

DESIGN DATA				
TRAFFIC		AVERAGE DAILY		
CURRENT:	2018	PASS:	< 40	
		TRUCKS:	< 40	
		TOTAL:	40	
FORECAST:		PASS:	< 100	
		TRUCKS:	< 100	
		TOTAL:	< 100	
DESIGN SPEED (1): 55 mph		DESIGN SPEED (2):		
CLEAR ZONE DISTANCE (1): 18 ft		CLEAR ZONE DISTANCE (2):		
MIN. SIGHT DISTANCE: 495 ft				
DESIGN ACCUM. ESALS: N/A		BRIDGES: STA 6+20		
PAVEMENT DESIGN LIFE: N/A				
ACCESS CONTROL: N/A				
LENGTH (NET MILES): 0.16		LENGTH (GROSS MILES):		0.16

CONSTRUCTION PLANS

PREPARED FOR

GRANT COUNTY, NORTH DAKOTA

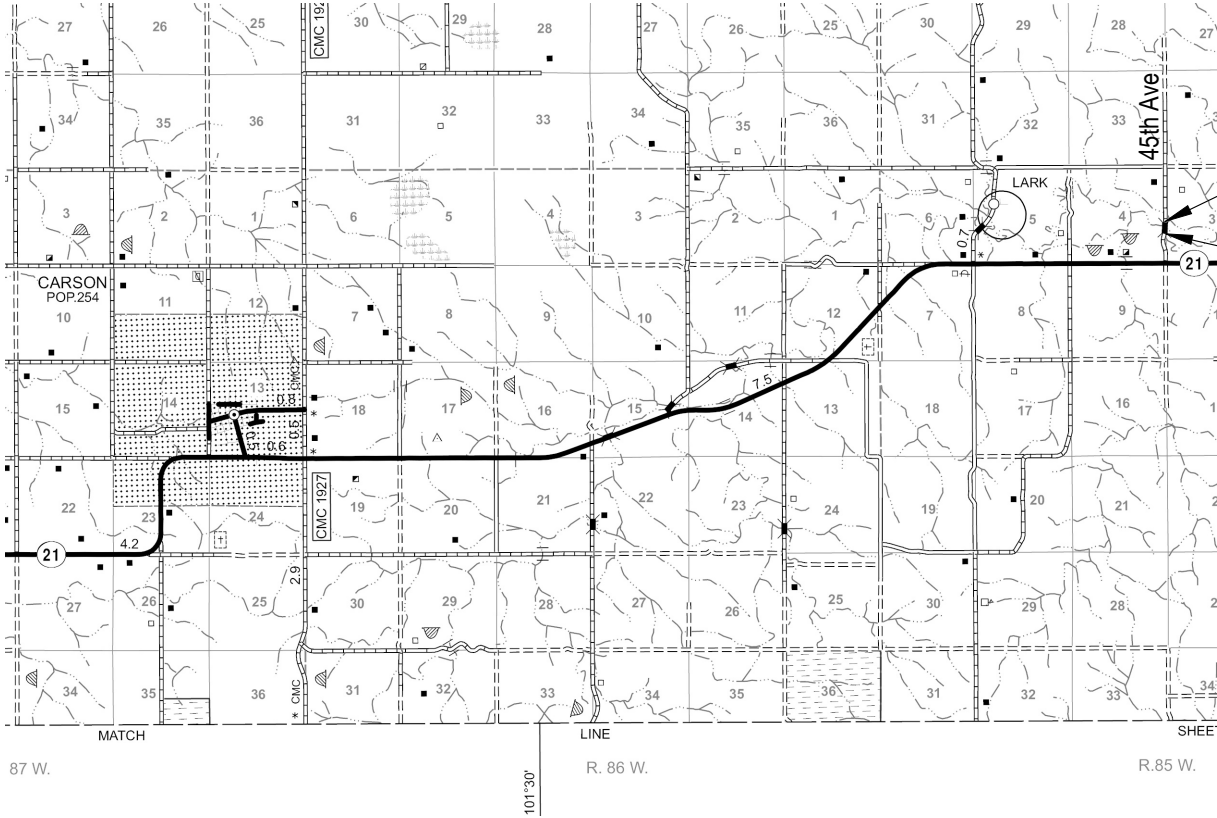
BRJ-0019(027)
BRIDGE #19-135-19.0
NEW BRIDGE #19-135-19.1

Project consists of the removal of existing Timber bridge and installation of a Double 10' x 10' x 64' long RCBC w/ PRBC end sections, Road Grading, Aggregate Surfacing, Temporary Bypass and Incidentals.
Located on 45th Avenue, 9.0 miles east and 1.0 mile north of Carson, ND

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GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	07/01/2025
Supplemental Specifications	NONE

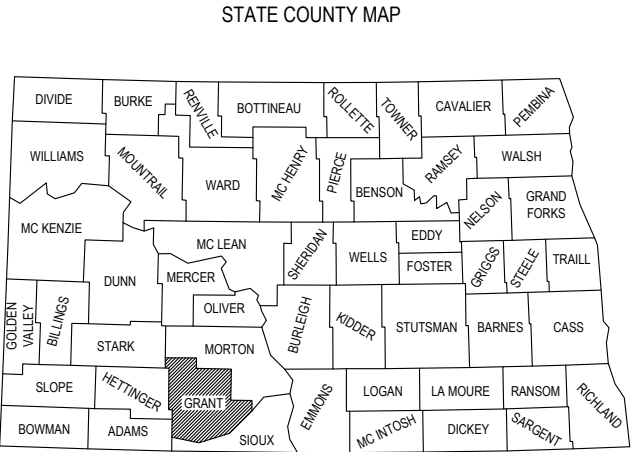
NET MILES GROSS MILES
0.16 0.16



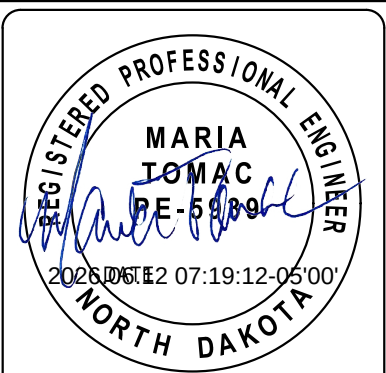
END PROJECT
STA 108+29.00
N = 286997.52
E = 1751503.05
Sec: 3/4-T134N-R85W

BEGIN PROJECT
STA 100+00.00
N = 286197.57
E = 1751408.00
Sec: 3/4-T134N-R85W

PROJECT ENGINEER MARIA TOMAC, PE
PROJECT MANAGER MARIA TOMAC
DESIGNER CARMEN KNOLL
DESIGNER ---
DESIGNER ---
DESIGNER ---
QA / QC DAMON DEVILLERS



GRANT COUNTY CARSON, ND	
GRANT COUNTY COMMISSION	3/18/2026
APPROVAL NAME	DATE



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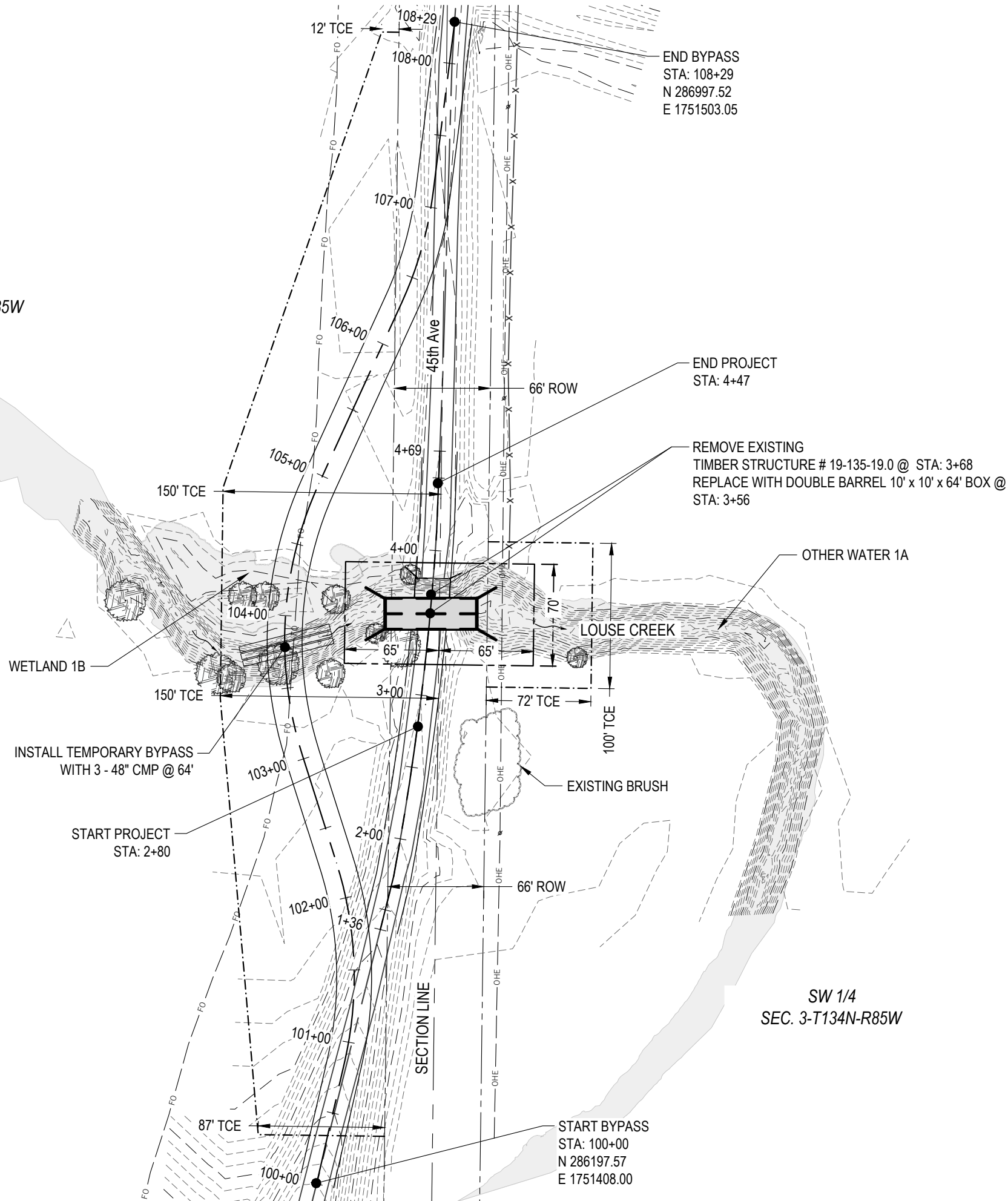
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10	1	Basis of Estimate	D-255-2	Erosion And Siltation Control - Erosion Control Blanket Installation
20	1-2	General Details	D-256-1	Erosion and Siltation Controls
30	1	Typical Sections	D-260-1	Erosion And Siltation Controls - Silt Fence
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77	1	Permanent Erosion Control	D-704-11	Construction Sign Details - Warning Signs
80	1	Fencing Layout	D-704-13	Barricade and Channelizing Device Details
81	1	Survey Data	D-704-14	Construction Sign Punching and Mounting Details
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			D-714-04	Round Corrugated Steel Pipe Culverts and End Sections
			D-752-1	Standard Barbed Wire Fence
			D-754-82	Object Markers
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Number	Description			
SP 380(25)	Temporary Water Diversion			
SP 381(25)	Structural and Channel Excavation and Foundation Fill			
SP 495(25)	Utility Coordination			
PSP 67(25)	Permits and Environmental Considerations			
SSP 1	Temporary Erosion and Sediment Best Management Practices			
SSP 3	Local Agency Contracts			

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SE 1/4
SEC. 4-T134N-R85W



LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- RIGHT OF WAY
- - - - - TEMPORARY EASEMENT
- FO --- FIBER OPTIC LINE
- OHE --- OVERHEAD POWER
- WETLAND / OTHER WATER



SCOPE OF WORK

BRIDGE REPLACEMENT
NEW BRIDGE #19-135-19.1

GRANT COUNTY

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NOTES

105-P01 UTILITIES:

Utility locations shown on the plans are approximate. It will be the contractor's responsibility to contact all utilities for verification of locations prior to construction in any area. The contractor will be liable for any costs resulting from damage to utilities or pipelines. Relocation of power poles shall be coordinated with the utility owner as needed for the project.

202-P01 REMOVAL OF TEMPORARY BYPASS:

1. Restore the area impacted by the construction of the temporary bypass to the original contours. Include the costs to restore the impacted area in the bid item, "Removal of Temporary Bypass."
2. Include all costs to remove the temporary bypass including embankment, culverts, Class 13, and riprap in the bid item, "Removal of Temporary Bypass."

203-010 SHRINKAGE:

25 percent additional volume is included for shrinkage in earth embankment.

203-P01 TOPSOIL:

Topsoil will not be measured separately and will be paid at plan quantity. All costs to salvage, stockpile, and replace the topsoil is included in the unit price bid for "Topsoil."

203-P02 COMMON EXCAVATION-TYPE B:

1. All Common Excavation and Borrow Excavation shall be Type B.
2. Common Excavation-Type B shall not be measured for payment and paid based on plan quantity (Contract Quantity).
3. After removing topsoil from original ground under all roadbed embankment areas, an additional six inches shall be scarified and re-compacted. Benching of the existing roadway in slopes is required. A standard detail is included; however, all benches shall be deep enough to provide sufficient width to permit placing, spreading, and compaction equipment to operate and each bench thoroughly compacted before additional embankment is placed. All scarifying, re-compacting, and benching is included in price bid for "Common Excavation – Type B."

203-P03 BORROW EXCAVATION

1. All borrow material needed for the project shall be furnished by the contractor. Contractor is responsible for all permits associated with a borrow source.
2. Borrow sources will be stripped of topsoil and vegetation before utilization. Erosion and sediment control required at contractor option sites is included in the price for "Borrow – Excavation".

210-P02 CHANNEL EXCAVATION:

Channel Excavation material within the project limits is assumed to be suitable for use in embankment areas. All material not considered suitable shall be used to fill the road in slopes unless the material is deemed waste excavation by the Engineer. Payment for all Channel Excavation to the limits shown on the plans will be Lump Sum. The price bid for Channel Excavation includes the costs for placement of this material in embankment areas. The embankment shall meet the requirements of section 203.04 E.3 Compaction Control Type B.

210-P06 WASTE EXCAVATION:

If applicable, any material from the structural and channel excavation not useable as embankment material shall be removed and disposed of at a site obtained by the Contractor. The Contractor is responsible for obtaining all permits needed for waste disposal and has full responsibility for complying with the requirements of said permits and with all applicable laws. The Contractor is responsible for restoring the waste disposal areas to satisfactory condition and any seeding required. This is included in the price bid for excavation with no direct compensation. The contractor is required to obtain a site release for the disposal site.

251-P01 SEEDING:

The "Seeding Class II", "Temporary Cover Crop", and "Straw Mulch" quantities are based on the calculated area between the edge of roadway and the limits of construction, estimated at 10' beyond earthwork limits. Seeding will not be measured separately and will be paid at plan quantity. Additional seeding and mulching for disturbed areas used to facilitate construction or accommodate the Contractor's method and means will be the responsibility of the Contractor with no additional cost to the project. This includes locations such as staging areas, stockpile sites and any other temporary locations. Seed these areas with the same mixture shown above and mulch.

265-P01 RIRAP GRADE II:

Geosynthetic Filter Fabric Type RR shall be installed under the Riprap and is included in the unit price bid for "Riprap Grade II".



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ENVIRONMENTAL NOTES

ENVIRONMENTAL NOTES (EN):

The North Dakota Department of Transportation, the Federal Highway Administration, and Grant County have made environmental commitments to secure approval of this project. The following environmental notes are required to comply with these commitments:

1. EN-1 AQUATIC NUISANCE SPECIES (ANS):

Notify the North Dakota Game and Fish Department (NDGFD) at least 72 hours prior to any vehicles, vessels, pumps and equipment entering the water, to allow the NDGFD sufficient time to inspect any and all such equipment for ANS. Contact the NDGFD ANS Coordinator, Ben Holen, by phone (701) 368-9117 or e-mail bholen@nd.gov for equipment inspections, or any additional information regarding ANS prevention protocol. Supply the inspection report to the engineer prior to work taking place in the water.

2. EN-2 TEMPORARY WETLAND IMPACT:

Temporary impact areas within wetlands and 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.

3. Permits Required:

US Army Corps of Engineers – Section 404 Permit

Status: Issued 06/05/2026 Permit # NWO-2026-00365-BIS

ND Department of Environmental Quality – NDPDES Permit

Status: To be obtained by contractor prior to construction. Owner to be listed as Grant County.



ESTIMATED QUANTITIES

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SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
103	0100	CONTRACT BOND	L SUM	1
201	0330	CLEARING AND GRUBBING	L SUM	1
202	0104	REMOVAL OF STRUCTURE	L SUM	1
202	0312	REMOVE EXISTING FENCE	LF	25
202	0350	REMOVAL OF TEMPORARY BYPASS	EA	1
203	0102	COMMON EXCAVATION - TYPE B	CY	2,953
203	0109	TOPSOIL	CY	644
203	0140	BORROW-EXCAVATION	CY	2,568
210	0050	BOX CULVERT EXCAVATION	EA	1
210	0127	CHANNEL EXCAVATION	L SUM	1
210	0209	FOUNDATION FILL	TONS	975
210	0250	BOX CULVERT FOUNDATION AGGREGATE	TONS	459
210	0405	FOUNDATION PREPARATION - BOX CULVERT	L SUM	1
216	0100	WATER	M GAL	71
251	0200	SEEDING CLASS II	ACRE	1.12
251	1000	WETLAND SEED	ACRE	0.04
251	2000	TEMPORARY COVER CROP	ACRE	0.82
253	0101	STRAW MULCH	ACRE	1.94
256	0200	RIPRAP - GRADE II	CY	204
260	0300	SILT FENCE	LF	200
260	0301	REMOVE SILT FENCE	LF	200
261	0112	FIBER ROLLS 12IN	LF	2,110
261	0113	REMOVE FIBER ROLLS 12IN	LF	1,010
262	0100	FLOTATION SILT CURTAIN	LF	18
262	0101	REMOVE FLOTATION SILT CURTAIN	LF	18
302	0356	AGGREGATE SURFACE COURSE CL 13	TON	783
606	3010	DBL 10FT X 10FT PRECAST RCB CULVERT	LF	64
606	7010	DBL 10FT X 10FT PRECAST RCB END SECTION	EA	2
702	0100	MOBILIZATION	L SUM	1
704	1000	TRAFFIC CONTROL SIGNS	UNIT	346
704	1052	TYPE III BARRICADE	EA	6
704	1060	DELINEATOR DRUMS	EA	10
704	1081	VERTICAL PANELS - BACK TO BACK	EA	20
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	294
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	306
714	4128	PIPE CONDUIT 48IN-APPROACH	LF	192
752	0100	FENCE BARBED WIRE 3 STRAND	LF	25
752	3140	CORNER ASSEMBLY BARBED WIRE	EA	1
754	0803	OBJECT MARKERS - TYPE III	EA	4
900	1000	TEMPORARY STREAM DIVERSION	EA	1

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BASIS OF ESTIMATE			
203-0102	COMMON EXCAVATION - TYPE B		
	MAINLINE EXCAVATION		385 CY
	MAINLINE EMBANKMENT		924 CY
	BYPASS EXCAVATION		0 CY
	BYPASS EMBANKMENT		2029 CY
		BORROW	2568 CY
203-0109	TOPSOIL (CY)		
	6 IN EXISTING TOPSOIL STRIPPED		767 CY
	6 IN TOPSOIL REPLACED		644 CY
		WASTE	123 CY
210-0209	FOUNDATION FILL		
	TOTAL FOUNDATION FILL		520 CY
			975 TONS
210-0250	BOX CULVERT FOUNDATION AGGREGATE		
	TOTAL FOUNDATION FILL TYPE 1		196 CY
			459 TONS
216-0100	WATER		
	10 GAL/CY FOR EMBANKMENT & FOUNDATION FILL		35 MGAL
	50 MGAL/MILE FOR DUST CONTROL		13 MGAL
	30 GAL/TON - GRAVEL SURFACING		23 MGAL
			71 MGAL
302-0356	AGGREGATE SURFACE COURSE CL 13		
	AGGREGATE SURFACE COURSE CL 13		783 TON

ASSUMPTIONS		
ITEM	CONVERSION FACTOR	
FOUNDATION FILL	1.875	TON/CY
AGGREGATE SURFACE COURSE	1.875	TON/CY
FILL FACTOR	1.25	PER CY
CUT FACTOR	1.00	PER CY

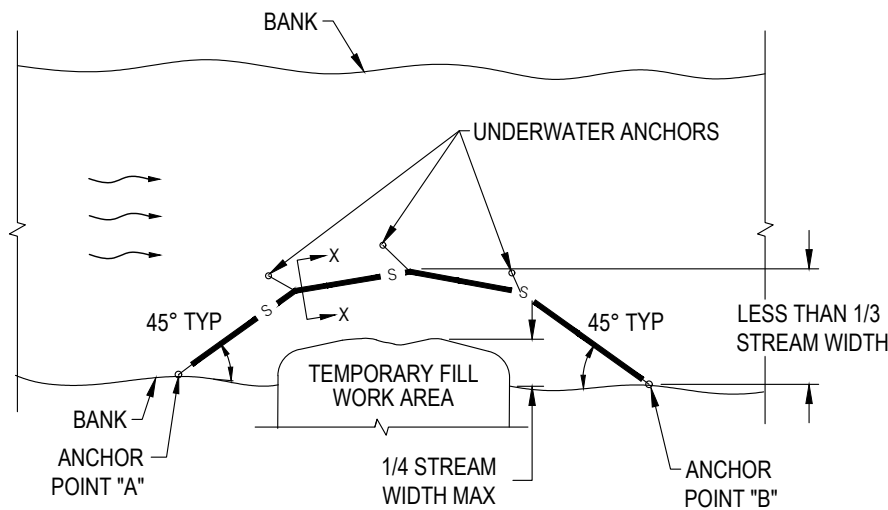


BASIS OF ESTIMATE

BRIDGE REPLACEMENT
NEW BRIDGE #19-135-19.1

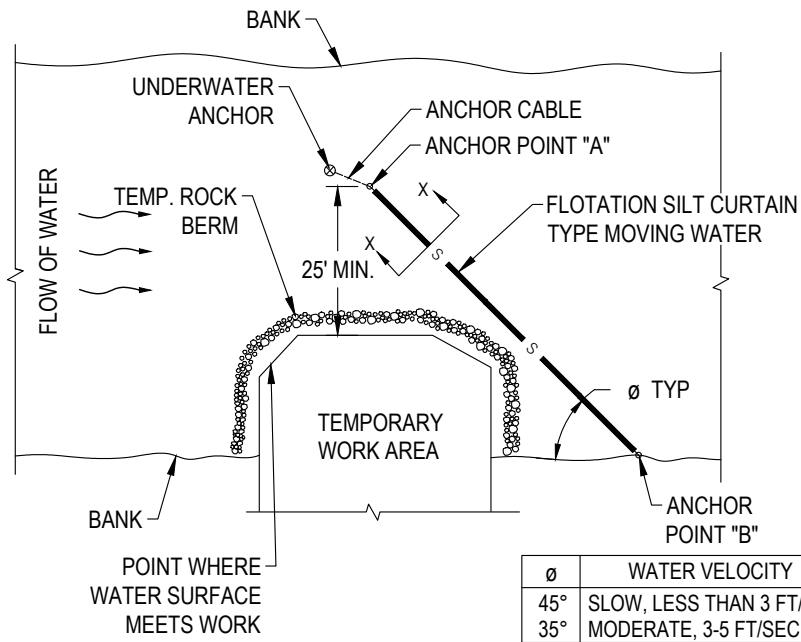
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PLAN VIEW
FLOTATION SILT CURTAIN - TYPE WORK AREA

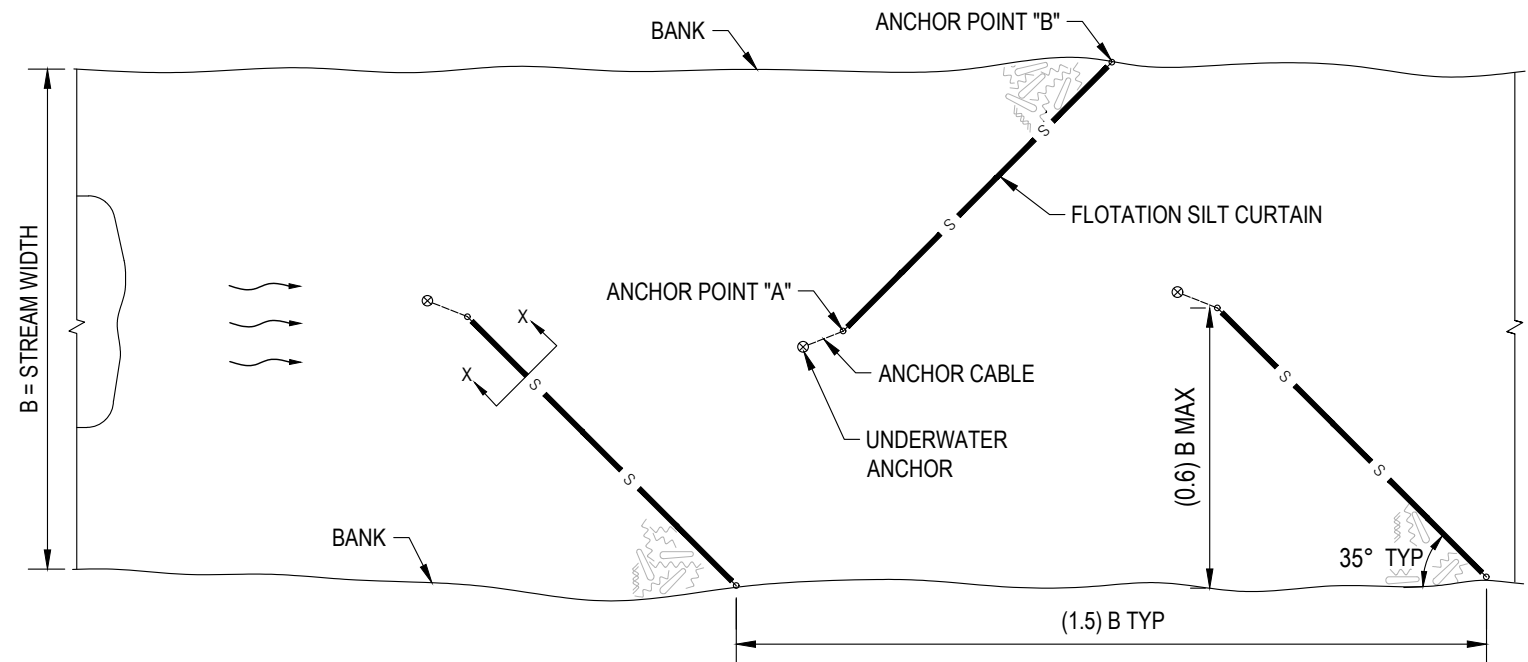
DESIGN GUIDELINES:
When temporary work encroaches less than 1/4 of the width of stream.



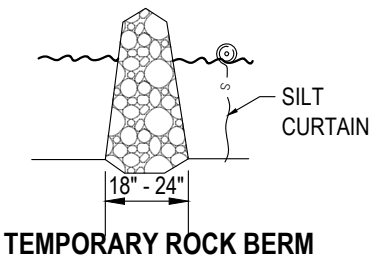
Ø	WATER VELOCITY
45°	SLOW, LESS THAN 3 FT/SEC
35°	MODERATE, 3-5 FT/SEC

PLAN VIEW
FLOTATION SILT CURTAIN - TYPE MOVING WATER

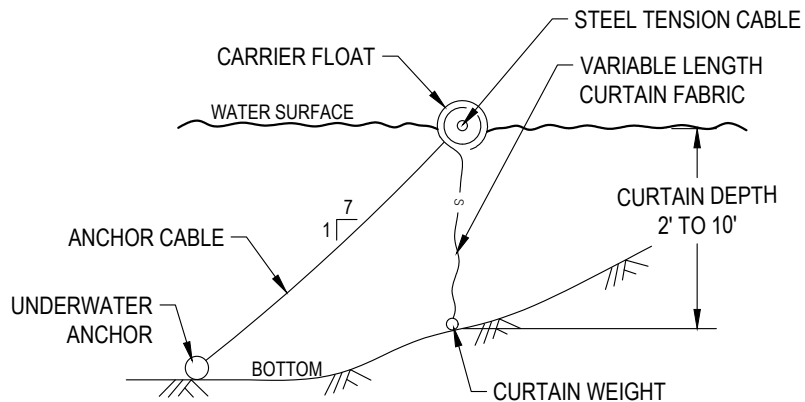
DESIGN GUIDELINES:
When temporary work encroaches more than 1/4 but less than 1/3 width of the stream.
For narrow waterways, the curtain may be placed 1 foot above the bottom of waterway to allow water to flow.
* In areas where the plans call for riprap at the bridge, provide a temporary rock berm.
Include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



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

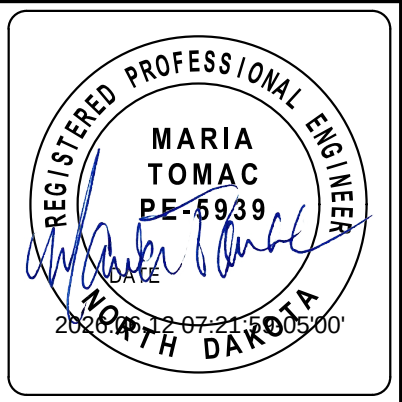


TEMPORARY ROCK BERM



SECTION X-X
FLOTATION SILT CURTAINS

NOTE:
Maximum water velocity for moving water = 5 ft/sec.

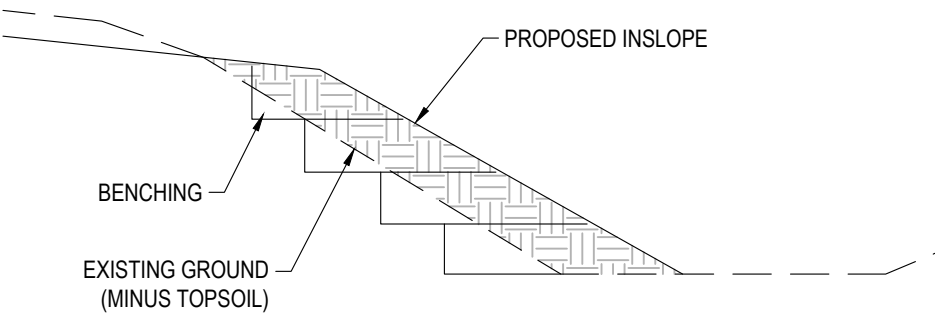


GENERAL DETAILS

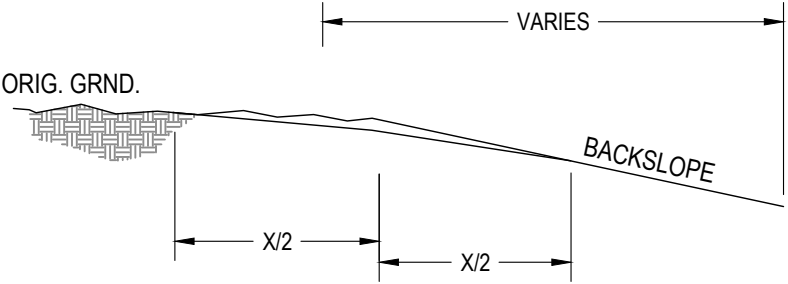
BRIDGE REPLACEMENT
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BENCHING TYPICAL SECTION
Scale: NTS



* BACKSLOPE ROUNDING WHERE X = 10' UNLESS RESTRICTED BY HEIGHT OF BACKSLOPE

BACK SLOPE ROUNDING
Scale: NTS

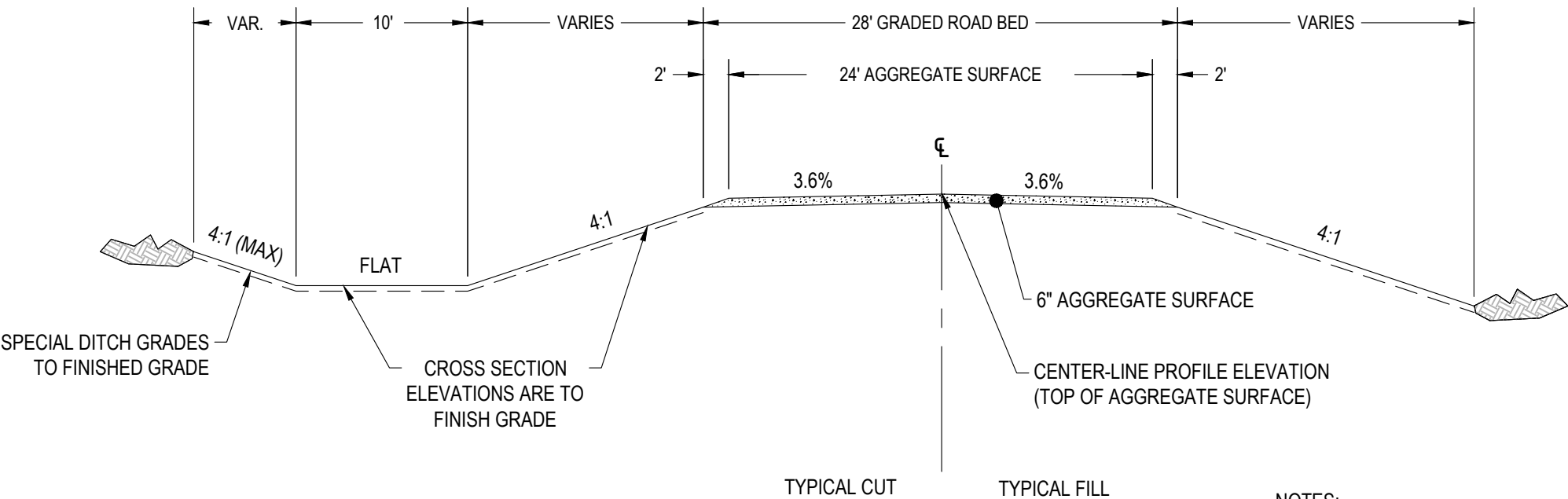


GENERAL DETAILS

BRIDGE REPLACEMENT
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GRANT COUNTY

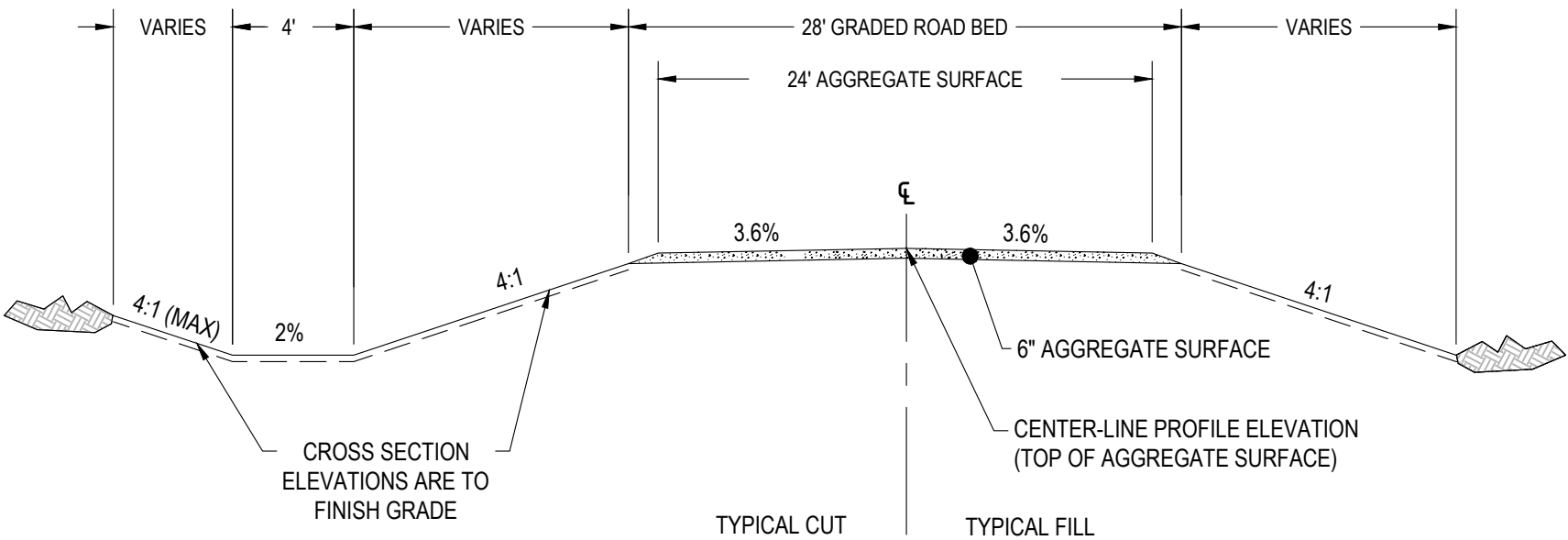
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ROADWAY SYMMETRICAL ABOUT CENTERLINE

PROPOSED ROAD TYPICAL SECTION
NTS

- NOTES:
1. SLOUGH WIDTH IS USED FOR ESTIMATING PURPOSES ONLY. ACTUAL SLOUGH WIDTH MAY VARY IN THE FIELD.
 2. DITCH BOTTOM ELEVATIONS AND GRADES SHOWN ON CROSS SECTIONS ARE FINISH GRADE.



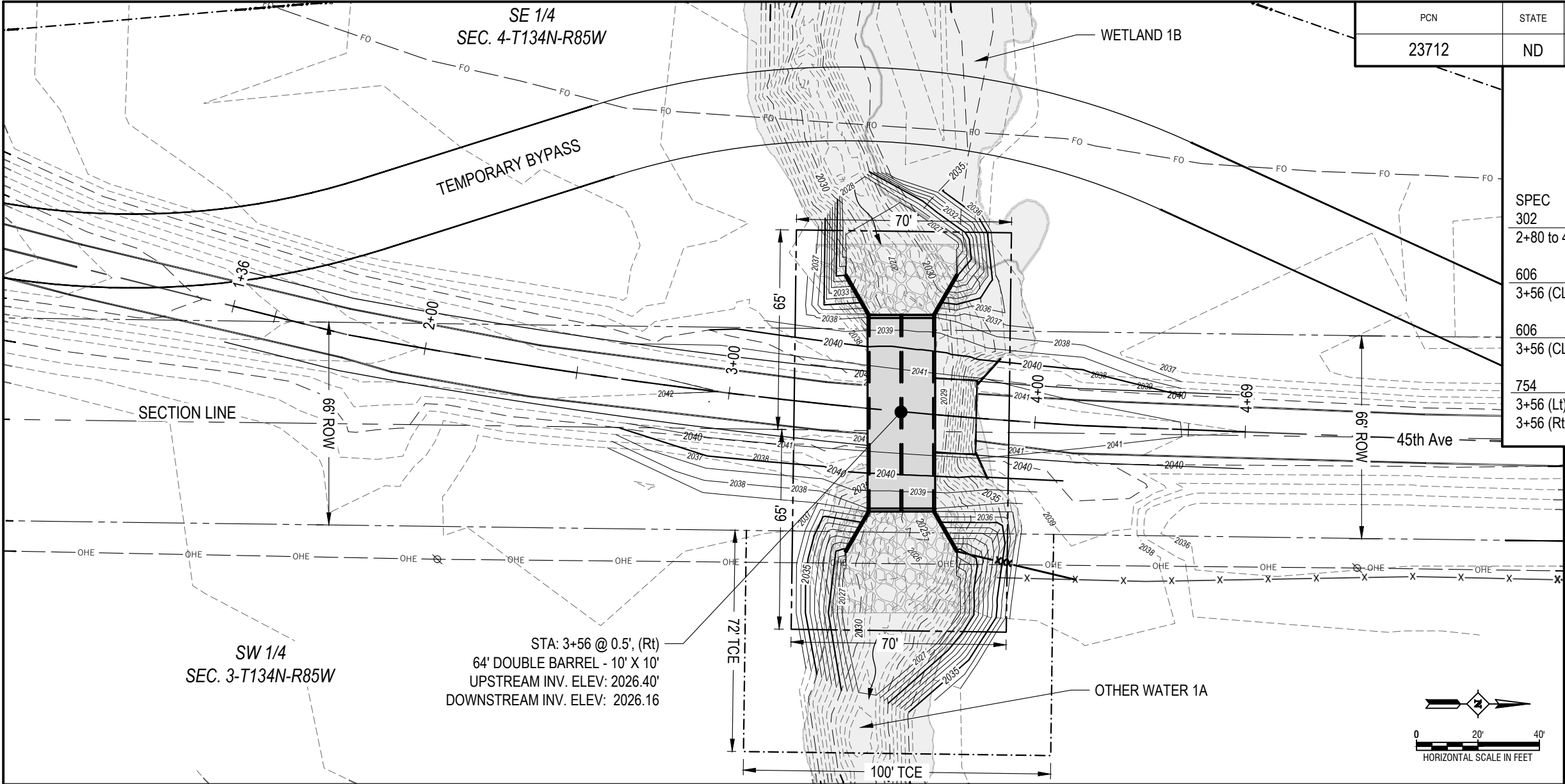
PROPOSED BYPASS TYPICAL SECTION
NTS



TYPICAL SECTIONS

BRIDGE REPLACEMENT
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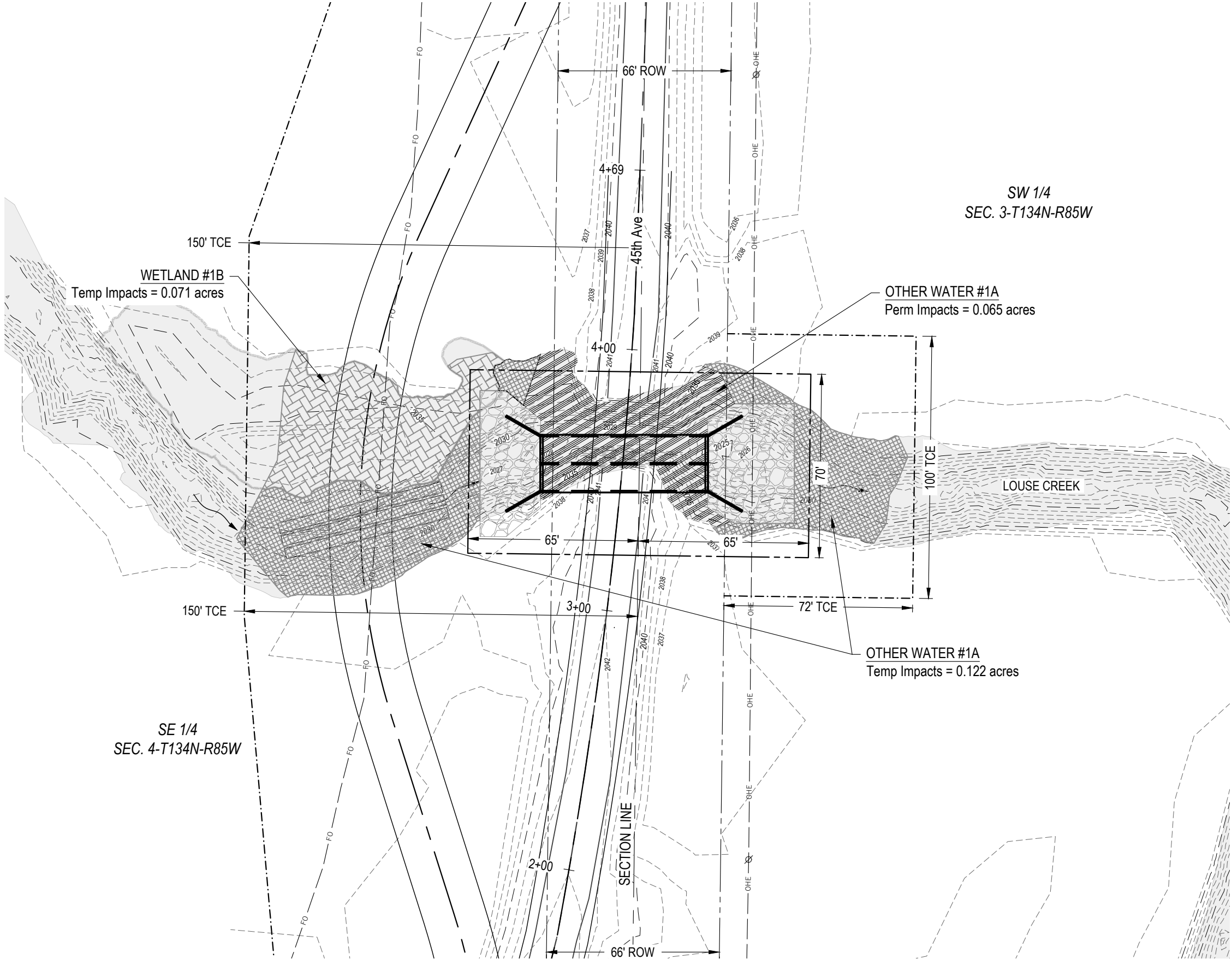
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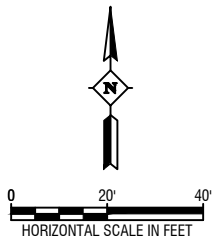


- NOTES:**
- Wetland delineation by Meadowlark Environmental collected in NAD83 UTM, Zone 14N, meters. Converted to NAD83 ND State Plane South, feet. Correction applied from grid coordinates to ground.



LEGEND

- WETLAND / OTHER WATER
- PERMANENT IMPACTS (0.065 acres)
- OTHER WATER TEMPORARY IMPACTS (0.122 acres)
- WETLAND TEMPORARY IMPACTS (0.071 acres)
- RIPRAP (0.058 acres)
- RIGHT OF WAY
- TEMPORARY EASEMENT



WETLAND IMPACTS

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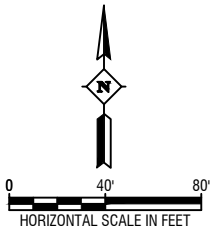


- NOTES:**
- All features shown shall be adjusted to comply with ND PES permit. Installations are anticipated to be staged as construction advances. Additional fiber rolls shall be installed at critical locations.

SPEC	CODE	BID ITEM	UNIT	QTY
251	2000	TEMPORARY COVER CROP		
100+40 to 108+13			ACRE	0.82
253	0101	STRAW MULCH		
100+40 to 108+13			ACRE	0.82
260	0300	SILT FENCE		
3+28 to 3+73 (Lt)			LF	100
3+39 to 3+82 (Rt)			LF	100
260	0301	REMOVE SILT FENCE		
3+28 to 3+73 (Lt)			LF	100
3+39 to 3+82 (Rt)			LF	100
261	0112	FIBER ROLLS 12IN		
100+52 to 104+43			LF	420
2+65 to 4+47			LF	590
261	0113	REMOVE FIBER ROLLS 12IN		
100+52 to 104+43			LF	420
2+65 to 4+47			LF	590
262	0100	FLOTATION SILT CURTAIN		
3+53 (Rt)			LF	18

LEGEND

- 12" FIBER ROLL
- SILT FENCE
- FLOTATION SILT CURTAIN
- TEMPORARY COVER CROP / STRAW MULCH



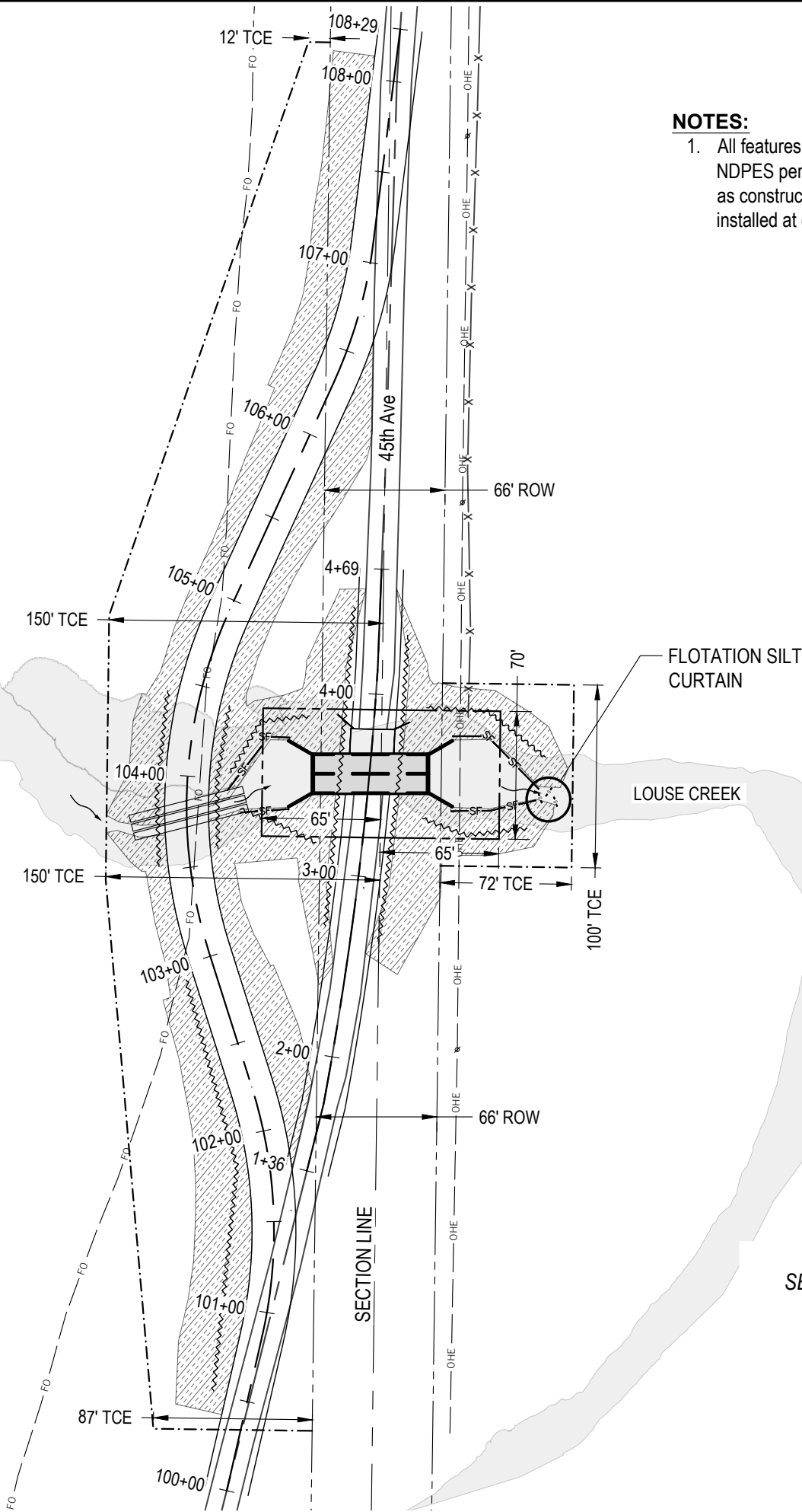
TEMPORARY EROSION CONTROL

BRIDGE REPLACEMENT
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SEC. 4-T134N-R85W

SW 1/4
SEC. 3-T134N-R85W



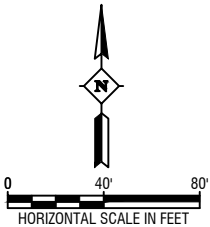
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SPEC	CODE	BID ITEM	UNIT	QTY
251	0200	SEEDING CLASS II		
100+40 to 108+13			ACRE	1.12
251	1000	WETLAND SEEDING		
3+44 (Lt)			ACRE	0.02
3+59 (Rt)			ACRE	0.02
253	0101	STRAW MULCH		
100+40 to 108+13			ACRE	0.82
256	0200	RIPRAP - GRADE II		
3+56 (Lt)			CY	94
3+56 (Rt)			CY	110
261	0112	FIBER ROLLS 12IN		
100+52 to 108+03			LF	520
2+65 to 4+47			LF	580
262	0101	FLOTATION SILT CURTAIN		
3+53 (Rt)			LF	18

LEGEND

- 12" FIBER ROLL
- RIP RAP
- SEEDING CLASS II / STRAW MULCH
- WETLAND SEEDING



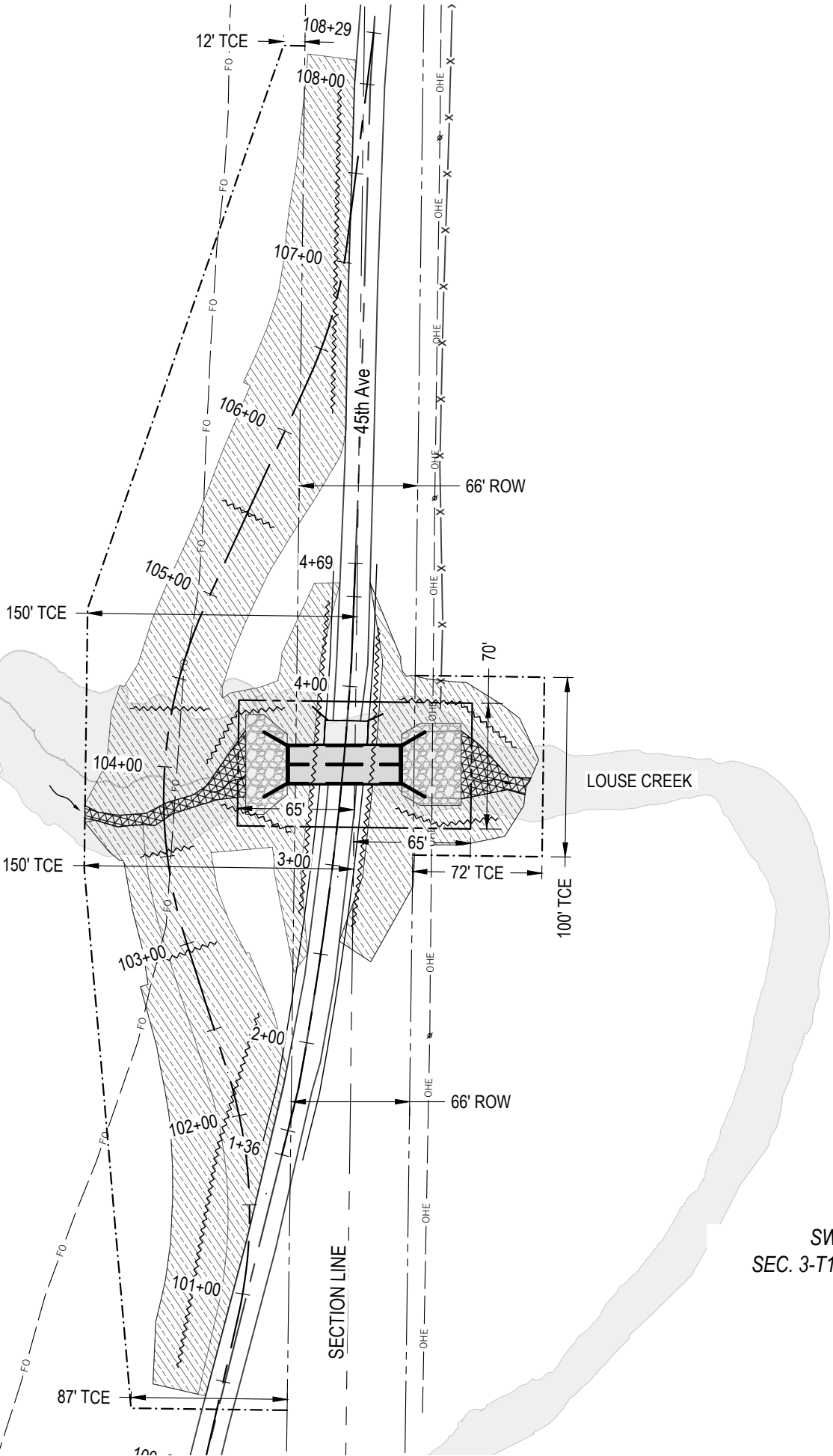
PERMANENT EROSION CONTROL

BRIDGE REPLACEMENT
NEW BRIDGE #19-135-19.1

GRANT COUNTY

SE 1/4
SEC. 4-T134N-R85W

SW 1/4
SEC. 3-T134N-R85W



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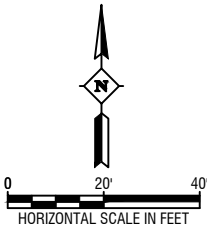
- NOTES:**
- See standard drawing D-752-1 for fence connection to wing wall.

SPEC	CODE	BID ITEM	UNIT	QTY
752	0100	FENCE BARBED WIRE 3 STRAND	LF	25
3+90 to 4+15 (Rt)				
752	3140	CORNER ASSEMBLY BARBED WIRE	EA	1
4+15 (Rt)				

INSTALL
BARBED WIRE FENCE WITH
CORNER ASSEMBLY

LEGEND

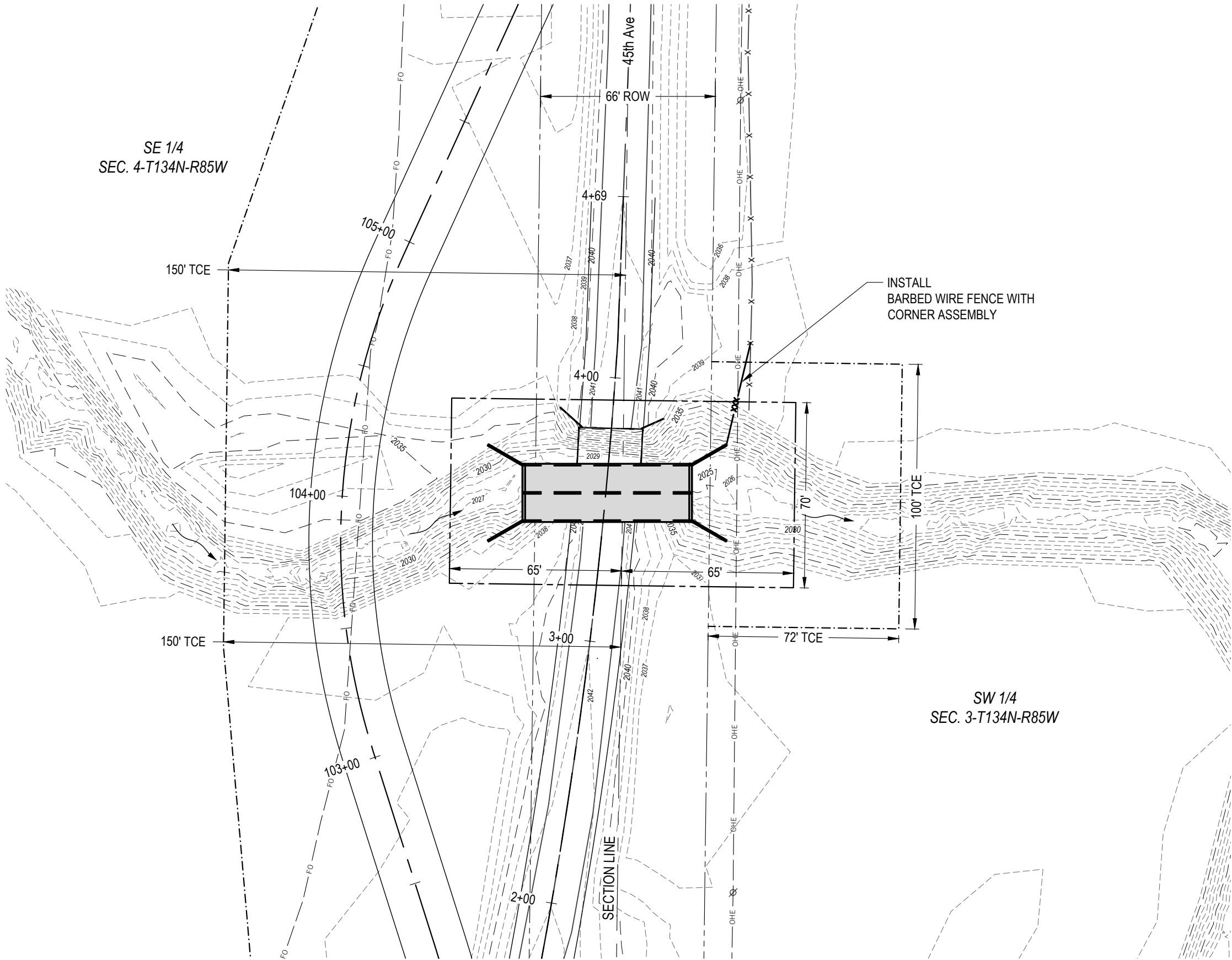
- x — EXISTING BARBED FENCE
- xxx — NEW 3 STRAND BARBED FENCE



FENCING LAYOUT

BRIDGE REPLACEMENT
NEW BRIDGE #19-135-19.1

GRANT COUNTY



PCN	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
23712	ND	BRJ-0019(027)	81	1



HORIZONTAL ALIGNMENT				CURVE DATA	US PUBLIC LAND SURVEY DATA				SURVEY CONTROL POINTS			
PNT	STATION	NORTHING	EASTING	ARC DEFINITION	DESC.	SEC-TWP-RGE	NORTHING	EASTING	PNT	NORTHING	EASTING	ELEV
MAINLINE												
BP	1+36	286372.640	1751451.886		NW COR	3-134-85	289975.6480	1751536.8890	CP #1	285968.0590	1751393.8300	2070.72
PC	1+73.86	286409.307	1751461.077						CP #2	287656.5030	1751494.2600	2067.40
				DELTA = 06°50'32"	W QTR COR	3-134-85	287310.1880	1751501.9300	CP #3	286408.6990	1751492.1860	2039.85
				LENGTH = 239.97'								
				RADIUS = 2009.50'	SW COR	3-134-85	284664.1660	1751467.3580				
PT	4+13.83	286647.301	1751490.689									
EP	4+69	286701.948	1751492.801									
BYPASS												
BP	0+00.00	286197.572	1751408.004									
PC	0+86.00	286281.678	1751427.314									
				DELTA = 30°31'55"								
				LENGTH = 138.55'								
				RADIUS = 260.00'								
PT	2+25.00	286418.480	1751421.736									
PC	3+03.00	286492.717	1751398.185									
				DELTA = 42°10'59"								
				LENGTH = 191.42								
				RADIUS = 260.00'								
PT	4+94.00	286679.496	1751409.578									
PC	6+31.00	286804.273	1751466.658									
				DELTA = 17°22'31"								
				LENGTH = 78.85'								
				RADIUS = 260.00'								
PT	7+10.00	286879.815	1751488.168									
EP	8+29.00	286997.518	1751503.051									

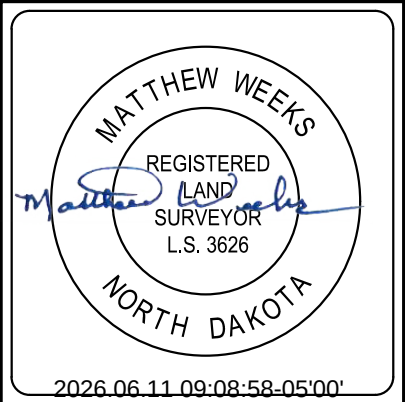
☐ ASSUMED COORDINATES

☒ ALL COORDINATES ON THIS SHEET ARE GRANT COUNTY GROUND COORDINATES. THEY ARE DERIVED FROM THE NAD83 (2011) REFERENCE FRAME; NORTH DAKOTA SOUTH ZONE (GRID), MULTIPLIED BY A COMBINATION FACTOR (1/cf) = 1.0001385192 TO CONVERT TO GROUND (International Foot)

DATE OF SURVEY: 07-29-25

☒ NAVD - 88☐ NGVD - 29

☐ GEOID 09☒ GEOID 18



SURVEY COORDINATES

BRIDGE REPLACEMENT
NEW BRIDGE #19-135-19.1

GRANT COUNTY



**INTERSTATE
ENGINEERING**
Professionals You Need, People You Trust.

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE			35
G20-1-60	60"x24"	ROAD WORK NEXT MILES			28
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)			18
G20-2-48	48"x24"	END ROAD WORK	2	26	52
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)			18
G20-4b-36	36"x30"	WAIT FOR PILOT CAR			18
G20-50a-72	72"x36"	ROAD WORK NEXT MILES RT & LT ARROWS			43
G20-52a-72	72"x24"	ROAD WORK NEXT MILES RT or LT ARROW			36
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT			59
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)			11
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)			10
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)			10
M3-1-24	24"x12"	NORTH (Mounted on route marker post)			7
M3-2-24	24"x12"	EAST (Mounted on route marker post)			7
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)			7
M3-4-24	24"x12"	WEST (Mounted on route marker post)			7
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)			7
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT			15
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)			7
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)			7
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)			9
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)			7
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)			9
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)			7
R1-1-48	48"x48"	STOP			32
R1-2-60	60"x60"	YIELD			29
R2-1-36	36"x48"	SPEED LIMIT (Portable only)			30
R2-1-48	48"x60"	SPEED LIMIT	2	39	78
R2-1aP-24	24"x18"	MINIMUM FEE \$80 (Mounted on Speed Limit post)			10
R3-2-48	48"x48"	NO LEFT TURN			35
R4-1-48	48"x60"	DO NOT PASS			39
R4-7-48	48"x60"	KEEP RIGHT			39
R5-1-48	48"x48"	DO NOT ENTER			35
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)			14
R7-1-12	12"x18"	NO PARKING ANY TIME			11
R10-6-24	24"x36"	STOP HERE ON RED			16
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)	2	12	24
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)			12
R11-3a-60	60"x30"	ROAD CLOSED MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)			15
R11-3c-60	60"x30"	STREET CLOSED MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)			15
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)			15
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT			35
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT			35
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT			35
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW	2	26	52
W3-1-48	48"x48"	STOP AHEAD			35
W3-3-48	48"x48"	SIGNAL AHEAD			35
W3-4-48	48"x48"	BE PREPARED TO STOP			35
W3-5-48	48"x48"	SPEED REDUCTION AHEAD	2	35	70
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT			35
W5-1-48	48"x48"	ROAD NARROWS			35
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE			35
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW			35
W6-3-48	48"x48"	TWO WAY TRAFFIC			35
W8-1-48	48"x48"	BUMP			35
W8-3-48	48"x48"	PAVEMENT ENDS			35
W8-7-48	48"x48"	LOOSE GRAVEL			35
W8-11-48	48"x48"	UNEVEN LANES			35
W8-12-48	48"x48"	NO CENTER LINE			35
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL			35
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY			35
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or FT or MILE			35
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or FT or MILE			35
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY			35
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL			35
W13-1P-30	30"x30"	MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)			14
W14-3-64	64"x48"	NO PASSING ZONE			28
W16-2P-30	30"x24"	FEET PLAQUE (Mounted on warning sign post)			10
W20-1-48	48"x48"	ROAD WORK AHEAD or FT or MILE	2	35	70
W20-2-48	48"x48"	DETOUR AHEAD or FT or MILE			35
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or FT or MILE			35
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or FT or MILE			35
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or FT or MILE			35
W20-7-48	48"x48"	FLAGGER			35
W20-8-18	18"x18"	STOP - SLOW PADDLE Back to Back			5
W20-52P-54	54"x12"	NEXT MILES (Mounted on warning sign post)			12
W21-1-48	48"x48"	WORKERS			35
W21-2-48	48"x48"	FRESH OIL			35
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or FT or MILE			35
W21-5-48	48"x48"	SHOULDER WORK			35
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED			35
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or FT or MILE			35

[illegible]

SPECIAL SIGNS

[illegible]

SPEC & CODE

704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	346
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[illegible]

WORK ZONE TRAFFIC CONTROL

BRIDGE REPLACEMENT
NEW BRIDGE #19-135-19.1

GRANT COUNTY

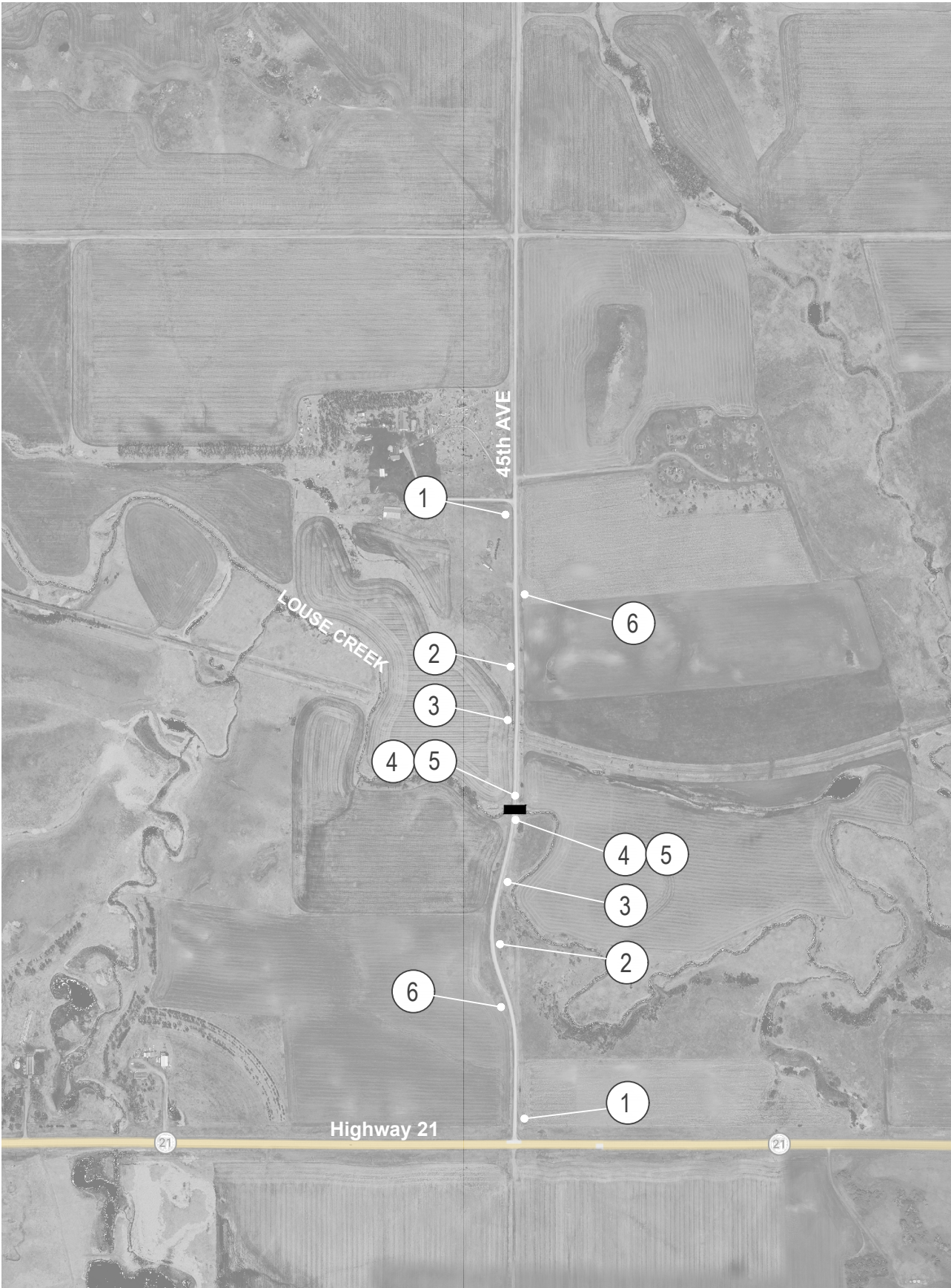
PCN	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES:

- 1. The construction signing layout is for informational purposes only. Traffic control signing shall be installed as per MUTCD manual and/or standard drawings.
- 2. If additional signs are required, units will be calculated using the formula from Section III-18.06 of the Design Manual. <http://www.dot.nd.gov/>
- 3. Coordinate with Grant County Highway Department to issue a public notice if required.
- 4. Road Closure Layout is to follow Type B of standard sheet D-704-15.

- 1. W20-1-48 "Road Work 2000 Feet" Post Mounted
- 2. W3-5-48 "Speed Reduction Ahead" Post Mounted
- 3. R2-1-48 "Speed Limit 25 MPH" Post Mounted
- 4. R11-2-48 "Road Closed" Barricade Mounted
- 5. W1-6-48 "Large Arrow" Barricade Mounted
- 6. G20-2-48 "End Road Work" Post Mounted



WORK ZONE TRAFFIC CONTROL

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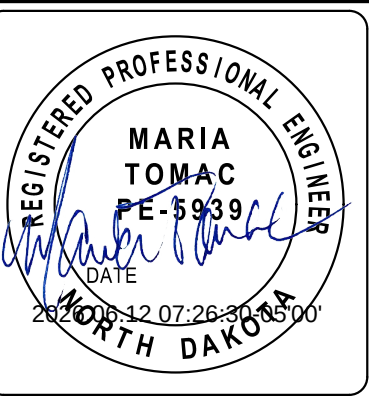


HYDRAULIC DESIGN DATA	
DRAINAGE AREA (CONTRIBUTING)	75.4 SQ MILES
DESIGN FREQUENCY	15 YEARS
DESIGN DISCHARGE	1633 CFS
DESIGN STAGE	2039.27
STREAM GRADIENT	0.0015 FT/FT
WATERWAY PROVIDED BELOW DESIGN STAGE	391.63 SQ FT
AVG. VELOCITY OF FLOW IN NATURAL CHANNEL	4.17 FPS
DEPTH OF FLOW	12.14 FT
VELOCITY OF FLOW THRU CULVERT	9.07 FPS
FREEBOARD PROVIDED	1.58 FT (MIN.)
100 YEAR FREQUENCY DISCHARGE	3040 CFS
100 YEAR FREQUENCY STAGE	2040.62
MAXIMUM OBSERVED STAGE	NOT RECORDED
MAXIMUM RECORDED DISCHARGE	NOT RECORDED
FREQUENCY OF MAXIMUM FLOOD	NOT RECORDED

SPEC.	CODE	ITEM DESCRIPTION	UNIT	QUAN.
210	0050	BOX CULVERT EXCAVATION	EA	1
210	0127	CHANNEL EXCAVATION	L SUM	1
210	0209	FOUNDATION FILL	TONS	975
210	0250	BOX CULVERT FOUNDATION AGGREGATE	TONS	459
210	0405	FOUNDATION PREPARATION - BOX CULVERT	L SUM	1
256	0200	RIPRAP - GRADE II	CY	204
606	3010	DBL 10FT X 10FT PRECAST RCB CULVERT	LF	64
606	7010	DBL 10FT X 10FT PRECAST RCB END SECTION	EA	2

NOTE:

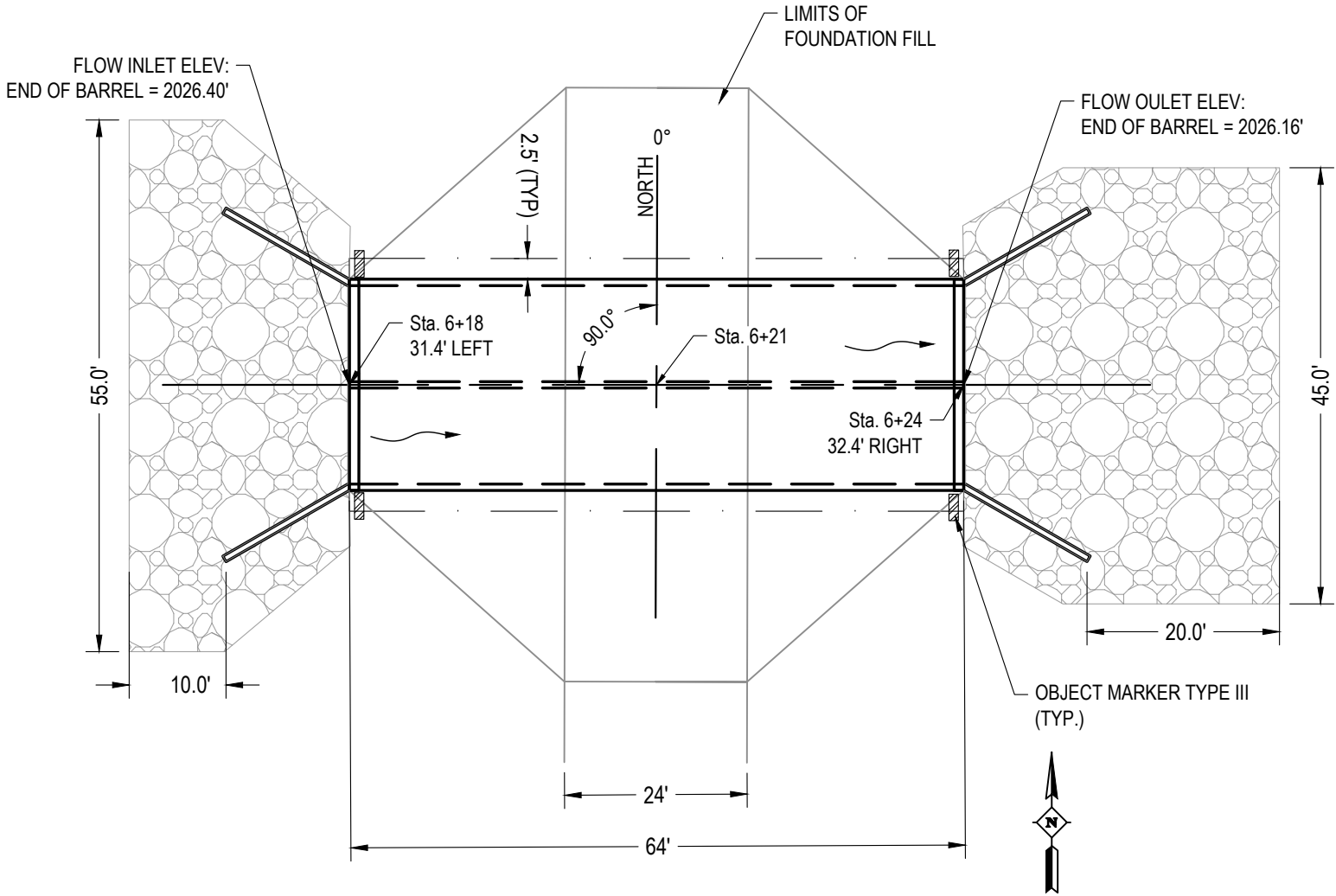
- CHANNEL EXCAVATION INCLUDES FACILITATING RIPRAP PLACEMENT WHERE REQUIRED TO PRODUCE SATISFACTORY TRANSITION TO/FROM CHANNEL TO END SECTIONS.
- EXISTING STREAM BED ELEVATION = 2027.13±
- THIS BOX CULVERT IS DESIGNED TO BE COUNTERSUNK 12 INCHES.
- RIPRAP QUANTITY INCLUDES RIPRAP AT INLET AND OUTLET OF BOX CULVERT AND ALONG SLOPES AS SHOWN IN SECTION 77.



BOX CULVERT LAYOUT

BRIDGE REPLACEMENT
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NOTES

202-P01 REMOVAL OF STRUCTURE:

- 1. The existing structure to be removed consists of a single span wood beam bridge constructed in 1942. The bridge spans 25 feet and has a width of 24 feet with a gravel wear course.
- 2. All costs for removal and disposal of the structure are included in the price bid for "Removal of Structure" including items listed as environmental commitments.

210-P01 BOX CULVERT EXCAVATION:

Box Culvert Excavation is to the limits shown. All material not considered suitable for the roadbed will be used to fill in slopes unless the material is deemed waste excavation by the Engineer. It is assumed that this material will be suitable for use in embankment areas. The price bid for Box Culvert Excavation includes the costs for placement of all material in embankment areas. The embankment shall meet the requirements of Section 203.04 E.3 Compaction Control Type B.

210-P03 FOUNDATION FILL-TYPE 1:

Foundation Fill-Type 1 shall be used under the box culvert as shown. This material shall be foundation fill per the standard specifications. This material will be measured by the ton based on plan dimensions and paid for based on the quantity shown in the plans.

210-P05 FOUNDATION PREPARATION:

Flowing or standing water is likely present in the channel at this location. The water level fluctuates throughout the year. Bidders shall include all costs generated due to site conditions into associated bid items. No additional compensation nor revisions to the completion date will be made due to fluctuations in the water level.

606-P01 PRECAST REINFORCED CONCRETE BOX CULVERT:

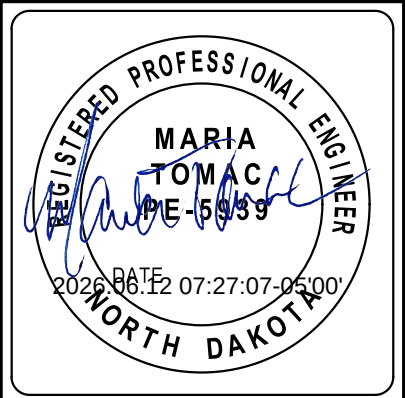
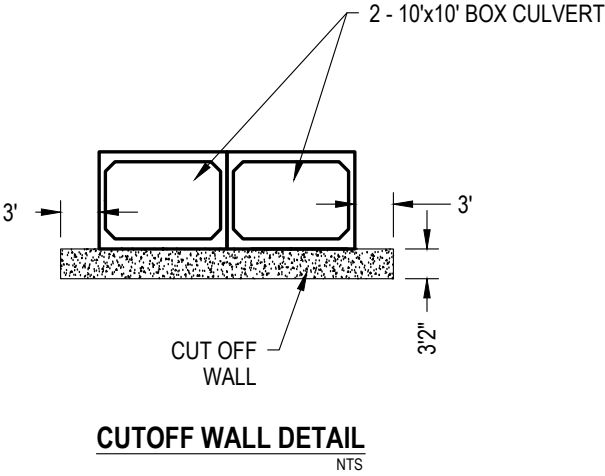
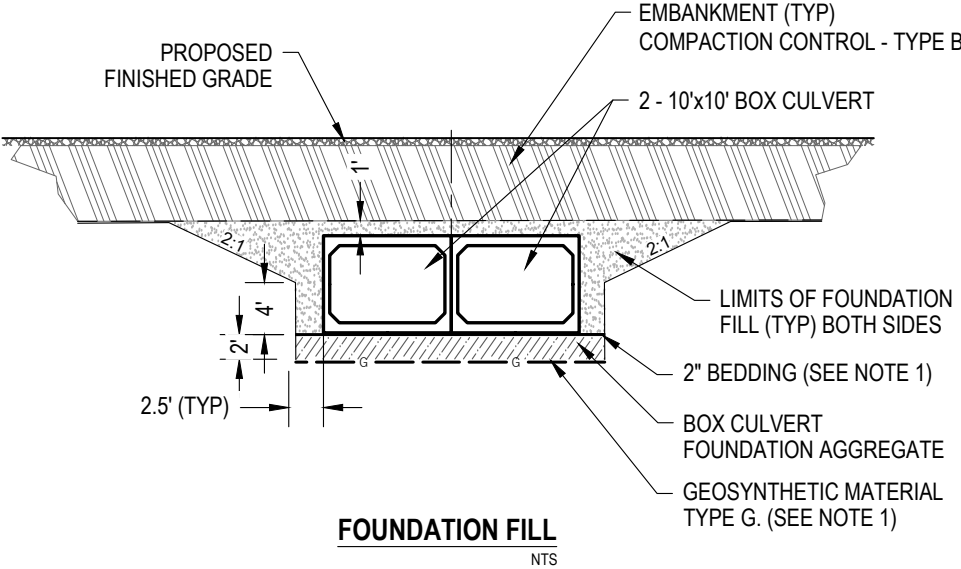
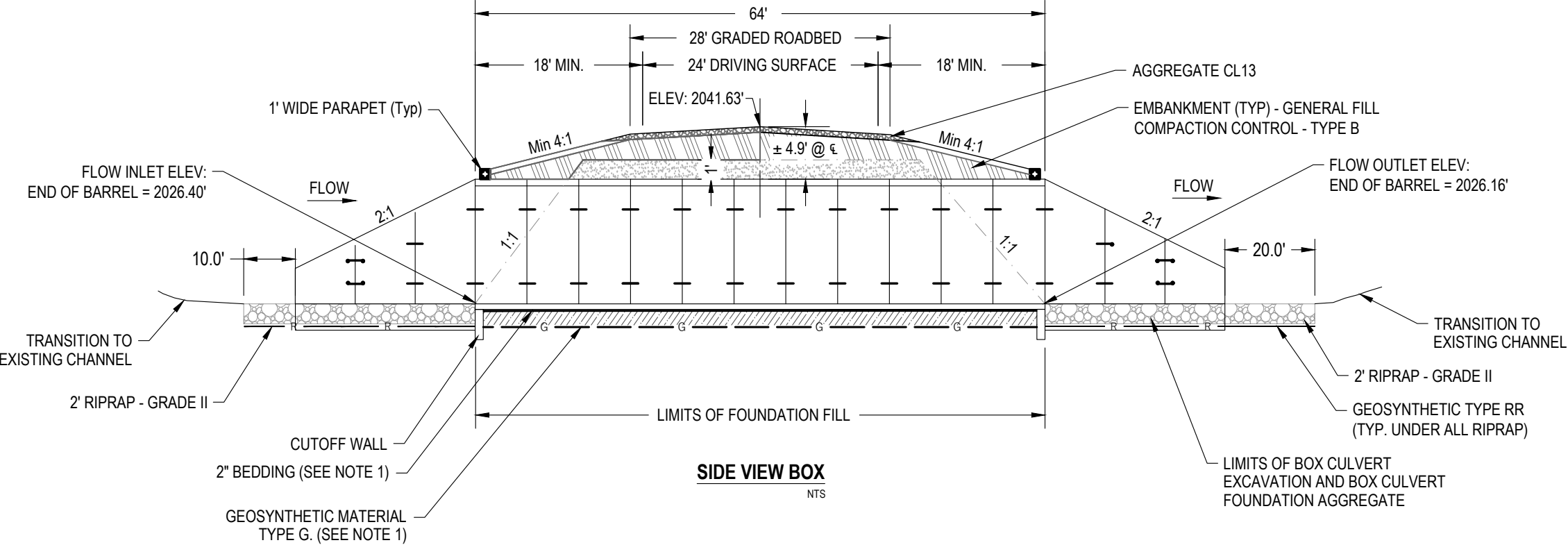
- 1. The contractor may substitute two single-cell precast RCBC for the specified double cell. If this substitution is made, the length of the single cell culverts shall be paid as twice the length of the double cell bid price.
- 2. The end sections include a reinforced concrete parapet on the top of the roof and a reinforced concrete cutoff wall below the floor. The parapet is one (1) foot by one (1) foot and as long as the barrel sections outside width. The cutoff walls shall be placed under the end of the sections and a minimum of one (1) foot thick, and three (3) feet, two (2) inches deep. The cutoff walls extend three (3) feet beyond the edges of outside box culvert walls.
- 3. Each precast RCBC section shall be secured with four tie bolts per joint.
- 4. Install four 3/4" diameter threaded inserts and steel eye bolts along top of the end sections to provide anchorage for fencing, as shown on Standard Drawing D-752-1.
- 5. If a substitution is made for two single-cell precast RCBC, the space between single cell precast unit shall be filled with controlled density backfill and capped as shown.
- 6. All costs associated with completing these items are included in the price bid for the precast units.
- 7. The shop drawings supersede the design intent documents for fabrication purposes.
- 8. Box Culvert Basis Design:
 - Top Slab Thickness = 9"
 - Bottom Slab = 10"
 - Wall Thickness = 8"
 - Haunches = 12"
 - HL-93 Loading
 - Max fill height = 4.9 feet



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- NOTES:**
1. Extend Geosynthetic, Bedding Material, and Box Culvert Foundation Aggregate beneath the Box Culvert.



BOX CULVERT BACKFILL DETAILS

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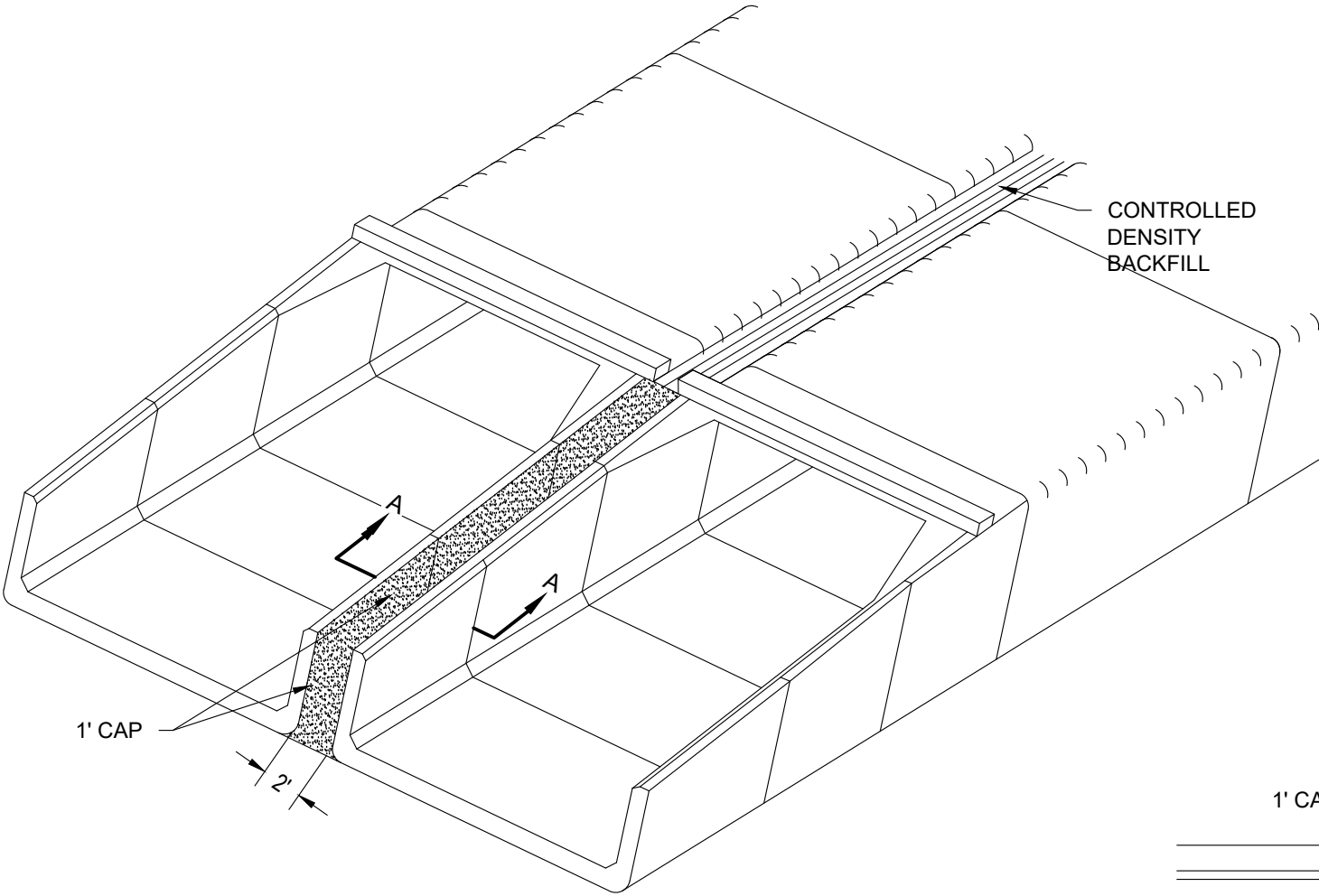
CONTROLLED DENSITY BACKFILL:

1. The controlled density backfill shall be a blend of cement, water, pozzolanic materials and fillers. The material shall be fluid on placement to flow around and fill voids in the backfill area. The material shall be able to support normal loads after 6 hours and shall have a compressive strength in the range of 75 psi to 125 psi at 28 days. The contractor shall provide mix designs and compression strength test results of the material to the engineer for approval 5 days prior to placement. A typical mix design is shown below. This mix design yields approx. 1 cubic yard of controlled density backfill

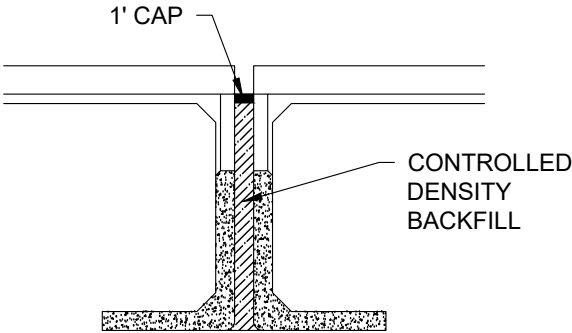
Sand	3000 lbs
Water	450 lbs
Flyash	250 lbs
Cement	30 lbs
2. The 1 foot cap shall consist of a weatherproof freeze/thaw resistant material such as Sika grout 212, Eva-pox Epoxy paste No. 22 Speed Crete red lime, or an approved equal.
3. Class AE-3 concrete may be substituted for the 1' cap with the approval of the engineer. The thickness shall be 2 feet in the area.

MULTIPLE CELL INSTALLATION:

1. The intent of this drawing is to show only the placement of the special backfill between adjacent barrels if, and only if, the multiple cell condition is built. The representation of the number of barrels and the wing geometry shown is arbitrary.



MULTIPLE CELL INSTALL
NTS



SECTION A-A
NTS



MULTIPLE CELL INSTALLATION

BRIDGE REPLACEMENT
NEW BRIDGE #19-135-19.1

GRANT COUNTY

CROSS SECTIONS

PCN

STATE

PROJECT NO.

SECTION NO.

SHEET NO.

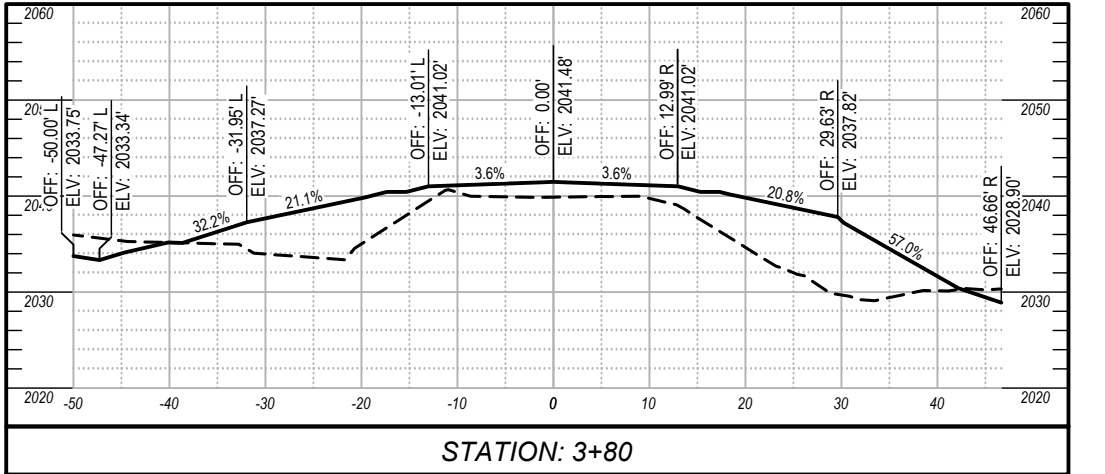
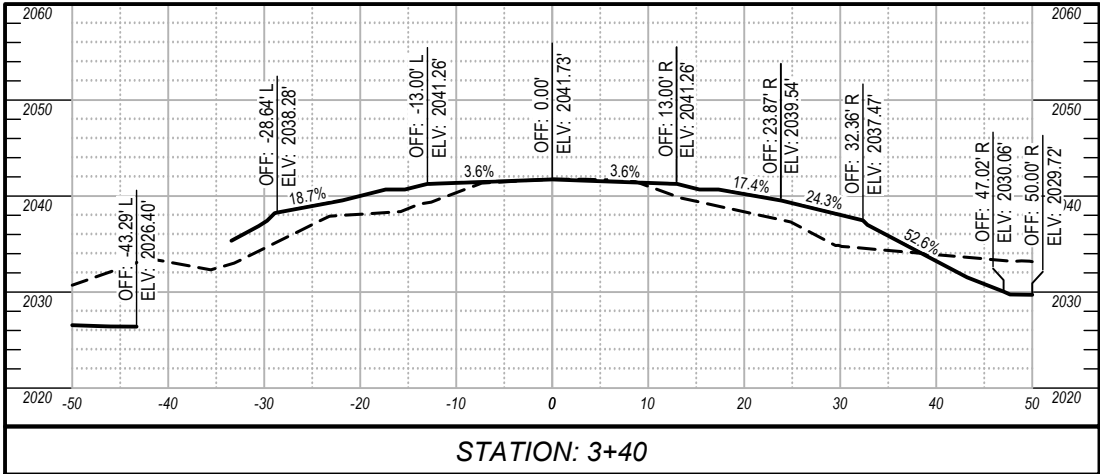
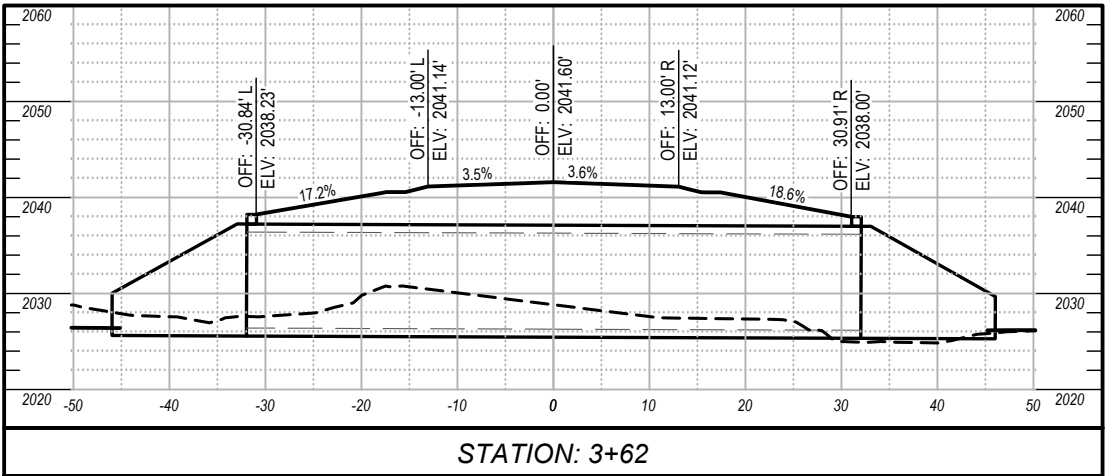
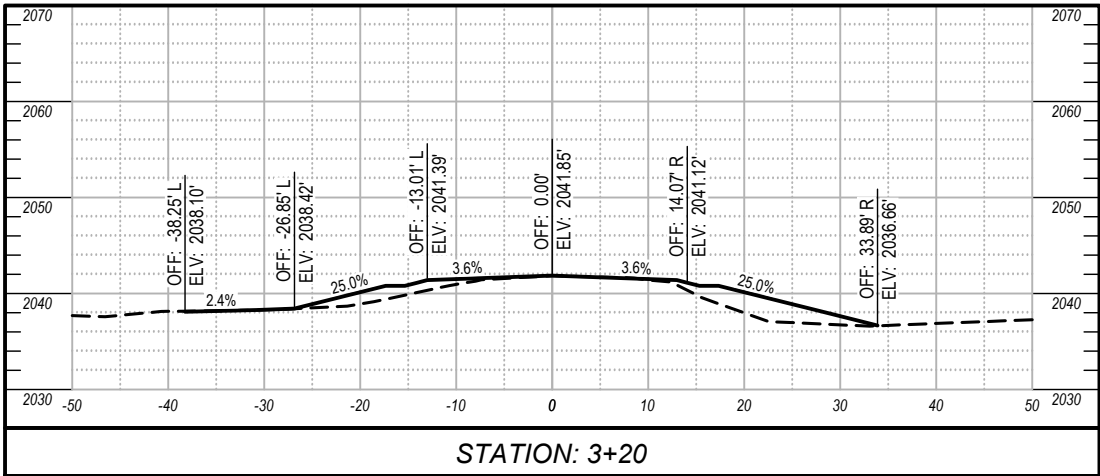
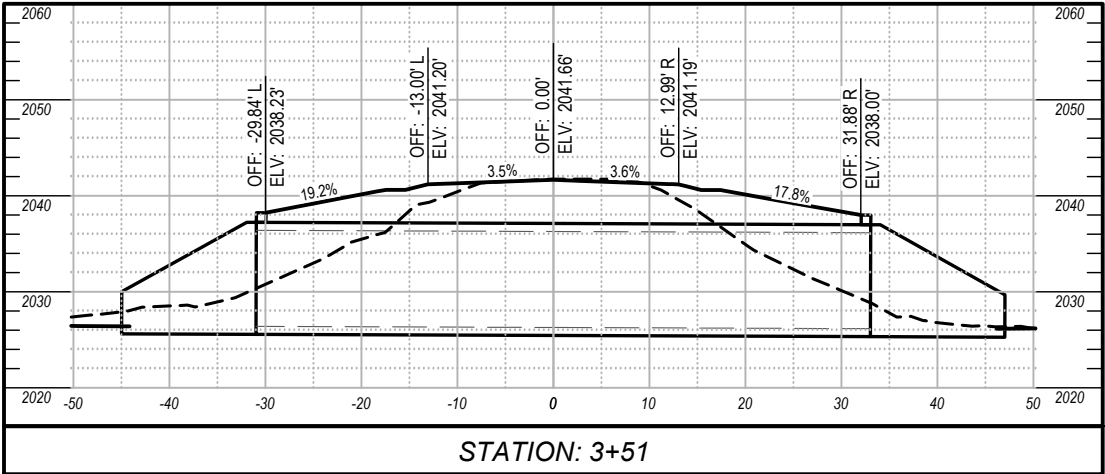
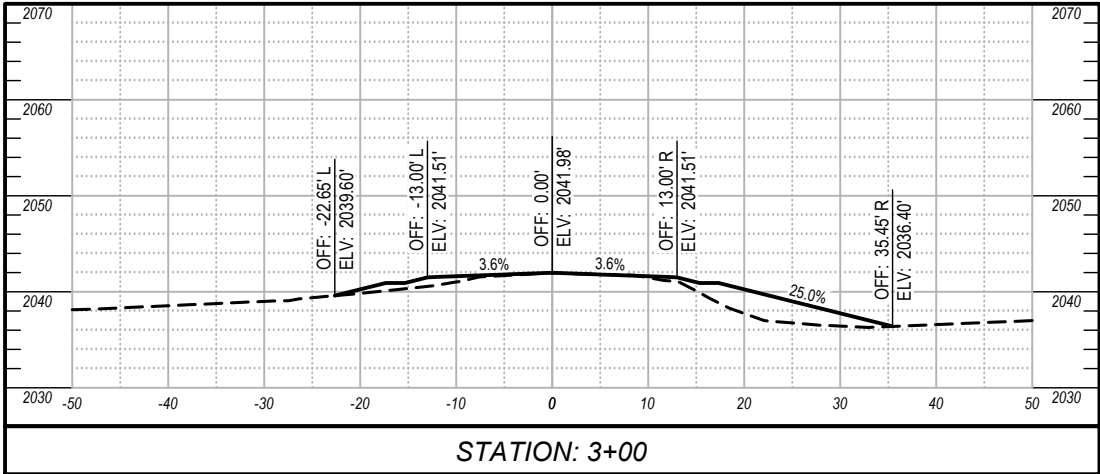
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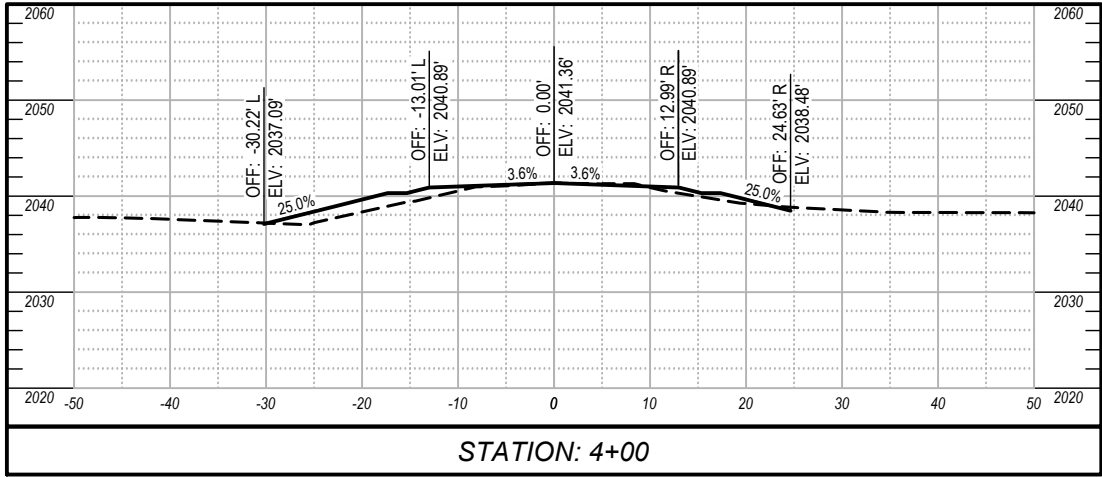
BRJ-0019(027)

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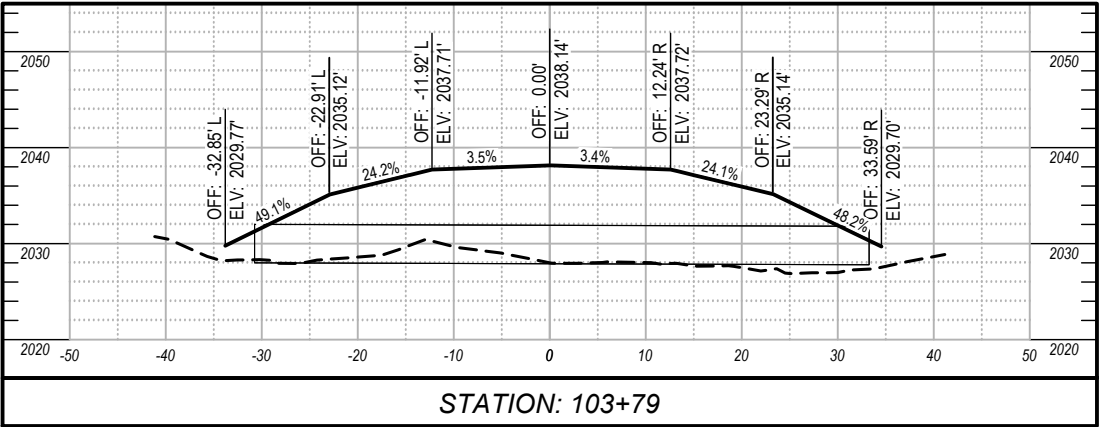
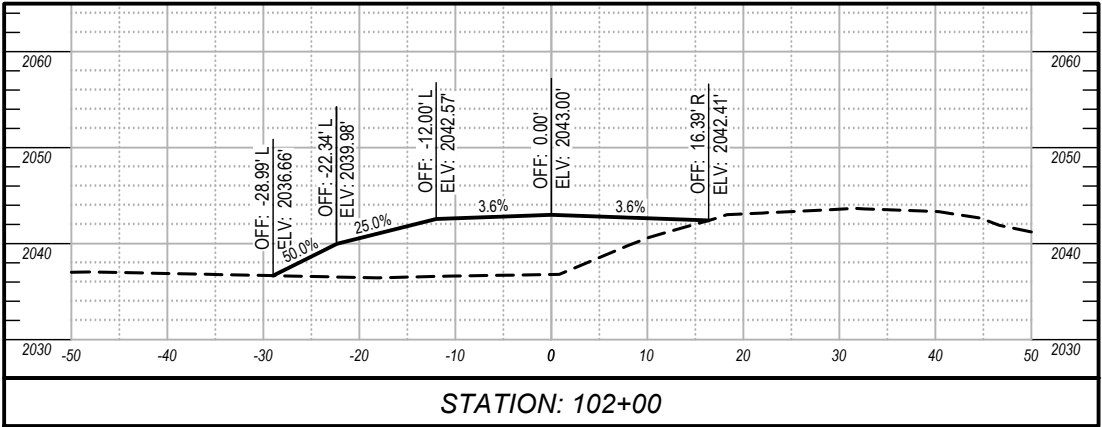
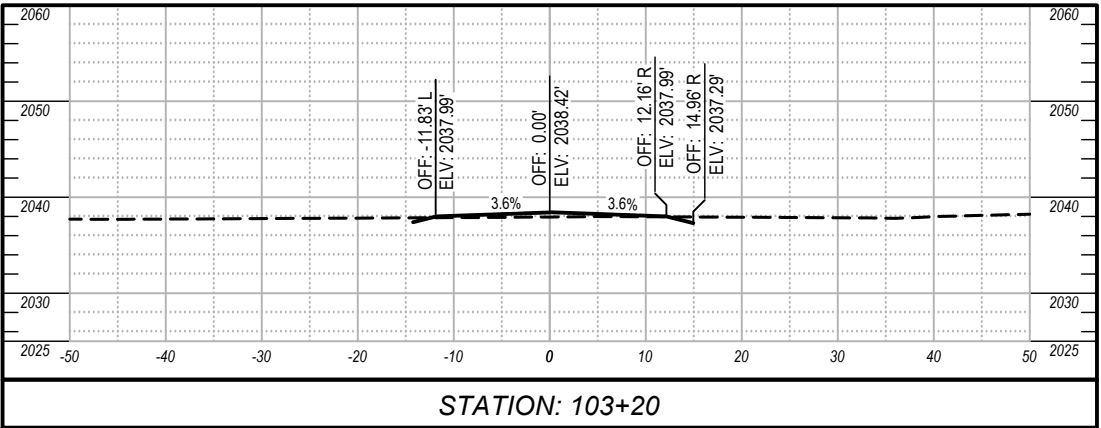
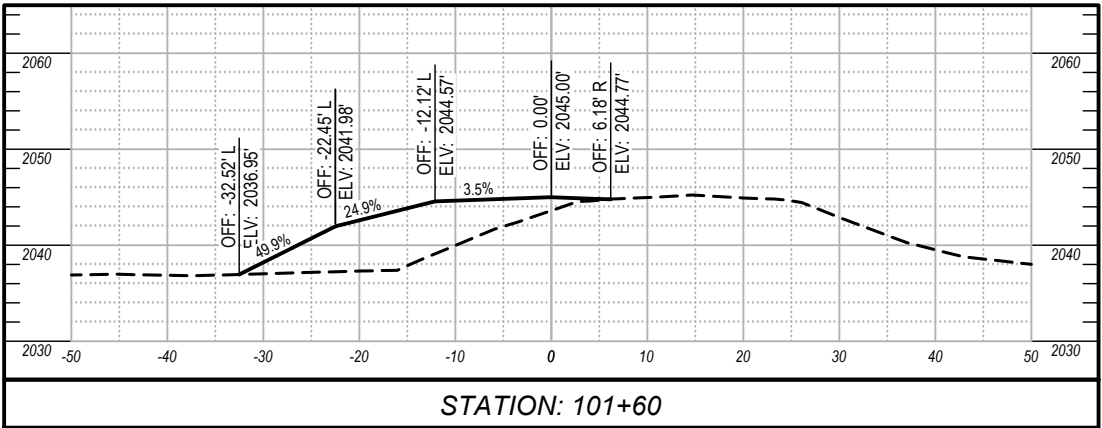
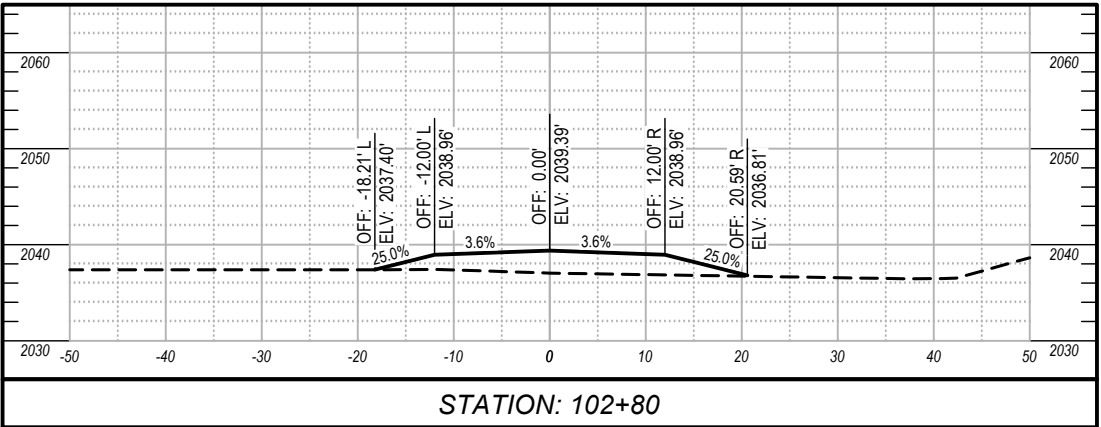
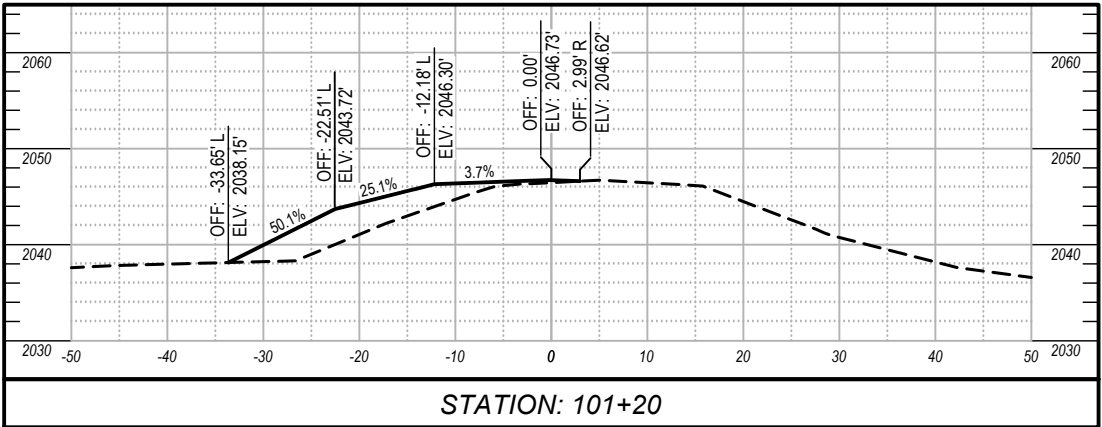
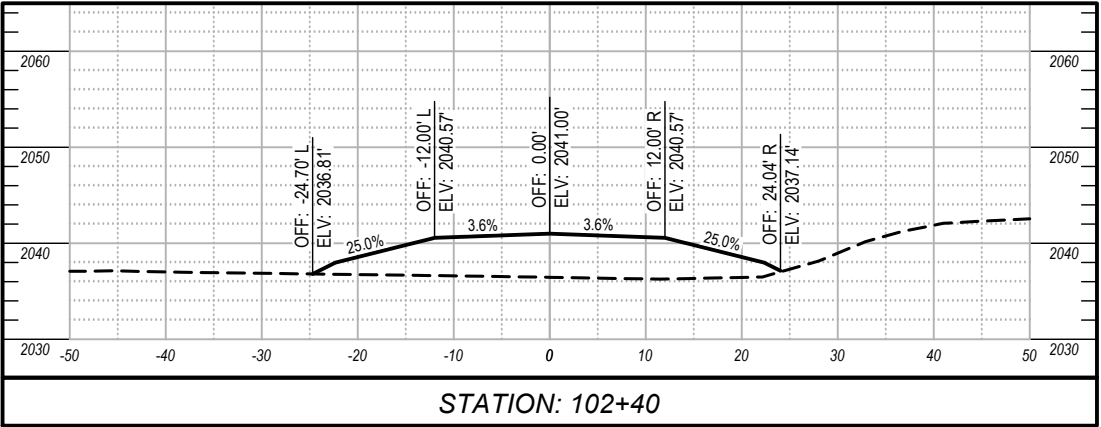
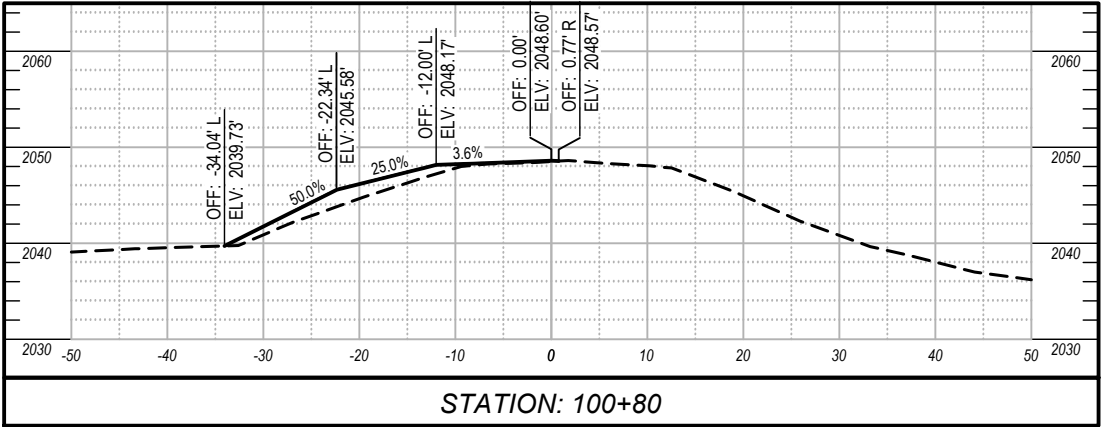


CROSS SECTIONS	PCN	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	23712	ND	BRJ-0019(027)	200	2



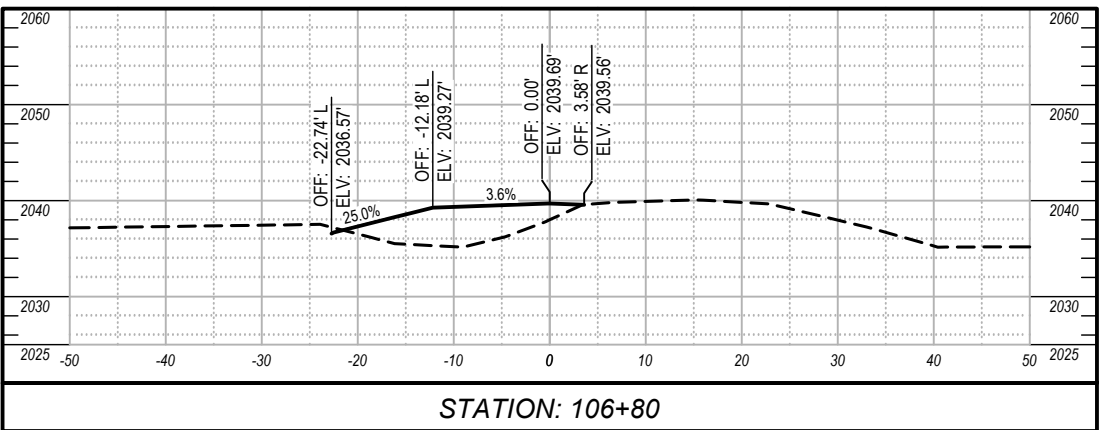
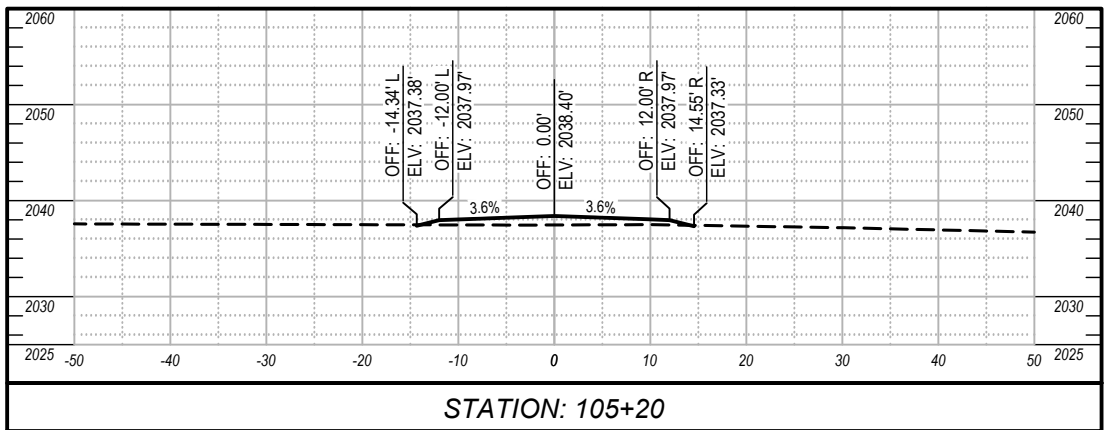
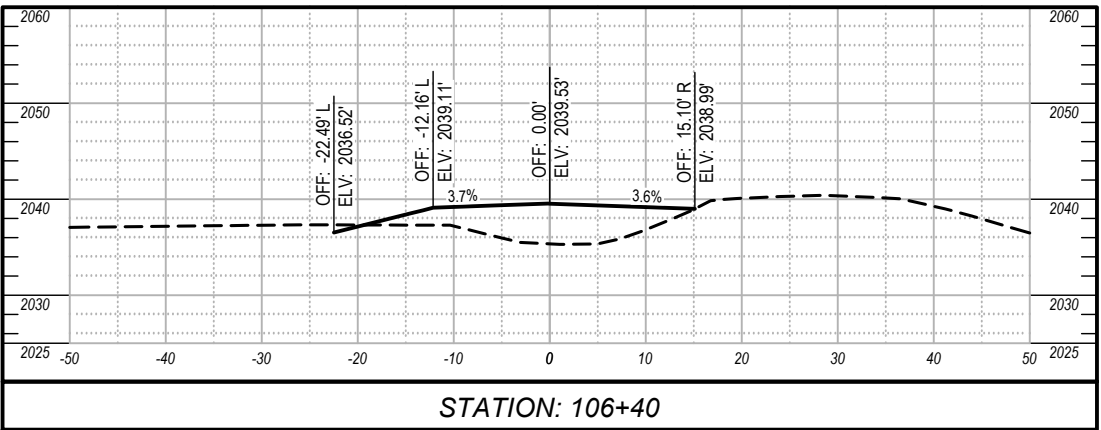
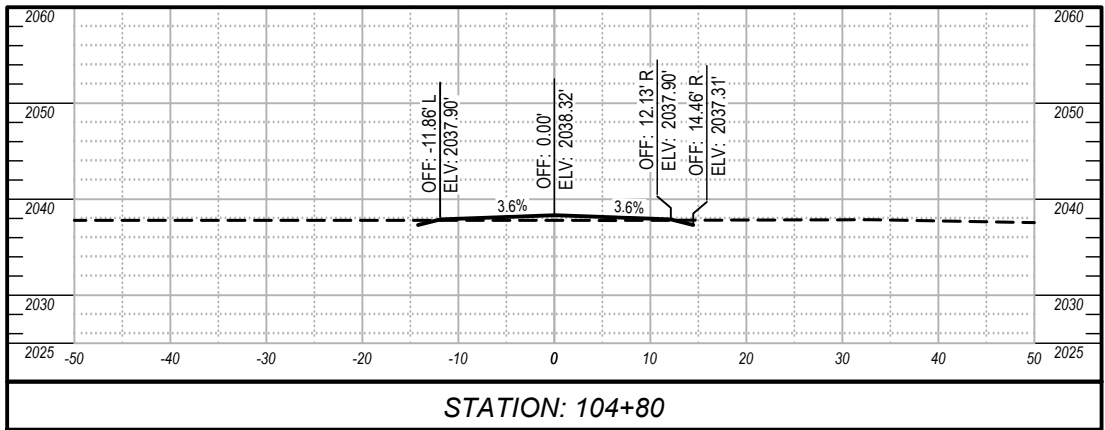
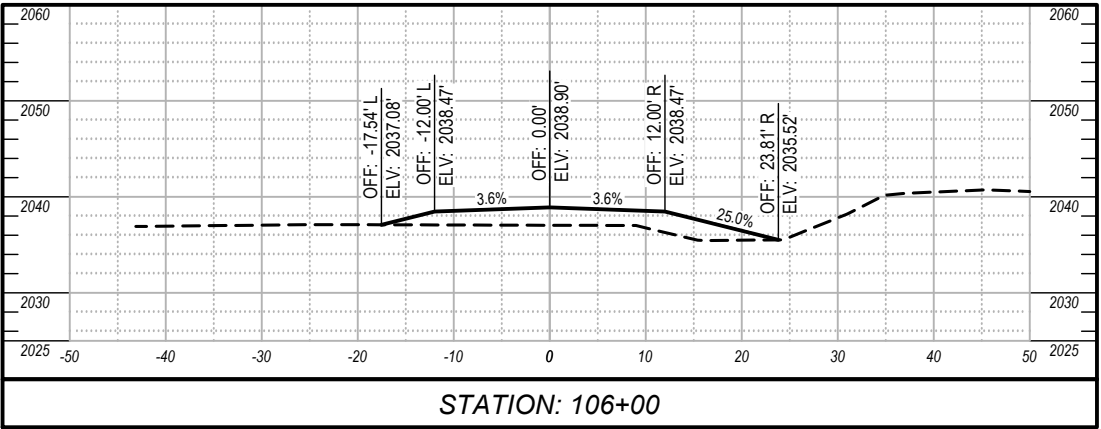
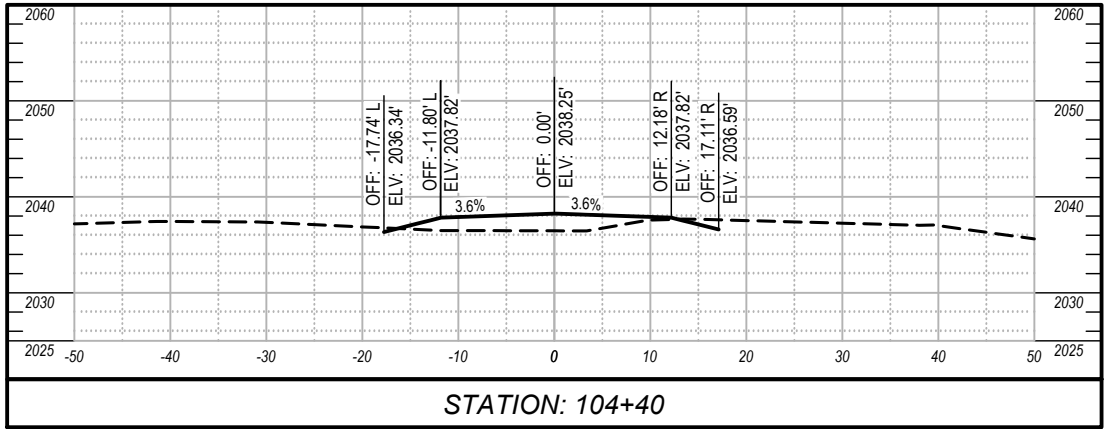
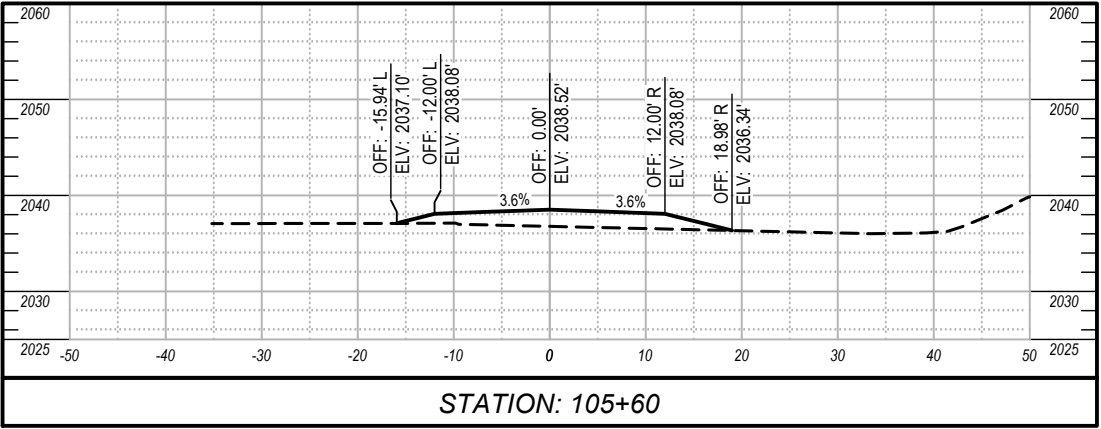
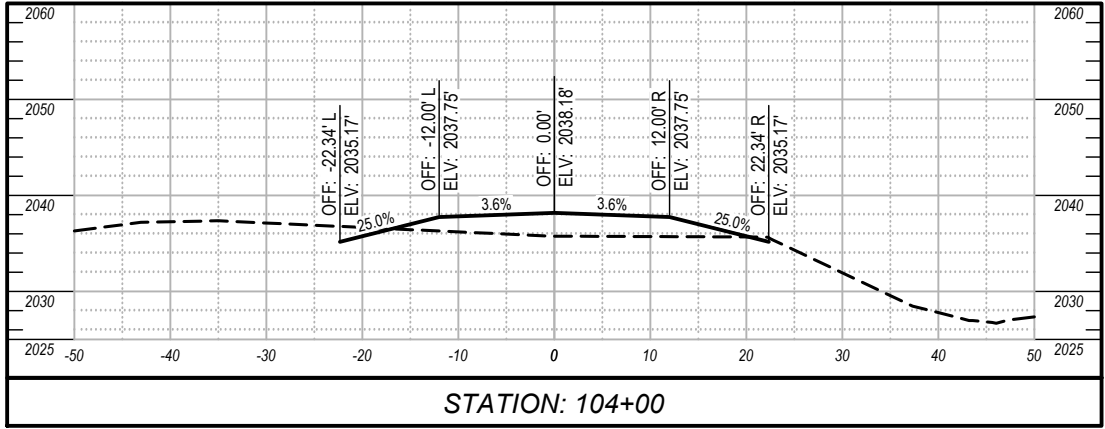
CROSS SECTIONS - BYPASS

PCN	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
23712	ND	BRJ-0019(027)	200	3

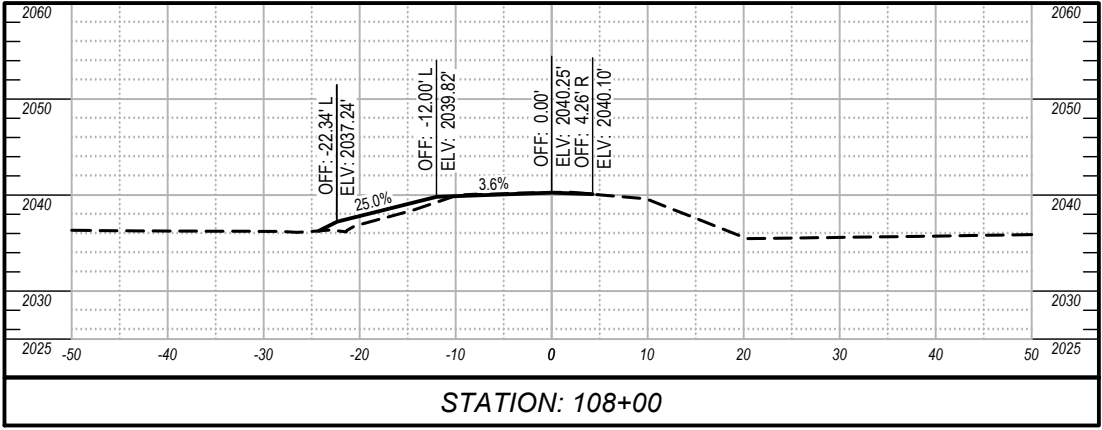
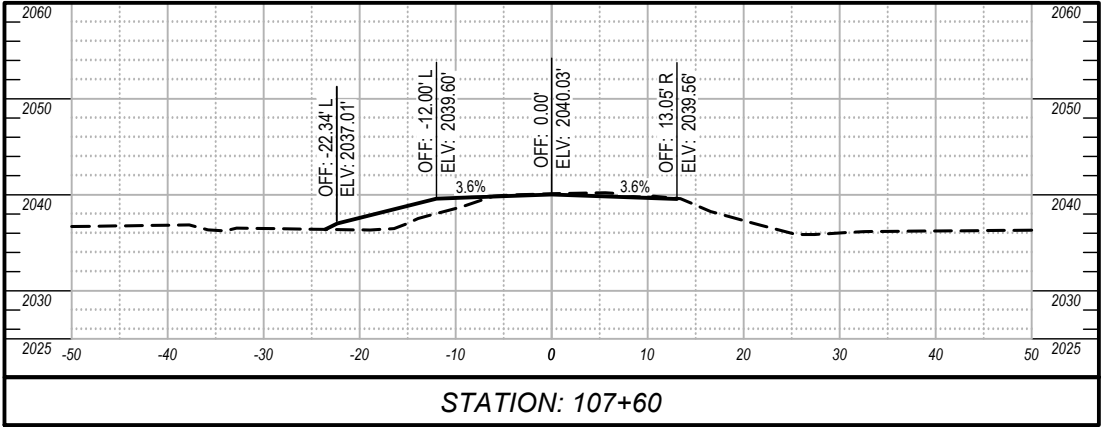
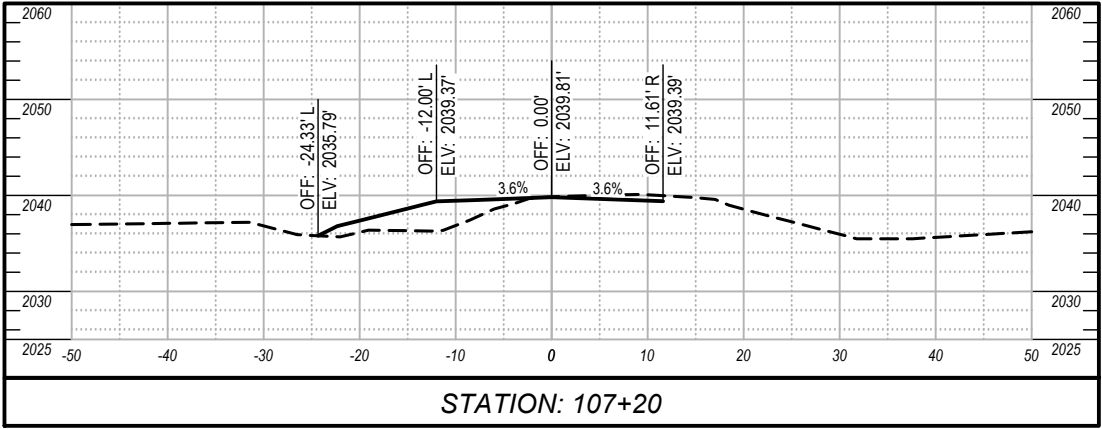


CROSS SECTIONS - BYPASS

PCN	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
23712	ND	BRJ-0019(027)	200	4



CROSS SECTIONS - BYPASS	PCN	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	23712	ND	BRJ-0019(027)	200	5



NDDOT ABBREVIATIONS

D-101-1

?	This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.	C Gdrl	cable guardrail	Culv	culvert	FOS	factor of safety
Abn	abandoned	Calc	calculate	C&G	curb & gutter	Fed	Federal
Abut	abutment	CIP	cast iron pipe	CI	curb inlet	FP	feed point
Adj	adjusted	CB	catch basin	CR	curb ramp	Fn	fence
Aggr	aggregate	CRS	cationic rapid setting	C	cut	Fn P	fence post
Ahd	ahead	C Gd	cattle guard	Dd Ld	dead load	FO	fiber optic
ARV	air release valve	C To C	center to center	Defl	deflection	FD	field drive
Align	alignment	CL or $\varnothing$	centerline	Defm	deformed	F	fill
Al	alley	Ch	chain	DInt	delineate	FAA	fine aggregate angularity
Alt	alternate	Chnlk	chain-link	DIntr	delineator	FH	fire hydrant
Alum	aluminum	Ch Blk	channel block	Depr	depression	Fl	flange
ADA	Americans with Disabilities Act	Ch Ch	channel change	Desc	description	Flrd	flared
&	and	Chk	check	Det	detail	FES	flared end section
Appr	approach	Chsld	chiseled	DWP	detectable warning panel	F Bcn	flashing beacon
Approx	approximate	Cir	circle	Dtr	detour	FA	flight auger sample
ACP	asbestos cement pipe	Cl	class	Dia or $\varnothing$	diameter	FL	flow line
Asph	asphalt	Clnt	clean-out	Dir	direction	Ftg	footing
AC	asphalt cement	Clr	clear	Dist	distance	FM	force main
Assmd	assumed	Cl&gr	clearing & grubbing	DM	disturbed material	Fnd	found
@	at	Comb.	combination	DB	ditch block	Fdn	foundation
Atten	attenuation	Coml	commercial	DG	ditch grade	Frac	fractional
ATR	automatic traffic recorder	Compr	compression	Dbl	double	Frwy	freeway
Ave	Avenue	CADD	computer aided drafting & design	Dn	down	Frt	front
Avg	average	Conc	concrete	Dwg	drawing	FF	front face
ADT	average daily traffic	CECB	concrete erosion control blanket	Dr	drive	F Disp	fuel dispenser
		Cond	conductor	Drw	driveway	FFP	fuel filler pipes
		Const	construction	DI	drop inlet	FLS	fuel leak sensor
		Cont	continuous	D	dry density	Furn	furnish/ed
		CSB	continuous split barrel sample				
		Contr	contraction				
		Contr	contractor				
Bk	back	CP	control point	Ea	each		
BF	back face	Coord	coordinate	Esmt	easement		
Balc	balcony	Cor	corner	E	East		
B Wire	barbed wire	Corr	corrected	EB	Eastbound		
Barr	barricade	CAES	corrugated aluminum end section	Elast	elastomeric		
Btry	battery	CAP	corrugated aluminum pipe	EL	electric locker		
BI	beehive inlet	CMES	corrugated metal end section	E Mtr	electric meter		
Beg	begin	CMP	corrugated metal pipe	EVSE	electric vehicle supply equipment		
BG	below grade	CPVCP	corrugated poly-vinyl chloride pipe	Elec	electric/al		
BM	bench mark	CSES	corrugated steel end section	EDM	electronic distance meter		
Bkwy	bikeway	CSFES	corrugated steel flared end section	Elev or El	elevation		
Bit	bituminous	CSP	corrugated steel pipe	Ellipt	elliptical		
Blk	block	CSTES	corrugated steel traversable end section	Emb	embankment		
BH	bore hole	Co	County	Emuls	emulsion/emulsified		
Bot	bottom	Crse	course	ES	end section		
Blvd	Boulevard	Ct	Court	Engr	engineer		
Bndry	boundary	Xarm	cross arm	ESS	environmental sensor station		
Brkwy	breakaway	Xbuck	cross buck	Eq	equal		
Br	bridge	Xsec	cross sections	Evgr	evergreen		
Bldg	building	Xing	crossing	Exc	excavation		
Bus.	business	Xrd	crossroad	Exst	existing		
BV	butterfly valve	Crn	crown	Exp	expansion		
Byp	bypass			Expy	Expressway		
				E	external of curve		
				Extru	extruded		

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12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions



NDDOT ABBREVIATIONS

D-101-2

Galv	galvanized	Ln	lane
Gar	garage	Lg	large
Gs L	gas line	Lat	latitude
G Reg	gas line regulator	Lt	left
GMV	gas main valve	Lens	lenses
G Mtr	gas meter	Lvl	level
GSV	gas service valve	Lvng	leveling
GVP	gas vent pipe	Lht	light
GV	gate valve	LP	light pole
Ga	gauge	Ltg	lighting
Gov	government	Liq	liquid
Grd	graded/grade	LL	liquid limit
Grnd	ground	Loc	location
GWM	ground water monitor	Long.	longitude
Gdrl	guardrail	Lp	loop
Gtr	gutter	LD	loop detector
		Lum	luminaire

H Plg	H piling
Hdwl	headwall
Ht	height
Hel	helical
HDPE	high density polyethylene
HM	high mast
HP	high pressure
HPS	high pressure sodium
HTCG	high tension cable guardrail
Hwy	highway
Hor	horizontal
HBP	hot bituminous pavement
HMA	hot mix asphalt
Hyd	hydrant
Ph	hydrogen ion content

Id	identification
Incl	inclinometer tube
IMH	inlet manhole
ID	inside diameter
Inst	instrument
Intchg	interchange
Intmdt	intermediate
Intscn	intersection
Inv	invert
IP	iron pipe

Jt	joint
Jct	junction

Mb	mailbox
ML	main line
MH	manhole
Mkd	marked
Mkr	marker
Mkg	marking
MA	mast arm
Matl	material
Max	maximum
Meas	measure
Mdn	median
MD	median drain
MC	medium curing
MGS	Midwest Guardrail System
MM	mile marker
MP	mile post
Min	minimum
Misc	miscellaneous
Mon	monument
Mnd	mound
Mtbl	mountable
Mtd	mounted
Mtg	mounting
Mk	muck

Neop	neoprene
Ntwk	network
N	North
NE	Northeast
NW	Northwest
NB	Northbound
No. or #	number

Obsc	obscure(d)
Ocpd	occupied
Ocpy	occupy
O/s	offset
OC	on center
C	one dimensional consolidation
OC	organic content
Orig	original
O To O	out to out
OD	outside diameter
OH	overhead

PMT	pad mounted transformer
Pg	pages
Pntd	painted
Pr	pair
Pnl	panel
Pk	park
PSD	passing sight distance
Pvmt	pavement
Ped	pedestal
Ped	pedestrian
PPP	pedestrian pushbutton post
Pen.	penetration
Perf	perforated
Per.	perimeter
Perm	permanent
PL	pipeline
Pl	place
P&P	plan & profile
PL	plastic limit
Pl or $\overline{P}$	plate
Pt	point
PE	polyethylene
PVC	polyvinyl chloride
PCC	Portland Cement concrete
PP	power pole
Preempt	preemption
Prefab	prefabricated
Prfmd or Pref	preformed
Prep	preperation
Press.	pressure
PRV	pressure relief valve
Prestr	prestressed
Pvt	private
PD	private drive
Prod.	production/produce
Prog	programmed
Prop.	property
Ppsd	proposed
PB	pull box

Qty	quantity
Qtr	quarter
Rad or R	radius
RR	railroad
Rlwy	railway
Rsd	raised
RC	rapid curing
Rec	record
Rcy	recycle
RAP	recycled asphalt pavement
RPCC	recycled portland cement concrete
Ref	reference
R Mkr	reference marker
RM	reference monument
RP	reference point
Refl	reflectorized
RCB	reinforced concrete box
RCES	reinforced concrete end section
RCFES	reinforced concrete flared end section
RCP	reinforced concrete pipe
RCPS	reinforced concrete pipe sewer
RCTES	reinforced concrete traversable end section
Reinf	reinforcement
Res	reservation
Res	residence
Ret	retaining
Rev	reverse
Rt	right
R/W	right of way
Riv	river
Rd	road
Rdbd	road bed
Rdwy	roadway
RWIS	roadway weather information system
Rk	rock
Rt	route

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NDDOT ABBREVIATIONS

D-101-3

Salv	salvage(d)	Tel	telephone
San	sanitary sewer line	Tel B	Telephone Booth
Sec	section	Tel P	telephone pole
SL	section line	Tv	television
Sep	separation	Temp	temperature
Seq	sequence	Temp	temporary
Serv	service	TBM	temporary bench mark
Sht	sheet	T	thinwall tube sample
Shtng	sheeting	Ts	topsoil
Shldr	shoulder	Traf	traffic
Sw or Sdwk	sidewalk	TSCB	traffic signal control box
SD	sight distance	Tr	trail
SN	sign number	Transf	transformer
Sig	signal	Trans	transition
Sgl	single	TT	transmission tower
SRCP	slotted reinforced concrete pipe	TES	traversable end section
SC	slow curing	Trans	transverse
SS	slow setting	Trtd	treated
Sm	small	Trmt	treatment
S	South	Qc	triaxial compression
SE	Southeast	TERO	tribal employment rights ordinance
SW	Southwest	Tpl	triple
SB	Southbound	Typ	typical
Sp	spaces		
Spcl	special	Qu	unconfined compressive strength
SA	special assembly	Ugrnd	underground
SP	special provisions	Util	utility
G	specific gravity		
Spk	spike		
SB	split barrel sample	VG	valley gutter
SH	sprinkler head	Vap	vapor
SV	sprinkler valve	Vert	vertical
Sq	square	VCP	vitrified clay pipe
Stk	stake	Vol	volume
Std	standard	VSFS	vehicle speed feedback sign
N	standard penetration test		
Std Specs	standard specifications	Wkwy	walkway
Stm L	steam line	W	water content
SEC	steel encased concrete	WGV	water gate valve
SMA	stone matrix asphalt	WL	water line
SSD	stopping sight distance	WM	water main
SD	storm drain	WMV	water main valve
St	street	W Mtr	water meter
SPP	structural plate pipe	WSV	water service valve
SPPA	structural plate pipe arch	WW	water well
Str	structure	Wrng	wearing
Subd	subdivision	WIM	weigh in motion
Sub	subgrade	W	west
Sub Prep	subgrade preperation	WB	westbound
Ss	subsoil	Wrng	wiring
SS	supplement specification	W/	with
Supp	supplemental	W/o	without
Surf	surfacing		
Surv	survey		
Sym	symmetrical		

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NDDOT ABBREVIATIONS

D-101-4

MEASUREMENTS

ac	acres
A	ampere
Bd Ft	board feet
Cd	candela
cm	centimeter
C	coulomb
CF	cubic feet
m3	cubic meter
m3/s	cubic meters per second
CY	cubic yard
CY/mi	cubic yards per mile
D or Deg	degree
F	Fahrenheit
F	farad
ft	feet/foot
Gal	gallon
G	giga
Ha	hectare
H	henry
Hz	hertz
hr	hour(s)
in.	inch
J	joule
K	kelvin
kN	kilo newton
kPa	kilo pascal
kg	kilogram
kg/m3	kilogram per cubic meter
km	kilometer
K	Kip(s)
LF	linear foot
L	litre
Lm	lumen
L sum	lump sum
Lx	lux
M Hr	man hour
M	mega
m	meter
m/s	meters per second
mi	mile
mL	milliliter
mm	millimeter
mm/hr	millimeters per hour
n	nano
N	newton
Pa	pascal
lb	pounds
sec	seconds
S	siemens
SF	square feet
km2	square kilometer
m2	square meter
SY	square yard
Sta Yd	station yards
SI	Systems International

T	tesla
T/mi	tons per mile
V	volt
W	watt
Wb	weber

SURVEY DESCRIPTIONS

Az	azimuth
Bs	backsight
Brg	bearing
BP Cap	blue plastic cap
BS	both sides
BC	brass cap
CC	closing corner
CS	curve to spiral
Eq	equation
E	external of curve
FS	far side
FB	field book
Fs	foresight
Geod	geodetic
GIS	Geographical Information System
GPS	Global Positioning System
HI	height of instrument
IM	iron monument
I Pn	iron pin
LS	Land Surveyor (licensed)
LSIT	Land Surveyor In Training
L	length of curve
LC	long chord
LB	level book
MC	meander corner
Mer	meridian
M	mid ordinate of curve
NGS	National Geodetic Survey
NS	near side
Obsn	observation
Off Loc	office location
OP Cap	orange plastic cap
PK	Parker-Kalon nail
P Cap	plastic cap
PP Cap	pink plastic cap
PCC	point of compound curve
PC	point of curve
PI	point of intersection
PRC	point of reverse curvature
PT	point of tangent
POC	point on curve
POT	point on tangent
RTP	random traverse point
Rge	range
RP Cap	red plastic cap
SC	spiral to curve
SC	standard corner
ST	spiral to tangent
Sta	station
SE	superelevation
Tan	tangent
T	tangent (semi)
TS	tangent to spiral
Twp	township
TB	transit book
TP	traverse point
TP	turning point
USC&G	US Coast & Geodetic Survey
USGS	US Geologic Survey
VC	vertical curve
WC	witness corner
WGS	World Geodetic System
YP Cap	yellow plastic cap
Z	zenith

SOIL TYPES

Cl	clay
Cl F	clay fill
Cl Hvy	clay heavy
Cl Lm	clay loam
Co S	coal slack
C Gr	coarse gravel
CS	coarse sand
FS	fine sand
Gr	gravel
Lig Co	lignite coal
Lig Sl	lignite slack
Lm	loam
Rk	rock
Sd	sand
Sdy Cl	sandy clay
Sdy Cl Lm	sandy clay loam
Sdy Fl	sandy fill
Sdy Lm	sandy loam
Sc	scoria
Sh	shale
Si Cl	silt clay
Si Cl Lm	silty clay loam
Si Lm	silty loam

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM
ACCENT
AGASSIZ WU
AGC
ALL PL
ALL SEAS WU
AMOCO PI
AMRDA HESS
AT&T
B PAW
BAKER ELEC
BASIN ELEC
BEK TEL
BELLE PL
BLM
BNSF
BOEING
BRNS RWD
BURK-DIV ELEC
BURL WRD
CABLE ONE
CABLE SERV
CAP ELEC
CASS CO ELEC
CASS RWU
CAV ELEC
CBLCOM
CENEX PL
CENT PL WATER DIST
CENT PWR ELEC
CENTURYLINK
COE
CONS COMM
CONS TELCOM
CONT RES
CPR
D O E
DAK CARR
DAK CENT TEL
DAK RWD
DGC
DICKY R NET
DICKY WRD
DICKY TEL
DNRR
DOME PL
DVELEC
DVMW
E CENT REG WD
ENBRDG
ENVENTIS
EQUINOR
FALK MNG
FHWA
G FKS-TRL WD
GETTY TRD & TRAN
GLDN W ELEC

702 Communications
Accent Communications
Agassiz Water Users District
Associated General Contractors of America
Alliance Pipeline
All Seasons Water Users District
Amoco Pipeline Company
Amerada Hess Corporation
AT&T Corporation
Bear Paw Energy Incorporated
Baker Electric
Basin Electric Cooperative Incorporated
Bek Communications Cooperative
Belle Fourche Pipeline Company
Bureau of Land Management
Burlington Northern Santa Fe Railway
Boeing
Barnes Rural Water District
Burke-Divide Electric Cooperative
Burleigh County Water Resource District
Cable One
Cable Services
Capital Electric Cooperative Incorporated
Cass County Electric Cooperative
Cass Rural Water Users District
Cavalier Rural Electric Cooperative
Cablecom Of Fargo
Cenex Pipeline
Central Pipe Line Water District
Central Power Electric Cooperative
CenturyLink
Corps of Engineers
Consolidated Communications
Consolidated Telcom
Continental Resource Inc
Canadian Pacific Railway
Department Of Energy
Dakota Carrier Network
Dakota Central Telephone
Dakota Rural Water District
Dakota Gasification Company
Dickey Rural Networks
Dickey County Water Resource District
Dickey Telephone
Dakota Northern Railroad
Dome Pipeline Company
Dakota Valley Electric Cooperative
Dakota, Missouri Valley & Western
East Central Water District
Enbridge Pipelines Incorporated
Enventis Telephone
Equinor Pipeline
Falkirk Mining Company
Federal Highway Administration
Grand Forks-traill Water District
Getty Trading & Transportation
Golden West Electric Cooperative

GTR RAMSEY WD
GT PLNS NAT GAS
HALS TEL
IDEA1
INT-COMM TEL
KANEB PL
KEM ELEC
KOCH GATH SYS
LKHD PL
LWR YELL R ELEC
LUMEN
MCKNZ CON
MCKNZ ELEC
MCKNZ WRD
MCLEOD
MCLN ELEC
MCLN-SHRDN R WAT
MDU
MIDCO
MIDSTATE TEL
MINOT CABLE
MINOT TEL
MISS VALL COMM
MISS W W S
MNKOTA PWR
MOR-GRAN-SOU ELEC
MOUNT-WILLI ELEC
MLGC
MUNICIPAL
MUNICIPAL
N CENT ELEC
N PRAIR REG WD
ND PKS & REC
ND TEL
NDDOT
NE REG WD
NDSU SOIL SCI DEPT
NEMONT TEL
NODAK R ELEC
NOON FRMS TEL
NPR
NSP
NTHN BRDR PL
NTHN PLNS ELEC
NTHWSTRN REF
NW COMM
NWRWD
ONEOK
OSHA
OTTR TL PWR
PAAP
P L E M
POLAR COM
PVT ELEC
QWEST
R&T REG WD

Greater Ramsey Water District
Great Plains Natural Gas Company
Halstad Telephone Company
Idea1
Inter-Community Telephone Company
Kaneb Pipeline Company
Kem Electric Cooperative Incorporated
Koch Gathering Systems Incorporated
Lakehead Pipeline Company
Lower Yellowstone Rural Electric
Lumen Technologies Incorporated
McKenzie Consolidated Telcom
McKenzie Electric Cooperative
McKenzie County Water Resource District
McLeod USA
McLean Electric Cooperative
McLean-Sheridan Rural Water District
Montana-dakota Utilities
MidContinent Communications
Midstate Telephone Company
Minot Cable Television
Minot Telephone Company
Missouri Valley Communications Incorporated
Missouri West Water System
Minnkota Power
Mor-gran-sou Electric Cooperative
Mountrail-williams Electric Cooperative
Moore & Liberty - Griggs County
City Water And Sewer
City Of '.....'
North Central Electric Cooperative
North Prairie Regional Water District
North Dakota Parks And Recreation
North Dakota Telephone Company
North Dakota Department of Transportation
Northeast Regional Water District
NDSU Soil Science Department
Nemont Telephone
Nodak Rural Electric Cooperative
Noonan Farmers Telephone Company
Northern Plains Railroad
Northern States Power
Northern Border Pipeline
Northern Plains Electric Cooperative Incorporated
Northwestern Refinery Company
Northwest Communication Cooperation
Northwest Rural Water District
Oneok gas
Occupational Safety and Health Administration
Otter Tail Power Company
Plains All American Pipeline
Praieliands Energy Marketing
Polar Communications
Private Electric
Qwest Communications
R & T Water District

RED RIV COMM
RESVTN TEL
ROBRTS TEL
R-RIDER ELEC
RRVW
S CENT REG WD
SE W U
SCOTT CABLE
SHERDN ELEC
SHEYN VLY ELEC
SKYTECH
SLOPE ELEC
SOURIS RIV TELCOM
ST WAT COMM
STATE LN WATER
STER ENG
STUT RWD
SW PL PRJ
SWWA
SUNOCO
T M C
TCI
TESORO GHG PLNS PL
TRI-CNTY WU
TRL CO WRD
UNTD TEL
UPPR SOUR WD
US SPRINT
USAF MSL CABLE
USFWS
USW COMM
VRNDRY ELEC
W RIV TEL
WAPA
WAWSA
WEB
WILLI WRD
WILSTN BAS PL
WLSH RWD
WOLVRTN TEL
XLENER
YSVR

Red River Communications
Reservation Telephone
Roberts Company Telephone
Roughrider Electric Cooperative
Red River Valley & Western Railroad
South Central Regional Water District
Southeast Water Users Incorporated
Scott Cable Television Dickinson
Sheridan Electric Cooperative
Sheyenne Valley Electric Cooperative
Skyland Technologies Incorporated
Slope Electric Cooperative Incorporated
Souris River Telecommunications
State Water Commission
State Line Water Cooperative
Sterling Energy
Stutsman Rural Water District
Southwest Pipeline Project
Southwest Water Authority
Sunoco LP
Turtle Mountain Communications
TCI of North Dakota
Tesoro High Plains Pipeline
Tri-County Water Users Incorporated
Traill County Water Resource District
United Telephone
Upper Souris Water District
U.S. Sprint
U.S.A.F. Missile Cable
US Fish and Wildlife Service
U.S. West Communications
Verendrye Electric Cooperative
West River Telephone Incorporated
Western Area Power Administration
Western Area Water Supply Authority
W. E. B. Water Development Association
Williams County Water Resource District
Williston Basin Interstate Pipeline Company
Walsh Water Rural Water District
Wolverton Telephone
Xcel Energy
Yellowstone Valley Railroad

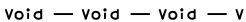
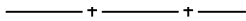
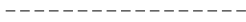
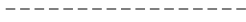
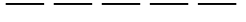
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
09-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions

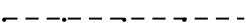
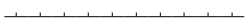
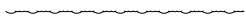
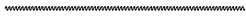
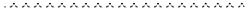
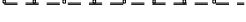
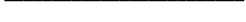


LINE STYLES

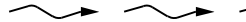
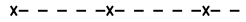
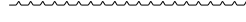
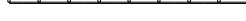
D-101-20

Existing Topography

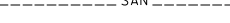
	Existing Ground Void
	Existing Cemetary Boundary
	Existing Box Culvert Bridge
	Existing Concrete Surface
	Existing Drainage Structure
	Existing Gravel Surface
	Existing Riprap
	Existing Dirt Surface
	Existing Asphalt Surface
	Existing Tie Point Line
	Existing Railroad Centerline
	Existing Guardrail Cable
	Existing Guardrail Metal
	Existing Edge of Water
	Existing Fence
	Existing Railroad
	Existing Field Line
	Exst Flow
	Existing Curb
	Existing Valley Gutter
	Existing Driveway Gutter
	Existing Curb and Gutter
	Existing Mountable Curb and Gutter

	Existing 3-Cable w Posts
	Site Boundary
	Existing Berm, Dike, Pit, or Earth Dam
	Existing Ditch Block
	Existing Tree Boundary
	Existing Brush or Shrub Boundary
	Existing Retaining Wall
	Existing Planter or Wall
	Existing W-Beam Guardrail with Posts
	Existing Railroad Switch
	Gravel Pit - Borrow Area
	Existing Wet Area-Vegetation Break
	Existing High Tension Cable Guardrail
	Existing High Tension Cable Guardrail with Posts

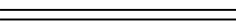
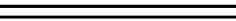
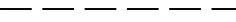
Proposed Topography

	3-Cable w Posts
	Flow
	Fence
	Remove Line
	Wall
	Retaining Wall (Plan View)
	W-Beam w Posts
	High Tension Cable Guardrail with Posts

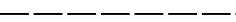
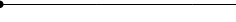
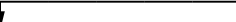
Existing Utilities

	Existing Electrical
	Existing Fiber Optic Line
	Existing TV Fiber Optic
	Existing Gas Pipe
	Existing Overhead Utility Line
	Existing Power
	Existing Fuel Pipeline
	Existing Undefined Above Ground Pipe Line
	Existing Sanitary Sewer
	Existing Sanitary Force Main
	Existing Storm Drain
	Existing Storm Drain Force Main
	Existing Culvert
	Existing Telephone Line
	Existing TV Line
	Existing Water or Steam Line
	Existing Under Drain
	Existing Slotted Drain
	Existing Conduit
	Existing Conductor
	Existing Down Guy Wire Down Guy
	Existing Underground Vault or Lift Station

Proposed Utilities

	24 Inch Pipe
	Reinforced Concrete Pipe
	Under Drain
	Edge Drain

Traffic Utilities

	Conductor
	Fiber Optic
	Existing Loop Detector
	Existing Double Micro Loop Detector
	Micro Loop Detector Double
	Existing Micro Loop Detector
	Micro Loop Detector
	Signal Head with Mast Arm
	Existing Signal Head with Mast Arm

Sign Structures

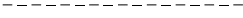
	Existing Overhead Sign Structure
	Existing Overhead Sign Structure Cantilever
	Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION			
07-01-14 REVISIONS			
DATE	CHANGE		
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions		
			12 18 2020

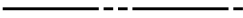
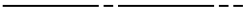
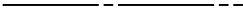
LINE STYLES

D-101-21

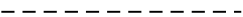
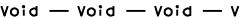
Right Of Way

	Easement
	Existing Easement
	Right of Way
	Existing Right of Way
	Existing Right of Way Railroad
	Existing Right of Way Not State Owned
	Existing Government Lot Line
	Existing Adjacent Block Lines
	Existing Adjacent Lot Lines
	Existing Adjacent Property Line
	Existing Adjacent Subdivision Lines
	Sight Distance Triangle Line
	Dimension Leader

Boundary Control

	Existing City Corporate Limits or Reservation Boundary
	Existing State or International Line
	Existing Township
	Existing County
	Existing Section Line
	Existing Quarter Section Line
	Existing Sixteenth Section Line
	Existing Centerline
	Tangent Line

Cross Sections and Typicals

	Existing Ground
	Existing Topsoil (Cross Section View)
	Existing Ground Void (Not Surveyed)
	Existing Concrete
	Existing Aggregate (Cross Section View)
	Existing Curb and Gutter (Cross Section View)
	Existing Asphalt (Cross Section View)
	Existing Reinforcement Rebar

Geotechnical

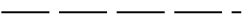
	Geotextile Fabric Type D
	Geogrid
	Geotextile Fabric Type R
	Geotextile Fabric Type R1
	Geotextile Fabric Type RR
	Geotextile Fabric Type S

	Subgrade Reinforcement
	Failure Line

Countours

	Depression Contours
	Supplemental Contour

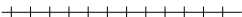
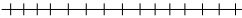
Profile

	Subgrade, Subcut or Ditch Grade
	Topsoil Profile

Striping

	Centerline Pavement Marking
	Barrier with Centerline Pavement Marking
	Barrier Pavement Marking
	Stripe 4 IN Dotted Extension White
	Stripe 8 IN Dotted Extension White
	Stripe 8 IN Lane Drop

Pavement Joints

	Doweled Joint
	Tie Bar 30 Inch 4 Foot Center to Center
	Tie Bar 18 Inch 3 Foot Center to Center
	Tie Bar at Random Spacing

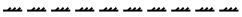
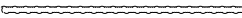
Bridge Details

	Small Hidden Object
	Large Hidden Object
	Phantom Object
	Existing Conditions Object
	Centerline Main
	Centerline Secondary
	Excavation Limits
	Proposed Ground
	Sheet Piling

Erosion Control

	Limits of Const Transition Line
	Bale Check
	Rock Check
	Floating Silt Curtain
	Silt Fence
	Excavation Limits
	Fiber Rolls

Environmental

	Wetland Mitigation
	Existing Wetland Easement USFWS
	Existing Wetland Jurisdictional
	Existing Wetland
	Tree Row

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		
07-01-14		
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DATE	CHANGE	
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions	

SYMBOLS

D-101-30



North Arrow (Half Scale)

Alignment Data Point

Alignment Monument

Spot Elevation

Existing Miscellaneous Spot

Existing Access Control Arrow

Existing Benchmark

Reset USGS Marker

Iron Monument Found

Iron Pin R/W Monument

Property Corner

Iron Pin Reference Monument

Right of Way Marker (Exst, Ppsd, Reset)

Existing Federal Reference Corner

Existing Section Corner (Full, Quarter, Sixteenth, Meander)

Existing Witness Corner

Existing Control Point (CP, GPS-RTK, TRI)

Existing Traverse PI Aerial Panel

Existing Reference Marker Point NGS

Existing EFB Misc

Existing Bush or Shrub

Existing Large Evergreen Tree

Existing Small Evergreen Tree

Existing Large Tree

Existing Small Tree

Existing Tree Trunk

Cairn or Stone Circle

Existing Artifact

Existing Satellite Dish

Existing Weather Station

Existing Windmill or Tower

Reinforced Pavement

Continuous Split Barrel Sample

Flight Auger Sample

Split Barrel Sample

Thinwall Tube Sample

Standard Penetration Test

Inclinometer Tube

Excavation Unit

Existing Ground Water Well Bore Hole

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DATE	CHANGE
12-18-20	General Revisions

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REGISTERED

PROFESSIONAL

PE-4683

ENGINEER

NORTH DAKOTA

12 18 2020

SYMBOLS

D-101-31

	Flexible Delineator		Highway Sign (Exst, Ppsd)
	Flexible Delineator Type A (Exst, Ppsd)		Mile Post Type A (Exst-Ppsd-Reset)
	Flexible Delineator Type B (Exst, Ppsd)		Mile Post Type B (Exst, Ppsd)
	Flexible Delineator Type C (Exst, Ppsd)		Mile Post Type C (Exst, Ppsd)
	Flexible Delineator Type D (Exst, Ppsd)		Object Marker Type I (Exst, Ppsd)
	Flexible Delineator Type E (Exst, Ppsd)		Object Marker Type II (Exst, Ppsd)
	Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)		Object Marker Type III (Exst, Ppsd)
	Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)		Existing Reference Marker
	Delineator Type C (Exst, Ppsd, Diamond Grade)		Road Closure Gate 18 Ft (Exst, Ppsd)
	Delineator Type D (Exst, Ppsd, Diamond Grade)		Road Closure Gate 28 Ft (Exst, Ppsd)
	Delineator Type E (Exst, Ppsd, Diamond Grade)		Road Closure Gate 40 Ft (Exst, Ppsd)
	Barricade (Type I, Type II, Type III)		Existing Railroad Battery Box
	Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)		Existing RR Profile Spot
	Attenuation Device		Existing Railroad Crossbuck
	Truck Mounted Attenuator		Existing Railroad Frog
	Delineator Drums		Existing Mailbox (Private, Federal)
	Flagger		
	Tubular Marker		
	Traffic Cone		
	Back to Back Vertical Panel Sign		

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12-18-20	General Revisions



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SYMBOLS

D-101-32

	Existing Luminaire			High Mast Light Standard 3 Luminaire (Exst, Ppsd)		Existing Traffic Signal Standard			
	Luminaire LED			High Mast Light Standard 4 Luminaire (Exst, Ppsd)				Pull Box (Exst-Ppsd-Undefined)	
	Existing Light Standard Luminaire			High Mast Light Standard 5 Luminaire (Exst, Ppsd)				Intelligent Transportation Pull Box (Exst, Ppsd)	
	Relocate Light Standard			High Mast Light Standard 6 Luminaire (Exst, Ppsd)				Transformer (Exst, Ppsd)	
	Light Standard Light LED Luminaire			High Mast Light Standard 7 Luminaire (Exst, Ppsd)				Power Pole (Exst-Ppsd-with Transformer)	
	Light Standard 35 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 8 Luminaire (Exst, Ppsd)				Wood Pole (Exst, Ppsd)	
	Light Standard 50 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 9 Luminaire (Exst, Ppsd)				Pedestrian Push Button Post (Exst, Ppsd)	
	Light Standard 70 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 10 Luminaire (Exst, Ppsd)				Existing Pole	
	Light Standard 100 Watt High Pressure Sodium Vapor Luminaire			Overhead Sign Structure Load Center (Exst, Ppsd)				Existing Telephone Pole	
	Light Standard 150 Watt High Pressure Sodium Vapor Luminaire			Traffic Signal Controller (Exst, Ppsd)				Existing Post	
	Light Standard 200 Watt High Pressure Sodium Vapor Luminaire			Pad Mounted Traffic Signal Controller (Exst, Ppsd)					Connection Conductor (Ground, Neutral, Phase 1, Phase 2)
	Light Standard 250 Watt High Pressure Sodium Vapor Luminaire			Flashing Beacon (Exst, Ppsd)					
	Light Standard 310 Watt High Pressure Sodium Vapor Luminaire			Concrete Foundation (Exst, Ppsd)					
	Light Standard 400 Watt High Pressure Sodium Vapor Luminaire			Pipe Mounted Flasher (Exst, Ppsd)					
	Light Standard 700 Watt High Pressure Sodium Vapor Luminaire			Pad Mounted Feed Point (Exst, Ppsd)					
	Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire			Pipe Mounted Feed Point with Pad (Exst, Ppsd)					
	Emergency Vehicle Detector			Pole Mounted Feed Point (Exst, Ppsd)					
	Video Detection Camera			Junction Box (Exst, Ppsd)					
				Existing Pedestrian Head with Number					
				Existing Signal Head					
				Pole Mounted Head					
				Existing Lighting Standard Pole					

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12-18-20	General Revisions



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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REVISIONS	
DATE	CHANGE
12-18-20	General Revisions



12 18 2020

SYMBOLS

D-101-33

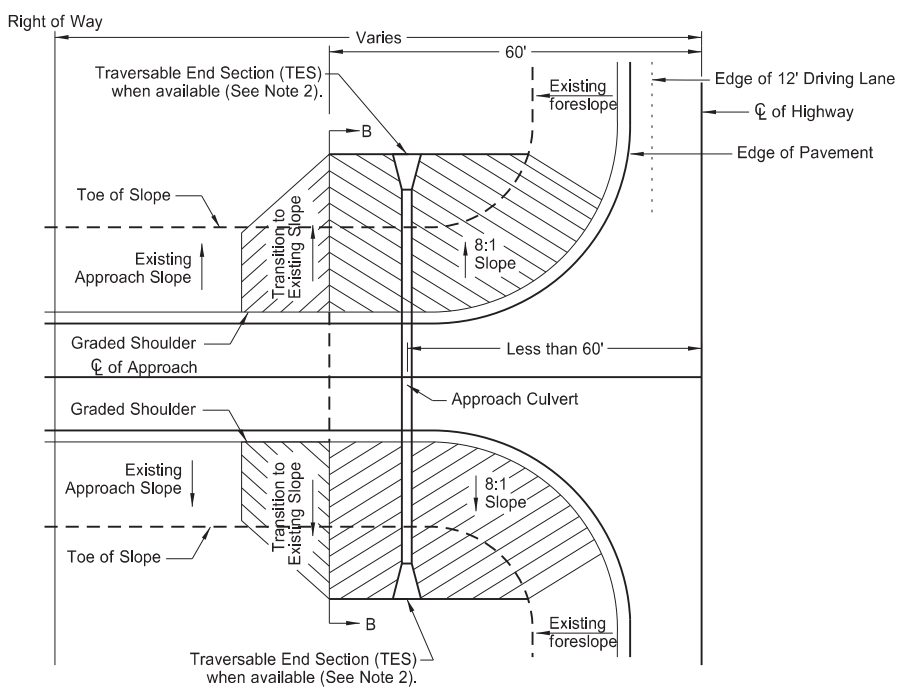
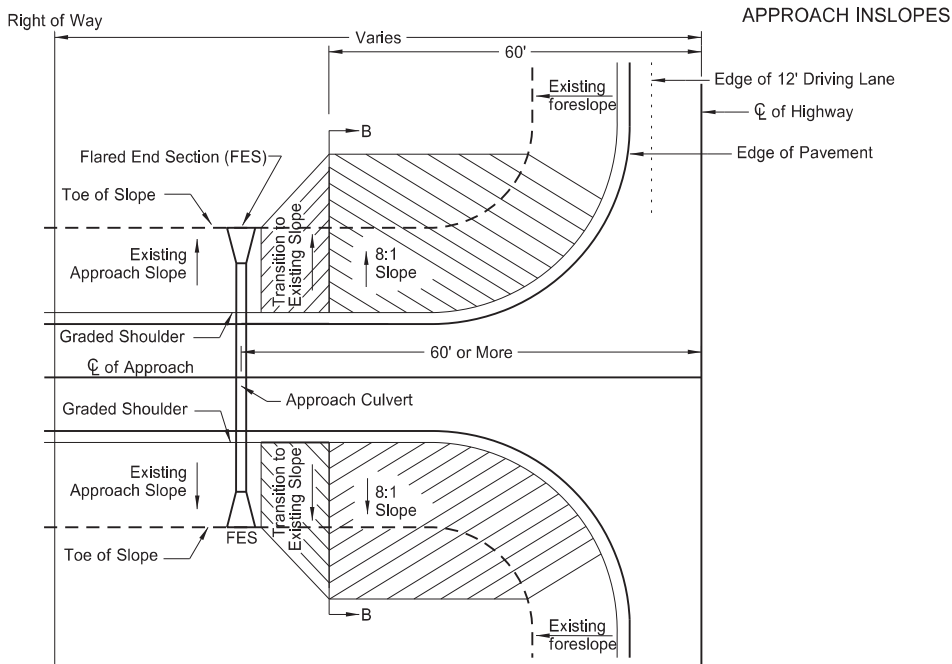
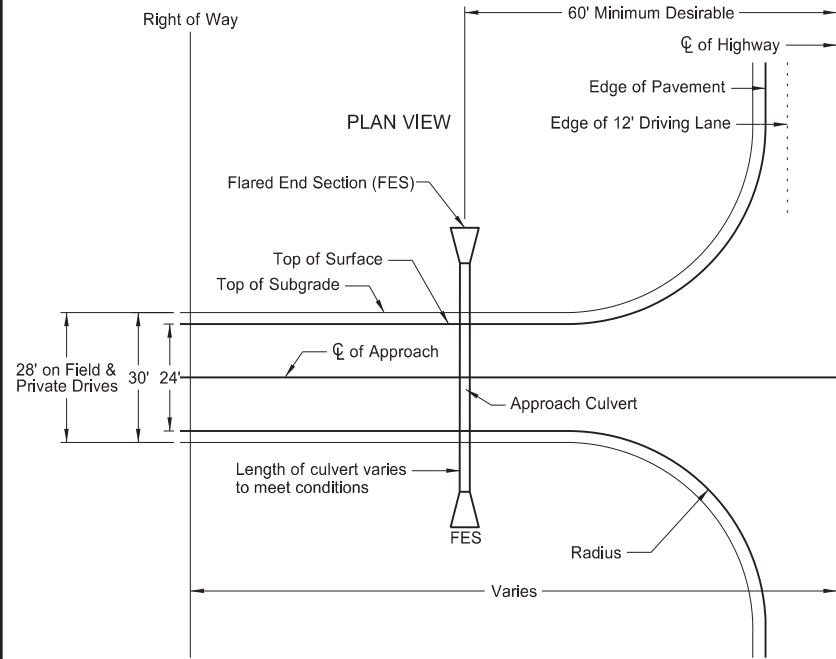
			Existing Manhole (Electrical, Gas, Telephone)		Cap or Stub Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water
			Water Manhole (Exst, Exst with Valve)		Existing Pedestal Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined
			Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)		Existing Pipe Vent Gas, Fuel, Sanitary, Storm Drain, Water, Undefined
			Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)		Valve Exst Gas, Exst Water, Ppsd Water, Exst Undefined
			Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)		Pump Sanitary, Storm Drain, Exst Water
			Force Main Storm Drain Manhole (Exst, Exst with Valve)		Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)
			Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)		Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)
			Existing Water Appurtenance		Existing Utility Marker
			Sprinkler Head (Exst, Ppsd)		Existing Meter
			Fire Hydrant (Exst, Ppsd)		Existing Fuel Dispensers
			Cleanout (Exst Sanitary, Underdrain)		Existing Fuel Filler Pipes
			Existing Catch Basin Inlet (Round, Square)		Existing Fuel Leak Sensors
			Existing Curb Inlet (Round, Square)		
			Existing Slotted Reinforced Concrete Pipe		
			Catch Basin (Riser 30 Inch, Beehive, Type A)		
			Inlet Mountable Curb (Type A, Type B)		
			Inlet Saddle Base (Type 1, Type 2)		
			Inlet Special (Catch Basin, Type 1, Type A)		
			Inlet (Tee, Type 1, Type 2, Type 2 Double)		
			Median Drain		
			Headwall (Exst, Ppsd, Ppsd Single with Vegetation Barrier, Ppsd Double with Vegetation Barrier)		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions Sheet added - Continued from D-101-32

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12 18 2020

STANDARD RURAL APPROACHES

D-203-8



CASE 1

APPROACH PIPE LOCATED
60' OR MORE FROM C

CASE 2

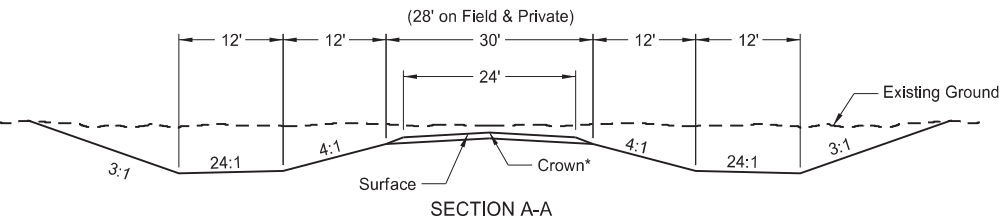
APPROACH PIPE LOCATED
LESS THAN 60' FROM C

Approach Pipe Traversable End Sections (TES)

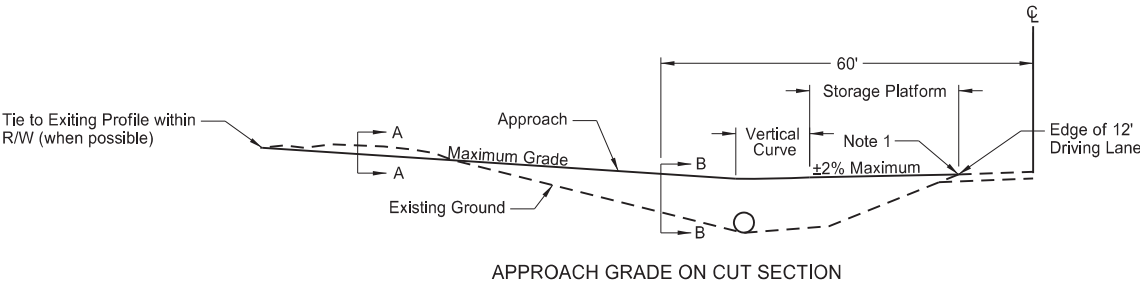
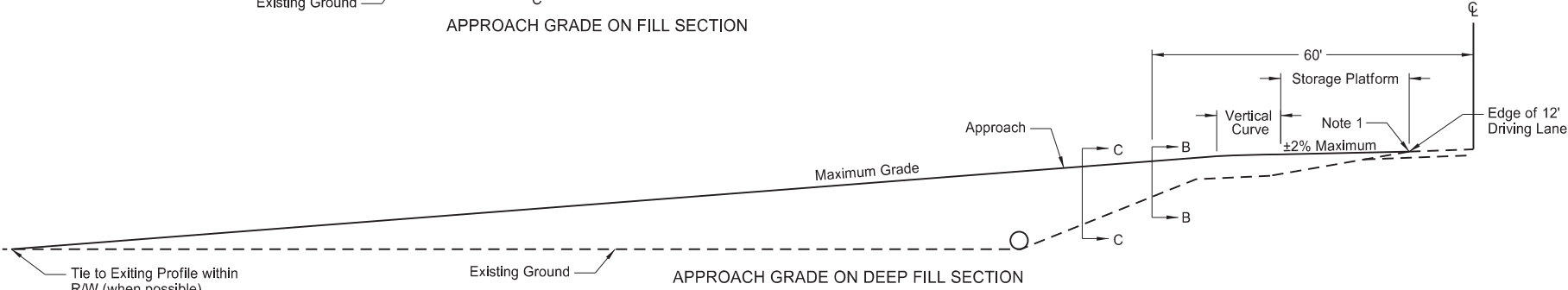
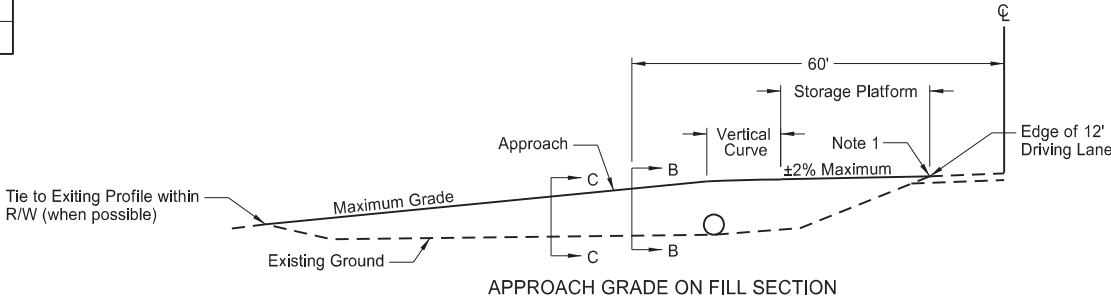
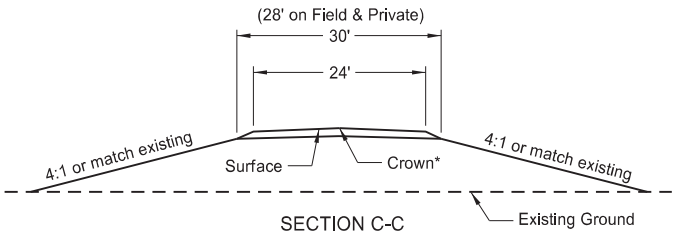
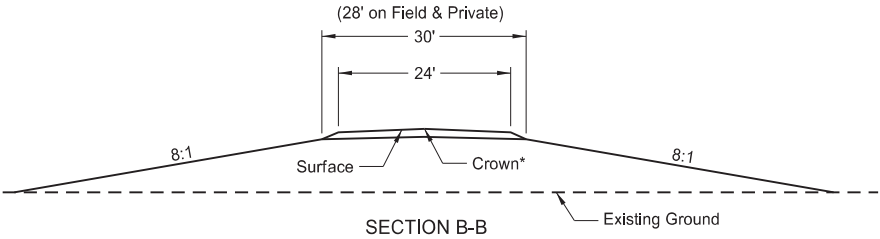
RCP	CSP	CSP Arch
15"	15"	
18"	18"	21"x15"
		24"x18"
24"	24"	28"x20"

CRITERIA FOR RURAL APPROACH TYPES

	Field Drives	Private Drives	Low Volume Public Roads
Radius	R=40 ft	R=40 ft	R=50 ft
Maximum Grade	10%	7%	7%
Storage Platform	24 ft	24 ft	50 ft
Vertical Curve Length	10 ft	10 ft	Varies (Min. 20 mph)



*2.1% crown for paved surface
*3.0% crown for gravel surface



NOTES:

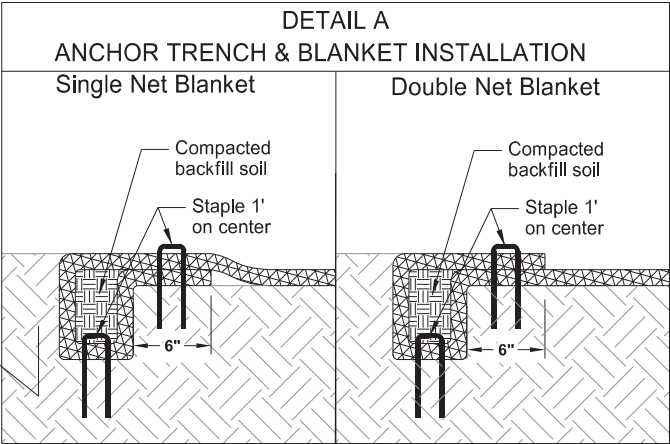
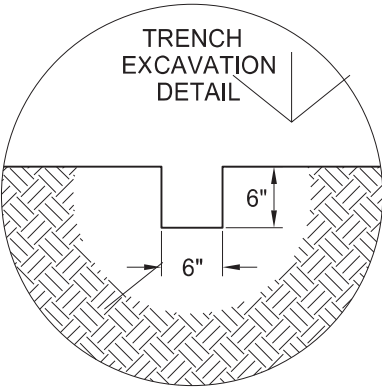
1. 5% Max Rollover between approach storage platform and highway.
2. Approach pipes up to 24" diameter are acceptable (with traversable end sections) for Case 2. Install approach pipes larger than 24" diameter in accordance with Case 1.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-25-14	
REVISIONS	
DATE	CHANGE
06-30-17	Revised Radius, Storage Platform, Inslope dimensions, and Note 1
10-25-19	Changed "Inslope" to "Foreslope"
06-29-22	Added "TES", Table, and Note 2

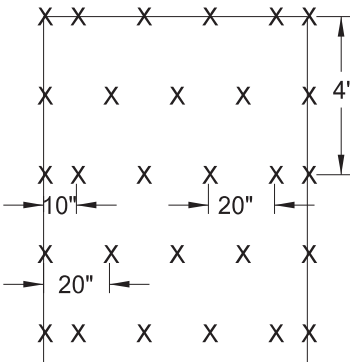
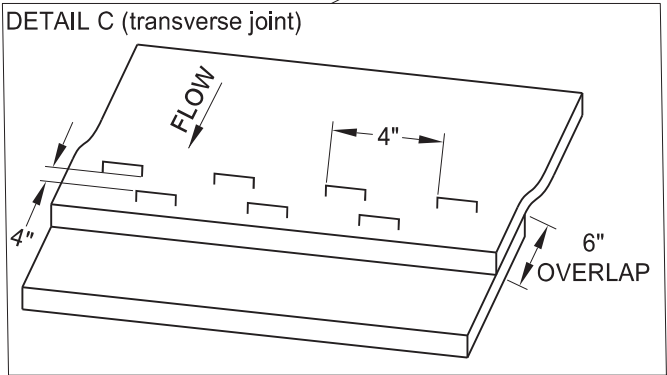
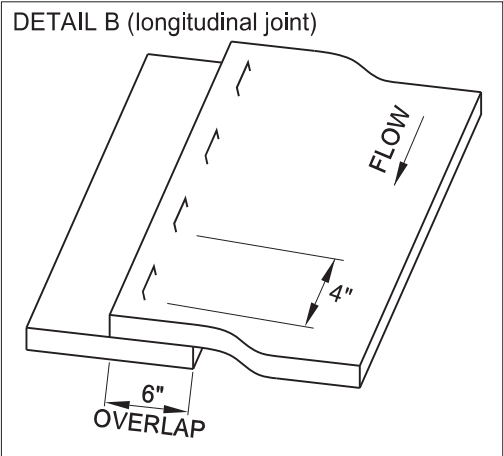


06/29/22

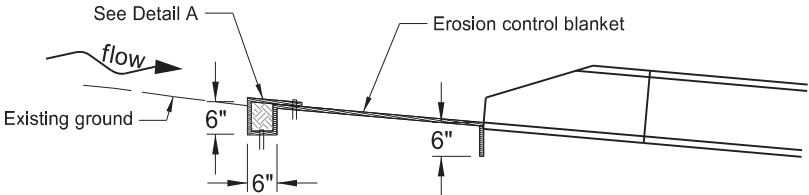
EROSION AND SILTATION CONTROL
EROSION CONTROL BLANKET INSTALLATION



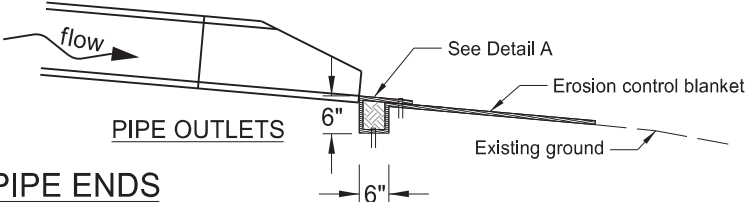
NOTE:
If a Single Net Blanket is used, the side with the netting should be on the top once the blanket is installed.



STAPLE PATTERN
(3.8 staples per square yard)

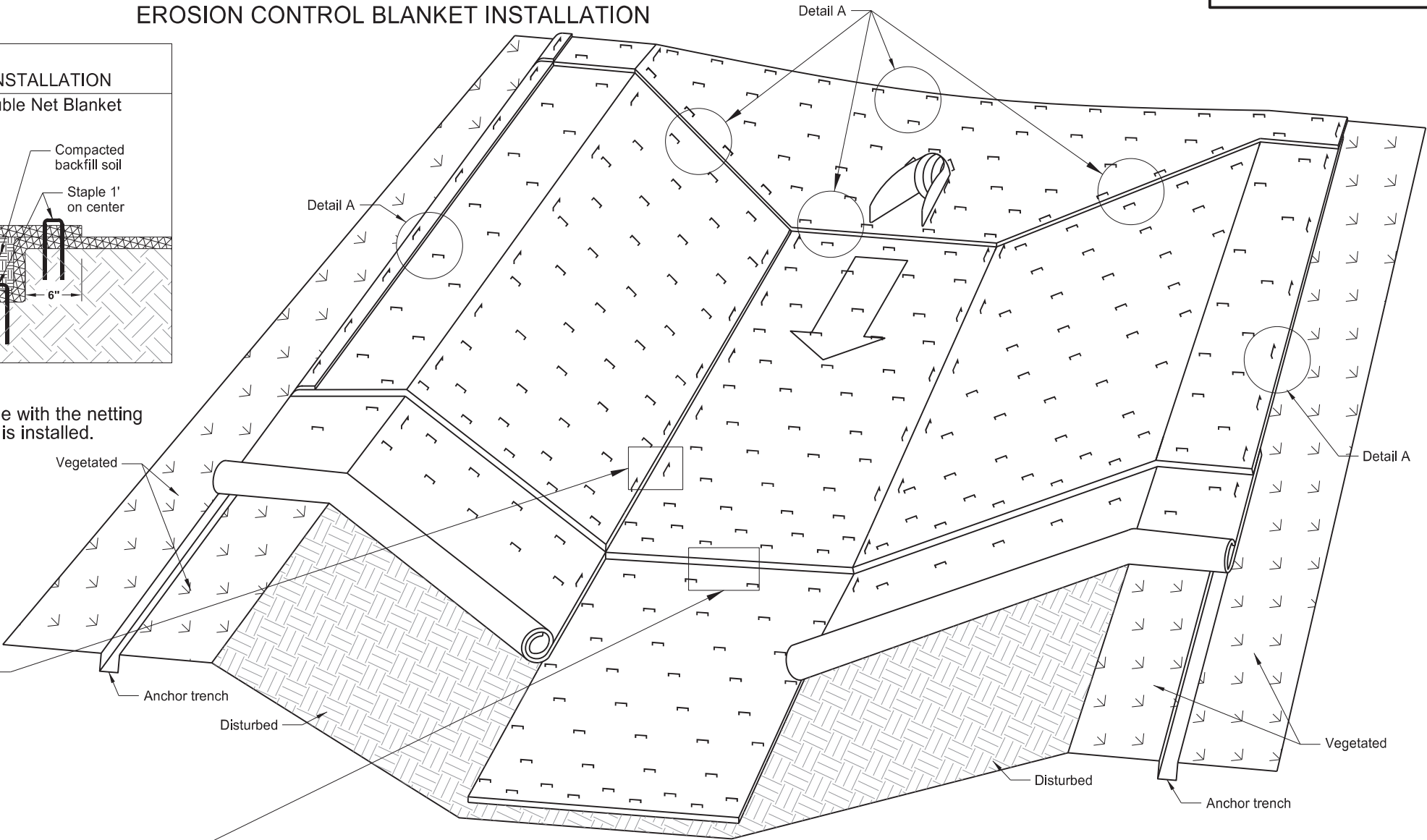


PIPE INLETS



PIPE OUTLETS

INSTALLATION AT PIPE ENDS



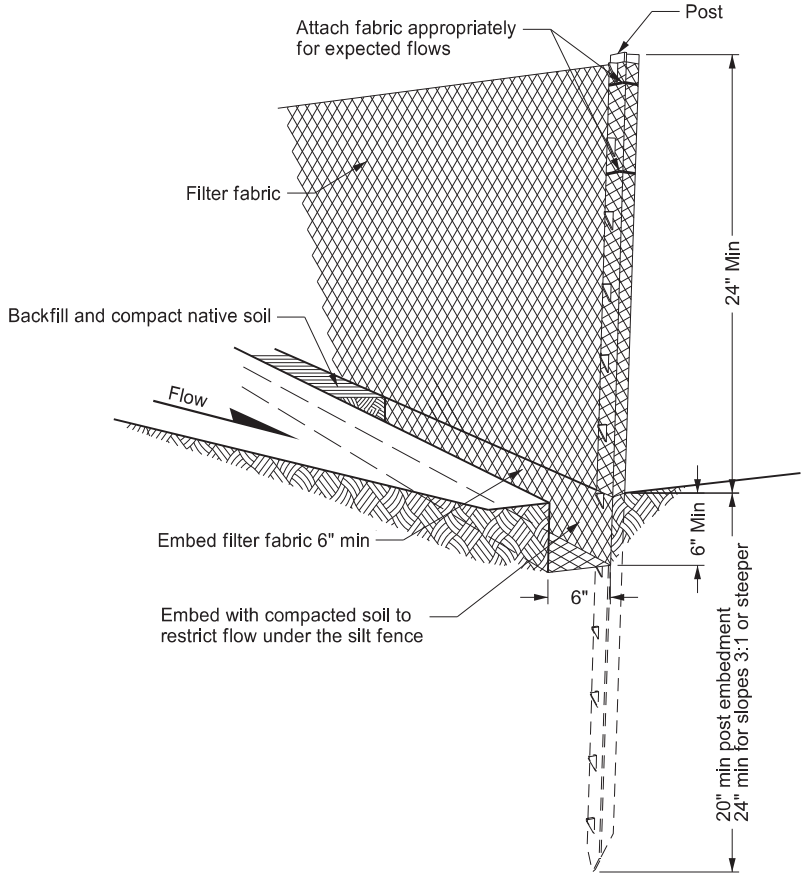
BLANKET LAYOUT
CHANNEL INSTALLATION

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Changed standard drawing number from D-708-6 to D-255-2
07-27-15	Changed installation details such as trench depth and overlap dimensions
08-27-19	New Design Engineer PE Stamp
08-27-25	Revised minor details for clarity

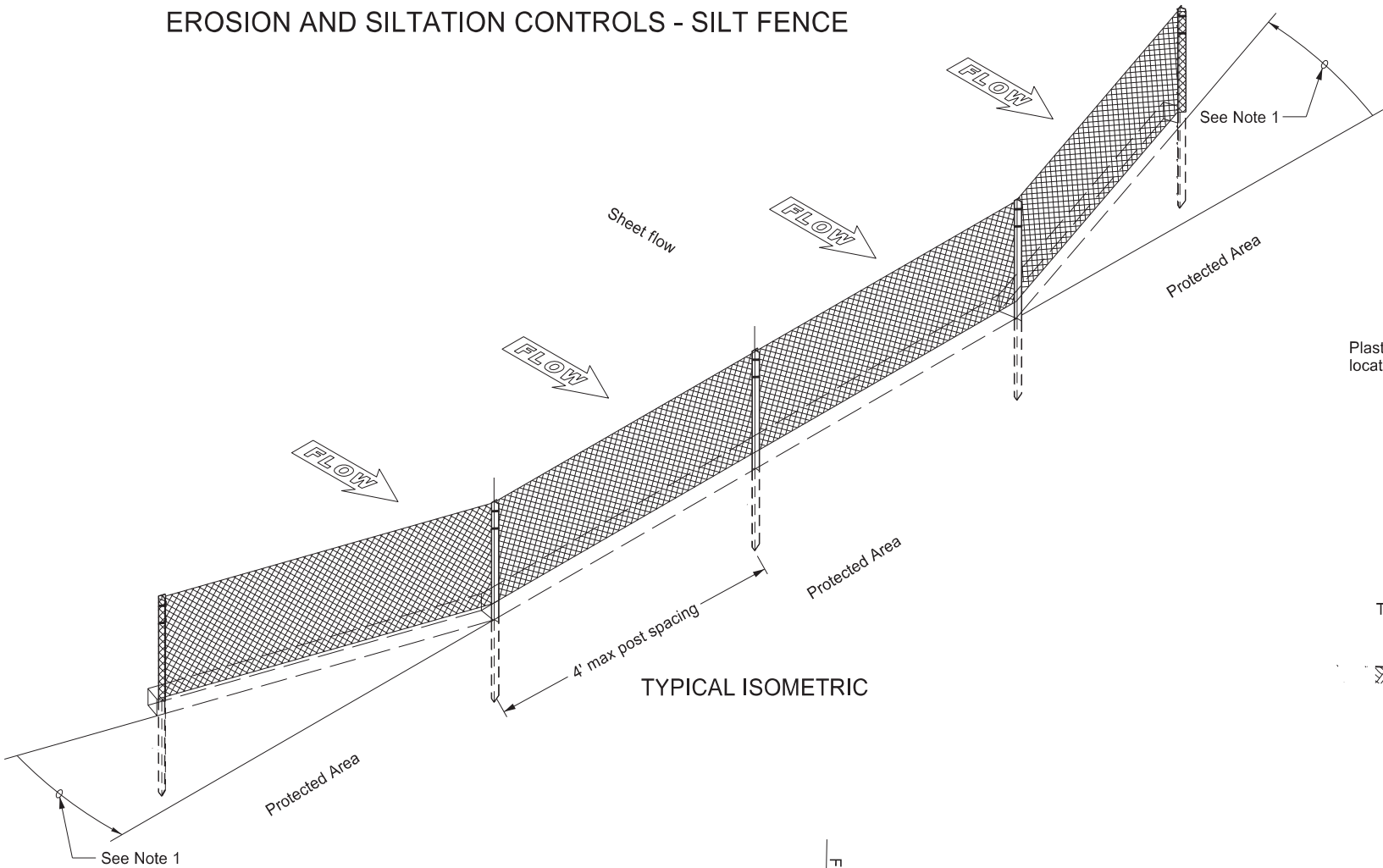


08/27/25

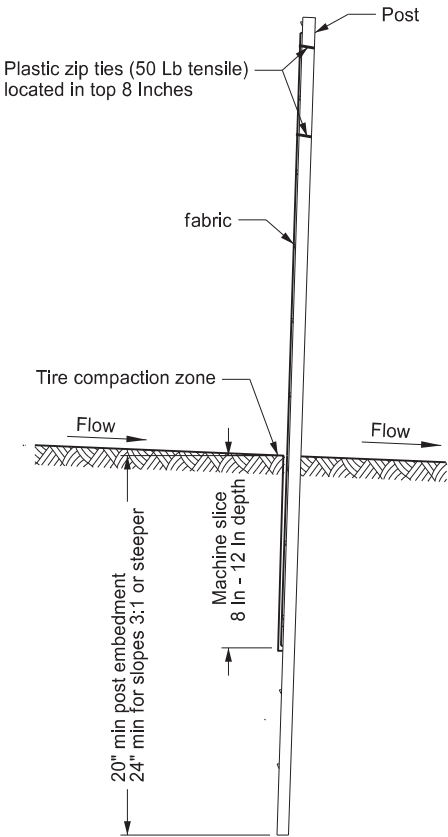
EROSION AND SILTATION CONTROLS - SILT FENCE



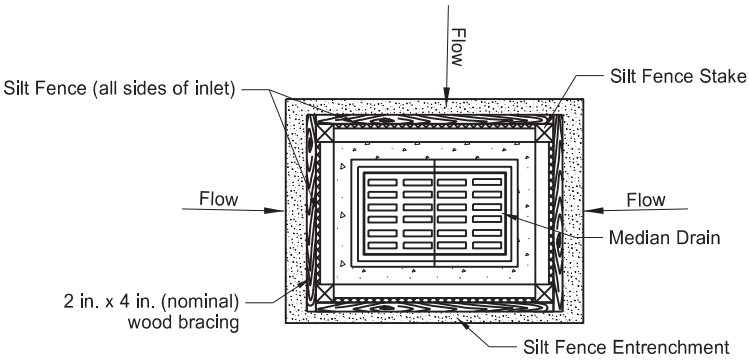
HAND PLACED INSTALLATION DETAIL
Minimize disturbance of ground around trench and smooth surface after excavation to avoid concentrating flows. Compact to prevent undercutting flows.



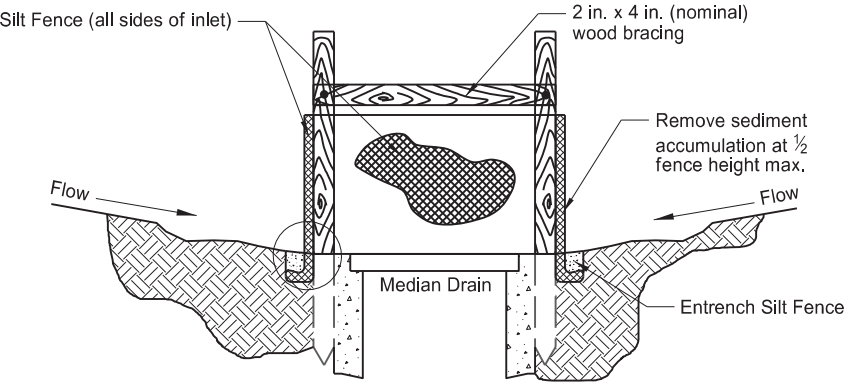
TYPICAL ISOMETRIC



MACHINE SLICED INSTALLATION DETAIL

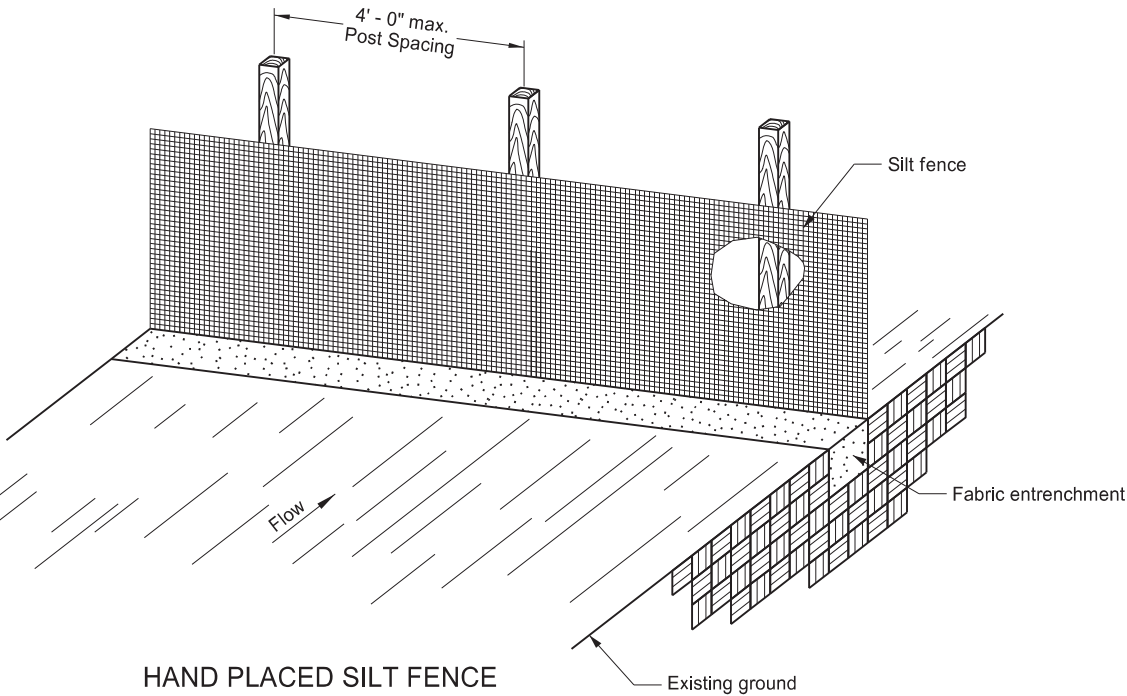


PLAN VIEW



PROFILE VIEW

SILT FENCE PROTECTION
(MEDIAN OR DITCH INLET)



HAND PLACED SILT FENCE

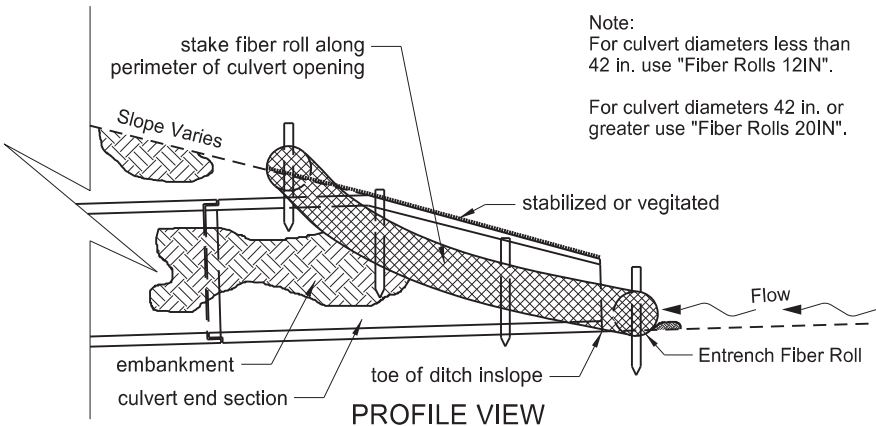
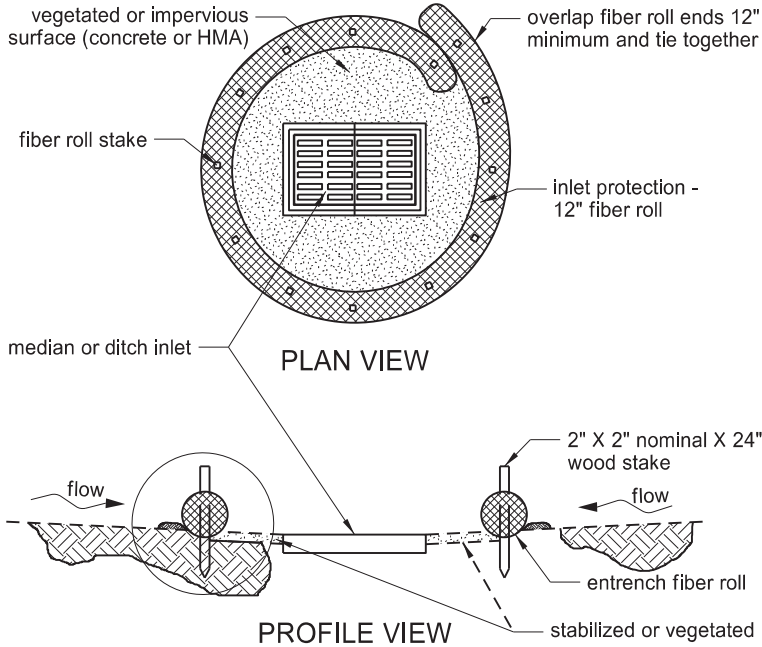
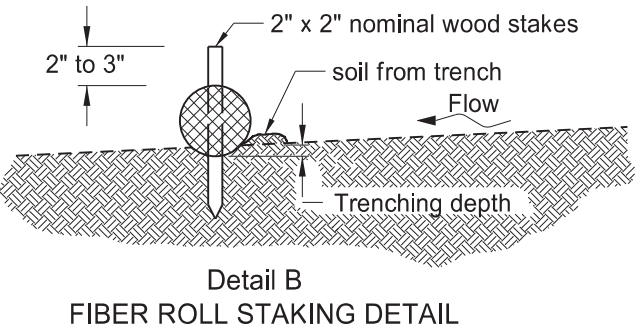
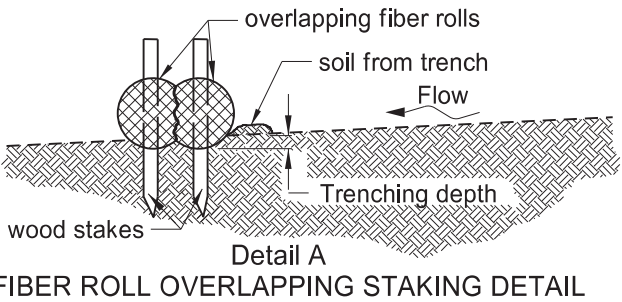
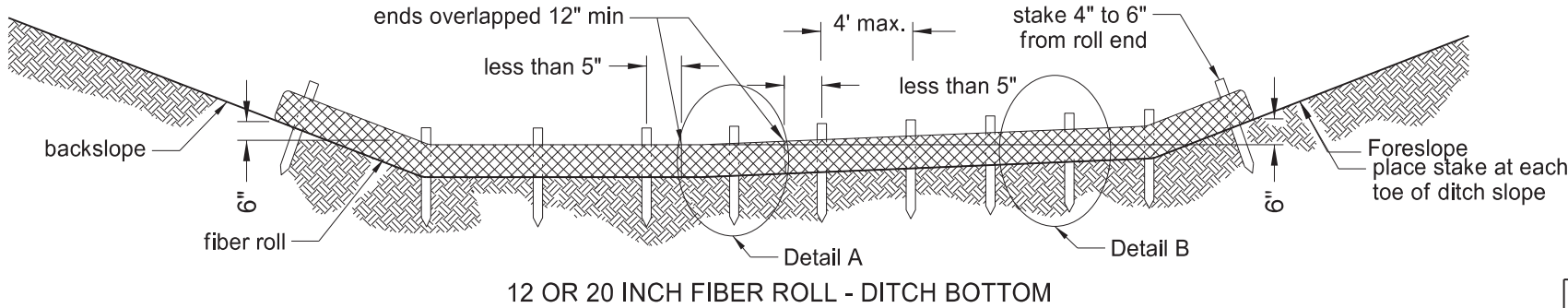
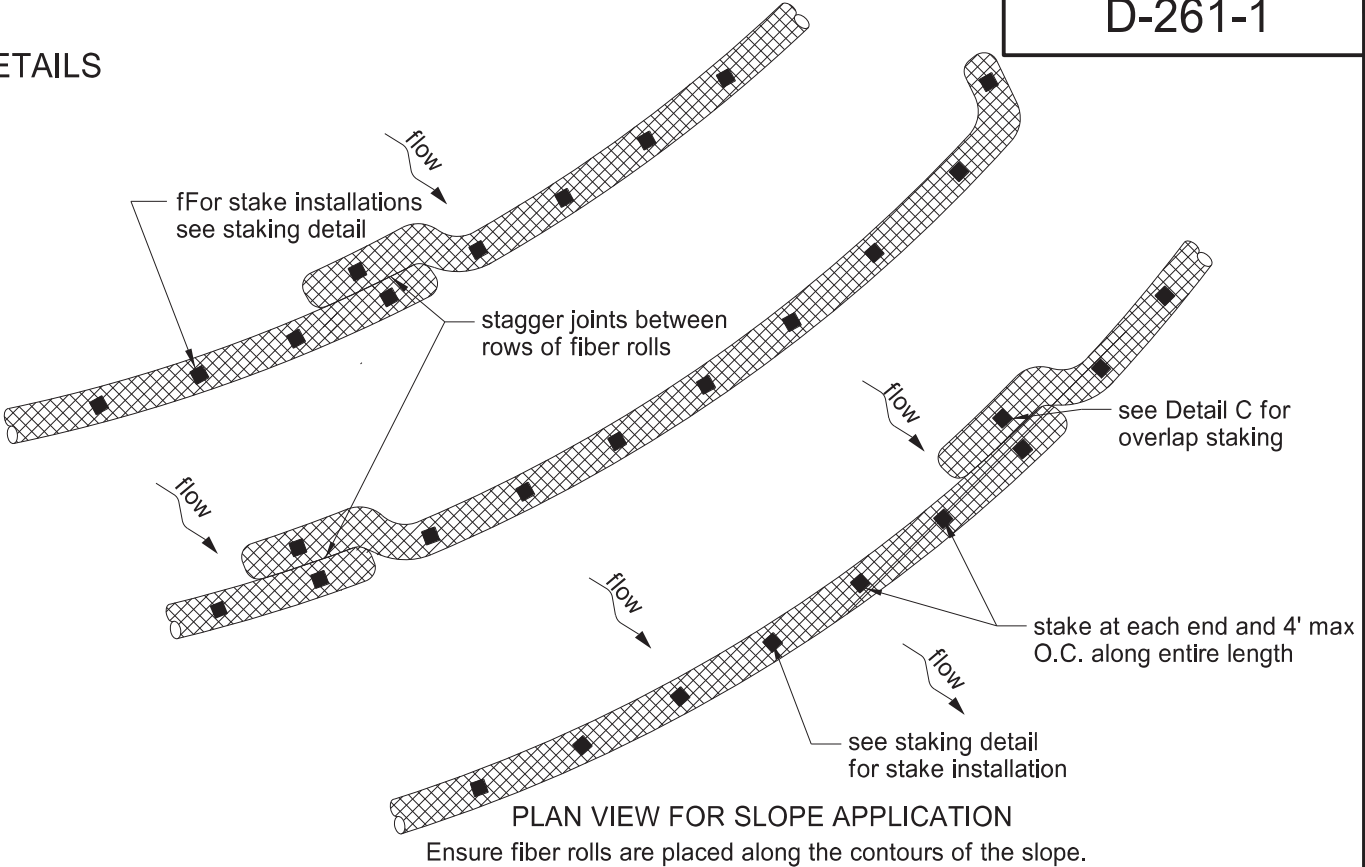
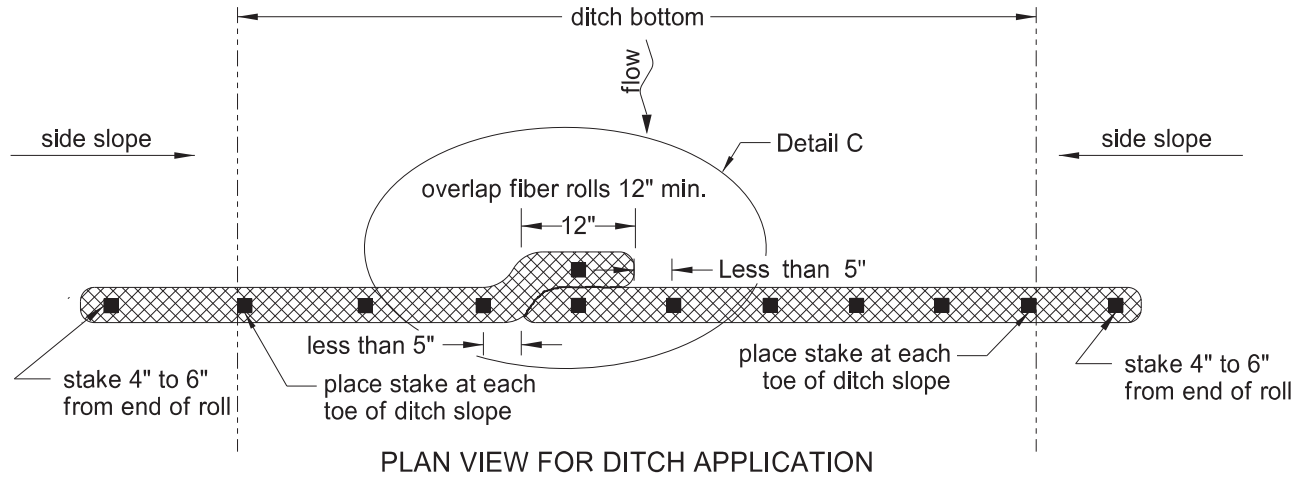
- NOTES:
1. Install the ends of the silt fence to point slightly upslope to prevent sediment from flowing around the ends of the fence.
 2. Place splices outside low spots.
 3. Do not embed silt fence placed in standing water.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Standard drawing resulted from splitting standard D-708-2
06-27-16	Revised details & added new ones
08-27-19	New Design Engineer PE Stamp
07-22-25	Matched revised silt fence specs
09-04-25	Added median-ditch inlet protection

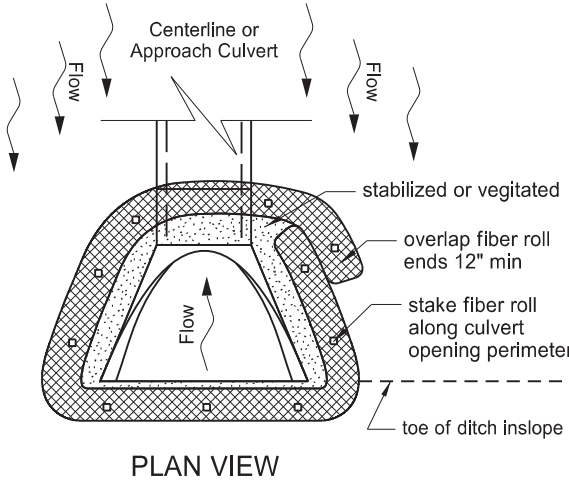


09/04/25

EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS



Note:
For culvert diameters less than 42 in. use "Fiber Rolls 12IN".
For culvert diameters 42 in. or greater use "Fiber Rolls 20IN".



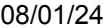
NOTE: Do not allow runoff to run under or around roll.

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

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.
08-27-19	New Design Engineer PE Stamp.
04-22-24	Slope Plan View-overlap change.
03-13-25	Added D-708-6 Culvert Inlet detail.
09-02-25	Added D-708-6 Inlet detail.



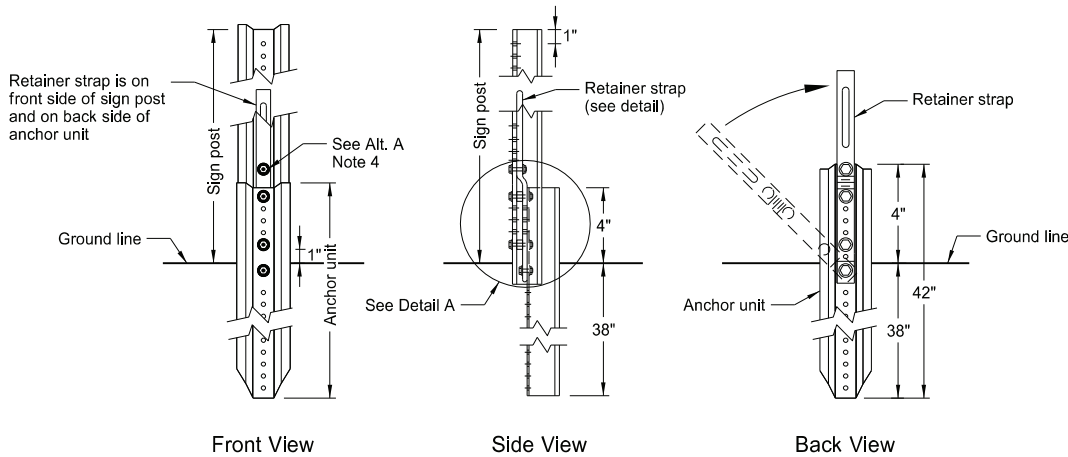
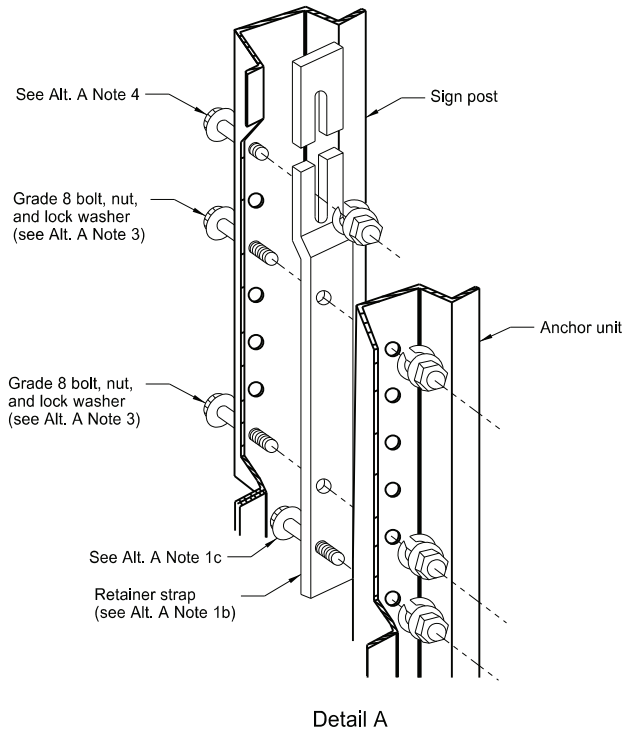
09/02/25



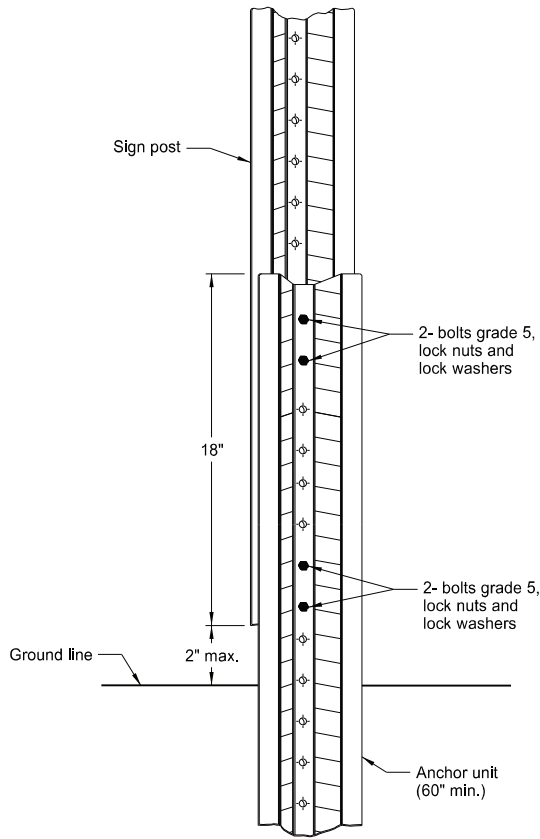
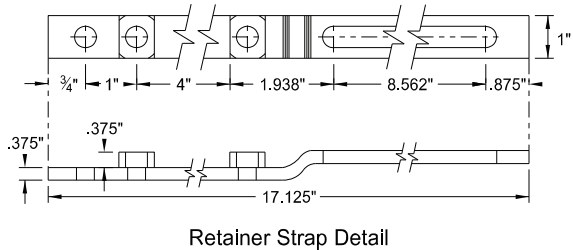
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

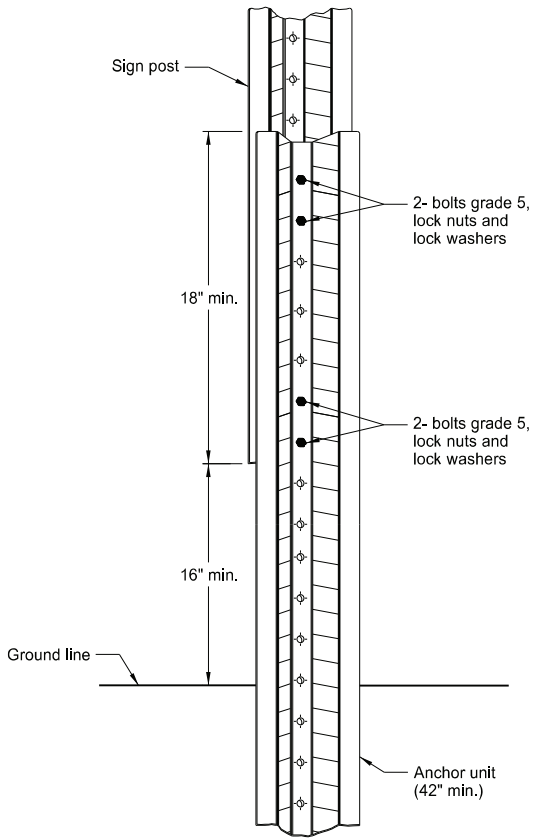
U-Channel Post



Breakaway U-Channel Detail
Alternate A
Install a maximum of 2 posts within 7'.



Breakaway U-Channel Splice Detail
Alternate B
(2.5 and 3 lb/ft)
Install a maximum of 3 posts within 7'.



Breakaway U-Channel Splice Detail
Alternate C
(2.5 and 3 lb/ft)
Install a maximum of 3 posts within 7'.

Alternate A Steps of Installation:

- a) Drive anchor unit to within 12" of ground level.
b) Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
d) Rotate strap 90° to left.
- a) Drive anchor unit to 4" above ground.
b) Rotate strap to vertical position.
- a) 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.
b) Alternately tighten two connector bolts.
- Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
- Properly nest base post, strap, and sign post. 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.

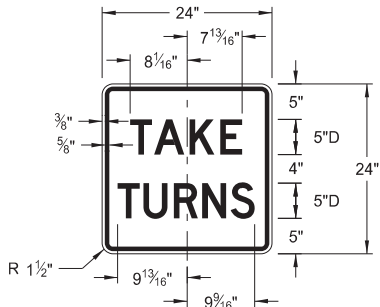
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature



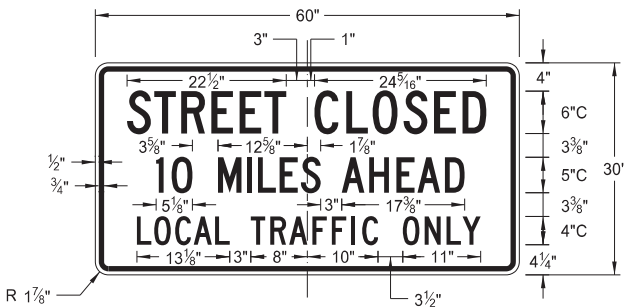
08/01/24

CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS

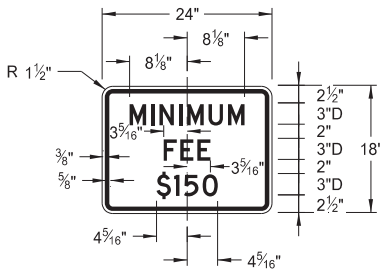
D-704-10



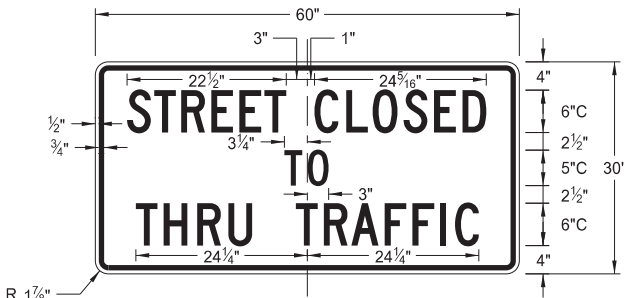
R1-50P-24
Legend: black (non-refl)
Background: white



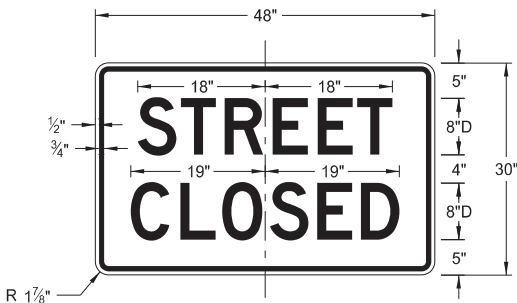
R11-3c-60
Legend: black (non-refl)
Background: white



R2-1aP-24
Legend: black (non-refl)
Background: white



R11-4a-60
Legend: black (non-refl)
Background: white



R11-2a-48
Legend: black (non-refl)
Background: white

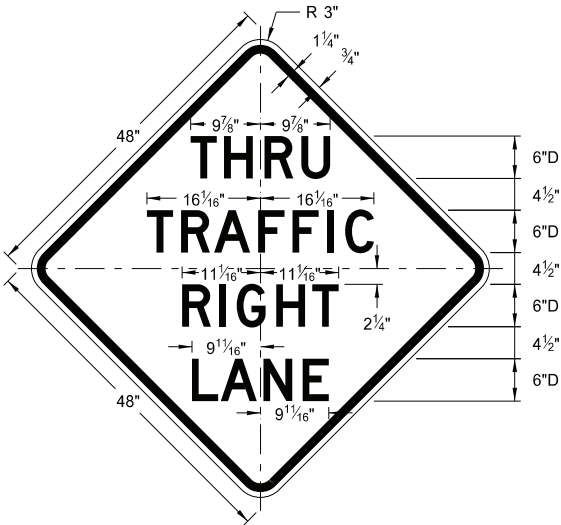
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



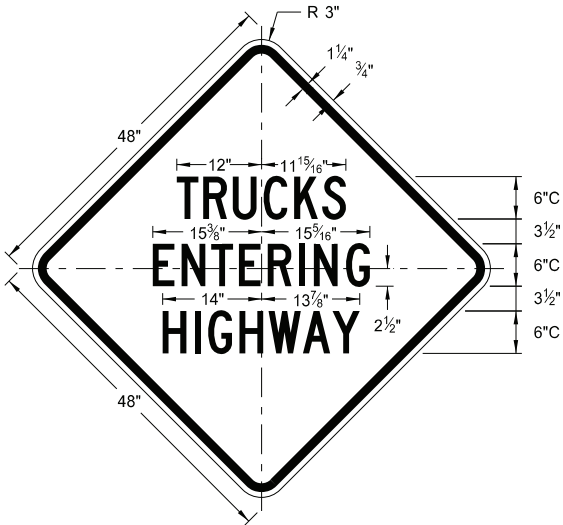
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

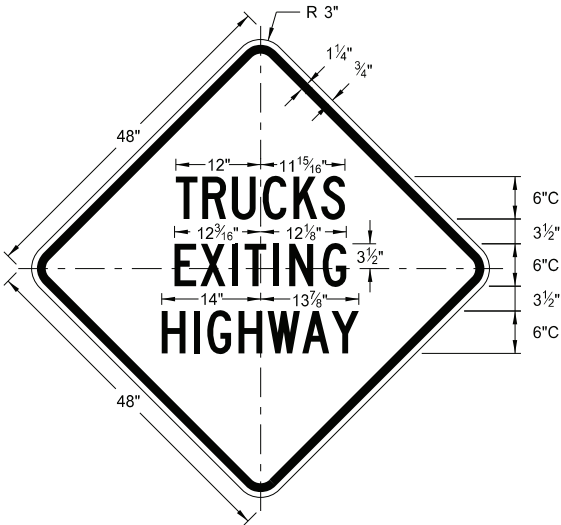
* DISTANCE MESSAGES



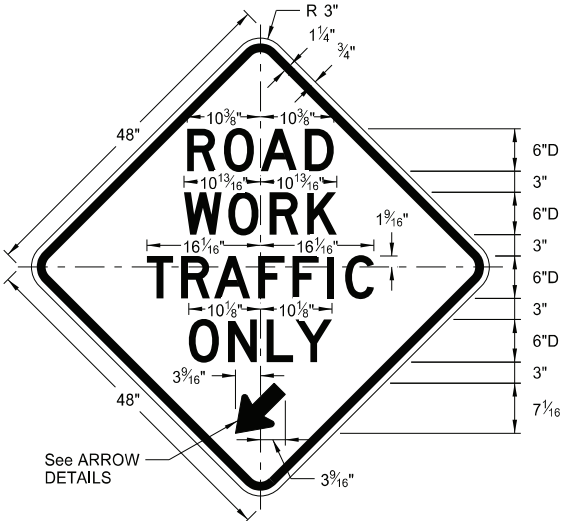
W5-8-48
Legend: black (non-refl)
Background: orange



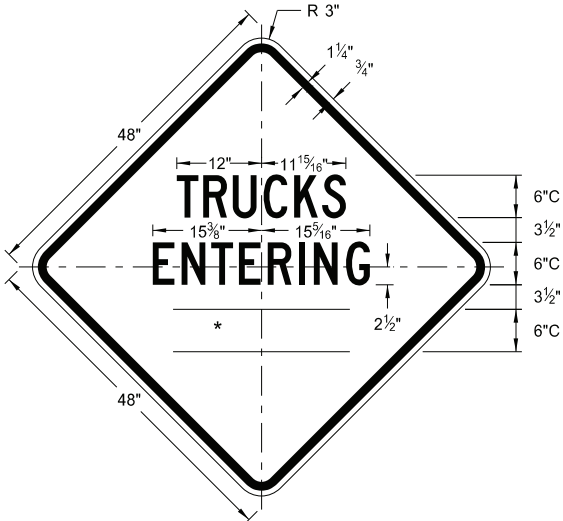
W8-53-48
Legend: black (non-refl)
Background: orange



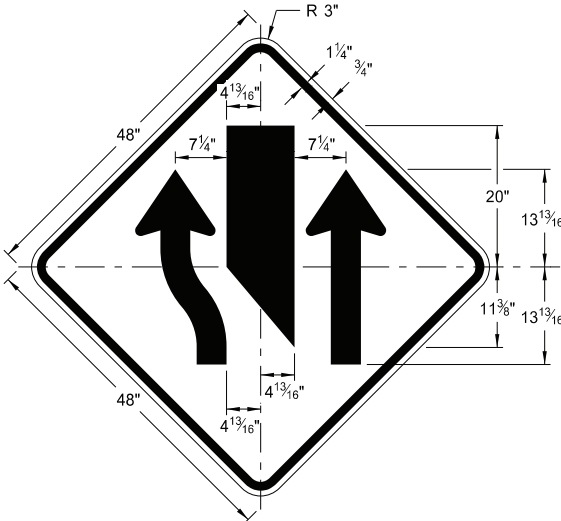
W8-56-48
Legend: black (non-refl)
Background: orange



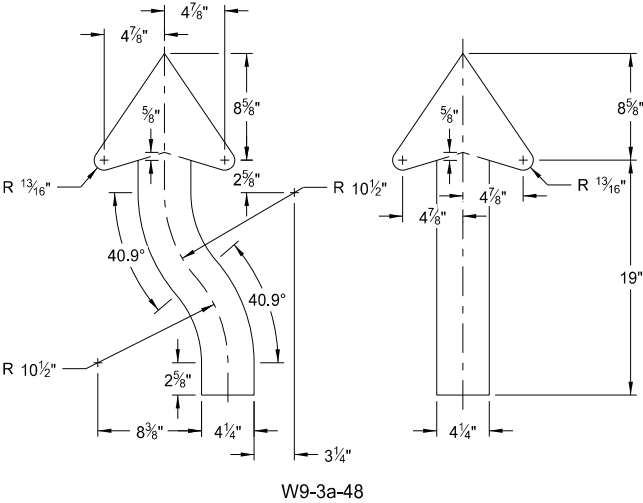
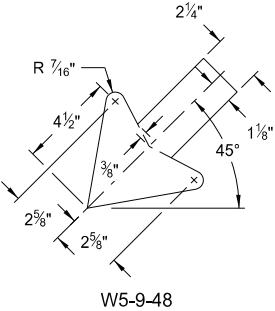
W5-9-48
Legend: black (non-refl)
Background: orange



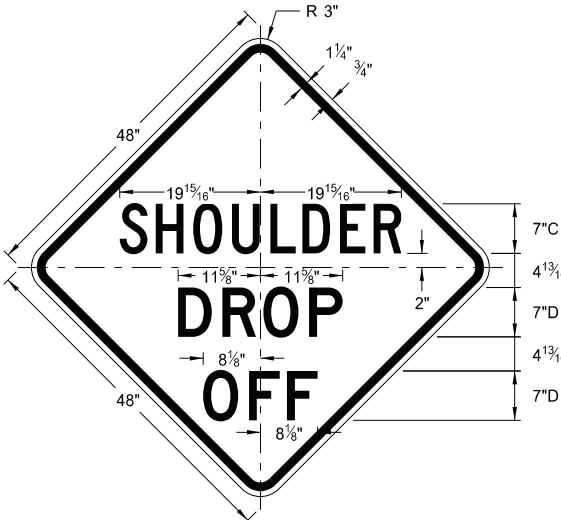
W8-54-48
Legend: black (non-refl)
Background: orange



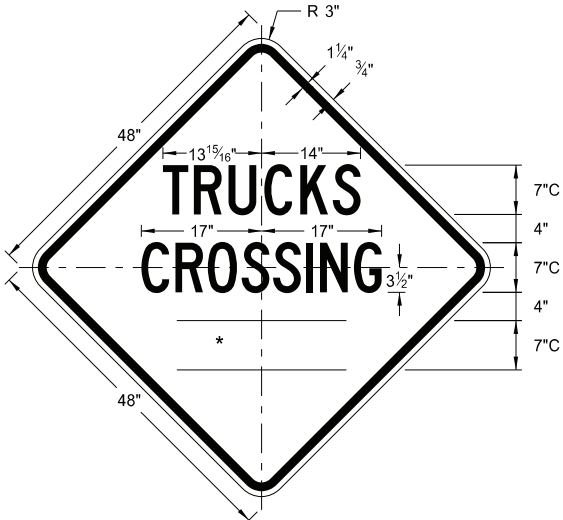
W9-3a-48
Legend: black (non-refl)
Background: orange



ARROW DETAILS



W8-9a-48
Legend: black (non-refl)
Background: orange



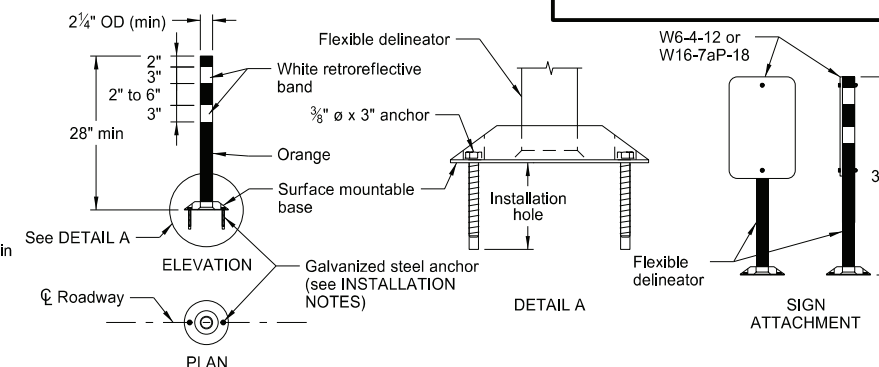
W8-55-48
Legend: black (non-refl)
Background: orange

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp
8-01-24	Electronic Stamp/Signature



08/01/24

D-704-13

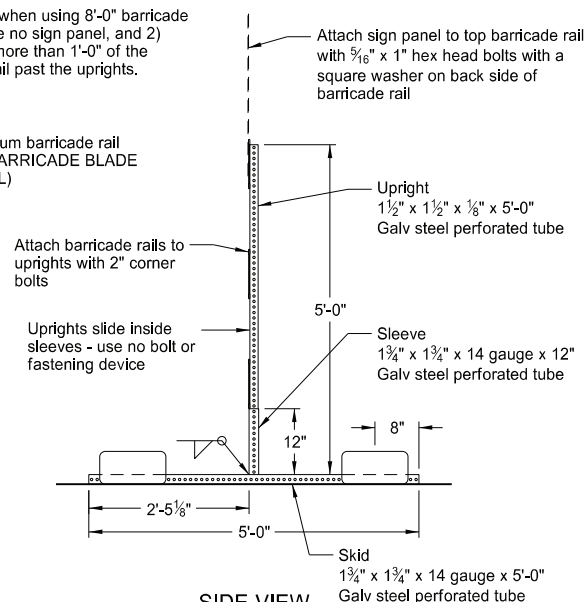


FLEXIBLE DELINEATOR

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

INSTALLATION NOTES:

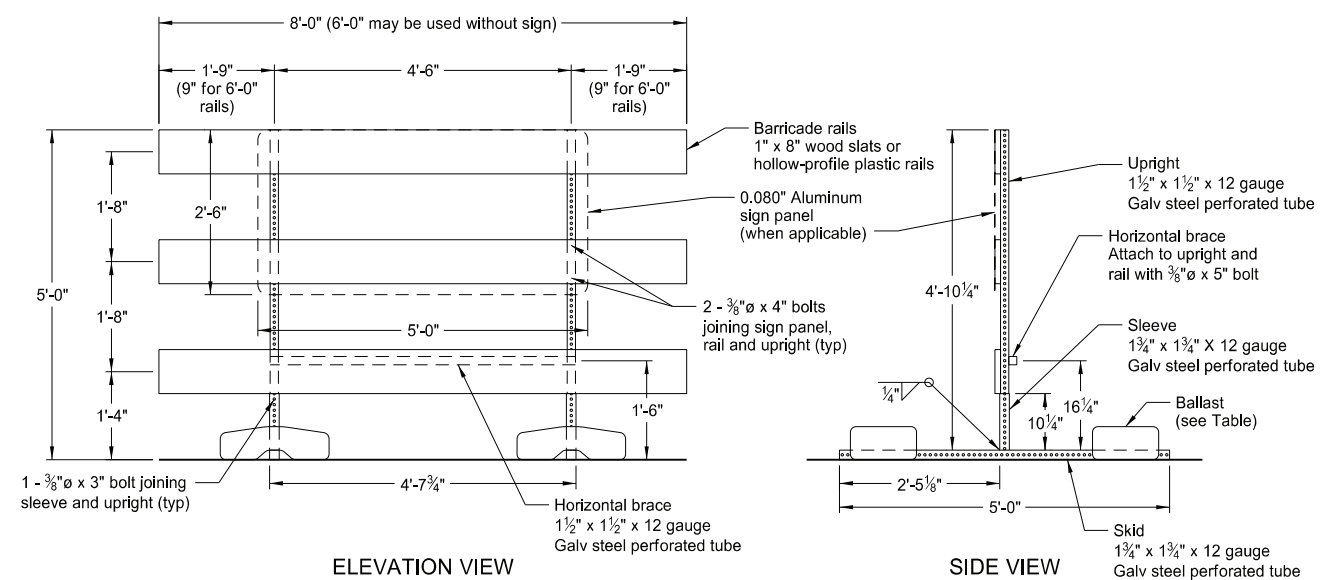
1. Drill installation holes to diameter and depth required by manufacturer's specifications.
2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
3. In lieu of bolted down base, use an 8" x 8" butyl pad or hot melt butyl. Remove butyl as close as possible to pavement surface.



BARRICADE BLADE DETAIL

ELEVATION VIEW

SIDE VIEW



ELEVATION VIEW

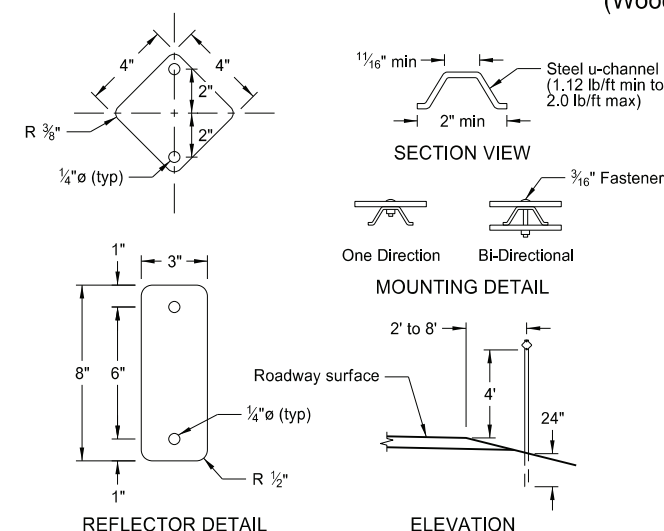
BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

SIDE VIEW

MINIMUM BALLAST
(each side of barricade support)

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

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

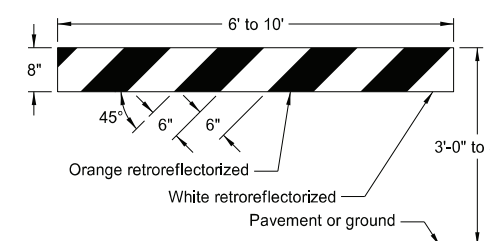


REFLECTOR DETAIL

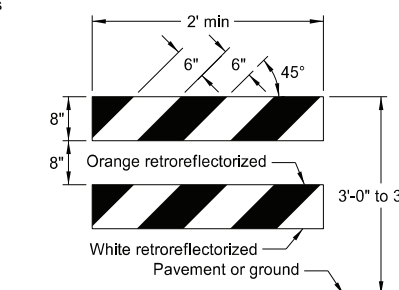
ELEVATION

DELINEATORS

NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", use a rail stripe width of 4".

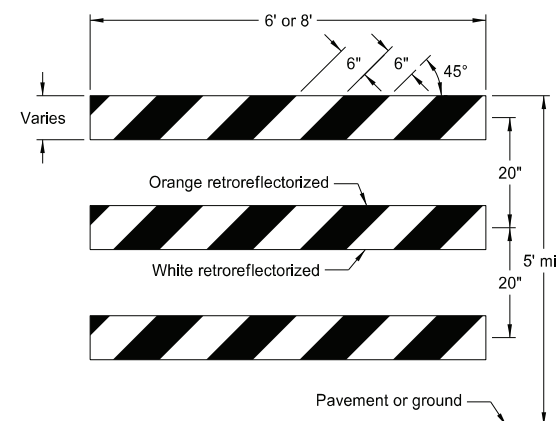


TYPE | BARRICADE



TYPE II BARRICADE

BARRICADE RAIL DETAILS



TYPE III BARRICADE

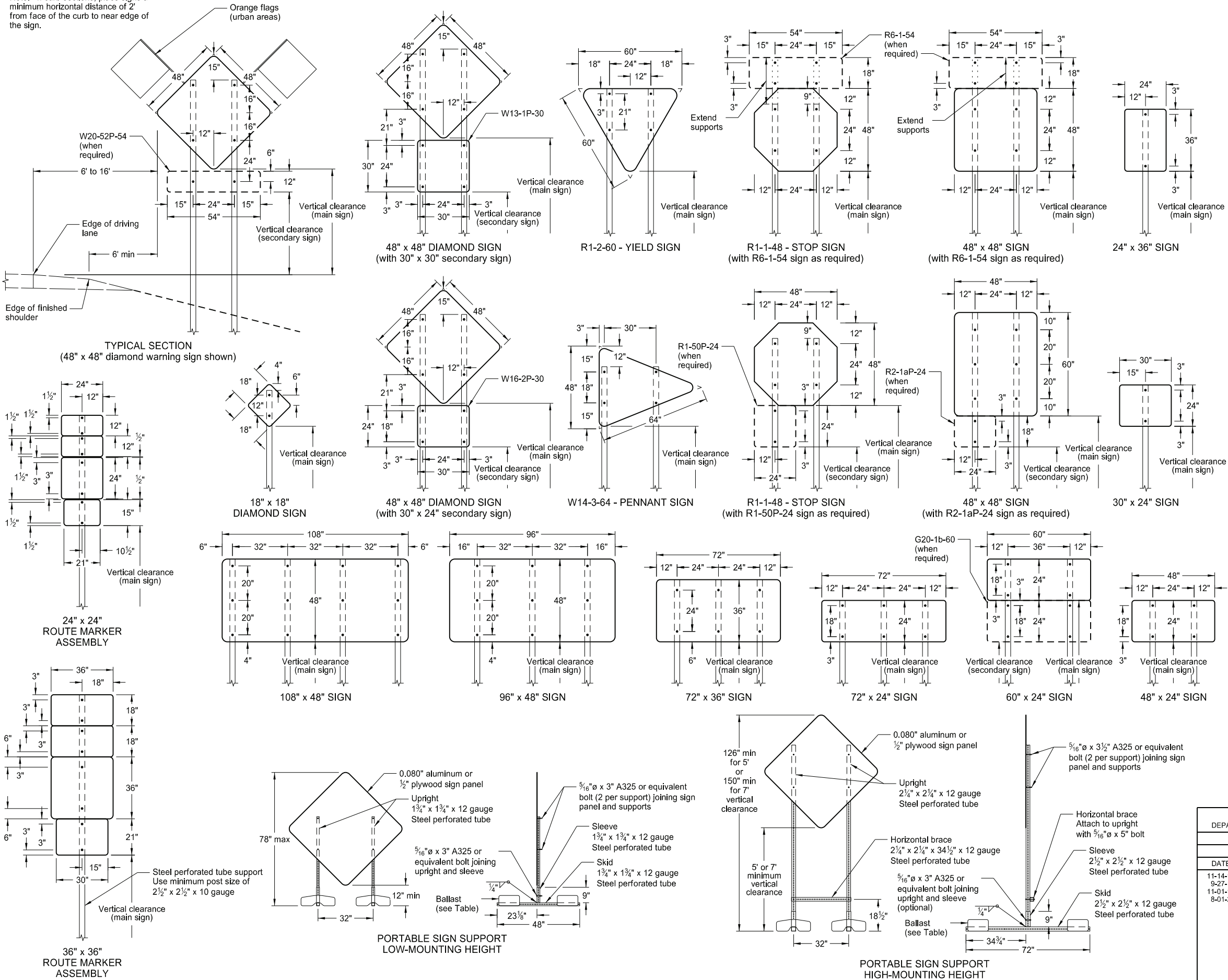
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
11-01-19	Revised details for Flexible Delineator
8-01-24	Electronic Stamp/Signature



08/01/24

CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



NOTES:

1. Sign Supports: Galvanize or paint supports. 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, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH.

Place signs over 50 square feet on 2½" x 2½" perforated tube supports as a minimum.

Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.
2. Sign Panels: Provide sign panels made of 0.100" aluminum, ½" plywood, or other approved material, except where noted. Punch all holes round for ⅜" bolts.
3. Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on 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 stated above.

Provide a minimum clearance of 7'-0" from the ground at the post for signs with an area exceeding 50 square feet.

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

Use of low-mounting height (minimum 12" vertical clearance) portable signs for 5 days or less, is allowed 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. Use of R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 is allowed for longer than 5 days.

Restrict signs mounted on portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT details to 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. Place sandbags at or near the ends of skids.

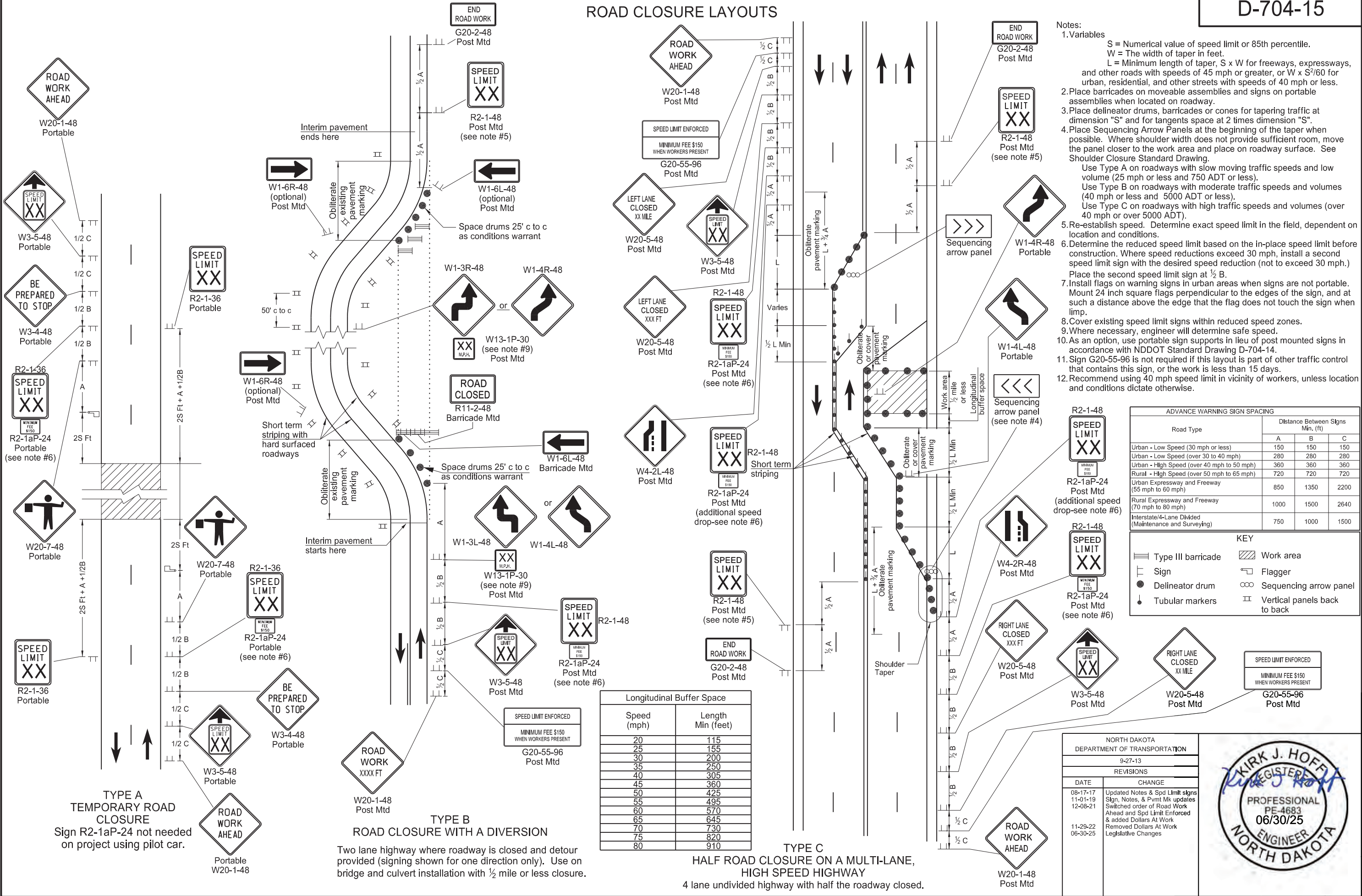
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
REVISIONS	
DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail
8-01-24	Electronic Stamp/Signature



08/01/24

ROAD CLOSURE LAYOUTS

D-704-15

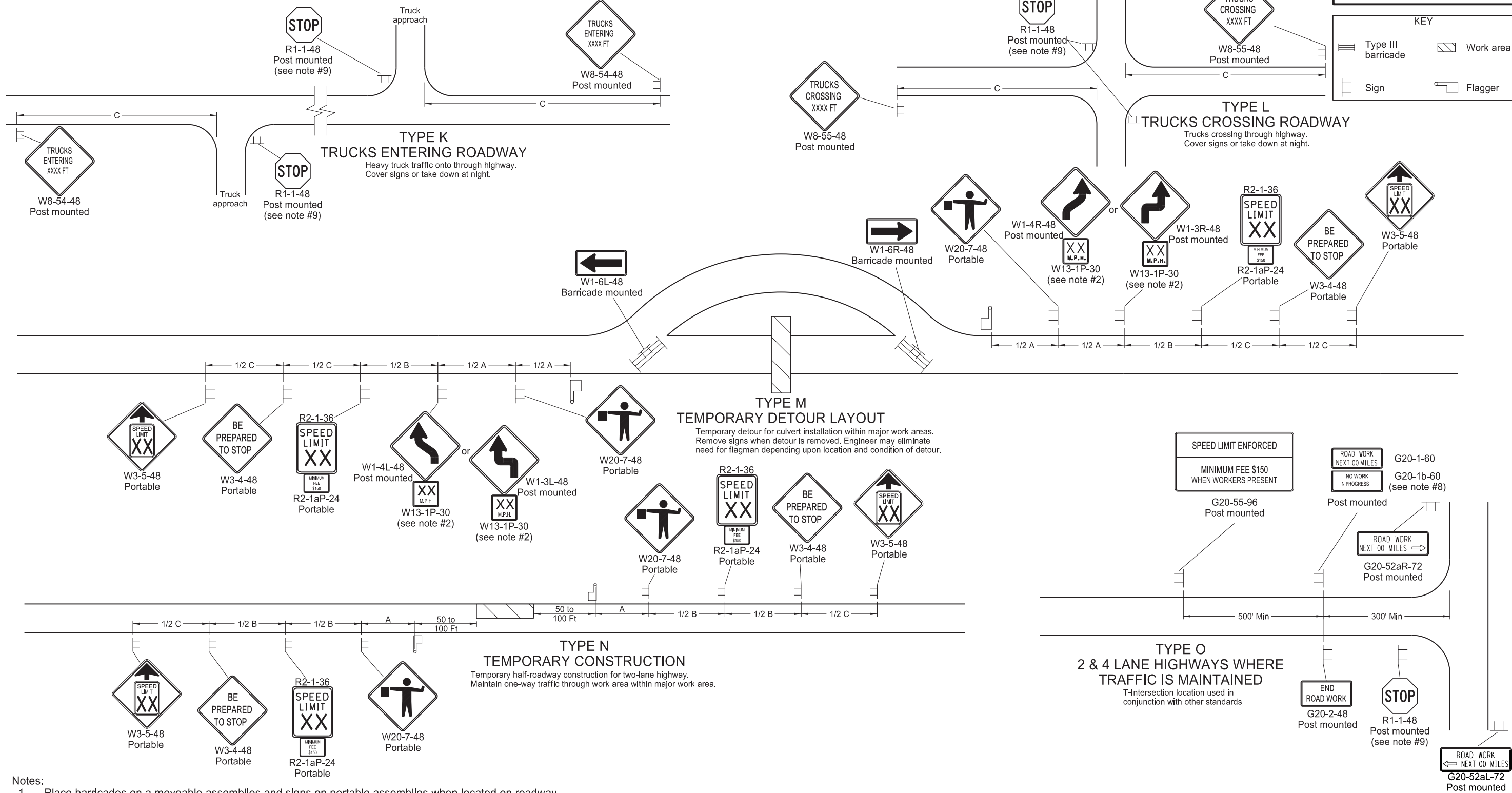


NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
9-27-13
REVISIONS
DATE CHANGE
08-17-17 Updated Notes & Spd Limit signs
11-01-19 Sign, Notes, & Pmnt Mk updates
12-08-21 Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22 Removed Dollars At Work
06-30-25 Legislative Changes



CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

D-704-22



Notes:

1. Place barricades on a moveable assemblies and signs on portable assemblies when located on roadway.
2. Where necessary, safe speed to be determined by the Engineer.
3. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B.
4. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
5. Cover existing speed limit signs within a reduced speed zone.
6. Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
7. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
8. Install sign G20-1b-60 when work is suspended for winter.
9. If existing stop sign is in place, a 48" stop sign is not required.
10. Sign G20-55-96 is not required if layout is part of other traffic control that contains this sign, or if work is less than 15 days.
11. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

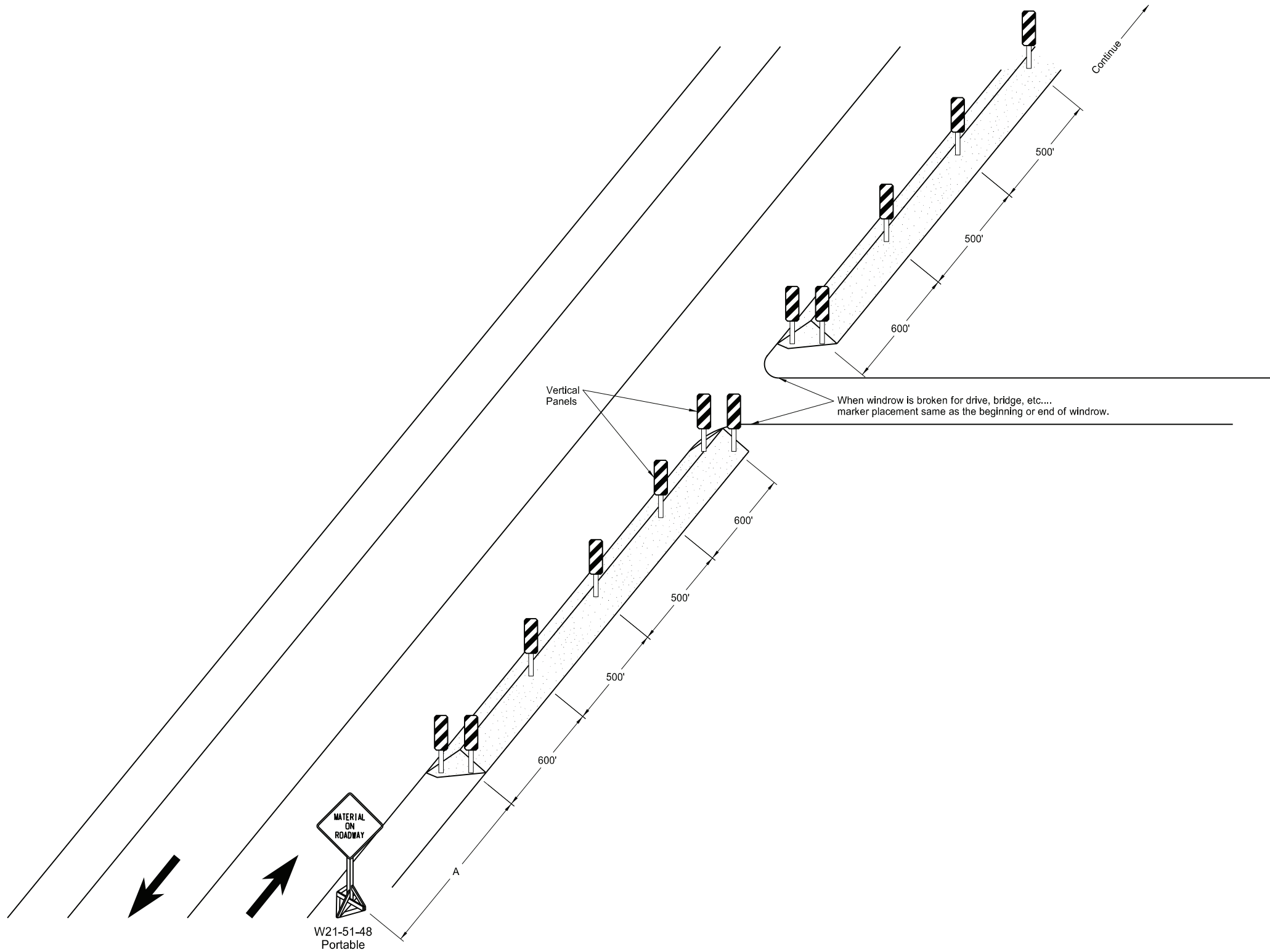
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes



WINDROW MARKING

D-704-30



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 (55 mph to 60 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

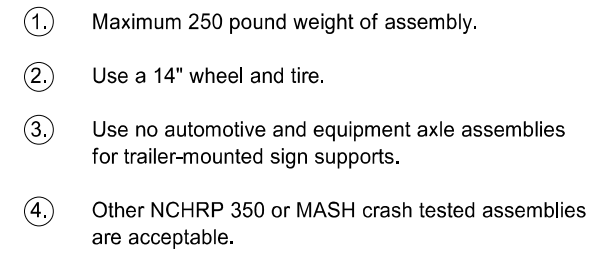
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-24-14	Revised Note
8-17-17	Updated notes & sign support
11-01-19	Revised note
8-02-24	Electronic Stamp/Signature



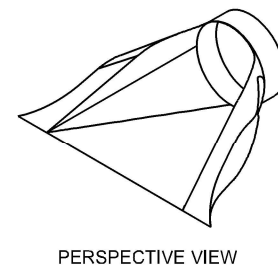
08/02/24

Notes:
As an option, use portable sign supports in lieu of post mounted sign in accordance with NDDOT Standard Drawing D-704-14.

D-704-50



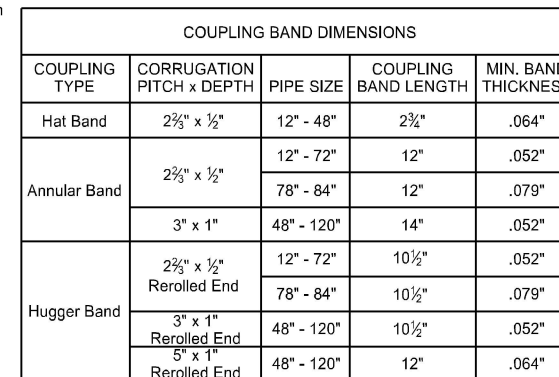
D-714-4



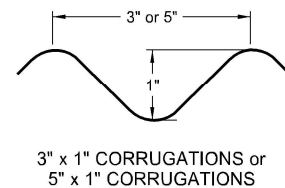
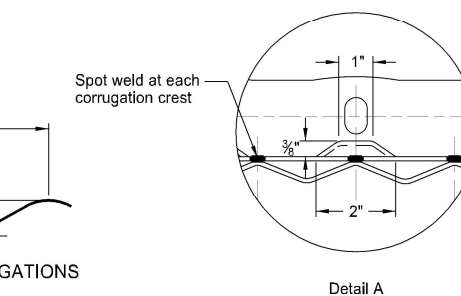
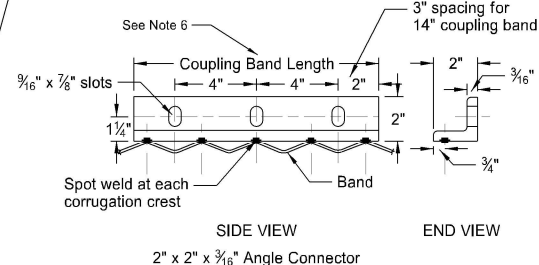
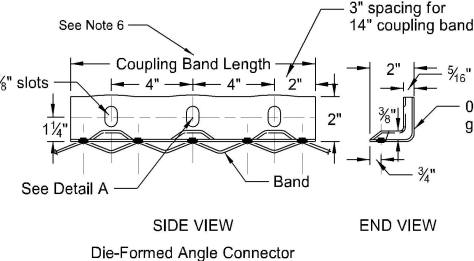
- * These sizes have 0.109" sides and 0.138" center panels.
- * * Pipe diameter is equal to dimension "D" of end section.

Manufacturers tolerances of above dimensions will be allowed.

Splices to be the lap riveted type.



- NOTES:
1. Pipes and connecting bands shall conform to applicable sections of NDDOT Standard Specifications and to AASHTO M-36.
 2. 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 to be attached by galv. 3/8" dia. bolts and nuts. Angles are to extend from pipe to the corner wing bend.
 3. 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.
 4. 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.
 5. 1/2" x 8" bolts may be used as a substitute for the 1/2" x 6" bolts shown in the details.
 6. 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.
 7. Length of spot welds shall be minimum 1/2".



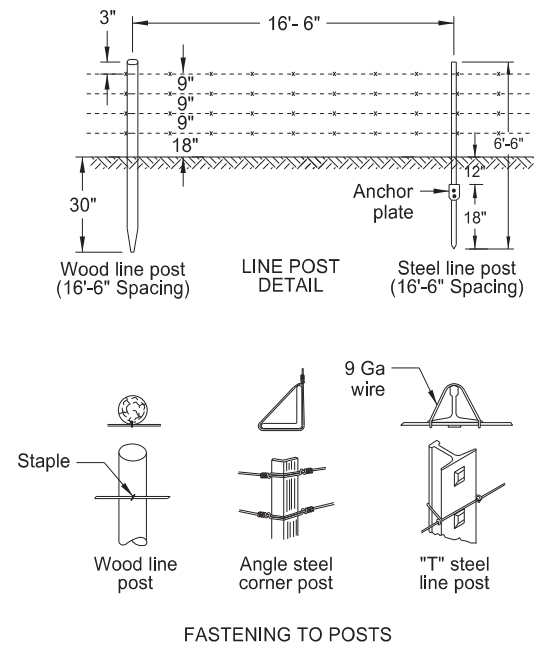
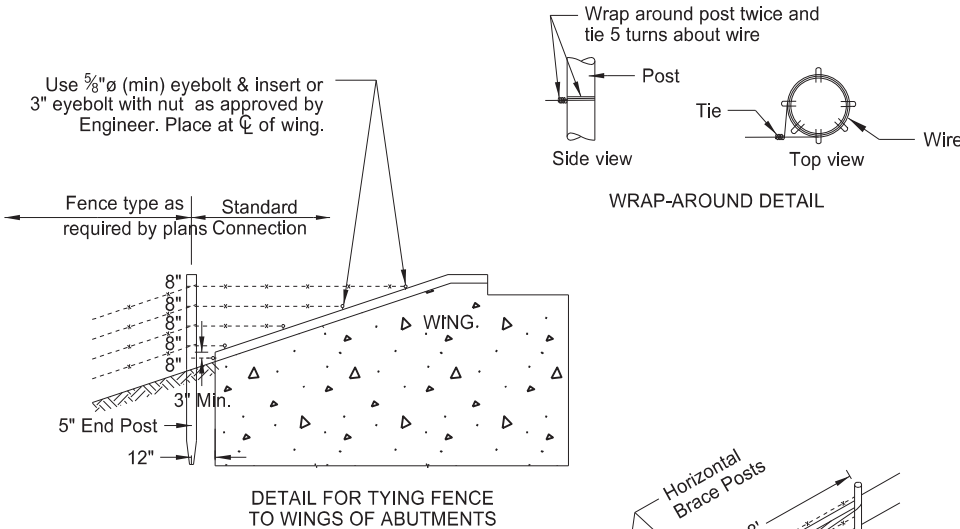
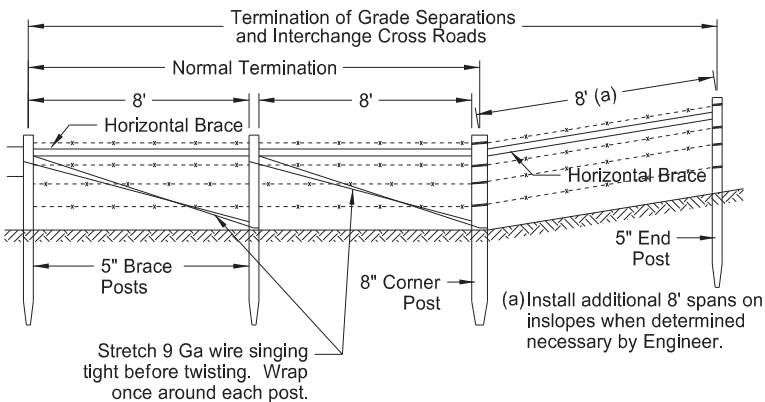
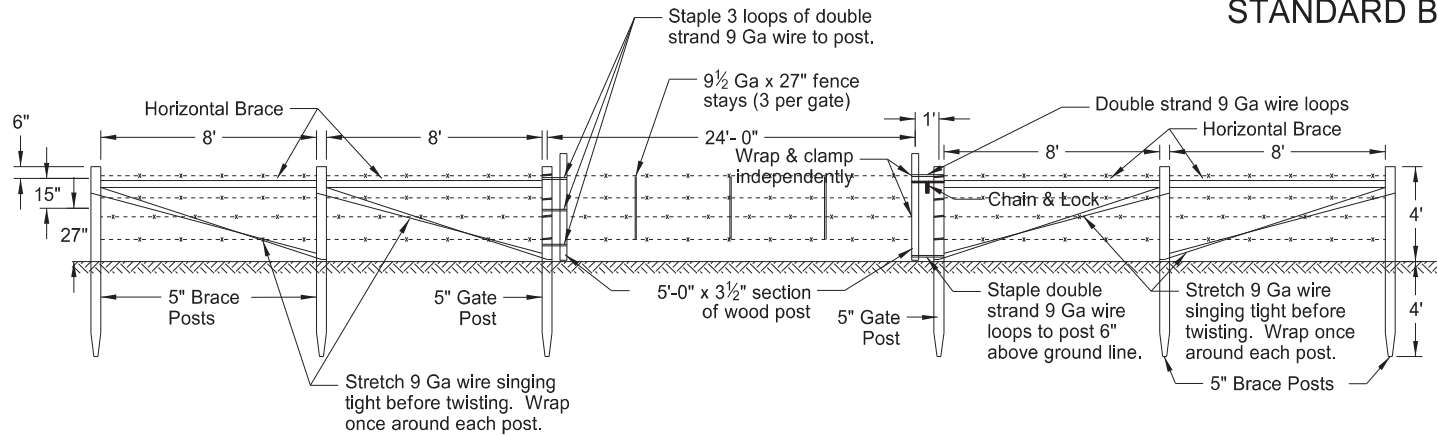
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
08-16-13	
REVISIONS	
DATE	CHANGE
01-07-14	End Section Plan View
02-27-14	3" x 1" Corrugation Detail
09-18-19	Added Perspective View Detail
09-23-22	Galvanized Thickness Table



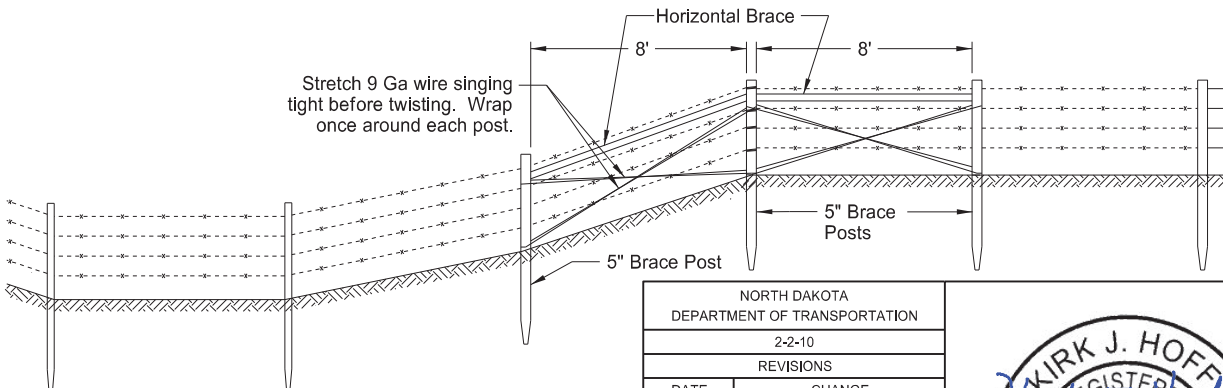
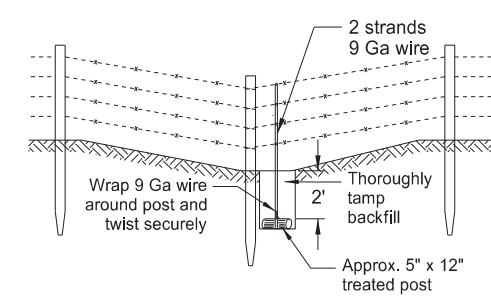
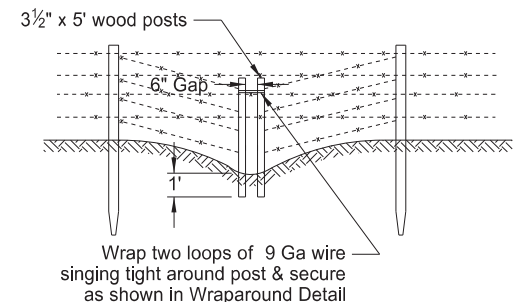
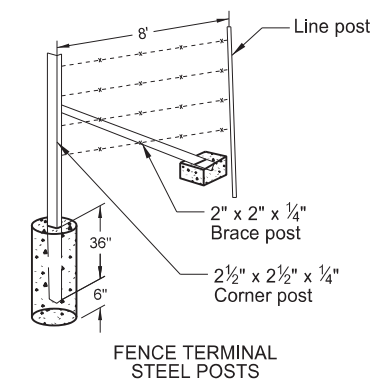
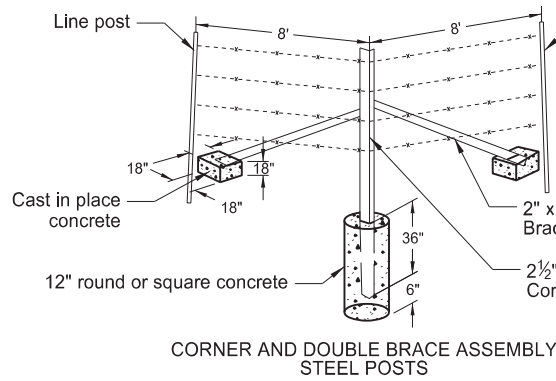
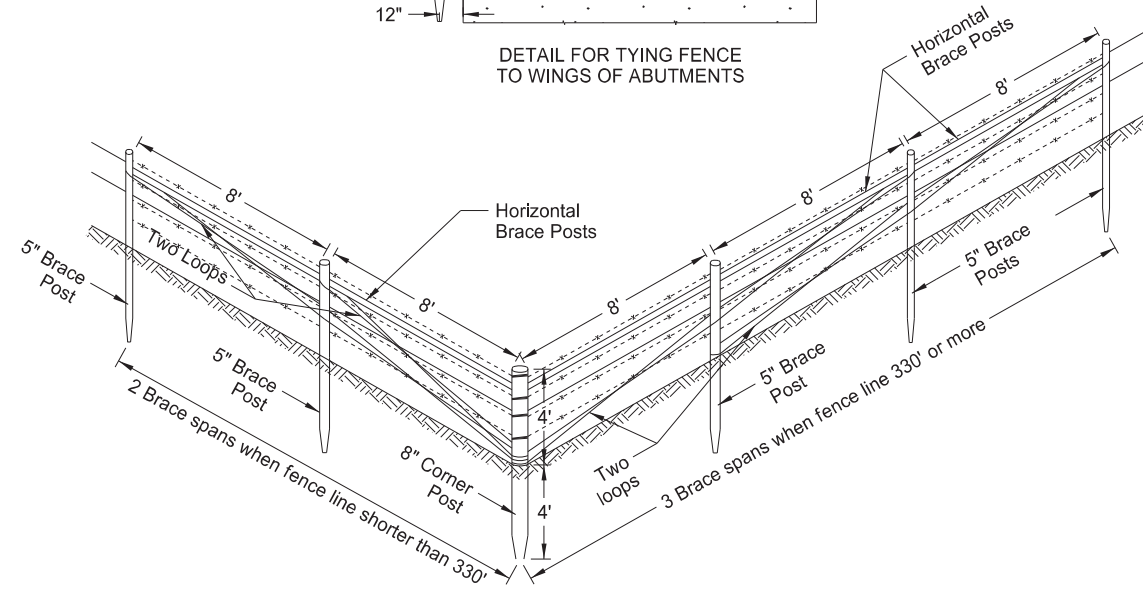
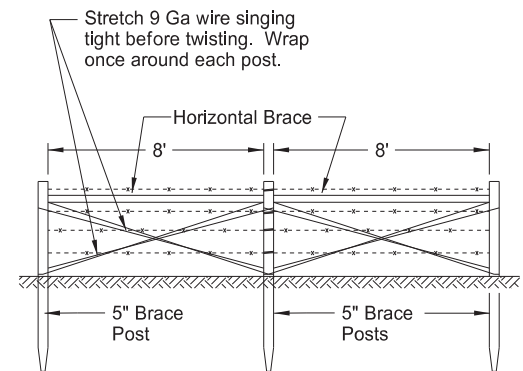
STANDARD BARBED WIRE FENCE

NOTES

- 1. No deduction in measured pay length of fence made for gates, corner assemblies, double brace assemblies, fence terminals, or depression fencing. Include all costs for abutment fencing in the price bid for fencing bid items.
- 2. Install double brace assemblies at locations shown on the plans or established by the Engineer. Place adjacent fence terminals, corner assemblies, or double brace assemblies at a maximum spacing of 1,320 feet.
- 3. Include all costs of furnishing and installing inserts and eyebolts in the unit price bid for fencing bid items. Use eyebolts galvanized according to AASHTO designation M-30; inserts of corrosion resistant material do not require galvanization. Use concrete inserts capable of developing the full strength of the 5/8" diameter threaded eyebolt, when installed in concrete.
- 4. Determine post type used, either wood or steel, unless otherwise specified in the plans.
- 5. Include the cost of bracing at vehicle gates in the price bid for "Vehicle Gate."



POST SIZES					
USE OF POST	TREATED WOOD		STEEL		
	Post dia.	Post length	Post length	Post wt. Lbs./Ft.	Anchor wt. Lbs.
Line post	3 1/2"	6'-6"	6'-6"	1.33	0.67
Corner post	8"	8'	7'	4.10	(Conc.)
End post	5"	8'			
Brace post	5"	8'	7'	3.19	(Conc.)
Gate post	5"	8'			
Horizontal brace	4"	8'	As approved by the Engineer		



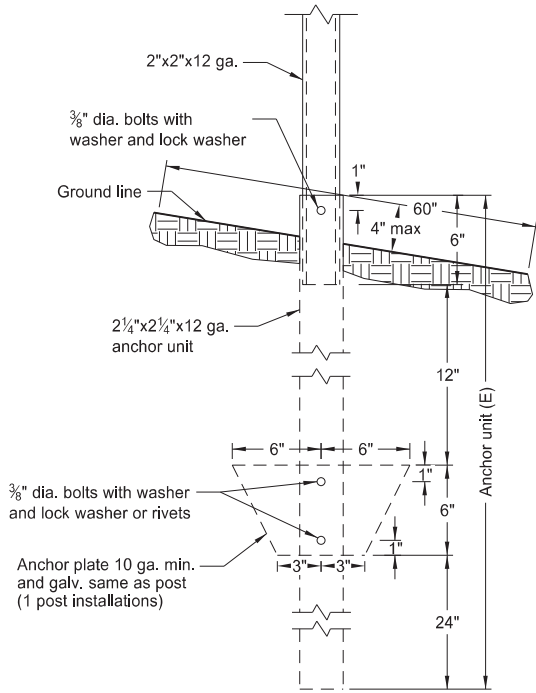
Use double brace installation, as shown, on opposite side of depression.

Decrease line post spacing as needed due to terrain.

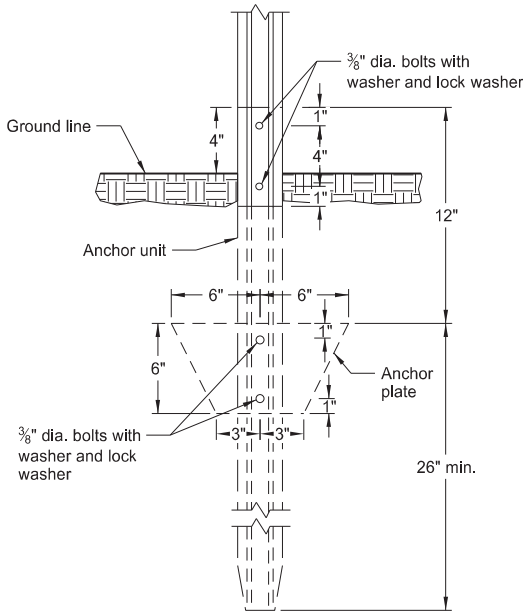
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-2-10	
REVISIONS	
DATE	CHANGE
10-02-12	Notes, steel assemblies/posts.
11-25-13	Revised Vehicle Gate.
10-17-17	Updated to active voice.
02-23-23	Revised post spacing/brace size.



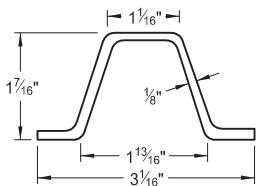
OBJECT MARKERS



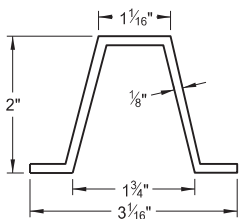
Perforated Tube Anchor Unit Assembly



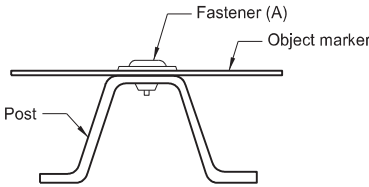
U-Channel Anchor Unit Assembly



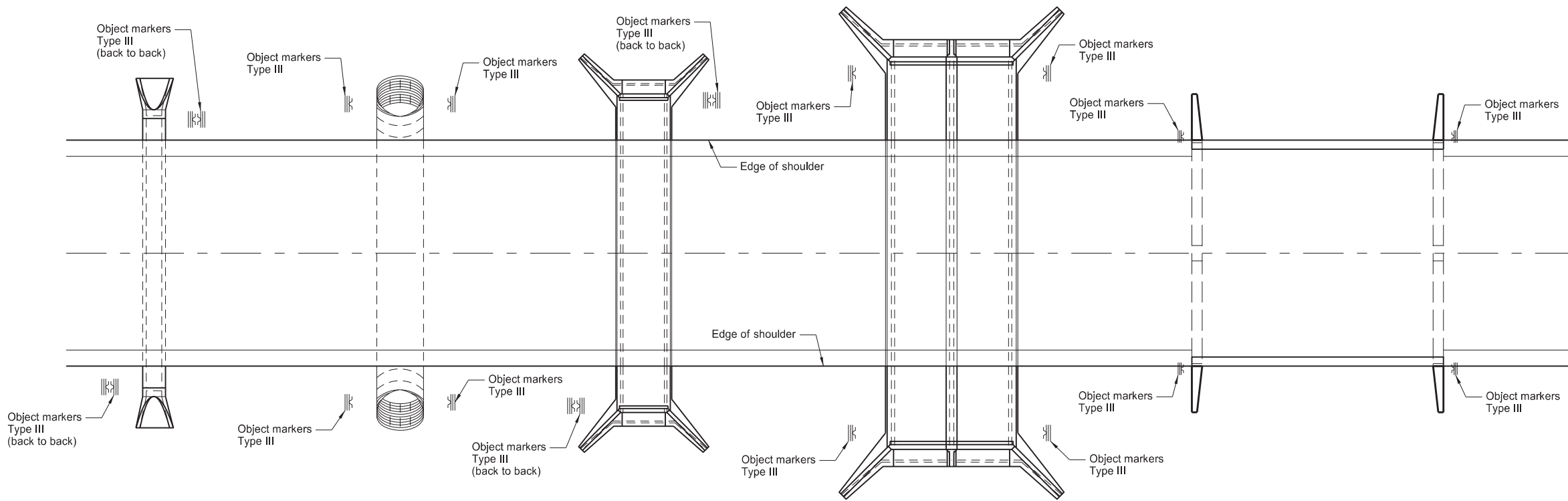
Steel Post Detail
Approx. 2 lb/ft



Aluminum Post Detail
Approx. 0.88 lb/ft



Fastener Detail



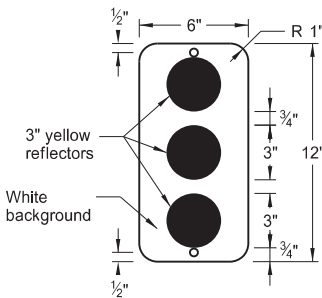
Pipe Culverts
10' max

Pipe Culverts
greater than 10'

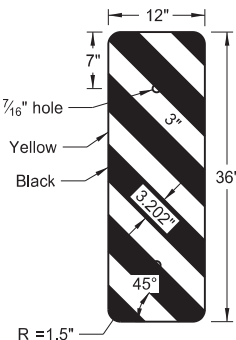
Box Culverts
10' max

Box Culverts
greater than 10'

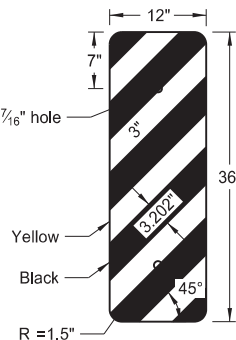
Bridges (B)



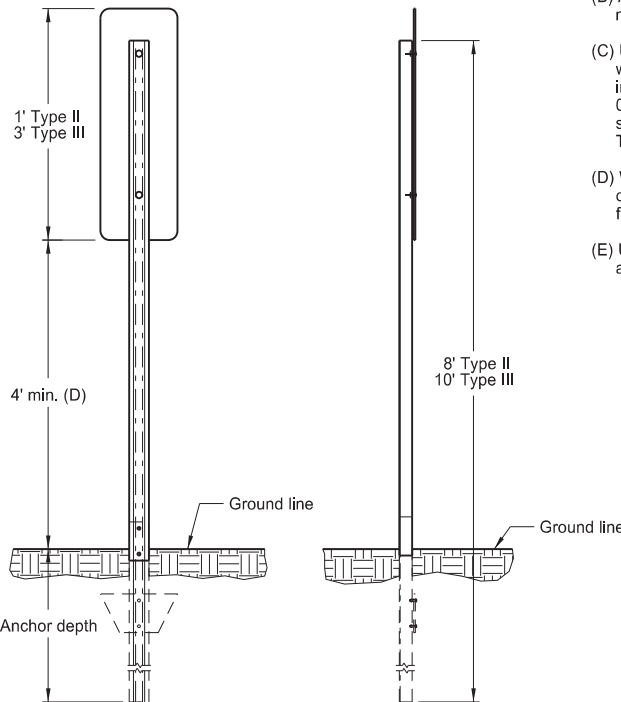
Object Marker
OM2-1V (C)
Type II



Object Marker Left
OM-3L (C)
Type III



Object Marker Right
OM-3R (C)
Type III



Object Marker
Installation Detail

Notes:

- (A) Use 3/8" dia. tension pin type or other non-rust vandal resistant fastener with min. outside dia. 1 3/16" flat washer.
- (B) At locations of approach guardrail with reflectors and end terminal with impact head object markers, do not install object markers.
- (C) Use two object markers for back to back mountings. On bridges where the distance between wheel guards is less than the approach width, mount object markers vertically on steel posts in front of the bridge railing on each side of highway to mark the horizontal clearance. Use 0.100" minimum thickness sheet aluminum for sign backing material. Use ASTM Type XI sheeting for Type III object markers and ASTM Type IV background sheeting with ASTM Type XI reflectors for Type II object markers.
- (D) When object marker is located 8' or less from shoulder or curb, provide 4' minimum vertical clearance from near edge of traveled way to bottom of sign. When located more than 8' from shoulder or curb provide 4' minimum vertical clearance from ground to bottom of sign.
- (E) Use 4" vertical clearance for anchor or breakaway base. Provide 4"x60" measurement above and below post location and back and ahead of post.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
7-18-14	Revised Note C
8-30-18	Updated notes to active voice and removed note.
9-05-19	New Design Engineer PE Stamp.
8-08-24	Electronic Stamp/Signature.



08/08/24