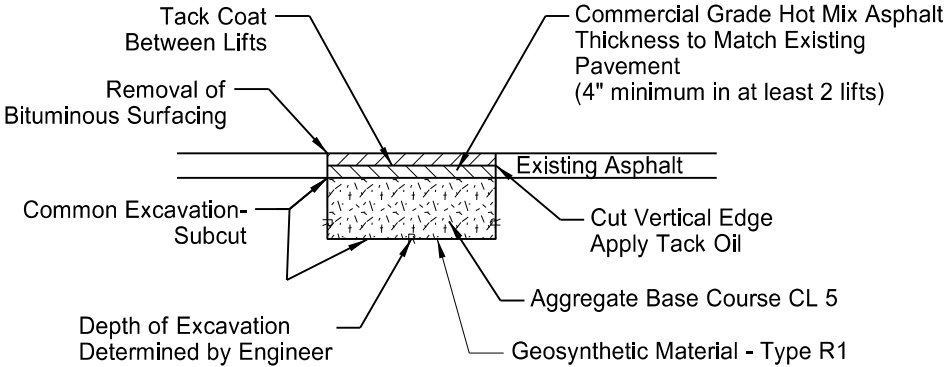


EROSION CONTROL  
ON SLOPE

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	20	4

SPEC CODE	BID ITEM	QTY	UNIT
202 0132	REMOVAL OF BITUMINOUS SURFACING	400	SY
203 0138	COMMON EXCAVATION-SUBCUT	89	CY
302 0120	AGGREGATE BASE COURSE CL 5	167	TON
430 0500	COMMERCIAL GRADE HOT MIX ASPHALT	89	TON
709 0151	GEOSYNTHETIC MATERIAL TYPE R1	400	SY




**SUBGRADE REPAIR**

1. Subgrade Repairs at depths of 1 foot or greater shall be excavated to the full width of the lane and tapered at a ratio of 20:1 on the ends.
2. Each lift of Hot Mix Asphalt shall cure overnight before installation of the next course.
3. Geosynthetic Material - Type R1 may be eliminated in field by the engineer.
4. Subgrade Repair areas determined in field by the engineer.

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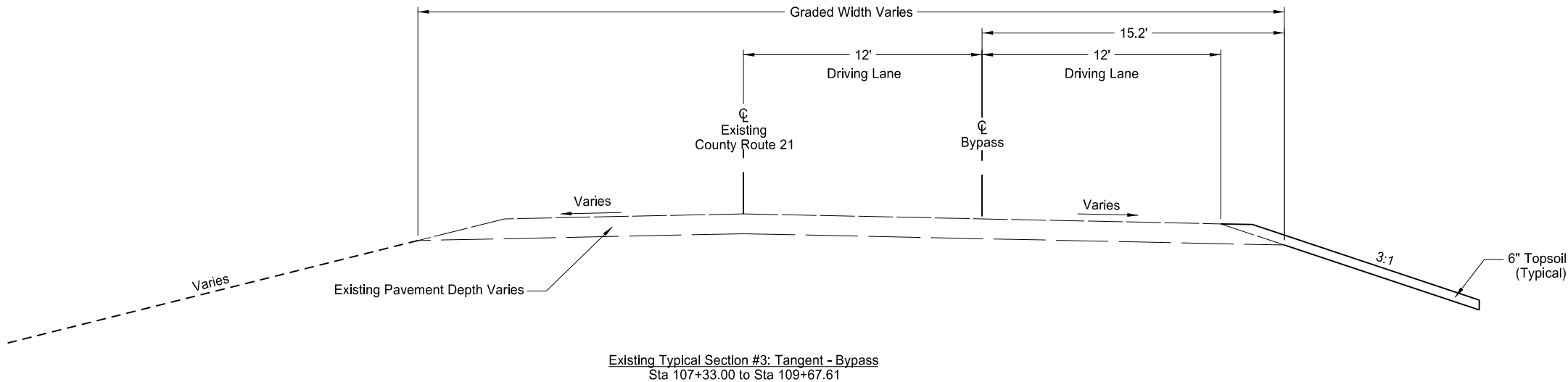
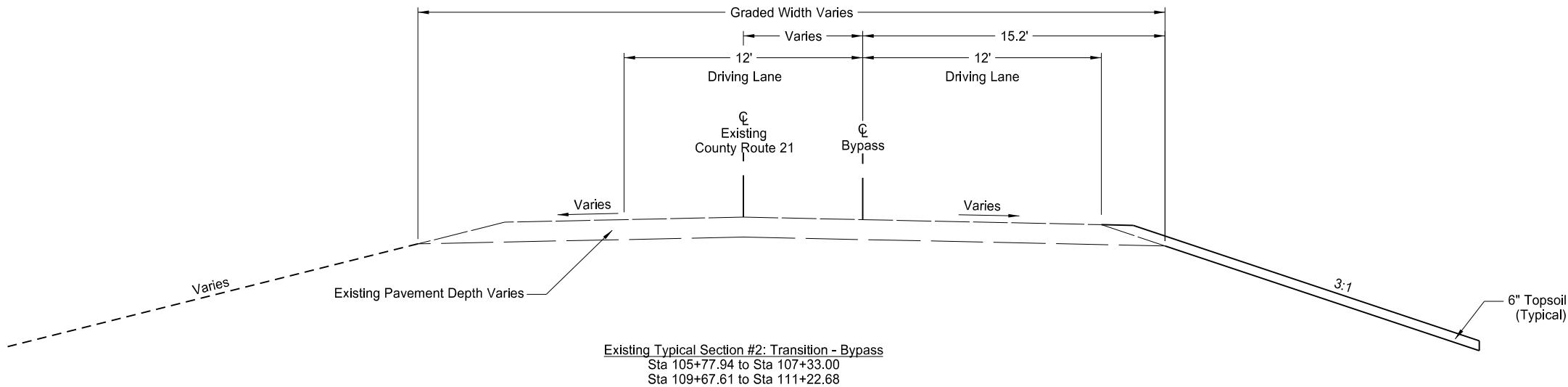
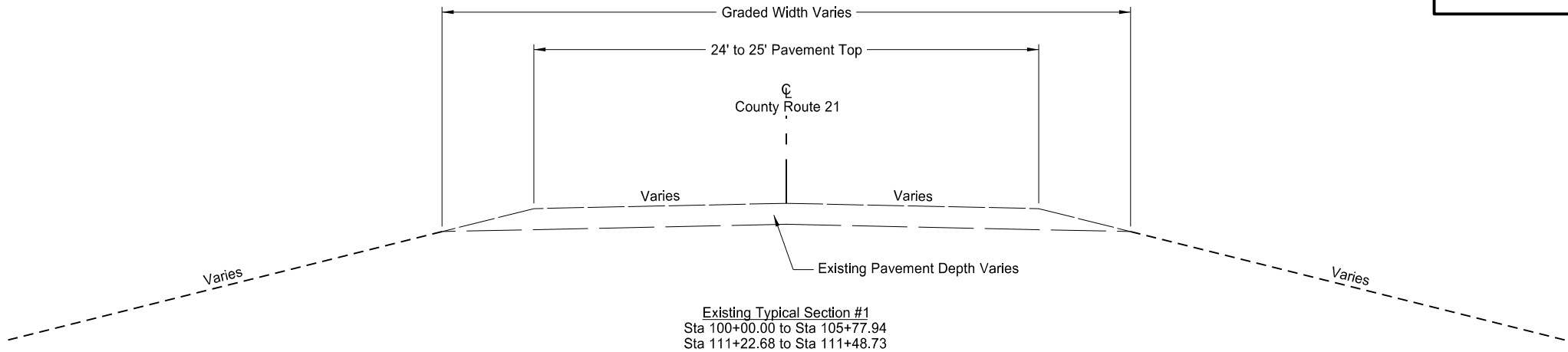
SUBGRADE REPAIR

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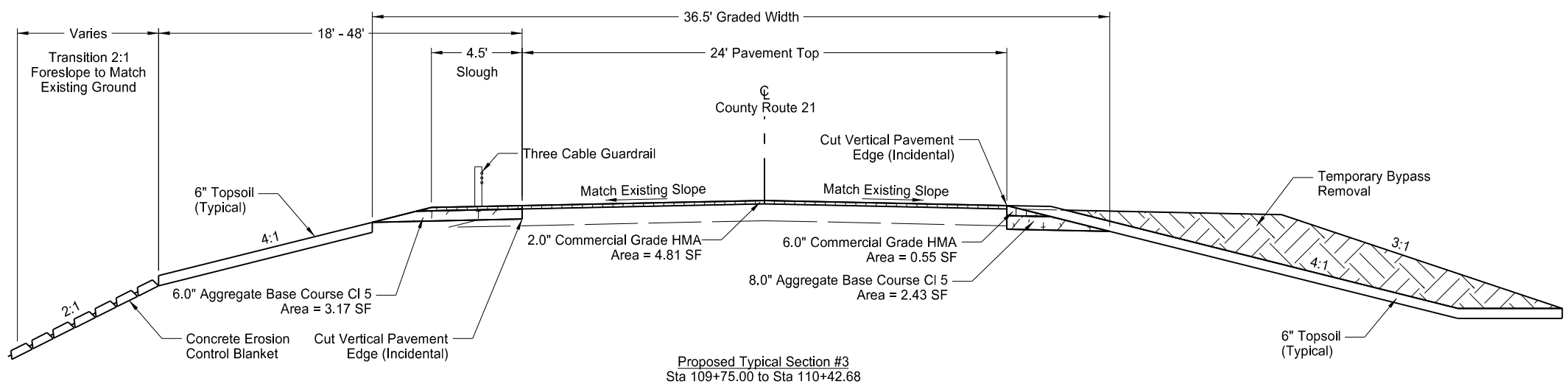
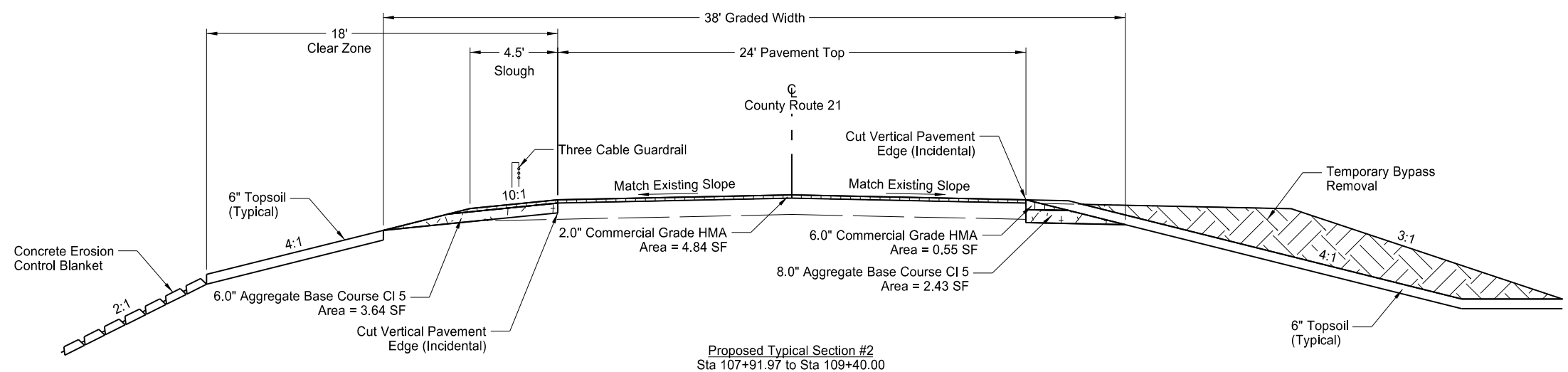
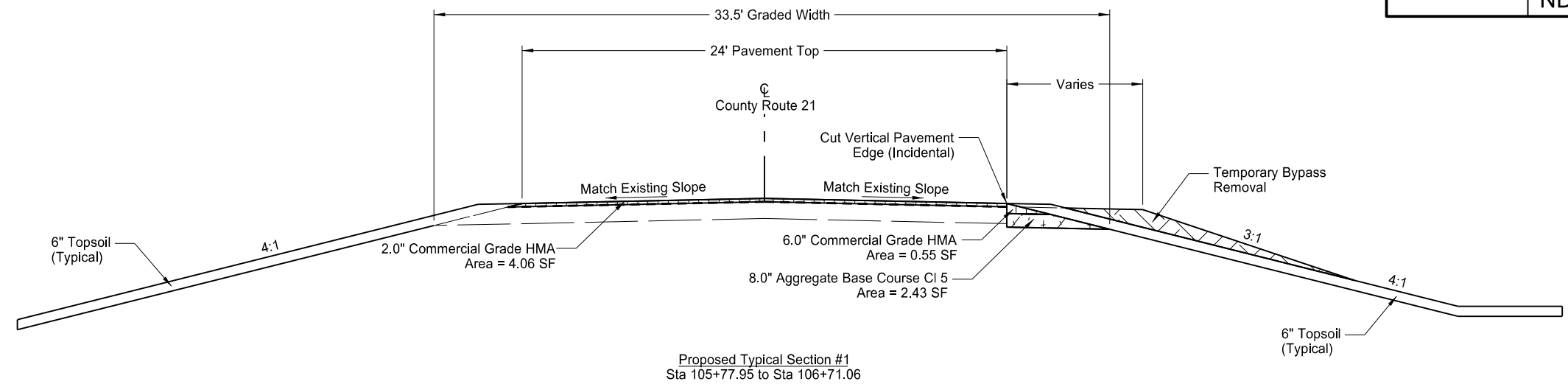
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	30	1



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<b>COUNTY HWY 21</b> 4 MILES NORTH OF KATHRYN BARNES COUNTY, ND		
	<b>TYPICAL SECTIONS</b>	
	DRWN BY AC	CHKD BY TO
PROJECT NO. 2003-00293		


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	30	2



- Notes:
1. Place 8" Aggregate Base Course CI 5 and 6" HMA prior to placing overlay

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COUNTY HWY 21  
4 MILES NORTH OF KATHRYN  
BARNES COUNTY, ND



TYPICAL SECTIONS

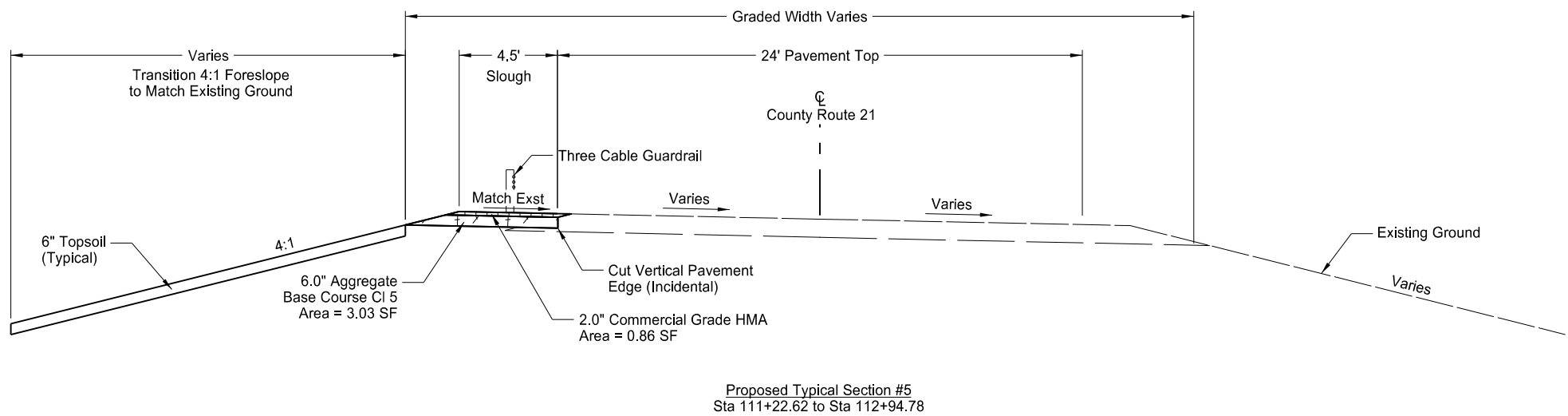
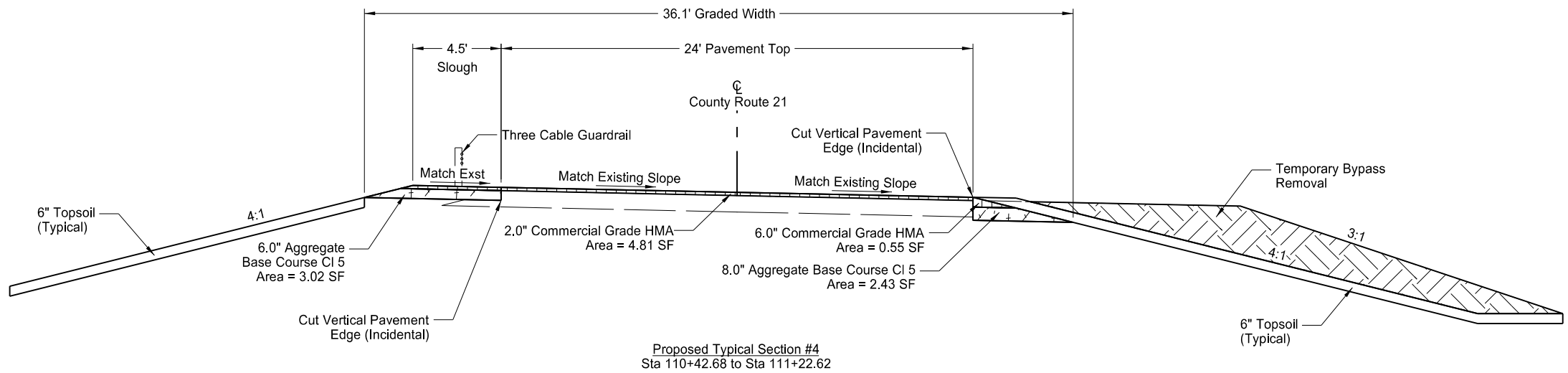
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PROJECT NO.  
2003-00293

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	30	3



- Notes:
1. Place 8" Aggregate Base Course CI 5 and 6" HMA prior to placing overlay

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COUNTY HWY 21  
4 MILES NORTH OF KATHRYN  
BARNES COUNTY, ND



TYPICAL SECTIONS

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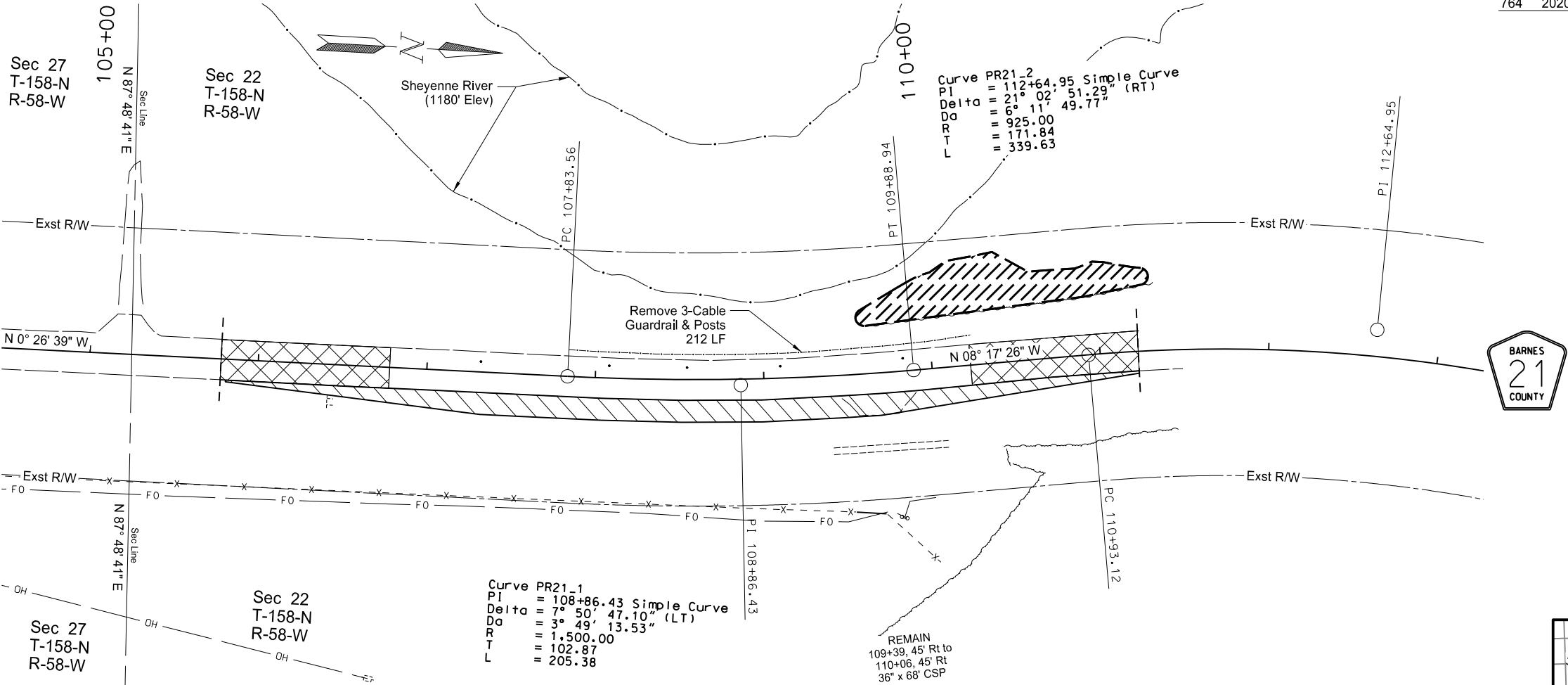
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2003-00293



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	CER-0221(079)	40	1

SPEC COD	BID ITEM	QTY	UNIT
201	0330 CLEARING & GRUBBING	1	L SUM
201	0352 REMOVAL OF TREES & BRUSH	1	L SUM
202	0132 REMOVAL OF BITUMINOUS SURFACING	588	SY
411	0105 MILLING PAVEMENT SURFACE	534	SY
764	2020 REMOVE 3-CABLE GUARDRAIL & POSTS	212	LF



LEGEND	
	Removal of Pavement (Asphalt & Aggregate)
	Milling Pavement Surface
	Clearing & Grubbing Removal of Trees
	Pavement Removal Limits



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COUNTY HWY 21  
4 MILES NORTH OF KATHRYN  
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REMOVALS

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2003-00293

Wetland Impact Table										
Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands	Wetland Impacts Acres(s)			Wetland Mitigation		
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Mitigation Required		
								EO 11990	USACE	USFWS
1	Sec 27, T138N, R58W	Ditch	Created	Y	-	-	-	N	N	N
3b	Sec 22, T138N, R58W	Riverine	Natural	Y	-	-	-	N	N	N
Totals					0.00	0.00	0.00			

Other Waters Impact Table															
Other Waters													Other Water Mitigation		
Number	Location	Type	Size		Feautre	USACE Jurisdictional Wetlands	Impacts to Other Waters						Mitigation Required		
			Acre(s)	Linear Feet			Acres			Linear Feet			EO 11990	USACE	USFWS
							Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm. (Fill/Drain)	Perm. (Cut)			
OW 2	Sec 22, T138N, R58W	River	0.66	489	Natural	Y	-	0.10	-	-	227	-	N	N	N
OW 3a	Sec 22, T138N, R58W	Stream	0.01	70	Natural	Y	-	-	-	-	-	-	N	N	N
						Totals	0.00	0.10	0.00	0	227	0			


<sup>1</sup> All aquatic resources are assumed to be USACE jurisdictional.

Mitigation Summary Table					
	Location	Onsite Acre(s)	11990 Bank Acre(s)	USACE/119 90 Bank Acre(s)	USFWS Bank Acre(s)
USACE Only	-	-		-	
EO 11990 Only	-	-	-		
USACE/119 90	-	-		-	
USFWS	-				
Total		0	0	0	0

Impact Summary Table			
Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	Total (Acres)	Wetland Type	Total (Acres/Lf)
Natural/JD (Fill/Drain)	-	Temporary JD	-
Natural/Non-JD (Fill/Drain)	-	Non-JD Temporary	-
Artifical/JD (Fill/Drain)	-	Permanent JD > 0.10	-
Artificial /Non-JD (Fill/Drain)	-	Permanent OW	0.10/227
Total	0.00	Temporary OW	-
JD Natural (Cut)	-		
JD Artificial (Cut)	-		
Non-JD Natural (Cut)	-		
Non-JD Artifical (Cut)	-		
Total	0.00		

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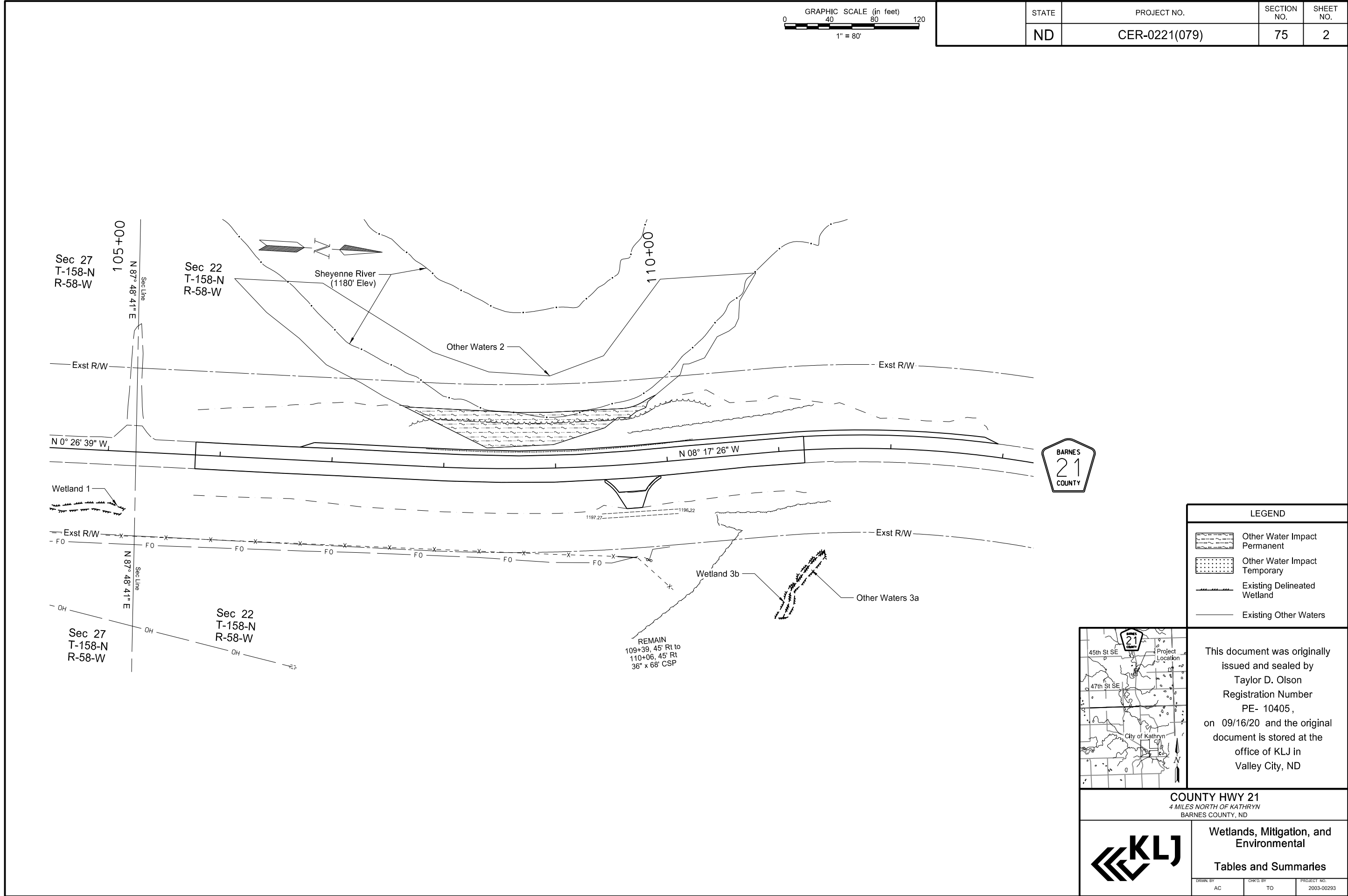


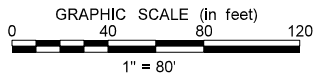
Wetlands, Mitigation, and Environmental  
Sta 105+77.94 to 112+94.78

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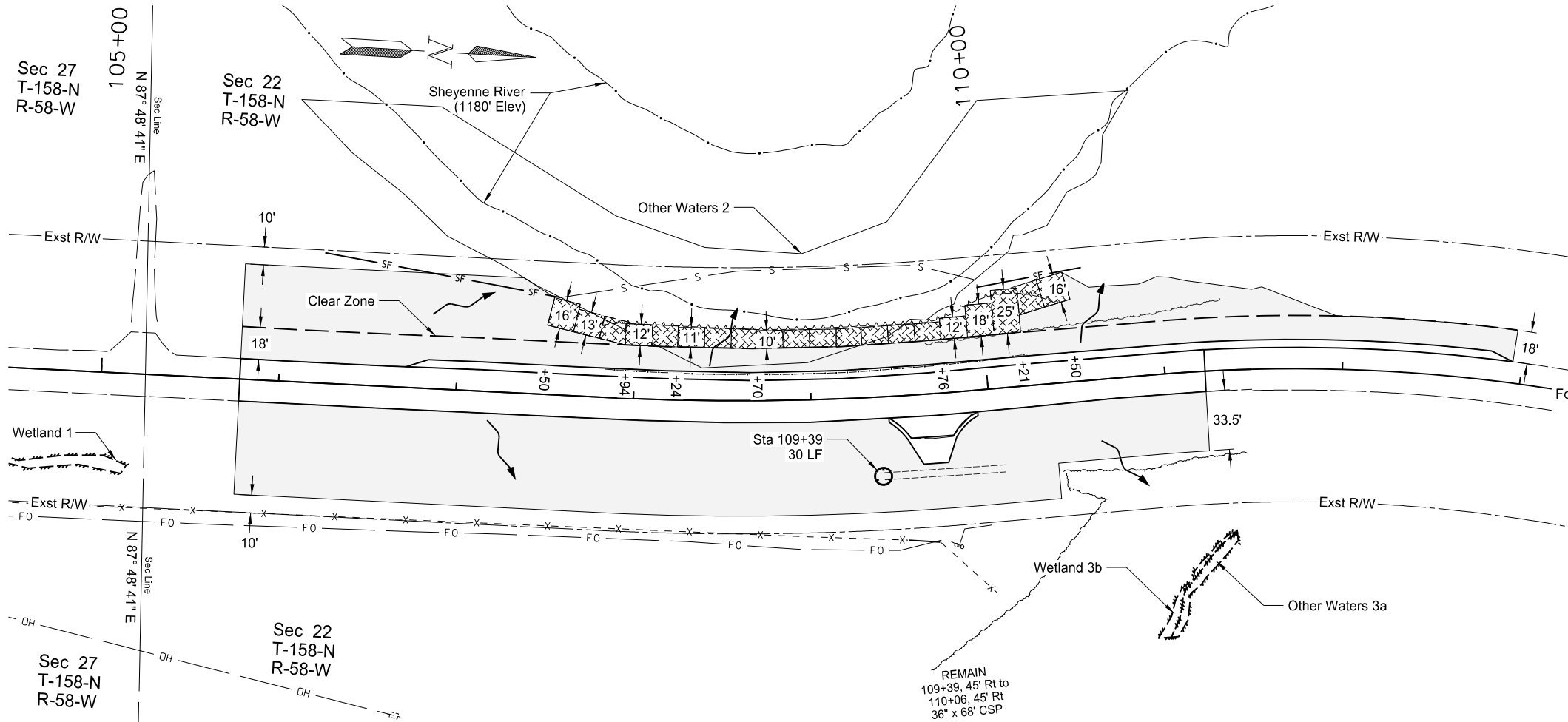
PROJECT NO.  
2003-00293





STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	CER-0221(079)	76	1

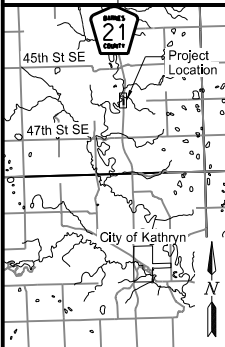
SPEC CODE	BID ITEM	QTY	UNIT
251	2000 TEMPORARY COVER CROP		
	Sta 105+78 to 112+95 Lt	0.45	ACRE
	Sta 105+78 to 111+23 Rt	0.61	ACRE
		1.06	ACRE
253	0101 STRAW MULCH		
	Sta 105+78 to 112+95 Lt	0.45	ACRE
	Sta 105+78 to 111+23 Rt	0.61	ACRE
		1.06	ACRE
255	0101 ECB TYPE 1	427	SY
260	0200 SILT FENCE SUPPORTED		
	Sta 106+22 to 107+56 Lt	135	LF
	Sta 109+98 to 110+58 Lt	60	LF
		195	LF
260	0201 REMOVE SILT FENCE SUPPORTED	195	LF
261	0112 FIBER ROLLS 12IN	30	LF
	Sta 109+39 Rt		
261	0113 REMOVE FIBER ROLLS 12IN	30	LF
262	0100 FLOTATION SILT CURTAIN	235	LF
	Sta 107+56 to 109+98 Lt		
262	0101 REMOVE FLOTATION SILT CURTAIN	235	LF



For ditch grades encountered in the field not listed, use the following spacing:  
Spacing = { Diameter of Roll (ft) - Entrenchment (ft) } / Slope (ft/ft)

DITCH FIBER SPACING	
Ditch Grade	Spacing (ft)
<0.5%	200
1%	85
2%	40
3%	30
4%	20

LEGEND	
	Erosion Control Blanket Type 1
	Temporary Cover Crop & Straw Mulch
	Fiber Rolls
	Silt Fence Supported
	Flotation Silt Curtain



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4 MILES NORTH OF KATHRYN  
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TEMPORARY SEDIMENT  
AND EROSION CONTROL

Sta 105+77.94 to 112+94.78

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
<b>ND</b>	<b>CER-0221(079)</b>	<b>100</b>	<b>1</b>

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE		35	
G20-1-60	60"x24"	ROAD WORK NEXT ___ MILES		28	
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)		18	
<b>G20-2-48</b>	<b>48"x24"</b>	<b>END ROAD WORK</b>	<b>2</b>	<b>26</b>	<b>52</b>
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)		18	
G20-10-108	108"x48"	CONTRACTOR SIGN		70	
G20-50a-72	72"x36"	ROAD WORK NEXT ___ MILES RT & LT ARROWS		43	
<b>G20-52a-72</b>	<b>72"x24"</b>	<b>ROAD WORK NEXT ___ MILES RT or LT ARROW</b>	<b>2</b>	<b>36</b>	<b>72</b>
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT		59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)		7	
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP		32	
R1-2-60	60"x60"	YIELD		29	
<b>R2-1-36</b>	<b>36"x48"</b>	<b>SPEED LIMIT ___ (Portable only)</b>	<b>4</b>	<b>30</b>	<b>120</b>
R2-1-48	48"x60"	SPEED LIMIT ___		39	
<b>R2-1aP-24</b>	<b>24"x18"</b>	<b>MINIMUM FEE \$80 (Mounted on Speed Limit post)</b>	<b>2</b>	<b>10</b>	<b>20</b>
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)		14	
R7-1-12	12"x18"	NO PARKING ANY TIME		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)		12	
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)		12	
R11-3a-60	60"x30"	ROAD CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-3c-60	60"x30"	STREET CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)		15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT		35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT		35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT		35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD		35	
W3-3-48	48"x48"	SIGNAL AHEAD		35	
<b>W3-4-48</b>	<b>48"x48"</b>	<b>BE PREPARED TO STOP</b>	<b>2</b>	<b>35</b>	<b>70</b>
<b>W3-5-48</b>	<b>48"x48"</b>	<b>SPEED REDUCTION AHEAD</b>	<b>2</b>	<b>35</b>	<b>70</b>
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC		35	
<b>W8-1-48</b>	<b>48"x48"</b>	<b>BUMP</b>	<b>4</b>	<b>35</b>	<b>140</b>
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
W8-12-48	48"x48"	NO CENTER LINE		35	
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or ___ FT or _ MILE		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or ___ FT or _ MILE		35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W12-2-48	48"x48"	LOW CLEARANCE		35	
W13-1P-30	30"x30"	___ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)		14	
W14-3-64	64"x48"	NO PASSING ZONE		28	

[illegible][illegible]

SPEC & CODE			
704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	764

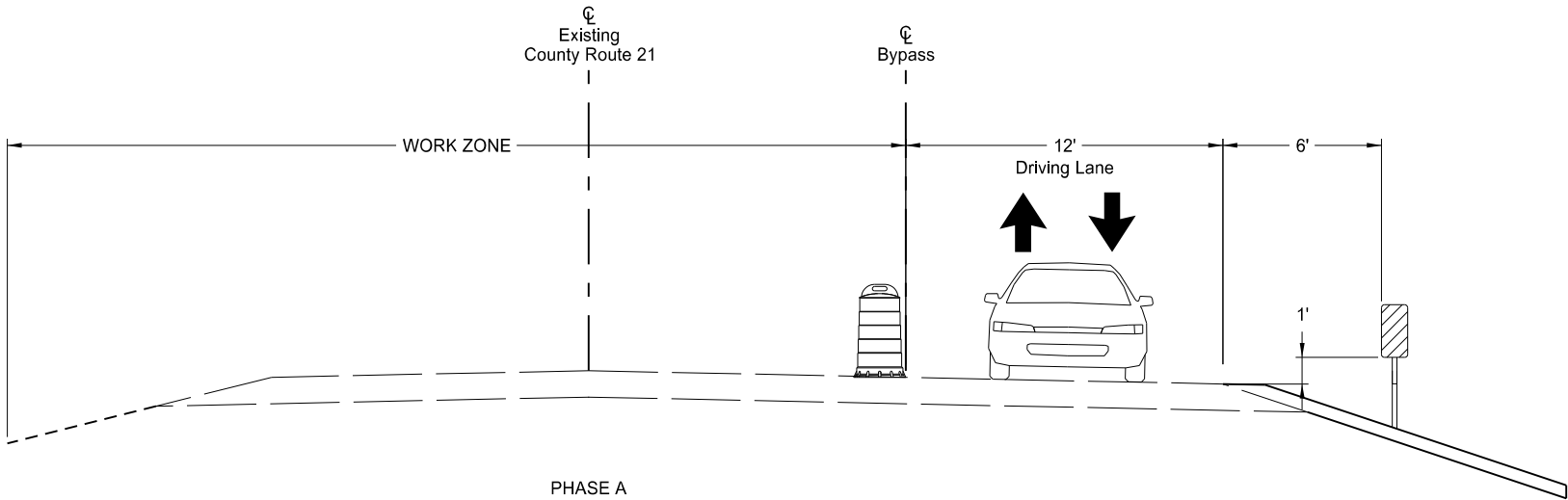
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**NOTE:**  
If additional signs are required, units will be calculated using the formula from Section III-18.06 of the Design Manual.  
<http://www.dot.nd.gov/>

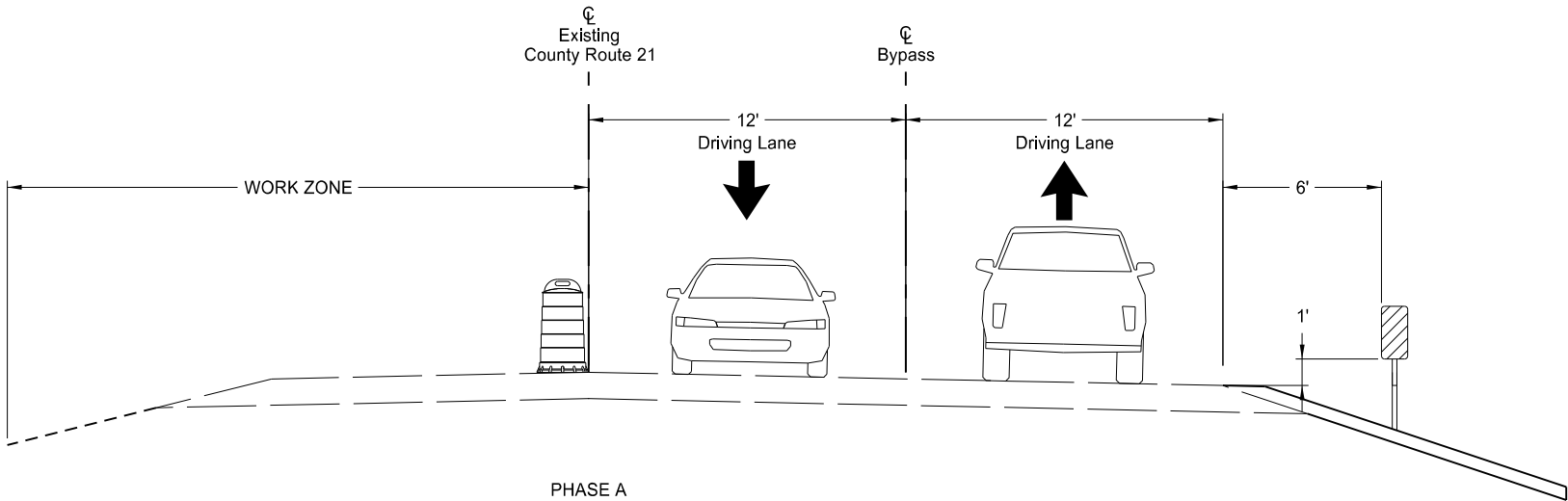
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## Traffic Control Devices List

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	100	2



PHASE A  
 Sheet Piling Construction - Temporary Lane Closure  
 (Flagger Controlled. Two roadway lanes must be open at the end of each construction day)



PHASE A  
 Sheet Piling Construction - End of Construction Day

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COUNTY HWY 21  
4 MILES NORTH OF KATHRYN  
BARNES COUNTY, ND

TYPICAL SECTIONS  
  
WORK ZONE  
TRAFFIC CONTROL

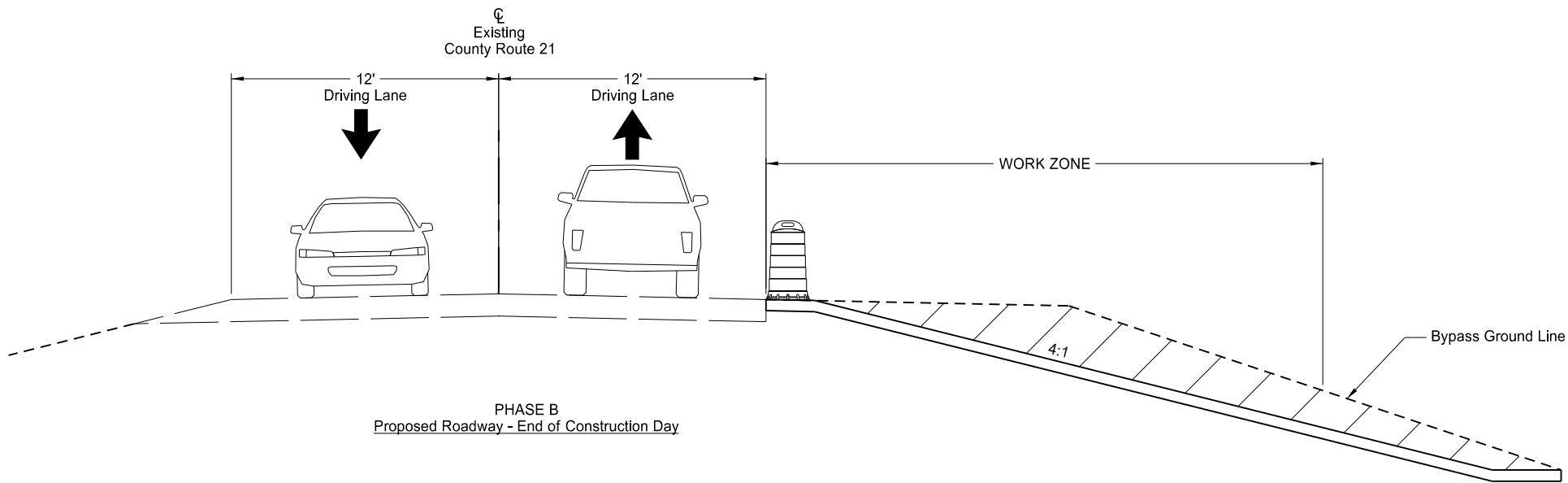
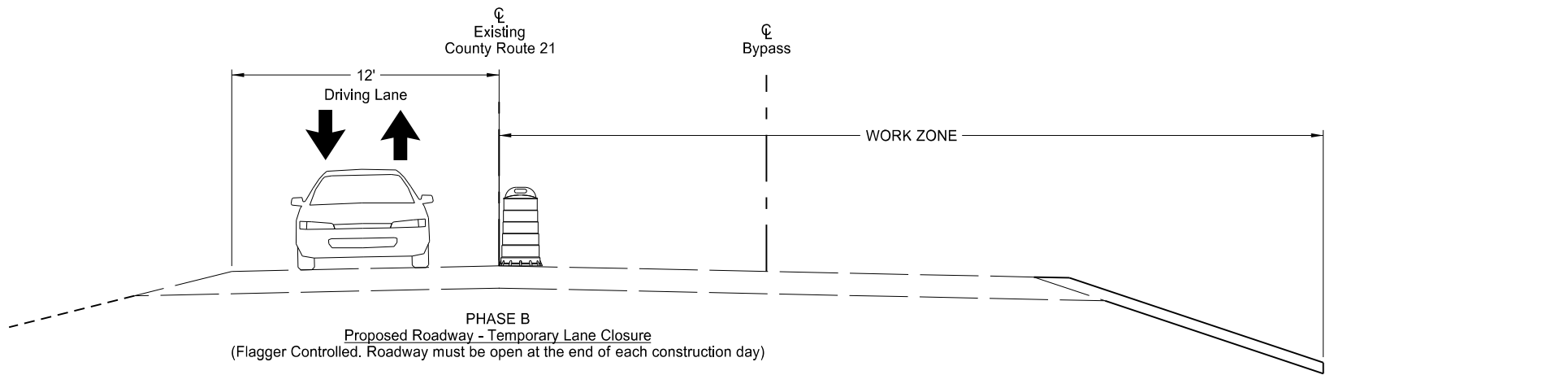
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	100	3



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COUNTY HWY 21  
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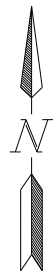
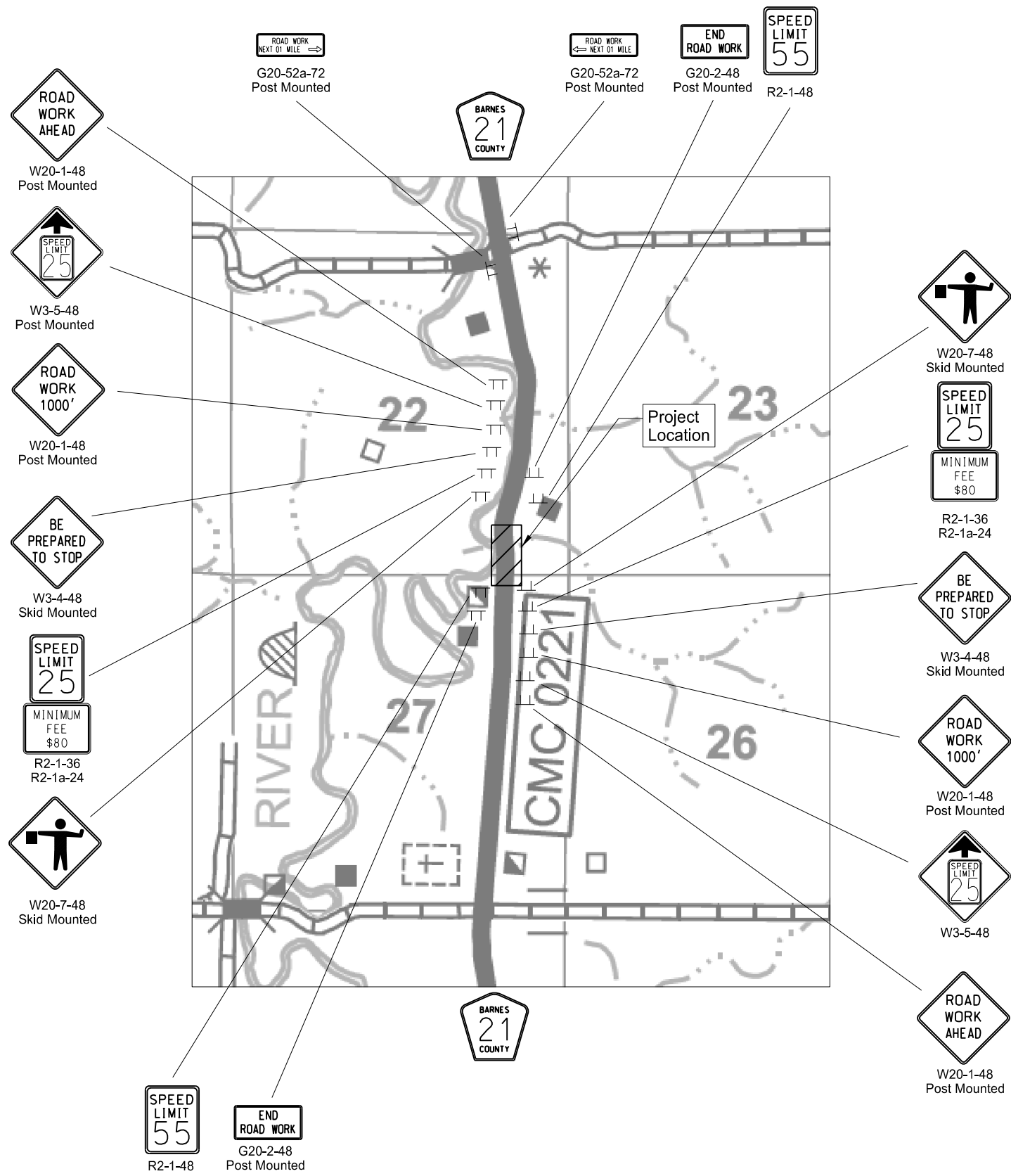
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WORK ZONE  
TRAFFIC CONTROL

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AC

CHKD. BY  
TO

PROJECT NO.  
2003-00293

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	100	4



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Taylor D. Olson  
Registration Number  
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COUNTY HWY 21  
4 MILES NORTH OF KATHRYN  
BARNES COUNTY, ND



WORKZONE TRAFFIC  
CONTROL SIGNING  
SIGNING LAYOUT

DRAWN BY: AC  
CHKD BY: TO  
PROJECT NO.: 2003-00293

[illegible]






	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	110	3

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COUNTY HWY 21  
4 MILES NORTH OF KATHRYN  
BARNES COUNTY, ND



PAVEMENT MARKING  
& SIGNAGE LAYOUT  
  
Sta 120+00 to 129+22

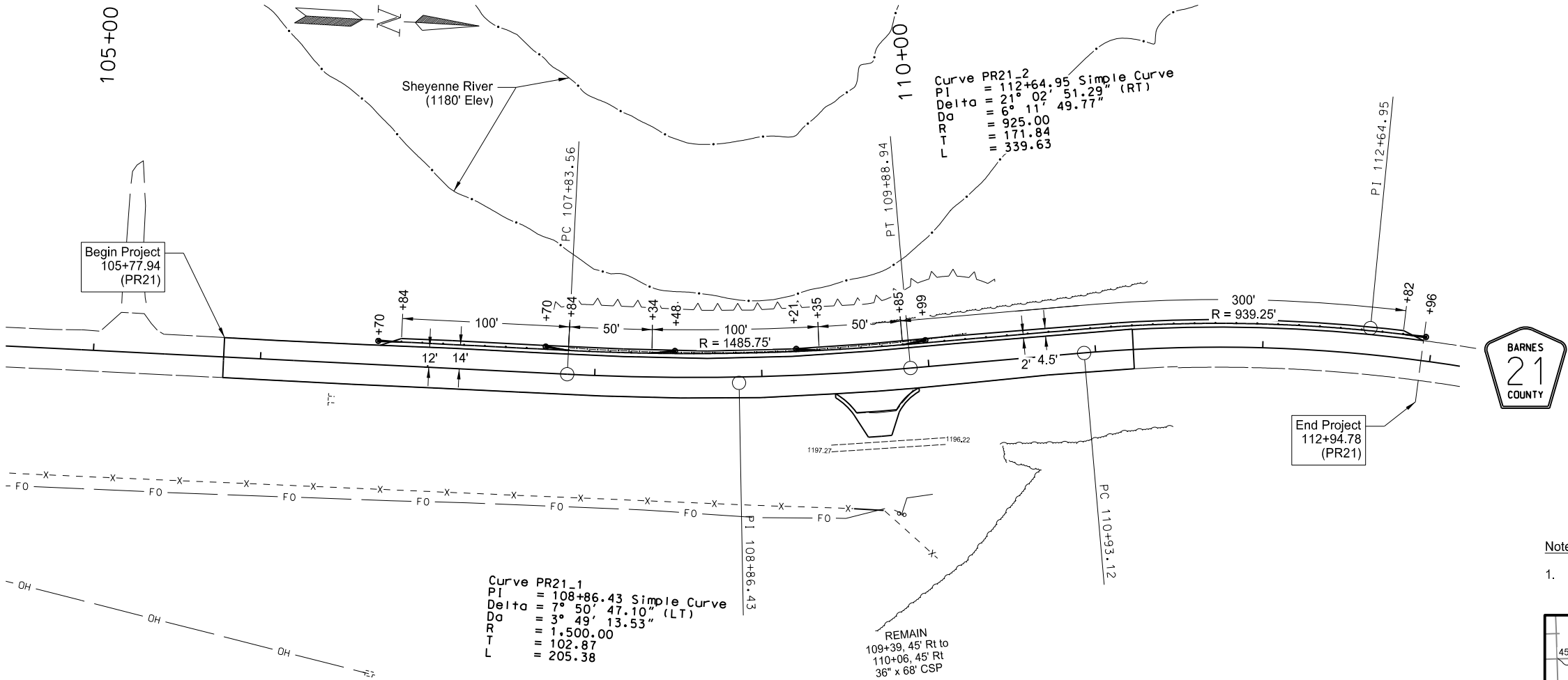
DRWN. BY  
AC

CHKD. BY  
TO

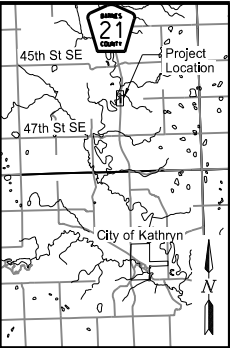
PROJECT NO.  
2003-00293

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	130	1


SPEC CODE	BID ITEM	QTY	UNIT
764 0115	3-CABLE GUARDRAIL		
	Sta 106+84 to 108+34 Lt	150	LF
	Sta 107+84 to 109+85 Lt	200	LF
	Sta 109+35 to 112+82 Lt	350	LF
		700	LF



- Notes:
- Associated dimensions to face of 3-Cable Guardrail



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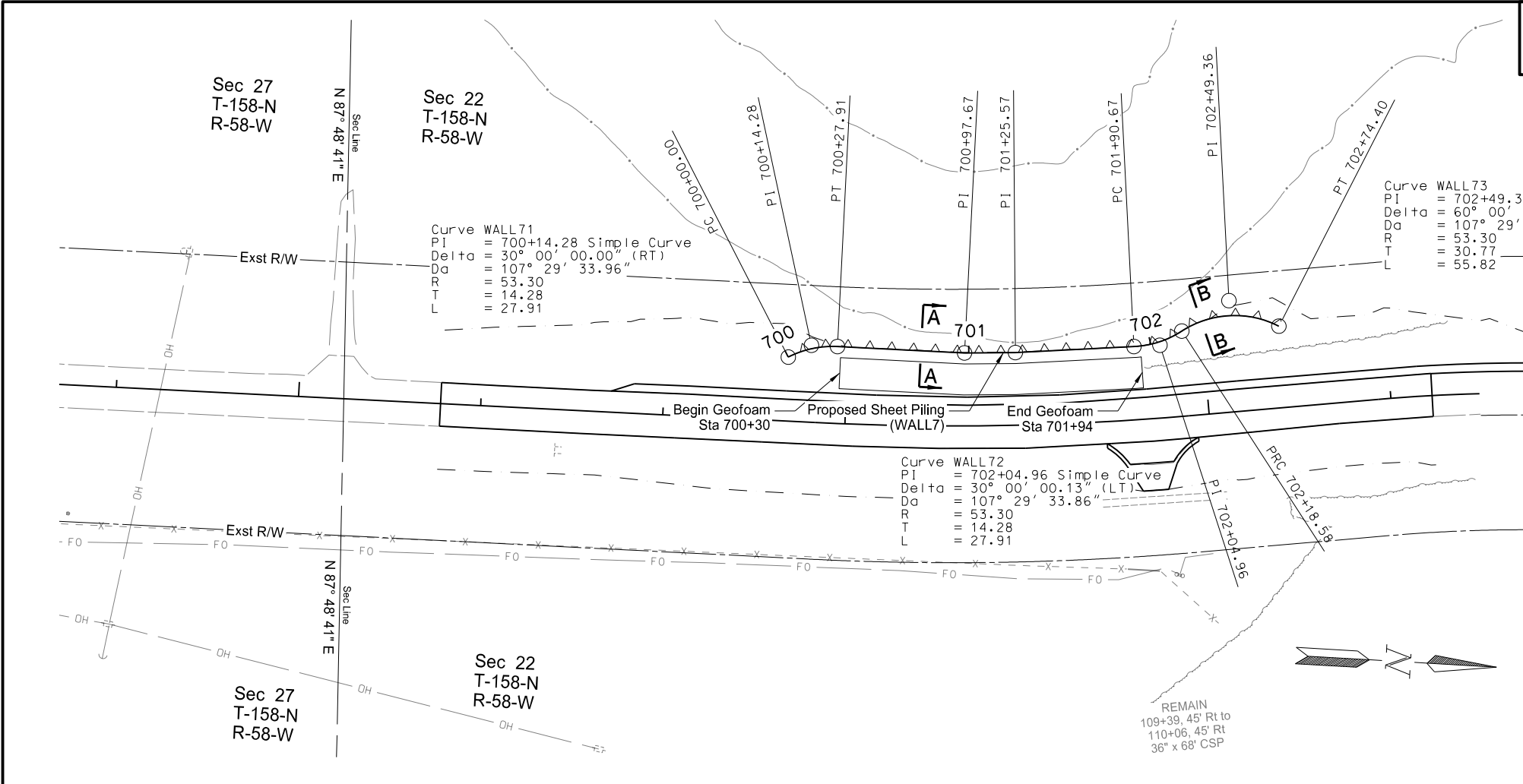
COUNTY HWY 21  
4 MILES NORTH OF KATHRYN  
BARNES COUNTY, ND

3-CABLE GUARDRAIL  
DESIGN DETAILS

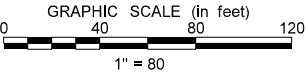
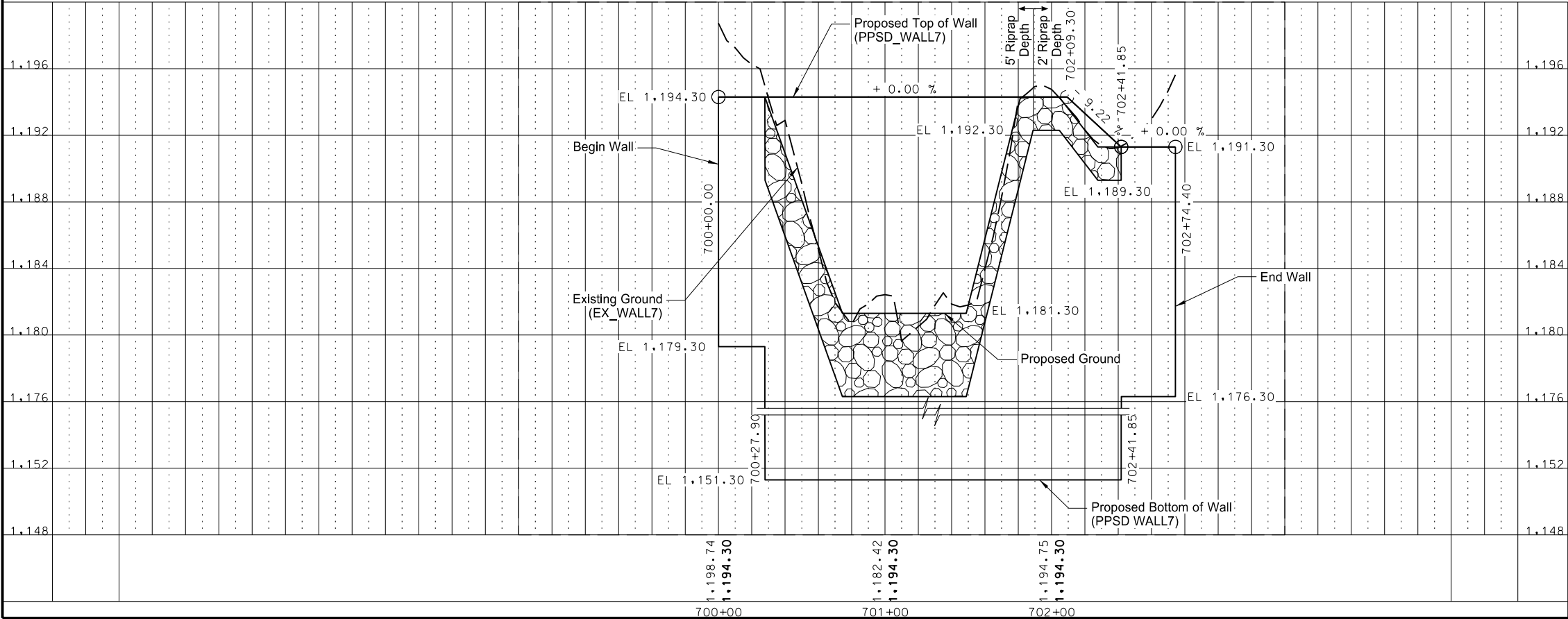
Sta 105+77.94 to 112+94.78

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	170	1



STRUCTURE VPI LOCATIONS					
Station	Offset	Northing	Easting	VPI Station	Point #
107+67.15	-35.1	404195.64	2600436.83	700+00.00 PC	WALL700
107+79.52	-42.2	404207.95	2600429.59	700+14.28 PI	WALL701
107+94.09	-42.2	404222.23	2600429.47	700+27.91 PT	WALL702
108+65.79	-40.1	404292.00	2600428.91	700+97.67	WALL703
108+94.44	-39.9	404319.84	2600427.09	701+25.57	WALL704
109+61.32	-40.2	404384.55	2600420.02	701+90.67 PC	WALL705
109+75.99	-39.9	404398.75	2600418.47	702+04.96 PI	WALL706
109+88.95	-46.6	404410.27	2600410.02	702+18.58 PRC	WALL707
110+16.13	-61.0	404435.09	2600391.83	702+49.36 PI	WALL708
110+42.22	-44.7	404463.26	2600404.23	702+74.40 PT	WALL709



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COUNTY HWY 21  
4 MILES NORTH OF KATHRYN  
BARNES COUNTY, ND



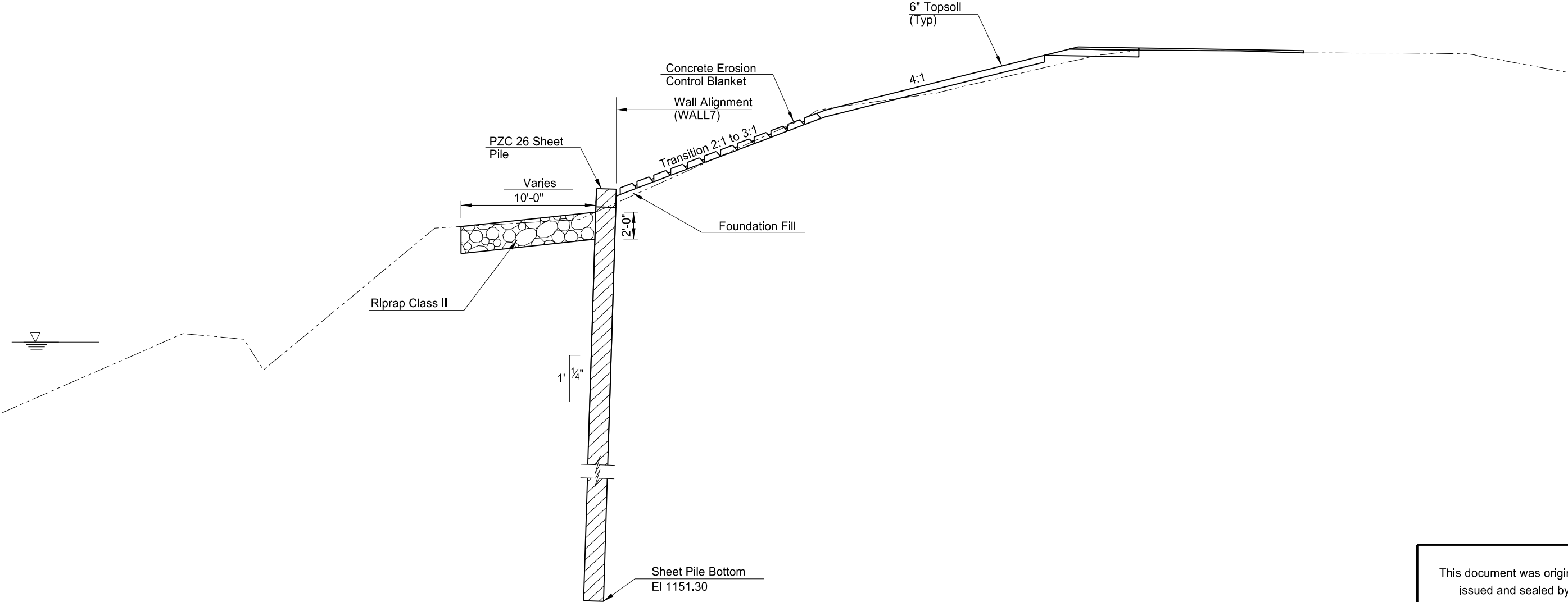
SHEET PILE  
WALL LAYOUT

DRAWN BY AC	CHKD BY MI	PROJECT NO. 2003-00293
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	170	3



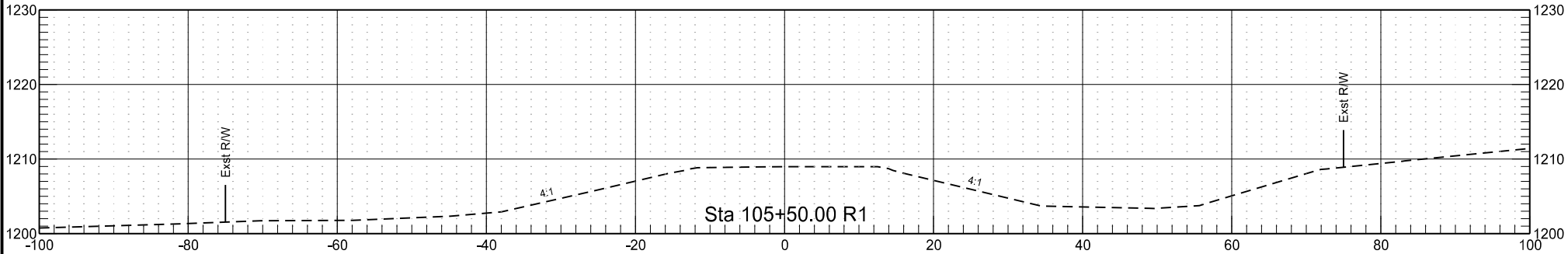
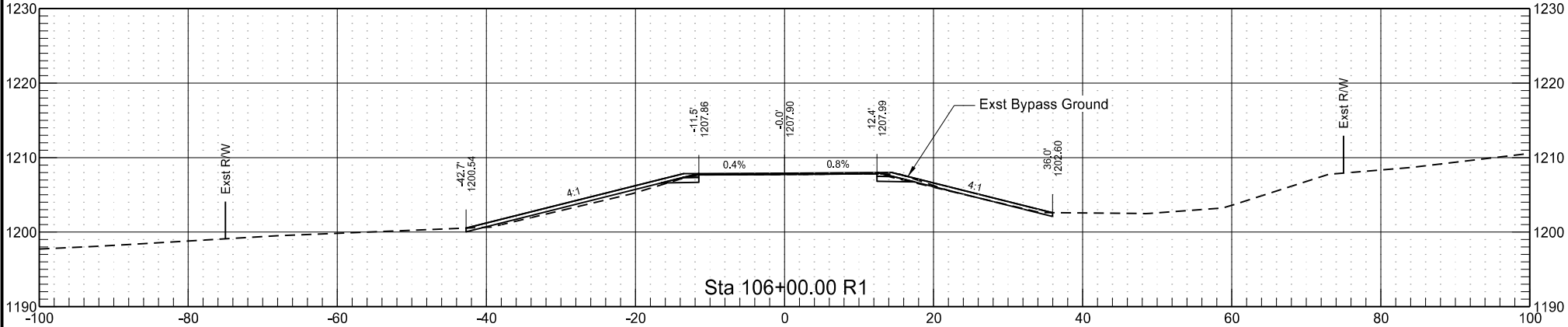
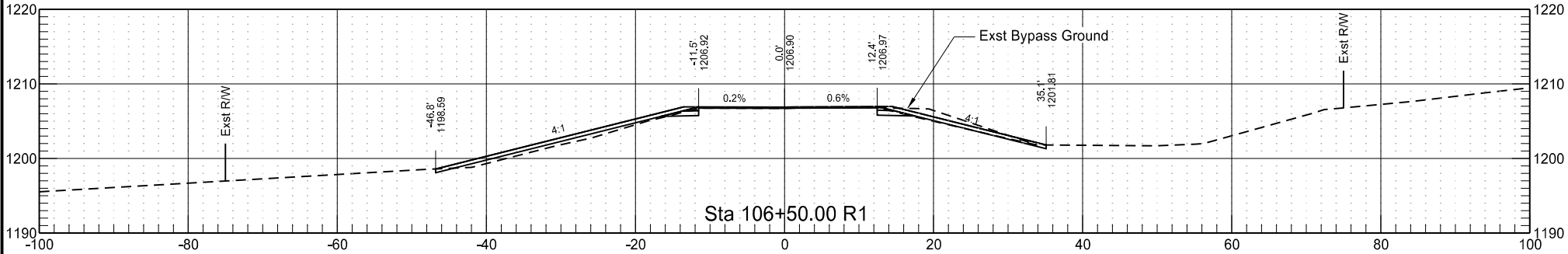
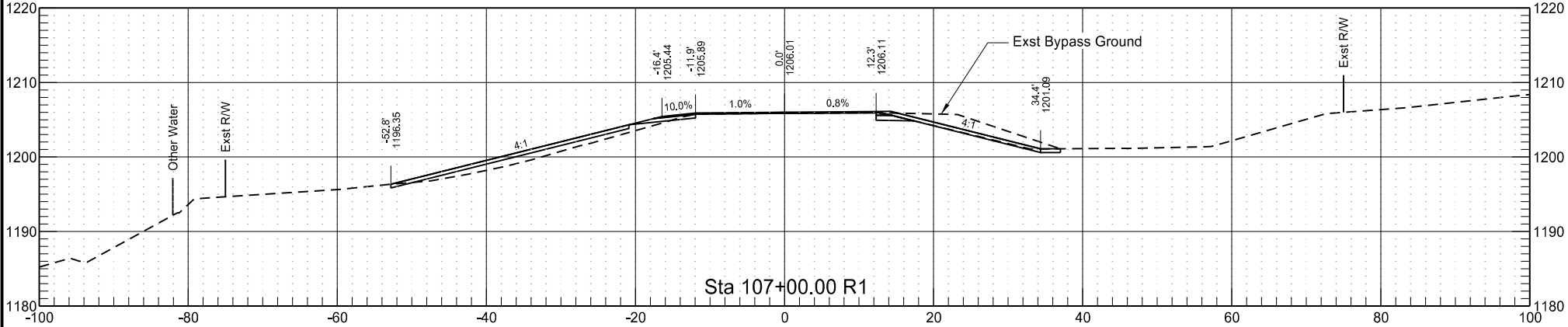
SECTION B-B  
PHASE II  
Sta 701+94.00 to 702+41.85

- Note:
- For the segment of wall from station 701+89.00 to 702+41.85 Riprap will be placed in a special typical section (2' layer) with the approximate limits shown. Transition this section to the normal riprap section as determined in the field.

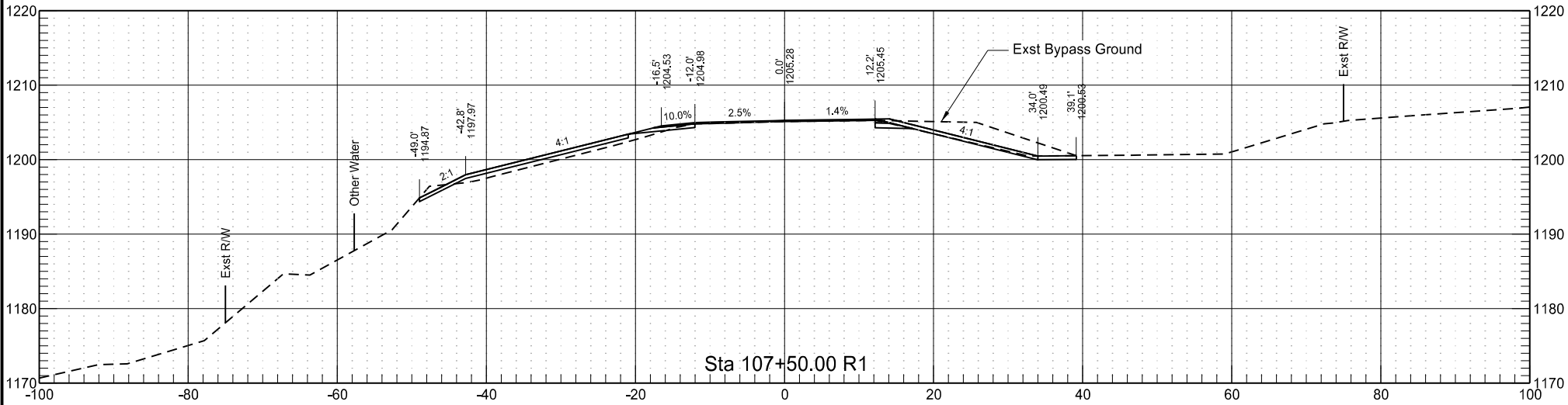
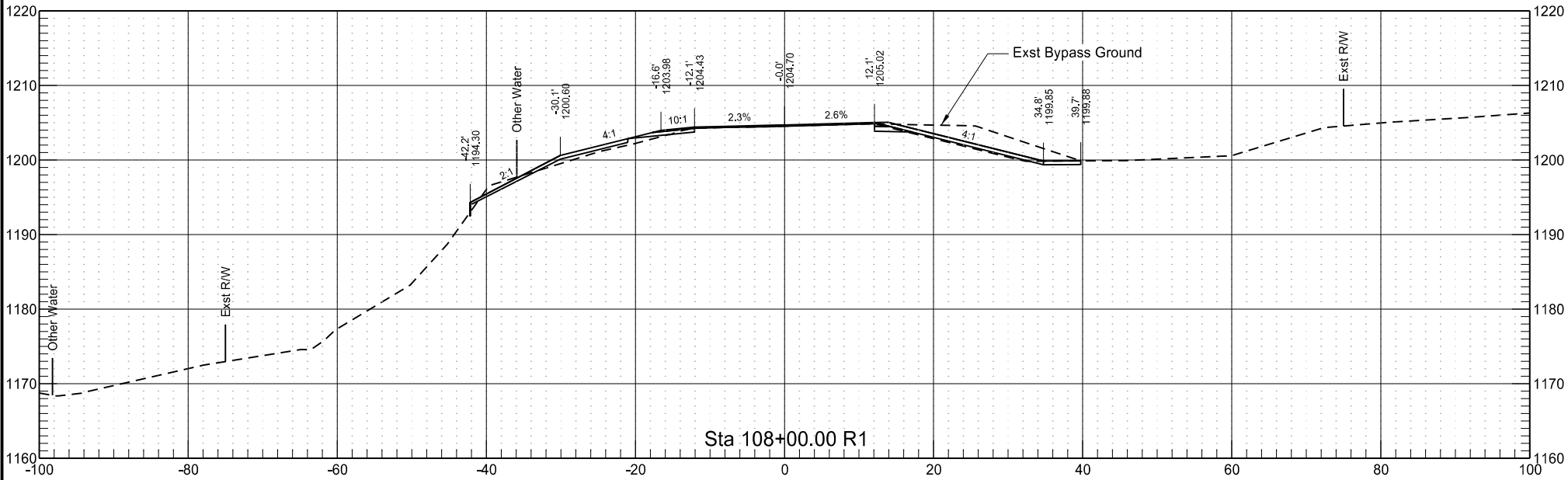
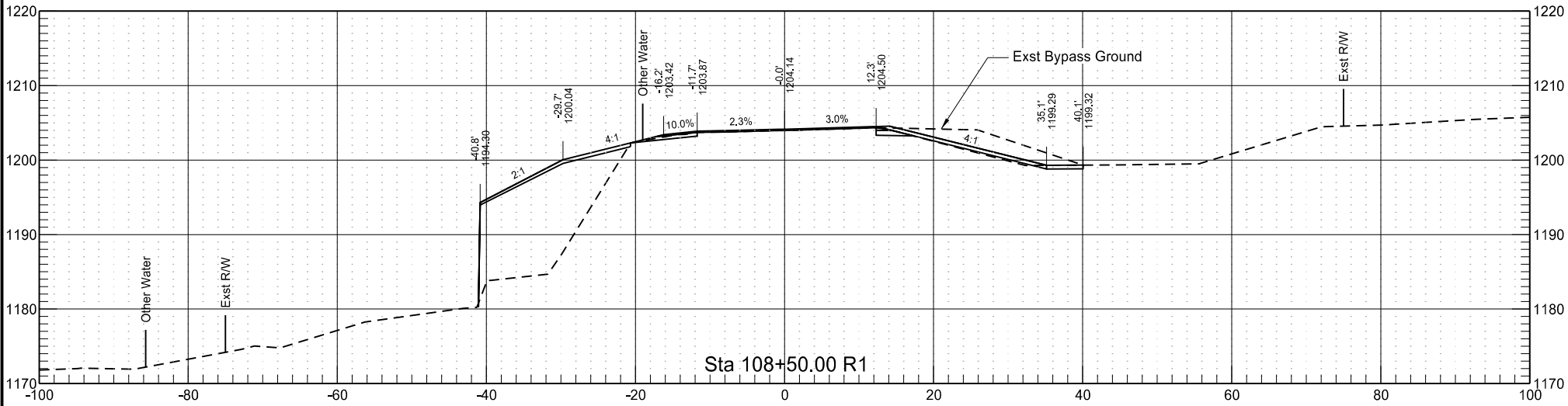
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COUNTY HWY 21 4 MILES NORTH OF KATHRYN BARNES COUNTY, ND		
	PHASE II RETAINING WALL DETAILS	
	DRWN BY DM	CHKD BY MI
		PROJECT NO. 2003-00293

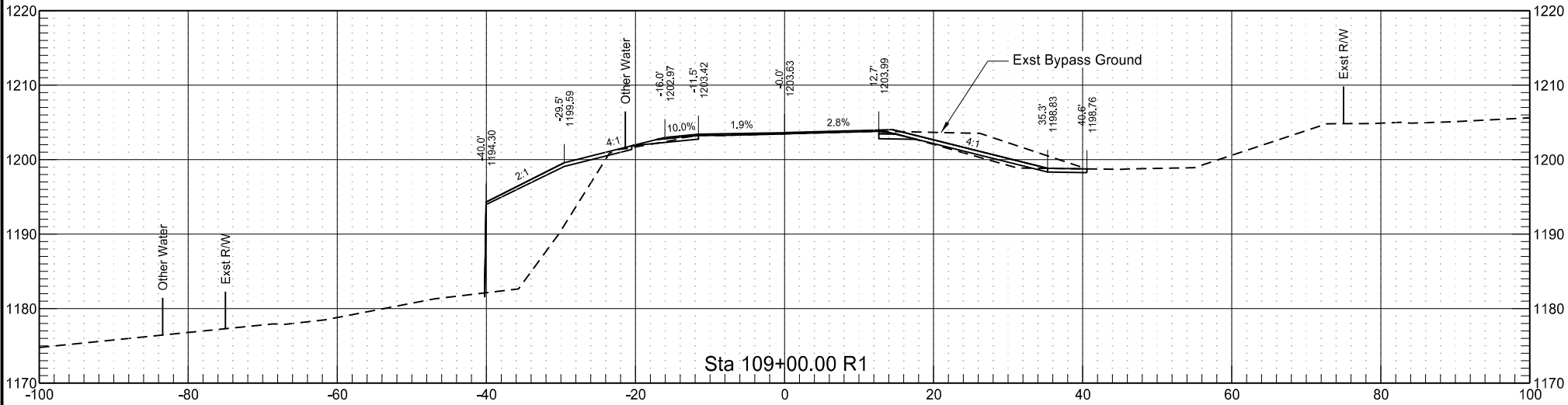
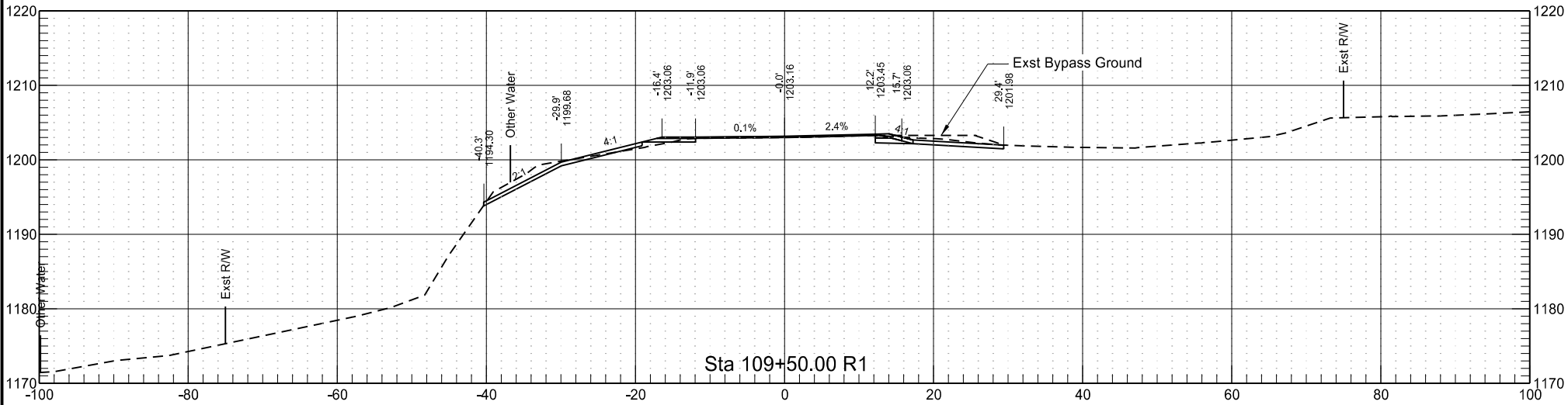
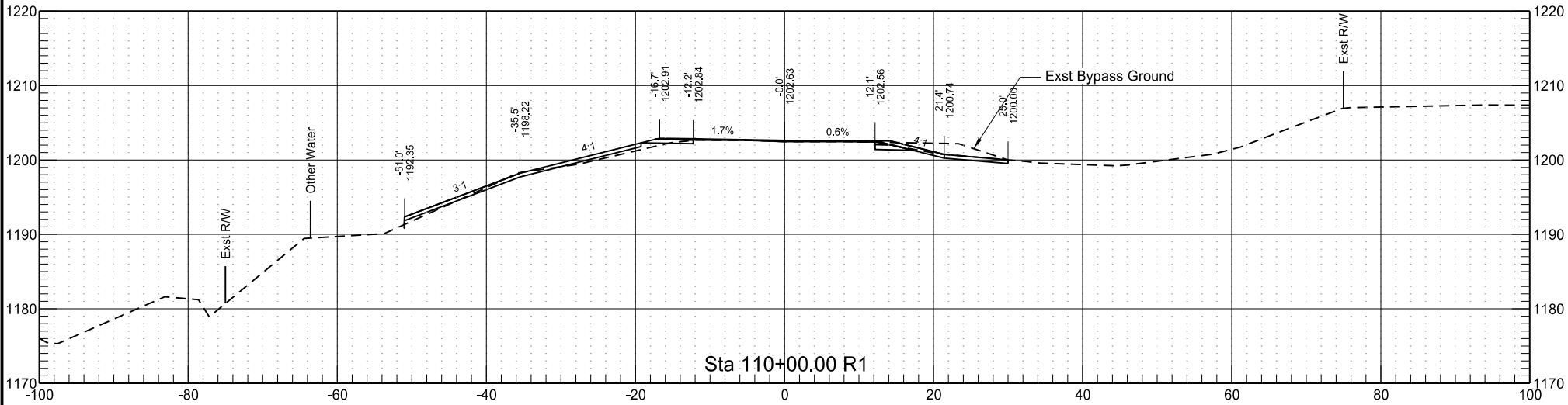
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	200	1



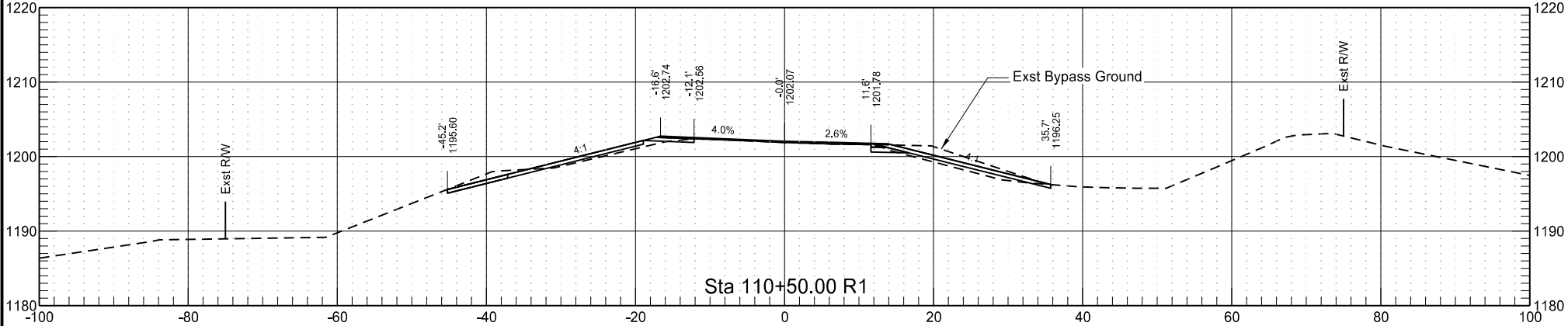
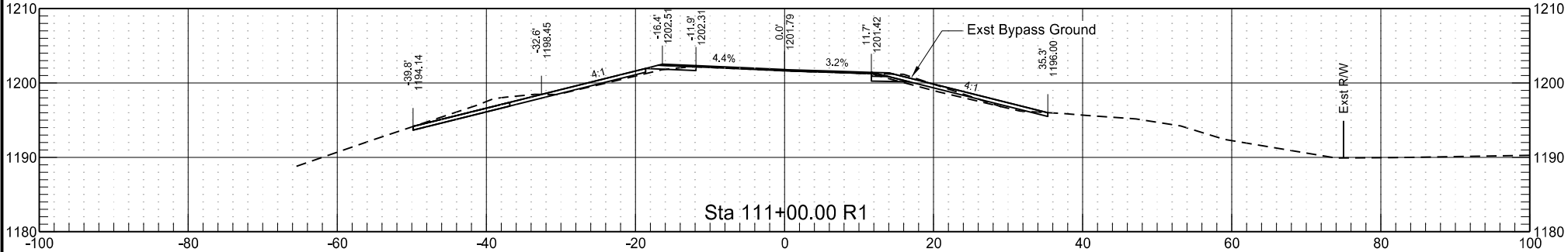
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	200	2



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	200	3



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	200	4



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	CER-0221(079)	200	5

