

DESIGN DATA				
Traffic	Average Daily			
Current 2020	Pass: 13,320	Trucks: 3,115	Total: 16,435	
Forecast 2040	Pass: 17,865	Trucks: 4,210	Total: 22,075	
Preventive Maintenance				

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

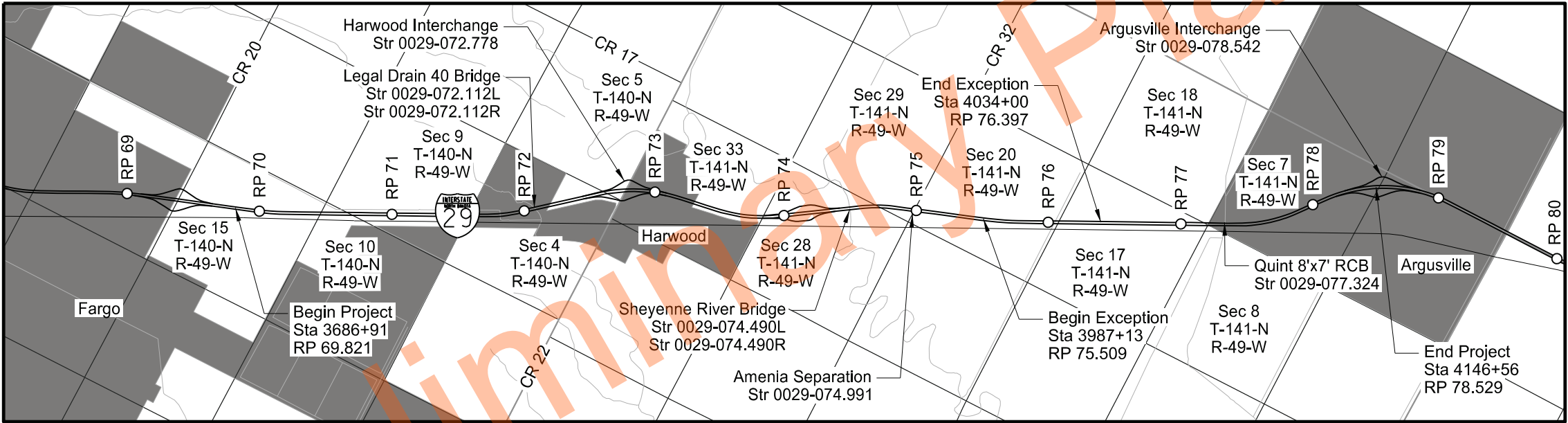
HEN-X-8-029(200)069

Cass County
Interstate 29 Median
Cass Co 20 to Argusville Interchange
High Tension Cable Median Barrier
Foreslope Flattening & Incidentals

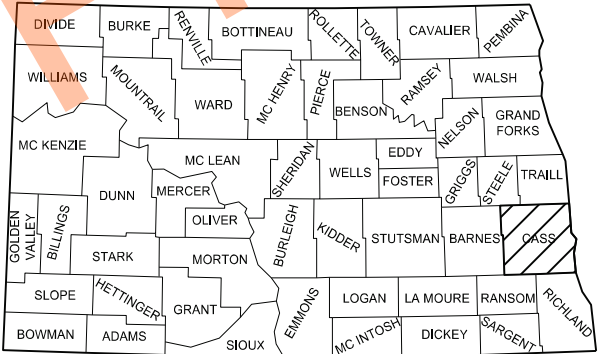
	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	HEN-X-8-029(200)069	22888	1	1

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	7/1/2024
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
HEN-X-8-029(200)069	7.818	8.705



DESIGNER Scott Middaugh, PE
DESIGNER Jeff Daley, PE
DESIGNER Frankie Halter, PE
DESIGNER Kyle Huffman, PE
DESIGNER Samantha Dvorak
DESIGNER Mason Heustis
DESIGNER Jonathon Backer



STATE COUNTY MAP

ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT

Kirk Hoff 07/23/25

KLJ

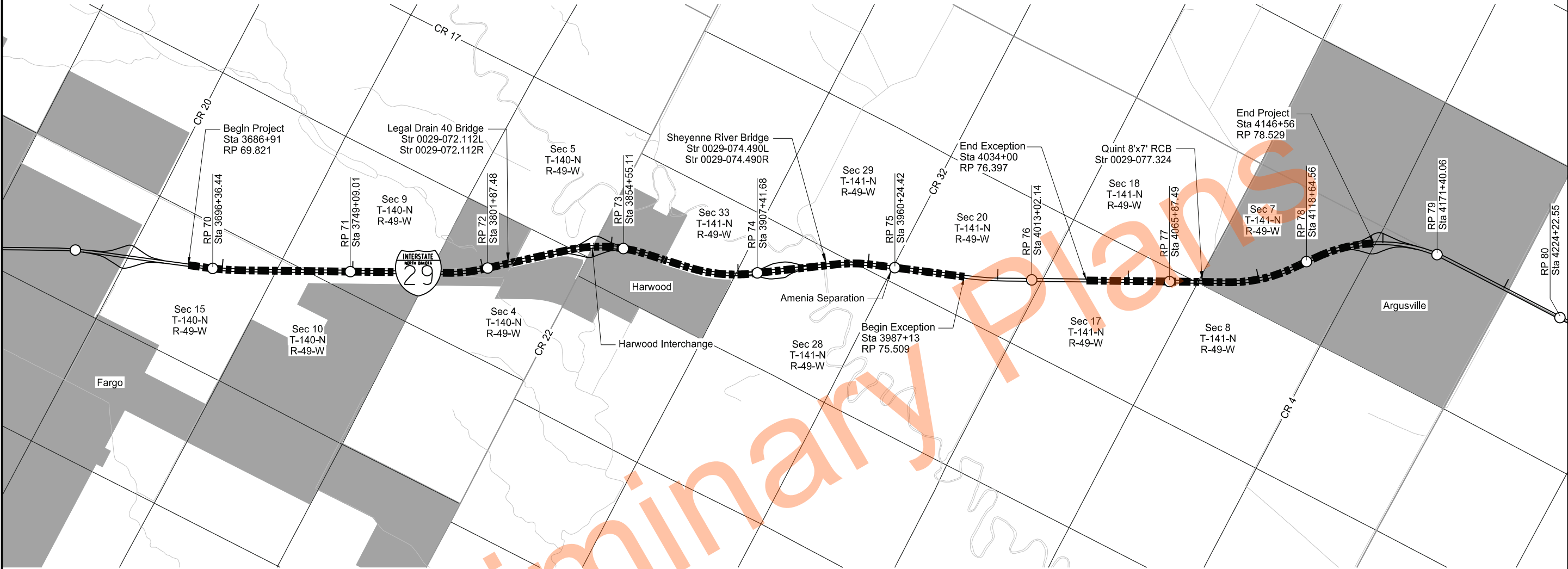
REGISTERED PROFESSIONAL ENGINEER

SCOTT MIDDAGH
PE-7499

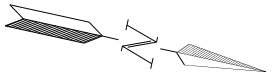
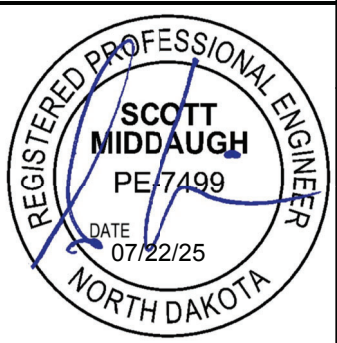
DATE 07/23/25
NORTH DAKOTA

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			D-708-6	Erosion And Siltation Controls - Median Or Ditch Inlet Protection					
SPECIAL PROVISIONS									
Number	Description								
PSP 85(24)	Permits and Environmental Considerations								
SP 532(24)	High Tension Cable Guardrail								
SP 534(24)	Utility Coordination								
SP 592(24)	Drilled Shaft Foundations for High Tension Median Guardrail								
SSP 1	Temporary Erosion and Sediment Best Management Practices								

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Preliminary



LEGEND
■ ■ ■ High Tension Cable Guardrail Installation

High Tension Cable Guardrail
Scope of Work
I-29 - Cass Co 20 to Argusville Interchange

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

GENERAL NOTES

- 100-P01COORDINATION OF PROJECTS: Other construction projects will be under contract and taking place within the highway right of way which may be in the vicinity of this project. Coordinate all activities, schedules, and traffic control with all other contractors working within the highway right of way.
- 105-P01MEDIAN MOWING: NDDOT District forces will mow the median within the project limits one time during construction. Provide the Engineer two weeks' notice for the mowing.

The median cannot be mowed by anyone other than NDDOT staff unless approved in writing by the Engineer.
- 203-010SHRINKAGE: 25 percent additional volume is included for shrinkage in earth embankment.
- 203-P01EMBANKMENT: Flatten the median inslopes as shown in the plans. Use Compaction Control Type B for the embankment material (embankment, borrow, or imported topsoil) used for the median inslope flattening.

Include all costs to flatten the median inslopes in the price bid for "Borrow-Excavation", and "Topsoil-Imported".
- 203-P02ADDITIONAL DAMAGE: If additional damage is incurred to topsoil, seed and mulch areas at the Contractor's expense.

SECTION 100

- 704-P01HIGH TENSION CABLE BARRIER TRAFFIC CONTROL: Provide traffic control according to the following layouts on the Standard Drawings for traffic control:

D-704-24 Type HH, left shoulder closed: For use on left shoulder on the opposite side of median where guardrail work is being performed and for use on left shoulder adjacent to work area where no guardrail work is being performed the following day. Use tubular markers in place of portable barriers. One 2-mile shoulder closure (2-miles in one direction) was provided so that work can progress at a constant pace.

D-704-35, left lane closed: For use on lane adjacent to work area when guardrail work is being performed. One 2-mile lane closure (2-miles in one direction) was provided so that work can progress at a constant pace.

Lane closure and shoulder closure traffic control device quantities are limited to an 10,000-foot work zone. 4-mile closures (2-miles in each direction) were provided so that work can progress at a constant pace.

Change adjacent lane closure to shoulder closure at the end of the workday if no guardrail work is scheduled for the following day.

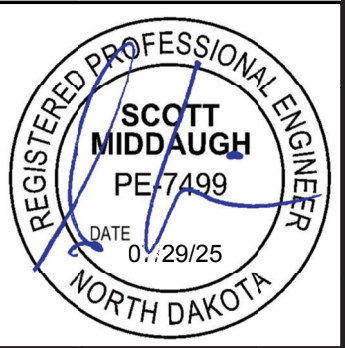
- 704-P02TRAFFIC CONTROL FOR DIRT WORK IN THE MEDIAN: Provide traffic control according to the following layouts on the Standard Drawings for traffic control:

D-704-24 Type HH, left shoulders closed: For use on adjacent shoulders of median where no dirt work is being performed the following day. Use tubular markers in place of portable barriers.

D-704-35, left lanes closed: For use on lanes adjacent to the work area when dirt work is being performed in the median.

Lane closure and shoulder closure traffic control device quantities are limited to one day's production. For estimating purposes, the traffic control device list is based on a 1-mile closure (1/2-mile closure in each direction).

Change adjacent lane closures to shoulder closures at the end of the workday if no median work is scheduled for the following day.



Estimated Quantities

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HEN-X-8-029(200)069	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITIES	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
203	0109	TOPSOIL	CY	559	559
203	0119	TOPSOIL-IMPORTED	CY	1006	1006
203	0140	BORROW-EXCAVATION	CY	329	329
251	0200	SEEDING CLASS II	ACRE	6.55	6.55
251	2000	TEMPORARY COVER CROP	ACRE	6.55	6.55
253	0101	STRAW MULCH	ACRE	13.1	13.1
261	0112	FIBER ROLLS 12IN	LF	640	640
261	0113	REMOVE FIBER ROLLS 12IN	LF	320	320
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	275	275
704	1000	TRAFFIC CONTROL SIGNS	UNIT	2436	2436
704	1052	TYPE III BARRICADE	EA	2	2
704	1060	DELINEATOR DRUMS	EA	78	78
704	1067	TUBULAR MARKERS	EA	225	225
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	2	2
764	0100	HIGH TENSION CABLE GUARDRAIL	LF	39157	39157
764	0105	HIGH TENSION CABLE ANCHOR ASSEMBLY	EA	22	22

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HEN-X-8-029(200)069	10	1

HEN-X-8-029(200)069								
LOCATION	TYPE OF WORK		EARTHWORK SUMMARY				TOPSOIL	TOPSOIL
			Excavation	Embankment ①	203 0140 BORROW-EXCAVATION		203 0109 TOPSOIL	203 0119 TOPSOIL - IMPORTED
			(CY)	(CY)	(CY)		(CY)	(CY)
			A	B	C = B - A		D	E
Cass County								
Sta 3782+00 to Sta 3786+73 (OCL29_CASS)	Inslope Flattening		-	-	-		-	24
Sta 3785+52 to Sta 3805+57 (OCL29_CASS)	Median Ditch Reshaping		-	-	-		6	85
Sta 3813+00 to Sta 3821+00 (OCL29_CASS)	Inslope Flattening		-	-	-		-	36
Sta 3868+00 to Sta 3878+00 (OCL29_CASS)	Inslope Flattening		-	-	-		-	79
Sta 3877+00 to Sta 3905+02 (OCL29_CASS)	Median Ditch Reshaping		-	-	-		27	119
Sta 3904+85 to Sta 3911+00 (OCL29_CASS)	Inslope Flattening		-	-	-		-	18
Sta 3939+00 to Sta 3943+00 (OCL29_CASS)	Inslope Flattening		-	-	-		-	48
Sta 3947+50 to Sta 3958+00 (OCL29_CASS)	Inslope Flattening		-	-	-		-	170
Sta 3960+50 to Sta 3966+00 (OCL29_CASS)	Inslope Flattening		-	138	138		231	-
Sta 3984+50 to Sta 3987+13 (OCL29_CASS)	Inslope Flattening		-	-	-		-	34
Sta 4033+85 to Sta 4039+00 (OCL29_CASS)	Inslope Flattening		-	191	191		276	-
Sta 4051+50 to Sta 4060+00 (OCL29_CASS)	Inslope Flattening		-	-	-		14	134
Sta 4071+50 to Sta 4081+00 (OCL29_CASS)	Inslope Flattening		-	-	-		2	136
Sta 4083+11 to Sta 4113+69 (OCL29_CASS)	Median Ditch Reshaping		-	-	-		3	123
Total =			-	329	329	559	1,006	

Notes:
① Additional 25% volume included for shrinkage.

Guardrail Runs							
Segment	RP		Station		Location	764 0100 HIGH TENSION CABLE GUARDRAIL	764 0105 HIGH TENSION CABLE ANCHOR ASSEMBLY
	Start	Stop	Start	Stop		(LF) ②	(EA)
A	69.843	71.707	3687+21	3786+43	LT	9,920	2
B	71.696	72.067	3785+82	3805+42	CL	1,961	2
C	72.218	72.762	3813+36	3842+03	LT	2,871	2
D	72.804	73.504	3844+22	3881+17	LT	3,702	2
E	73.492	73.949	3880+56	3904+72	CL	2,416	2
F	73.958	74.455	3905+19	3931+46	LT	2,627	2
G	74.593	74.973	3938+76	3958+83	LT	2,012	2
H	75.011	75.504	3960+83	3986+83	LT	2,600	2
I	76.403	77.311	4034+30	4082+31	LT	4,801	2
J	77.332	77.900	4083+41	4113+39	CL	2,998	2
K	77.909	78.524	4113+86	4146+27	LT	3,249	2
Total =						39,157	22

Notes:
② Guardrail quantity measured along the guardrail, not along the alignment.

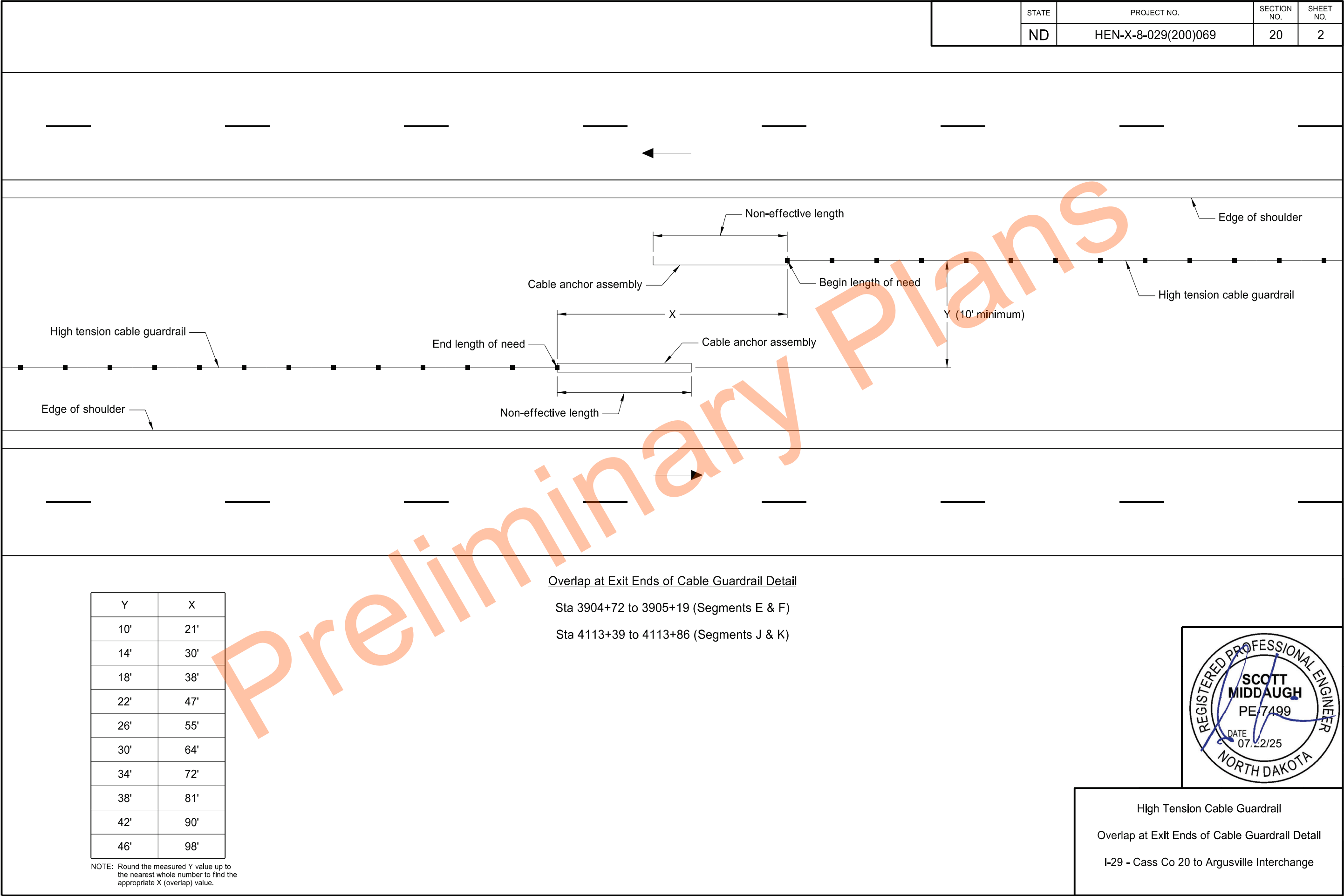
* WATER			
Material	Basis	Basis Quantity	Quantity (MGAL)
Embankment	10 Gal/CY	329	4
Total =			4

* Not a pay item. To be included in the unit bid price for "BORROW-EXCAVATION".

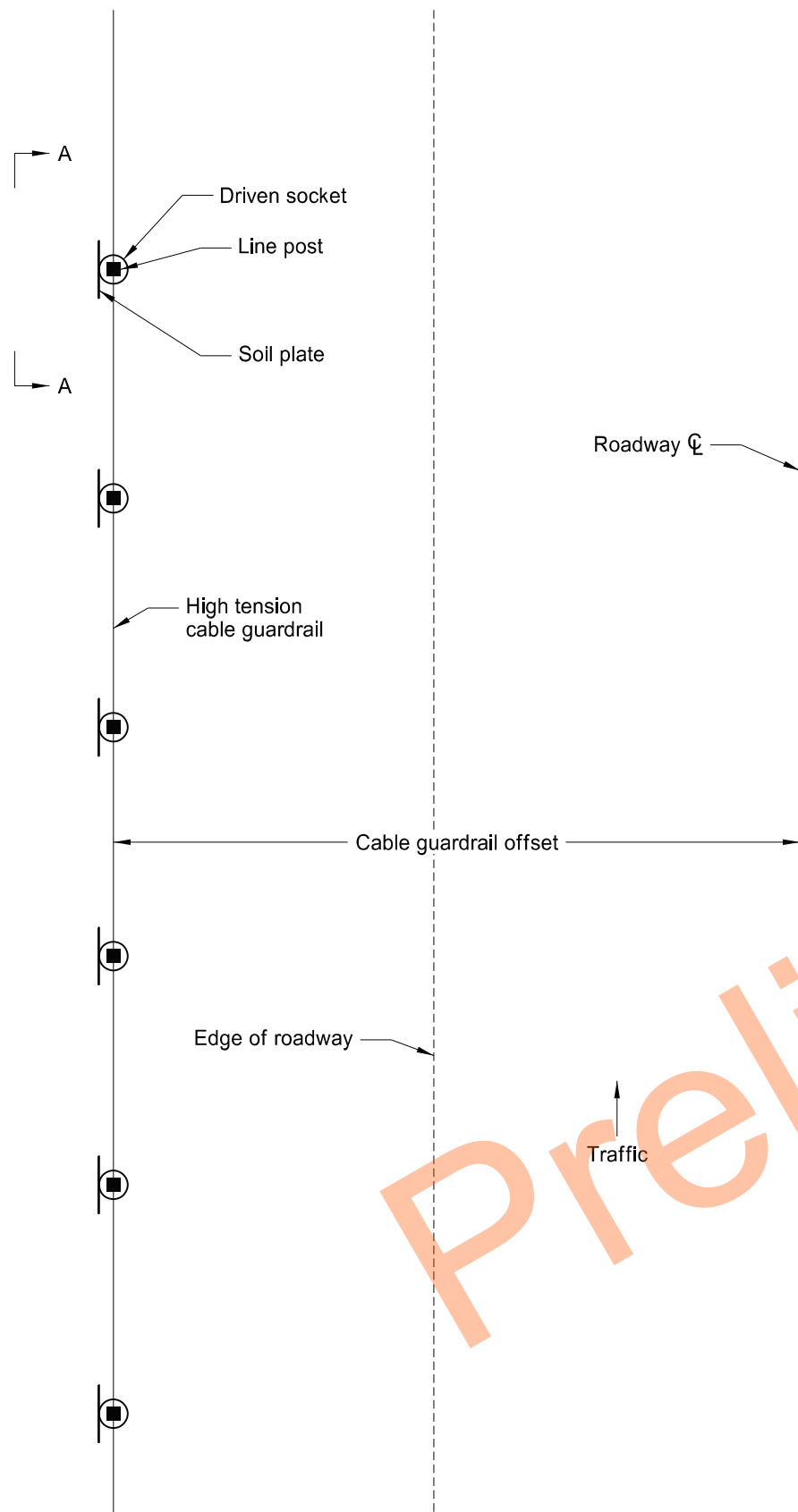
SPEC CODE	BID ITEM	QTY	UNIT
203 0109	TOPSOIL Topsoil	559	CY
203 0119	TOPSOIL-IMPORTED Topsoil	1,006	CY
203 0140	BORROW-EXCAVATION Earthwork Summary	329	CY
764 0100	HIGH TENSION CABLE GUARDRAIL Guardrail Runs	39,157	LF
764 0105	HIGH TENSION CABLE ANCHOR ASSEMBLY Guardrail Runs	22	EA



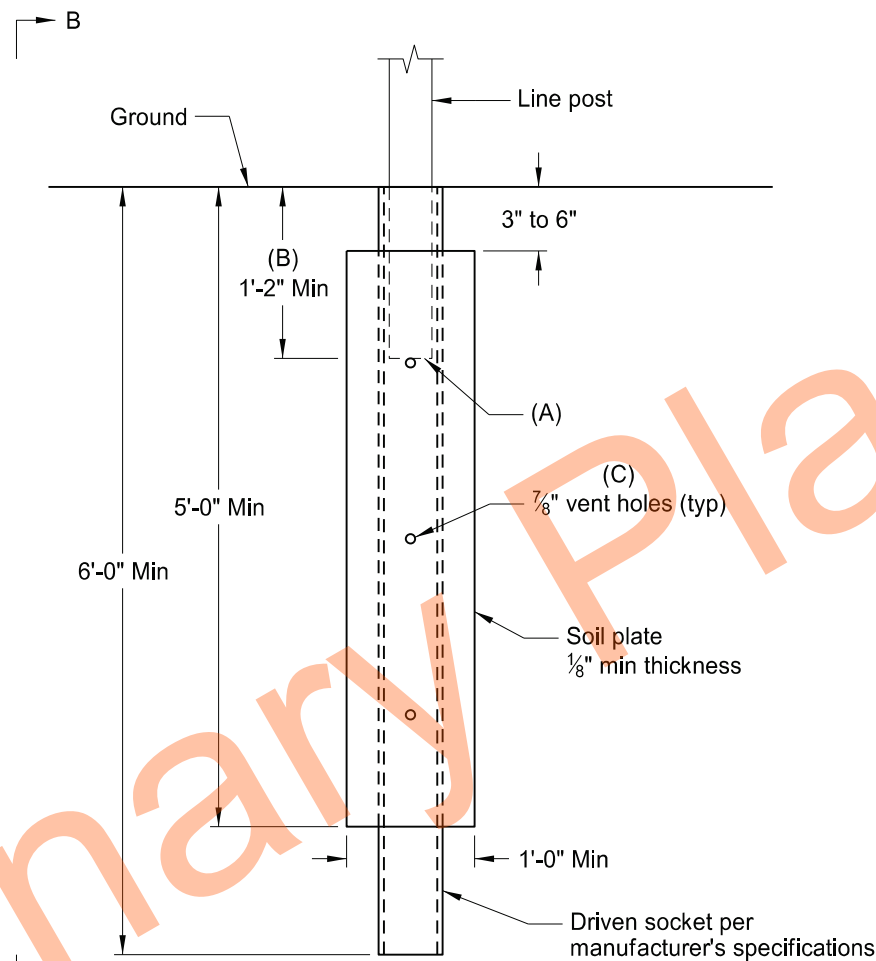
High Tension Cable Guardrail
Basis of Estimate
I-29 - Cass Co 20 to Argusville Interchange



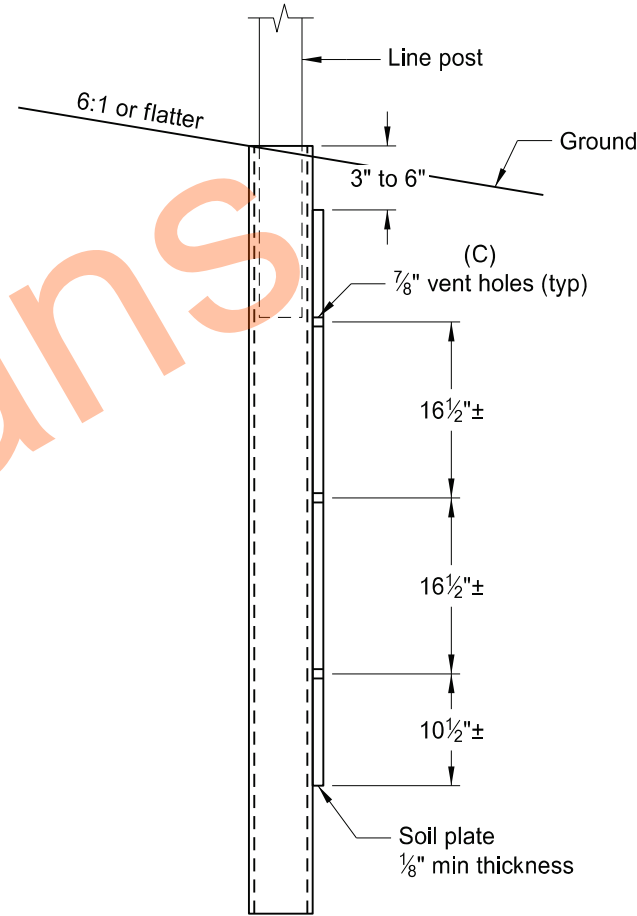
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PLAN VIEW



SECTION A-A



SECTION B-B

DESIGN REQUIREMENTS:

1. Design socket for a maximum deflection of 1" at ground level.
2. Sockets to have a yield strength equal to or greater than that of the crash tested line posts.
3. Design socket for line posts to yield above ground.

NOTES:

- (A) Provide post stop per manufacturer's recommendation.
- (B) Line post depth as per manufacturer's specifications.
- (C) Provide three 7/8" diameter vent holes for galvanizing. Upper hole may be used for post stop. Vent holes are optional per manufacturer's recommendation.

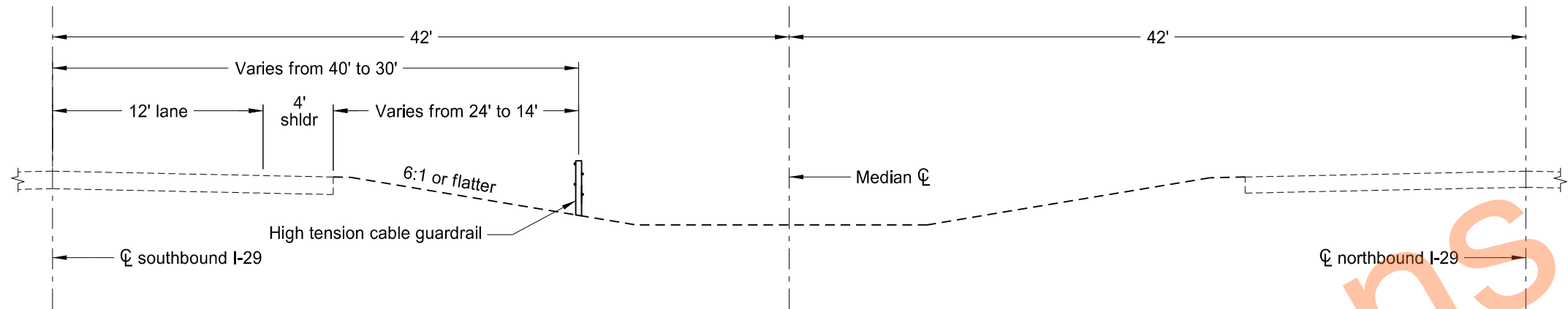


High Tension Cable Guardrail

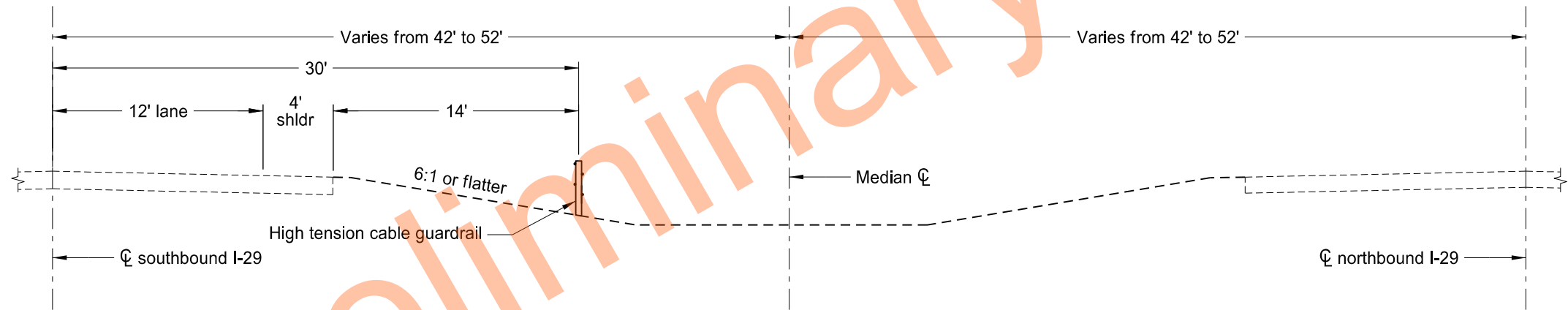
Steel Driven Socket Detail

I-29 - Cass Co 20 to Argusville Interchange

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HEN-X-8-029(200)069	30	1



Section A - A
Sta 3687+21 to 3690+71

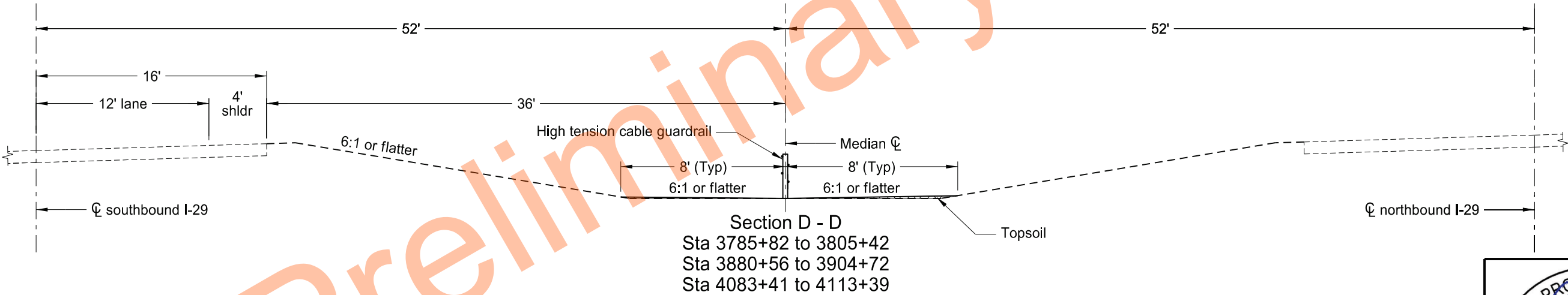
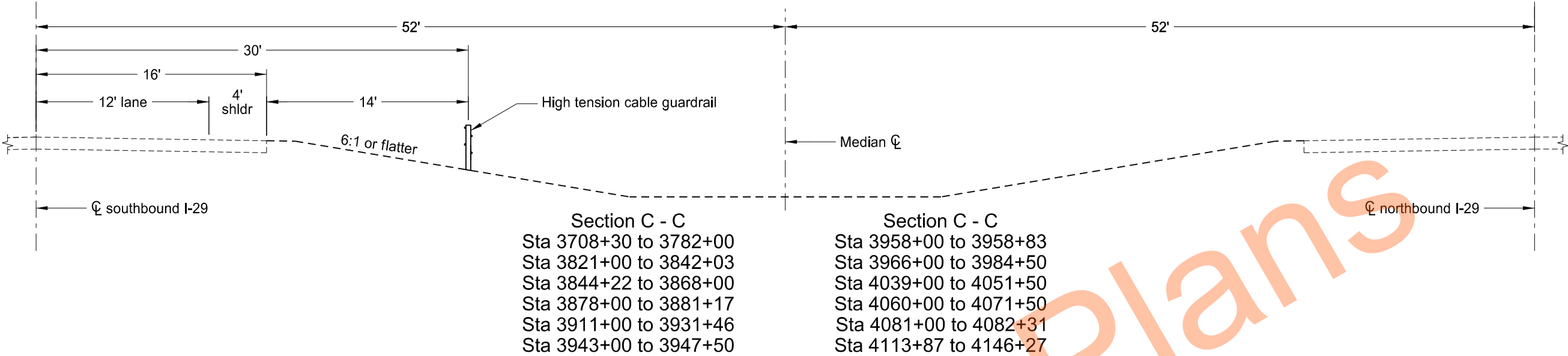


Section B - B
Sta 3690+71 to 3708+30



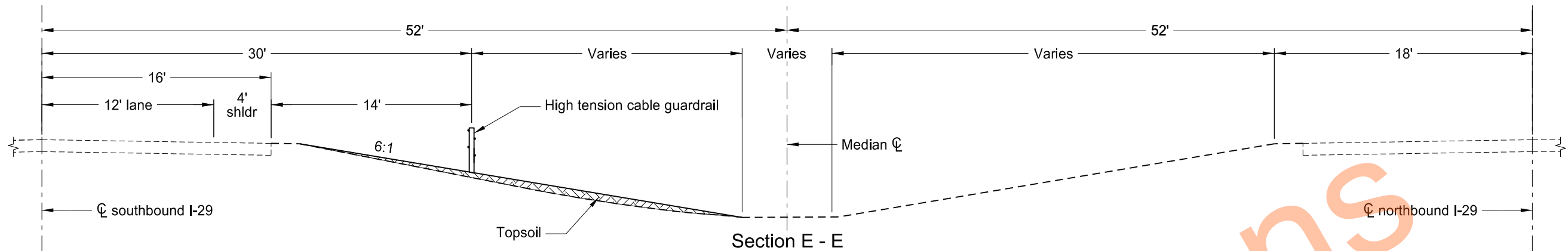
High Tension Cable Guardrail
Proposed Typical Sections
I-29 - Cass Co 20 to Argusville Interchange

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	30	2

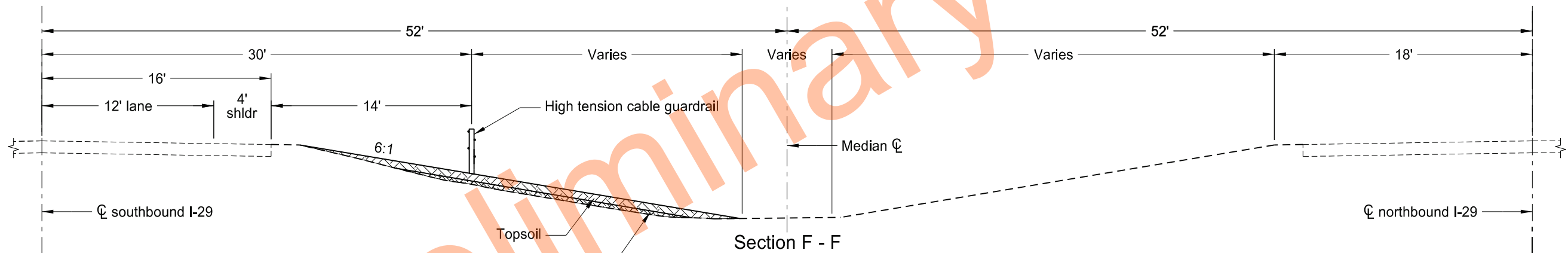


High Tension Cable Guardrail
Proposed Typical Sections
I-29 - Cass Co 20 to Argusville Interchange

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	30	3



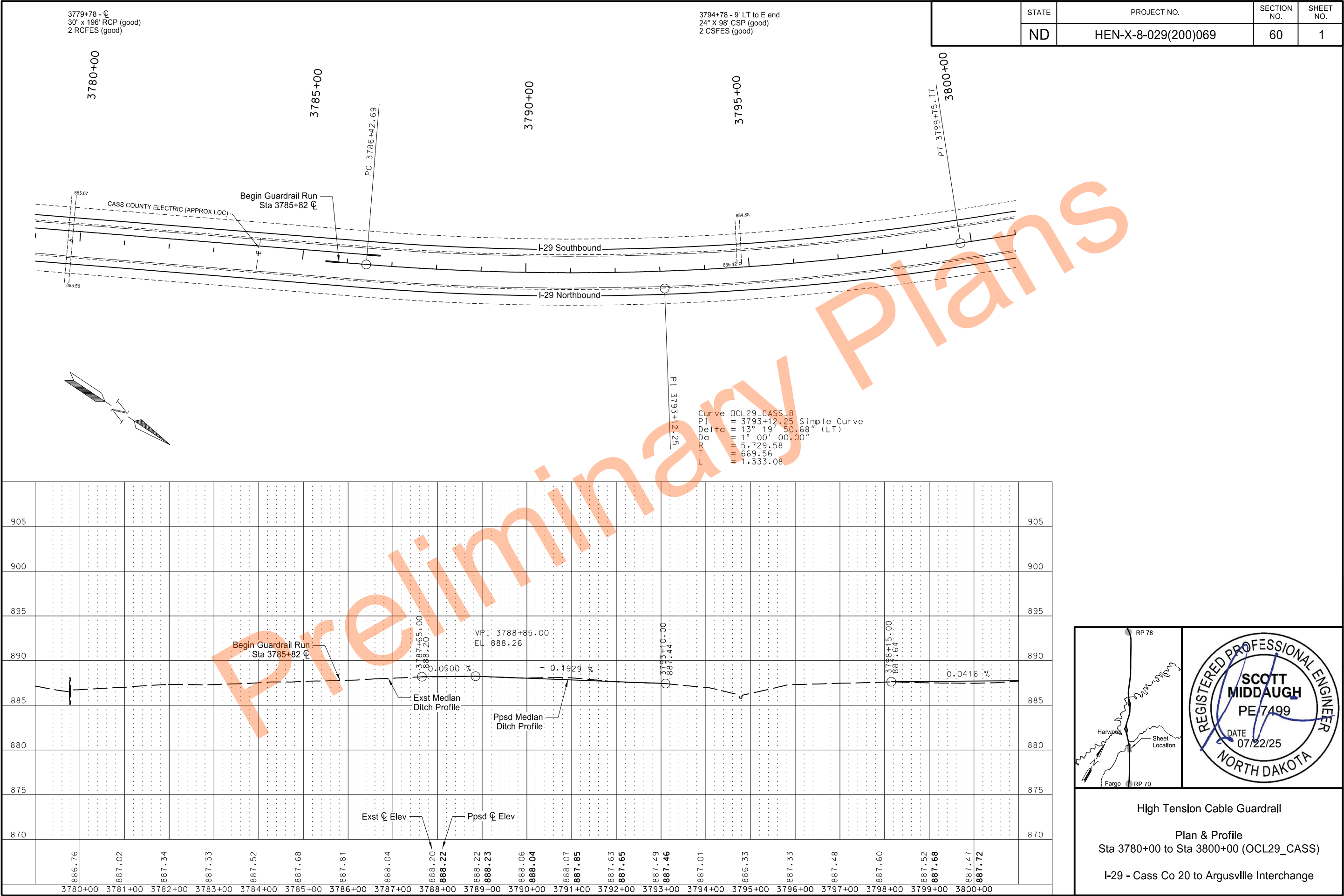
Section E - E
Sta 3782+00 to 3786+43
Sta 3813+36 to 3821+00
Sta 3905+19 to 3911+00
Sta 3938+76 to 3943+00
Sta 3947+50 to 3958+00
Sta 3984+50 to 3986+83
Sta 4051+50 to 4060+00
Sta 4071+50 to 4081+00



Section F - F
Sta 3868+00 to 3878+00
Sta 3960+83 to 3966+00
Sta 4034+30 to 4039+00



High Tension Cable Guardrail
Proposed Typical Sections
I-29 - Cass Co 20 to Argusville Interchange



RP 78

Harwood

Fargo

RP 70

Sheet Location

REGISTERED PROFESSIONAL ENGINEER

SCOTT MIDDAGH

PE 7499

DATE 07/22/25

NORTH DAKOTA

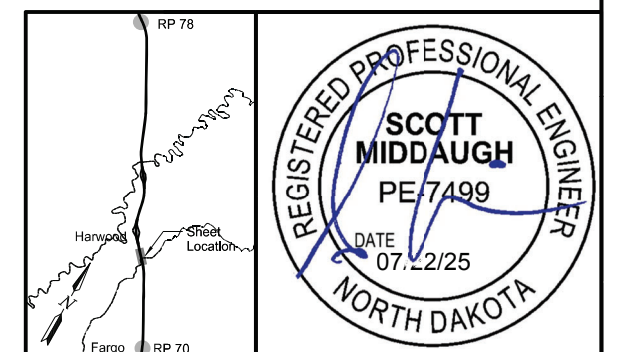
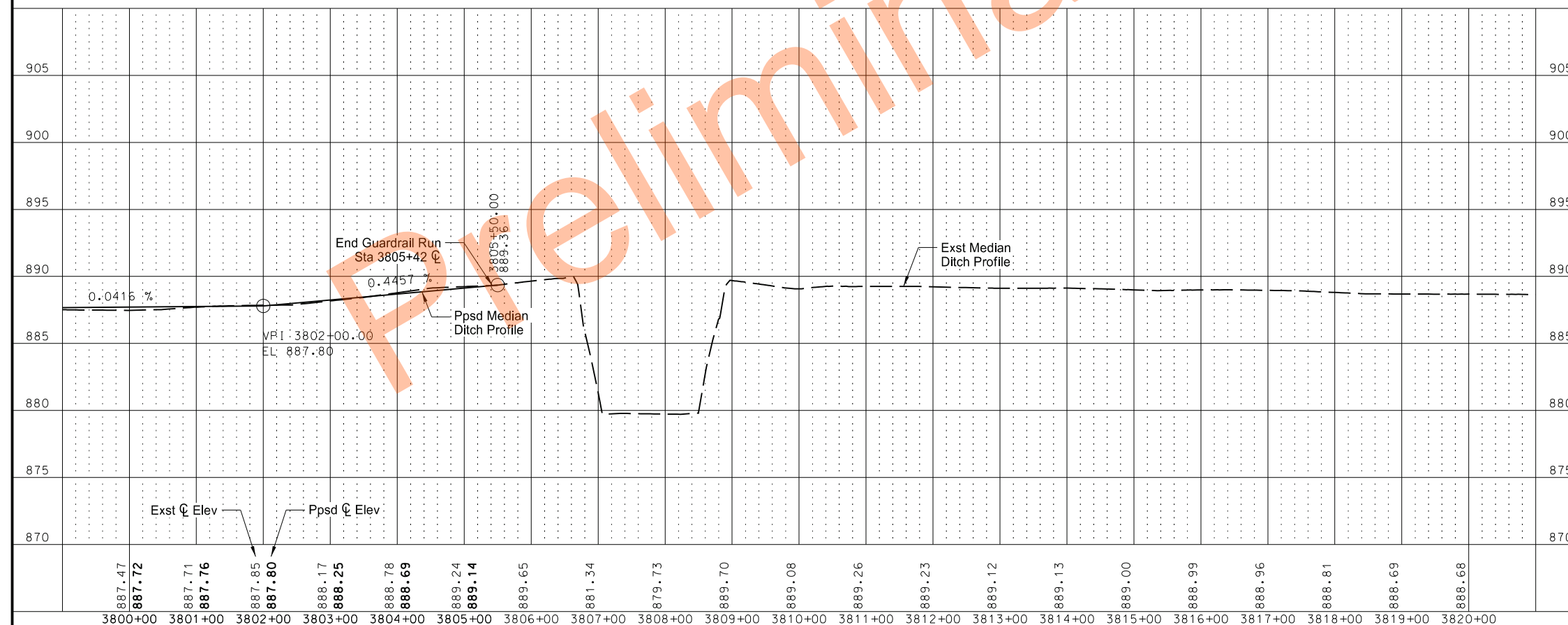
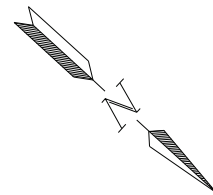
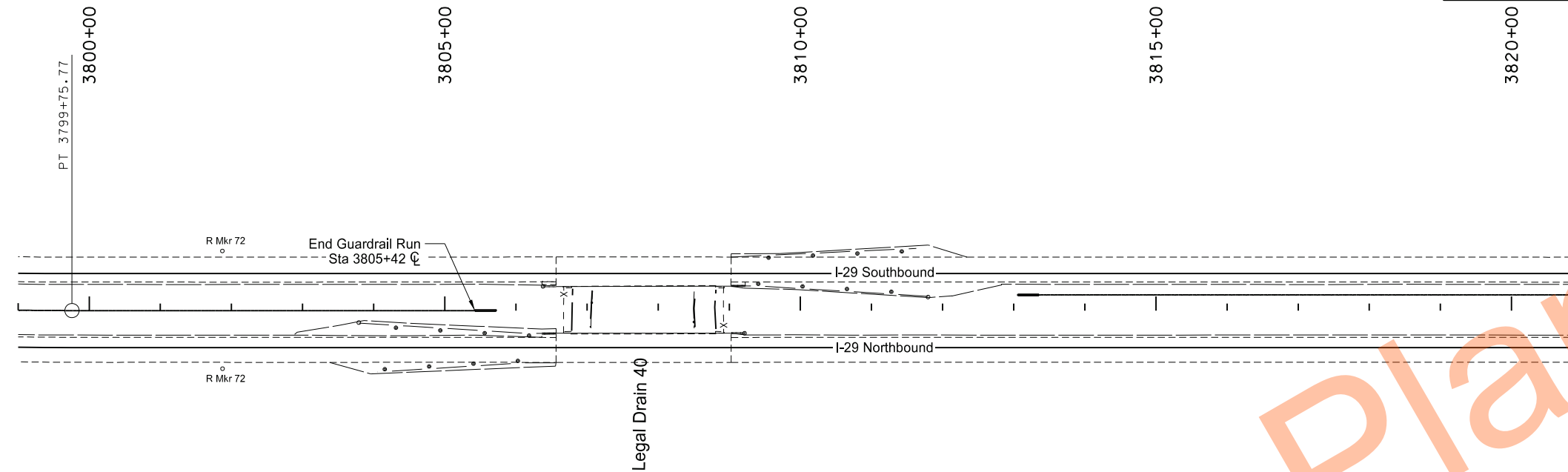
High Tension Cable Guardrail

Plan & Profile

Sta 3780+00 to Sta 3800+00 (OCL29_CASS)

I-29 - Cass Co 20 to Argusville Interchange

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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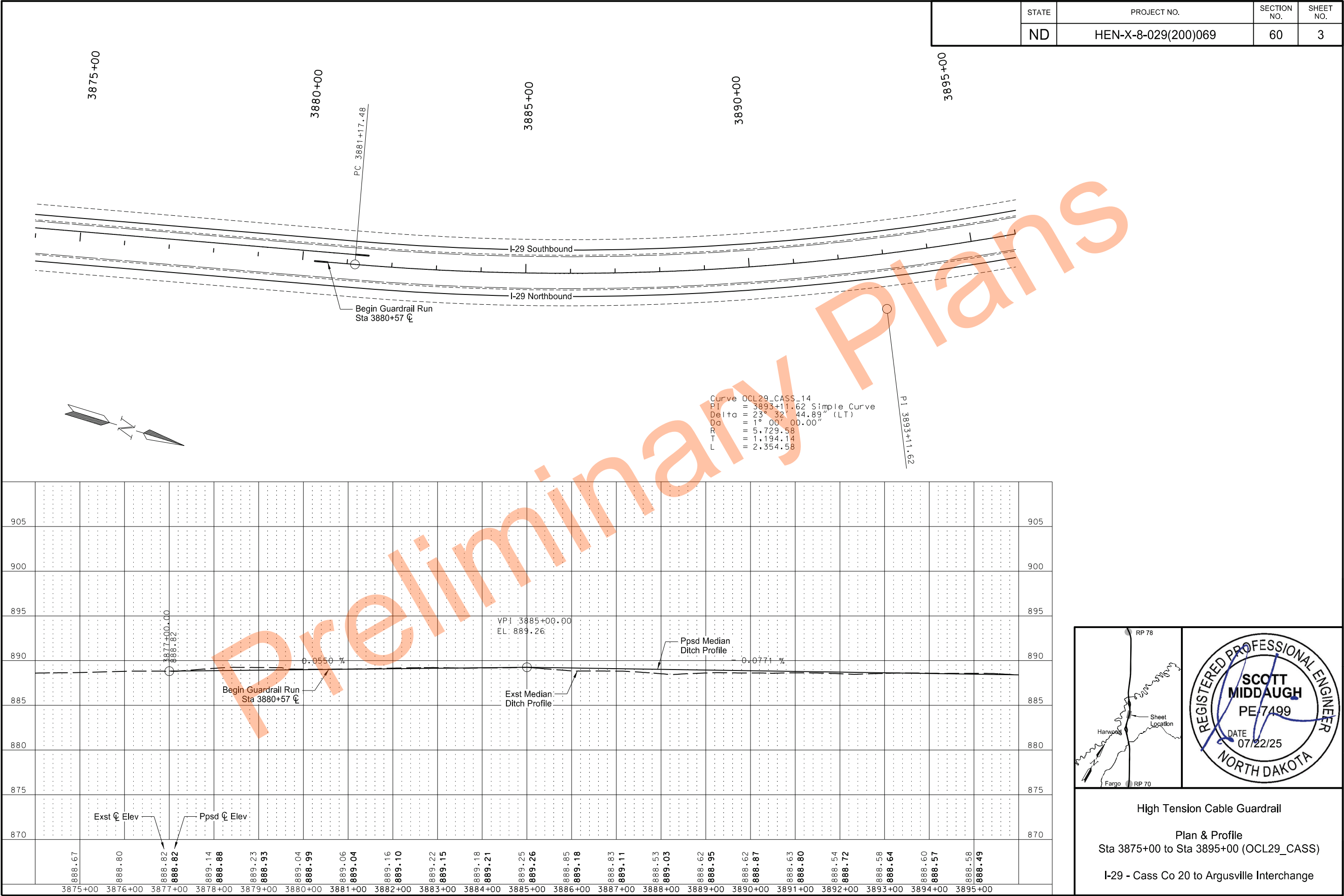


High Tension Cable Guardrail

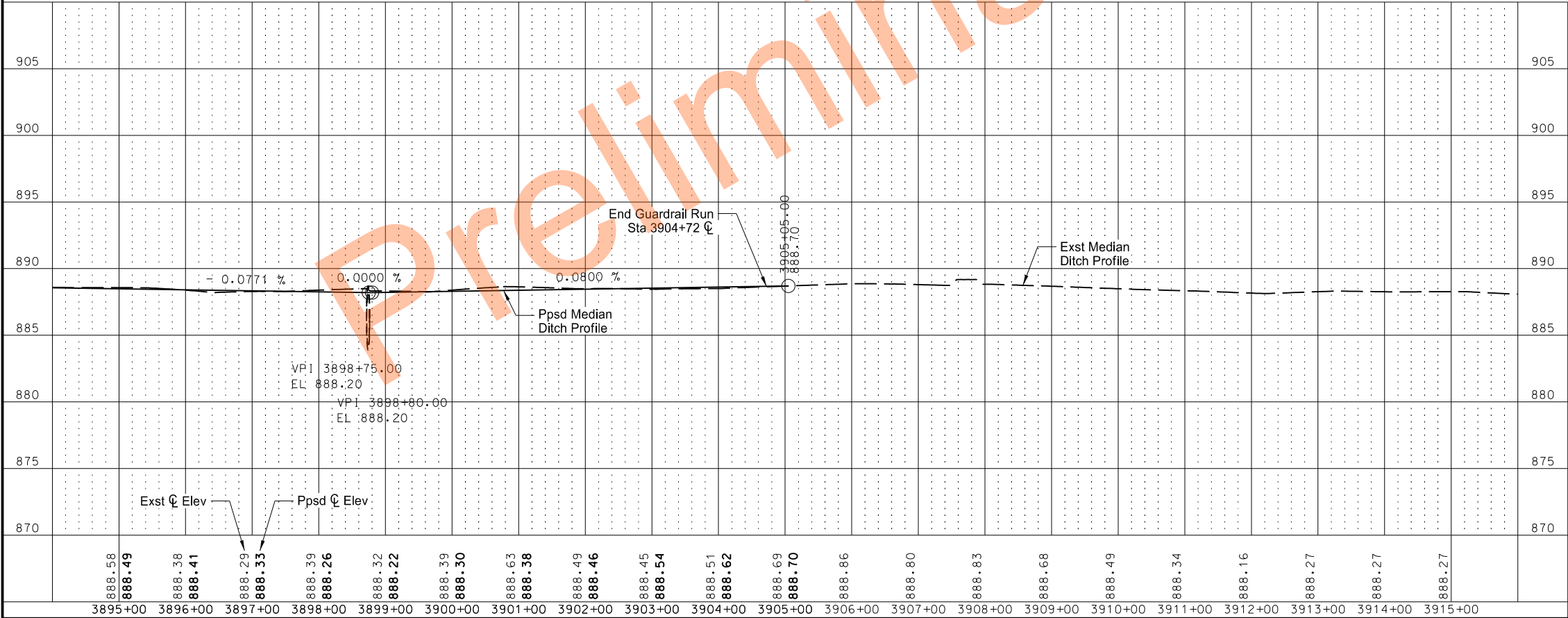
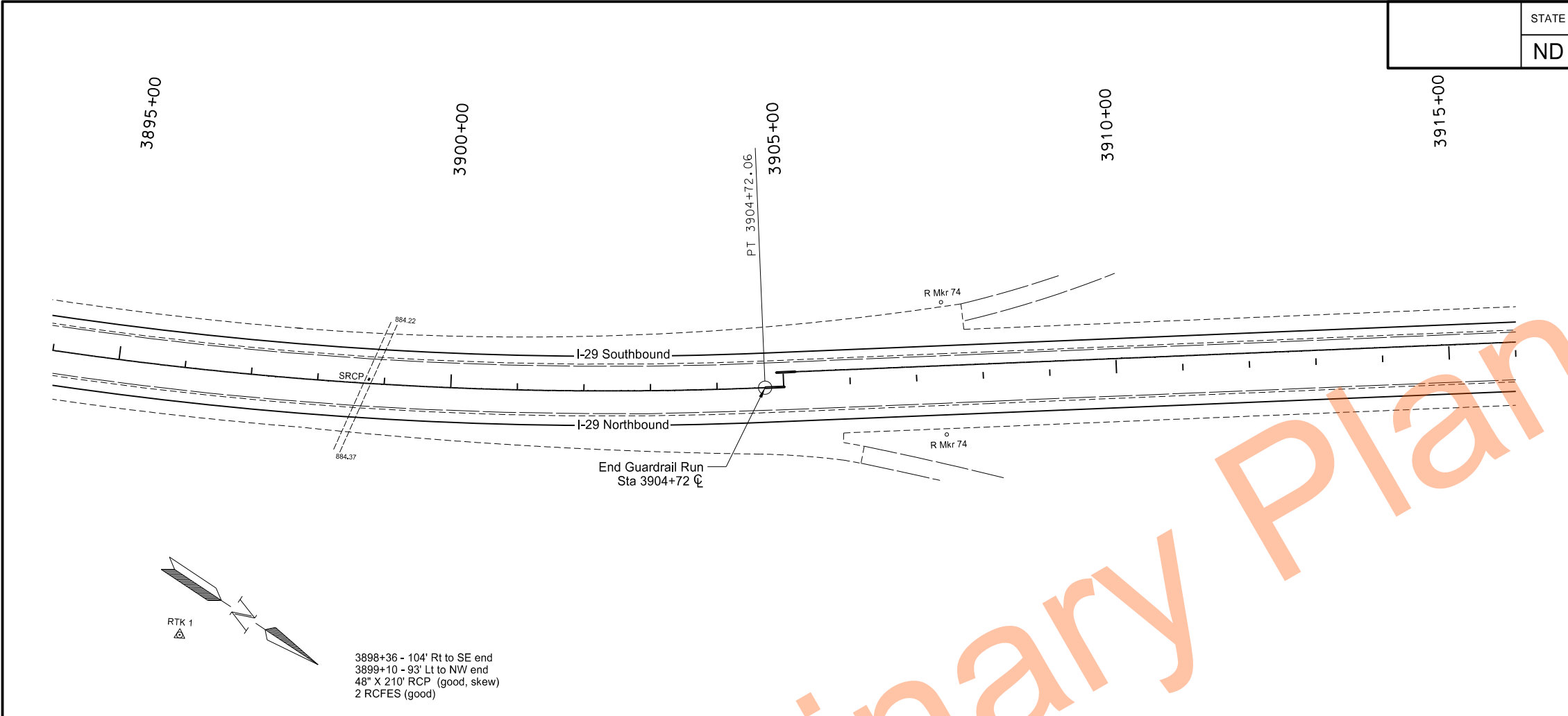
Plan & Profile

Sta 3800+00 to Sta 3820+00 (OCL29_CASS)

I-29 - Cass Co 20 to Argusville Interchange



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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RP 78

Sheet Location

Fargo

RP 70

REGISTERED PROFESSIONAL ENGINEER

SCOTT MIDDLEAUGH

PE 7499

DATE 07/22/25

NORTH DAKOTA

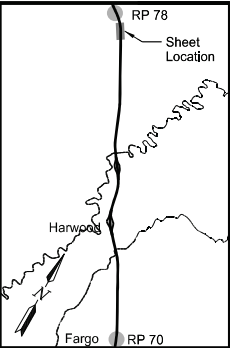
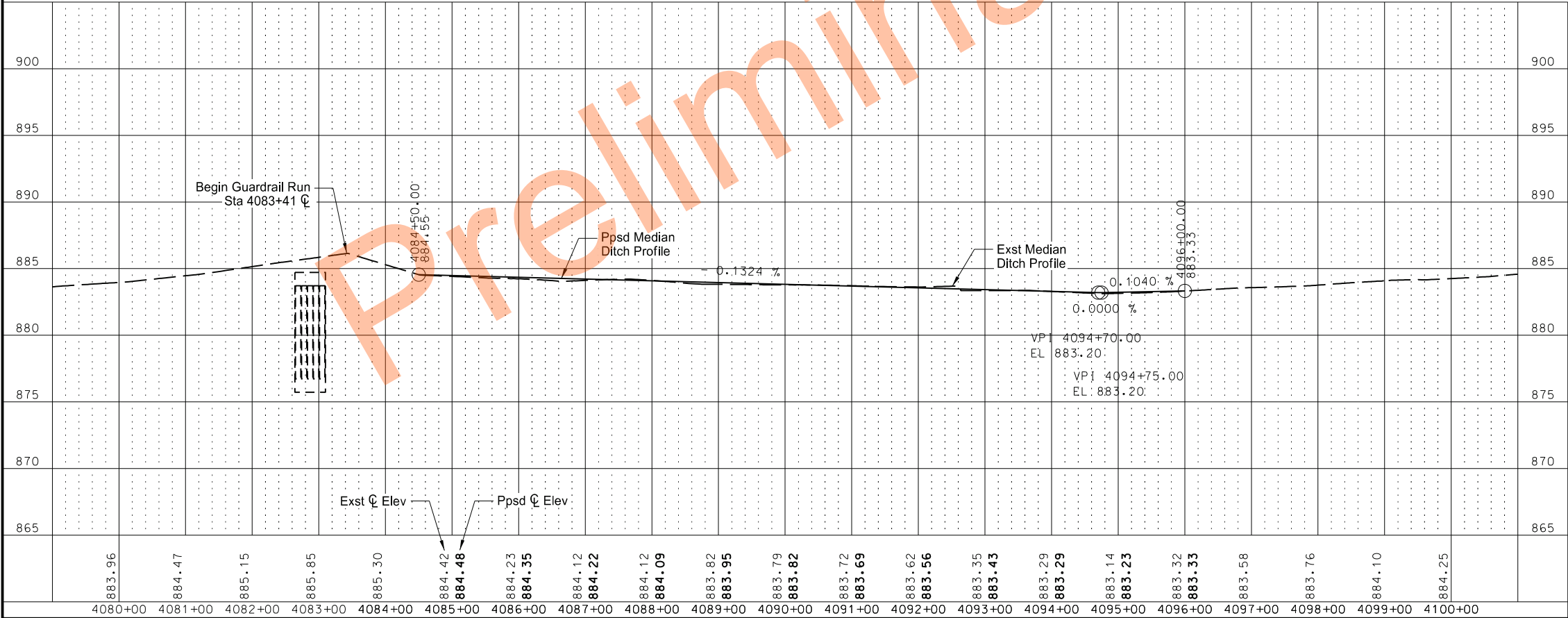
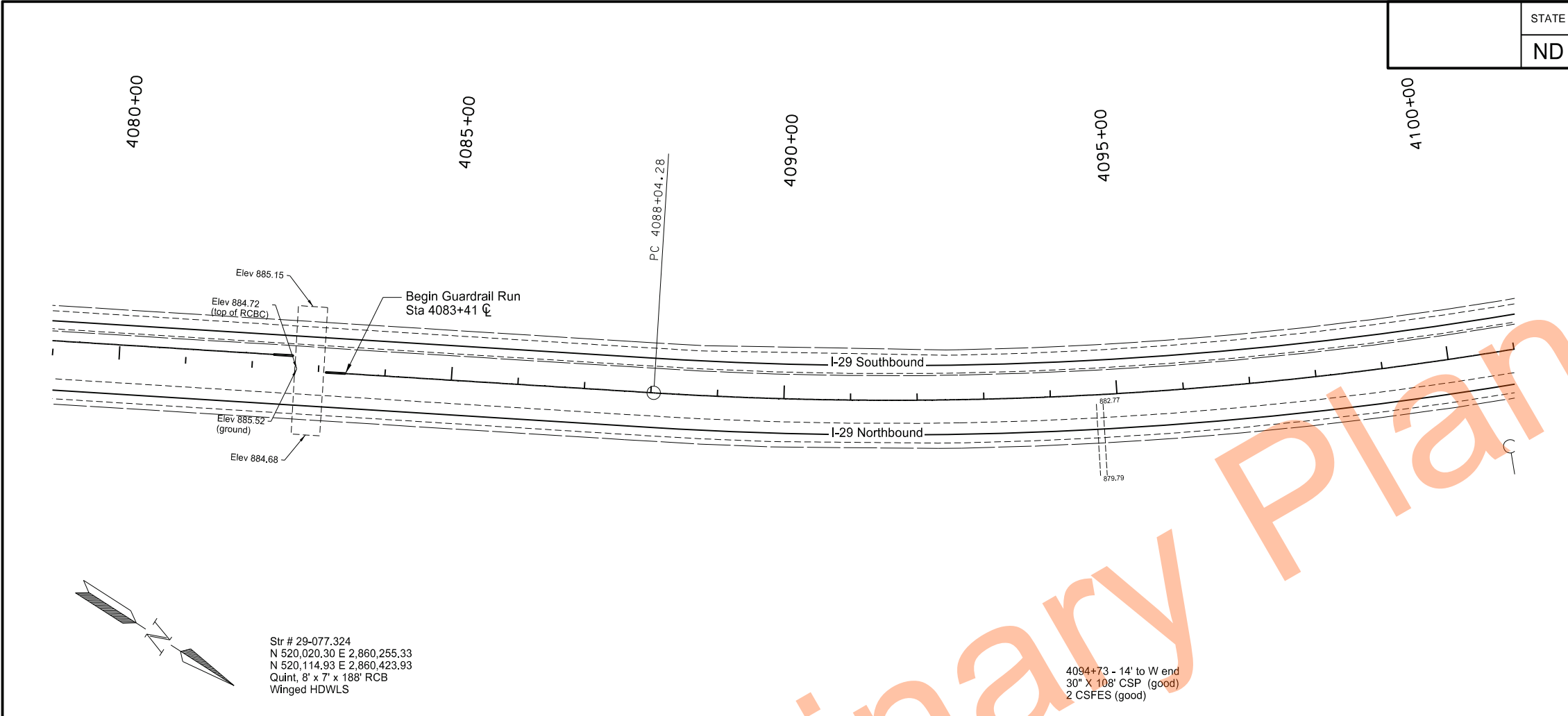
High Tension Cable Guardrail

Plan & Profile

Sta 3895+00 to Sta 3915+00 (OCL29_CASS)

I-29 - Cass Co 20 to Argusville Interchange

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	60	5

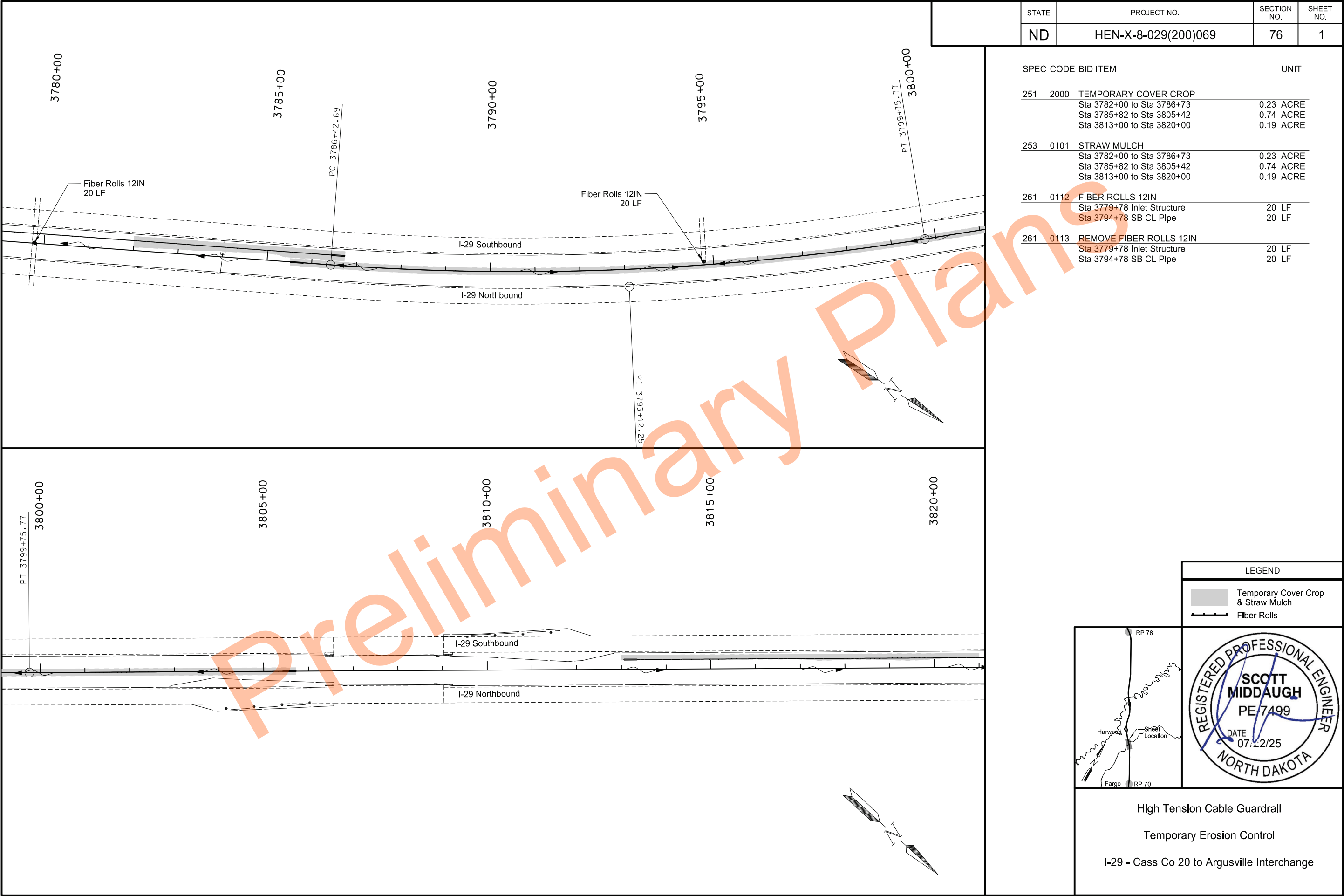


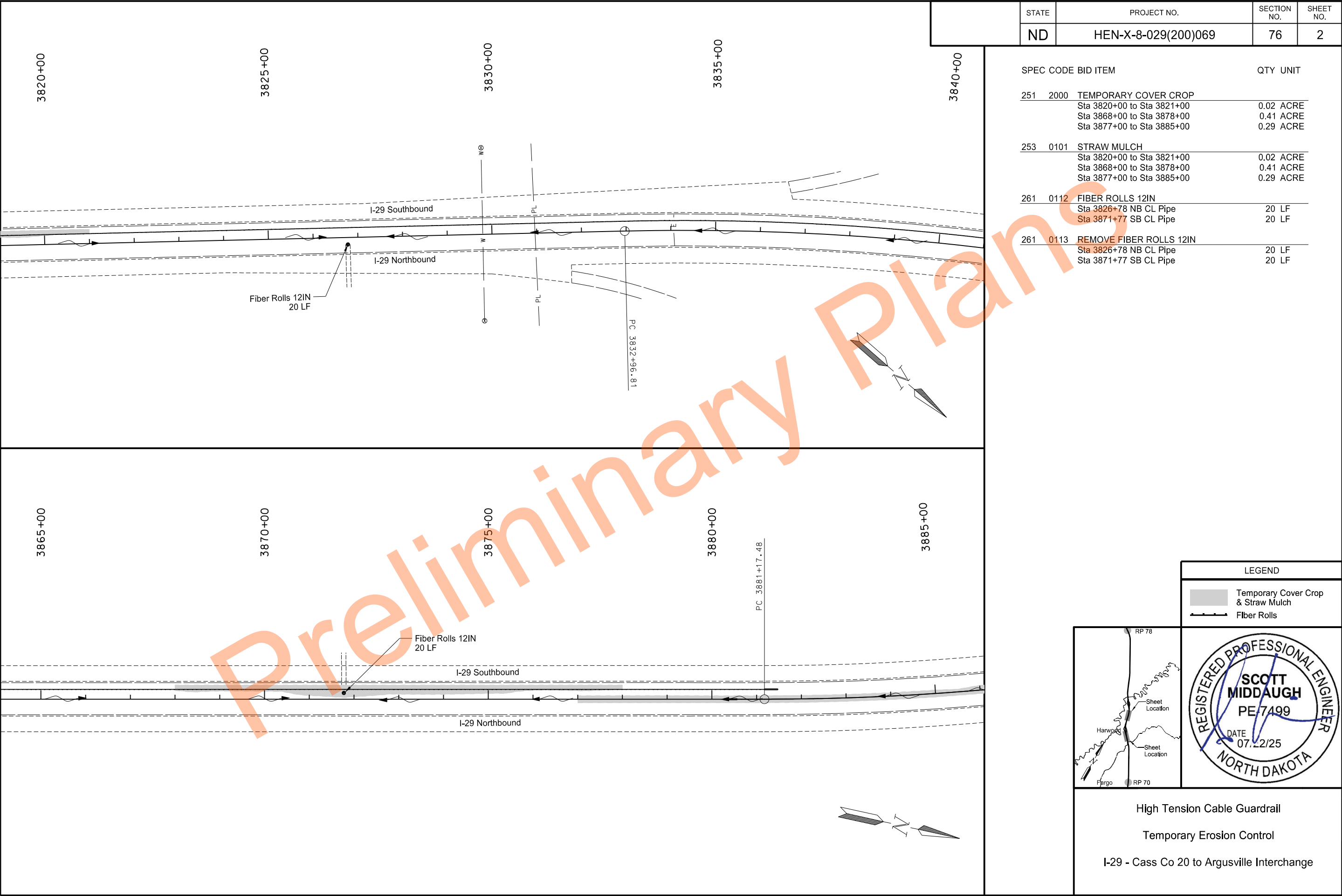
High Tension Cable Guardrail

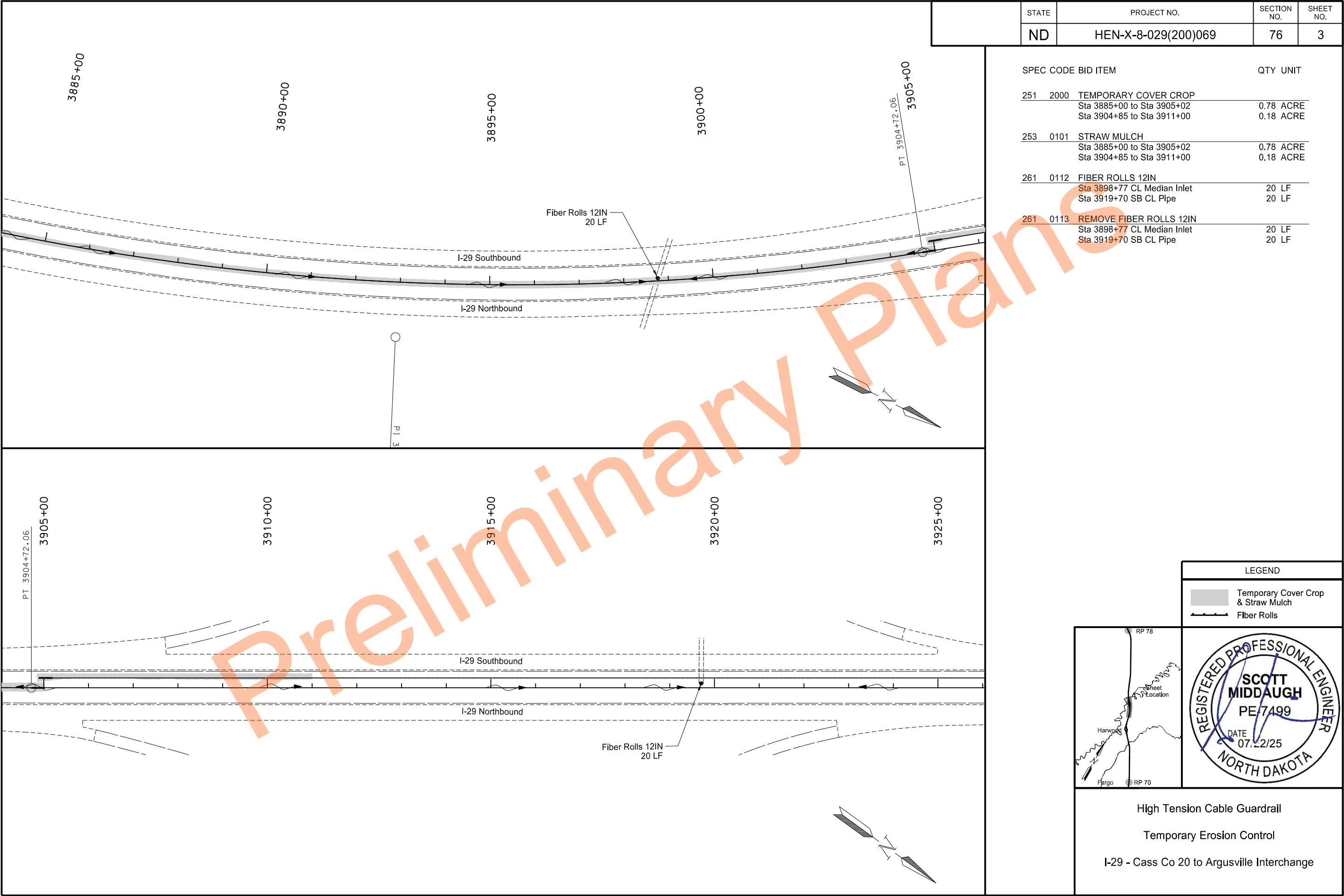
Plan & Profile

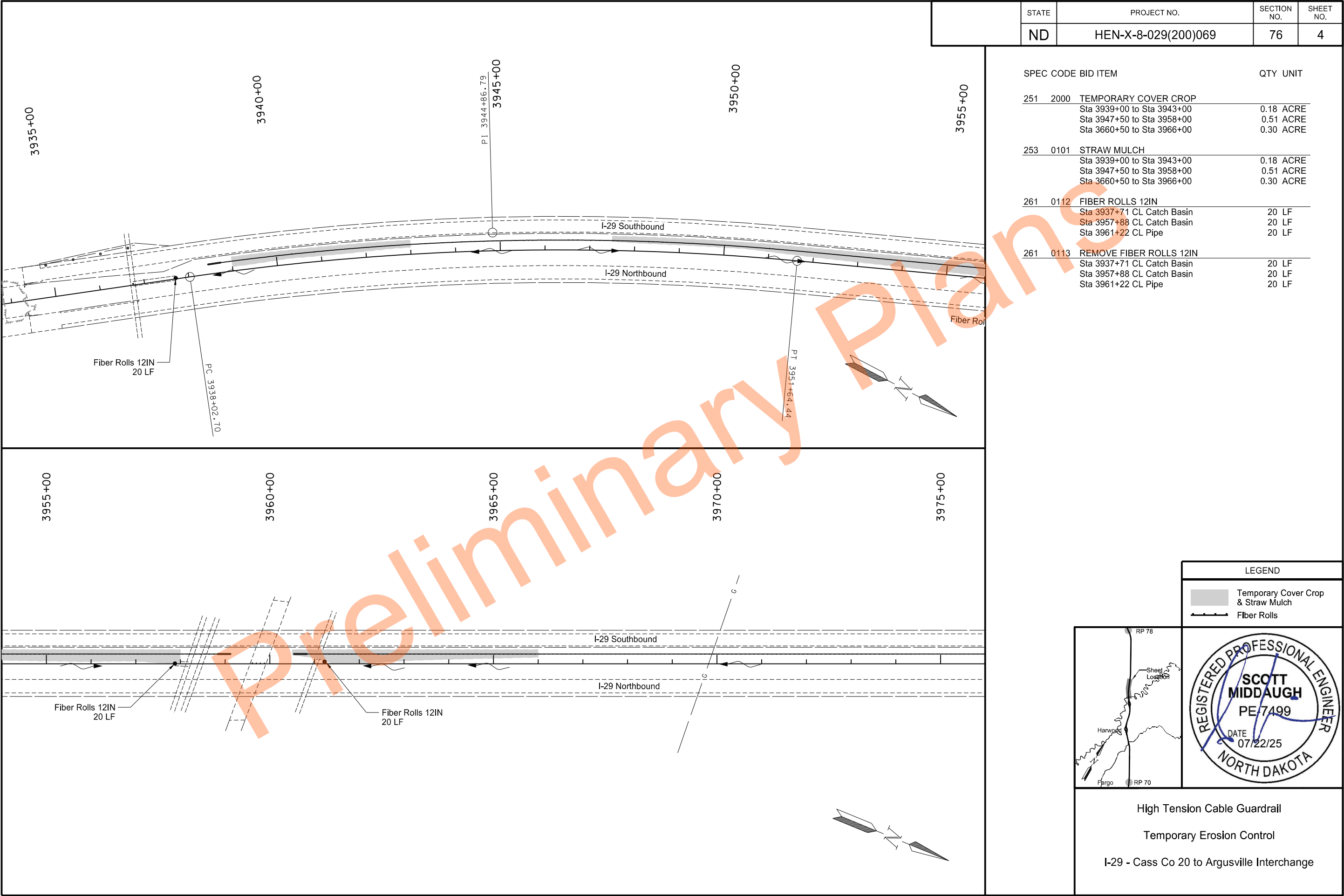
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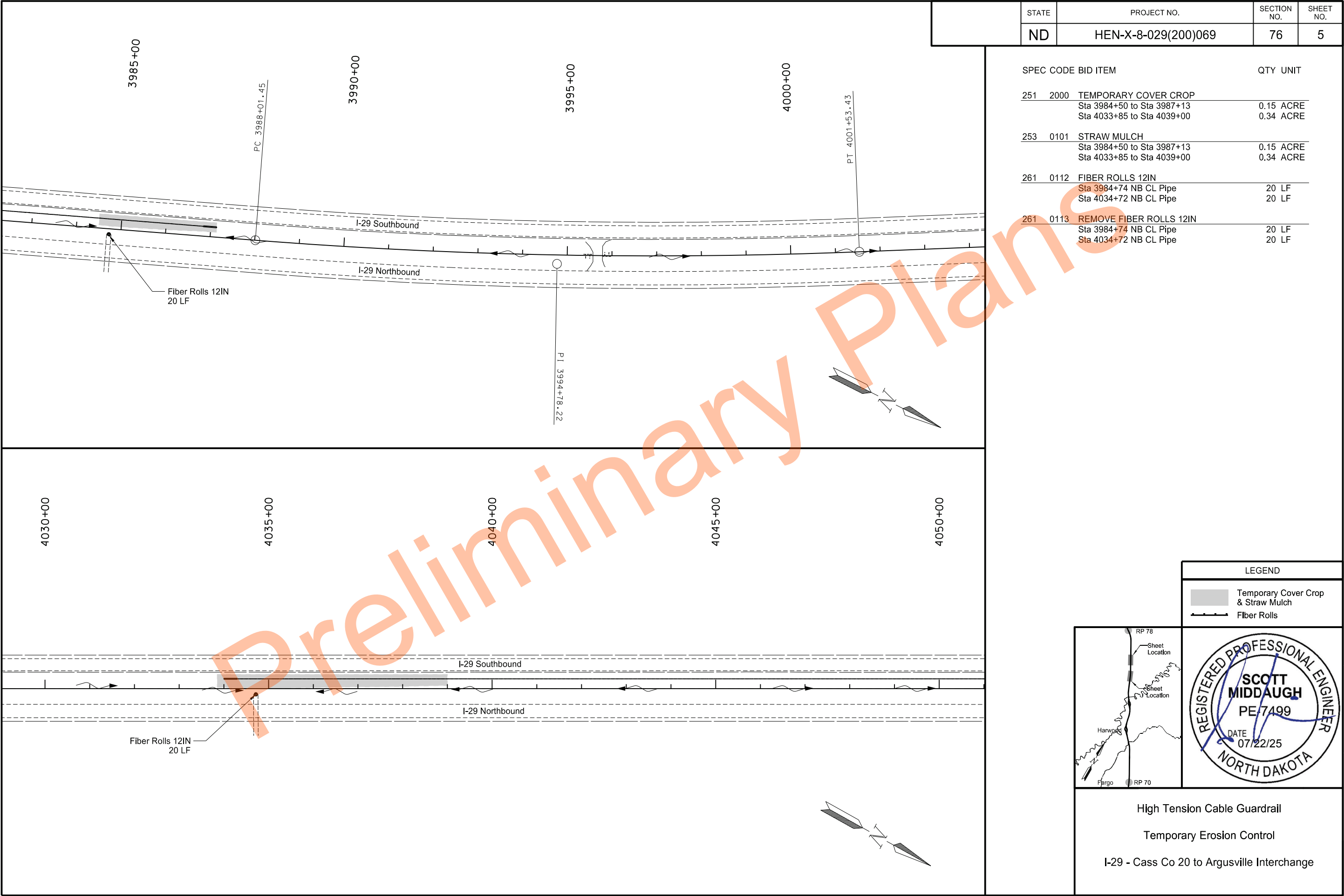
I-29 - Cass Co 20 to Argusville Interchange

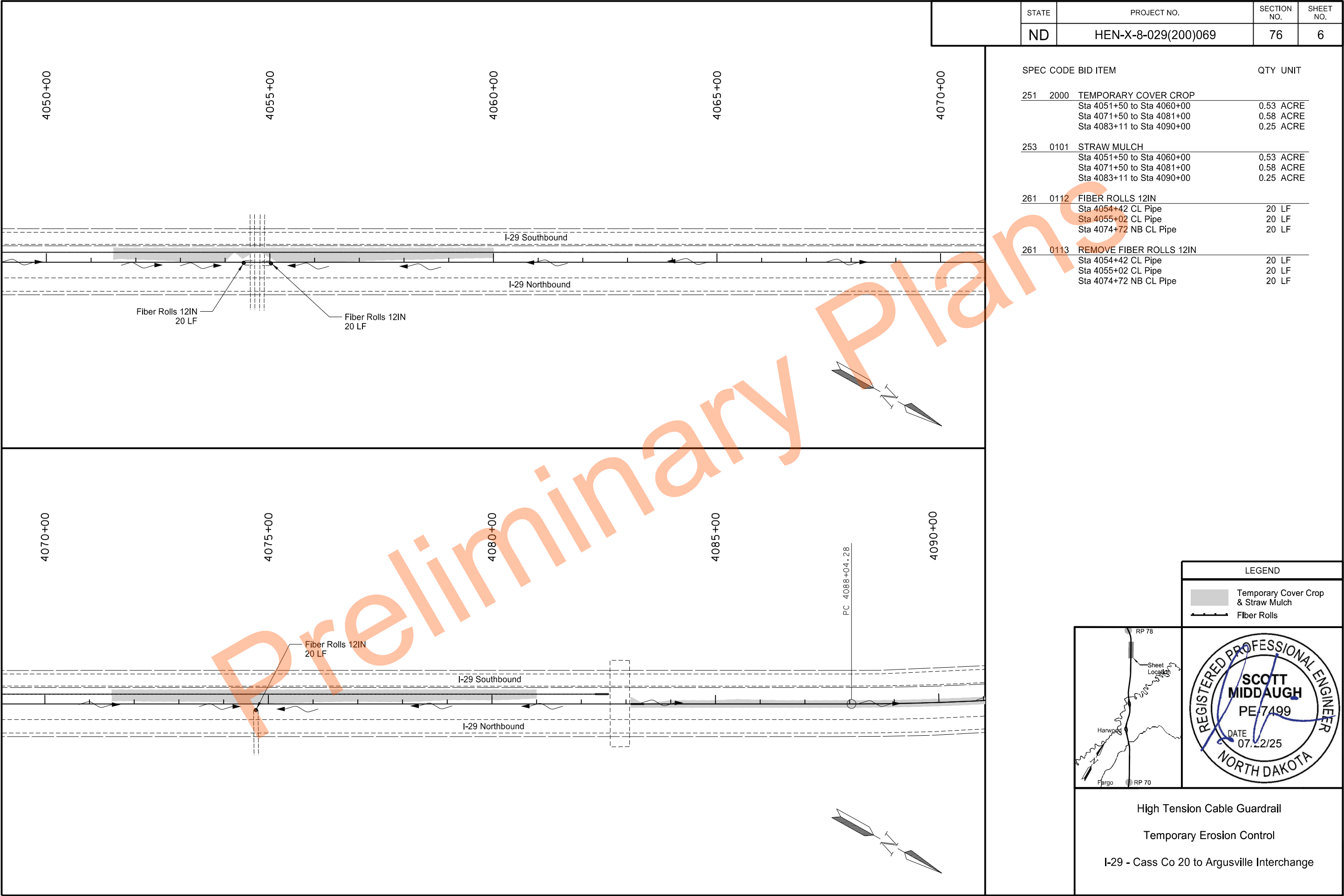






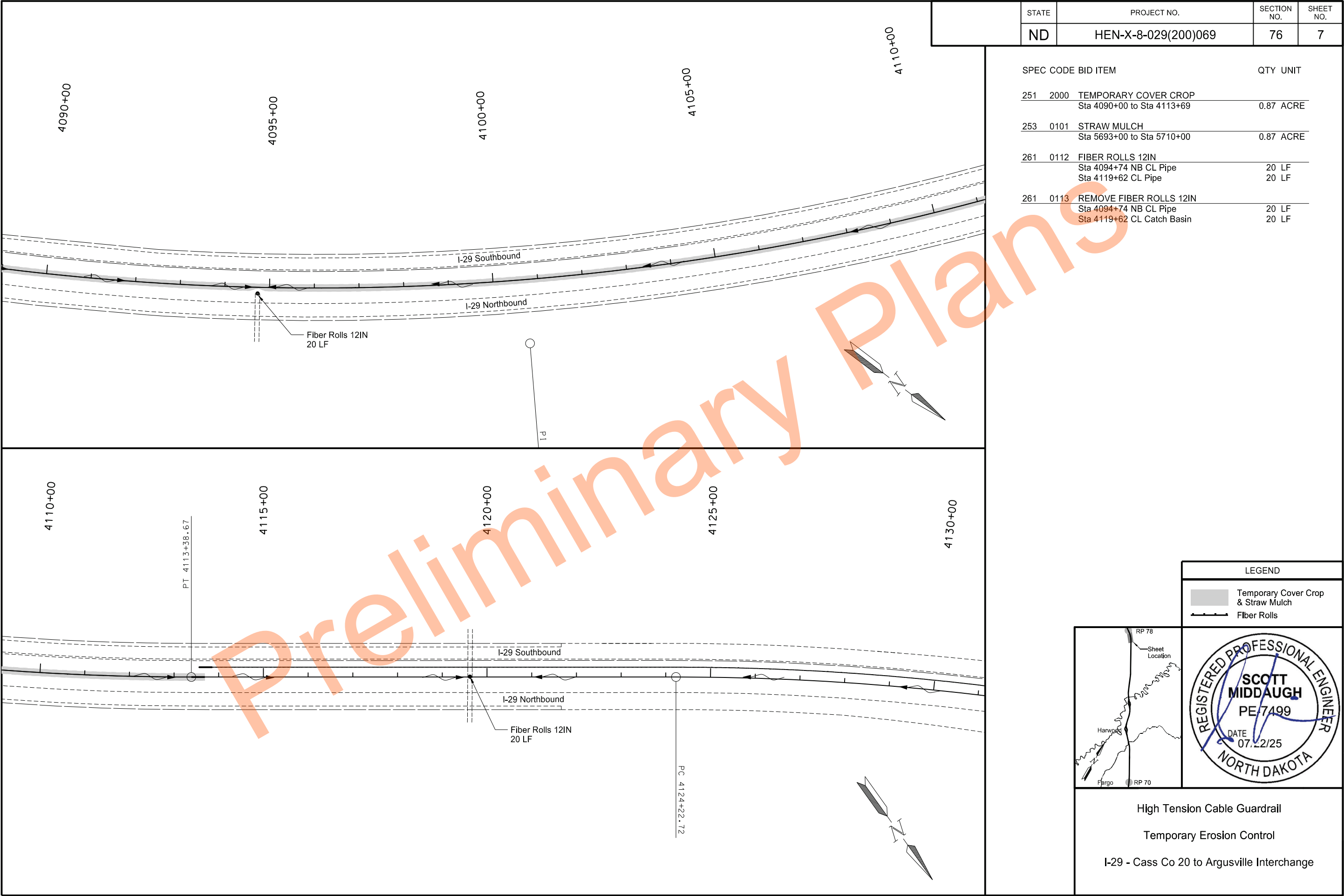






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ND	HEN-X-8-029(200)069	76	6

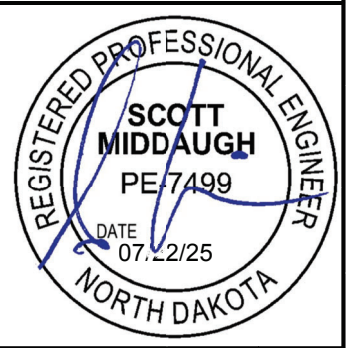
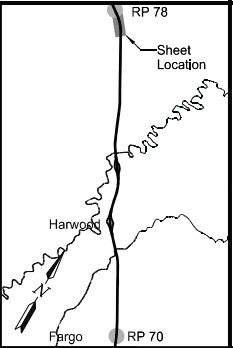
SPEC CODE	BID ITEM	QTY	UNIT
251	2000 TEMPORARY COVER CROP		
	Sta 4051+50 to Sta 4060+00	0.53	ACRE
	Sta 4071+50 to Sta 4081+00	0.58	ACRE
	Sta 4083+11 to Sta 4090+00	0.25	ACRE
253	0101 STRAW MULCH		
	Sta 4051+50 to Sta 4060+00	0.53	ACRE
	Sta 4071+50 to Sta 4081+00	0.58	ACRE
	Sta 4083+11 to Sta 4090+00	0.25	ACRE
261	0112 FIBER ROLLS 12IN		
	Sta 4054+42 CL Pipe	20	LF
	Sta 4055+02 CL Pipe	20	LF
	Sta 4074+72 NB CL Pipe	20	LF
261	0113 REMOVE FIBER ROLLS 12IN		
	Sta 4054+42 CL Pipe	20	LF
	Sta 4055+02 CL Pipe	20	LF
	Sta 4074+72 NB CL Pipe	20	LF



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	76	7

SPEC CODE	BID ITEM	QTY	UNIT
251 2000	TEMPORARY COVER CROP Sta 4090+00 to Sta 4113+69	0.87	ACRE
253 0101	STRAW MULCH Sta 5693+00 to Sta 5710+00	0.87	ACRE
261 0112	FIBER ROLLS 12IN Sta 4094+74 NB CL Pipe Sta 4119+62 CL Pipe	20 LF 20 LF	
261 0113	REMOVE FIBER ROLLS 12IN Sta 4094+74 NB CL Pipe Sta 4119+62 CL Catch Basin	20 LF 20 LF	

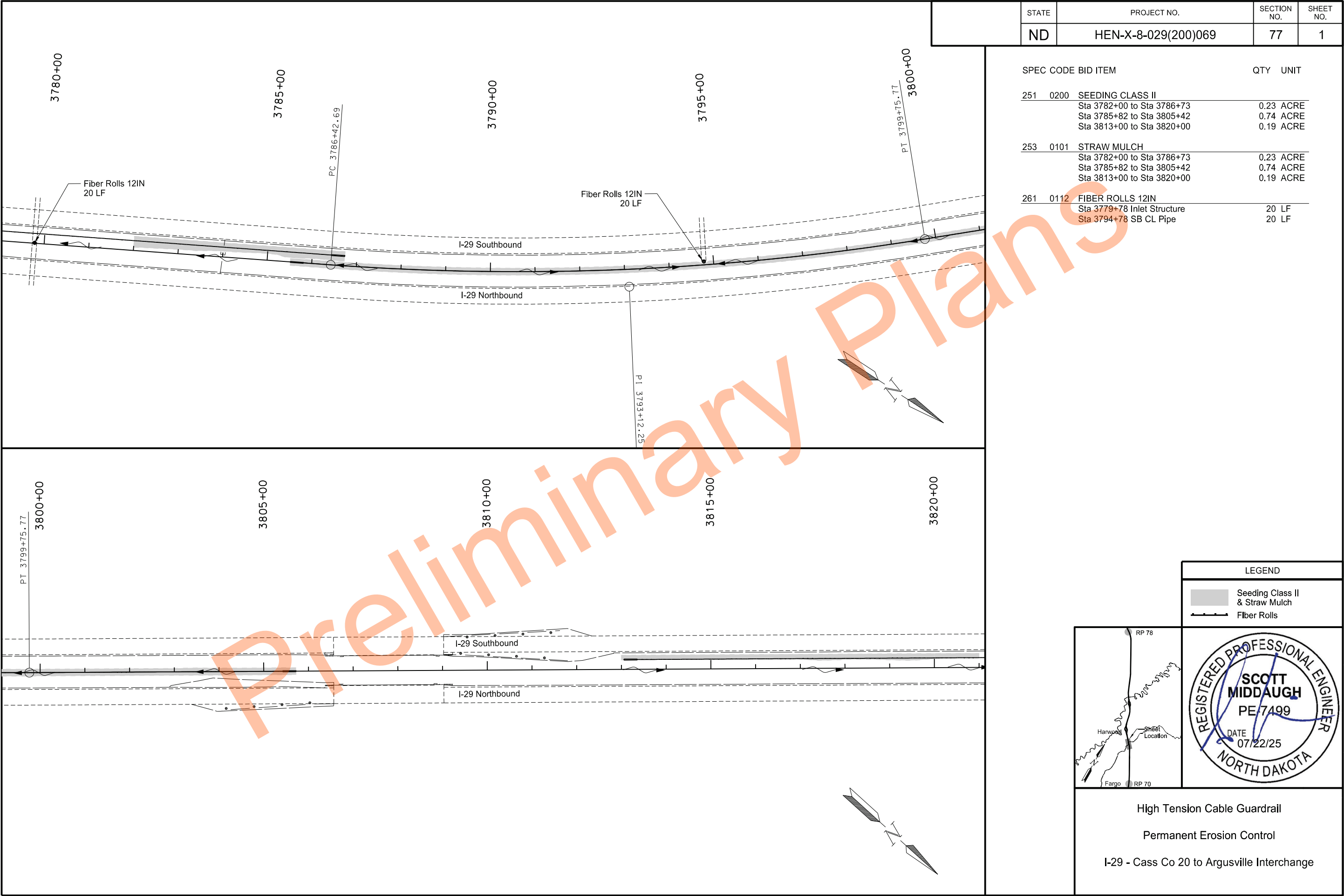
LEGEND
Temporary Cover Crop & Straw Mulch
Fiber Rolls

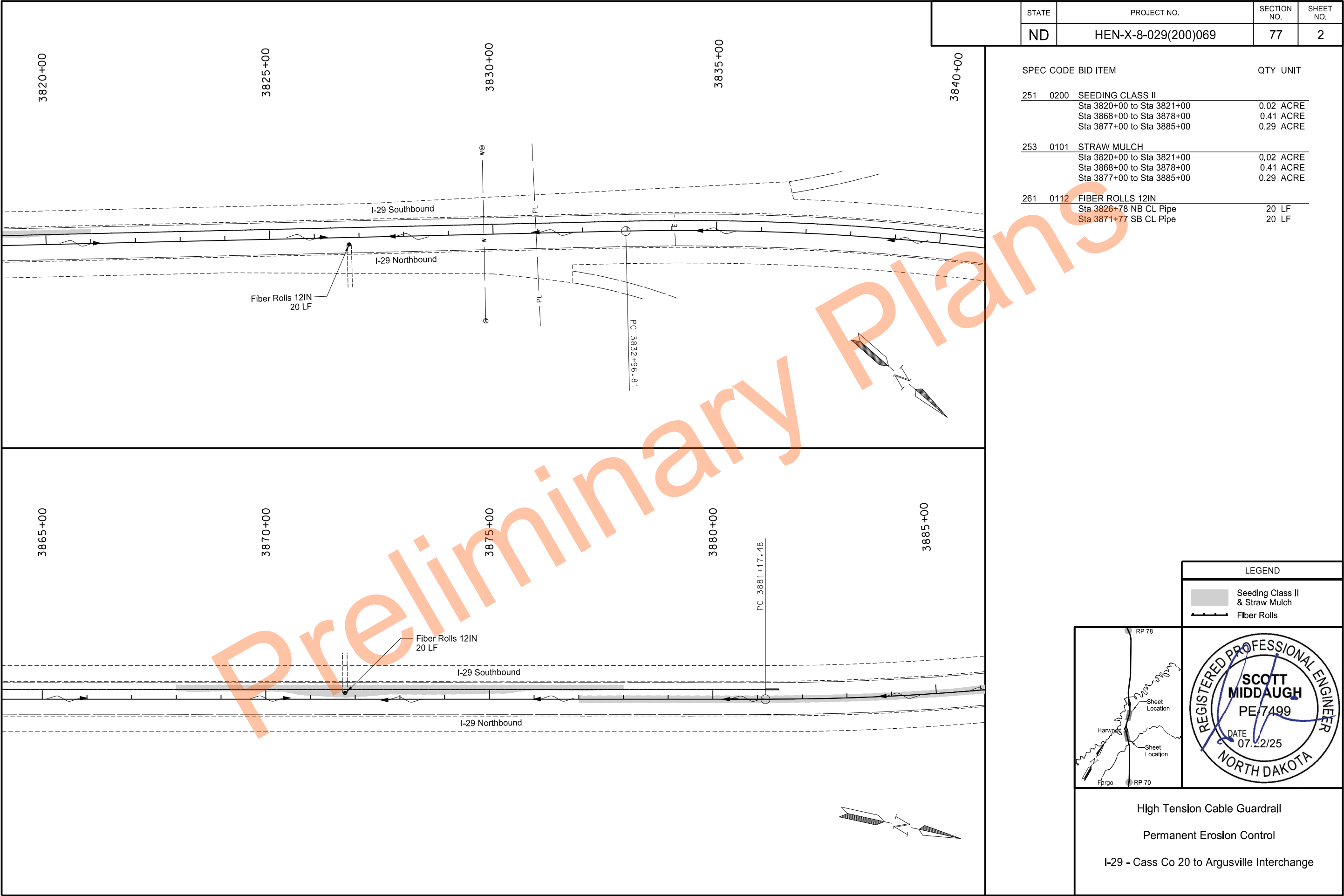


High Tension Cable Guardrail

Temporary Erosion Control

I-29 - Cass Co 20 to Argusville Interchange





LEGEND

Seeding Class II
& Straw Mulch

Fiber Rolls

RP 78

Sheet Location

Harwood

Sheet Location

Fargo

RP 70

REGISTERED PROFESSIONAL ENGINEER

SCOTT MIDDAGH

PE 7499

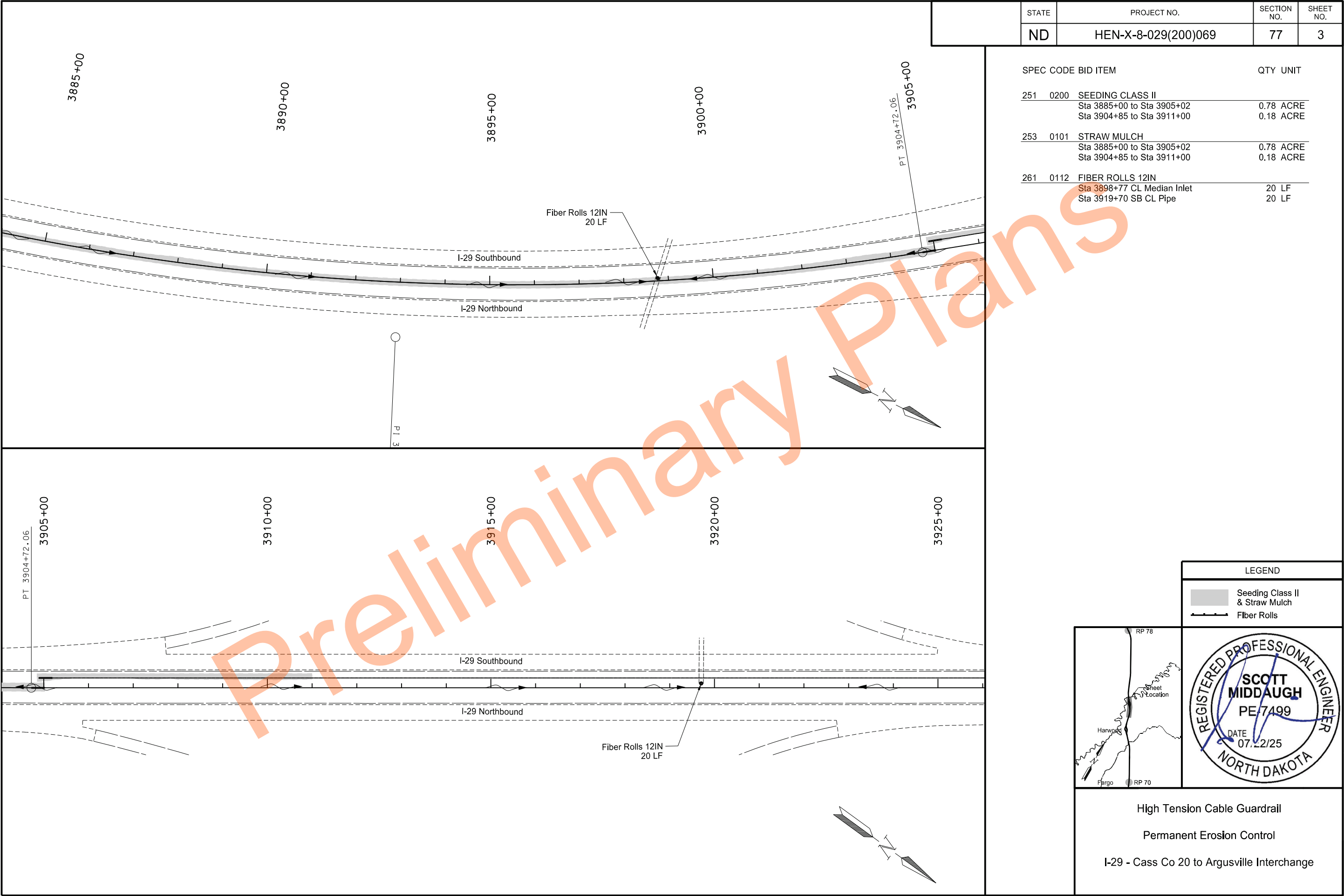
DATE 07.22/25

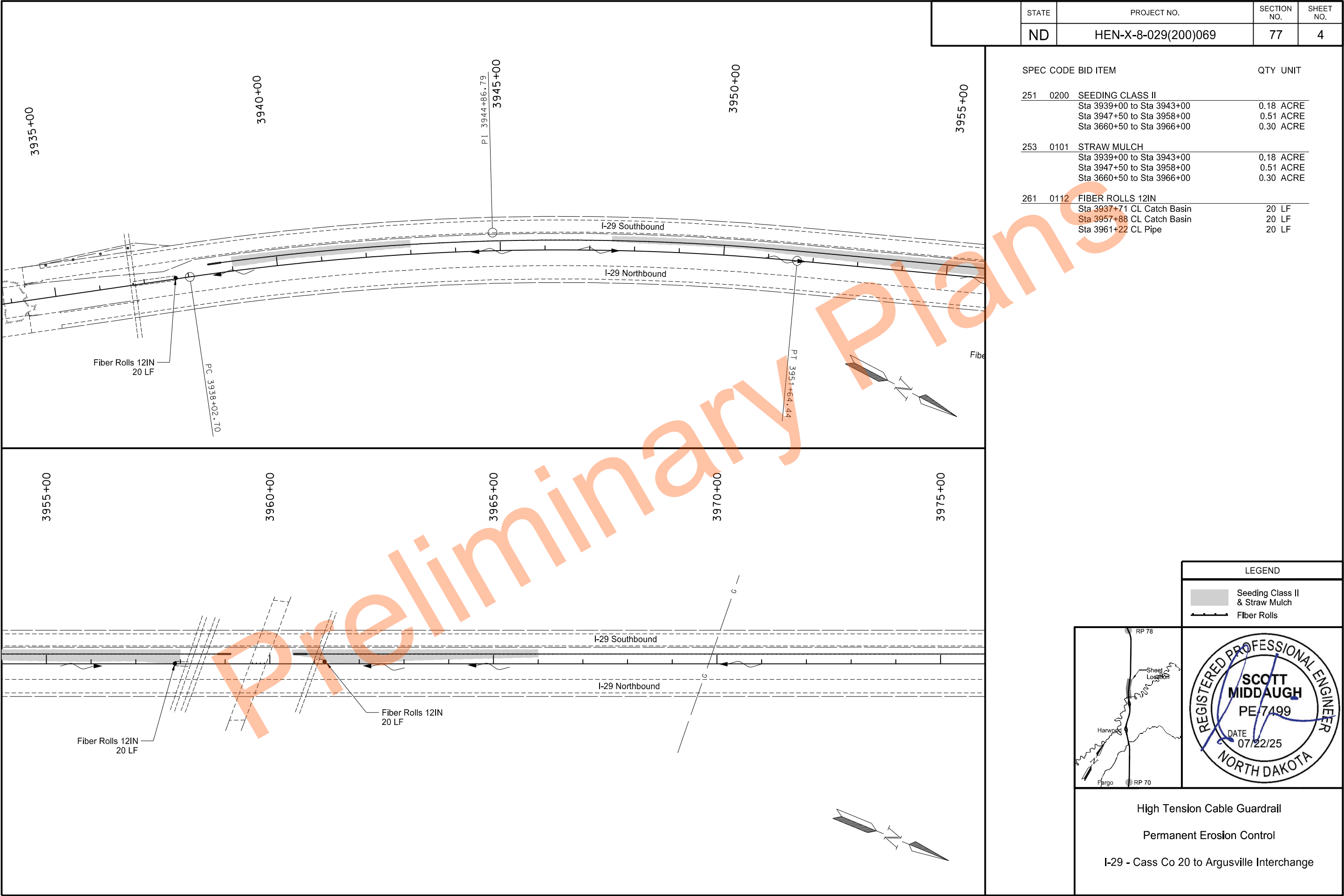
NORTH DAKOTA

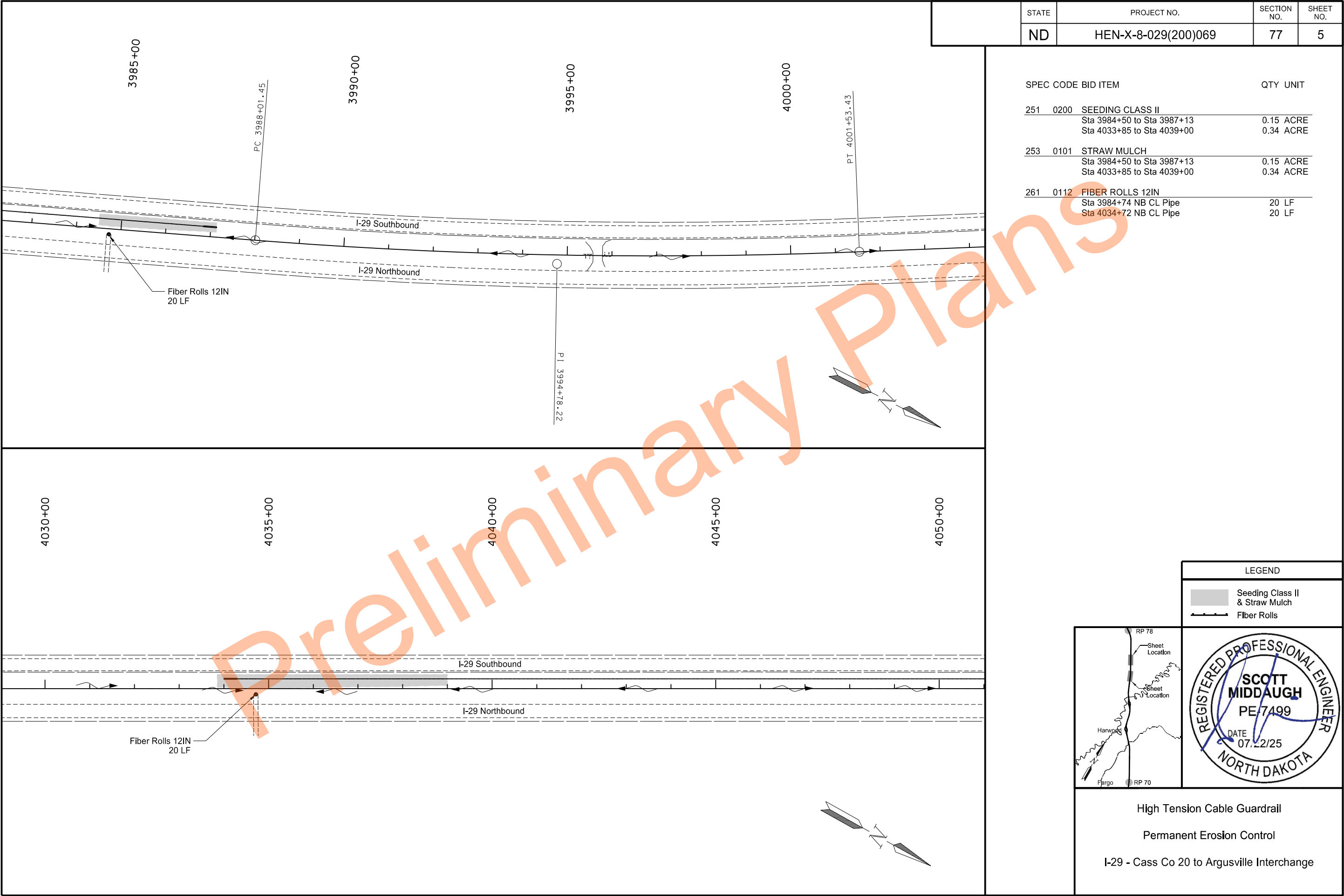
High Tension Cable Guardrail

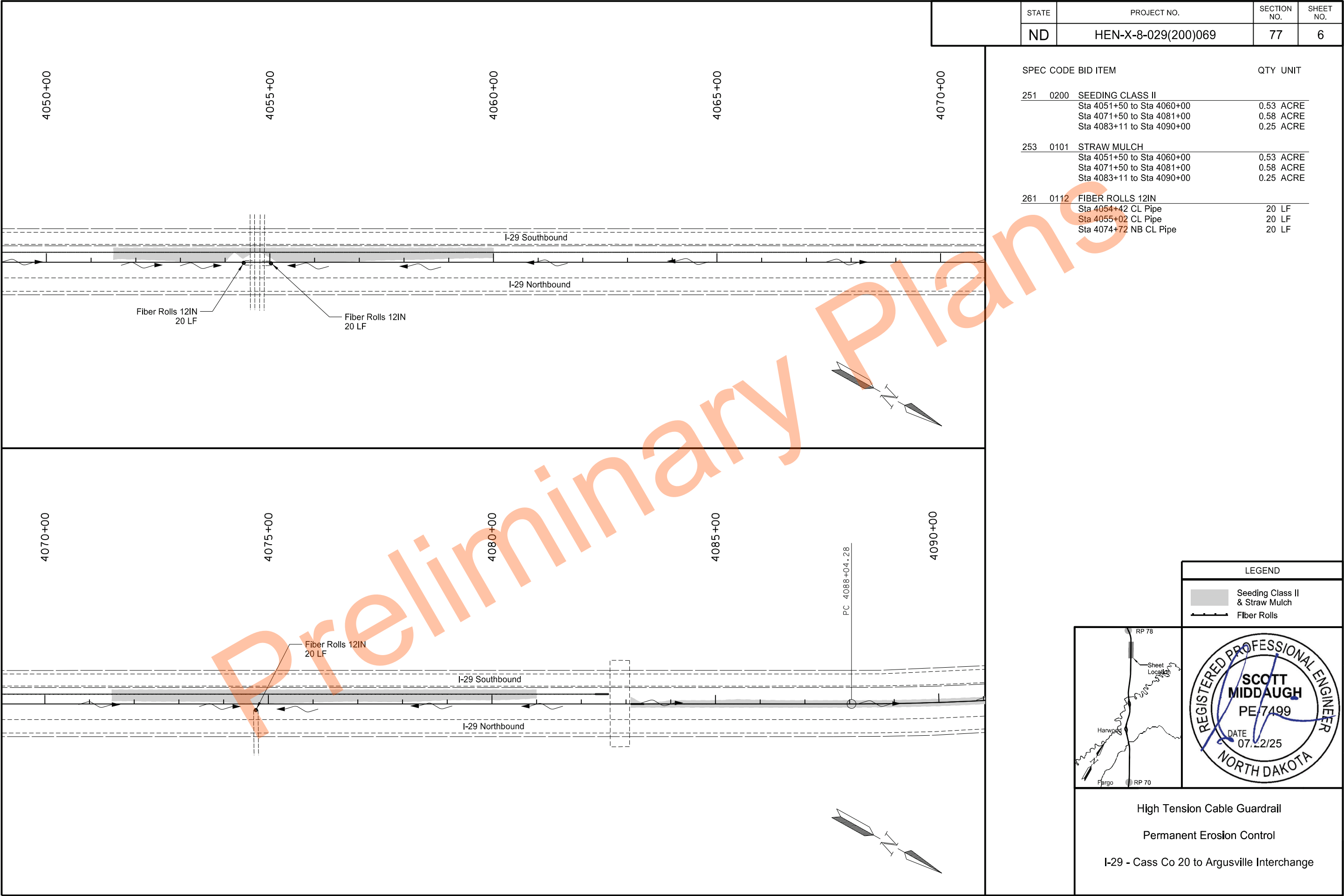
Permanent Erosion Control

I-29 - Cass Co 20 to Argusville Interchange



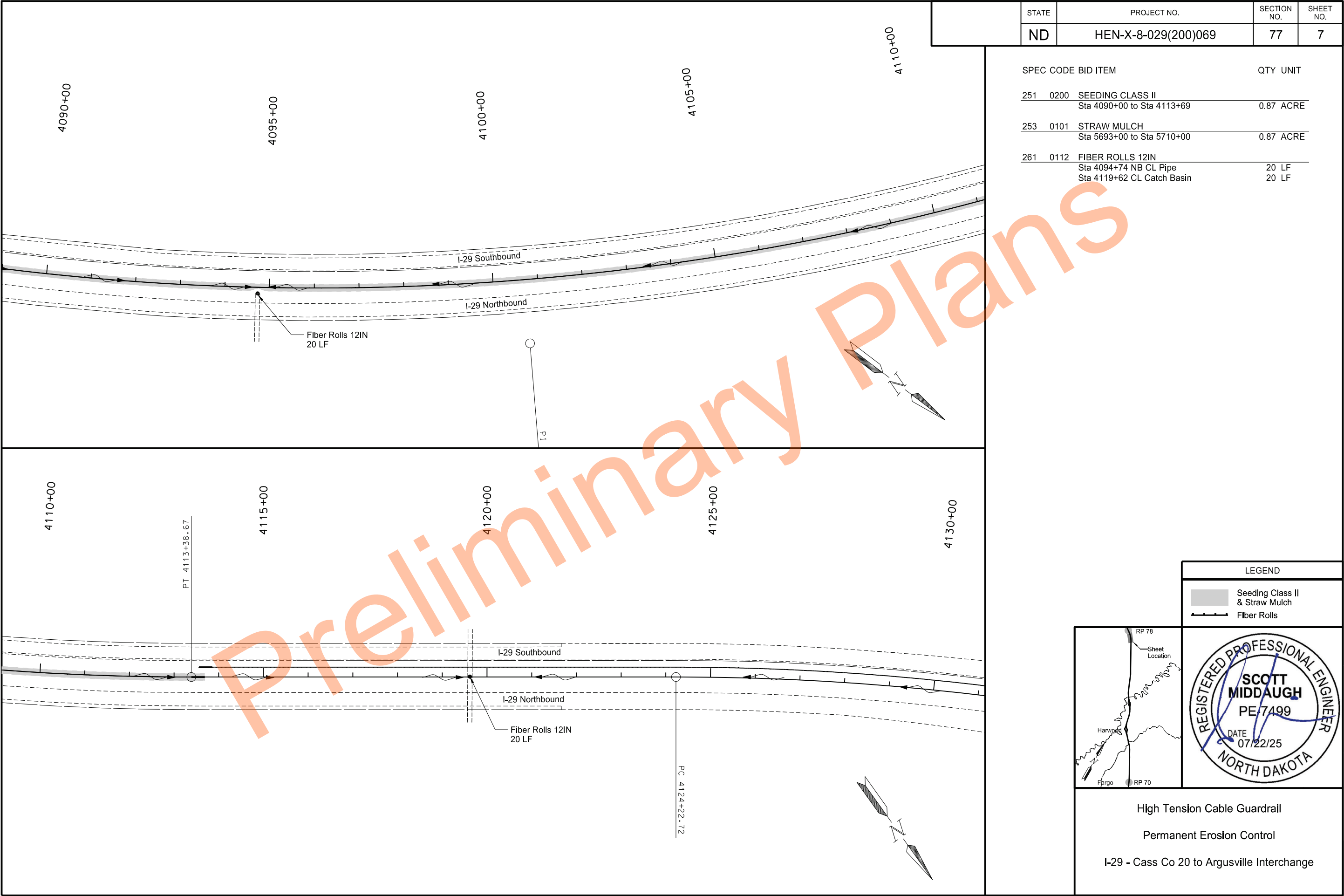






STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	77	6

SPEC CODE	BID ITEM	QTY	UNIT
251 0200	SEEDING CLASS II		
	Sta 4051+50 to Sta 4060+00	0.53	ACRE
	Sta 4071+50 to Sta 4081+00	0.58	ACRE
	Sta 4083+11 to Sta 4090+00	0.25	ACRE
253 0101	STRAW MULCH		
	Sta 4051+50 to Sta 4060+00	0.53	ACRE
	Sta 4071+50 to Sta 4081+00	0.58	ACRE
	Sta 4083+11 to Sta 4090+00	0.25	ACRE
261 0112	FIBER ROLLS 12IN		
	Sta 4054+42 CL Pipe	20	LF
	Sta 4055+02 CL Pipe	20	LF
	Sta 4074+72 NB CL Pipe	20	LF



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	77	7

SPEC CODE	BID ITEM	QTY	UNIT
251 0200	SEEDING CLASS II Sta 4090+00 to Sta 4113+69	0.87	ACRE
253 0101	STRAW MULCH Sta 5693+00 to Sta 5710+00	0.87	ACRE
261 0112	FIBER ROLLS 12IN Sta 4094+74 NB CL Pipe	20	LF
	Sta 4119+62 CL Catch Basin	20	LF

LEGEND

Seeding Class II & Straw Mulch

Fiber Rolls

RP 78

Sheet Location

Harwood

Fargo

RP 70

REGISTERED PROFESSIONAL ENGINEER

SCOTT MIDDLEAUGH

PE 7499

DATE 07/22/25

NORTH DAKOTA

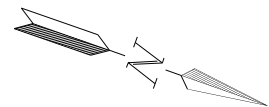
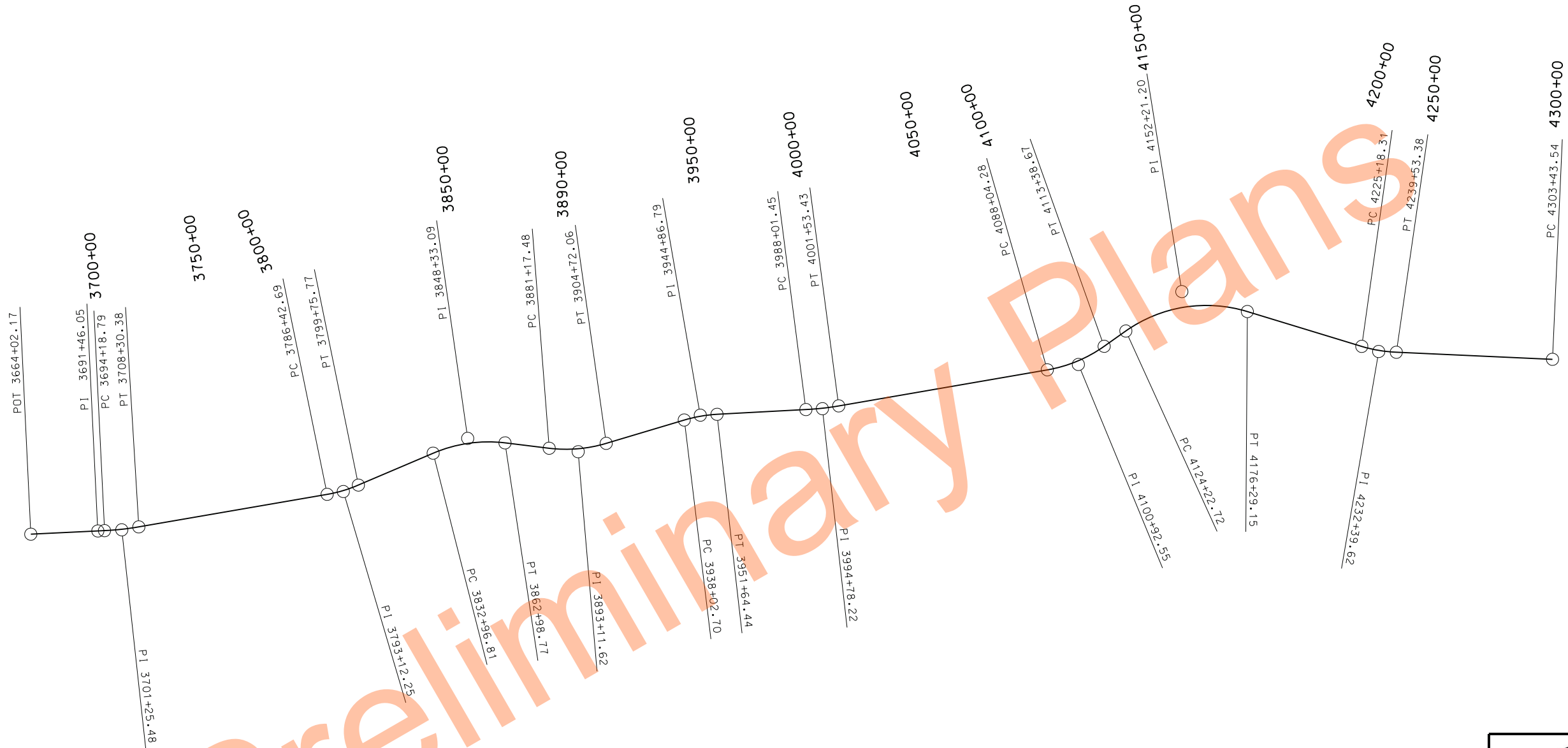
High Tension Cable Guardrail

Permanent Erosion Control

I-29 - Cass Co 20 to Argusville Interchange

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - I-29 - MILE 69.4 TO CASS/TRAILL COUNTY LINE										STATE	PROJECT NO.			SECTION NO.	SHEET NO.	
										ND	HEN-X-8-029(200)069			81	1	
HORIZONTAL ALIGNMENT				CURVE DATA		REFERENCE MARKERS					SURVEY CONTROL POINTS					
PNT	STATION	NORTHING	EASTING	ARC DEFINITION		R MKR #	NORTHING	EASTING	STATION	OFFSET	PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
						I-29 (CHAIN OCL29_CASS)					MONUMENT DESCRIPTION					
						70	486,492.51	2,878,863.42	3696+36	74' Lt	Secondary Control (Station/Offset from Chain OCL29_CASS)					
						70	486,552.95	2,878,999.84	3696+38	75' Rt						
						71	491,115.67	2,876,352.43	3749+07	83' Lt	RTK 1	503,968.89	2,869,673.45	888.51	3896+34	400' Rt
						71	491,197.58	2,876,495.82	3749+09	82' Rt	NGS Brass Disk in Concrete Stamped Harwood NW Base 1954					
						72	495,599.55	2,873,627.48	3801+87	84' Lt	RTK 2	524,646.62	2,856,389.78	896.14	4144+47	319' Rt
						72	495,711.39	2,873,749.51	3801+87	82' Rt	#5 Rebar w/ Red Plastic Cap					
						73	499,758.04	2,870,365.50	3854+72	102' Lt	RTK 3	561,282.50	2,846,092.43	900.39	4530+14	371' Rt
						73	499,812.04	2,870,554.50	3854+55	94' Rt	#5 Rebar w/ Red Plastic Cap					
						74	504,644.67	2,868,625.02	3907+41	117' Lt						
						74	504,761.85	2,868,785.69	3907+42	81' Rt						
						75	509,152.07	2,865,844.80	3960+38	92' Lt						
						75	509,205.36	2,866,010.26	3960+24	82' Rt						
						76	513,924.66	2,863,662.58	4013+03	83' Lt						
						76	514,004.09	2,863,806.48	4013+02	81' Rt						
						77	518,540.82	2,861,094.53	4065+85	83' Lt						
						77	518,623.12	2,861,237.55	4065+87	82' Rt						
						78	522,632.29	2,857,939.93	4118+62	84' Lt						
						78	522,768.22	2,858,034.19	4118+65	82' Rt						
						79	526,952.64	2,855,099.06	4171+40	84' Lt						
						79	526,973.56	2,855,263.01	4171+40	82' Rt						
						80	532,244.02	2,854,859.48	4224+30	83' Lt						
						80	532,243.10	2,855,023.86	4224+23	81' Rt						
						81	537,311.73	2,853,544.05	4277+01	84' Lt						
						81	537,359.00	2,853,701.90	4277+00	81' Rt						
						82	542,176.13	2,851,617.18	4329+78	83' Lt						
						82	542,255.73	2,851,760.71	4329+76	81' Rt						
						83	547,233.55	2,850,305.75	4382+59	84' Lt						
						83	547,241.71	2,850,470.57	4382+59	81' Rt						
						84	552,315.32	2,849,037.35	4435+35	83' Lt	All coordinates and measurements on this document derived from the International Foot definition.					
						84	552,363.72	2,849,194.45	4435+36	81' Rt						
						☐ Assumed Coordinates					INITIALIZING BENCH MARK Trimble Now (MIDSTATES) VRS					
						☒ All coordinates on this sheet are Cass County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota South Zone Combination Factor (cf) = 0.9998875					☒ NAVD-88 ☐ _____					
											☐ GEOID12B ☐ _____ ☒ GEOID18					
NOTES: Sheet 1 of 2 Primary control from Trimble Now VRS. Static sessions performed with OPUS solutions used for a check on VRS control.				Date Survey Completed 10/02/2020							REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR CARL P. OLSON PE-4687 LS-4687 DATE 07/22/25 NORTH DAKOTA					

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HEN-X-8-029(200)069	82	1



High Tension Cable Guardrail

Survey Data Layouts
Chain OCL29_CASS

I-29 - Cass Co 20 to Argusville Interchange

Beginning chain OCL29 CASS description
Feature: Alignment 1 L
=====

Point 279 N 483,524.3640 E 2,880,146.8740 Sta 3664+02.17

Course from 279 to 280 N 22° 01' 42.26" W Dist 2,743.8783

Point 280 N 486,067.9337 E 2,879,117.7379 Sta 3691+46.05

Course from 280 to PC OCL29 CASS 5 N 22° 01' 41.90" W Dist 272.7355

Curve Data

Curve OCL29 CASS 5
P.I. Station 3701+25.48 N 486,975.8611 E 2,878,750.3896
Delta = 7° 03' 28.63" (LT)
Degree = 0° 29' 59.99"
Tangent = 706.6913
Length = 1,411.5948
Radius = 11,459.1900
External = 21.7702
Long Chord = 1,410.7025
Mid. Ord. = 21.7290
P.C. Station 3694+18.79 N 486,320.7592 E 2,879,015.4445
P.T. Station 3708+30.38 N 487,593.4307 E 2,878,406.8487
C.C. N 482,022.8228 E 2,868,392.7904
Back = N 22° 01' 41.90" W
Ahead = N 29° 05' 10.53" W
Chord Bear = N 25° 33' 26.21" W

Course from PT OCL29 CASS 5 to PC OCL29 CASS 8 N 29° 05' 10.53" W Dist 7,812.3110

Curve Data

Curve OCL29 CASS 8
P.I. Station 3793+12.25 N 495,005.6438 E 2,874,283.5920
Delta = 13° 19' 50.68" (LT)
Degree = 1° 00' 00.00"
Tangent = 669.5607
Length = 1,333.0751
Radius = 5,729.5800
External = 38.9899
Long Chord = 1,330.0703
Mid. Ord. = 38.7264
P.C. Station 3786+42.69 N 494,420.5221 E 2,874,609.0828
P.T. Station 3799+75.77 N 495,499.9504 E 2,873,831.9589
C.C. N 491,635.2255 E 2,869,602.0667
Back = N 29° 05' 10.53" W
Ahead = N 42° 25' 01.21" W
Chord Bear = N 35° 45' 05.87" W

Course from PT OCL29 CASS 8 to PC OCL29 CASS 11 N 42° 25' 01.21" W Dist 3,321.0385

Curve Data

Curve OCL29 CASS 11
P.I. Station 3848+33.09 N 499,085.8969 E 2,870,555.5877
Delta = 30° 01' 10.64" (RT)
Degree = 1° 00' 00.00"
Tangent = 1,536.2880
Length = 3,001.9634
Radius = 5,729.5800
External = 202.3900
Long Chord = 2,967.7443
Mid. Ord. = 195.4847
P.C. Station 3832+96.81 N 497,951.7244 E 2,871,591.8470
P.T. Station 3862+98.77 N 500,586.3619 E 2,870,225.7610
C.C. N 501,816.4493 E 2,875,821.7392
Back = N 42° 25' 01.21" W
Ahead = N 12° 23' 50.57" W
Chord Bear = N 27° 24' 25.89" W

Course from PT OCL29 CASS 11 to PC OCL29 CASS 14 N 12° 23' 50.57" W Dist 1,818.7086

Curve Data

Curve OCL29 CASS 14
P.I. Station 3893+11.62 N 503,528.9608 E 2,869,578.9297
Delta = 23° 32' 44.89" (LT)
Degree = 1° 00' 00.00"
Tangent = 1,194.1437
Length = 2,354.5810
Radius = 5,729.5800
External = 123.1173
Long Chord = 2,338.0474
Mid. Ord. = 120.5274
P.C. Station 3881+17.48 N 502,362.6620 E 2,869,835.3012
P.T. Station 3904+72.06 N 504,495.7389 E 2,868,877.9880
C.C. N 501,132.5746 E 2,864,239.3230
Back = N 12° 23' 50.57" W
Ahead = N 35° 56' 35.46" W
Chord Bear = N 24° 10' 13.01" W

Course from PT OCL29 CASS 14 to PC OCL29 CASS 17 N 35° 56' 35.46" W Dist 3,330.6372

Curve Data

Curve OCL29 CASS 17
P.I. Station 3944+86.79 N 507,746.0658 E 2,866,521.4084
Delta = 13° 37' 02.91" (RT)
Degree = 1° 00' 00.00"
Tangent = 684.0973
Length = 1,361.7481
Radius = 5,729.5800
External = 40.6952
Long Chord = 1,358.5453
Mid. Ord. = 40.4082
P.C. Station 3938+02.70 N 507,192.2210 E 2,866,922.9616
P.T. Station 3951+64.44 N 508,378.8828 E 2,866,261.5395
C.C. N 510,555.3853 E 2,871,561.6266
Back = N 35° 56' 35.46" W
Ahead = N 22° 19' 32.54" W
Chord Bear = N 29° 08' 04.00" W

Course from PT OCL29 CASS 17 to PC OCL29 CASS 20 N 22° 19' 32.54" W Dist 3,637.0045

Curve Data

Curve OCL29 CASS 20
P.I. Station 3994+78.22 N 512,369.2981 E 2,864,622.8590
Delta = 6° 45' 35.53" (LT)
Degree = 0° 29' 59.99"
Tangent = 676.7743
Length = 1,351.9781
Radius = 11,459.1900
External = 19.9676
Long Chord = 1,351.1941
Mid. Ord. = 19.9329
P.C. Station 3988+01.45 N 511,743.2552 E 2,864,879.9461
P.T. Station 4001+53.43 N 512,960.7275 E 2,864,293.8686
C.C. N 507,390.2387 E 2,854,279.7441
Back = N 22° 19' 32.54" W
Ahead = N 29° 05' 08.08" W
Chord Bear = N 25° 42' 20.31" W

Course from PT OCL29 CASS 20 to PC OCL29 CASS 23 N 29° 05' 08.08" W Dist 8,650.8540

Curve Data

Curve OCL29 CASS 23
P.I. Station 4100+92.55 N 521,646.4750 E 2,859,462.3071
Delta = 25° 20' 38.11" (LT)
Degree = 1° 00' 00.00"
Tangent = 1,288.2705
Length = 2,534.3928
Radius = 5,729.5800
External = 143.0453
Long Chord = 2,513.7816
Mid. Ord. = 139.5610
P.C. Station 4088+04.28 N 520,520.6623 E 2,860,088.5552
P.T. Station 4113+38.67 N 522,395.8675 E 2,858,414.4275
C.C. N 517,735.4252 E 2,855,081.5061
Back = N 29° 05' 08.08" W
Ahead = N 54° 25' 46.18" W
Chord Bear = N 41° 45' 27.13" W

Course from PT OCL29 CASS 23 to PC OCL29 CASS 26 N 54° 25' 46.18" W Dist 1,084.0493

Curve Data

Curve OCL29 CASS 26
P.I. Station 4152+21.20 N 524,654.3511 E 2,855,256.3774
Delta = 52° 03' 51.22" (RT)
Degree = 1° 00' 00.00"
Tangent = 2,798.4793
Length = 5,206.4246
Radius = 5,729.5800
External = 646.9060
Long Chord = 5,029.1371
Mid. Ord. = 581.2762
P.C. Station 4124+22.72 N 523,026.4636 E 2,857,532.6614
P.T. Station 4176+29.15 N 527,450.4462 E 2,855,140.8842
C.C. N 527,686.9059 E 2,860,865.5828
Back = N 54° 25' 46.18" W
Ahead = N 2° 21' 54.96" W
Chord Bear = N 28° 23' 50.57" W

Course from PT OCL29 CASS 26 to PC OCL29 CASS 29 N 2° 21' 54.96" W Dist 4,889.1662

Curve Data

Curve OCL29 CASS 29
P.I. Station 4232+39.62 N 533,056.1383 E 2,854,909.3401
Delta = 14° 21' 02.22" (LT)
Degree = 1° 00' 00.00"
Tangent = 721.3058
Length = 1,435.0622
Radius = 5,729.5800
External = 45.2247
Long Chord = 1,431.3140
Mid. Ord. = 44.8705
P.C. Station 4225+18.31 N 532,335.4469 E 2,854,939.1084
P.T. Station 4239+53.38 N 533,746.9637 E 2,854,701.8737
C.C. N 532,098.9872 E 2,849,214.4098
Back = N 2° 21' 54.96" W
Ahead = N 16° 42' 57.18" W
Chord Bear = N 9° 32' 26.07" W

Course from PT OCL29 CASS 29 to PC OCL29 CASS 32 N 16° 42' 57.18" W Dist 6,390.1618

Curve Data

Curve OCL29 CASS 32
P.I. Station 4309+99.95 N 540,495.7644 E 2,852,675.0969
Delta = 13° 04' 16.14" (LT)
Degree = 1° 00' 00.00"
Tangent = 656.4071
Length = 1,307.1155
Radius = 5,729.5800
External = 37.4779
Long Chord = 1,304.2828
Mid. Ord. = 37.2344
P.C. Station 4303+43.54 N 539,867.0952 E 2,852,863.8967
P.T. Station 4316+50.65 N 541,065.4456 E 2,852,349.0086
C.C. N 538,219.1187 E 2,847,376.4328
Back = N 16° 42' 57.18" W
Ahead = N 29° 47' 13.33" W
Chord Bear = N 23° 15' 05.25" W

Course from PT OCL29 CASS 32 to PC OCL29 CASS 35 N 29° 47' 13.33" W Dist 2,286.4358

Curve Data

Curve OCL29 CASS 35
P.I. Station 4353+22.73 N 544,252.3603 E 2,850,524.8028
Delta = 27° 11' 26.69" (RT)
Degree = 1° 00' 00.00"
Tangent = 1,385.6415
Length = 2,719.0756
Radius = 5,729.5800
External = 165.1710
Long Chord = 2,693.6316
Mid. Ord. = 160.5429
P.C. Station 4339+37.09 N 543,049.7927 E 2,851,213.1585
P.T. Station 4366+56.17 N 545,636.5795 E 2,850,462.0357
C.C. N 545,896.1196 E 2,856,185.7343
Back = N 29° 47' 13.33" W
Ahead = N 2° 35' 46.64" W
Chord Bear = N 16° 11' 29.98" W

Course from PT OCL29 CASS 35 to PC OCL29 CASS 38 N 2° 35' 46.64" W Dist 1,914.6716

Curve Data

Curve OCL29 CASS 38
P.I. Station 4392+80.56 N 548,258.2823 E 2,850,343.1550
Delta = 14° 07' 21.21" (LT)
Degree = 1° 00' 00.00"
Tangent = 709.7251
Length = 1,412.2563
Radius = 5,729.5800
External = 43.7896
Long Chord = 1,408.6840
Mid. Ord. = 43.4575
P.C. Station 4385+70.84 N 547,549.2857 E 2,850,375.3043
P.T. Station 4399+83.09 N 548,938.0058 E 2,850,138.9844
C.C. N 547,289.7456 E 2,844,651.6057
Back = N 2° 35' 46.64" W
Ahead = N 16° 43' 07.85" W
Chord Bear = N 9° 39' 27.24" W



High Tension Cable Guardrail

Survey Data Layouts
Chain OCL29_CASS

I-29 - Cass Co 20 to Argusville Interchange

Course from PT OCL29 CASS 38 to PC OCL29 CASS 41 N 16° 43' 07.85" W Dist 8,374.8720

Curve Data

Curve OCL29 CASS 41
P.I. Station 4488+86.41 N 557,464.9623 E 2,847,577.7172
Delta = 10° 32' 20.78" (LT)
Degree = 1° 00' 00.00"
Tangent = 528.4464
Length = 1,053.9111
Radius = 5,729.5800
External = 24.3180
Long Chord = 1,052.4259
Mid. Ord. = 24.2153
P.C. Station 4483+57.97 N 556,958.8545 E 2,847,729.7383
P.T. Station 4494+11.88 N 557,934.7266 E 2,847,335.6902
C.C. N 555,310.5943 E 2,842,242.3596
Back = N 16° 43' 07.85" W
Ahead = N 27° 15' 28.63" W
Chord Bear = N 21° 59' 18.24" W

Course from PT OCL29 CASS 41 to PC OCL29 CASS 44 N 27° 15' 28.63" W Dist 2,766.0411

Curve Data

Curve OCL29 CASS 44
P.I. Station 4534+48.86 N 561,523.4198 E 2,845,486.7614
Delta = 25° 00' 49.94" (RT)
Degree = 1° 00' 00.00"
Tangent = 1,270.9450
Length = 2,501.3881
Radius = 5,729.5800
External = 139.2690
Long Chord = 2,481.5705
Mid. Ord. = 135.9641
P.C. Station 4521+77.92 N 560,393.6087 E 2,846,068.8508
P.T. Station 4546+79.31 N 562,793.3901 E 2,845,436.9955
C.C. N 563,017.7410 E 2,851,162.1814
Back = N 27° 15' 28.63" W
Ahead = N 2° 14' 38.69" W
Chord Bear = N 14° 45' 03.66" W

Course from PT OCL29 CASS 44 to PC OCL29 CASS 47 N 2° 14' 38.69" W Dist 1,332.9943

Curve Data

Curve OCL29 CASS 47
P.I. Station 4567+40.23 N 564,852.7363 E 2,845,356.2966
Delta = 14° 28' 51.82" (LT)
Degree = 1° 00' 00.00"
Tangent = 727.9324
Length = 1,448.1066
Radius = 5,729.5800
External = 46.0561
Long Chord = 1,444.2554
Mid. Ord. = 45.6889
P.C. Station 4560+12.30 N 564,125.3621 E 2,845,384.8000
P.T. Station 4574+60.41 N 565,549.8744 E 2,845,146.8116
C.C. N 563,901.0113 E 2,839,659.6141
Back = N 2° 14' 38.69" W
Ahead = N 16° 43' 30.51" W
Chord Bear = N 9° 29' 04.60" W

Course from PT OCL29 CASS 47 to PC OCL29 CASS 50 N 16° 43' 30.51" W Dist 3,442.4301

Curve Data

Curve OCL29 CASS 50
P.I. Station 4614+97.96 N 569,416.6282 E 2,843,984.8801
Delta = 5° 56' 45.29" (LT)
Degree = 0° 29' 59.99"
Tangent = 595.1273
Length = 1,189.1862
Radius = 11,459.1900
External = 15.4434
Long Chord = 1,188.6527
Mid. Ord. = 15.4226
P.C. Station 4609+02.84 N 568,846.6770 E 2,844,156.1463
P.T. Station 4620+92.02 N 569,965.7718 E 2,843,755.4943
C.C. N 565,548.9421 E 2,833,181.7224
Back = N 16° 43' 30.51" W
Ahead = N 22° 40' 15.80" W
Chord Bear = N 19° 41' 53.16" W

Course from PT OCL29 CASS 50 to 281 N 22° 40' 15.80" W Dist 1,980.4615

Point 281 N 571,793.2088 E 2,842,992.1453 Sta 4640+72.48

Course from 281 to 282 N 22° 40' 15.80" W Dist 1,012.2175

Point 282 N 572,727.2152 E 2,842,601.9962 Sta 4650+84.70

Course from 282 to TS OCL29 CASS 57 N 22° 40' 15.80" W Dist 2,931.8556

Spiral OCL29 CASS 57 Type 1 Spiral Element

Angle 1° 57' 00.00" (RT) P 0.7374 BK N 22° 40' 15.80" W
LS 260.0000 K 129.9950 AH N 20° 43' 15.80" W
R 3,819.7186 LT 173.3439 CB N 22° 01' 15.83" W
YS 2.9494 ST 86.6762 Defl 0° 38' 59.98"
XS 259.9699 LC 259.9866 Deg 1° 30' 00.00"

Spiral Coordinates

Point North East Station
TS 575,432.5349 2,841,471.9419 4680+16.56
PI 575,592.4850 2,841,405.1282 4681+89.90
SC 575,673.5545 2,841,374.4606 4682+76.56
CC 577,025.0420 2,844,947.0971

Curve Data

Curve OCL29 CASS 58
P.I. Station 4688+16.41 N 576,178.4871 E 2,841,183.4503
Delta = 16° 05' 20.56" (RT)
Degree = 1° 30' 00.00"
Tangent = 539.8535
Length = 1,072.6029
Radius = 3,819.7186
External = 37.9610
Long Chord = 1,069.0824
Mid. Ord. = 37.5875
P.C. Station 4682+76.56 N 575,673.5545 E 2,841,374.4606
P.T. Station 4693+49.16 N 576,716.5775 E 2,841,139.8540
C.C. N 577,025.0420 E 2,844,947.0971
Back = N 20° 43' 15.80" W
Ahead = N 4° 37' 55.24" W
Chord Bear = N 12° 40' 35.52" W

Spiral OCL29 CASS 59 Type 2 Spiral Element

Angle 1° 57' 00.00" (RT) P 0.7374 BK N 4° 37' 55.24" W
LS 260.0000 K 129.9950 AH N 2° 40' 55.24" W
R 3,819.7186 LT 173.3439 CB N 3° 19' 55.22" W
YS 2.9494 ST 86.6762 Defl 0° 38' 59.98"
XS 259.9699 LC 259.9866 Deg 1° 30' 00.00"

Spiral Coordinates

Point North East Station
CS 576,716.5775 2,841,139.8540 4693+49.16
PI 576,802.9706 2,841,132.8544 4694+35.84
ST 576,976.1246 2,841,124.7431 4696+09.16
CC 577,025.0420 2,844,947.0971

Course from ST OCL29 CASS 59 to 283 N 2° 40' 55.24" W Dist 51.4069

Point 283 N 577,027.4751 E 2,841,122.3377 Sta 4696+60.57

Course from 283 to PC OCL29 CASS 64 N 2° 40' 55.24" W Dist 1,553.0950

Curve Data

Curve OCL29 CASS 64
P.I. Station 4719+19.45 N 579,283.8865 E 2,841,016.6380
Delta = 14° 02' 41.58" (LT)
Degree = 0° 59' 59.95"
Tangent = 705.7907
Length = 1,404.5059
Radius = 5,729.6500
External = 43.3067
Long Chord = 1,400.9921
Mid. Ord. = 42.9819
P.C. Station 4712+13.66 N 578,578.8689 E 2,841,049.6639
P.T. Station 4726+18.17 N 579,959.8134 E 2,840,813.5043
C.C. N 578,310.7623 E 2,835,326.2901
Back = N 2° 40' 55.24" W
Ahead = N 16° 43' 36.82" W
Chord Bear = N 9° 42' 16.03" W

Course from PT OCL29 CASS 64 to PC OCL29 CASS 67 N 16° 43' 36.82" W Dist 6,417.0446

Curve Data

Curve OCL29 CASS 67
P.I. Station 4799+30.81 N 586,963.0358 E 2,838,708.8532
Delta = 17° 46' 04.36" (LT)
Degree = 0° 59' 59.95"
Tangent = 895.5939
Length = 1,776.8102
Radius = 5,729.6500
External = 69.5721
Long Chord = 1,769.6992
Mid. Ord. = 68.7375
P.C. Station 4790+35.21 N 586,105.3368 E 2,838,966.6141
P.T. Station 4808+12.02 N 587,701.1644 E 2,838,201.6505
C.C. N 584,456.2857 E 2,833,479.3999
Back = N 16° 43' 36.82" W
Ahead = N 34° 29' 41.18" W
Chord Bear = N 25° 36' 39.00" W

Course from PT OCL29 CASS 67 to PC OCL29 CASS 70 N 34° 29' 41.18" W Dist 2,086.7335

Curve Data

Curve OCL29 CASS 70
P.I. Station 4841+03.45 N 590,413.8850 E 2,836,337.6136
Delta = 12° 00' 10.09" (RT)
Degree = 0° 29' 59.99"
Tangent = 1,204.6927
Length = 2,400.5676
Radius = 11,459.1900
External = 63.1500
Long Chord = 2,396.1805
Mid. Ord. = 62.8039
P.C. Station 4828+98.76 N 589,421.0040 E 2,837,019.8686
P.T. Station 4852+99.32 N 591,526.9406 E 2,835,876.7536
C.C. N 595,910.6992 E 2,846,464.2791
Back = N 34° 29' 41.18" W
Ahead = N 22° 29' 31.10" W
Chord Bear = N 28° 29' 36.14" W

Course from PT OCL29 CASS 70 to 284 N 22° 29' 31.10" W Dist 1,232.3401

Point 284 N 592,665.5405 E 2,835,405.3170 Sta 4865+31.66

Course from 284 to 285 N 22° 29' 31.10" W Dist 3,985.3757

Point 285 N 596,347.7612 E 2,833,880.6957 Sta 4905+17.04

=====

Ending chain OCL29 CASS description



High Tension Cable Guardrail

Survey Data Layouts
Chain OCL29_CASS

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23 USC § 407 Documents
NDDOT Reserves All Objections

STATE

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SECTION
NO.

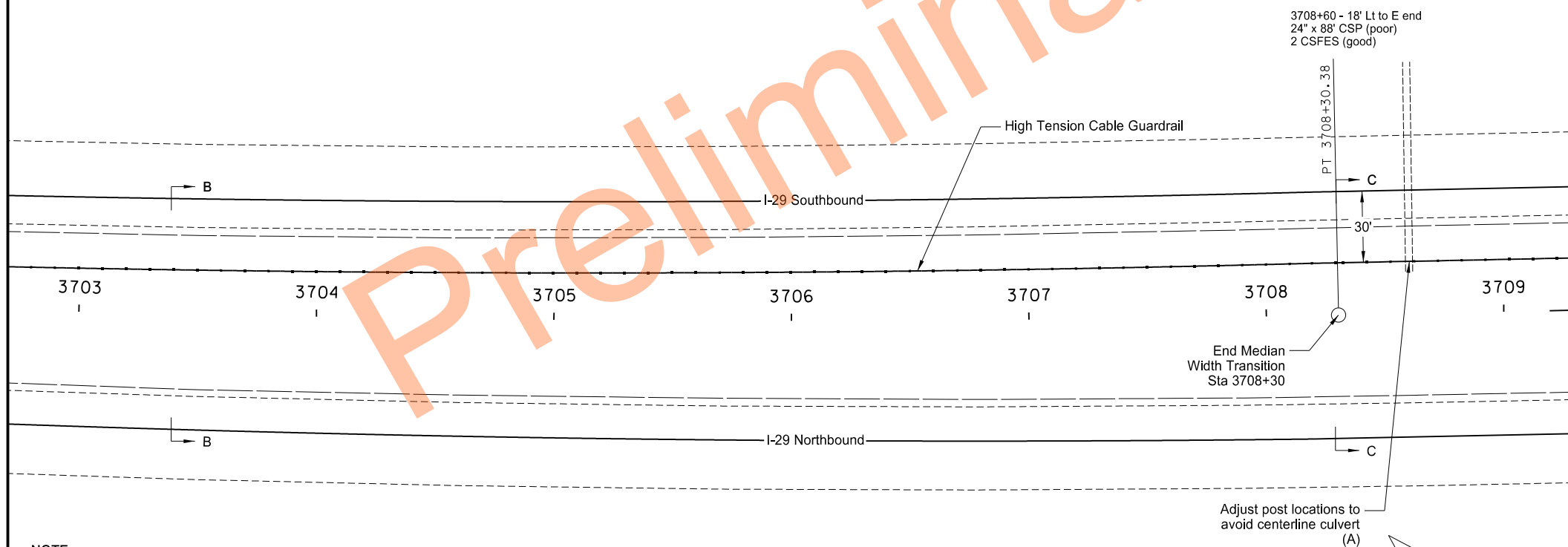
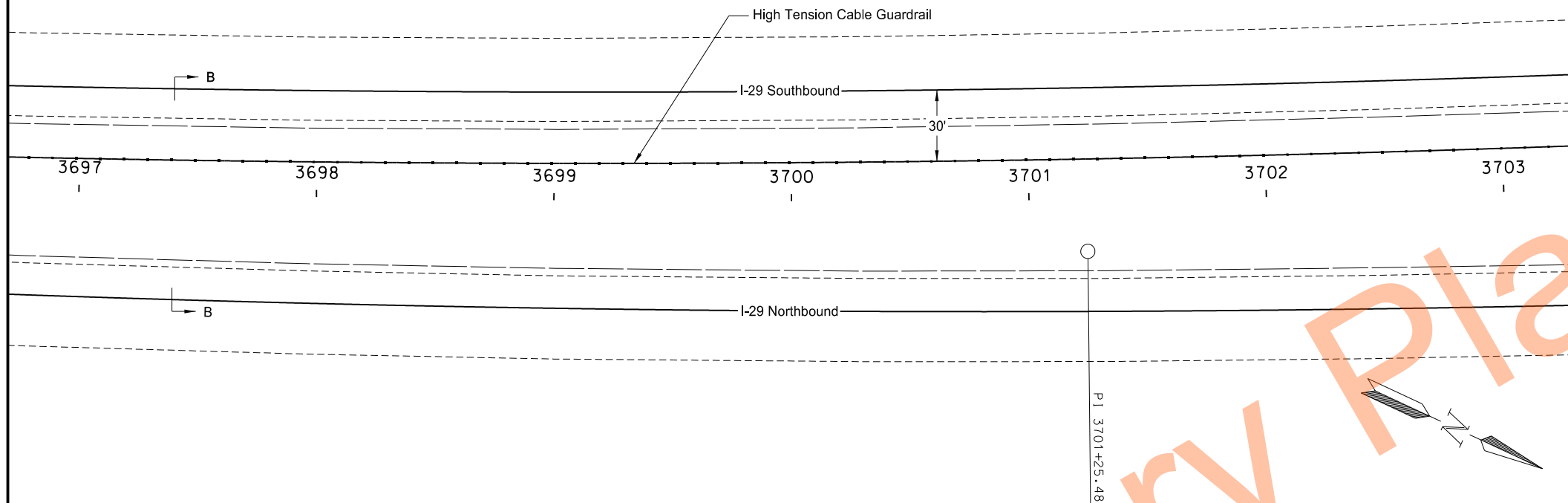
SHEET
NO.

ND

HEN-X-8-029(200)069

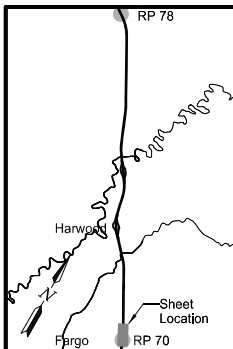
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2



NOTE:

(A) Maintain minimum two feet of spacing between the outside edges of centerline pipe and guardrail posts. Adjust post locations to avoid centerline culvert.



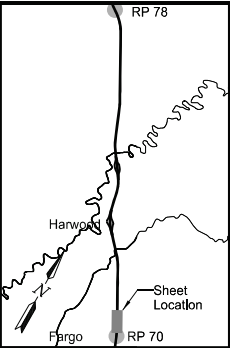
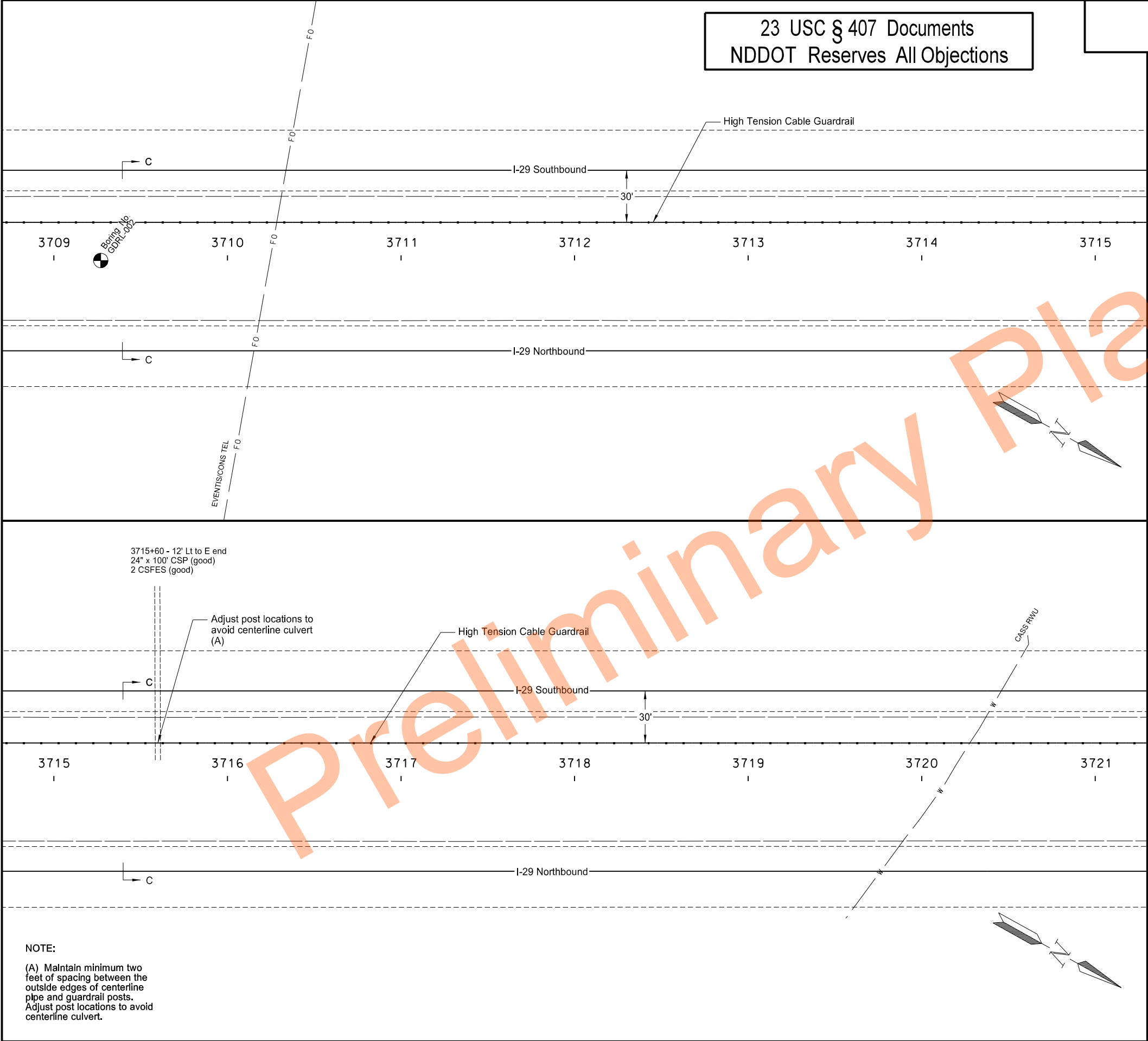
High Tension Cable Guardrail Layout

Segment A - Sta 3697+00 to 3709+00

I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

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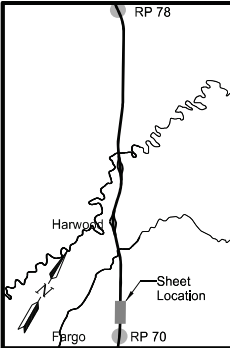
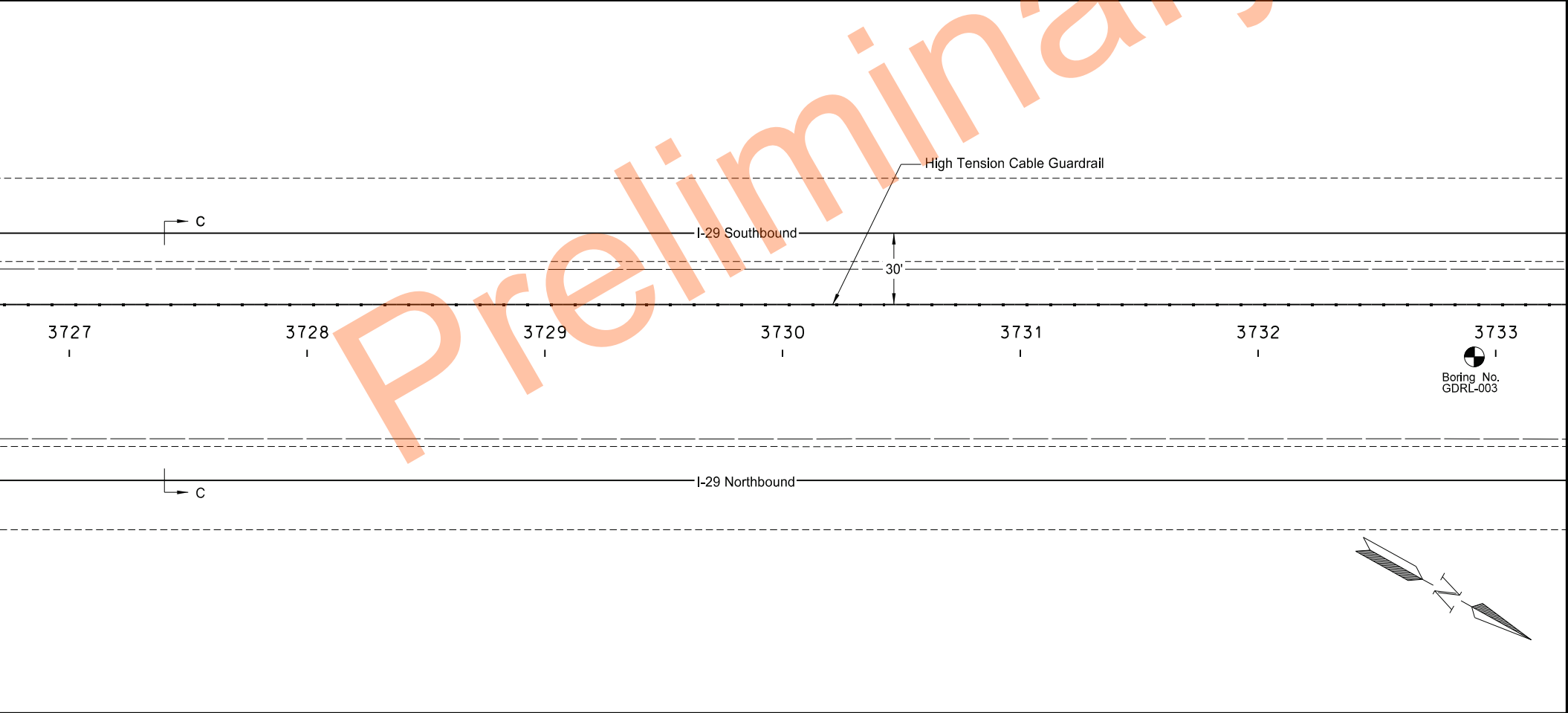
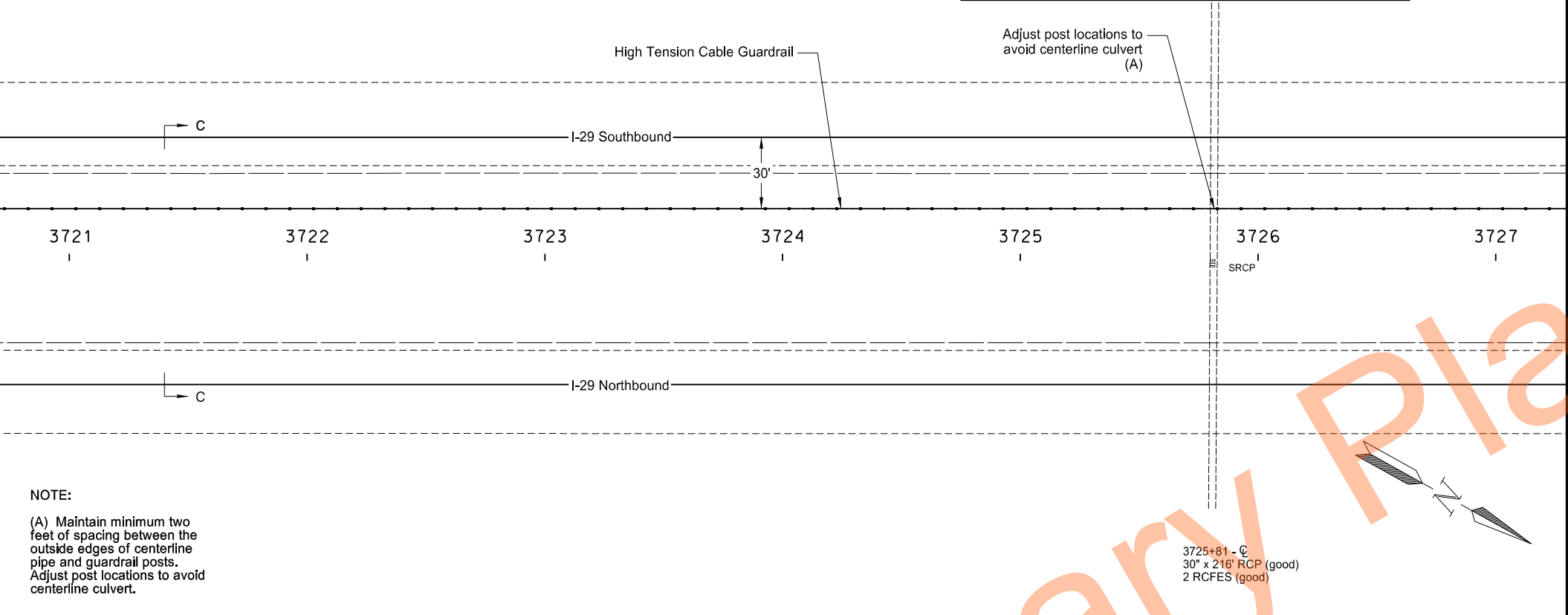
High Tension Cable Guardrail Layout

Segment A - Sta 3709+00 to 3721+00

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23 USC § 407 Documents
NDDOT Reserves All Objections

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High Tension Cable Guardrail Layout

Segment A - Sta 3721+00 to 3733+00

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23 USC § 407 Documents
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SECTION
NO.

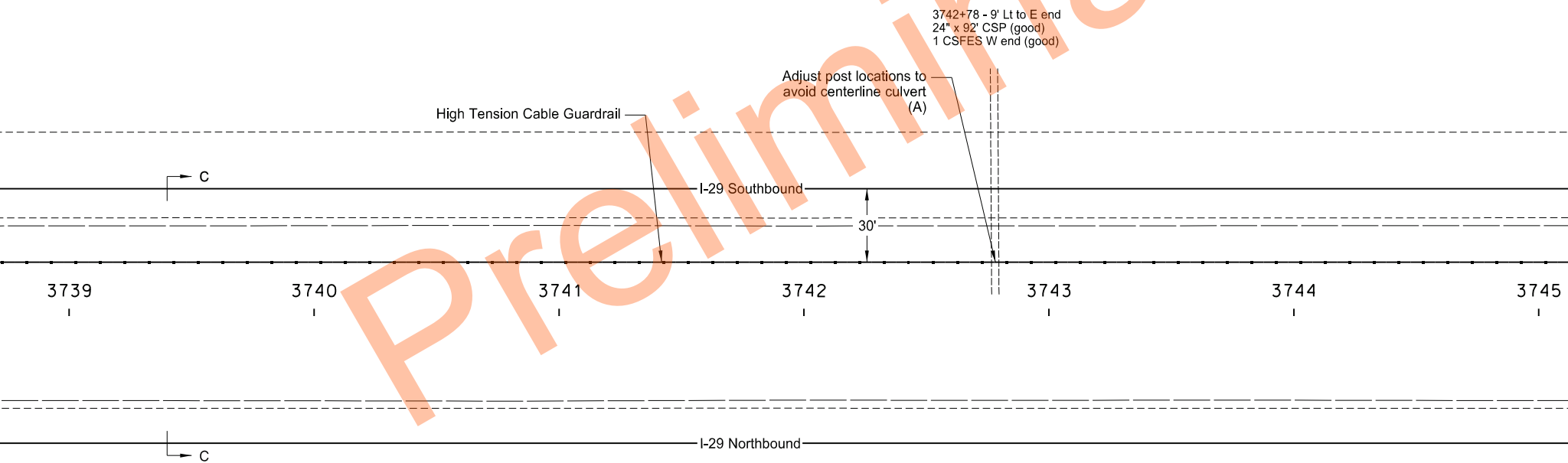
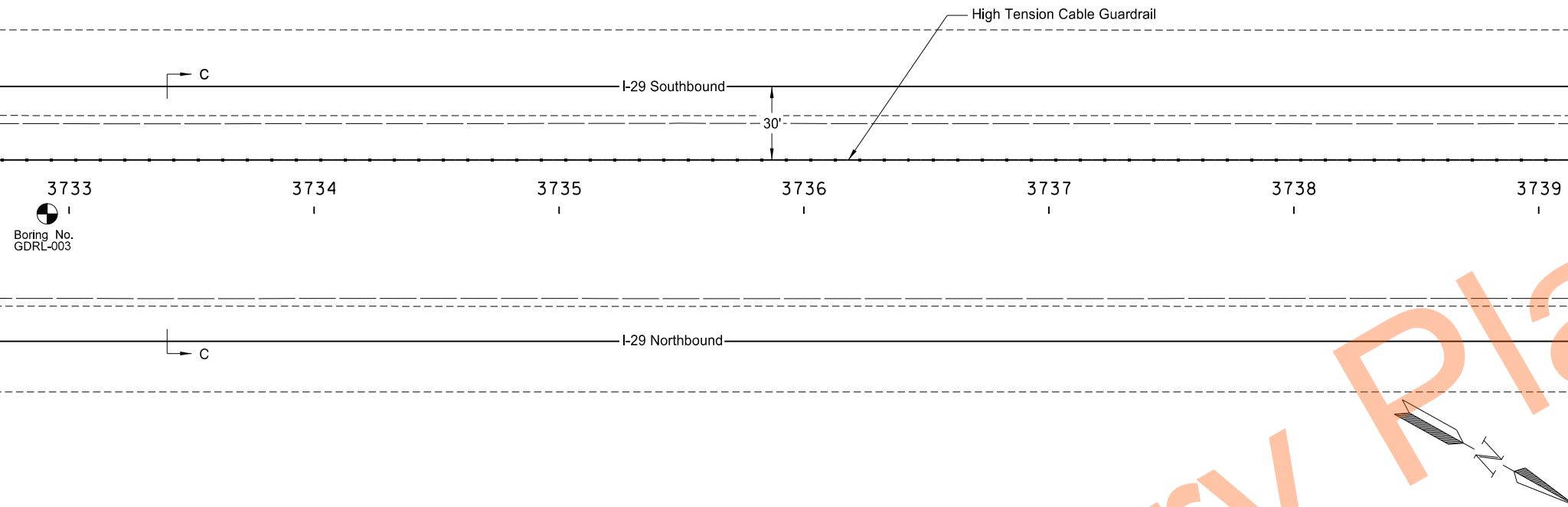
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HEN-X-8-029(200)069

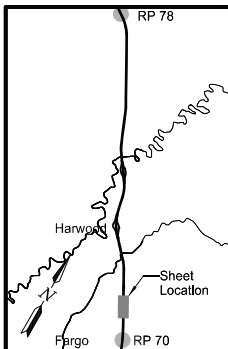
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5



NOTE:

(A) Maintain minimum two feet of spacing between the outside edges of centerline pipe and guardrail posts. Adjust post locations to avoid centerline culvert.



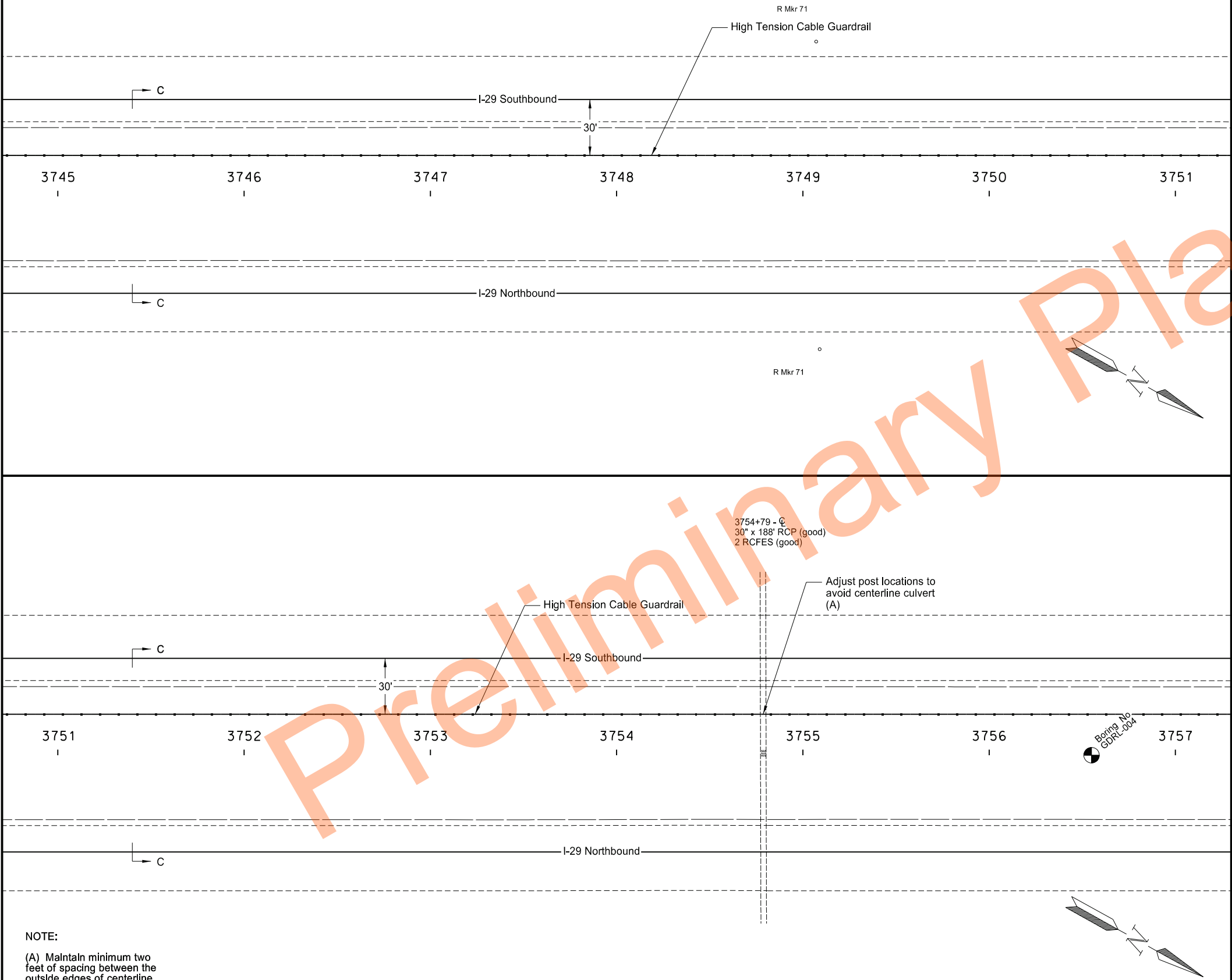
High Tension Cable Guardrail Layout

Segment A - Sta 3733+00 to 3745+00

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23 USC § 407 Documents
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Harwood

Fargo

RP 70

Sheet Location

REGISTERED PROFESSIONAL ENGINEER

SCOTT MIDDLEAUGH

PE 7499

DATE 07/22/25

NORTH DAKOTA

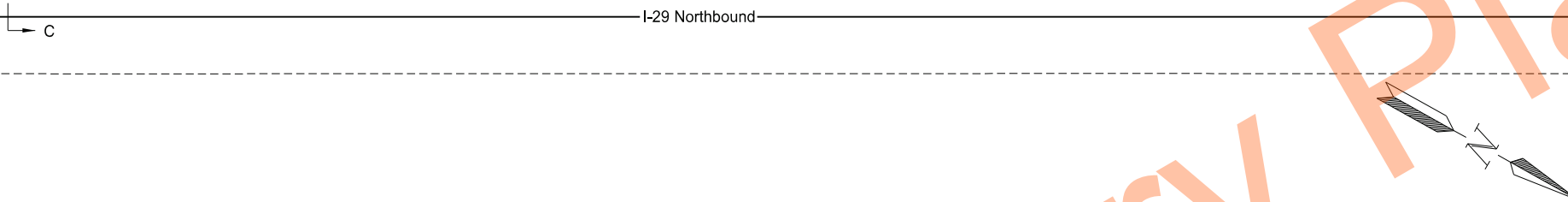
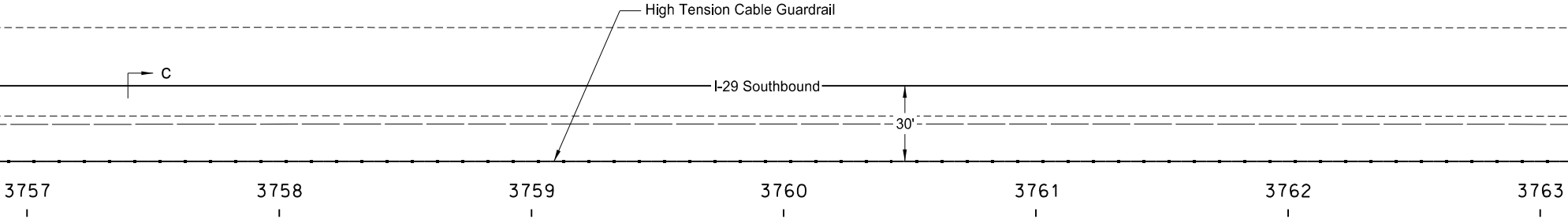
High Tension Cable Guardrail Layout

Segment A - Sta 3745+00 to 3757+00

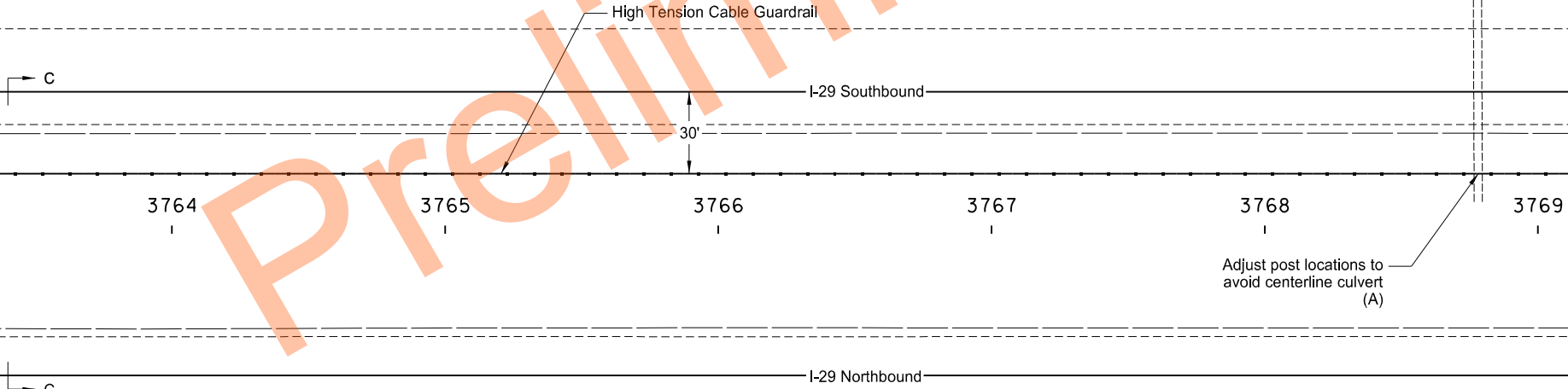
I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

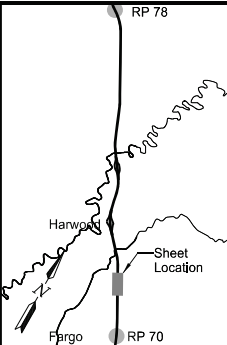
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3768+78 - 12' Lt to E end
24" x 88' CSP (bent)
1 CSFES W end



NOTE:
(A) Maintain minimum two feet of spacing between the outside edges of centerline pipe and guardrail posts. Adjust post locations to avoid centerline culvert.



High Tension Cable Guardrail Layout
Segment A - Sta 3757+00 to 3769+00
I-29 - Cass Co 20 to Argusville Interchange

3768+78 - 12' Lt to E end
24" x 88" CSP (bent)
1 CSFES W end

23 USC § 407 Documents
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SECTION
NO.

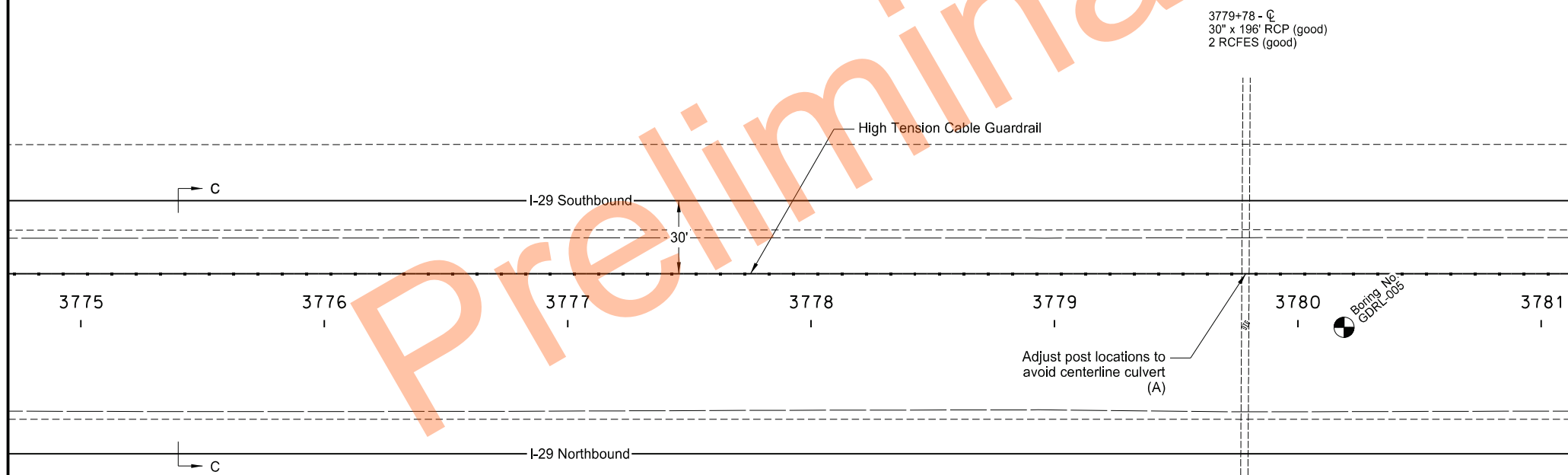
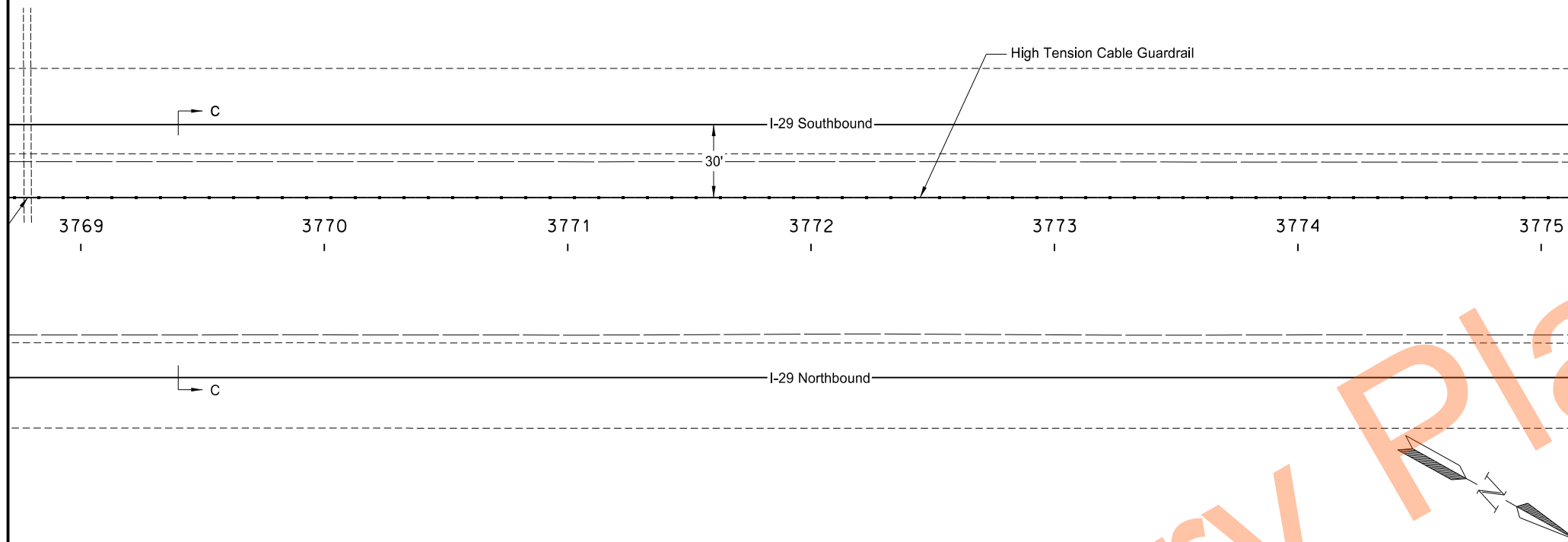
SHEET
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ND

HEN-X-8-029(200)069

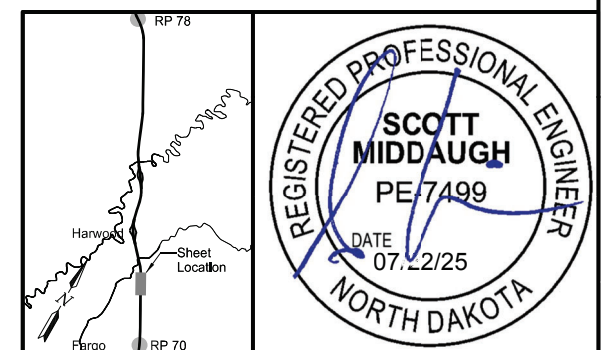
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8



NOTE:

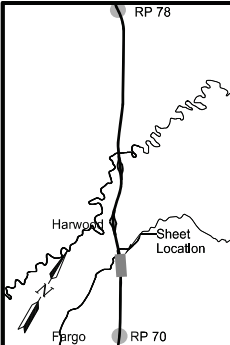
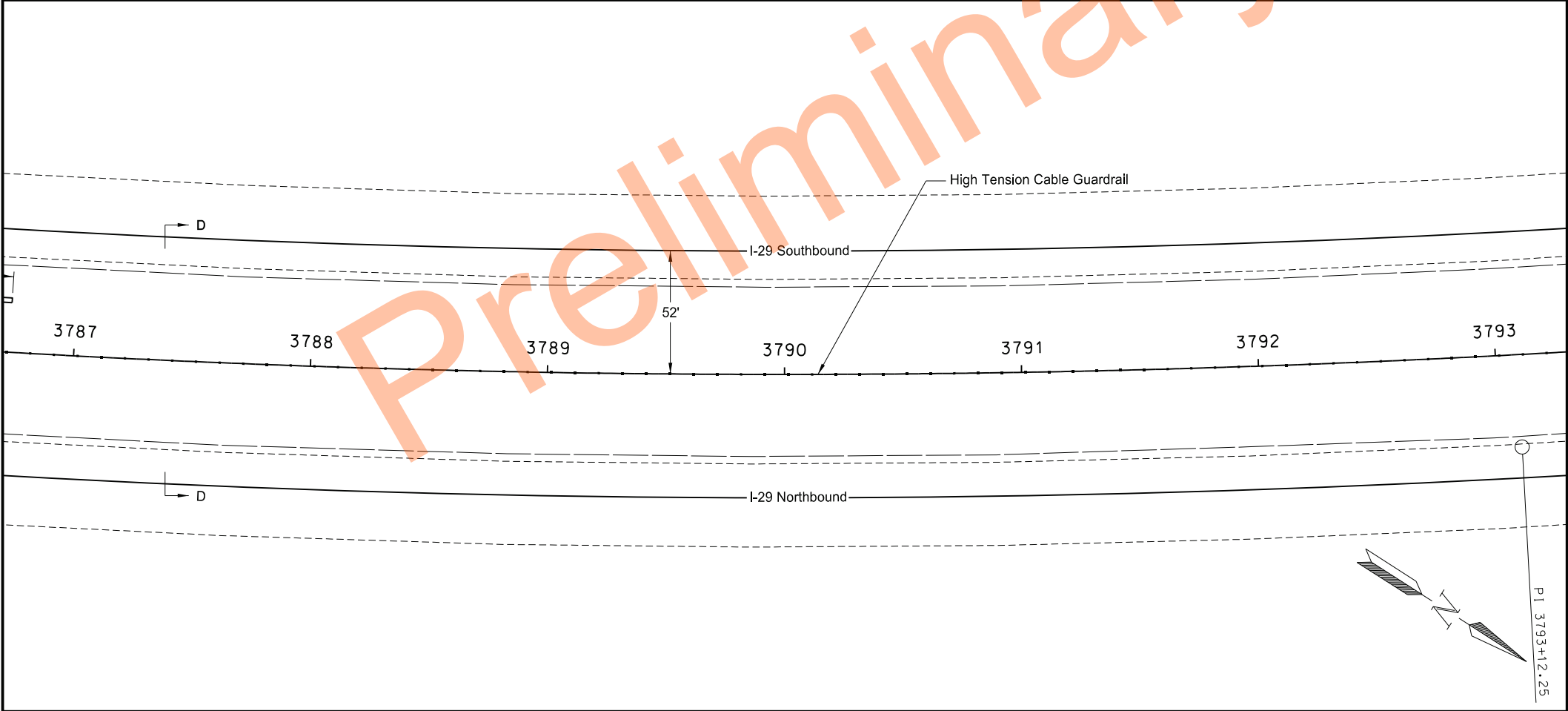
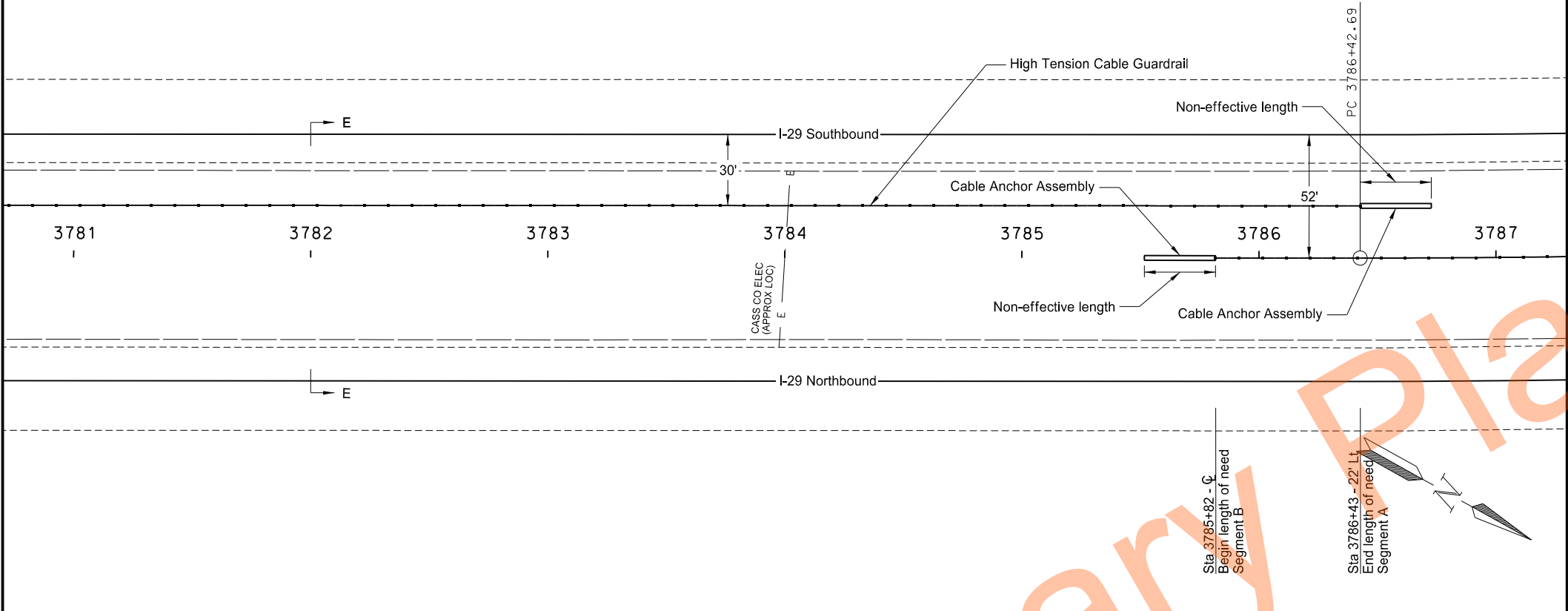
(A) Maintain minimum two feet of spacing between the outside edges of centerline pipe and guardrail posts. Adjust post locations to avoid centerline culvert.



High Tension Cable Guardrail Layout
Segment A - Sta 3769+00 to 3781+00
I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

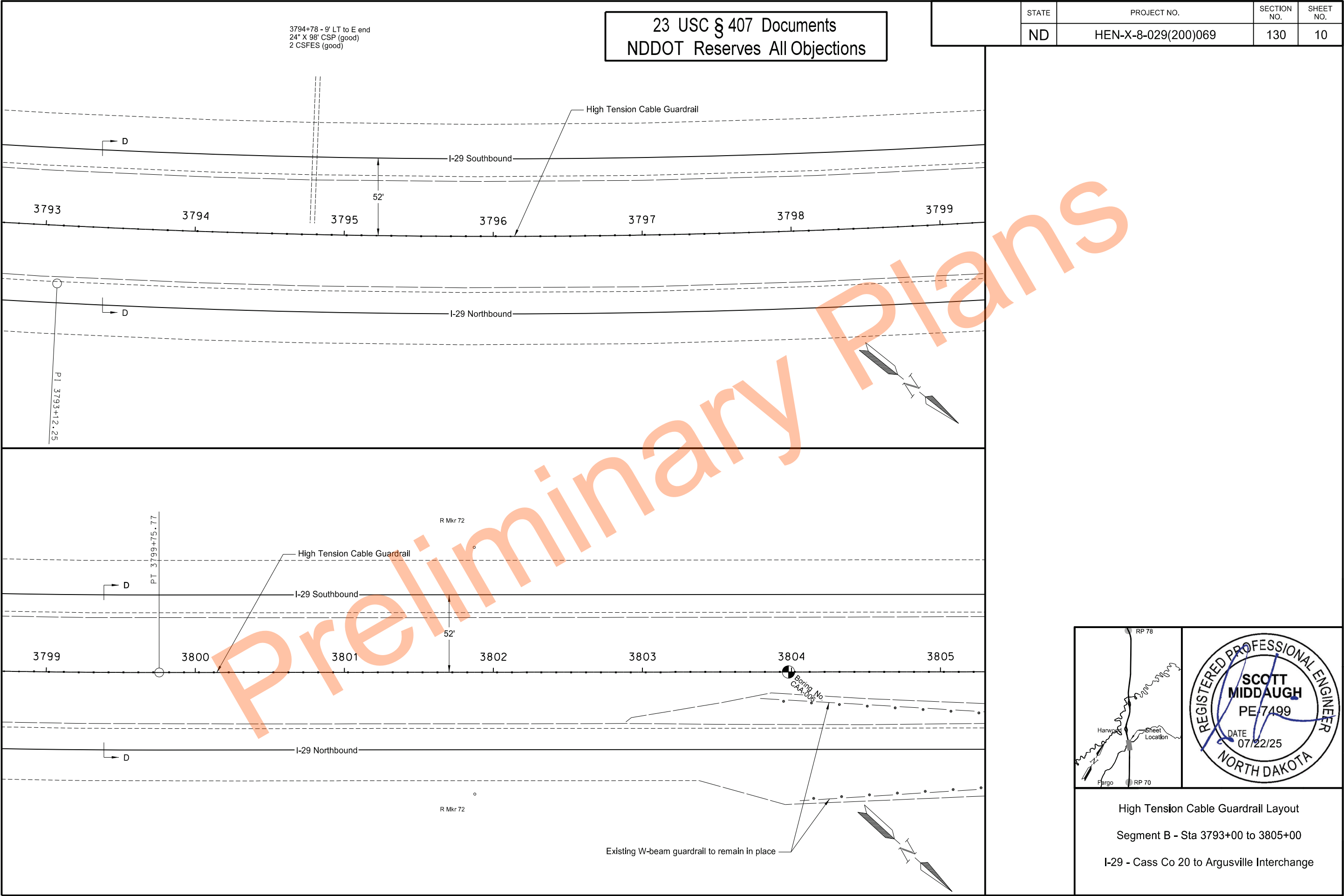
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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High Tension Cable Guardrail Layout

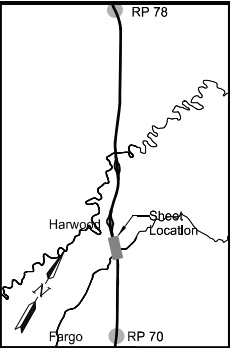
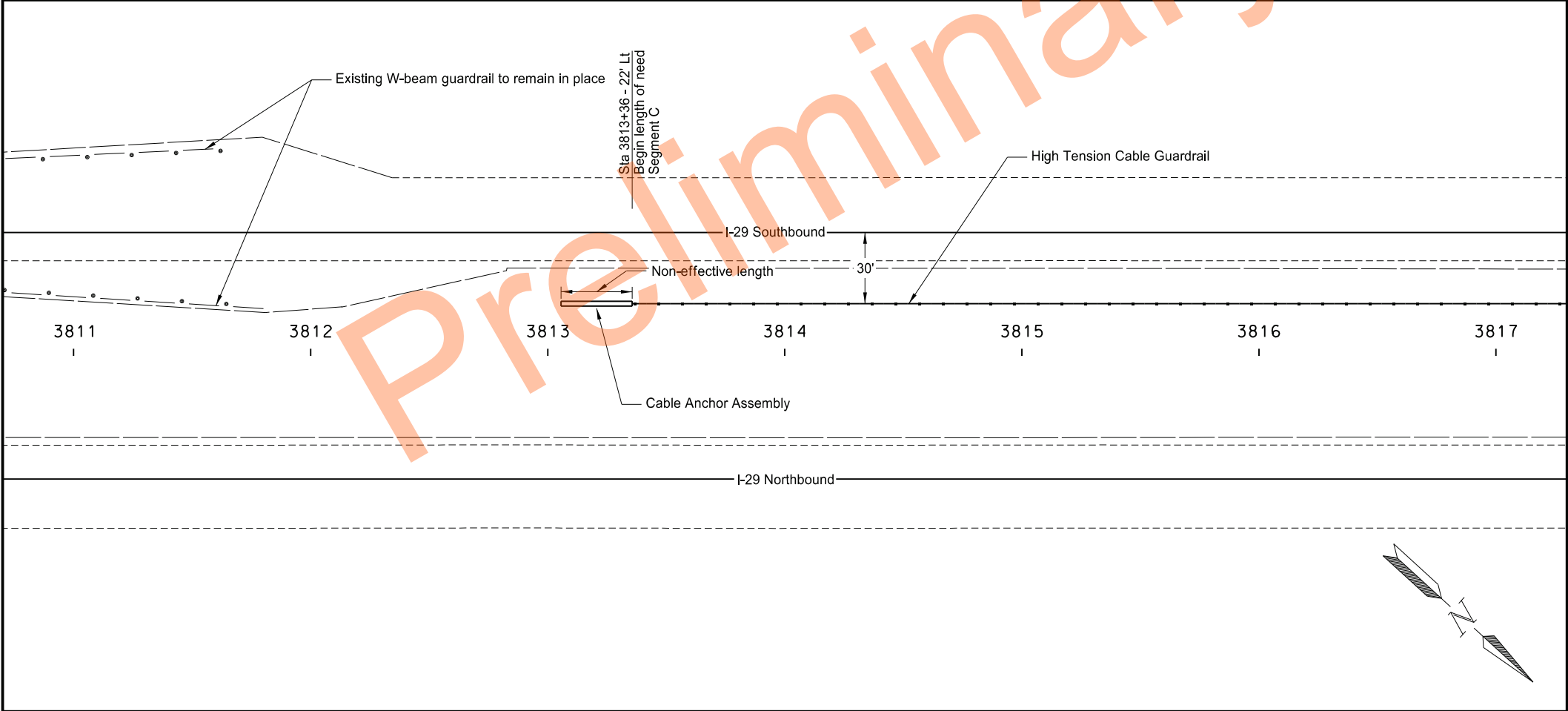
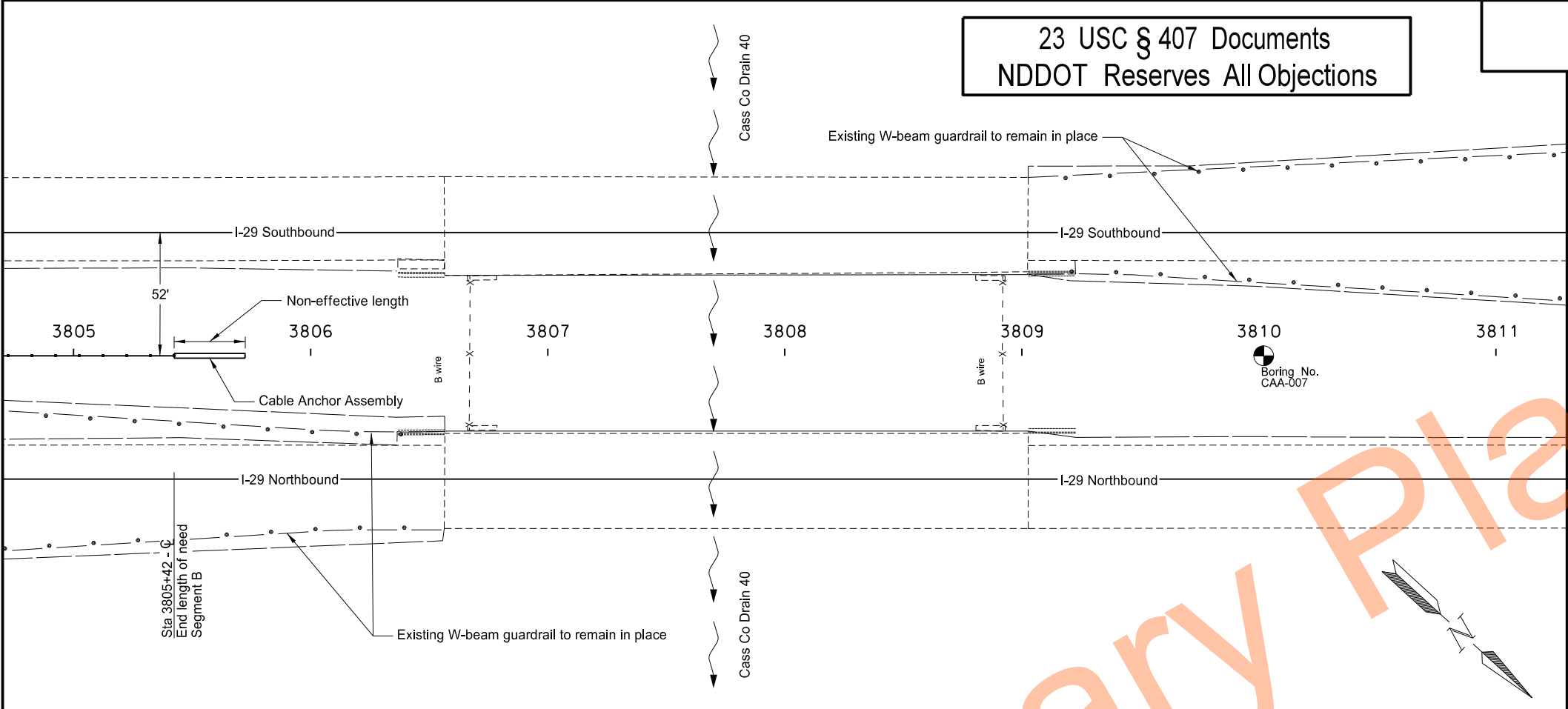
Segment A - Sta 3781+00 to 3786+43
Segment B - Sta 3785+82 to 3793+00

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23 USC § 407 Documents
NDDOT Reserves All Objections

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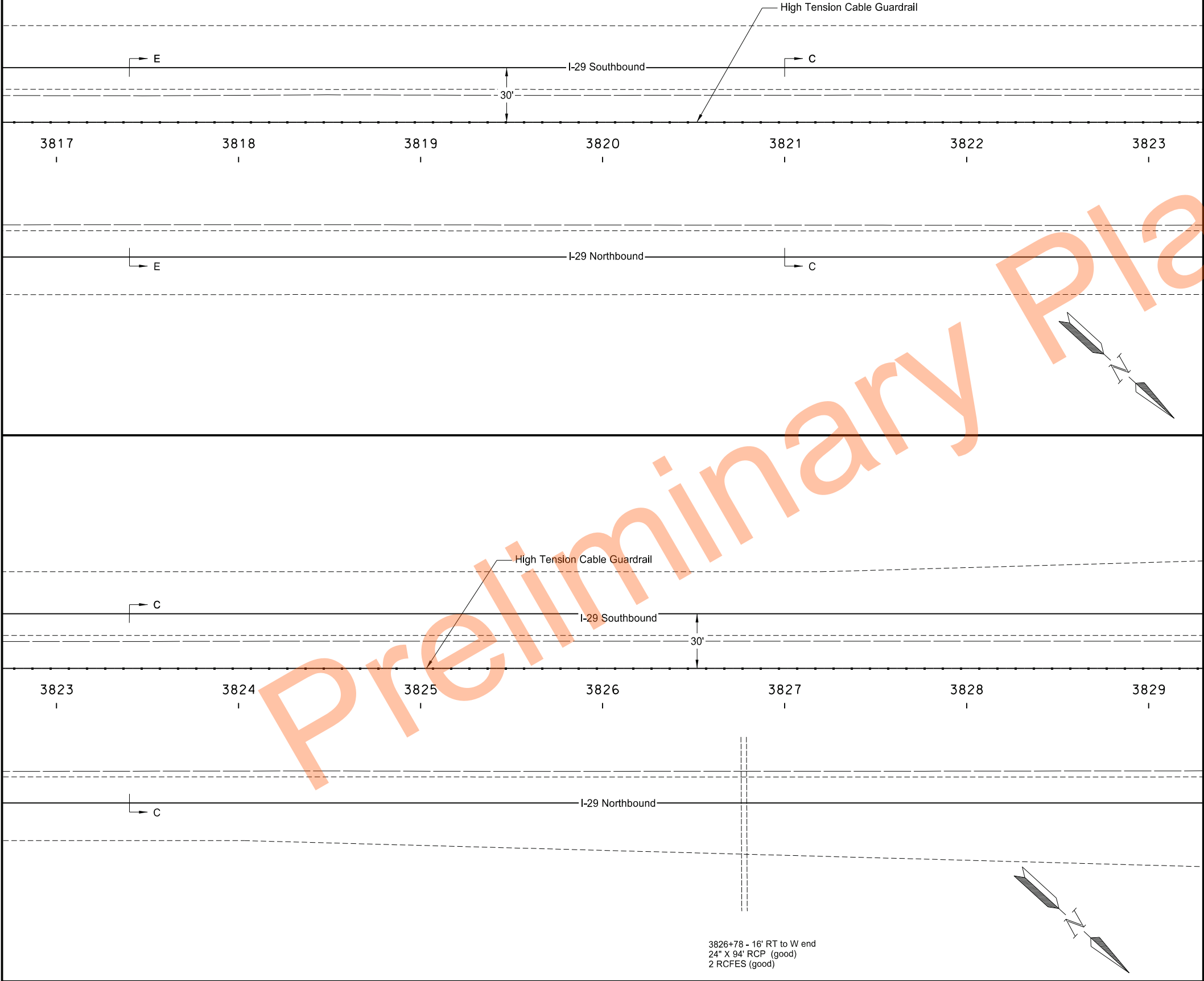
High Tension Cable Guardrail Layout

Segment B - Sta 3805+00 to 3805+42
Segment C - Sta 3813+36 to 3817+00

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Harwood

Fargo

RP 70

Sheet Location

REGISTERED PROFESSIONAL ENGINEER

SCOTT MIDDLEAUGH

PE 7499

DATE 07/22/25

NORTH DAKOTA

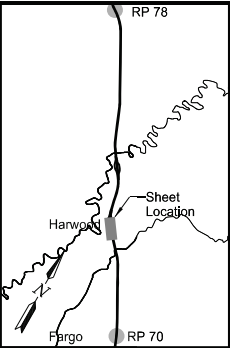
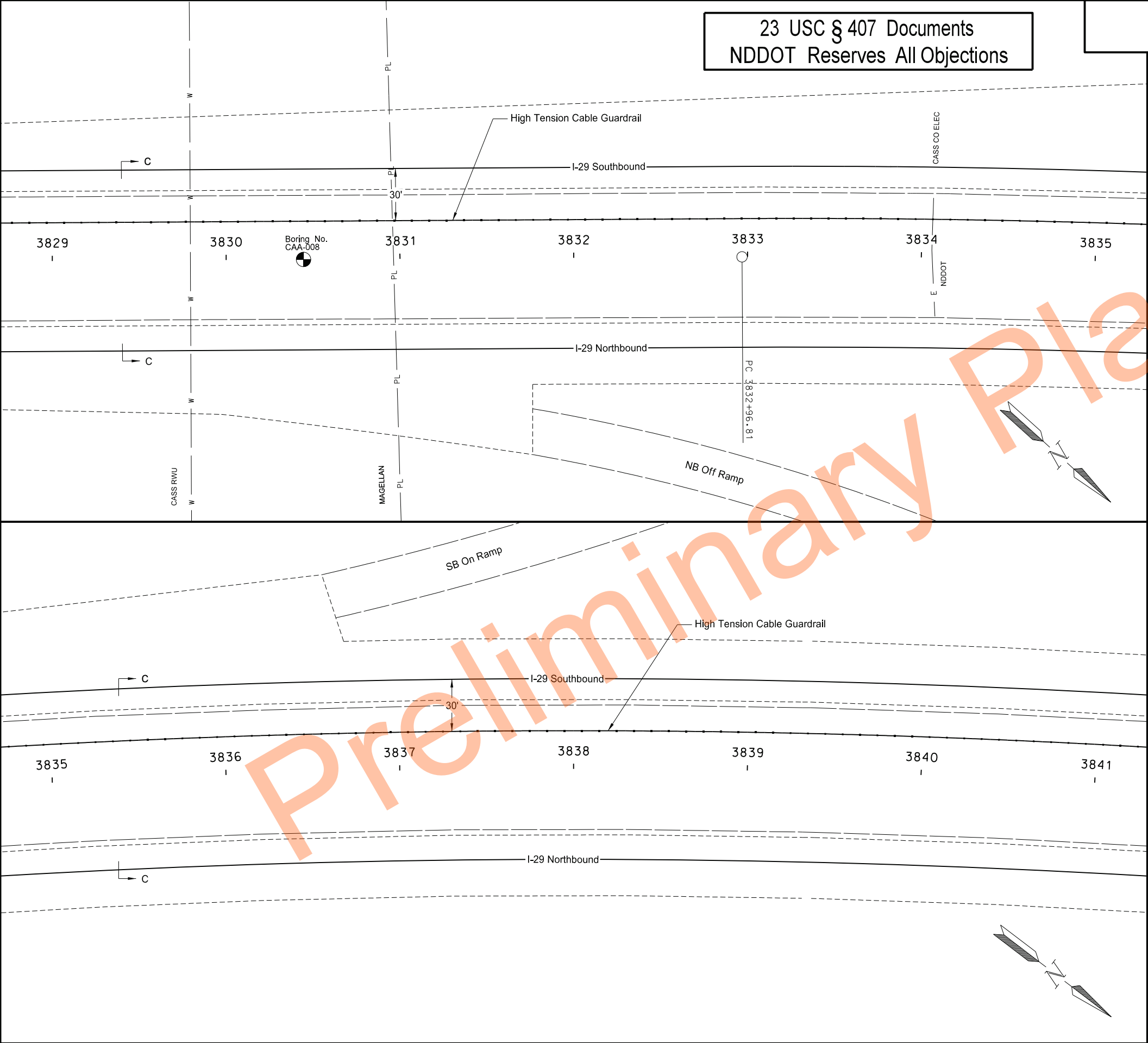
High Tension Cable Guardrail Layout

Segment C - Sta 3817+00 to 3829+00

I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

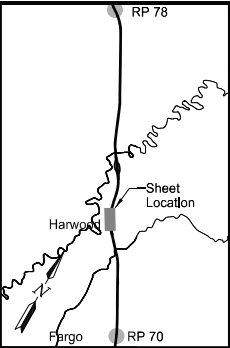
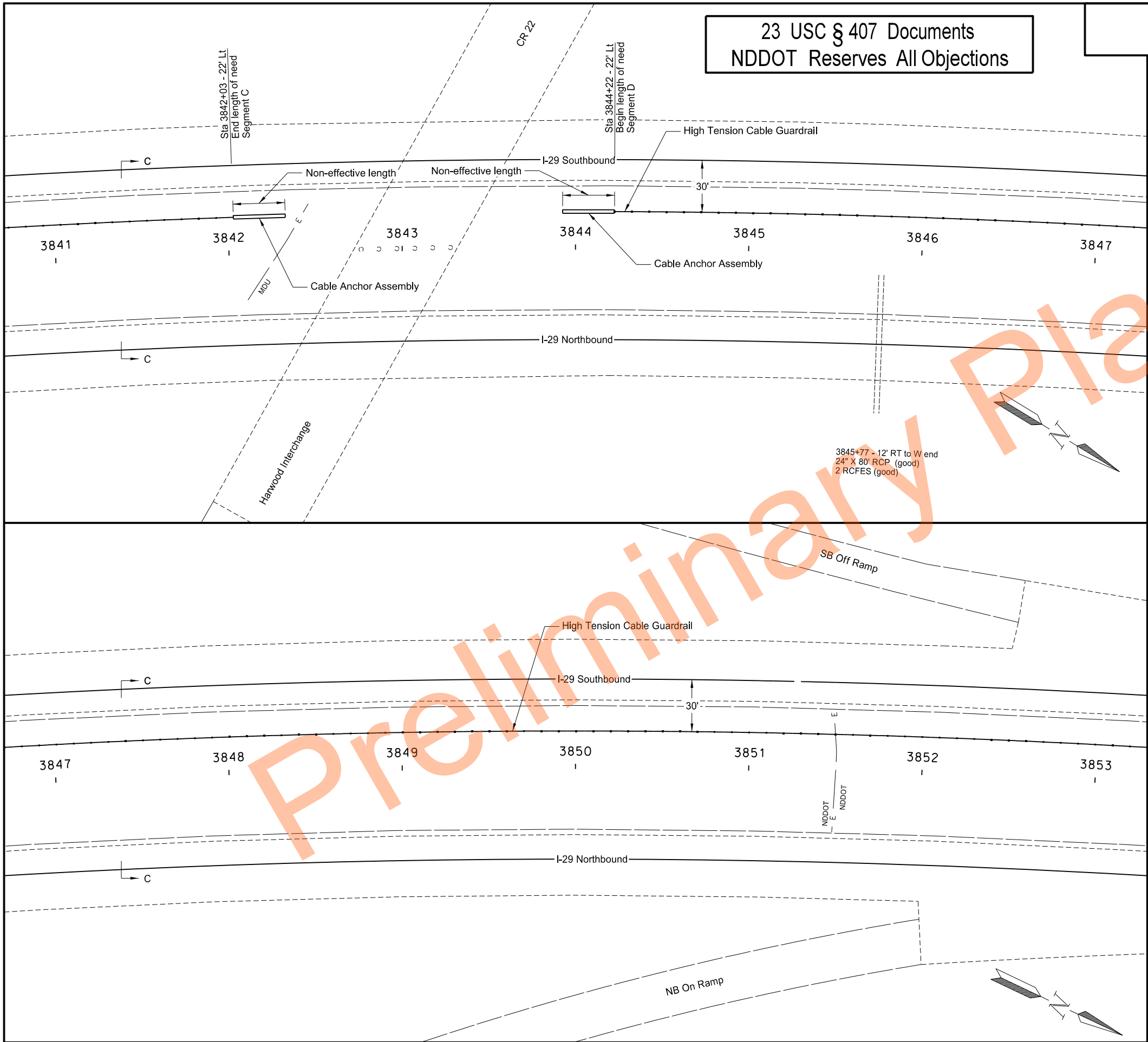
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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High Tension Cable Guardrail Layout
Segment C - Sta 3829+00 to 3841+00
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23 USC § 407 Documents
NDDOT Reserves All Objections

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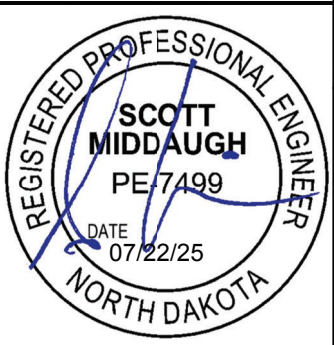
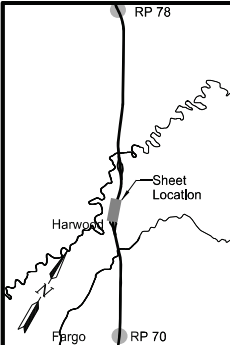
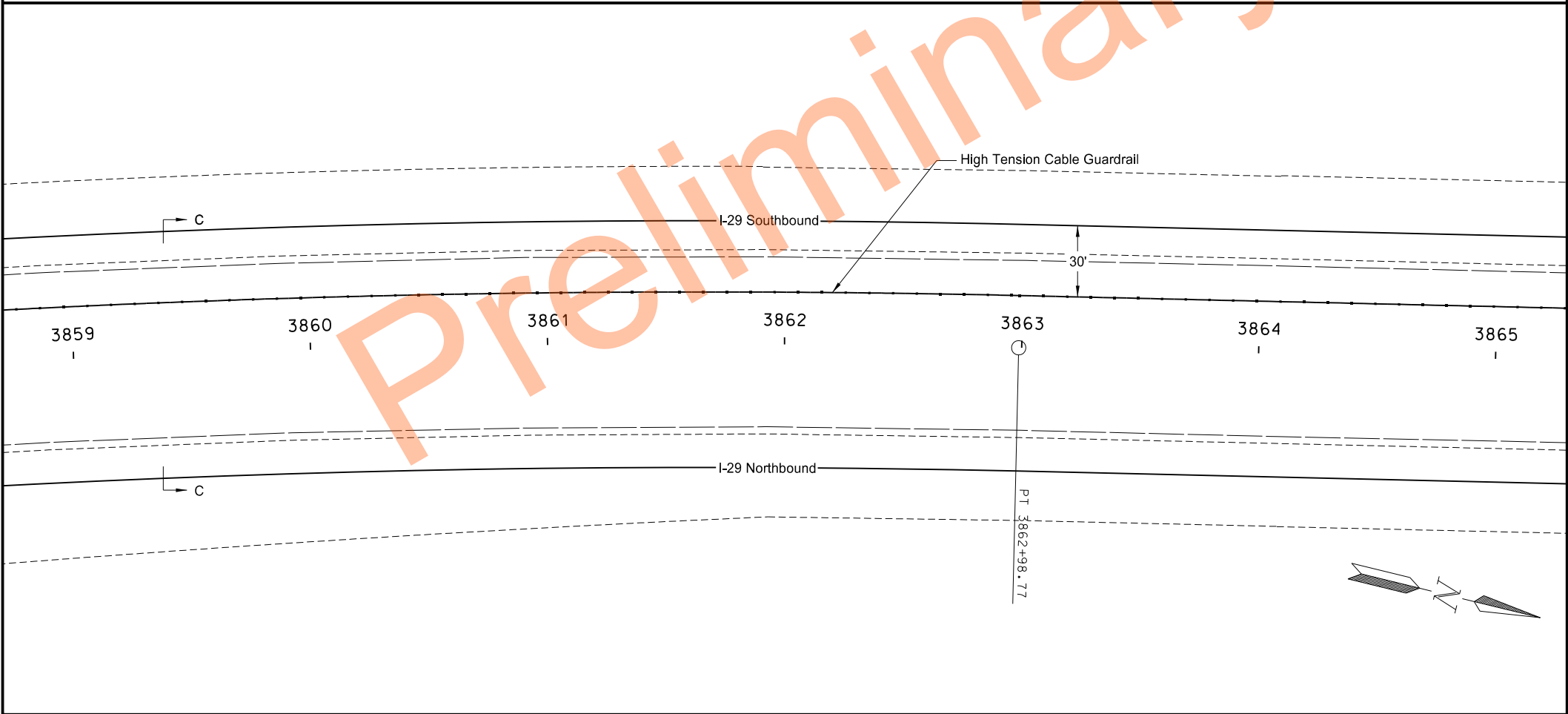
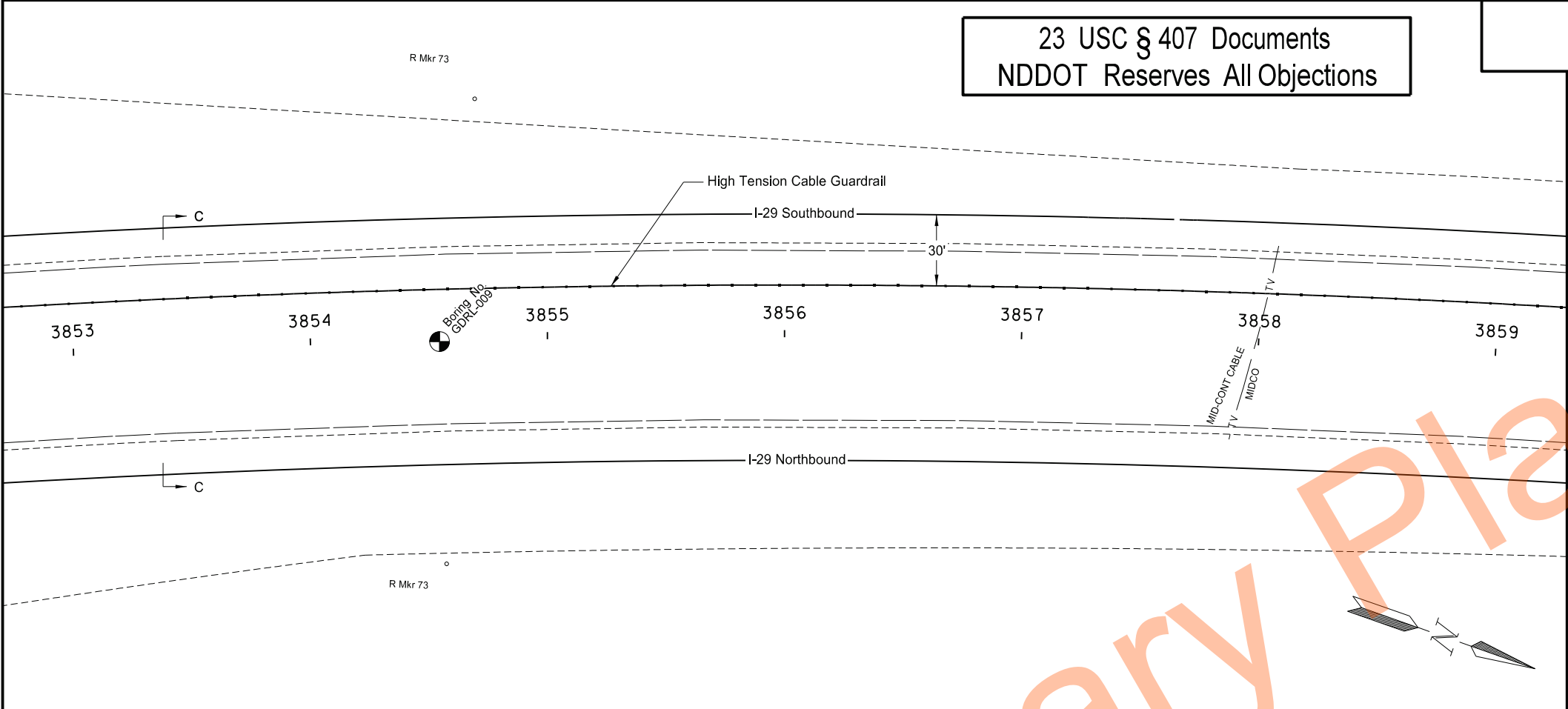
High Tension Cable Guardrail Layout

Segment C - Sta 3841+00 to 3842+03
Segment D - Sta 3844+22 to 3853+00

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23 USC § 407 Documents
NDDOT Reserves All Objections

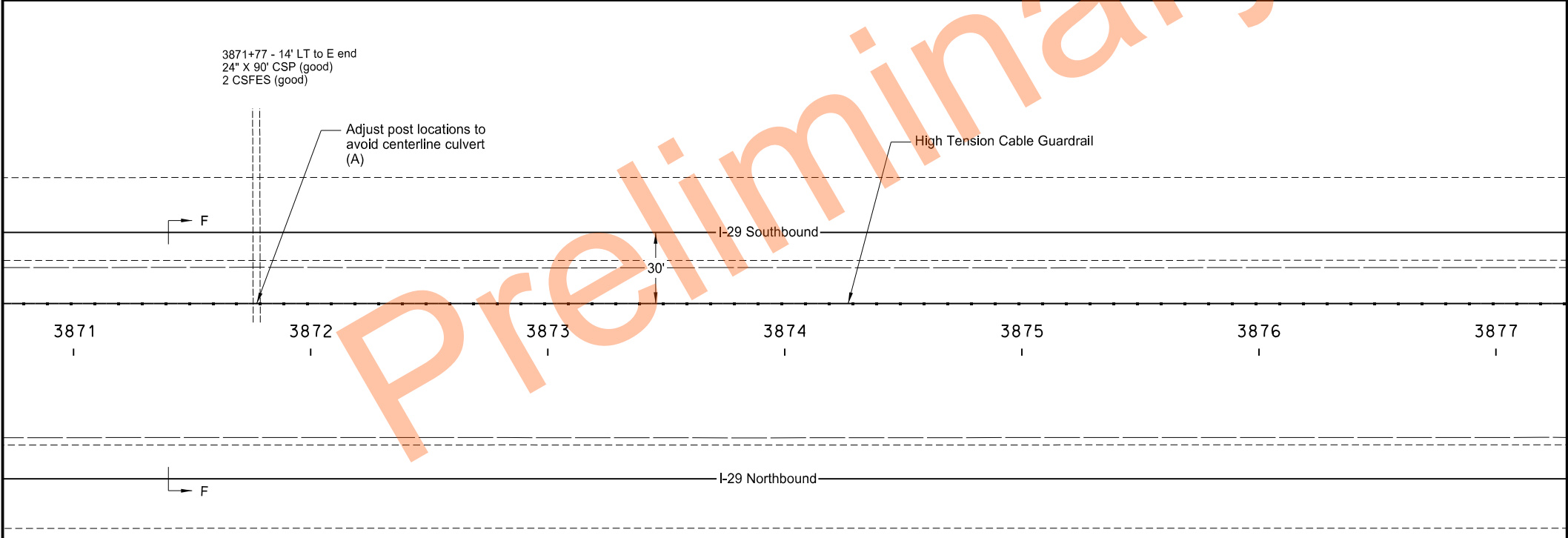
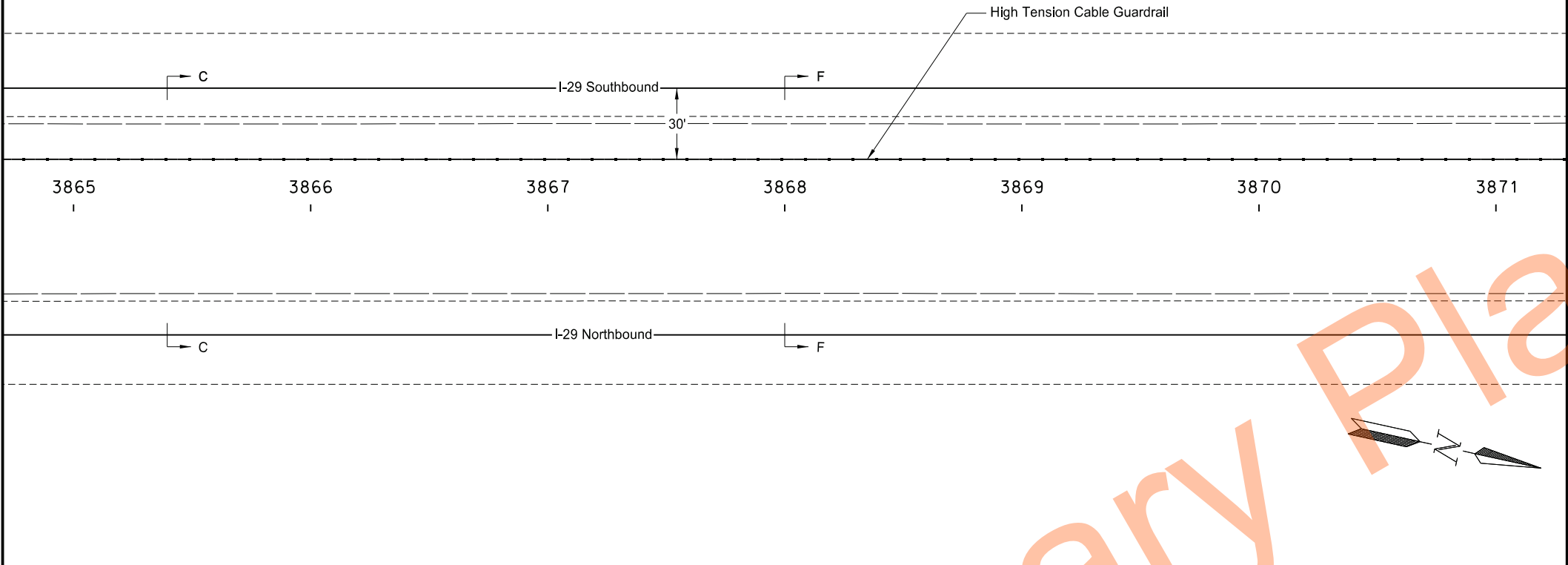
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	15



High Tension Cable Guardrail Layout
Segment D - Sta 3853+00 to 3865+00
I-29 - Cass Co 20 to Argusville Interchange

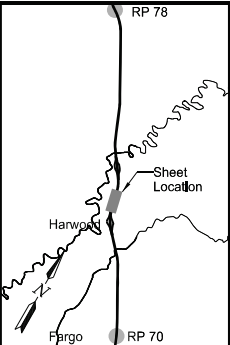
23 USC § 407 Documents
NDDOT Reserves All Objections

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NOTE:

(A) Maintain minimum two feet of spacing between the outside edges of centerline pipe and guardrail posts. Adjust post locations to avoid centerline culvert.



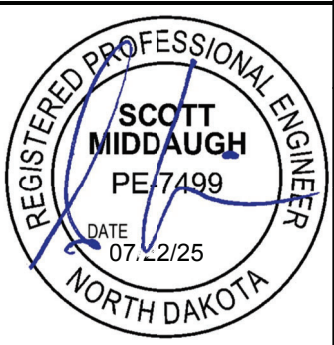
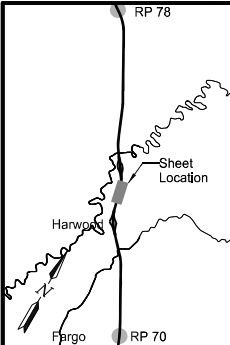
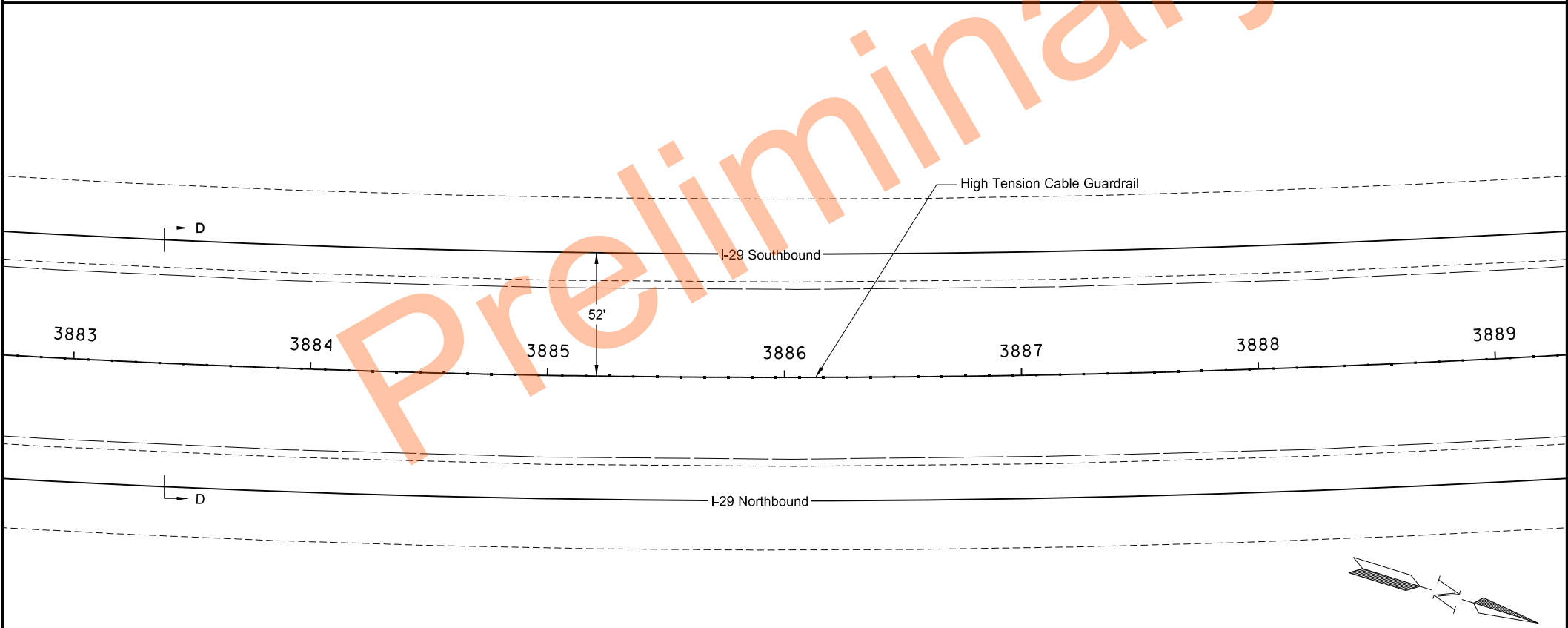
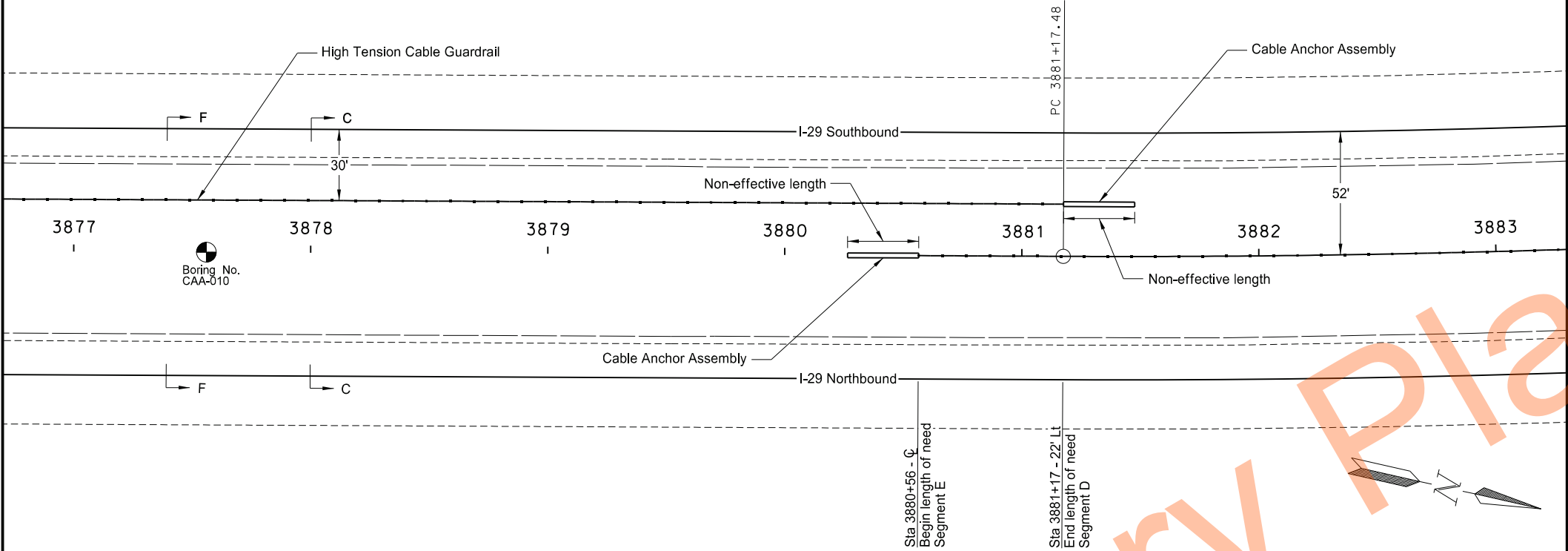
High Tension Cable Guardrail Layout

Segment D - Sta 3865+00 to 3877+00

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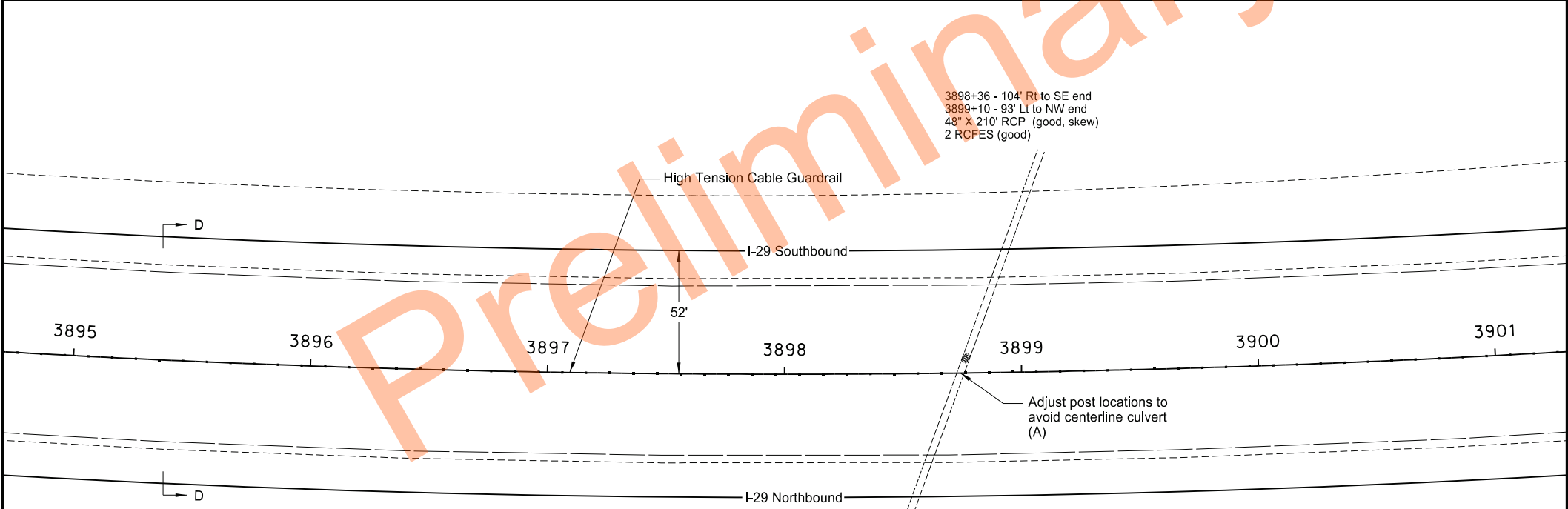
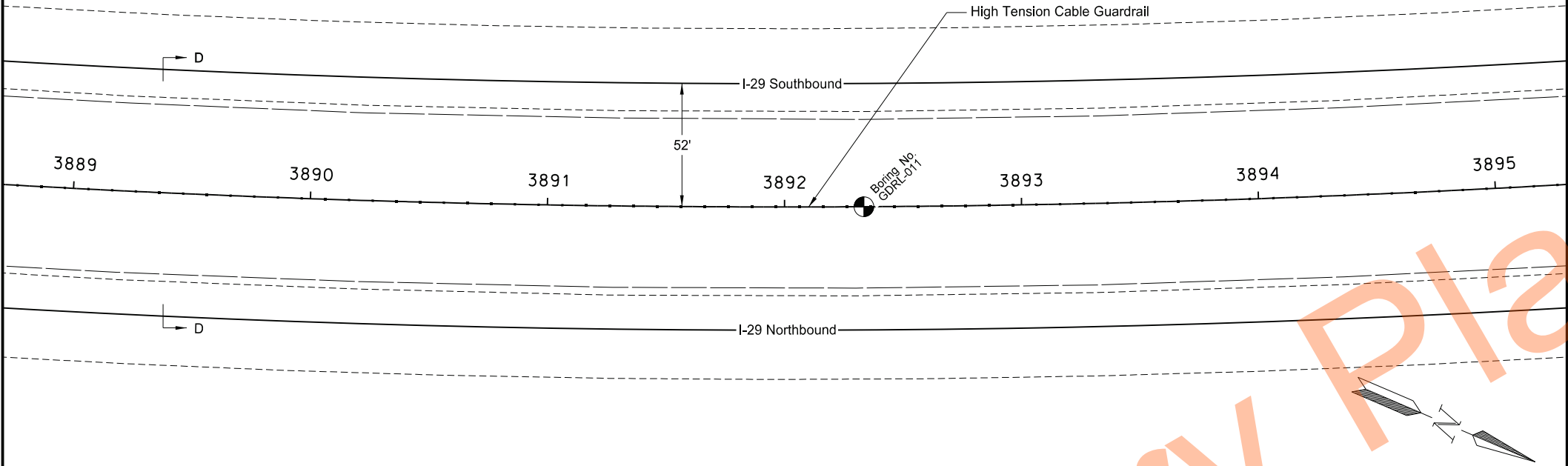
High Tension Cable Guardrail Layout

Segment D - Sta 3877+00 to 3881+17
Segment E - Sta 3880+56 to 3889+00

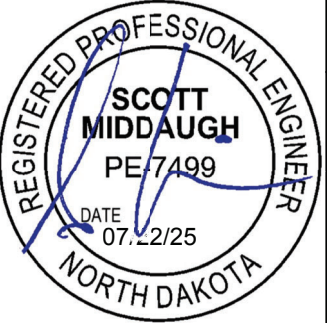
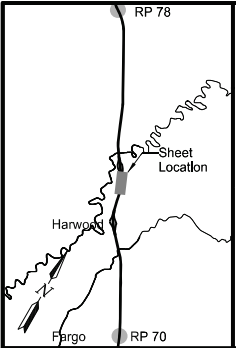
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23 USC § 407 Documents
NDDOT Reserves All Objections

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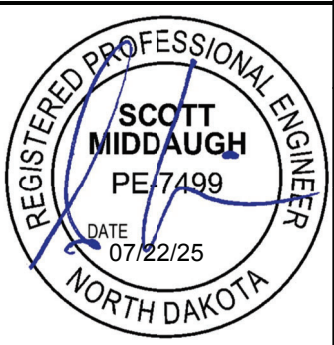
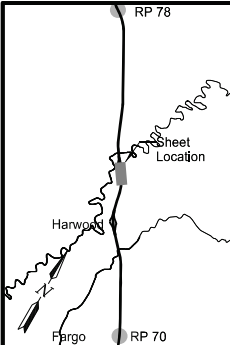
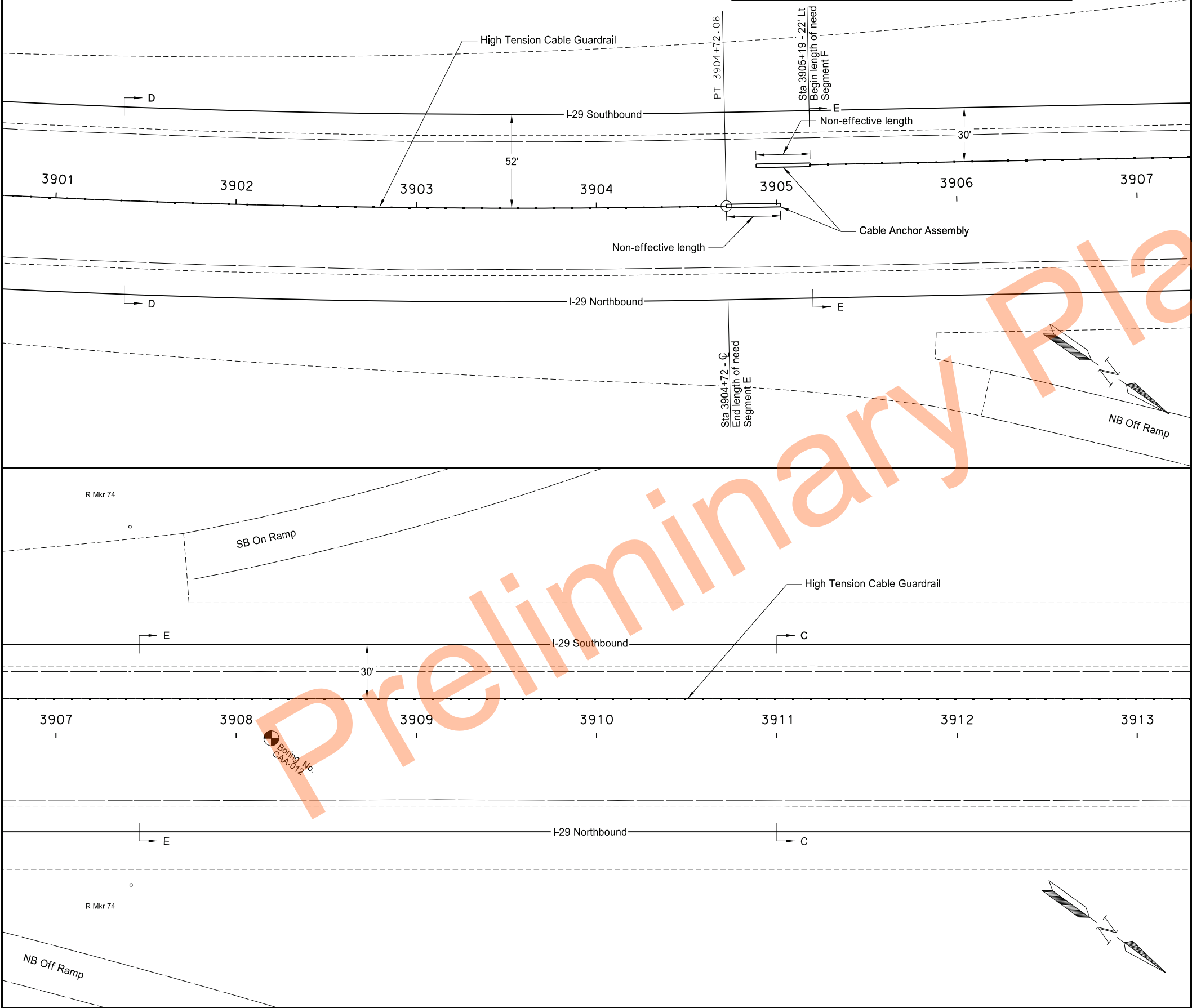
NOTE:
(A) Maintain minimum two feet of spacing between the outside edges of centerline pipe and guardrail posts. Adjust post locations to avoid centerline culvert.



High Tension Cable Guardrail Layout
Segment E - Sta 3889+00 to 3901+00
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23 USC § 407 Documents
NDDOT Reserves All Objections

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ND	HEN-X-8-029(200)069	130	19



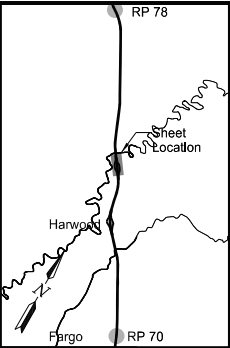
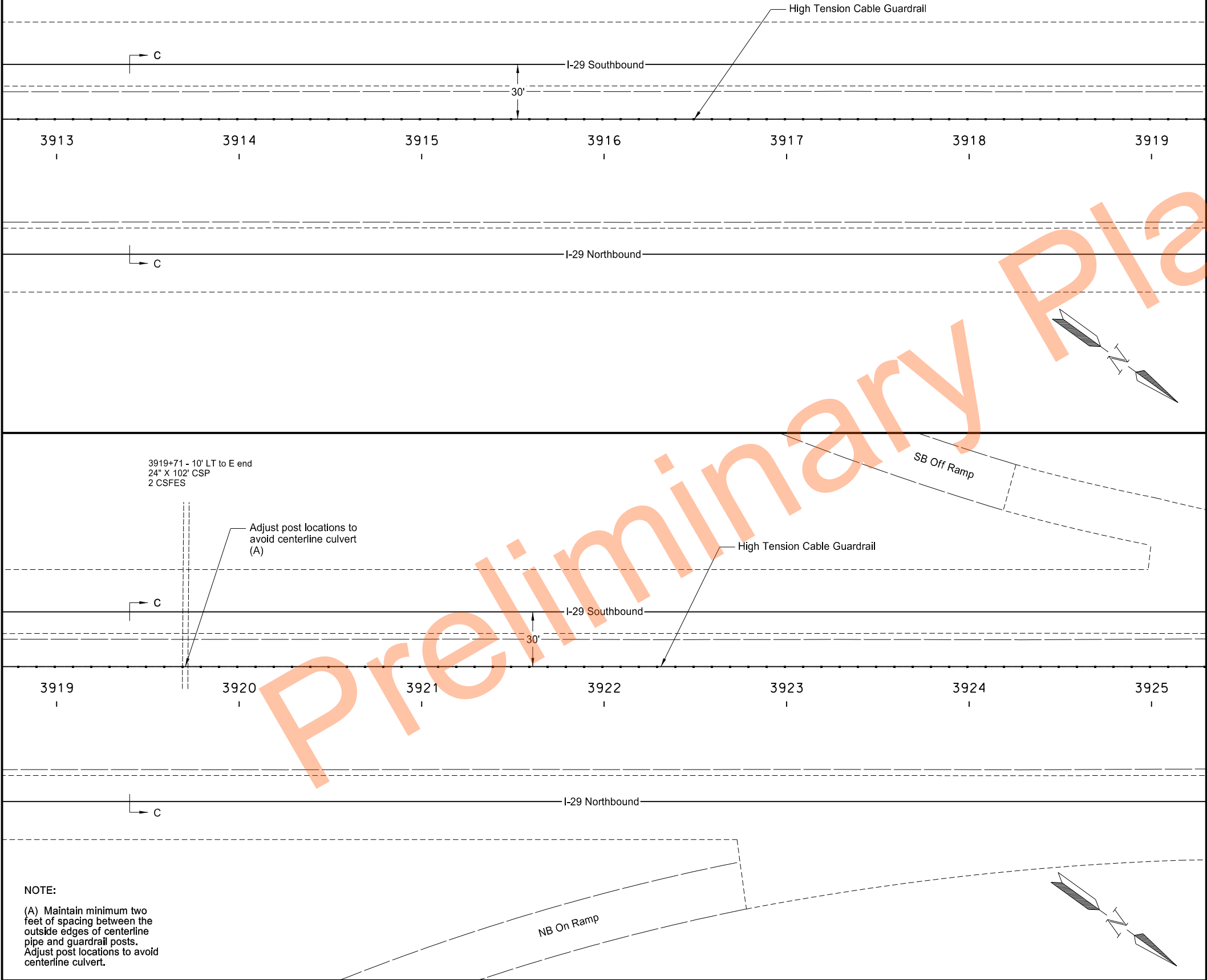
High Tension Cable Guardrail Layout

Segment E - Sta 3901+00 to 3904+72
Segment F - Sta 3905+19 to 3913+00

I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

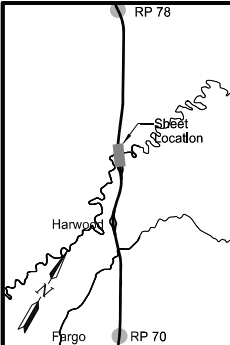
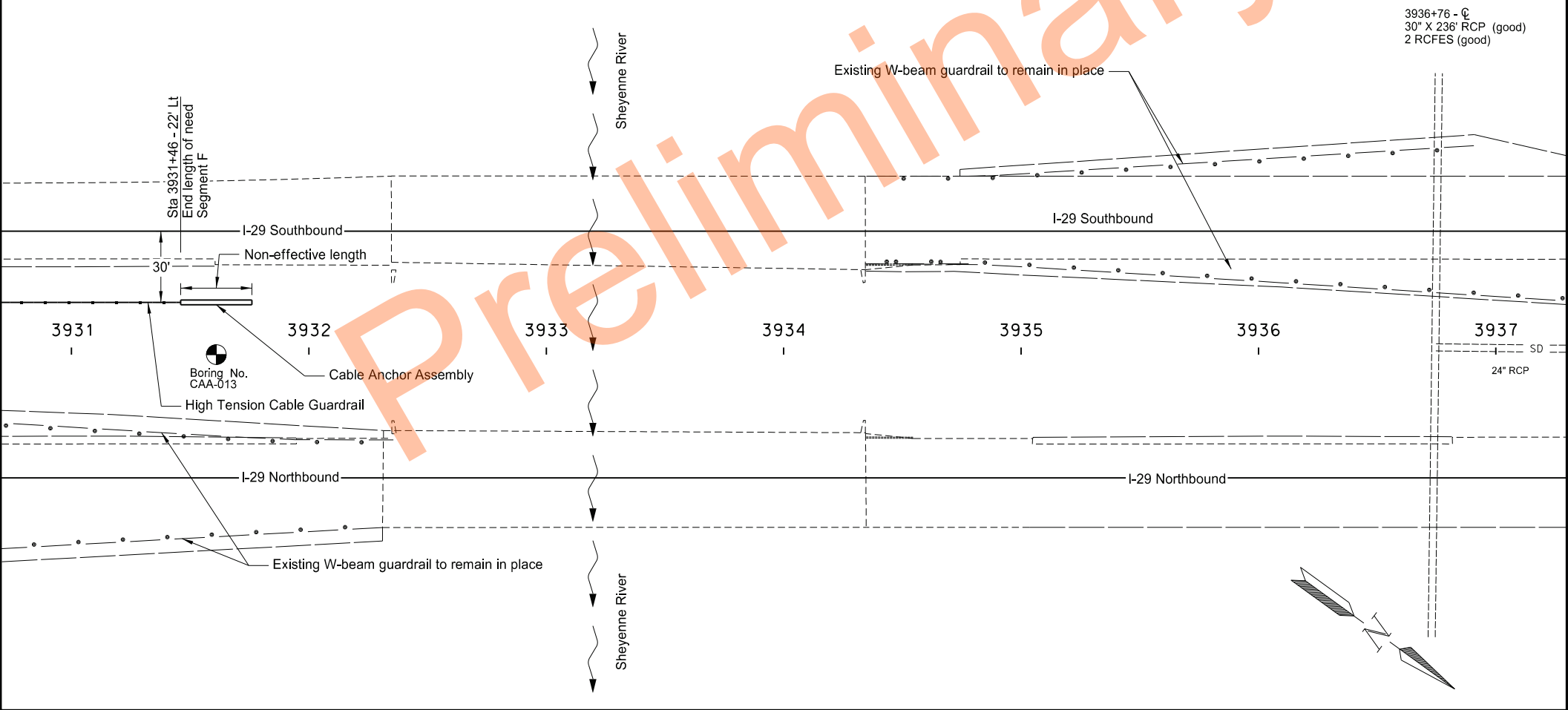
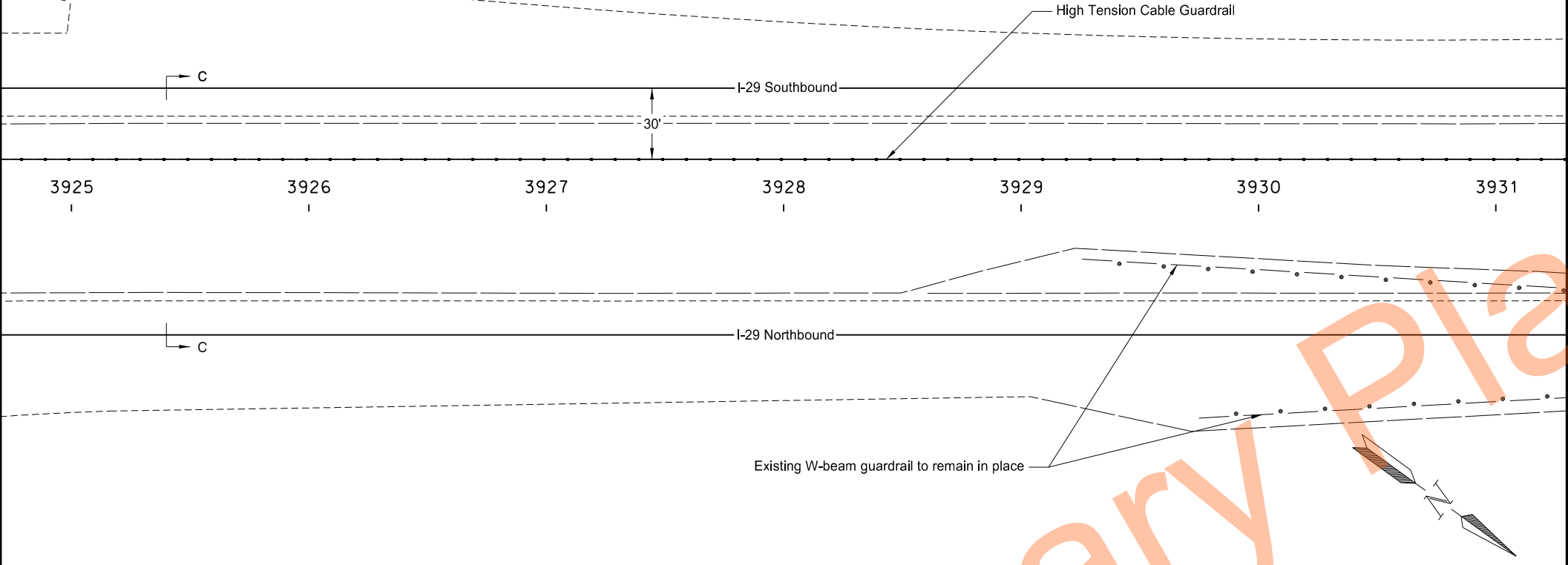
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	20



High Tension Cable Guardrail Layout
Segment F - Sta 3913+00 to 3925+00
I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

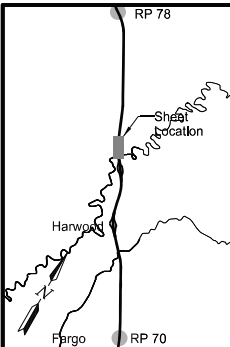
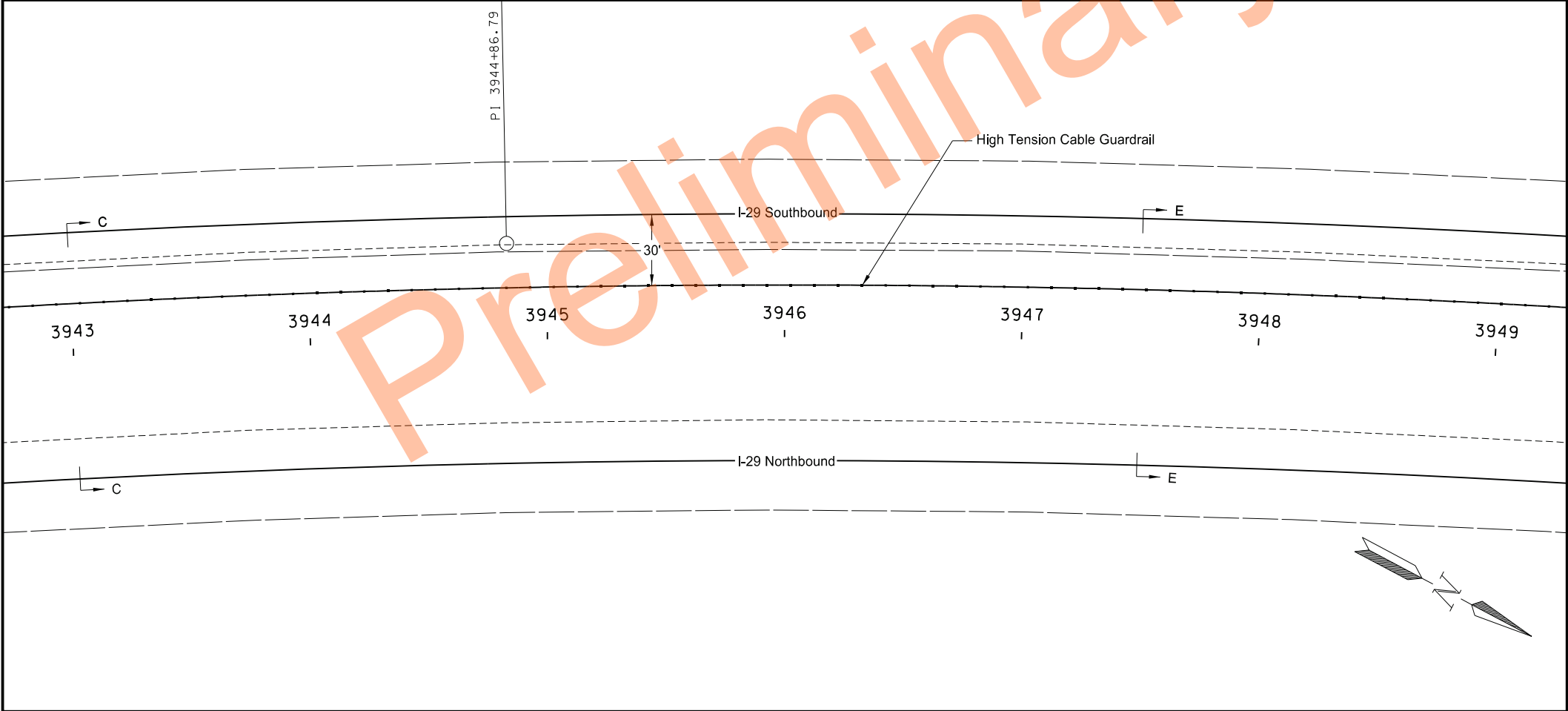
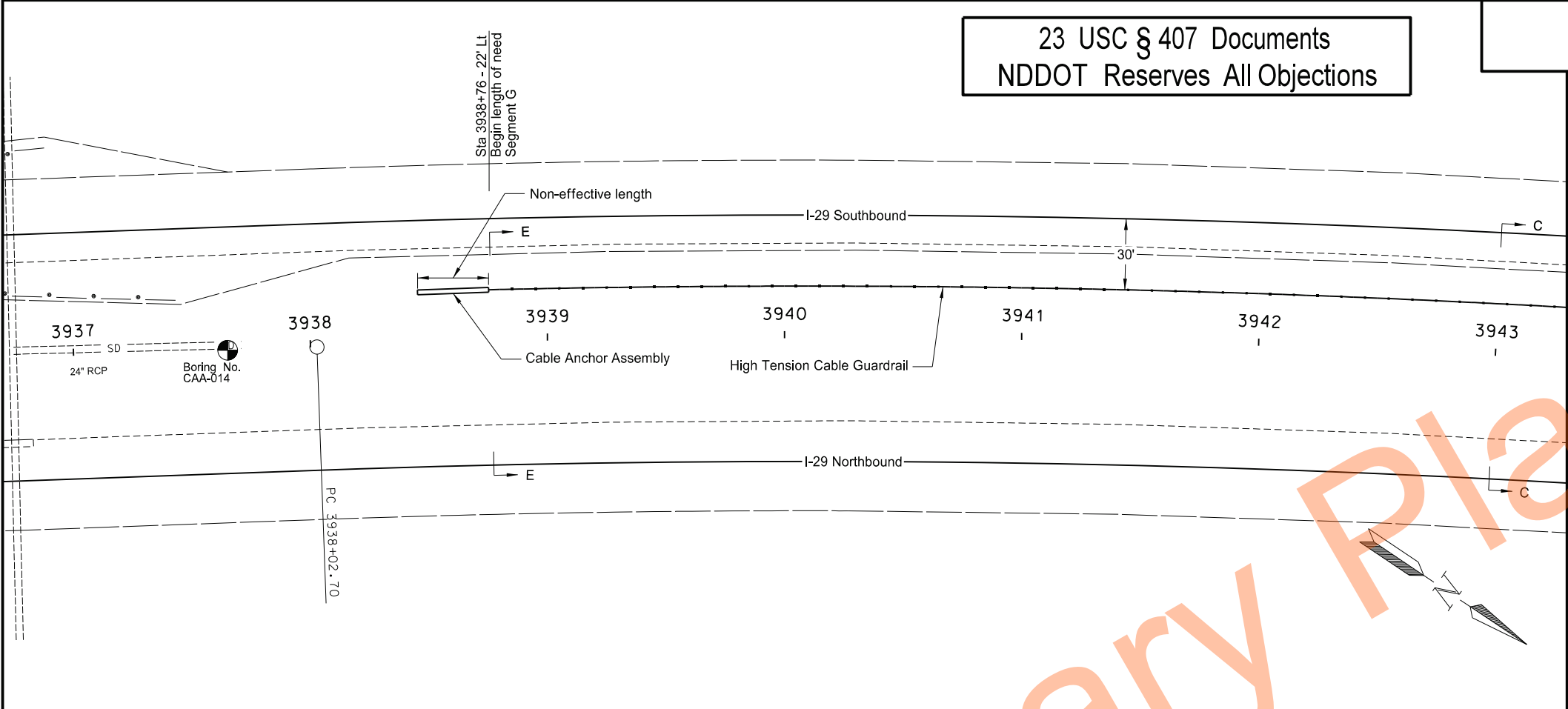
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	21



High Tension Cable Guardrail Layout
Segment F - Sta 3925+00 to 3931+46
I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

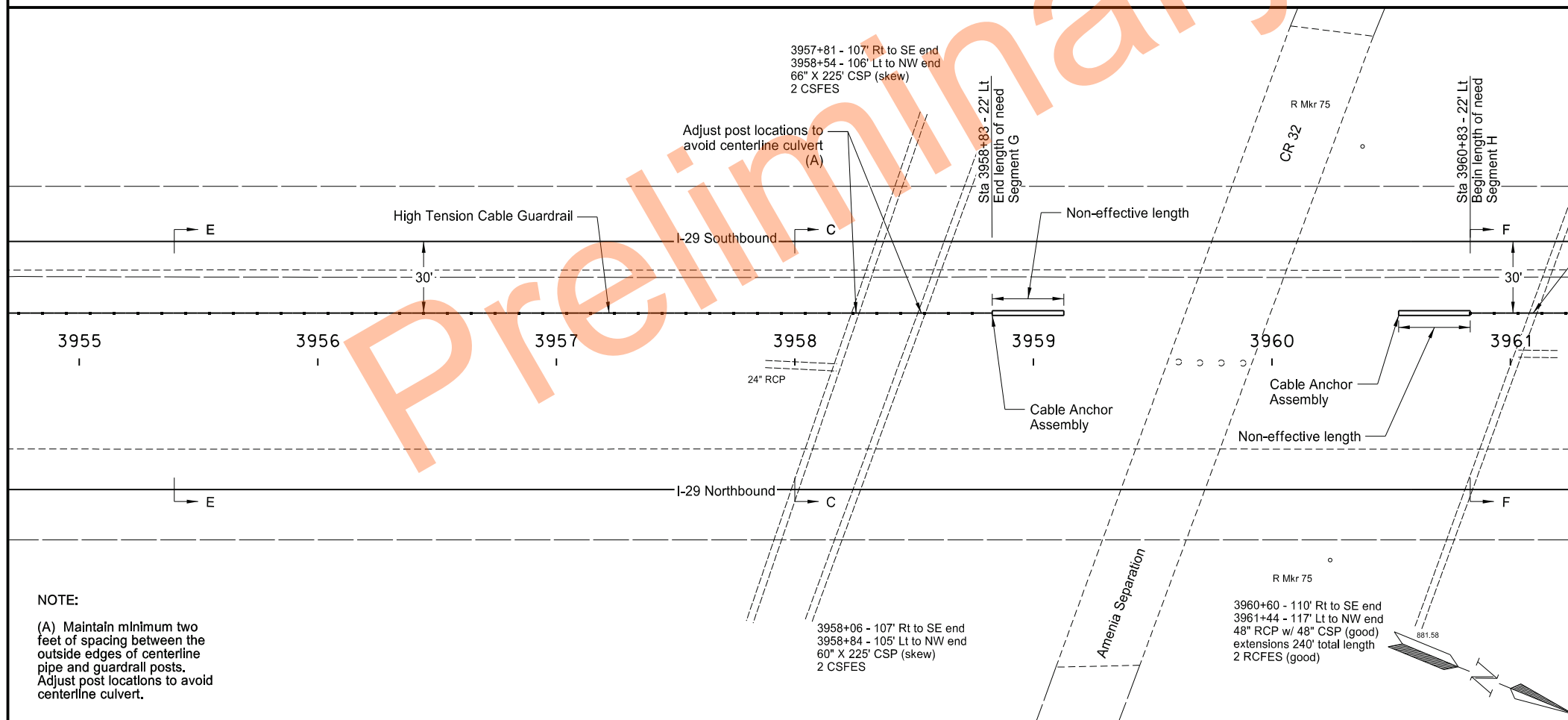
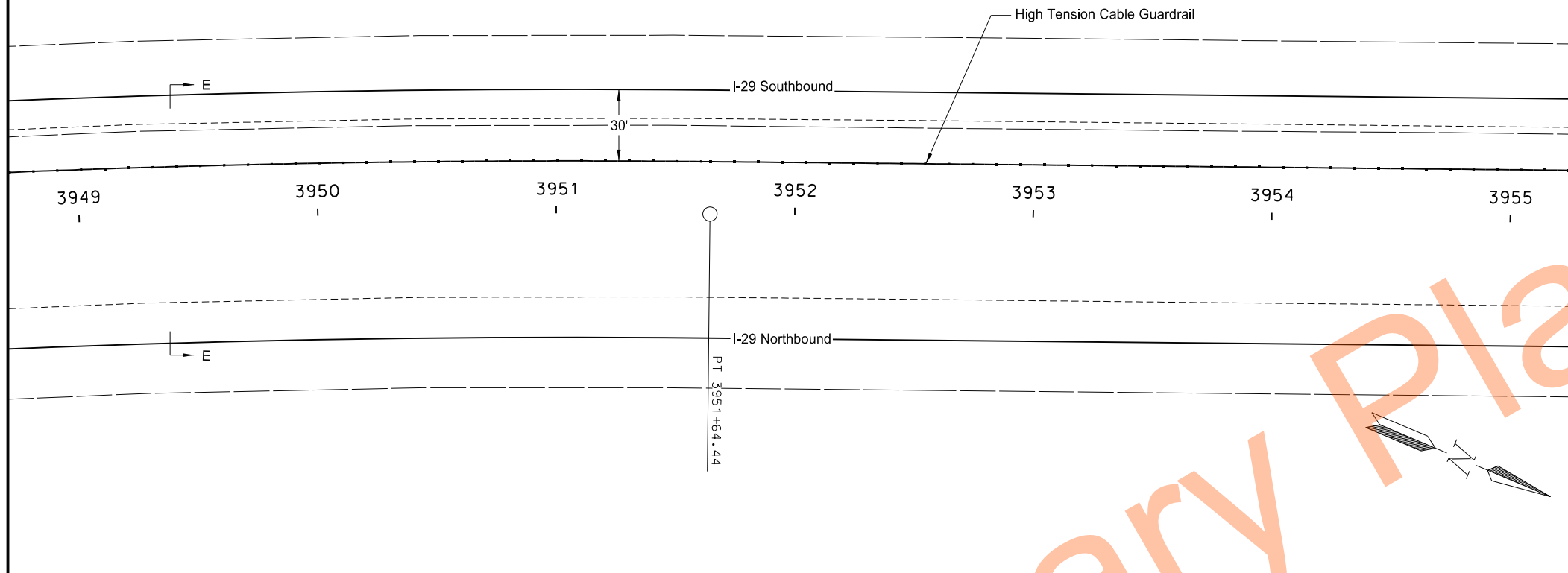
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	22



High Tension Cable Guardrail Layout
Segment G - Sta 3938+76 to 3949+00
I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	23



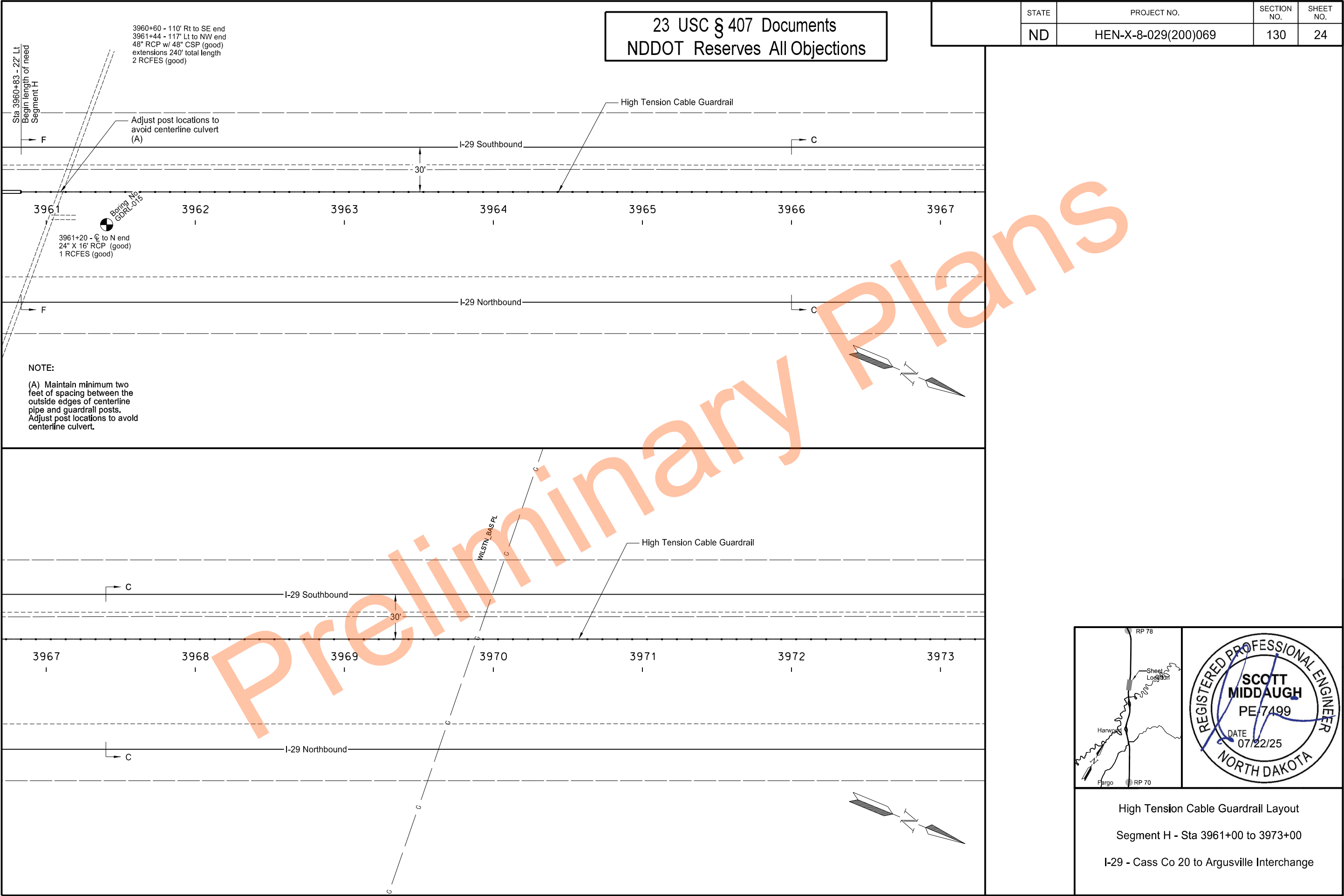
RP 78
Sheepshead
Harwood
Fargo
RP 70

REGISTERED PROFESSIONAL ENGINEER
SCOTT MIDDAGH
PE 7499
DATE 07/22/25
NORTH DAKOTA

High Tension Cable Guardrail Layout

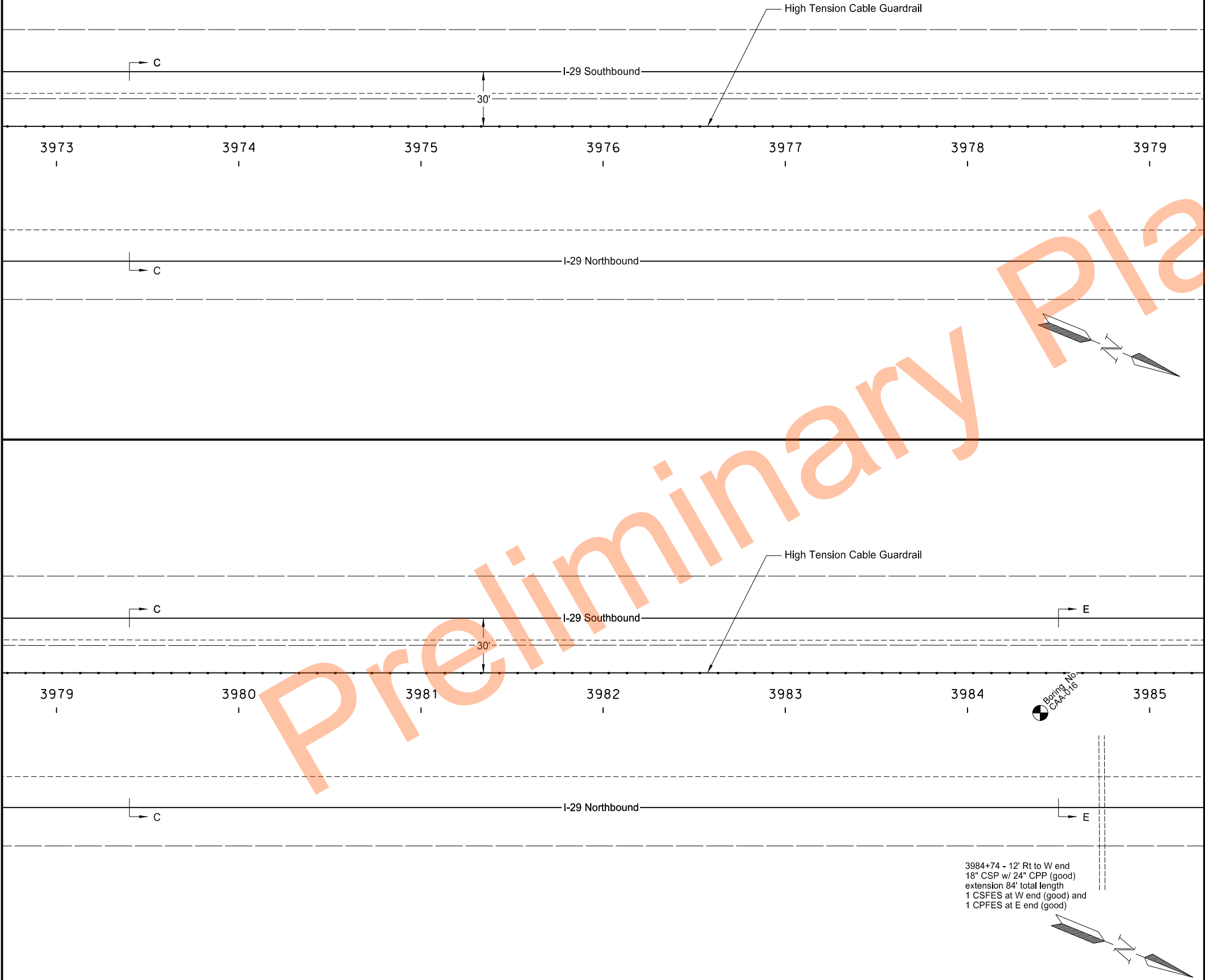
Segment G - Sta 3949+00 to 3958+83
Segment H - Sta 3960+83 to 3961+00

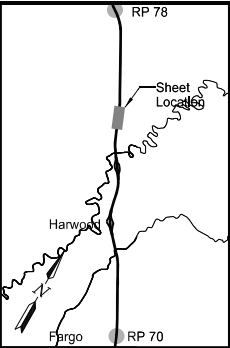
I-29 - Cass Co 20 to Argusville Interchange



23 USC § 407 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	25





REGISTERED PROFESSIONAL ENGINEER

SCOTT MIDDGAUGH

PE 7499

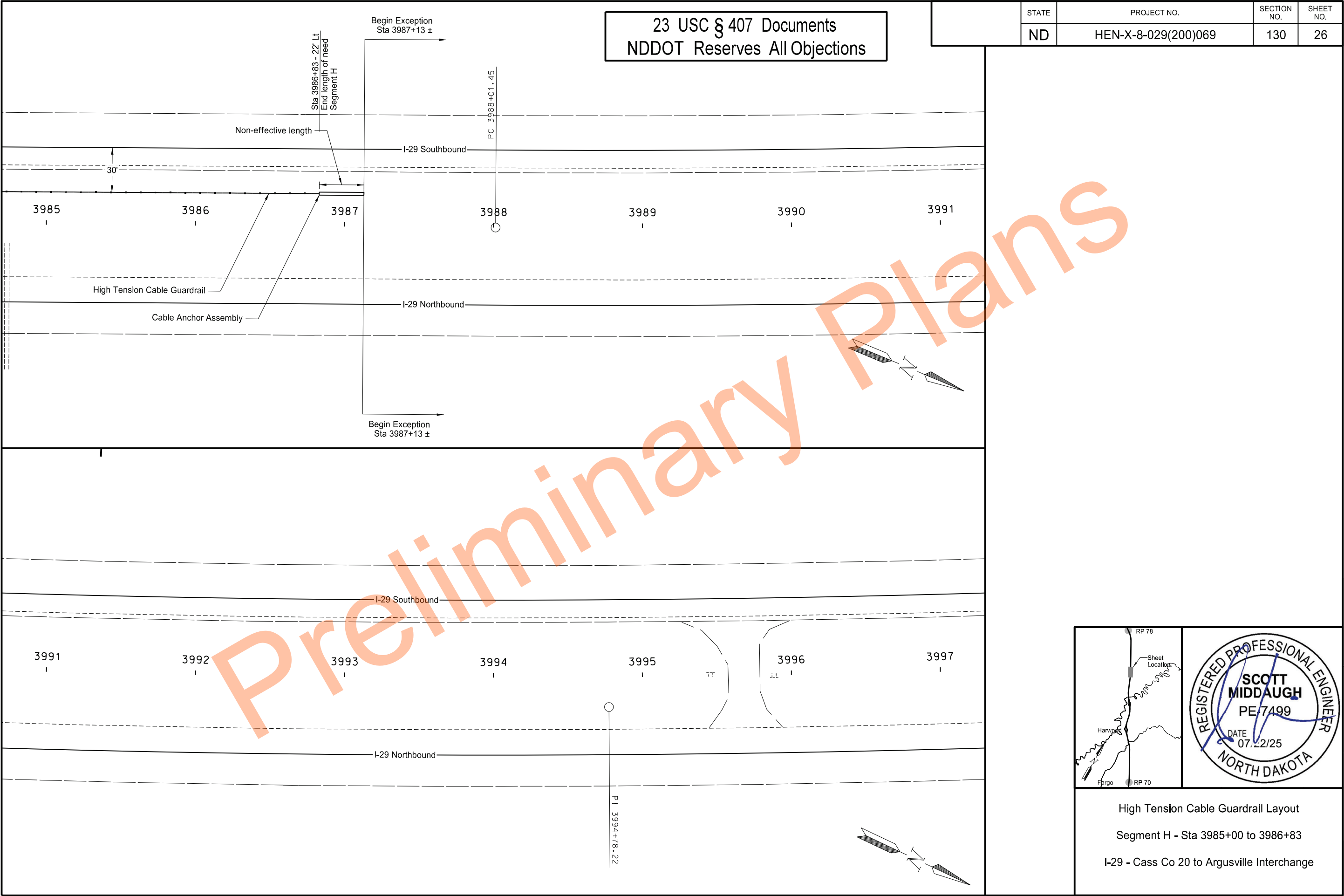
DATE 07/22/25

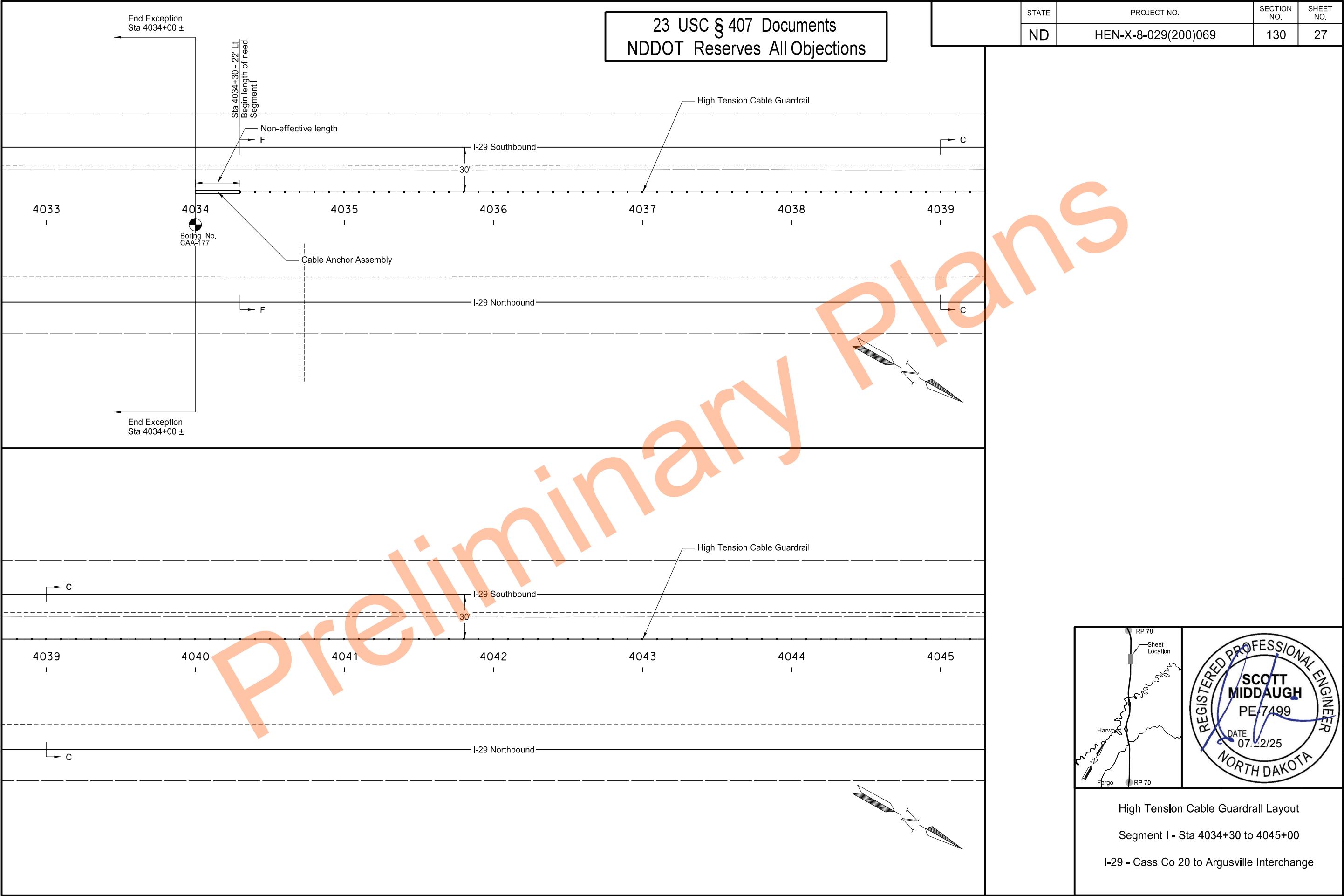
NORTH DAKOTA

High Tension Cable Guardrail Layout

Segment H - Sta 3973+00 to 3985+00

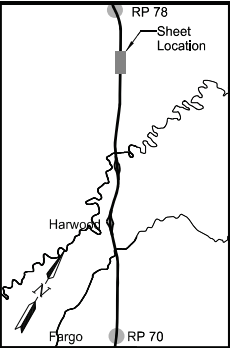
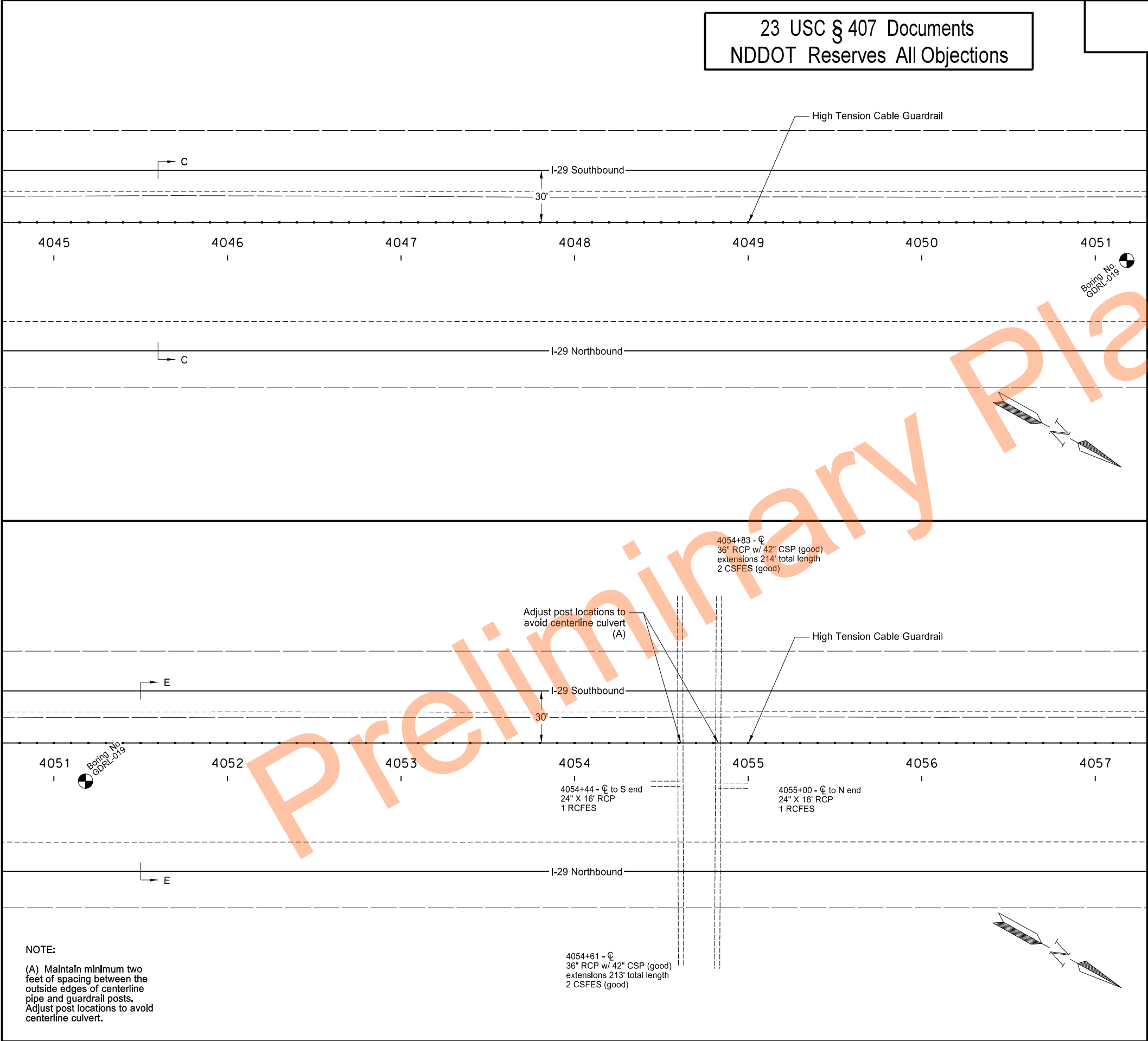
I-29 - Cass Co 20 to Argusville Interchange





23 USC § 407 Documents
NDDOT Reserves All Objections

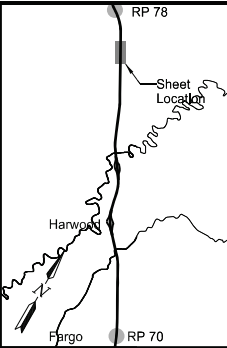
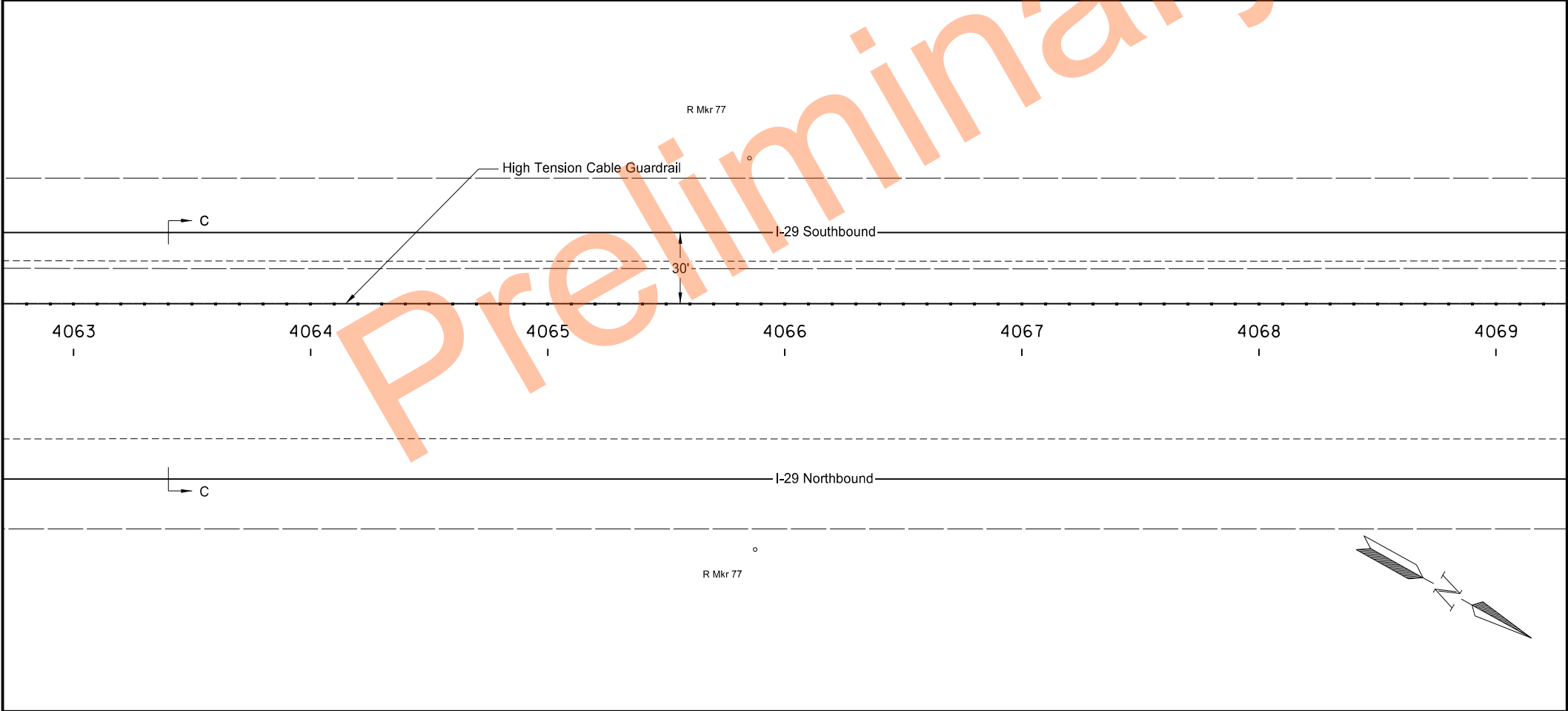
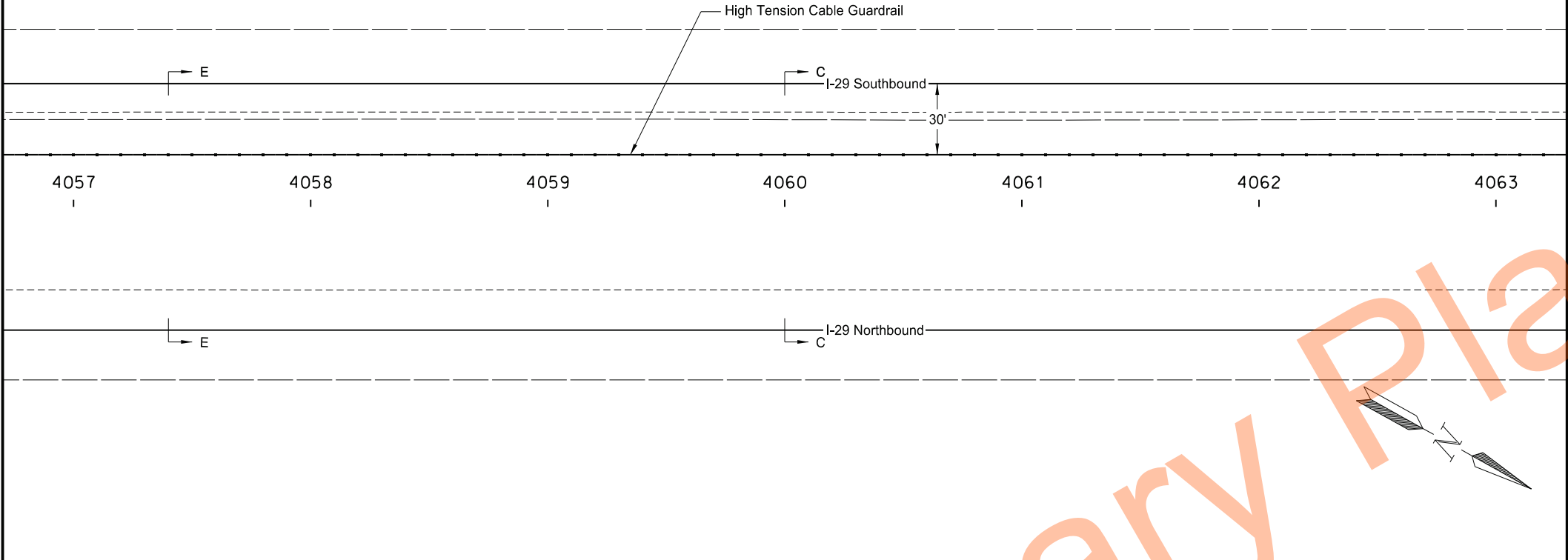
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	28



High Tension Cable Guardrail Layout
Segment I - Sta 4045+45 to 4057+00
I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

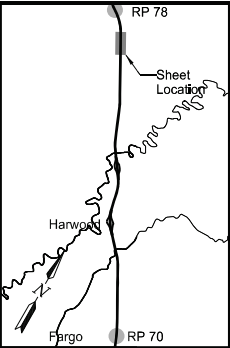
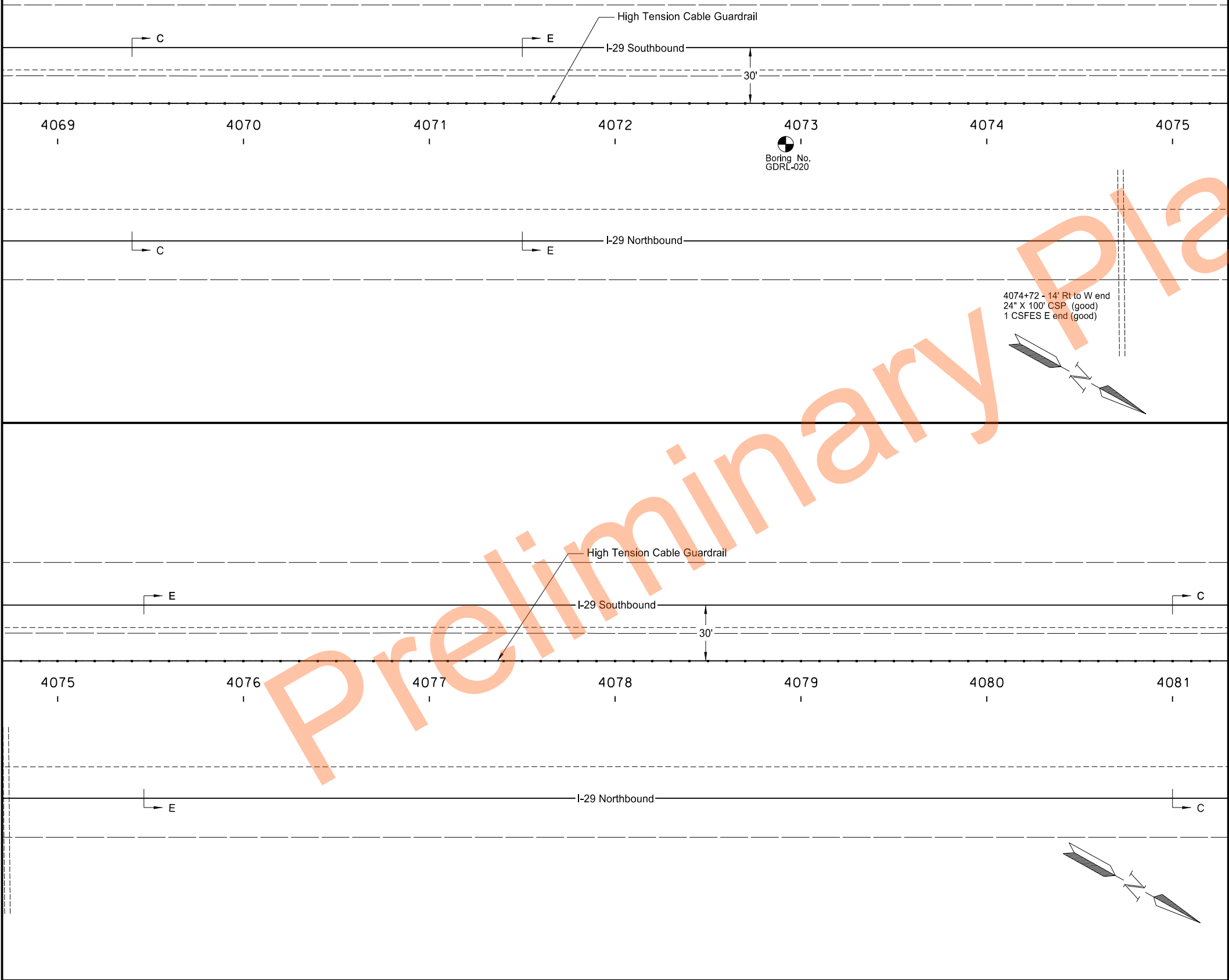
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	29



High Tension Cable Guardrail Layout
Segment I - Sta 4057+00 to 4069+00
I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	30

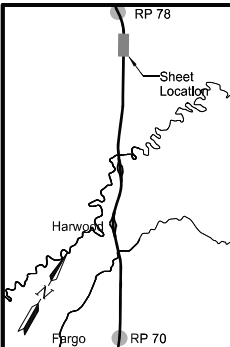
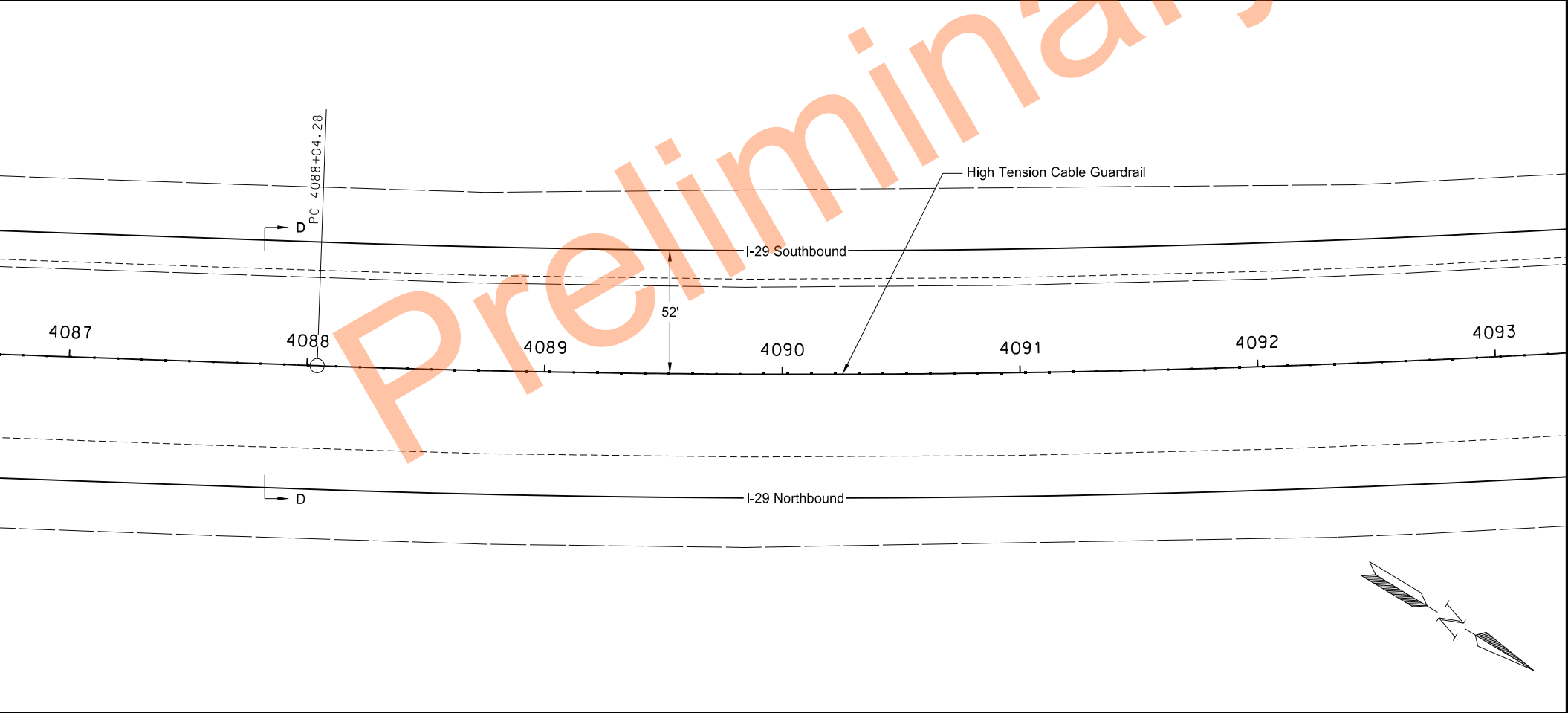
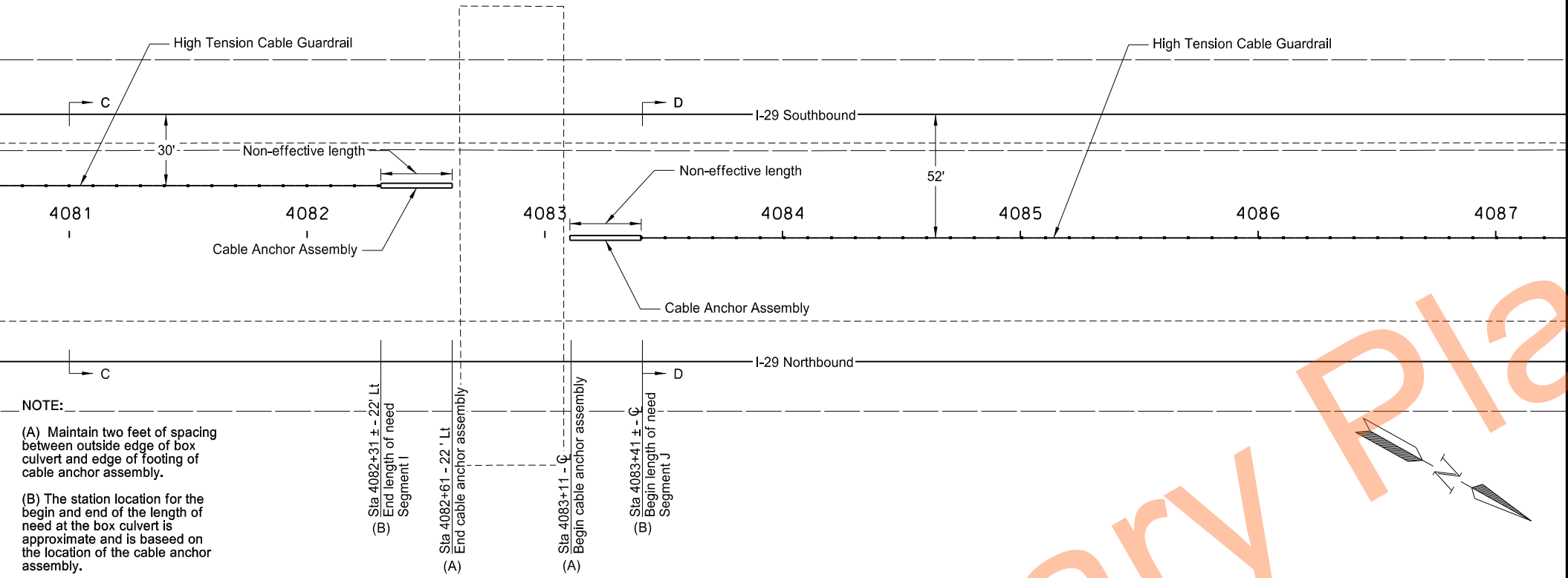


High Tension Cable Guardrail Layout
Segment I - Sta 4069+00 to 4081+00
I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

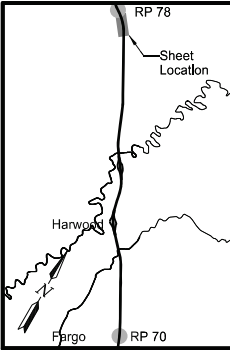
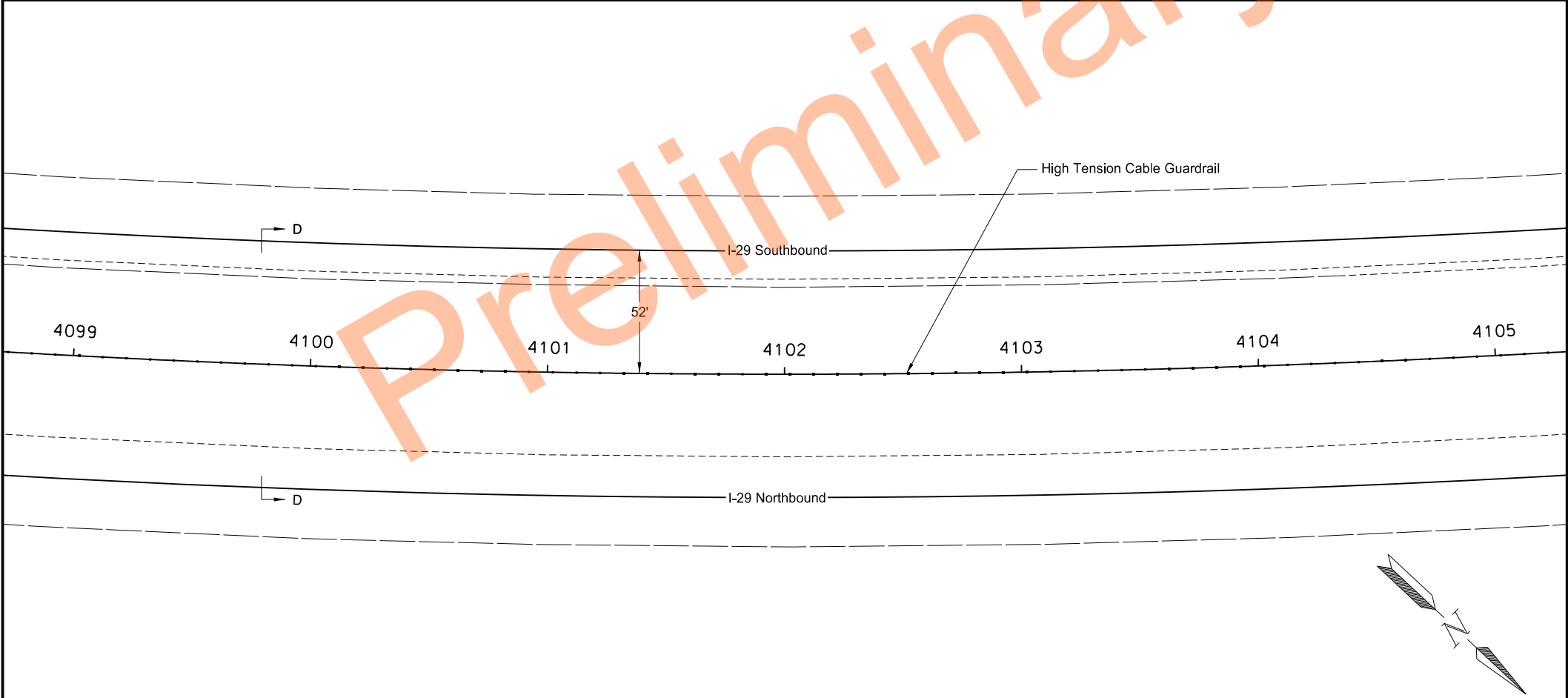
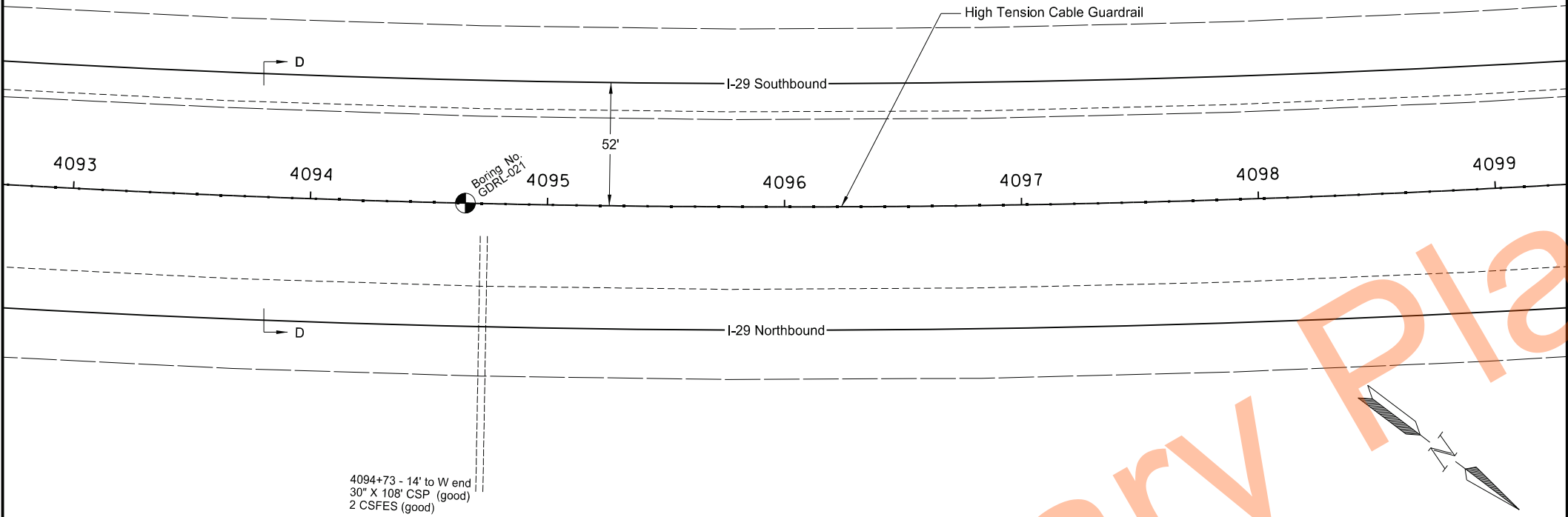
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	31

Str # 29-077.324
N 520,020.30 E 2,860,255.33
N 520,114.93 E 2,860,423.93
Quint, 8' x 7' x 188' RCB
Winged HDWLS



23 USC § 407 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	32



High Tension Cable Guardrail Layout
Segment J - Sta 4093+00 to 4105+00
I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

STATE

PROJECT NO.

SECTION
NO.

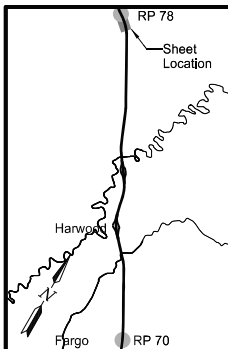
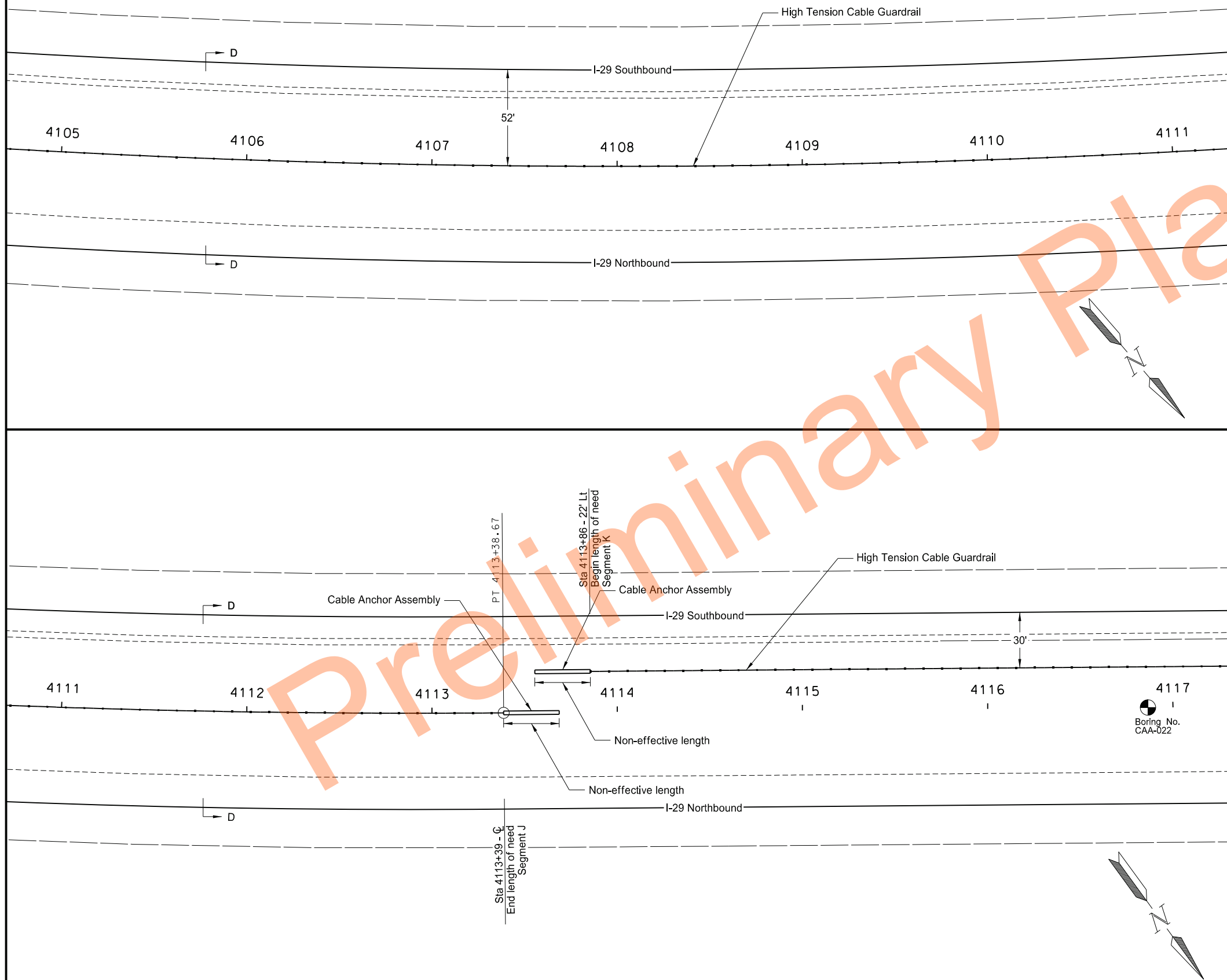
SHEET
NO.

ND

HEN-X-8-029(200)069

130

33



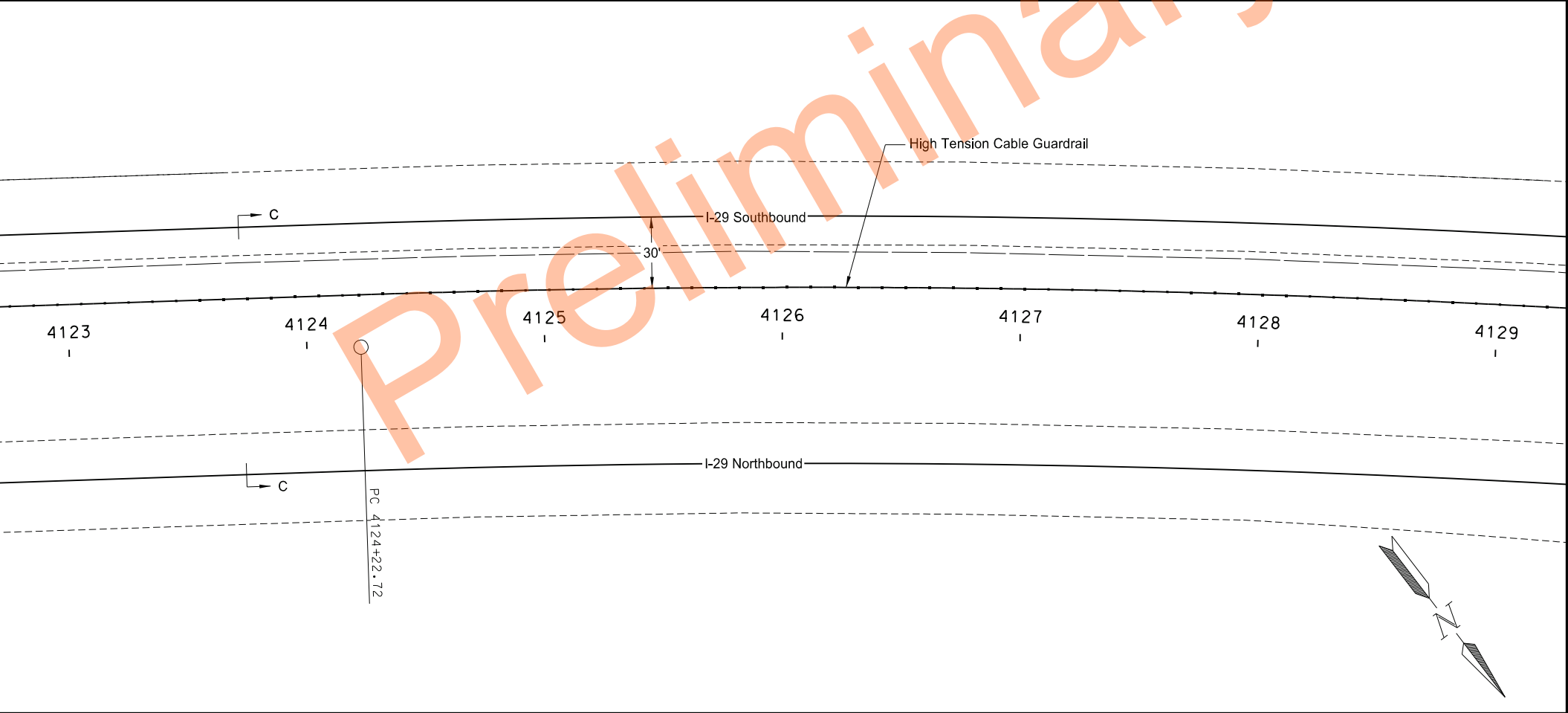
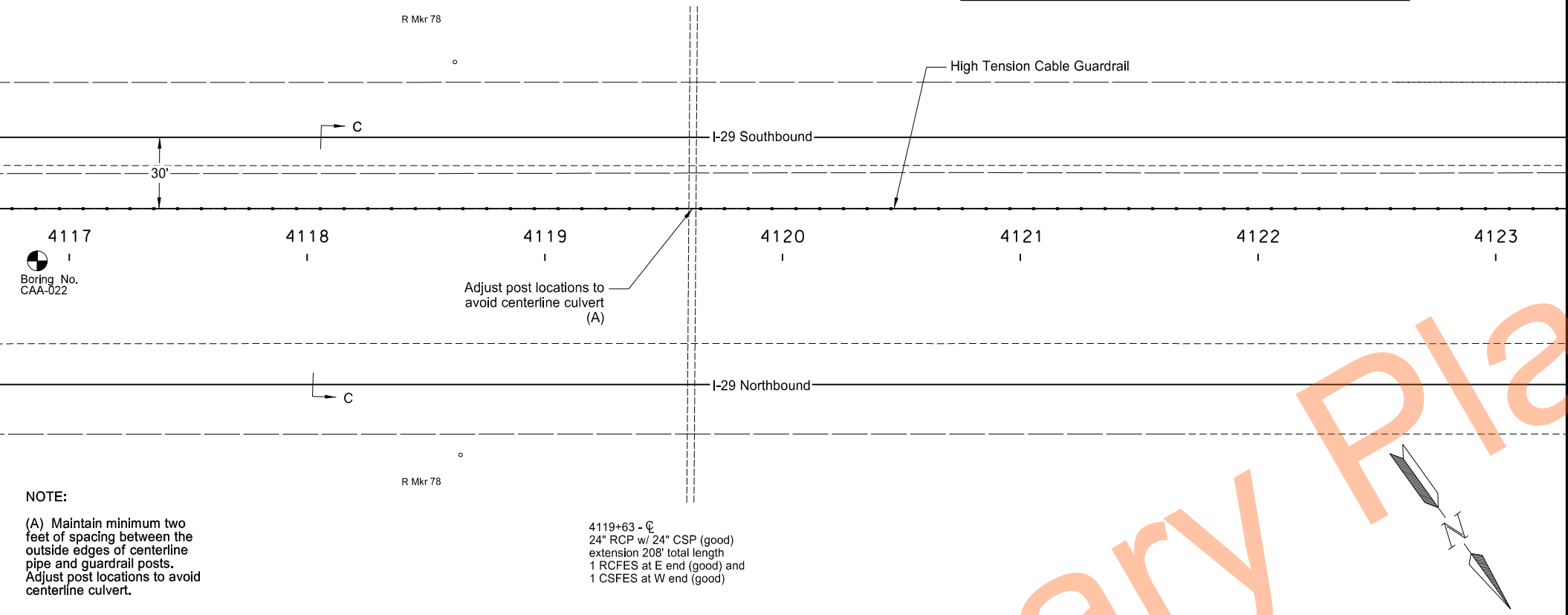
High Tension Cable Guardrail Layout

Segment J - Sta 4105+00 to 4113+39
Segment K - Sta 4113+86 to 4117+00

I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	34



RP 87

Gardner

Sheet Location

Argusville

RP 78

REGISTERED PROFESSIONAL ENGINEER

SCOTT MIDDLEDAUGH

PE 7499

DATE 07/22/25

NORTH DAKOTA

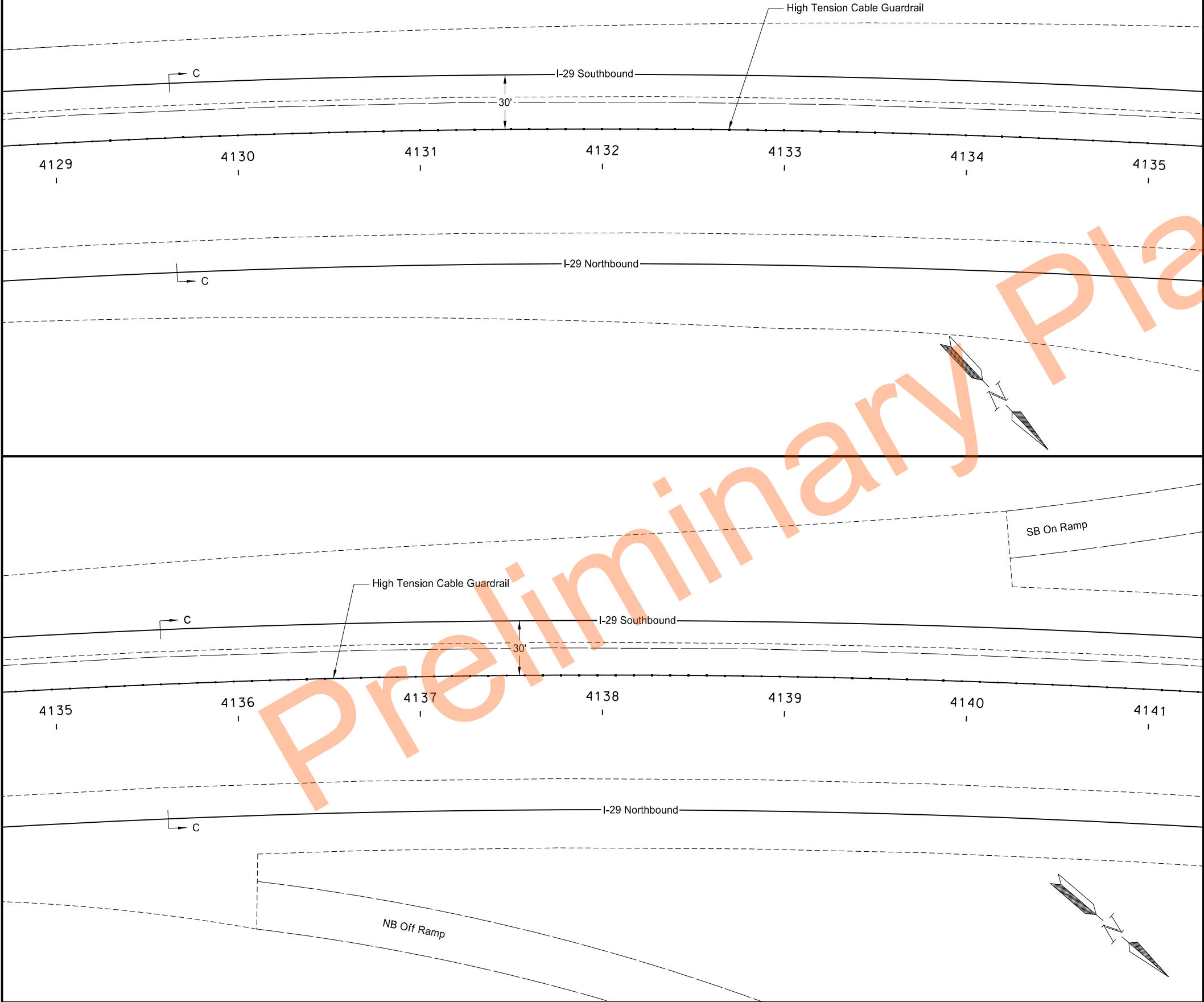
High Tension Cable Guardrail Layout

Segment J - Sta 4117+00 to 4129+00

I-29 - Cass Co 20 to Argusville Interchange

23 USC § 407 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HEN-X-8-029(200)069	130	35



RP 87
Gardner
Sheet Location
Argusville
RP 78

REGISTERED PROFESSIONAL ENGINEER
SCOTT MIDDAUGH
PE 7499
DATE 07/22/25
NORTH DAKOTA

High Tension Cable Guardrail Layout
Segment J - Sta 4129+00 to 4141+00
I-29 - Cass Co 20 to Argusville Interchange

