

DESIGN DATA			
Traffic	Average Daily		
Current (2016)	Pass:	Trucks:	Total: 321
Forecast (2036)	Pass:	Trucks:	Total: 477
Clear Zone Distance:		Design Speed: 55	
Minimum Sight Dist. for Stopping: 495'		Bridges: None	
Sight Dist. for No Passing Zone: 900'			
Pavement Design Life: NA (years)			
Design Accumulated One-way Rigid ESALs: NA, Flexible ESALs: NA			

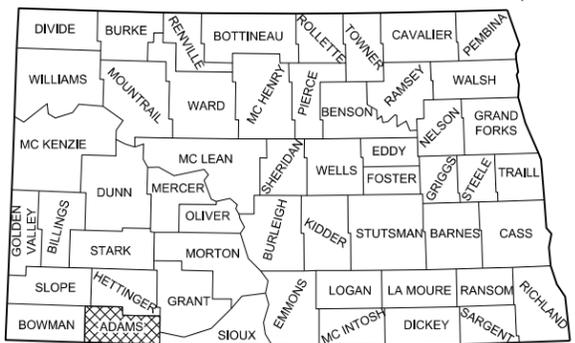
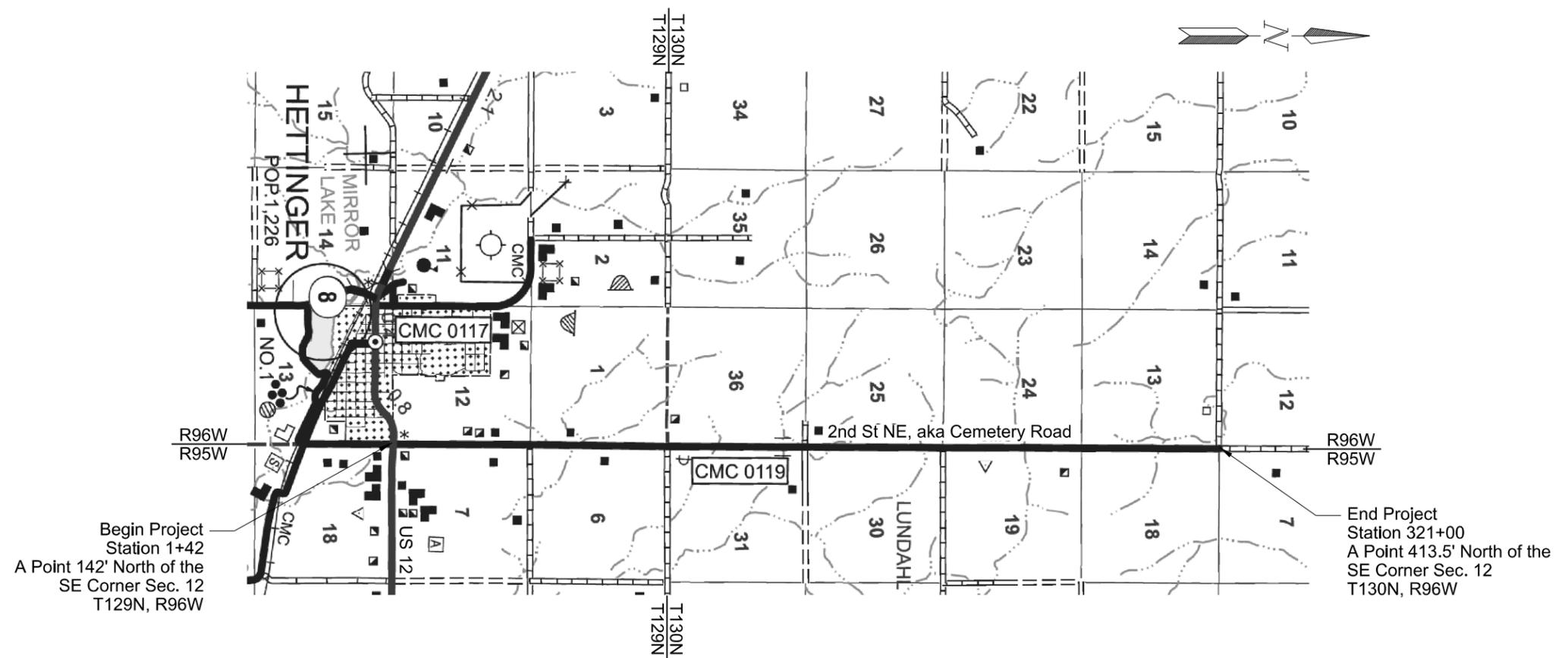
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	21357	1	1

JOB # 1
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
 Federal Aid Project SC-CNOA-CNOB-CNOC-0119(057)

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
SC-CNOA-CNOB-CNOC-0119(057)	6.053	6.053

Adams County
 Cemetery Road Reconstruction
 CMC 0119 from Hettinger North 6 Miles
 Widening, Regrade, Subgrade Repairs,
 Double Chip Seal Coat and Incidentals



STATE COUNTY MAP

DESIGNERS
Jade Hedge
William Doerr, P.E.

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

APPROVED DATE 03/21/2016

William Doerr /s/
 BROSZ ENGINEERING, INC.

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-CNOA-CNOB-CNOC-0119(057)	2	1

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100	1-2	Work Zone Traffic Control
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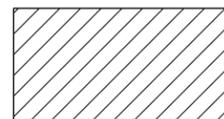
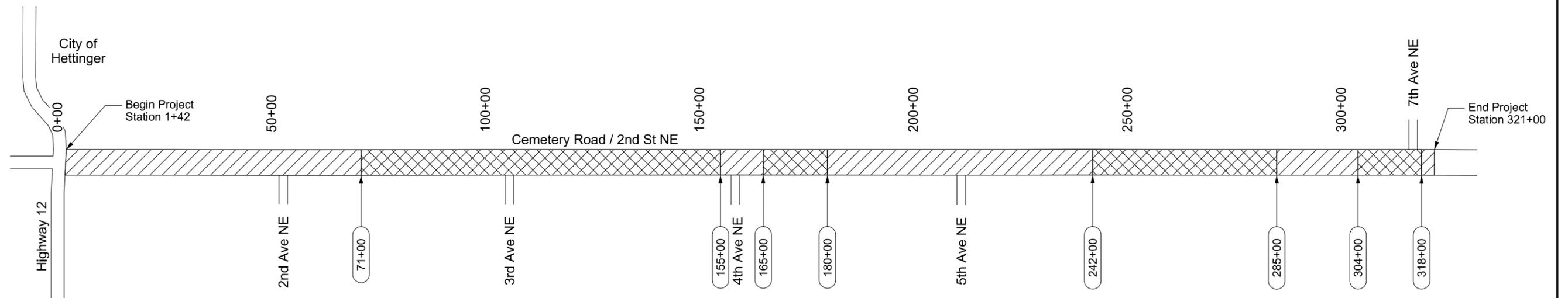
LIST OF SPECIAL PROVISIONS (SP)

<u>SP#</u>	<u>Description</u>
5108(14)	Permits and Environmental Considerations

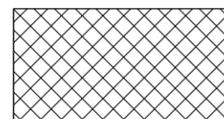
LIST OF STANDARD DRAWINGS

D-261-1	Erosion Control Fiber Roll Placement Details
D-704-7 & 8	Breakaway Systems for Construction Zone Signs
D-704-13	Barricade and Channelizing Device Details
D-704-14	Construction Sign Punching and Mounting Details
D-704-15	Road Closure Layout
D-704-20	Terminal and Seal Coat Sign Layouts
D-704-22	Construction Truck and Temporary Detour Layouts
D-704-24	Shoulder Closures and Bridge Painting Layouts
D-704-26	Miscellaneous Sign Layouts
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	4	1



Reconstruction



Reconstruction with Subgrade Repairs

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Scope of Work
 Cemetery Road
 Adams County, ND

PLAN NOTES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-CNOA-CNOB-CNOC(0119)057	6	1

- 100-P01 COORDINATION OF PROJECTS: Another project within the vicinity of this project will be under contract during the 2016 construction season, CNOC-SRF-0001(051), PCN 21356, which is a reconstruction and hot mix asphalt project on Mirror Lake Road and Cemetery Road south of US Hwy 12 near Hettinger.
- 107-710 HAUL ROADS: Before submitting a proposal, contact the appropriate State, County, Township or City officials to determine if there are any roadways that will be designated as "no haul routes".
- 202-P01 REMOVAL OF BITUMINOUS SURFACING: Salvage the removed material and stockpile it onsite. Reincorporate the removed material into the Salvaged Base Course. The Engineer will determine final quantity by field measurement and unit weight calculations based on samples obtained from the stockpile.
- 202-P02 REMOVAL OF BITUMINOUS SURFACING: Include the cost of the full depth vertical saw cuts adjacent to pavement removal areas, specified in Section 202.04 A "General", in the contract unit price for "Remove & Salvage Bituminous Surfacing."
- 203-010 SHRINKAGE: 35 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-TYPE B: Incorporate the material being removed from the subgrade repair areas into the embankment located outside of the roadbed. This has been figured into the earthwork summary. Include all costs to complete this work in the contract unit price for "Common Excavation - Type B."
- 203-P02 COMMON EXCAVATION-TYPE B: Segment excavation and subgrade repair operations into a length of roadway capable of being completed in one day. If the operation is not completed at day's end, provide traffic control that meets nighttime operations and NDDOT standards at no additional expense.
- 203-P03 COMMON EXCAVATION-TYPE B: Volume will be computed in cubic yards by the average end area method. The measurement of accepted quantities of excavation will be measured in its original position by cross sectioning before the topsoil is removed. Final cross-sections will be taken after the topsoil is replaced.
- 302-P01 GRANULAR MATERIAL FOR SUBGRADE REPAIR: Provide a material to be used for backfilling the subgrade repair areas that meets the following requirements:
 - 100% Passing the 1" Sieve
 - 35% Max Passing the No. 200 Sieve
 - LL < 40
 - PI < 10

The Engineer will test and approve the material based on the average of 5 samples taken from the stockpile.
- 420-P01 SEAL COAT: Protect the existing concrete driveways from oil overspray. Include all labor and materials necessary to protect the concrete in the contract unit price for the seal coat bid items.

420-P03 COVER COAT MATERIAL: Provide cover coat materials that meets the following requirements:

Sieve Size or Testing Method	Aggregate Class	
	42-Modified	43-Modified
	Percent Passing or Testing Requirement	
1/2 inch	100	
3/8 inch		100
No. 4	40-70	20-70
No. 8	2-20	0-17
No. 16		
No. 50		
No. 200	0-5	0-3
NDT 113, Shale (max %)	8.0%	
NDT 96 L.A. Abrasion (max %)	40%	
NDDOT 4, Fractured Faces	50% shall have 2 fractured faces	

704-P01 TRAFFIC CONTROL FOR GRADING, GRAVELING, SUBGRADE REPAIRS AND CHIP SEAL APPLICATION: Provide traffic control consisting of a temporary lane closure, flagging and a pilot car. Flagging and Pilot Car will not be paid for during the chip seal according to specification 420.04 F.

Traffic control device quantities are based on the list below. Provide additional devices at no additional cost to the Department.

1. Standard D-704-12
2. Standard D-704-15, layout A
3. Standard D-704-20, layout G and H
4. Standard D-704-22, layout K and L
5. Standard D-704-24, layout R
6. Standard D-704-26, layout CC, EE and GG

When installing layout H from Standard D-704-20, do not post mount the signs.

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PLAN NOTES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-CNOA-CNOB-CNOC(0119)057	6	2

- 714-P01 PIPE CORR STEEL: Include the cost of all materials and equipment necessary to extend the steel culverts in the contract unit price for the appropriate steel pipe bid item. This includes the repair and/or removal of the existing pipe as shown in the plans.

- 754-P01 REMOVAL OF SIGNS: Remove, salvage and stockpile all signs and supports as designated in the plans. The stockpiled signs and supports will be picked up by County forces. Include all work associated with the removal, salvaging and stockpiling of the signs in the price bid for other items. Replace any signs or supports damaged by Contractor's negligence at no additional expense.

- 762-050 PAVEMENT MARKING: If the Engineer and Contractor agree, plan quantity will be used as the measurement for payment for pavement marking items.

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ENVIRONMENTAL NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC(0119)057	6	3

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

EN-1 AVOIDANCE AREAS: The Project Engineer will contact Robert Christensen of the Environmental and Transportation Services Division to coordinate any meetings needed to identify the limits of the avoidance areas. The sites are 32AD82 (approximate Sta. 23+40 to Sta. 26+40 Lt.), 32AD142 (approximate Sta. 167+40 to Sta. 175+40 Rt.), 32AD145 (approximate Sta. 200+50 to Sta. 203+70 Rt.), 32AD146 (approximate Sta. 210+30 to Sta. 215+60 Rt.) and 32AD143 (approximate Sta. 226+80 to Sta. 229+30 Rt.). These avoidance areas must not be disturbed and will be fenced prior to commencement of any construction. Provide the fence and fence posts, install the fence in the location designated in the plans, maintain the fence and remove the fence upon completion of the project. A quantity of 2,279 LF of Temporary Safety Fence has been included for this purpose. All costs to provide, place, maintain and remove the fence shall be included in the price bid for "Temporary Safety Fence."

EN-2 TEMPORARY WETLAND IMPACTS: Temporary impact areas within wetlands and or other waters are incorporated into the plans for this project. Remove temporary fill placed and sedimentation in wetlands or other waters. Restore these wetlands to preconstruction contours.

EN-3 IMPACTS ON WATER BODIES: Care is to be taken during construction activities near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Take all necessary measures to minimize adverse effects on all water bodies. The ND Department of Health Guidelines for minimizing degradation to waterways during construction should be followed.

EN-4 NOISE IMPACTS: Noise from construction activities may have adverse effects on persons who live near the construction area. Minimize noise levels by ensuring that construction equipment is equipped with a recommended muffler in good working order and that construction activities are not conducted during early morning or late evening hours.

EN-5 PALEOCENE ROCKS: Paleocene rocks occur at or near the surface in Adams County. Stay within the disturbed area of the existing road ditch.

NOTIFICATIONS TO BE FILED BY CONTRACTOR:

EN-6 Notification is required for work within 3 nautical miles of the airport. Complete the Federal Aviation Administration Notice of Proposed Construction or Alteration Form 7460-1 (online at <http://oeaaa.faa.gov>).

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ESTIMATE OF QUANTITIES

	STATE	PROJECT NO.	SECTION	SHEET
	ND	SC-CNOA-CNOB-CNOC-0119(057)	8	1

<u>SPEC</u>	<u>CODE</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>TOTAL</u>
103	0100	CONTRACT BOND	L SUM	1
202	0135	REMOVAL OF BITUMINOUS SURFACING	TON	26,636
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES	EA	1
203	0102	COMMON EXCAVATION-TYPE B	CY	27,355
203	0109	TOPSOIL	CY	13,628
216	0100	WATER	M GAL	1,803
251	0200	SEEDING CLASS II	ACRE	88
251	2000	TEMPORARY COVER CROP	ACRE	88
253	0101	STRAW MULCH	ACRE	176
261	0112	FIBER ROLLS 12IN	LF	6,370
261	0113	REMOVE FIBER ROLLS 12IN	LF	3,185
302	0100	SALVAGED BASE COURSE	TON	45,855
302	0244	GRANULAR MATERIAL FOR SUBGRADE REPAIR	TON	64,762
420	0090	MC800 LIQUID ASPHALT	GAL	52,765
420	0111	CRS2P EMULSIFIED ASPHALT	GAL	48,546
420	0143	COVER COAT MATERIAL CL 42-MODIFIED	TON	1,583
420	0144	COVER COAT MATERIAL CL 43-MODIFIED	TON	1,217
420	0160	BLOTTER MATERIAL CL 44	TON	426
702	0100	MOBILIZATION	L SUM	1
704	0100	FLAGGING	MHR	1,300
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1,522
704	1052	TYPE III BARRICADE	EA	10
704	1060	DELINEATOR DRUMS	EA	10
704	1067	TUBULAR MARKERS	EA	100
704	1080	STACKABLE VERTICAL PANELS	EA	100
704	1185	PILOT CAR	HR	650
709	0151	GEOSYNTHETIC MATERIAL TYPE R1	SY	52,252
714	5040	PIPE CORR STEEL .064IN 30IN	LF	10
714	5045	PIPE CORR STEEL .064IN 36IN	LF	5
752	0911	TEMPORARY SAFETY FENCE	LF	2,279
762	1104	PVMT MK PAINTED 4IN LINE	LF	85,088
766	0100	MAILBOX - ALL TYPES	EA	9

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	10	1

Surfacing

Salvaged Base Course @ 1.875 Ton/CY
 Granular Material for Subgrade Repair @ 1.75 Ton/CY
 MC800 Liquid Asphalt @ 0.50 Gal/SY
 CRS2P Emulsified Asphalt @ 0.46 Gal/SY
 Cover Coat Material CL 43-Modified @ 30 Lbs/SY
 Cover Coat Material CL 42-Modified @ 23 Lbs/SY
 Blotter Material CL 44 @ 8 Lbs/SY

Removals

Removal of Bituminous Surfacing @ 1.875 Ton/CY
 (includes bituminous surfacing and base)

Water

25 MGal/Mile for Dust Palliative
 20 Gal/Ton for Aggregates
 10 Gal/Ton for Select Backfill
 10 Gal/CY for Embankment

Topsoil

4" Removal and Replacement Depth

28' Finished Section with Chip Seal		28' Finished Section with Subgrade Repair and Chip Seal		28' Finished Section without Chip Seal	
Begin Station	End Station	Begin Station	End Station	Begin Station	End Station
1+42	71+00	71+00	155+00	318+00	321+00
155+00	165+00	165+00	180+00		
180+00	242+00	242+00	285+00		
285+00	304+00	304+00	318+00		
Total Stations =	160.58	Total Stations =	156.00	Total Stations =	3.00

Spec-Code	Material	Unit	Width (ft)	Quantity per Station	Sub-Total	Width (ft)	Quantity per Station	Sub-Total	Width (ft)	Quantity per Station	Sub-Total	Total	Unit
202-0135	Removal of Bituminous Surfacing (1.875 Ton/CY)	Ton	24	83.34	13,383	24	83.34	13,002	24	83.34	251	26,636	Ton
302-0100	Salvaged Base Course (1.875 Ton/CY)	Ton	28	143.48	23,041	28	143.48	22,383	28	143.48	431	45,855	Ton
420-0090	MC800 Liquid Asphalt (0.50 Gal/SY) (1st Application)	Gal	30	166.67	26,764	30	166.67	26,001	---	---	---	52,765	Gal
420-0111	CRS2P Emulsified Asphalt (0.46 Gal/SY) (2nd Application)	Gal	30	153.34	24,624	30	153.34	23,922	---	---	---	48,546	Gal
420-0144	Cover Coat Material CL 43-Modified (30 Lbs/SY) (1st Application)	Ton	30	5.00	803	30	5.00	780	---	---	---	1,583	Ton
420-0143	Cover Coat Material CL 42-Modified (23 Lbs/SY) (2nd Application)	Ton	30	3.84	617	30	3.84	600	---	---	---	1,217	Ton
420-0160	Blotter Material CL 44 (8 Lbs/SY) (1 Application)	Ton	30	1.34	216	30	1.34	210	---	---	---	426	Ton

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Basis of Estimate
 Cemetery Road
 Adams County, ND

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-CNOA-CNOB-CNOC-0119(057)	10	2

APPROACHES			
Station	Side	Type	Salvaged Base Course (Ton)
7+53	Rt	Field	15
24+10	Rt	Field	15
27+10	Lt	Driveway	15
29+20	Lt	Driveway	15
32+84	Lt	Driveway	15
36+60	Rt	Driveway	15
40+08	Lt	Driveway	15
40+55	Rt	Driveway	15
52+83	Rt	Intersection	15
68+34	Lt	Driveway	15
79+24	Lt	Field	15
80+48	Rt	Driveway	15
81+81	Rt	Driveway	15
105+63	Lt	Driveway	15
105+63	Rt	Intersection	25
109+00	Rt	Substation	15
143+26	Rt	Field	15
152+87	Rt	Driveway	15
158+47	Lt	Driveway	15
158+47	Rt	Intersection	15
184+53	Rt	Field	15
211+29	Rt	Intersection	25
213+75	Lt	Field	15
237+45	Lt	Field	15
237+54	Rt	Field	15
248+87	Lt	Field	15
256+30	Rt	Driveway	15
264+25	Rt	Field	15
279+06	Rt	Field	15
283+67	Lt	Field	15
291+62	Rt	Field	15
302+00	Rt	Field	15
316+86	Lt	Intersection	25
316+86	Rt	Field	15
SALVAGED BASE COURSE (TON) =			540

PAVEMENT MARKINGS - YELLOW CENTERLINE					
Location	Start Station	End Station	Measured Length	Basis (ft/ft)	Painted Length
Double Barrier	1+42	8+75	733	2.00	1,466
Single Barrier (NB Passing)	8+75	17+75	900	1.25	1,125
Skips	17+75	97+00	7,925	0.25	1,981
Single Barrier (SB Passing)	97+00	105+00	800	1.25	1,000
Double Barrier	105+00	106+00	100	2.00	200
Single Barrier (NB Passing)	106+00	114+00	800	1.25	1,000
Skips	114+00	165+00	5,100	0.25	1,275
Single Barrier (SB Passing)	165+00	174+00	900	1.25	1,125
Double Barrier	174+00	177+00	300	2.00	600
Single Barrier (NB Passing)	177+00	186+00	900	1.25	1,125
Skips	186+00	206+00	2,000	0.25	500
Single Barrier (SB Passing)	206+00	225+00	1,900	1.25	2,375
Double Barrier	225+00	227+50	250	2.00	500
Single Barrier (NB Passing)	227+50	236+50	900	1.25	1,125
Skips	236+50	248+00	1,150	0.25	288
Single Barrier (SB Passing)	248+00	257+00	900	1.25	1,125
Double Barrier	257+00	261+00	400	2.00	800
Single Barrier (NB Passing)	261+00	270+00	900	1.25	1,125
Skips	270+00	297+50	2,750	0.25	688
Single Barrier (SB Passing)	297+50	306+50	900	1.25	1,125
Double Barrier	306+50	308+00	150	2.00	300
Single Barrier (NB Passing)	308+00	317+00	900	1.25	1,125
4 INCH YELLOW LINE =					21,972
PAVEMENT MARKINGS - WHITE EDGELINE					
Location	Start Station	End Station	Measured Length	Basis (ft/ft)	Painted Length
Left Edge Line	1+42	317+00	31,558	1.00	31,558
Right Edge Line	1+42	317+00	31,558	1.00	31,558
4 INCH WHITE LINE =					63,116
TOTAL PVMT MK PAINTED 4IN LINE (LF) =					85,088

SIGNS		
Station	Offset	Message
2+47	26' Rt	Speed Limit 50 MPH
5+46	30' Rt	Trucks 45 MPH
5+98	29' Lt	Stop Ahead
111+41	31' Lt	Do Not Drive On Shoulder
111+41	32' Rt	Do Not Drive On Shoulder
169+61	30' Lt	School Bus Stop
210+32	30' Lt	Do Not Drive On Shoulder
212+56	27' Rt	Do Not Drive On Shoulder
312+75	31' Lt	Trucks 45 MPH
314+70	29' Lt	Do Not Drive On Shoulder
315+74	28' Lt	Speed Limit 50 MPH
314+26	32' Rt	Pavement Ends

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Basis of Estimate
Cemetery Road
Adams County, ND

Earthwork Summary

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-CNOA-CNOB-CNOC-0119(057)	11	1

End Area Balances					
Station	Cut		Fill		Mass Ordinate
	Area	Volume	Area	Volume	
1+00.00	1.0	0.0	17.1	0.0	0.0
2+00.00	0.0	1.9	10.9	70.0	-68.1
3+00.00	0.0	0.0	4.5	38.6	-106.7
4+00.00	1.3	2.4	1.8	15.9	-120.3
5+00.00	0.0	2.3	37.3	97.8	-215.7
6+00.00	0.0	0.0	5.4	106.6	-322.3
7+00.00	4.1	7.5	0.6	14.8	-329.5
8+00.00	3.4	13.8	0.8	3.4	-319.2
9+00.00	4.4	14.3	0.5	3.4	-308.2
10+00.00	2.0	11.8	1.0	3.8	-300.2
11+00.00	1.7	6.9	1.8	6.9	-300.2
12+00.00	4.8	12.0	0.6	5.9	-294.0
13+00.00	7.9	23.5	0.6	2.9	-273.5
14+00.00	5.7	25.2	0.6	3.0	-251.2
15+00.00	7.4	24.4	0.6	3.1	-229.9
16+00.00	6.0	24.8	0.6	3.0	-208.1
17+00.00	2.1	15.0	0.8	3.5	-196.6
18+00.00	3.4	10.2	0.5	3.4	-189.8
19+00.00	5.1	15.6	0.5	2.7	-176.9
20+00.00	6.8	22.1	0.6	2.7	-157.5
21+00.00	4.1	20.2	1.7	5.7	-143.0
22+00.00	0.1	7.7	7.2	22.4	-157.6
23+00.00	1.8	3.4	7.3	36.3	-190.5
24+00.00	6.4	15.1	0.8	20.2	-195.6
25+00.00	6.5	23.8	0.6	3.5	-175.3
26+00.00	9.0	28.6	0.7	3.4	-150.1
27+00.00	18.4	50.8	0.6	3.4	-102.7
28+00.00	7.0	47.0	0.8	3.5	-59.2
29+00.00	19.9	49.8	0.6	3.4	-12.8
29+27.32					0.0
30+00.00	7.2	50.2	0.7	3.2	34.1
31+00.00	6.5	25.3	1.9	6.5	52.9
32+00.00	11.4	33.1	0.6	6.3	79.6
33+00.00	13.4	45.8	1.3	4.7	120.7
34+00.00	7.7	39.0	0.6	4.6	155.1
35+00.00	3.8	21.4	0.6	3.1	173.4
36+00.00	1.6	10.0	1.1	4.5	179.0
37+00.00	0.8	4.4	2.8	9.8	173.6
38+00.00	0.5	2.4	2.4	12.9	163.1
39+00.00	0.0	0.9	6.3	21.7	142.2
40+00.00	0.2	0.4	7.2	33.7	109.0
41+00.00	0.6	1.4	2.3	23.8	86.6
42+00.00	0.6	2.2	2.5	12.0	76.8
43+00.00	0.1	1.2	7.5	25.0	53.1
43+74.42					0.0
44+00.00	0.0	0.1	21.0	71.4	-18.2
45+00.00	0.0	0.0	24.2	113.0	-131.3
46+00.00	0.0	0.0	55.5	199.2	-330.5
47+00.00	0.0	0.0	20.8	190.8	-521.3
48+00.00	0.0	0.0	11.4	80.5	-601.8
49+00.00	0.0	0.0	7.9	48.2	-649.9
50+00.00	0.0	0.0	5.8	34.2	-684.1
51+00.00	0.0	0.0	6.2	29.9	-714.0
52+00.00	0.1	0.3	3.5	24.1	-737.8
53+00.00	2.8	5.4	2.0	13.7	-746.1

End Area Balances					
Station	Cut		Fill		Mass Ordinate
	Area	Volume	Area	Volume	
54+00.00	0.1	5.4	1.8	9.5	-750.2
55+00.00	0.2	0.6	2.3	10.3	-760.0
56+00.00	0.0	0.3	7.6	24.9	-784.6
57+00.00	0.0	0.0	5.0	31.7	-816.2
58+00.00	0.1	0.1	6.1	27.9	-844.1
59+00.00	0.0	0.1	7.4	33.7	-877.7
60+00.00	0.0	0.0	9.8	42.9	-920.6
61+00.00	0.0	0.1	3.3	32.8	-953.3
62+00.00	0.2	0.4	4.5	19.5	-972.4
63+00.00	0.2	0.7	2.8	18.3	-990.0
64+00.00	0.0	0.4	3.7	16.2	-1005.8
65+00.00	0.0	0.1	3.9	18.9	-1024.6
66+00.00	0.0	0.0	10.0	34.7	-1059.3
67+00.00	0.0	0.0	7.2	43.1	-1102.4
68+00.00	4.3	7.9	0.6	19.5	-1114.1
69+00.00	5.4	17.9	0.6	2.8	-1099.0
70+00.00	56.3	114.2	9.6	25.5	-1010.2
71+00.00	59.0	213.5	0.5	25.3	-822.0
72+00.00	59.5	219.4	0.5	2.4	-605.0
73+00.00	54.1	210.4	0.5	2.4	-397.0
74+00.00	46.8	186.9	0.5	2.5	-212.6
75+00.00	37.1	155.3	2.3	7.1	-64.3
75+75.39					0.0
76+00.00	30.8	125.8	13.9	40.5	21.0
77+00.00	27.3	107.7	16.5	76.0	52.7
78+00.00	25.4	97.7	11.5	70.1	80.3
79+00.00	34.5	110.9	6.8	45.7	145.5
80+00.00	35.0	128.6	9.2	39.8	234.3
81+00.00	26.9	114.5	17.4	66.4	282.4
82+00.00	34.4	113.4	3.7	52.8	343.1
83+00.00	36.2	130.6	13.0	41.9	431.8
84+00.00	33.4	128.8	4.1	43.0	517.6
85+00.00	30.4	118.1	14.9	47.6	588.1
86+00.00	24.6	101.9	20.0	87.3	602.8
87+00.00	17.1	77.3	30.0	125.0	555.1
88+00.00	14.9	59.2	27.7	144.1	470.2
89+00.00	12.8	51.2	28.7	140.8	380.6
90+00.00	7.4	37.3	35.4	160.3	257.6
91+00.00	9.8	31.8	41.5	192.4	97.0
91+59.67					0.0
92+00.00	10.1	36.8	38.2	199.4	-65.6
93+00.00	7.0	31.7	41.8	200.1	-233.9
94+00.00	8.1	28.0	46.9	221.8	-427.7
95+00.00	10.3	34.1	48.9	239.6	-633.2
96+00.00	16.6	49.7	36.6	213.9	-797.5
97+00.00	20.1	67.9	23.1	149.3	-878.9
98+00.00	25.3	84.1	19.8	107.3	-902.2
99+00.00	24.1	91.4	24.3	110.3	-921.1
100+00.00	29.5	99.2	24.8	122.6	-944.4
101+00.00	30.9	111.9	21.8	116.4	-949.0
102+00.00	39.2	129.9	6.3	70.3	-889.4
103+00.00	46.0	157.8	1.6	19.8	-751.5
104+00.00	49.8	177.3	0.5	5.4	-579.5
105+00.00	60.2	203.7	0.5	2.5	-378.4
106+00.00	104.3	304.6	0.6	2.6	-76.4

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Registration Number
PE- 7113,
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Earthwork Summary
Cemetery Road
Adams County, ND

Earthwork Summary

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-CNOA-CNOB-CNOC-0119(057)	11	2

End Area Balances					
Station	Cut		Fill		Mass Ordinate
	Area	Volume	Area	Volume	
106+40.86					0.0
107+00.00	23.3	236.2	19.1	49.3	110.6
108+00.00	16.2	73.0	36.6	139.2	44.4
109+00.00	25.5	77.1	10.3	117.0	4.4
110+00.00	29.2	101.3	18.3	71.5	34.2
111+00.00	36.5	121.7	18.4	92.0	63.9
112+00.00	41.0	143.4	14.4	82.2	125.1
113+00.00	29.9	131.3	22.6	92.5	163.9
114+00.00	25.8	103.3	22.4	112.4	154.8
115+00.00	31.9	106.9	12.2	86.5	175.1
116+00.00	38.1	129.5	6.6	46.9	257.7
117+00.00	34.9	135.1	10.3	42.3	350.5
118+00.00	25.4	111.6	13.1	58.5	403.6
119+00.00	26.2	95.5	18.1	78.0	421.1
120+00.00	25.9	96.5	16.5	86.5	431.0
121+00.00	22.5	89.6	23.5	100.1	420.6
122+00.00	19.2	77.2	29.4	132.4	365.3
123+00.00	14.8	63.0	28.9	145.8	282.5
124+00.00	16.8	58.5	35.9	161.9	179.1
125+00.00	20.3	68.6	47.8	209.1	38.6
125+26.36					0.0
126+00.00	20.7	75.9	41.1	222.2	-107.7
127+00.00	22.8	80.5	29.9	177.4	-204.6
128+00.00	20.1	79.4	32.2	155.3	-280.6
129+00.00	18.4	71.2	28.5	151.8	-361.2
130+00.00	19.1	69.4	23.6	130.3	-422.1
131+00.00	21.4	75.1	26.7	125.8	-472.8
132+00.00	30.9	97.0	12.1	97.1	-472.9
133+00.00	44.4	139.6	3.6	39.4	-372.8
134+00.00	41.9	159.9	1.1	11.8	-224.7
135+00.00	40.2	152.0	5.7	16.9	-89.6
136+00.00	29.2	128.5	17.7	58.3	-19.5
137+00.00	23.7	98.0	22.0	99.1	-20.6
138+00.00	25.1	90.5	24.0	114.9	-44.9
139+00.00	22.3	87.8	34.9	147.1	-104.2
140+00.00	9.1	58.2	52.8	219.1	-265.1
141+00.00	11.0	37.2	47.0	249.4	-477.3
142+00.00	27.2	70.6	21.1	170.3	-576.9
143+00.00	27.6	101.5	14.1	88.1	-563.5
144+00.00	29.7	106.1	15.2	73.3	-530.7
145+00.00	34.7	119.2	16.0	78.0	-489.5
146+00.00	35.3	129.6	19.4	88.5	-448.4
147+00.00	32.1	124.7	25.5	112.2	-435.9
148+00.00	31.6	118.0	18.4	109.8	-427.7
149+00.00	24.9	104.6	46.3	161.7	-484.7
150+00.00	36.0	112.7	12.3	146.5	-518.6
151+00.00	40.9	142.5	1.3	34.0	-410.1
152+00.00	52.0	172.2	0.5	4.5	-242.3
153+00.00	63.2	213.4	0.5	2.4	-31.3
153+15.46					0.0
154+00.00	51.7	212.8	3.5	10.0	171.4
155+00.00	53.5	194.8	4.2	19.3	346.9
156+00.00	3.6	105.8	0.5	11.7	441.0
157+00.00	7.3	20.2	8.1	21.5	439.7
158+00.00	13.9	39.2	0.4	21.4	457.4

End Area Balances					
Station	Cut		Fill		Mass Ordinate
	Area	Volume	Area	Volume	
159+00.00	2.9	31.2	1.3	4.3	484.3
160+00.00	1.0	7.2	3.0	10.8	480.7
161+00.00	0.1	2.0	12.8	39.5	443.2
162+00.00	0.0	0.3	12.1	62.1	381.3
163+00.00	0.0	0.0	25.9	94.8	286.5
164+00.00	0.0	0.0	40.9	166.8	119.7
165+00.00	25.4	46.9	24.1	162.4	4.2
165+06.56					0.0
166+00.00	20.4	84.8	35.3	148.5	-59.6
167+00.00	19.8	74.5	24.8	150.2	-135.4
168+00.00	18.7	71.4	32.1	142.1	-206.1
169+00.00	30.3	90.8	21.5	133.9	-249.2
170+00.00	31.9	115.1	21.0	106.1	-240.2
171+00.00	15.5	87.7	31.2	130.3	-282.8
172+00.00	13.2	53.0	32.5	159.2	-389.0
173+00.00	24.6	69.9	31.9	161.0	-480.1
174+00.00	38.2	116.4	12.7	111.5	-475.2
175+00.00	60.0	181.9	4.2	42.2	-335.5
176+00.00	58.9	220.2	3.7	19.7	-135.0
176+74.64					0.0
177+00.00	44.4	191.4	0.5	10.5	45.9
178+00.00	12.9	106.2	24.7	63.1	89.0
179+00.00	12.1	46.3	19.7	111.1	24.2
180+00.00	26.1	70.6	16.5	90.7	4.2
180+07.65					0.0
181+00.00	0.0	48.3	24.8	103.3	-50.8
182+00.00	0.0	0.0	11.3	90.2	-141.0
183+00.00	0.0	0.0	14.8	65.2	-206.3
184+00.00	0.0	0.0	29.2	109.9	-316.1
185+00.00	0.0	0.0	28.8	144.9	-461.0
186+00.00	0.0	0.0	48.9	194.1	-655.1
187+00.00	0.0	0.0	47.7	241.5	-896.6
188+00.00	0.0	0.0	25.4	182.8	-1079.4
189+00.00	0.0	0.0	15.5	102.3	-1181.7
190+00.00	0.1	0.3	6.5	55.1	-1236.5
191+00.00	0.0	0.3	11.9	46.2	-1282.4
192+00.00	0.0	0.0	20.5	81.1	-1363.6
193+00.00	0.2	0.4	7.9	71.1	-1434.2
194+00.00	4.4	8.6	1.7	24.0	-1449.6
195+00.00	19.9	45.1	0.5	5.5	-1409.9
196+00.00	18.0	70.2	0.5	2.5	-1342.2
197+00.00	13.1	57.6	0.5	2.6	-1287.2
198+00.00	9.4	41.8	0.5	2.7	-1248.1
199+00.00	13.3	42.2	0.6	2.8	-1208.6
200+00.00	10.0	43.3	0.5	2.7	-1168.0
201+00.00	16.2	48.6	0.6	2.7	-1122.1
202+00.00	21.6	70.1	0.6	2.8	-1054.8
203+00.00	15.8	69.3	0.6	3.0	-988.5
204+00.00	11.6	50.8	0.5	3.0	-940.7
205+00.00	12.4	44.4	0.6	2.8	-899.0
206+00.00	9.4	40.3	0.6	2.9	-861.6
207+00.00	15.3	45.7	0.5	2.8	-818.7
208+00.00	18.8	63.2	0.5	2.7	-758.2
209+00.00	60.8	147.5	0.5	2.5	-613.3
210+00.00	76.2	253.8	0.5	2.5	-362.0

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William Doerr
Registration Number
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Earthwork Summary
Cemetery Road
Adams County, ND

Earthwork Summary

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-CNOA-CNOB-CNOC-0119(057)	11	3

Station	End Area Balances				Mass Ordinate
	Cut		Fill		
	Area	Volume	Area	Volume	
211+00.00	50.2	234.2	1.0	3.8	-131.7
211+81.81					0.0
212+00.00	38.7	164.8	0.6	3.8	29.3
213+00.00	23.3	114.8	0.6	2.8	141.3
214+00.00	25.5	90.2	0.5	2.6	228.9
215+00.00	25.7	94.8	0.5	2.4	321.3
216+00.00	21.1	86.8	0.5	2.5	405.6
217+00.00	16.3	69.3	0.5	2.4	472.5
218+00.00	13.8	55.7	0.5	2.5	525.7
219+00.00	10.6	45.2	0.5	2.5	568.4
220+00.00	10.2	38.5	0.5	2.5	604.5
221+00.00	10.1	37.6	0.5	2.4	639.6
222+00.00	8.5	34.5	0.5	2.5	671.6
223+00.00	13.6	40.9	0.6	2.7	709.7
224+00.00	26.5	74.2	0.6	2.9	781.0
225+00.00	73.5	185.2	0.6	3.0	963.2
226+00.00	105.0	330.5	1.1	4.4	1289.3
227+00.00	121.5	419.5	1.0	5.3	1703.4
228+00.00	56.7	330.0	0.7	4.2	2029.2
229+00.00	43.3	185.2	1.5	5.5	2208.9
230+00.00	51.8	176.2	1.1	6.5	2378.5
231+00.00	20.0	132.9	10.2	28.3	2483.2
232+00.00	1.2	39.3	11.7	54.8	2467.7
233+00.00	0.0	2.3	43.9	139.0	2331.0
234+00.00	0.0	0.0	49.1	232.3	2098.7
235+00.00	0.0	0.0	49.9	247.4	1851.3
236+00.00	0.0	0.0	25.0	187.3	1664.0
237+00.00	71.2	131.8	7.3	80.9	1714.9
238+00.00	0.1	132.0	13.4	51.8	1795.1
239+00.00	0.9	1.8	28.4	104.6	1692.3
240+00.00	43.7	82.5	27.7	140.3	1634.5
241+00.00	32.5	141.0	89.1	291.9	1483.6
242+00.00	19.6	96.4	172.8	654.8	925.2
243+00.00	10.6	55.9	177.3	875.4	105.7
243+12.78					0.0
244+00.00	8.8	35.9	167.9	863.1	-721.5
245+00.00	15.0	44.1	37.2	512.9	-1190.3
246+00.00	21.5	67.6	25.8	157.5	-1280.3
247+00.00	39.1	112.1	14.3	100.3	-1268.4
248+00.00	50.5	165.9	9.6	59.8	-1162.4
249+00.00	64.6	213.1	0.8	26.1	-975.4
250+00.00	63.1	236.4	0.5	3.3	-742.3
251+00.00	66.2	239.4	0.5	2.4	-505.3
252+00.00	68.5	249.4	8.3	21.9	-277.8
253+00.00	66.7	250.2	16.5	62.1	-89.6
253+39.81					0.0
254+00.00	77.8	267.6	0.4	42.5	135.5
255+00.00	65.0	264.5	0.5	2.3	397.6
256+00.00	50.4	213.7	0.5	2.4	608.9
257+00.00	48.0	182.3	0.5	2.5	788.7
258+00.00	54.1	189.1	0.5	2.5	975.3
259+00.00	64.4	219.5	0.5	2.4	1192.3
260+00.00	88.1	282.4	0.4	2.2	1472.5
261+00.00	83.7	318.1	1.3	4.2	1786.4
262+00.00	56.4	259.4	4.9	15.5	2030.3

Station	End Area Balances				Mass Ordinate
	Cut		Fill		
	Area	Volume	Area	Volume	
263+00.00	45.0	187.9	4.6	23.8	2194.4
264+00.00	47.0	170.5	0.6	13.0	2351.9
265+00.00	45.3	171.0	0.5	2.6	2520.3
266+00.00	33.6	146.2	17.2	44.3	2622.3
267+00.00	18.3	96.1	33.5	126.9	2591.5
268+00.00	5.4	43.9	35.1	171.6	2463.8
269+00.00	7.4	23.8	40.9	190.0	2297.6
270+00.00	0.0	13.7	66.8	269.3	2042.0
271+00.00	3.9	7.2	50.5	293.3	1755.9
272+00.00	0.0	7.2	50.5	252.6	1510.6
273+00.00	0.0	0.0	47.8	245.8	1264.7
274+00.00	4.1	7.6	25.9	184.2	1088.1
275+00.00	3.1	13.2	22.2	120.2	981.2
276+00.00	13.2	30.1	20.4	106.5	904.8
277+00.00	13.8	50.1	21.5	104.6	850.4
278+00.00	8.3	41.1	33.1	136.4	755.1
279+00.00	9.2	32.4	23.2	140.6	646.9
280+00.00	8.3	32.3	49.6	181.8	497.4
281+00.00	3.0	21.0	68.7	295.7	222.7
281+66.54					0.0
282+00.00	0.2	6.0	67.6	340.7	-112.0
283+00.00	1.3	2.9	55.1	306.7	-415.8
284+00.00	14.7	29.7	28.3	208.6	-594.7
285+00.00	24.4	72.4	17.8	115.3	-637.7
286+00.00	0.0	45.1	48.9	166.9	-759.4
287+00.00	0.0	0.0	38.6	218.8	-978.2
288+00.00	0.0	0.0	8.2	117.0	-1095.3
289+00.00	0.0	0.0	7.9	40.4	-1135.7
290+00.00	0.0	0.1	4.0	29.9	-1165.5
291+00.00	0.1	0.3	2.4	16.1	-1181.3
292+00.00	2.4	4.8	0.6	7.5	-1184.0
293+00.00	0.0	4.5	18.1	46.8	-1226.2
294+00.00	0.0	0.0	41.5	149.2	-1375.4
295+00.00	0.0	0.0	53.7	238.0	-1613.4
296+00.00	0.0	0.0	66.8	301.2	-1914.6
297+00.00	0.0	0.0	67.9	336.7	-2251.2
298+00.00	0.0	0.0	52.6	301.1	-2552.3
299+00.00	0.0	0.0	39.7	230.8	-2783.0
300+00.00	25.4	47.1	13.0	131.9	-2867.9
301+00.00	32.0	106.4	9.1	55.4	-2816.9
302+00.00	43.2	139.2	13.0	55.2	-2732.9
303+00.00	35.9	146.4	17.6	76.4	-2662.9
304+00.00	63.1	183.4	11.2	71.9	-2551.4
305+00.00	111.9	324.1	0.8	29.8	-2257.0
306+00.00	158.1	499.9	1.6	5.9	-1763.1
307+00.00	173.0	613.0	0.7	5.7	-1155.8
308+00.00	200.5	691.5	1.6	5.6	-469.9
308+68.78					0.0
309+00.00	173.5	692.6	2.1	9.3	213.3
310+00.00	82.0	473.2	0.5	6.5	680.0
311+00.00	40.7	227.3	1.7	5.4	901.9
312+00.00	24.1	120.0	23.6	63.1	958.8
313+00.00	15.6	73.5	25.6	122.9	909.4
314+00.00	16.0	58.4	29.2	137.0	830.8
315+00.00	20.5	67.5	19.3	121.2	777.2

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Earthwork Summary
Cemetery Road
Adams County, ND

Earthwork Summary

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-CNOA-CNOB-CNOC-0119(057)	11	4

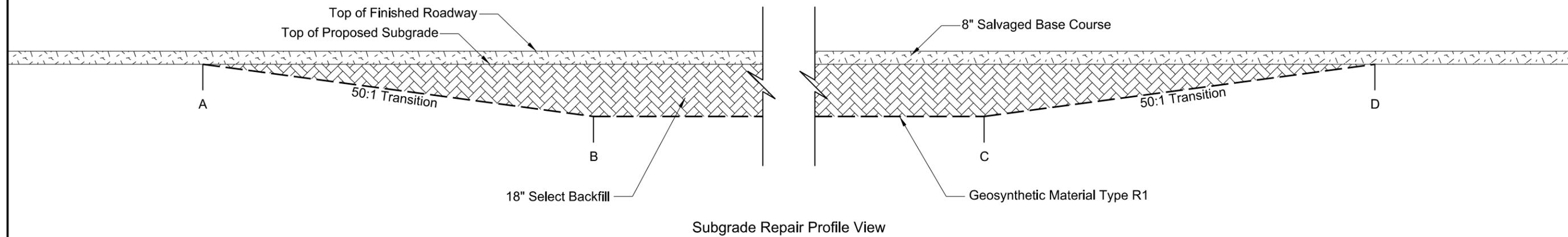
End Area Balances					
Station	Cut		Fill		Mass Ordinate
	Area	Volume	Area	Volume	
316+00.00	21.9	78.5	7.3	66.5	789.2
317+00.00	51.9	136.5	0.9	20.6	905.1
318+00.00	23.6	139.7	1.4	5.8	1039.0
319+00.00	27.9	95.3	1.7	7.8	1126.5
320+00.00	39.1	124.2	0.7	6.1	1244.6
321+00.00	44.2	154.3	0.7	3.5	1395.4
Grand Total:		27355.2		25959.8	

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Earthwork Summary
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	20	1

Drawing Not To Scale

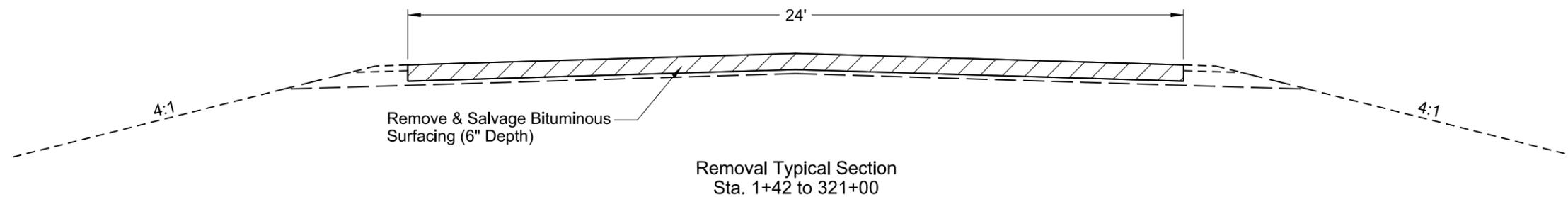
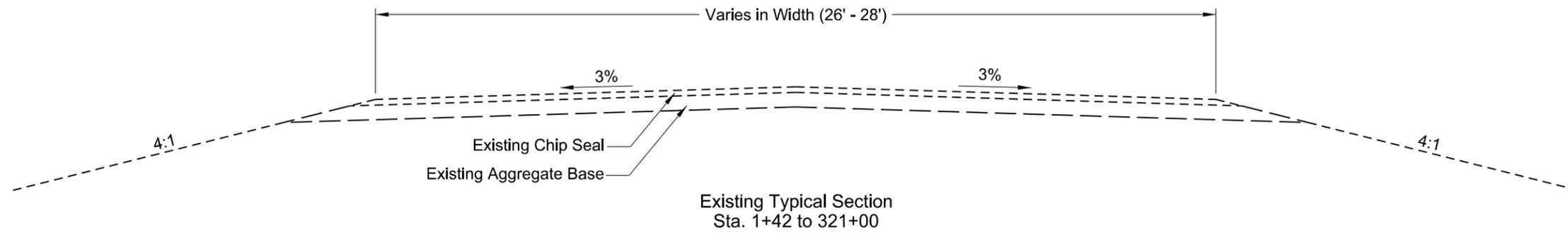


Location	A	B	C	D	Length (LF)	Granular Material for Subgrade Repair (TON)	Geosynthetic Material Type R1 (SY)
18" Subcut #1	71+00	71+75	154+25	155+00	8,400	32,235	25,667
18" Subcut #2	165+00	165+75	179+25	180+00	1,500	5,518	4,584
18" Subcut #3	242+00	242+75	284+25	285+00	4,300	16,360	13,139
18" Subcut #4	304+00	304+75	317+25	318+00	1,400	5,131	4,278
18" Discretionary	-	-	-	-	1,500	5,518	4,584
Total						64,762	52,252

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Subgrade Repair
Cemetery Road
Adams County, ND

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-CNOA-CNOB-CNOC-0119(057)	30	1



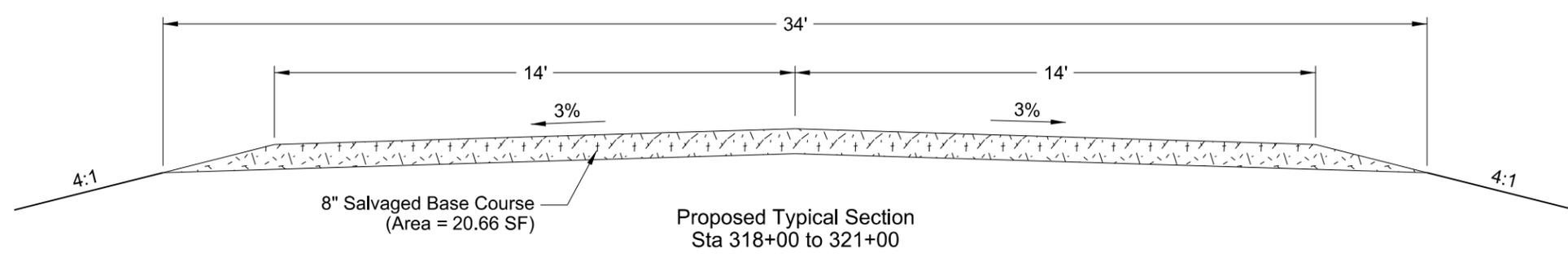
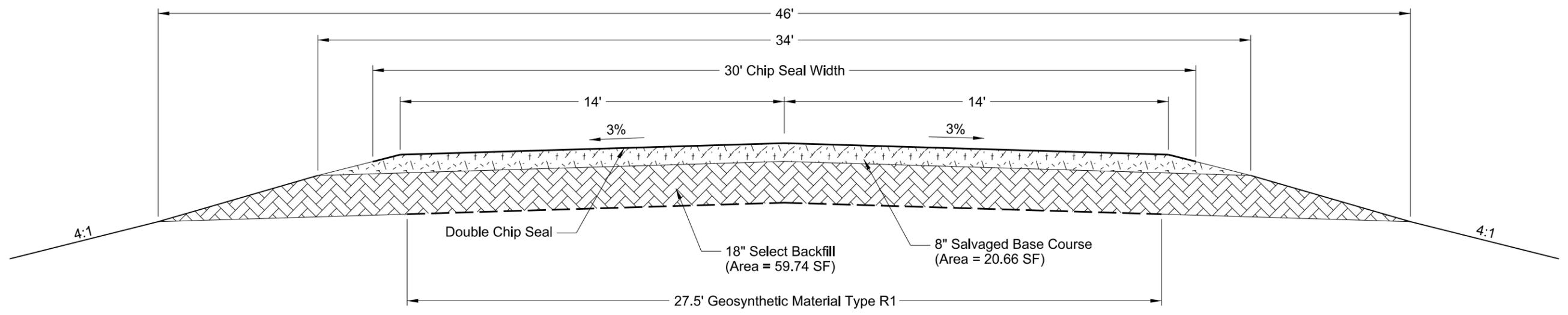
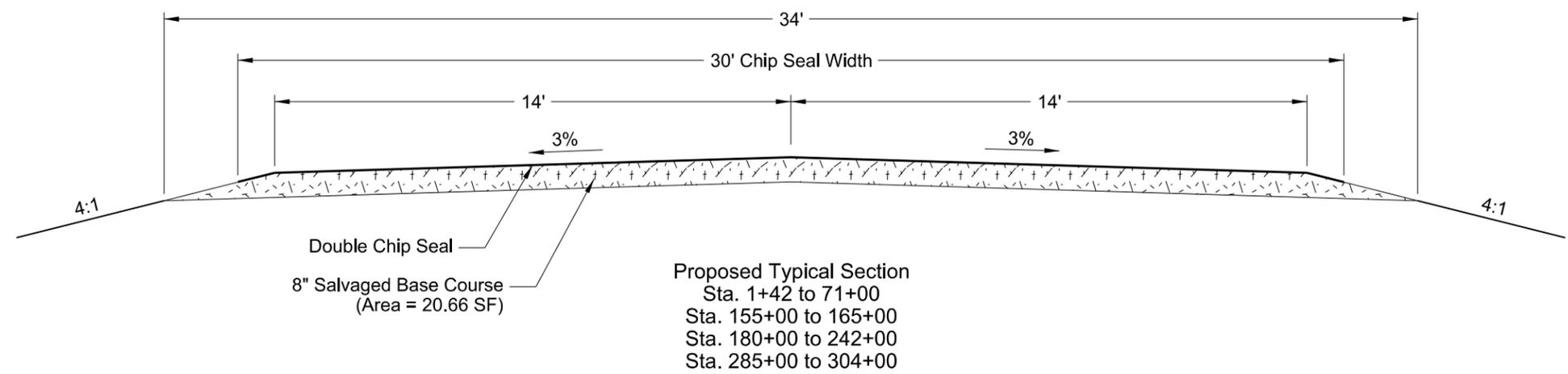
Cemetery Road Core Data

Station	Offset	Chip Seal (inches)	Gravel Base (Inches)
14+89	2' Rt	1.50	5.50
42+45	7' Lt	2.00	5.00
62+46	3' Rt	1.75	5.75
90+82	6' Lt	2.50	6.00
112+99	6' Rt	4.00	5.50
139+39	8' Lt	2.50	4.50
175+30	2' Rt	2.00	4.00
191+66	6' Lt	1.00	6.00
216+48	6' Rt	1.75	5.75
242+88	4' Lt	2.50	5.00
274+03	4' Rt	1.50	6.00
295+68	2' Lt	2.00	5.50
Average =		2.08	5.38

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Existing Typical Section
Cemetery Road
Adams County, ND

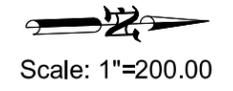
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	30	2



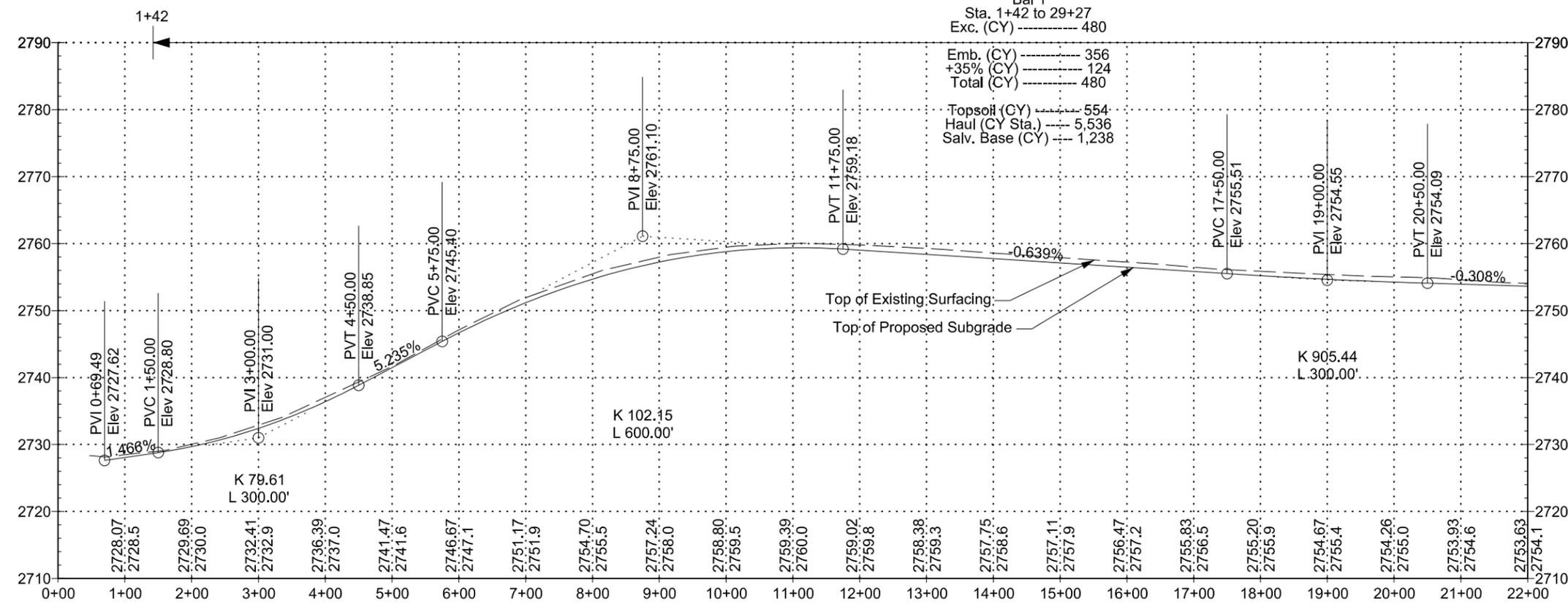
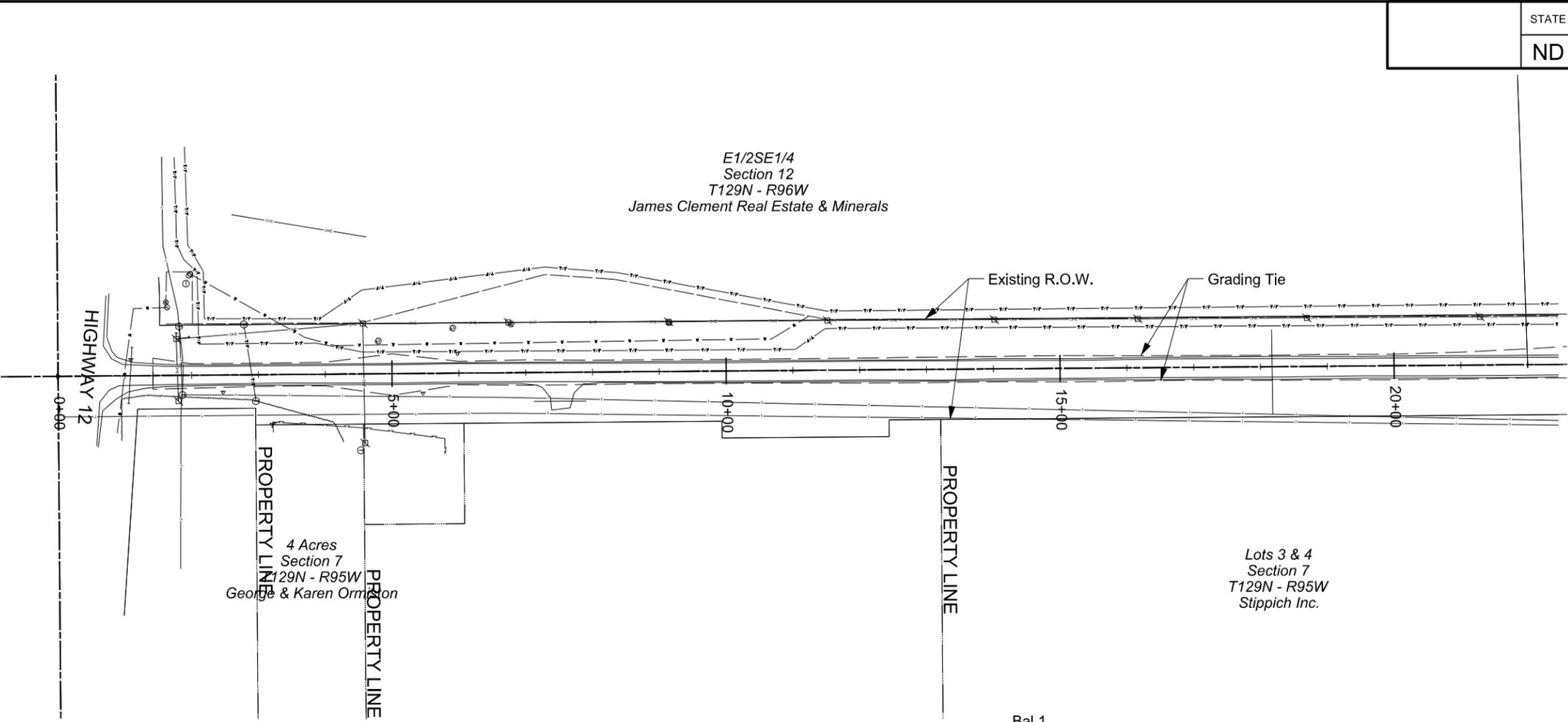
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Proposed Typical Section
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	1

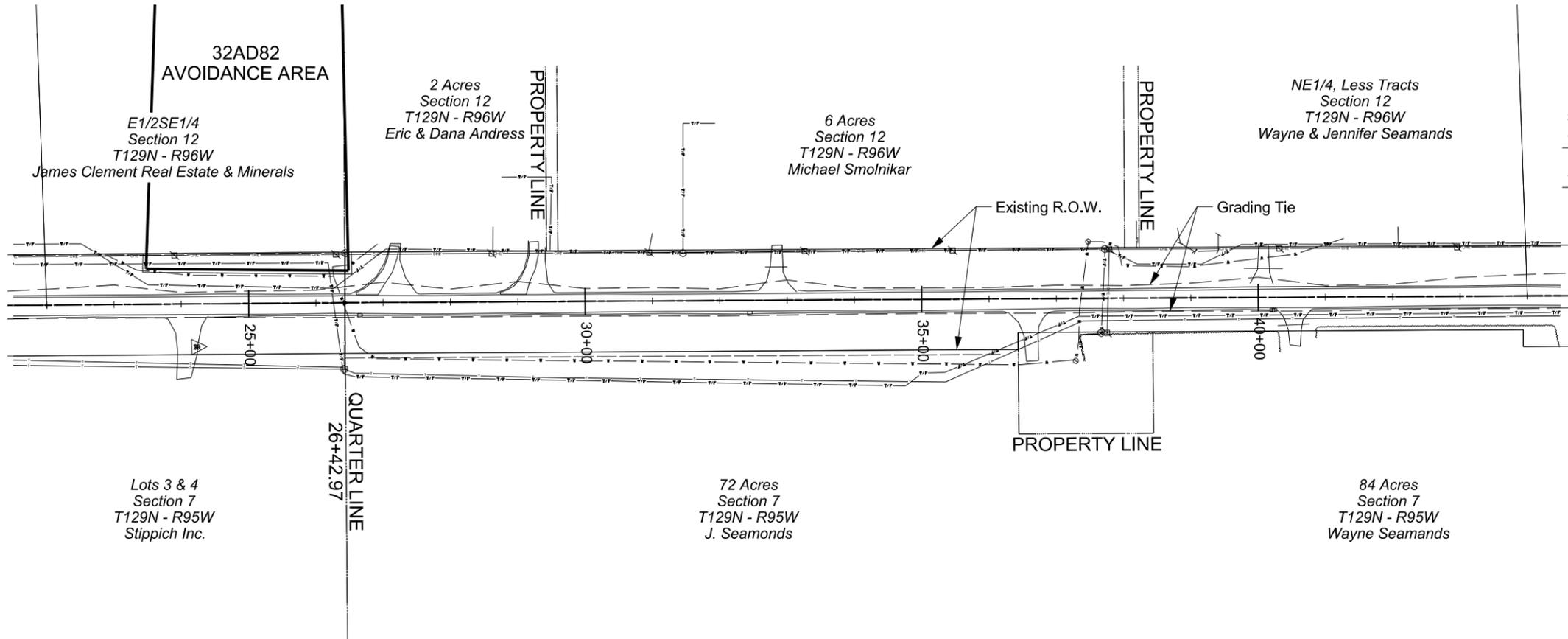
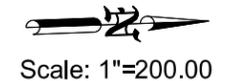


E1/2SE1/4
Section 12
T129N - R96W
James Clement Real Estate & Minerals

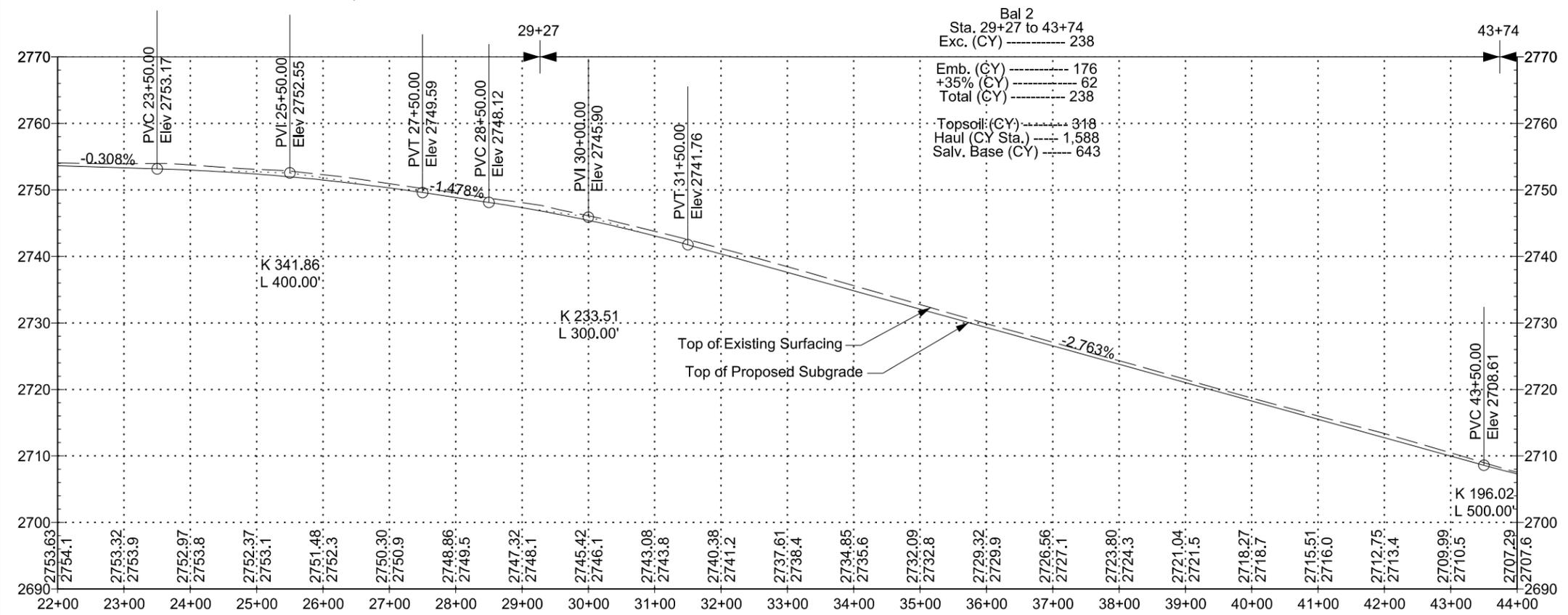


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Plan and Profile
Cemetery Road
Adams County, ND



SPEC	CODE	BID ITEM	QUANTITY	UNIT
752	0911	TEMPORARY SAFETY FENCE		
		23+42 to 26+53 Lt	370	LF
766	0100	MAILBOX - ALL TYPES		
		26+65 Rt	1	EA
		32+45 Rt	1	EA
		40+21 Rt	1	EA



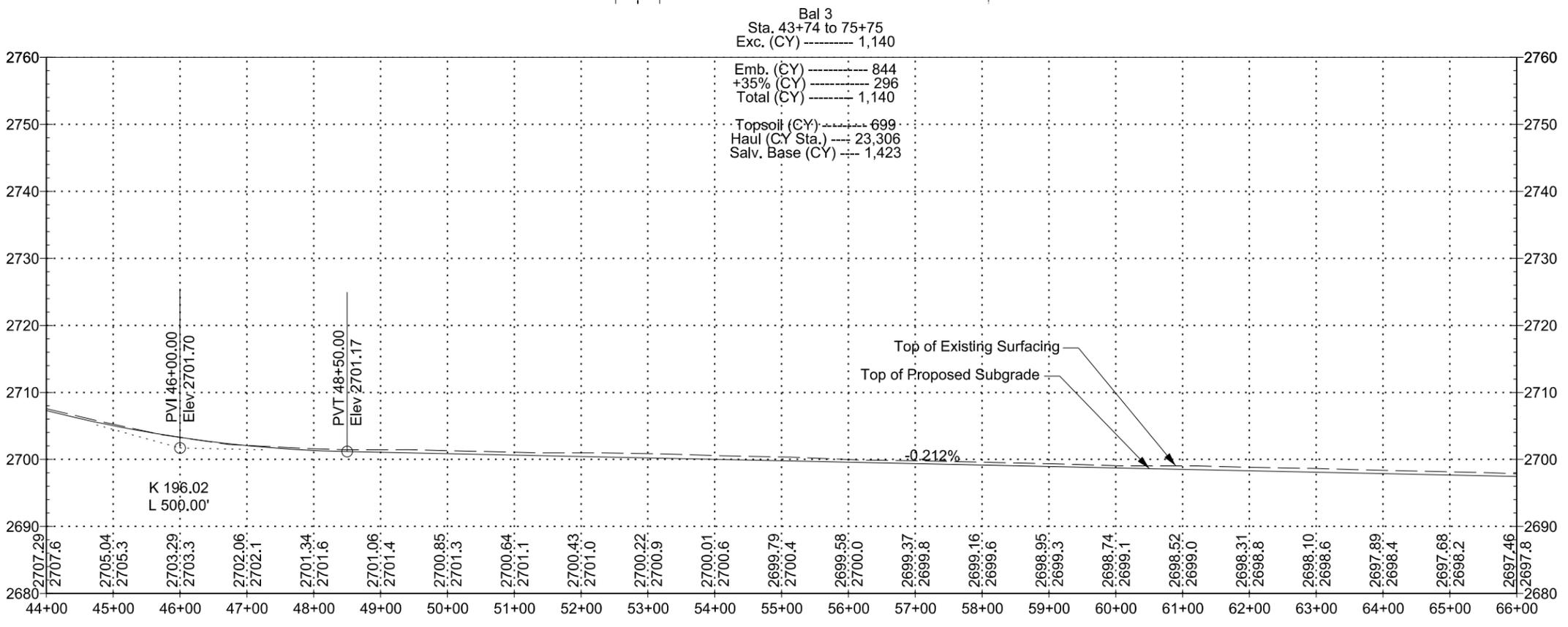
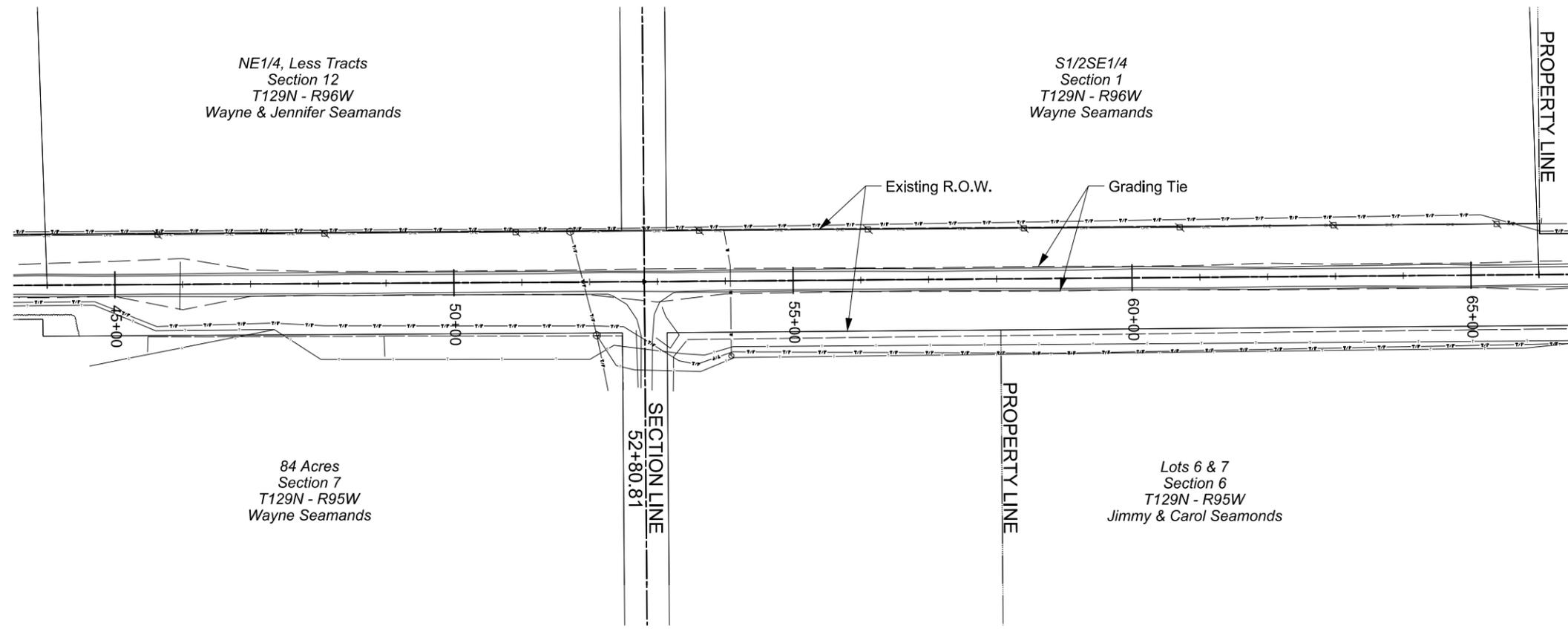
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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	3

Scale: 1"=200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
714	5040	PIPE CORR STEEL .064IN 30IN	5	LF
		45+96 Lt		



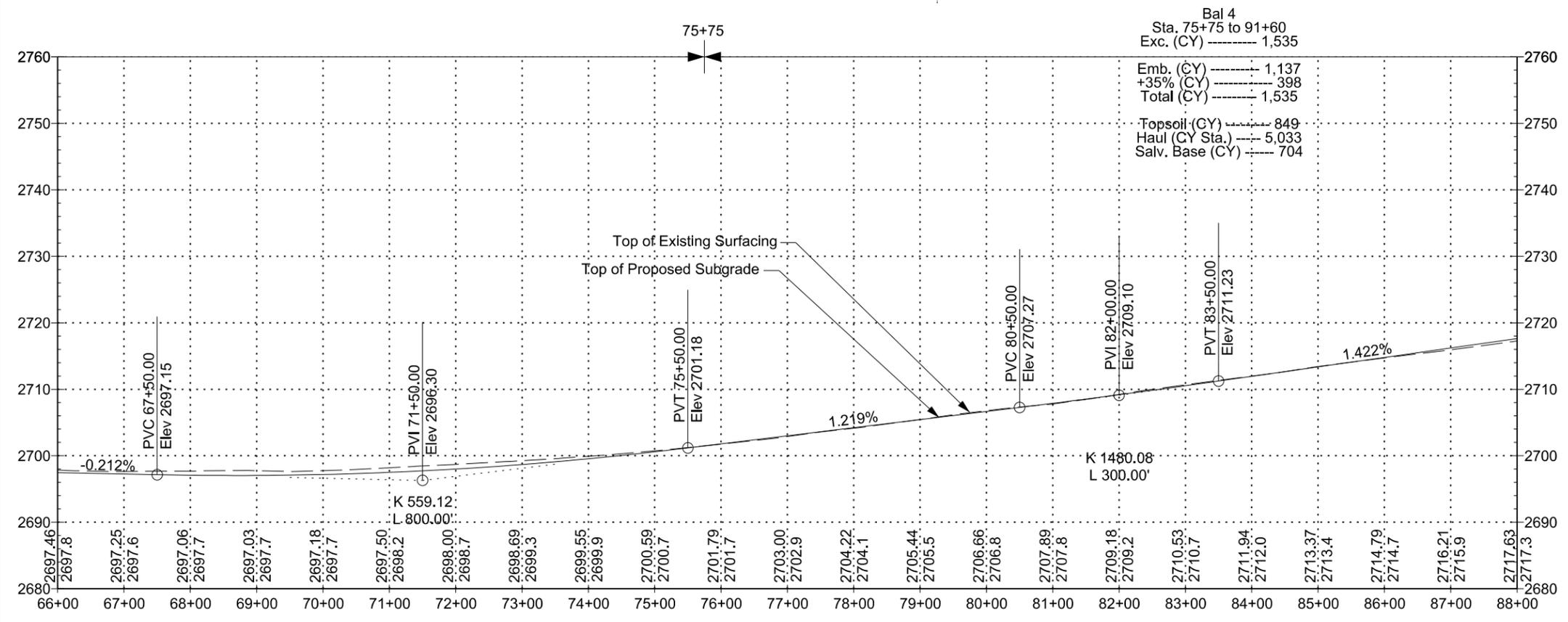
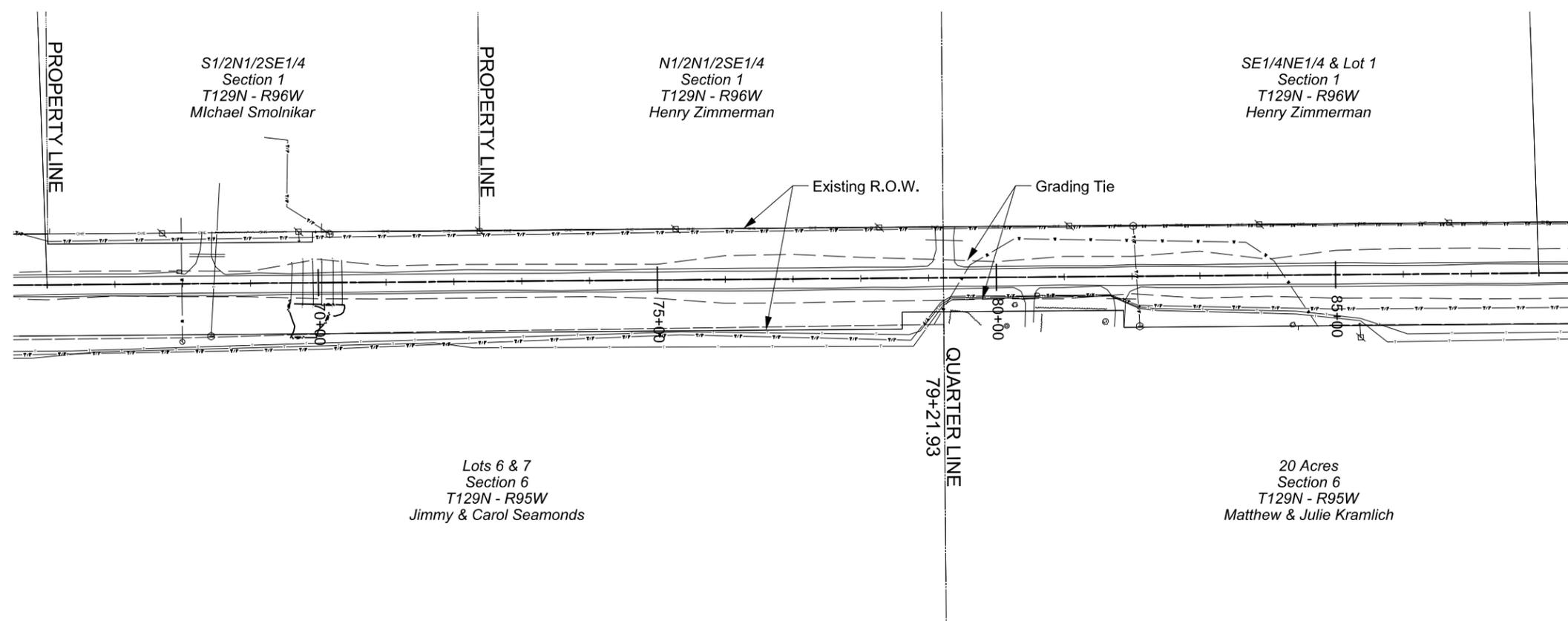
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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	4

Scale: 1"=200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
766	0100	MAILBOX - ALL TYPES		
		67+95 Lt	1	EA
		80+60 Rt	1	EA



Bal 4
Sta. 75+75 to 91+60
Exc. (CY) ----- 1,535

Emb. (CY) ----- 1,137
+35% (CY) ----- 398
Total (CY) ----- 1,535

Topsoil (CY) ----- 849
Haul (CY Sta.) ----- 5,033
Salv. Base (CY) ----- 704

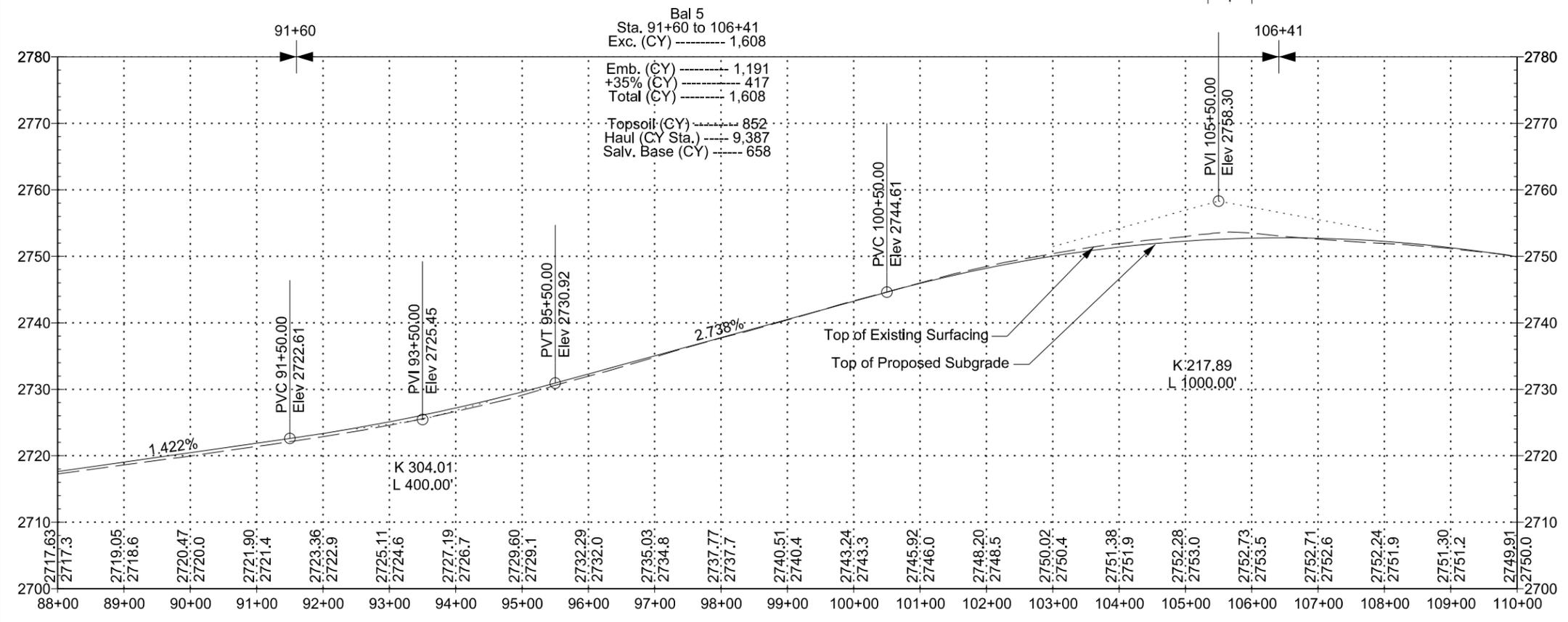
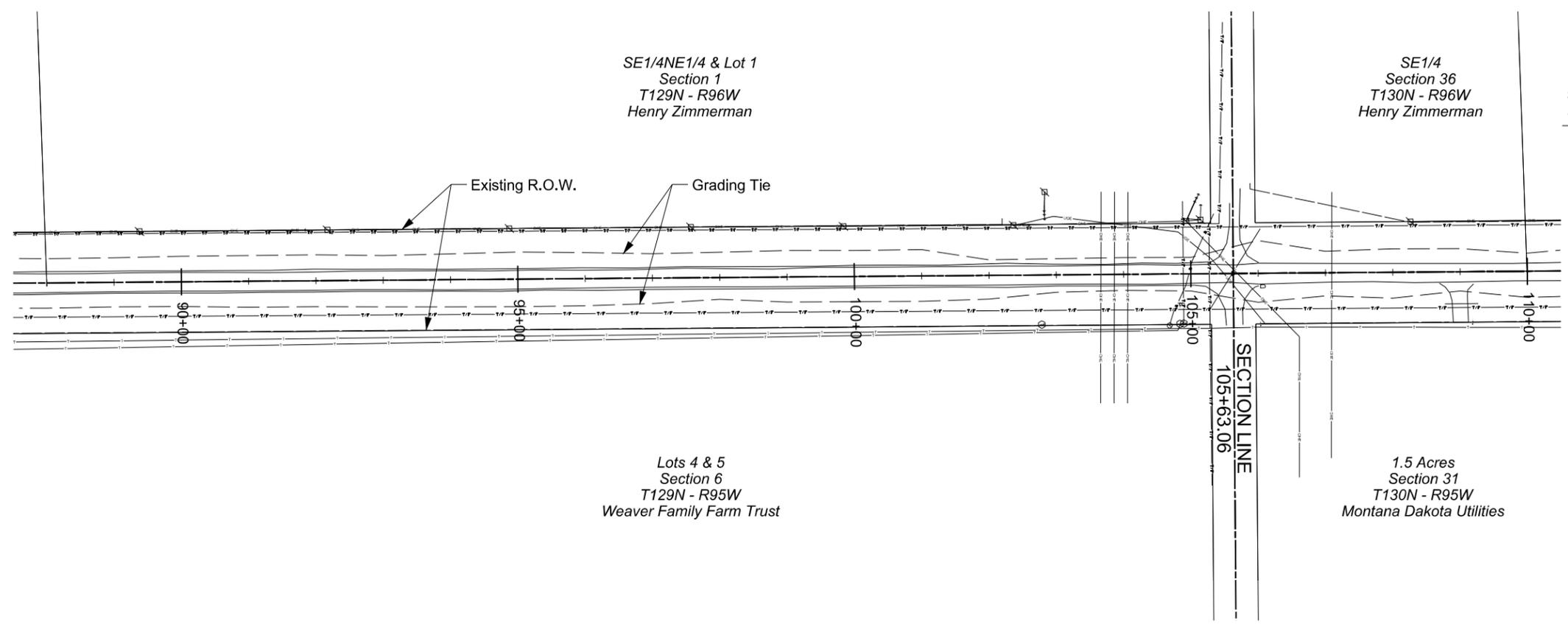
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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	5

Scale: 1"=200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
766	0100	MAILBOX - ALL TYPES	1	EA
		106+07 Rt		



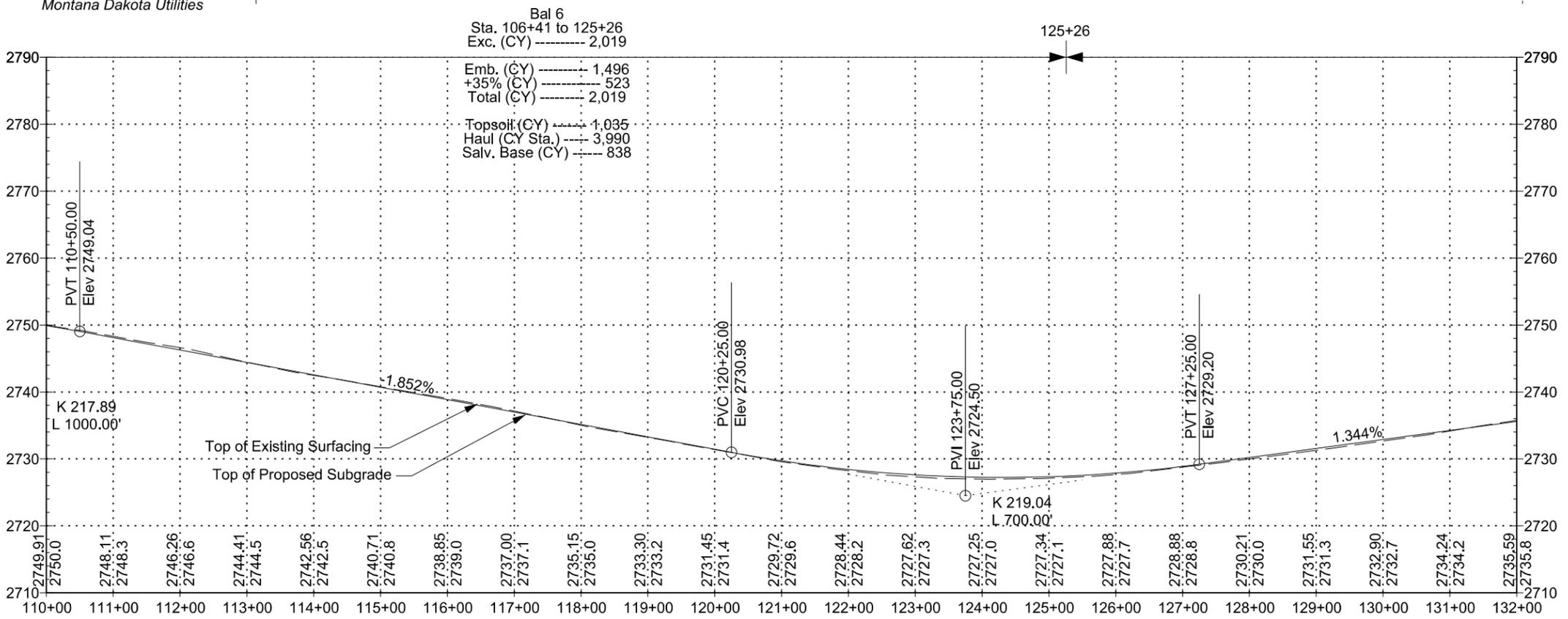
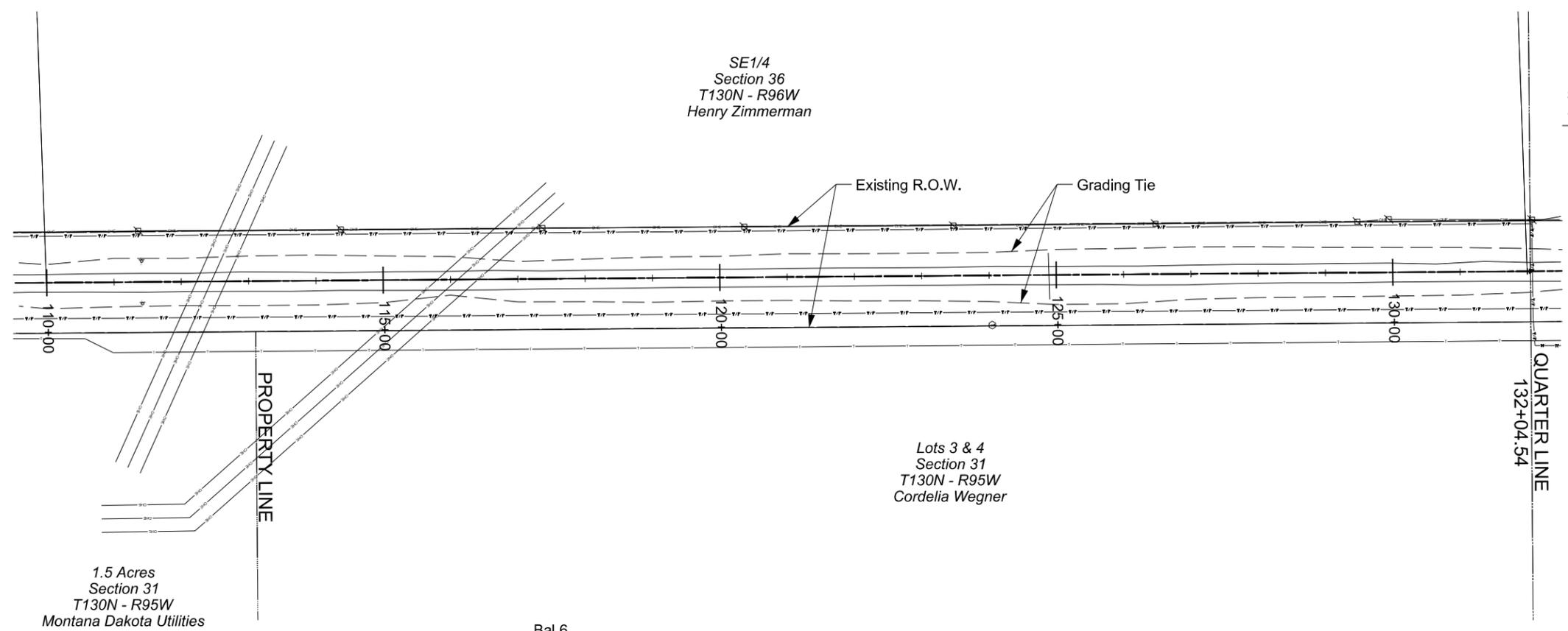
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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	6

Scale: 1"=200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
714	5040	PIPE CORR STEEL .064IN 30IN	5	LF
		124+89 Rt		



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Plan and Profile
Cemetery Road
Adams County, ND

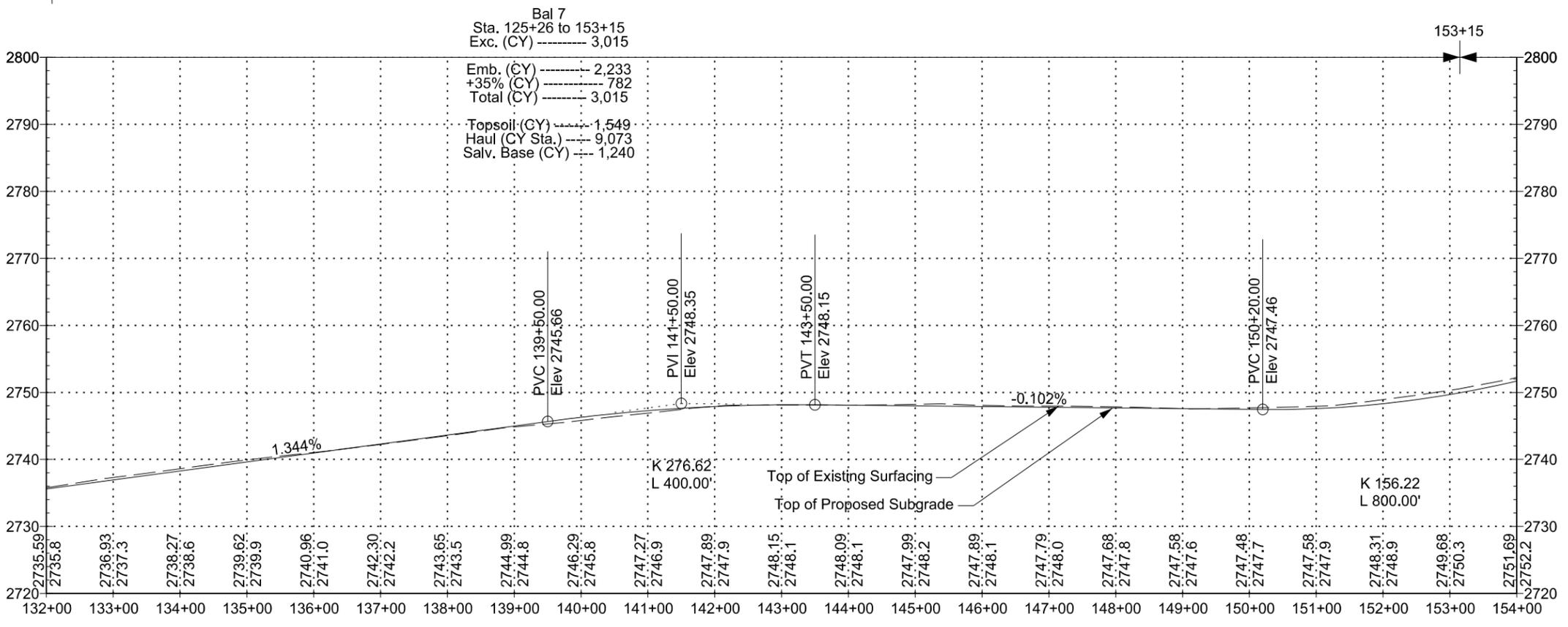
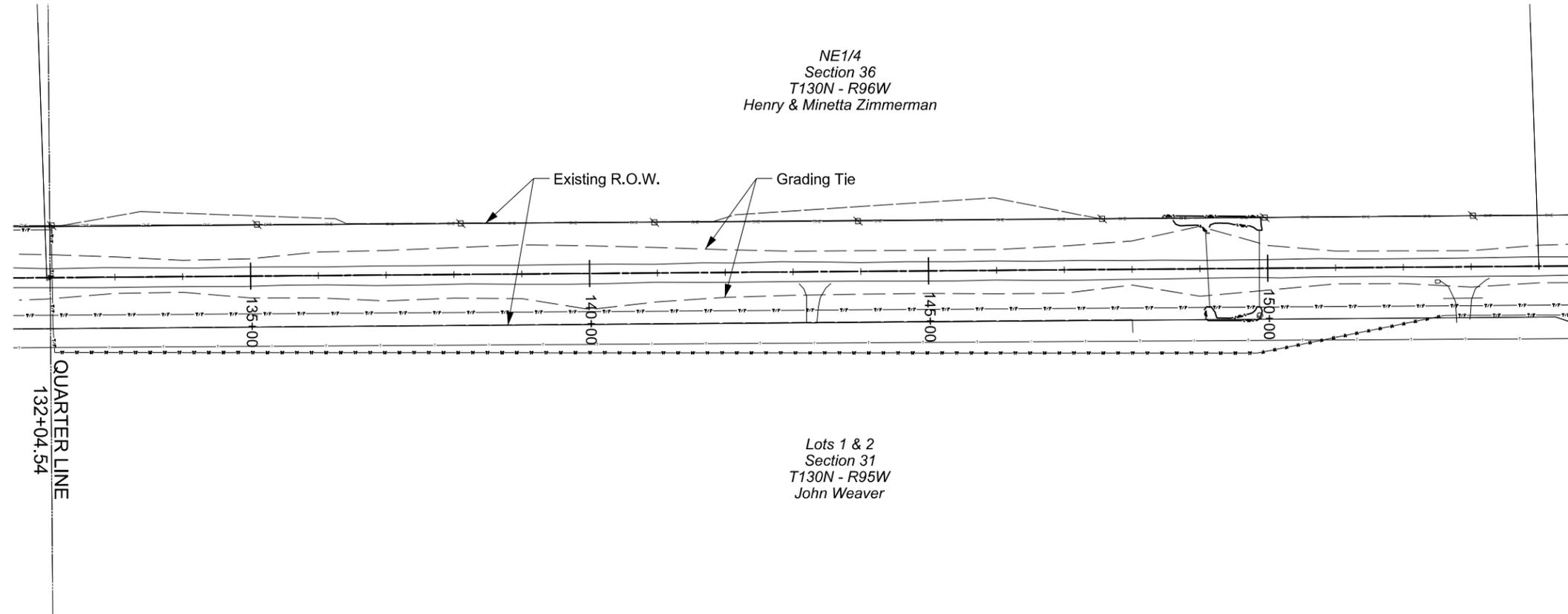
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	7

Scale: 1"=200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
766	0100	MAILBOX - ALL TYPES	1	EA
		152+51 Rt		

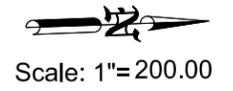
NE1/4
Section 36
T130N - R96W
Henry & Minetta Zimmerman

Lots 1 & 2
Section 31
T130N - R95W
John Weaver

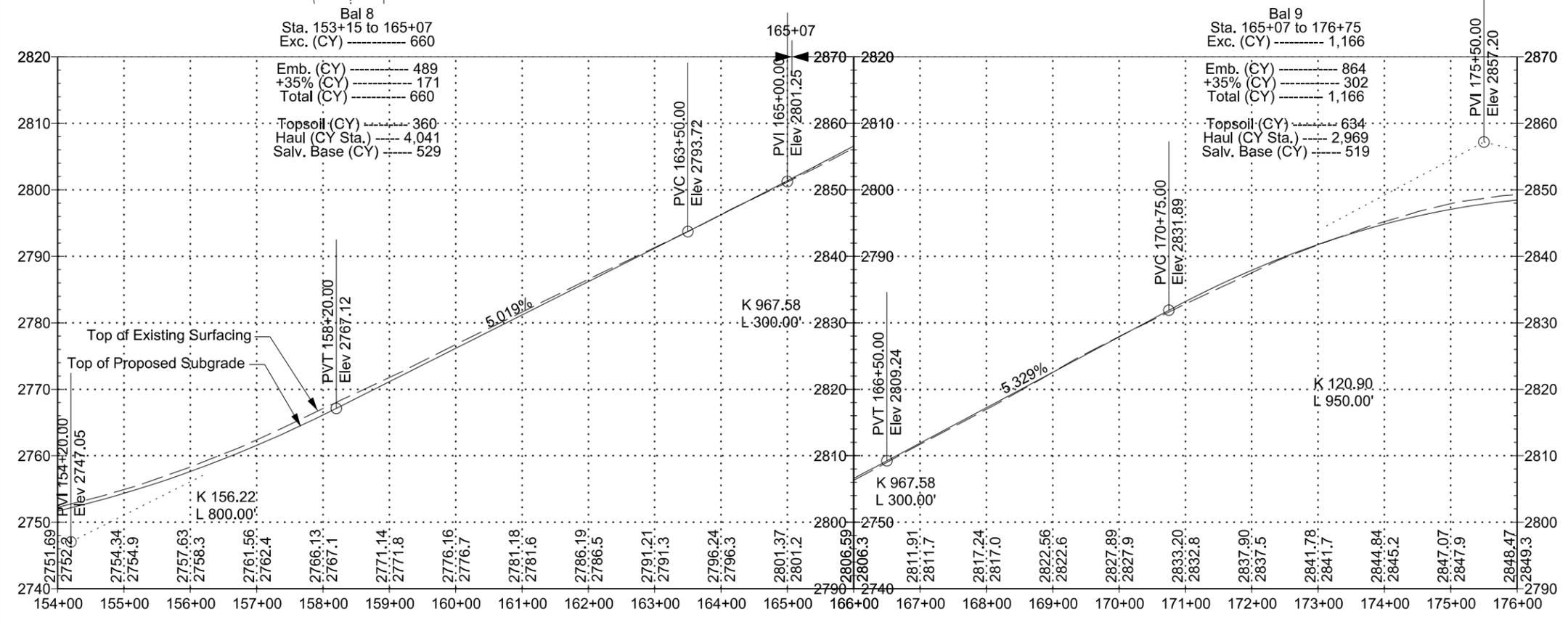
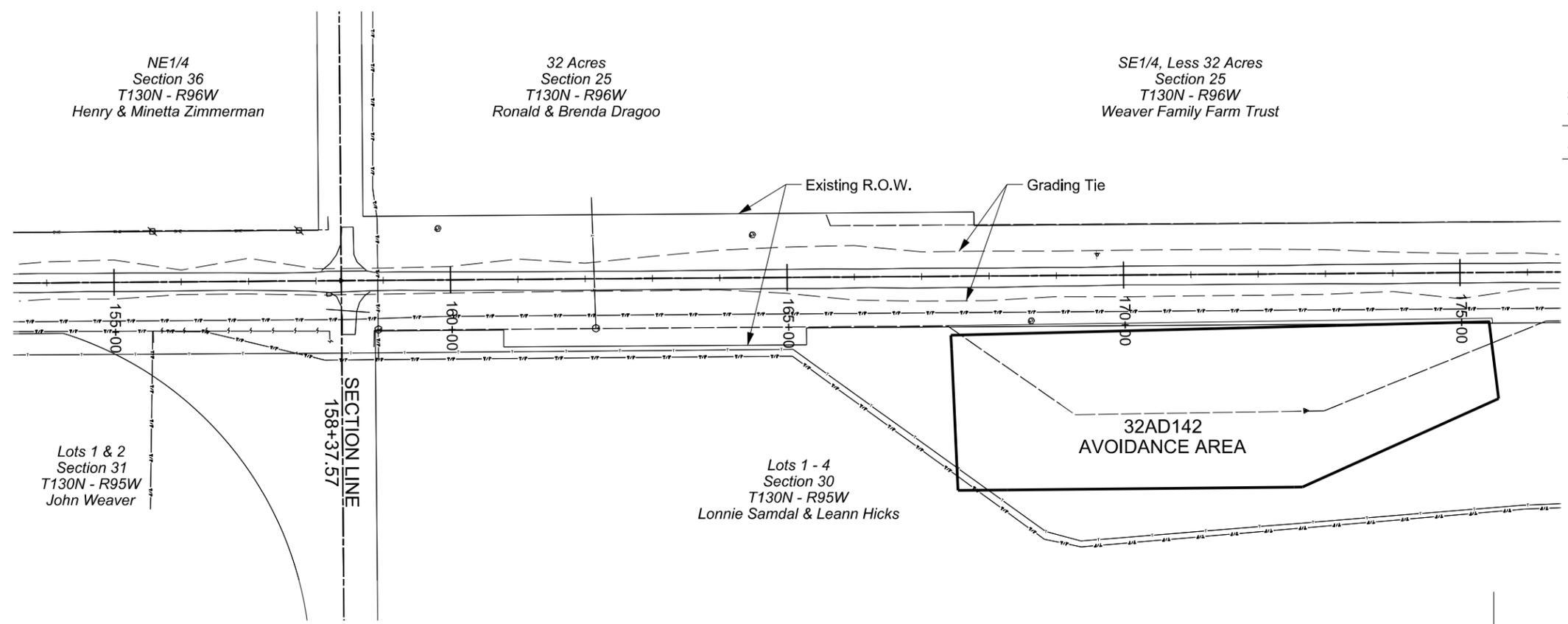


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Plan and Profile
Cemetery Road
Adams County, ND



SPEC	CODE	BID ITEM	QUANTITY	UNIT
752	0911	TEMPORARY SAFETY FENCE 167+38 to 175+48 Rt	817	LF
766	0100	MAILBOX - ALL TYPES 158+19 Rt	1	EA



Bal 8
Sta. 153+15 to 165+07
Exc. (CY) ----- 660

Emb. (CY) ----- 489
+35% (CY) ----- 171
Total (CY) ----- 660

Topsoil (CY) ----- 360
Haul (CY Sta.) ----- 4,041
Salv. Base (CY) ----- 529

Bal 9
Sta. 165+07 to 176+75
Exc. (CY) ----- 1,166

Emb. (CY) ----- 864
+35% (CY) ----- 302
Total (CY) ----- 1,166

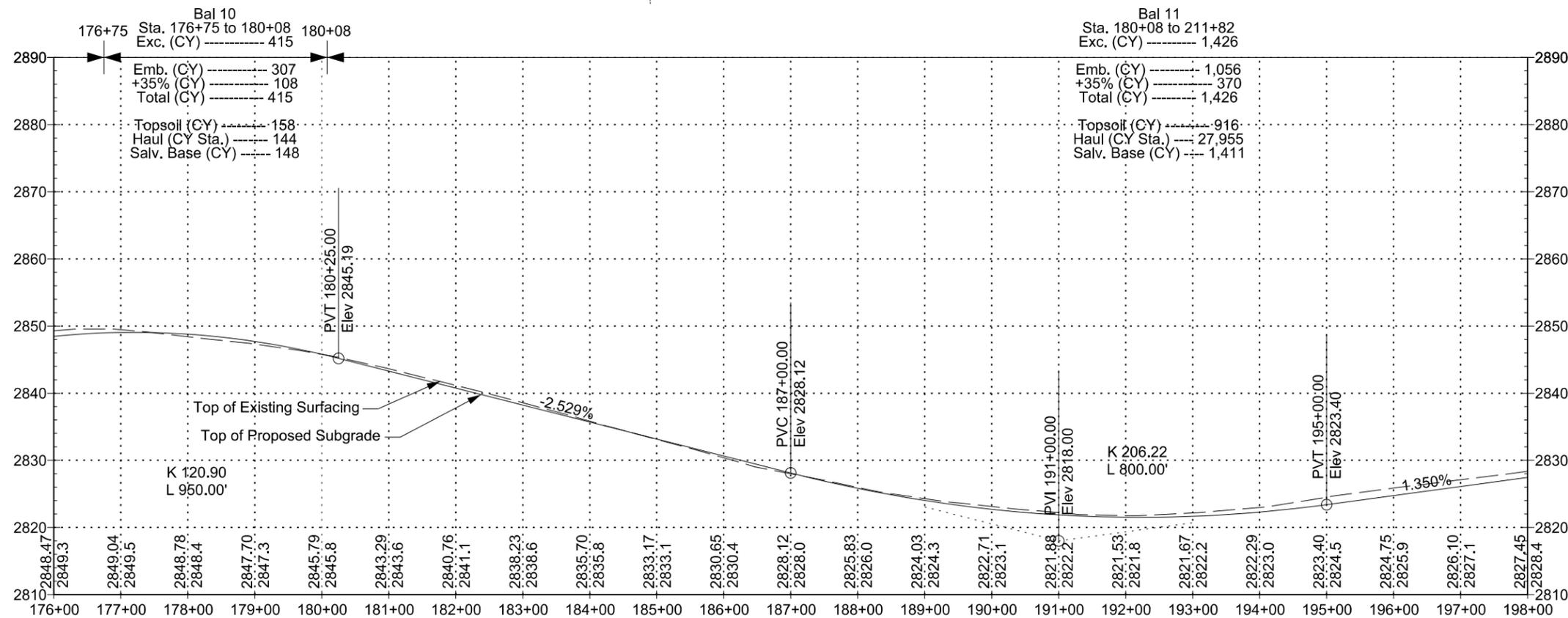
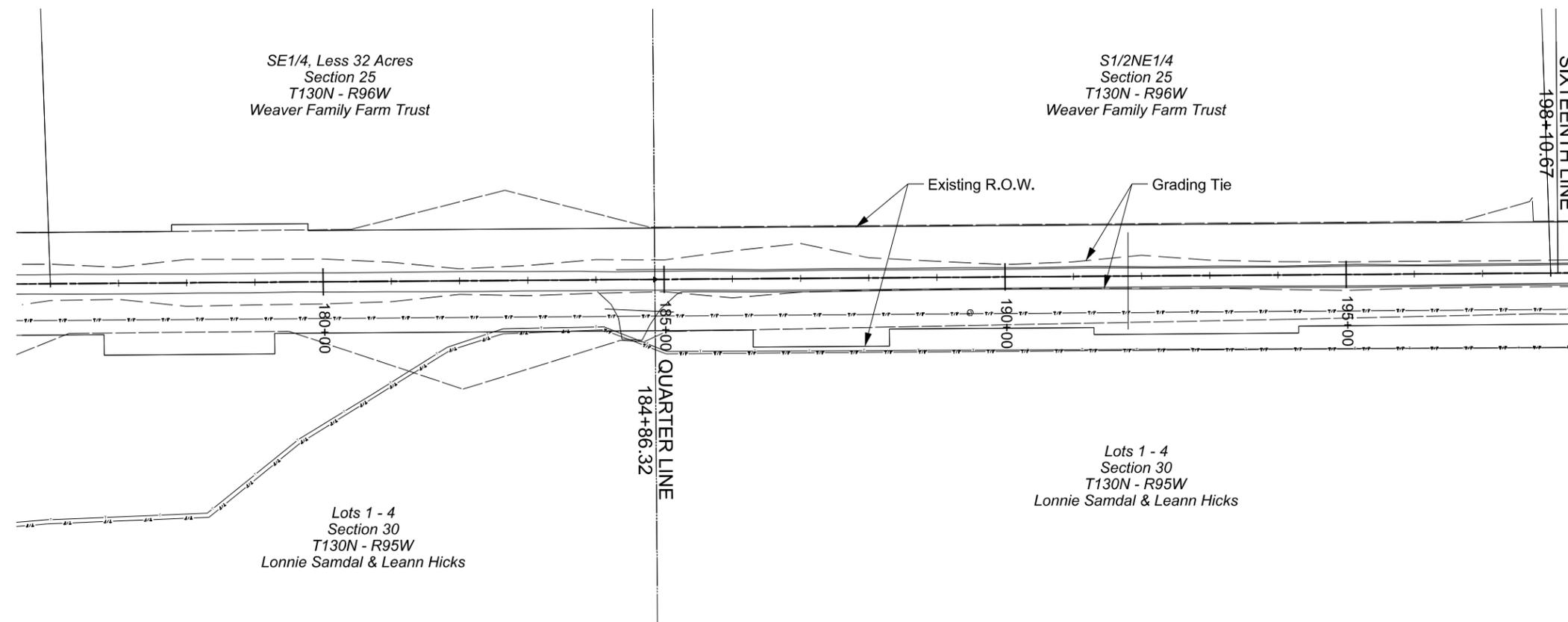
Topsoil (CY) ----- 634
Haul (CY Sta.) ----- 2,969
Salv. Base (CY) ----- 519

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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	9

Scale: 1"=200.00



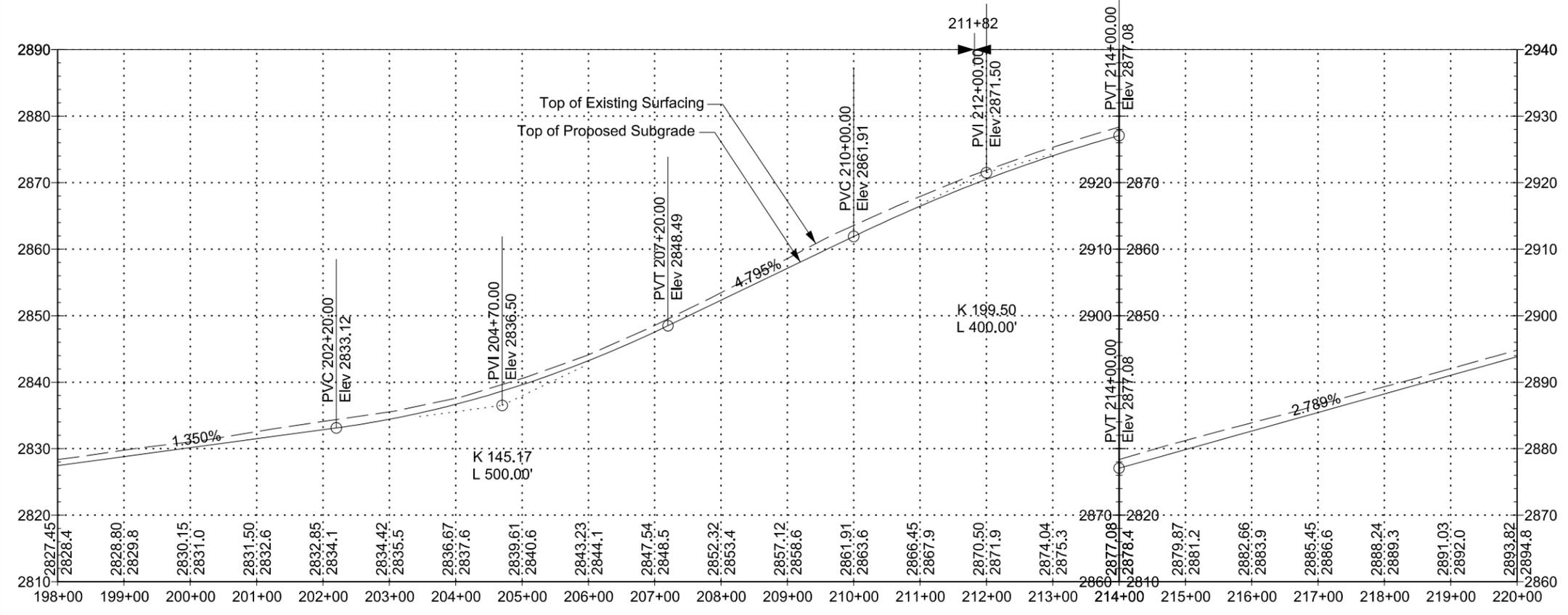
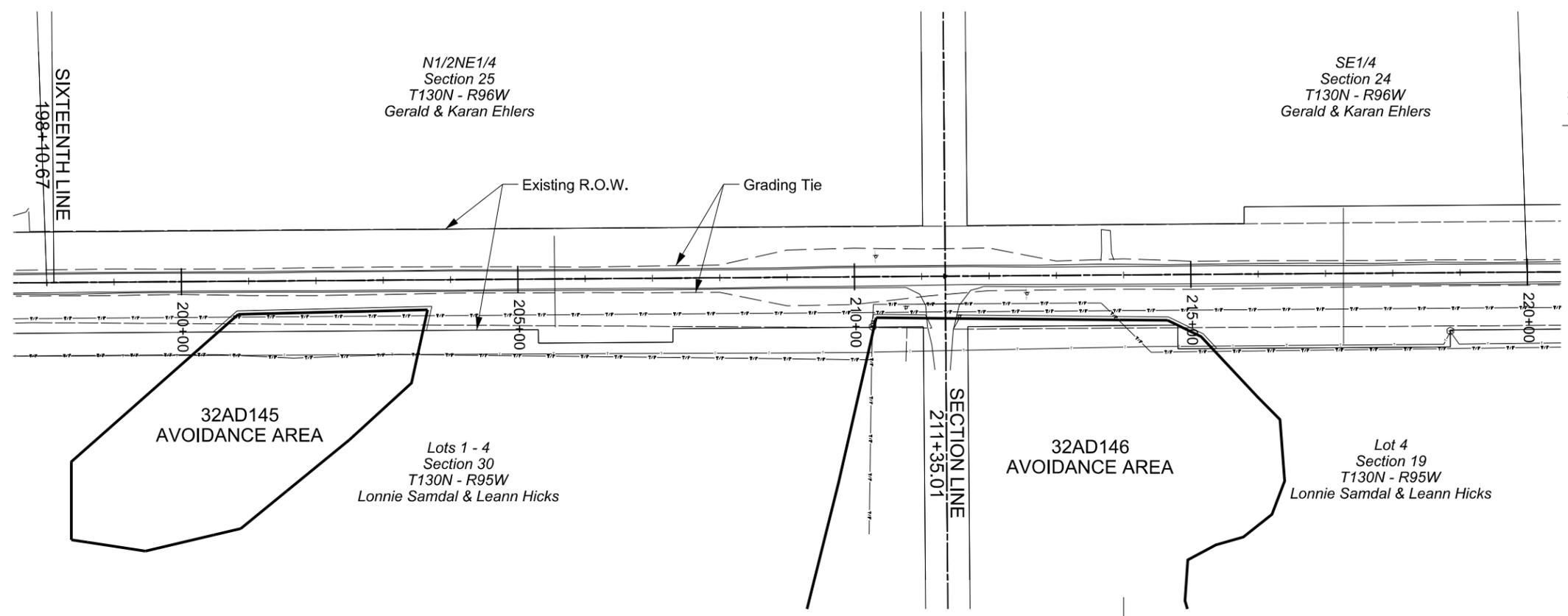
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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	10

Scale: 1"=200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
752	0911	TEMPORARY SAFETY FENCE		
		200+47 to 203+72 Rt	373	LF
		210+26 to 211+15 Rt	119	LF
		211+47 to 215+39 Rt	419	LF



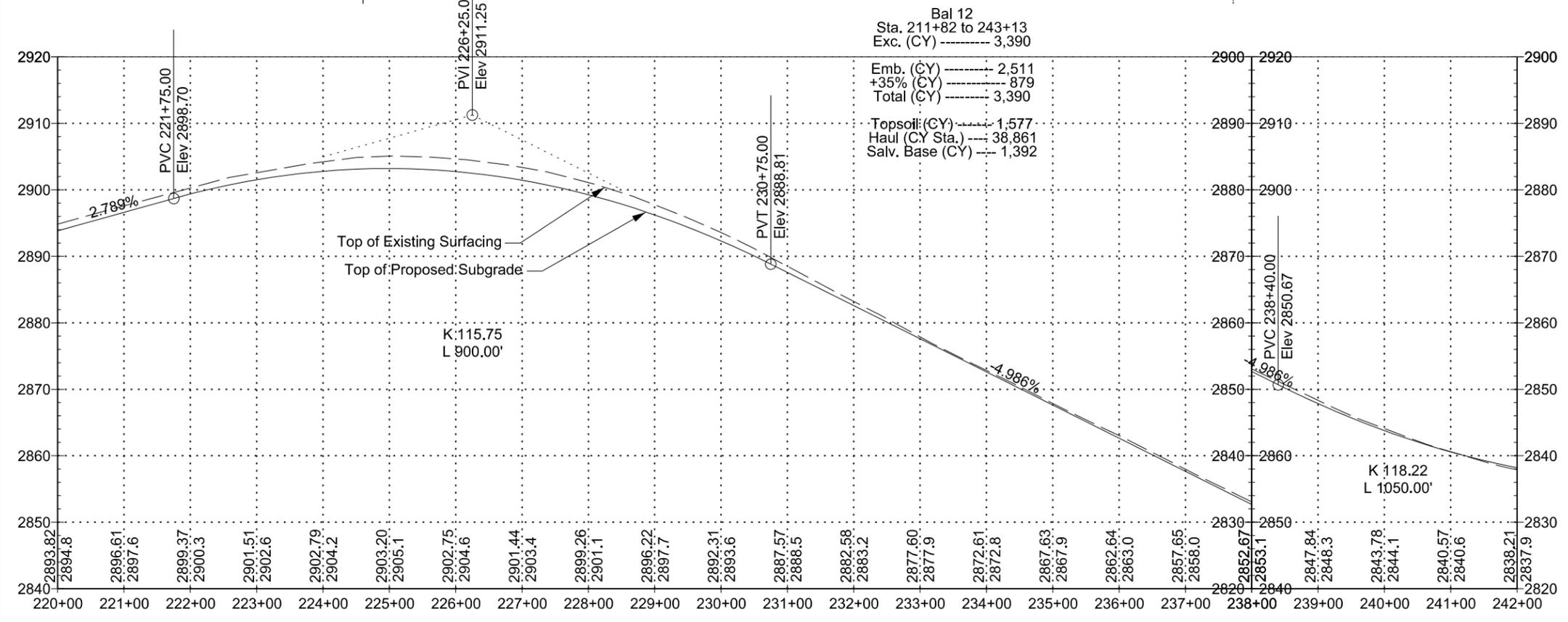
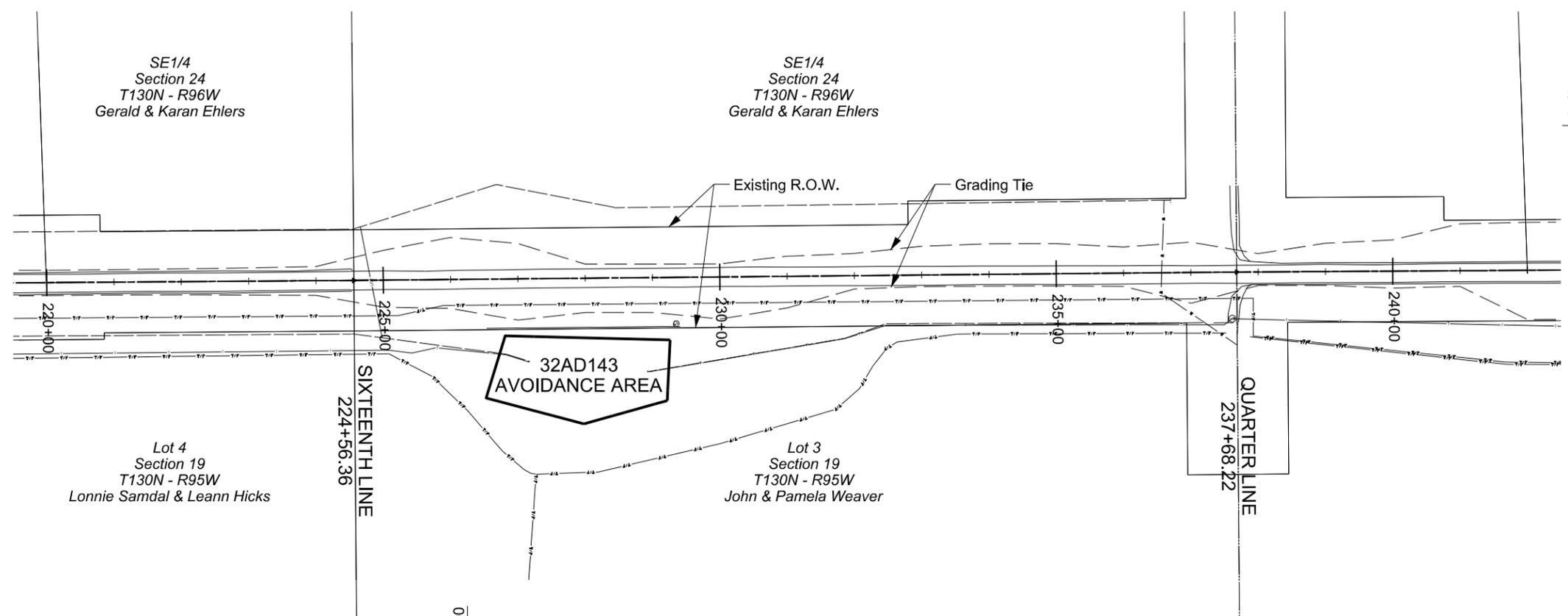
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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	11

Scale: 1"=200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
752	0911	TEMPORARY SAFETY FENCE	181	LF
		226+54 to 229+41 Rt		



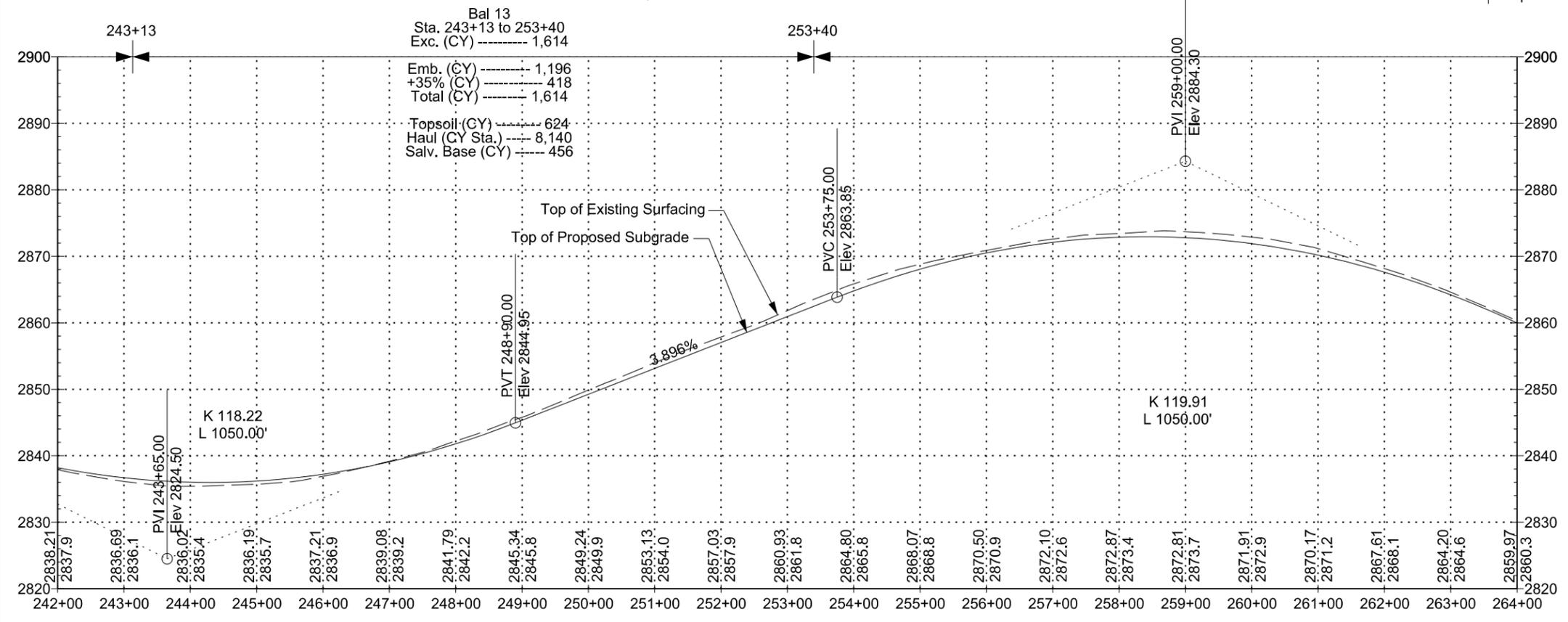
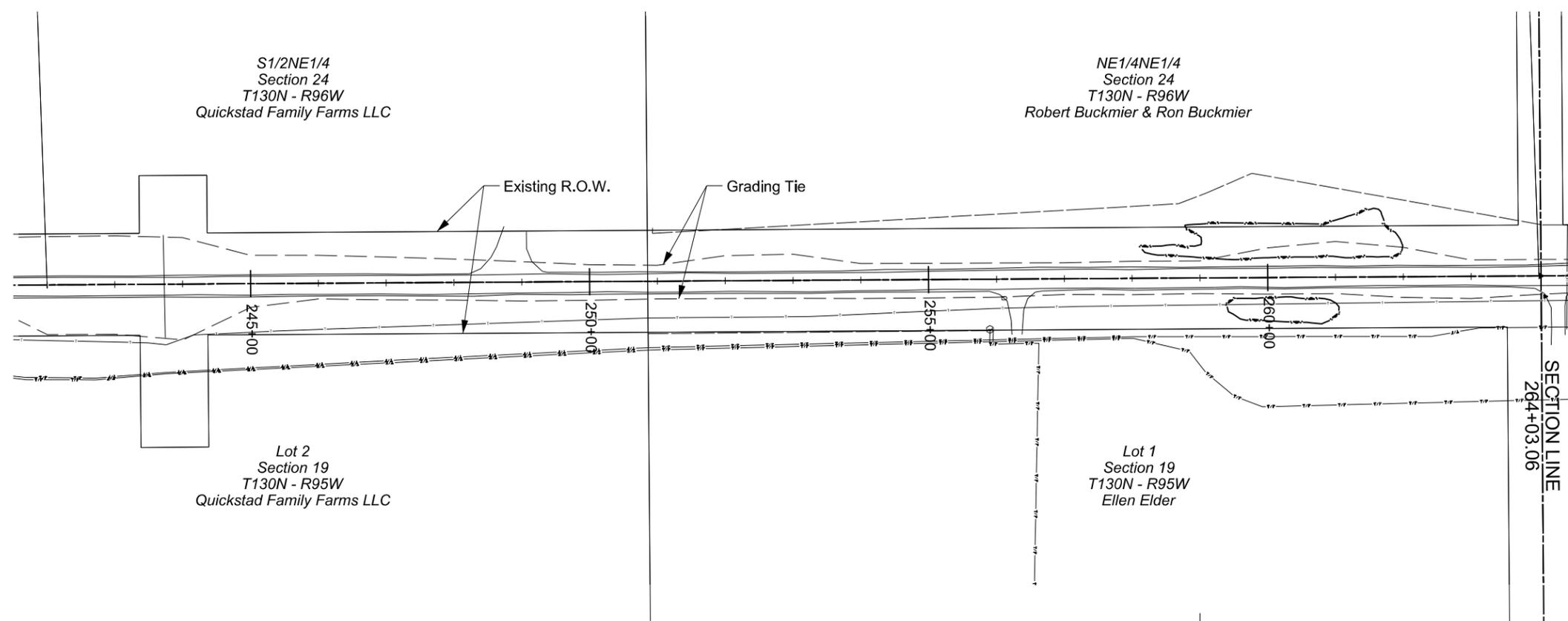
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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	12

Scale: 1"=200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
766	0100	MAILBOX - ALL TYPES	1	EA
		256+11 Rt		



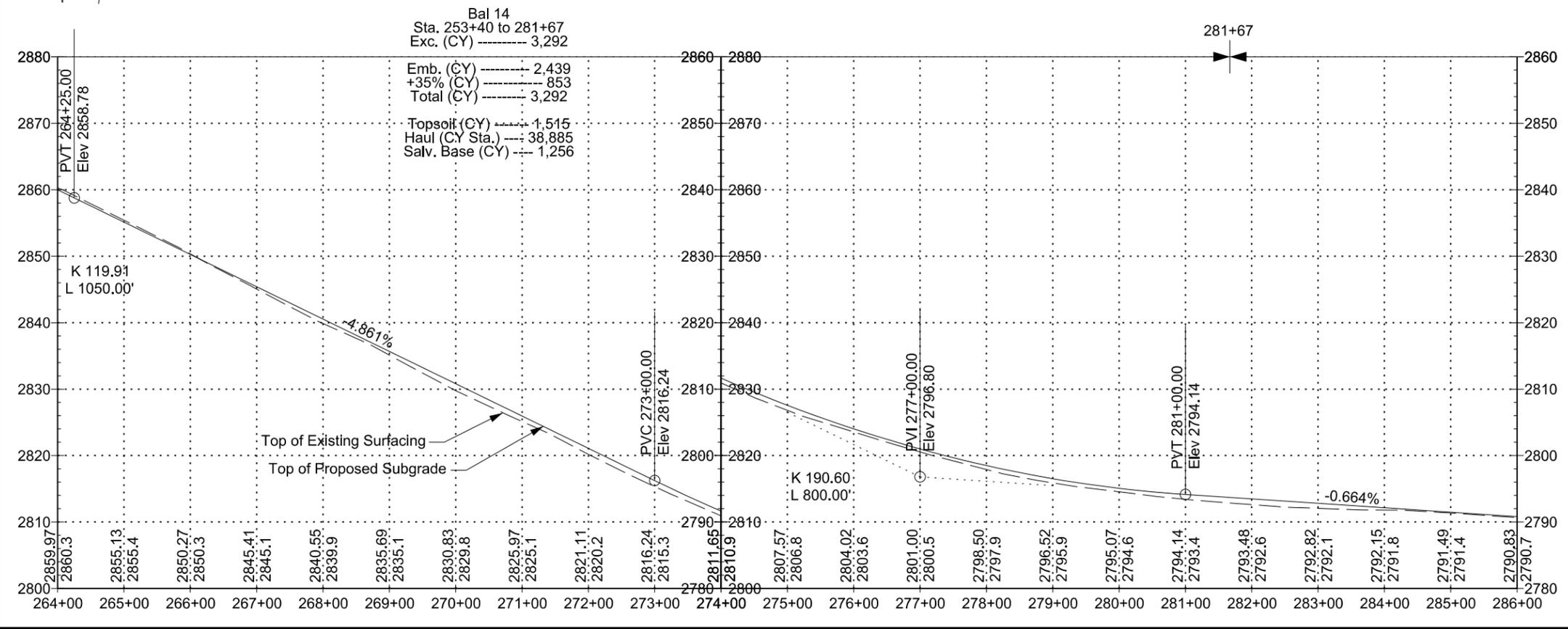
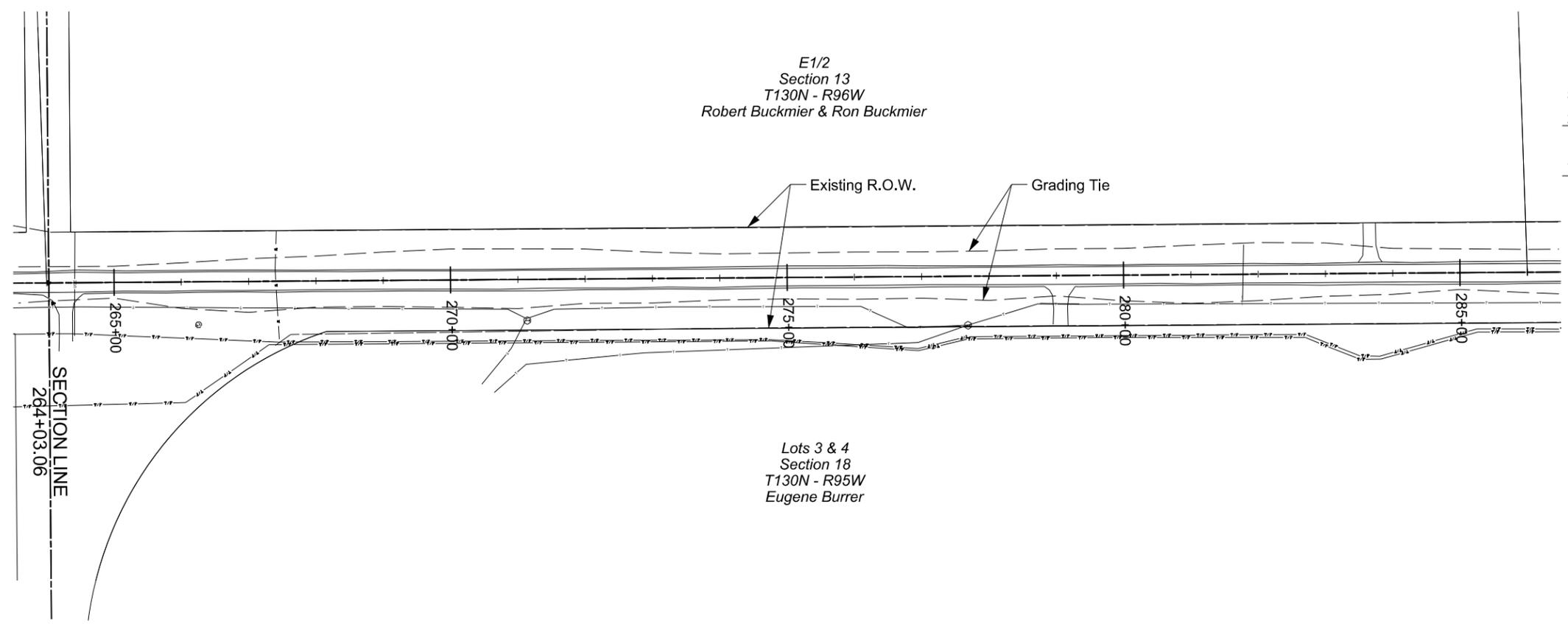
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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	13

Scale: 1"=200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES 281+78 Rt	1	EA
714	5040	PIPE CORR STEEL .079IN 36IN 281+78 Rt	5	LF

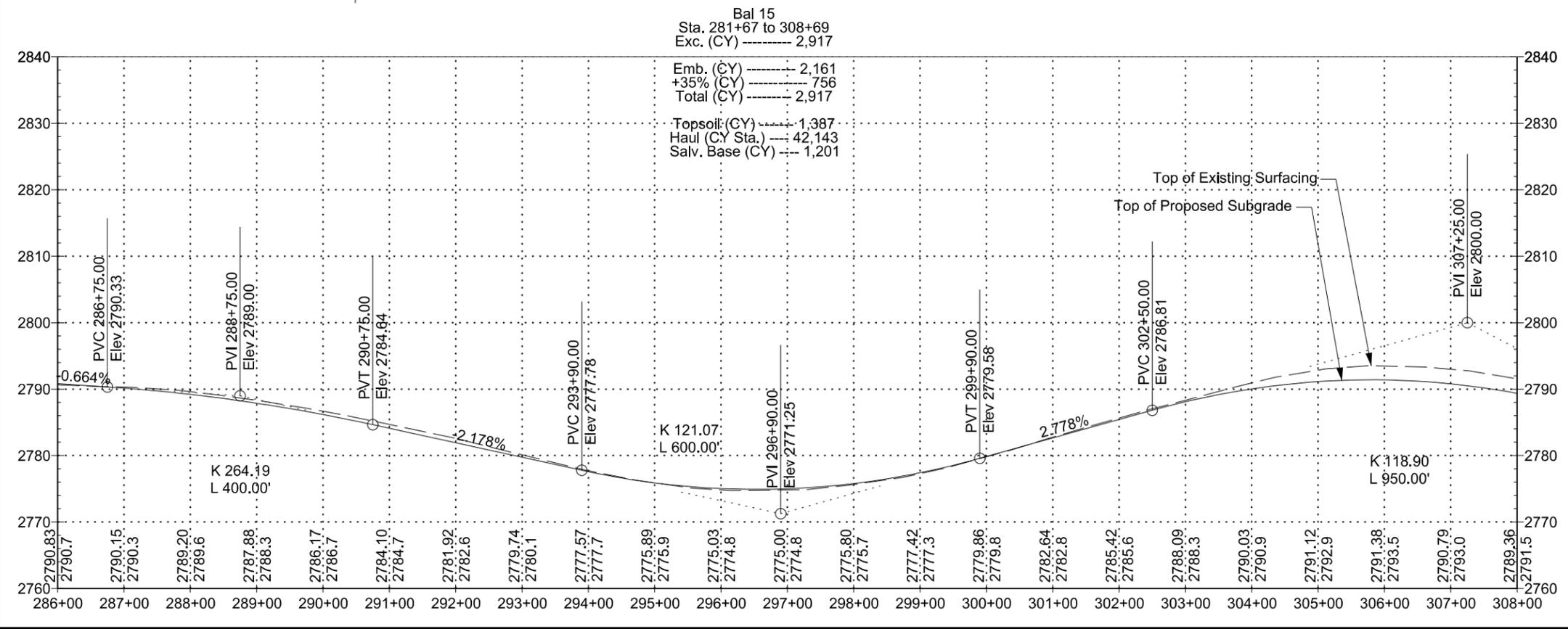
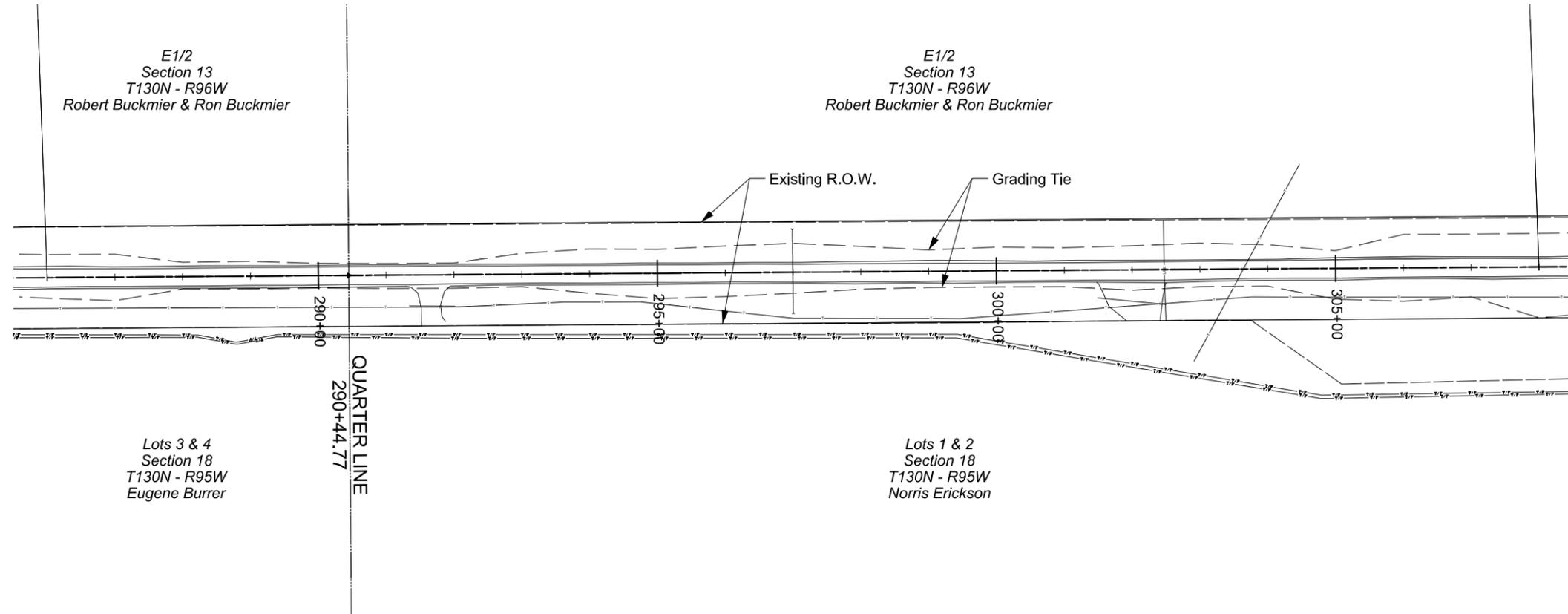


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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	14

Scale: 1"=200.00

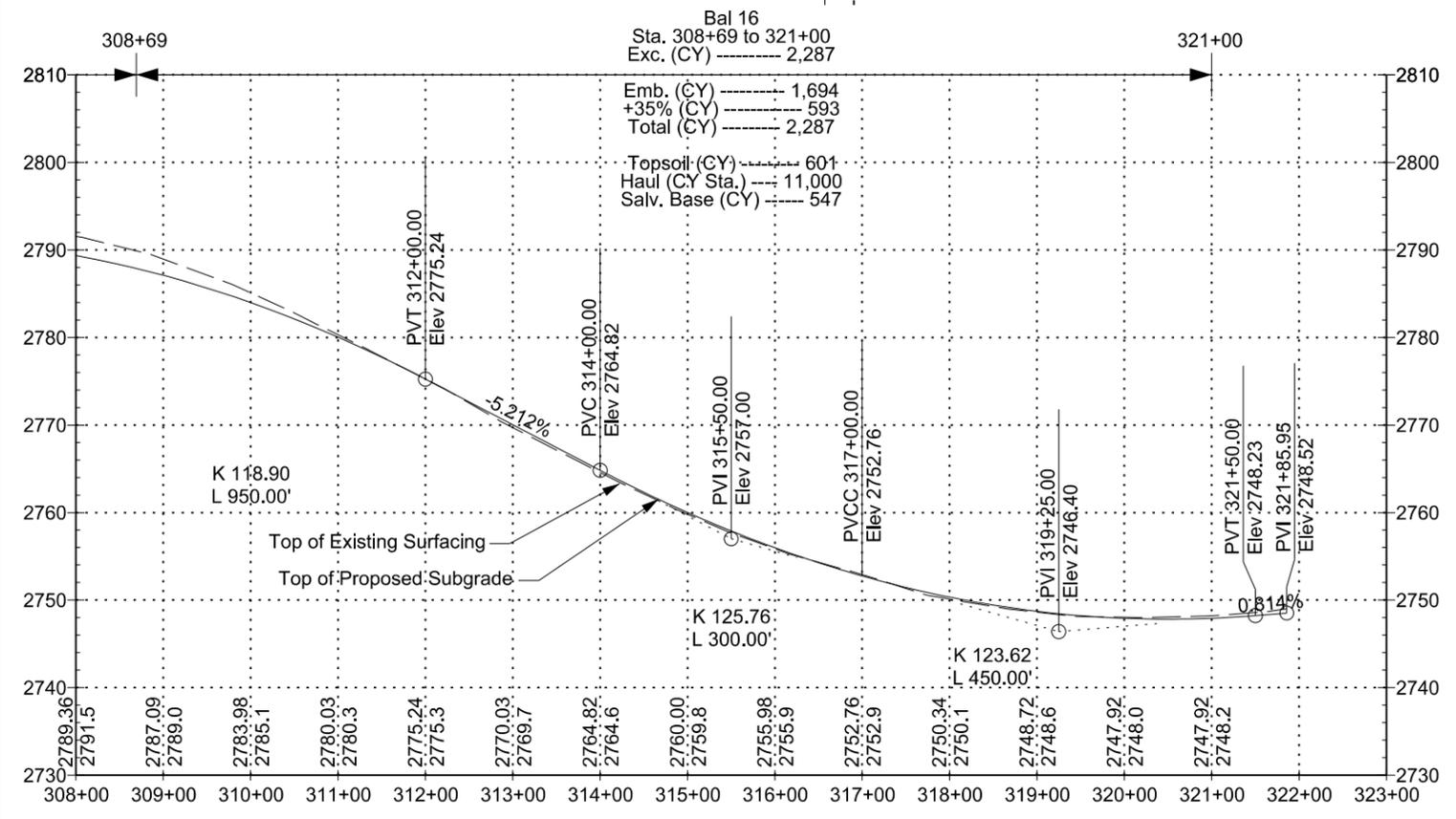
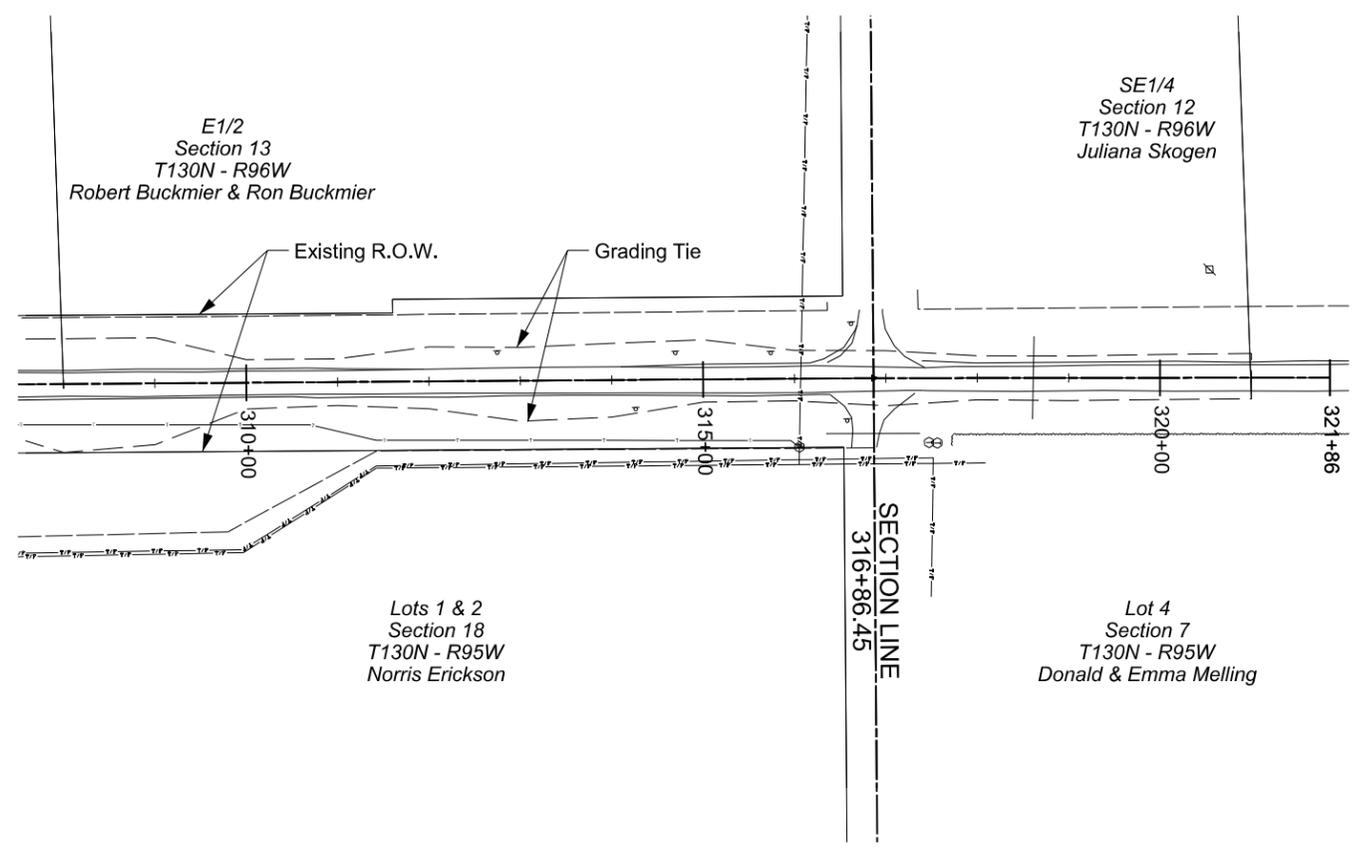


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Plan and Profile
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	60	15

Scale: 1"=200.00



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Plan and Profile
Cemetery Road
Adams County, ND

Wetland Impact Table																			
Wetland Number	Location	Cowardin Class.	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands ¹	Wetland Impacts (acres)		USFWS Easement Impacts (acres)		Wetland Mitigation								
							Temp.	Perm.	Temp.	Perm.	Mitigation Required			Bank		Onsite			
											EO 11990	USACE	USFWS	Location	acres	Mitigation Location; Ratio	acres	Constructed Site #	Constructed size (acres)
1	Sec. 24, T130N, R96W	PEMAx	Ditch	0.39	Artificial	No	0.07	0.09			N	N	N						
2	Sec. 19, T130N, R95W	PEMAx	Ditch	0.12	Artificial	No	0.01	0.00			N	N	N						
3a	Sec. 36, T130N, R96W	PEMC	Drainage	0.04	Natural	Yes	0.01	0.00			N	N	N						
3b	Sec. 31, T130N, R95W	PEMC	Drainage	0.02	Natural	Yes	0.01	0.00			N	N	N						
4	Sec. 6, T129N, R95W	PEMC	Drainage	0.07	Natural	Yes	0.01	0.00			N	N	N						
Totals				0.64			0.11	0.09						0.00		0.00		0.00	

¹ A wetland Jurisdictional Determination was issued by the USACE on 1/15/2016; NWO-2015-2416-BIS.

² All impacts to natural wetlands (natural/jurisdictional and natural/non-jurisdictional), regardless of size, as well as impacts greater than 0.10 acre to artificial/jurisdictional wetlands require mitigation.

³ All artificial/non-jurisdictional, deep water (impacts greater than 6.6 feet), Other Waters less than 300 linear feet (determined by the USACE on a case by case), and temporary impacts do not require mitigation.

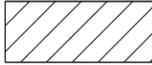
Summary Impact Table			
Total Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	Total (Acres)	Wetland Type	Total (Acres/Lf)
Natural/JD	0.00	Temporary JD	0.03
Natural/Non-JD	0.00	Non-JD Temporary	0.08
Artificial/JD	0.00	Permanent JD > 0.10	0.00
Artificial/Non-JD	0.09	Permanent OW	0.00
Total	0.09	Temporary OW	0.00

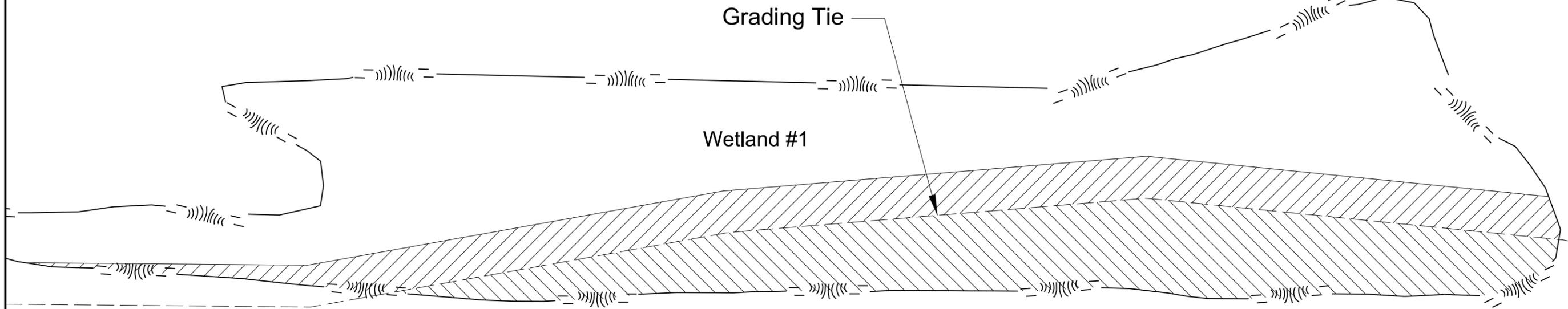
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Wetland Mitigation & Environmental
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	75	2

Wetland 1 Impact Summary

-  Temporary Impacts (0.07 Acres)
-  Permanent Impacts (0.09 Acres)



Centerline of Cemetery Road

259+00

260+00

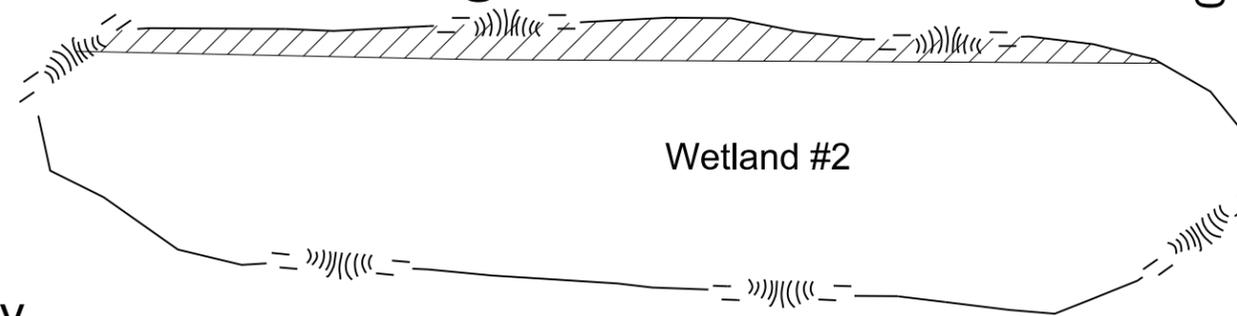
261+00

Grading Tie

Wetland #2

Wetland 2 Impact Summary

-  Temporary Impacts (0.01 Acres)
-  Permanent Impacts (0.00 Acres)

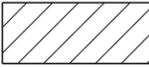


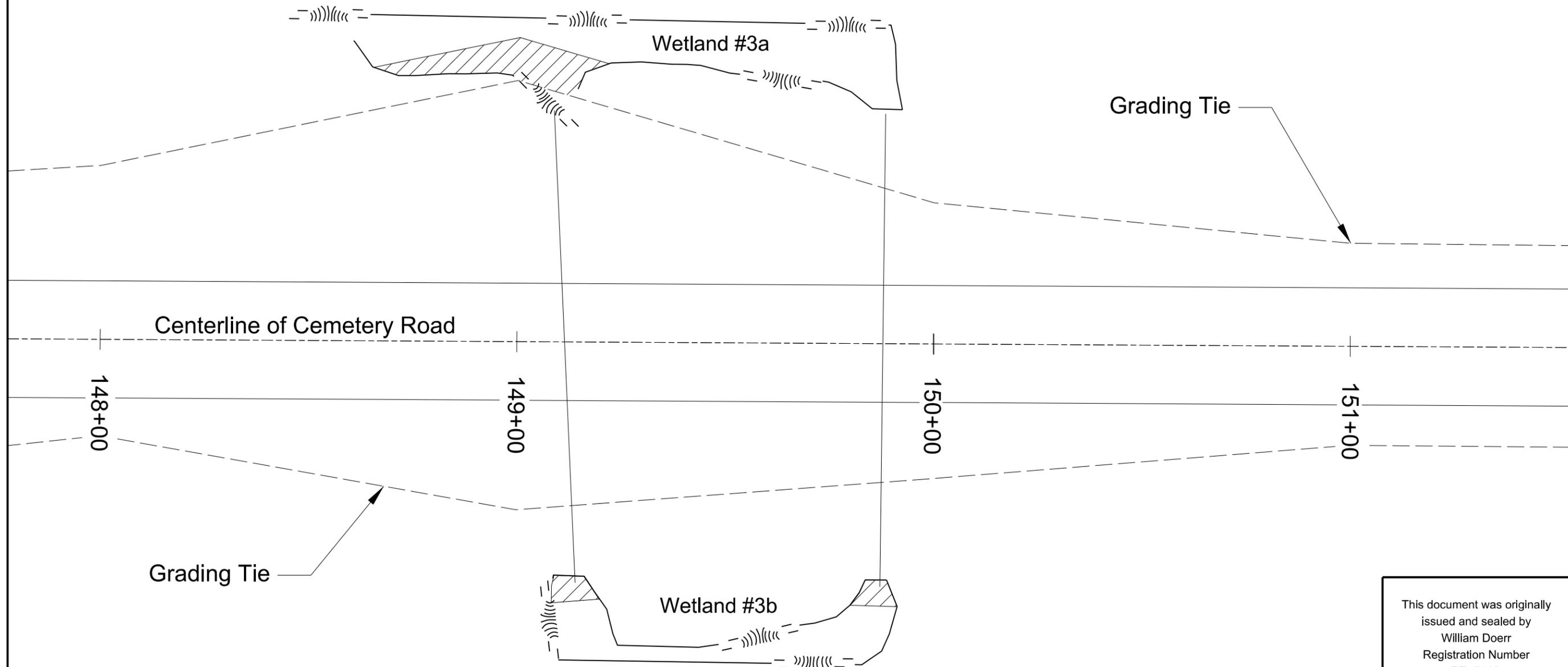
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Wetland Mitigation & Environmental
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	75	3

Wetland 3a Impact Summary

-  Temporary Impacts (0.01 Acres)
-  Permanent Impacts (0.00 Acres)



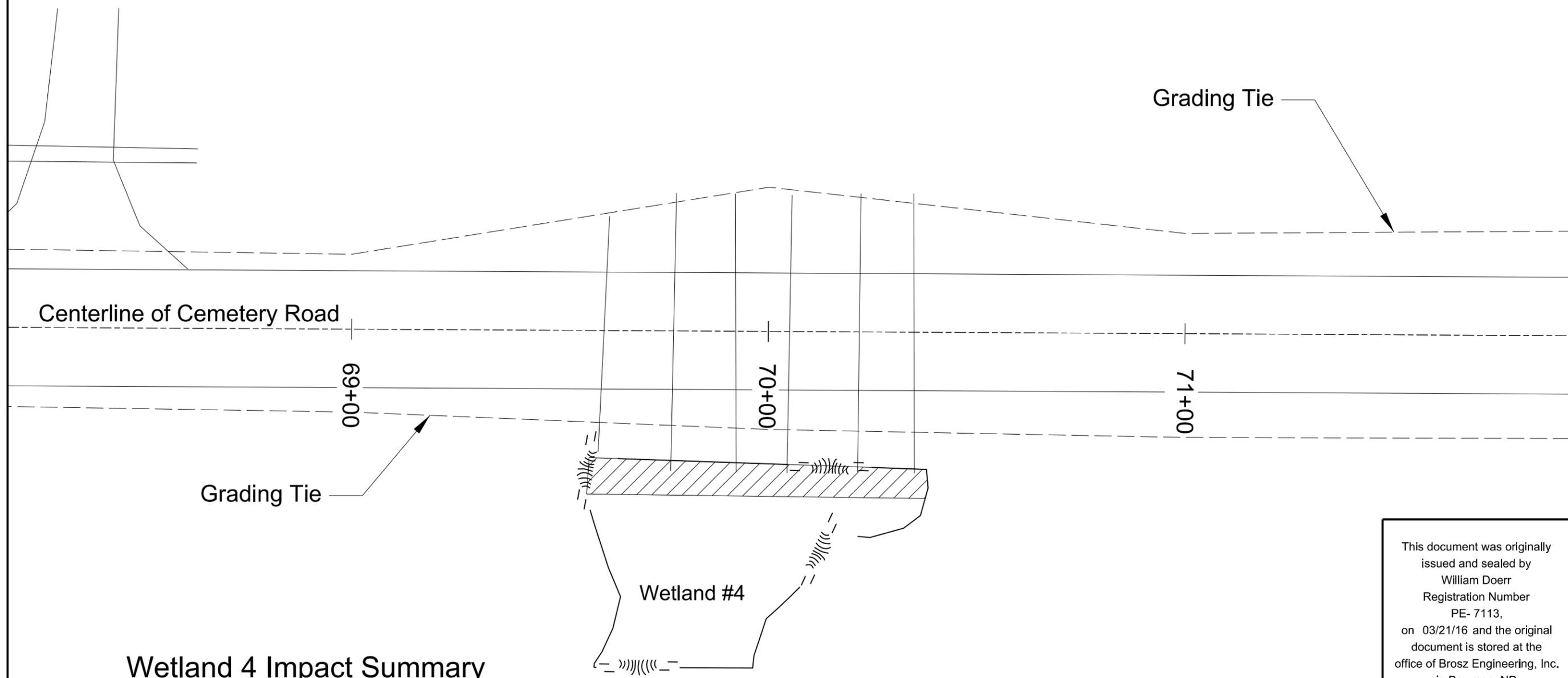
Wetland 3b Impact Summary

-  Temporary Impacts (0.01 Acres)
-  Permanent Impacts (0.00 Acres)

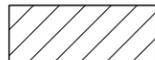
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Wetland Mitigation & Environmental
Cemetery Road
Adams County, ND

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-CNOA-CNOB-CNOC-0119(057)	75	4



Wetland 4 Impact Summary

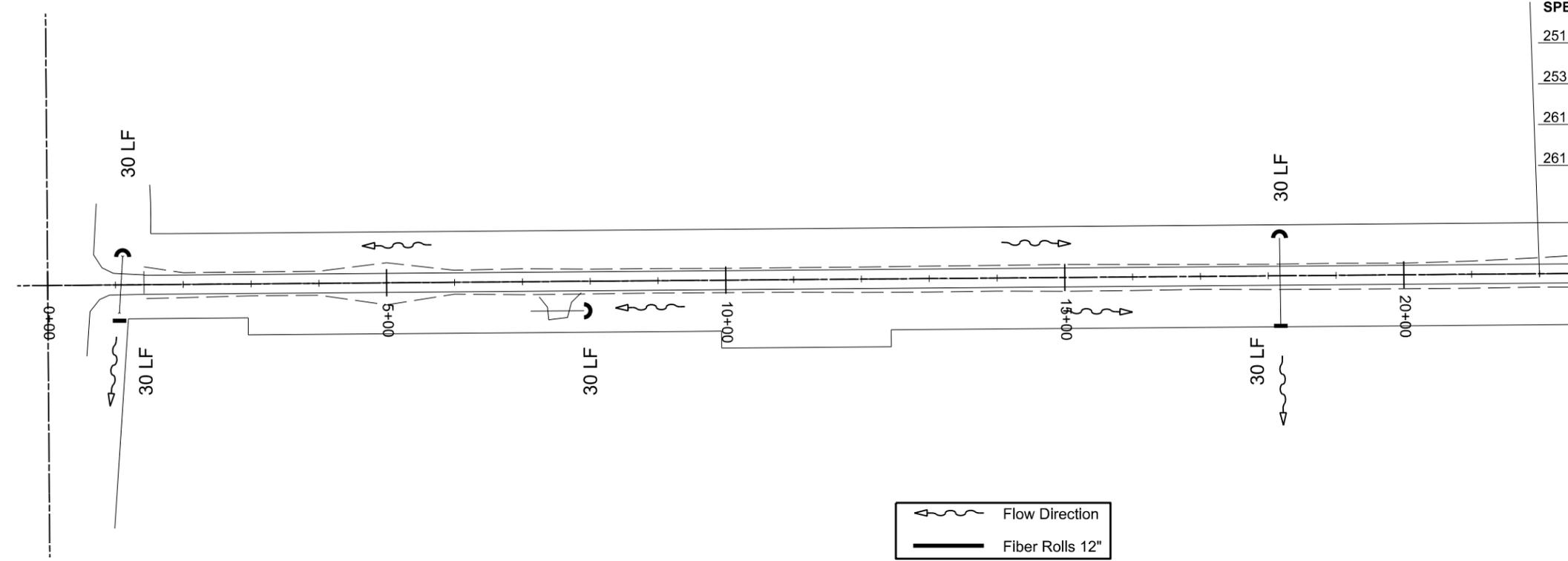
-  Temporary Impacts (0.01 Acres)
-  Permanent Impacts (0.00 Acres)

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Wetland Mitigation & Environmental
 Cemetery Road
 Adams County, ND

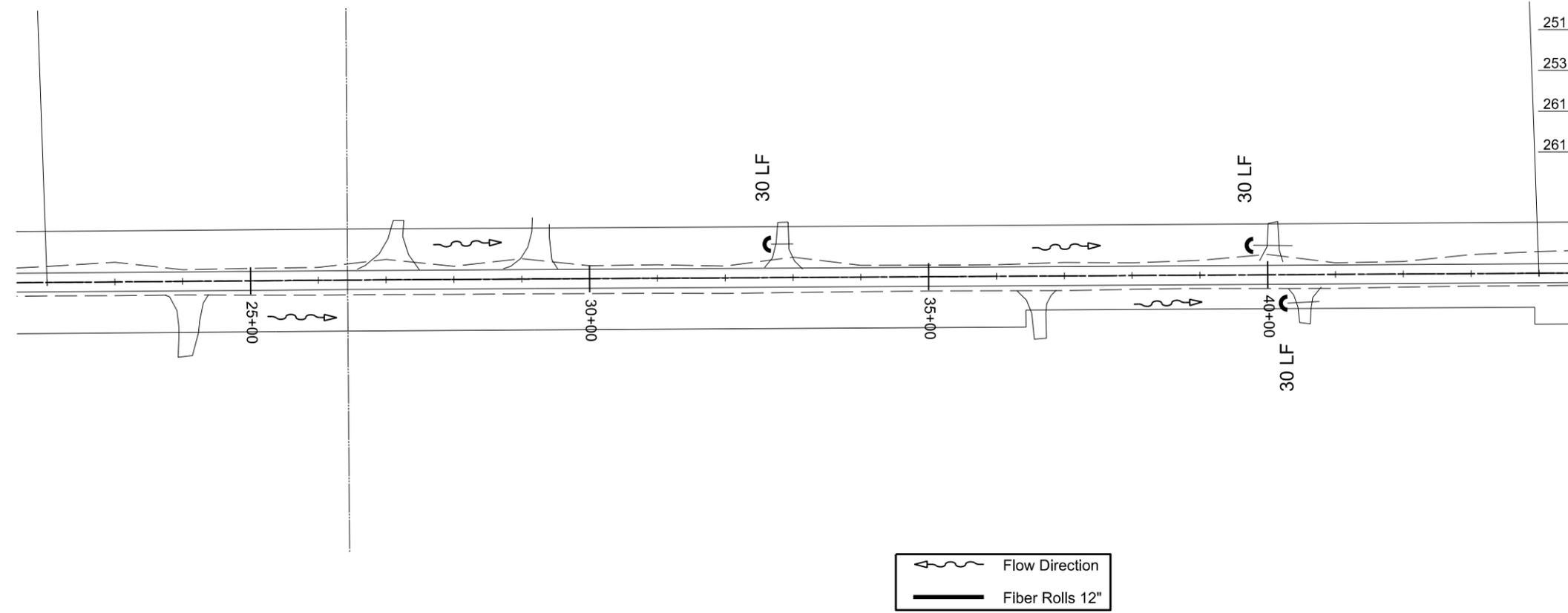
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	76	1

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	5.4	ACRES
253	0101	STRAW MULCH	5.4	ACRES
261	0112	FIBER ROLLS 12IN	150	LF
261	0113	REMOVE FIBER ROLLS 12IN	150	LF



Scale: 1" = 200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	5.7	ACRES
253	0200	STRAW MULCH	5.7	ACRES
261	0112	FIBER ROLLS 12IN	90	LF
261	0113	REMOVE FIBER ROLLS 12IN	90	LF

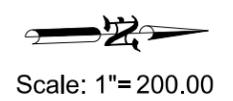
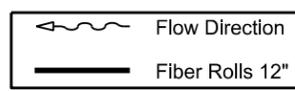
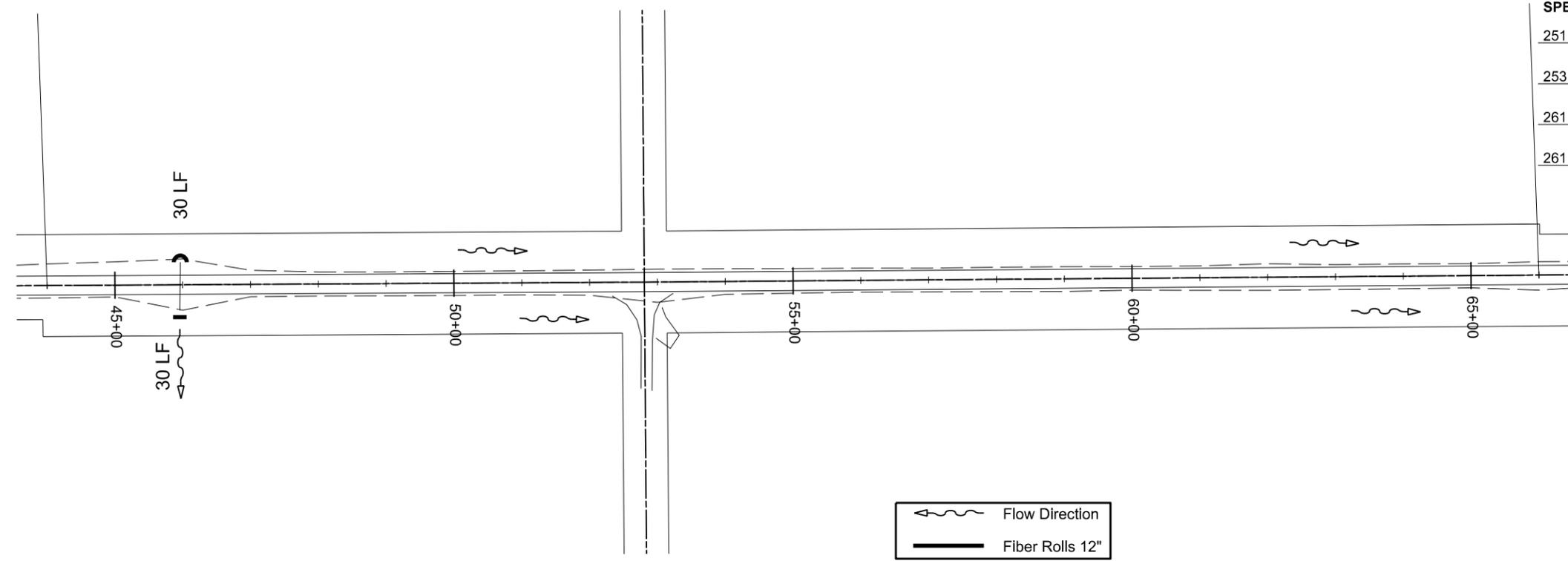


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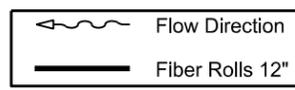
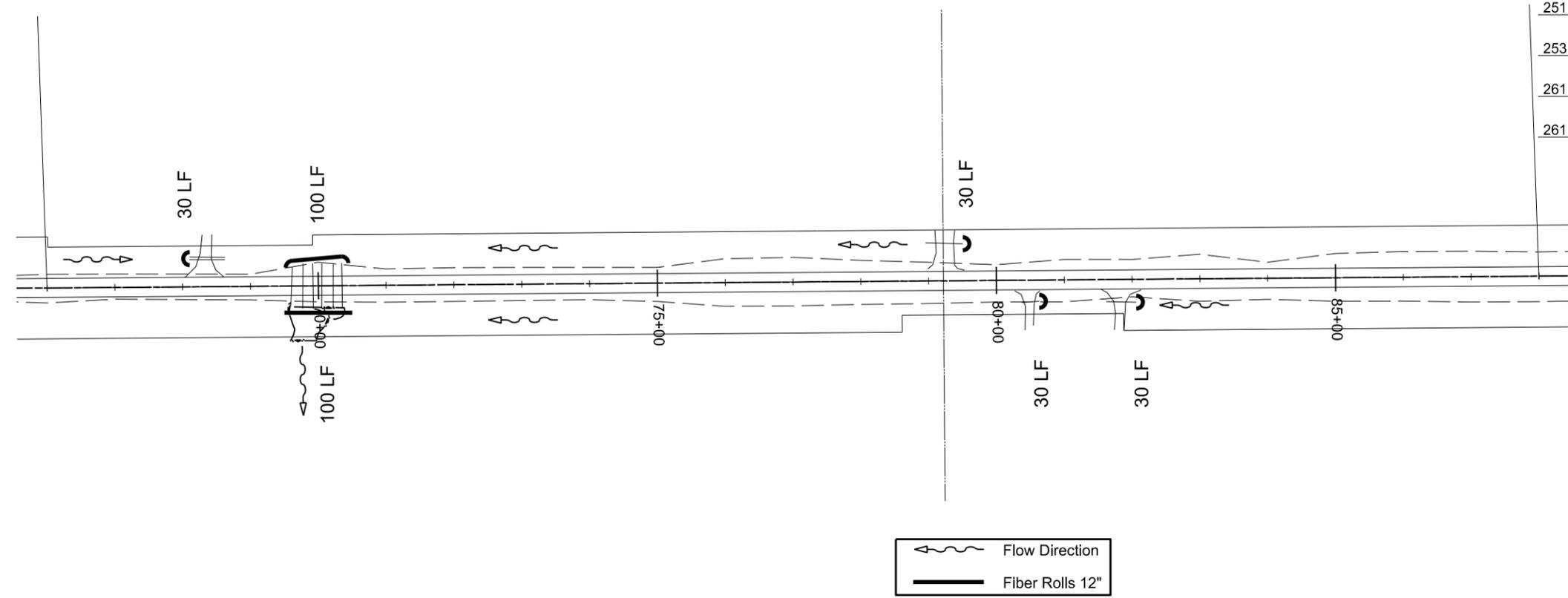
Temporary Erosion Control
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	76	2

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	6.2	ACRES
253	0101	STRAW MULCH	6.2	ACRES
261	0112	FIBER ROLLS 12IN	60	LF
261	0113	REMOVE FIBER ROLLS 12IN	60	LF



SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	5.8	ACRES
253	0200	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	320	LF
261	0113	REMOVE FIBER ROLLS 12IN	320	LF

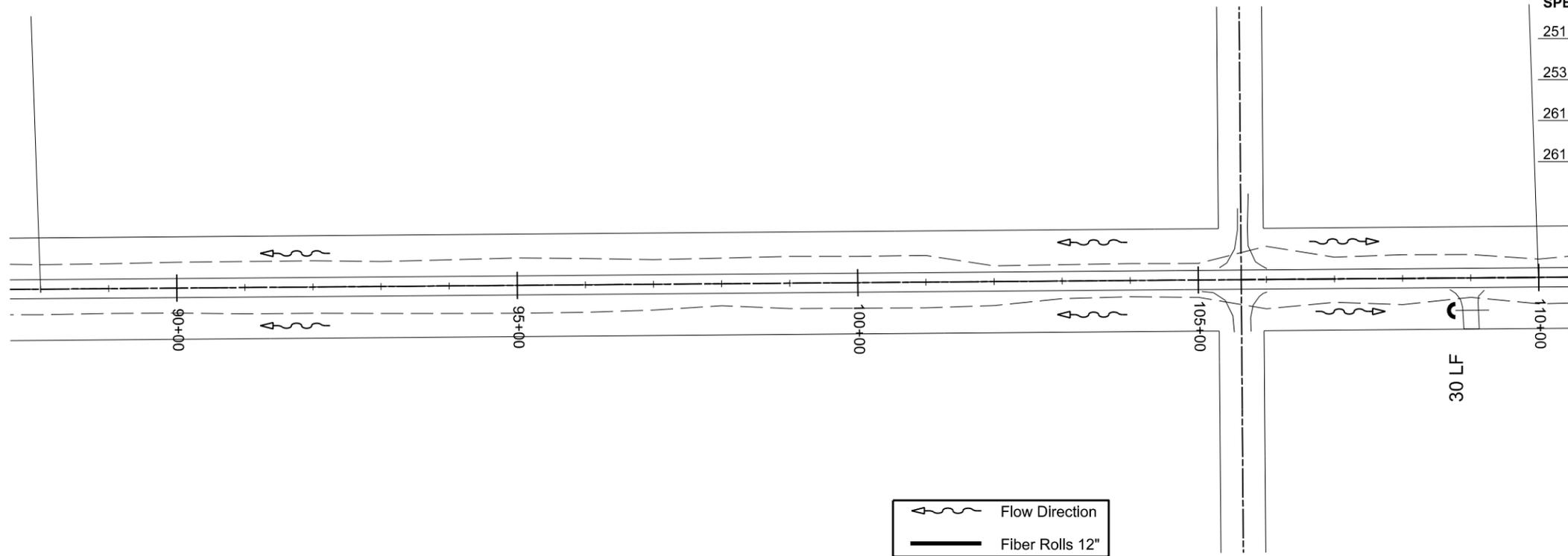


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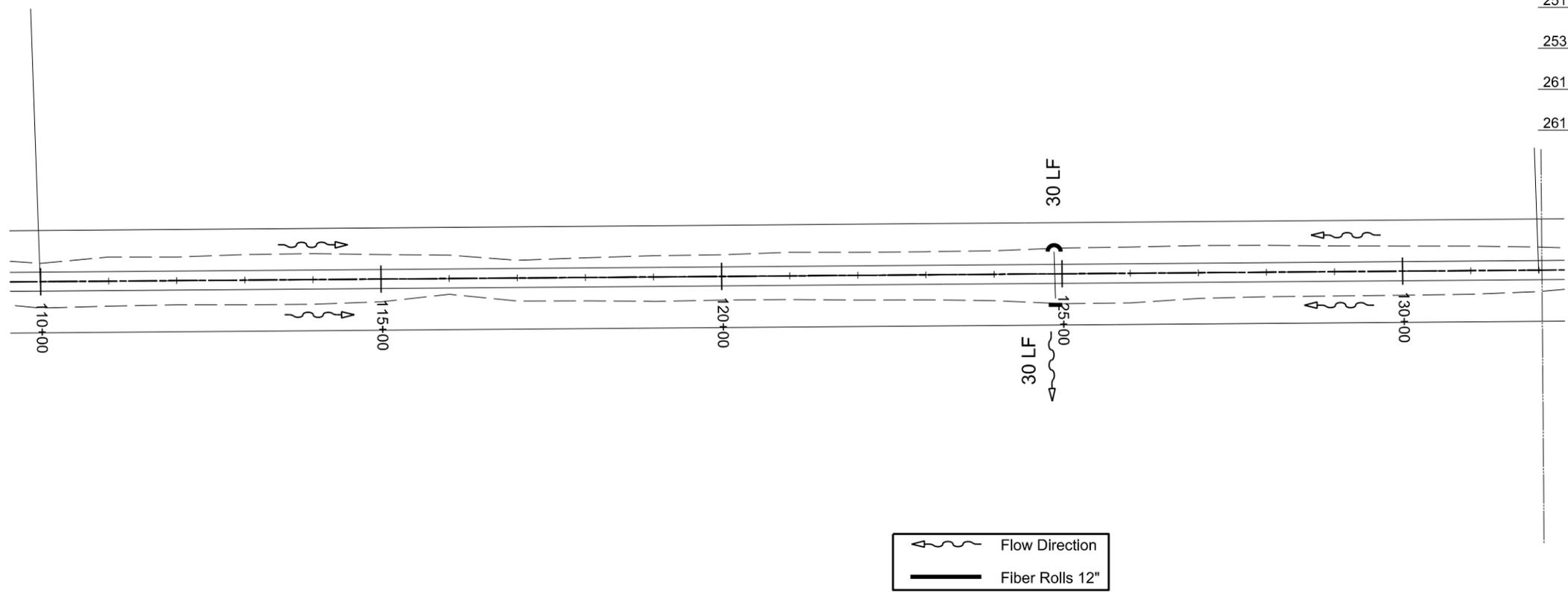
Temporary Erosion Control
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	76	3

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	5.8	ACRES
253	0101	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	30	LF
261	0113	REMOVE FIBER ROLLS 12IN	30	LF



SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	5.8	ACRES
253	0200	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	60	LF
261	0113	REMOVE FIBER ROLLS 12IN	60	LF

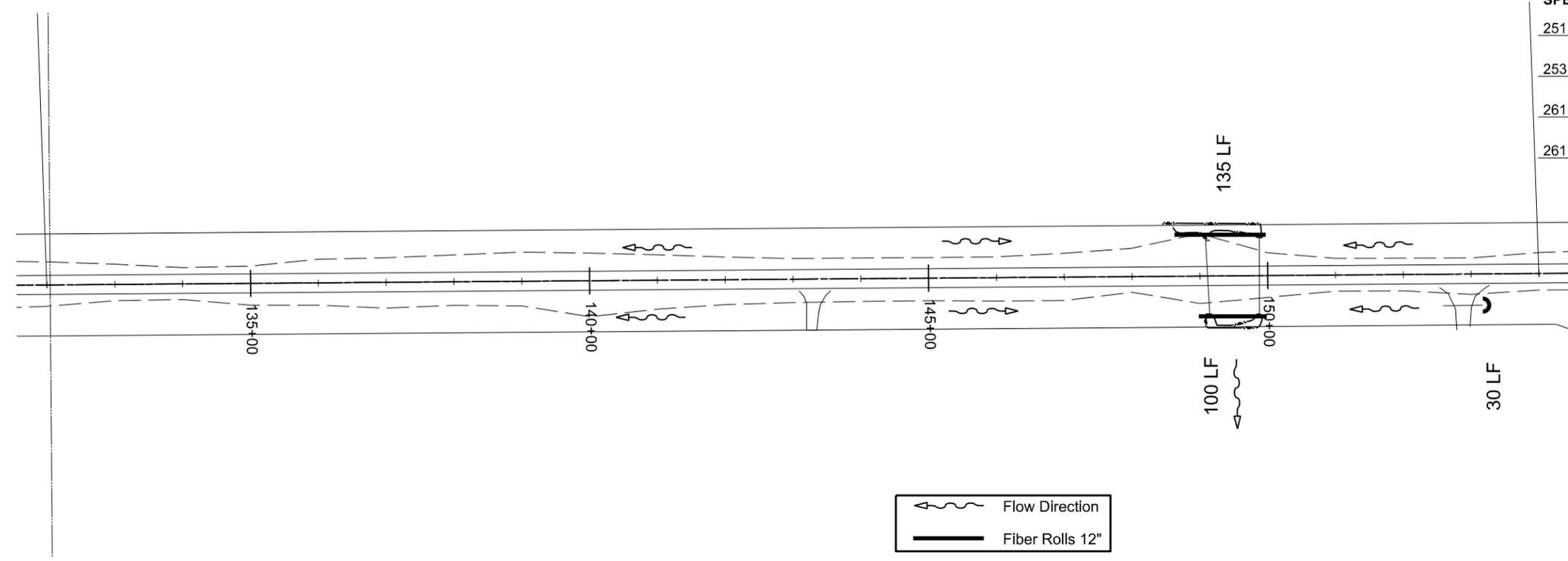


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Temporary Erosion Control
Cemetery Road
Adams County, ND

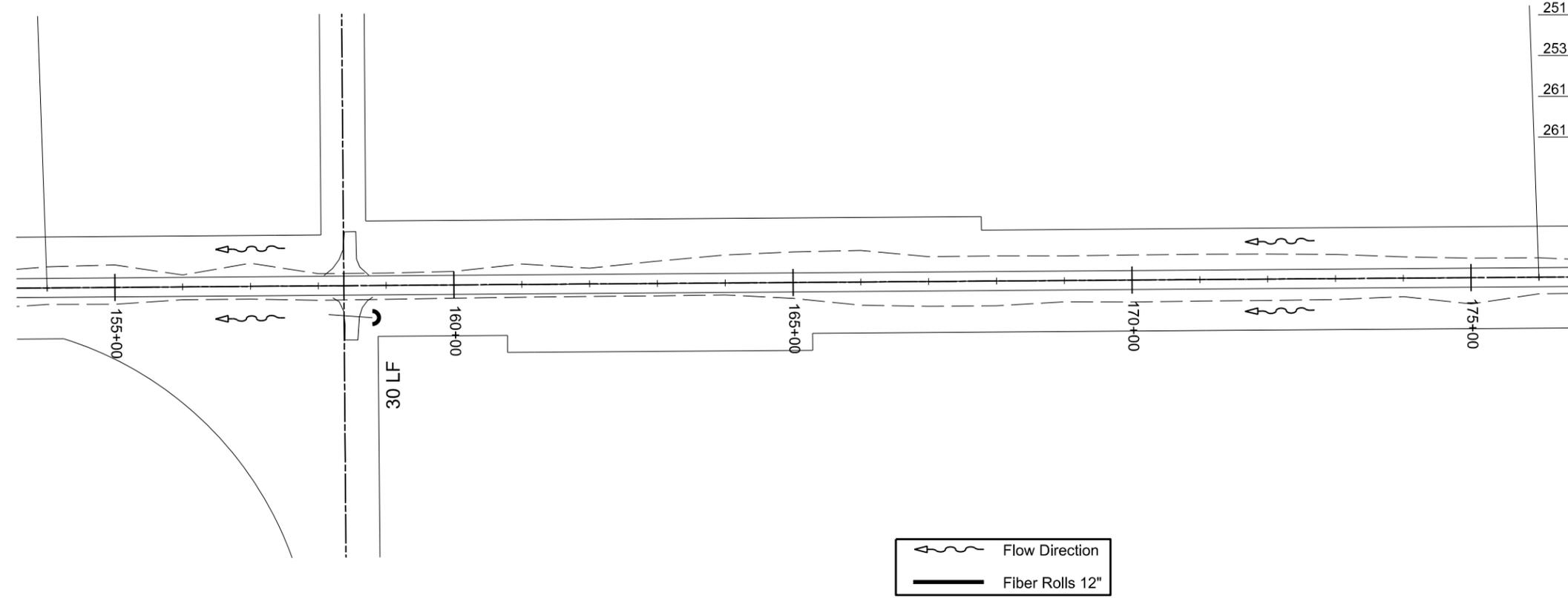
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	76	4

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	5.8	ACRES
253	0101	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	265	LF
261	0113	REMOVE FIBER ROLLS 12IN	265	LF



Scale: 1"= 200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	6.6	ACRES
253	0200	STRAW MULCH	6.6	ACRES
261	0112	FIBER ROLLS 12IN	30	LF
261	0113	REMOVE FIBER ROLLS 12IN	30	LF

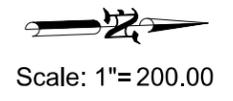
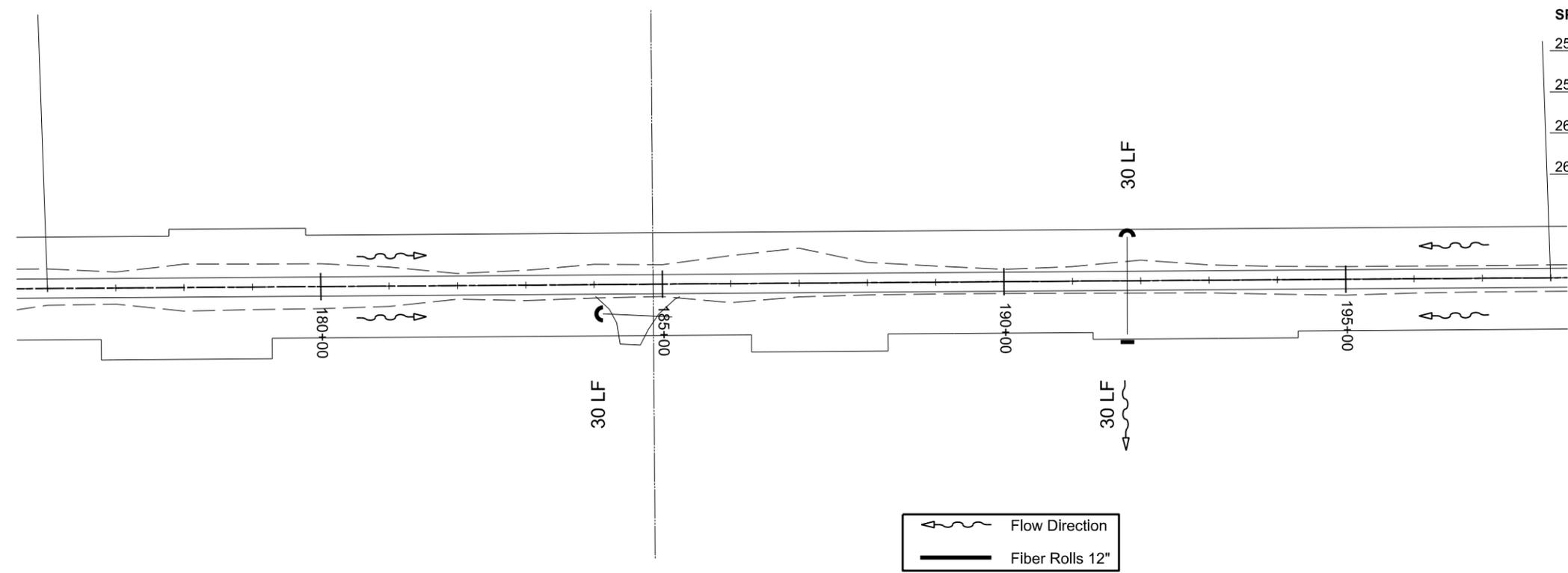


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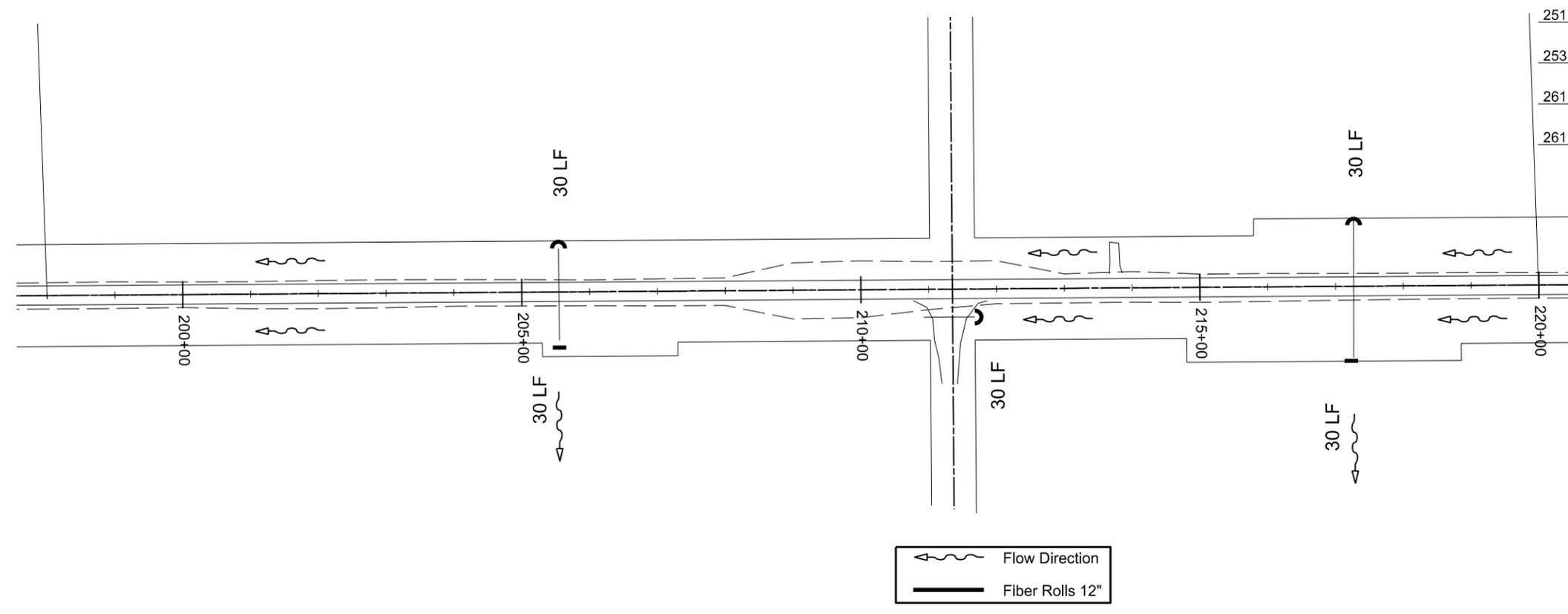
Temporary Erosion Control
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	76	5

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	5.8	ACRES
253	0101	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	90	LF
261	0113	REMOVE FIBER ROLLS 12IN	90	LF



SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	6.2	ACRES
253	0200	STRAW MULCH	6.2	ACRES
261	0112	FIBER ROLLS 12IN	150	LF
261	0113	REMOVE FIBER ROLLS 12IN	150	LF

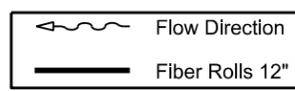
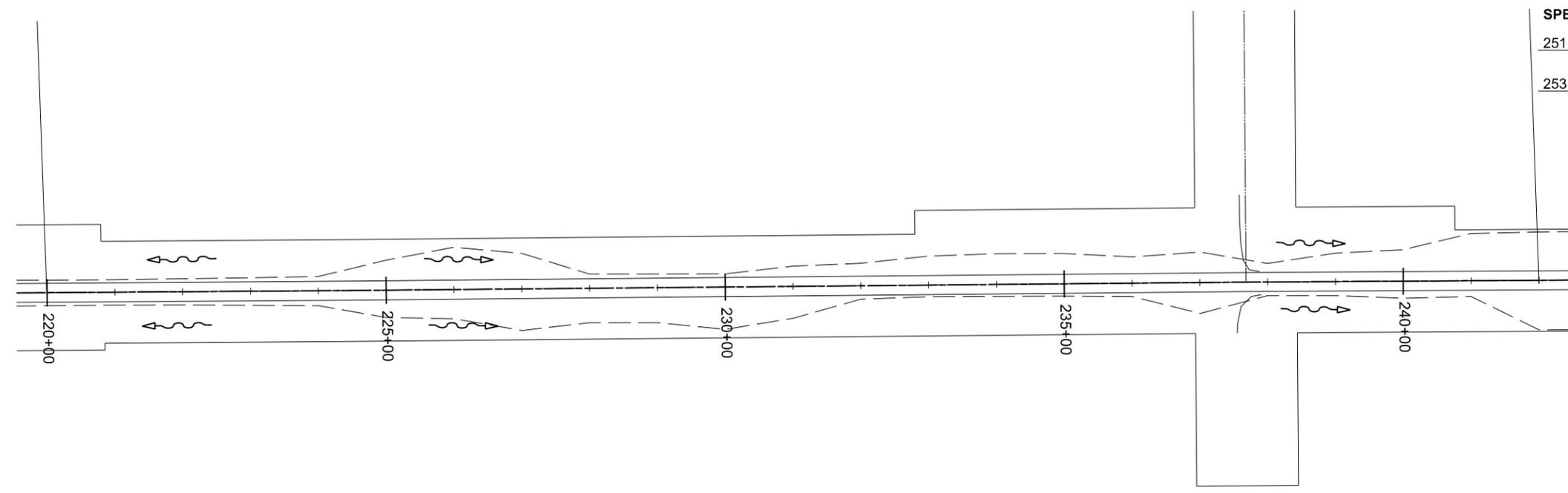


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Temporary Erosion Control
Cemetery Road
Adams County, ND

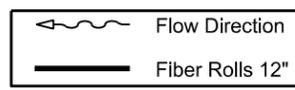
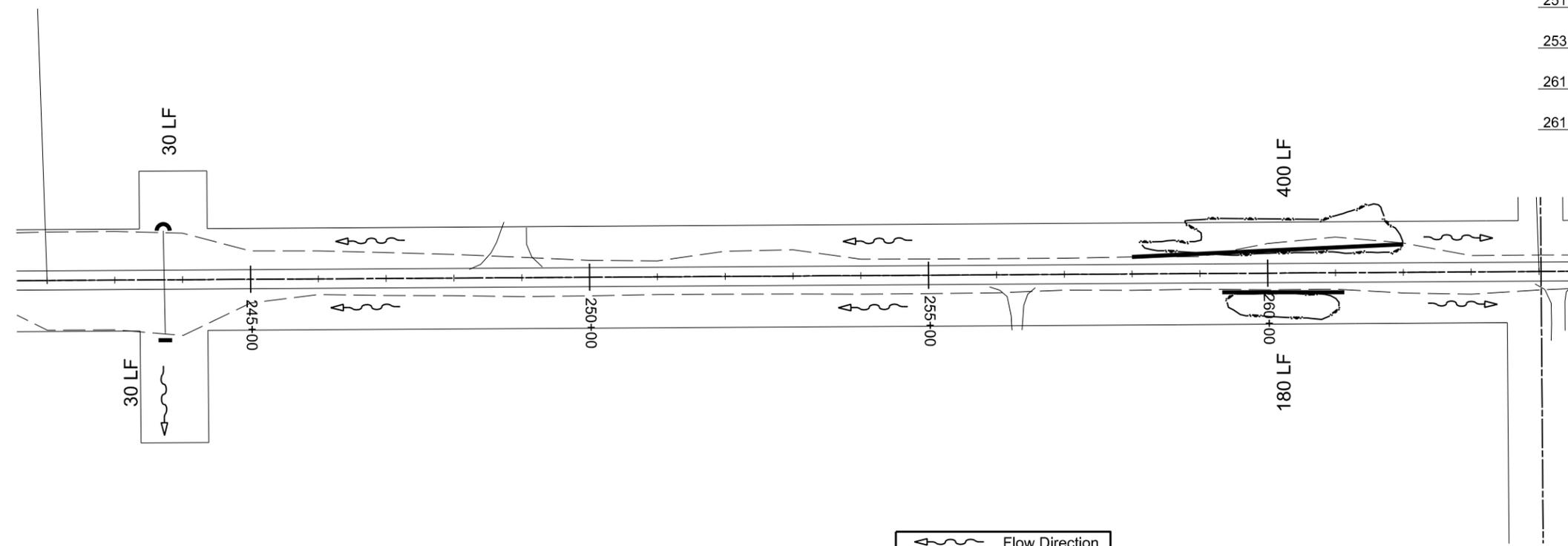
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	76	6

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	6.8	ACRES
253	0101	STRAW MULCH	6.8	ACRES




Scale: 1" = 200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	6.7	ACRES
253	0200	STRAW MULCH	6.7	ACRES
261	0112	FIBER ROLLS 12IN	640	LF
261	0113	REMOVE FIBER ROLLS 12IN	640	LF

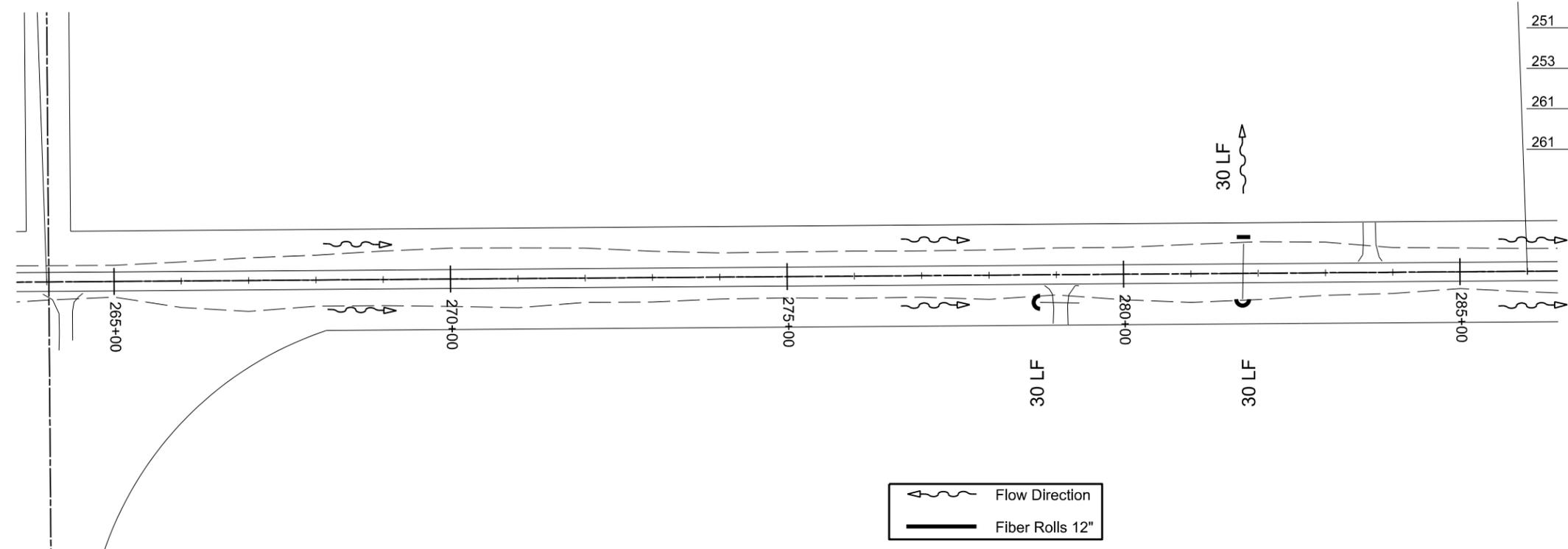


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Temporary Erosion Control
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	76	7

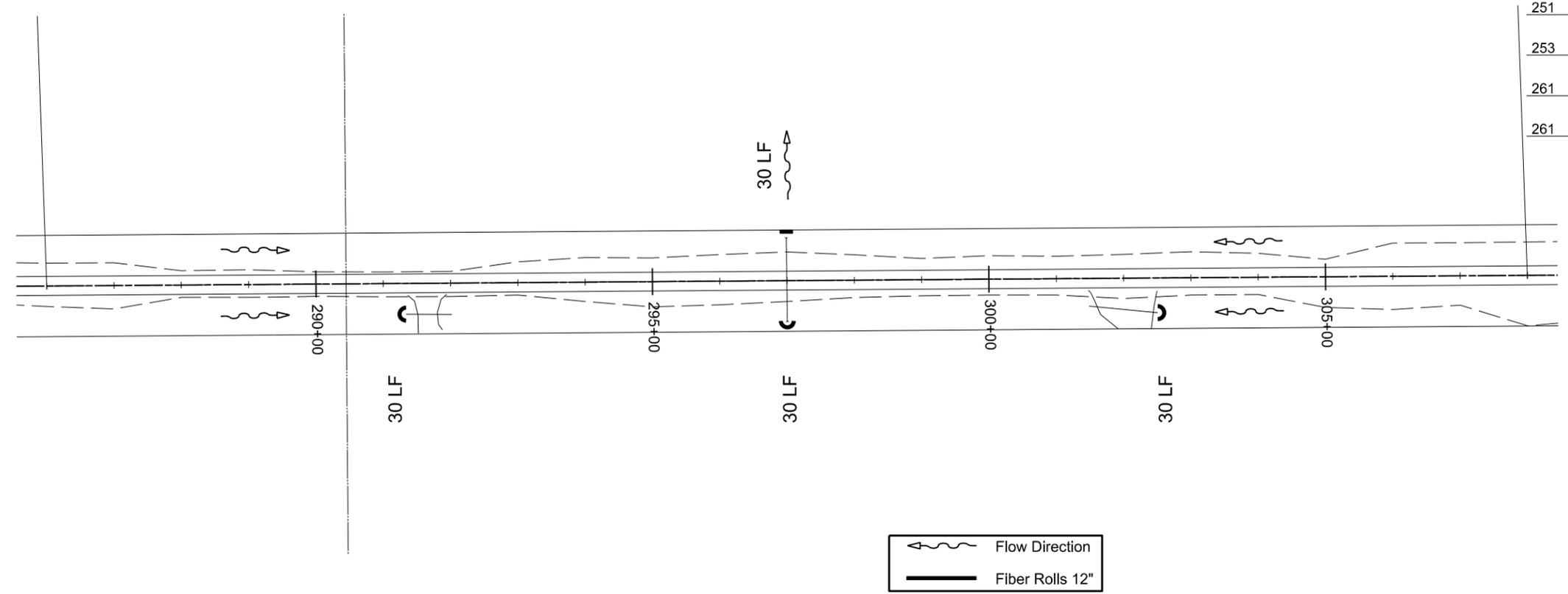
SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	5.8	ACRES
253	0101	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	90	LF
261	0113	REMOVE FIBER ROLLS 12IN	90	LF



 Flow Direction
 Fiber Rolls 12"


 Scale: 1" = 200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	5.8	ACRES
253	0200	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	120	LF
261	0113	REMOVE FIBER ROLLS 12IN	120	LF



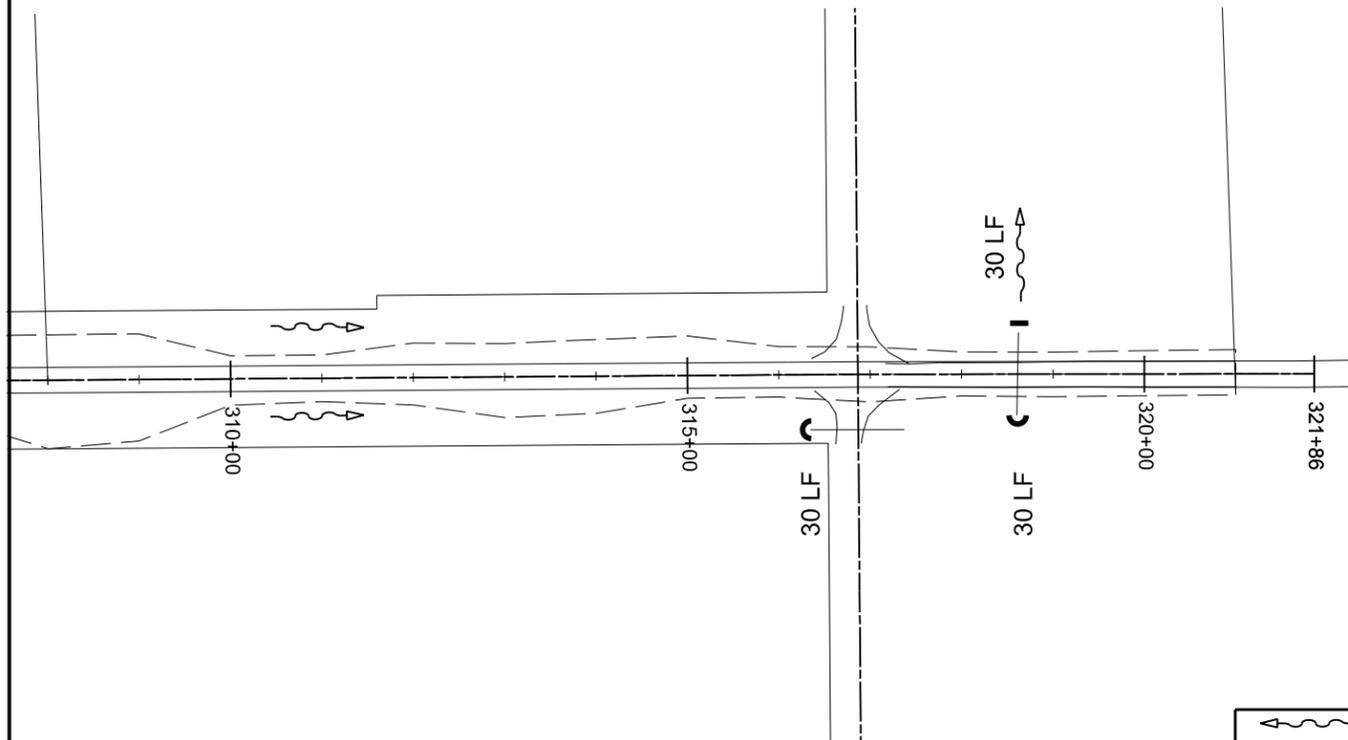
 Flow Direction
 Fiber Rolls 12"

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Temporary Erosion Control
 Cemetery Road
 Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	76	8

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP	3.9	ACRES
253	0101	STRAW MULCH	3.9	ACRES
261	0112	FIBER ROLLS 12IN	90	LF
261	0113	REMOVE FIBER ROLLS 12IN	90	LF



Scale: 1"=200.00

Station		(LF)
1+10	Lt	30'
1+10	Rt	30'
8+00	Rt	30'
18+16	Lt	30'
18+16	Rt	30'
32+57	Lt	30'
39+69	Lt	30'
40+19	Rt	30'
45+95	Lt	30'
45+95	Rt	30'
68+00	Lt	30'
70+00	Lt	100'
70+00	Rt	100'
79+60	Lt	30'
80+73	Rt	30'

82+15	Rt	30'
108+68	Rt	30'
124+88	Lt	30'
124+88	Rt	30'
149+50	Lt	135'
149+50	Rt	100'
153+26	Rt	30'
158+89	Rt	30'
184+10	Rt	30'
191+80	Lt	30'
191+80	Rt	30'
205+54	Lt	30'
205+54	Rt	30'
211+78	Rt	30'
217+27	Lt	30'
217+27	Rt	30'

243+71	Lt	30'
243+71	Rt	30'
260+00	Lt	400'
260+00	Rt	180'
278+66	Rt	30'
281+78	Lt	30'
281+78	Rt	30'
291+24	Rt	30'
297+00	Lt	30'
297+00	Rt	30'
302+60	Rt	30'
316+25	Rt	30'
318+62	Lt	30'
318+62	Rt	30'

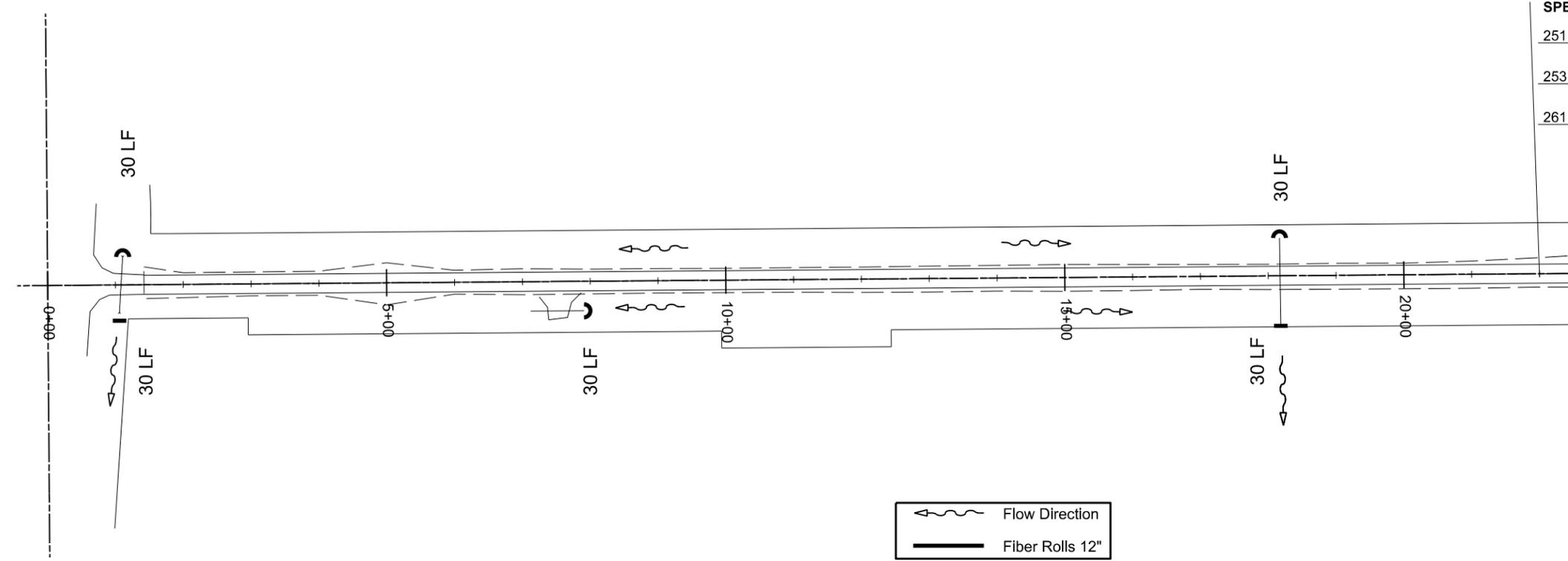
Additional	1000'
Total	3185'

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Temporary Erosion Control
Cemetery Road
Adams County, ND

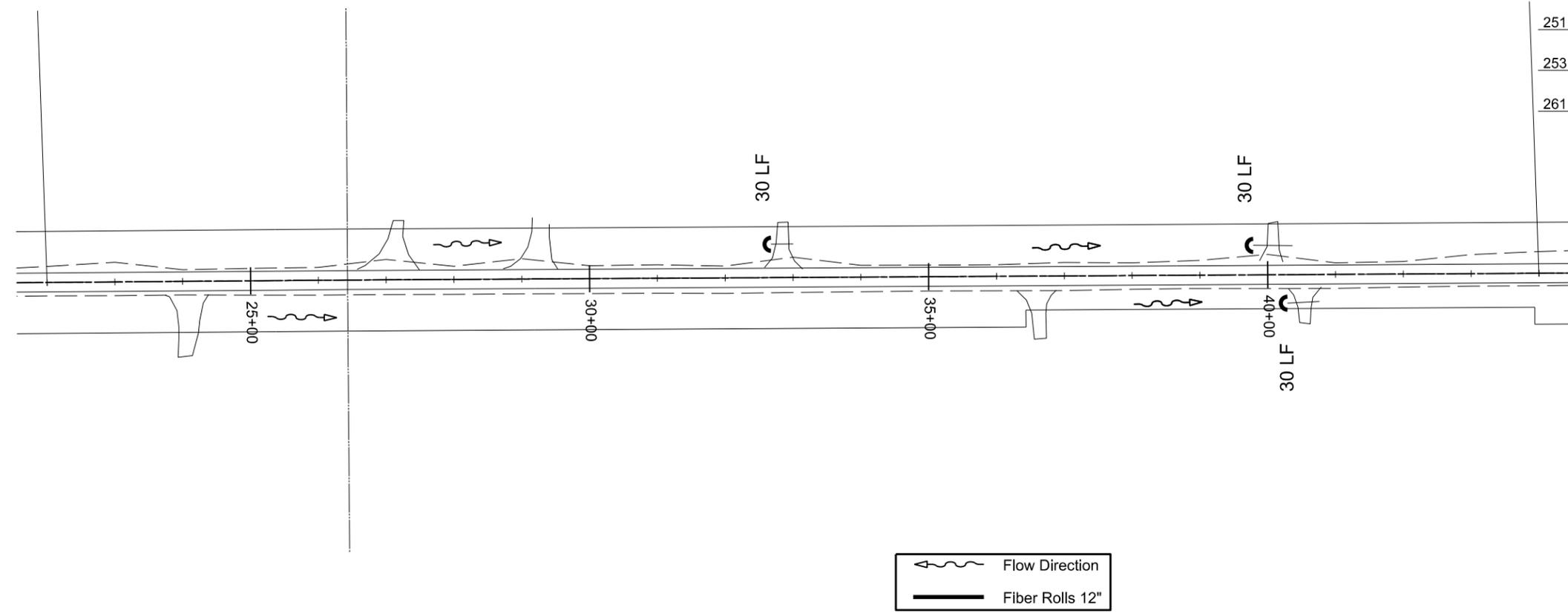
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	77	1

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	5.4	ACRES
253	0101	STRAW MULCH	5.4	ACRES
261	0112	FIBER ROLLS 12IN	150	LF




Scale: 1" = 200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	5.7	ACRES
253	0200	STRAW MULCH	5.7	ACRES
261	0112	FIBER ROLLS 12IN	90	LF

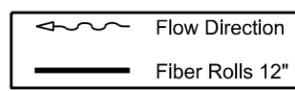
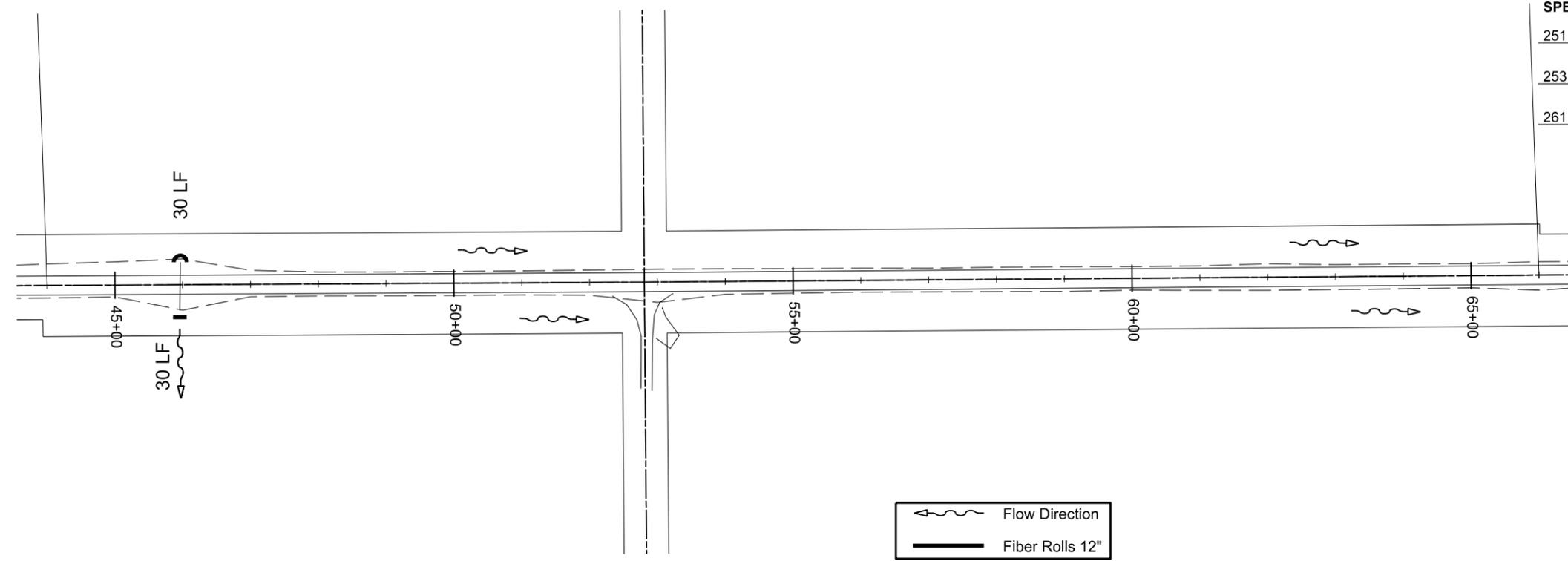


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Permanent Erosion Control
Cemetery Road
Adams County, ND

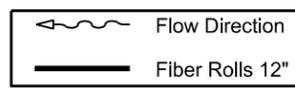
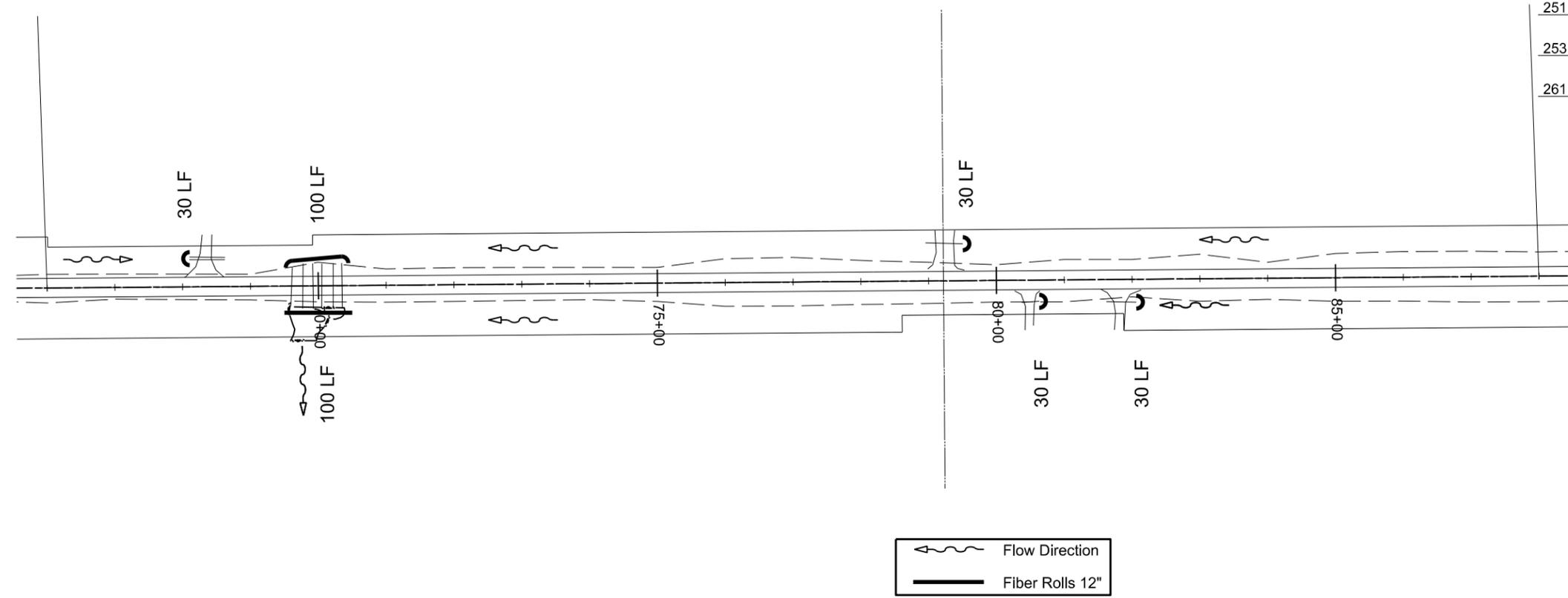
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	77	2

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	6.2	ACRES
253	0101	STRAW MULCH	6.2	ACRES
261	0112	FIBER ROLLS 12IN	60	LF




Scale: 1"= 200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	5.8	ACRES
253	0200	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	320	LF

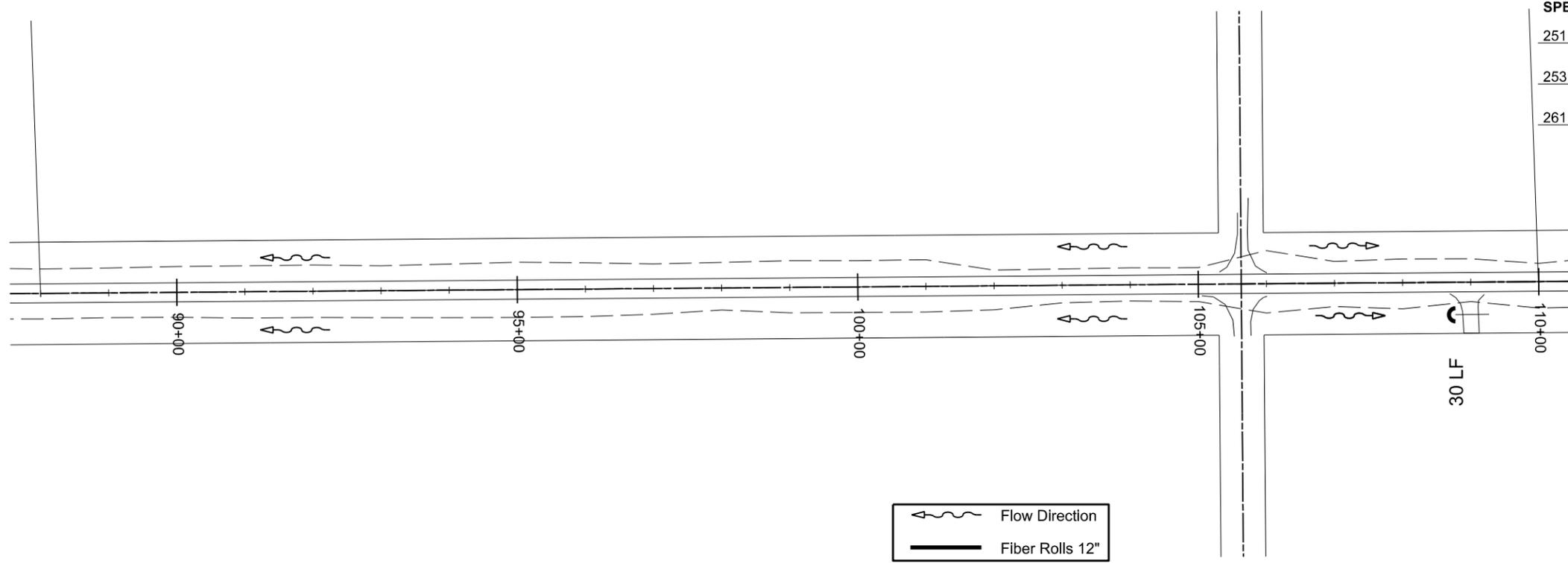


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Permanent Erosion Control
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	77	3

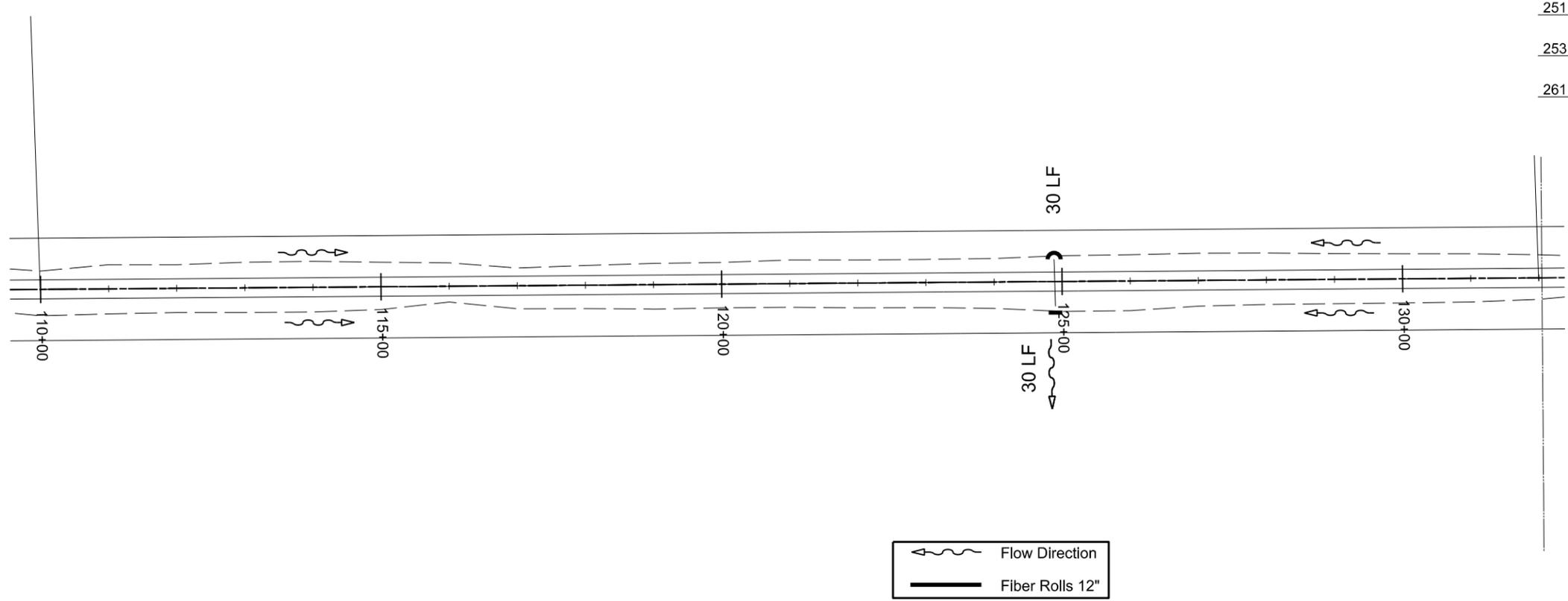
SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	5.8	ACRES
253	0101	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	30	LF



Flow Direction
 Fiber Rolls 12"

Scale: 1"= 200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	5.8	ACRES
253	0200	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	60	LF



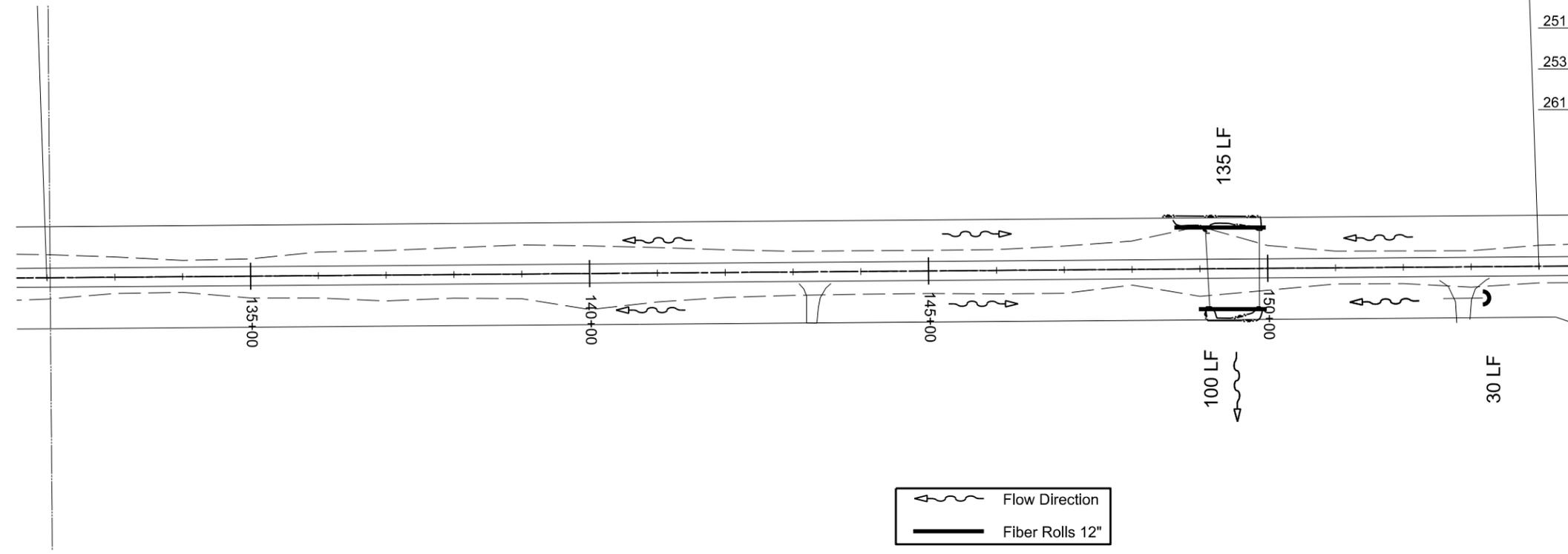
Flow Direction
 Fiber Rolls 12"

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Permanent Erosion Control
 Cemetery Road
 Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	77	4

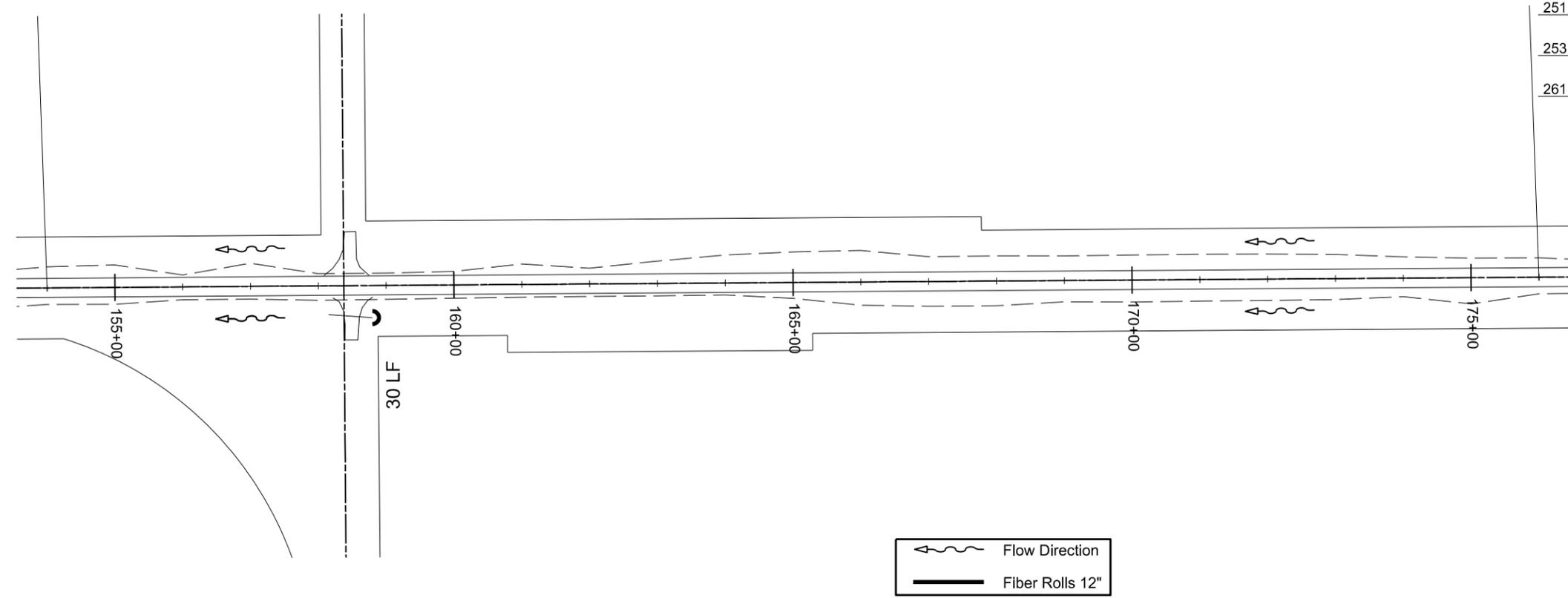
SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	5.8	ACRES
253	0101	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	265	LF



Flow Direction
 Fiber Rolls 12"

Scale: 1"=200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	6.6	ACRES
253	0200	STRAW MULCH	6.6	ACRES
261	0112	FIBER ROLLS 12IN	30	LF



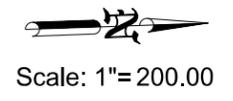
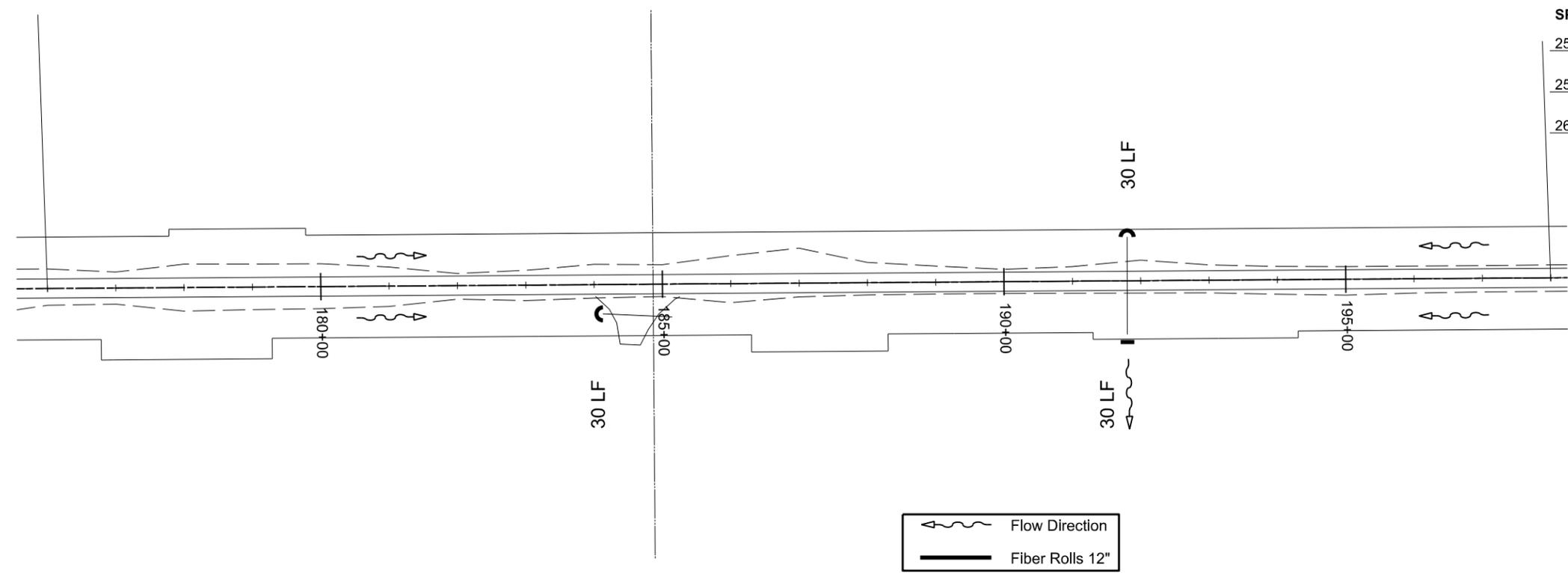
Flow Direction
 Fiber Rolls 12"

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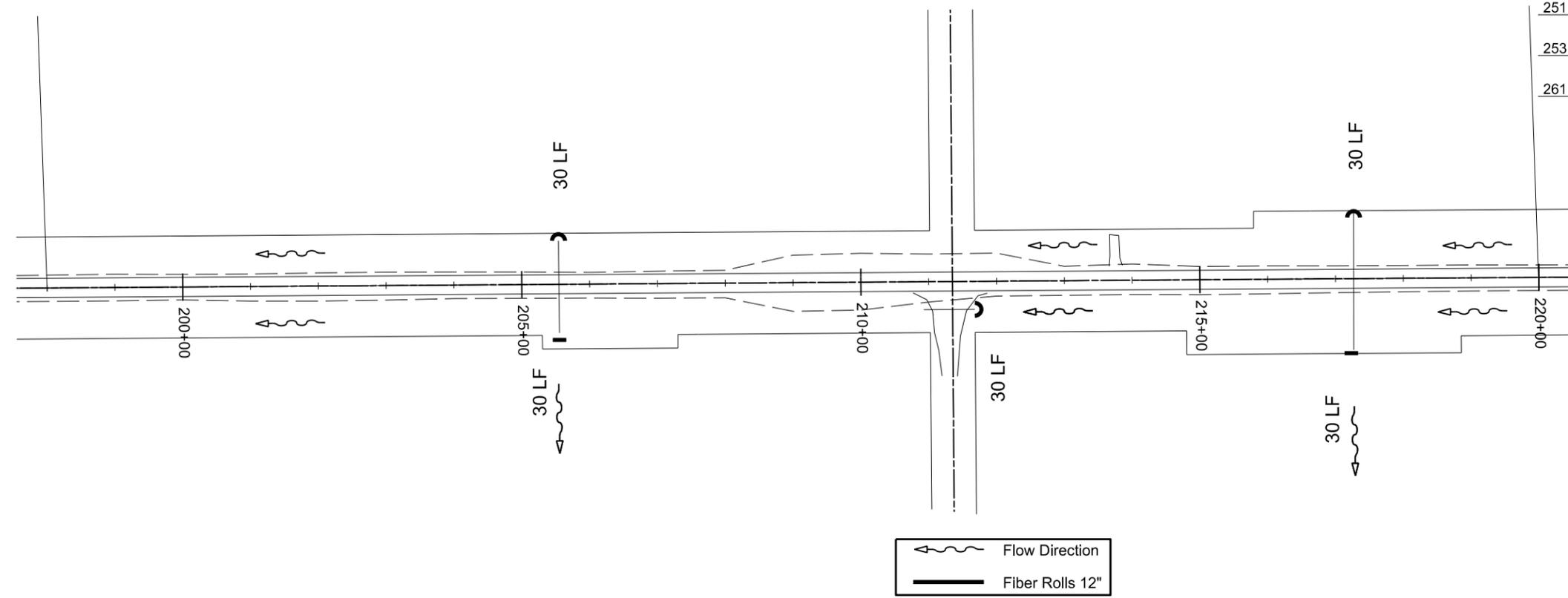
Permanent Erosion Control
 Cemetery Road
 Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	77	5

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	5.8	ACRES
253	0101	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	90	LF



SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	6.2	ACRES
253	0200	STRAW MULCH	6.2	ACRES
261	0112	FIBER ROLLS 12IN	150	LF

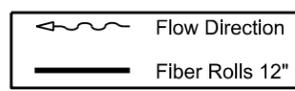
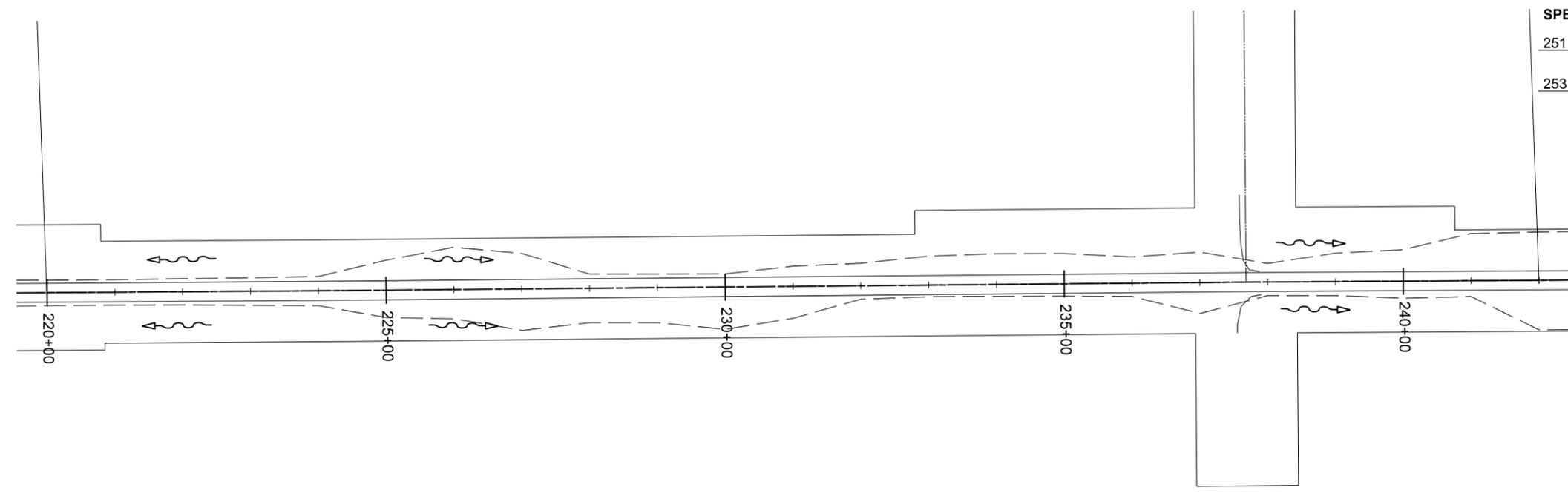


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Permanent Erosion Control
Cemetery Road
Adams County, ND

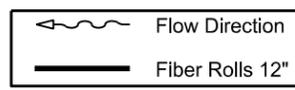
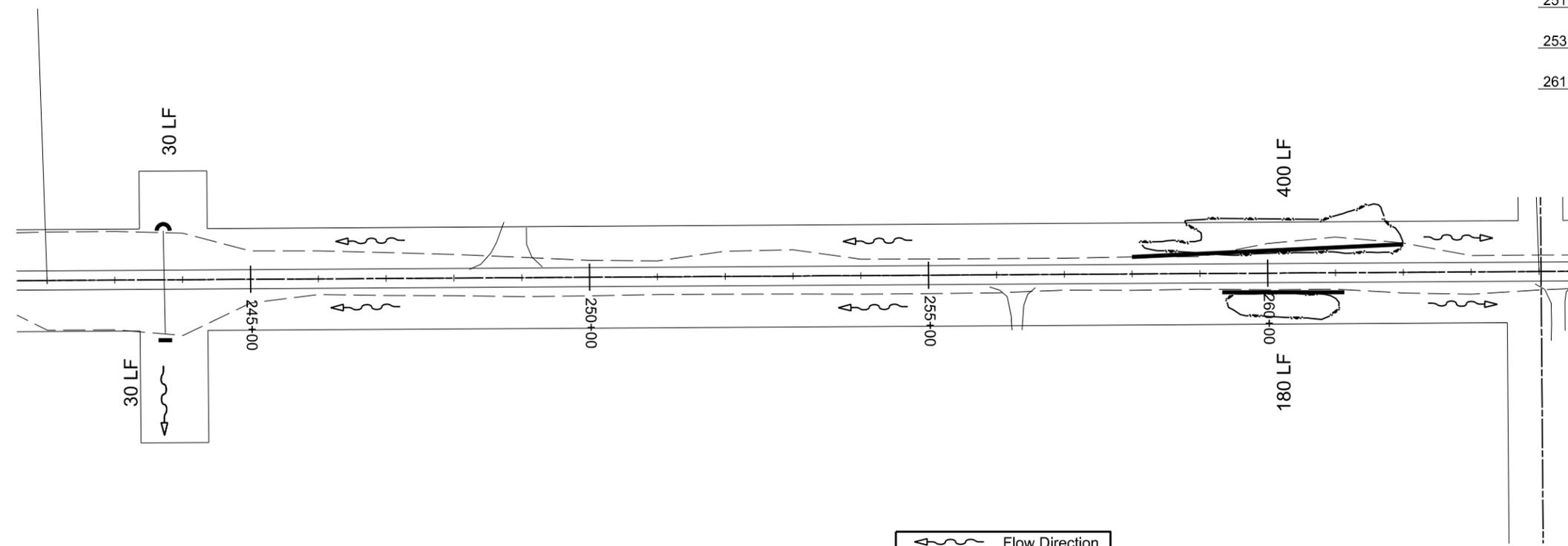
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	77	6

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	6.8	ACRES
253	0101	STRAW MULCH	6.8	ACRES



Scale: 1" = 200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	6.7	ACRES
253	0200	STRAW MULCH	6.7	ACRES
261	0112	FIBER ROLLS 12IN	640	LF

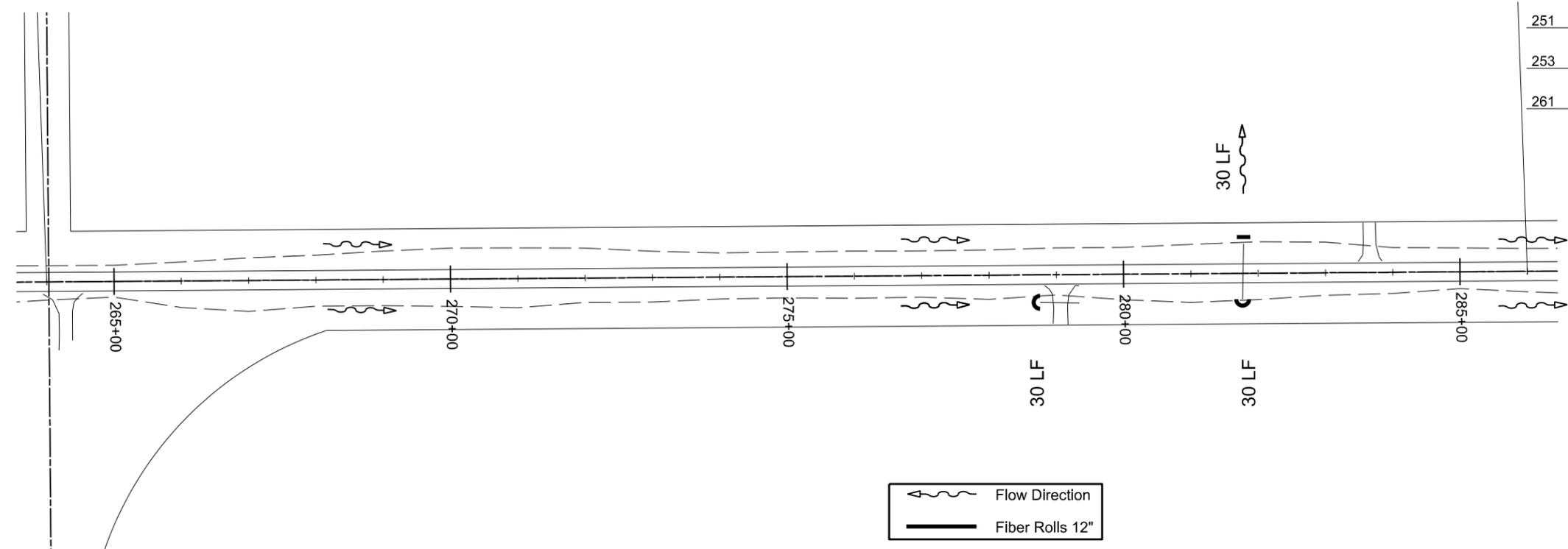


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Permanent Erosion Control
Cemetery Road
Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	77	7

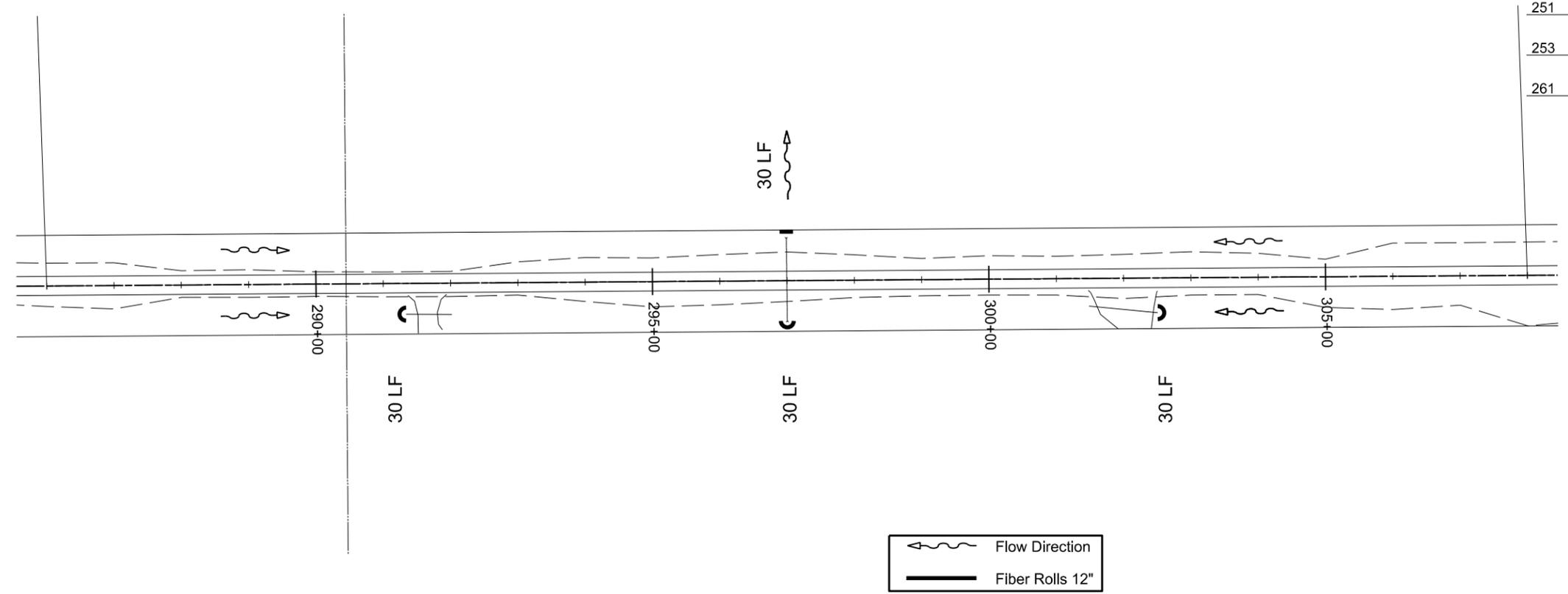
SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	5.8	ACRES
253	0101	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	90	LF



 Flow Direction
 Fiber Rolls 12"


 Scale: 1" = 200.00

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	5.8	ACRES
253	0200	STRAW MULCH	5.8	ACRES
261	0112	FIBER ROLLS 12IN	120	LF



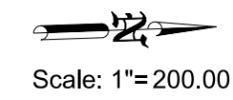
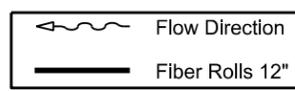
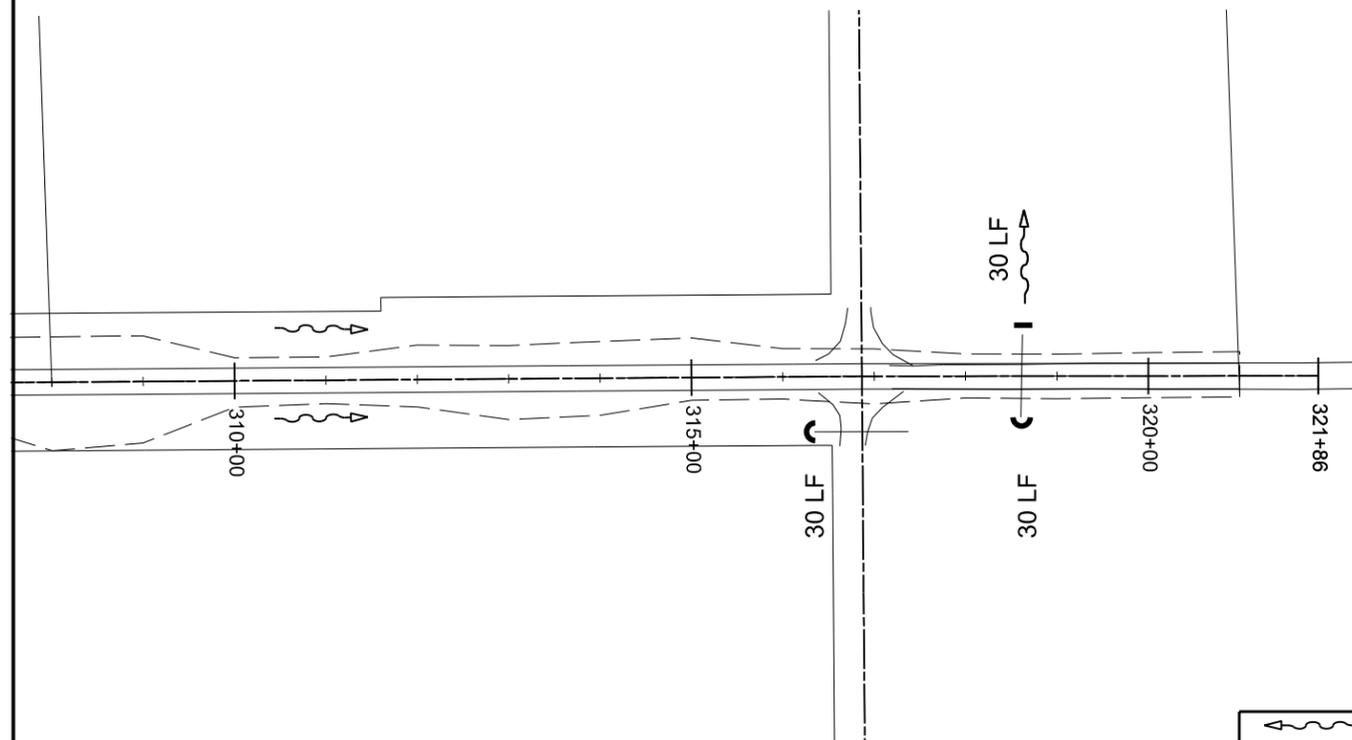
 Flow Direction
 Fiber Rolls 12"

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Permanent Erosion Control
 Cemetery Road
 Adams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	77	8

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	0200	SEEDING CLASS II	3.9	ACRES
253	0101	STRAW MULCH	3.9	ACRES
261	0112	FIBER ROLLS 12IN	90	LF



Station		(LF)
1+10	Lt	30'
1+10	Rt	30'
8+00	Rt	30'
18+16	Lt	30'
18+16	Rt	30'
32+57	Lt	30'
39+69	Lt	30'
40+19	Rt	30'
45+95	Lt	30'
45+95	Rt	30'
68+00	Lt	30'
70+00	Lt	100'
70+00	Rt	100'
79+60	Lt	30'
80+73	Rt	30'

82+15	Rt	30'
108+68	Rt	30'
124+88	Lt	30'
124+88	Rt	30'
149+50	Lt	135'
149+50	Rt	100'
153+26	Rt	30'
158+89	Rt	30'
184+10	Rt	30'
191+80	Lt	30'
191+80	Rt	30'
205+54	Lt	30'
205+54	Rt	30'
211+78	Rt	30'
217+27	Lt	30'
217+27	Rt	30'

243+71	Lt	30'
243+71	Rt	30'
260+00	Lt	400'
260+00	Rt	180'
278+66	Rt	30'
281+78	Lt	30'
281+78	Rt	30'
291+24	Rt	30'
297+00	Lt	30'
297+00	Rt	30'
302+60	Rt	30'
316+25	Rt	30'
318+62	Lt	30'
318+62	Rt	30'

Additional	1000'
Total	3185'

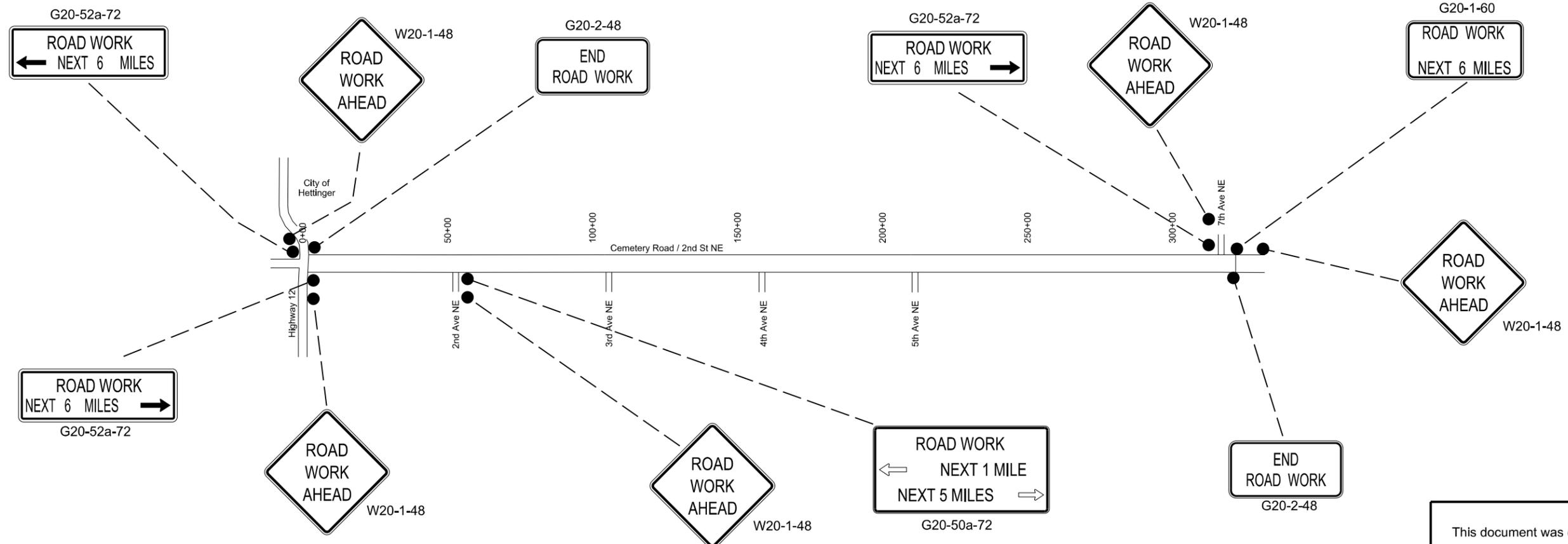
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Permanent Erosion Control
Cemetery Road
Adams County, ND

NOTE:
 The sign layout as shown is for general informational purposes only.
 The contractor will be required to conform to MUTCD and the
 standard drawings when installing the Traffic Control Signing.



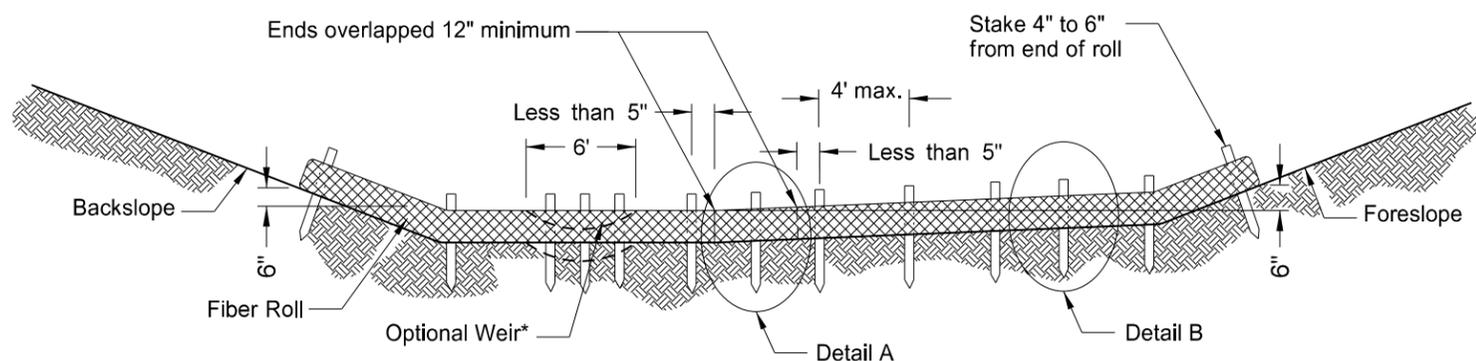
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOA-CNOB-CNOC-0119(057)	100	2



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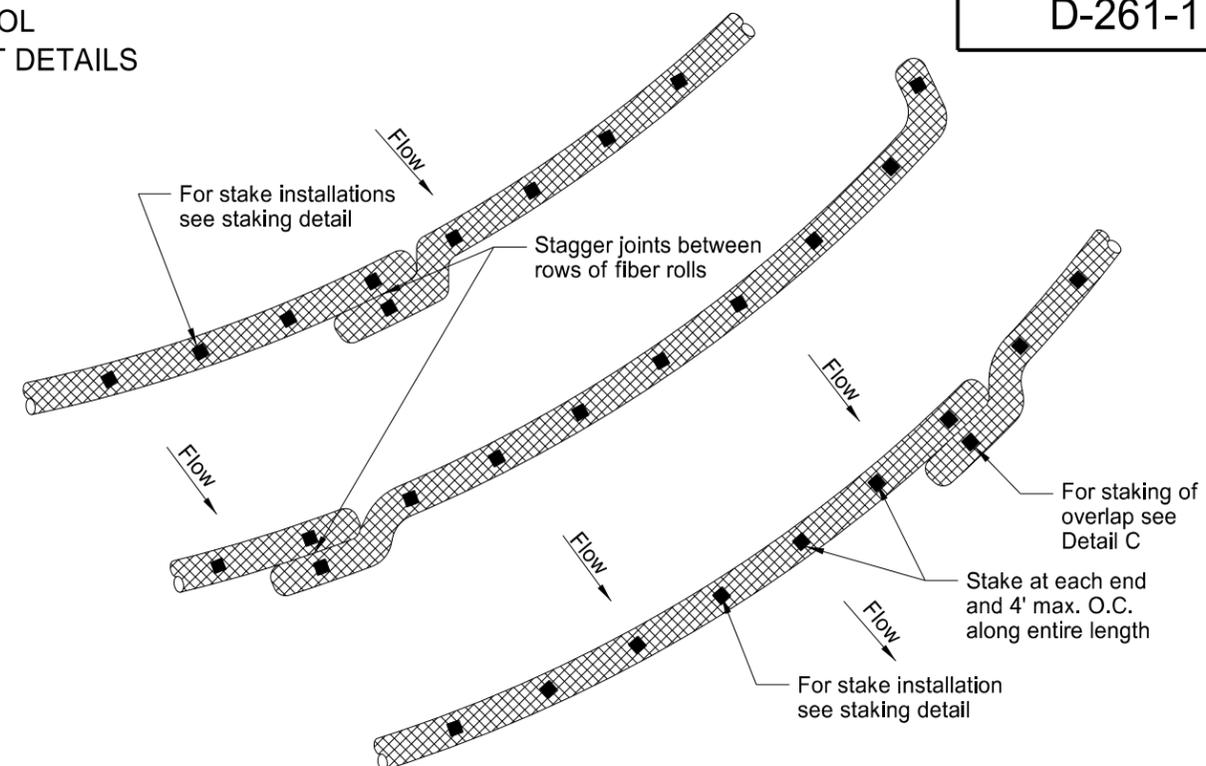
Traffic Control
 Cemetery Road
 Adams County, ND

EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS

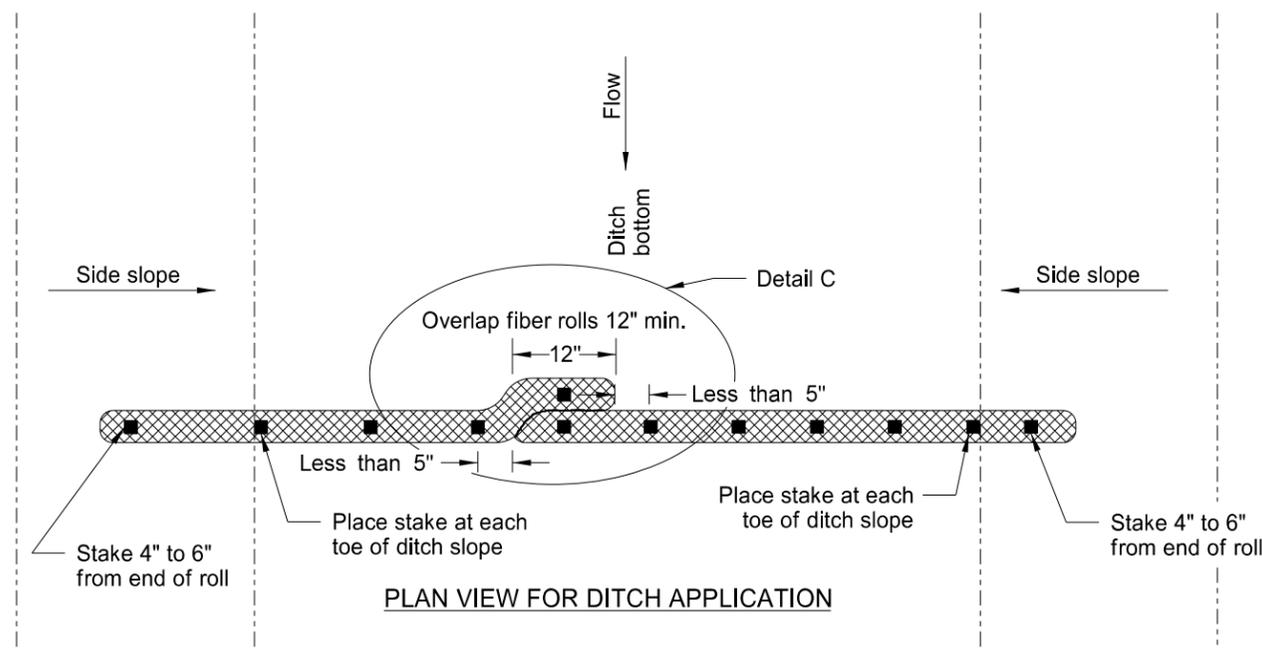


*Optional Weir. Use in flat areas, such as the Red River Valley, where there is potential for water to back up on adjacent property. Lower fiber roll enough to prevent water from backing up on adjacent property. Do not use 20-inch fiber rolls in flat areas where there is potential for water to back up on adjacent property.

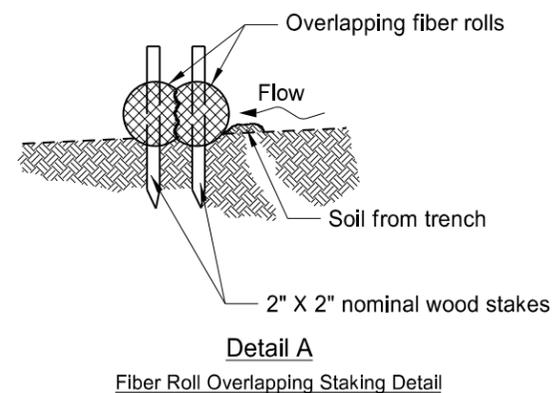
12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



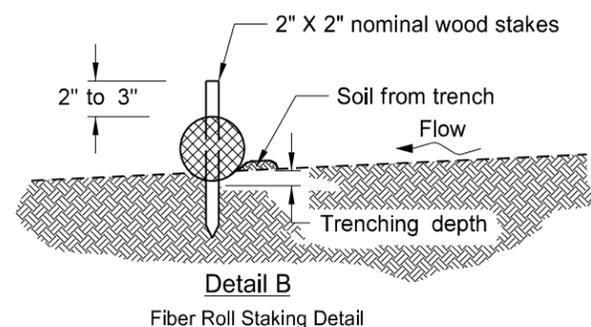
PLAN VIEW FOR SLOPE APPLICATION



PLAN VIEW FOR DITCH APPLICATION



Detail A
Fiber Roll Overlapping Staking Detail



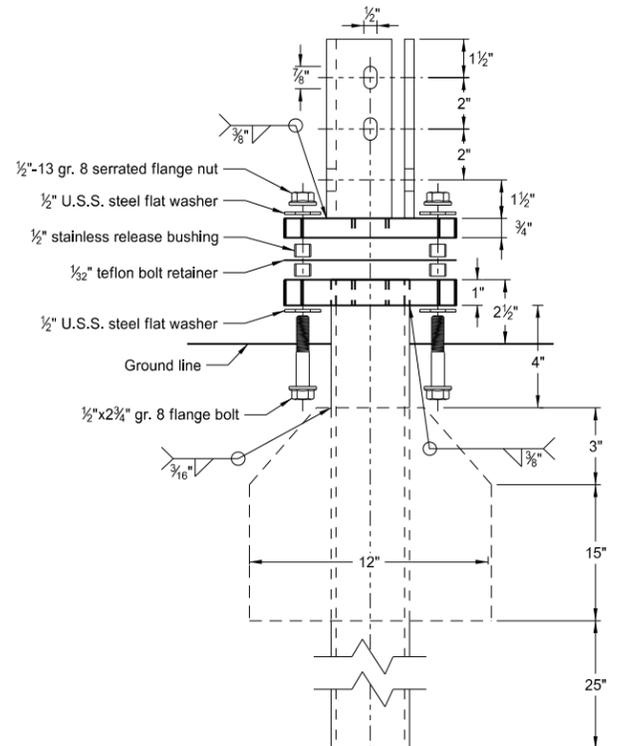
Detail B
Fiber Roll Staking Detail

FIBER ROLL DIAMETER	NOMINAL STAKE SIZE	MINIMUM STAKE LENGTH	MINIMUM TRENCH DEPTH	MAXIMUM TRENCH DEPTH
6"	2" x 2"	18"	2"	2"
12"	2" x 2"	24"	2"	3"
20"	2" x 2"	36"	3"	5"

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

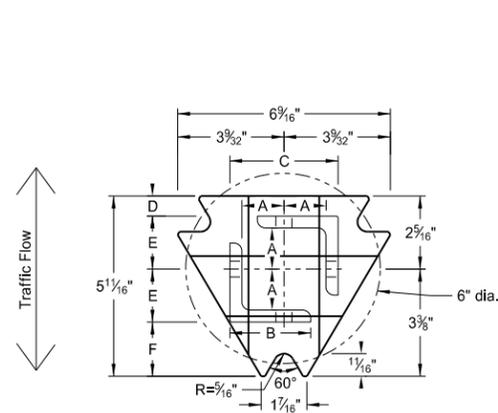
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-18-10	
REVISIONS	
DATE	CHANGE
06-10-13	Added plan view for ditch and slope application, Added table with values for stake and trench dimensions.
10-04-13	Revised fiber roll overlap detail.
06-26-14	Changed standard drawing number from D-708-7 to D-261-1

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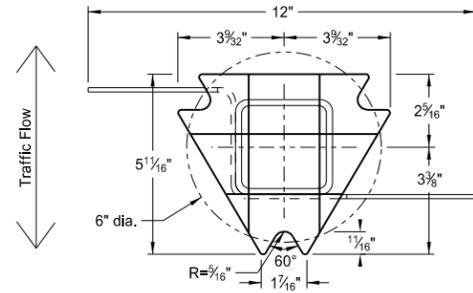


Multi-Directional Slip Base Assembly

Perforated Tube



Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2 1/2"x2 1/2"x3/8" ASTM A36 structural angle



Bottom Soil Stub
Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50

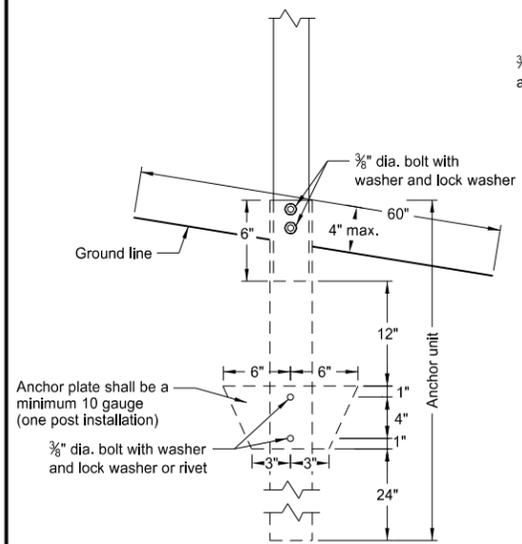
Notes:

1. Slip base bolts shall be torqued as specified by the manufacturer.
2. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI.
3. The 4" vertical clearance is required for the anchor or breakaway base. The 4"x60" measurement shall be made above and below post location and also back and ahead of the post.
4. When used in concrete sidewalk, anchor shall be same except without the wings.
5. Four post signs shall have over 7' between the first and the fourth posts.

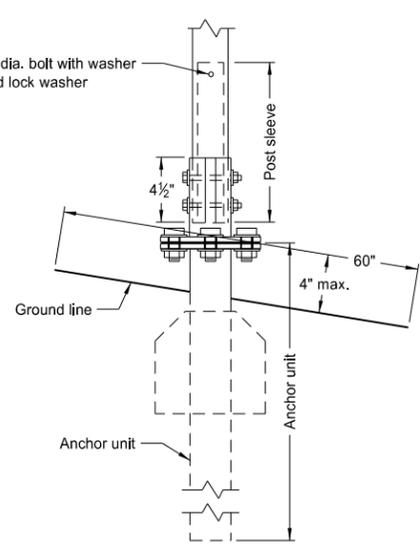
Number of Posts	Post Size in.	Wall Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	12			Yes	
2	2 1/4	10	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in. ⁴	Cross Sec. Area in. ²	Section Modulus in. ³
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785

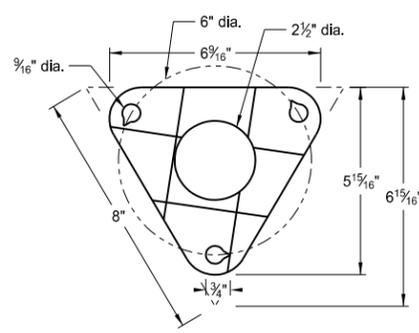
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 9/64"	2 1/2"	3 1/32"	2 5/32"	1 33/64"	1 1/8"
2 1/2"x10 ga.	1 9/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"



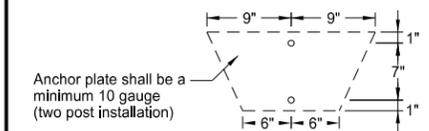
Anchor Unit and Post Assembly



Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



Bolt Retainer for Base Connection
Bolt Retainer - 1/32" Reprocessed Teflon

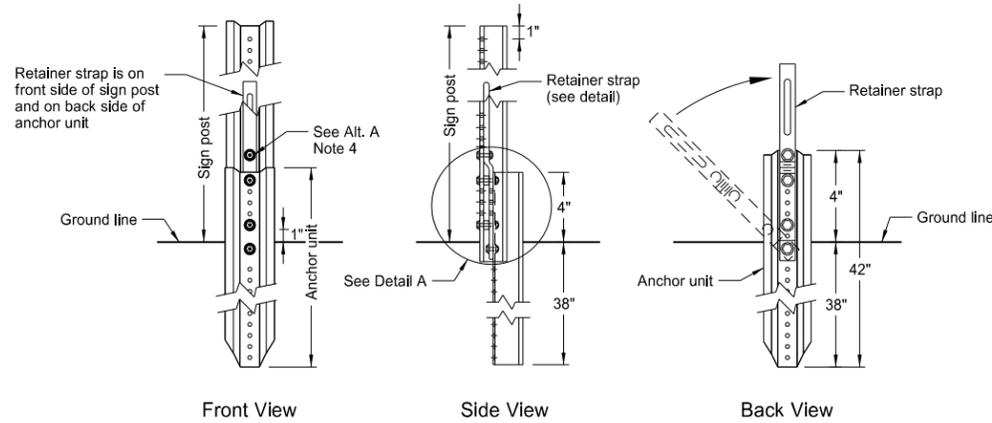
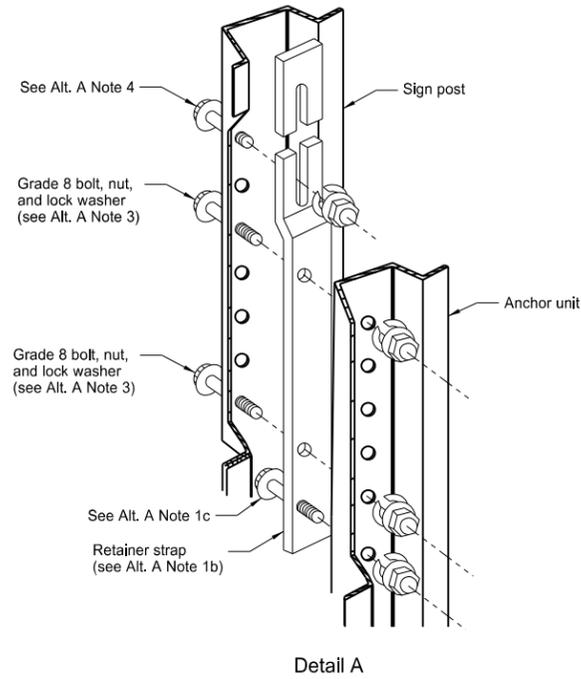


Anchor plate shall be a minimum 10 gauge (two post installation)

- (A) The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak.
(B) The 2 3/16"x10 ga. may be inserted into 2 1/2"x10 ga. for additional wind load.

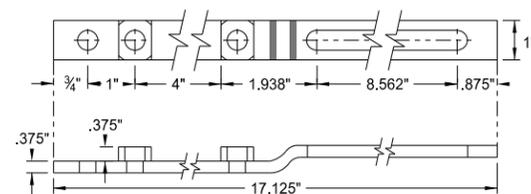
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 2/28/14 and the original document is stored at the North Dakota Department of Transportation
2-28-14		
REVISIONS		
DATE	CHANGE	

U-Channel Post

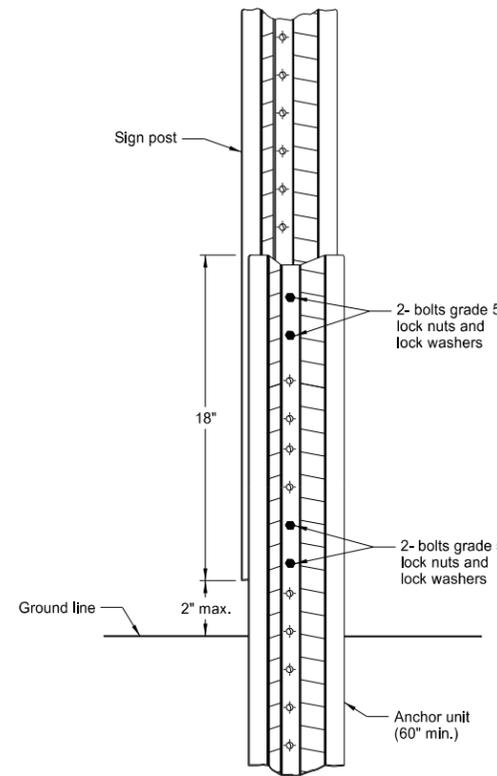


Breakaway U-Channel Detail Alternate A

A maximum of 2 posts shall be installed within 7'.

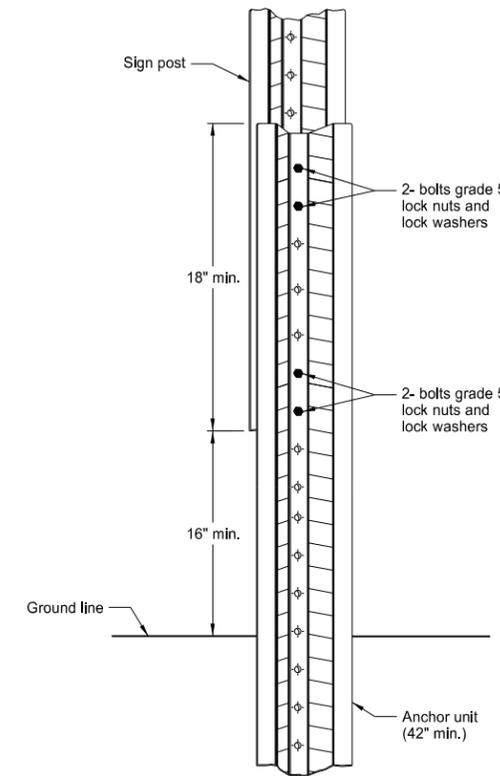


Retainer Strap Detail



Breakaway U-Channel Splice Detail Alternate B (2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.



Breakaway U-Channel Splice Detail Alternate C (2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.

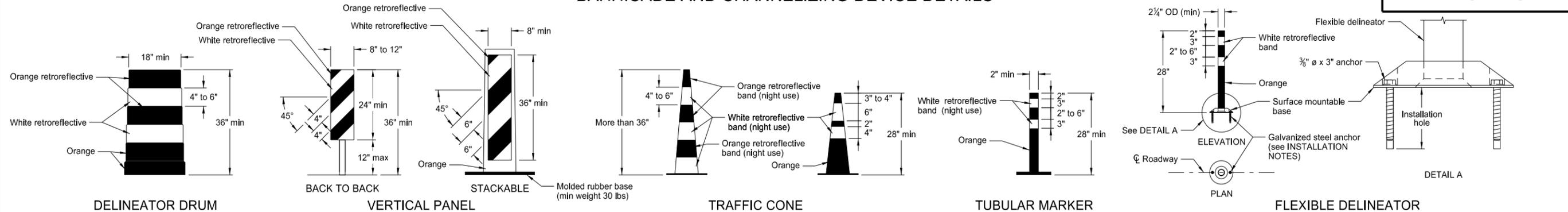
Alternate A Steps of Installation:

- Drive anchor unit to within 12" of ground level.
 - Proper assembly established by lining up the bottom hole of retainer strap with the 6th hole from the top of the anchor unit.
 - Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
 - Rotate strap 90° to left.
- Drive anchor unit to 4" above ground.
 - Rotate strap to vertical position.
- Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
 - Alternately tighten two connector bolts.
- Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
- The base post, strap and sign post shall be properly nested. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

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2-28-14	
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DATE	CHANGE

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BARRICADE AND CHANNELIZING DEVICE DETAILS



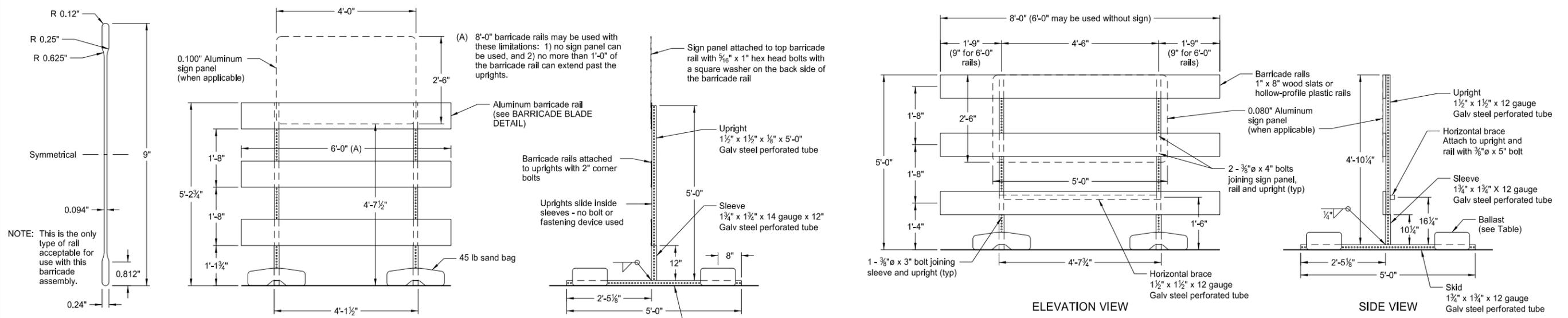
- INSTALLATION NOTES:**
1. Drill installation holes to diameter and depth as required by manufacturer's specifications.
 2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
 3. In lieu of bolted down base, the contractor may use an 8" x 8" butyl pad or hot melt butyl. Butyl shall be removed as close as possible to pavement surface.

The markings on drums shall be horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide. Each drum shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectORIZED spaces between the horizontal orange and white stripes shall not exceed 3" wide. Stripes shall not be placed on ribs or indentations in the drum. Drums shall have closed tops that will not allow collection of construction debris or other debris. Ballast shall not be placed on the top of a drum.

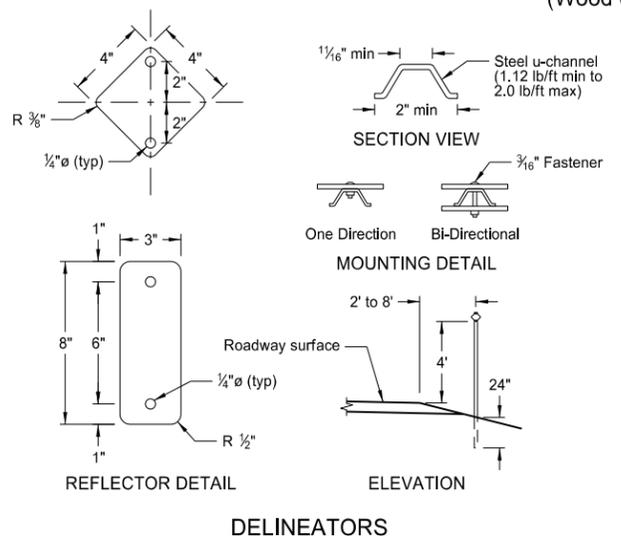
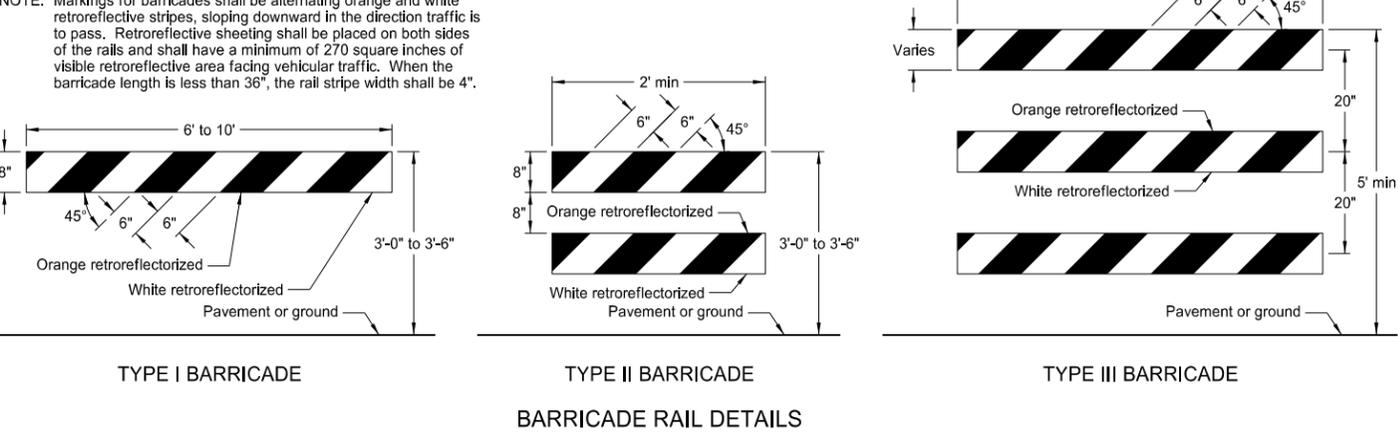
Markings for vertical panels shall be alternating orange and white retroreflective stripes, sloping downward in the direction vehicular traffic is to pass. Retroreflective sheeting shall be placed on both sides of panel and shall have a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, a stripe width of 6 inches shall be used.

RetroreflectORIZATION of cones more than 36" in height shall be provided by alternating orange and white retroreflective stripes. Each cone shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectORIZED space between the orange and white stripes shall not exceed 3" wide.

RetroreflectORIZATION of tubular markers more than 42" in height shall be provided by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



NOTE: Markings for barricades shall be alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Retroreflective sheeting shall be placed on both sides of the rails and shall have a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", the rail stripe width shall be 4".



MINIMUM BALLAST
(For each side of barricade support)

Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

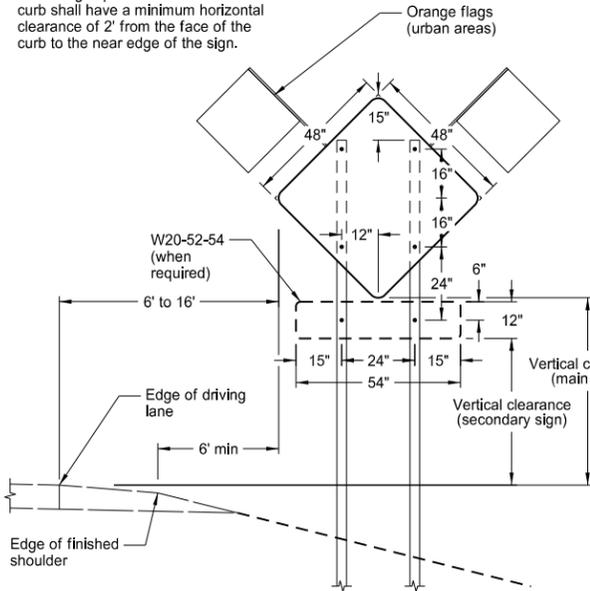
Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE

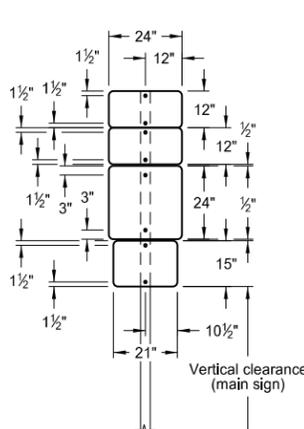
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CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

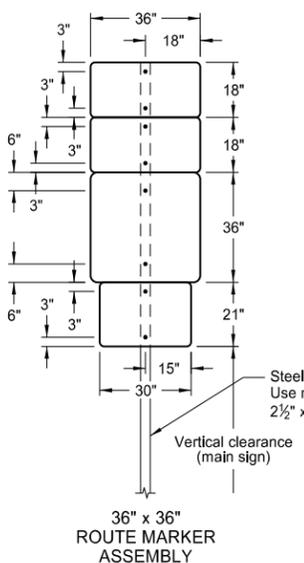
Note: Signs placed in sections with curb shall have a minimum horizontal clearance of 2' from the face of the curb to the near edge of the sign.



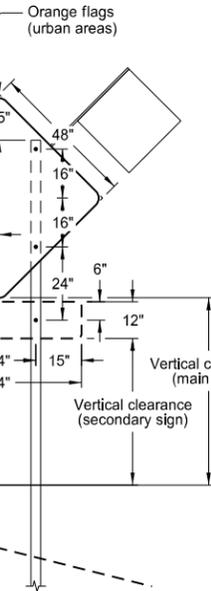
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



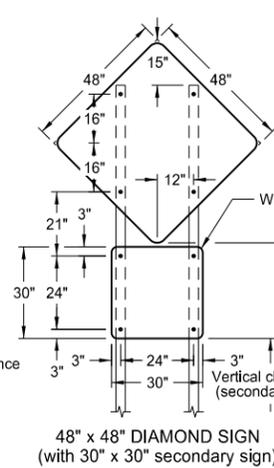
24" x 24" ROUTE MARKER ASSEMBLY



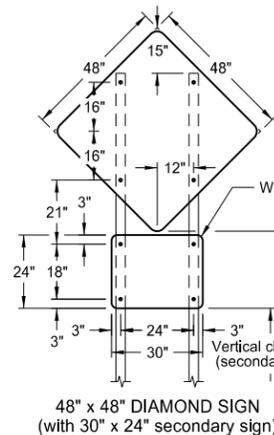
36" x 36" ROUTE MARKER ASSEMBLY



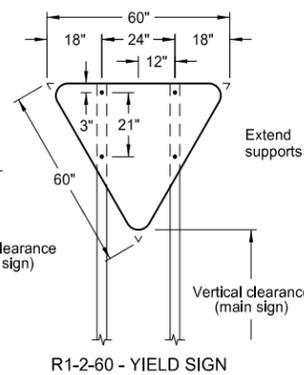
18" x 18" DIAMOND SIGN



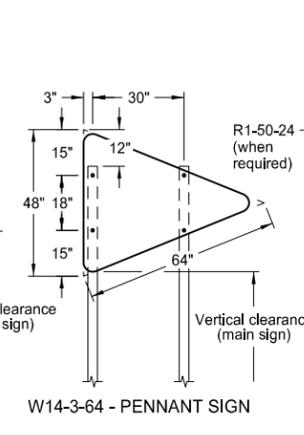
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



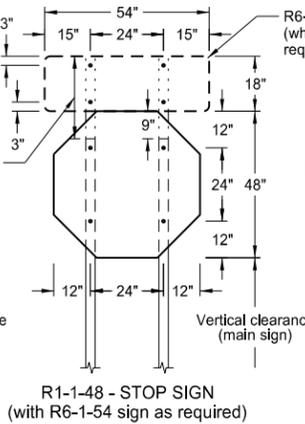
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



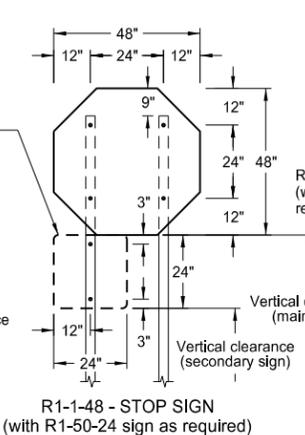
R1-2-60 - YIELD SIGN



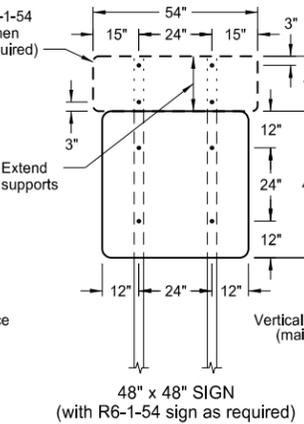
W14-3-64 - PENNANT SIGN



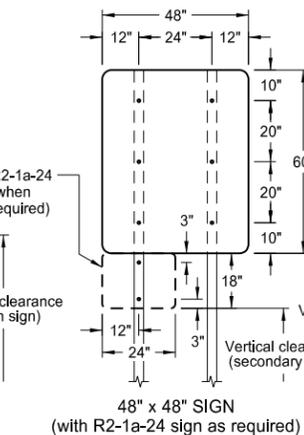
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



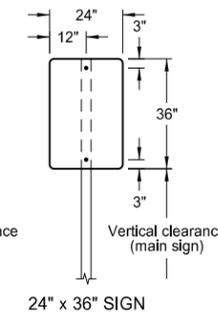
R1-1-48 - STOP SIGN
(with R1-50-24 sign as required)



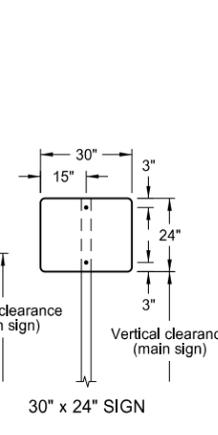
48" x 48" SIGN
(with R6-1-54 sign as required)



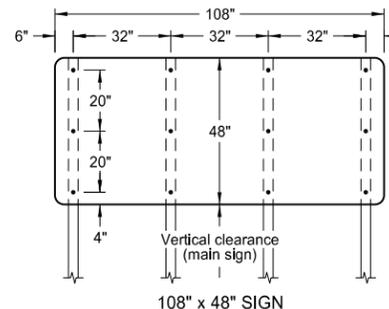
48" x 48" SIGN
(with R2-1a-24 sign as required)



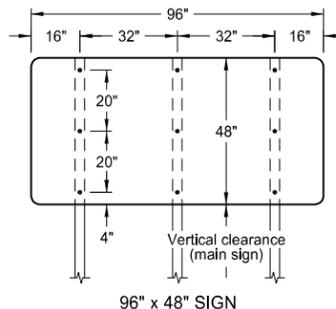
24" x 36" SIGN



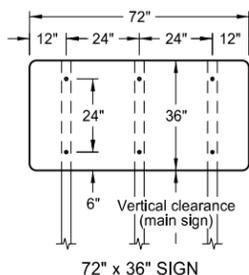
30" x 24" SIGN



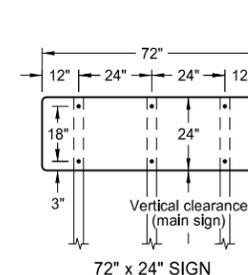
108" x 48" SIGN



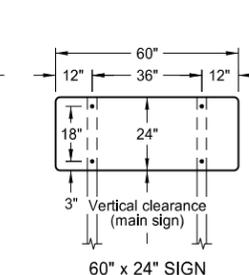
96" x 48" SIGN



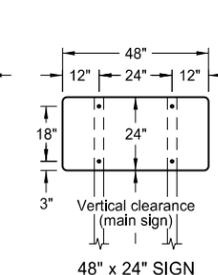
72" x 36" SIGN



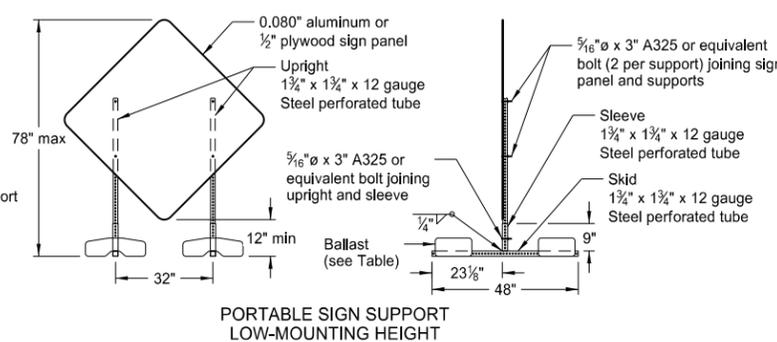
72" x 24" SIGN



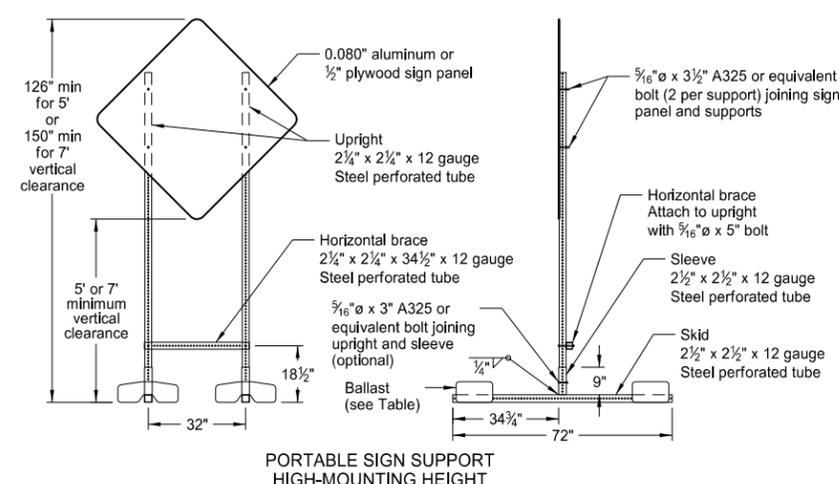
60" x 24" SIGN



48" x 24" SIGN



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

1. Sign Supports: Supports shall be galvanized or painted. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, the minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes are based on a wind speed of 55 MPH.

Signs over 50 square feet should be installed on 2 1/2" x 2 1/2" perforated tube supports as a minimum.

Guy wires shall not be attached to sign supports. Wind beams may be attached to u-posts behind the sign panels.

2. Sign Panels: Provide sign panels made of 0.100" aluminum, 1/2" plywood, or other approved material, except where noted. All holes to be punched round for 3/8" bolts.

3. Alternate Messages: The signs that have alternate messages may have these alternate messages placed on a reflectorized plate (without a border) and installed and removed as required. (i.e. "Left" and "Right" message on a lane closure sign)

4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

Interstate - white legend on blue background
Interstate Business Loop - white legend on green background
US and State - black legend on white background
County - yellow legend on blue background

5. Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.

The vertical clearance to secondary signs is 1'-0" less than the vertical clearance as stated above.

Large signs having an area exceeding 50 square feet shall have a minimum clearance of 7'-0" from the ground at the post.

6. Portable Signs: Provide portable signs that meet the vertical clearance as stated above. Use portable signs when it is necessary to place signs within the pavement surface.

When portable signs are used for 5 days or less, low-mounting height (minimum 12" vertical clearance) sign supports may be used as long as the view of the sign is not obstructed. Time delays caused by unforeseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. The R9-8 through R9-11a series, W1-5 through W1-8 series, M4-10, and E5-1 may be used for longer than 5 days.

Signs mounted to the portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT Details shall have a maximum surface area of 16 square feet.

MINIMUM BALLAST
(For each side of sign support base)

Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
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DATE	CHANGE
11-14-13	Revised Note 6.

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ROAD CLOSURE LAYOUTS

Notes

- Variables
 S = Numerical value of speed limit or 85th percentile.
 W = The width of taper.
 L = Minimum length of taper, or S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or $W \times S^2/60$ for urban, residential, and other streets with speeds of 40 mph or less.
- Barricades placed on roadway shall be on a moveable assembly. Signs placed on roadway shall be placed on skid mounted assemblies.
- Delineator drums, barricades or cones used for tapering traffic shall be spaced at the dimension "S". Delineator drums or cones used for tangents shall be spaced at 2 times dimension "S".
- Sequencing Arrow Panels
 Panels should normally be placed at the beginning of the taper. Where shoulder width does not provide sufficient room, the panel should be moved closer to the work area so that it can be placed on the roadway surface. See Shoulder Closure Standard Drawing.
 Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
 Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
 Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
- The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
- The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
- Use when work area is 1 mile or longer.
- When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
- Existing speed limit signs within a reduced speed zone shall be covered.
- Where necessary, safe speed to be determined by the Engineer.
- The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
- G20-55-96 sign is not required if this standard is part of other traffic control layouts, or the work is less than 15 days.

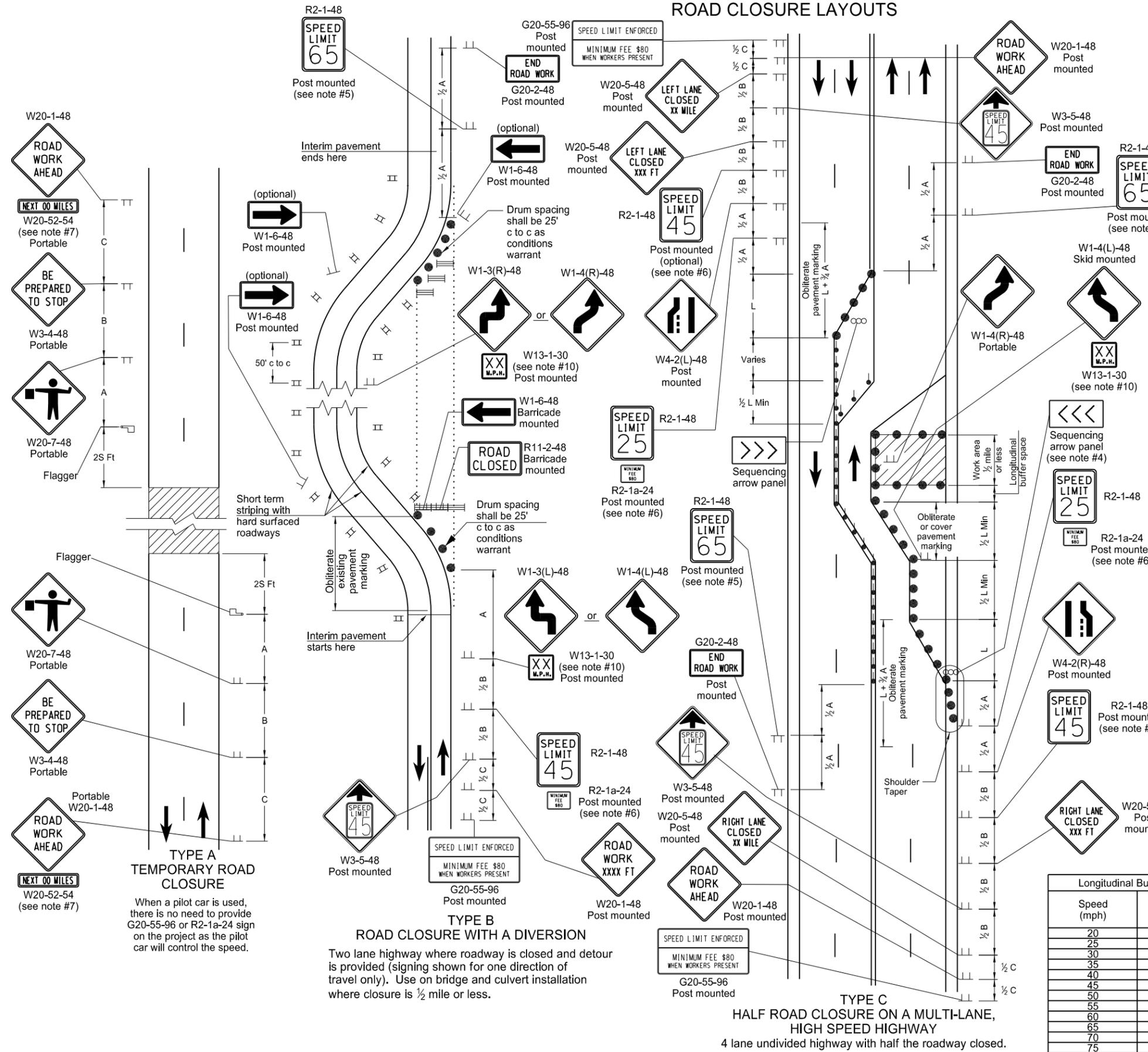
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY	
	Type III barricade
	Sign
	Delineator drum
	Tubular markers
	Work area
	Flagger
	Sequencing arrow panel
	Vertical panels back to back

Longitudinal Buffer Space	
Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

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TYPE A TEMPORARY ROAD CLOSURE

When a pilot car is used, there is no need to provide G20-55-96 or R2-1a-24 sign on the project as the pilot car will control the speed.

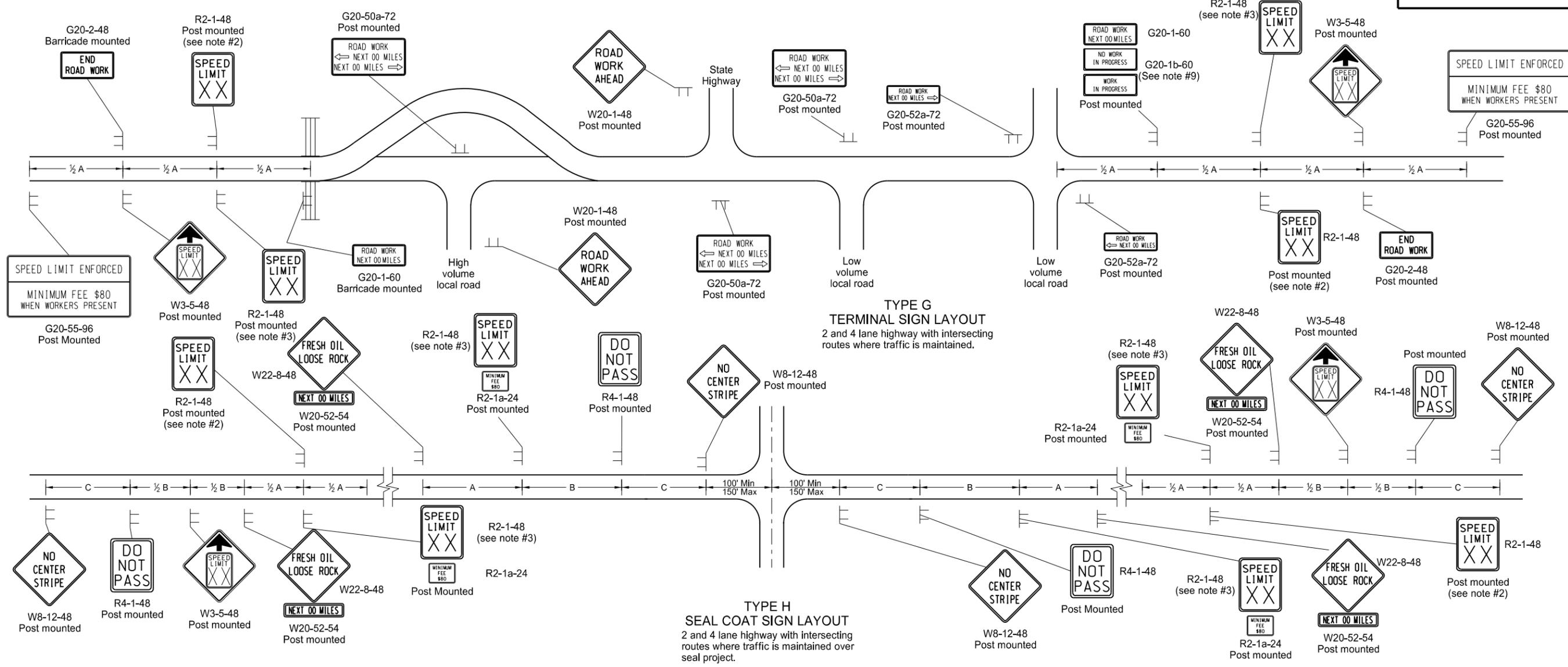
TYPE B ROAD CLOSURE WITH A DIVERSION

Two lane highway where roadway is closed and detour is provided (signing shown for one direction of travel only). Use on bridge and culvert installation where closure is 1/2 mile or less.

TYPE C HALF ROAD CLOSURE ON A MULTI-LANE, HIGH SPEED HIGHWAY
4 lane undivided highway with half the roadway closed.

TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



- Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies.
- The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
- The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 MPH below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 MPH. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
- When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
- Existing speed limit signs within a reduced speed zone shall be covered.
- On seal projects, signs R2-1-48, R2-1a-24, R4-1-48, W22-8-48 and W20-52-54 shall be placed just after all important intersections and at five mile intervals thereafter. Sign W8-12-48 shall be placed just after all important intersections and at 2 mile intervals thereafter until the short term center line pavement marking is in place. No short term pavement markings are placed when traffic volumes are 750 ADT or less.
- The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
- Type H construction sign traffic control shall have the speed limit signs covered or removed once the loose aggregate has been removed.
- The contractor shall install the G20-1b-60 sign when work is suspended for winter.
- Other traffic control layouts will be required in the immediate work areas. If the speed limit is reduced in the work area, speed limit signs shall have the R2-1a-24 sign placed below.
- G20-55-96 sign is not required if work is less than 15 days.

KEY

≡ Type III barricade

⊥ Sign

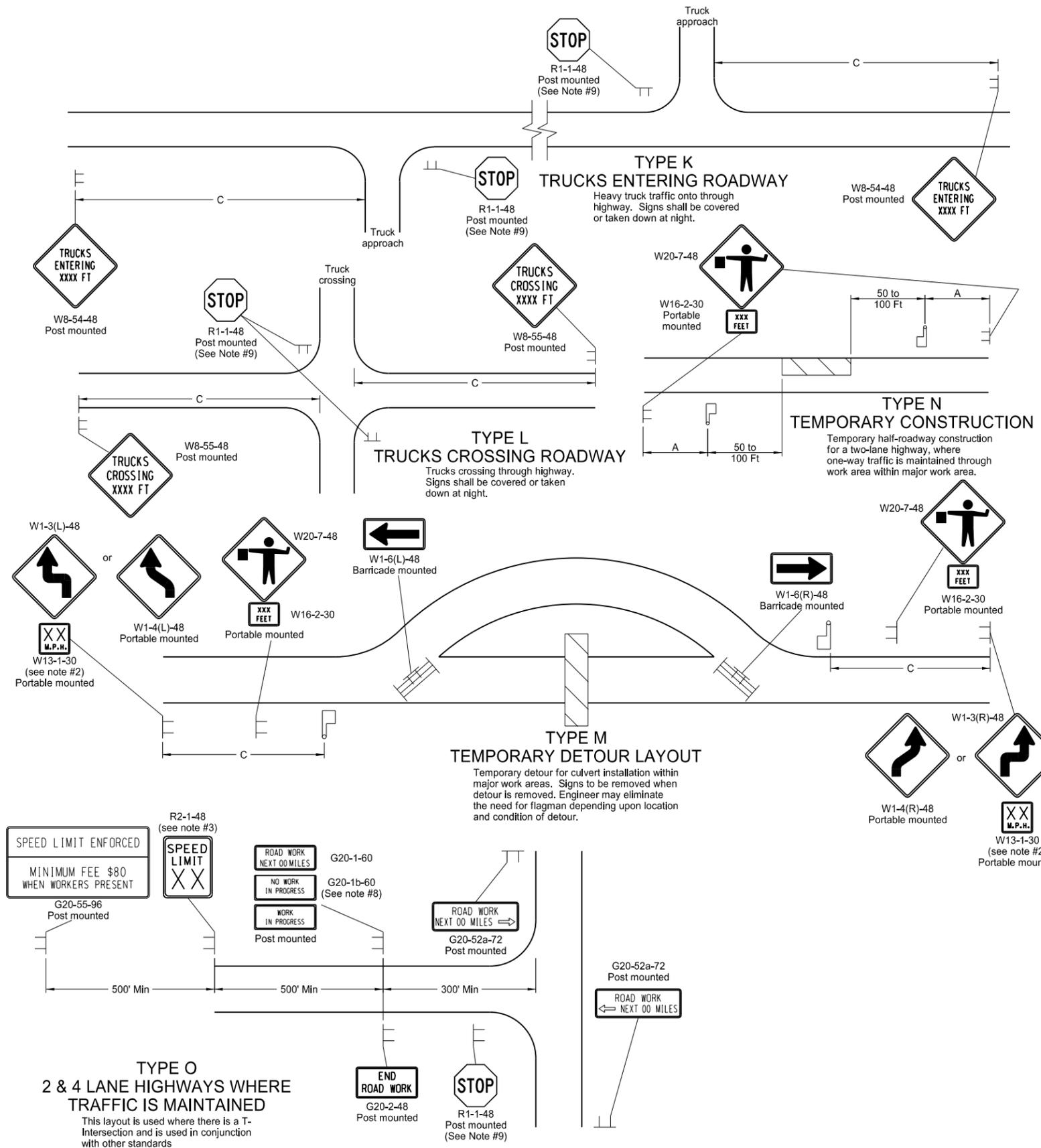
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

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CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

D-704-22



- Notes
1. Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies. Where necessary, safe speed to be determined by the Engineer.
 2. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
 3. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
 4. Existing speed limit signs within a reduced speed zone shall be covered. Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
 5. The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
 6. The contractor shall install the G20-1b-60 sign when work is suspended for winter.
 7. If existing stop sign is in place, a 48" stop sign is not required.
 8. G20-55-96 sign is not required if this standard is part of other traffic control layouts with this sign or the work is less than 15 days.

KEY

- Type III barricade
- Work area
- Sign
- Flagger

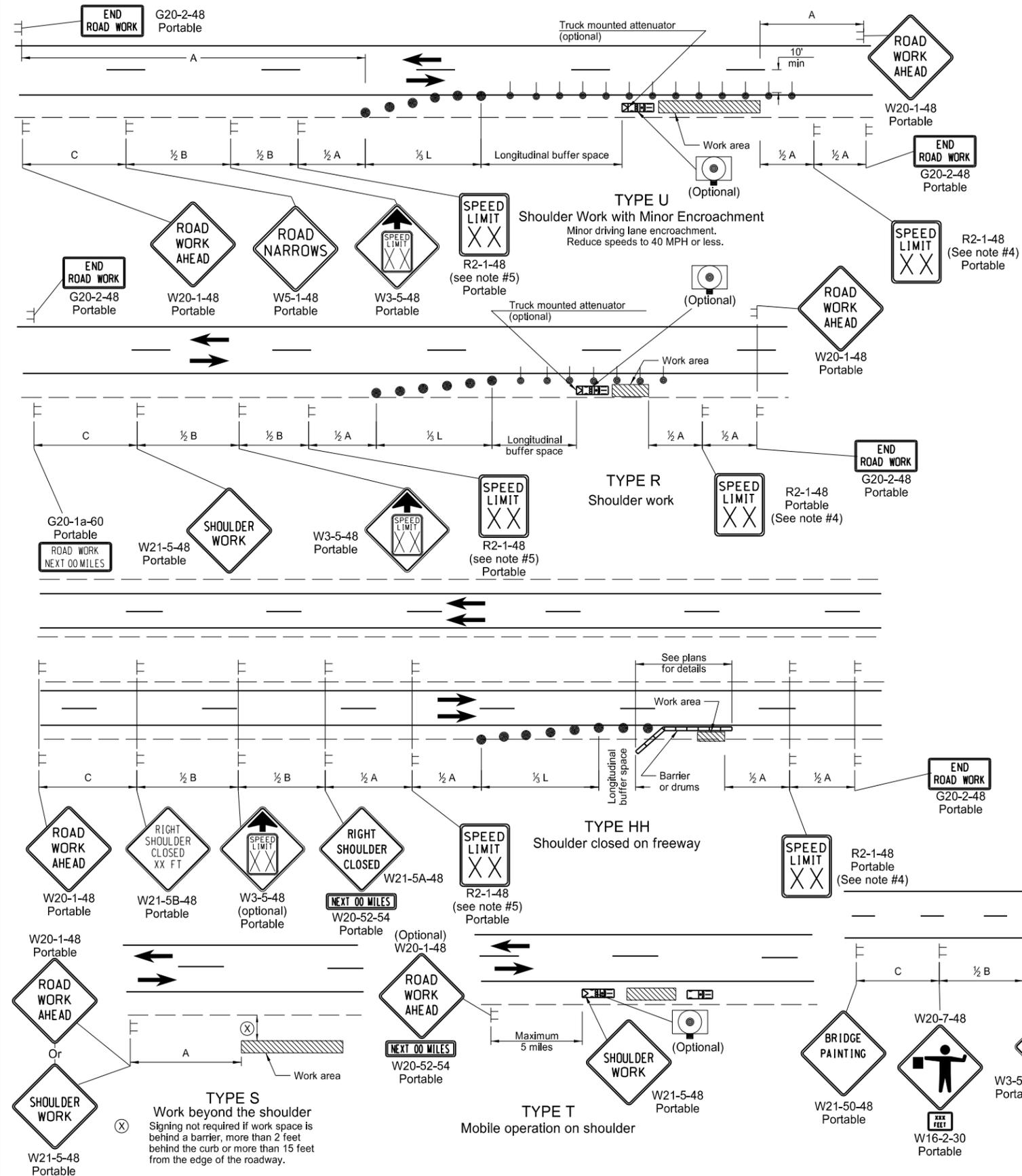
Road Type	ADVANCE WARNING SIGN SPACING		
	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

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SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS

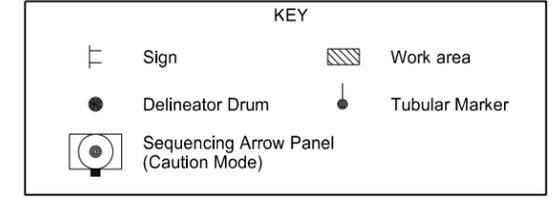
D-704-24



- Notes
- Variables
S = Numerical value of speed limit or 85th percentile.
W = The width of the taper.
L = Minimum length of taper, or $S \times W$ for freeways, expressways, and all other roads with speeds of 45 mph or greater, or $W \times S^2 / 60$ for urban, residential, and other streets with speeds of 40 mph or less.
 - Delineator drums used for tapering traffic shall be spaced at dimension "S".
Delineator drums or tubular markers used for tangents shall be spaced at 2 times "S".
 - Sequencing Arrow Panels
Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
 - The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
 - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at $\frac{1}{2}B$.
 - When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
 - Existing speed limit signs within a reduced speed zone shall be covered.
 - The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.

Longitudinal Buffer Space	
Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

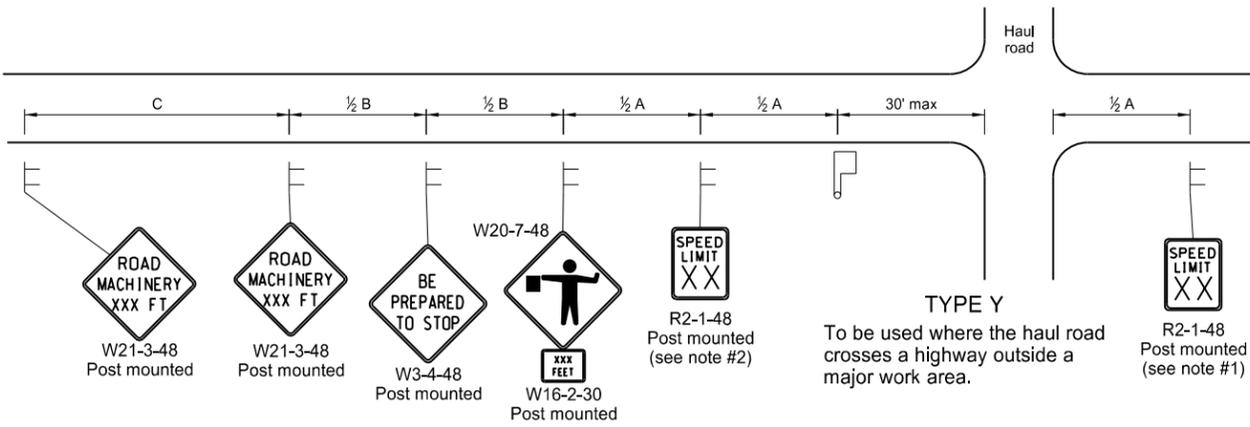


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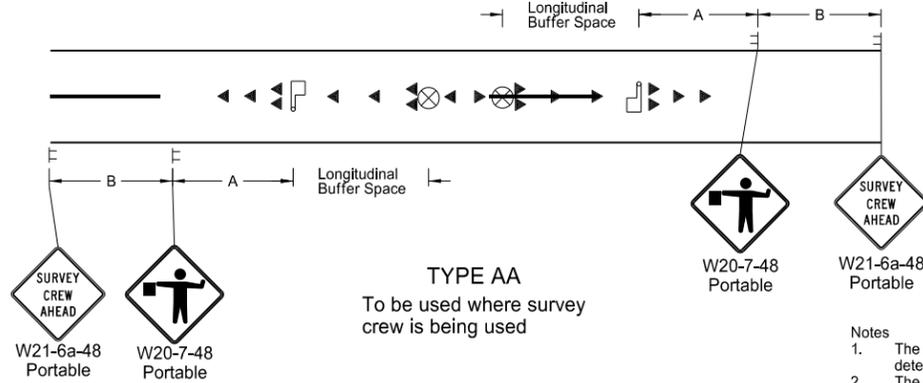
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MISCELLANEOUS SIGN LAYOUTS

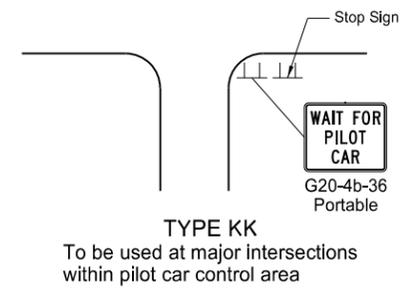
D-704-26



TYPE Y
To be used where the haul road crosses a highway outside a major work area.

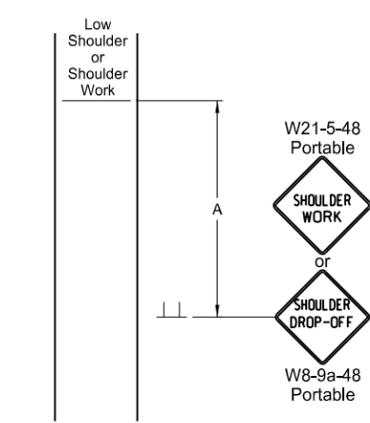


TYPE AA
To be used where survey crew is being used

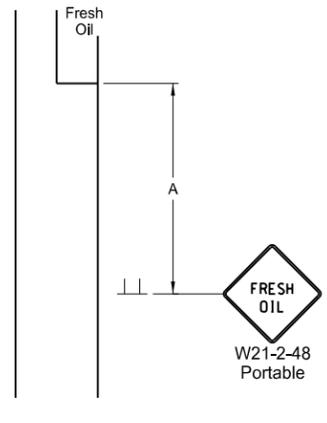


TYPE KK
To be used at major intersections within pilot car control area

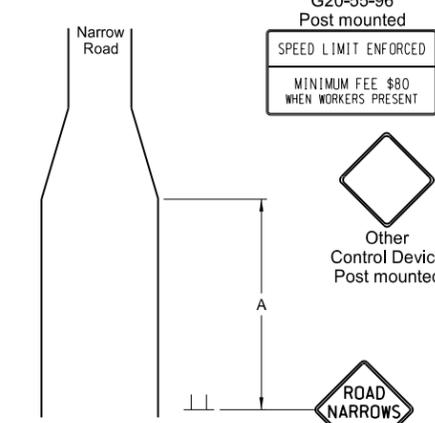
- Notes
1. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
 2. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
 3. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
 4. Existing speed limit signs within a reduced speed zone shall be covered.
 5. The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
 6. G20-55-96 signs are not required if this standard is part of other traffic control layouts, or the work is less than 15 days.
 7. When a pilot car operation is used, place a G20-4b-36 "Wait For Pilot Car" sign at major intersections within pilot car control area.



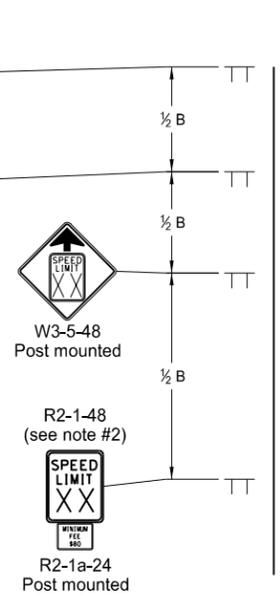
TYPE BB
To be used within a major work area where the sign conditions exist



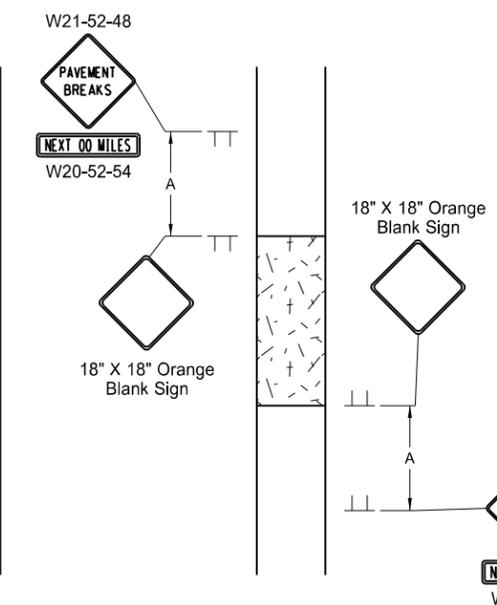
TYPE CC
To be used where the sign conditions exist



TYPE DD
To be used where the sign conditions exist



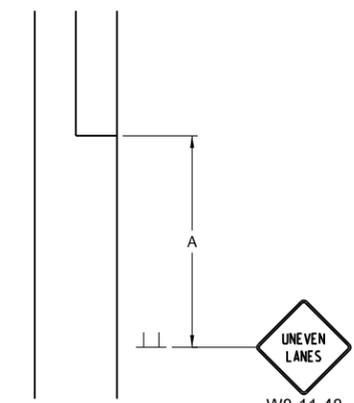
TYPE Z
To be used where speed zone is needed



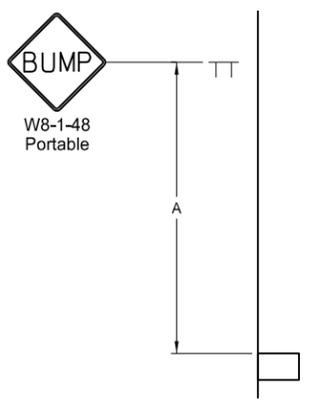
TYPE JJ
To be used where there is a break in the pavement. These signs may be skid mounted or post mounted and shall be installed when conditions exist and removed when not applicable.

Longitudinal Buffer Space	
*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

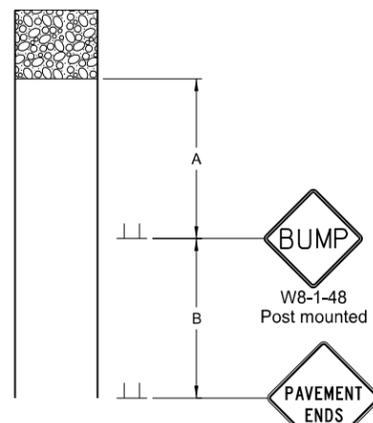
* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.



TYPE GG
To be used where a difference of elevation between lanes exist



TYPE EE
To be used where the sign conditions exist



TYPE FF
To be used where the sign conditions exist

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

Sign (represented by a vertical line with a horizontal bar)

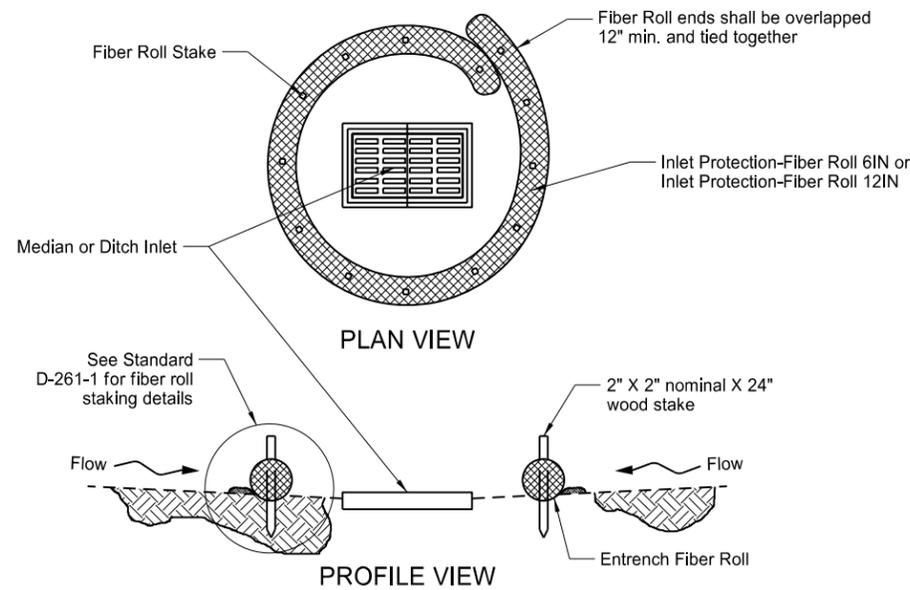
Flagger (represented by a square with a diagonal line)

Cones (represented by a triangle)

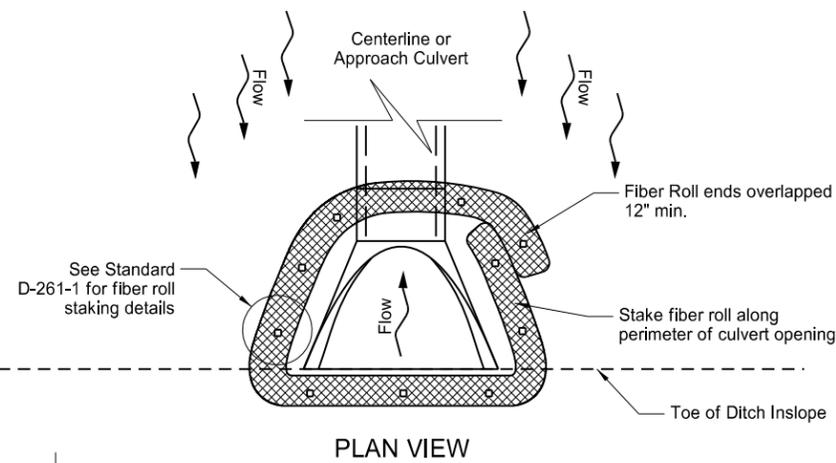
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9-27-13	
REVISIONS	
DATE	CHANGE

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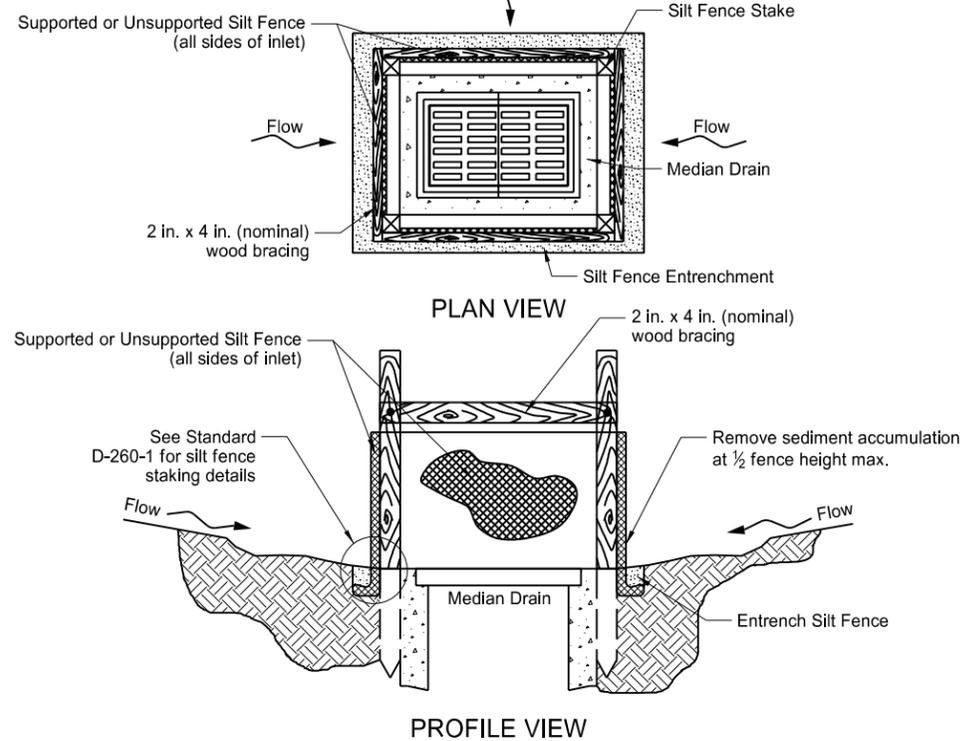
EROSION AND SILTATION CONTROLS
MEDIAN OR DITCH INLET PROTECTION



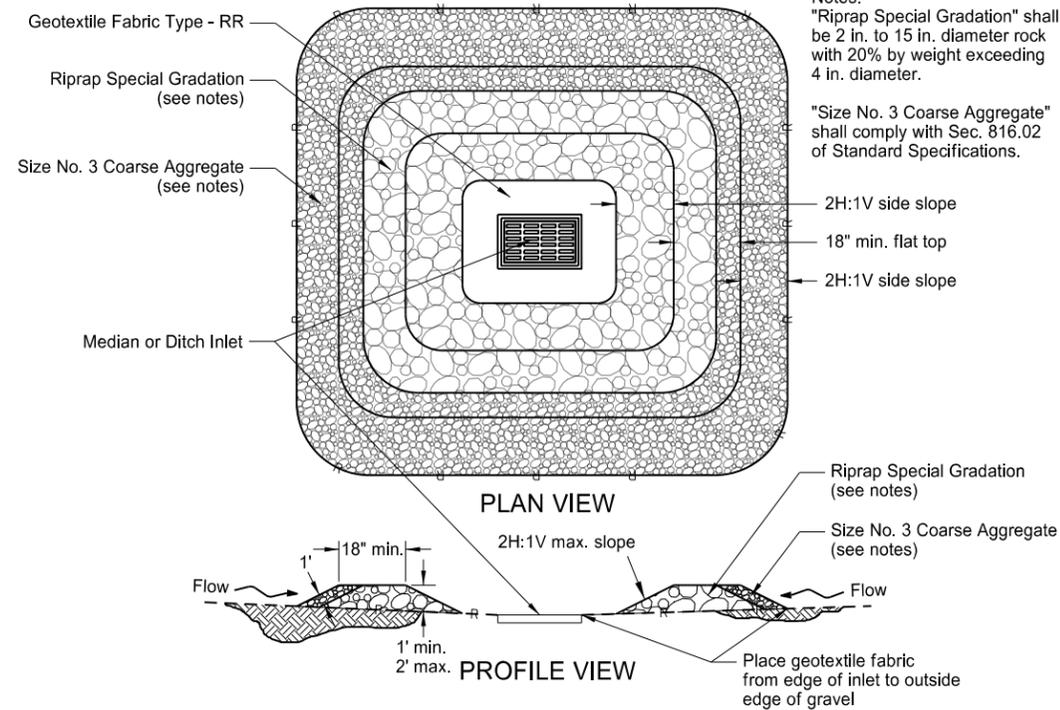
FIBER ROLL PROTECTION (MEDIAN OR DITCH INLET)



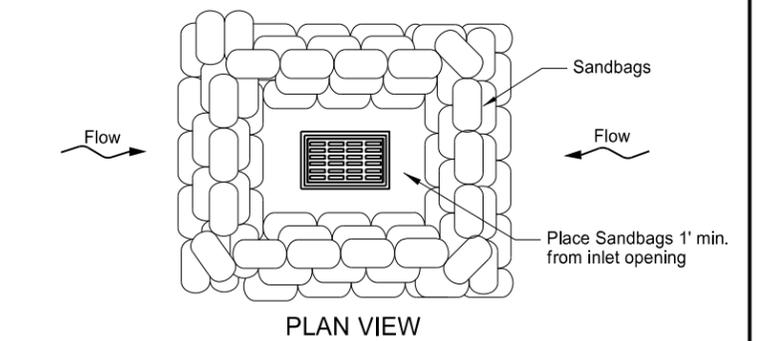
FIBER ROLL PROTECTION (INLET OF CULVERT)



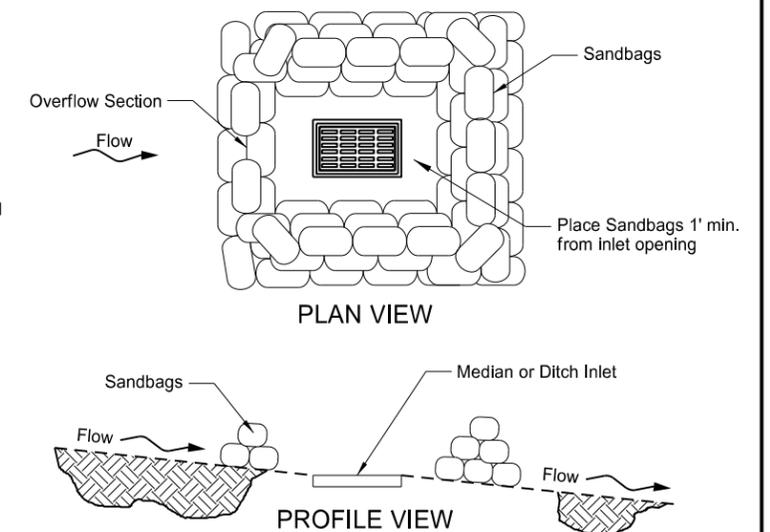
SILT FENCE PROTECTION (MEDIAN OR DITCH INLET)



GRAVEL INLET PROTECTION (MEDIAN OR DITCH INLET)



SANDBAG PROTECTION (LOW POINT)



SANDBAG PROTECTION (ON SLOPE)

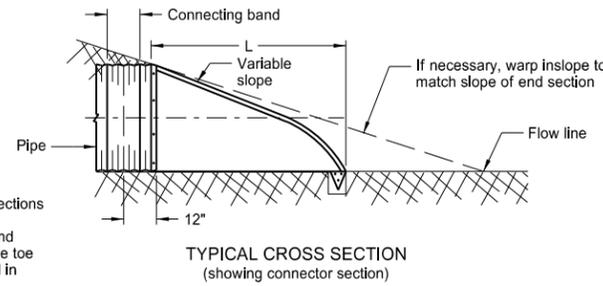
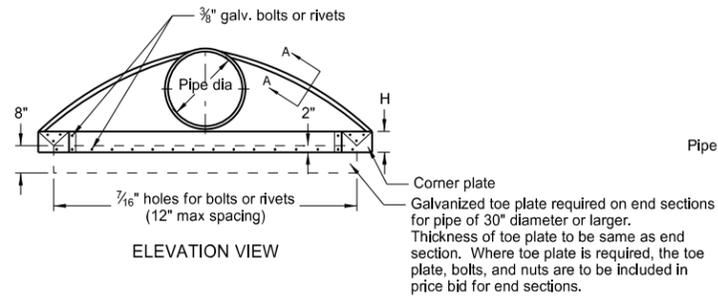
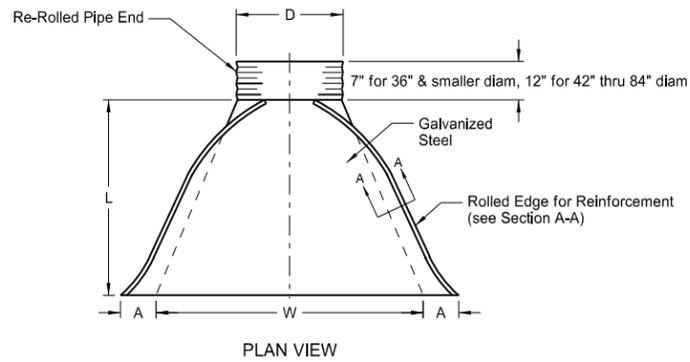
Notes:
"Riprap Special Gradation" shall be 2 in. to 15 in. diameter rock with 20% by weight exceeding 4 in. diameter.
"Size No. 3 Coarse Aggregate" shall comply with Sec. 816.02 of Standard Specifications.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Updated reference to standard drawing number for fiber roll staking details.
10-01-14	Updated reference to standard drawing number for silt fence.

This document was originally issued and sealed by
Roger Weigel
Registration Number
PE-2930,
on 10/01/14 and the original document is stored at the North Dakota Department of Transportation

ROUND CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS

D-714-4



PIPE DIA. IN	GALV. THICK.	END SECTION DIMENSIONS					APPROX. SLOPE	BODY PIECE
		A IN	B IN	H IN	L IN	W IN		
15	0.064	7	8	6	26	30	2 1/2:1	1
18	0.064	8	10	6	31	36	2 1/2:1	1
24	0.064	10	13	6	41	48	2 1/2:1	1
30	0.079	12	16	8	51	60	2 1/2:1	1 or 2
36	0.079	14	19	9	60	72	2 1/2:1	2
42	0.109	16	22	11	69	84	2 1/2:1	2
48	0.109	18	27	12	78	90	2 1/2:1	2
54	0.109	18	30	12	84	102	2:1	2
* 60	0.109	18	33	12	87	114	1 1/2:1	3
* 66	0.109	18	36	12	87	120	1 1/2:1	3
* 72	0.109	18	39	12	87	126	1 1/3 :1	3
* 78	0.109	18	42	12	87	132	1 1/2:1	3
* 84	0.109	18	45	12	87	138	1 1/6 :1	3

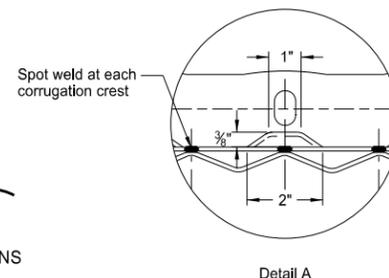
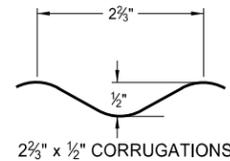
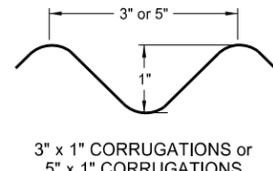
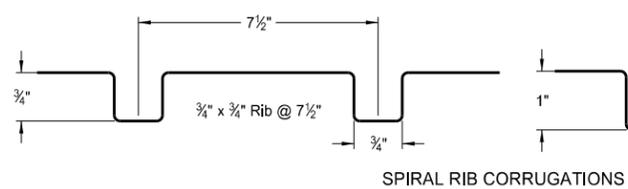
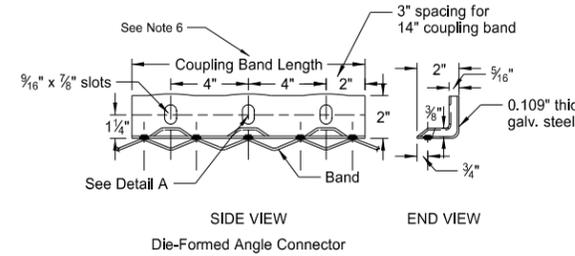
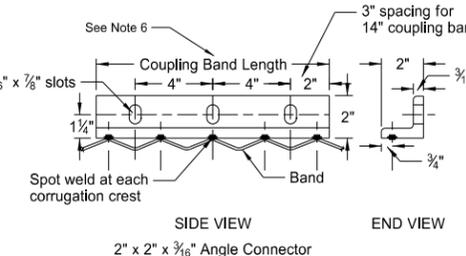
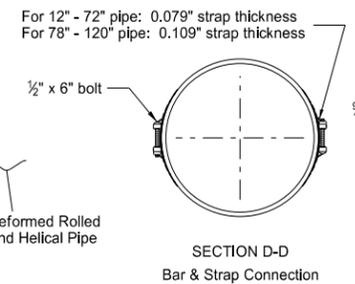
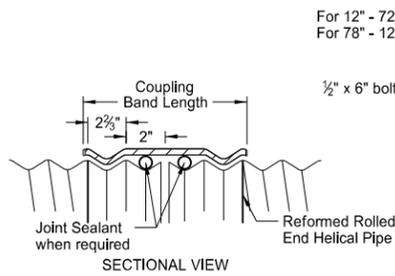
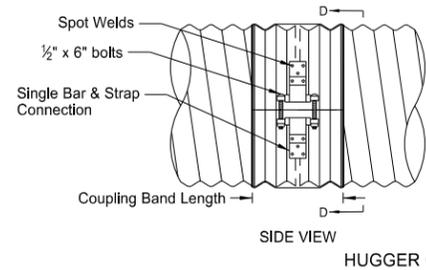
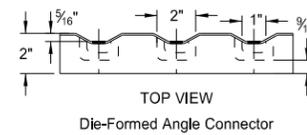
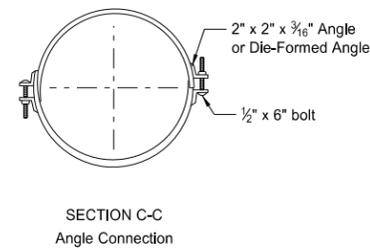
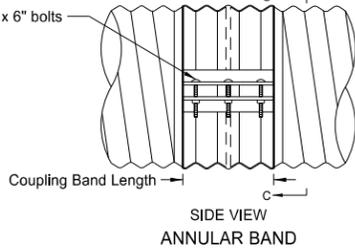
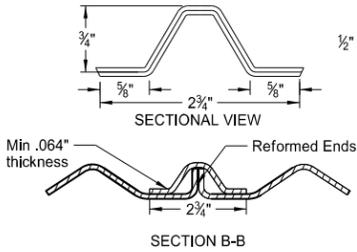
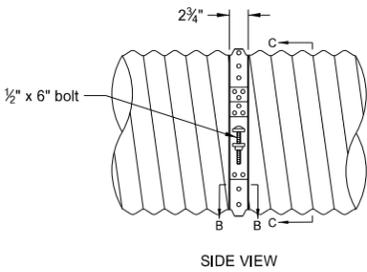
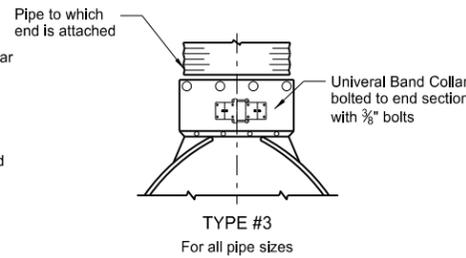
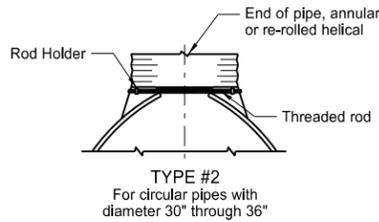
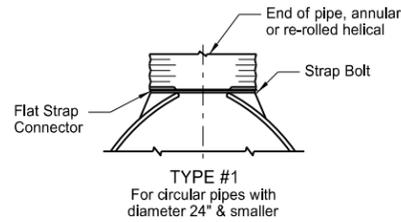
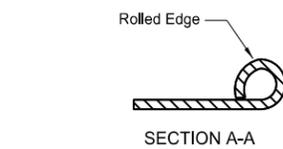
- These sizes have 0.109" sides and 0.138" center panels.
 - Pipe diameter is equal to dimension "D" of end section.
- Manufacturers tolerances of above dimensions will be allowed.
- Splices to be the lap riveted type.

Multiple panel bodies shall have lap seams which are to be tightly joined with 3/8" dia. galv. bolts or rivets. Nuts to be torqued to 25 foot-lbs ±.

NOTES:

- Pipes and connecting bands shall conform to applicable sections of NDDOT Standard Specifications and to AASHTO M-36.
- Top edge of all end sections to have rolled edges for reinforcement (see Section A-A). The reinforced edges are to be supplemented with 2" x 2" x 1/4" galv. angle for 60" through 72" dia. and 2 1/2" x 2 1/2" x 1/4" galv. angle for 78" and 84" dia.. Angles are to be attached by galv. 3/8" dia. bolts and nuts. Angles are to extend from pipe to the corner wing bend.
- Elongated pipes shall be factory preformed so that the vertical diameter shall be 5% greater and the horizontal diameter 5% less than a circular pipe.
- Coupling bands shall be two-piece for pipes larger than 36" as shown in Section C-C & D-D details. For pipes 36" and smaller, a one-piece band is acceptable.
- 1/2" x 8" bolts may be used as a substitute for the 1/2" x 6" bolts shown in the details.
- Coupling bands wider than 14" may be used if a minimum of four 1/2" bolts with maximum spacing of 5 1/2" are used for the connection.
- Length of spot welds shall be minimum 1/2".

COUPLING BAND DIMENSIONS				
COUPLING TYPE	CORRUGATION PITCH x DEPTH	PIPE SIZE	COUPLING BAND LENGTH	MIN. BAND THICKNESS
Hat Band	2 3/8" x 1/2"	12" - 48"	2 3/4"	.064"
Annular Band	2 3/8" x 1/2"	12" - 72"	12"	.052"
		78" - 84"	12"	.079"
Hugger Band	2 5/8" x 1/2" Rerolled End	12" - 72"	10 1/2"	.052"
		78" - 84"	10 1/2"	.079"
	3" x 1" Rerolled End	48" - 120"	10 1/2"	.052"
	5" x 1" Rerolled End	48" - 120"	12"	.064"



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
08-06-13	
REVISIONS	
DATE	CHANGE
01-07-14	End Section Plan View
02-27-14	3" x 1" Corrugation Detail

This document was originally issued and sealed by Terrence R. Udland, Registration Number PE- 2674 , on 02/27/2014 and the original document is stored at the North Dakota Department of Transportation