DESIGN DATA				
Traffic	Average Daily			
Current 2017	Pass: 115	Trucks: 15	Total: 130	
Forecast 2037	Pass: 165	Trucks: 20	Total: 185	
Clear Zone Distance: 14 ft		Design Speed: 45 MPH		
Minimum Sight Dist. for Stopping: 360 ft		Bridges: HL-93 Design Loading		
Sight Dist. for No Passing Zone: NA				
Pavement Design Life NA (years)				
Design Accumulated One-way NA ESALs:				

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	21853	1	1

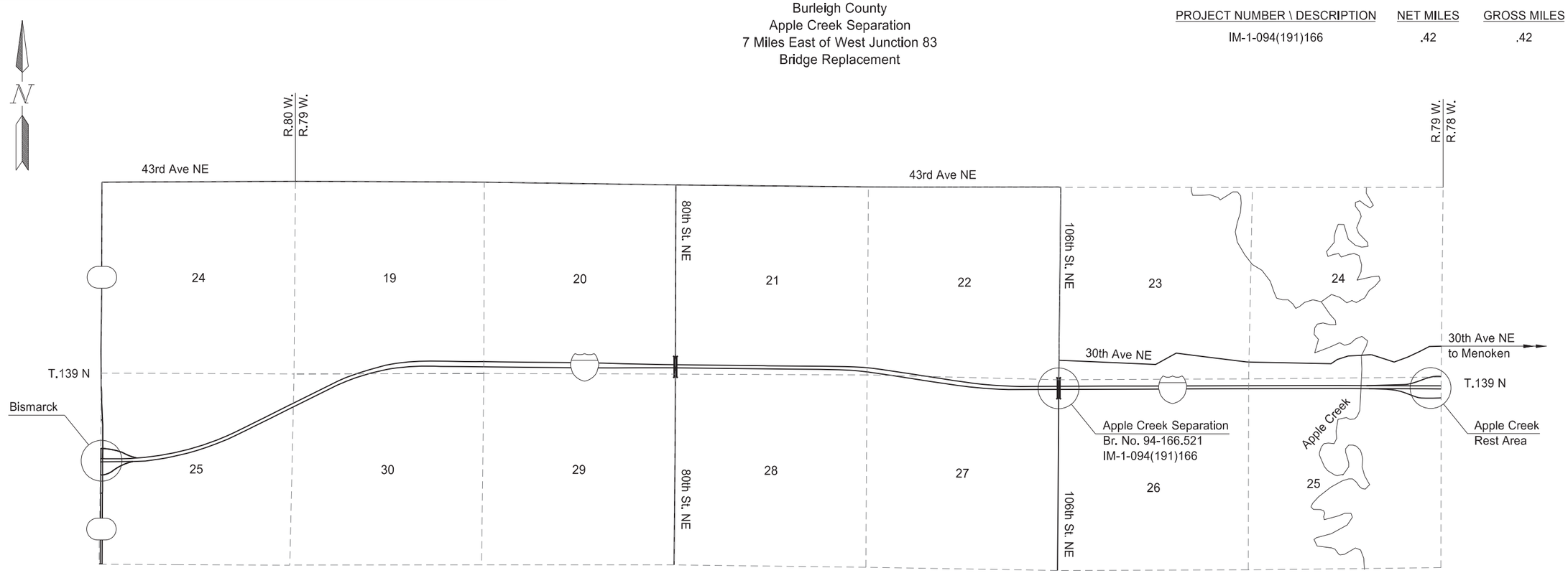
JOB # 1
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

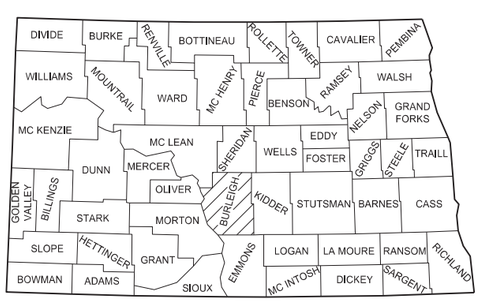
IM-1-094(191)166

Burleigh County
Apple Creek Separation
7 Miles East of West Junction 83
Bridge Replacement

GOVERNING SPECIFICATIONS:
2014 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
IM-1-094(191)166	.42	.42





STATE COUNTY MAP

ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

08/07/20

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BRIDGE DIVISION

JONATHAN D KETTERING
REGISTERED
PROFESSIONAL
PE-4684
ENGINEER
NORTH DAKOTA

08/07/20

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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20	1	General Details
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60	1 - 6	Plan & Profile
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130	1 - 13	Guardrail
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SP 004(14)	Federal Migratory Bird Treaty Act
SP 1147(14)	Winter Suspension
SP 576(14)	Architectural Surface Finish

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D-261-1	Erosion Control - Fiber Roll Placement Details
D-622-1	Pile Splice Details
D-704-1	Attenuation Device
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D-704-8	Breakaway Systems For Construction Zone Signs - U-Channel Post
D-704-9	Construction Sign Details - Terminal And Guide Signs
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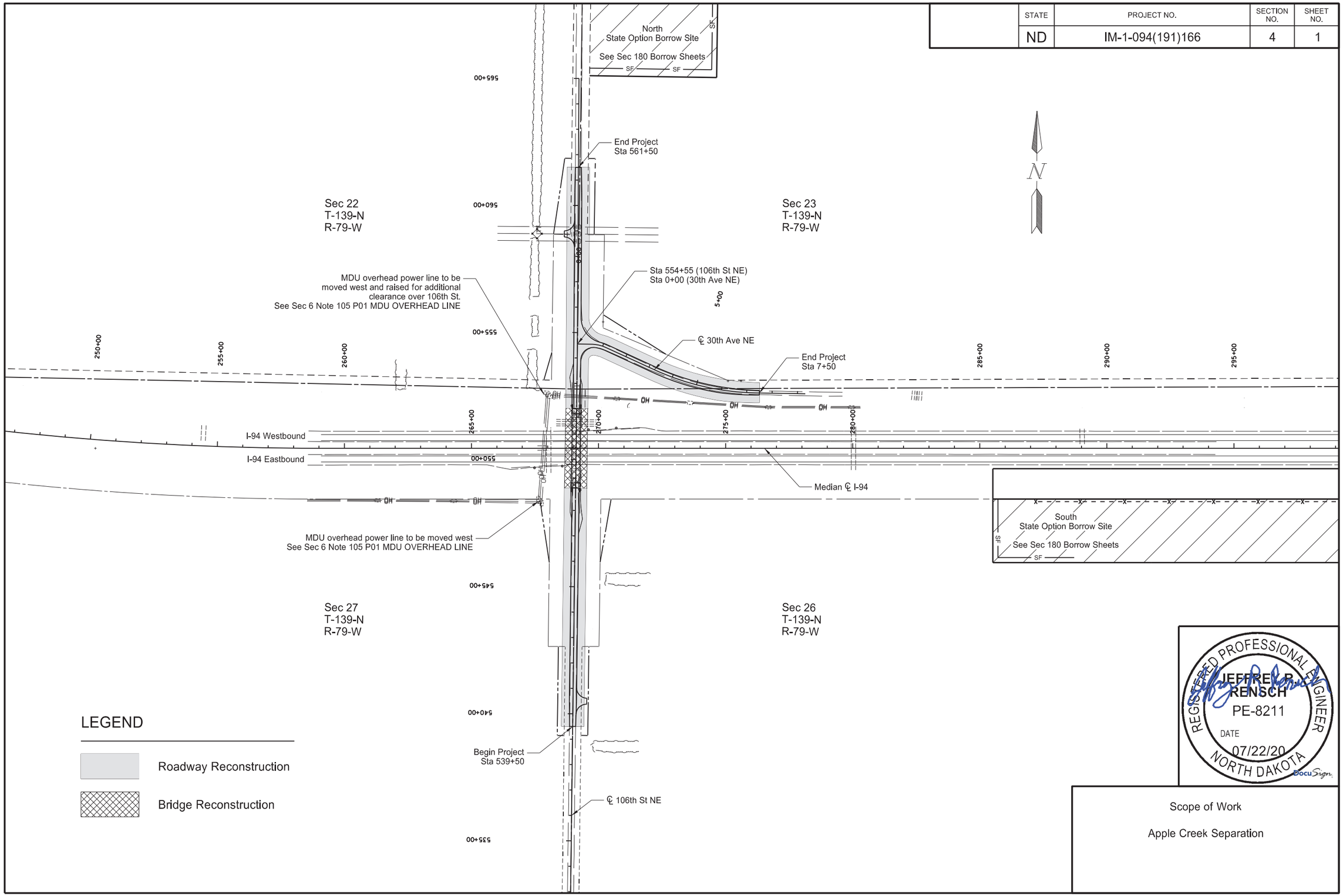
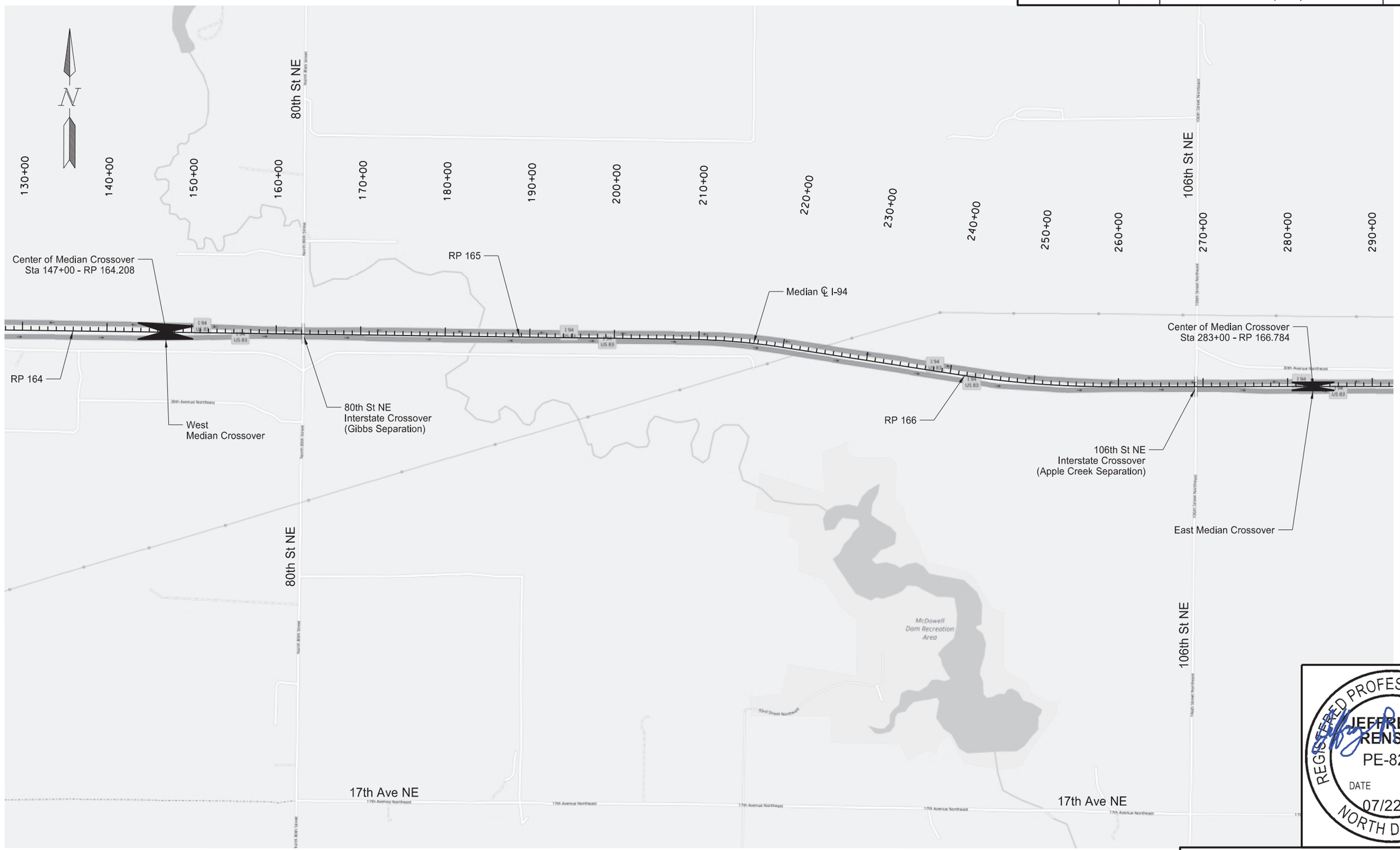


Scope of Work

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	4	2



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Notes: Median Crossovers to remain in place after construction.

Scope of Work

Apple Creek Separation
Median Crossovers

NOTES

105-200 UTILITY COORDINATION: A utility coordination meeting is required.

105-P01 MDU OVERHEAD LINE: MDU will be modifying the overhead power lines within the project area due to the impacts from this project. The utility work is as follows:

1. Replacing the poles to increase vertical clearance over 106th Street north of the bridge. The existing clearance is approximately 24.5' at the northerly wire. The roadway profile will be raised more than 4' under this overhead power line.
2. Adjust poles and overhead power lines that cross I-94 to be located outside the grading area.

This utility work will be completed in year 2020 or year 2021. If the utility work is not completed prior to construction, work around the existing utility poles and work with the existing power line clearance over 106th Street. This described utility work is shown in Sec 4 Scope of Work.

The Contractor will be responsible for working with MDU to coordinate this utility work and ensure that continuous service is maintained at all times.

203-010 SHRINKAGE: 25 percent additional volume is included for shrinkage in earth embankment.

203-385 AVERAGE HAUL: No average haul has been computed for this project.

203-P01 COMMON EXCAVATION: Common Excavation will not be measured but paid for as plan quantity.

203-P02 TOPSOIL: The topsoil in the median may be stockpiled in the median for the construction of median crossovers. The median topsoil stockpile must have foreslopes 4:1 or flatter and approach slopes that are 10:1 or flatter.

203-P03 TOPSOIL AT SPECIAL TOPSOIL AREA: Stockpile the topsoil located in the "Special Topsoil Area" shown in Sec 76 and Sec 77 separately from other topsoil on the project. This topsoil is stockpiled separately due to the adjacent property owner's organic farming operation.

261-P01 PERMANENT FIBER ROLLS: If fiber rolls are to remain on the project, use fiber rolls that are composed of netting that meets either of the following:

- Plastic or natural fiber photodegradable netting that has a life expectancy between 12 to 24 months. If the photodegradable netting is plastic, the netting color must be either clear or green. Black plastic netting will not be allowed.
- 100 percent biodegradable jute netting that has a life expectancy between 6 to 12 months.

302-P01 AGGREGATE SURFACE COURSE CL 13: Construct the surfacing at the guardrail locations in accordance with Standard Drawing D-764-48 except the 2-inch thickness of HMA is not required. The guardrail surfacing will consist of "Aggregate Surfacing Course Cl 13" for a depth of 6 inches.

704-200 PRECAST CONCRETE MEDIAN BARRIERS – STATE FURNISHED: Obtain and return barriers from the following NDDOT property:

- 120 from the Sterling Reloading Yard located 0.8 miles south of I-94, 0.2 miles west of Hwy 83 on Burleigh County Hwy 10.

Install any missing markers on the barriers before traffic use. Include the cost of the markers in the contract unit price for "Precast Concrete Median Barrier – State Furnished".

Some 4 inch x 4 inch boards are available at the return location. Provide any additional 4 inch x 4 inch boards necessary to stack barriers. The boards will become property of the Department. Include the cost for boards in the contract unit price for "Precast Concrete Median Barrier - State Furnished".

704-301 SEQUENCING ARROW PANEL – TYPE C – CROSSOVER: Provide solar powered arrow panels that meet the requirements of the MUTCD and ITE and that are capable of operating for 20 days without a solar charge.

Include all costs for materials, equipment, labor, and incidentals in the contract unit price for "Sequencing Arrow Panel – Type C – Crossover".

704-P01 CONTRACTOR FURNISHED PRECAST CONCRETE MED BARRIERS: Supply and install 192 portable precast concrete median barriers to be used for work zone traffic control as shown in Sec 100 Barrier Layout plan sheet. If the contractor furnished barriers are intermixed with the 2.5' wide state furnished barriers, supply barriers the same 2.5' width for the continuous barrier run. Install contractor furnished concrete barriers in accordance with the manufacturer's specifications.

Include all costs for providing, installing, maintaining, and removing barriers in the unit price bid for "Portable Precast Concrete Med Barrier, LF."

704-P02 TRAFFIC CONTROL DEVICES: The traffic control devices list has been developed using the following layouts on the Standard Drawing for traffic control.

D-704-22, Type K and Type L for construction trucks hauling material.
D-704-35, Sign layout for One Lane Closure
D-704-38 & 39, Sign Layout for Median Crossover
D-704-58 & 59, Structure removal and replacement

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NOTES

704-P03 WORK ZONE TRAFFIC CONTROL PHASES: The device list and plan sheets have been developed based on the following phases:

Phases 1 & 5:
Two one–lane closures (one for eastbound I-94 and one for westbound I-94) have been provided to construct the median crossovers and placement of the portable concrete barriers (Phase 1). Place terminal signs in accordance with Section 100 Phases 2 & 4 and devices in accordance with D-704-35. In addition, use the one-lane closures when removing the portable concrete barriers from the median crossover locations (Phase 5).

Phases 2 & 4:
Direct traffic onto the median crossovers and travel head to head on one bound of I-94 when the superstructure demolition is taking place over the other bound of I-94 (Phase 2). Place signs and devices in accordance with Sec 100 plan sheets based on D-704-38 and D-704-39. In addition, use the median crossovers when setting bridge beams over I-94 (Phase 4).

The median crossovers are only to be used during daylight hours from 6:00 am to 8:00 pm for structure demolition and beam placement.

Phase 3:
Maintain two lanes of traffic in each direction of I-94 while the remaining substructure is being removed and the new structure is being constructed. Place signs and devices in accordance with Sec 100 plan sheets based on D-704-58.

704-P05 TUBULAR MARKERS: Install a quantity of 60 triple weighted tubular markers on the median crossovers (30 each) upon completion of the project as shown in the Sec 100 of the plans. The tubular markers will remain in-place and become property of the NDDOT after completion of the project.

Include all costs for providing and installing tubular markers in the unit price bid for "Tubular Markers".

720-P01 ALIGNMENT MONUMENT IN BRIDGE DECK: For alignment monuments located within the bridge deck, construct in accordance with Standard Drawing D-720-1 Alignment Monument details for a concrete roadway with the following changes:

1. Install the alignment monument into the bridge deck after the longitudinal grooving is complete.
2. The No. 5 x 18” deformed bar is not required.
3. Recess the top of the aluminum cap 1/8” to 1/4” below the finished bridge deck surface by drilling a hole slightly larger in diameter than the aluminum survey cap.
4. Modify the stem depth of the aluminum cap to be placed in a drilled hole of 3/4” max. depth into the bridge deck.
5. Epoxy the cap into the bridge deck.

Include all costs for this work in the price bid for “Alignment Monument”.

766-P01 MAILBOXES: Notify affected mailbox owners in advance of disturbing the existing mailboxes and supports. Provide written notifications 30 days in advance of disturbance and provide copies of the notifications to the Engineer.

Just prior to removing the existing mailbox and support, coordinate verbally with the mailbox owner to discuss resetting the existing mailbox on a new support. Contact the U.S. Postal Service for the mailbox owners’ contact information.

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NOTES

SECTION 130

602-P01 SINGLE SLOPE BARRIER: This work consists of constructing a reinforced concrete single slope barrier at the median bridge pier at the Apple Creek Separation, as shown in the plans.

The single slope barrier consists of a single slope barrier wall on each side of the pier. The barriers taper to a common end. Install Cl 43 aggregate fill and a 4" thick reinforced concrete cap slab between the two barrier walls as shown in the plans. Each barrier wall will not be measured separately. The pay length is from the beginning to the end of the complete barrier wall installation.

Include all costs to construct the single slope barrier in the contract unit price bid "Single Slope Barrier." The work includes furnishing and installing Class AAE-3 concrete, grade 60 reinforcing steel, mastic, joint sealant materials, aggregate, and all other materials, equipment and labor required to complete the installations as shown in the plans.

748-P01 CURB & GUTTER – TYPE 1 SPECIAL: Install curb and gutter at the Apple Creek Separation, in accordance with Standard Drawing D-748-1, except for height transitions at each end, as shown on Standard Drawing D-764-60.

Include all costs for constructing the curb and gutter as described above in the contract unit price bid for the item "Curb & Gutter – Type 1 Special."

764-P01 MODIFY BARREL ATTENUATION DEVICE: At the median pier of the Apple Creek Separation, remove and reset the existing Barrel Attenuation Device – Type B75.

Remove the existing 6" thick concrete bases which each have an area of 345.2 SF.

Construct the new barrel attenuation device bases, as shown in the plans, to meet one of the following requirements:

- 2 inches of aggregate base and 6 inches of Class AE-3 concrete
- 2 inches of aggregate base and 8 inches of HMA

Include all costs for the removal and resetting of the existing attenuation device barrels, removing the existing concrete bases, and installing new attenuation device bases in the contract unit price bid for "Modify Barrel Attenuation Device".

764-P02 CENTER PIER PROTECTION ATTENUATION DEVICES: If the contractor elects to construct the center pier during the fall of 2020 as described in the "Winter Suspension" Special Provision, it must be protected with attenuation devices during the winter of 20/21.

Either construct the single slope barriers, reset the attenuation devices on a new concrete/bituminous pad as shown in Single Slope Barrier and Attenuation Device Layout in Section 130. Or reset the existing attenuation devices on a temporary earthen pad for the winter as shown in Attenuation Device Layout for Winter Suspension in Section 130 and construct the barriers and pad the following year.

If the existing attenuation devices are temporally set on an earthen pad, the cost to reset these devices will not be paid for separately, but should be included in the price bid for "Modify Barrel Attenuation Device".

07/23/20

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
202	0105	REMOVAL OF STRUCTURE	L SUM	1	1
202	0113	REMOVAL OF CONCRETE	CY	8	8
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	635	635
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES	LF	20	20
202	0312	REMOVE EXISTING FENCE	LF	3,952	3,952
203	0101	COMMON EXCAVATION-TYPE A	CY	1,429	1,429
203	0109	TOPSOIL	CY	9,622	9,622
203	0122	TOPSOIL-DEPT OPTION BORROW AREA	CY	22,586	22,586
203	0140	BORROW-EXCAVATION	CY	51,667	51,667
210	0099	CLASS 1 EXCAVATION	L SUM	1	1
210	0201	FOUNDATION PREPARATION	EA	1	1
216	0100	WATER	M GAL	700	700
251	0200	SEEDING CLASS II	ACRE	21.93	21.93
251	2000	TEMPORARY COVER CROP	ACRE	21.93	21.93
253	0101	STRAW MULCH	ACRE	33.86	33.86
255	0102	ECB TYPE 2	SY	158	158
255	0201	TRM TYPE 1	SY	520	520
260	0200	SILT FENCE SUPPORTED	LF	4,065	4,065
260	0201	REMOVE SILT FENCE SUPPORTED	LF	4,065	4,065
261	0112	FIBER ROLLS 12IN	LF	10,450	10,450
261	0113	REMOVE FIBER ROLLS 12IN	LF	3,630	3,630
302	0356	AGGREGATE SURFACE COURSE CL 13	TON	6,526	6,526
401	0060	PRIME COAT	GAL	4,010	4,010
401	0160	BLOTTER MATERIAL CL 44	TON	70	70
602	0130	CLASS AAE-3 CONCRETE	CY	393.2	393.2
602	1130	CLASS AE-3 CONCRETE	CY	136	136
602	1134	PILE SUPPORTED APPROACH SLAB	SY	153.4	153.4
602	1220	SINGLE SLOPE BARRIER	LF	109	109
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	1,390	1,390
604	9925	PRESTRESSED I-BEAM-72IN	LF	1,350	1,350
612	0115	REINFORCING STEEL-GRADE 60	LBS	18,940	18,940
612	0116	REINFORCING STEEL-GRADE 60-EPOXY COATED	LBS	87,209	87,209

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	8	2

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
622	0020	STEEL PILING HP 10 X 42	LF	960	960
622	0070	STEEL PILING HP 14 X 102	LF	1,950	1,950
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	400	400
704	1000	TRAFFIC CONTROL SIGNS	UNIT	2,891	2,891
704	1045	ATTENUATION DEVICE-TYPE B-75	EA	8	8
704	1052	TYPE III BARRICADE	EA	10	10
704	1060	DELINEATOR DRUMS	EA	136	136
704	1067	TUBULAR MARKERS	EA	280	280
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	2	2
704	3510	PRECAST CONCRETE MED BARRIER-STATE FURNISHED	EA	312	312
714	0310	PIPE CONC REINF 18IN CL III	LF	12	12
714	4099	PIPE CONDUIT 18IN-APPROACH	LF	92	92
714	4106	PIPE CONDUIT 24IN-APPROACH	LF	56	56
714	7030	PIPE PVC 12IN	LF	335	335
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES	EA	1	1
720	0110	RIGHT OF WAY MARKERS	EA	27	27
720	0125	ALIGNMENT MONUMENTS	EA	2	2
720	0130	IRON PIN R/W MONUMENTS	EA	21	21
720	0135	IRON PIN REFERENCE MONUMENTS	EA	4	4
748	0141	CURB & GUTTER-TYPE 1 SPECIAL	LF	60	60
752	0200	FENCE BARBED WIRE 4 STRAND	LF	790	790
752	0400	FENCE BARBED WIRE 5 STRAND	LF	2,000	2,000
752	0993	FENCE TERMINAL	EA	4	4
752	3140	CORNER ASSEMBLY BARBED WIRE	EA	2	2
752	4100	DOUBLE BRACE ASSEMBLY BARBED WIRE	EA	2	2
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	38	38
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	96	96
754	0592	RESET SIGN PANEL	EA	1	1
754	0593	RESET SIGN SUPPORT	EA	1	1
754	0805	OBJECT MARKERS - CULVERTS	EA	1	1
764	0131	W-BEAM GUARDRAIL	LF	362	362
764	0145	W-BEAM GUARDRAIL END TERMINAL	EA	4	4

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ESTIMATE OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
764	0151	REMOVE W-BEAM GUARDRAIL & POSTS	LF	765	765
764	2081	REMOVE END TREATMENT & TRANSITION	EA	6	6
764	8080	MODIFY BARREL ATTENUATION DEVICE	EA	2	2
766	0100	MAILBOX-ALL TYPES	EA	1	1
930	3000	BRIDGE BENCH MARKS	SET	1	1
930	7012	ROADWAY CANOPY	L SUM	1	1
930	8600	ELASTOMERIC BEARING PAD	SF	40	40
930	8686	AGGREGATE SLOPE PROTECTION	SY	426	426
930	9537	ABUTMENT UNDERDRAIN SYSTEM	EA	2	2

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Water
50 Mgal for Dust Palliative
20 Gal/Ton for Aggregates
10 Gal/CY for Embankments

Materials

Aggregate Surface Course CL 13	1.5 Ton/CY + 25%
Prime Coat	0.35 Gal/SY
Blotter Material CL 44	12 Lb/SY

Earthwork

Location	203-0101 COMMON EXCAVATION - TYPE A	EMBANKMENT	203-0140 BORROW EXCAVATION
	Pay Item		Pay Item
	(CY)	(CY)	(CY)
	A	B	C = B - A
West Median Crossover	0	4,636	4,636
East Median Crossover	0	1,078	1,078
106th Street NE - South of I-94	252	21,943	21,691
106th Street NE - North of I-94	628	17,076	16,448
30th Ave NE	49	7,073	7,024
I-94 Median Guardrail Embankment	0	290	290
Temporary I-94 Shoulders for WZTC Barriers		500	500
Removal of Temporary I-94 Shoulders for WZTC Barriers	500		
TOTAL	1,429	52,596	51,667

Aggregate Surfacing

Location	302-0356 AGGREGATE SURFACE COURSE - CL 13
	Pay Item
	(Tons)
West Median Crossover	2,452
East Median Crossover	1,125
106th Street NE - South of I-94	1,033
106th Street NE - North of I-94	1,044
Guardrail Surfacing - 106th St NE	144
30th Ave NE	728
TOTAL	6,526

Prime Coat & Blotter

Location	401-0060 PRIME COAT	401-0060 PRIME COAT	401-0160 BLOTTER MATERIAL CL 44	401-0160 BLOTTER MATERIAL CL 44
	Pay Item	Pay Item	Pay Item	Pay Item
	(Gal)	(Gal)	(Tons)	(Tons)
	1st Application	2nd Application	1st Application	2nd Application
West Median Crossover	1,375	1,375	24	24
East Median Crossover	630	630	11	11
TOTAL	2,005	2,005	35	35

Note: Quantity for Prime Coat & Blotter Material is based on 2 separate applications.

Mailboxes

Mailbox Location	Type	Work
Sta 555+75 - Rt	Double	Replace

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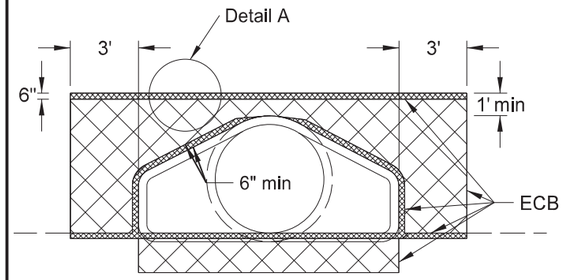
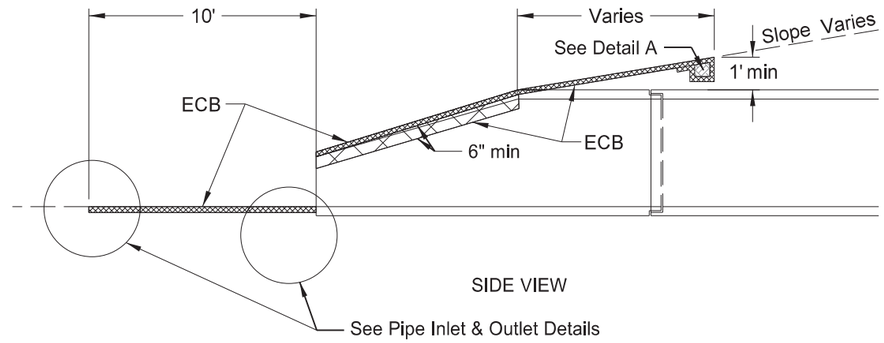
Basis of Estimate

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	20	1



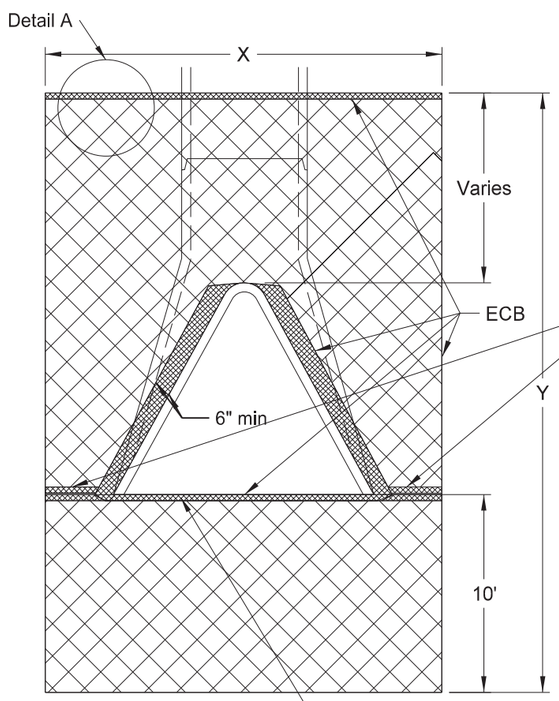
FRONT VIEW



SIDE VIEW

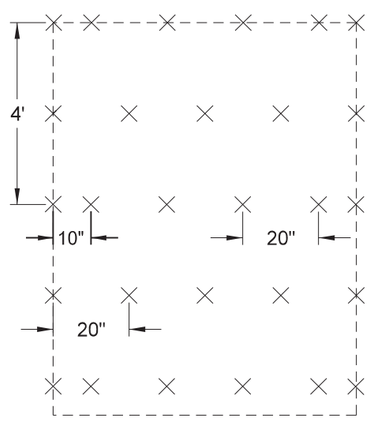
Erosion Control Blanket (ECB)									
	Location to be Protected Station	Culvert Type Appr/CL	Pipe Diam (Inch)	No	Unit Quantity (SY)	Total Quantity Type 1 (SY)	Type 2 (SY)	Type 3 (SY)	Type 4 (SY)
①	558+56 Lt	Appr	24	1	24		24		
①	559+12 Lt	Appr	24	1	24		24		
①	540+29 Rt	Appr	18	2	22		44		
①	540+75 Rt	Appr	18	2	22		44		
②	267+48	Appr	18	1	22		22		
	Total (SYs)						158		

① Stations listed from Chain: EX106ST
② Stations listed from Chain: SCL_I94



TOP VIEW

NOTE: Tuck the ECB a minimum of 6" into the embankment (against the flared end section) around the opening of the flared end section.

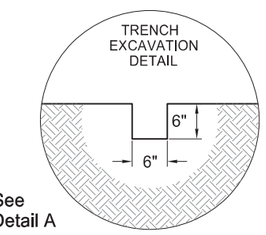


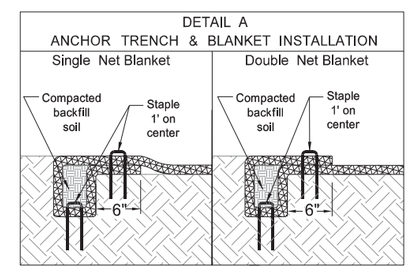
STAPLE PATTERN

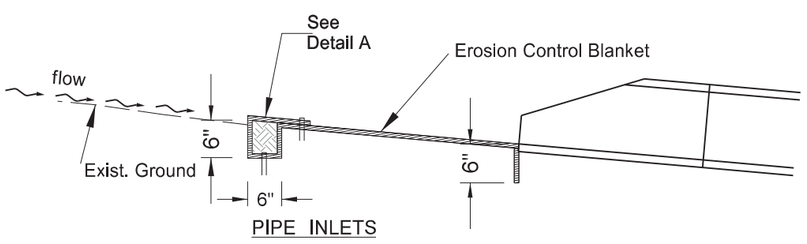
APPROACH CULVERTS				
DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
15	9.0	20.0	176.0	20
18	9.5	20.7	190.7	22
21	9.5	21.0	190.9	22
24	10.5	21.6	214.1	24
27	11.0	22.0	226.3	25
30	11.6	22.5	241.5	27
36	12.7	23.3	268.8	30
42	13.3	23.3	279.7	31
48	13.8	24.0	293.2	33
54	14.5	23.4	300.6	34
60	15.0	23.0	307.5	35
66	15.6	24.0	325.6	37
72	16.2	24.5	340.6	38

Note: Quantities based on 8:1 slope.

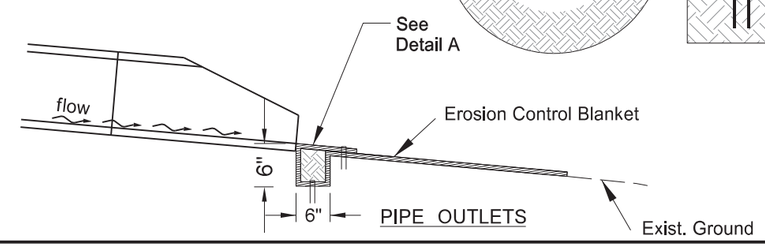
CENTERLINE CULVERTS									
DIA	X	Y	Surface area to be protected	ECB	DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY	In	Ft	Ft	SF	SY
24	10.5	19.6	193.1	22	24	10.5	27.6	172.1	20
27	11.0	20.0	204.3	23	27	11.0	18.0	182.3	21
30	11.6	20.5	218.3	25	30	11.6	18.5	195.1	22
36	12.7	21.2	242.1	27	36	12.7	19.2	216.7	24
42	13.3	21.2	251.8	28	42	13.3	19.2	225.2	25
48	13.8	22.0	265.6	30	48	13.8	20.0	238.0	27
54	14.5	21.5	273.7	31	54	14.5	19.5	244.7	28
60	15.0	21.0	278.3	31	60	15.0	19.0	248.3	28
66	15.6	22.0	295.7	33	66	15.6	20.0	264.5	30
72	16.2	22.5	309.2	35	72	16.2	20.5	276.8	31
Note: Quantities based on 6:1 slope.					Note: Quantities based on 4:1 slope.				



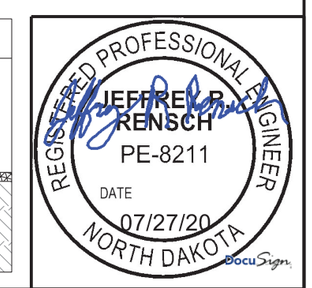




PIPE INLETS



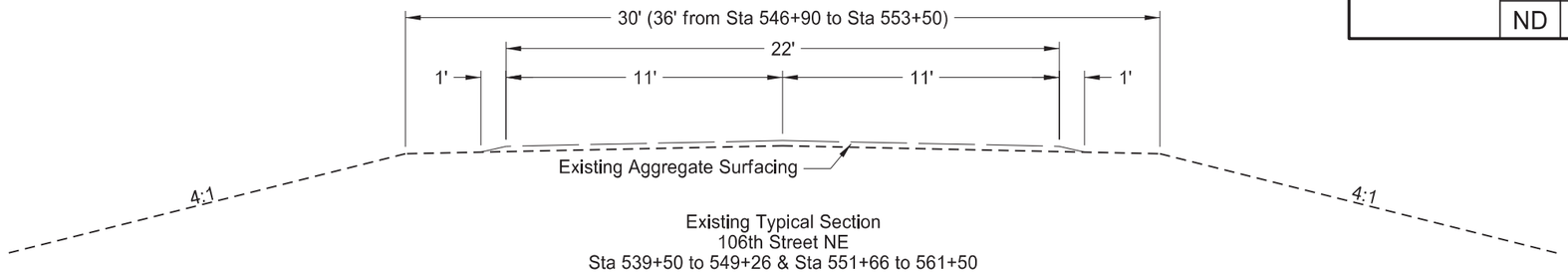
PIPE OUTLETS



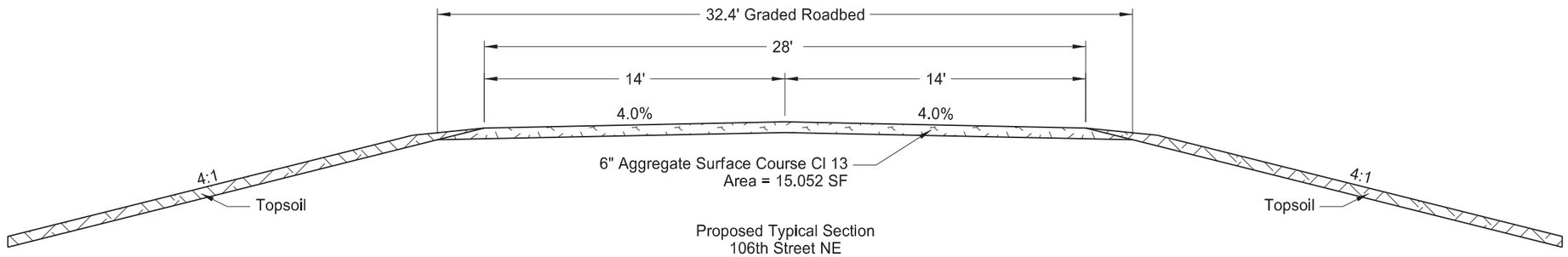
Erosion Control at Culvert Flared End Sections

Apple Creek Separation

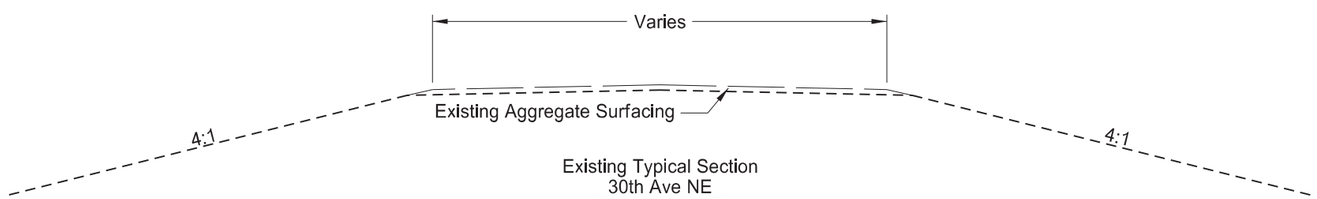
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	30	1



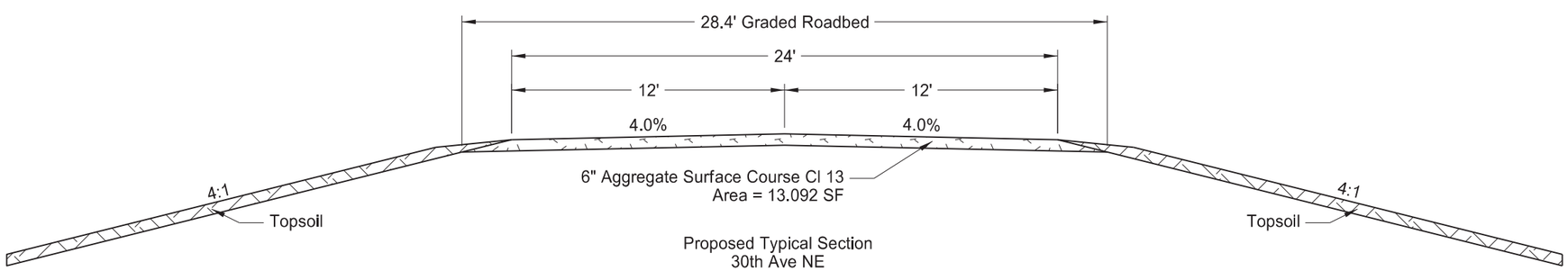
Existing Typical Section
106th Street NE
Sta 539+50 to 549+26 & Sta 551+66 to 561+50



Proposed Typical Section
106th Street NE
Sta 539+50 to 548+87.67 & Sta 552+01.67 to 561+50



Existing Typical Section
30th Ave NE
Sta 0+00 to 7+50



Proposed Typical Section
30th Ave NE
Sta 0+00 to 7+50

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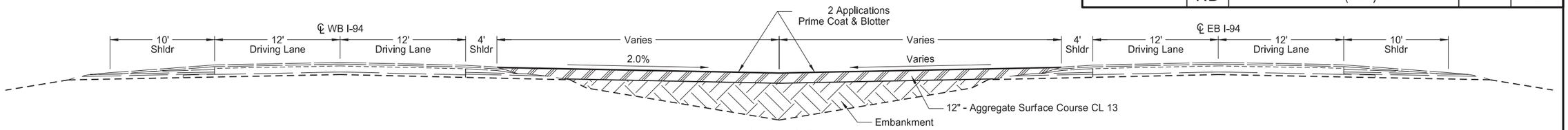
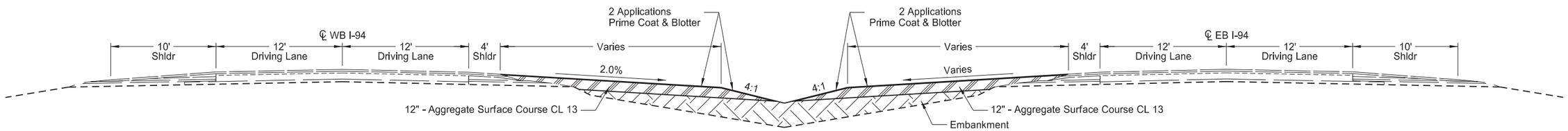
Existing and Proposed Typical Sections

Apple Creek Separation

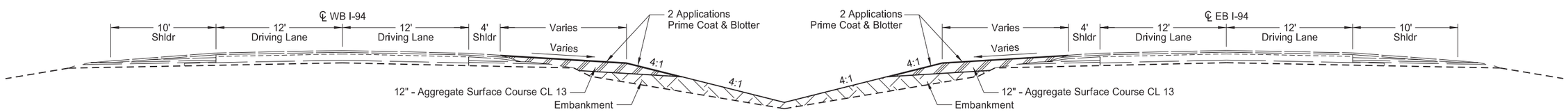
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	30	2



Section D-D



Section C-C



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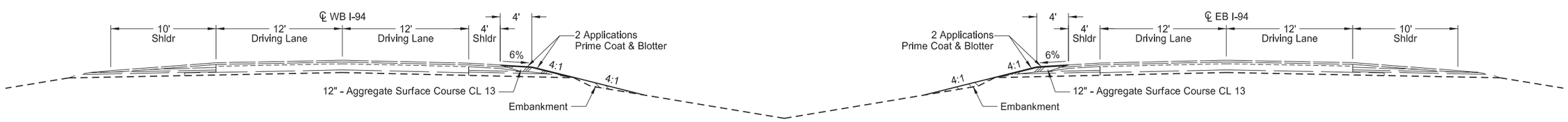
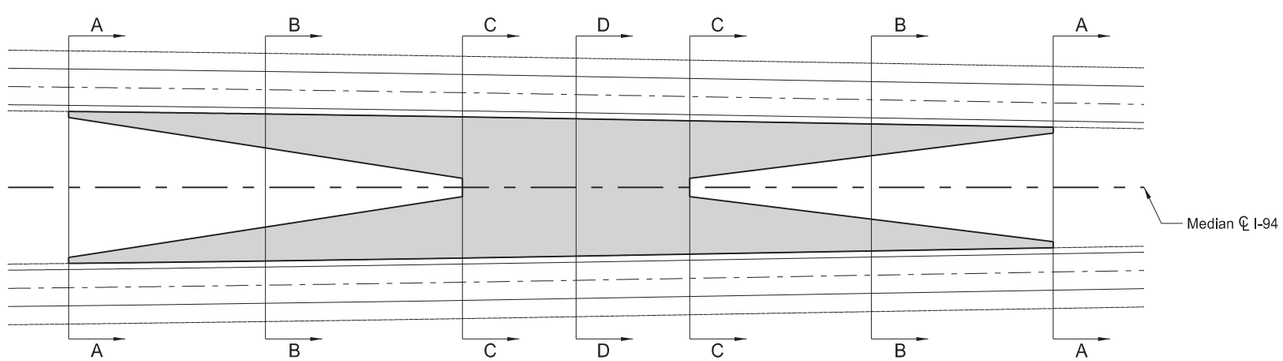


Section A-A



Plan View - Median Crossover

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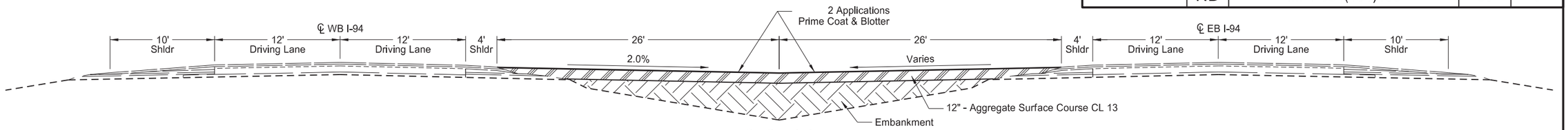
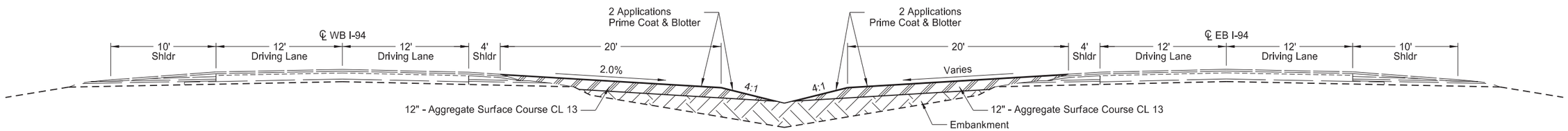
Proposed Typical Sections

West Median Crossover

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	30	3



Section D-D



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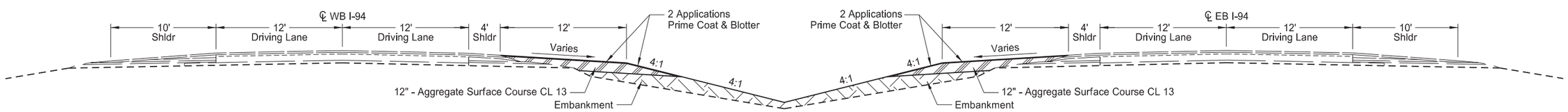

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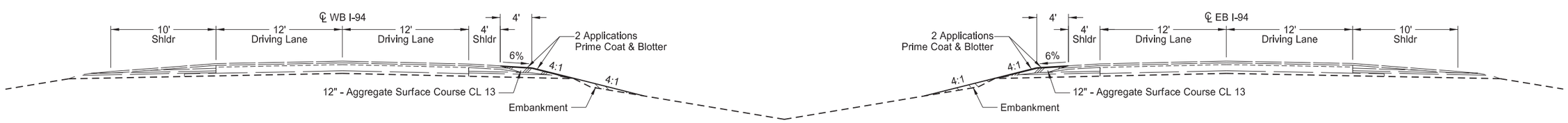
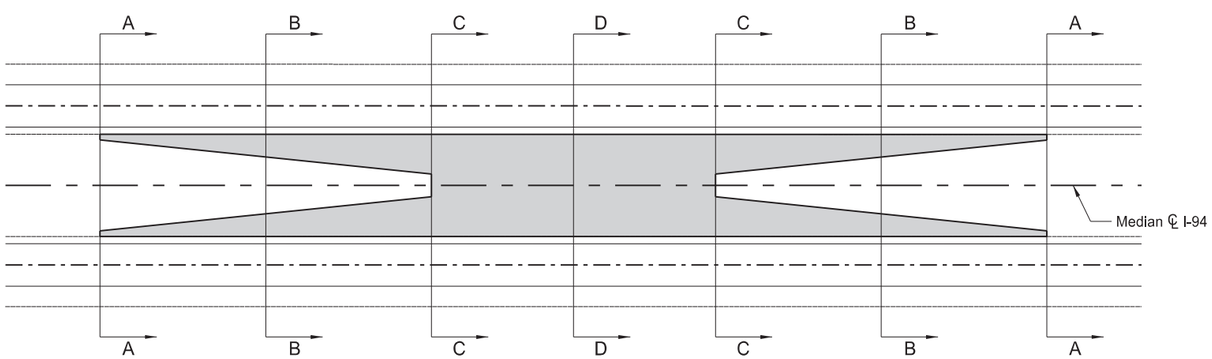


Section A-A



Plan View - Median Crossover

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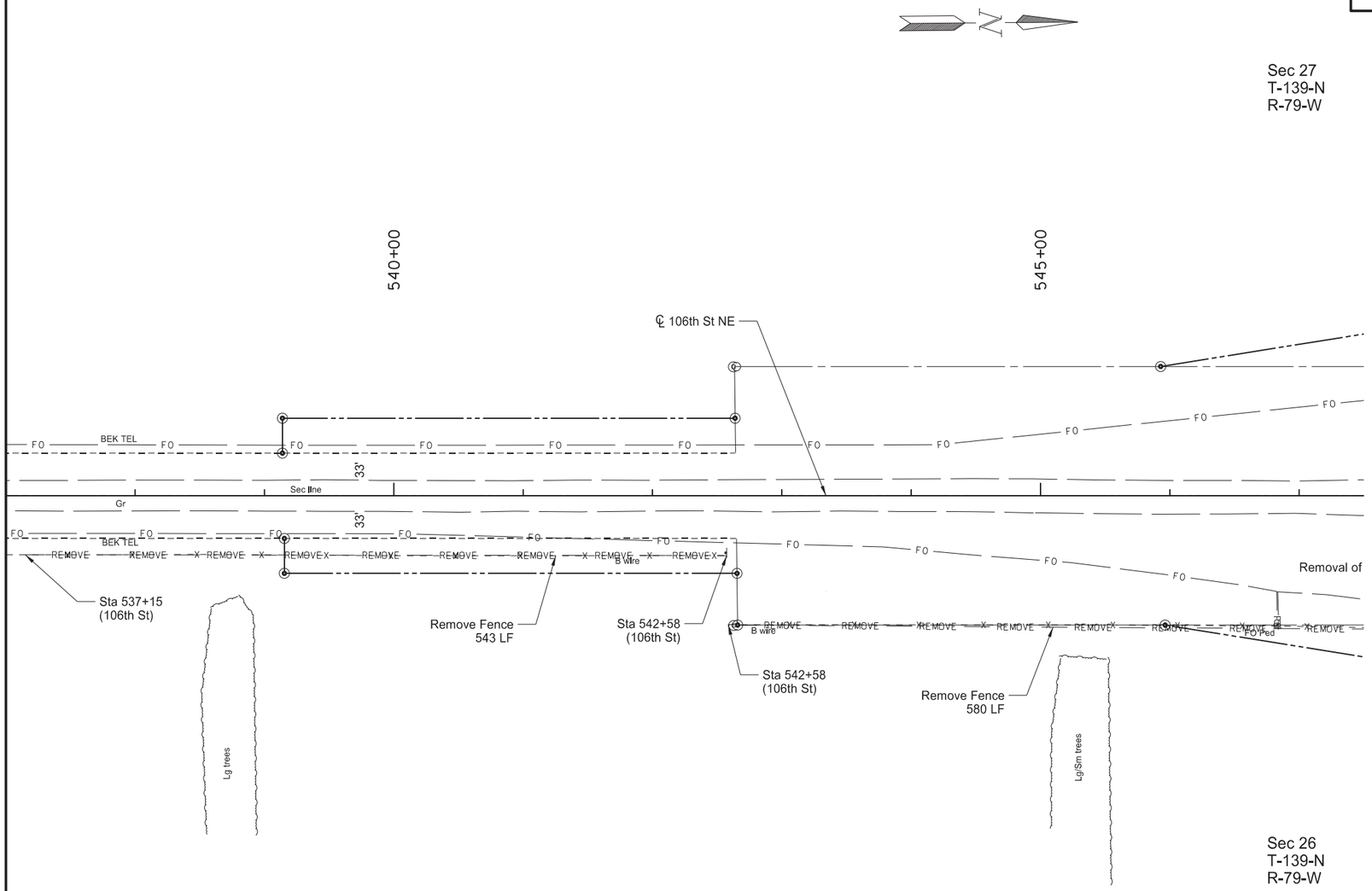
Proposed Typical Sections

East Median Crossover

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	40	1

SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 537+15 to 542+58 - Rt	543	LF
		Sta 542+58 to 548+47 - Rt	580	LF



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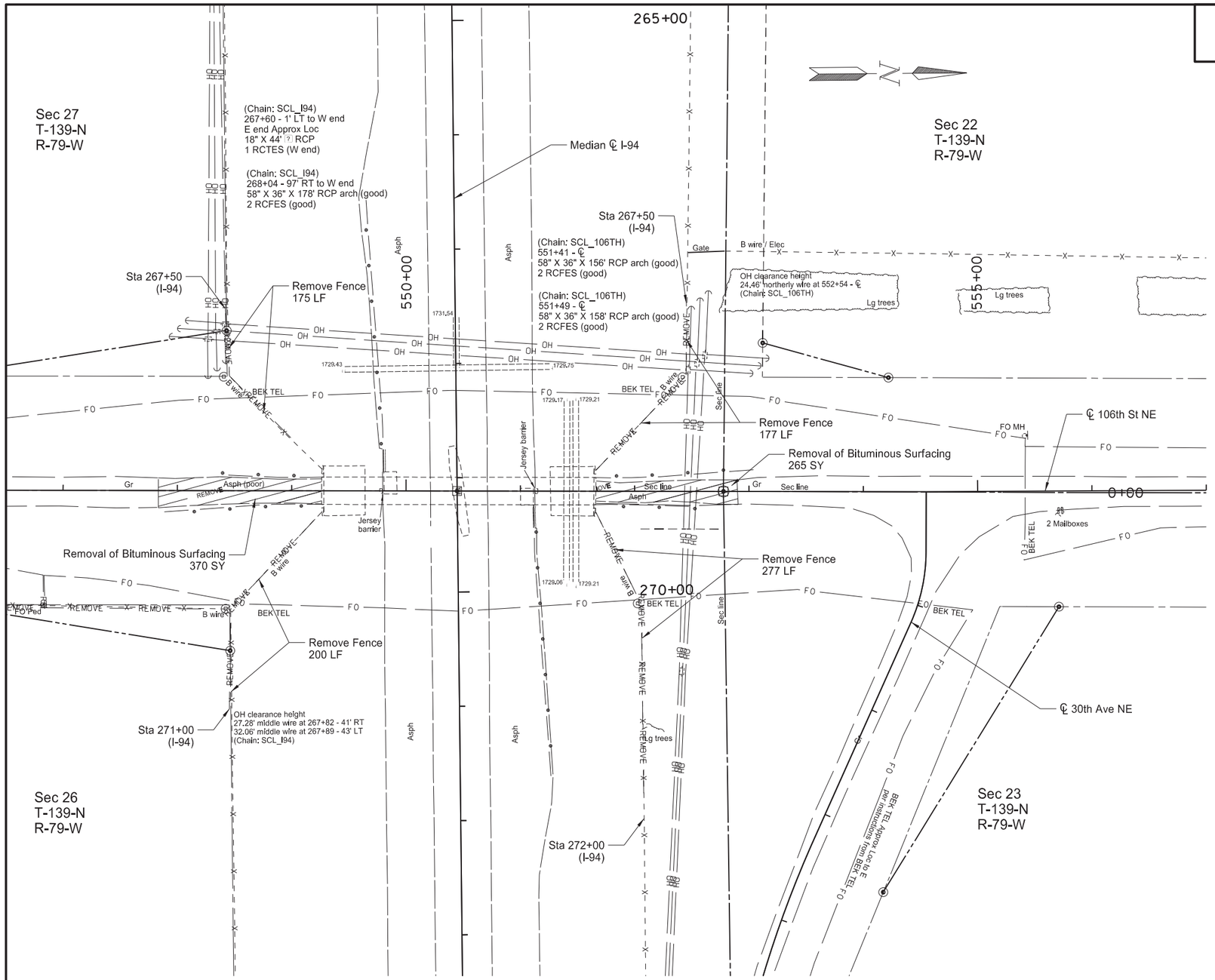
Removals

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	40	2



SPEC	CODE	BID ITEM	QTY	UNIT
202	0132	REMOVAL OF BITUMINOUS SURFACING		
		South Bridge Approach	370	SY
		North Bridge Approach	265	SY
202	0312	REMOVE EXISTING FENCE		
		SW Quadrant	175	LF
		SE Quadrant	200	LF
		NW Quadrant	177	LF
		NE Quadrant	277	LF

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Removals

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	51	1

Alignment	Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	R1 Fabric (Pay Item)	(*) End Sections		Applicable Backfill
														Begin	End	
					In	Bid Item	LF		In	Type		In	SY	EA	EA	
I-94 Median CL (Chain: SCL_I94)	Sta 145+25	0	Sta 148+60	0	12	Pipe PVC 12 IN	335	Polyvinyl Chloride (PVC)	12							
I-94 Median CL (Chain: SCL_I94)	Sta 267+48	0	Sta 267+60	0	18	Pipe Conc. Reinf. CL III (Extension)	12	Reinforced Concrete Pipe - Class III (barrel length = 12 LF)	18					Remove & Relay		Specification 714.04A
106th St NE (Chain: EX106ST)	Sta 540+29	33' Rt	Sta 540+75	33' Rt	18	Pipe Conduit - Approach	46	Reinforced Concrete Pipe - Class III (barrell length = 38 LF)	18					FES	FES	Specification 714.04 A
								Corrugated Steel Pipe	18	Z, A, P	2	0.064				
								Spiral Rib Steel Pipe	18	Z, A, P	3/4, 1	0.064				
								High-Density Polyethylene	18							
								Polypropylene Pipe (AASHTO M330, Type S)	18							
106th St NE (Chain: EX106ST)	Sta 540+29	38' Rt	Sta 540+75	38' Rt	18	Pipe Conduit - Approach	46	Reinforced Concrete Pipe - Class III (barrell length = 38 LF)	18					FES	FES	Specification 714.04 A
								Corrugated Steel Pipe	18	Z, A, P	2	0.064				
								Spiral Rib Steel Pipe	18	Z, A, P	3/4, 1	0.064				
								High-Density Polyethylene	18							
								Polypropylene Pipe (AASHTO M330, Type S)	18							
106th St NE (Chain: EX106ST)	Sta 558+56	46' Lt	Sta 559+12	42' Lt	24	Pipe Conduit - Approach	56	Reinforced Concrete Pipe - Class III (barrell length = 52 LF)	24					FES	FES	Specification 714.04 A
								Corrugated Steel Pipe	24	Z, A, P	2	0.064				
								Spiral Rib Steel Pipe	24	Z, A, P	3/4, 1	0.064				
								High-Density Polyethylene	24							
								Polypropylene Pipe (AASHTO M330, Type S)	24							

Coatings: Z = Zinc
A = Aluminum
P = Polymeric (over Zinc or Aluminum)

Corrugations: 2 = 2-2/3"x1/2"
3 = 3"x1"
5 = 5"x1"

Spiral Ribs: 3/4 = 3/4"x3/4"@7-1/2"
1 = 3/4"x1"@11-1/2"

(*) End sections are measured and paid for separately for pipe extensions.
FES = Flared End Section
TES = Traversable End Section

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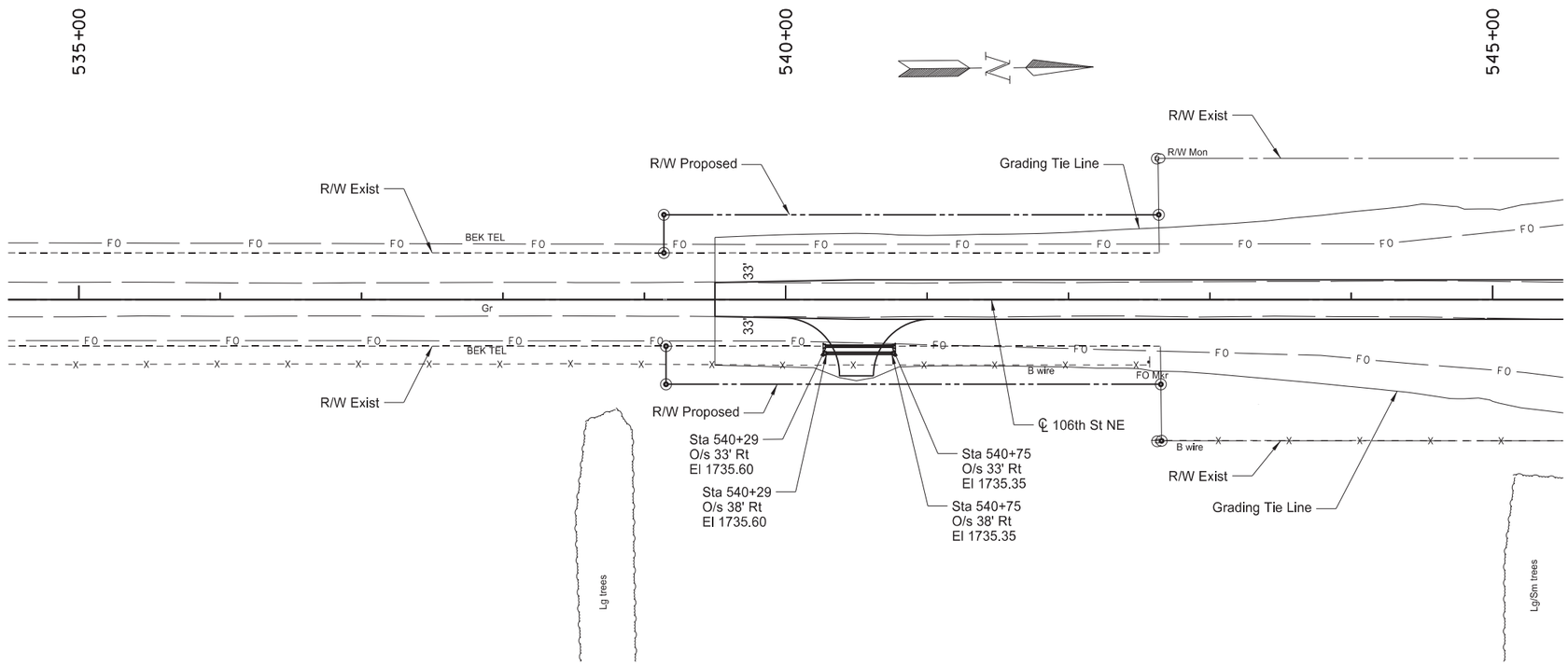
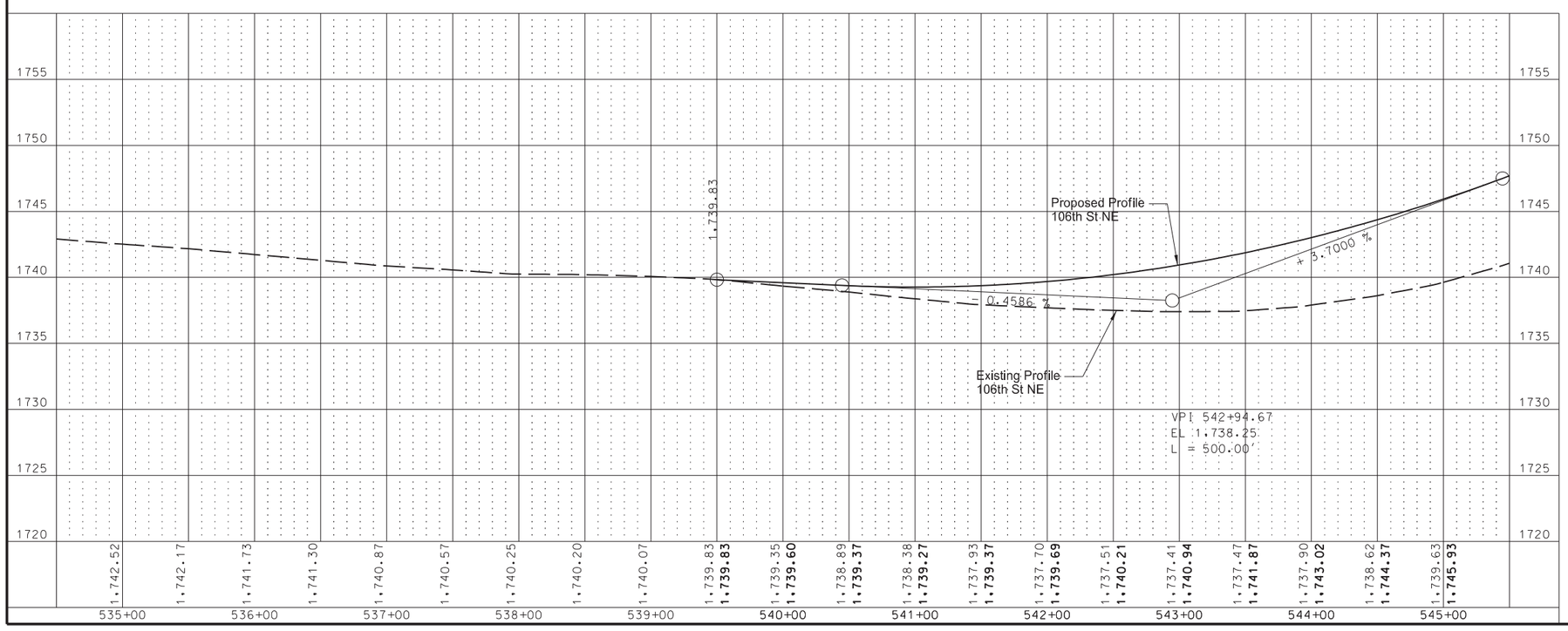
Allowable Pipe List

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	60	1

SPEC CODE	BID ITEM	QTY	UNIT
714 4099	PIPE CONDUIT 18IN - APPROACH		
	Sta 540+29 to 540+75 - 33' Rt	46	LF
	Sta 540+29 to 540+75 - 38' Rt	46	LF





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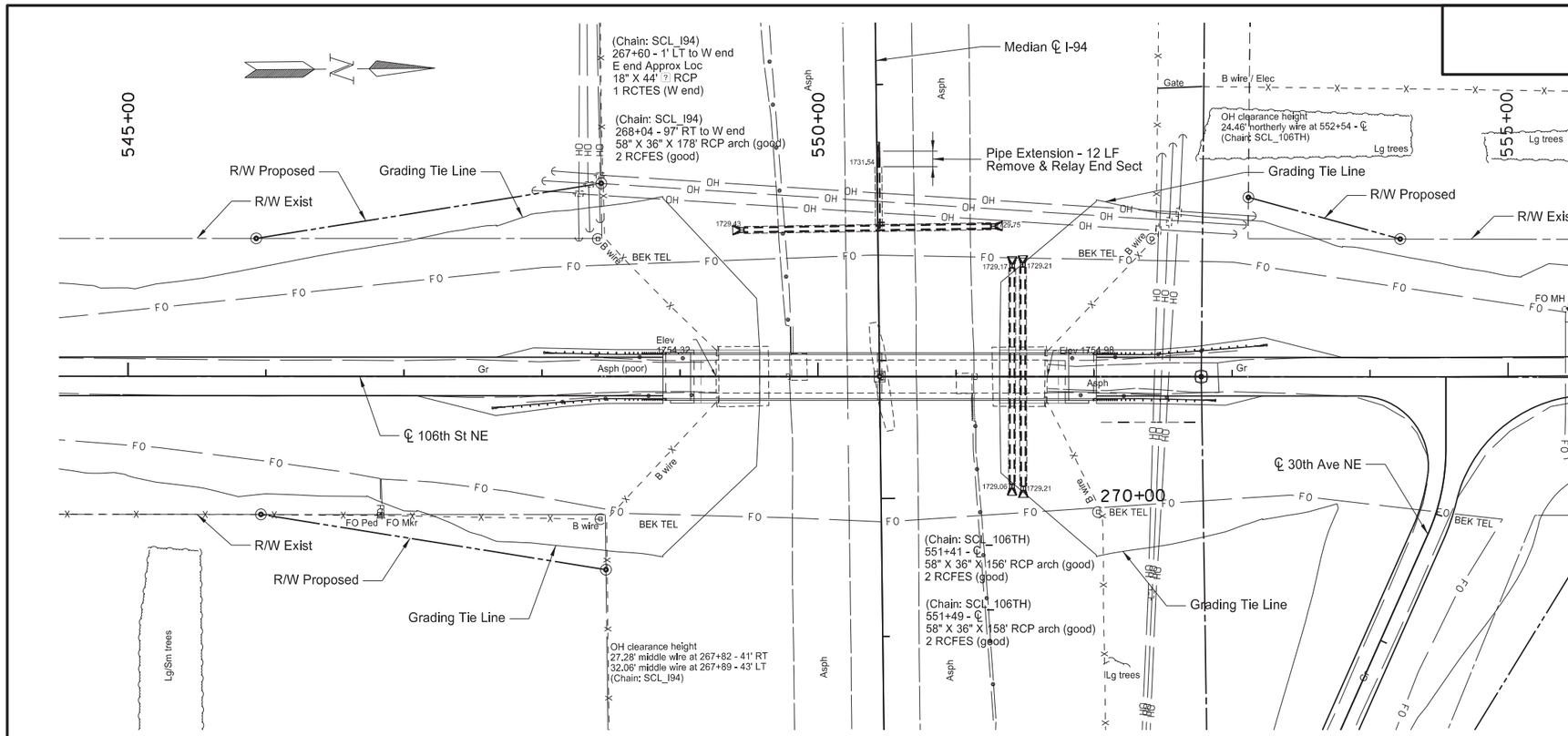
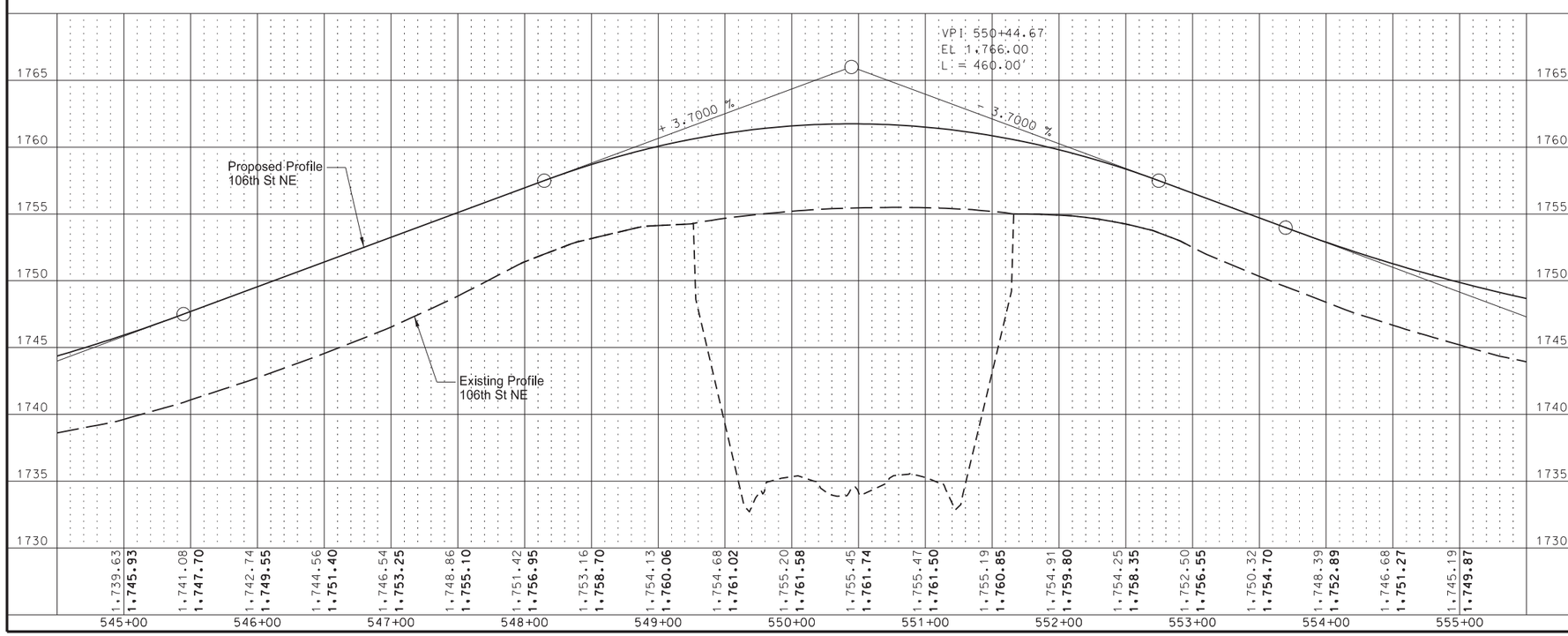
Apple Creek Separation
106th St NE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	60	2



SPEC	CODE	BID ITEM	QTY	UNIT
714	0310	PIPE CONC REINF 18IN CL III		
		Sta 267+48 to 267+60 (Chain: SCL_I94)	12	LF
714	9660	REMOVE & RELAY END SECTION - ALL TYPE & SIZES		
		Sta 267+60 (Chain: SCL_I94)	1	EA
754	0805	OBJECT MARKERS - CULVERTS		
		Sta 267+60 (Chain: SCL_I94)	1	EA



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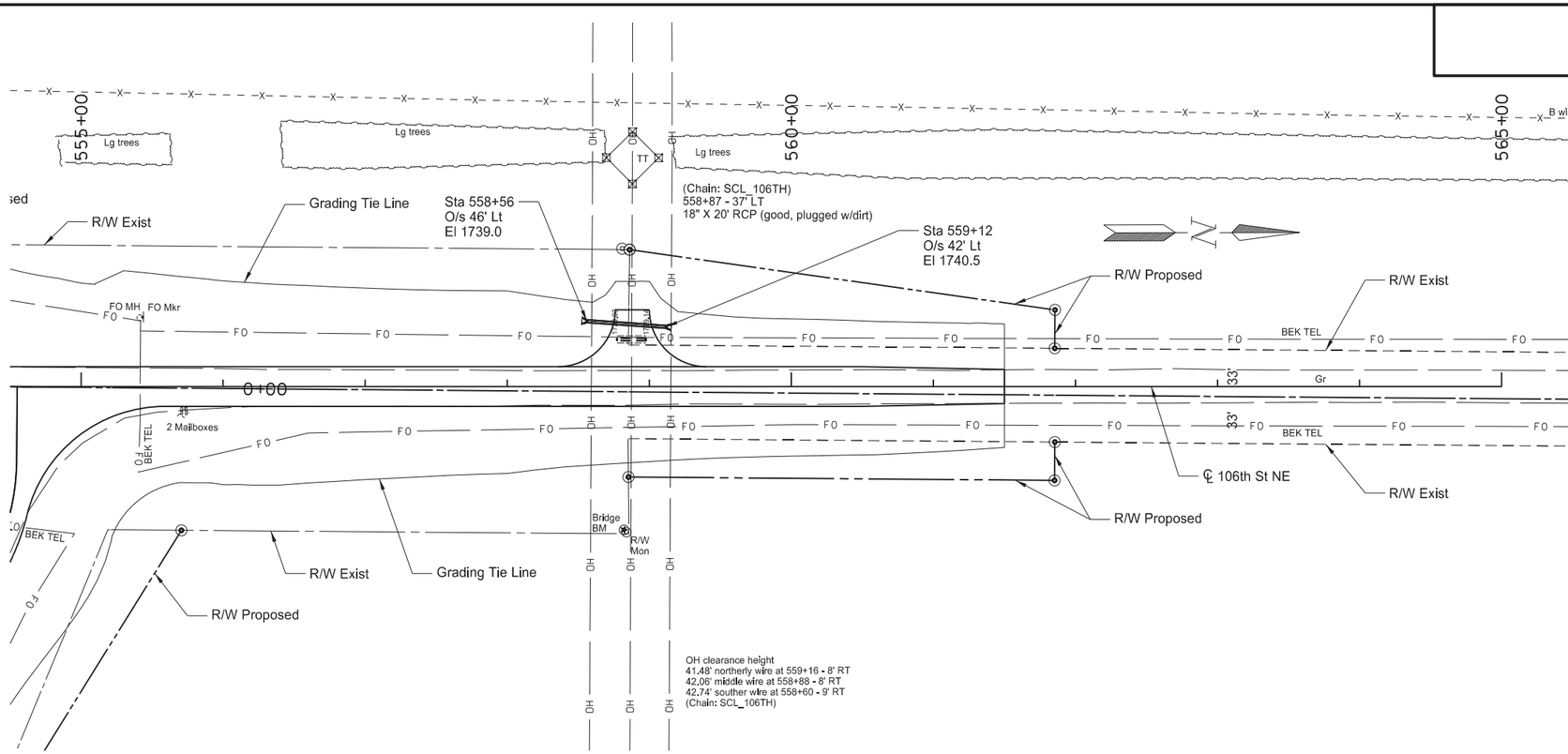
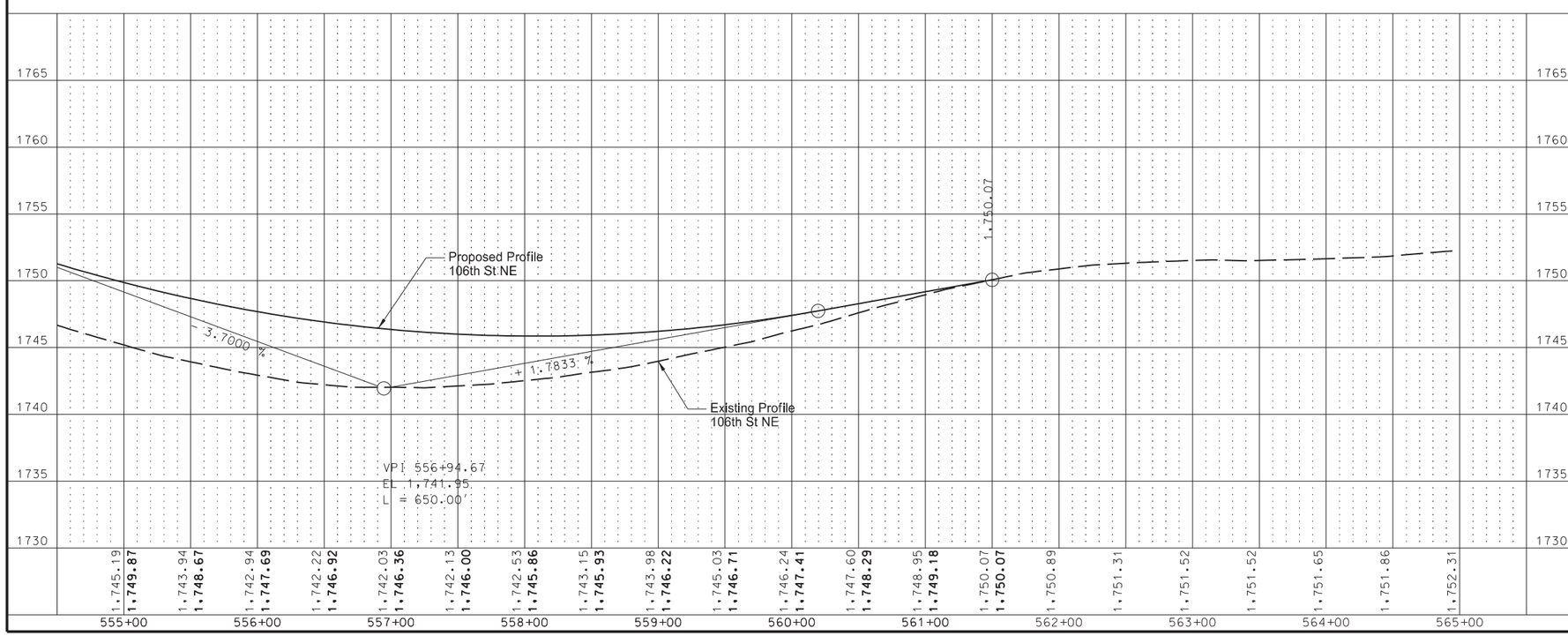
Apple Creek Separation
106th St NE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	60	3

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES & SIZES		
		Sta 558+87 - Lt	20	LF
714	4106	PIPE CONDUIT 24IN - APPROACH		
		Sta 558+56 to 559+12 - Lt	56	LF





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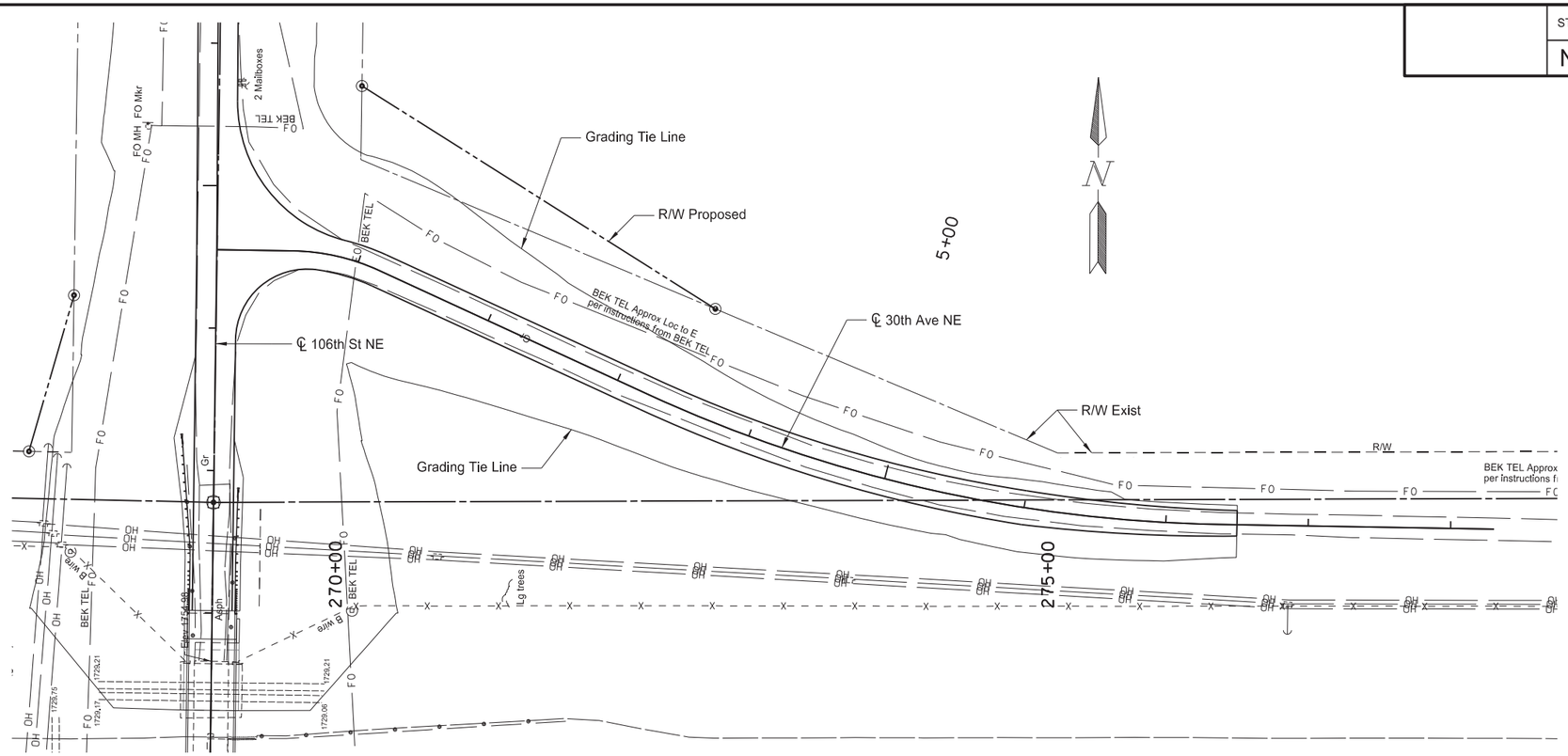
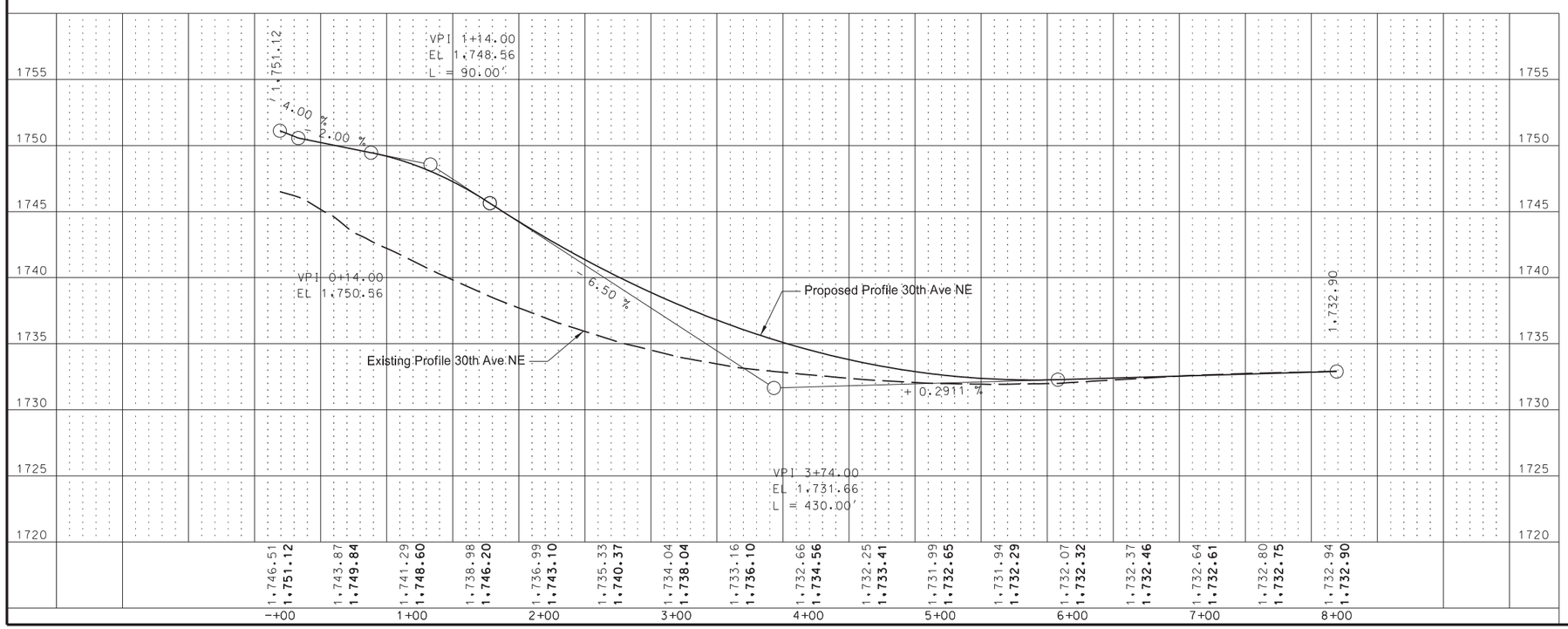
Apple Creek Separation
106th St NE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	60	4





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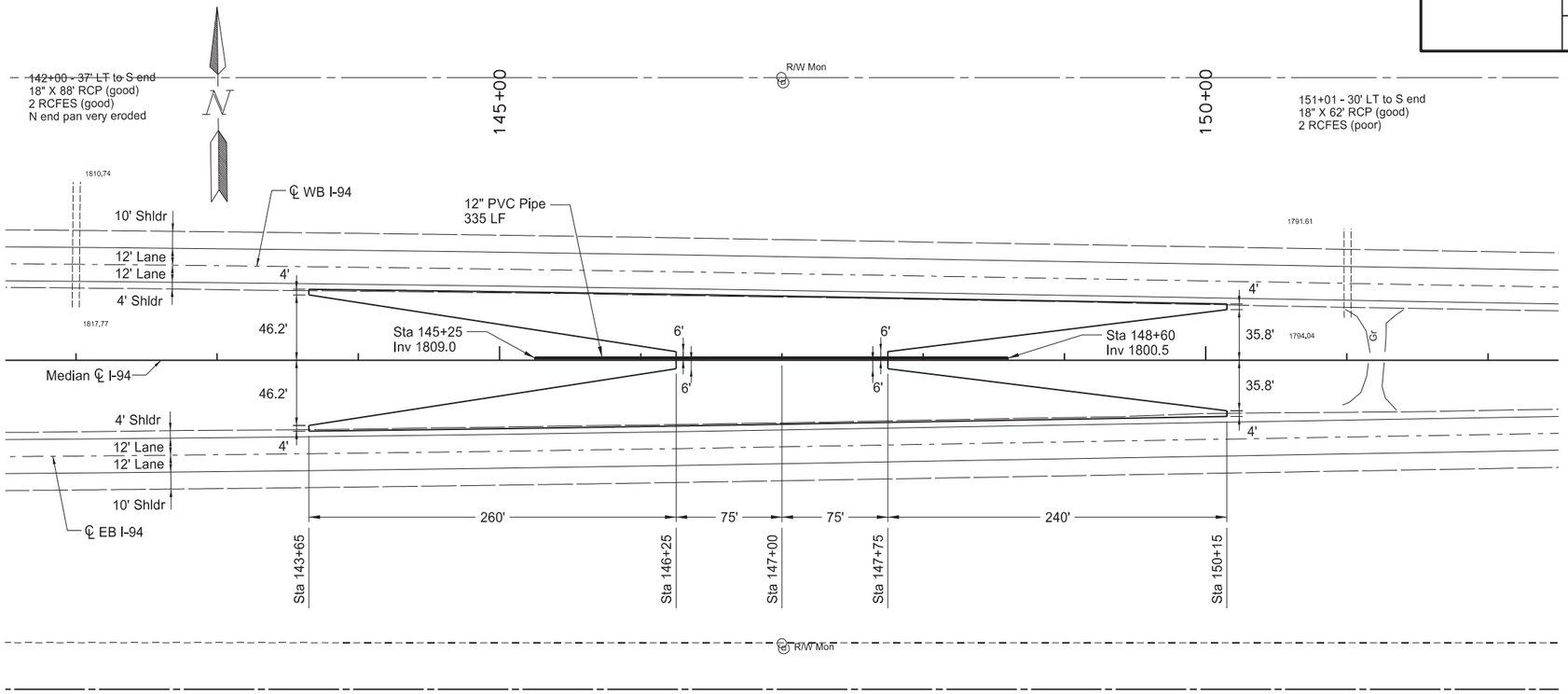
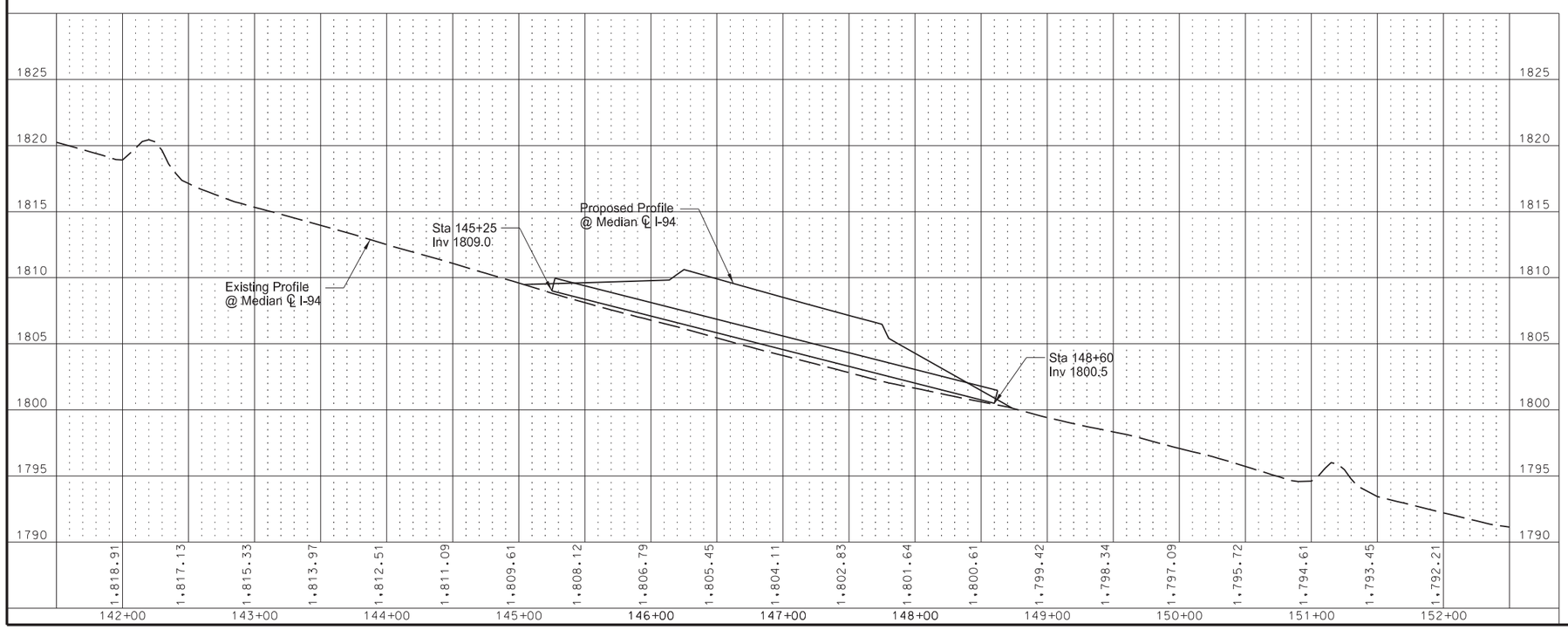
Apple Creek Separation
30th Ave NE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	60	5

SPEC	CODE	BID ITEM	QTY	UNIT
714	7030	PIPE PVC 12IN		
		Sta 145+25 to 148+60 (Chain: SCL_I94)	335	LF





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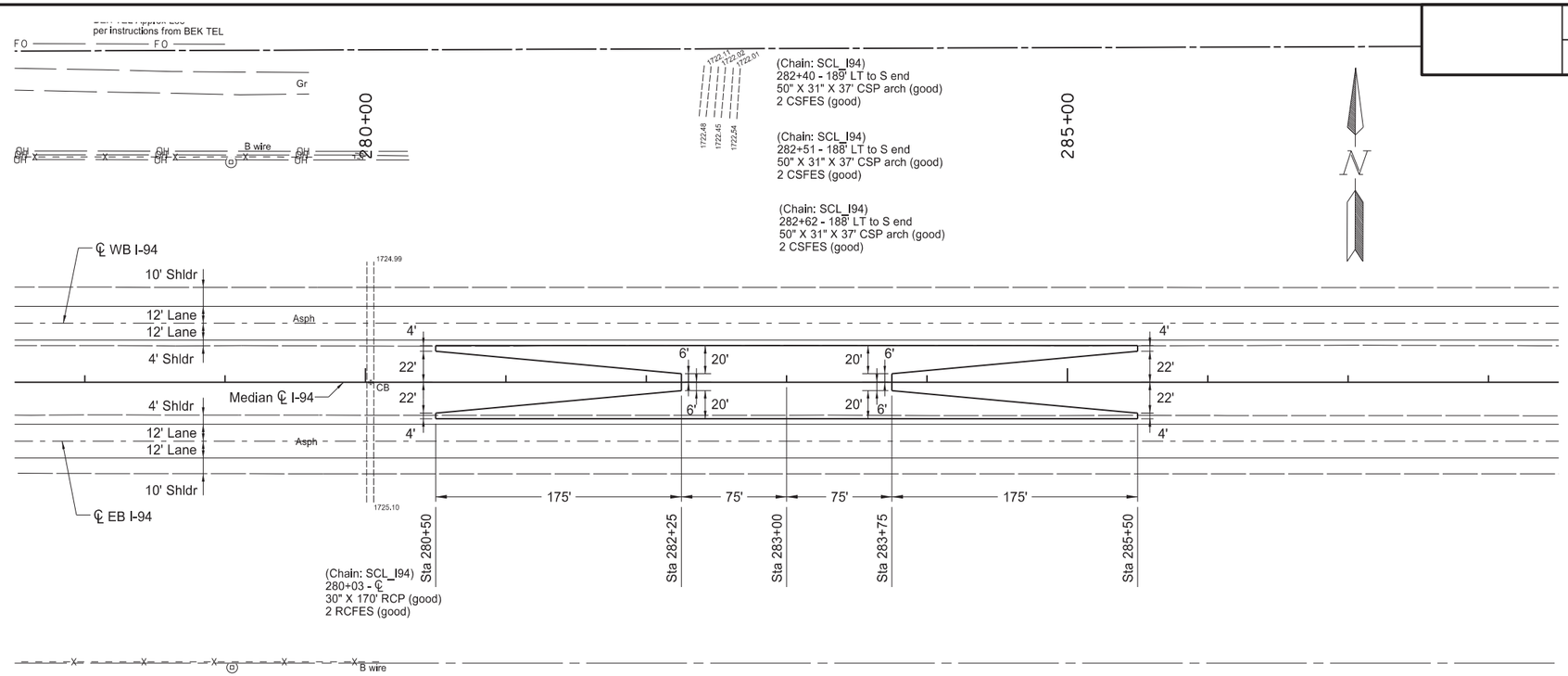
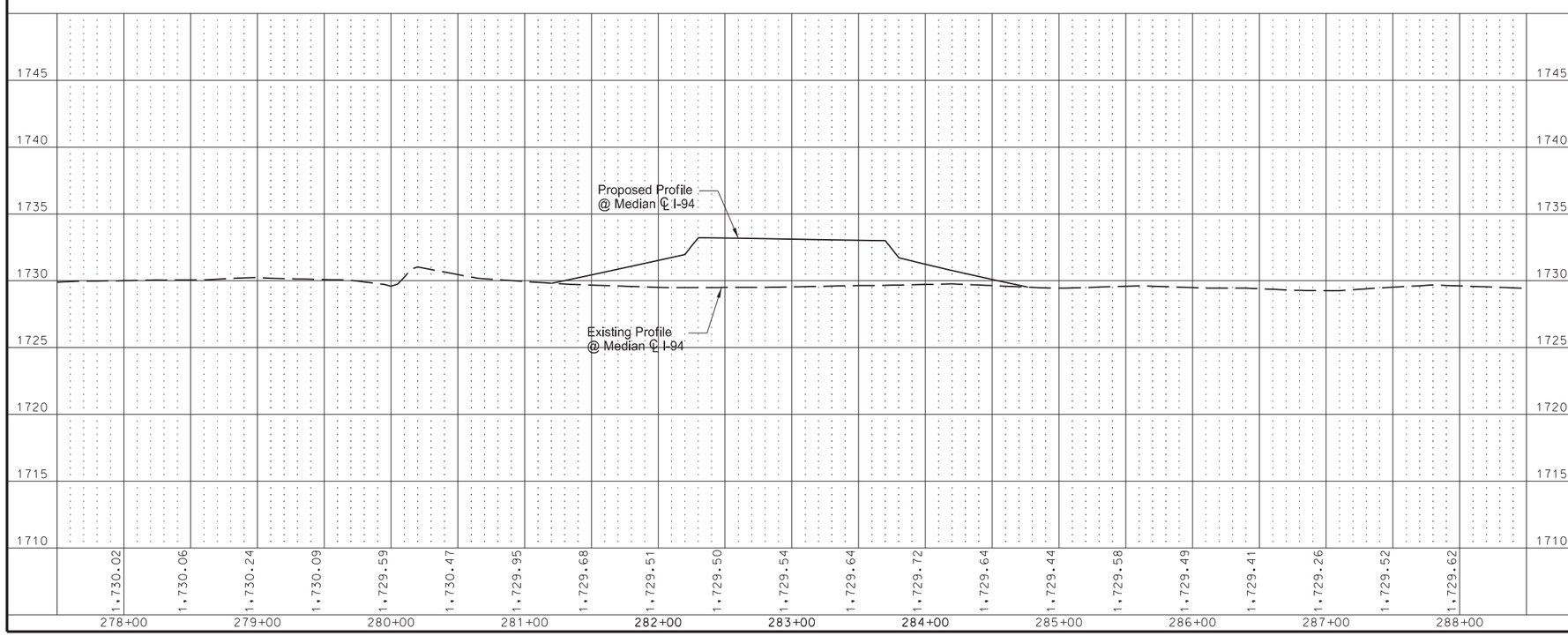
Plan & Profile

West Median Crossover

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	60	6





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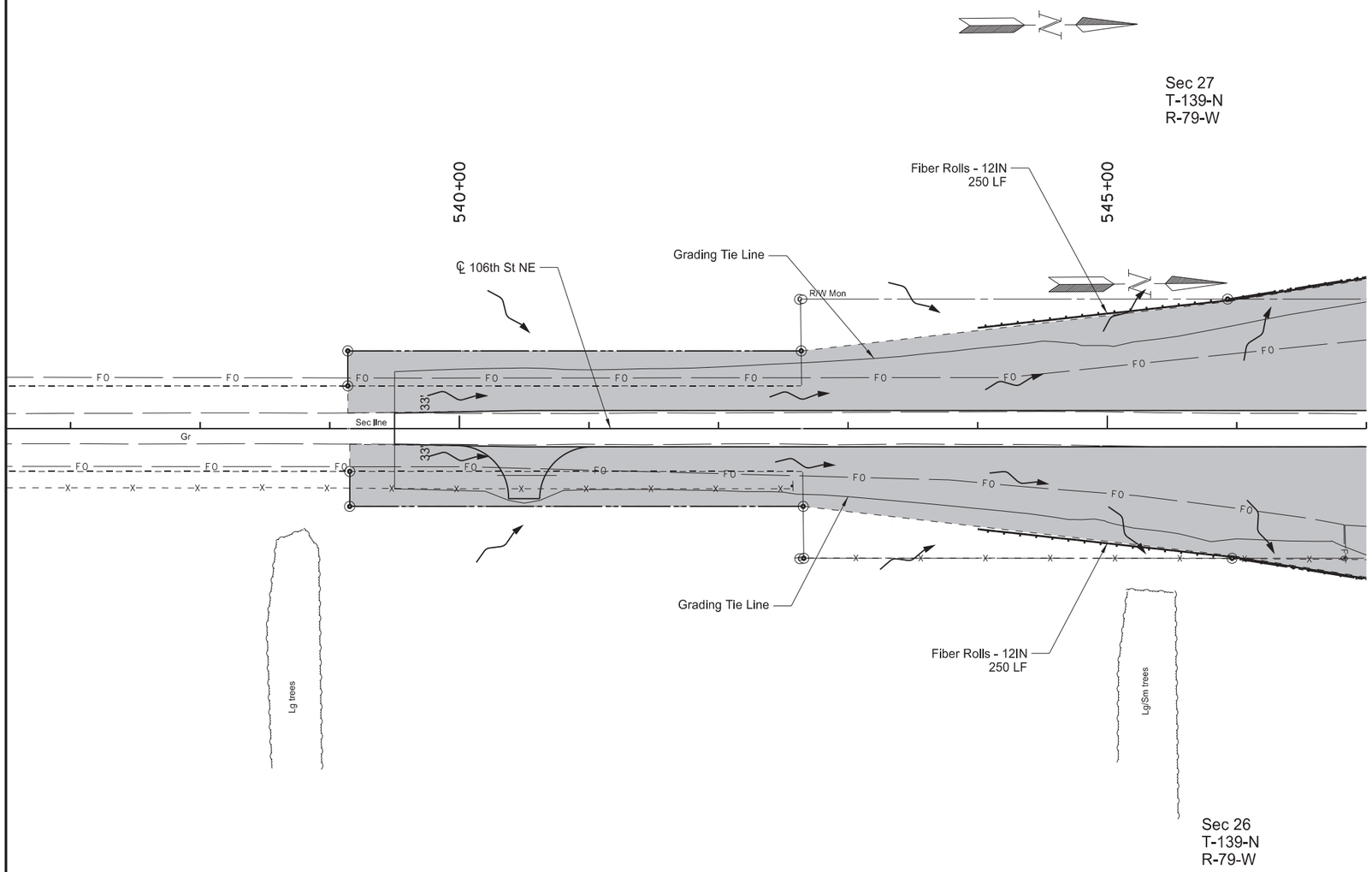
East Median Crossover

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	76	1

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sta 539+15 to 546+50 (EX106ST)	1.95	ACRE
253	0101	STRAW MULCH		
		Sta 539+15 to 546+50 (EX106ST)	1.95	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 544+00 to 546+50 - Lt (Leaving R/W)	250	LF
		Sta 544+00 to 546+50 - Rt (Leaving R/W)	250	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 544+00 to 546+50 - Lt (Leaving R/W)	250	LF
		Sta 544+00 to 546+50 - Rt (Leaving R/W)	250	LF



LEGEND

Temporary Cover Crop & Straw Mulch

Direction of Flow

Fiber Rolls

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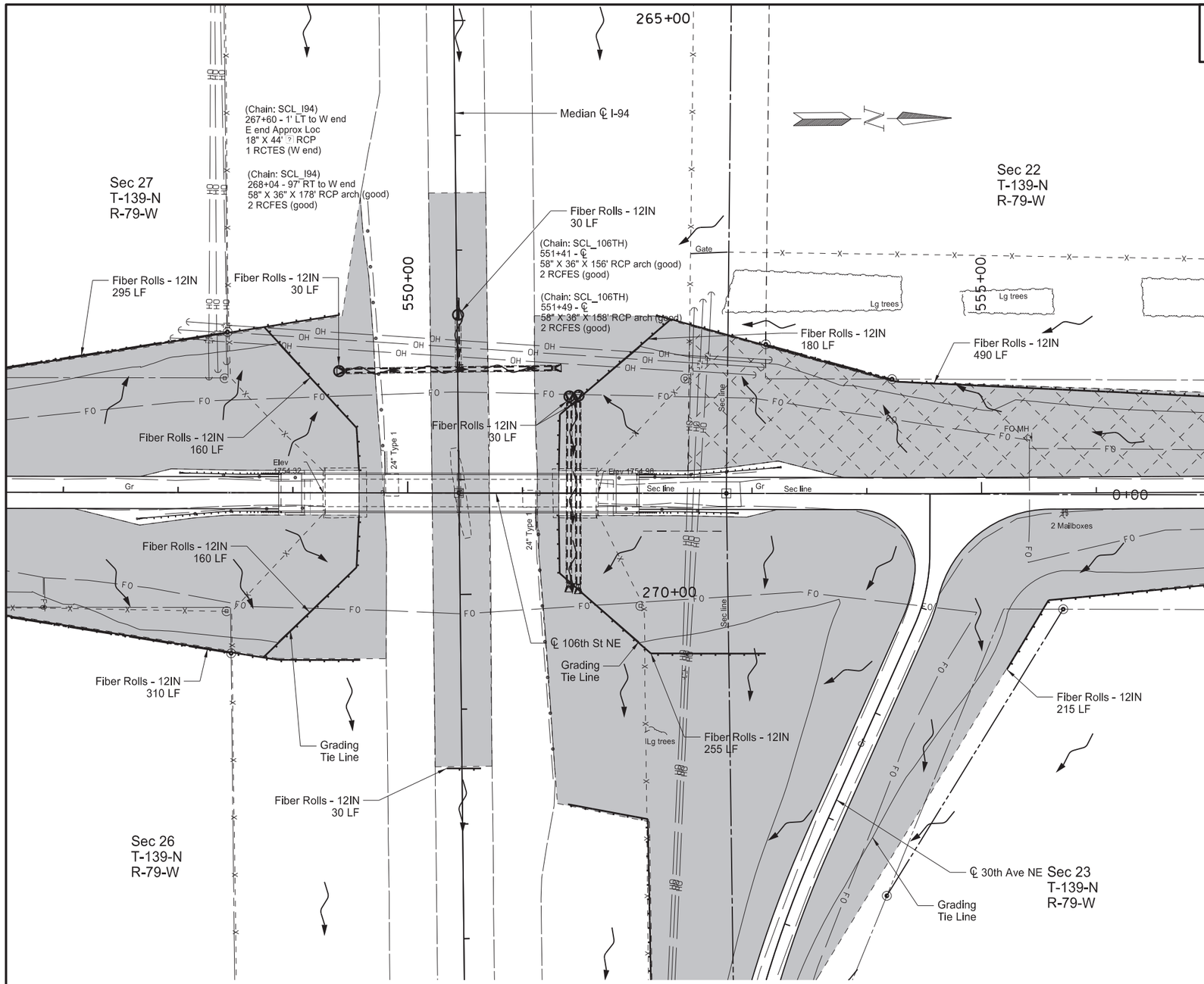
Temporary Erosion Control

Apple Creek Separation
106th St NE
Sta 539+00 to 546+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	76	2



SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sta 546+50 to 557+00 LT (EX106ST)	2.52	ACRE
		Sta 546+51 to 557+00 RT (EX106ST)	3.31	ACRE
253	0101	STRAW MULCH		
		Sta 546+50 to 557+00 LT (EX106ST)	2.52	ACRE
		Sta 546+51 to 557+00 RT (EX106ST)	3.31	ACRE
261	0112	FIBER ROLLS 12IN		
		4 Locations (Protecting Culvert Inlet)	120	LF
		Sta 546+50 to 549+40 - Lt (Leaving R/W)	295	LF
		Sta 546+50 to 549+60 - Rt (Leaving R/W)	310	LF
		Sta 548+75 to 549+58 - Lt (Protecting Slope)	160	LF
		Sta 548+75 to 549+58 - Rt (Protecting Slope)	160	LF
		Sta 552+15 to 557+00 - Lt (Leaving R/W)	490	LF
		Sta 551+31 to 552+30 - Lt (Protecting Slope)	180	LF
		Sta 551+31 to 553+10 - Rt (Protecting Slope)	255	LF
		Sta 550+20 to 557+00 - Rt (Leaving R/W)	215	LF
		Sta 271+50 - I-94 Median (Ditch Checks)	30	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		4 Locations (Protecting Culvert Inlet)	120	LF
		Sta 546+50 to 549+40 - Lt (Leaving R/W)	295	LF
		Sta 546+50 to 549+60 - Rt (Leaving R/W)	310	LF
		Sta 548+75 to 549+58 - Lt (Protecting Slope)	160	LF
		Sta 548+75 to 549+58 - Rt (Protecting Slope)	160	LF
		Sta 552+15 to 557+00 - Lt (Leaving R/W)	490	LF
		Sta 551+31 to 552+30 - Lt (Protecting Slope)	180	LF
		Sta 551+31 to 553+10 - Rt (Protecting Slope)	255	LF
		Sta 550+20 to 557+00 - Rt (Leaving R/W)	215	LF
		Sta 271+50 - I-94 Median (Ditch Checks)	30	LF

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LEGEND

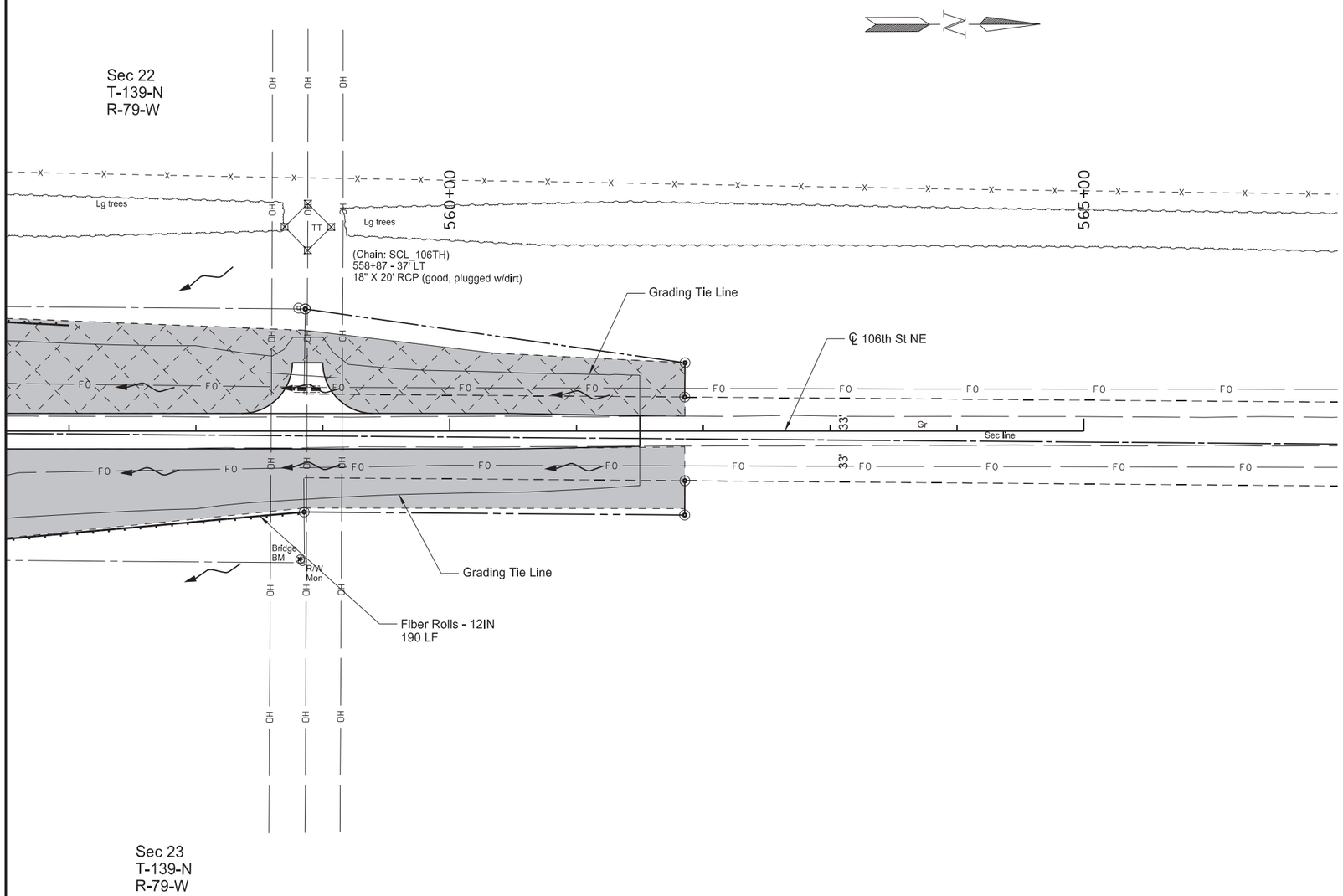
- Temporary Cover Crop & Straw Mulch
- Temporary Cover Crop & Straw Mulch (Special Topsoil Area)
- Direction of Flow
- Fiber Rolls

Temporary Erosion Control

Apple Creek Separation
106th Street NE
Sta 546+50 to 557+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	76	3

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sta 557+00 to 561+85 LT (EX106ST)	0.61	ACRE
		Sta 557+00 to 561+85 RT (EX106ST)	0.56	ACRE
253	0101	STRAW MULCH		
		Sta 557+00 to 561+85 LT (EX106ST)	0.61	ACRE
		Sta 557+00 to 561+85 RT (EX106ST)	0.56	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 557+00 to 558+90 - Rt (Leaving R/W)	190	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 557+00 to 558+90 - Rt (Leaving R/W)	190	LF



LEGEND

- Temporary Cover Crop & Straw Mulch
- Temporary Cover Crop & Straw Mulch (Special Topsoil Area)
- Direction of Flow
- Fiber Rolls

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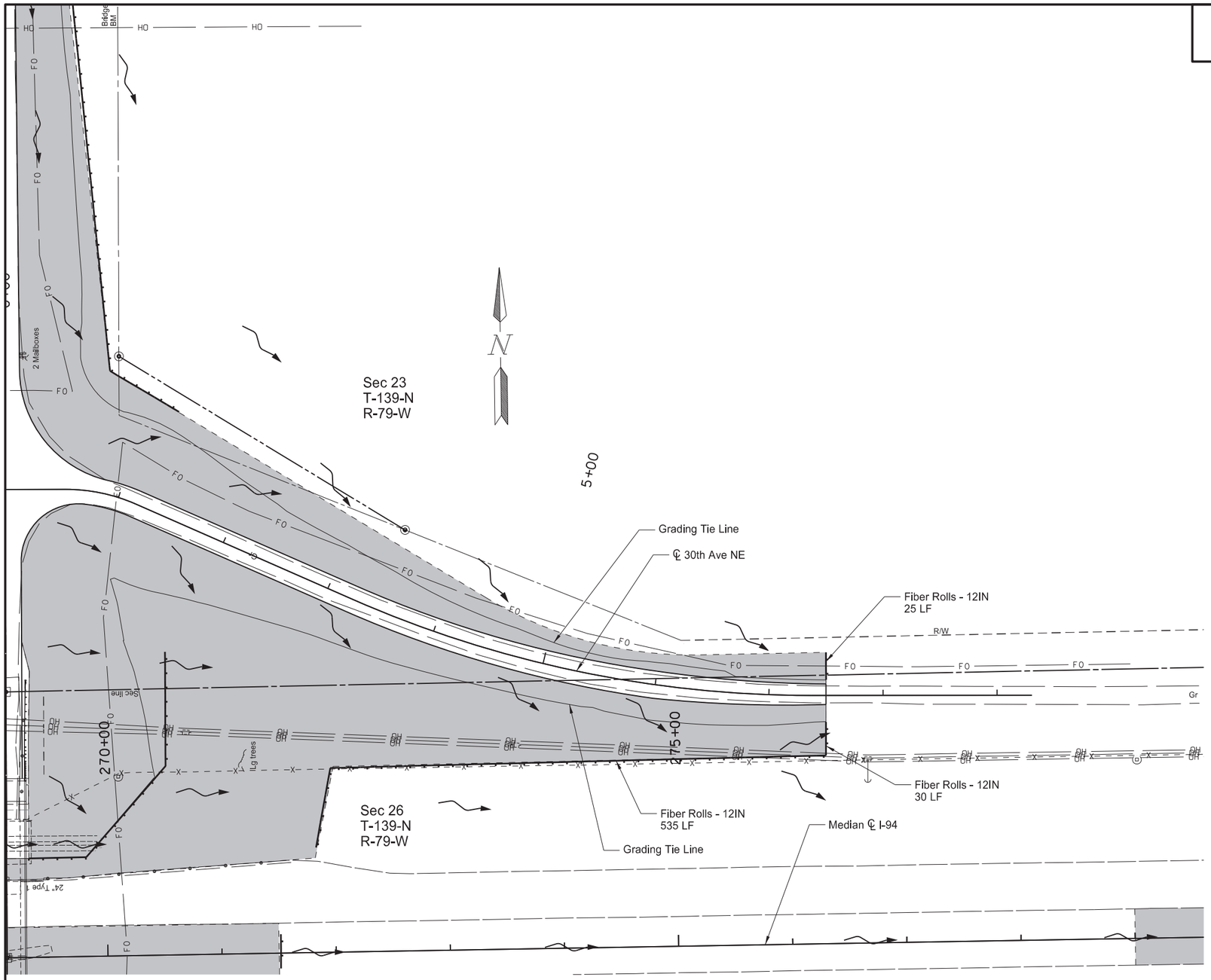
Temporary Erosion Control

Apple Creek Separation
106th St NE
Sta 557+00 to 562+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	76	4

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sta 3+00 to 7+50 (EX30AVE)	1.32	ACRE
253	0101	STRAW MULCH		
		Sta 3+00 to 7+50 (EX30AVE)	1.32	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 7+50 - Lt (Ditch Checks)	25	LF
		Sta 7+50 - Rt (Ditch Checks)	30	LF
		Sta 3+80 to 7+50 - Rt (Leaving R/W)	535	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 7+50 - Lt (Ditch Checks)	25	LF
		Sta 7+50 - Rt (Ditch Checks)	30	LF
		Sta 3+80 to 7+50 - Rt (Leaving R/W)	535	LF



LEGEND

Temporary Cover Crop & Straw Mulch

Direction of Flow

Fiber Rolls

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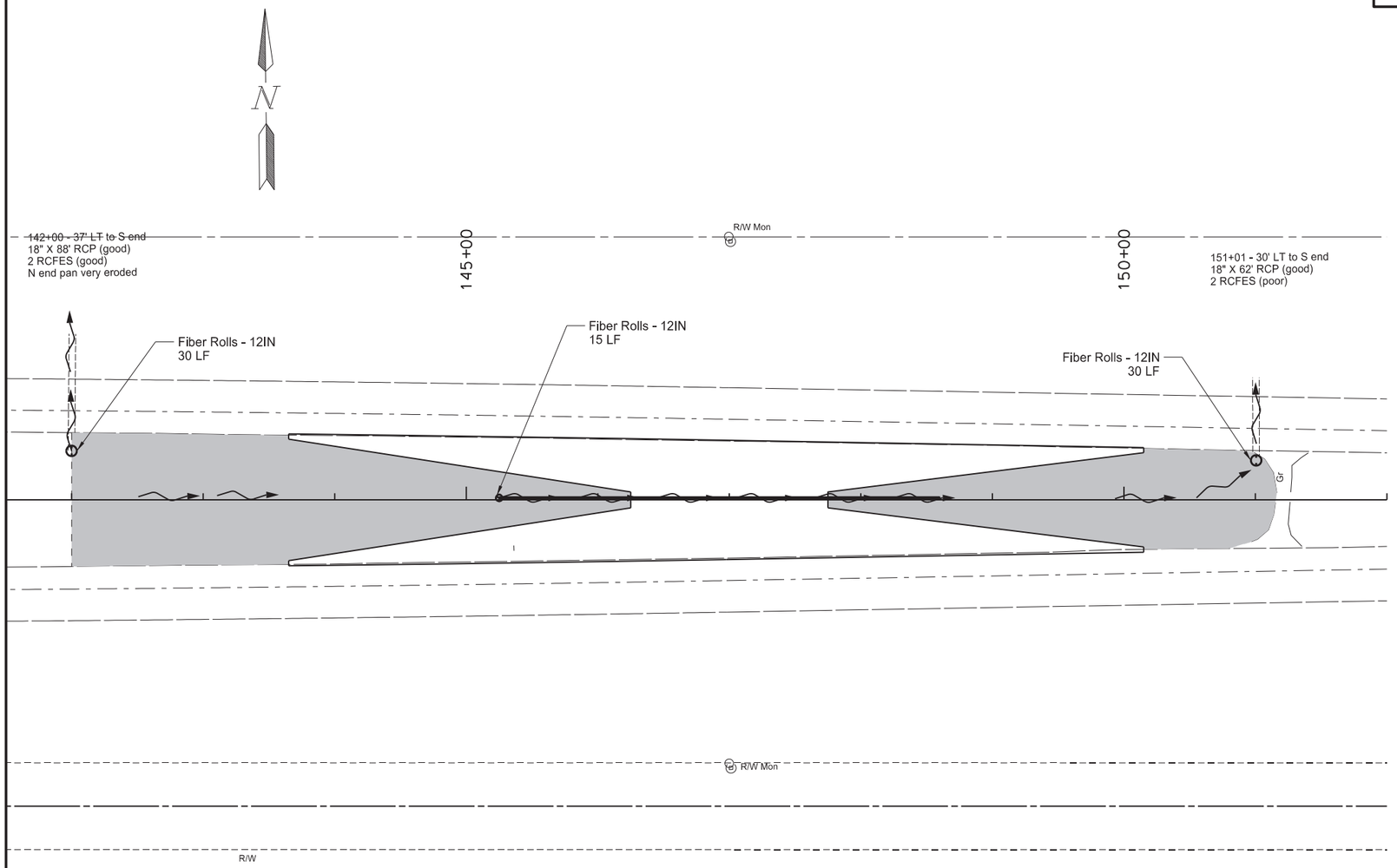
Temporary Erosion Control

Apple Creek Separation
30th Ave NE
Sta 3+00 to 7+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	76	5

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sta 142+00 to 151+15 (SCL_I94)	1.08	ACRE
253	0101	STRAW MULCH		
		Sta 142+00 to 151+15 (SCL_I94)	1.08	ACRE
261	0112	FIBER ROLLS 12IN		
		3 Locations (Protecting Culvert Inlet)	75	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		3 Locations (Protecting Culvert Inlet)	75	LF



LEGEND

Temporary Cover Crop & Straw Mulch

Direction of Flow

Fiber Rolls

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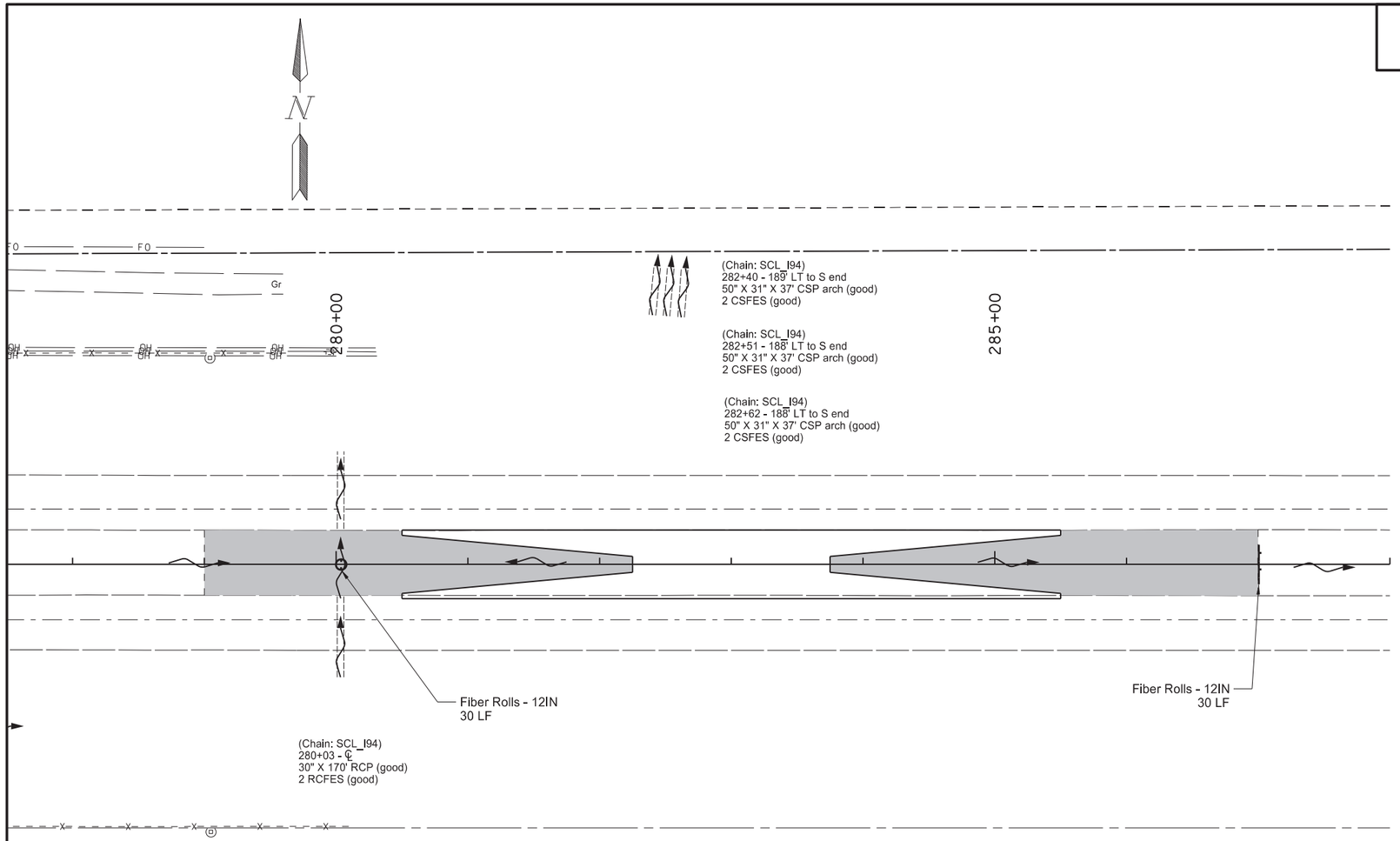
Temporary Erosion Control

West Median Crossover

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	76	6

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sta 279+00 to 287+00 (SCL_I94)	0.57	ACRE
253	0101	STRAW MULCH		
		Sta 279+00 to 287+00 (SCL_I94)	0.57	ACRE
261	0112	FIBER ROLLS 12IN		
		1 Locations (Protecting Culvert Inlet)	30	LF
		Sta 287+00 (Ditch Checks)	30	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		1 Locations (Protecting Culvert Inlet)	30	LF
		Sta 287+00 (Ditch Checks)	30	LF



LEGEND

Temporary Cover Crop & Straw Mulch

Direction of Flow

Fiber Rolls

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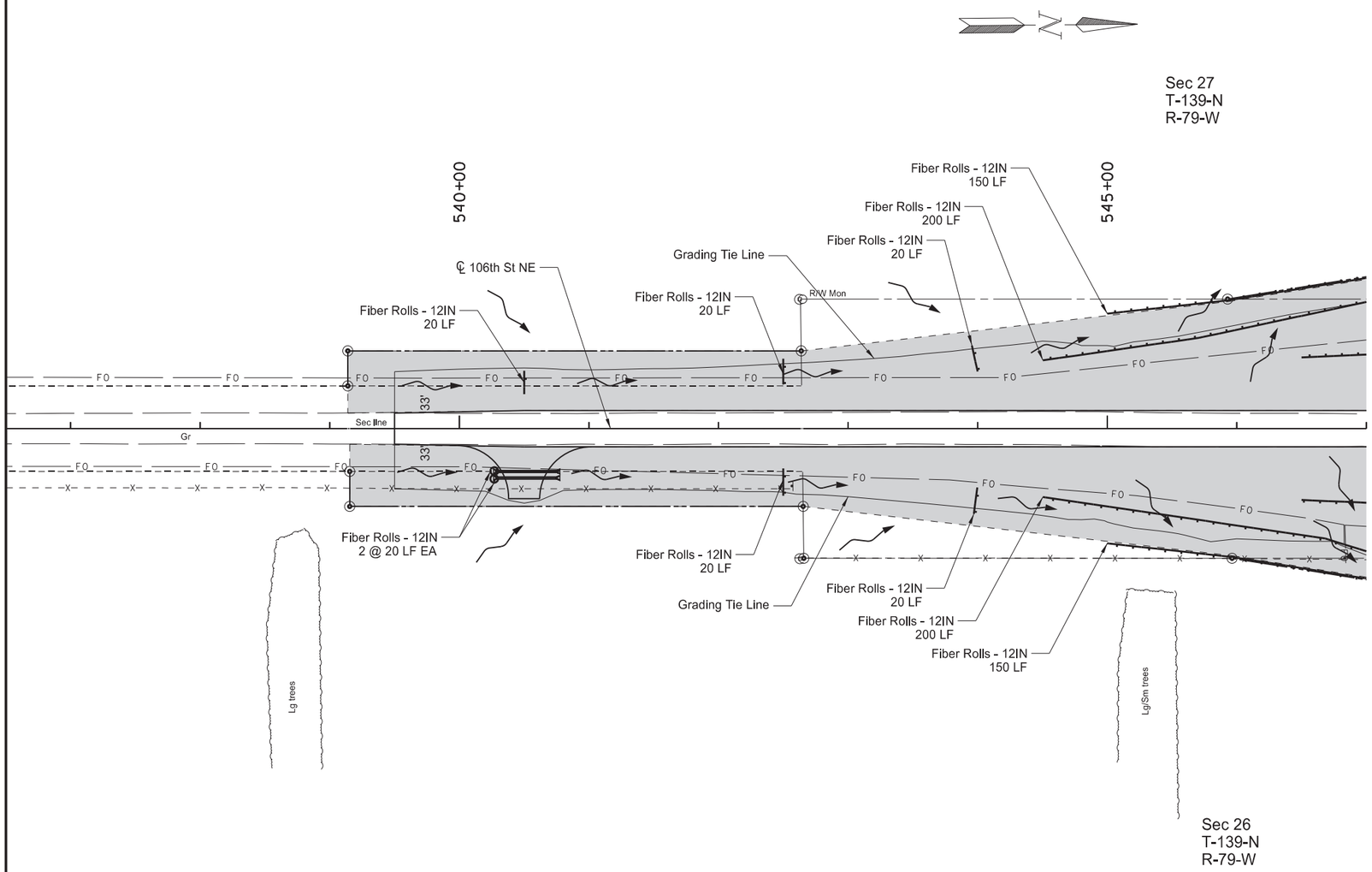
Temporary Erosion Control

East Median Crossover

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	77	1

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 539+15 to 546+50 (EX106ST)	1.96	ACRE
253	0101	STRAW MULCH		
		Sta 539+15 to 546+50 (EX106ST)	1.96	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 545+00 to 546+50 - Lt (Leaving R/W)	250	LF
		Sta 545+00 to 546+50 - Rt (Leaving R/W)	250	LF
		Sta 540+50 to 544+00 - Lt (Ditch Checks)	60	LF
		Sta 542+50 to 544+00 - Rt (Ditch Checks)	40	LF
		Sta 544+03 to 546+53 - Lt (Protecting Slope)	200	LF
		Sta 544+04 to 546+54 - Rt (Protecting Slope)	200	LF
		Sta 541+29 - Rt (Protecting Culvert Inlet)	40	LF



LEGEND

Seeding Class II & Straw Mulch

Direction of Flow

Fiber Rolls

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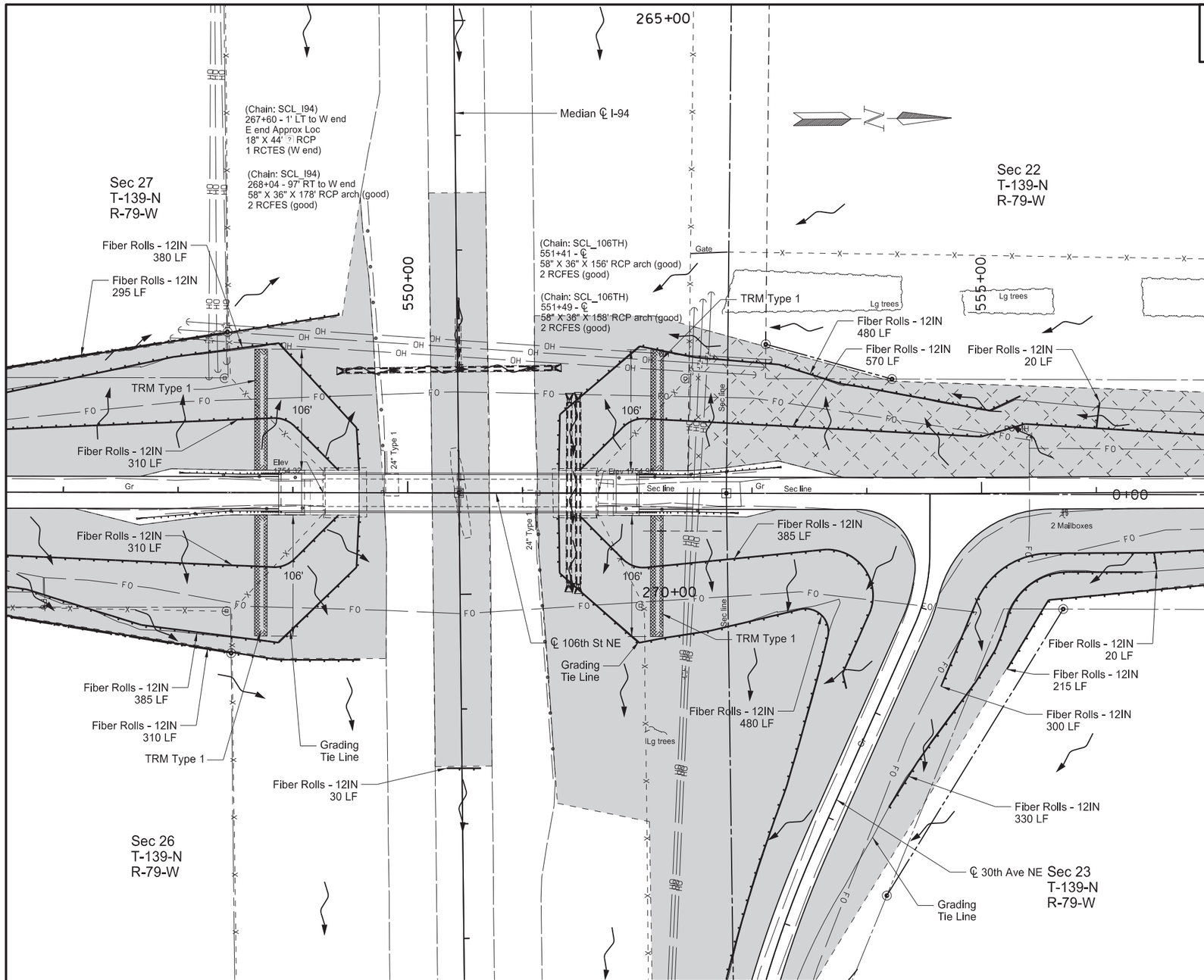
Permanent Erosion Control

Apple Creek Separation
106th St NE
Sta 539+00 to 546+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	77	2



SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 546+50 to 557+00 LT (EX106ST)	2.52	ACRE
		Sta 546+51 to 557+00 RT (EX106ST)	3.31	ACRE
253	0101	STRAW MULCH		
		Sta 546+50 to 557+00 LT (EX106ST)	2.52	ACRE
		Sta 546+51 to 557+00 RT (EX106ST)	3.31	ACRE
255	0201	TRM TYPE 1		
		Sta 548+72- Lt (EX106ST)	130	SY
		Sta 548+72- Rt (EX106ST)	130	SY
		Sta 552+16- Lt (EX106ST)	130	SY
		Sta 552+16- Rt (EX106ST)	130	SY
261	0112	FIBER ROLLS 12IN		
		Sta 546+50 to 549+40 - Lt (Leaving R/W)	295	LF
		Sta 546+50 to 549+60 - Rt (Leaving R/W)	310	LF
		Sta 546+50 to 549+58 - Lt (Protecting Slope)	380	LF
		Sta 546+50 to 549+58 - Rt (Protecting Slope)	385	LF
		Sta 546+50 to 549+40 - Lt (Protecting Slope)	310	LF
		Sta 546+50 to 549+40 - Rt (Protecting Slope)	310	LF
		Sta 551+31 to 555+35 - Lt (Protecting Slope)	480	LF
		Sta 551+50 to 557+00 - Lt (Protecting Slope)	570	LF
		Sta 551+31 to 3+00 (EX30AVE) - Rt (Protecting Slope)	480	LF
		Sta 551+50 to 1+90 (EX30AVE) - Rt (Protecting Slope)	385	LF
		Sta 2+70 (EX30AVE) to 556+40 - Rt (Protecting Slope)	330	LF
		Sta 1+55 (EX30AVE) to 557+00 - Rt (Protecting Slope)	300	LF
		Sta 555+20 to 557+00 - Rt (Leaving R/W)	215	LF
		Sta 556+00 to - Lt (Ditch Checks)	20	LF
		Sta 556+40 to - Rt (Ditch Checks)	20	LF
		Sta 271+50 I-94 Median - Rt (Ditch Checks)	30	LF

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LEGEND

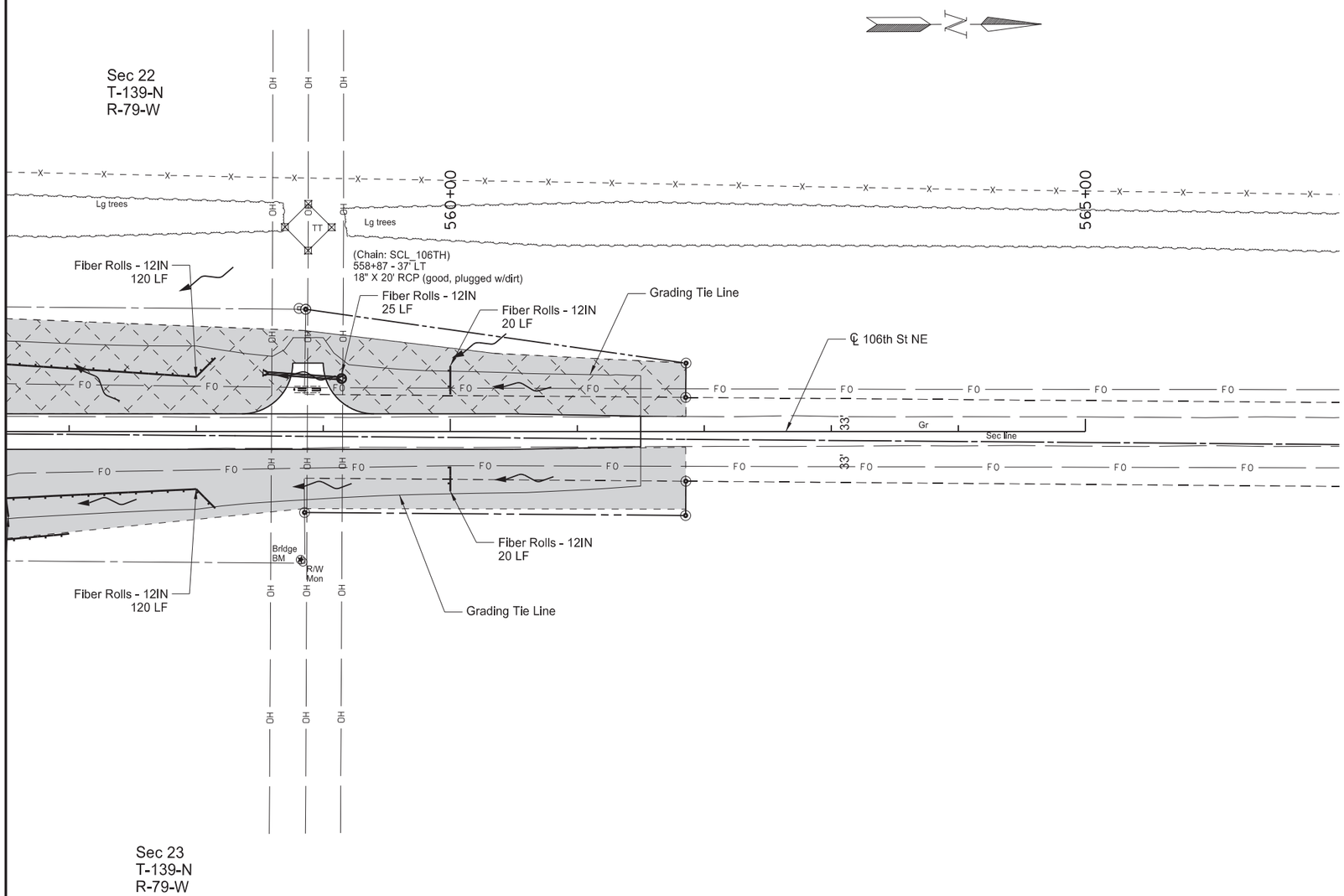
- Seeding Class II & Straw Mulch
- Seeding Class II & Straw Mulch (Special Topsoil Area)
- Direction of Flow
- TRM Type 1
- Fiber Rolls

Permanent Erosion Control

Apple Creek Separation
106th St NE
Sta 546+50 to 557+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	77	3

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 557+00 to 561+85 LT (EX106ST)	0.61	ACRE
		Sta 557+00 to 561+85 RT (EX106ST)	0.56	ACRE
253	0101	STRAW MULCH		
		Sta 557+00 to 561+85 LT (EX106ST)	0.61	ACRE
		Sta 557+00 to 561+85 RT (EX106ST)	0.56	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 557+00 to 558+15 - Lt (Protecting Slope)	120	LF
		Sta 557+00 to 558+15 - Rt (Protecting Slope)	120	LF
		Sta 560+00 - Lt (Ditch Checks)	20	LF
		Sta 560+00 - Rt (Ditch Checks)	20	LF
		Sta 559+12 - Lt (Protecting Culvert Inlet)	25	LF



LEGEND

- Seeding Class II & Straw Mulch
- Seeding Class II & Straw Mulch (Special Topsoil Area)
- Direction of Flow
- Fiber Rolls

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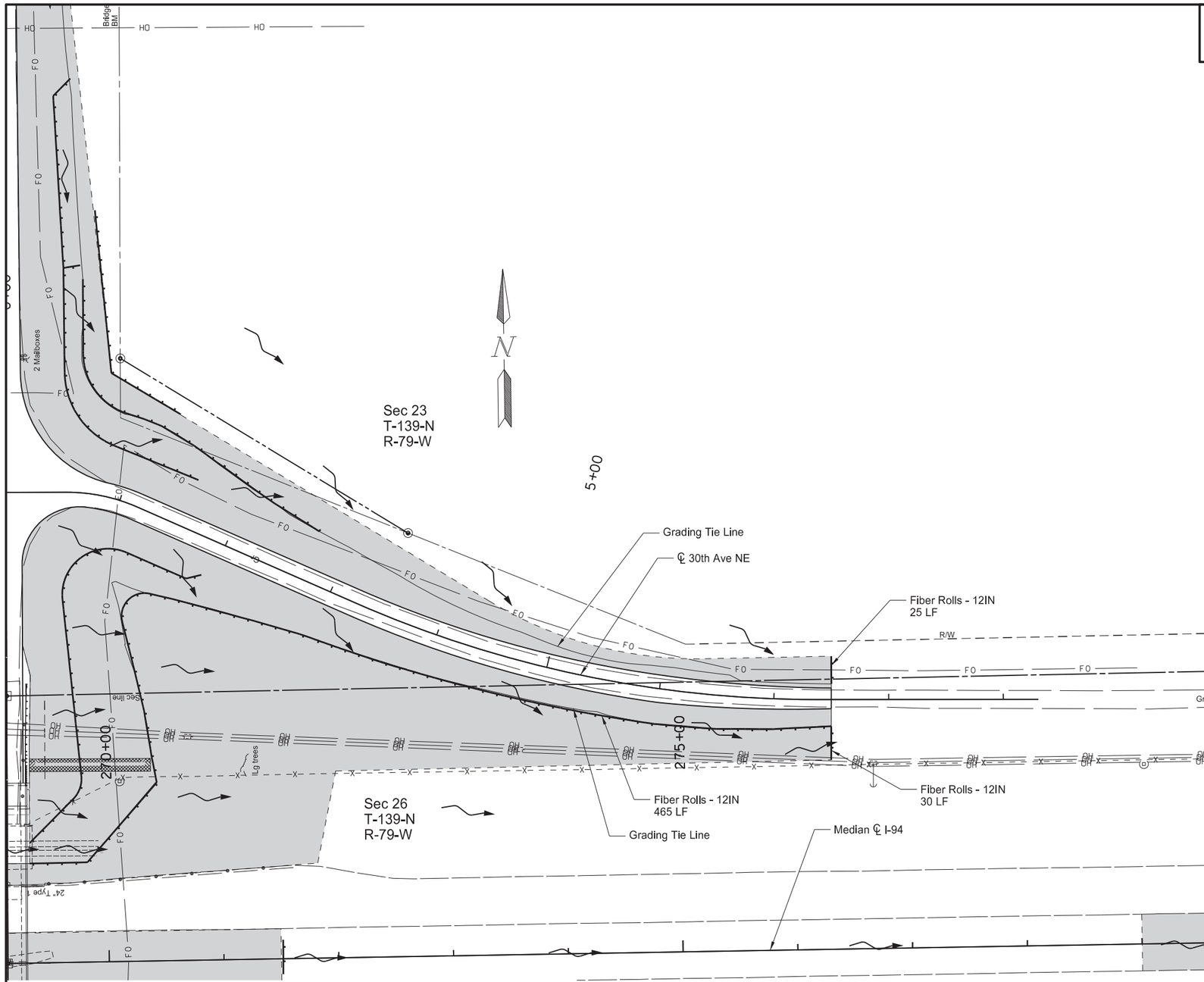
Permanent Erosion Control

Apple Creek Separation
106th St NE
Sta 557+00 to 562+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	77	4

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 3+00 to 7+50 (EX30AVE)	1.32	ACRE
253	0101	STRAW MULCH		
		Sta 3+00 to 7+50 (EX30AVE)	1.32	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 7+50 - Lt (Ditch Checks)	25	LF
		Sta 7+50 - Rt (Ditch Checks)	30	LF
		Sta 3+00 to 7+50 - Rt (Protecting Slope)	465	LF



LEGEND

Seeding Class II & Straw Mulch

Direction of Flow

Fiber Rolls

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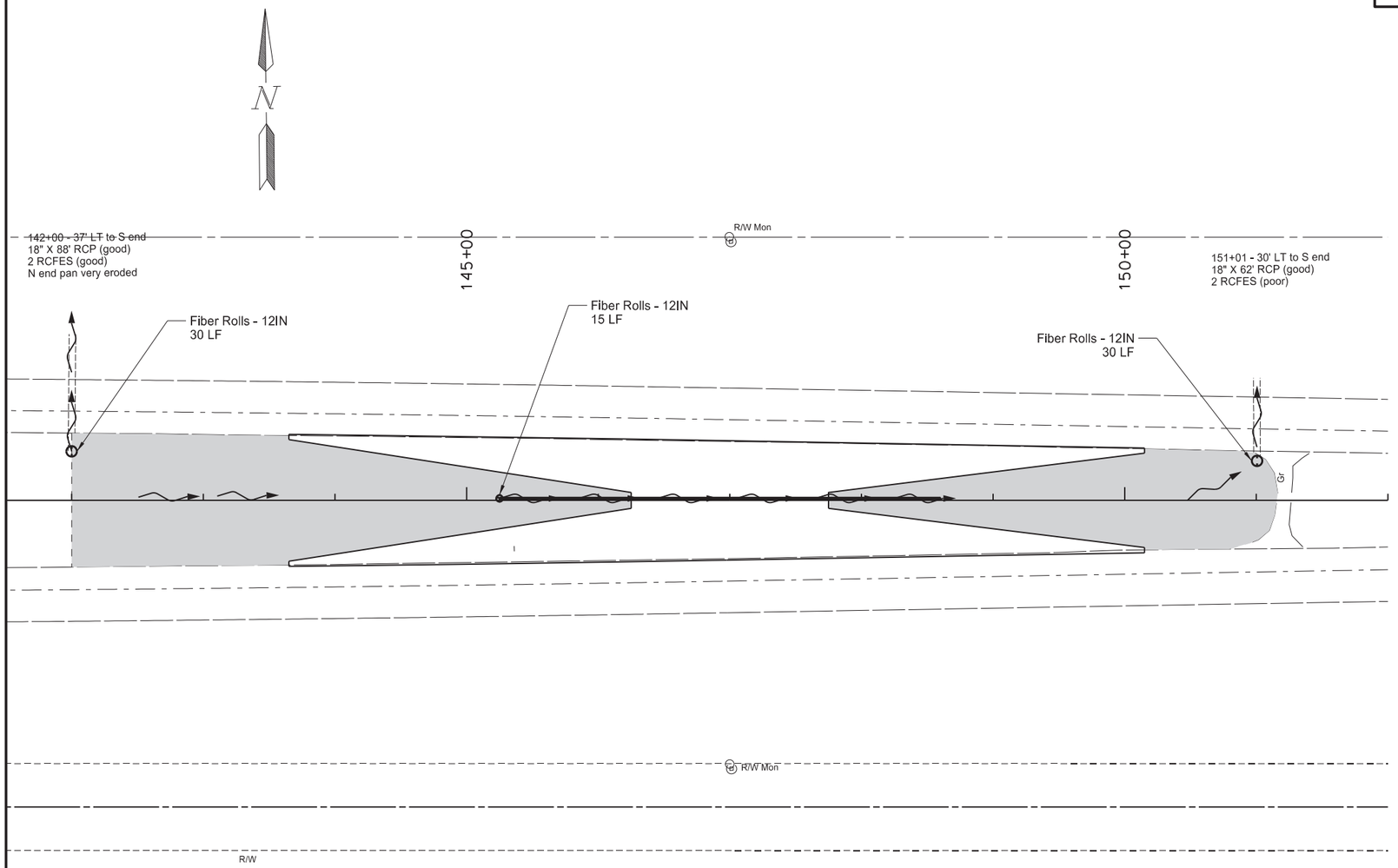
Permanent Erosion Control

Apple Creek Separation
30th Ave NE
Sta 3+00 to 7+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	77	5

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 142+00 to 151+15 (SCL_I94)	1.08	ACRE
253	0101	STRAW MULCH		
		Sta 142+00 to 151+15 (SCL_I94)	1.08	ACRE
261	0112	FIBER ROLLS 12IN		
		3 Locations (Protecting Culvert Inlet)	75	LF



LEGEND

Seeding Class II & Straw Mulch

Direction of Flow

Fiber Rolls

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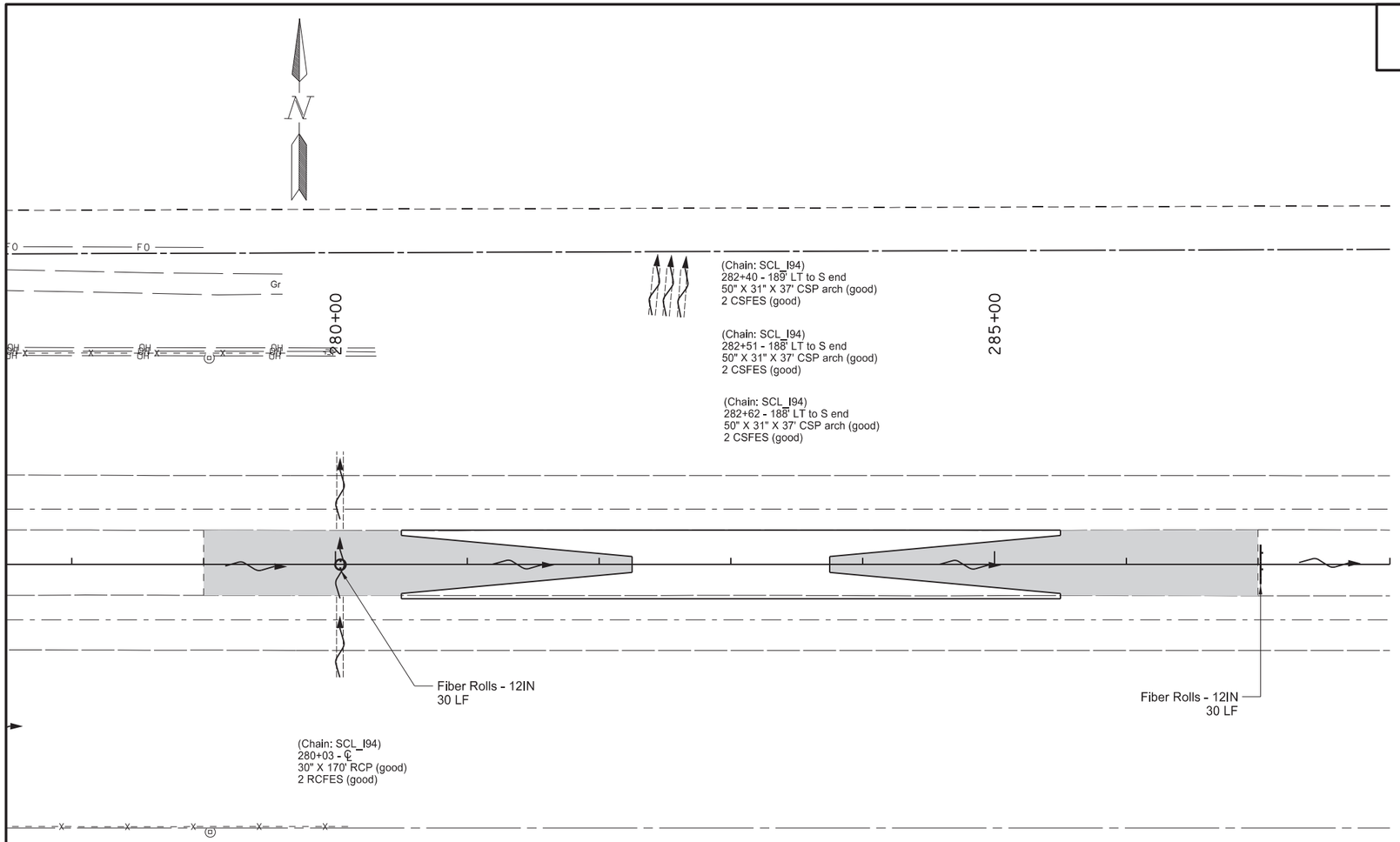
Permanent Erosion Control

West Median Crossover

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	77	6

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 279+00 to 287+00 (SCL_I94)	0.57	ACRE
253	0101	STRAW MULCH		
		Sta 279+00 to 287+00 (SCL_I94)	0.57	ACRE
261	0112	FIBER ROLLS 12IN		
		1 Locations (Protecting Culvert Inlet)	30	LF
		Sta 287+00 (Ditch Checks)	30	LF



LEGEND

Seeding Class II & Straw Mulch

Direction of Flow

Fiber Rolls

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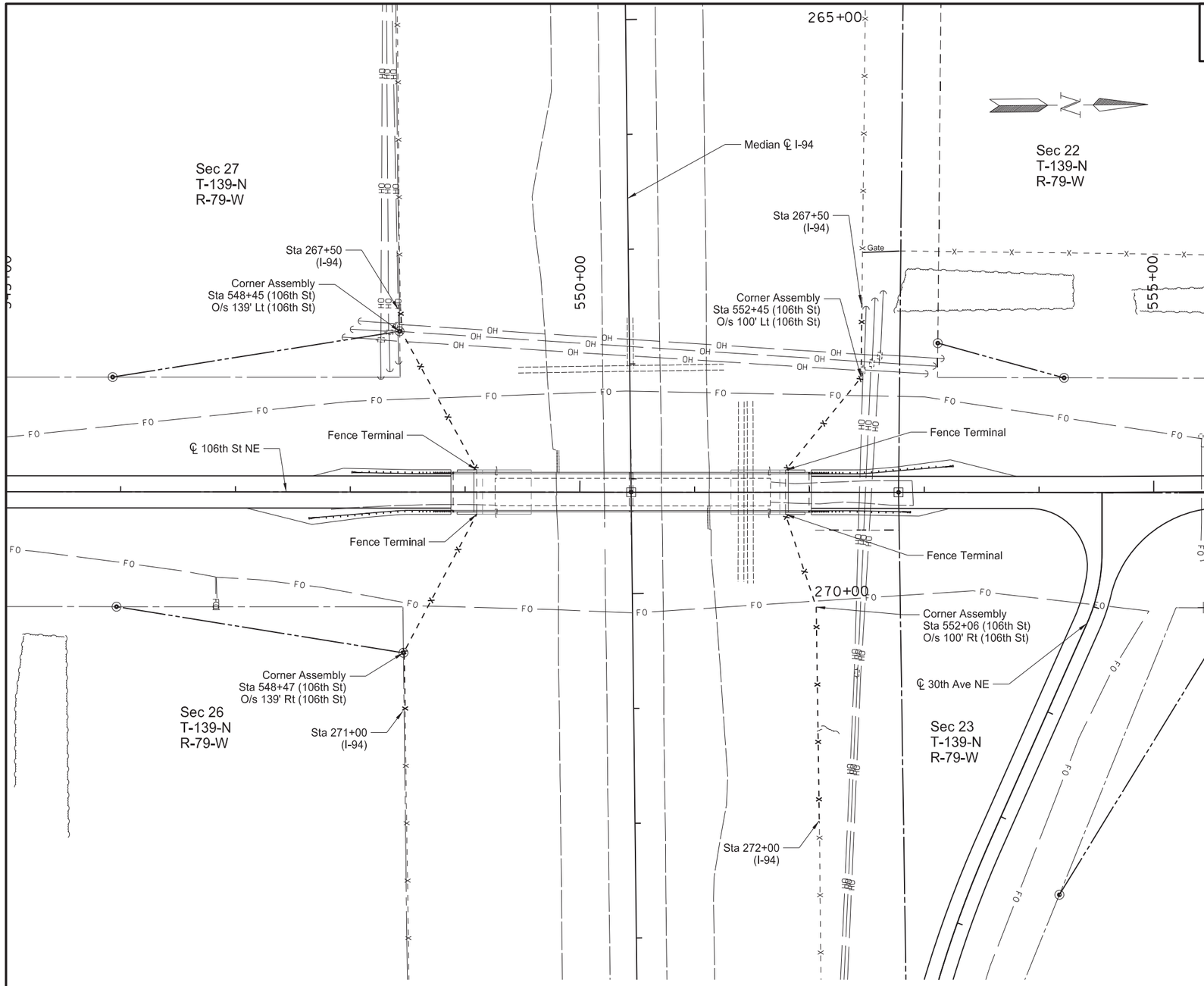
Permanent Erosion Control

East Median Crossover

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	80	1



SPEC	CODE	BID ITEM	QTY	UNIT
752	0200	FENCE BARBED WIRE 4 STRAND		
		SW Quadrant	160	LF
		SE Quadrant	190	LF
		NW Quadrant	170	LF
		NE Quadrant	270	LF
752	0993	FENCE TERMINAL		
		SW Quadrant	1	EA
		SE Quadrant	1	EA
		NW Quadrant	1	EA
		NE Quadrant	1	EA
752	3140	CORNER ASSEMBLY BARBED WIRE		
		SW Quadrant	1	EA
		SE Quadrant	1	EA
		NW Quadrant	1	EA
		NE Quadrant	1	EA

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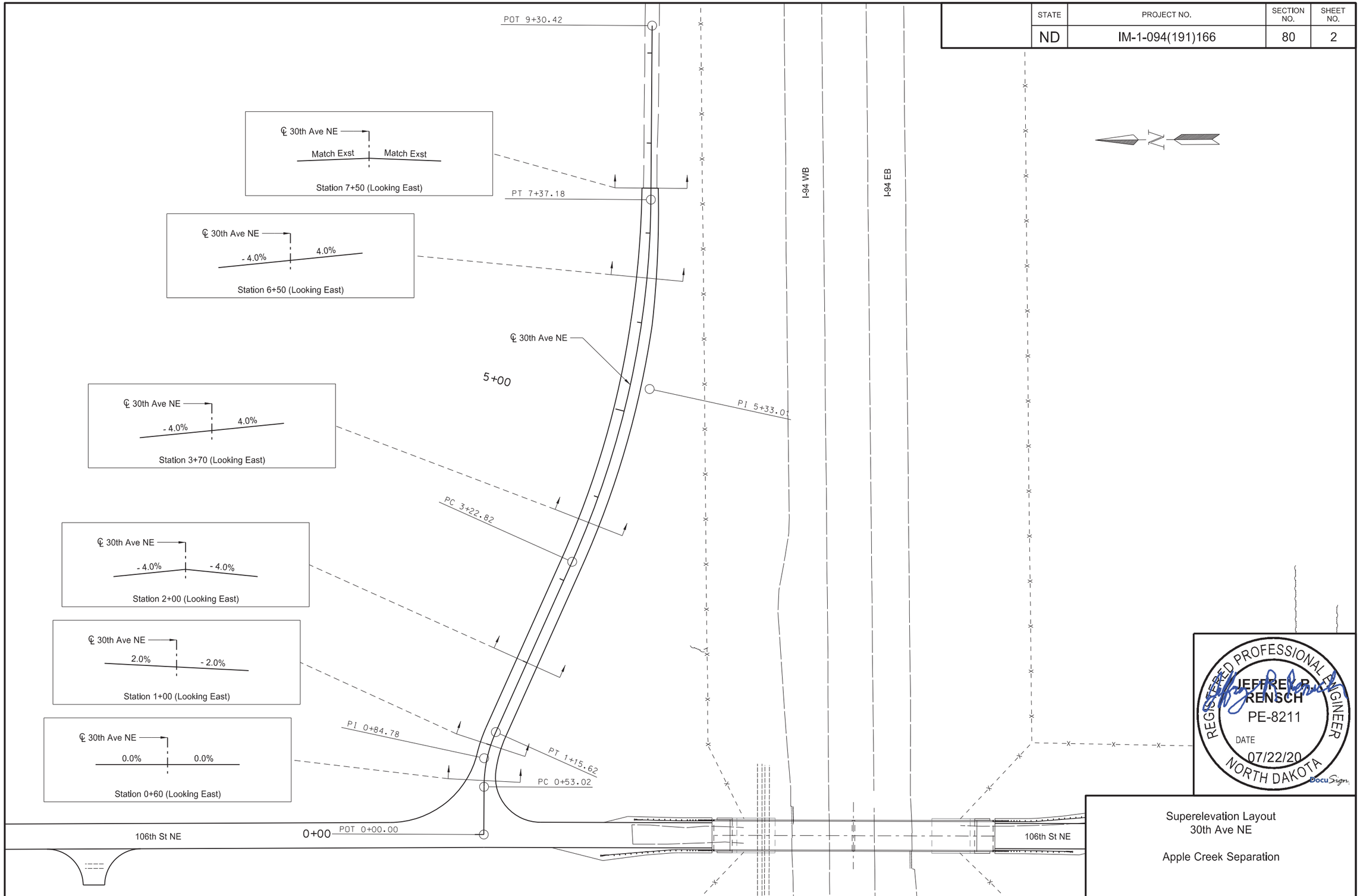
Fencing Layout

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	80	2



Superelevation Layout
30th Ave NE

Apple Creek Separation

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - APPLE CREEK SEP - 7 MI E OF W JCT US83

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-094(191)166	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
I-94 (Chain: SCL_I94)			
BEGIN	110+24.00	427546.94	1921584.55
Sec line	163+26.88	427488.76	1926887.11
PC	208+81.00	427438.62	1931440.96
PI C504	214+18.28	427432.70	1931978.20
PT	219+53.79	427351.65	1932509.33
PC	241+35.94	427022.45	1934666.51
PI C505	250+23.83	426888.51	1935544.23
PT	259+08.17	426891.36	1936432.11
Station equation I-94 (SCL_I94) & 106th St NE (SCL_106TH)			
I-94	269+11.63	426894.59	1937435.57
106th St NE	550+44.67	426894.59	1937435.57
END	321+73.20	426911.46	1942697.10
106th St NE (Chain: SCL_106TH)			
Rec Sec Cor	500+00.00	421850.13	1937389.05
I-94	550+44.67	426894.59	1937435.57
Rec Sec Cor	552+77.68	427127.58	1937437.72

CURVE DATA

ARC DEFINITION	
C504	
PI STA	= 214+18.28
Delta	= 8° 02' 45" RT
D_a	= 0° 45' 00"
R	= 7639.49'
T	= 537.28'
L	= 1072.79'
C505	
PI STA	= 250+23.83
Delta	= 8° 51' 40" LT
D_a	= 0° 30' 00"
R	= 11459.19'
T	= 887.89'
L	= 1772.23'

US PUBLIC LAND SURVEY DATA

DESC.	SEC-TWP-RGE	NORTHING	EASTING
SW Cor Sec 20	T-139-N R-79-W	427313.95	1921582.01
S 1/4 Cor Sec 26	T-139-N R-79-W	427284.92	1924234.16
E 1/4 Cor Sec 20	T-139-N R-79-W	429892.69	1926897.90
NE Cor Sec 20	T-139-N R-79-W	432531.23	1926921.04
NW Cor Sec 28	T-139-N R-79-W	427255.76	1926886.06
SW Cor Sec 28	T-139-N R-79-W	421975.83	1926812.73
NE Cor Sec 28	T-139-N R-79-W	427221.27	1932178.22
SW Cor Sec 26	T-139-N R-79-W	421850.13	1937389.05
SW Cor Sec 23	T-139-N R-79-W	427127.58	1937437.72
NW Cor Sec 23	T-139-N R-79-W	432407.54	1937494.45
SE Cor Sec 23	T-139-N R-79-W	427161.56	1942696.30

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEVATION	STATION	OFFSET	ALIGNMENT
CONTROL POINT DESCRIPTION						
PRIMARY CONTROL						
GPS 1	427031.66	1926778.30	1799.19	162+23	458' Rt	SCL_I94
18" #5 Rebar w/ 1 1/2" Alum cap stamped ND DOT GPS CONTROL						
GPS 2	426183.69	1937503.10	1734.72	543+34	74' Rt	SCL_106TH
18" #5 Rebar w/ 1 1/2" Alum cap stamped ND DOT GPS CONTROL						
SECONDARY CONTROL						
RTK 20001	428536.03	1926958.91	1776.49	163+87	1048' Lt	SCL_I94
RTK 20002	427284.60	1927146.02	1789.65	165+88	201' Rt	SCL_I94
RTK 22079	426883.20	1937178.68	1733.08	550+31	257' Lt	SCL_106TH
RTK 1002	424173.28	1937385.26	1746.50	523+23	25' Lt	SCL_106TH
RTK 1001	429372.78	1937475.26	1767.05	575+23	13' Rt	SCL_106TH
RTK 22078	426889.68	1937543.82	1732.92	550+41	108' Rt	SCL_106TH

REFERENCE MARKERS

R Mkr #	NORTHING	EASTING	STATION	OFFSET	ALIGNMENT
164	427618.36	1924155.07	135+94	99' Lt	SCL_I94
164	427419.17	1924166.37	136+07	99' Rt	SCL_I94
165	427531.17	1929442.58	188+82	71' Lt	SCL_I94
165	427388.79	1929447.05	188+88	72' Rt	SCL_I94
166	426928.78	1934692.51	241+75	89' Rt	SCL_I94
166	427105.00	1934713.39	241+70	89' Lt	SCL_I94
167	426973.48	1939956.10	294+32	71' Lt	SCL_I94
167	426830.89	1939957.94	294+34	72' Rt	SCL_I94

All coordinates and measurements on this document derived from the International Foot definition.

NOTES: Sheet 1 of 1

Date Survey Completed 8/14/17

☐ Assumed Coordinates

☒ All coordinates on this sheet are Burleigh County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota South Zone Combination Factor (cf) = 0.9998515

INITIALIZING BENCH MARK
NDGPS Stations (OPUS)

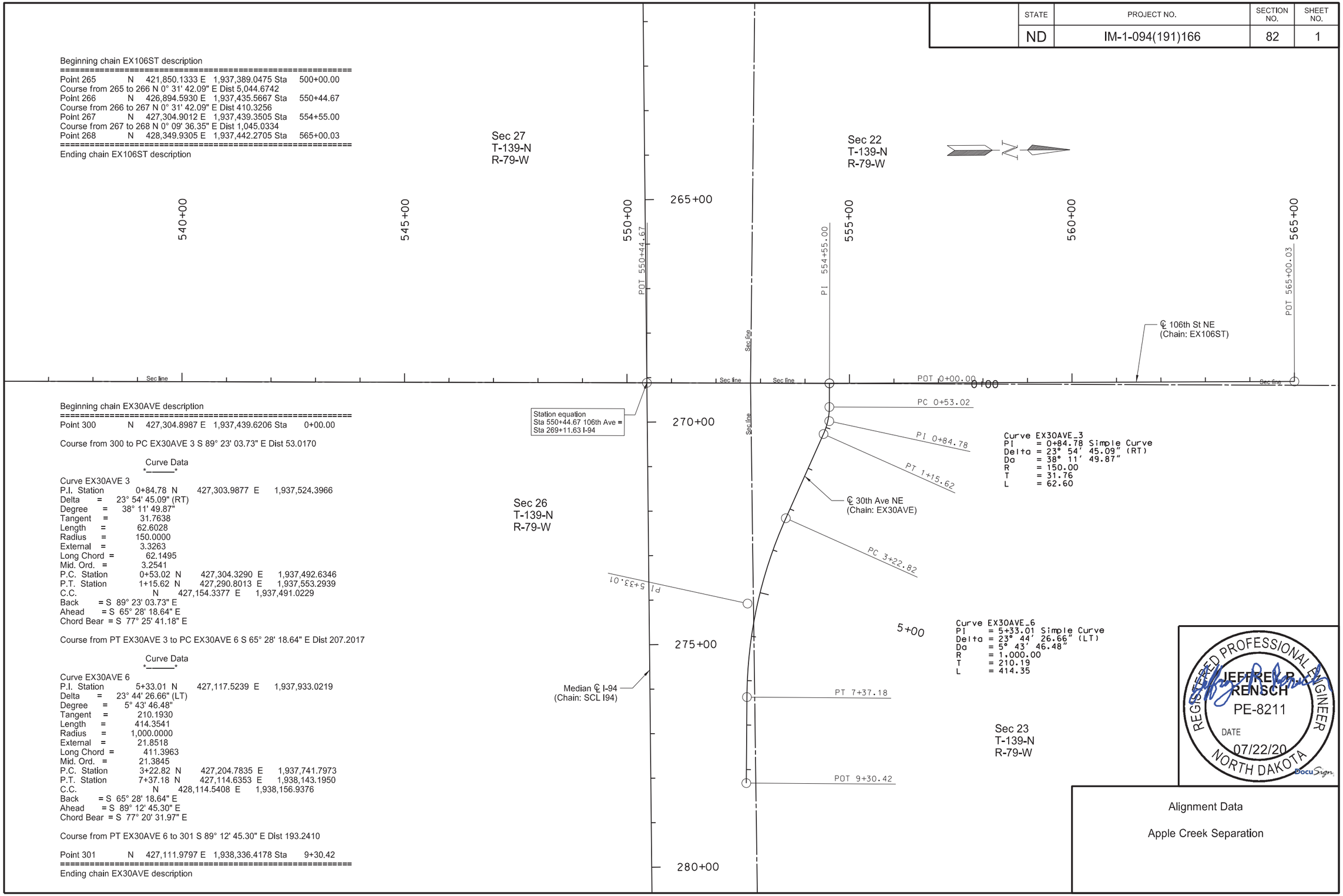
☒ NAVD-88
☐ NGVD-29

☐ GEOID 09 ☒ GEOID 12B
☐ GEOID 12A

REGISTERED PROFESSIONAL LAND SURVEYOR
KRISTOFOR JOHNSON
LS-10169
DATE
07/06/20
NORTH DAKOTA
DocuSign

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	82	1

Beginning chain EX106ST description
==========
Point 265 N 421,850.1333 E 1,937,389.0475 Sta 500+00.00
Course from 265 to 266 N 0° 31' 42.09" E Dist 5,044.6742
Point 266 N 426,894.5930 E 1,937,435.5667 Sta 550+44.67
Course from 266 to 267 N 0° 31' 42.09" E Dist 410.3256
Point 267 N 427,304.9012 E 1,937,439.3505 Sta 554+55.00
Course from 267 to 268 N 0° 09' 36.35" E Dist 1,045.0334
Point 268 N 428,349.9305 E 1,937,442.2705 Sta 565+00.03
==========
Ending chain EX106ST description



Beginning chain EX30AVE description
==========
Point 300 N 427,304.8987 E 1,937,439.6206 Sta 0+00.00

Course from 300 to PC EX30AVE 3 S 89° 23' 03.73" E Dist 53.0170

Curve Data
———

Curve EX30AVE 3
P.I. Station 0+84.78 N 427,303.9877 E 1,937,524.3966
Delta = 23° 54' 45.09" (RT)
Degree = 38° 11' 49.87"
Tangent = 31.7638
Length = 62.6028
Radius = 150.0000
External = 3.3263
Long Chord = 62.1495
Mid. Ord. = 3.2541
P.C. Station 0+53.02 N 427,304.3290 E 1,937,492.6346
P.T. Station 1+15.62 N 427,290.8013 E 1,937,553.2939
C.C. N 427,154.3377 E 1,937,491.0229
Back = S 89° 23' 03.73" E
Ahead = S 65° 28' 18.64" E
Chord Bear = S 77° 25' 41.18" E

Course from PT EX30AVE 3 to PC EX30AVE 6 S 65° 28' 18.64" E Dist 207.2017

Curve Data
———

Curve EX30AVE 6
P.I. Station 5+33.01 N 427,117.5239 E 1,937,933.0219
Delta = 23° 44' 26.66" (LT)
Degree = 5° 43' 46.48"
Tangent = 210.1930
Length = 414.3541
Radius = 1,000.0000
External = 21.8518
Long Chord = 411.3963
Mid. Ord. = 21.3845
P.C. Station 3+22.82 N 427,204.7835 E 1,937,741.7973
P.T. Station 7+37.18 N 427,114.6353 E 1,938,143.1950
C.C. N 428,114.5408 E 1,938,156.9376
Back = S 65° 28' 18.64" E
Ahead = S 89° 12' 45.30" E
Chord Bear = S 77° 20' 31.97" E

Course from PT EX30AVE 6 to 301 S 89° 12' 45.30" E Dist 193.2410

Point 301 N 427,111.9797 E 1,938,336.4178 Sta 9+30.42
==========
Ending chain EX30AVE description

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
07/22/20
NORTH DAKOTA
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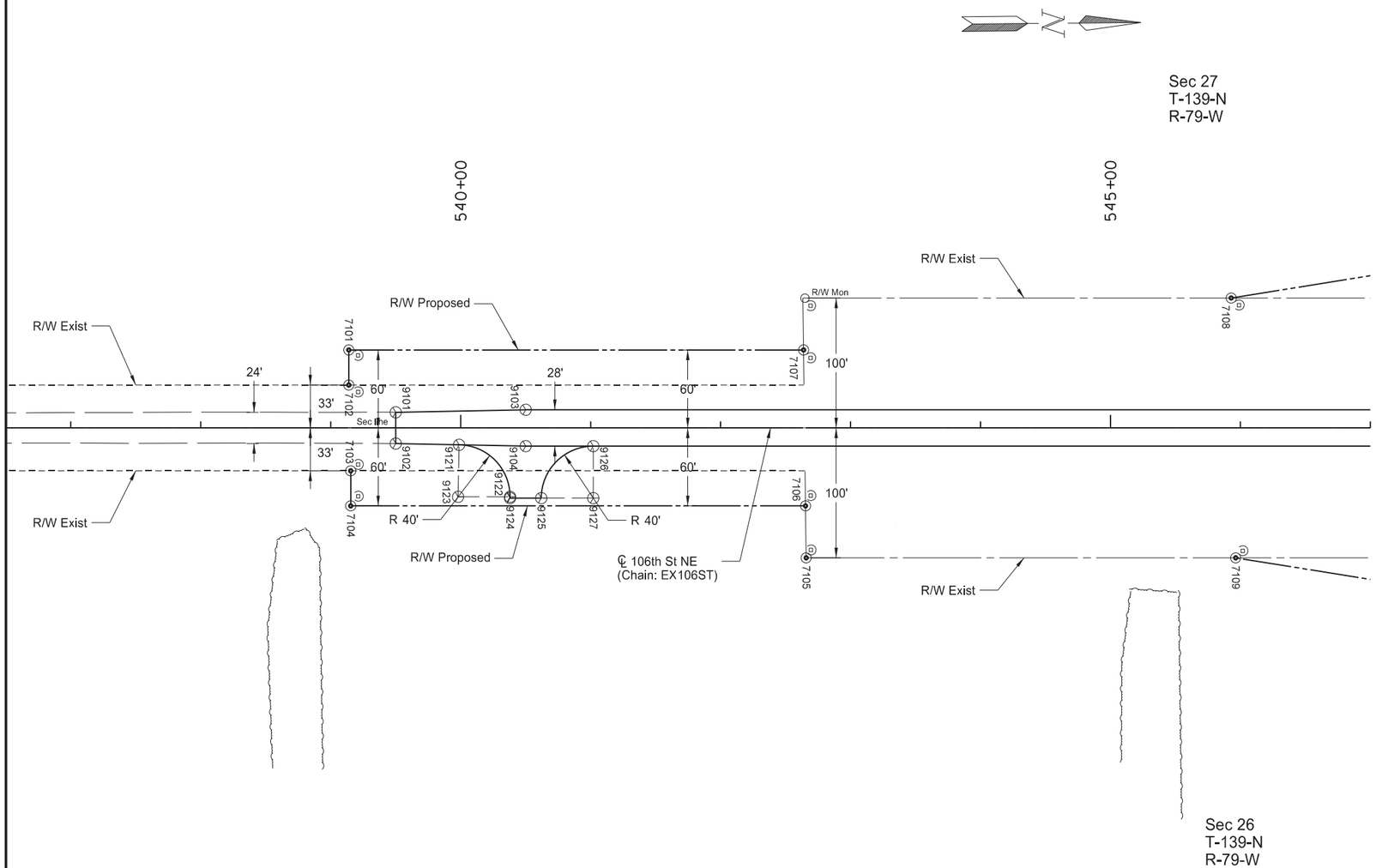
Alignment Data

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	82	2

SPEC	CODE	BID ITEM	QTY	UNIT
720	0110	RIGHT OF WAY MARKERS		
		Place as shown	10	EA
720	0130	IRON PIN R/W MONUMENTS		
		Points 7101 to 7109	9	EA



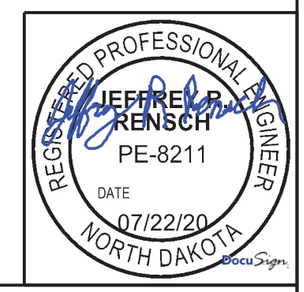
IRON PIN R/W MONUMENTS

Point	North	East	Station	Offset
7101	425764.3764	1937365.1421	539+13.86	-59.9994
7102	425764.1274	1937392.1409	539+13.86	-32.9994
7103	425765.0103	1937458.1519	539+15.35	33.0006
7104	425764.7613	1937485.1507	539+15.35	60.0006
7105	426114.8747	1937528.3811	542+65.84	100.0006
7106	426114.7464	1937488.3782	542+65.35	60.0006
7107	426114.3615	1937368.3696	542+63.86	-59.9994
7108	426443.7820	1937331.4057	545+92.92	-99.9994
7109	426445.3874	1937531.4291	545+96.37	100.0006

NOTE: Stations and offsets are listed from Chain: EX106ST

Point	North	East	Station	Offset
9101	425800.0760	1937413.4727	539+50.00	-12.0000
9102	425799.8547	1937437.4717	539+50.00	12.0000
9103	425900.0902	1937412.3950	540+50.00	-14.0000
9104	425899.8320	1937440.3938	540+50.00	14.0000
9121	425848.6435	1937438.8977	539+98.80	12.9760
9122	425887.4732	1937479.2494	540+38.00	52.9680
9123	425847.4749	1937478.8806	539+98.00	52.9680
9124	425887.4637	1937480.2814	540+38.00	54.0000
9125	425911.4626	1937480.5027	540+62.00	54.0000
9126	425951.8298	1937440.8733	541+02.00	14.0000
9127	425951.4609	1937480.8716	541+02.00	54.0000

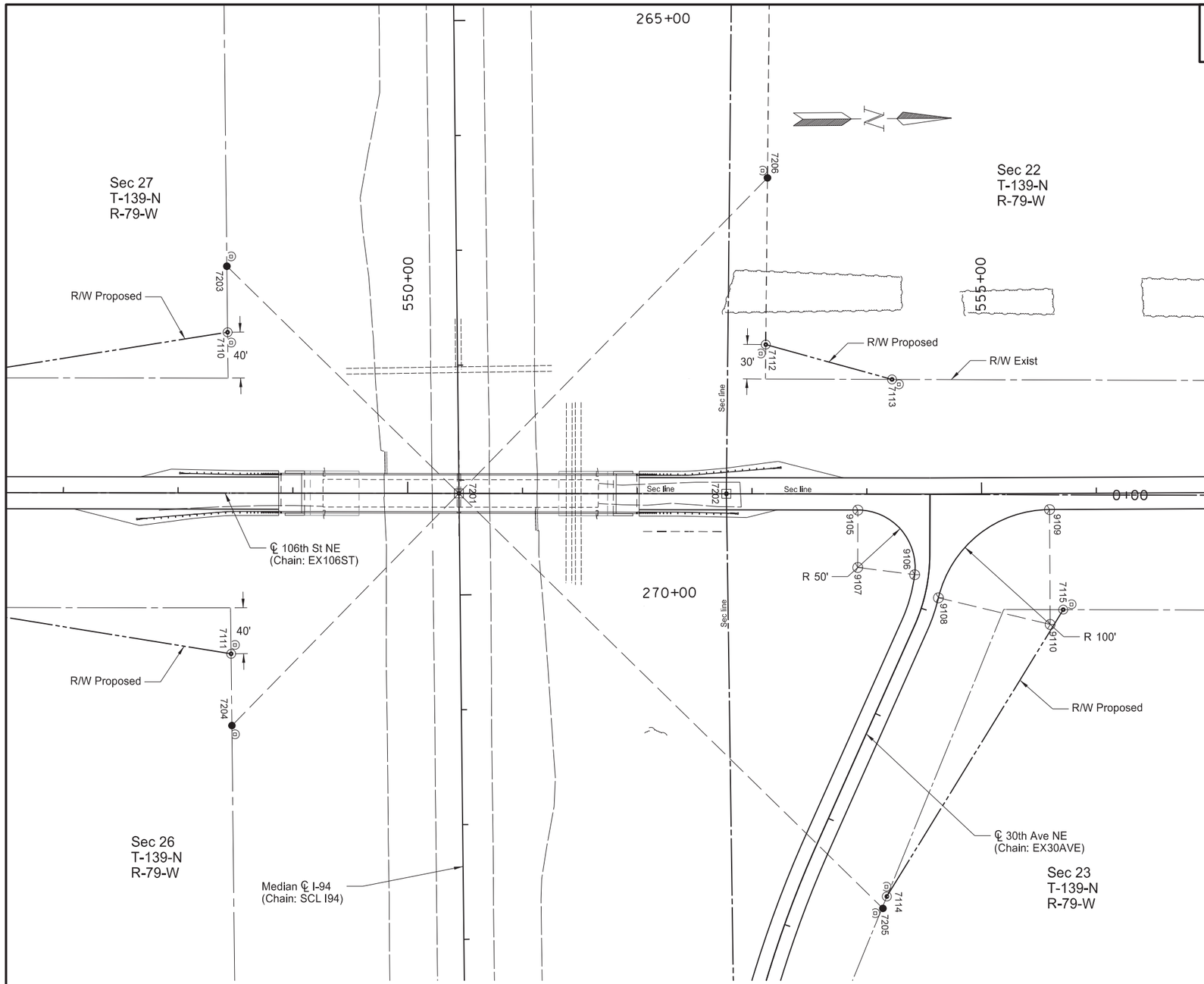
NOTE: Stations and offsets are listed from Chain: EX106ST



Survey Data

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	82	3



SPEC	CODE	BID ITEM	QTY	UNIT
720	0110	RIGHT OF WAY MARKERS		
		Place as shown	10	EA
720	0125	ALIGNMENT MONUMENTS		
		Points 7201 & 7202	2	EA
720	0130	IRON PIN R/W MONUMENTS		
		Points 7110 to 7115	6	EA
720	0135	IRON PIN REFERENCE MONUMENTS		
		Points 7203 to 7206	4	EA

IRON PIN R/W MONUMENTS

Point	North	East	Station	Offset
7110	426694.1251	1937293.7127	548+42.91	-139.9994
7111	426695.0231	1937573.7329	548+46.39	140.0006
7112	427162.8973	1937308.0880	553+11.79	-129.9475
7113	427272.6259	1937339.2686	554+21.80	-99.7800
7114	427265.5139	1937789.4129	554+18.84	350.4107
7115	427420.2481	1937540.8664	555+70.63	101.1932
7116	427735.0255	1937504.2465	558+85.30	63.6939

NOTE: Stations and offsets are listed from Chain: EX106ST

ALIGNMENT MONUMENTS

Point	North	East	Station	Offset
7201	426894.5822	1937435.5666	269+11.63	0.0000
7202	427127.5841	1937437.7153	269+14.53	-232.9939

NOTE: Stations and offsets are listed from Chain: SCL_I94

IRON PIN REFERENCE MONUMENTS

Point	North	East	Station	Offset
7203	426693.9418	1937236.2090	267+11.63	200.0000
7204	426695.2246	1937636.2070	271+11.63	200.0000
7205	427261.1507	1937799.7914	272+77.03	-365.3985
7206	427165.4842	1937162.9214	266+39.86	-271.7750

NOTE: Stations and offsets are listed from Chain: SCL_I94

Point	North	East	Station	Offset
9105	427242.0113	1937452.7711	553+92.24	14.0000
9106	427291.1028	1937509.4429	554+41.85	70.2167
9107	427241.5502	1937502.7690	553+92.24	64.0000
9108	427311.6428	1937529.7410	554+61.99	90.3713
9109	427409.0242	1937453.6415	555+59.16	14.0000
9110	427408.7448	1937553.6411	555+59.16	114.0000

NOTE: Stations and offsets are listed from Chain: EX106ST

REGISTERED PROFESSIONAL ENGINEER
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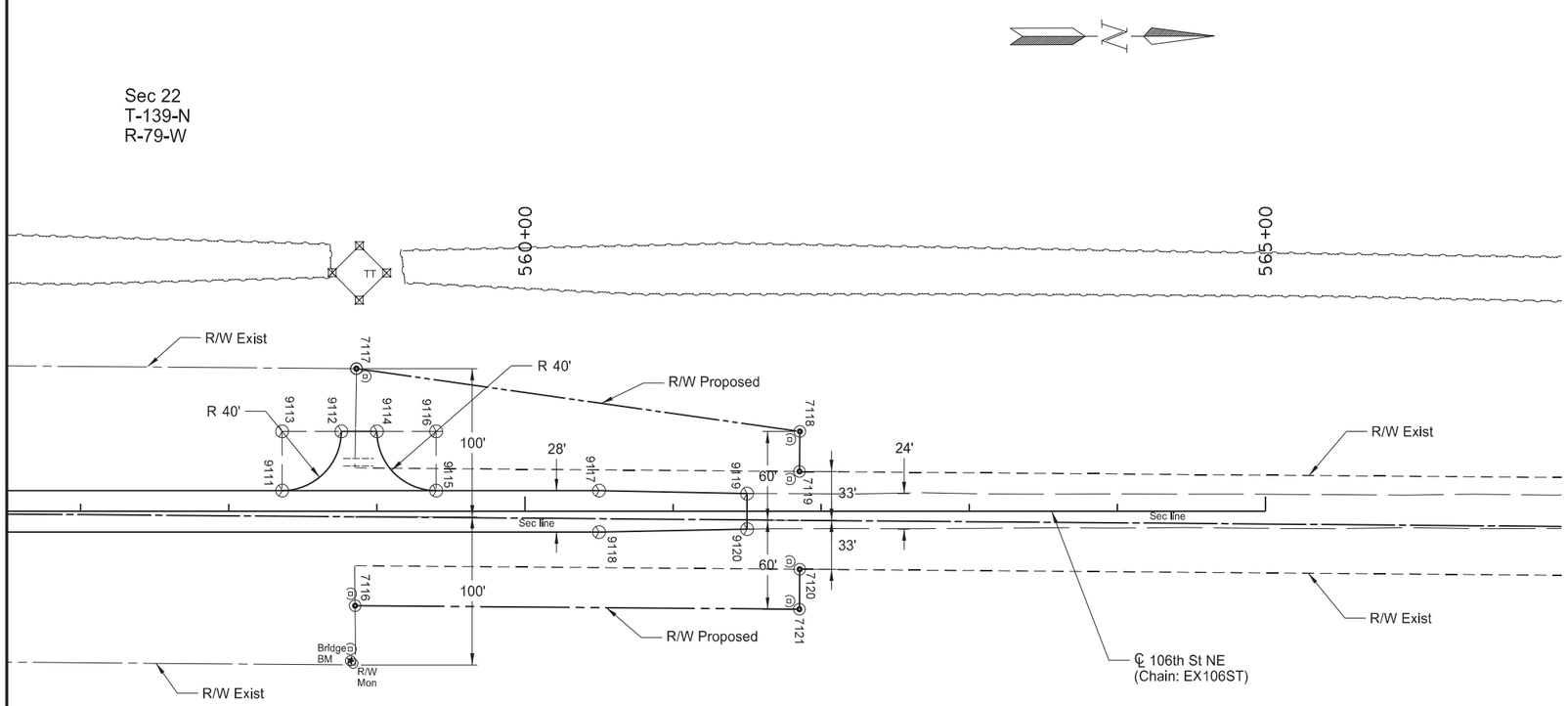
Survey Data

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	82	4

SPEC	CODE	BID ITEM	QTY	UNIT
720	0110	RIGHT OF WAY MARKERS		
		Place as shown	7	EA
720	0130	IRON PIN R/W MONUMENTS		
		Sta 267+60 (Chain: SCL_I94)	6	EA



Sec 23
T-139-N
R-79-W

IRON PIN R/W MONUMENTS

Point	North	East	Station	Offset
7117	427736.3442	1937344.2514	558+86.18	-96.3043
7118	428035.6556	1937387.4699	561+85.61	-53.9223
7119	428035.3655	1937414.4683	561+85.39	-26.9232
7120	428035.2571	1937480.4709	561+85.47	39.0795
7121	428035.0082	1937507.4698	561+85.29	66.0790

NOTE: Stations and offsets are listed from Chain: EX106ST

Point	North	East	Station	Offset
9111	427685.9390	1937426.4151	558+36.00	-14.0000
9112	427726.0506	1937386.5271	558+76.00	-54.0000
9113	427686.0508	1937386.4153	558+36.00	-54.0000
9114	427750.0505	1937386.5941	559+00.00	-54.0000
9115	427789.9386	1937426.7057	559+40.00	-14.0000
9116	427790.0504	1937386.7059	559+40.00	-54.0000
9117	427899.9382	1937427.0131	560+50.00	-14.0000
9118	427899.8599	1937455.0130	560+50.00	14.0000
9119	427999.9322	1937429.2925	561+50.00	-12.0000
9120	427999.8651	1937453.2924	561+50.00	12.0000

NOTE: Stations and offsets are listed from Chain: EX106ST

REGISTERED PROFESSIONAL ENGINEER
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Survey Data

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4	5	TOTAL 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	
G20-2-48	**48"x24"**	**END ROAD WORK**	**4**	**4**	**4**	**4**	**4**	**4**	**26**	**104**
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)							18	
G20-10-108	**108"x48"**	**CONTRACTOR SIGN**	**2**	**2**	**2**	**2**	**2**	**2**	**70**	**140**
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS							43	
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW							36	
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT**	**4**	**4**	**4**	**4**	**4**	**4**	**59**	**236**
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**	**4**	**4**	**4**	**4**	**4**	**4**	**32**	**128**
R1-2-60	60"x60"	YIELD							29	
R2-1-36	**36"x48"**	**SPEED LIMIT __ (Portable only)**	**4**				**4**	**4**	**30**	**120**
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**8**	**15**	**10**	**15**	**8**	**15**	**39**	**585**
R2-1aP-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**8**	**11**	**4**	**11**	**8**	**11**	**10**	**110**
R3-2-48	48"x48"	NO LEFT TURN							35	
R4-1-48	**48"x60"**	**DO NOT PASS**		**2**		**2**		**2**	**39**	**78**
R4-7-48	**48"x60"**	**KEEP RIGHT**		**2**		**2**		**2**	**39**	**78**
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)**	**2**	**4**	**2**	**4**	**2**	**4**	**12**	**48**
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	
R11-3b-60	**60"x30"**	**BRIDGE OUT __ MILES AHEAD LOCAL TRAFFIC ONLY**	**3**	**3**	**3**	**3**	**3**	**3**	**31**	**93**
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**		**3**		**3**		**3**	**35**	**105**
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT							35	
W1-6-48	**48"x24"**	**ONE DIRECTION LARGE ARROW**		**2**		**2**		**2**	**26**	**52**
W3-1-48	48"x48"	STOP AHEAD							35	
W3-3-48	48"x48"	SIGNAL AHEAD							35	
W3-4-48	48"x48"	BE PREPARED TO STOP							35	
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**4**	**4**	**4**	**4**	**4**	**4**	**35**	**140**
W4-2-48	**48"x48"**	**LANE ENDS RIGHT or LEFT**	**4**	**4**		**4**	**4**	**4**	**35**	**140**
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**		**2**		**2**		**2**	**35**	**70**
W8-1-48	48"x48"	BUMP							35	
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**	**2**	**2**	**2**	**2**	**2**	**2**	**35**	**70**
W8-55-48	**48"x48"**	**TRUCKS CROSSING AHEAD or __ FT or _ MILE**	**2**	**2**	**2**	**2**	**2**	**2**	**35**	**70**
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	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)							10	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**4**	**4**	**4**	**4**	**4**	**4**	**35**	**140**
W20-2-48	48"x48"	DETOUR AHEAD or __FT or _ MILE							35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or _ MILE							35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or _ MILE							35	
W20-5-48	**48"x48"**	**RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE**	**4**	**4**		**4**	**4**	**4**	**35**	**140**
W20-7-48	**48"x48"**	**FLAGGER**	**2**				**2**	**2**	**35**	**70**
W20-8-18	**18"x18"**	**STOP - SLOW PADDLE Back to Back**	**2**				**2**	**2**	**5**	**10**
W20-52P-54	**54"x12"**	**NEXT __ MILES (Mounted on warning sign post)**		**2**		**2**		**2**	**12**	**24**
W21-1-48	48"x48"	WORKERS							35	
W21-2-48	48"x48"	FRESH OIL							35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or _ MILE							35	
W21-5-48	48"x48"	SHOULDER WORK							35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4	5	TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED							35	
W21-5b-48	**48"x48"**	**RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT or _ MILE**			**4**			**4**	**35**	**140**
W21-6-48	48"x48"	SURVEY CREW							35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT							35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY							35	
W21-52-48	48"x48"	PAVEMENT BREAKS							35	
W21-53-48	48"x48"	RUMBLE STRIPS AHEAD							35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK							35	

SPECIAL SIGNS

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**2891**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2	3	4	5	TOTAL QUANTITY
701-1045	**ATTENUATION DEVICE-TYPE B-75**	EACH		**8**	**8**	**8**		**8**
704-0100	**FLAGGING**	MHR	**200**				**200**	**400**
704-1048	PORTABLE RUMBLE STRIPS	EACH						
704-1050	TYPE I BARRICADES	EACH						
704-1052	**TYPE III BARRICADES**	EACH	**10**	**10**	**6**	**10**	**10**	**10**
704-1060	**DELINEATOR DRUMS**	EACH	**46**	**136**		**136**	**46**	**136**
704-1065	TRAFFIC CONES	EACH						
704-1067	**TUBULAR MARKERS**	EACH	**220**	**185**	**60**	**185**	**280**	**280**
704-1070	DELINEATOR	EACH						
704-1072	FLEXIBLE DELINEATORS	EACH						
704-1080	STACKABLE VERTICAL PANELS	EACH						
704-1081	VERTICAL PANELS - BACK TO BACK	EACH						
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH						
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH						
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH						
704-1088	**SEQUENCING ARROW PANEL - TYPE C - CROSSOVER**	EACH	**2**	**2**		**2**	**2**	**2**
704-1500	OBLITERATION OF PVMT MK	SF						
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF						
704-3510	**PRECAST CONCRETE MED BARRIER - STATE FURNISHED**	EACH		**312**	**312**	**312**		**312**
762-0200	RAISED PAVEMENT MARKERS	EACH						
762-0420	SHORT TERM 4IN LINE - TYPE R	LF						
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF						

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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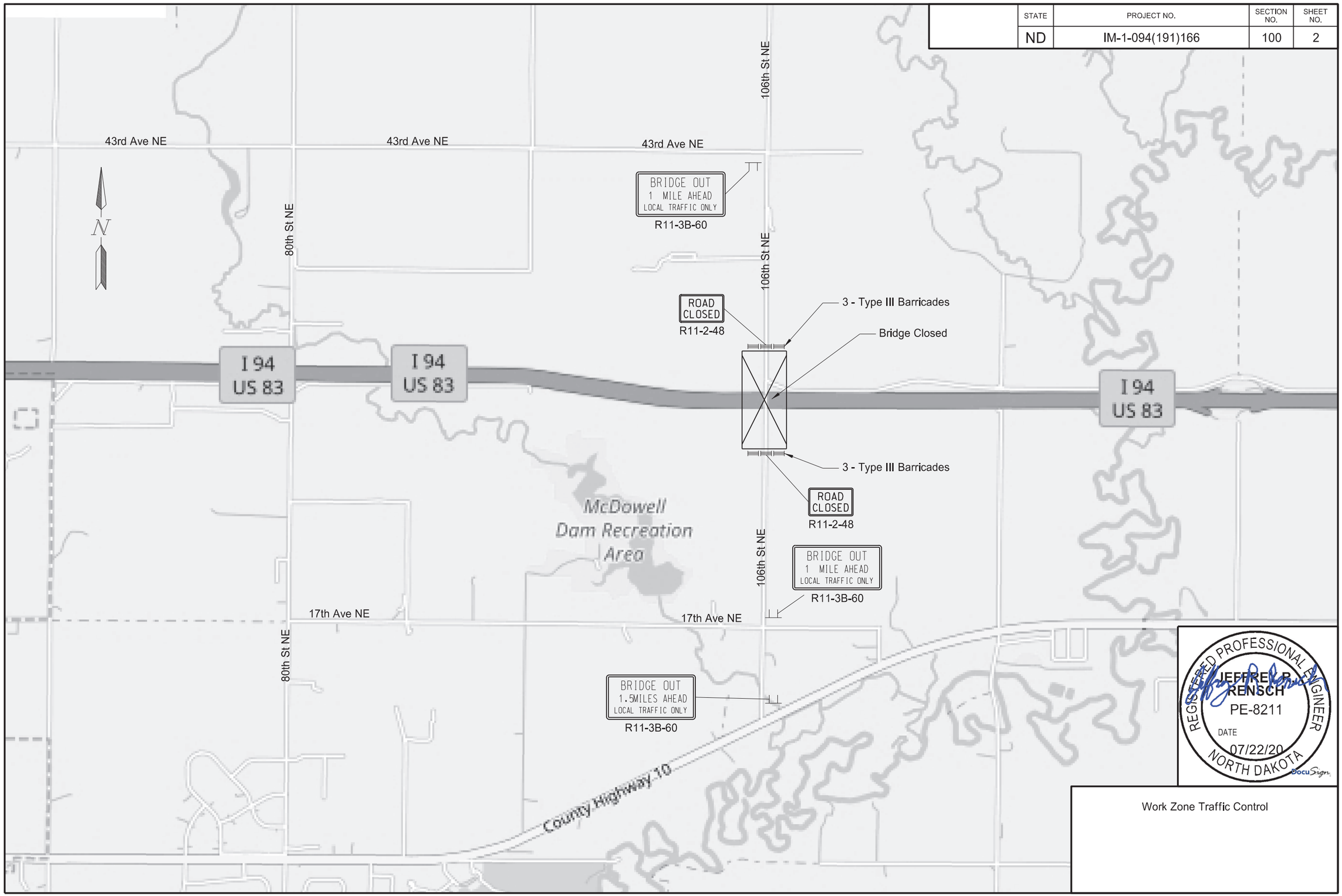
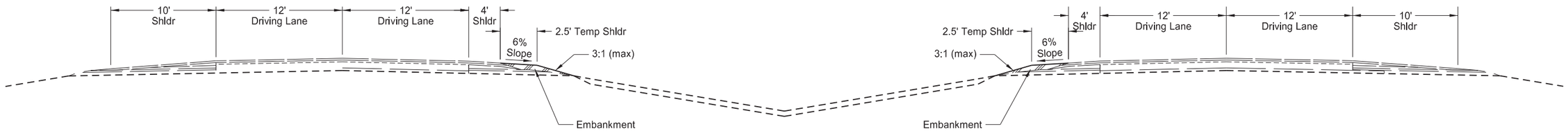
Traffic Control Devices List

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	2

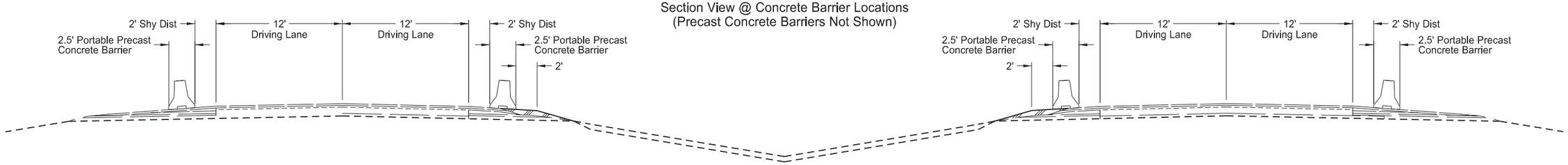


Work Zone Traffic Control

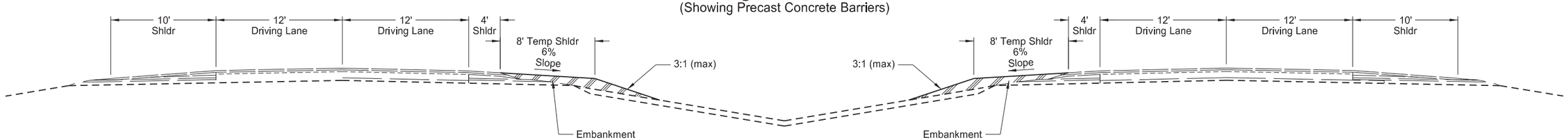
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	3



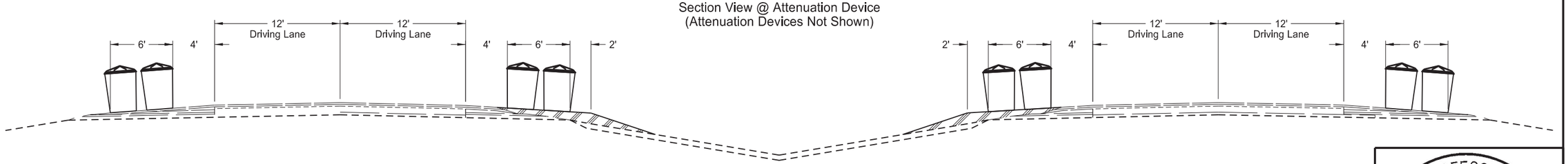
Section View @ Concrete Barrier Locations
(Precast Concrete Barriers Not Shown)



Section View @ Concrete Barrier Locations
(Showing Precast Concrete Barriers)



Section View @ Attenuation Device
(Attenuation Devices Not Shown)



Section View @ Attenuation Device
(Showing Attenuation Devices)

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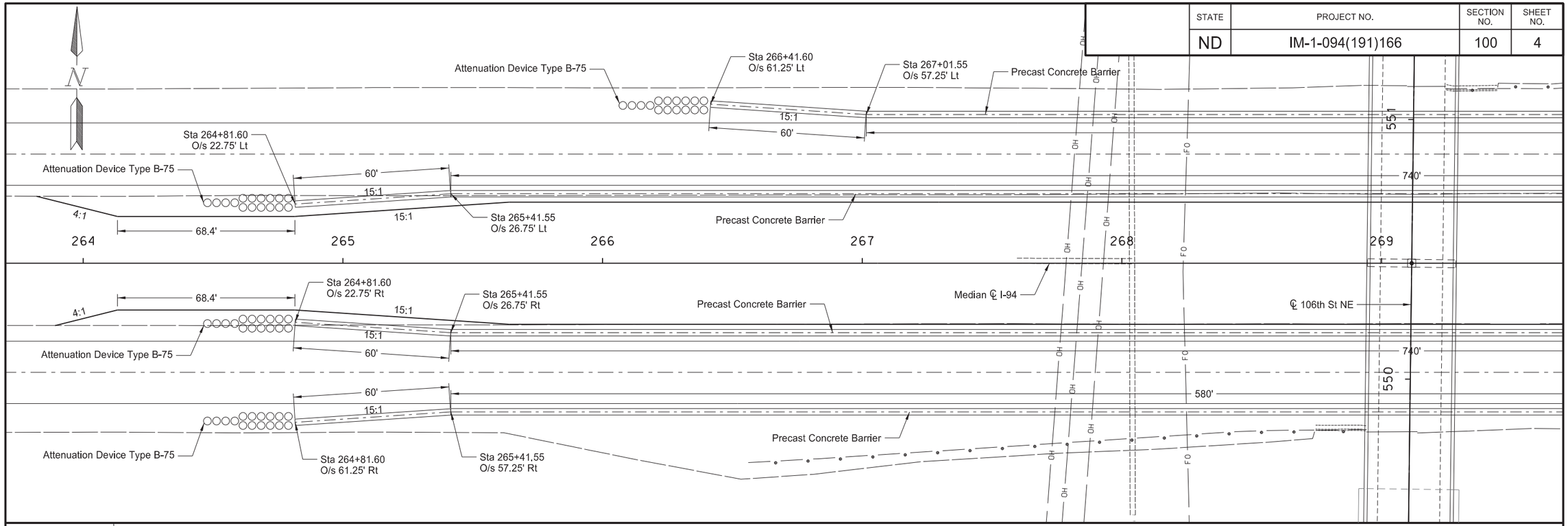
Work Zone Traffic Control
Typical Sections using Precast Concrete Barriers

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	4



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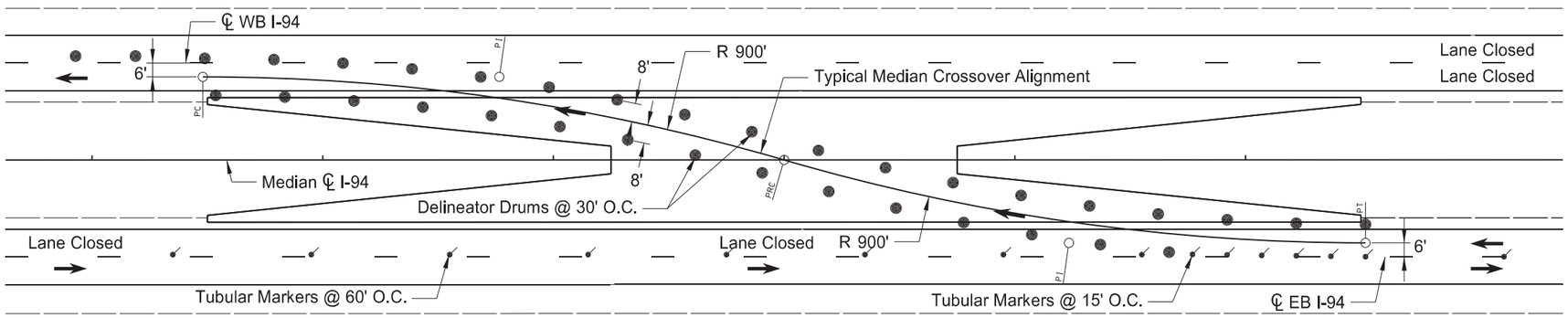
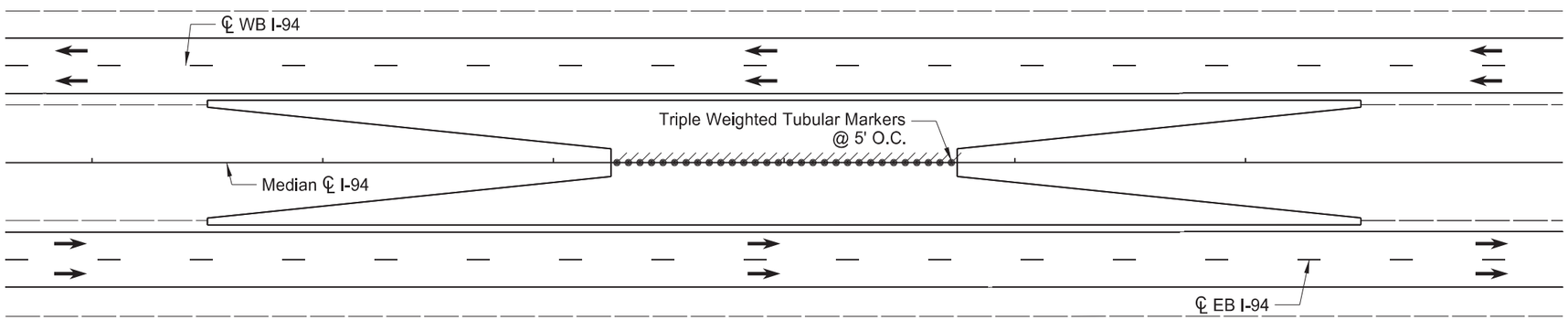
Work Zone Traffic Control
Precast Concrete Median Barrier Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	5



Typical Crossover Layout - Phases 2 & 4



Typical Crossover Layout when Crossover Not in Use

(Devices shown to remain in place after completion of project)

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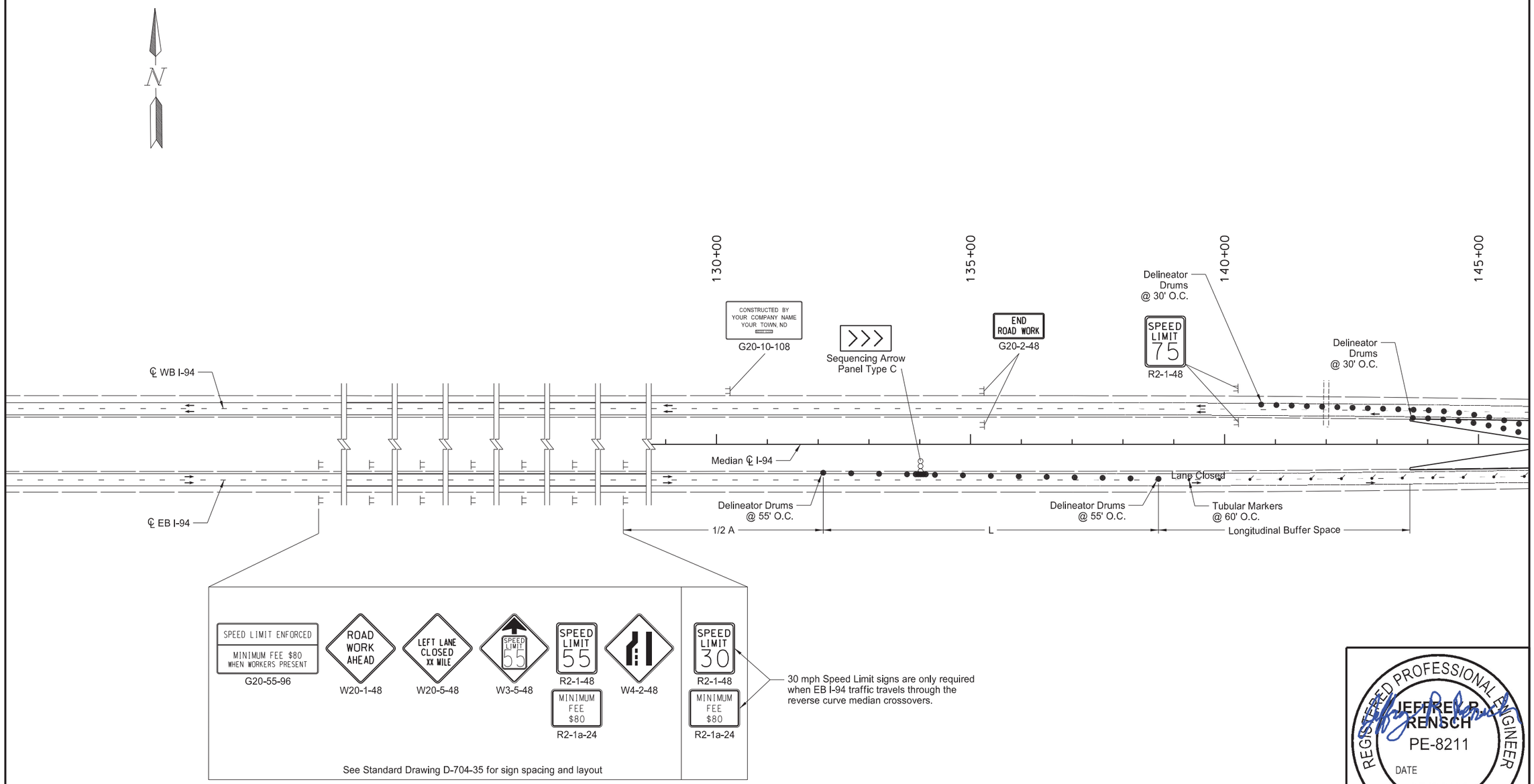
Notes:

1. See Traffic Control Layouts for Individual Phases for additional details and signing.
2. Layout for WB lane closure shown. EB lane closure similar.

Work Zone Traffic Control
Typical Median Crossover Alignment

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	6



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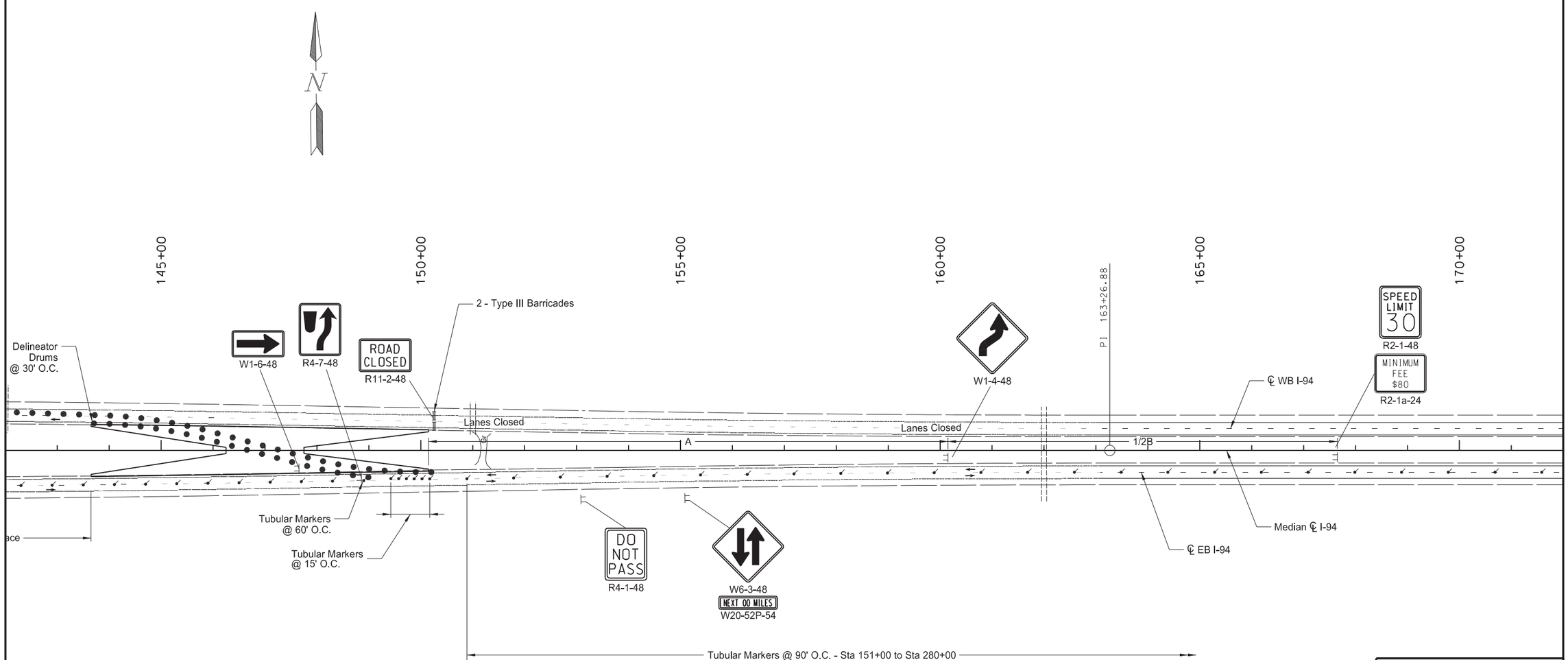
Notes:

Device Layout for WB lane closure is shown. Layout for EB lane closure is similar

Work Zone Traffic Control

Phase 2 & 4 Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	7



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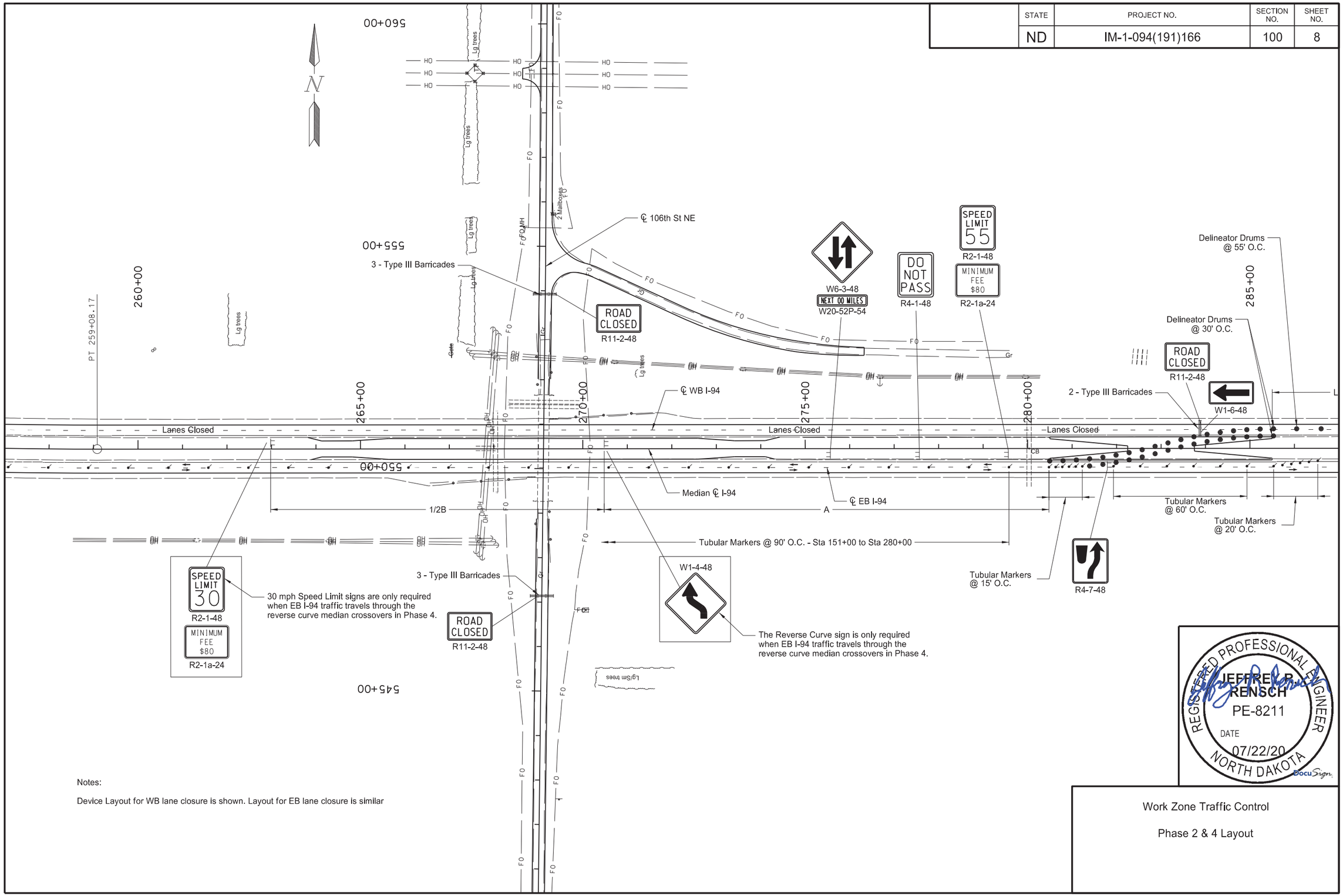
Notes:

Device Layout for WB lane closure is shown. Layout for EB lane closure is similar

Work Zone Traffic Control

Phase 2 & 4 Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	8



Notes:

Device Layout for WB lane closure is shown. Layout for EB lane closure is similar

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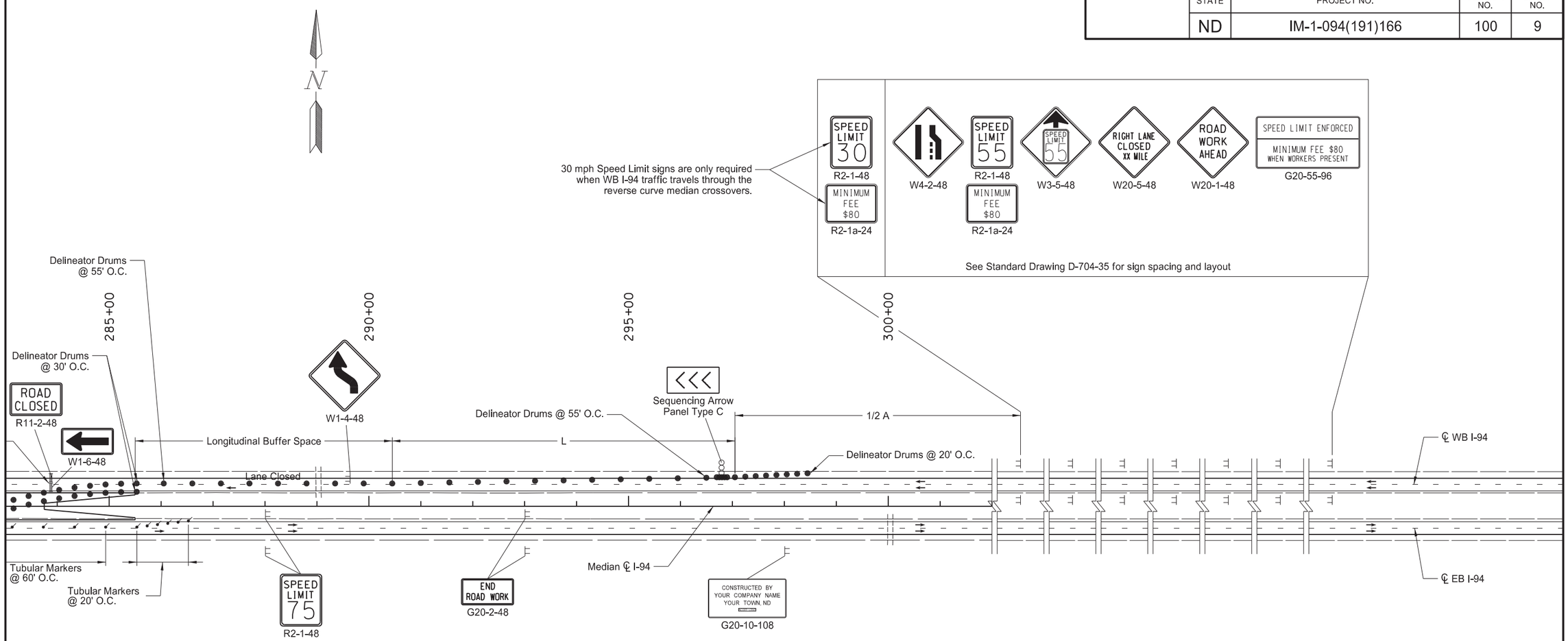
Work Zone Traffic Control

Phase 2 & 4 Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	9



Notes:

Device Layout for WB lane closure is shown. Layout for EB lane closure is similar

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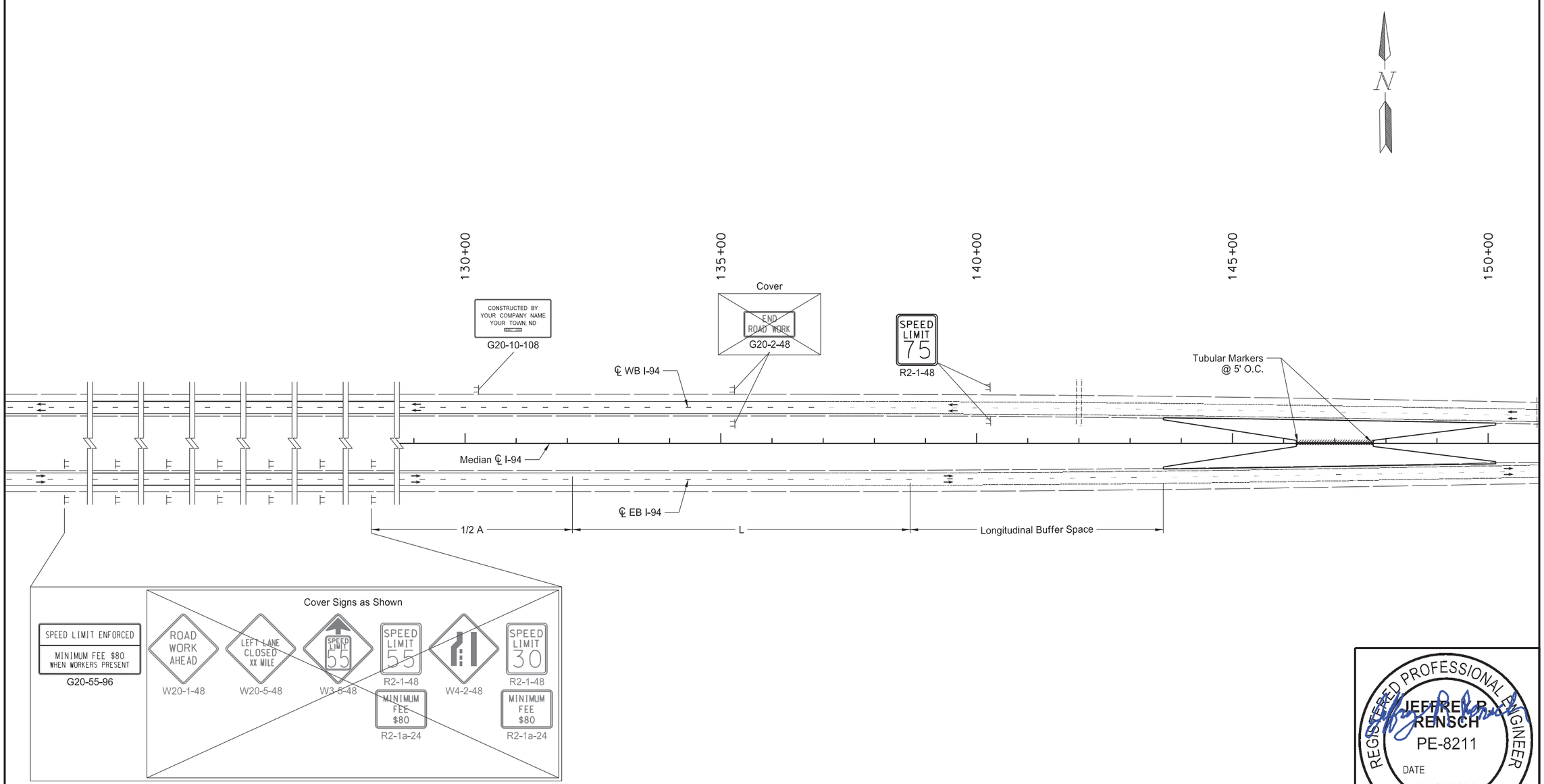
Work Zone Traffic Control

Phase 2 & 4 Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	10



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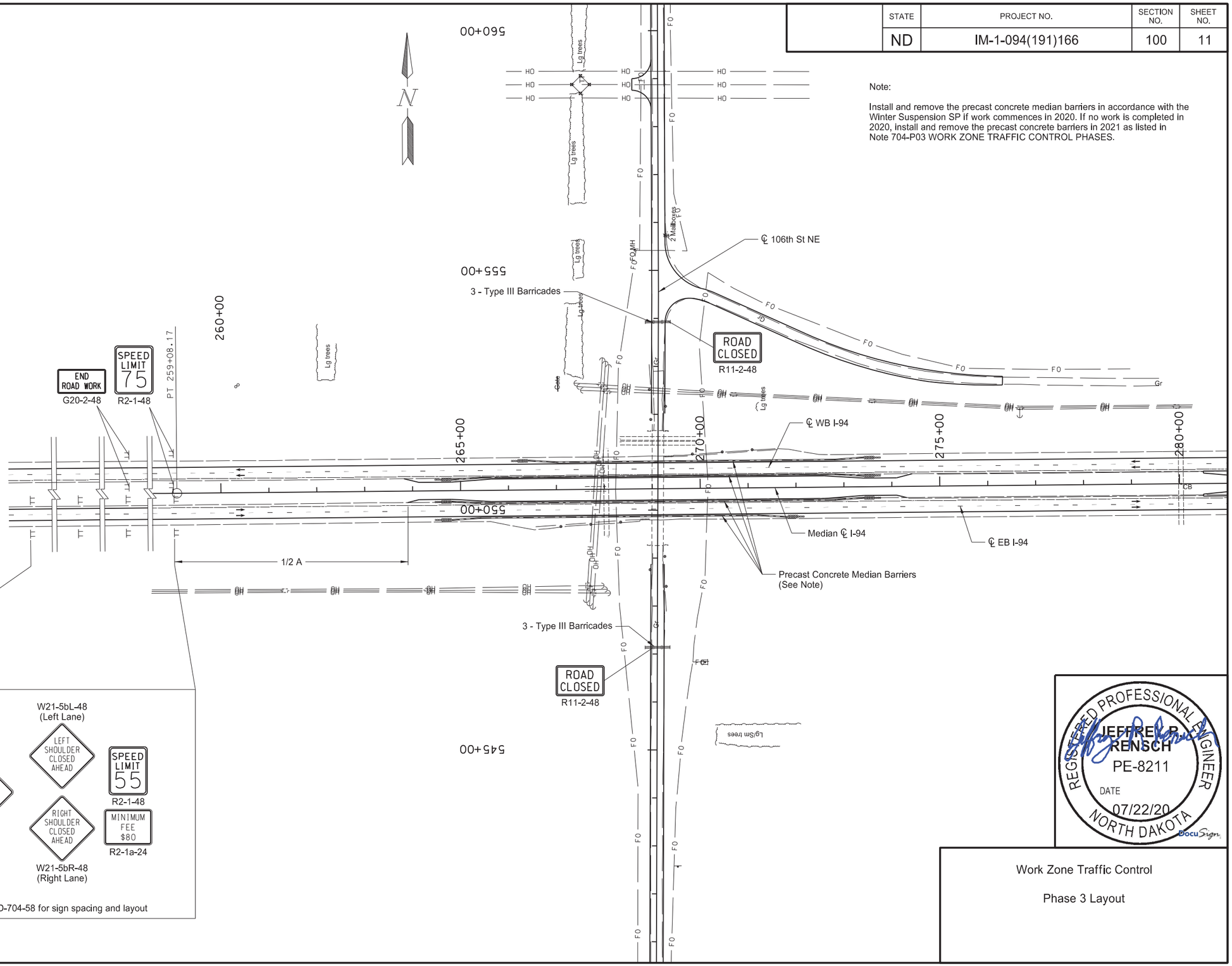
Work Zone Traffic Control

Phase 3 Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	11

Note:

Install and remove the precast concrete median barriers in accordance with the Winter Suspension SP if work commences in 2020. If no work is completed in 2020, install and remove the precast concrete barriers in 2021 as listed in Note 704-P03 WORK ZONE TRAFFIC CONTROL PHASES.



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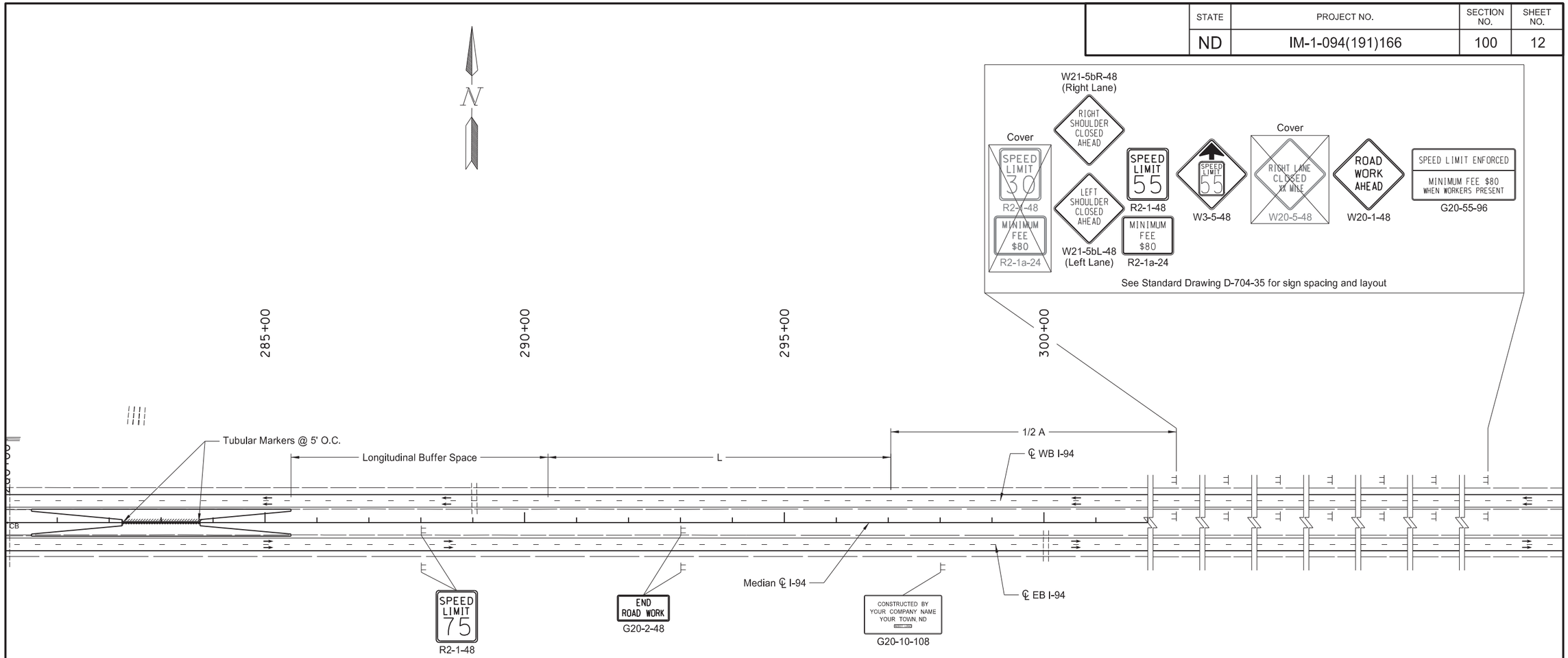
Work Zone Traffic Control

Phase 3 Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	100	12



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Work Zone Traffic Control

Phase 3 Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	IM-1-094(191)166	110	1

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	Sleeve Length 2nd LF	Sleeve Length 3rd LF	Sleeve Length 4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
530+44 Rt		20		9.0	12.7				5.0	2.25 x 2.25 12 ga	14.1	4.0				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
540+44 Lt		9		5.0	11.7				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
540+44 Rt		9		5.0	11.7				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
555+71 Lt									5.0	2 x 2 12 ga										1	1		
560+45 Rt		9		5.0	11.7				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
560+45 Lt		9		5.0	11.7				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
570+45 Lt		20		9.0	12.7				5.0	2.25 x 2.25 12 ga	14.1	4.0				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
Sub Total			0.0	38.0		**Total**	72.2										**Total**	24.0		1	1	2	
Grand Total			**0.0**	**38.0**		**Total**	**72.2**										**Total**	**24**	**0**	**1**	**1**	**2**	

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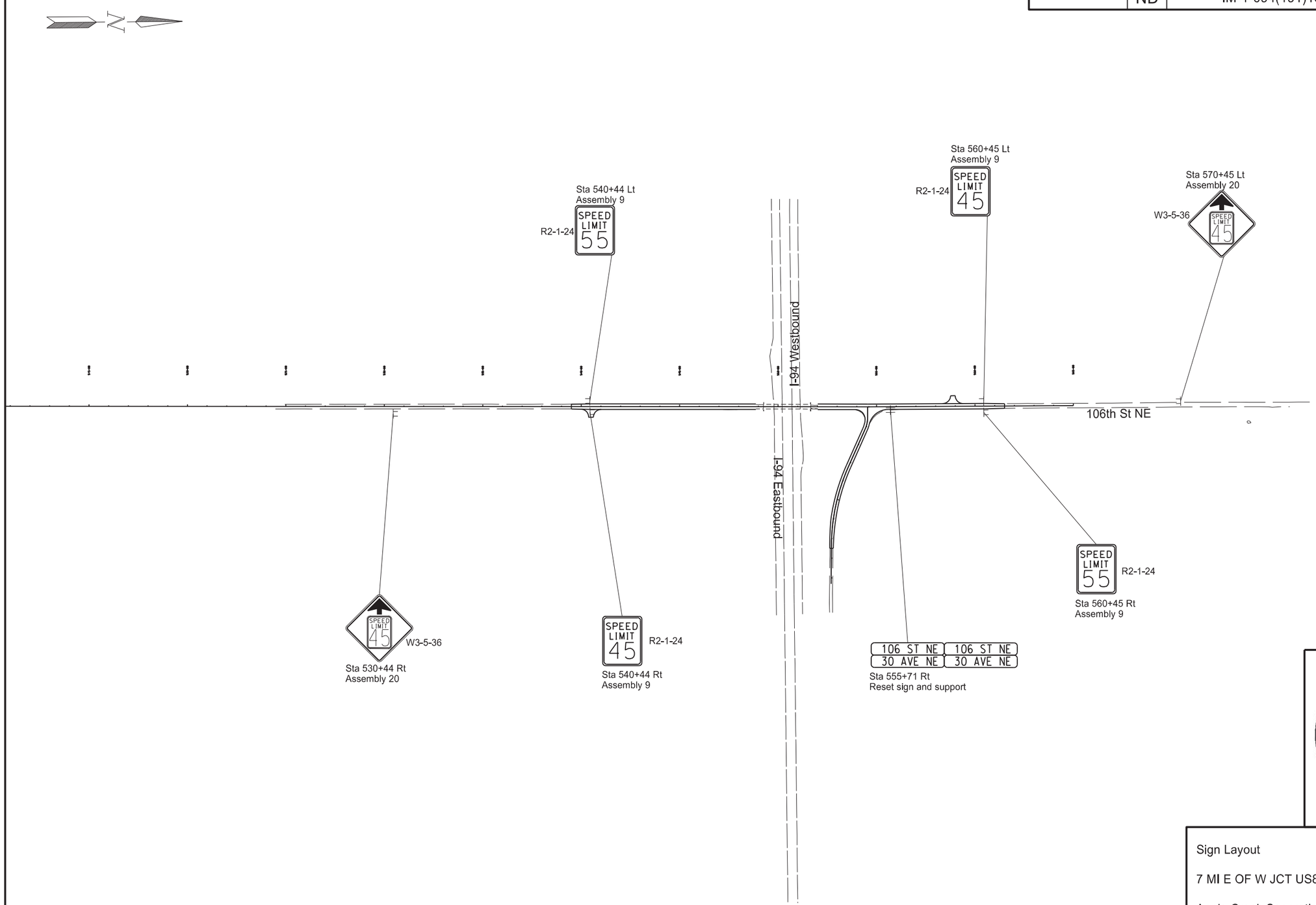
Sign Summary
Perforated Tube

7 MI E OF W JCT US83

Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	110	2



07/23/20

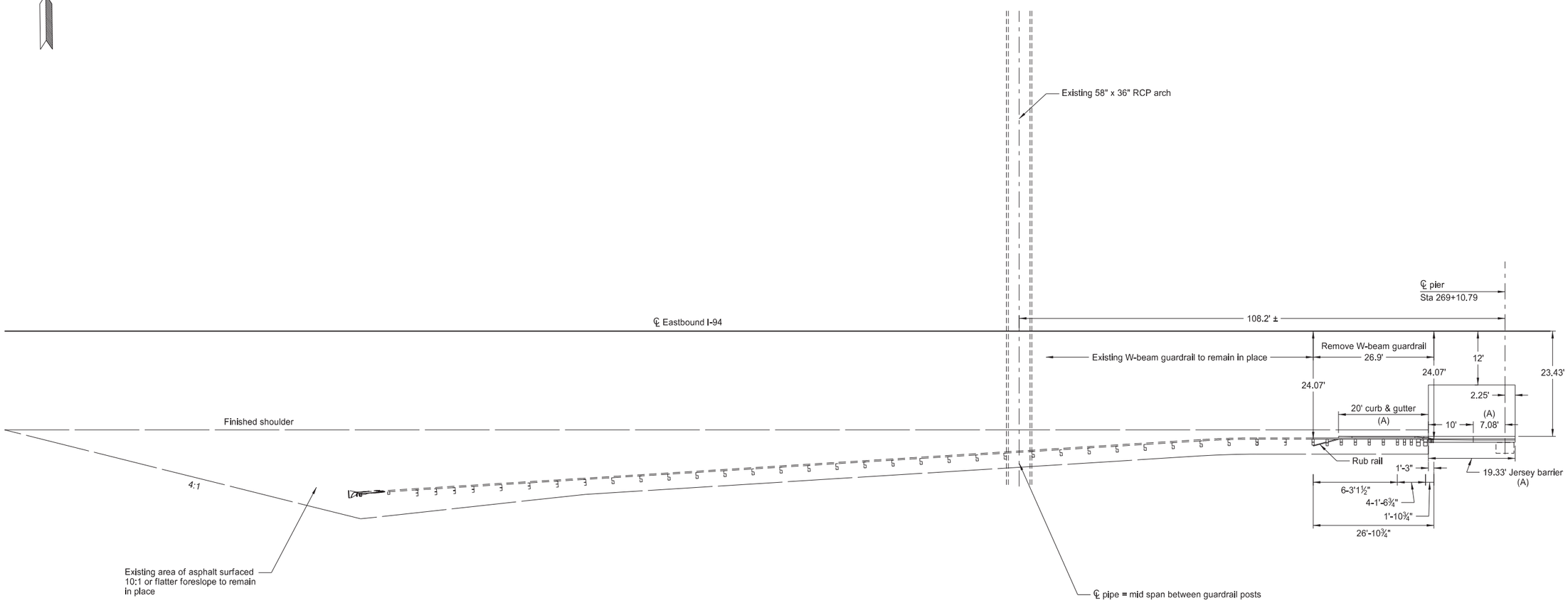
Sign Layout

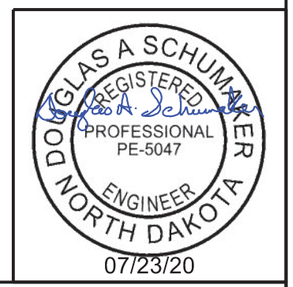
7 MI E OF W JCT US83

Apple Creek Separation

23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	1





SPEC	CODE	BID ITEM	QTY	UNIT
202	0113	REMOVAL OF CONCRETE		
		Sta 268+73.71 to 269+13.04 Rt	4.6	CY
764	0151	REMOVE W-BEAM GUARDRAIL & POSTS		
		Sta 268+68.06 to 268+94.96 Rt	26.9	LF

(A) Jersey barrier length was installed based on location of pipe with a designed length of 19.33'. Minimum jersey barrier length = 14.5'. See Removal of Concrete at Existing Outside Pier Protection.

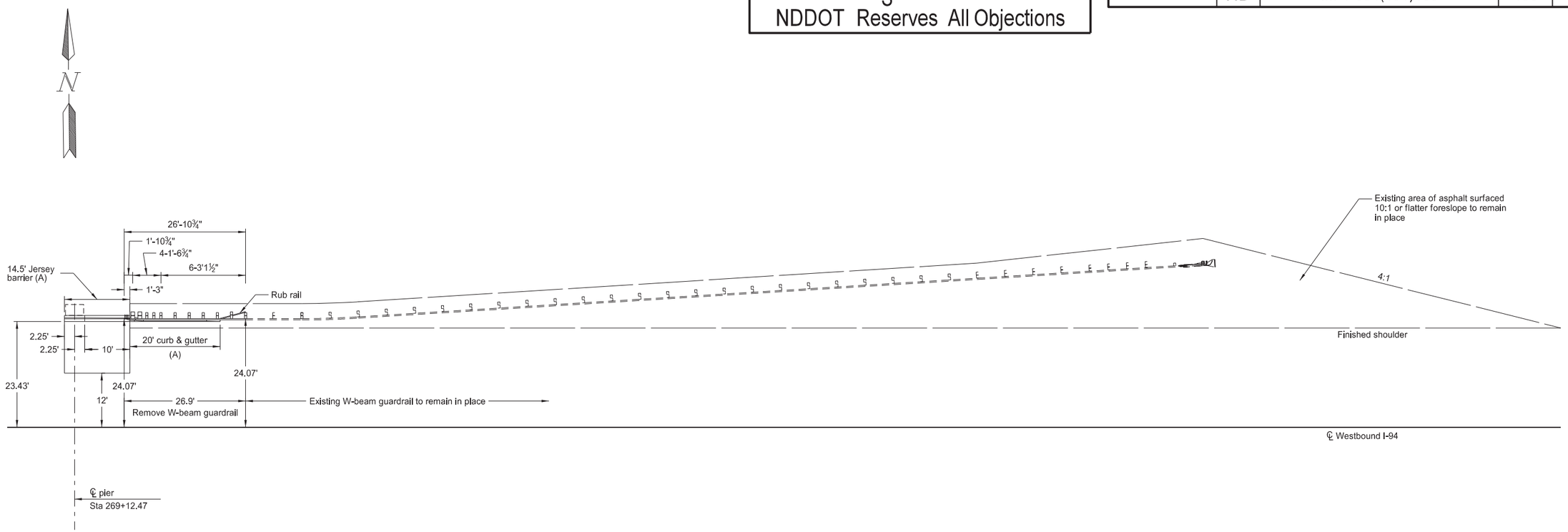
Removal of Concrete and W-Beam Guardrail Layout

Outside Pier Protection

Apple Creek Separation
RP 166.531
Eastbound I-94

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	2

23 USC § 409 Documents
NDDOT Reserves All Objections



(A) See Removal of Concrete at Existing Outside Pier Protection.

SPEC	CODE	BID ITEM	QTY	UNIT
202	0113	REMOVAL OF CONCRETE		
		Sta 269+10.22 to 269+44.72 Lt	3.7	CY
764	0151	REMOVE W-BEAM GUARDRAIL & POSTS		
		Sta 269+23.47 to 269+50.37 Lt	26.9	LF

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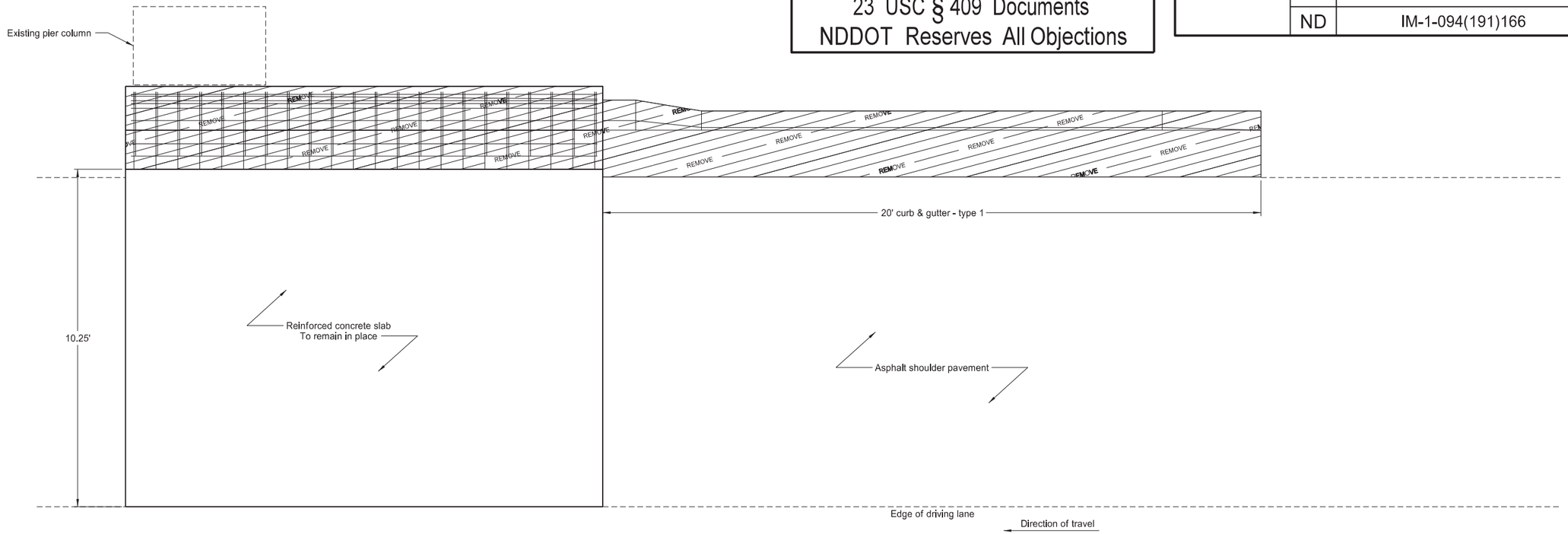
Removal of Concrete and W-Beam Guardrail Layout

Outside Pier Protection

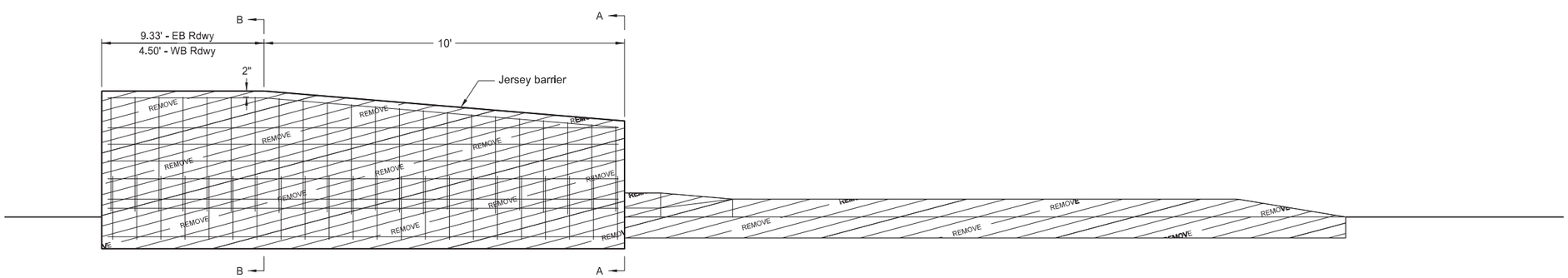
Apple Creek Separation
RP 166.531
Westbound I-94

23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	3

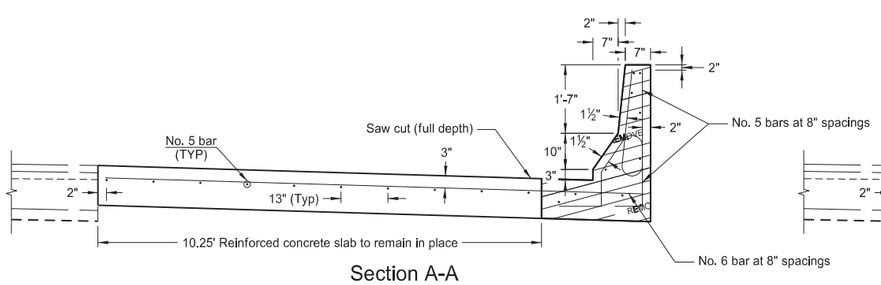


Plan View

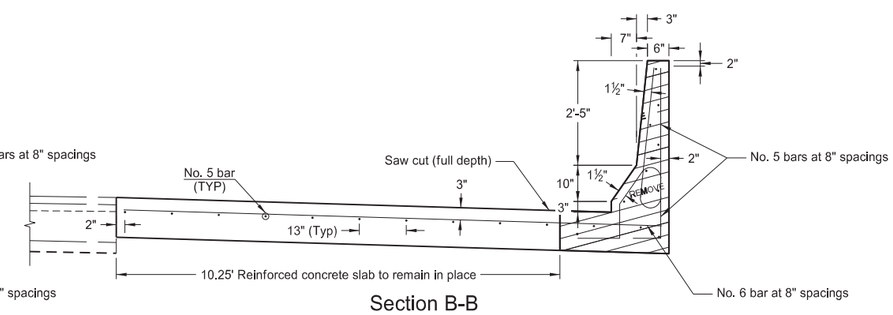


Elevation View

Facing South for Eastbound Roadway
Facing North for Westbound Roadway



Section A-A



Section B-B

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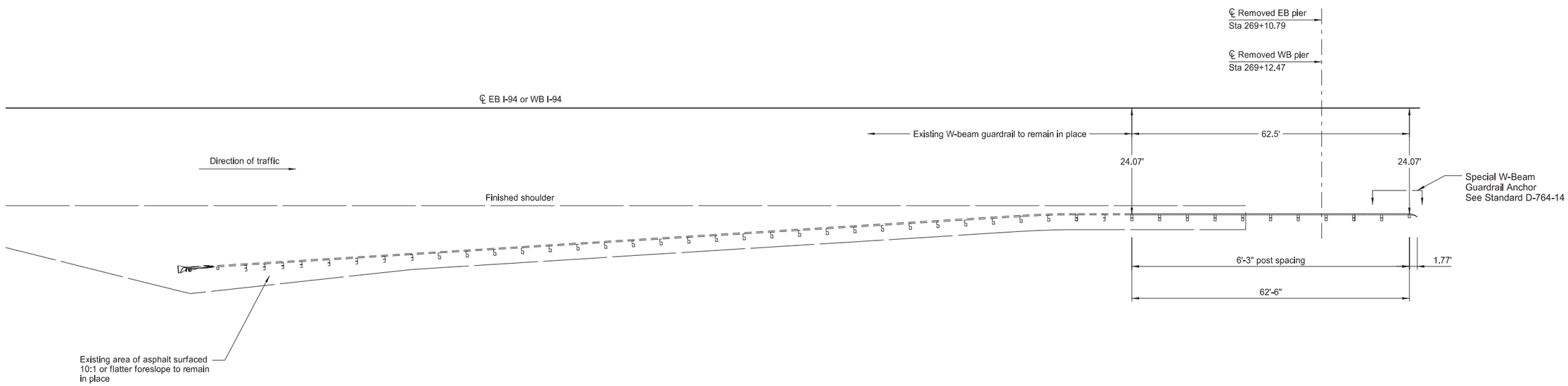
Removal of Concrete

Outside Pier Protection

Apple Creek Separation
RP 166.531
Eastbound and Westbound I-94

23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	4



07/23/20

Note: See Standard Drawing D-764-22.

W-Beam Guardrail Layout At Removed Outside Pier
For Winter Suspension

Outside Embankment Protection

Apple Creek Separation
RP 166.531
Eastbound and Westbound I-94

23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	5

W-BEAM GUARDRAIL SUMMARY OF QUANTITIES

W-BEAM GUARDRAIL AT OBSTRUCTIONS
DIVIDED HIGHWAYS

LOCATION	(A) 5/8" Ø x 18" LONG BUTTON HEAD BOLT	(A) 5/8" Ø x 1 1/4" LONG BUTTON HEAD BOLT	(A) 5/8" Ø x 10" LONG GUARD-RAIL BOLT	(A) 6" x 8" x 14" TIMBER BLOCK	(A) 6" x 8" x 6'-0" TIMBER POST	(A) 12'-6" STRAIGHT RAIL SECTION	(A) 12'-6" CURVED RAIL SECTION	(A) REFLECTOR-IZED PLATES	(A) W-BEAM END SECTION (FLARED)	(A) BCT CABLE ASSEM-BLY AND BEARING PLATE	(A) BCT ANCHOR PLATE	(A) BCT TERMINAL POST	(A) 5/8" Ø x 1 1/2" LONG HEX HEAD BOLT
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
Sta 268+68.06 to 269+32.33 Rt	9	48	1	9	9	5		2	1	1	1	1	8
Sta 269+86.10 to 269+50.37 Lt	9	48	1	9	9	5		2	1	1	1	1	8
TOTAL	18	96	1	18	18	10		4	1	1	1	1	8

(A) Include these items in the contract unit price bid for "W-Beam Guardrail".

SPEC	CODE	BID ITEM	QTY	UNIT
764	0131	W-BEAM GUARDRAIL		
		Sta 268+68.06 to 269+32.33 Rt	64.3	LF
		Sta 269+86.10 to 269+50.37 Lt	64.3	LF
		Total	128.6	LF

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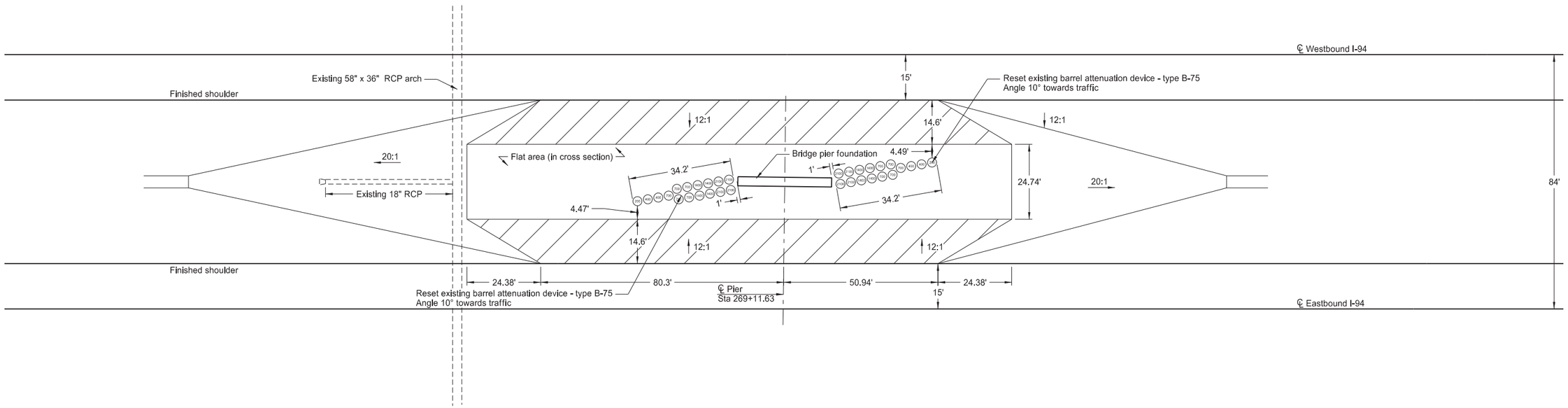
W-Beam Guardrail Quantities
For Winter Suspension

Outside Embankment Protection

Apple Creek Separation
RP 166.531
Eastbound or Westbound I-94

23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	6



Notes: 1. Remove the existing barrel attenuation devices from each side of the existing pier and reset them as shown above if required for winter suspension. See Standard Drawing D-704-1.

Include all costs to remove the existing concrete bases in the contract unit price bid for the item "Modify Barrel Attenuation Device."

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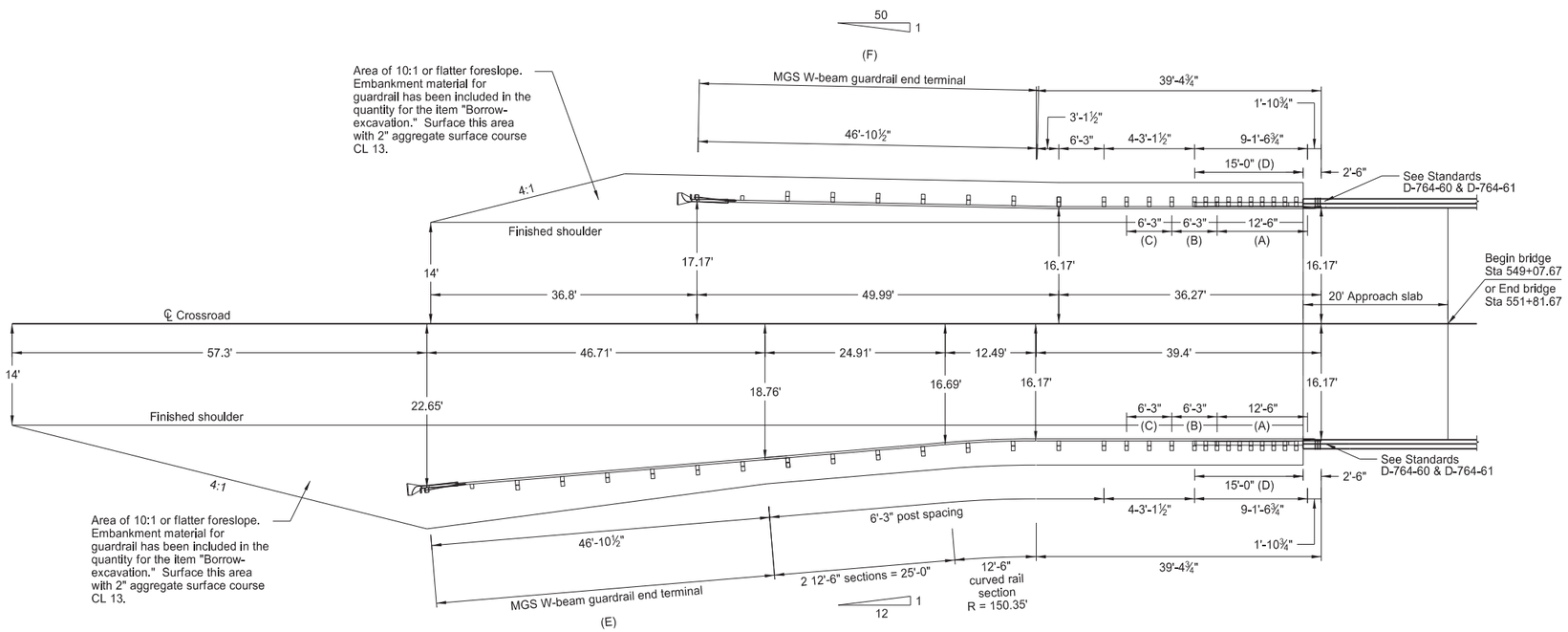
Attenuation Device Layout
For Winter Suspension

Median Pier Protection

Apple Creek Separation
RP 166.531
I-94

23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	7



(A) Thrie beam rail section (double thickness)

(B) Thrie beam rail section

(C) Asymmetrical W-Thrie beam transition section

(D) Curb & gutter - type 1 special. Install in accordance with Standard Drawing D-748-1, except for height transitions on each end as shown on Standard Drawing D-764-60.

(E) Install a FLEAT end terminal at this location. See Standard D-764-38.

(F) Install either a MASH SKT or a MASH SoftStop Terminal at this location.

If a MASH SKT is installed, install the end terminal as shown above. See Standard D-764-51.

If a MASH SoftStop is installed, install it with the offset as shown on Standard D-764-50. Additional guardrail embankment required is at the contractor's expense.

Note: See Standard Drawing D-764-48 for guardrail embankment fill and surfacing details.

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Thrie/MGS W-Beam Guardrail Layout
At Both Ends of Bridge

Apple Creek Separation Crossroad
RP 166.531

I-94

23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	8

MGS W-BEAM GUARDRAIL SUMMARY OF QUANTITIES

THRIE/MGS W-BEAM GUARDRAIL AT BRIDGE ENDS

LOCATION	(A) 5/8" Ø x 18" LONG GUARD-RAIL BOLT	(A) 6" x 8" x 6'-0" TIMBER POST	(A) 6" x 8" x 14" TIMBER BLOCK	(A) 5/8" Ø x 1 1/4" LONG GUARD-RAIL BOLT	(A) 12'- 6" STRAIGHT W-BEAM RAIL SECTION	(A) 12'- 6" CURVED W-BEAM RAIL SECTION	(A) REFL-ECTOR-IZED PLATES	(A) 6" x 8" x 7' WOOD POST	(A) 6" x 8" x 19" WOOD OFF-SET BLOCK	(A) 6'-3" W-THRIE BEAM TRANS-ITION SECTION	(A) 6'-3" THRIE BEAM SECTION	(A) 12'-6" DOUBLE THRIE BEAM SECTION	(A) 2'-6" THRIE BEAM TERM-INAL CON-NECTOR	(A) 7/8" Ø x 15" LONG HEX HEAD BOLT	(A) SINGLE SLOPE TO THRIE BEAM CONN-ECTOR PLATE
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
Sta 548+13.37 to 548+90.17 Rt	32	15	9	76	3	1	7	6	12	1	1	1	1	5	1
Sta 548+50.77 to 548+90.17 Lt	26	9	3	52	1		5	6	12	1	1	1	1	5	1
Sta 551+99.17 to 552+38.57 Rt	26	9	3	52	1		5	6	12	1	1	1	1	5	1
Sta 551+99.17 to 552+75.97 Lt	32	15	9	76	3	1	7	6	12	1	1	1	1	5	1
TOTAL	116	48	24	256	8	2	24	24	48	4	4	4	4	20	4

SPEC	CODE	BID ITEM	QTY	UNIT
748	0141	CURB & GUTTER - TYPE 1 SPECIAL		
		Sta 548+72.67 to 548+87.67 Rt	15	LF
		Sta 548+72.67 to 548+87.67 Lt	15	LF
		Sta 552+01.067 to 552+16.67 Rt	15	LF
		Sta 552+01.067 to 552+16.67 Lt	15	LF
		Total	60	LF
764	0131	W-BEAM GUARDRAIL		
		Sta 548+13.37 to 548+90.17 Rt	76.9	LF
		Sta 548+50.77 to 548+90.17 Lt	39.4	LF
		Sta 551+99.17 to 552+38.57 Rt	39.4	LF
		Sta 551+99.17 to 552+75.97 Lt	76.9	LF
		Total	232.6	LF
764	0145	W-BEAM GUARDRAIL END TERMINAL		
		Sta 547+66.66 to 548+13.37 Rt	1	Ea
		Sta 548+03.91 to 548+50.77 Lt	1	Ea
		Sta 552+38.57 to 552+85.43 Rt	1	Ea
		Sta 552+75.97 to 553+22.68 Lt	1	Ea
		Total	4	Ea

SPEC	CODE	BID ITEM	QTY	UNIT	
764	0151	REMOVE W-BEAM GUARDRAIL & POSTS			
		Sta 548+39.05 to 549+28.31 Rt	89.4	LF	
		Sta 548+88.91 to 549+28.31 Lt	39.4	LF	
		Sta 551+63.97 to 552+03.37 Rt	39.4	LF	
		Sta 551+63.97 to 552+53.23 Lt	89.4	LF	
		Sta 267+05.84 to 269+32.33 Rt	226.8	LF	(B)
		Sta 268+86.1 to 271+12.60 Lt	226.8	LF	(B)
		Total	711.2	LF	
764	2081	REMOVE END TREATMENT & TRANSITION			
		Sta 547+89.22 to 548+39.05 Rt	1	Ea	
		Sta 548+38.95 to 548+88.91 Lt	1	Ea	
		Sta 552+03.37 to 552+53.33 Rt	1	Ea	
		Sta 552+53.23 to 553+03.06 Lt	1	Ea	
		Sta 266+55.94 to 267+05.84 Rt	1	Ea	(B)
		Sta 271+12.60 to 271+62.50 Lt	1	Ea	(B)
		Total	6	Ea	

(A) Include these items in the contract unit price bid for "W-Beam Guardrail".

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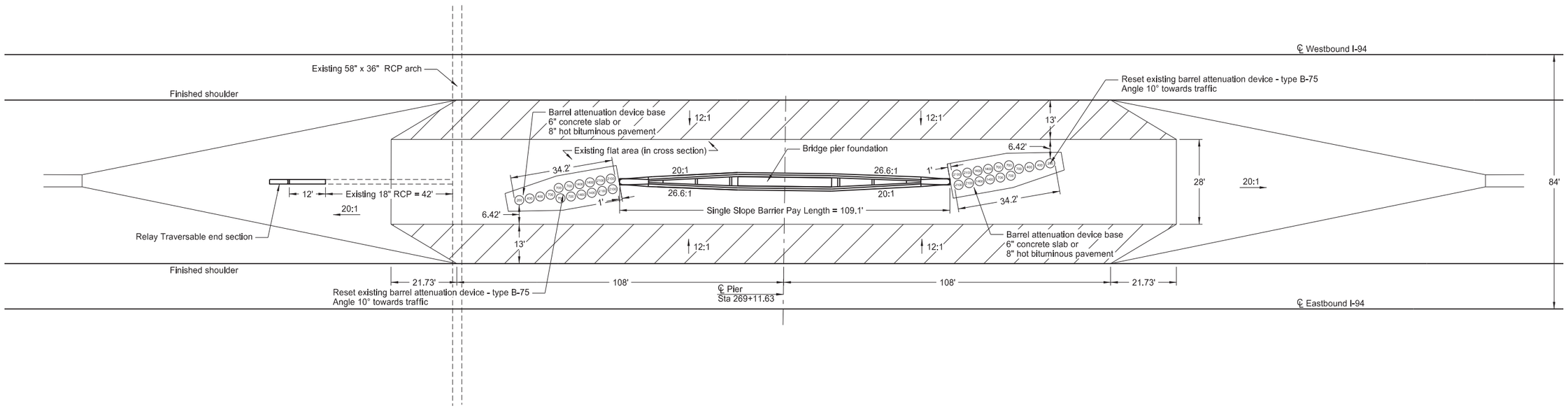
Thrie/MGS W-Beam Guardrail Quantities

Apple Creek Separation Crossroad
RP 166.531

I-94

23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	9



SPEC	CODE	BID ITEM	QTY	UNIT
602	1220	SINGLE SLOPE BARRIER	109.1	LF
764	8080	MODIFY BARREL ATTENUATION DEVICE	2	EA

Notes:

1. Remove the existing barrel attenuation devices from each side of the existing pier and reset them as shown above. See Standard Drawing D-704-1.

   Include all costs to remove the existing concrete bases and to install the new barrel attenuation device bases in the contract unit price bid for the item "Modify Barrel Attenuation Device."

2. See Section 51 and Section 60 for pipe information.

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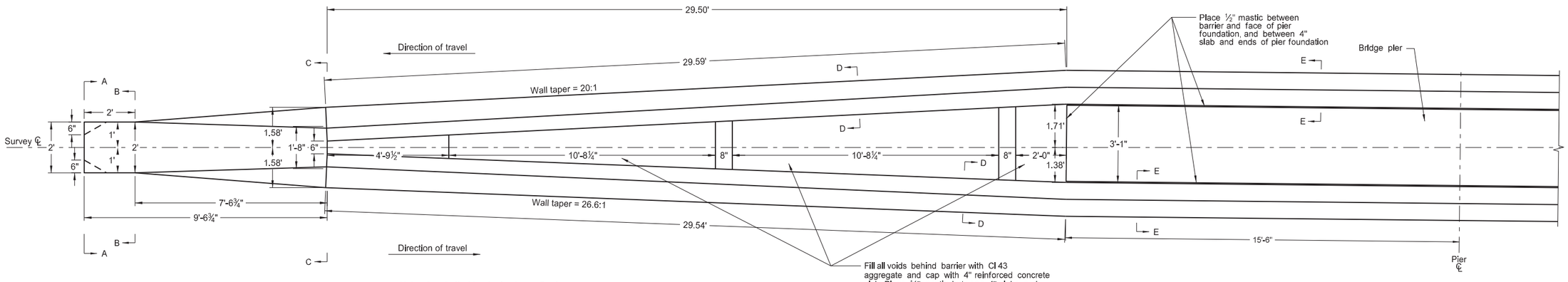
Single Slope Barrier and Attenuation Device Layout

Median Pier Protection

Apple Creek Separation
RP 166.531
I-94

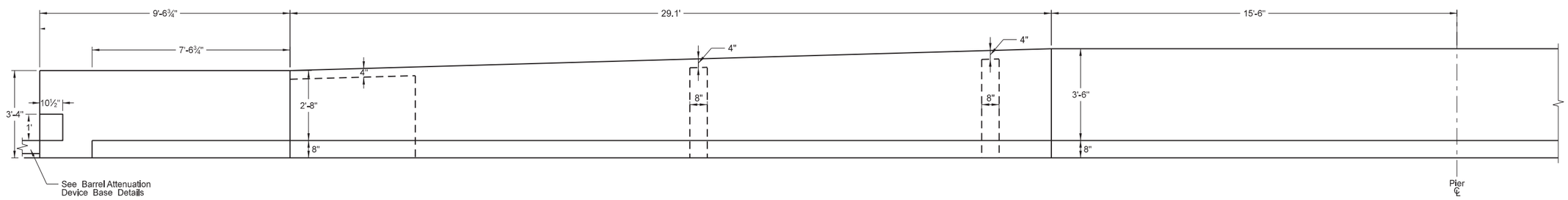
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	10

23 USC § 409 Documents
NDDOT Reserves All Objections

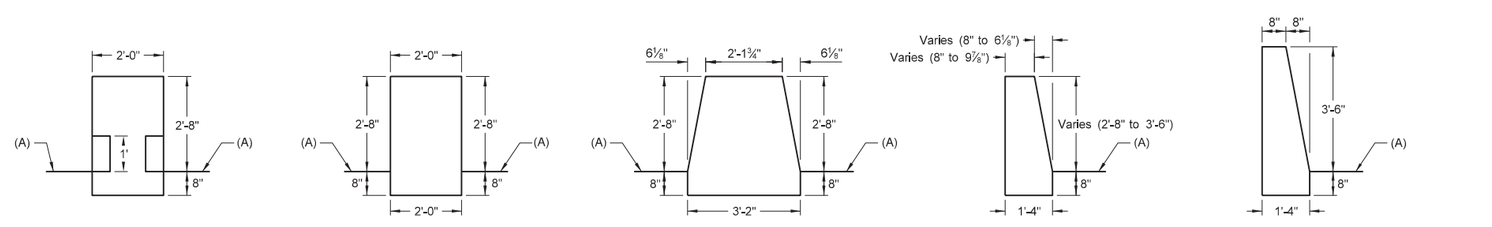


Note: One half of barrier is shown. Barrier layout is symmetrical about pier ℄.

PLAN VIEW



ELEVATION VIEW



Section A-A | Section B-B | Section C-C | Section D-D | Section E-E

(A) Finished surface

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PE-5047
NORTH DAKOTA
07/23/20

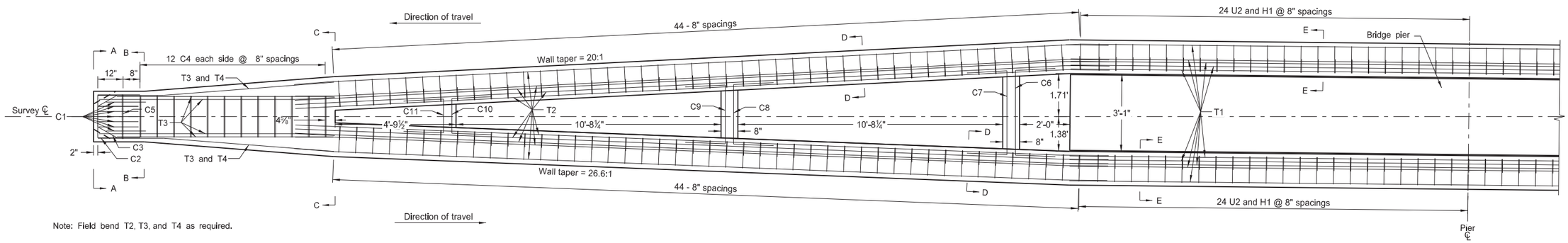
Single Slope Barrier Details

Median Pier Protection

Apple Creek Separation
RP 166.531
I-94

23 USC § 409 Documents
NDDOT Reserves All Objections

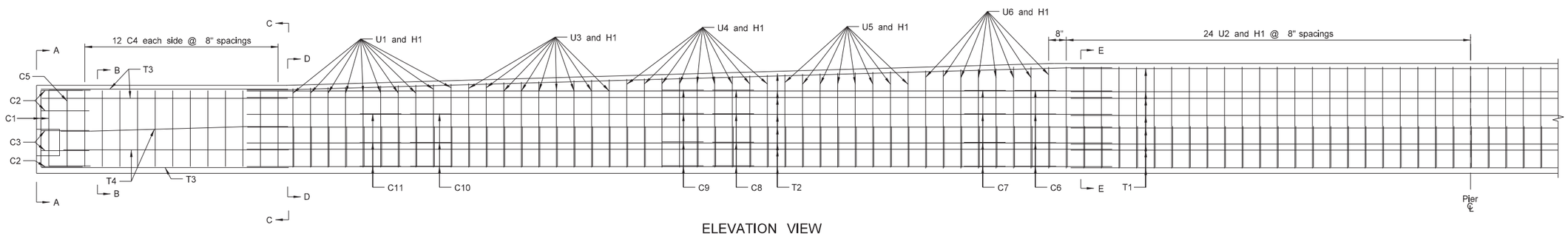
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	11



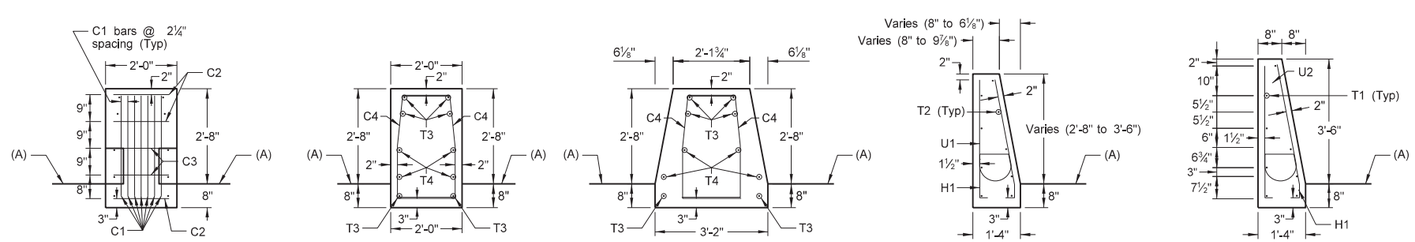
Note: Field bend T2, T3, and T4 as required.

Note: One half of barrier is shown. Barrier layout is symmetrical about pier ℄.

PLAN VIEW



ELEVATION VIEW



SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

(A) Finished surface

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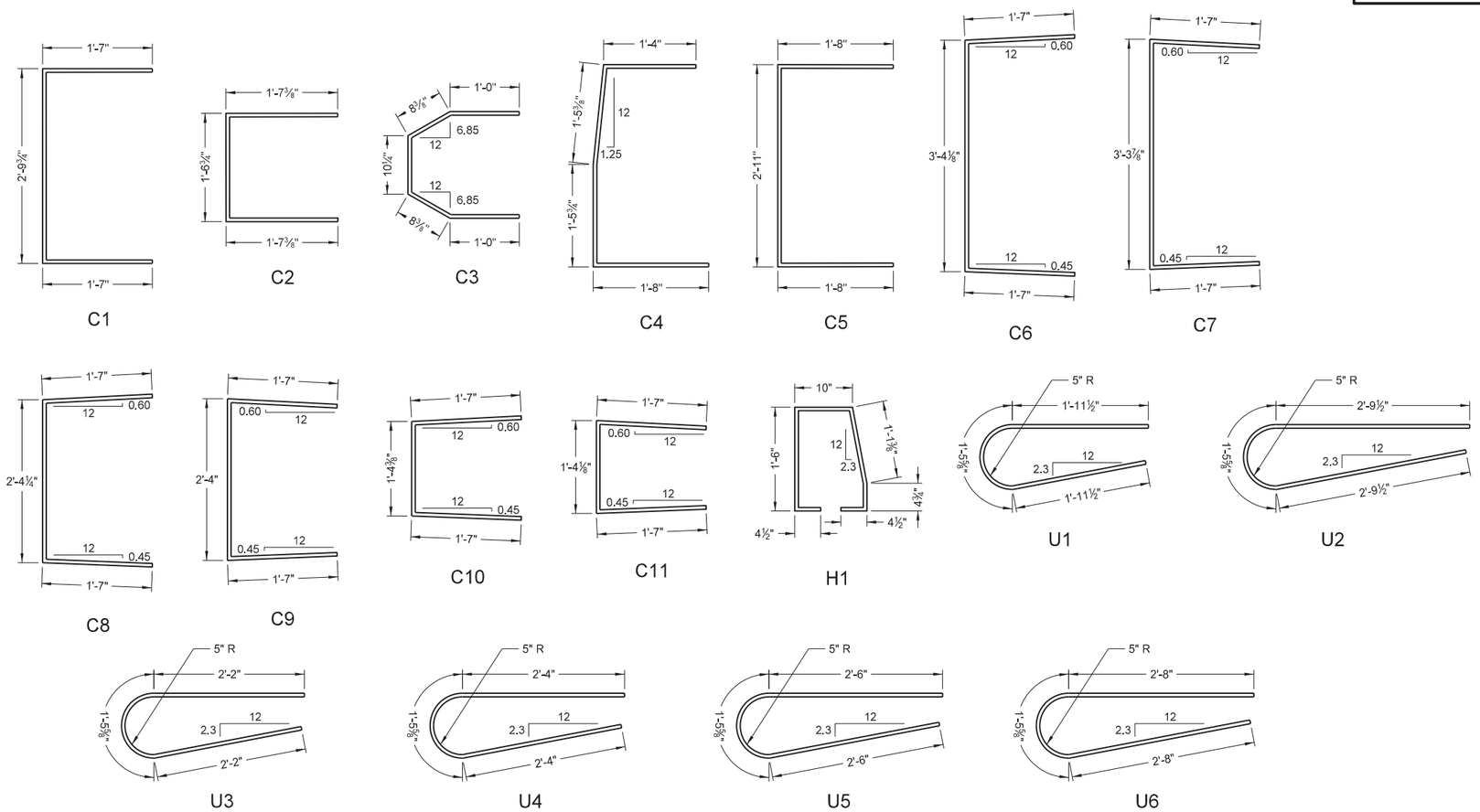
Single Slope Barrier Details
Reinforcing Steel Layout

Median Pier Protection

Apple Creek Separation
RP 166.531
I-94

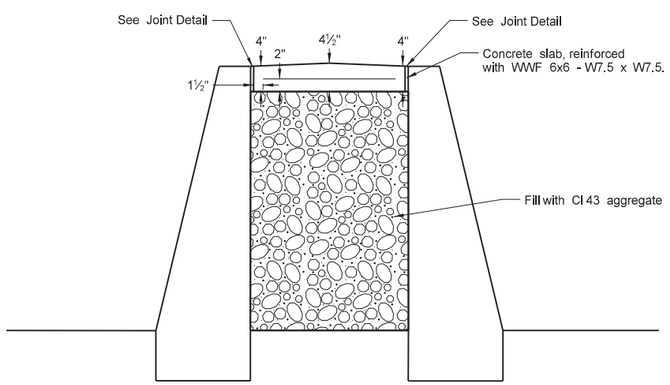
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	12

23 USC § 409 Documents
NDDOT Reserves All Objections

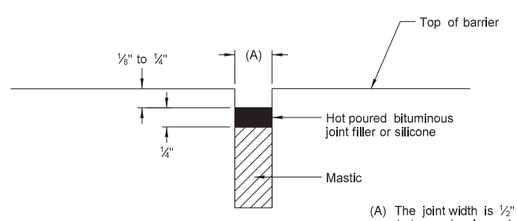


BENT BAR DETAILS

BAR LIST				
MARK	SIZE	NO.	LENGTH	SHAPE
C1	6	14	5'-11¾"	BENT
C2	5	6	4'-9½"	BENT
C3	5	4	4'-3"	BENT
C4	5	48	5'-11⅛"	BENT
C5	5	4	6'-3"	BENT
C6	5	8	6'-6⅛"	BENT
C7	5	8	6'-5⅞"	BENT
C8	5	8	5'-6¼"	BENT
C9	5	8	5'-6"	BENT
C10	5	6	4'-6⅜"	BENT
C11	5	6	4'-6⅛"	BENT
H1	5	270	4'-7⅛"	BENT
T1	5	16	31'-0"	STRAIGHT
T2	5	36	32'-6"	STRAIGHT
T3	5	12	9'-4¼"	STRAIGHT
T4	5	8	8'-7"	STRAIGHT
U1	5	40	5'-4⅝"	BENT
U2	5	94	7'-0⅝"	BENT
U3	5	36	5'-9⅝"	BENT
U4	5	36	6'-1⅜"	BENT
U5	5	32	6'-5⅝"	BENT
U6	5	32	6'-9⅝"	BENT



4" Slab and Aggregate Fill Detail



Joint Detail

(A) The joint width is ½" between barrier and 4" slab, and between barrier and pier columns.

Construction notes:

1. Construct barriers according to the provisions of Section 602.04 G, except no deflection joints are required. Make ¾" V-grooves in all faces of the barriers at approximately 10 foot spacings.
2. Dimensions of bent bars are given out to out. The length of bent bars listed is the sum of the detailing dimensions. All radii are given to the inside of the bend.
3. Use grade 60 reinforcing steel and Class AAE-3 concrete
4. Longitudinal reinforcing splice length is 19"
5. Surface finish "D" is required for all exposed surfaces of the barrier. See Section 170 for surface finish color.

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07/23/20

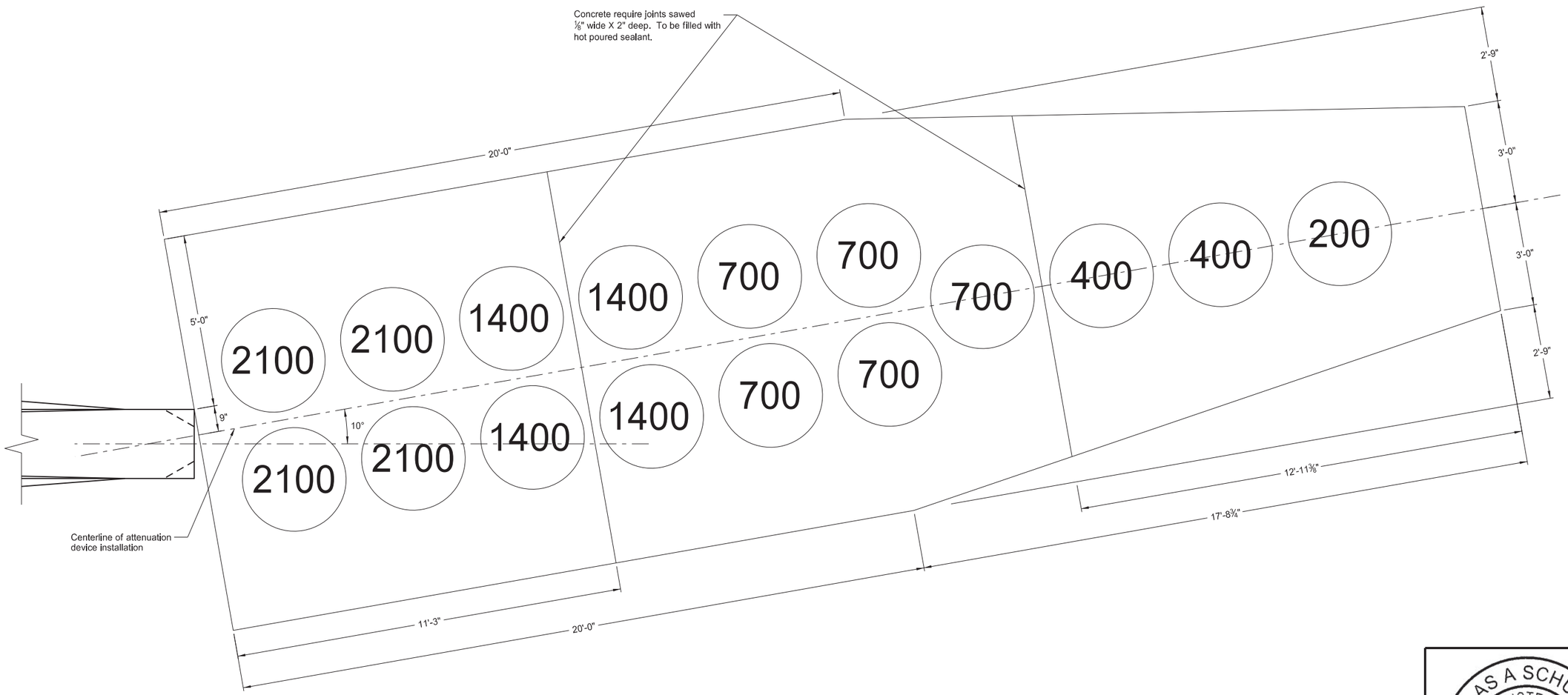
Single Slope Barrier Details, Bent Bar Details, Bar List, Joint Detail, 4" Slab and Aggregate Fill Detail

Median Pier Protection

Apple Creek Separation
RP 166.531
I-94

23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	130	13



Plan View
Area = 385.13 square feet

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07/23/20

Construct the barrel attenuation device bases using either 2" of aggregate base and 8" of HMA, or 2" of aggregate base and 6" of Class AE-3 concrete. Slightly slope the surface of the bases to facilitate drainage.

Paint the perimeter of each attenuation device module, and the specified mass (weight) of Cl 43 aggregate in each module on the surface of the bases.

Include all materials, equipment and labor required to construct the concrete or asphalt slab in the contract unit price bid for item "Modify Barrel Attenuation Device."

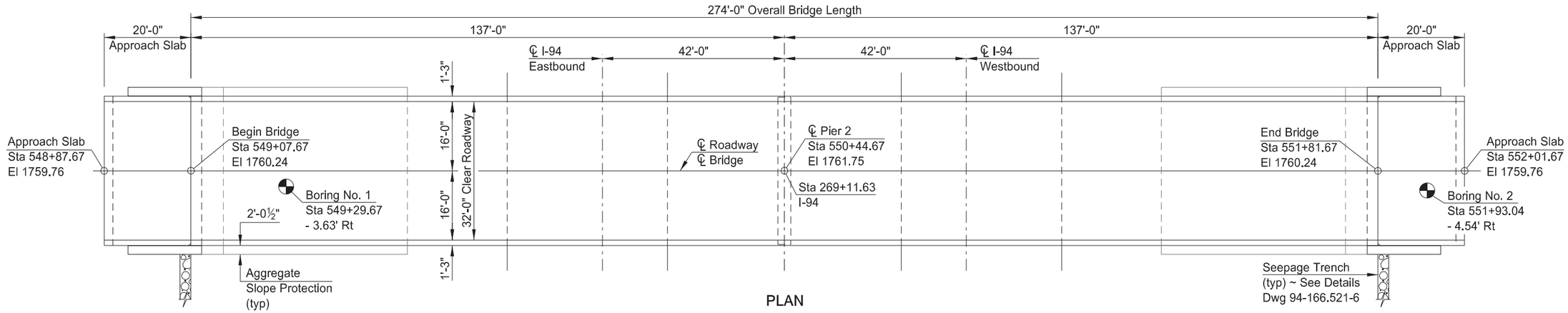
Barrel Attenuation Device Base Details

Median Pier Protection

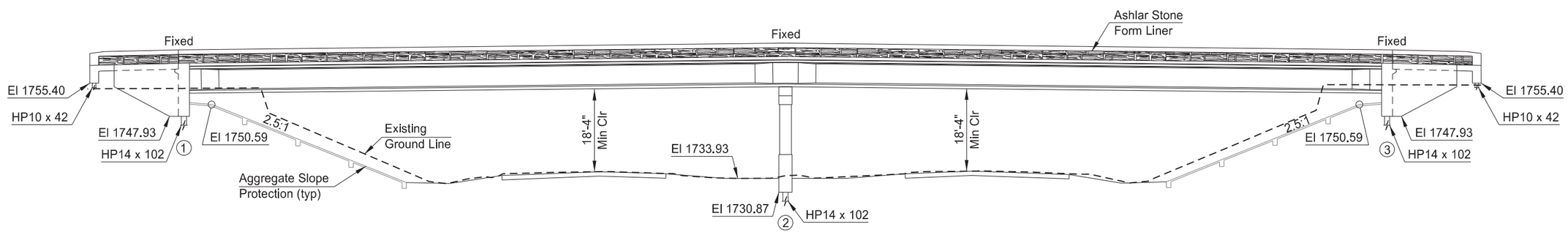
Apple Creek Separation
RP 166.531
I-94

23 U.S.C. 409
NDDOT Reserves All Objections

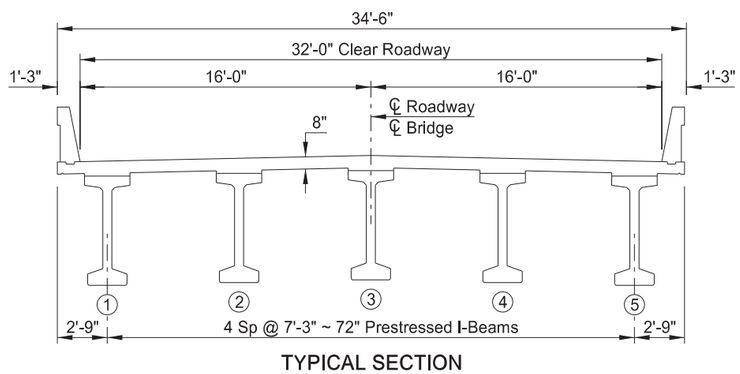
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	1



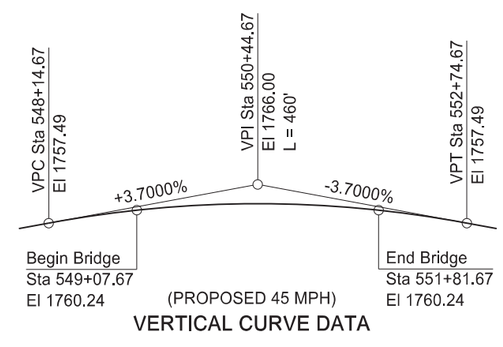
PLAN



ELEVATION



TYPICAL SECTION



VERTICAL CURVE DATA

DESIGN STRENGTHS:

f'c = 3,000 psi ~ Class AE-3 Concrete
f'c = 4,000 psi ~ Class AAE-3 Concrete
f'c = 6,500 psi ~ Prestressed Beam Concrete
fy = 60,000 psi ~ Reinforcing Steel

Load & Resistance Factor Design

SURVEY CONTROL POINTS			
POINT	NORTHING	EASTING	ELEVATION
RTK 22,078	426,889.68	1,937,543.82	1,732.92
RTK 22,079	426,883.20	1,937,178.68	1,733.08

REGISTERED PROFESSIONAL ENGINEER
DUSTIN WING
PE-7128
DATE
08/06/20
NORTH DAKOTA
DocuSign

SPECIAL PROVISIONS	
SP 4(14)	MIGRATORY BIRD TREATY ACT
SP 576(14)	ARCHITECTURAL SURFACE FINISH

STANDARD DRAWINGS

D-622-1, D-714-18, D-900-1

F.W.S. 15 PSF

HL-93 DESIGN LOADING

APPLE CREEK SEPARATION

BURLEIGH COUNTY
STATION: 550+44.67

BRIDGE LAYOUT

ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

08/07/20

DocuSign

NOTES

100 SCOPE OF WORK: This project consists of building a new 2-span prestressed concrete I-beam bridge with an overall bridge length of 274'-0" and a clear roadway width of 32'-0".

100 GENERAL: Include the cost of furnishing and placing preformed expansion joint filler, concrete inserts, rebar couplers, silicone sealant, waterproof membrane, and other miscellaneous items in the price bid for Class AE-3 and AAE-3 concrete.

105 WORK DRAWINGS: Submit work drawings for the prestressed concrete I-beams to the Engineer for review.

202 REMOVAL OF STRUCTURE: The existing structure is a 4-span steel rolled beam bridge, 240'-0" long with a clear roadway width of 24'-0". The substructures are made of concrete and supported on steel encased concrete (SEC) piling. Remove the abutments and center pier entirely. Remove the outside piers 1'-0" below the new ground line. Cut the SEC piles at 1'-0" below the new ground line.

Include all costs for the removal of the bridge and concrete slope protection in the contract unit price for "Removal of Structure."

210 EXCAVATION: Include the excavation costs at the abutments, as shown in the "Detail at Abutment", and the excavation costs at the pier in the lump sum bid item, "Class 1 Excavation."

602 DIAPHRAGMS AND ENDWALLS: Place the intermediate diaphragm concrete before the deck concrete and allow the diaphragms to cure at least 72 hours before deck placement. Place the pier diaphragm and endwall concrete at the same time as the deck concrete.

602 DECK PLACEMENT: Place the deck concrete at a minimum rate of 50 CY per hour.

602 BRIDGE DECK AND APPROACH SLAB CURING: Do not cover the wet cure burlap with a waterproof material such as polyethylene during the curing period.

602 LONGITUDINAL GROOVING: Do not run a metal tine transversely across the deck or approach slab surfaces immediately following the artificial grass drag as per 602.04 D. After the curing of the deck and approach slabs is complete and before the penetrating water repellent is applied, cut in longitudinal grooves into the deck and approach slabs using a mechanical cutting device. Perform any required surface correction grinding to the deck and approach slabs prior to grooving it. Cut grooves that are 1/8 inch in width (±1/64 inch) and 1/8 inch in depth (±1/64 inch). Space grooves at ¾ inch center to center. Stop the grooving 2 feet from the face of the barrier/curb and 6 inches from the beginning and end of the deck and approach slabs. Include the price for grooving in the bid item "Class AAE-3 Concrete."

602 FORM LINERS: Include the cost to provide and install the form liners in the price bid for the appropriate concrete items.

602 BARRIERS: Construct V-grooves that are ¾ inch wide and ¾ inch deep in all faces, excluding the form liner areas, of the barriers at the pier and at equal spaces between the pier and abutments at approximately 10-foot spacing.

602 SURFACE FINISH "D": Apply Surface Finish "D" to all exposed substructure surfaces, the fascia of the exterior beams, the outside edges of the pier diaphragm, the outside edges of the deck, the exposed endwall areas outside of the exterior beams, and to all bridge and approach slab barrier surfaces except for the recessed form liner areas. Use gray surface finish color number 36424 meeting Federal Standard 595C for the inside surfaces of the bridge and approach slab barrier. Use a color matching the darkest shade of brown in the Architectural Surface Finish, as it looks applied to the barrier form liner areas, for all other surfaces.

622 PREBORING: Bore pilot holes for the abutment and approach slab piling to an elevation of 1732 feet before driving piling. Do not bore pilot holes until all of the constructed embankment is in place. Bore pilot holes to a diameter of 24 inches. Prior to pile driving, backfill the pilot holes with polymer free sodium bentonite slurry. Mix the slurry at a ratio of 100 gallons of water per 120 pounds of bentonite. Use powdered bentonite to mix the slurry. Do not use bentonite chips. Place the slurry in the pilot hole from the bottom up using a tremie pipe. Check the hole after 24 hours for settlement of the slurry and top off the hole with slurry mixed at the previously specified ratio. Repeat this process until no observed settlement of the slurry occurs. Include all costs associated with boring pilot holes and backfilling with bentonite in the price bid for HP10 x 42 and HP14 x 102 piling.

622 PILING: Drive bridge piling with a diesel hammer with a rated energy and ram weight (minimum of 6,000 pounds) of at least 211,442 foot-pound-tons computed by the formula:

$W(E–30,800) + 1.373E$

Drive approach slab piling with a diesel hammer with a rated energy and ram weight (minimum of 2,800 pounds) of at least 45,535 foot-pound-tons computed by the formula:

$W(E–12,936) + 0.704E$

W = Weight of the ram (tons)
E = Rated hammer energy

Run the hammer at an energy that produces a penetration at bearing between ½" and 3 inches in the last 10 blows.

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NOTES

930 ROADWAY CANOPY: Construct a canopy above the traveled roadway under the existing structure and a canopy under the new structure to protect traffic from falling material. The canopies are an added safeguard and do not relieve the Contractor from any responsibility for the safety of the public.

Submit the canopy details, including materials that will be used, to the Engineer for review. Provide a canopy under the existing structure with 15’-6” of clearance above the traveled roadway, and a canopy for the new structure with 17’-4” of clearance above the traveled roadway. The canopies will be extended a minimum distance of 5'-0" beyond the outside edge of deck of the structures and a minimum distance of 5'-0" beyond the edge of the driving lanes beneath the structures.

Construct the first canopy before the concrete superstructure of the existing structure is removed. The second canopy must be in place before installing forming for the new deck. This canopy will remain in place until after the new superstructure is complete.

The canopies may be supported from the ground or suspended from the beams. Complete the installation of the canopies in a minimum amount of time and with the least inconvenience to the public.

Include all costs for construction, maintenance, and removal of the canopy systems for the existing structure and the new structure in the Lump Sum bid item “Roadway Canopy.”

930 AGGREGATE SLOPE PROTECTION: Place aggregate slope protection on the embankment slopes as shown.

Clear the subgrade of rubbish and vegetation before placing the aggregate slope protection. Thoroughly compact all loose material. Excavate or backfill as required to obtain the plan cross-section or lines and grades established in the field.

The gradation of the material used to form the slope protection is given in the following chart:

Sieve Size	% Passing
2"	100%
¾"	5-35%
#4	0-5%

The minimum fractured face requirement of the aggregate is 50% by weight on the portion of the aggregate retained on the No. 4 sieve. To be considered fractured the rock must have at least one fractured face.

Deposit, spread, consolidate, and shape the aggregate by mechanical or hand methods to provide a uniform depth and density and produce a uniform surface appearance. Apply MC-250 that meets the requirements of Section 818.02 C, “Medium-Curing Cutback Asphalt” at an approximate rate of 1.8 gallons per square yard. The bituminous materials are to penetrate to a depth of not less than one-half the required thickness of the aggregate. Protect adjacent structure surfaces against bituminous splatter. Include all costs for labor, materials, and equipment to complete this work in the unit price bid for “Aggregate Slope Protection.”

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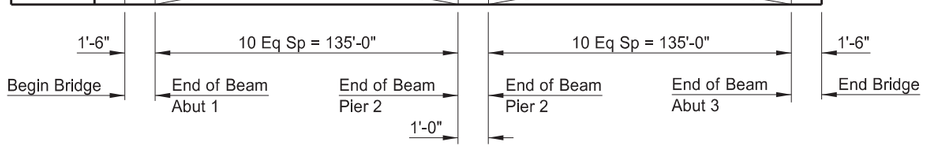
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	4

℄ BEAM 1	℄ BEAM 2	℄ BEAM 3	℄ BEAM 4	℄ BEAM 5
1759.93	1760.08	1760.24	1760.08	1759.93
1759.97	1760.12	1760.27	1760.12	1759.97
1760.29	.44	.59	.44	1760.29
.58	.73	1760.88	.73	.58
1760.83	1760.99	1761.14	1760.99	1760.83
1761.05	1761.20	.35	1761.20	1761.05
.21	.37	.52	.37	.21
.34	.49	.64	.49	.34
.42	.58	.73	.58	.42
.47	.62	.77	.62	.47
.47	.62	.77	.62	.47
1761.44	1761.59	1761.75	1761.59	1761.44
1761.44	1761.59	1761.75	1761.59	1761.44
.47	.62	.77	.62	.47
.47	.62	.77	.62	.47
.42	.58	.73	.58	.42
.34	.49	.64	.49	.34
.21	.37	.52	.37	.21
1761.05	1761.20	.35	1761.20	1761.05
1760.83	1760.99	1761.14	1760.99	1760.83
.58	.73	1760.88	.73	.58
.29	.44	.59	.44	.29
1759.97	1760.12	1760.27	1760.12	1759.97
1759.93	1760.08	1760.24	1760.08	1759.93

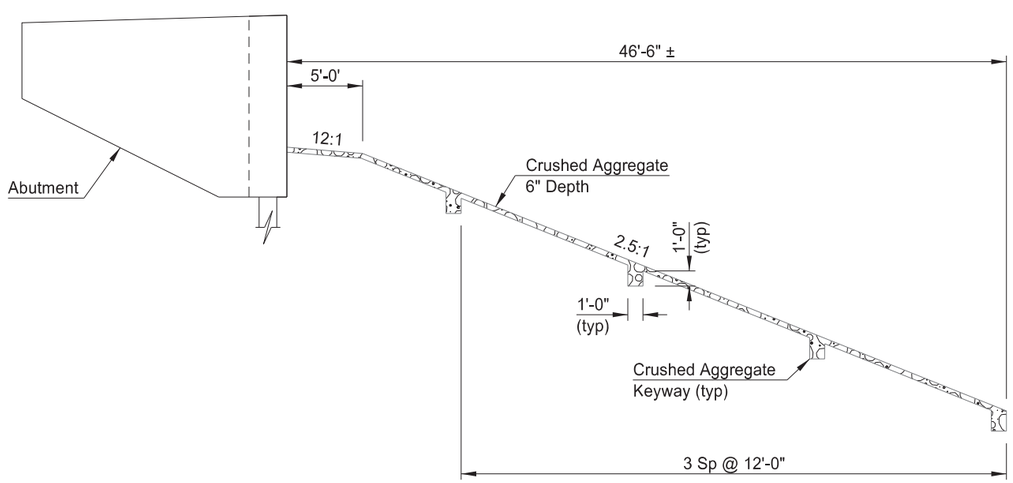


Beam 1 is the west beam.

SCREED ELEVATIONS

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0105	REMOVAL OF STRUCTURE	L SUM	1
210	0099	CLASS 1 EXCAVATION	L SUM	1
210	0201	FOUNDATION PREPARATION	EA	1
602	0130	CLASS AAE-3 CONCRETE	CY	393.2
602	1130	CLASS AE-3 CONCRETE	CY	136.0
602	1134	PILE SUPPORTED APPROACH SLAB	SY	153.4
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	1,390
604	9925	PRESTRESSED I-BEAM-72 IN	LF	1,350
612	0115	REINFORCING STEEL-GRADE 60	LBS	19,120
612	0116	REINFORCING STEEL-GRADE 60-EPOXY COATED	LBS	87,209
622	0020	STEEL PILING HP 10 X 42	LF	960
622	0070	STEEL PILING HP 14 X 102	LF	1,950
930	3000	BRIDGE BENCH MARKS	SET	1
930	7012	ROADWAY CANOPY	L SUM	1
930	8600	ELASTOMERIC BEARING PAD	SF	40
930	8686	AGGREGATE SLOPE PROTECTION	SY	426
930	9537	ABUTMENT UNDERDRAIN SYSTEM	EA	2



ELEVATION

AGGREGATE SLOPE PROTECTION DETAIL

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SCREED ELEVATIONS, BID ITEM QUANTITIES & SLOPE PROTECTION DETAIL

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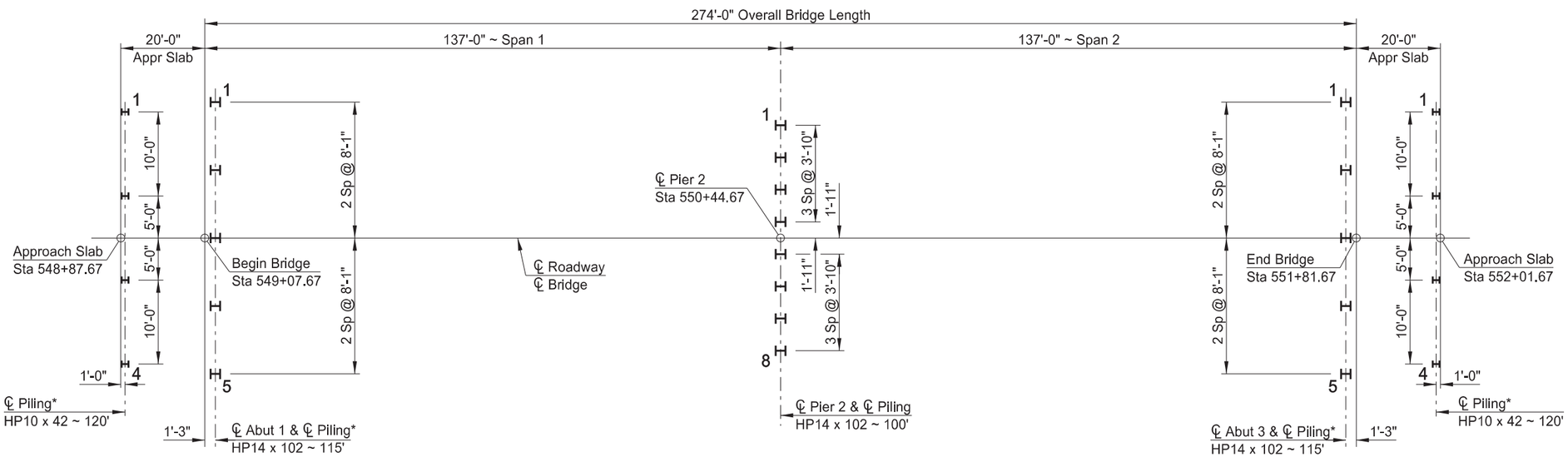
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	5



* Do not drive approach slab or abutment piling until all constructed embankment is in place.

Drive the HP10 x 42 Pile to a Safe Bearing value of 105 tons.
Drive the HP14 x 102 Pile to a Safe Bearing value of 250 tons.

PILING LAYOUT

	PILE COORDINATES		
	PILE	NORTHING	EASTING
SOUTH APPR SLAB	1	426,738.73	1,937,419.13
	4	426,738.46	1,937,449.13
ABUT 1	1	426,758.99	1,937,418.15
	5	426,758.70	1,937,450.48
PIER 2	1	426,894.71	1,937,422.15
	8	426,894.47	1,937,448.98
ABUT 3	1	427,030.48	1,937,420.65
	5	427,030.18	1,937,452.98
NORTH APPR SLAB	1	427,050.72	1,937,422.01
	4	427,050.44	1,937,452.00

NOTE:

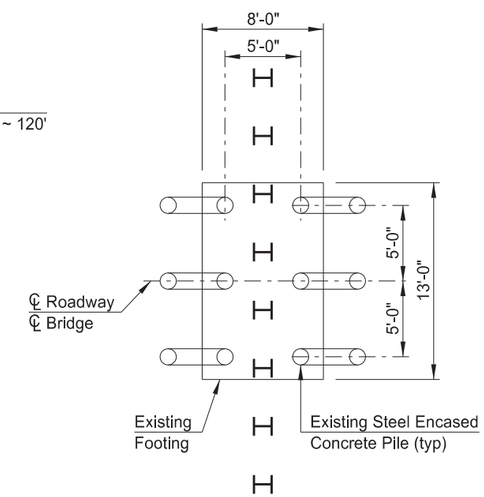
For double acting or single acting diesel hammers, calculate the safe bearing value of piles by the following formula:

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

Where:

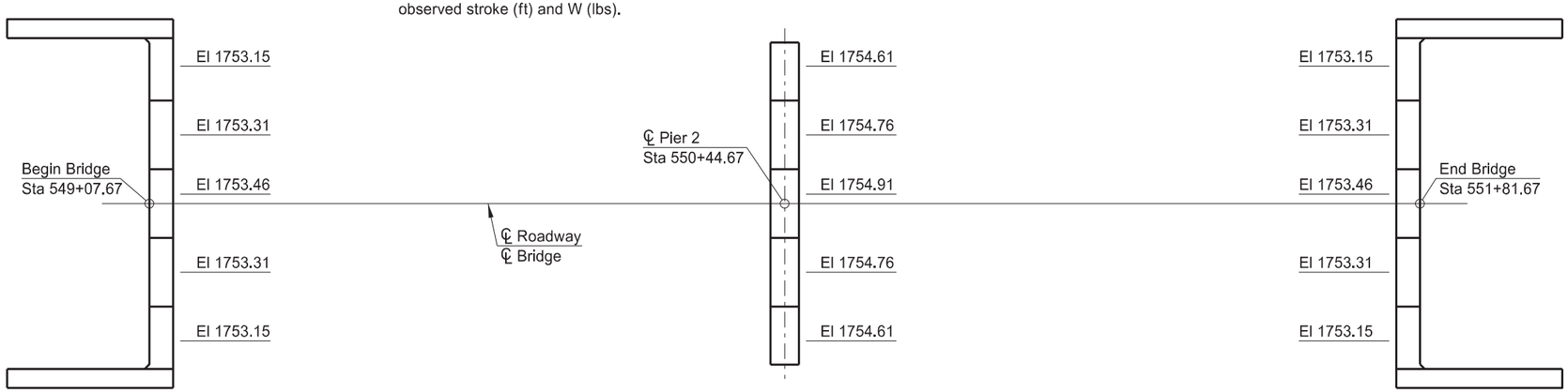
P = Safe bearing value, in pounds.
W = Weight of striking parts (ram), in pounds.
M = Weight of parts being driven, in pounds. Includes pile weight, anvil (if any), driving cap, etc.
E = Energy per blow, in foot-pounds.
S = Average penetration of pile in inches per blow for last ten blows.

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



Existing SEC piling are battered at 1.5:12 as shown.

PIER 2 PILING LAYOUT



Elevations shown are to top of finished concrete.

BEARING ELEVATIONS

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APPLE CREEK SEPARATION

PILING LAYOUT &
BEARING ELEVATIONS

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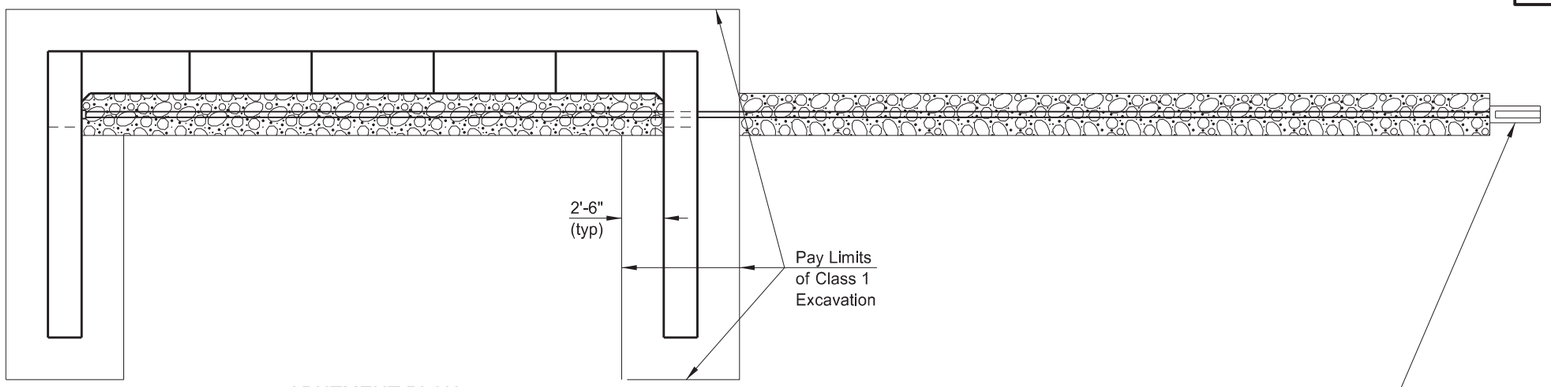
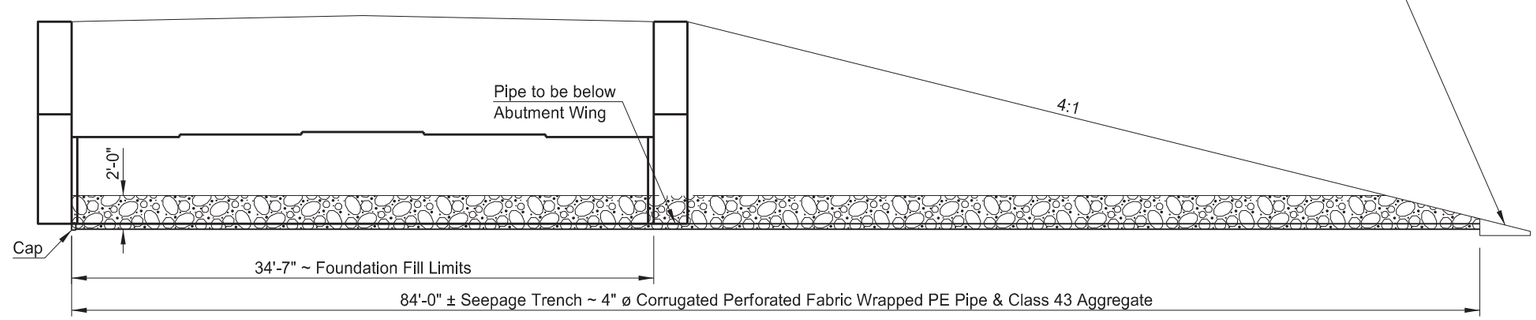
NDDOT Reserves All Objections

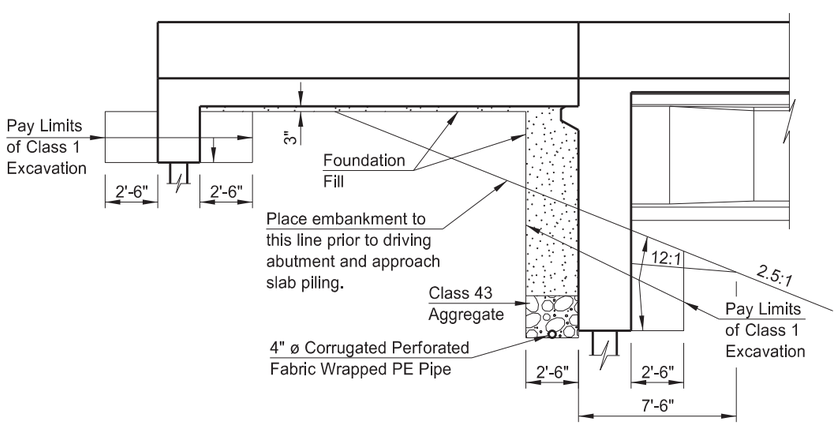
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	6



ABUTMENT PLAN



BACK FACE OF ABUTMENT



DETAIL AT ABUTMENT

NOTES:

Use corrugated perforated fabric wrapped PE pipe that meets the requirements of Section 830.03 A.4. Provide fabric wrapping for the pipe that meets the requirements of Section 858.01 for D3 or D4 drainage fabric. Provide aggregate that meets the requirements of Section 816.03, Class 43. Provide foundation fill that meets the requirements of Section 210.

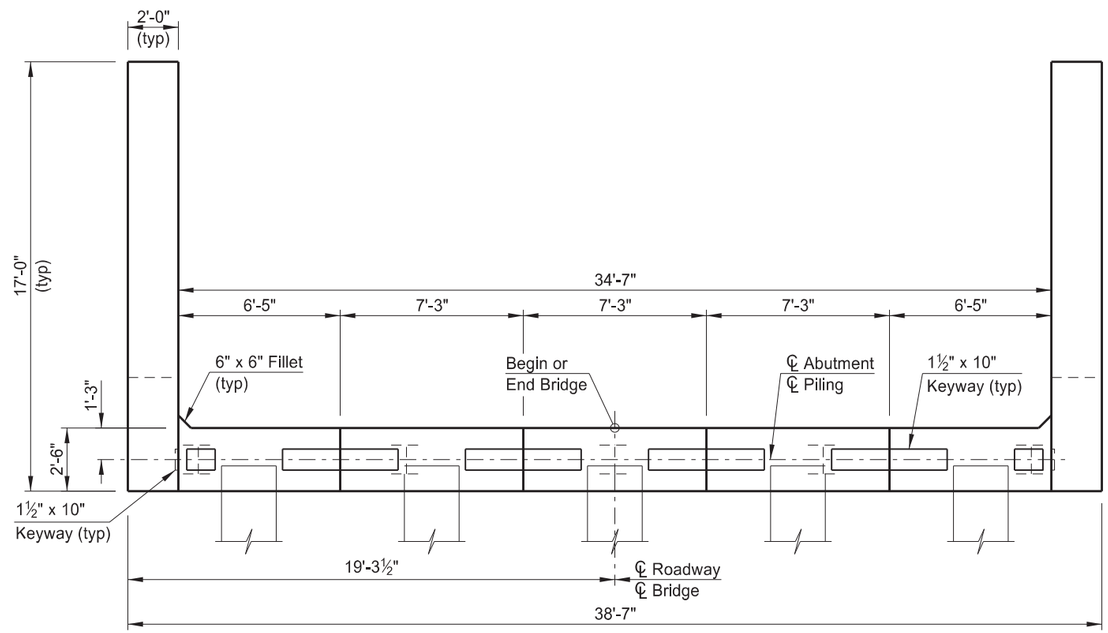
Include the cost to furnish and place the foundation fill, aggregate, corrugated perforated pipe and headwalls in the pay item "Abutment Underdrain System."

APPLE CREEK SEPARATION

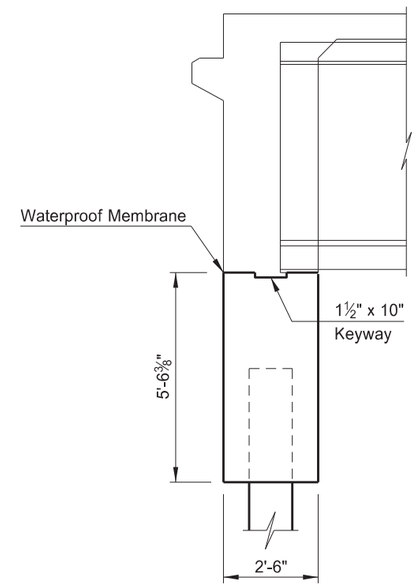
ABUTMENT UNDERDRAIN &
EXCAVATION DETAILS

23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	7



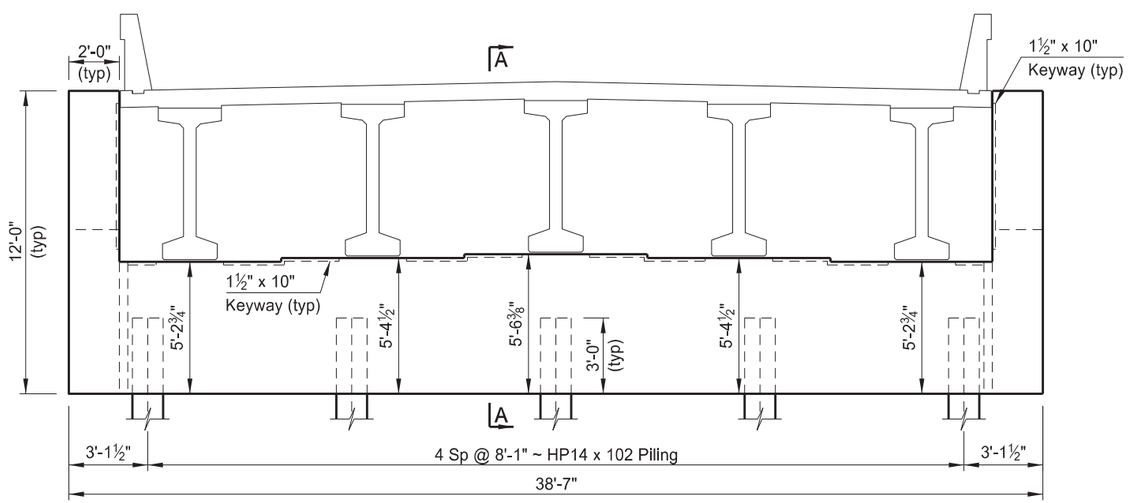
PLAN



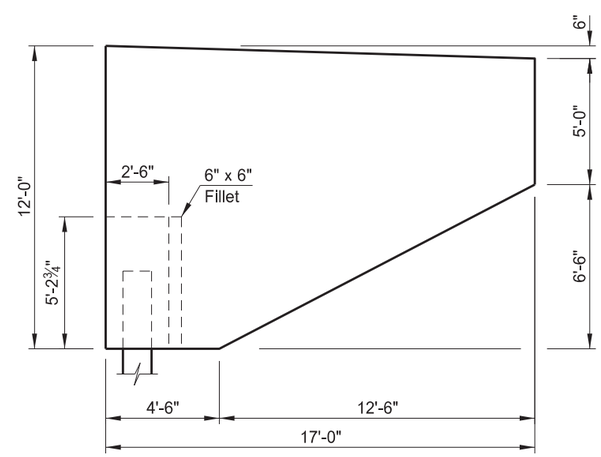
A-A

NOTE:

Use waterproof membrane that meets the requirements of Section 602.03 B. Center the waterproof membrane (1"-0" minimum width) on the joint.



ELEVATION



WING ELEVATION

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QUANTITIES
SEE DWG 94-166.521-8

APPLE CREEK SEPARATION

(SHOWING DIMENSIONS)

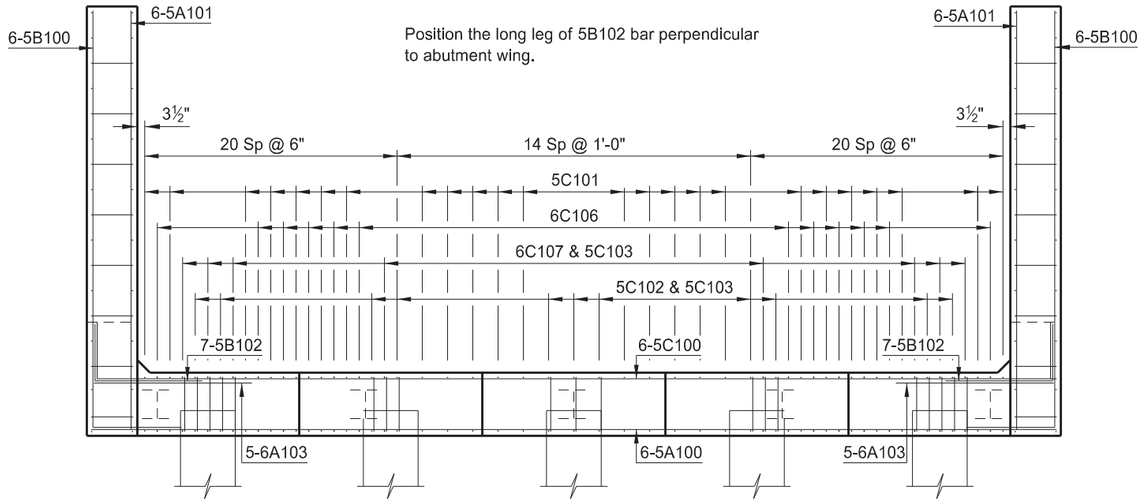
ABUTMENT DETAILS

23 U.S.C. 409
NDDOT Reserves All Objections

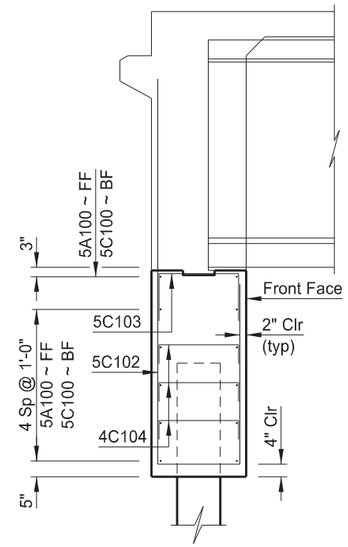
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	8

NOTE:

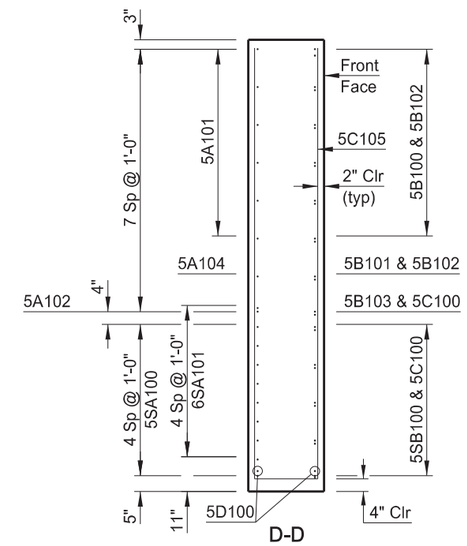
Position the long leg of 5B102 bar perpendicular to abutment wing.



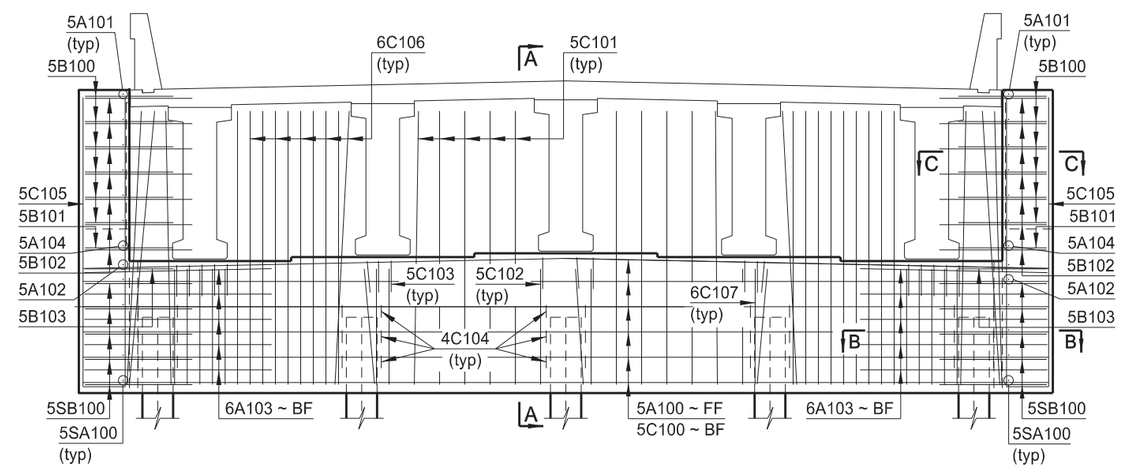
PLAN



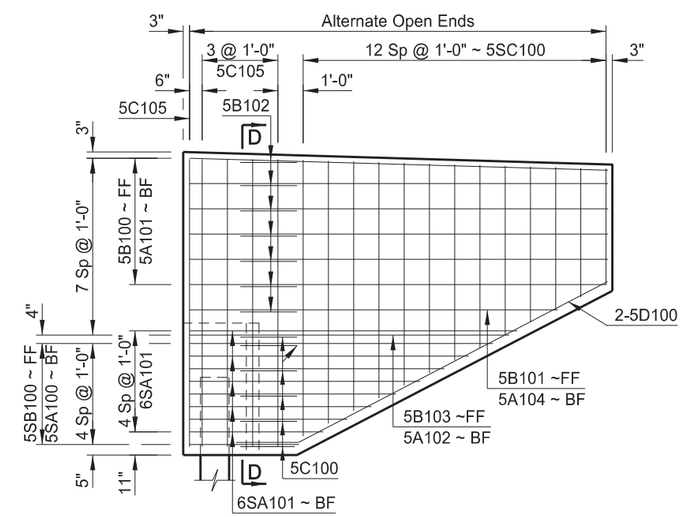
A-A



D-D



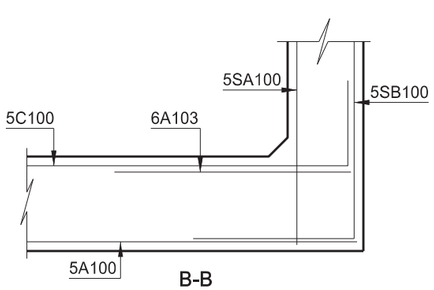
ELEVATION



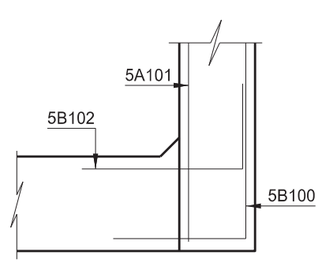
WING ELEVATION

NOMENCLATURE:

FF = Front Face
BF = Back Face



B-B



C-C

QUANTITIES	(ONE ABUTMENT)
CLASS AE-3 CONCRETE	40.8 CY
REINFORCING STEEL	4,047 LBS

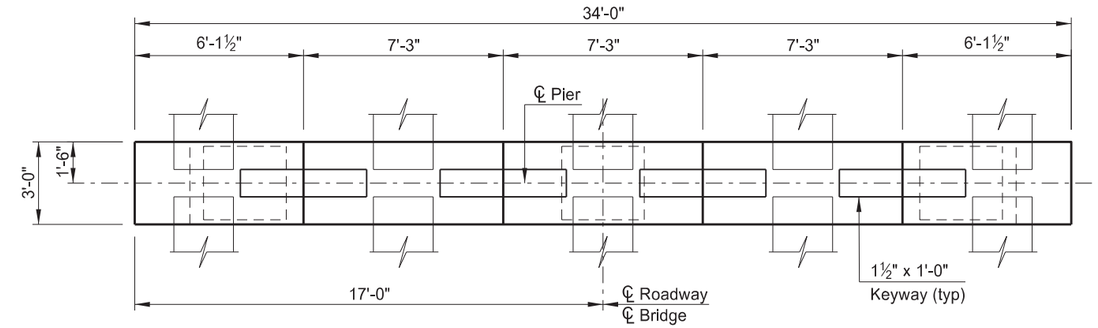
APPLE CREEK SEPARATION

(SHOWING REINFORCING)

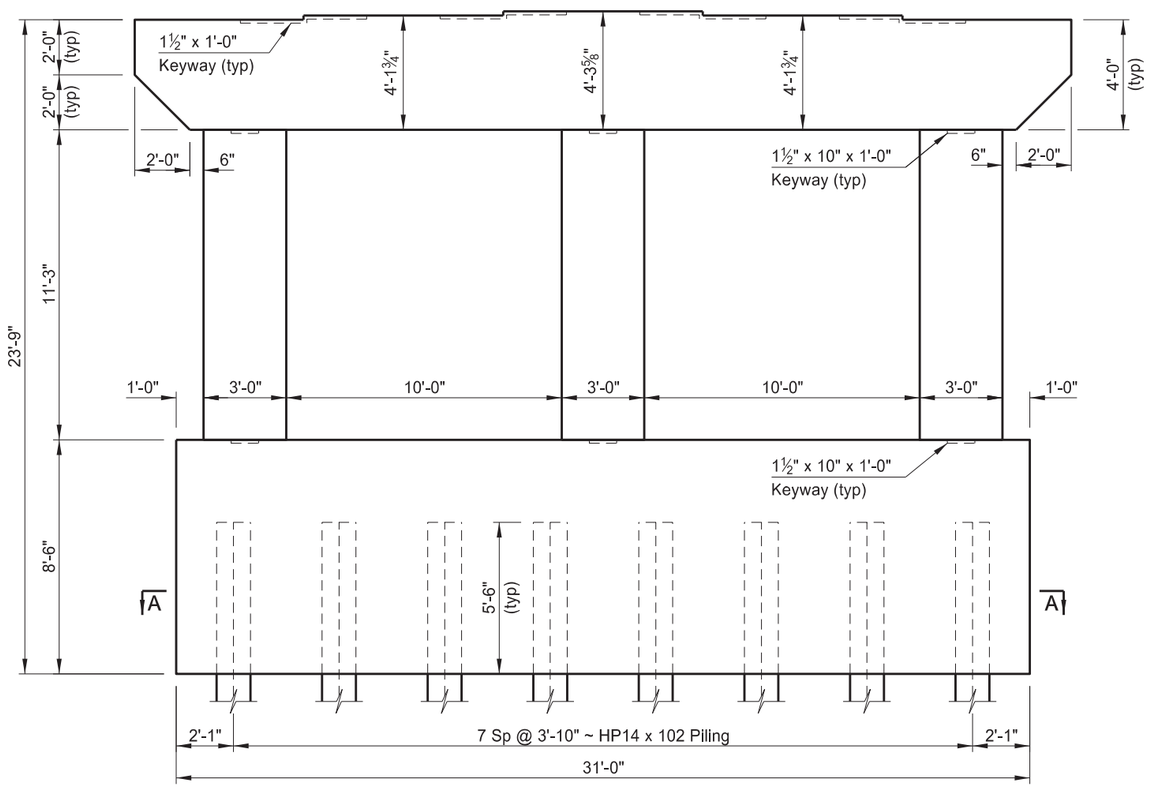
ABUTMENT DETAILS

23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	9



PLAN



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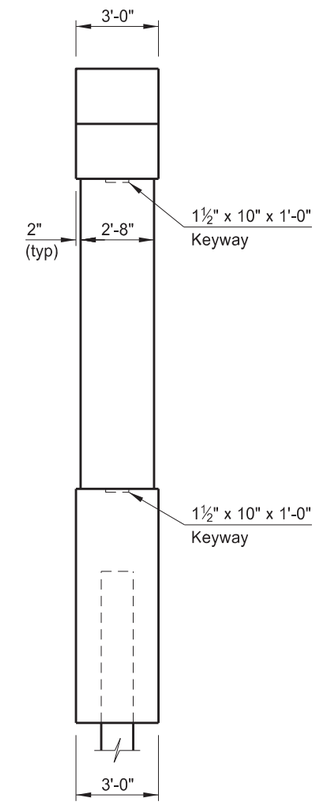
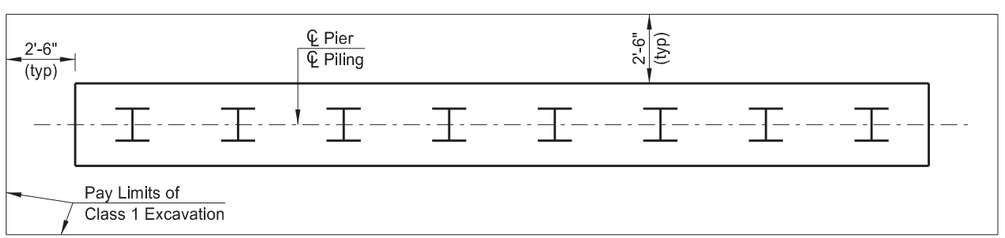


END VIEW



A-A

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QUANTITIES
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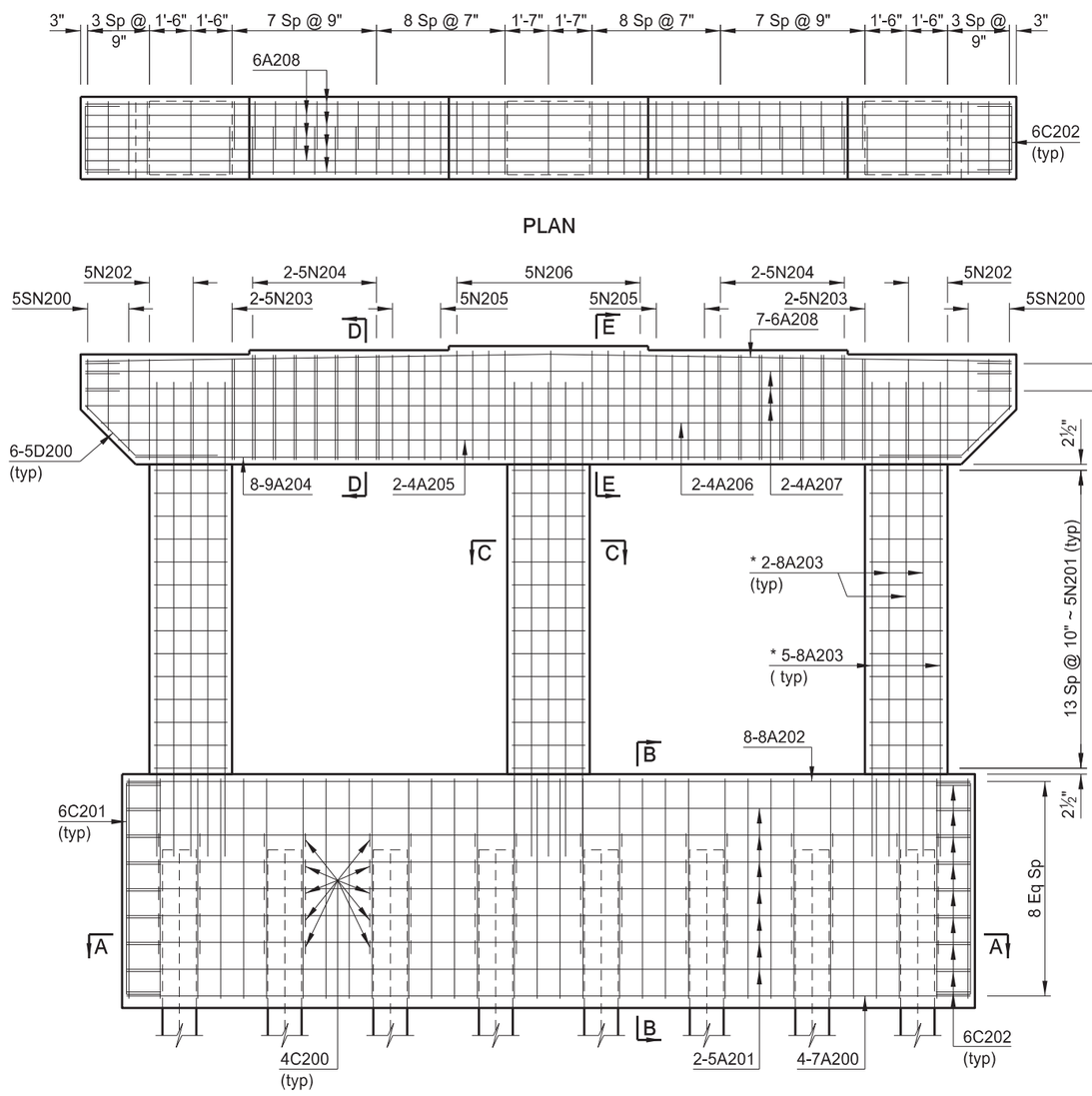
APPLE CREEK SEPARATION

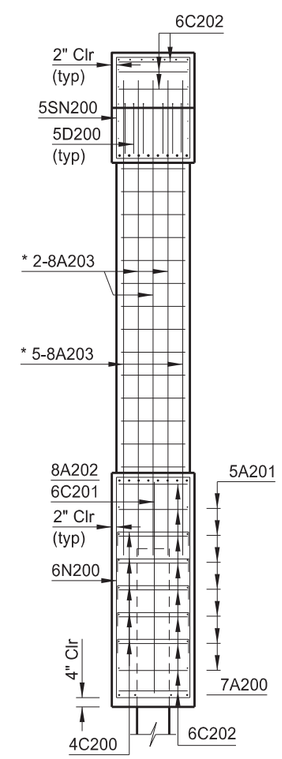
(SHOWING DIMENSIONS)

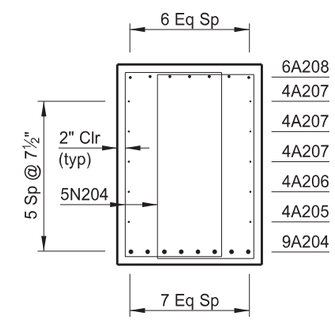
PIER DETAILS

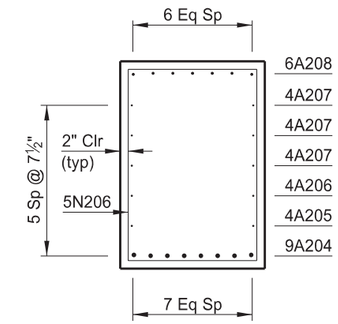
23 U.S.C. 409
NDDOT Reserves All Objections

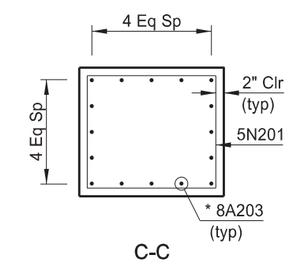
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	10



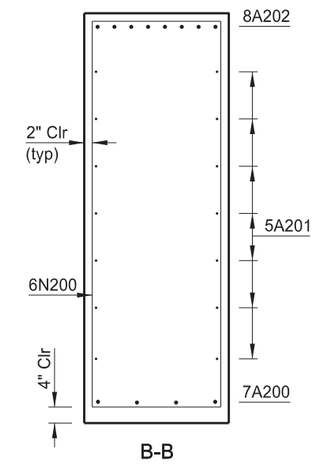


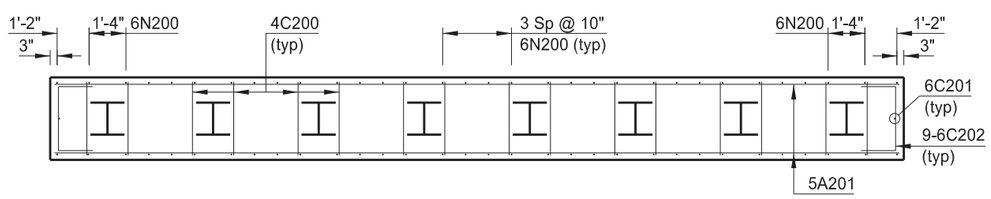






* Embed the 8A203 bars 3'-0" into the footing wall.





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DUSTIN WING
PE-7128
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QUANTITIES	
CLASS AE-3 CONCRETE	54.4 CY
REINFORCING STEEL	7,782 LBS

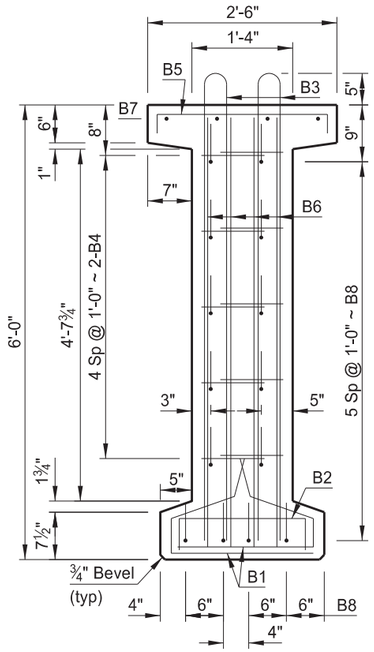
APPLE CREEK SEPARATION

(SHOWING REINFORCING)

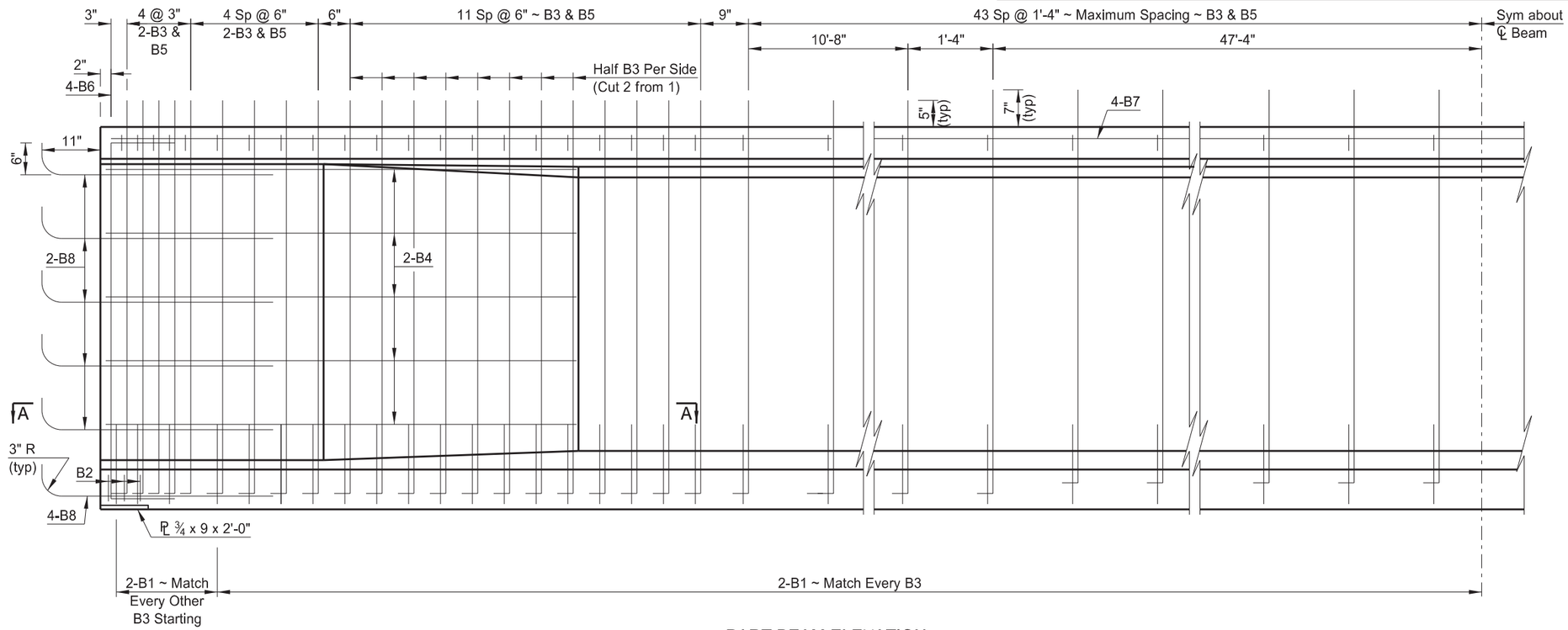
PIER DETAILS

23 U.S.C. 409
NDDOT Reserves All Objections

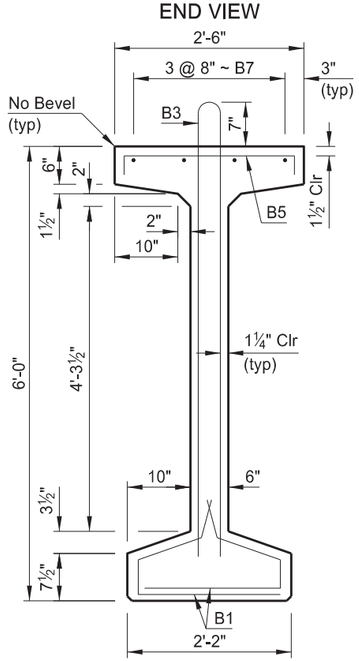
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	11



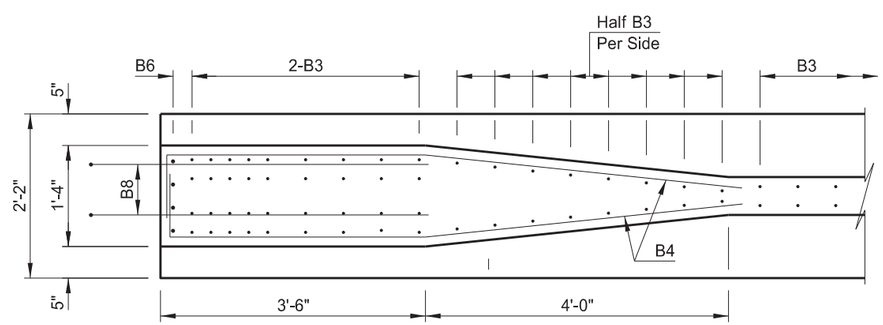
END VIEW



PART BEAM ELEVATION



SECTION @ ℄



A-A

BAR LIST ~ ONE BEAM				
MARK	SIZE	NO.	LENGTH	SHAPE
B1	4	246	3'-9"	BENT
B2	5	6	2'-6"	BENT
B3	4	147	13'-0"	BENT
B4	4	20	8'-5"	BENT
B5	3	129	2'-9"	BENT
B6	5	8	7'-8"	BENT
B7	5	20	29'-4"	STR
* B8	5	28	4'-0"	STR

* Field bend as shown (Grade 40).

BEAM SECTION DATA
WT = 846.0 LBS/FT + 5436 LBS FOR END BLOCKS
CROSS SECTIONAL AREA AT ℄ SPAN = 786 IN^2
C.G. (FROM BOTTOM) = 35.60 IN
I = 547,922 IN^4
S_B = 15,391 IN^3
END AREA = 1326.75 IN^2

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QUANTITIES	(ONE BEAM)
BEAM LENGTH	135.0 LF

APPLE CREEK SEPARATION

PRE-TENSIONED 72"
PRESTRESSED I-BEAM

23 U.S.C. 409
NDDOT Reserves All Objections

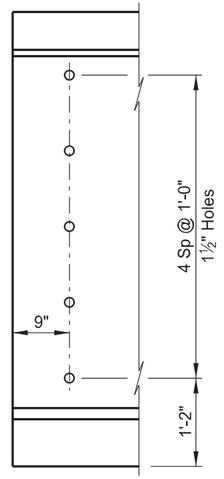
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	12

NOTES:

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

Provide holes and inserts in the beams at locations shown to accommodate the diaphragm bars.

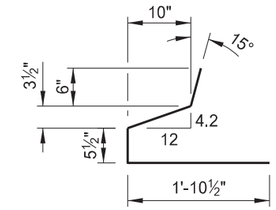
Minor changes to the shape of the beam and to reinforcing steel may be made to accommodate the forms of various contractors and their construction methods with the approval of the Engineer.



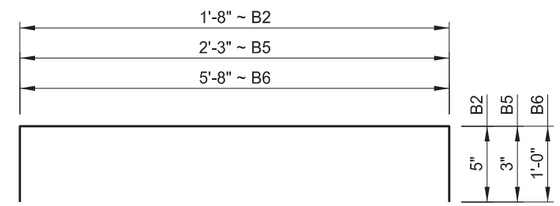
(Use holes for all beams at the Abutments & for the interior beams only at the Pier. Use inserts for the exterior beams at the Pier.)

ELEVATION

BEAM END DETAIL

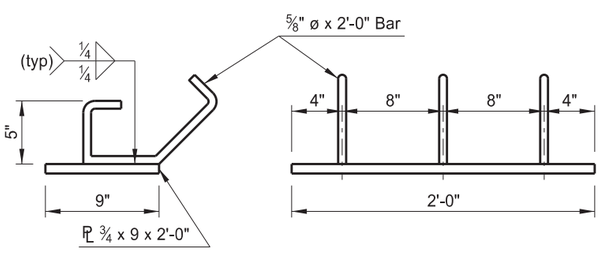


B1



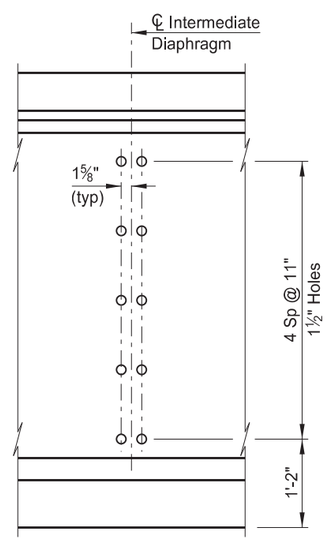
B2, B5 & B6

PRESTRESSING DATA					
C.G.	FINAL FORCE	DETENSION STRENGTH	ACCEPTANCE STRENGTH	WEIGHT (TONS)	BEAM LENGTH
4.25"	1273.9 k	6500 psi (Min)	6500 psi (Min)	60.3	135'-0"
4.50"	1280.2 k				
4.75"	1286.5 k				



(Use ASTM A36 steel, hot dipped galvanized, for the bearing plate. Include the costs in the bid price for the beam.)

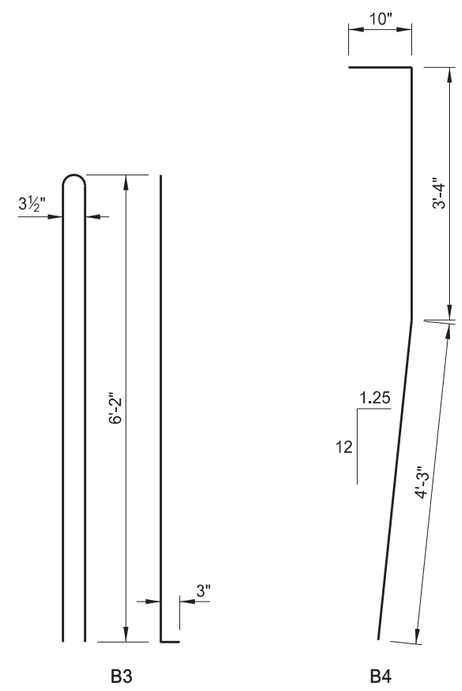
BEARING DETAIL



(Use holes for interior beams only. Use inserts for the exterior beams. See Dwg 94-166.521-13 for locations.)

ELEVATION

INTERMEDIATE DIAPHRAGM DETAIL



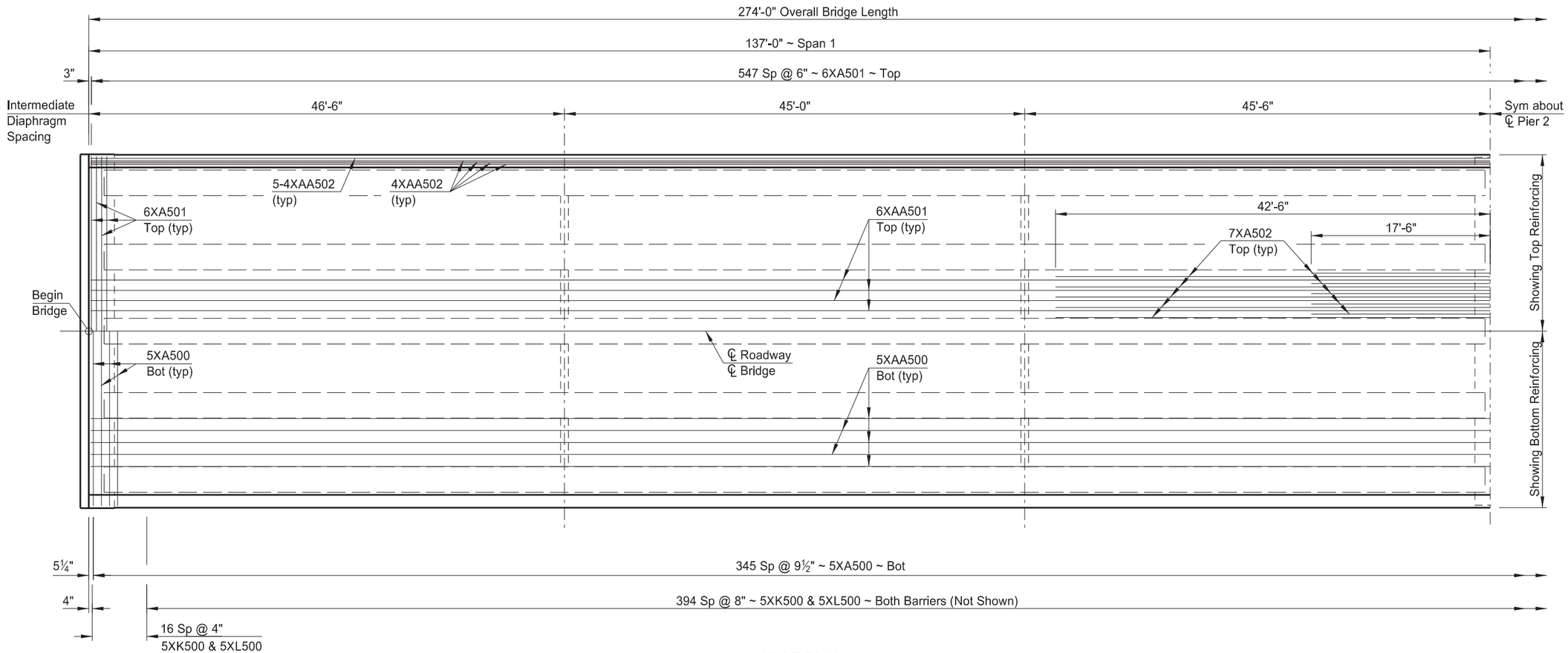
(DIMENSIONS SHOWN ARE OUT TO OUT)

BENT BAR DETAILS

APPLE CREEK SEPARATION

PRE-TENSIONED 72" PRESTRESSED I-BEAM

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	13



HALF PLAN

REGISTERED PROFESSIONAL ENGINEER
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PE-7128
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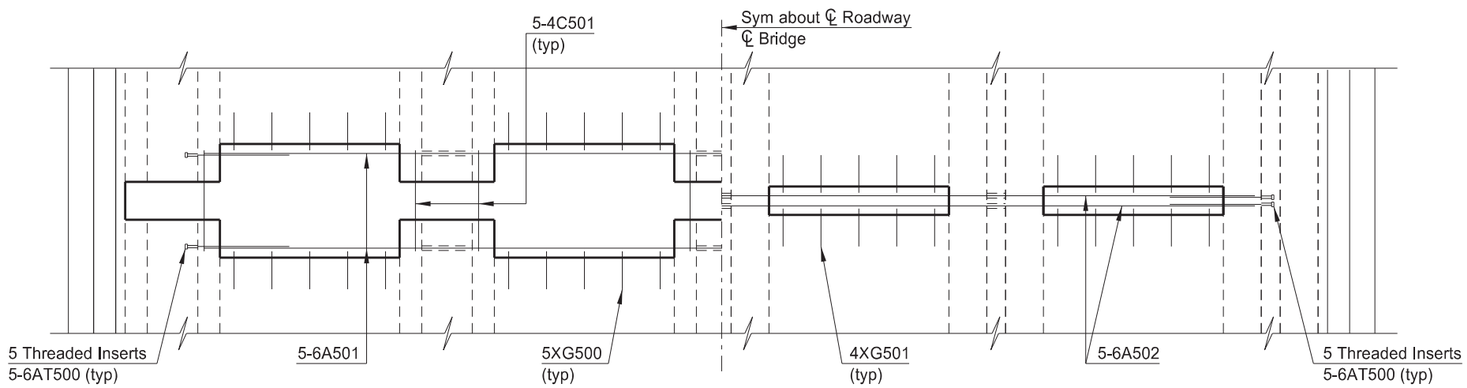
QUANTITIES
SEE DWG 94-166.521-16

APPLE CREEK SEPARATION

HALF SLAB LAYOUT

23 U.S.C. 409
NDDOT Reserves All Objections

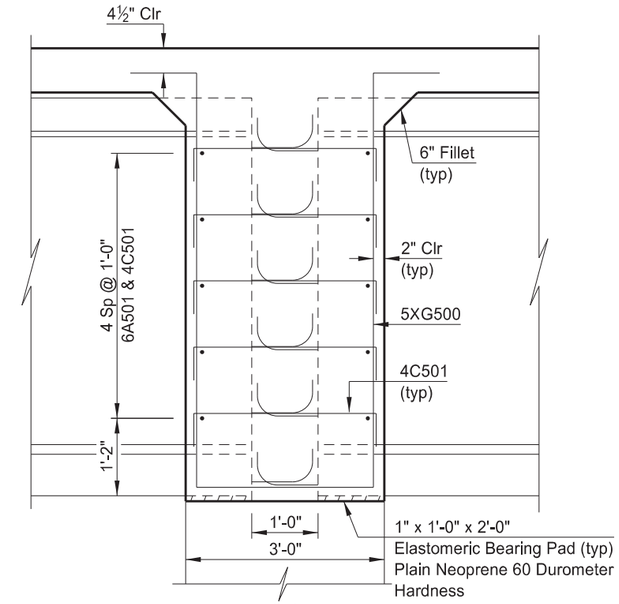
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	14



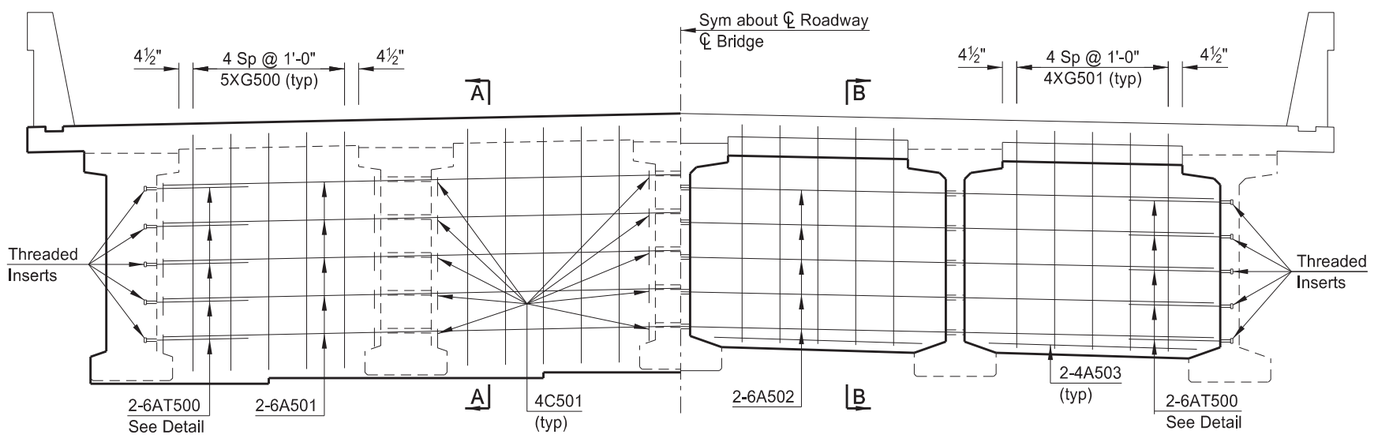
(SHOWING PIER DIAPHRAGM)

PLAN

(SHOWING INTERMEDIATE DIAPHRAGM)



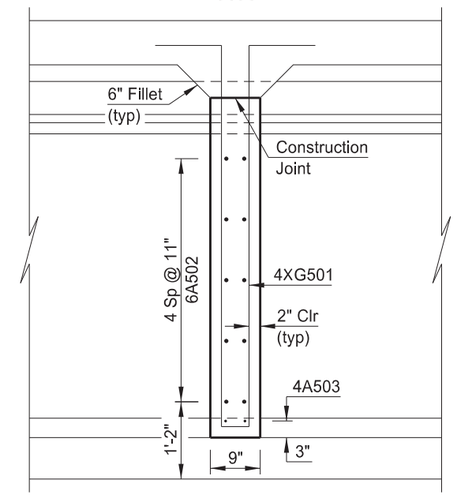
A-A



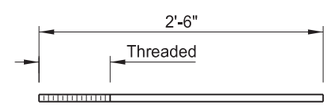
(SHOWING PIER DIAPHRAGM)

ELEVATION

(SHOWING INTERMEDIATE DIAPHRAGM)



B-B



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

6AT500 DETAIL

REGISTERED PROFESSIONAL ENGINEER
DUSTIN WING
PE-7128
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QUANTITIES

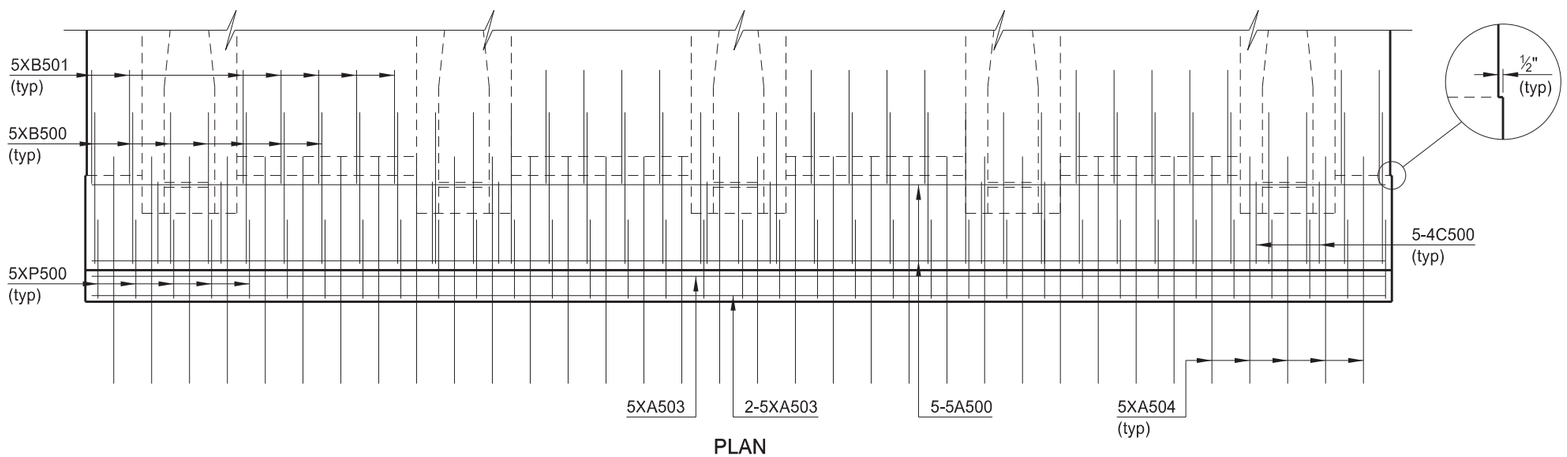
SEE DWG 94-166.521-16

APPLE CREEK SEPARATION

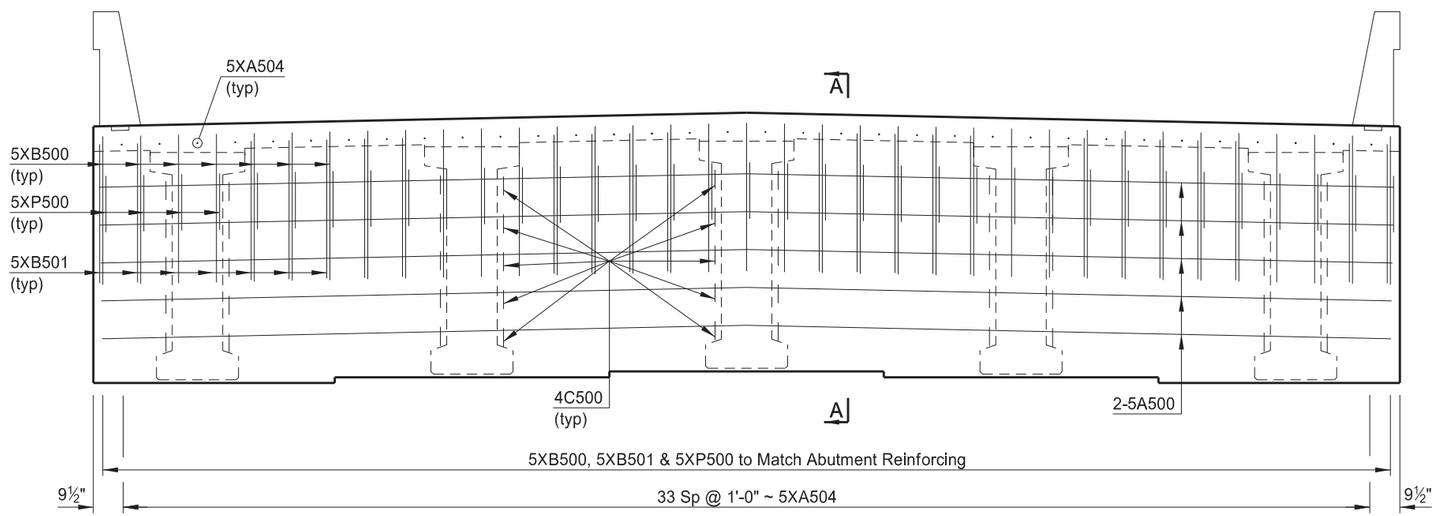
PIER & INTERMEDIATE
DIAPHRAGM DETAILS

23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	15

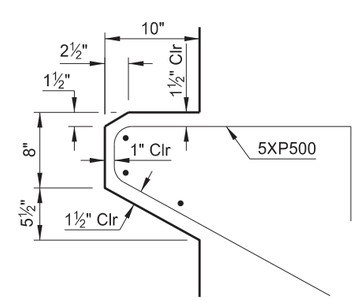


PLAN

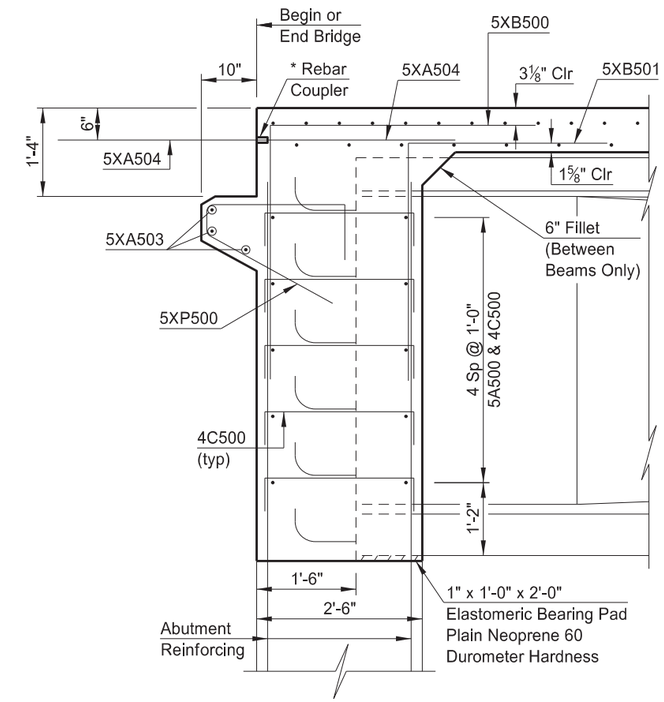


(APPROACH LIP NOT SHOWN)

ELEVATION



APPROACH LIP DETAIL



A-A

* Use approved mechanical connectors for the couplers capable of developing 125% of the reinforcing steel specified yield strength. Provide epoxy coated couplers according to Section 836.02 A and repair any damaged epoxy coating according to Section 612.04 E.

NOTES:

Do not install the 5XA504 bars into the approach slab until all of the foundation fill is in place.

Position the 4'-0" leg of 5XB500 bar and the 3'-0" leg of 5XB501 bar horizontal.

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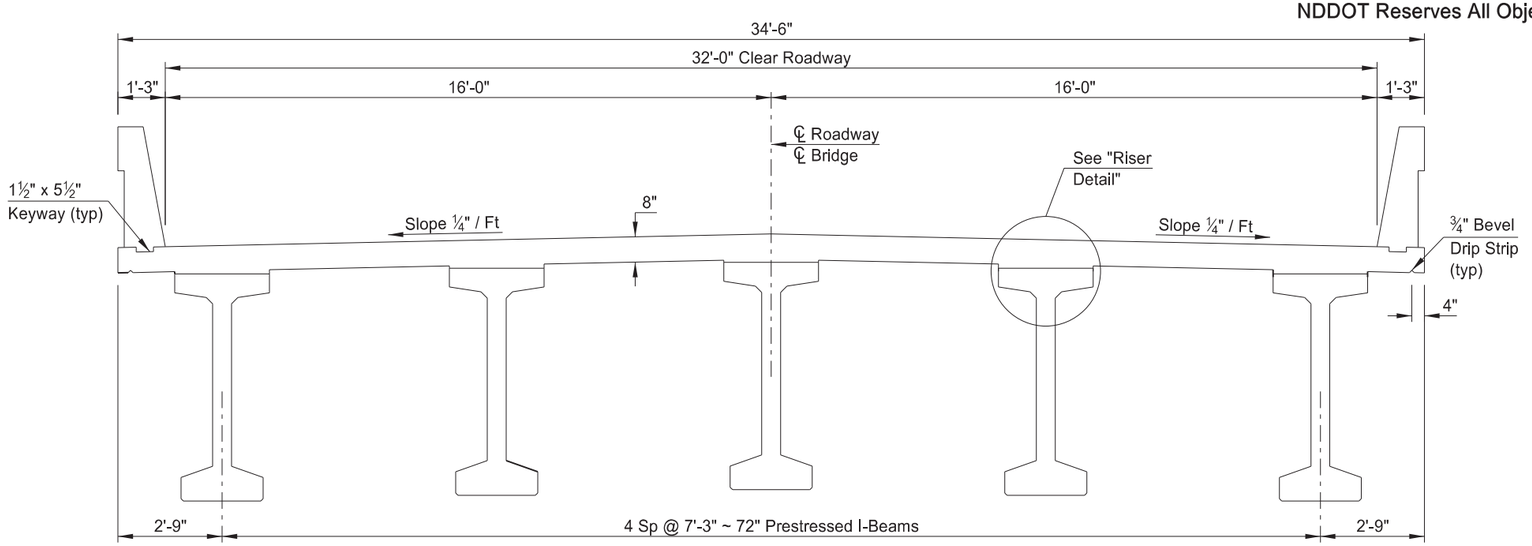
QUANTITIES
SEE DWG 94-166.521-16

APPLE CREEK SEPARATION

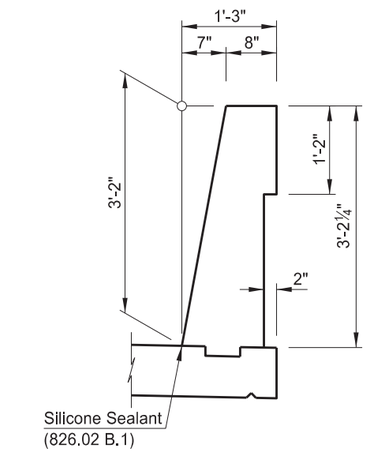
ENDWALL DETAILS

23 U.S.C. 409
NDDOT Reserves All Objections

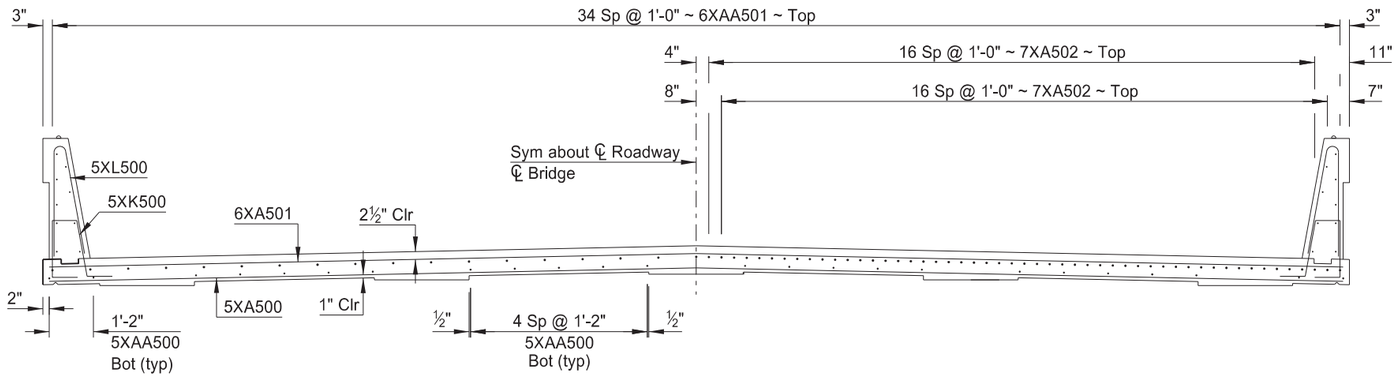
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	16



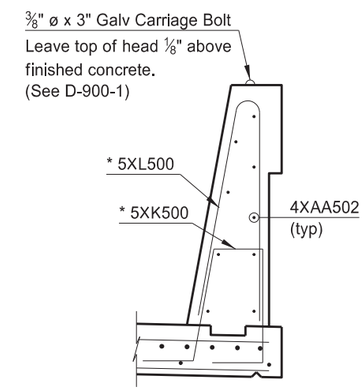
(SHOWING DIMENSIONS)
SLAB SECTION



SHOWING DIMENSIONS

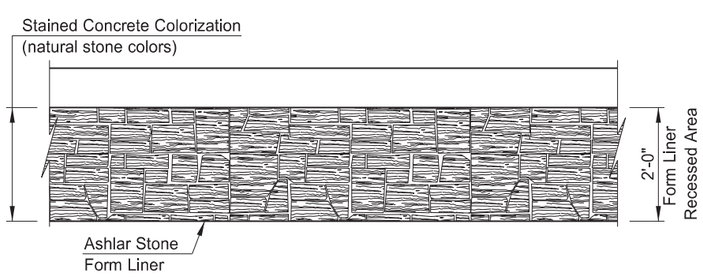


(SHOWING REINFORCING BETWEEN SUPPORTS)
SLAB SECTION

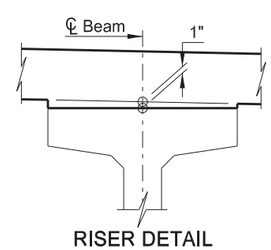


* Provide a 1½" clearance to the barrier reinforcing.

SHOWING REINFORCING
BARRIER DETAIL



(SHOWING FORM LINER ~ BACK FACE)
BARRIER ELEVATION



RISER DETAIL

The 1" dimension shown is located at the supports. The anticipated midspan riser is 3½". Adjust the riser to maintain the 8" slab thickness.

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QUANTITIES	
CLASS AAE-3 CONCRETE	393.2 CY
REINFORCING STEEL	3,244 LBS
REINFORCING STEEL (EPOXY)	87,209 LBS

APPLE CREEK SEPARATION

SLAB SECTION

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	17

BILL OF REINFORCING STEEL, GRADE 60

LETTER PREFIX OF BAR MARK DENOTES SHAPE ~ SEE BAR DETAILS

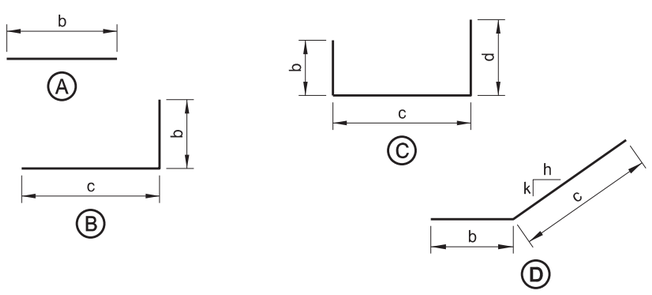
LOCATION	SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS a	b	c	d	e	f	g	h	k
ABUTMENTS	5	A100	12	38'-3"		38'-3"							
	5	A101	24	16'-7"		16'-7"							
	5	A102	4	12'-7"		12'-7"							
	6	A103	20	7'-5"		7'-5"							
	5	A104	4	14'-7"		14'-7"							
	5	B100	24	20'-1"		3'-6"	16'-7"						
	5	B101	4	18'-1"		3'-6"	14'-7"						
	5	B102	28	6'-6"		2'-3"	4'-3"						
	5	B103	4	16'-1"		3'-6"	12'-7"						
	5	C100	12	42'-7"		2'-3"	38'-1"	2'-3"					
	5	C101	48	23'-10"		10'-10"	2'-2"	10'-10"					
	5	C102	22	17'-8"		4'-8"	2'-2"	10'-10"					
	5	C103	38	4'-10"		1'-4"	2'-2"	1'-4"					
	4	C104	60	3'-2"		6"	2'-2"	6"					
	5	C105	20	24'-6"		11'-5"	1'-8"	11'-5"					
	6	C106	24	23'-10"		10'-10"	2'-2"	10'-10"					
	6	C107	16	17'-8"		4'-8"	2'-2"	10'-10"					
	5	D100	8	16'-3"		2'-6"	13'-9"					12	6.2
	5	SA100	4	40'-10"	4'-4"		12'-0"		4				
	6	SA101	4	45'-8"	5'-4"		12'-11"		4				
	5	SB100	4	62'-1"	4'-3"	4'-4"	4'-3"	12'-0"	4				
	5	SC100	4	226'-5"	1'-8"	4'-7"	11'-2"	1'-8"	12				

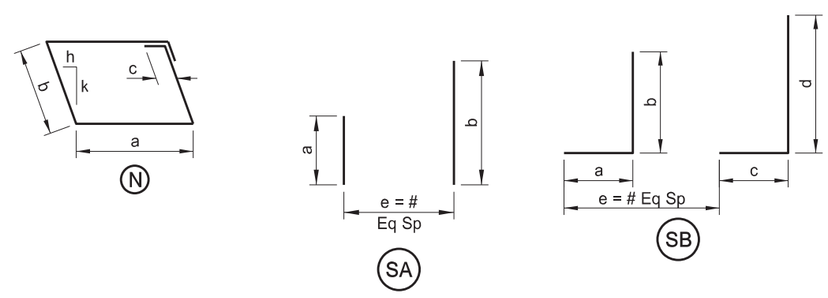
LOCATION	SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS a	b	c	d	e	f	g	h	k
PIER	7	A200	4	30'-8"		30'-8"							
	5	A201	14	30'-8"		30'-8"							
	8	A202	8	30'-8"		30'-8"							
	8	A203	48	17'-3"		17'-3"							
	9	A204	8	30'-0"		30'-0"							
	4	A205	2	31'-3"		31'-3"							
	4	A206	2	32'-6"		32'-6"							
	4	A207	6	33'-8"		33'-8"							
	6	A208	7	33'-8"		33'-8"							
	4	C200	80	3'-8"		6"	2'-8"	6"					
	6	C201	2	10"-4"		1'-3"	7'-10"	1'-3"					
	6	C202	24	5'-0"		1'-3"	2'-6"	1'-3"					
	5	D200	12	5'-8"		3'-0"	2'-8"					12	12
	6	N200	32	22'-4"	2'-8"	8'-0"	6"					0	12
	5	N201	42	11'-0"	2'-8"	2'-4"	6"					0	12
	5	N202	4	13'-8"	2'-8"	3'-8"	6"					0	12
	5	N203	4	12'-4"	2'-0"	3'-8"	6"					0	12
	5	N204	28	12'-6"	2'-0"	3'-9"	6"					0	12
	5	N205	8	13'-10"	2'-8"	3'-9"	6"					0	12
	5	N206	9	14'-2"	2'-8"	3'-11"	6"					0	12
	5	SN200	2	34'-6"	2'-8"	1'-10"	6"	3'-4"	2				

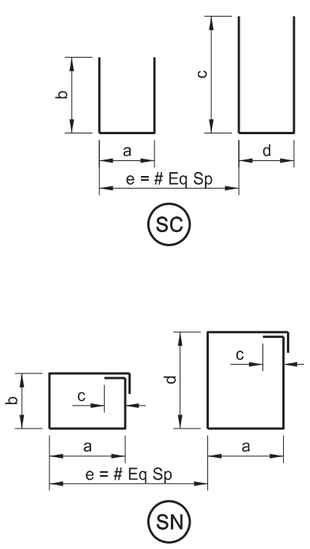
23 U.S.C. 409
NDDOT Reserves All Objections

NOTES:

1. Verify the quantity, size, and shape of the bar reinforcement against the structure drawings and immediately notify the Engineer of any discrepancies. Discrepancies in the bar list will not be cause for adjustment of the contract unit price.
2. All dimensions are out to out of bars.
3. Nominal length of each bent bar or cut bar is the sum total of the detailing dimensions for that bar, unless otherwise noted.







REGISTERED PROFESSIONAL ENGINEER
DUSTIN WING
PE-7128
DATE
08/06/20
NORTH DAKOTA
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APPLE CREEK SEPARATION

REINFORCING BAR LIST & DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	18

BILL OF REINFORCING STEEL, GRADE 60

LETTER PREFIX OF BAR MARK DENOTES SHAPE ~ SEE BAR DETAILS

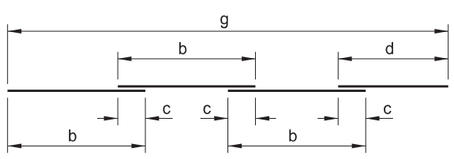
LOCATION	SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS a	b	c	d	e	f	g	h	k

LOCATION		SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS a	b	c	d	e	f	g	h	k
SUPERSTRUCTURE	REGULAR	5	A500	20	34'-3"		34'-3"							
		6	A501	10	27'-4"		27'-4"							
		6	A502	40	28'-2"		28'-2"							
		4	A503	32	5'-6"		5'-6"							
		4	C500	100	3'-2"		6"	2'-2"	6"					
		4	C501	40	3'-8"		6"	2'-8"	6"					
	EPOXY	5	XA500	346	34'-2"		34'-2"							
		6	XA501	548	34'-2"		34'-2"							
		7	XA502	68	60'-0"		60'-0"							
		5	XA503	6	34'-3"		34'-3"							
		5	XA504	136	3'-0"		3'-0"							
		5	XB500	70	7'-11"		3'-11"	4'-0"						
		5	XB501	48	6'-8"		3'-8"	3'-0"						
		5	XG500	20	17'-2"	6'-3"	2'-8"	6'-3"	1'-0"				12	0
		4	XG501	80	13'-11"	5'-9"	5"	5'-9"	1'-0"				12	0
		5	XK500	854	4'-11"	1'-6"	7"			10"		8"	2.2	12
		5	XL500	854	5'-11"	9"	2'-9"	5"			1.25"		2.2	12
		5	XP500	70	5'-6"	5"	2'-1"	2'-2"			1.25"	10"	12	6.5
		5	XAA500	24	285'-8"		60'-0"	3'-0"	45'-8"	4		273'-8"		
		6	XAA501	35	288'-8"		60'-0"	3'-9"	48'-8"	4		273'-8"		
		4	XAA502	18	281'-8"		60'-0"	2'-0"	41'-8"	4		273'-8"		

23 U.S.C. 409
NDDOT Reserves All Objections

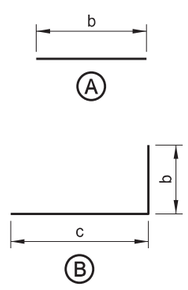
NOTES:

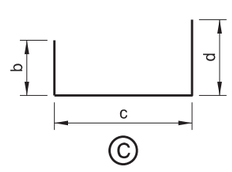
1. Verify the quantity, size, and shape of the bar reinforcement against the structure drawings and immediately notify the Engineer of any discrepancies. Discrepancies in the bar list will not be cause for adjustment of the contract unit price.
2. All dimensions are out to out of bars.
3. Nominal length of each bent bar or cut bar is the sum total of the detailing dimensions for that bar, unless otherwise noted.
4. Turn adjacent "AA" bars end for end so that the splice locations are staggered.
5. The "f" dimension indicates the inside radius unless otherwise noted.
6. An "X" preceding a bar designation indicates an epoxy coated bar.

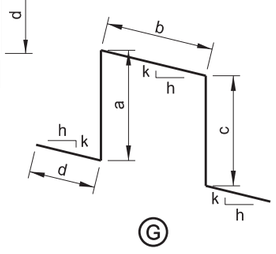


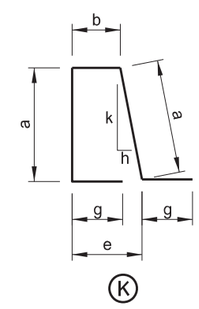
c = Lap Splice (typ)
e = # of "b" Length Pieces in a Set
Total Length per Set = e x b + d

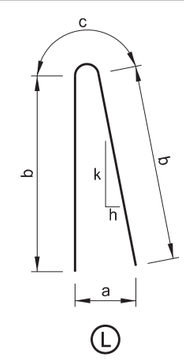
(AA)

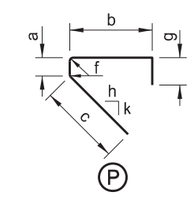












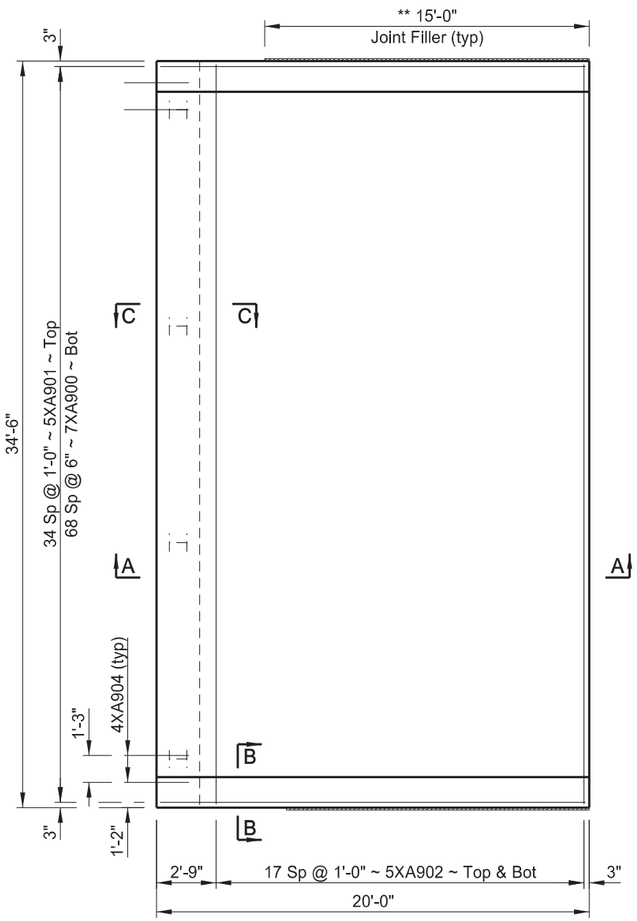
REGISTERED PROFESSIONAL ENGINEER
DUSTIN WING
PE-7128
DATE
08/06/20
NORTH DAKOTA
DocuSign

APPLE CREEK SEPARATION

REINFORCING BAR LIST & DETAILS

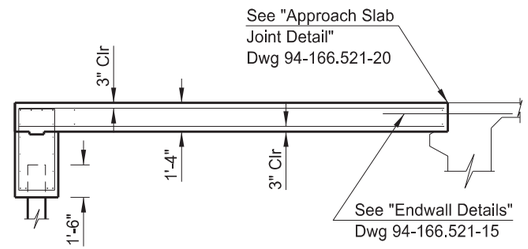
23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	19

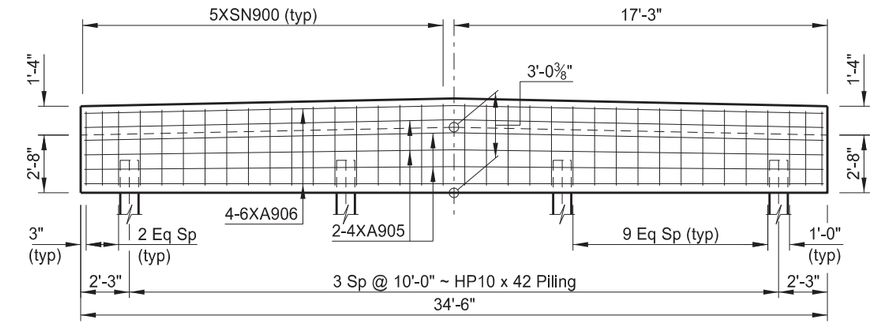


PLAN

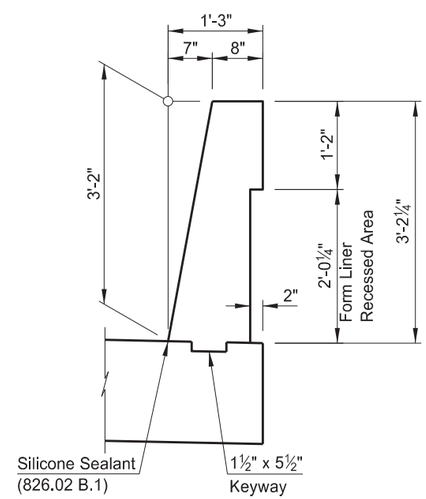
** ½" x 14" Pref Exp Joint Filler
~ Place between approach
slab & abutment wing (typ).



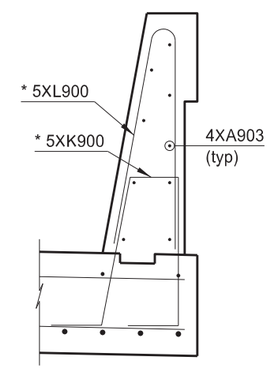
A-A



FOOTING ELEVATION



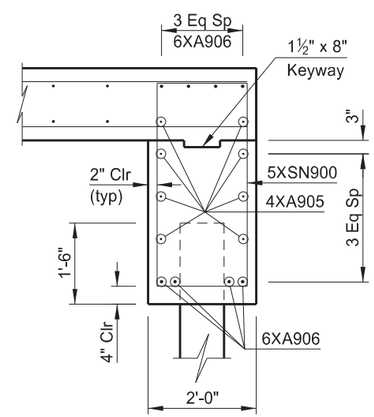
SHOWING DIMENSIONS



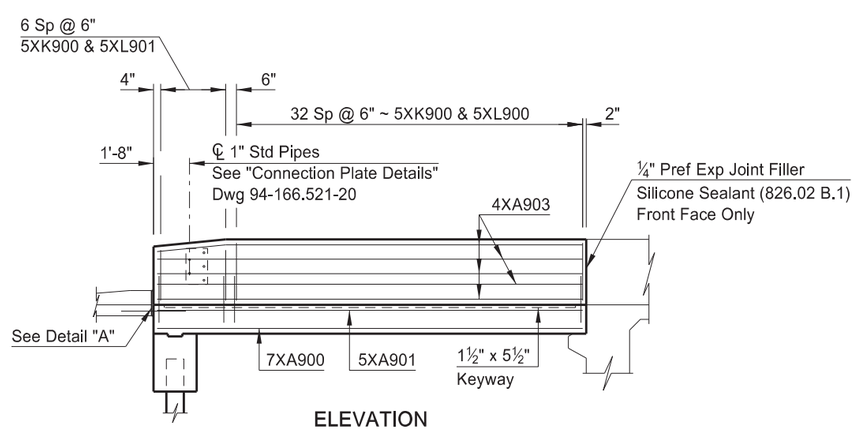
* Provide a 1½" clearance from the front face to the barrier reinforcing.

SHOWING REINFORCING

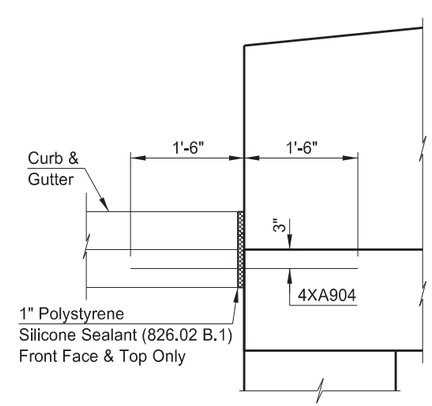
B-B



C-C



ELEVATION



DETAIL "A"

REGISTERED PROFESSIONAL ENGINEER
DUSTIN WING
PE-7128
DATE
08/06/20
NORTH DAKOTA
DocuSign

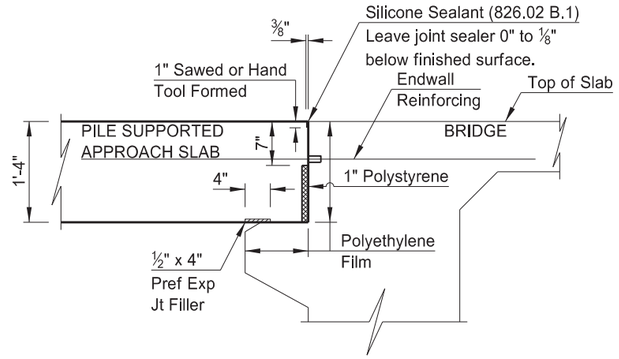
QUANTITIES
SEE DWG 94-166.521-20

APPLE CREEK SEPARATION

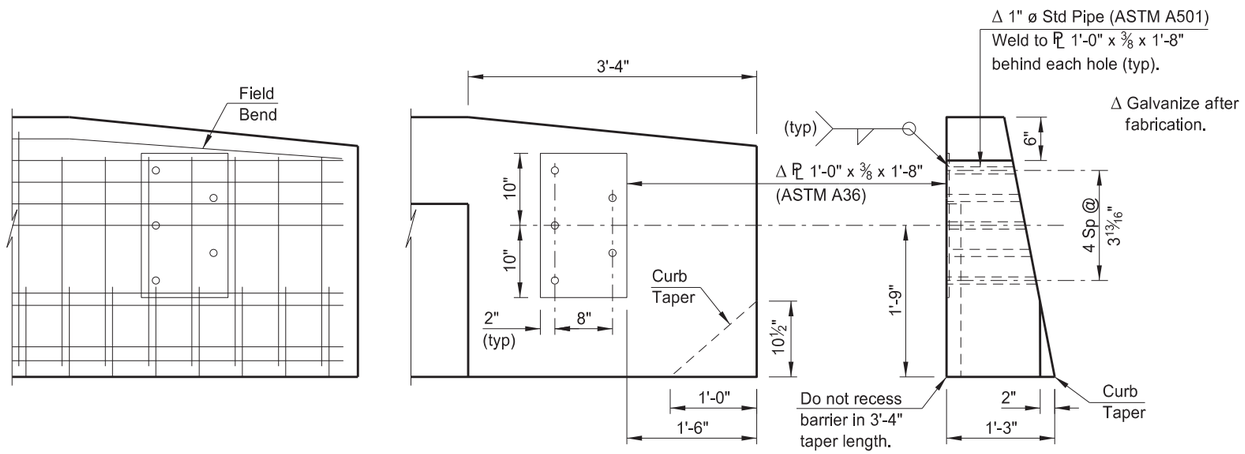
APPROACH SLAB DETAILS

23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	170	20



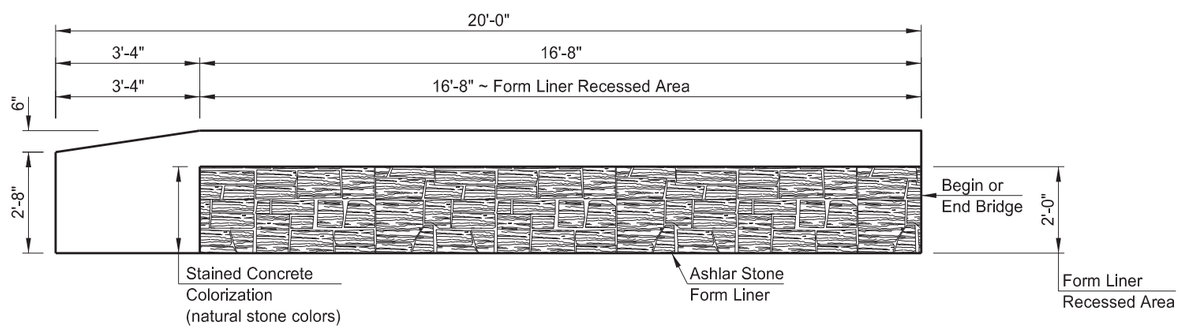
APPROACH SLAB JOINT DETAIL



SHOWING REINFORCING

SHOWING DIMENSIONS

(SHOWING BACK FACE)
CONNECTION PLATE DETAILS



(SHOWING FORM LINER ~ BACK FACE)
BARRIER ELEVATION

NOTES:

The estimated material quantities shown are for information purposes only. Include the concrete, reinforcing bars, polyethylene film, preformed joint filler, polystyrene, silicone sealant, connection plates and pipes, and labor required to build the approach slabs and barriers in the pay item "Pile Supported Approach Slab." Use Class AE-3 concrete and Grade 60 reinforcing steel. Provide reinforcing steel that meets the requirements of Section 612. Use polyethylene film that meets the requirements of ASTM C171.

The bar marks beginning with an "X" indicate an epoxy coated bar. The dimensions shown in the "Bent Bar Details" are out to out.

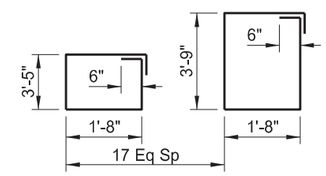
SKEW ANGLE = 0°

BAR LIST - ONE SLAB

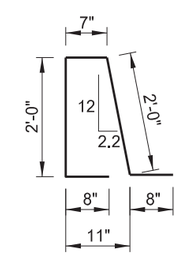
SIZE	MARK	NO.	LENGTH
7	XA900	69	19'-8"
5	XA901	35	19'-8"
5	XA902	36	34'-2"
4	XA903	18	19'-8"
4	XA904	4	3'-0"
4	XA905	8	34'-2"
6	XA906	8	34'-2"
5	XK900	80	5'-11"
5	XL900	66	5'-11"
5	XL901	14	5'-3"
5	XSN900	2	207'-0"

ESTIMATED MATERIAL QUANTITIES

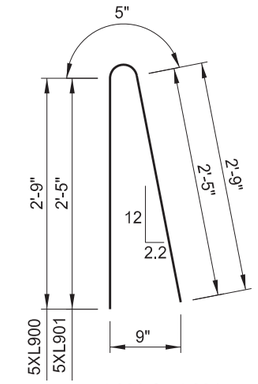
REINFORCING STEEL (LBS)	CONCRETE (CY)
7,022	45.8



XSN900



XK900



XL900 & XL901

BENT BAR DETAILS

QUANTITIES	(ONE SLAB)
APPROACH SLAB	76.7 SY

REGISTERED PROFESSIONAL ENGINEER
DUSTIN WING
PE-7128
DATE
08/06/20
NORTH DAKOTA
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APPLE CREEK SEPARATION

APPROACH SLAB DETAILS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	175	1

NORTH DAKOTA DEPARTMENT OF TRANSPORATION
300 AIRPORT ROAD
BISMARCK, ND 58504

LOG OF BORING SB - 1

PROJECT NUMBER IM-1-094(191)166 **DATE STARTED** 4/3/17 **COMPLETED** 4/4/17
PCN 21853 **ELEVATION** 1755 ft
LOCATION Burleigh County **Northing** ft **Easting** ft
DRILLED BY Dallan **LOGGED BY** Jamie **DRILLING METHOD** Hollow Stem Auger
ENGINEER Kurle
NOTES

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	AASHTO	USCS	SAMPLE TYPE & NUMBER	RECOVERY (%)	SPT N VALUE	MC / PL / LL	CLAY FRACTION (%)	TESTS & REMARKS
	0	GRAVEL 0.5 ft								
1754.5 ft		FILL Very Stiff Moist Brown Sandy Lean Clay	A-6	CL	41	75	13	16 40		
			A-6	CL	42	65	13	15 36		
			A-6	CL	43	75	25	15 34		
	10		A-6	CL	44	75	29	16 36		Coal Deposits, Gravel Coal Deposits, Gravel Rock or Cobble from 10.0-11.3
1740		1738.0 ft 17.0 ft	A-6	CL	45	80		17 37		
		FILL Hard Moist Black/Brown Lean Clay	A-6	CL	46	90	54	15 33		γ_d = 111.9 pcf γ = 132.0 pcf UU = 3847 psf Fuel Odor
	20	22.0 ft	A-6	CL	47	90		17 35		
		1733.0 ft	A-6	CL	48	70	20	17 38		
1730		Very Stiff Moist Black/Brown Lean Clay with Sand	A-7-6	CL	49	45		22 42		γ_d = 111.0 pcf γ = 132.6 pcf UU = 4837 psf
		29.0 ft	A-7-6	CH	50	75	23	18 50		
			A-6	CL	51	75		16 32		Topsoil/Organics
	30	1726.0 ft	A-6	CL	52	95	8	15 29		γ_d = 103.3 pcf γ = 126.0 pcf UU = 3917 psf
		Stiff Wet Brown Lean Clay with Sand	A-6	CL	53	100		16 37		
1720			A-6	CL	54	100	10	16 39		
			A-7-6	CL	55	100		15 42		UU = 2314 psf
	40		A-7-6	CL	56	100	12	16 42		γ_d = 95.1 pcf γ = 121.8 pcf
			A-6	CL	57	100		17 35		γ_d = 92.9 pcf γ = 122.1 pcf UU = 1068 psf
1710			A-6	CL	58	100	8	17 35		
			A-6	CL	59	100		17 40		
	50	1704.0 ft 51.0 ft	A-6	CL	60	100	8	17 31	0	γ_d = 97.1 pcf γ = 123.2 pcf UU = 2002 psf
		Loose to Medium Dense Wet Brown Silty Sand	A-4	SM	61	100			0	
1700			A-4	ML	62	100	16	123		
			A-4	SC-SM	63	100		122		
	60		A-2-4	SC-SM	64	100	16		0	
			A-2-4	SM	65	100			0	
1690			A-2-4	SM	66	100	13		0	
			A-2-4	SM	67	100			0	
	70	1684.0 ft 71.0 ft	A-2-4	SM	68	100	12	1426		
		Medium Dense Moist Grey/Brown Silty, Clayey Sand	A-2-6	SC	69	100			0	
1680			A-2-4	SM	70	100	17	124		
			A-2-4	SC-SM	71	100	16	126		
	80	1674.0 ft 81.0 ft	A-2-4	SC	72	100				
1670		Medium Dense Wet Grey/Brown Silty Sand								
	90		A-4	SM	73	50	18	24 16 30		
			A-6	SC	74	100	17		0	
1660			A-2-4	SM	75	100				
	100		A-2-4	SC	76	100	12	127		
		1650.0 ft 105.0 ft								
1650		Very Stiff Moist Grey Sandy Lean Clay	A-2-4	SC-SM	77	100	18	20 15		
			A-7-6	CL	77.1	100		36	0	UU = 3424 psf γ_d = 97.5 pcf γ = 124.8 pcf
	110	1644.0 ft 111.0 ft	A-4	SM	78	100	31	18 41		
		Very Dense Moist Grey Silt with Sand	A-7-6	CL	79	100				
1640		1639.0 ft 116.0 ft	A-4	ML	80	100	58		0	
		Moist Grey Clayey Sand			81	100				
	120									
1630		1629.5 ft 125.5 ft	A-2-6	SC	82	100		100 16 37		
		Hard Moist Grey Fat Clay								
	130		A-6	CL	83	100	90	18 36		
1620		1619.0 ft 136.0 ft	A-7-6	CH	84	100	69	24 54		

Bottom of borehole at 136.0 ft

REGISTERED PROFESSIONAL ENGINEER
MATTHEW C KURLE
PE-8777
DATE
07/22/20
NORTH DAKOTA
DocuSign

Boring Log 1

NDDOT LOG 11X17 PLAN SHEET - 20171219.GDT - 7/22/20 13:03 - F:\LAB\PROJECTS\GINT\UPLOADED TO DATABASE\2018-NEED TO BE REDONE\1-094(191)166.GPJ

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	175	2

NORTH DAKOTA DEPARTMENT OF TRANSPORATION
300 AIRPORT ROAD
BISMARCK, ND 58504

LOG OF BORING SB - 2

PROJECT NUMBER IM-1-094(191)166 **DATE STARTED** 4/5/17 **COMPLETED** 4/6/17
PCN 21853 **ELEVATION** 1754 ft
LOCATION Burleigh County **Northing** ft **Easting** ft
DRILLED BY Dallan **LOGGED BY** Jamie **DRILLING METHOD** Hollow Stem Auger
ENGINEER Kurle
NOTES

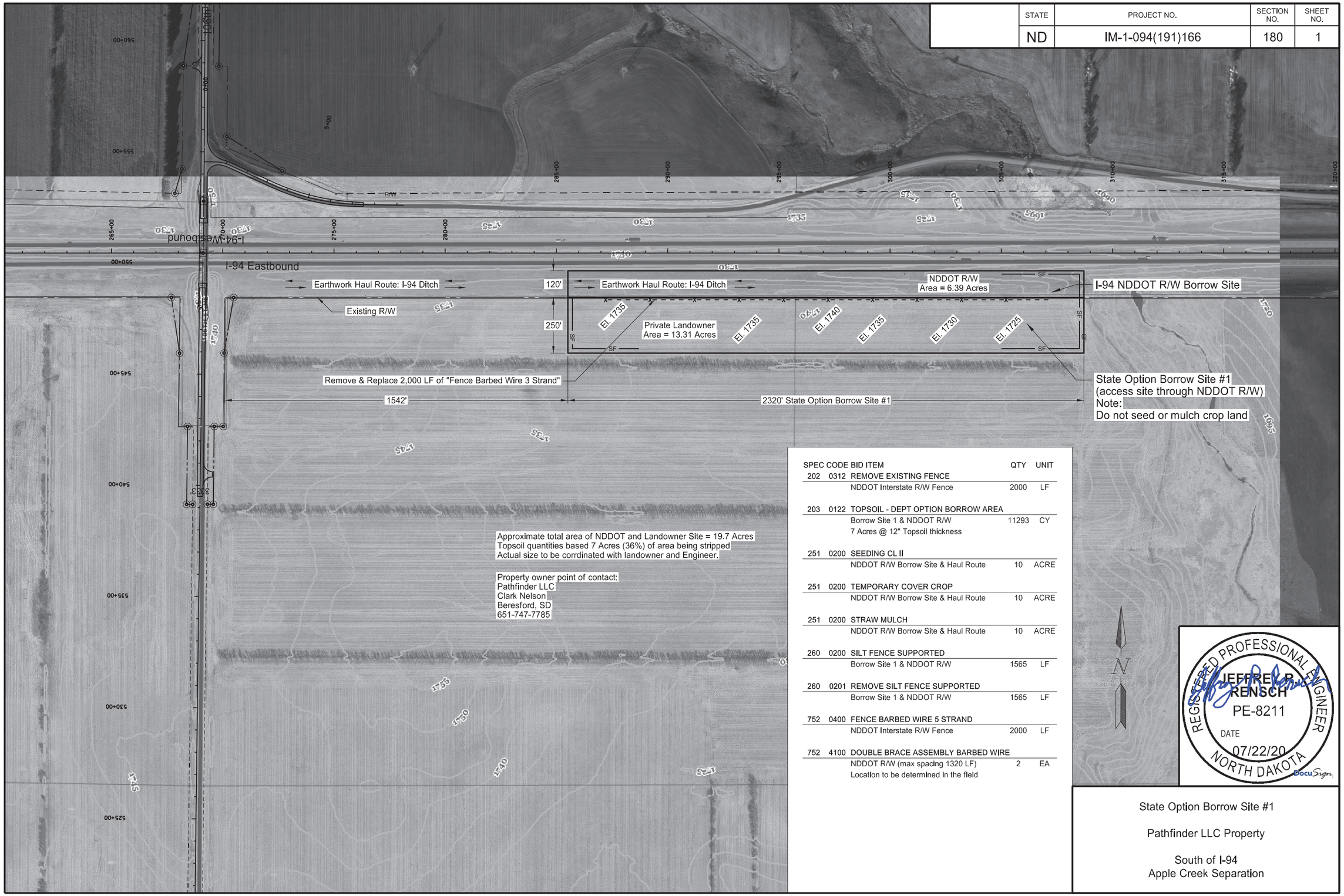
ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	AASHTO	USCS	SAMPLE TYPE & NUMBER	RECOVERY (%)	SPT N VALUE	MC / PL–LL / CLAY FRACTION (%)	TESTS & REMARKS
	0	GRAVEL 0.5 ft	A-7-6	CL				17 46	
1750		1753.5 ft						15 33	
		FILL	A-6	CL	86	65	18	16 37	γ_d = 112.1 pcf
		Very Stiff Moist Grey/Brown Lean Clay with Sand	A-6	CL	87	75		17 45	γ = 132.5 pcf, UU = 3071 psf
	10		A-7-6	CL	88	85	20	17 39	γ_d = 96.9 pcf
1740			A-6	CL	89	85		17 38	γ = 122.9 pcf, UU = 1921 psf
			A-6	CL	90	100	25	17 35	
			A-6	CL	91	90		17 42	
	20	1731.0 ft 23.0 ft	A-7-6	CL	92	50	13	15 38	γ_d = 112.3 pcf
			A-6	CL	93	55		17 39	γ = 136.4 pcf, UU = 5508 psf
1730		Medium Stiff to Stiff Moist Brown Sandy Lean Clay	A-6	CL	94	65	15	16 38	γ_d = 114.5 pcf
			A-6	CL	95	90		25 83	γ = 133.9 pcf, UU = 4976 psf
	30		A-7-6	CH	96	65	8	15 38	
			A-6	CL	97	100		19 61	Gravel
1720			A-7-6	CH	98	100	8	15 35	γ_d = 96.2 pcf
			A-6	CL	99	100	7	15 39	γ = 128.1 pcf, UU = 1494 psf
	40		A-6	CL	100	100	7	17 33	
			A-6	CL	101	100	11	15 33	
1710			A-6	CL	102	100	12	17 31	
			A-6	CL	103	100	10	16 35	
	50		A-6	CL	104	100	12	18 30	
			A-6	SC	105	90	10	15 34	
1700			A-6	CL	106	100			
	60		A-7-6	CL	107	100	11	16 42	
1690			A-6	CL	108	100	13	16 36	
	70	1683.5 ft 70.5 ft	A-6	CL	109	100	23	15 38	Gravel and Rock
1680		Rock Layer 72.0 ft Brown 1682.0 ft							
	80	Stiff Moist Black/Brown Silty Sand	A-2-4	SM				0	
1670			A-2-4	SM				0	
		1665.0 ft 89.0 ft	A-6	CL				15 38	
	90	Very Stiff to Hard Moist Grey/Black Lean Clay with Sand							
1660			A-6	CL	113	90	25	15 40	
	100		A-7-6	CL	114	90	36	16 47	
		1650.0 ft 104.0 ft	A-7-6	CH				19 55	
1650		Hard Moist Grey Fat Clay							
	110		A-7-6	CH	116	100	59	19 56	
		1640.0 ft 114.0 ft	A-4	SC				127	
1640		Very Dense Moist Grey Silty Sand							100 Blow in 0.1 of 3rd Set
	120		A-2-4	SM				0	100 Blow in 0.2 of 3rd Set
1630		1629.0 ft 125.0 ft	A-2-4	SM				0	
		Hard Moist Grey/Black Silty Clay							
	130	1623.0 ft 131.0 ft			120	100	63	23 68	

Bottom of borehole at 131.0 ft

Boring Log 2

NDDOT LOG 11X17 PLAN SHEET - 20171219.GDT - 7/22/20 13:03 - F:\LAB\PROJECTS\GINT\UPLOADED TO DATABASE\2018-NEED TO BE REDONE\1-094(191)166.GPJ

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	180	1



SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		NDDOT Interstate R/W Fence	2000	LF
203	0122	TOPSOIL - DEPT OPTION BORROW AREA		
		Borrow Site 1 & NDDOT R/W	11293	CY
		7 Acres @ 12" Topsoil thickness		
251	0200	SEEDING CL II		
		NDDOT R/W Borrow Site & Haul Route	10	ACRE
251	0200	TEMPORARY COVER CROP		
		NDDOT R/W Borrow Site & Haul Route	10	ACRE
251	0200	STRAW MULCH		
		NDDOT R/W Borrow Site & Haul Route	10	ACRE
260	0200	SILT FENCE SUPPORTED		
		Borrow Site 1 & NDDOT R/W	1565	LF
260	0201	REMOVE SILT FENCE SUPPORTED		
		Borrow Site 1 & NDDOT R/W	1565	LF
752	0400	FENCE BARBED WIRE 5 STRAND		
		NDDOT Interstate R/W Fence	2000	LF
752	4100	DOUBLE BRACE ASSEMBLY BARBED WIRE		
		NDDOT R/W (max spacing 1320 LF)	2	EA
		Location to be determined in the field		

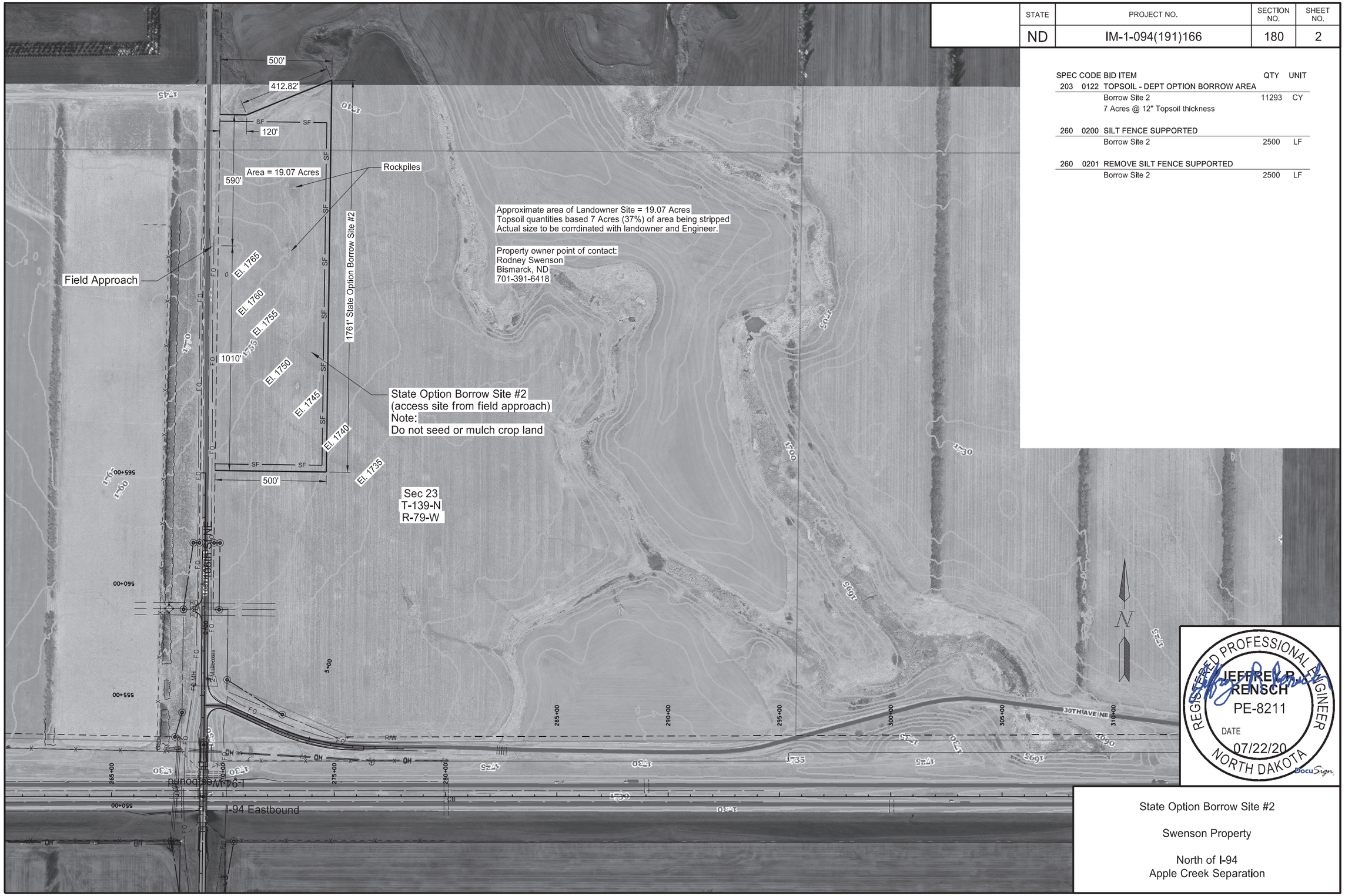
REGISTERED PROFESSIONAL ENGINEER
JEFFREY P. RENSCH
PE-8211
DATE
07/22/20
NORTH DAKOTA
DocuSign

State Option Borrow Site #1

Pathfinder LLC Property

South of I-94
Apple Creek Separation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-1-094(191)166	180	2



SPEC CODE	BID ITEM	QTY	UNIT
203 0122	TOPSOIL - DEPT OPTION BORROW AREA		
	Borrow Site 2	11293	CY
	7 Acres @ 12" Topsoil thickness		
260 0200	SILT FENCE SUPPORTED		
	Borrow Site 2	2500	LF
260 0201	REMOVE SILT FENCE SUPPORTED		
	Borrow Site 2	2500	LF

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
07/22/20
NORTH DAKOTA
DocuSign

State Option Borrow Site #2

Swenson Property

North of I-94
Apple Creek Separation