DESIGN DATA				
Traffic	Average Daily			
Current 2022	Pass: 10	Trucks: 15	Total: 25	
Forecast 2042	Pass: 12	Trucks: 18	Total: 30	
Clear Zone Distance: 30'		Design Speed: 45 MPH		
Minimum Sight Dist. for Stopping: N/A		Bridges: HL-93		
Sight Dist. for No Passing Zone: N/A				
Pavement Design Life N/A				
Design Accumulated One-way N/A ESALs: N/A				

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	23550	1	1

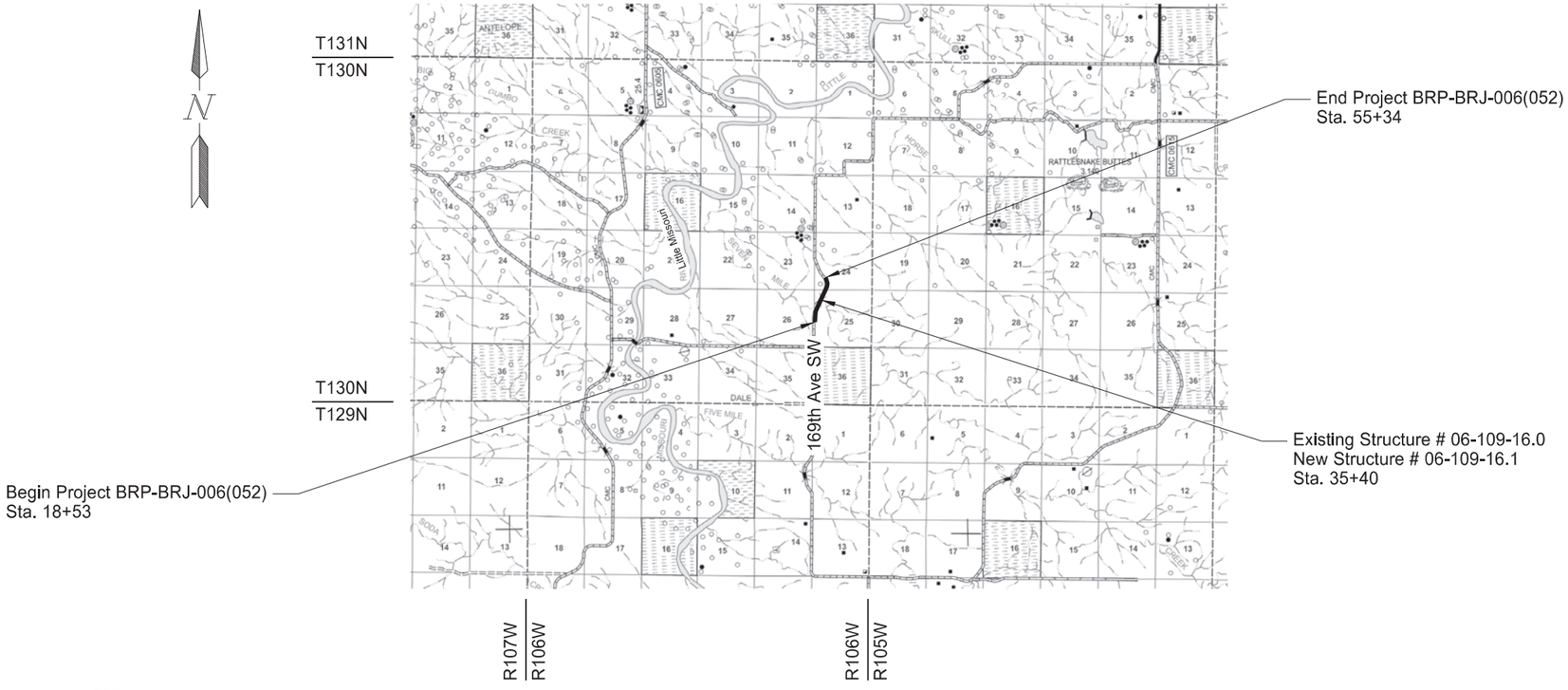
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

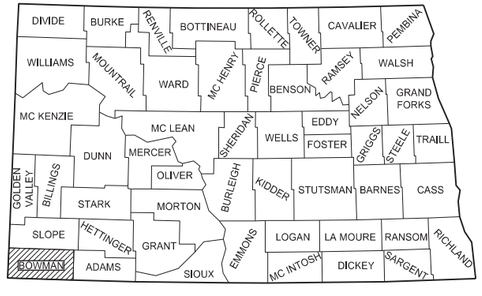
BRP-BRJ-0006(052)
PCN 23550

Bowman County
17 Miles South and 3 Miles East of Marmarth, ND
Existing Structure # 06-109-16.0
New Structure # 06-109-16.1
Structure Replacement, Grading & Incidentals

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

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
BRP-BRJ-0006(052) \ Structure Replacement	0.70	0.70





STATE COUNTY MAP

DESIGNER
Lucas Doerr
DESIGNER
Ryan Mlekoday
DESIGNER
Ryan Kleppinger

Brosz Engineering, Inc.

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

12/6/2024 11:50:12 AM lucas S:\2022proj\Bowman\2201234\Design\Plan Sheets\001TS_001.dgn

Revised 1/30/2025	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	2	1

TABLE OF CONTENTS

PLAN SECTIONS

LIST OF STANDARD DRAWINGS

Number	Description
D-101-1, 2,3,4	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20, 21	Line Styles
D-101-30, 31,32,33	Symbols
D-101-40	Cross Section Legend
D-203-8	Standard Rural Approaches
D-256-1	Erosion And Siltation Controls
D-261-1	Erosion Control - Fiber Roll Placement Details
D-704-7, 8	Breakaway Systems For Construction Zone Signs - Perforated Tube
D-704-10, 11,11A,13,15	Construction Sign Details - Regulatory Signs
D-714-1, 4,11,26	Reinforced Concrete Pipe Culverts And End Sections (Round Pipe)
D-714-22	Concrete Pipe, Cattle Pass, or Precast Concrete Box Culvert Ties
D-752-1	Standard Barbed Wire Fence

SPECIAL PROVISIONS

Number	Description
SSP 1	Temporary Erosion and Sediment Best Management Practices
SSP 2	Federal Migratory Bird Treaty Act
69(23)	Permits and Environmental Considerations
366(23)	Contract Time for Completion
378(23)	Utility Coordination
380(23)	Temporary Water Diversion

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	2	1

TABLE OF CONTENTS

PLAN SECTIONS

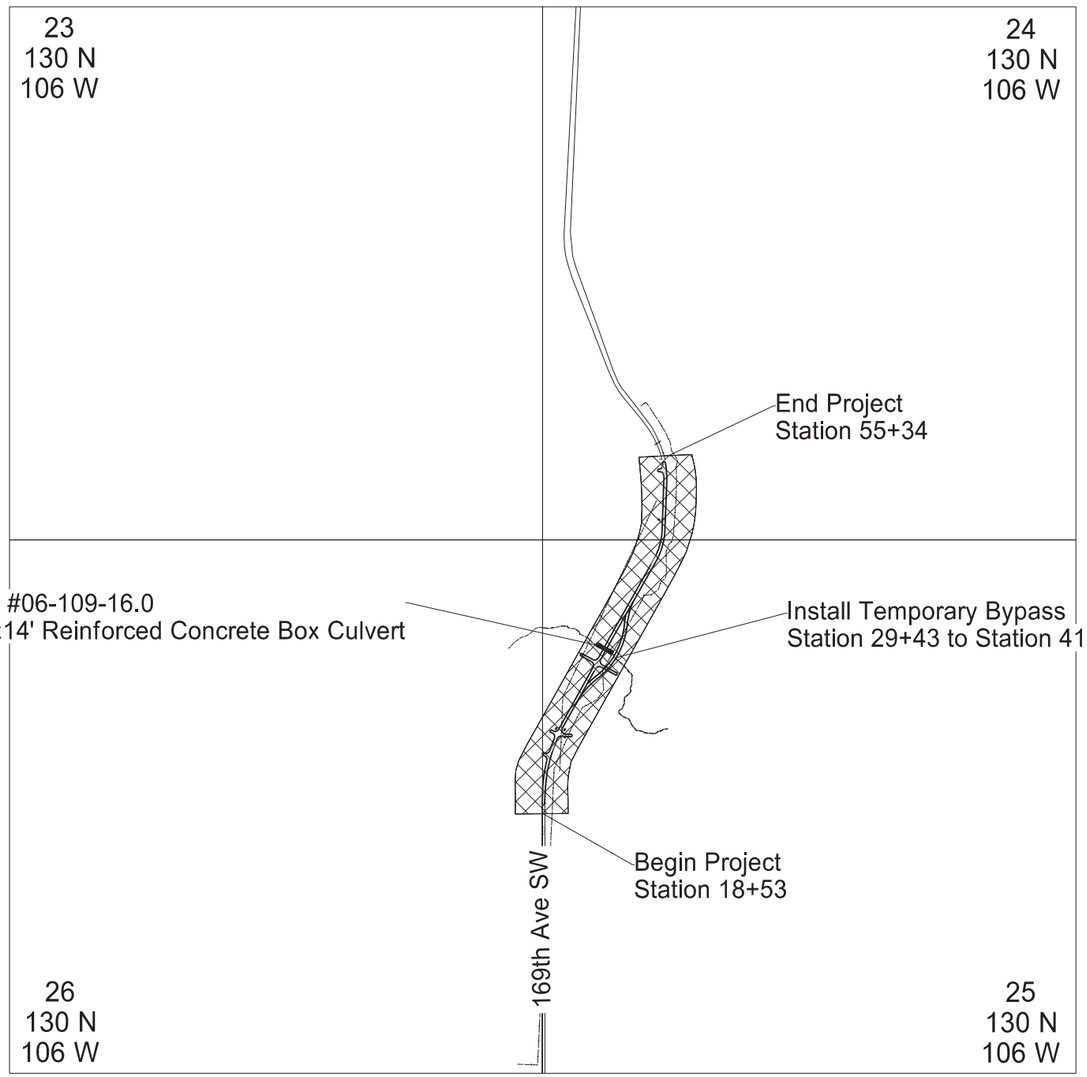
LIST OF STANDARD DRAWINGS

SPECIAL PROVISIONS

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	4	1

N

Scale: 1" = 150'



Grading, Aggregate Surfacing

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Scope of Work

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

Revised 1/30/2025	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	6	1

NOTES

105-P01 **UTILITY COORDINATION:** Coordinate your work schedule with the utility companies, the County, and the Engineer. The County will be responsible for the cost of any utility adjustments, except in cases of negligence by the Contractor.

Work around power poles, telephone lines, pipelines and other utilities not designated for adjustments. Coordinate your schedule with the utility owners for utilities that will require adjustments.

105-P02 **RIGHT OF WAY:** Permanent Easements and Temporary Construction Easements have been obtained by Bowman County and are shown in the plans. Utilize Temporary Construction Easements for cutting slopes, construction staging and stockpiling topsoil. Minimize impacts within the Temporary Construction Easement areas as much as possible.

107-P01 **MAINTAINING TRAFFIC DURING CONSTRUCTION:** Install a temporary bypass to maintain traffic during the removal and replacement of the structure. After the new structure has been installed and backfilled, install the detour signage and close the mainline roadway to through traffic. Complete the remainder of the mainline grading and surfacing within the specified working days in the Contract Time for Completion special provision. Do not begin mainline grading operations on the existing road top until the roadway is closed to through traffic.

Coordinate with the adjacent landowners to provide daily access through the project.

107-P02 **TEMPORARY BYPASS:** Utilize embankment material from the Phase I mainline grading operation to construct the temporary bypass. Do not disturb the existing road top and maintain 4:1 inslopes from the edge of the existing gravel shoulder to the clear zone. Approximately, 34,196 CY of material will be generated from the Phase I mainline grading. Utilize Compaction Control, Type C to construct the temporary bypass. Embankment material used to construct the temporary bypass will not be measured for payment. The material will be paid for as common excavation and borrow excavation and will be paid for once. The final quantity will be calculated by a surveyed recross after the grading on the project is complete. Include all costs associated with excavating, hauling, placing, and compacting the embankment material for the temporary bypass to the grades specified in the plans in the unit price bid for “Temporary Bypass.”

201-P01 **CLEARING & GRUBBING:** Include the cost to remove and dispose of all trees, stumps and brush within the construction area or wherever designated in the plans in the contract lump sum price for "Clearing and Grubbing." No field measurements will be taken. This includes the cost of removing and disposing of large trees. Exercise care in your construction operations to ensure that trees, shrubs and native grasses outside of the construction area are not disturbed.

202-P01 **REMOVAL OF TEMPORARY BYPASS:** Utilize the temporary bypass embankment material as embankment on the mainline. Do not remove the temporary bypass until the mainline roadway is closed to through traffic. Restore the temporary bypass area to its pre-existing conditions. Include all costs associated with the removal of the pipe conduit and riprap, and with restoring the temporary bypass area to its pre-existing conditions in the unit price bid for “Removal of Temporary Bypass.”

202-P02 **SALVAGE & RELAY AGGREGATE SURFACE COURSE:** This work consists of salvaging the existing aggregate surfacing from the roadway, stockpiling the material, then relaying it on the new roadbed. The estimated depth of existing aggregate surfacing is 4 inches. No additional payment will be made for deviations in the depth of material.

Relay the salvaged aggregate surfacing on the new roadbed once it is constructed to grade and accepted by the Engineer. Relay the salvaged aggregate surfacing prior to placing new aggregate surfacing. Do not contaminate the salvaged aggregate surfacing during stockpiling operation. Relay and compact the salvage aggregate in accordance with Section 302.04, with exception of 302.04 A.

Include the cost for removing, stockpiling, loading, hauling, laying, compacting, and any other incidentals to complete this work in the contract unit price bid for “Salvage & Relay Aggregate Surface Course.”

202-P03 **REMOVAL OF STRUCTURE:** Remove and salvage the concrete deck slabs. Take care when handling the concrete deck slabs and be responsible for all damages that may occur due to Contractor’s negligence. Stockpile the deck slabs within the right of way for pickup by County Forces.

203-010 **SHRINKAGE:** 30 percent additional volume is included for shrinkage in earth embankment.

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

203-P01 **BORROW EXCAVATION:** Furnish the Borrow Excavation material necessary to complete the project. Use Compaction Control, Type B to compact the mainline embankment material.

Utilize all available mainline common excavation material from Phase I and Phase II earthwork operations for mainline embankment prior to utilizing additional borrow excavation. Do not use borrow excavation in place of common excavation.

203-P02 **DITCH BLOCKS:** Construct ditch block as indicated in the plans. Ditch blocks will be measured in the earthwork recross.

251-P01 **SEEDING & MULCHING:** Seed and mulch all disturbed areas due to construction and staging activities. The seeding and mulching plan quantities were calculated using a 10’ buffer around the construction limits. Unless otherwise approved by the Engineer, payment for seeding and mulching items will not exceed plans quantity.

256-P01 **RIPRAP GRADE II:** Once the temporary bypass is removed, remove and place the 47 CY of Riprap Grade II in the riprap limits around the DBL 14FT x 14FT Precast RCB Culvert. Include all costs associated with removing the riprap from the temporary bypass and placing it in the structure’s riprap limits in the price bid for “Removal of Temporary Bypass.”

256-P02 **ROCK CHECK:** Ditch checks shall be constructed of loose stone and shall conform to standard drawing D-256-1. All costs associated with the construction of rock ditch checks shall be paid under the price bid for “Ditch Checks”.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	6	1

NOTES

105-P01 **UTILITY COORDINATION:** Coordinate your work schedule with the utility companies, the County, and the Engineer. The County will be responsible for the cost of any utility adjustments, except in cases of negligence by the Contractor.

Work around power poles, telephone lines, pipelines and other utilities not designated for adjustments. Coordinate your schedule with the utility owners for utilities that will require adjustments.

105-P02 **RIGHT OF WAY:** Permanent Easements and Temporary Construction Easements have been obtained by Bowman County and are shown in the plans. Utilize Temporary Construction Easements for cutting slopes, construction staging and stockpiling topsoil. Minimize impacts within the Temporary Construction Easement areas as much as possible.

107-P01 **MAINTAINING TRAFFIC DURING CONSTRUCTION:** Install a temporary bypass to maintain traffic during the removal and replacement of the structure. After the new structure has been installed and backfilled, install the detour signage and close the mainline roadway to through traffic. Complete the remainder of the mainline grading and surfacing within the specified working days in the Contract Time for Completion special provision. Do not begin mainline grading operations outside the limits of the temporary bypass until the roadway is closed to through traffic.

Coordinate with the adjacent landowners to provide daily access through the project.

107-P02 **TEMPORARY BYPASS:** Furnish the embankment material needed to construct the bypass from an approved location outside of the project limits and utilize Compaction Control, Type C. Embankment material used to construct the temporary bypass will not be measured for payment. Include all costs associated with furnishing, hauling, placing, and compacting the embankment material for the temporary bypass to the grades specified in the plans in the unit price bid for “Temporary Bypass.”

201-P01 **CLEARING & GRUBBING:** Include the cost to remove and dispose of all trees, stumps and brush within the construction area or wherever designated in the plans in the contract lump sum price for "Clearing and Grubbing." No field measurements will be taken. This includes the cost of removing and disposing of large trees. Exercise care in your construction operations to ensure that trees, shrubs and native grasses outside of the construction area are not disturbed.

202-P01 **REMOVAL OF TEMPORARY BYPASS:** Do not remove the temporary bypass until the mainline roadway is closed to through traffic. Restore the temporary bypass area to its pre-existing conditions. Include all costs associated with the removal of the pipe conduit and riprap, and with restoring the temporary bypass area to its pre-existing conditions in the unit price bid for “Removal of Temporary Bypass.”

Utilize a portion of the temporary bypass embankment material as embankment on the mainline. This material will be paid for as “Borrow-Excavation”. Waste the remaining temporary bypass embankment material in its source of origin or in an approved location, so it can be measured for payment. This material will be paid for as “Common Excavation – Waste”.

202-P02 **SALVAGE & RELAY AGGREGATE SURFACE COURSE:** This work consists of salvaging the existing aggregate surfacing from the roadway, stockpiling the material, then relaying it on the new roadbed. The estimated depth of existing aggregate surfacing is 4 inches. No additional payment will be made for deviations in the depth of material.

Relay the salvaged aggregate surfacing on the new roadbed once it is constructed to grade and accepted by the Engineer. Relay the salvaged aggregate surfacing prior to placing new aggregate surfacing. Do not contaminate the salvaged aggregate surfacing during stockpiling operation. Relay and compact the salvage aggregate in accordance with Section 302.04, with exception of 302.04 A.

Include the cost for removing, stockpiling, loading, hauling, laying, compacting, and any other incidentals to complete this work in the contract unit price bid for “Salvage & Relay Aggregate Surface Course.”

202-P03 **REMOVAL OF STRUCTURE:** Remove and salvage the concrete deck slabs. Take care when handling the concrete deck slabs and be responsible for all damages that may occur due to Contractor’s negligence. Stockpile the deck slabs within the right of way for pickup by County Forces.

203-010 **SHRINKAGE:** 35 percent additional volume is included for shrinkage in earth embankment.

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

203-P01 **BORROW EXCAVATION:** Furnish the Borrow Excavation material necessary to complete the project. Use Compaction Control, Type B to compact the embankment material.

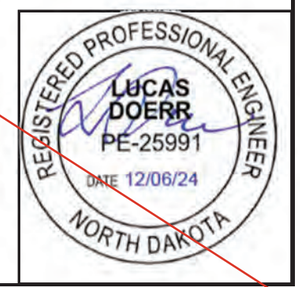
Utilize all available mainline common excavation material for embankment prior to utilizing material from the temporary bypass. Borrow excavation can not be utilized in place of common excavation.

203-P02 **DITCH BLOCKS:** Construct ditch block as indicated in the plans. Ditch blocks will be measured in the earthwork recross.

251-P01 **SEEDING & MULCHING:** Seed and mulch all disturbed areas due to construction and staging activities. The seeding and mulching plan quantities were calculated using a 10’ buffer around the construction limits. Unless otherwise approved by the Engineer, payment for seeding and mulching items will not exceed plans quantity.

256-P01 **RIPRAP GRADE II:** Once the temporary bypass is removed, remove and place the 47 CY of Riprap Grade II in the riprap limits around the DBL 14FT x 14FT Precast RCB Culvert. Include all costs associated with removing the riprap from the temporary bypass and placing it in the structure’s riprap limits in the price bid for “Removal of Temporary Bypass.”

256-P02 **ROCK CHECK:** Ditch checks shall be constructed of loose stone and shall conform to standard drawing D-256-1. All costs associated with the construction of rock ditch checks shall be paid under the price bid for “Ditch Checks”.



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	6	2

NOTES

302-P01 **GRAVEL SURFACING:** Place aggregate in no less than two (2) equal lifts of compacted material using a predetermined spread rate. Uniformly mix aggregate placed in windrows before spreading to avoid material segregation. Side dump trucks will not be allowed. Spread material within 48 hours of placing the material in a windrow. Do not leave material windrows on the roadway over weekends or holidays.

Spread and finish gravel at the length of the entire project to provide smooth surfacing. Compact aggregate utilizing pneumatic-tired rollers until the surface is tightly bound and shows no rutting or displacement under the roller operation. 25 percent additional volume is included for compaction in gravel surfacing.

302-P02 **TRAFFIC SERVICE AGGREGATE:** Utilize Class 5 or 13 Aggregate for Traffic Service Aggregate material. Place and compact Traffic Service Aggregate per Section 302.04 B. A blade must be onsite to maintain a smooth and compacted surface on the temporary bypass during the entire duration of the temporary bypass. Provide dust control as necessary utilizing water or similar methods. Include all costs for maintenance in the contract unit price for “Traffic Service Aggregate.”

Remove and salvage the Traffic Service Aggregate prior to removing the Temporary Bypass. Stockpile the salvaged Traffic Service Aggregate and use this material as surfacing on the approaches. Place and compact the salvaged aggregate on the approaches as designated in the plans after the mainline and approach grading is complete. Include all costs to remove, salvage, stockpile, relay, and compact the salvaged aggregate on the approaches in the contract unit price for “Traffic Service Aggregate.”

704-P01 **TRAFFIC CONTROL:** The required traffic control signs and devices are included in the “Traffic Control Devices List” and will be measured and paid at the Contract Unit Price for each device used. Additional devices required to accommodate the Contractor’s operation will be the Contractor’s responsibility.

752-P01 **REMOVAL EXISTING FENCING:** Remove and stockpile the existing fencing materials on the property of the adjacent landowner with the approval of the Engineer.

752-P02 **TEMPORARY FENCING:** Place temporary fencing prior to removing existing fencing. Place temporary fencing around temporary construction easements where existing fence is removed until permanent fencing is in place. Field fit temporary fencing in areas of deep draws or wooded areas, with the approval of the Engineer. Verify the need for temporary fence with the landowner. The cost to install and remove temporary fencing is included in the price bid for “Temporary Fence”.

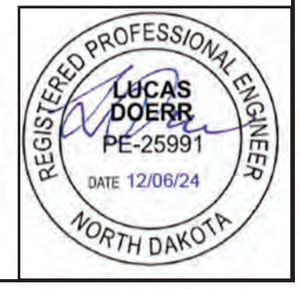
752-P03 **PERMANENT FENCING:** Double brace assemblies will be paid as corner assemblies.

752-P04 **VEHICLE GATE:** Install vehicle gates with double brace assemblies as shown in Standard Drawing D-752-1. Include the cost of all materials and labor to install double brace assemblies and gate in the EA bid item for “Vehicle Gate”.

754-P01 **REMOVE SIGN FOUNDATION:** Remove and salvage all signs and posts on the project as designated in the plans. Take care when handling the signs and be responsible for all damages that may occur due to Contractor’s negligence. Stockpile the signs within the right of way for pickup by County Forces.

754-P02 **NO HUNTING SIGNS:** Remove all existing No Hunting Signs from the existing fence and reset them on the Temporary Fence and also the new Permanent Fence. Take care when handling the signs and be responsible for all damages that may occur due to Contractor’s negligence. All work related to the No Hunting Signs will be incidental to other bid items.

980-P01 **CATTLE GUARD RESET:** Remove the existing cattle guards as designated in the plans. Clean all debris and materials from the base of the cattle guards prior to resetting. Include all work associated with removing the existing cattle guard, clearing any material out of the base, and resetting it after the approaches have been graded in the price bid for “Cattle Guard Reset.”



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	6	3

ENVIRONMENTAL NOTES

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

EN-1 AVOIDANCE AREAS: The Project Engineer will contact Reilly Lembo of the Environmental and Transportation Services Division to coordinate any meetings needed to identify the limits of the avoidance area. The site is at Sta. 39+25 to Sta. 41+00. This avoidance area is near the project limits and must not be disturbed and will be fenced prior to commencement of any construction. Provide the fence and fence posts, install the fence in the location designated in the plans, maintain the fence, and remove the fence upon completion of the project. A quantity of *646* LF of *Temporary Safety Fence* has been included for this purpose. All costs to provide, place, maintain, and remove the fence shall be included in the price bid for "TEMPORARY SAFETY FENCE."

EN-2 AQUATIC NUISANCE SPECIES (ANS): Equipment that was last used outside of North Dakota or within a Class I infested waterbody (identified on the North Dakota Game and Fish Department (NDGFD) website) requires an inspection by NDGFD. Notify the NDGFD at least 10 business days prior to pumps, watercraft, or any equipment entering a public water to allow the NDGFD sufficient time to inspect any and all such equipment for ANS. Contact the NDGFD ANS Coordinator, Ben Holen by e-mail - bholen@nd.gov for equipment inspections. Supply one of the following to the engineer as proof of compliance prior to work taking place in the water: (1) the NDGFD inspection report, (2) documented NDGFD correspondence (email or signed letter).

EN-3 TEMPORARY WETLAND IMPACT: Temporary impact areas within wetlands and or other waters are incorporated into the plans for this project. Remove temporary fill placed and sedimentation in wetlands or other waters. Restore these wetlands to preconstruction contours.

EN-4 WETLAND MITIGATION CREDITS: Prior to beginning any work on the project at all sites, purchase exactly 0.172 acres of wetland mitigation credits from Ducks Unlimited to satisfy the Environmental Commitments shown in Section 75 of the plans and the Section 404 Permits issued for the project (see SP 69 (23)). No work can begin on the project until a Credit Sales Letter(s) from Ducks Unlimited is submitted to and accepted by the US Army Corps of Engineers (USACE), North Dakota Regulatory Office. Reference Project Number NWO-2023-01372-BIS, when contacting the USACE and Ducks Unlimited.

Purchase the wetland mitigation credits from the Southwest Slope mitigation site. The details are:

Southwest Slope: 0.172 Credits @ $85,000/credit = $14,620.

The contact information to purchase the wetland mitigation credits from Ducks Unlimited is

Trenton Hieb
Regional Biologist – Ecosystem Services – Mitigation
Ducks Unlimited (Great Plains Region)
2525 River Road
Bismarck, ND 58503
Phone: 701-355-3573
Email: thieb@ducks.org

Permits Required
US Army Corps of Engineers – Section 404 Permit
Status: Obtained.

ND Department of Health – NDPDES Permit
Status: To be obtained by contractor prior to construction. Owner to be listed as Bowman County on permit.

Revised 1/27/2025	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	8	1

Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline:				TOTAL
103	0100	CONTRACT BOND	L SUM	1				1
201	0330	CLEARING & GRUBBING	L SUM	1				1
202	0105	REMOVAL OF STRUCTURE	L SUM	1				1
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES	EA	2				2
202	0170	REMOVAL OF CULVERTS-ALL TYPES & SIZES	LF	43				43
202	0312	REMOVE EXISTING FENCE	LF	6108				6108
202	0350	REMOVAL OF TEMPORARY BYPASS	EA	1				1
203	0102	COMMON EXCAVATION-TYPE B	CY	40032				40032
203	0109	TOPSOIL	CY	5862				5862
203	0140	BORROW-EXCAVATION	CY	4840				4840
210	0050	BOX CULVERT EXCAVATION	EA	1				1
210	0210	FOUNDATION FILL	CY	404				404
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1				1
216	0100	WATER	M GAL	856				856
251	0200	SEEDING CLASS II	ACRE	11.9				11.9
251	2000	TEMPORARY COVER CROP	ACRE	14.4				14.4
253	0101	STRAW MULCH	ACRE	26.3				26.3
256	0100	RIPRAP GRADE I	CY	119				119
256	0200	RIPRAP GRADE II	CY	106				106
256	1500	ROCK CHECK	EA	91				91
261	0112	FIBER ROLLS 12IN	LF	160				160
261	0113	REMOVE FIBER ROLLS 12IN	LF	80				80
261	0120	FIBER ROLLS 20IN	LF	5296				5296
261	0121	REMOVE FIBER ROLLS 20IN	LF	5296				5296
262	0100	FLOTATION SILT CURTAIN	LF	60				60
262	0101	REMOVE FLOTATION SILT CURTAIN	LF	60				60
302	0050	TRAFFIC SERVICE AGGREGATE	TON	1738				1738
302	0356	AGGREGATE SURFACE COURSE CL 13	TON	4921				4921
302	0402	SALVAGE & RELAY AGGREGATE SURFACE COURSE	MILE	0.7				0.7
606	3414	DBL 14FT X 14FT PRECAST RCB CULVERT	LF	94				94
606	7414	DBL 14FT X 14FT PRECAST RCB END SECTION	EA	2				2
702	0100	MOBILIZATION	L SUM	1				1
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1017				1017
704	1052	TYPE III BARRICADE	EA	6				6
704	1067	TUBULAR MARKERS	EA	16				16
704	1081	VERTICAL PANELS-BACK TO BACK	EA	85				85
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	644				644
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	394				394
710	0200	TEMPORARY BYPASS	L SUM	1				1
714	4099	PIPE CONDUIT 18IN-APPROACH	LF	46				46
714	4105	PIPE CONDUIT 24IN	LF	82				82
714	4106	PIPE CONDUIT 24IN-APPROACH	LF	134				134
714	4125	PIPE CONDUIT 48IN	LF	122				122
752	0200	FENCE BARBED WIRE 4 STRAND	LF	7473				7473
752	0905	TEMPORARY FENCE	LF	8353				8353
752	0911	TEMPORARY SAFETY FENCE	LF	645				645
752	2100	VEHICLE GATE	EA	4				4

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	8	1

Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline:				TOTAL
103	0100	CONTRACT BOND	L SUM	1				1
201	0330	CLEARING & GRUBBING	L SUM	1				1
202	0105	REMOVAL OF STRUCTURE	L SUM	1				1
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES	EA	2				2
202	0170	REMOVAL OF CULVERTS-ALL TYPES & SIZES	LF	43				43
202	0312	REMOVE EXISTING FENCE	LF	6108				6108
202	0350	REMOVAL OF TEMPORARY BYPASS	EA	1				1
203	0102	COMMON EXCAVATION-TYPE B	CY	40032				40032
203	0109	TOPSOIL	CY	5862				5862
203	0113	COMMON EXCAVATION-WASTE	CY	29359				29359
203	0140	BORROW-EXCAVATION	CY	4840				4840
210	0050	BOX CULVERT EXCAVATION	EA	1				1
210	0210	FOUNDATION FILL	CY	404				404
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1				1
216	0100	WATER	M GAL	856				856
251	0200	SEEDING CLASS II	ACRE	11.9				11.9
251	2000	TEMPORARY COVER CROP	ACRE	14.4				14.4
253	0101	STRAW MULCH	ACRE	26.3				26.3
256	0100	RIPRAP GRADE I	CY	119				119
256	0200	RIPRAP GRADE II	CY	106				106
256	1500	ROCK CHECK	EA	91				91
261	0112	FIBER ROLLS 12IN	LF	160				160
261	0113	REMOVE FIBER ROLLS 12IN	LF	80				80
261	0120	FIBER ROLLS 20IN	LF	5296				5296
261	0121	REMOVE FIBER ROLLS 20IN	LF	5296				5296
262	0100	FLOTATION SILT CURTAIN	LF	60				60
262	0101	REMOVE FLOTATION SILT CURTAIN	LF	60				60
302	0050	TRAFFIC SERVICE AGGREGATE	TON	1738				1738
302	0356	AGGREGATE SURFACE COURSE CL 13	TON	4921				4921
302	0402	SALVAGE & RELAY AGGREGATE SURFACE COURSE	MILE	0.7				0.7
606	3414	DBL 14FT X 14FT PRECAST RCB CULVERT	LF	94				94
606	7414	DBL 14FT X 14FT PRECAST RCB END SECTION	EA	2				2
702	0100	MOBILIZATION	L SUM	1				1
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1017				1017
704	1052	TYPE III BARRICADE	EA	6				6
704	1067	TUBULAR MARKERS	EA	16				16
704	1081	VERTICAL PANELS-BACK TO BACK	EA	85				85
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	870				870
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	394				394
710	0200	TEMPORARY BYPASS	L SUM	1				1
714	4099	PIPE CONDUIT 18IN-APPROACH	LF	46				46
714	4105	PIPE CONDUIT 24IN	LF	82				82
714	4106	PIPE CONDUIT 24IN-APPROACH	LF	134				134
714	4125	PIPE CONDUIT 48IN	LF	122				122
752	0200	FENCE BARBED WIRE 4 STRAND	LF	7473				7473
752	0905	TEMPORARY FENCE	LF	8353				8353
752	0911	TEMPORARY SAFETY FENCE	LF	645				645

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	8	2

Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline:				TOTAL
752	2100	VEHICLE GATE	EA	4				4
752	3140	CORNER ASSEMBLY BARBED WIRE	EA	12				12
754	1104	REMOVE SIGN FOUNDATION	EA	2				2
900	1000	TEMPORARY STREAM DIVERSION	EA	1				1
900	2001	WETLAND MITIGATION SITE 1	ACRE	0.172				0.172
930	0200	DEWATERING	L SUM	1				1
980	0170	CATTLE GUARD RESET	EA	2				2

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	10	1

Basis of Estimate 169th Ave SW		Proposed Typical Section				Temporary Bypass Typical Section			
Surfacing Quantities		Stationing			Total Stations	Stationing			Total Stations
		18+53	to	55+34	36.81	100+00	to	113+00	13.00
		Total =			36.81	Total =			13.00
Material	Unit	Width (ft)	AREA	Quantity per Station	Total	Width (ft)	AREA	Quantity per Station	Total
Surfacing Aggregate CL 13 (1st Lift)	TON	28.0	7.7	53.5	2,460.39	-	-	-	-
Surfacing Aggregate CL 13 (2nd Lift)	TON	28.0	7.7	53.5	2,460.39	-	-	-	-
Traffic Service Aggregate	TON	-	-	-	-	28.0	15.4	106.9	1,737.85

Water	Mgal
25 MGal for Dust Palliative	25
20 Gal/Ton for Aggregates	40
10 Gal/CY for Embankment	791
Total	856

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Basis of Estimate

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

Revised 1/27/25	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	11	1

EARTHWORK SUMMARY

Location	203-0102 Common Excavation Type B (CY) Pay Item	Temporary Bypass Embankment (CY)	Embankment Material from Removal of Temporary Bypass (CY)	Mainline Embankment (CY)	203-0140 Borrow Excavation (CY) Pay Item	203-0109 Topsoil (CY) *Pay Item
Earthwork Operation Phase I: Perform mainline common excavation from Station 18+53 to 30+00 and from 40+00 to 55+34 per plan note 107-P02. Utilize this material and borrow excavation to construct the temporary bypass.	34,196	34,196				---
Earthwork Operation Phase II: Remove the temporary bypass and utilize the material as mainline embankment. Complete the remaining mainline common excavation and utilize additional borrow excavation to complete the mainline grading.	5,836		34,196	44,872	4,840	---
Total	40,032	34,196	34,196	44,872	4,840	5,862

* Topsoil volumes are computed from surface areas measurements. Topsoil within delineated Wetlands and Other Waters is based on an 8" depth.
All other topsoil areas are based on a 4" depth.

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Earthwork Summary

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 1/30/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	11	1

EARTHWORK SUMMARY

Location	203-0102 Common Excavation Type B (CY) Pay Item	Embankment (CY)	203-0140 Borrow Excavation (CY) **Pay Item	203-0130 Borrow Excavation (CY) Pay Item	203-0109 Topsoil (CY) *Pay Item
	A	B	C=B-A	D	E
18+53 to 55+34 (169th Ave SW)	40032	44,872	4,840	---	4,946
Temporary Bypass	---	34,199	34,199	29,359	916
Total	40032	79,071	4,840	29,359	5,862

* Topsoil volumes computed from surface areas measurements. Topsoil within delineated Wetlands and Other Waters is based on an 8" depth.

** Temporary Bypass "Borrow Excavation" is for informational purposes only, "Borrow Excavation" for Temporary Bypass is incidental to the bid item "Temporary Bypass"

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Earthwork Summary

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	20	1

P.C. Station 19+99.60
P.I. Station 23+38.30
Delta = 26° 36' 26" (RT)
Degree = 4° 00' 00.00"
Tangent = 338.70
Length = 665.18
Radius = 1432.39
P.T. Station 26+64.78

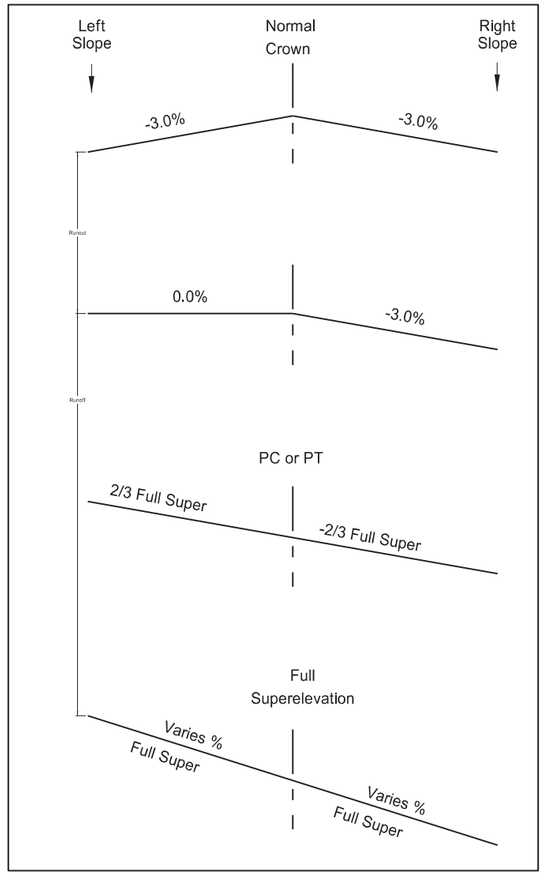
Station	Left Slope	Right Slope
PC-161.79'	-3.0	-3.0
PC-81.79'	0.0	-3.0
PC	3.0	-3.0
PC+40.88'	4.6	-4.6
PT-40.88'	4.6	-4.6
PT	3.0	-3.0
PT+81.79'	0.0	-3.0
PT+161.79'	-3.0	-3.0

P.C. Station 45+47.32
P.I. Station 47+06.07
Delta = 27° 27' 01" (LT)
Degree = 8° 48' 53.00"
Tangent = 158.75
Length = 311.41
Radius = 650.00
P.T. Station 48+58.73

Station	Left Slope	Right Slope
PC-186.68'	-3.0	-3.0
PC-106.68'	-3.0	0.0
PC	-3.0	3.0
PC+53.32'	-6.0	6.0
PT-53.32'	-6.0	6.0
PT	-3.0	3.0
PT+106.68'	-3.0	0.0
PT+186.68'	-3.0	-3.0

P.C. Station 53+41.82
P.I. Station 56+54.12
Delta = 40° 20' 51" (LT)
Degree = 6° 44' 26.00"
Tangent = 312.30
Length = 598.57
Radius = 850.00
P.T. Station 59+40.39

Station	Left Slope	Right Slope
PC-183.12'	-3.0	-3.0
PC-103.12'	-3.0	0.0
PC	-3.0	3.0
PC+51.55'	-5.8	5.8



Note: Calculations based on AASHTO method five. A design speed of 45 mph and maximum superelevation of 6% were used.

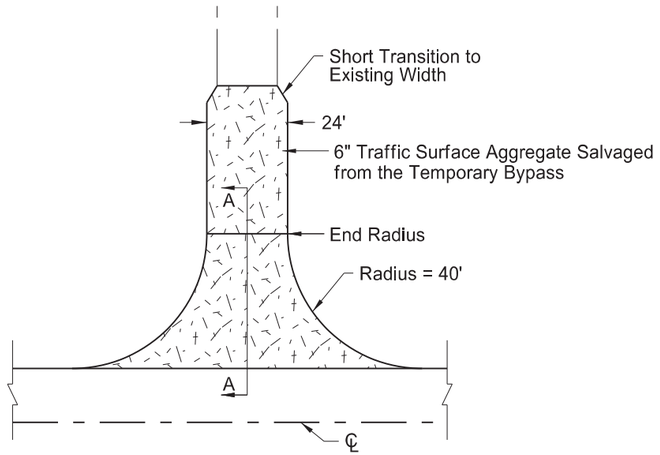
Bowman County

Hestekin Bridge Replacement
169th Ave SW

Superelevation Tables

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

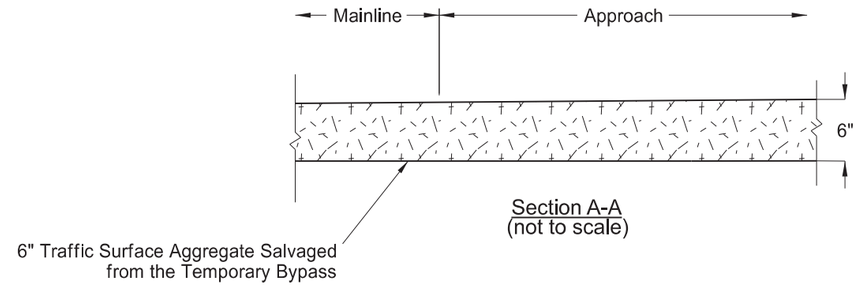
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	20	2



(1) Field Drive Approach

Notes:

1. Actual aggregate base course locations may vary in the field, as approved by the Engineer.
2. Quantity totals have been included in the bid items of the "Estimate of Quantities" of the plans.



Locations For Apporaches
1: Field Drive
Location
Sta 23+43 Lt
Sta 25+72 Lt
Sta 25+94 Rt
Sta 33+76 Lt
Sta 33+76 Rt
Sta 54+59 Lt

BASIS OF ESTIMATE		(1)	
ITEM	UNIT	Gravel Private Drive	TOTALS
Number of Locations	#	6	
Salvaged Traffic Surface Aggregate	TON	125	750

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Approach Details

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
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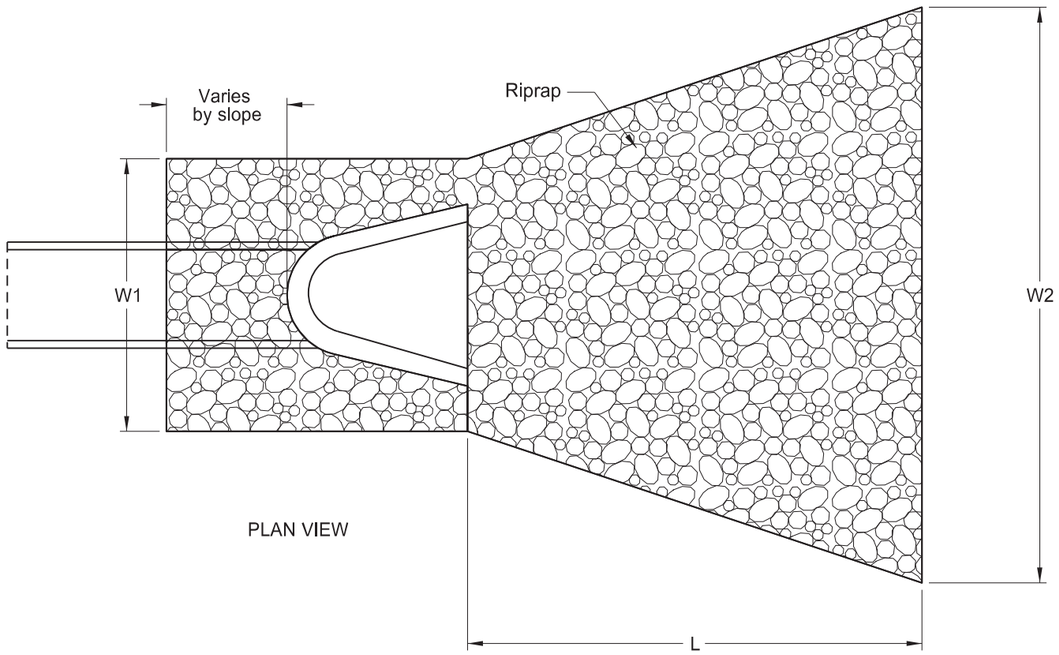
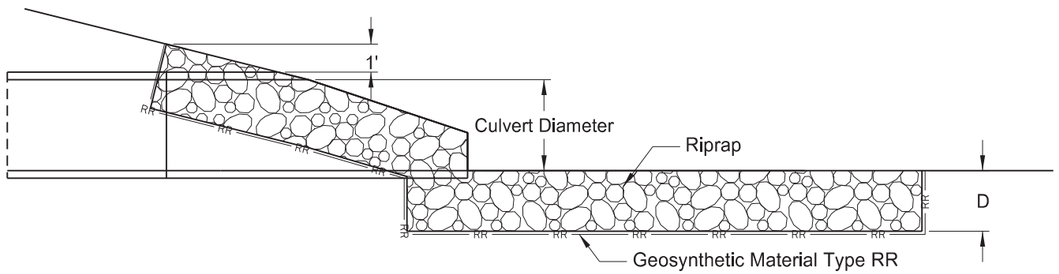
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	20	3



PLAN VIEW



PROFILE VIEW

Location	Dimensions: Culvert Diameter (inches)	L (feet)	W1 (feet)	W2 (feet)	Riprap Depth, D (inches)	Riprap Grade	Quantities: Geosynthetic Material Type RR (SY)	Riprap Grade I (CY)
*106+19 Rt	48	19	12	25	24	I	73	33
26+08 Lt	24	9	6	12	24	I	23	10
26+37 Rt	24	9	6	12	24	I	23	10
49+63 Lt	24	9	6	12	24	I	23	10
TOTAL							142	63

*Temporary Bypass Culvert

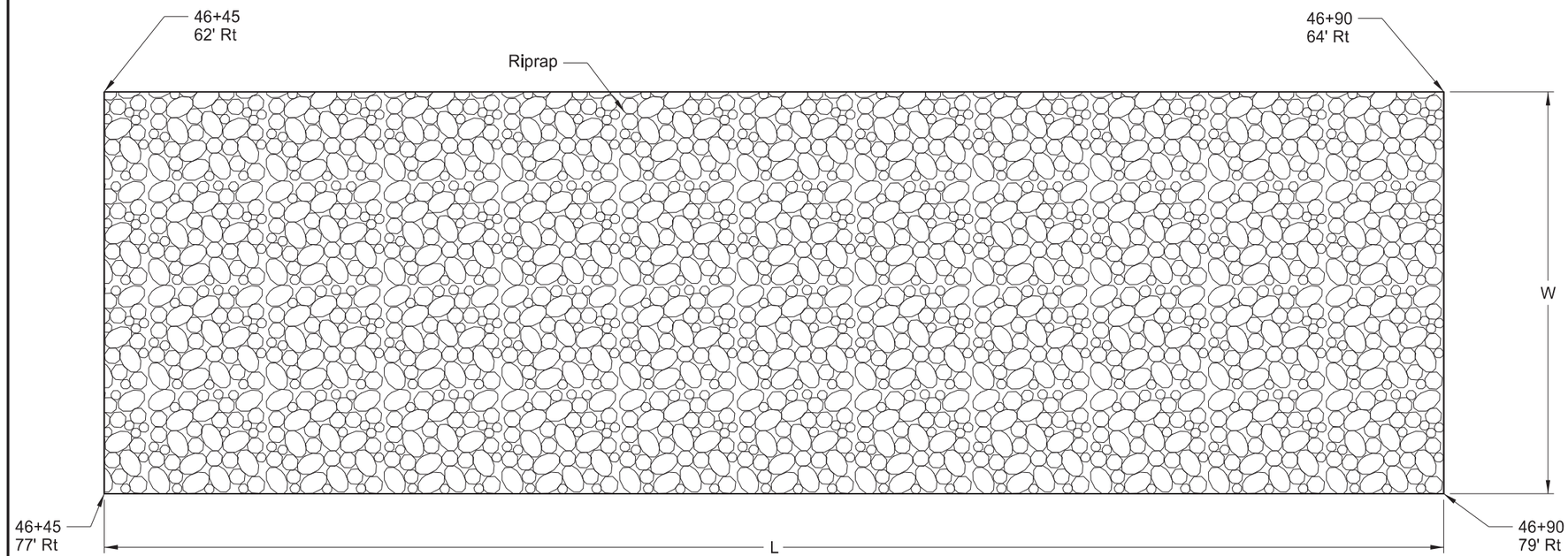
Bowman County

Hestekin Bridge Replacement
169th Ave SW

Riprap at Pipe Outlets Detail

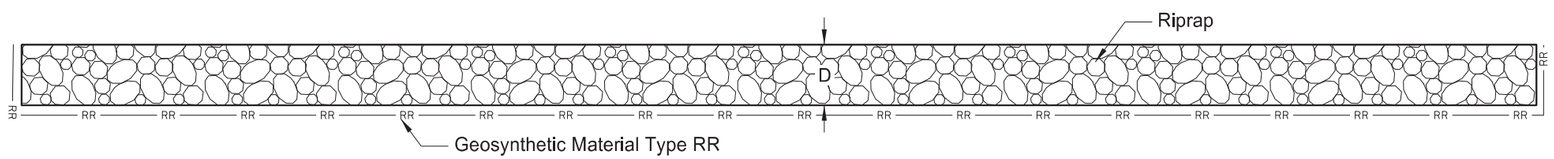
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	20	4



PLAN VIEW

Location	Dimensions L (feet)	W (feet)	Riprap Depth, D (inches)	Riprap Grade	Quantities Geosynthetic Material Type RR (SY)	Riprap Grade I (CY)
46+45 to 46+90 Rt	50	15	24	I	92	56
TOTAL					92	56



PROFILE VIEW

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Riprap Detail

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DATE 12/06/24
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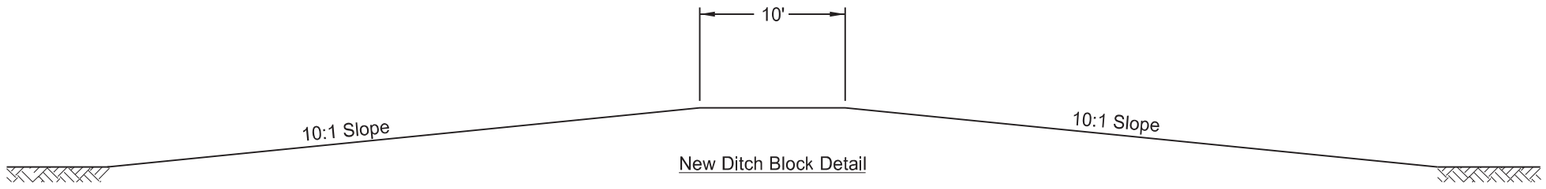
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	20	5



New Ditch Block Detail

DITCH BLOCK

Location	Top Elevation
Sta 31+88 Lt	2902.84
Sta 49+35 Rt	2958.32

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Ditch Block Detail

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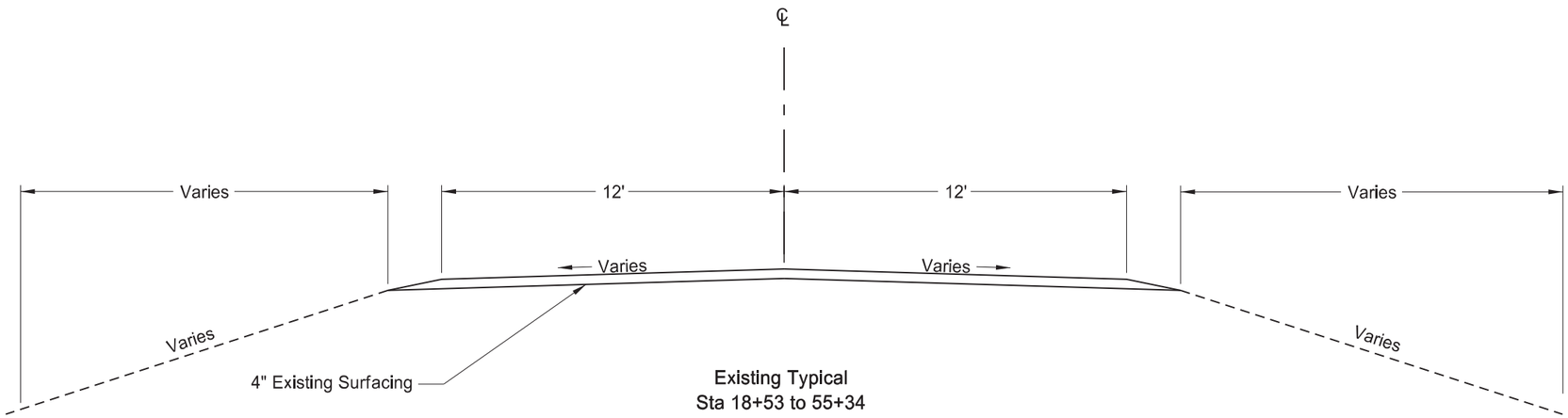
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	30	1



Existing Typical
Sta 18+53 to 55+34

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Existing Typical Section

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PE-25991
DATE 12/06/24
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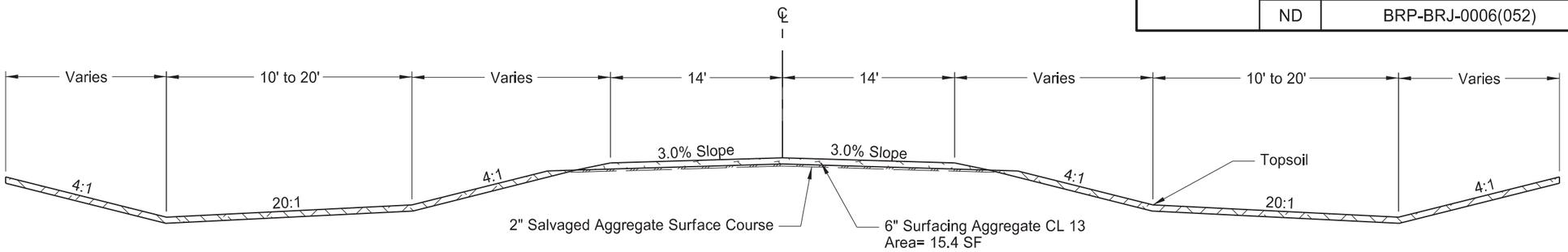
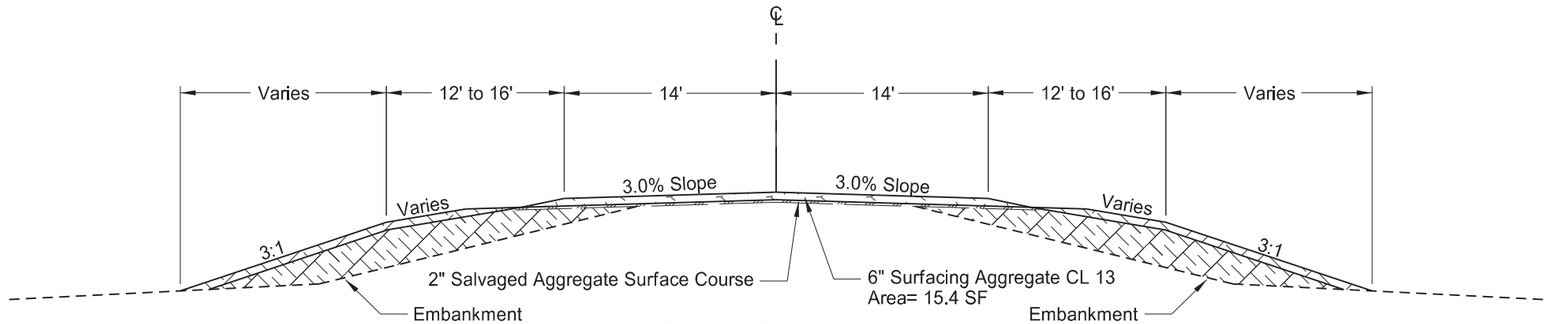
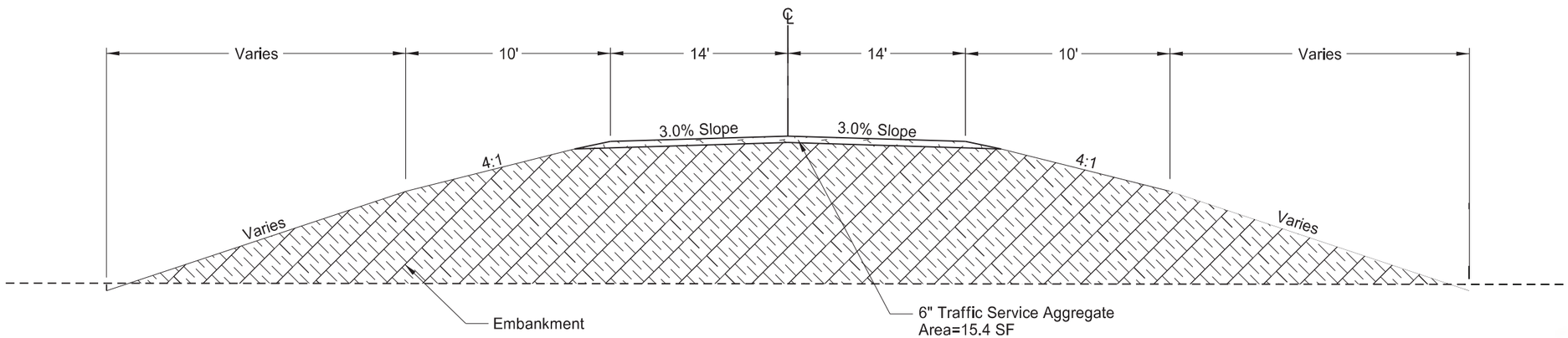
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	30	2



Proposed Typical Section
Sta 18+53* to 31+75
Sta 39+05 to 55+34*



Proposed Typical Section
Sta 31+75 to 39+05



Temporary Bypass
Sta 100+00 to 113+00

*Taper from exisitng typical section to proposed typical section from Sta 18+53 to 19+53 and Sta 54+34 to 55+34

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Proposed Typical Sections

REGISTERED PROFESSIONAL ENGINEER
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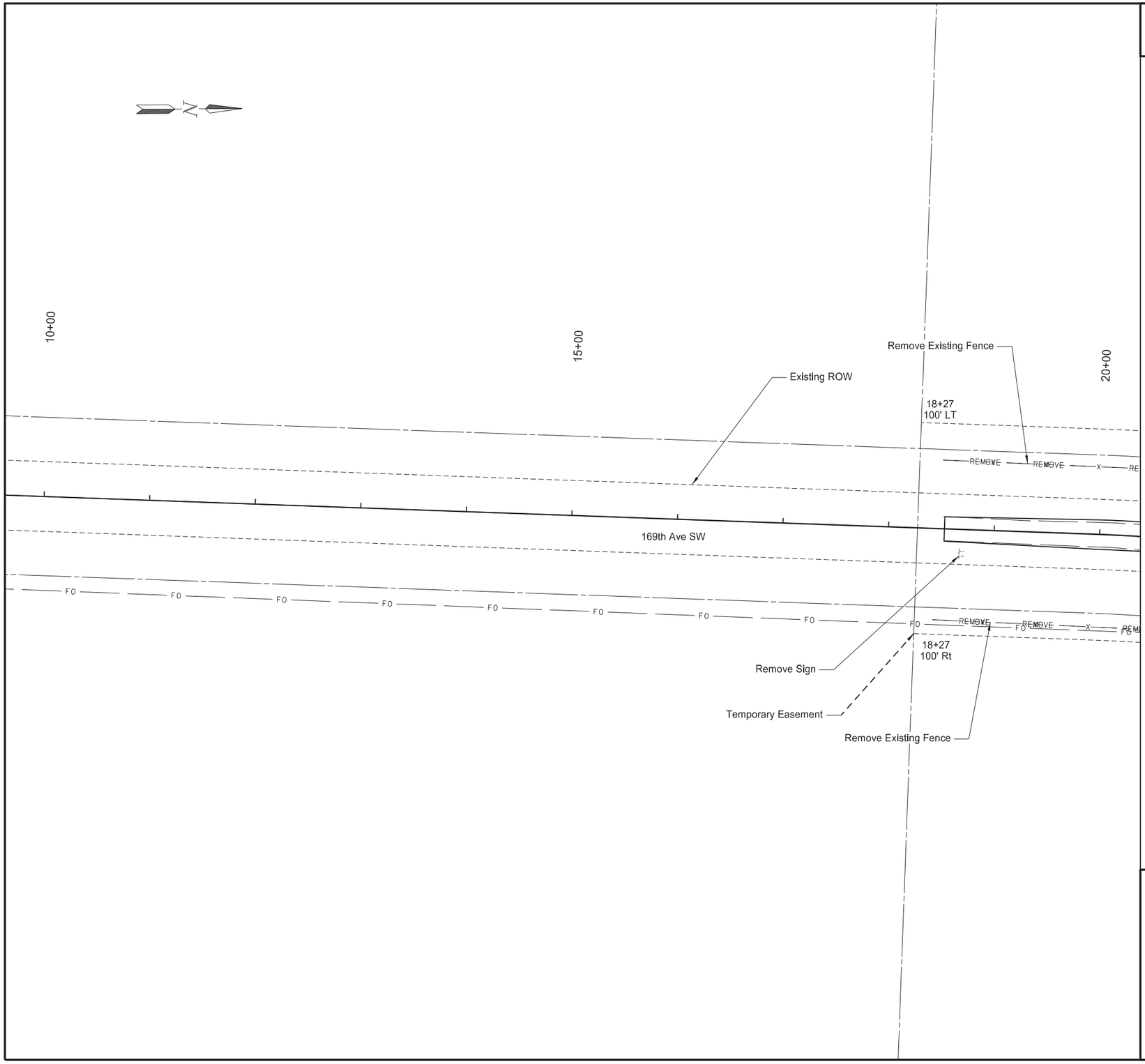

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	40	1

SPEC	CODE	BID ITEM	QUANTITY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 18+53 to 20+00	306	LF
754	1104	REMOVE SIGN FOUNDATION		
		Sta 18+67 RT	1	EA

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Removals

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

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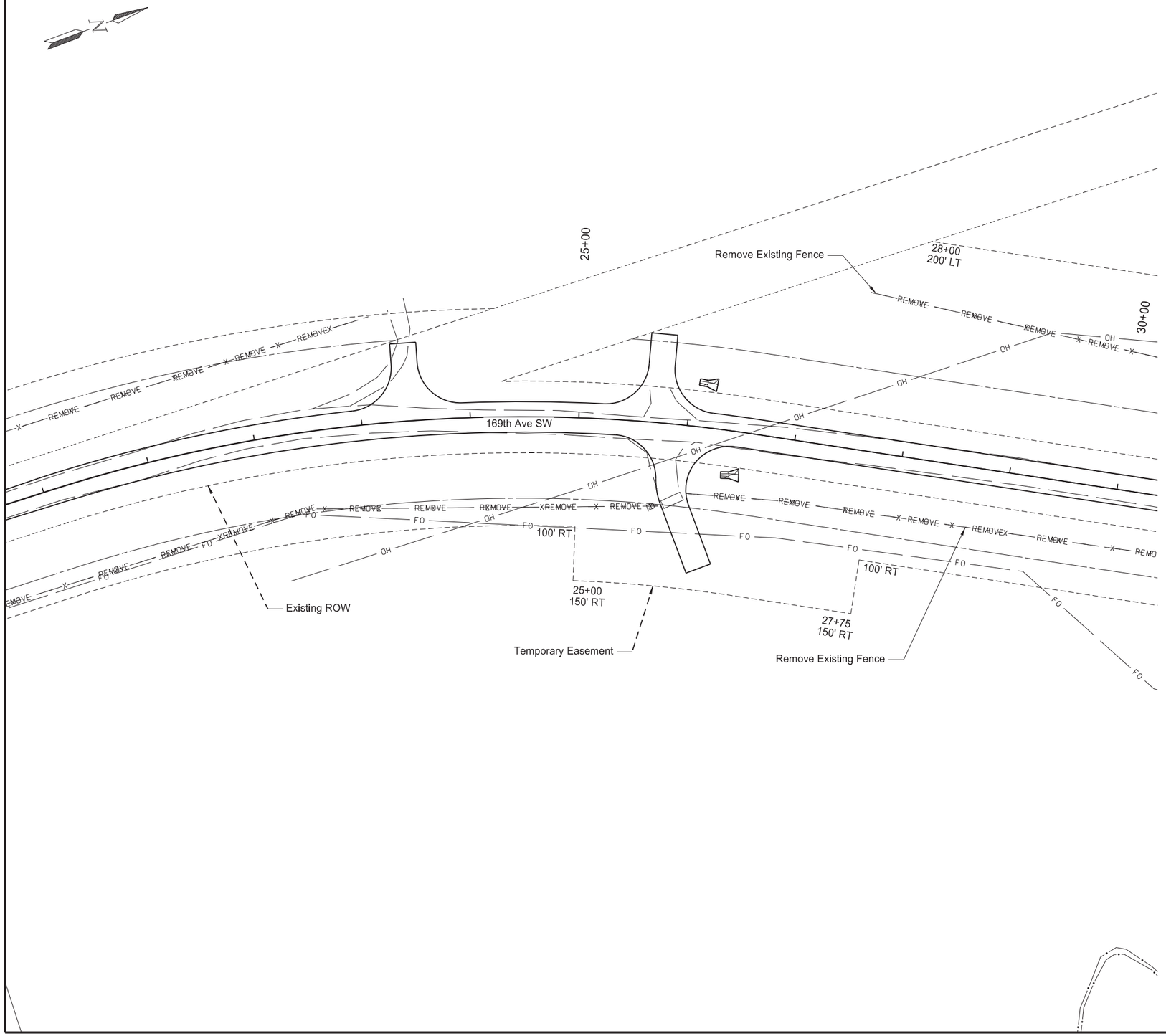

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	40	2

SPEC	CODE	BID ITEM	QUANTITY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 20+00 to 30+00	1142	LF

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Removals

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
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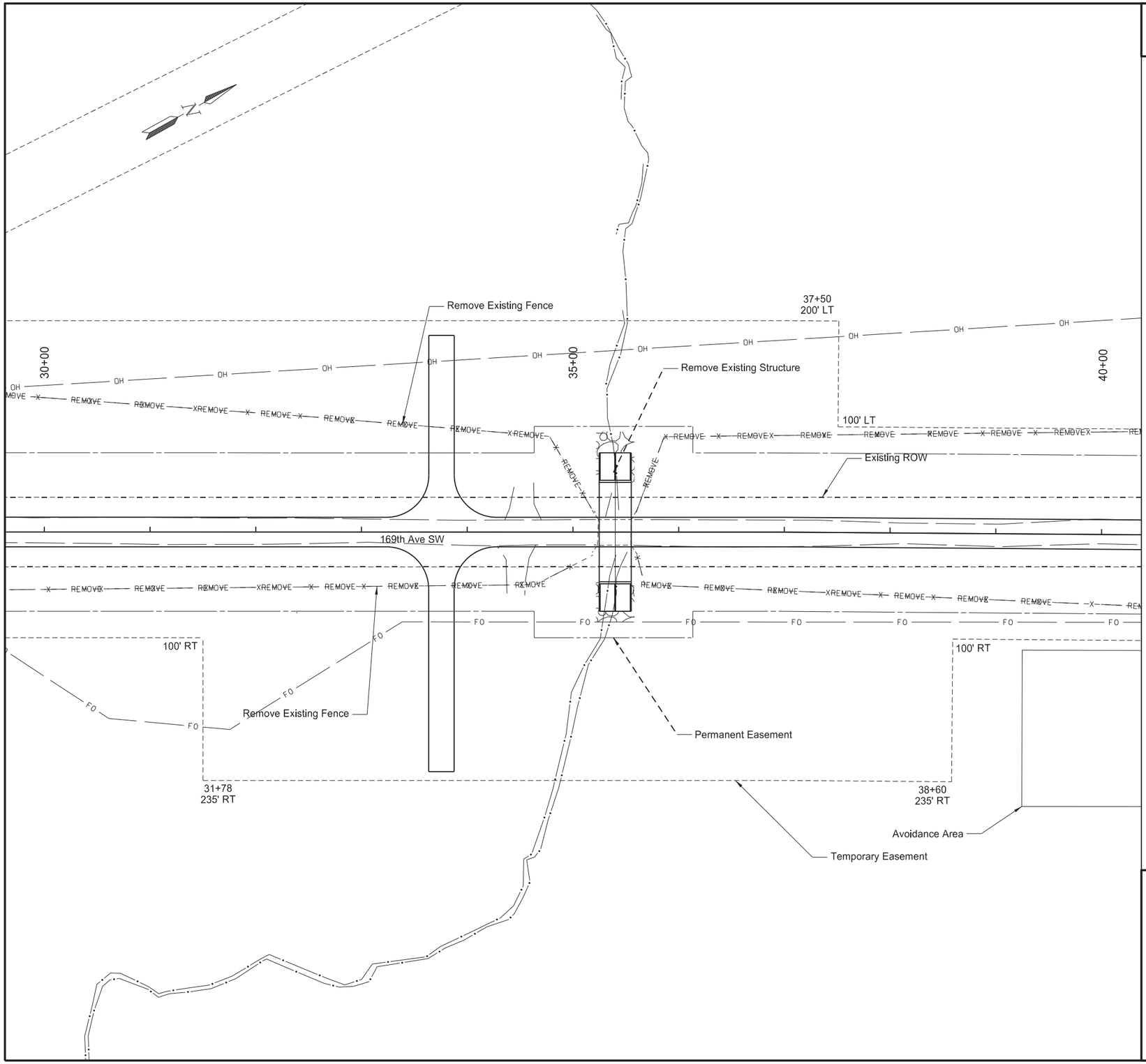
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	40	3

SPEC	CODE	BID ITEM	QUANTITY	UNIT
202	0104	REMOVAL OF STRUCTURE		
		Sta 35+39	1	EACH
202	0312	REMOVE EXISTING FENCE		
		Sta 30+00 to 40+00	2036	LF



Bowman County

Hestekin Bridge Replacement
169th Ave SW

Removals

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
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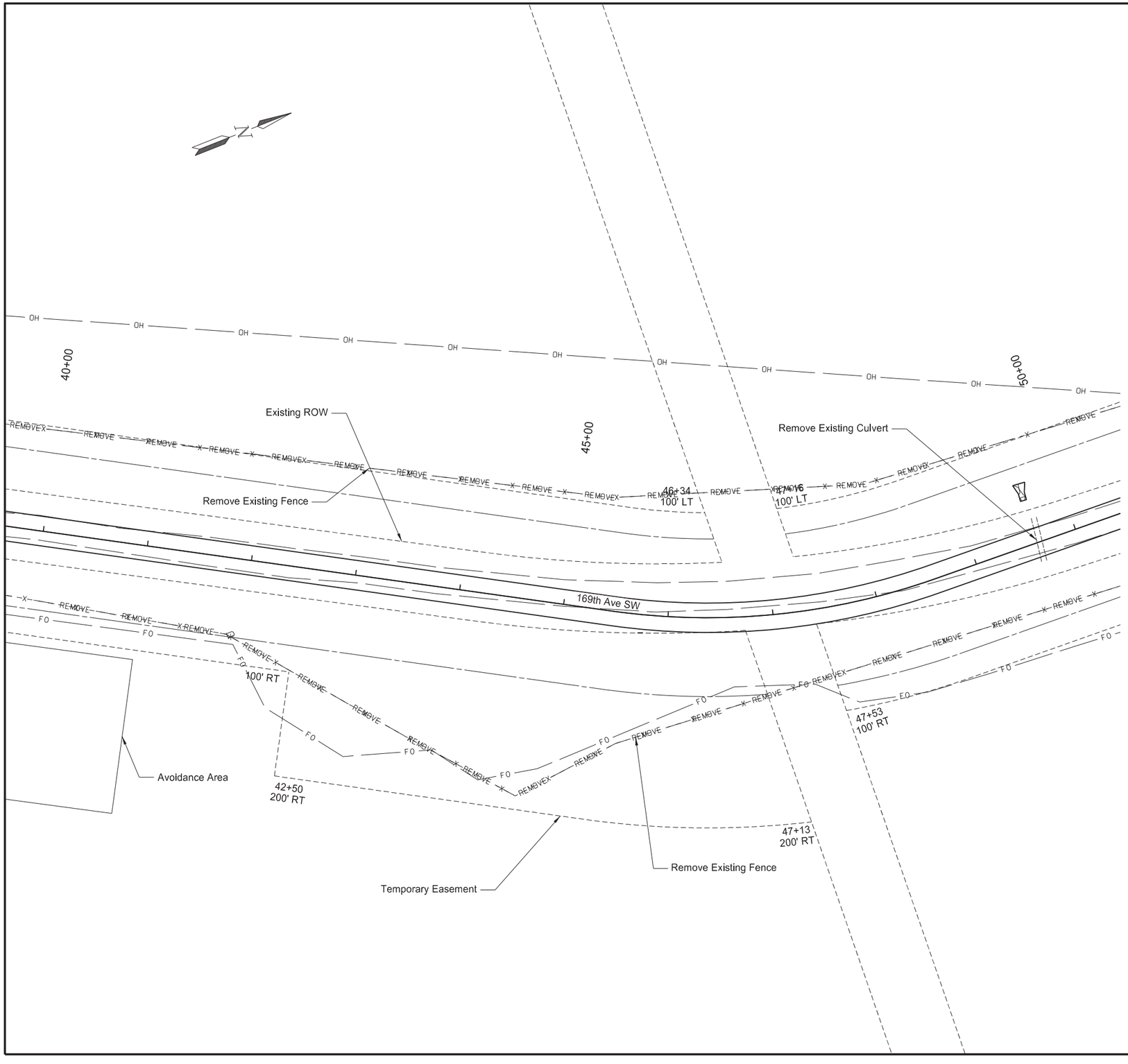
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	40	4

SPEC	CODE	BID ITEM	QUANTITY	UNIT
202	0169	REMOVAL OF END SECTION - ALL TYPES & SIZES		
		Sta 46+64	2	EA
202	0170	REMOVAL OF CULVERTS - ALL TYPES & SIZES		
		Sta 46+64	43	LF
202	0312	REMOVE EXISTING FENCE		
		Sta 40+00 to 50+00	2037	LF



Bowman County

Hestekin Bridge Replacement
169th Ave SW

Removals

REGISTERED PROFESSIONAL ENGINEER
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PE-25991
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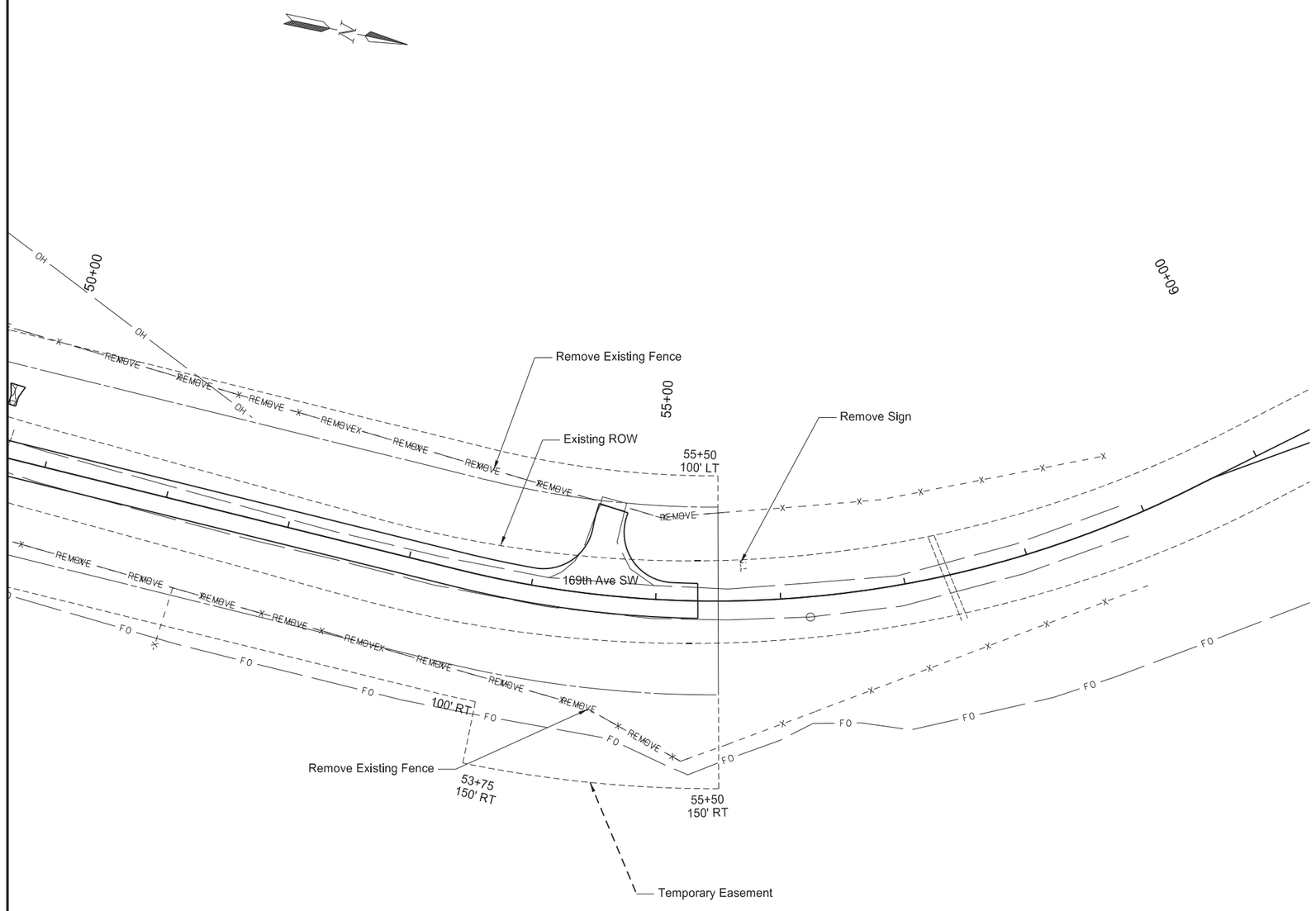
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	40	5

SPEC	CODE	BID ITEM	QUANTITY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 50+00 to 55+34	587	LF
754	1104	REMOVE SIGN FOUNDATION		
		Sta 55+69 LT	1	EA



Bowman County

Hestekin Bridge Replacement
169th Ave SW

Removals

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

Revised 1/27/2025	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	Geosythetic Material - Type G (Pay Item)	(*) End Sections		Applicable Backfill
				In	Bid Item	LF		In	Type		In	SY	Begin EA	End EA	
23+23	49' Lt	23+67	49' Lt	18	Pipe Conduit - Approach	46'	Reinforced Concrete Pipe - Class III	18							Specification 714.04 A
							Corrugated Steel Pipe	18	P	2	0.064				
							Spiral Rib Steel Pipe	18	P	3/4, 1	0.064				
							Polypropylene Pipe (AASHTO M330, Type S)	18							
25+48	47' Lt	26+08	41' Lt	24	Pipe Conduit - Approach	62'	Reinforced Concrete Pipe - Class III	24							Specification 714.04 A
							Corrugated Steel Pipe	24	P	2	0.064				
							Spiral Rib Steel Pipe	24	P	3/4, 1	0.064				
							Polypropylene Pipe (AASHTO M330, Type S)	24							
25+63	48' Rt	26+37	41' Rt	24	Pipe Conduit - Approach	72'	Reinforced Concrete Pipe - Class III	24							Specification 714.04 A
							Corrugated Steel Pipe	24	P	2	0.064				
							Spiral Rib Steel Pipe	24	P	3/4, 1	0.064				
							Polypropylene Pipe (AASHTO M330, Type S)	24							
49+63	38' Lt	49+63	40' Rt	24	Pipe Conduit	82'	Reinforced Concrete Pipe - Class III	24				55	FES	FES	Standard D-714-26
							Corrugated Steel Pipe	24	P	2	0.064				
							Spiral Rib Steel Pipe	24	P	3/4, 1	0.064				
							Polypropylene Pipe (AASHTO M330, Type S)	24							
106+19	67' Rt	106+78	51' Lt	48	Pipe Conduit	122	Reinforced Concrete Pipe - Class III	48							Specification 714.04 A
							Corrugated Steel Pipe	48	P	2	0.064		TES (4:1)	TES (4:1)	
							Spiral Rib Steel Pipe	48	P	3/4, 1	0.064				
							Polypropylene Pipe (AASHTO M330, Type S)	48							

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

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

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

(*) End sections are incidental to the bid item "Pipe Conduit"
FES = Flared End Section
TES = Traversable End Section

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Allowable Pipe List

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 1/30/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	Geosythetic Material - Type G (Pay Item)	(*) End Sections		Applicable Backfill
				In	Bid Item	LF		In	Type		In	SY	Begin EA	End EA	
23+23	49' Lt	23+67	49' Lt	18	Pipe Conduit	46'	Reinforced Concrete Pipe - Class III	18				28			Standard D-714-26
							Corrugated Steel Pipe	18	P	2	0.064				
							Spiral Rib Steel Pipe	18	P	3/4, 1	0.064				
							Polypropylene Pipe (AASHTO M330, Type S)	18							
25+48	47' Lt	26+08	41' Lt	24	Pipe Conduit	62'	Reinforced Concrete Pipe - Class III	24				42			Standard D-714-26
							Corrugated Steel Pipe	24	P	2	0.064				
							Spiral Rib Steel Pipe	24	P	3/4, 1	0.064				
							Polypropylene Pipe (AASHTO M330, Type S)	24							
25+63	48' Rt	26+37	41' Rt	24	Pipe Conduit	72'	Reinforced Concrete Pipe - Class III	24				48			Standard D-714-26
							Corrugated Steel Pipe	24	P	2	0.064				
							Spiral Rib Steel Pipe	24	P	3/4, 1	0.064				
							Polypropylene Pipe (AASHTO M330, Type S)	24							
49+63	38' Lt	49+63	40' Rt	24	Pipe Conduit	82'	Reinforced Concrete Pipe - Class III	24				55	FES	FES	Standard D-714-26
							Corrugated Steel Pipe	24	P	2	0.064				
							Spiral Rib Steel Pipe	24	P	3/4, 1	0.064				
							Polypropylene Pipe (AASHTO M330, Type S)	24							
106+19	67' Rt	106+78	51' Lt	48	Pipe Conduit	122	Reinforced Concrete Pipe - Class III	48				108	TES (4:1)	TES (4:1)	Standard D-714-28
							Corrugated Steel Pipe	48	P	2	0.064				
							Spiral Rib Steel Pipe	48	P	3/4, 1	0.064				
							Polypropylene Pipe (AASHTO M330, Type S)	48							

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

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

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

(*) End sections are incidental to the bid item "Pipe Conduit"
FES = Flared End Section
TES = Traversable End Section

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Allowable Pipe List

REGISTERED PROFESSIONAL ENGINEER
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PE-25991
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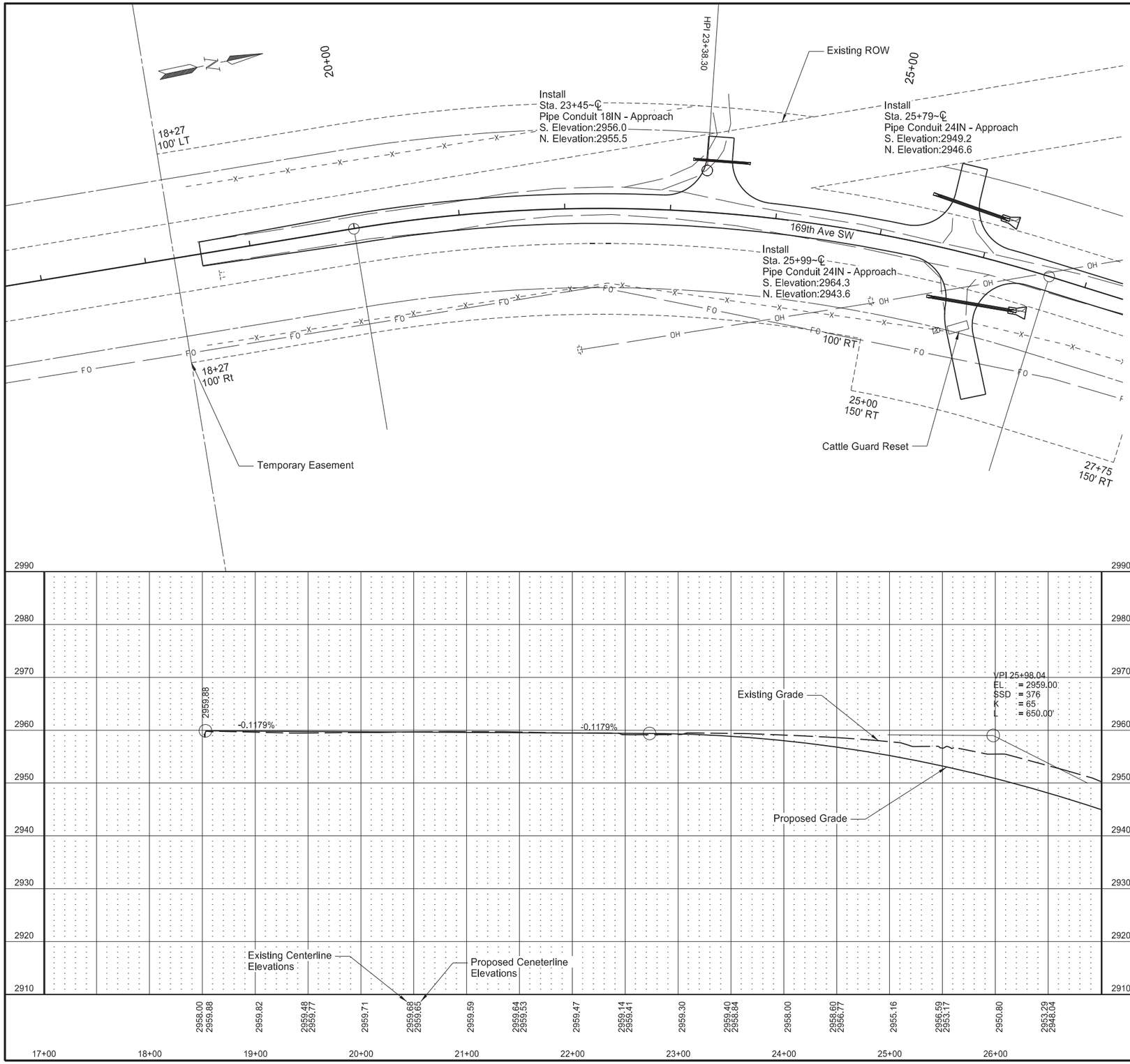

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	60	1

SPEC	CODE	BID ITEM	QUANTITY	UNIT
714	4099	PIPE CONDUIT 18IN - APPROACH		
		Sta 23+45 Lt	46	LF
714	4106	PIPE CONDUIT 24IN - APPROACH		
		Sta 25+79 Lt	62	LF
		Sta 25+99 Rt	72	LF
980	0170	CATTLE GUARD RESET		
		Sta 25+91 Rt	1	EACH

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Plan & Profile

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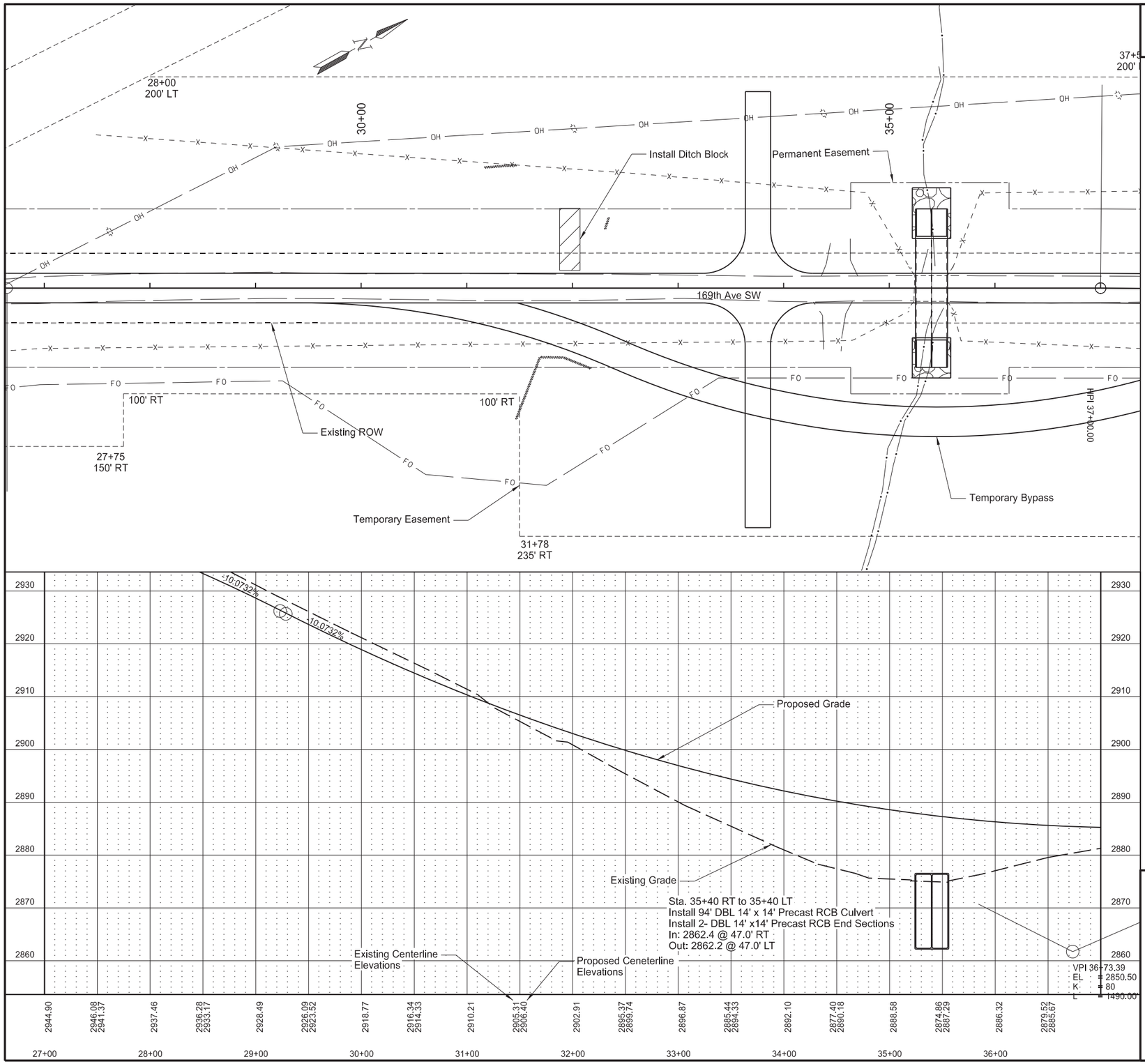
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	60	2



Bowman County

Hestekin Bridge Replacement
169th Ave SW

Plan & Profile

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	60	3

37+50
200' LT

100' LT

40+00

45+00

46+34
100' LT

47+16
100' LT

169th Ave SW

HPI 37+00.00

100' RT

100' RT

Avoidance Area

Temporary Easement

Existing ROW

HPI 47+06.07

38+60
235' RT

42+50
200' RT

-8.6606%

Proposed Grade

Existing Grade

2899.03

37+29.09
2885.27

Existing Centerline Elevations

Proposed Ceneterline Elevations

2885.33	2881.80 2885.30	2885.59	2883.36 2886.20	2887.11	2885.65 2888.35	2889.90	2889.55 2891.76	2893.94	2894.05 2896.44	2899.25	2900.33 2902.37	2905.81	2907.61 2909.56	2913.63	2916.34 2917.96	2922.30	2925.10 2926.64	2930.98	2933.96 2935.33
37+00		38+00		39+00		40+00		41+00		42+00		43+00		44+00		45+00		46+00	

Bowman County

Hestekin Bridge Replacement
169th Ave SW

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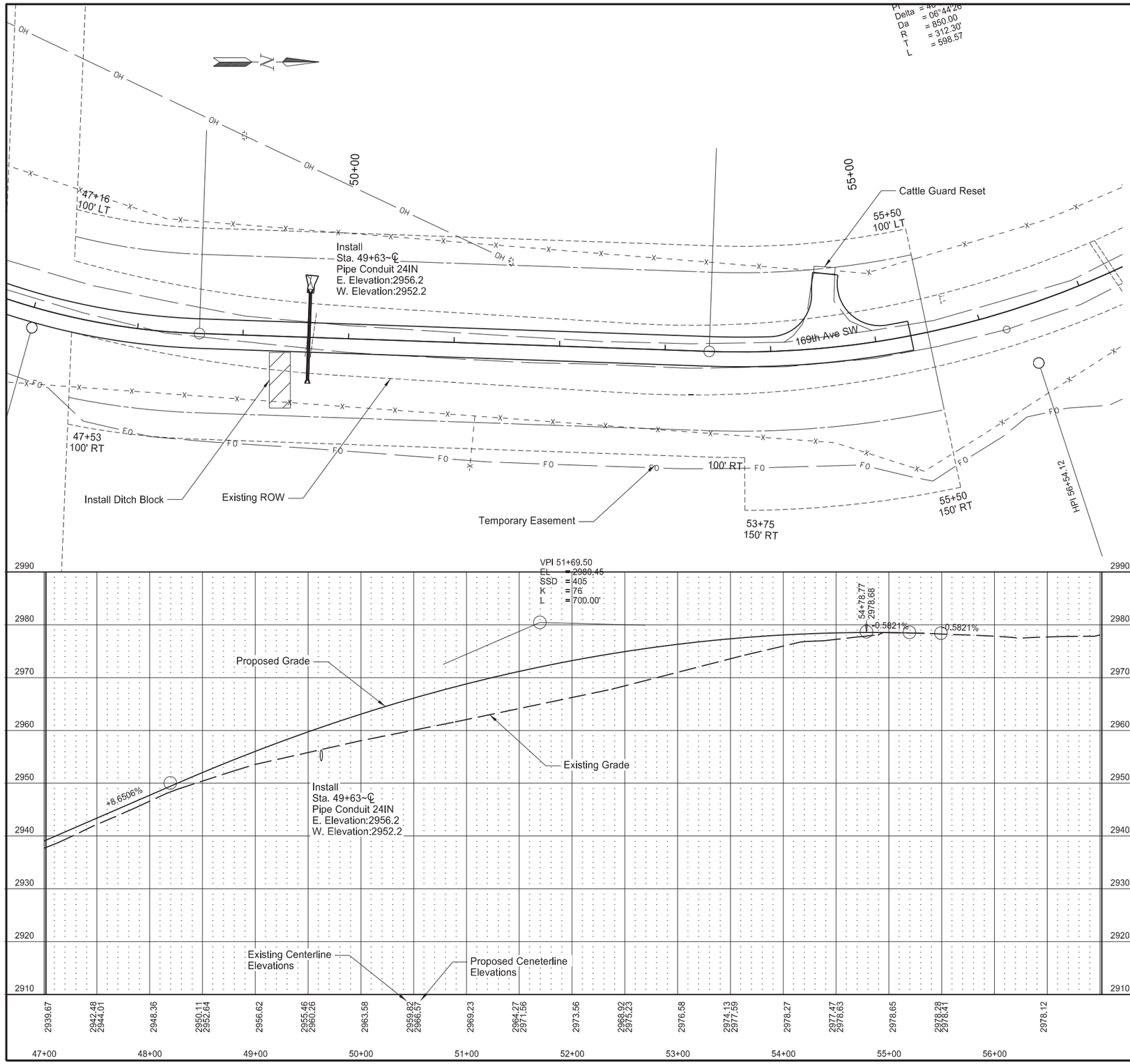

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	60	4

SPEC	CODE	BID ITEM	QUANTITY	UNIT
714	4105	PIPE CONDUIT 24IN		
		Sta 49+63	82	LF
980	0170	CATTLE GUARD RESET		
		Sta 54+59 Lt	1	EACH

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Plan & Profile

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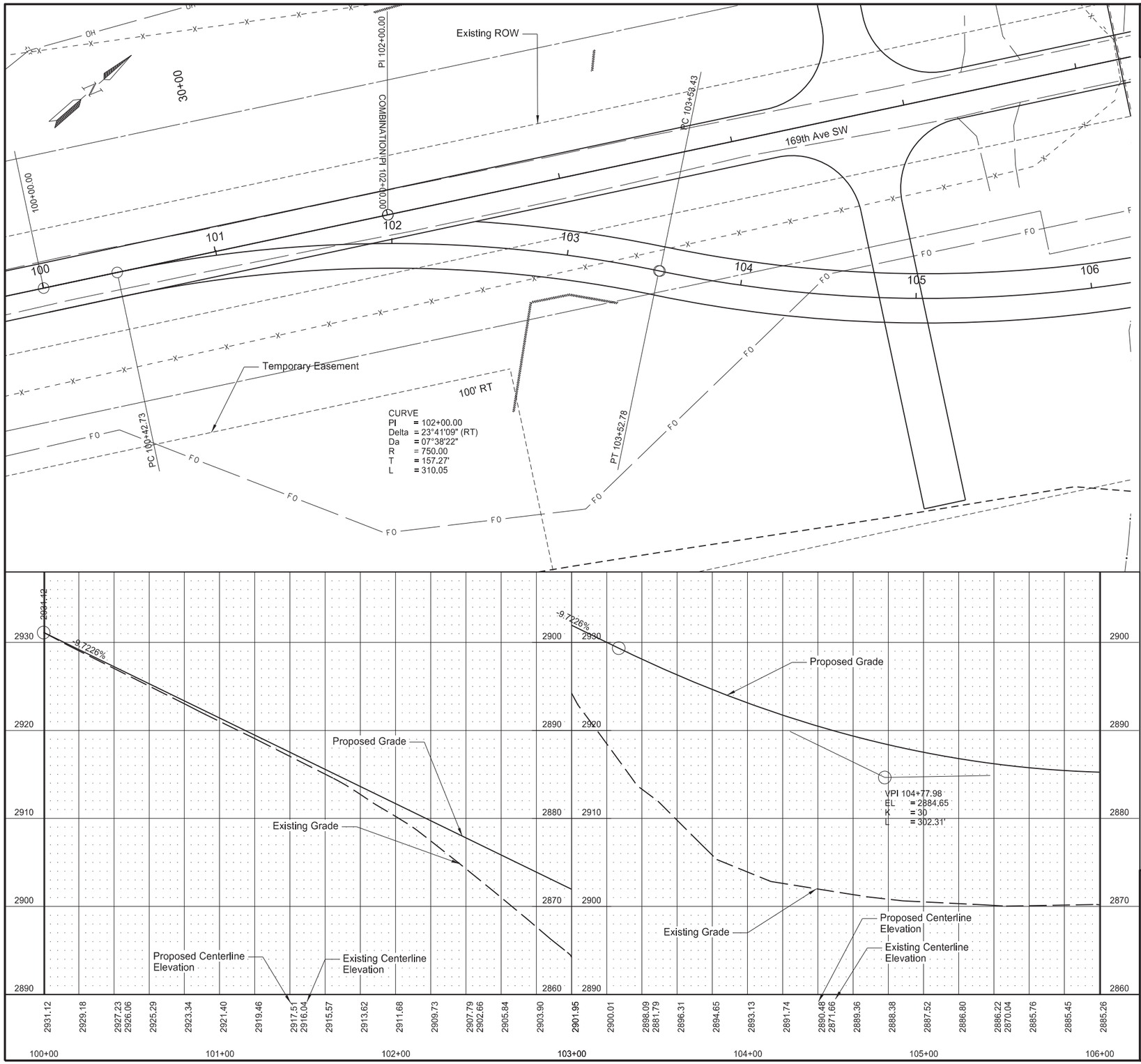
ND	BRP-BRJ-0006(052)	60	5



Bowman County

Hestekin Bridge Replacement
169th Ave SW

Plan & Profile
Temporary Bypass

REGISTERED PROFESSIONAL ENGINEER
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PE-25991
DATE 12/06/24
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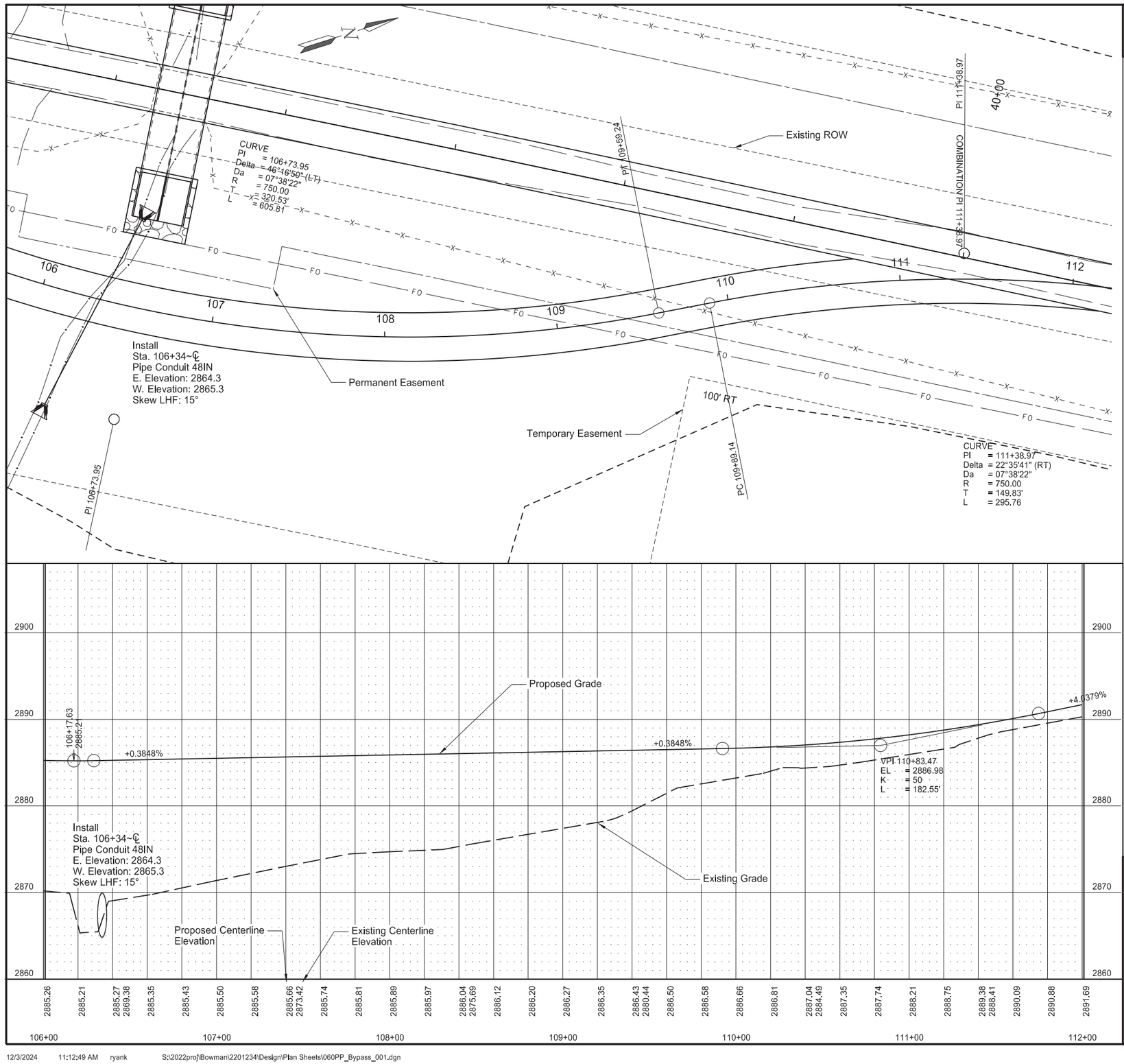

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	60	6

SPEC	CODE	BID ITEM	QUANTITY	UNIT
710	0200	TEMPORARY BYPASS		
		Sta 100+00 to Sta 113+00	1	LSUM
714	4125	PIPE CONDUIT 48IN		
		Sta 106+34 (Temporary Bypass)	122	LF

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Plan & Profile
Temporary Bypass

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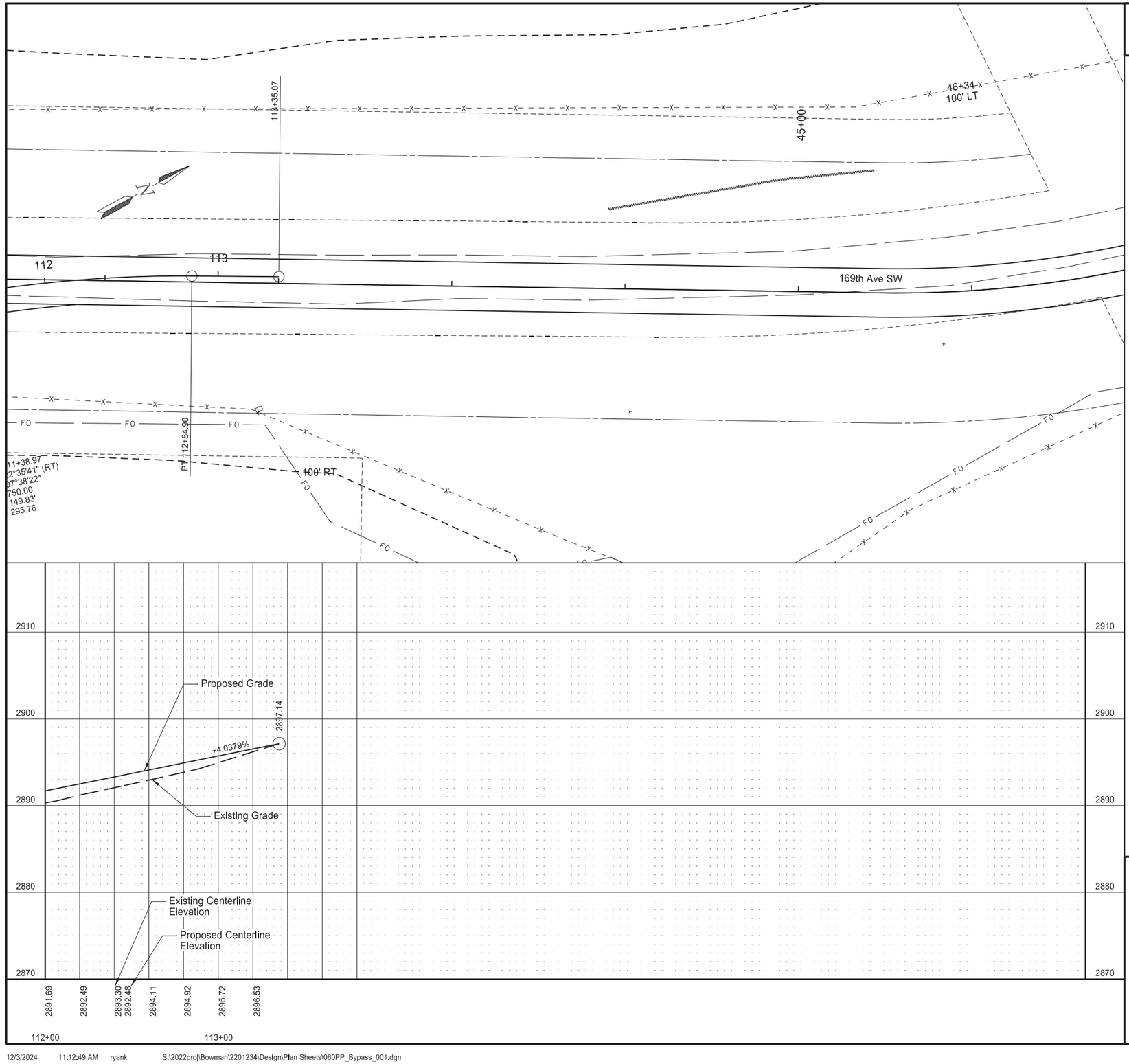
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	60	7



Bowman County

Hestekin Bridge Replacement
169th Ave SW

Plan & Profile
Temporary Bypass

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	75	1

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact: Wetland Impacts Acre(s) Temp.	Wetland Impact: Wetland Impacts Acre(s) Perm. (Fill/Drain)	Wetland Impact: Wetland Impacts Acre(s) Perm. (Cut)	Wetland Impact: USFWS Easement Impacts Acre(s) Temp.	Wetland Impact: USFWS Easement Impacts Acre(s) Perm.	Wetland Mitigation: Mitigation Proposed EO 11990	Wetland Mitigation: Mitigation Proposed USACE	Wetland Mitigation: Mitigation Proposed USFWS
1	Sec 25, T130N, R106W	Depression	Natural	Yes	0.000	0.000				N	N	N
2	Sec 25, T130N, R106W	Depression	Natural	Yes	0.000	0.000				N	N	N
3	Sec 25, T130N, R106W	Drainage	Natural	Yes	0.000	0.000				N	N	N
				Totals	**0.000**	**0.000**						

Other Waters Impact Table

Number	Location	Type	Feature	USACE Jurisdictional[1]	Impacts to Other Waters: Acres Temp.	Acres Perm. (Fill/Drain)	Acres Perm. (Cut)	Linear Feet Temp.	Linear Feet Perm. (Fill/Drain)	Linear Feet Perm. (Cut)	Other Water Mitigation: Mitigation Proposed EO 11990	Mitigation Proposed USACE	Mitigation Proposed USFWS	USACE Mitigation Bank Mitigation Location; ratio	USACE Mitigation Bank Method
OW-1	Sec 25, T130N, R106W	Perennial Stream	Natural	Yes	0.091	0.086		105.000	133.000		N	Y	N	Mitigation Bank; 2:1	0.172
				Totals	**0.091**	**0.086**									

[1] A wetland Jurisdictional Determination was issued by the USACE on 9/11/2023; NWO-2023-01372-BIS

Impact Summary Table

Permanent Impact Summary: Wetland Type	Total Acre(s)	Temporary Impacts and additional information: Water Type	Total Acre(s)
Natural/JD (Fill/Drain)	0.000	Temporary Wetland JD	0.000
Natural/Non-JD (Fill/Drain)	0.000	Non-JD Wetland Temporary	0.000
Artificial/JD (Fill/Drain)	0.000		
Artificial /Non-JD (Fill/Drain))	0.000	Permanent OW	0.086
Total	**0.000**	Temporary OW	0.091
JD Natural (Cut)		Permanent OW-d	
JD Artificial (Cut)		Temporary OW-d	
Non-JD Natural (Cut)			
Non-JD Artificial (Cut)			
Total	**0.000**		

Mitigation Summary Table

	Location	Ditch Shift Acre(s)	Onsite Acre(s)	11990 Bank Acre(s)	USACE/11990 Bank Acre(s)	USFWS Bank Acre(s)
USACE Only	Mitigation Bank	---	---		0.172	
EO 11990 Only	---	---	---	---		
USACE/11990	---	---	---		---	
USFWS		---				---
	Total	**0**	**0**	**0**	**0.172**	**0**

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Wetland Impacts Table

REGISTERED PROFESSIONAL ENGINEER
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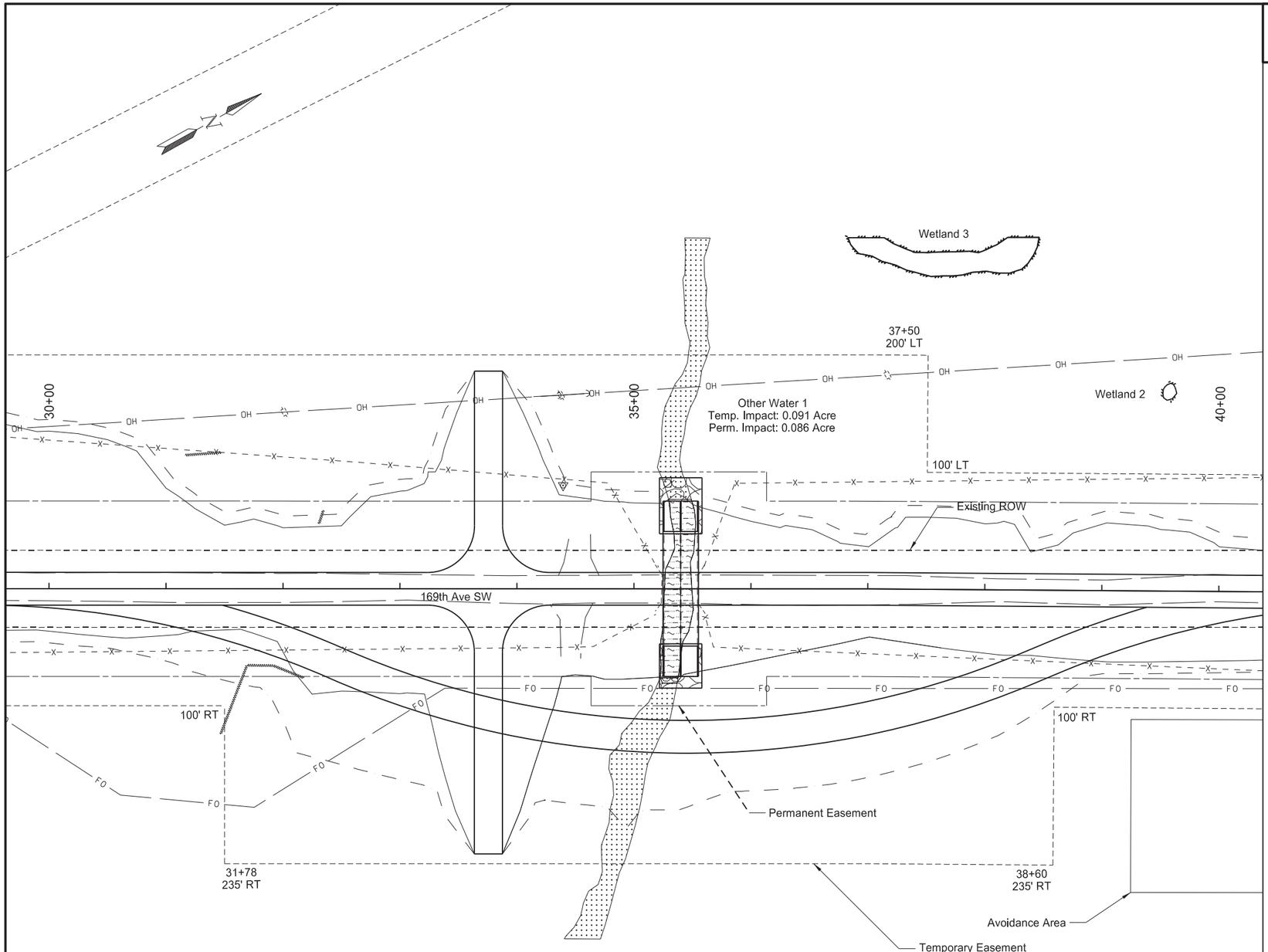
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	75	2



LEGEND

- Grading Tie Line
- Other Water Permanent Impact
- Other Water Temporary Impact
- Wetland Permanent Impact
- Wetland Temporary Impact
- Wetland & Other Water Mitigation

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Wetland Impacts

REGISTERED PROFESSIONAL ENGINEER
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DATE 12/06/24
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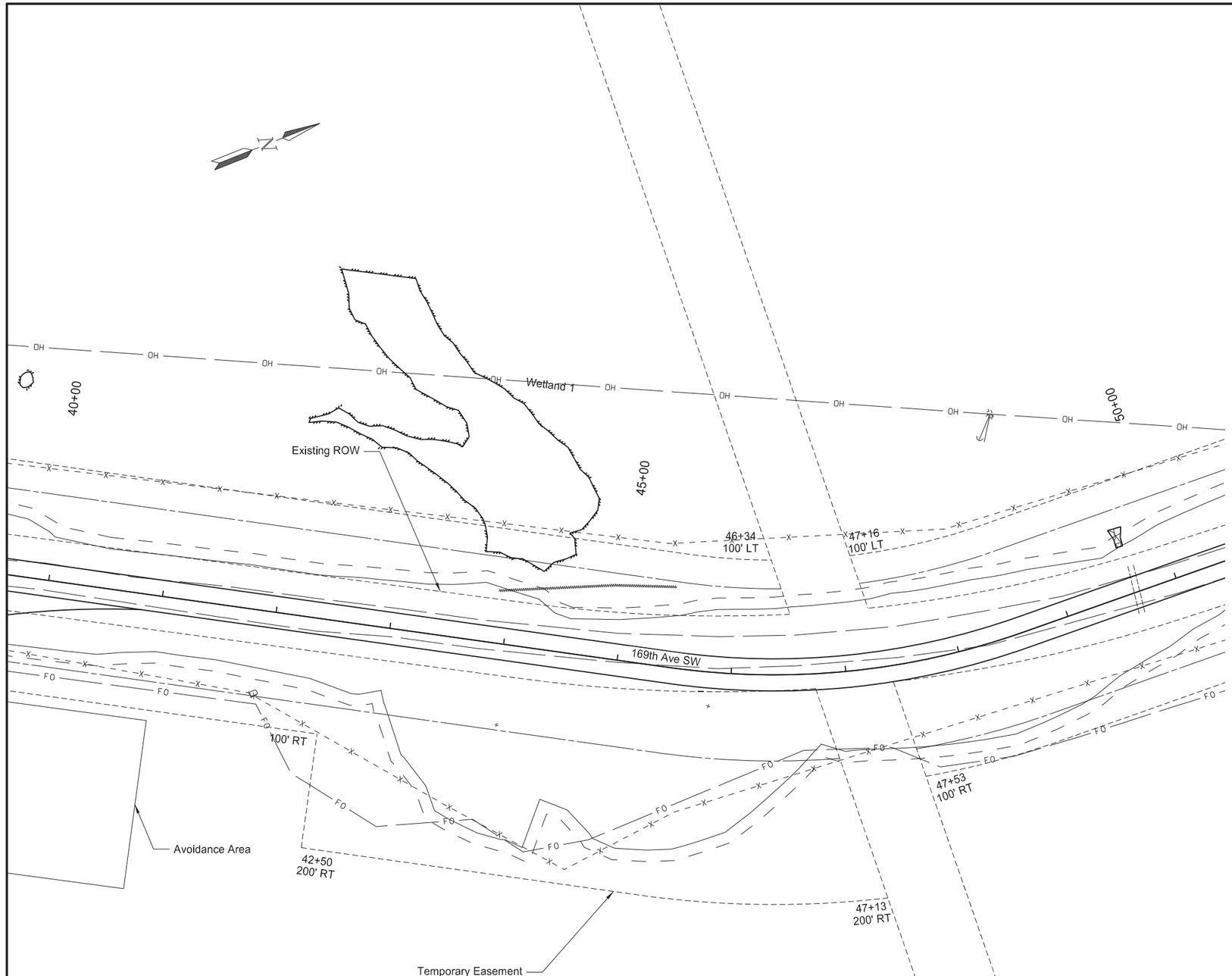
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	75	3



LEGEND

- Grading Tie Line
- Other Water Permanent Impact
- Other Water Temporary Impact
- Wetland Permanent Impact
- Wetland Temporary Impact
- Wetland & Other Water Mitigation

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Wetland Impacts

REGISTERED PROFESSIONAL ENGINEER
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DATE 12/06/24
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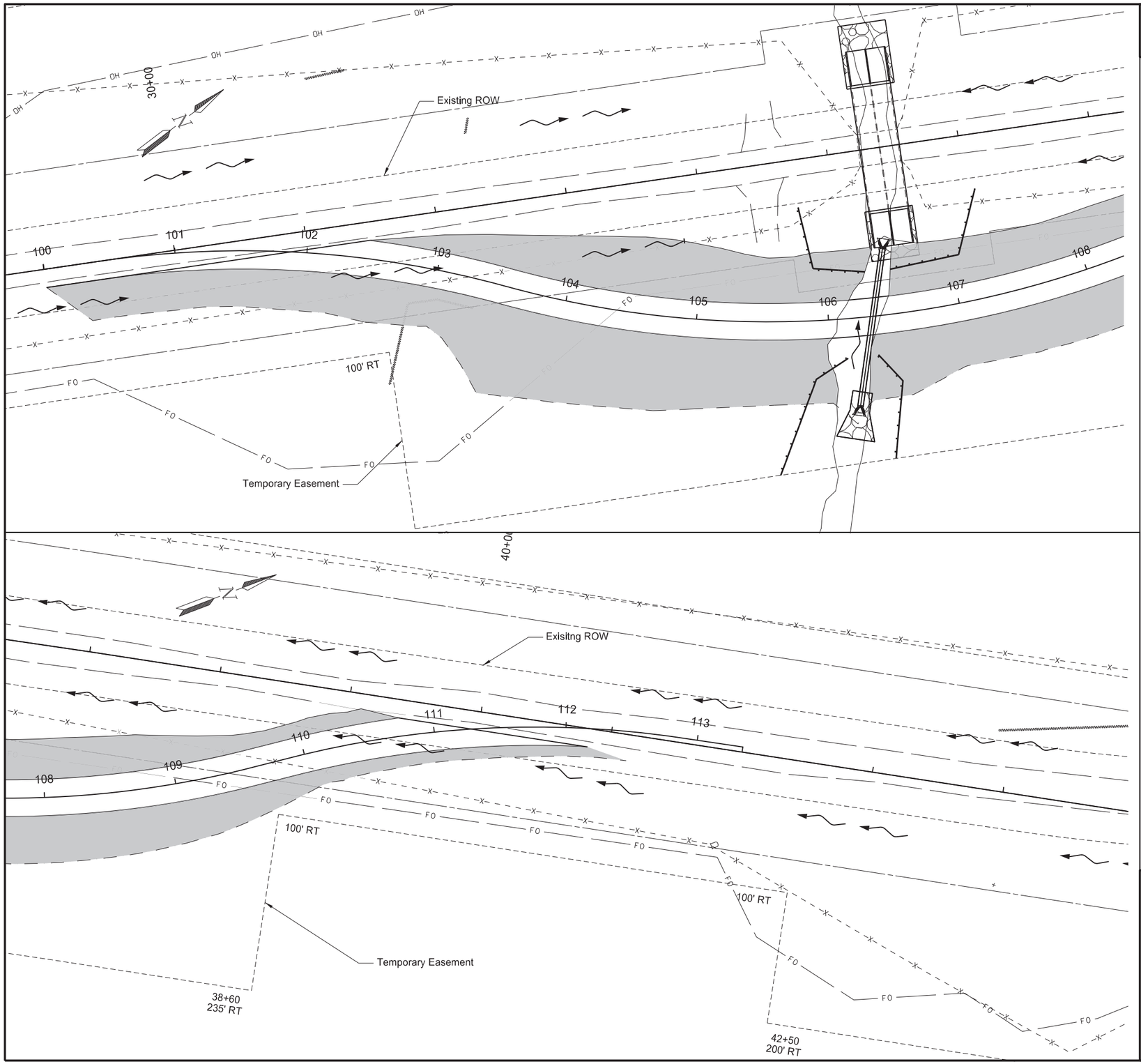

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	76	1

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP		
		STA 100+00 to 113+00	1.5	ACRE
253	0101	STRAW MULCH		
		STA 100+00 to 113+00	1.5	ACRE
261	0120	FIBER ROLLS 20IN		
		STA 105+68 to 106+13 Rt	100	LF
		STA 105+80 to 106+31 Lt	100	LF
		STA 106+35 to 106+46 Rt	100	LF
		STA 106+51 to 107+32 Lt	100	LF
261	0121	REMOVE FIBER ROLLS 20IN		
		STA 105+68 to 106+13 Rt	100	LF
		STA 105+80 to 106+31 Lt	100	LF
		STA 106+35 to 106+46 Rt	100	LF
		STA 106+51 to 107+32 Lt	100	LF

LEGEND

- Temporary Cover Crop & Straw Mulch
- Fiber Rolls 20"
- Flow Direction

Bowman County

Hestekin Bridge Replacement
Temporary Bypass

Temporary Sediment & Erosion Control

REGISTERED PROFESSIONAL ENGINEER
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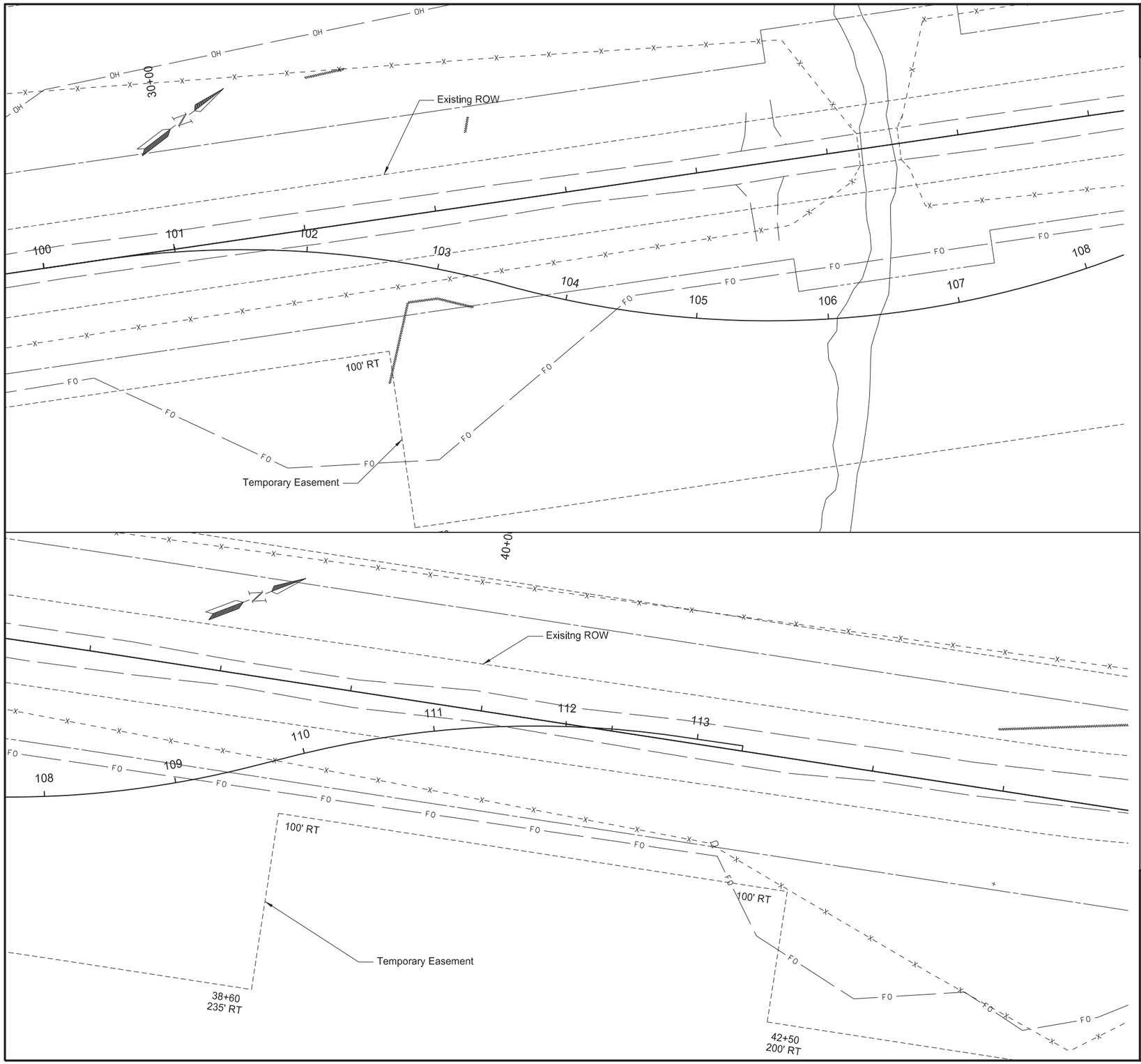

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	76	2

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP		
		STA 100+00 to 113+00	2.1	ACRE
253	0101	STRAW MULCH		
		STA 100+00 to 113+00	2.1	ACRE
261	0120	FIBER ROLLS 20IN		
		STA 105+99 Rt to 106+38 Lt	200	LF
		STA 106+15 Rt to 106+54 Lt	200	LF

LEGEND

- Temporary Cover Crop & Straw Mulch
- Fiber Rolls 20"
- Flow Direction

Bowman County

Hestekin Bridge Replacement
Removed Temporary Bypass

Temporary Sediment & Erosion Control

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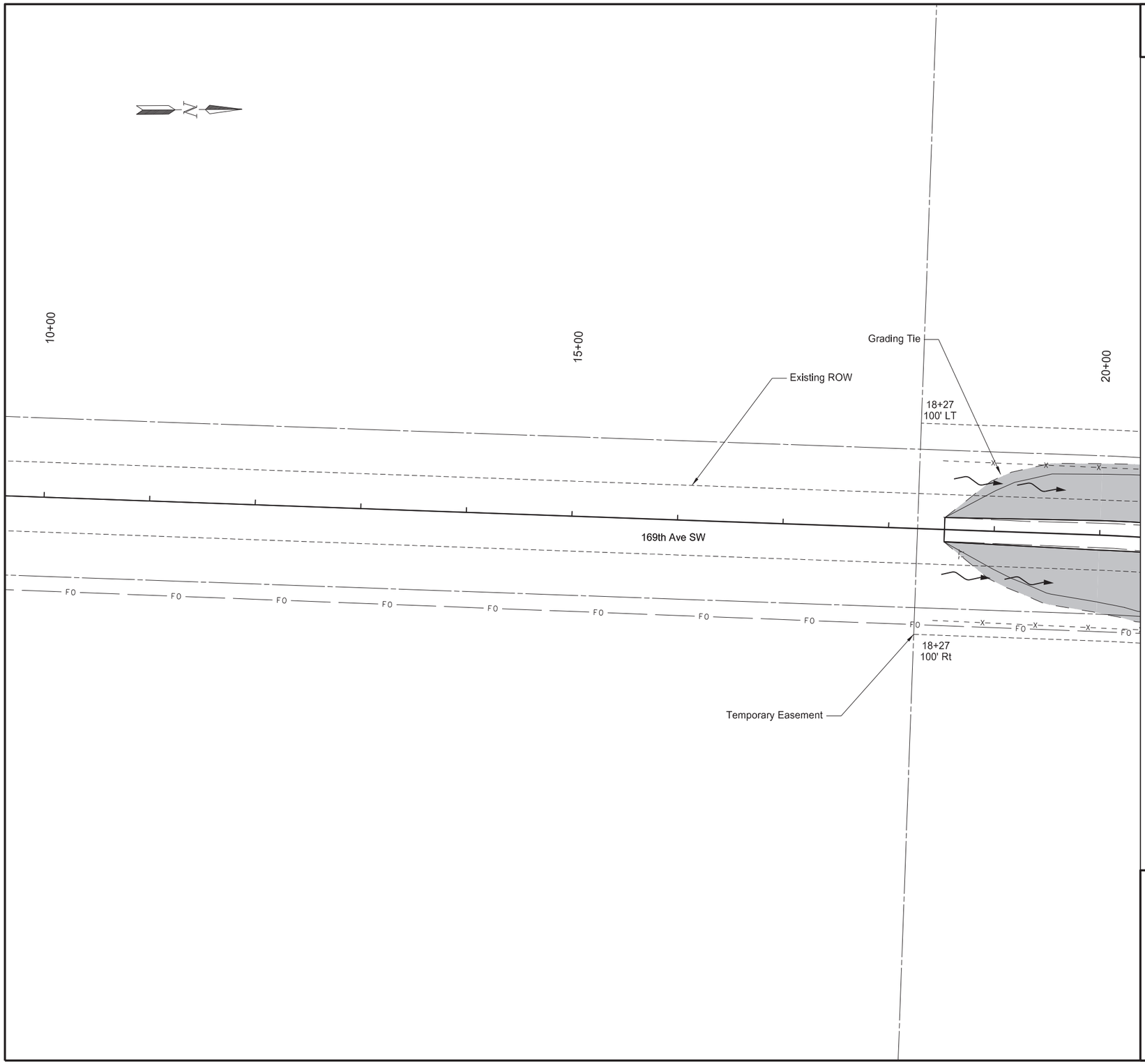

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	76	3

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sta 18+53 to 20+00	0.3	ACRE
253	0101	STRAW MULCH		
		Sta 18+53 to 20+00	0.3	ACRE

LEGEND

- Temporary Cover Crop & Straw Mulch
- Fiber Rolls 20" & 12"
- Flow Direction

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Temporary Sediment & Erosion Control

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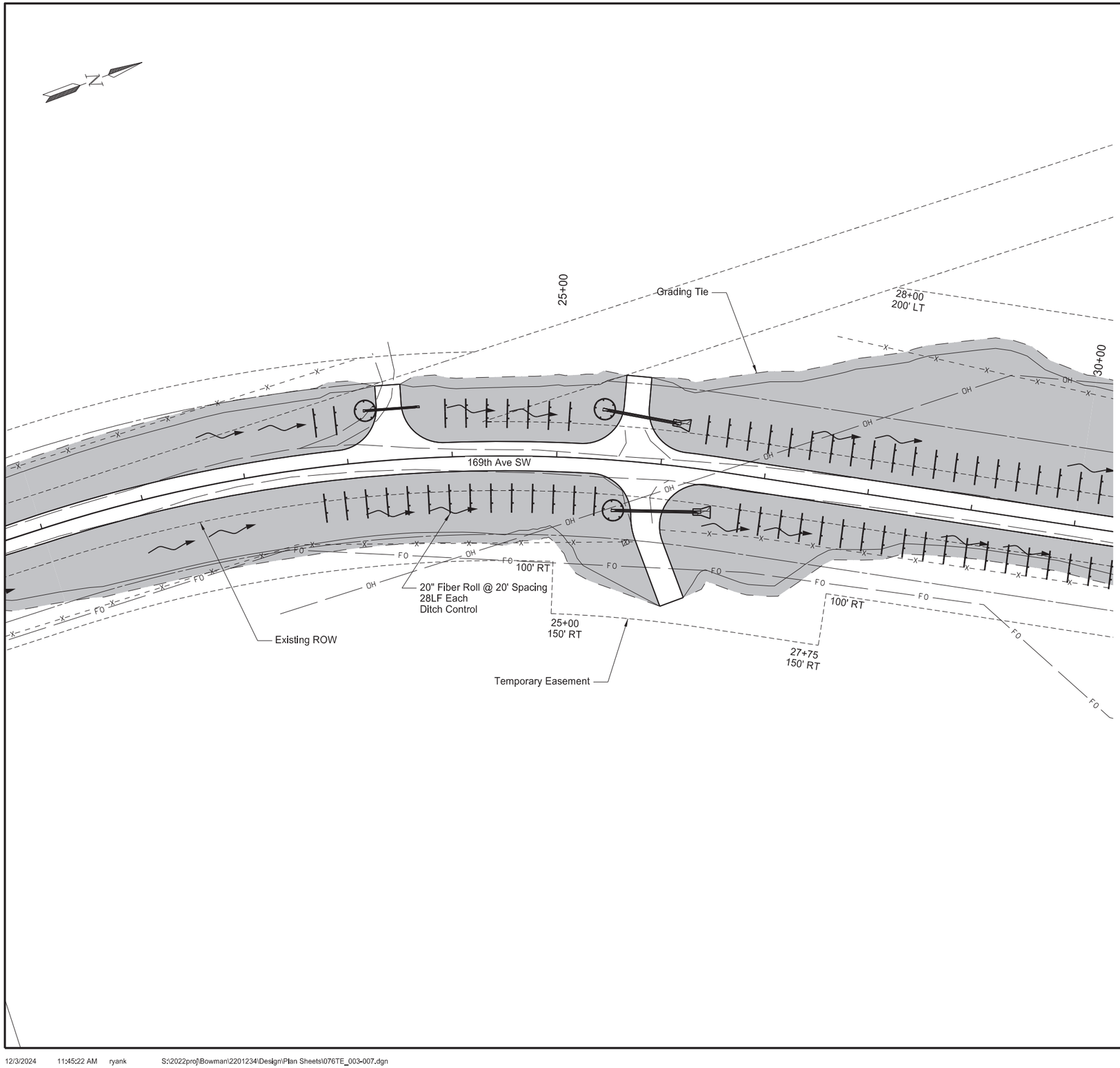

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	76	4

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP		
		STA 20+00 to 30+00	3.3	ACRE
253	0101	STRAW MULCH		
		STA 20+00 to 30+00	3.3	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 23+22 Lt	20	LF
		Sta 25+43 Lt	20	LF
		Sta 25+58 Lt	20	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 23+22 Lt	20	LF
		Sta 25+43 Lt	20	LF
		Sta 25+58 Lt	20	LF
261	0120	FIBER ROLLS 20IN		
		STA 20+00 to 30+00 Lt	729	LF
		STA 20+00 to 30+00 Rt	840	LF
261	0121	REMOVE FIBER ROLLS 20IN		
		STA 20+00 to 30+00 Lt	729	LF
		STA 20+00 to 30+00 Rt	840	LF

LEGEND

- Temporary Cover Crop & Straw Mulch
- Fiber Rolls 20" & 12"
- Flow Direction

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Temporary Sediment & Erosion Control

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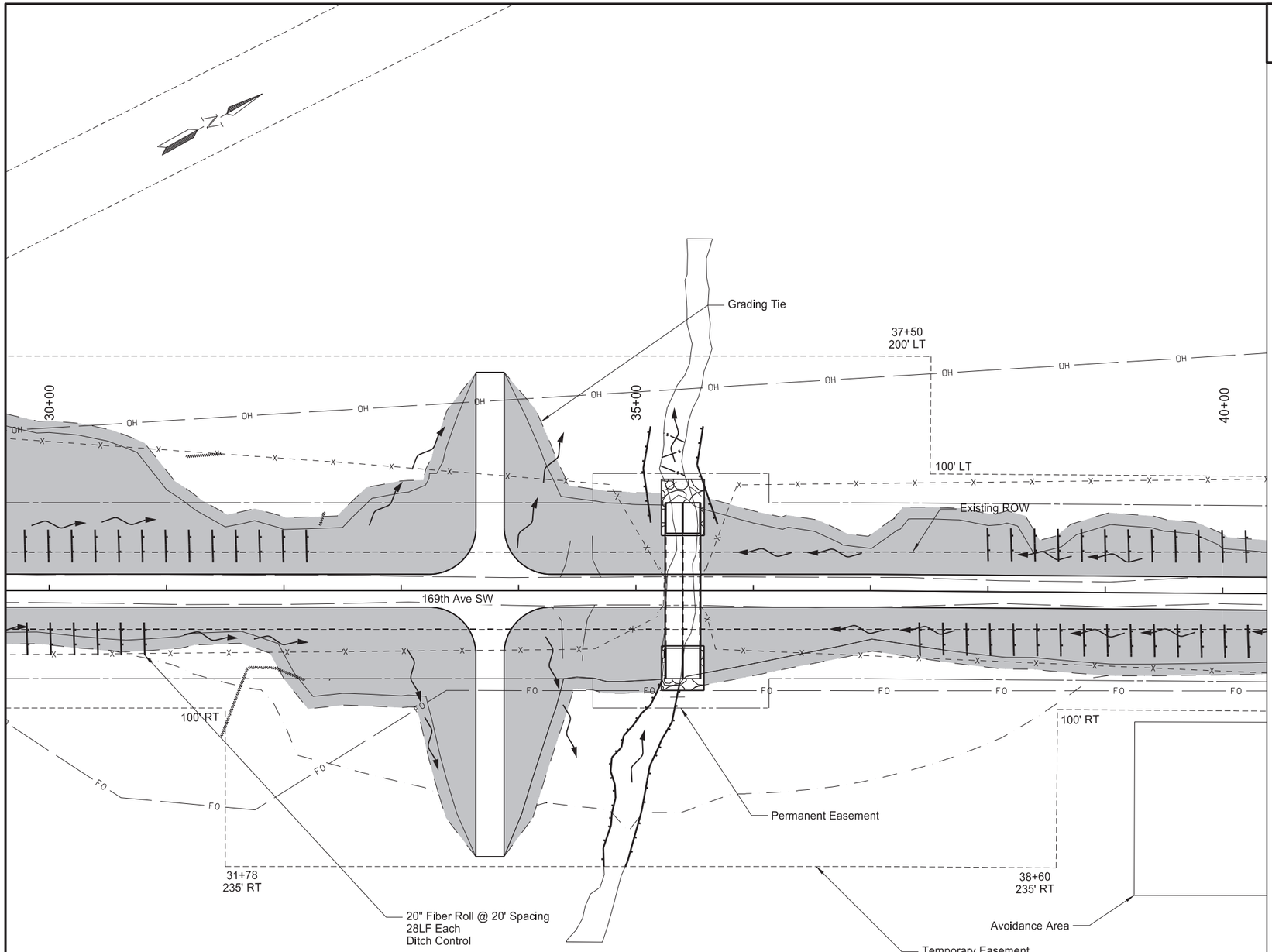

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	76	5

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sta 30+00 to 40+00	2.9	ACRE
253	0101	STRAW MULCH		
		Sta 30+00 to 40+00	2.9	ACRE
261	0120	FIBER ROLLS 20IN		
		Sta 30+00 to 40+00 Lt	816	LF
		Sta 30+00 to 40+00 Rt	504	LF
261	0121	REMOVE FIBER ROLLS 20IN		
		Sta 30+00 to 40+00 Lt	816	LF
		Sta 30+00 to 40+00 Rt	504	LF
		STA 34+00 to 35+22 Rt	200	LF
		STA 34+91 to 35+38 Rt	200	LF
708	1375	FLOTATION SILT CURTAIN		
		Sta 35+31 Lt	60	LF
708	1376	REMOVAL FLOTATION SILT CURTAIN		
		Sta 35+31 Lt	60	LF

LEGEND

- Temporary Cover Crop & Straw Mulch
- Fiber Rolls 20" & 12"
- Flow Direction

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Temporary Sediment & Erosion Control

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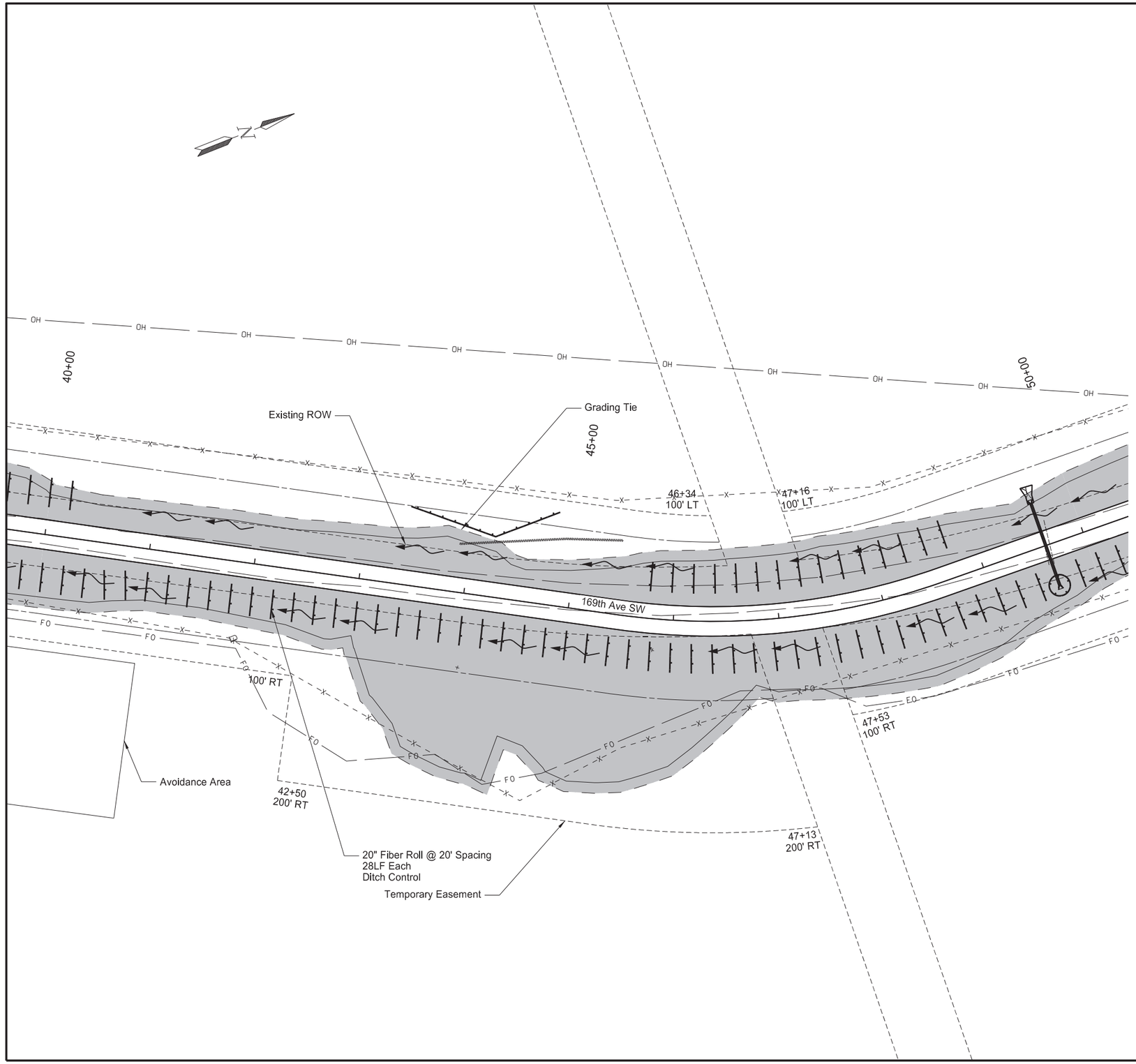

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	76	6

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	**TEMPORARY COVER CROP**		
		Sta 40+00 to 50+00	3.1	ACRE
253	0101	**STRAW MULCH**		
		Sta 40+00 to 50+00	3.1	ACRE
261	0112	**FIBER ROLLS 12IN**		
		Sta 49+63 Rt	20	LF
261	0113	**REMOVE FIBER ROLLS 12IN**		
		Sta 49+63 Rt	20	LF
261	0120	**FIBER ROLLS 20IN**		
		Sta 40+00 to 50+00 Lt	608	LF
		Sta 40+00 to 50+00 Rt	963	LF
261	0121	**REMOVE FIBER ROLLS 20IN**		
		Sta 40+00 to 50+00 Lt	608	LF
		Sta 40+00 to 50+00 Rt	963	LF

LEGEND

- Temporary Cover Crop & Straw Mulch
- Fiber Rolls 20" & 12"
- Flow Direction

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Temporary Sediment & Erosion Control

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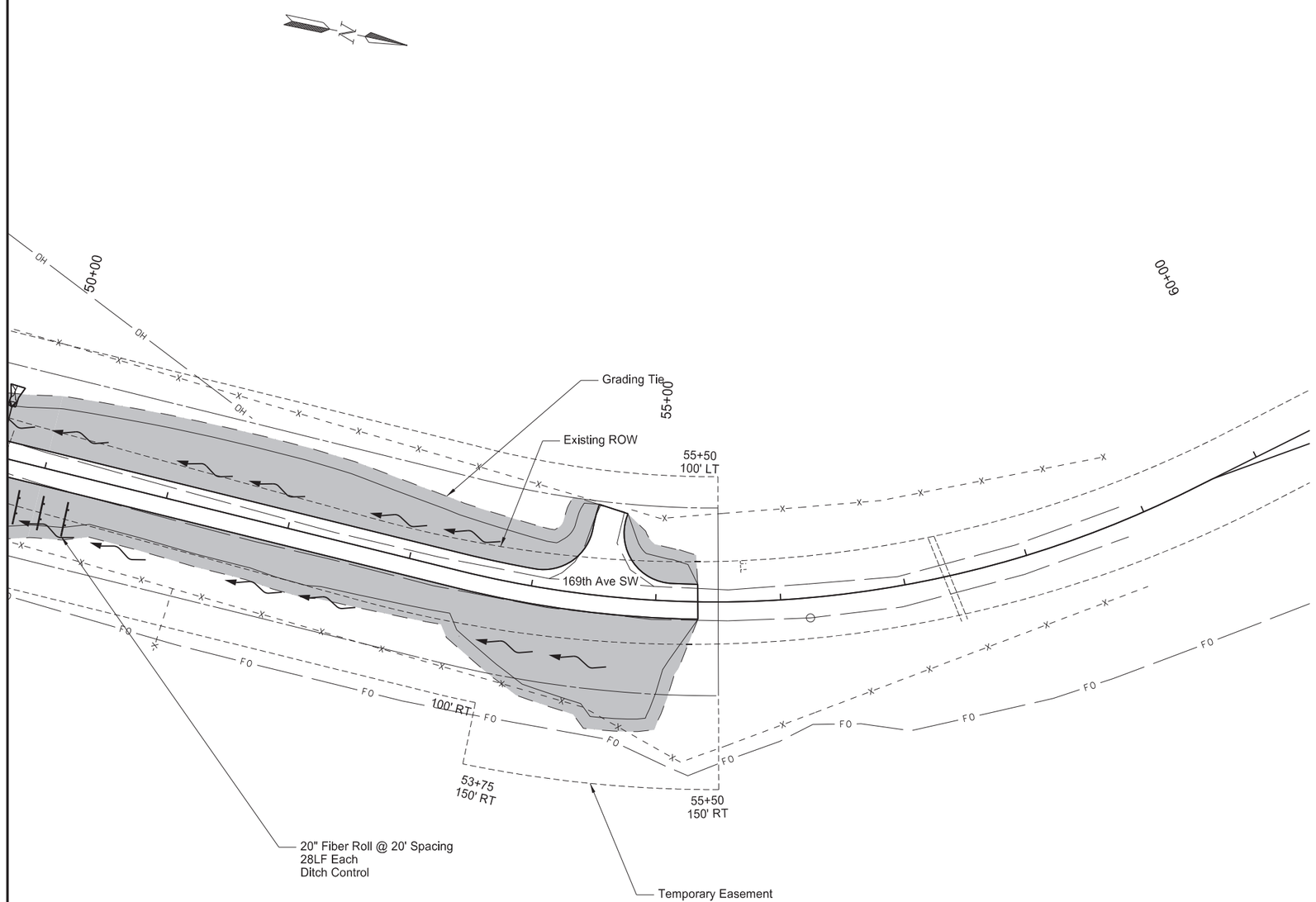
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	76	7

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sta 50+00 to 55+34	1.2	ACRE
253	0101	STRAW MULCH		
		Sta 50+00 to 55+34	1.2	ACRE
261	0120	FIBER ROLLS 20IN		
		Sta 50+00 to 55+34 Rt	36	LF
261	0121	REMOVE FIBER ROLLS 20IN		
		Sta 50+00 to 55+34 Rt	36	LF



LEGEND

- Temporary Cover Crop & Straw Mulch
- Fiber Rolls 20" &12"
- Flow Direction

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Temporary Sediment & Erosion Control

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	76	8

Pipe End Section Fiber Rolls		
Station	Fiber Rolls 12" (LF)	
	LT	RT
23+22	20	
25+43	20	
25+58		20
49+63		20

R/W Fiber Rolls				
Station to Station			Fiber Rolls 20" (LF)	
			LT	RT
*105+68	to	*106+13		100
*105+80	to	*106+31	100	
*105+99		*106+38	100	100
*106+15		*106+54	100	100
*106+35	to	*106+46		100
*106+51	to	*107+32	100	
35+13	to	35+13	100	
35+57	to	35+70	100	
43+40	to	44+80	160	

*Stationing is Temporary Bypass

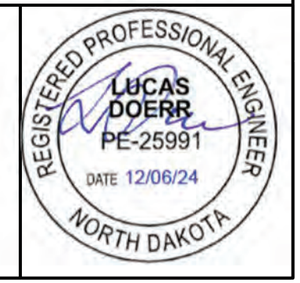
Ditch Fiber Rolls		
Station	Fiber Rolls 12" (LF)	
	LT	RT
22+73	28	28
22+93	28	28
23+13		28
23+33		28
23+53		28
23+73		28
23+93	28	28
24+13	28	28
24+33	28	28
24+53	28	28
24+73	28	28
24+93	28	28
25+13	28	28
25+33		28
26+40	18	
26+60	18	
26+80	18	28
27+00	18	28
27+20	18	28
27+40	23	28
27+60	28	28
27+80	28	28
28+00	28	28
28+20	28	28
28+40	28	28
28+60	28	28
28+80	28	28
29+00	28	28
29+20	28	28
29+40	28	28
29+60	28	28
29+80	28	28
30+00	28	28
30+20	28	28
30+40	28	28
30+60	28	28
30+80	28	28
31+00	28	
31+20	28	
31+40	28	
31+60	28	
31+80	28	
32+00	28	
32+20	28	
37+42		28
37+62		28
37+82		28
38+02	28	28
38+22	28	28
38+42	28	28
38+62	28	28
38+82	28	28
39+02	28	28
39+22	28	28

Ditch Fiber Rolls		
Station	Fiber Rolls 12" (LF)	
	LT	RT
39+42	28	28
39+62	28	28
39+82	28	28
40+02	28	28
40+22	28	28
40+42		28
40+62		28
40+82		23
41+02		18
41+22		18
41+42		18
41+62		18
41+82		18
42+02		18
42+22		18
42+42		18
42+62		18
42+82		18
43+02		18
43+22		18
43+42		18
43+62		18
43+82		18
44+02		18
44+22		18
44+42		18
44+62		18
44+82		18
45+02		18
45+22		18
45+42		18
45+62		18
45+82	28	18
46+02	28	18
46+22	28	18
46+42	28	18
46+62	28	18
46+82	28	18
47+02	28	18
47+22	28	18
47+42	28	18
47+62	28	18
47+82	28	18
48+02	28	18
48+22	28	18
48+42	28	18
48+62		18
48+82		18
49+02		18
49+22		18
49+42		18
49+62		18
50+22		18
50+44		18

Bowman County

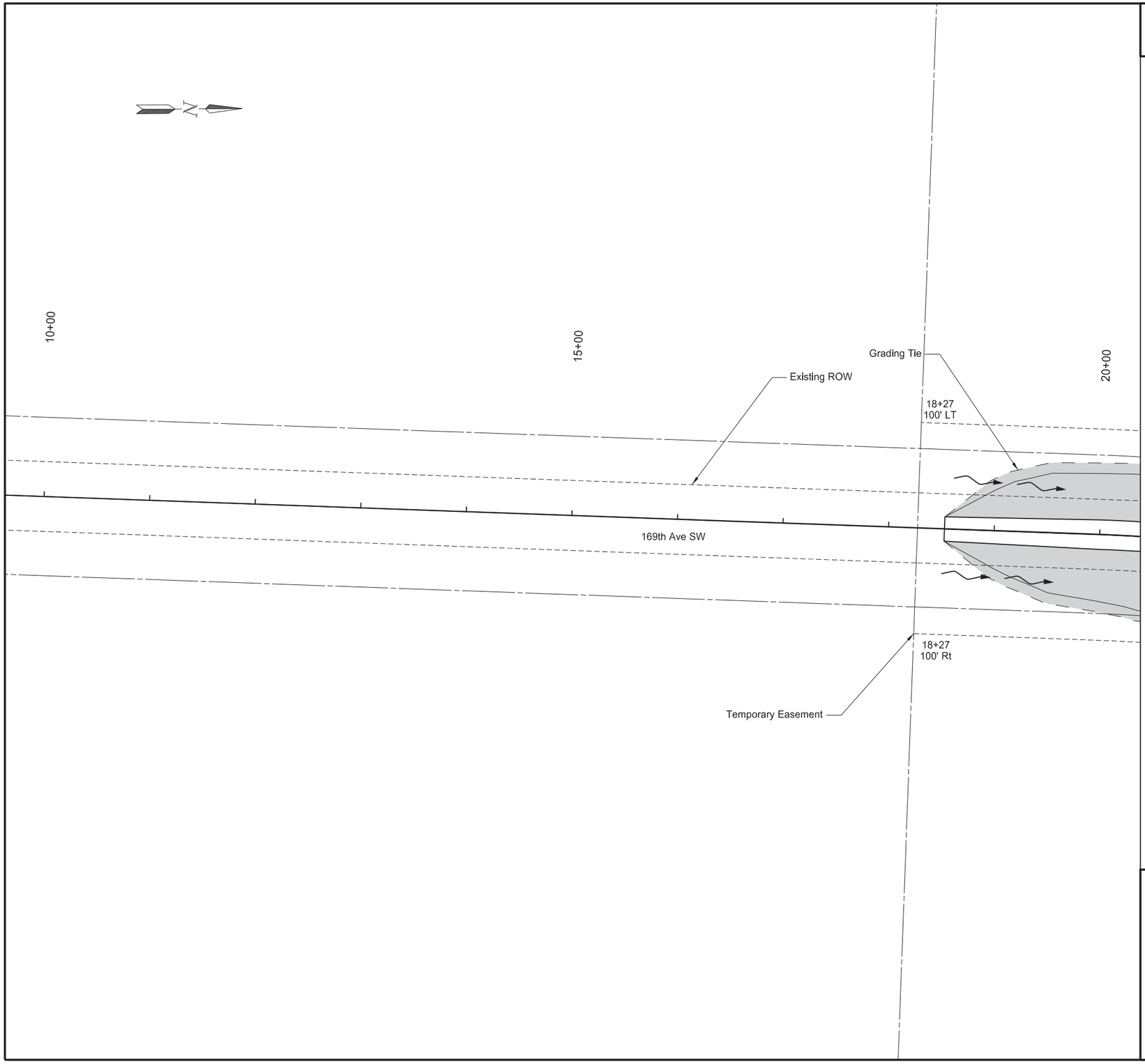
Hestekin Bridge Replacement
169th Ave SW

Temporary Sediment & Erosion Control



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	77	1

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	200	SEEDING CLASS II		
		Sta 18+53 to 20+00	0.3	ACRE
253	0101	STRAW MULCH		
		Sta 18+53 to 20+00	0.3	ACRE



LEGEND

- Seeding Class II & Straw Mulch
- Fiber Rolls 20"
- Flow Direction
- Rock Check

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Permanent Sediment & Erosion Control

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

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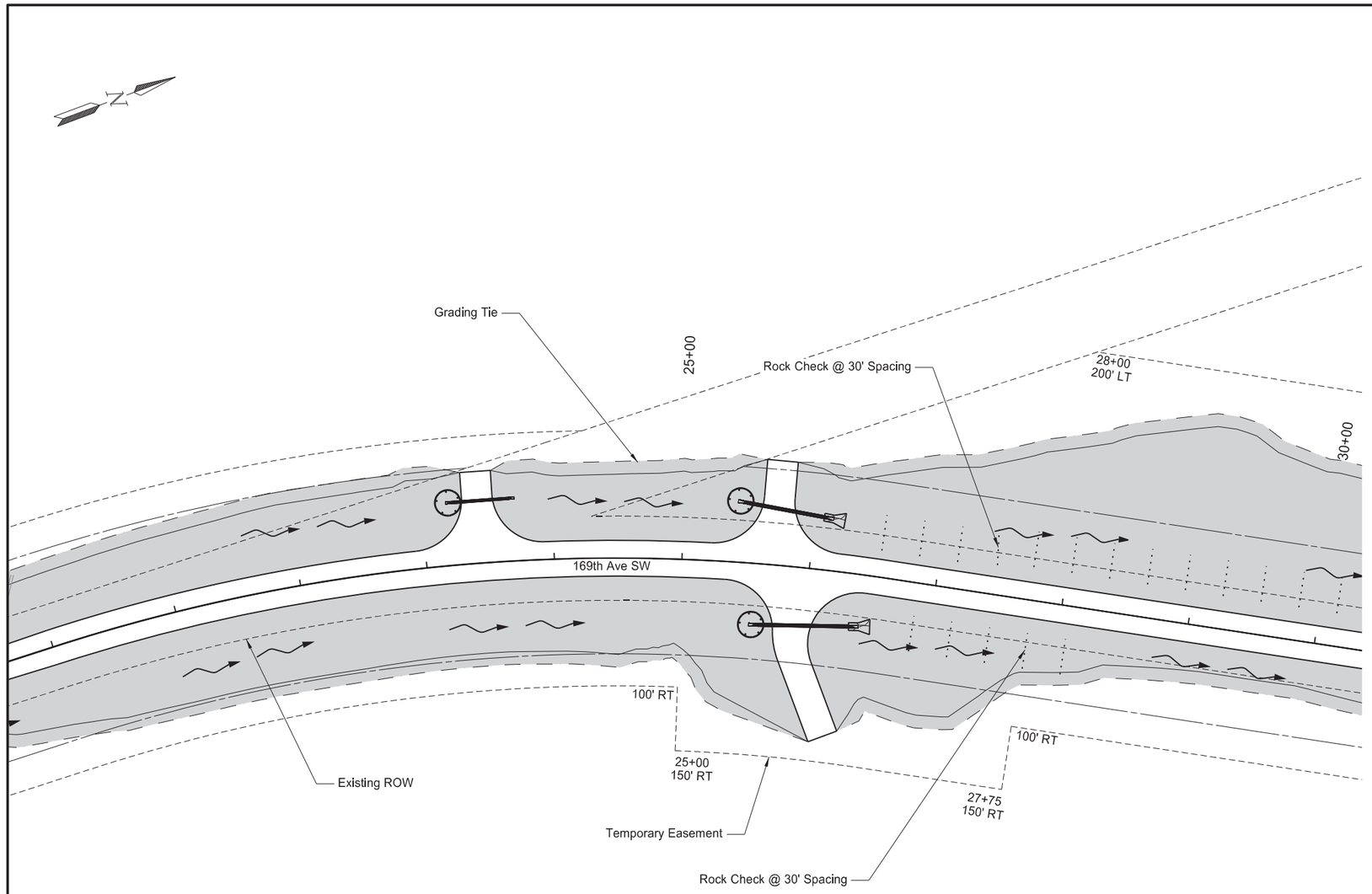

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	77	2

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	200	**SEEDING CLASS II**		
		Sta 20+00 to 30+00	3.3	ACRE
253	0101	**STRAW MULCH**		
		Sta 20+00 to 30+00	3.3	ACRE
256	1500	**ROCK CHECK**		
		STA 20+00 to 30+00 LT	12	EACH
		STA 20+00 to 30+00 RT	5	EACH
261	0112	**FIBER ROLLS 12IN**		
		Sta 23+22 Lt	20	LF
		Sta 25+43 Lt	**20**	**LF**
		Sta 25+58 Rt	20	LF

LEGEND

- Seeding Class II & Straw Mulch
- Fiber Rolls 20"
- Flow Direction
- Rock Check

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Permanent Sediment & Erosion Control

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
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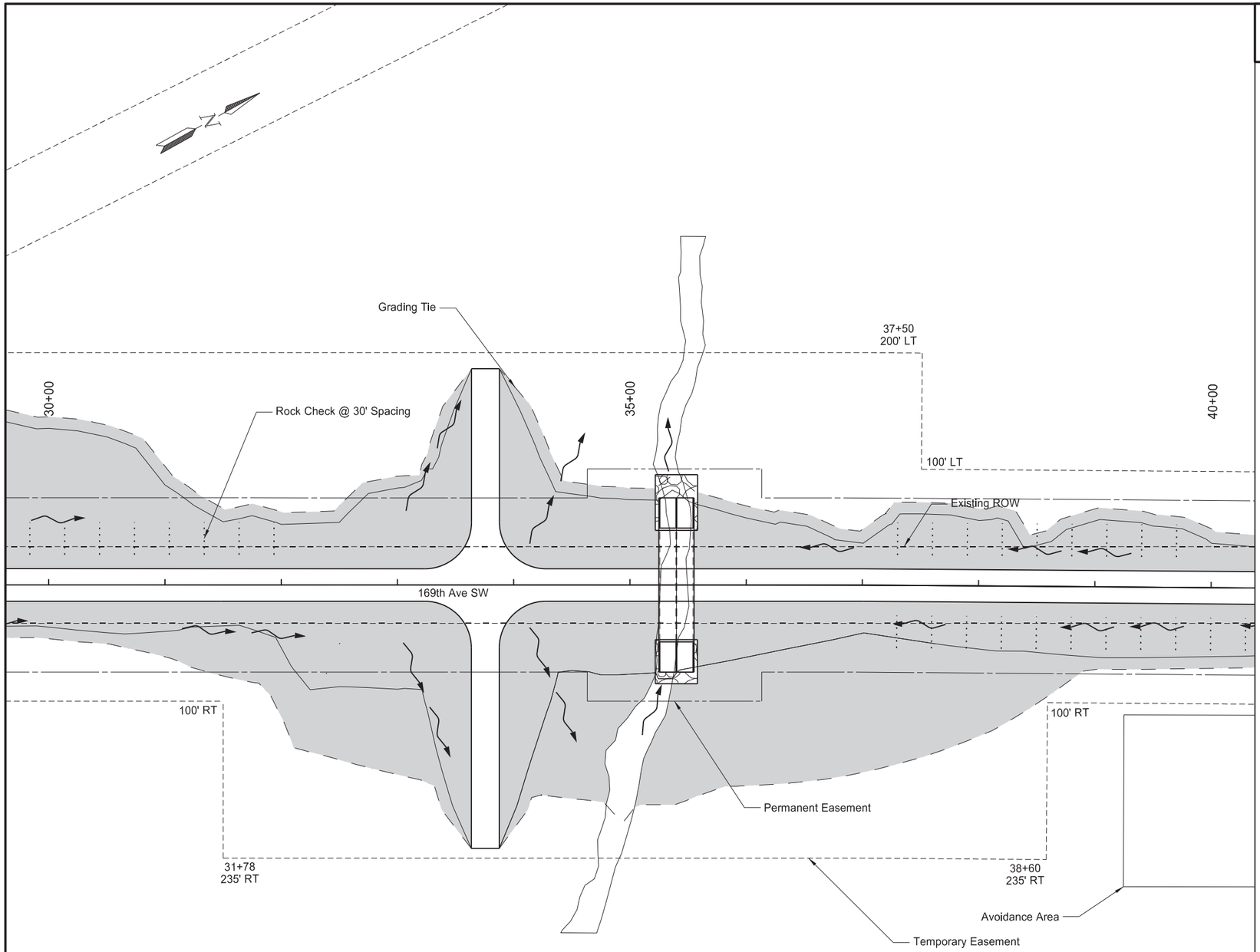

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	77	3

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	200	SEEDING CLASS II		
		Sta 30+00 to 40+00	4.0	ACRE
253	0101	STRAW MULCH		
		Sta 30+00 to 40+00	4.0	ACRE
256	1500	ROCK CHECK		
		Sta 30+00 to 40+00 LT	16	EACH
		Sta 30+00 to 40+00 RT	10	EACH

LEGEND

- Seeding Class II & Straw Mulch
- Fiber Rolls 20"
- Flow Direction
- Rock Check

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Permanent Sediment & Erosion Control

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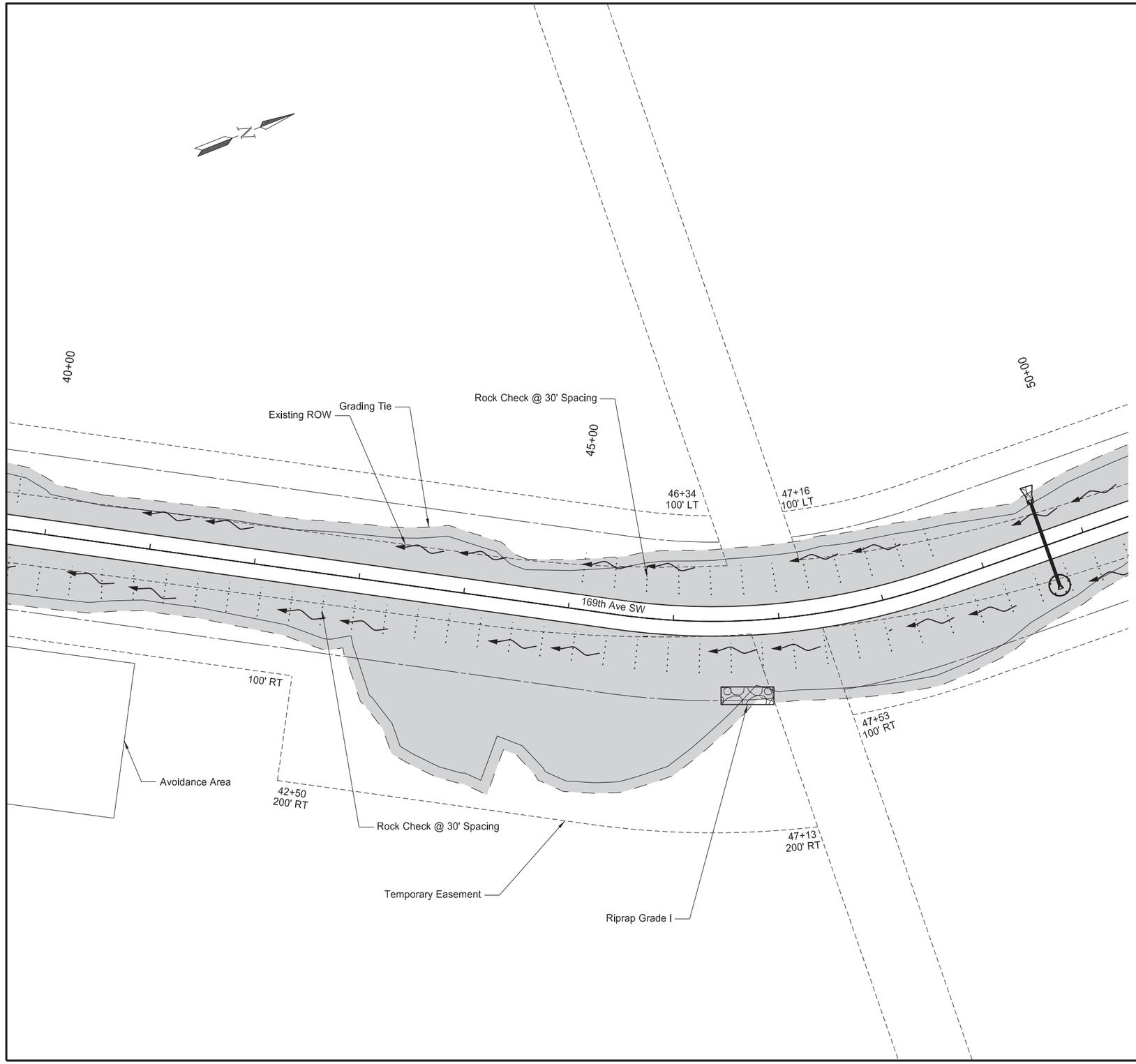

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	77	4

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	200	**SEEDING CLASS II**		
		Sta 40+00 to 50+00	3.1	ACRE
253	0101	**STRAW MULCH**		
		Sta 40+00 to 50+00	3.1	ACRE
256	1500	**ROCK CHECK**		
		Sta 40+00 to 50+00 LT	12	EACH
		Sta 40+00 to 50+00 RT	33	EACH
		Sta 46+50 to 46+86 RT	1	EACH
261	0112	**FIBER ROLLS 12IN**		
		Sta 49+63 RT	**20**	**LF**

LEGEND

- Seeding Class II & Straw Mulch
- Fiber Rolls 20"
- Flow Direction
- Rock Check

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Permanent Sediment & Erosion Control

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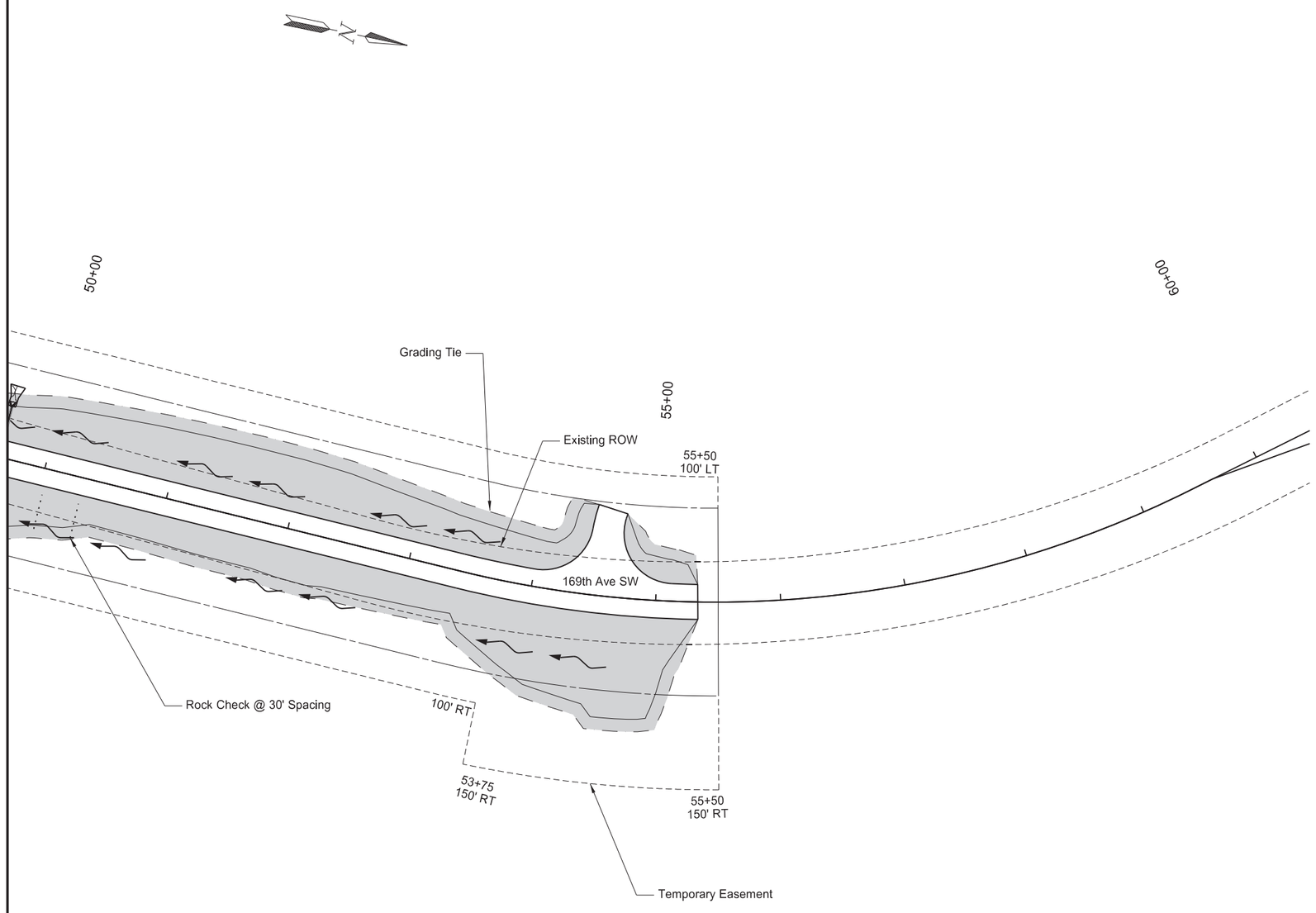

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	77	5

SPEC	CODE	BID ITEM	QUANTITY	UNIT
251	200	SEEDING CLASS II		
		Sta 50+00 to 55+34	1.2	ACRE
253	0101	STRAW MULCH		
		Sta 50+00 to 55+34	1.2	ACRE
256	1500	ROCK CHECK		
		Sta 50+00 to 55+34 RT	2	EACH

LEGEND

- Seeding Class II & Straw Mulch
- Fiber Rolls 20"
- Flow Direction
- Rock Check

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Permanent Sediment & Erosion Control

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	77	6

Rock Check (EA)				
Station	LT	*Ditch Width (LF)	RT	*Ditch Width (LF)
26+55	1	10		
26+85	1	10	1	20
27+15	1	20	1	20
27+45	1	20	1	20
27+75	1	20	1	20
28+05	1	20	1	20
28+35	1	20		
28+65	1	20		
28+95	1	20		
29+25	1	20		
29+55	1	20		
29+85	1	20		
30+15	1	20		
30+45	1	20		
30+75	1	20		
31+05	1	20		
31+35	1	20		
31+65	1	20		
31+95	1	20		
37+30	1	20	1	20
37+60	1	20	1	20
37+90	1	20	1	20
38+20	1	20	1	20
38+50	1	20	1	20
38+80	1	20	1	20
39+10	1	20	1	20
39+40	1	20	1	20
39+70	1	20	1	20
40+00			1	20
40+30			1	20
40+60			1	15
40+90			1	10
41+20			1	10
41+50			1	10
41+80			1	10
42+10			1	10
42+40			1	10
42+70			1	10
43+00			1	10
43+30			1	10
43+60			1	10
43+90			1	10

Rock Check (EA)				
Station	LT	*Ditch Width (LF)	RT	*Ditch Width (LF)
44+20			1	10
44+50			1	10
44+80			1	10
45+10	1	20	1	10
45+40	1	20	1	10
45+70	1	20	1	10
46+00	1	20	1	10
46+30	1	20	1	10
46+60	1	20	1	10
46+90	1	20	1	10
47+20	1	20	1	10
47+50	1	20	1	10
47+80	1	20	1	10
48+10	1	20	1	10
48+40	1	20	1	10
48+70			1	10
49+00			1	10
49+30			1	10
49+60			1	10
49+90			1	10
50+20			1	10
50+50			1	10

*Ditch Widths are for informational purposes only, install Rock Ditch Checks according to Standard Drawing D-256-1

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Permanent Erosion Control

REGISTERED PROFESSIONAL ENGINEER
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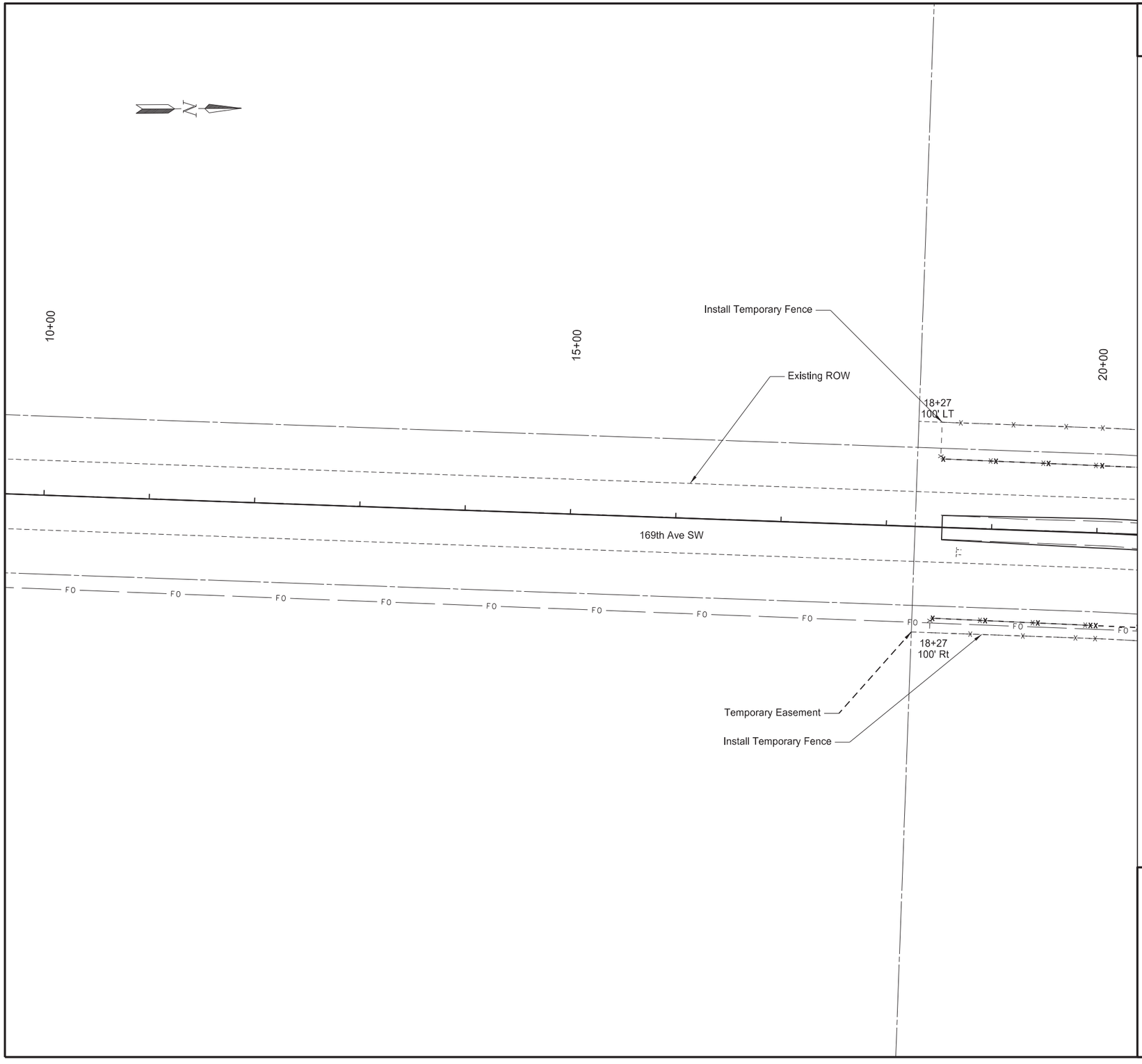

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	80	1

SPEC	CODE	BID ITEM	QUANTITY	UNIT
752	0200	FENCE BARBED WIRE 4 Strand		
		Sta 18+53 to 20+00	306	LF
752	0905	TEMPORARY FENCE		
		Sta 18+53 to 20+00	354	LF

LEGEND

x– – – –x– · Temp Fence

x– – – –x– · Fencing

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Fencing

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
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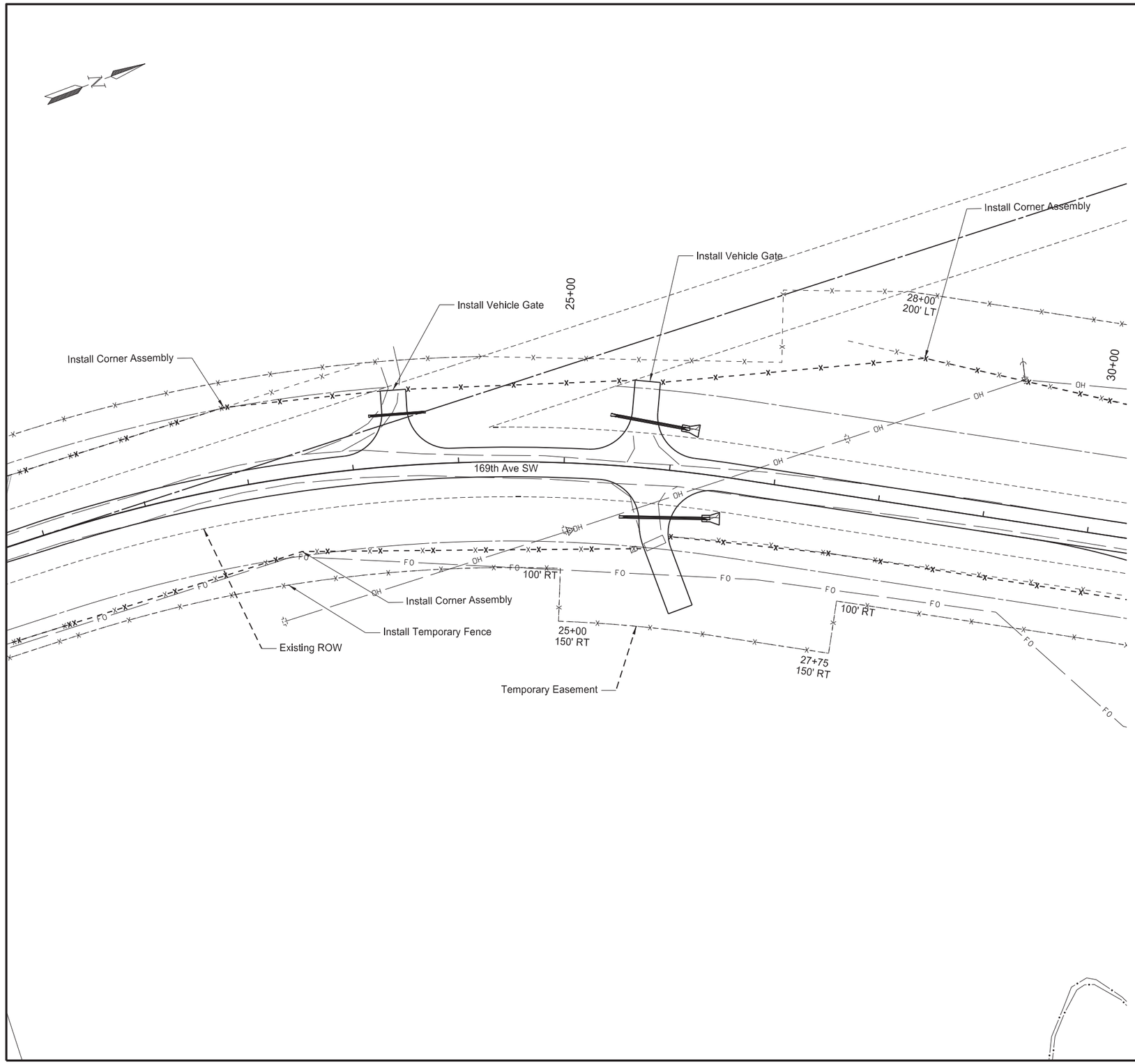
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	80	2



SPEC	CODE	BID ITEM	QUANTITY	UNIT
752	0200	FENCE BARBED WIRE 4 Strand		
		Sta 20+00 to 30+00	1936	LF
752	0905	TEMPORARY FENCE		
		Sta 20+00 to 30+00	2175	LF
752	2100	VEHICLE GATE		
		Sta 23+43 Lt	1	EACH
		Sta 25+72 Lt	1	EACH
752	3140	CORNER ASSEBLY BARBED WIRE		
		Sta 21+90 Lt	1	EACH
		Sta 22+41 Rt	1	EACH
		Sta 28+23 Lt	1	EACH

LEGEND

x– – – –x– · Temp Fence

x– – – –x– · Fencing

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Fencing

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
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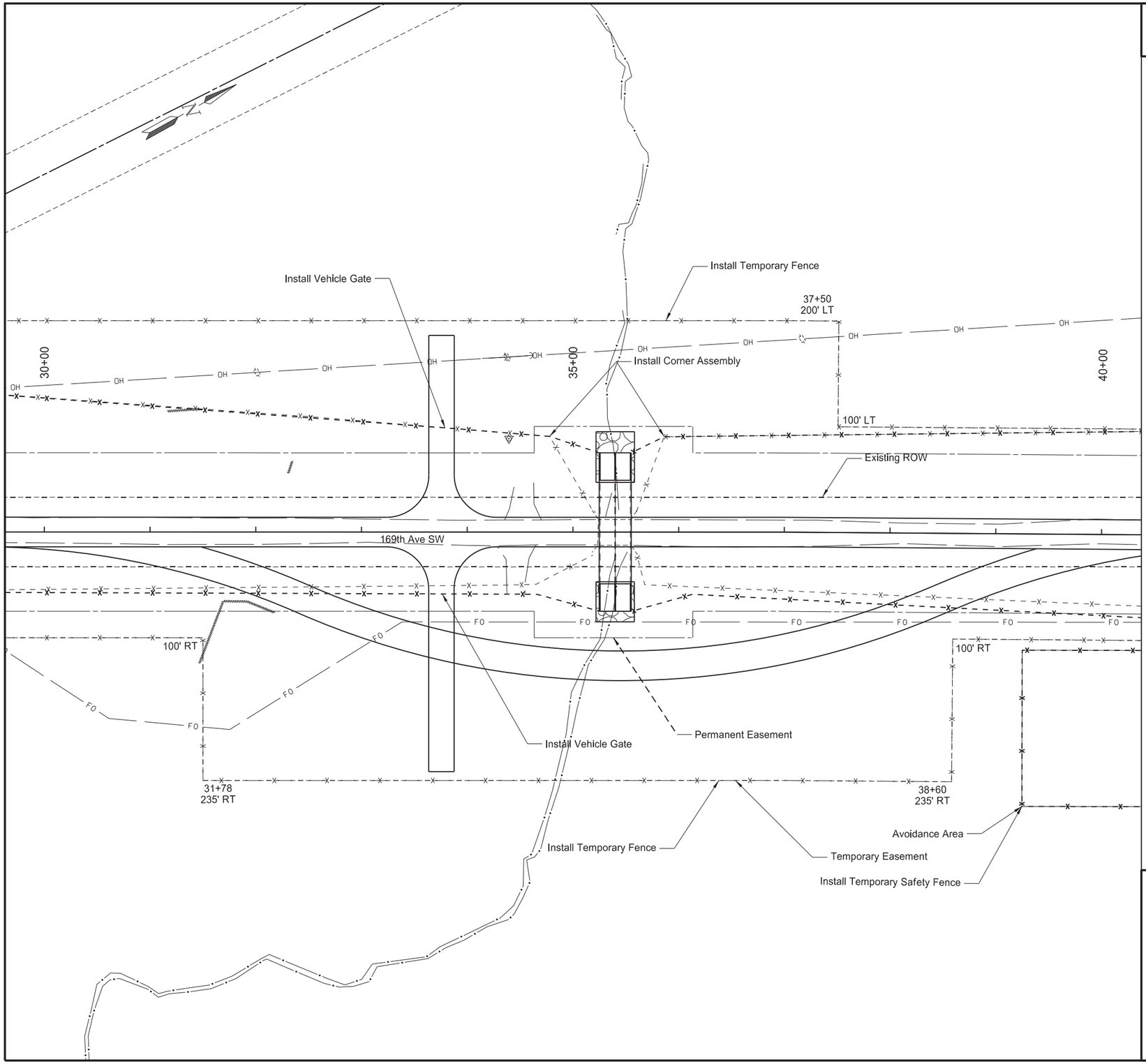
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	80	3

SPEC	CODE	BID ITEM	QUANTITY	UNIT
752	0200	FENCE BARBED WIRE 4 Strand		
		Sta 30+00 to 40+00	1944	LF
752	0905	TEMPORARY FENCE		
		Sta 30+00 to 40+00	2370	LF
752	0911	TEMPORARY SAFETY FENCE		
		Sta 39+25 to 40+00	295	LF
752	2100	VEHICLE GATE		
		Sta 33+76 Lt	1	EACH
		Sta 33+76 Rt	1	EACH
752	3140	CORNER ASSEBLY BARBED WIRE		
		Sta 34+78 Lt	1	EACH
		Sta 35+86 Lt	1	EACH



LEGEND

- Temp Fence
- Fencing
- Temporary Safety Fence

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Fencing

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
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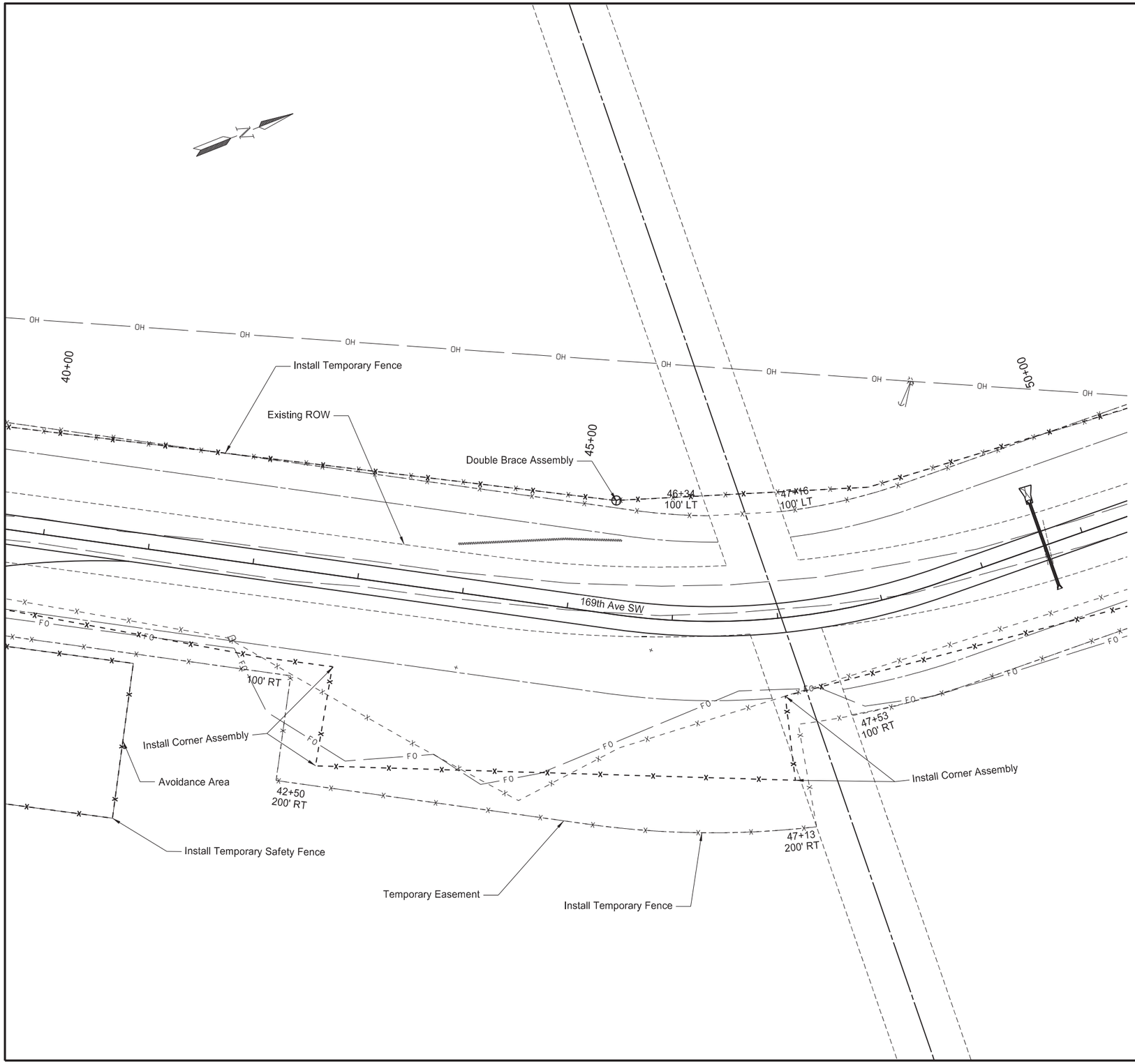

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	80	4

SPEC	CODE	BID ITEM	QUANTITY	UNIT
752	0200	FENCE BARBED WIRE 4 Strand		
		Sta 40+00 to 50+00	2182	LF
752	0905	TEMPORARY FENCE		
		Sta 40+00 to 50+00	2231	LF
752	0911	TEMPORARY SAFETY FENCE		
		Sta 40+00 to 41+00	350	LF
752	3140	CORNER ASSEBLY BARBED WIRE		
		Sta 43+00 Rt	2	EACH
		Sta 45+32 Lt	1	EACH
		Sta 47+00 Rt	2	EACH

LEGEND

x– – – –x– · Temp Fence

x– – – –x– · Fencing

Bowman County

Hestekin Bridge Replacement
169th Ave SW

Fencing

REGISTERED PROFESSIONAL ENGINEER
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PE-25991
DATE 12/06/24
NORTH DAKOTA

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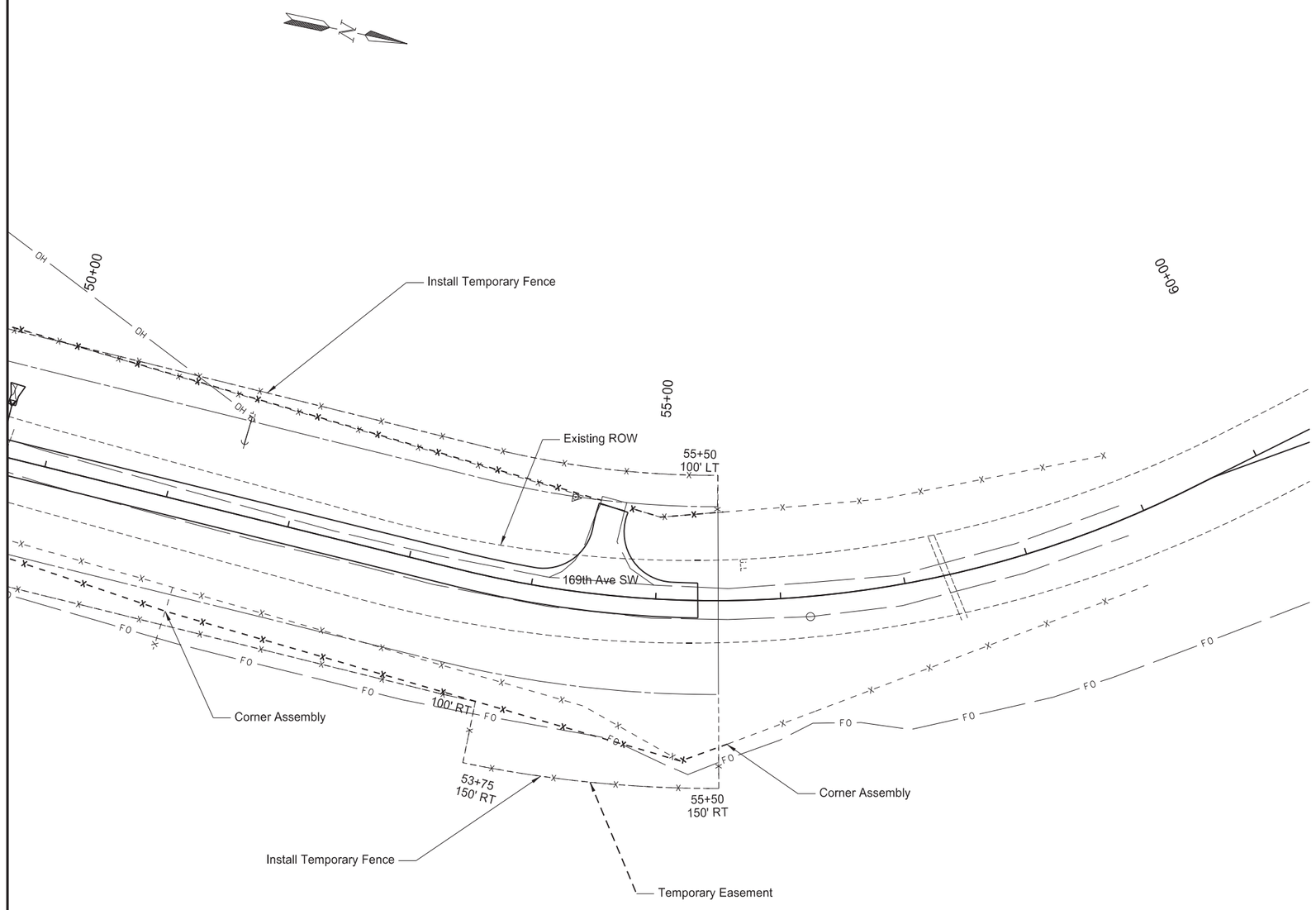
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	80	5



SPEC	CODE	BID ITEM	QUANTITY	UNIT
752	0200	FENCE BARBED WIRE 4 Strand		
		Sta 50+00 to 55+29	1105	LF
752	0905	TEMPORARY FENCE		
		Sta 50+00 to 55+29	1223	LF
752	3140	CORNER ASSEBLY BARBED WIRE		
		Sta 51+16 Rt	1	EACH
		Sta 55+24 Rt	1	EACH

LEGEND

x- - - -x- · Temp Fence

x- - - -x- · Fencing

Bowman County

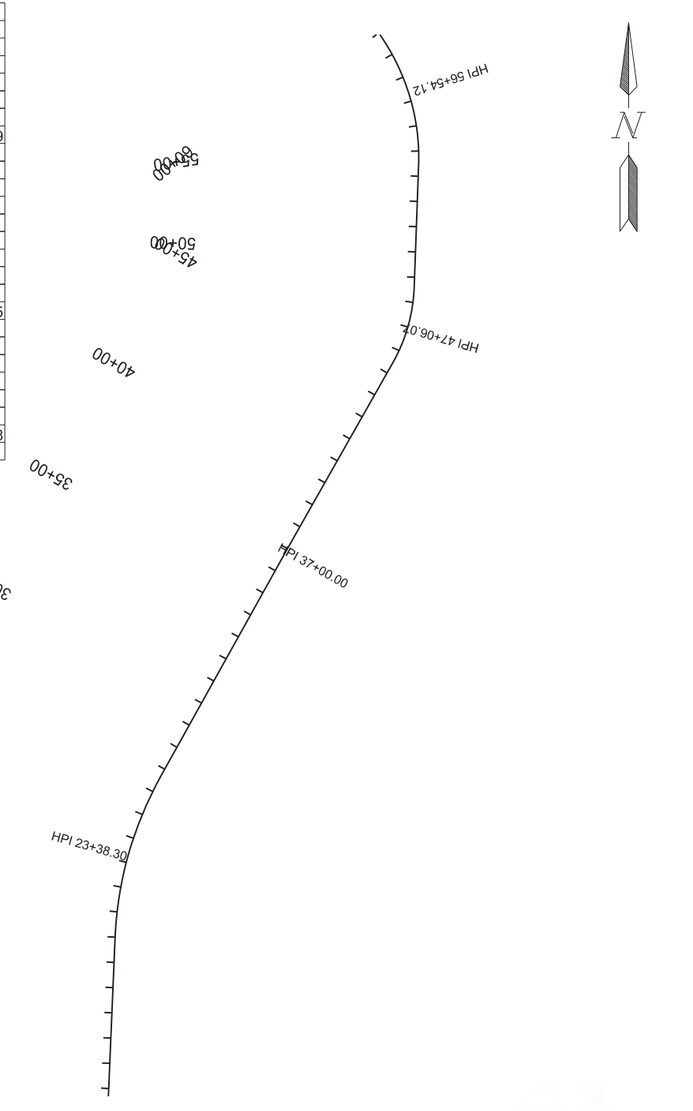
Hestekin Bridge Replacement
169th Ave SW

Fencing

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	82	1

Point Type	Station	Northing	Easting	Radius	Length	Tangent
Aligment Name:		169th Ave SW-Horizontal				
Description:						
START	5+00.00	158436.38	1108538.065			
PC	19+99.60	159934.568	1108603.031			
PC	19+99.60	159934.568	1108603.031			
COMBINATION PI	23+38.30	160272.949	1108617.704	1432.394	665.181	338.699
PT	26+64.78	160568.923	1108782.374			
PT	26+64.78	160568.923	1108782.374			
COMBINATION PI	37+00.00	161473.559	1109285.685			
COMBINATION PI	37+00.00	161473.559	1109285.685			
PC	45+47.32	162210.832	1109703.265			
PC	45+47.32	162210.832	1109703.265			
COMBINATION PI	47+06.07	162348.969	1109781.503	650.000	311.413	158.755
PT	48+58.73	162507.62	1109787.255			
PT	48+58.73	162507.62	1109787.255			
PC	53+41.82	162990.396	1109804.758			
PC	53+41.82	162990.396	1109804.758			
COMBINATION PI	56+54.12	163302.489	1109816.072	850.000	598.569	312.298
PT	59+40.39	163547.67	1109622.639			



SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	MONUMENT DESCRIPTION
CP1	163047.854	1109586.024	2972.472	54+24.95	78.98' Lt	Barcap
CP2	160382.497	1108629.478	2957.236	25+07.87	65.75' Rt	Rebar
CP3	161268.056	1108938.74	2869.591	34+39.48	88.36' Lt	Rebar

Bowman County

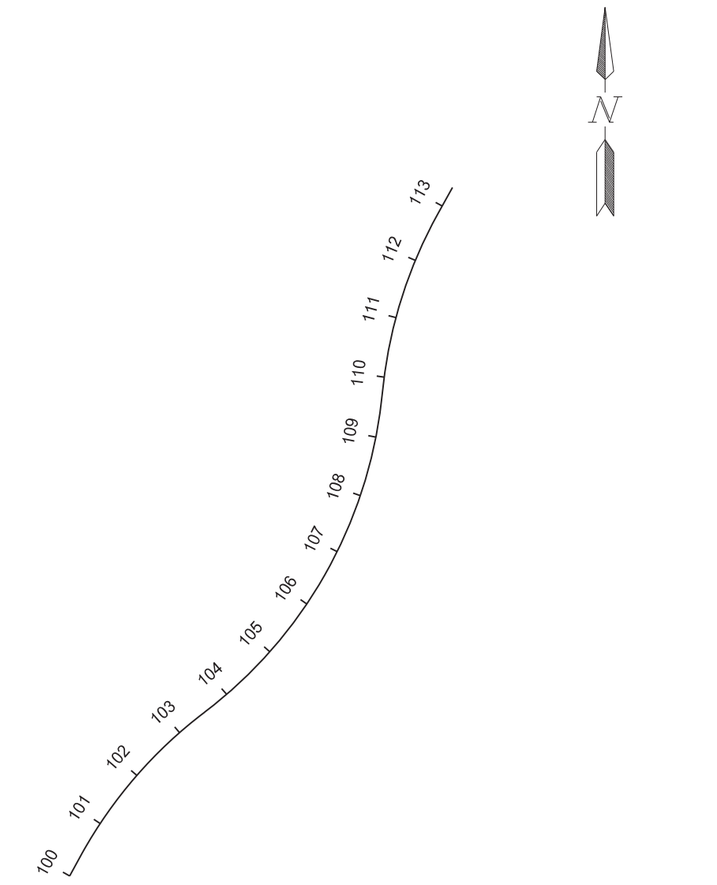
Hestekin Bridge Replacement
169th Ave SW

Survey Data

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	82	2

Point Type	Station	Northing	Easting	Radius	Length	Tangent
Aligment Name:		Temporary Bypass Horizontal				
Description:						
START	100+00.00	160774.7	1108896.82			
PC	100+42.73	160812.04	1108917.6			
PC	100+42.73	160812.04	1108917.6			
COMBINATION PI	102+00.00	160949.47	1108994.05	750	310.05	157.27
PT	103+52.78	161044.62	1109119.28			
PT	103+52.78	161044.62	1109119.28			
PC	103+53.43	161045.01	1109119.8			
PC	103+53.43	161045.01	1109119.8			
COMBINATION PI	106+73.95	161238.92	1109375.01	750	605.81	320.525
PT	109+59.24	161557.39	1109411.25			
PT	109+59.24	161557.39	1109411.25			
PC	109+89.14	161587.1	1109414.64			
PC	109+89.14	161587.1	1109414.64			
COMBINATION PI	111+38.97	161735.97	1109431.58	750	295.76	149.828
PT	112+84.90	161866.9	1109504.41			
PT	112+84.90	161866.9	1109504.41			
END	113+35.07	161910.74	1109528.8			



Bowman County

Hestekin Bridge Replacement
Temporary Bypass

Survey Data

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE					35	
G20-1-60	60"x24"	ROAD WORK NEXT __ MILES					28	
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)					18	
G20-2-48	**48"x24"**	**END ROAD WORK**	**2**			**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**	**2**			**2**	**59**	**118**
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 __**	**4**			**4**	**39**	**156**
R2-1aP-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**2**			**2**	**10**	**20**
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**			**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**	**4**			**4**	**35**	**140**
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT					35	
W1-6-48	**48"x24"**	**ONE DIRECTION LARGE ARROW**	**2**			**2**	**26**	**52**
W3-1-48	48"x48"	STOP AHEAD					35	
W3-3-48	48"x48"	SIGNAL AHEAD					35	
W3-4-48	48"x48"	BE PREPARED TO STOP					35	
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**2**			**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**	**5**			**5**	**35**	**175**
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**		**6**		**6**	**35**	**210**
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	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-6-48	48"x48"	SURVEY CREW					35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT					35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY					35	
W21-52-48	48"x48"	PAVEMENT BREAKS					35	
W21-53-48	48"x48"	RUMBLE STRIPS AHEAD					35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK					35	
W24-1-48	48"x48"	DOUBLE REVERSE CURVE					35	

SPECIAL SIGNS

SPEC & CODE		TOTAL UNITS	
704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**1017**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2		TOTAL QUANTITY
704-0100	FLAGGING	MHR				
704-1048	PORTABLE RUMBLE STRIPS	EACH				
704-1050	TYPE I BARRICADES	EACH				
704-1052	**TYPE III BARRICADES**	EACH	**6**			**6**
704-1060	**DELINEATOR DRUMS**	EACH	**16**			**16**
704-1065	TRAFFIC CONES	EACH				
704-1067	TUBULAR MARKERS	EACH				
704-1070	DELINEATOR	EACH				
704-1072	FLEXIBLE DELINEATORS	EACH				
704-1080	STACKABLE VERTICAL PANELS	EACH				
704-1081	**VERTICAL PANELS - BACK TO BACK**	EACH	**85**			**85**
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH				
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH				
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH				
704-1500	OBLITERATION OF PVMT MK	SF				
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF				
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH				
762-0200	RAISED PAVEMENT MARKERS	EACH				
762-0420	SHORT TERM 4IN LINE - TYPE R	LF				
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF				

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

REGISTERED PROFESSIONAL ENGINEER
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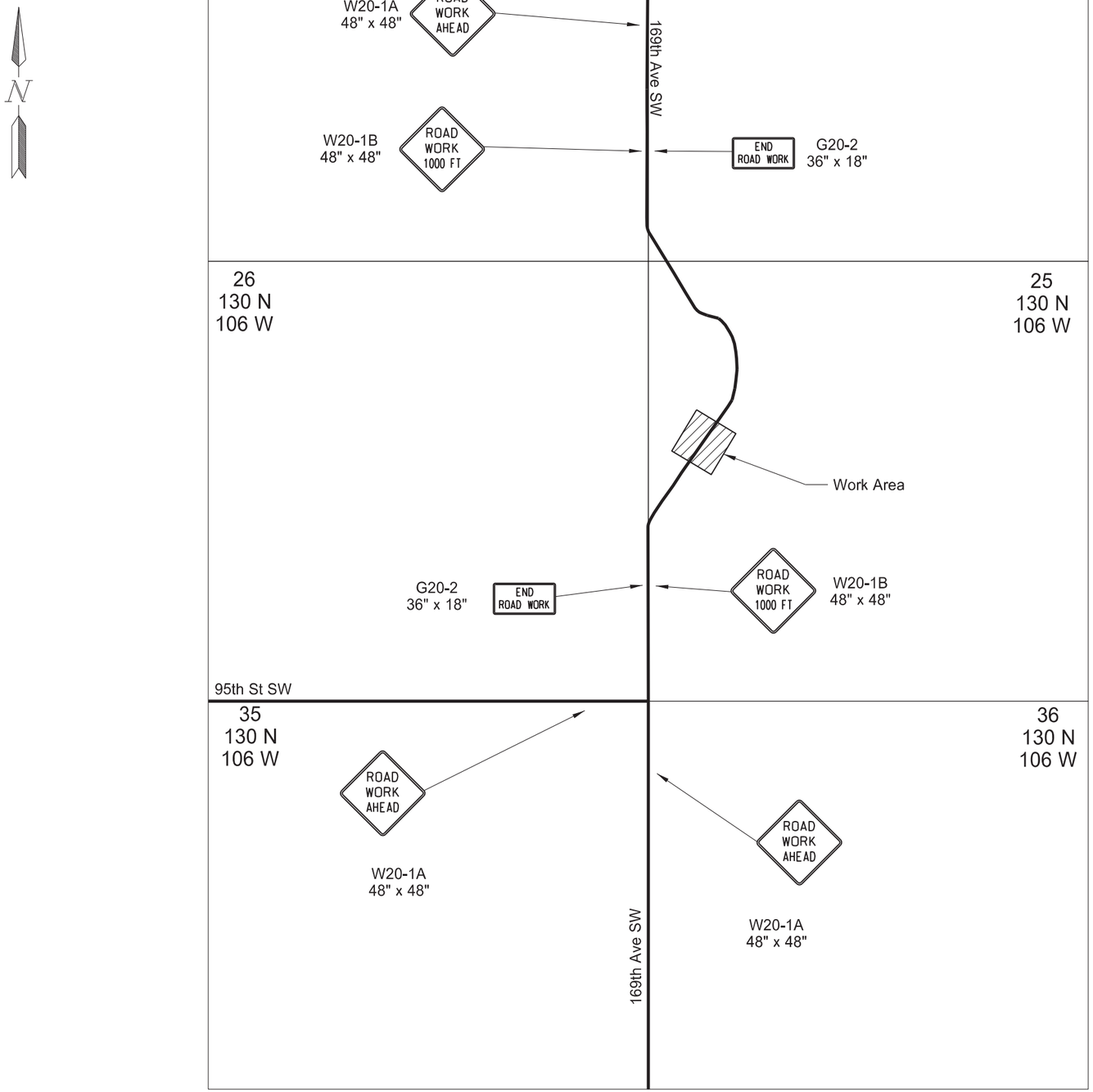
PE-25991
DATE 12/06/24
NORTH DAKOTA

Traffic Control Devices List
Bowman County
Hestekin Bridge Replacement
169th Ave SW

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	100	2



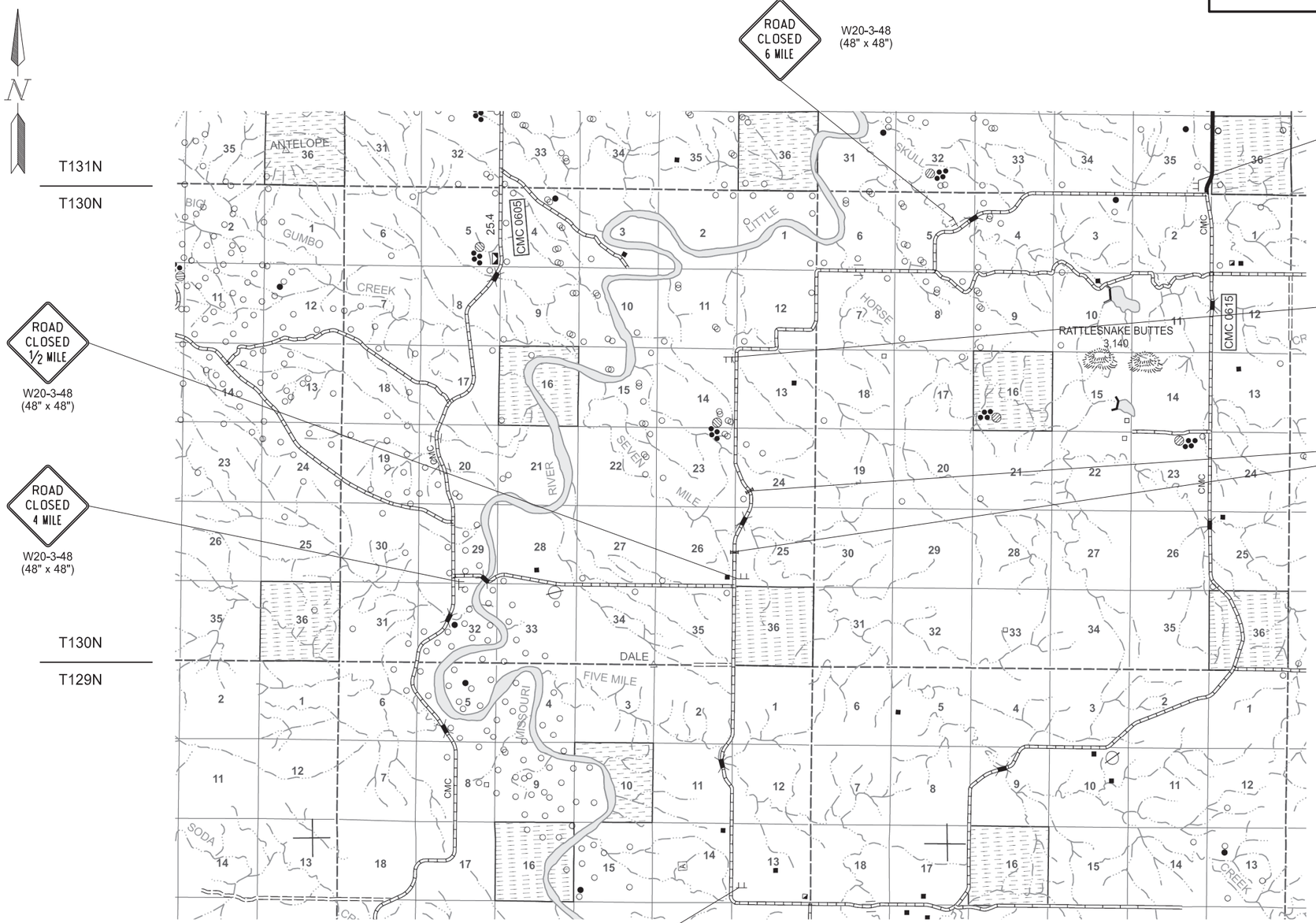
Bowman County

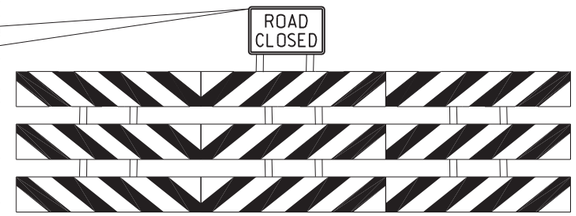
Hestekin Bridge Replacement
169th Ave SW

Work Zone Traffic Control

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	100	3





R11-2a-48
(60" x 30")
3 - TYPE III BARRICADES (24FT)

Bowman County

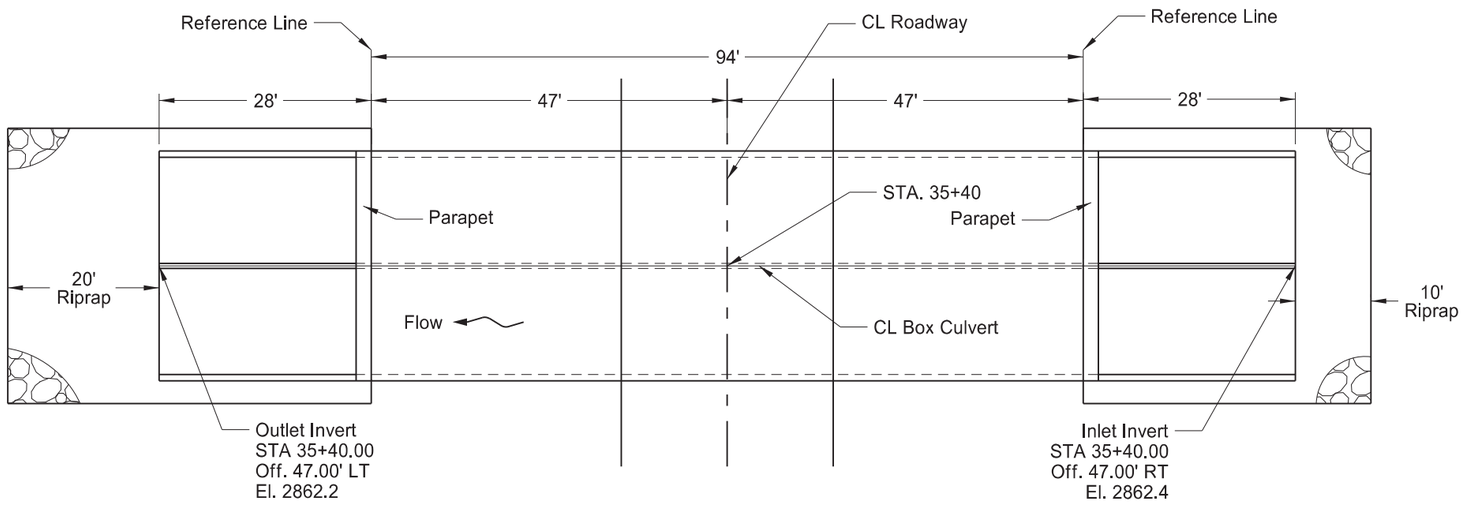
Hestekin Bridge Replacement
169th Ave SW

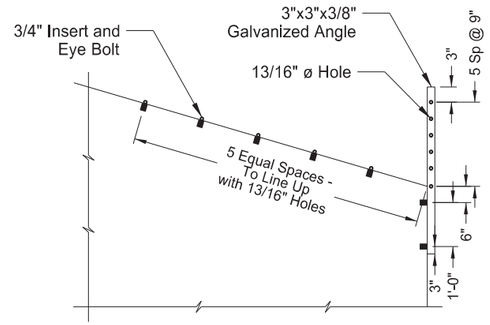
Work Zone Traffic Control

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 12/06/24
NORTH DAKOTA

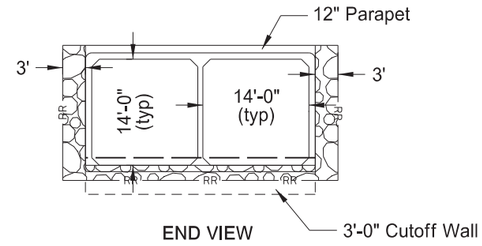
23 U.S.C. § 407 Documents
NDDOT Reserves All Objections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	170	1



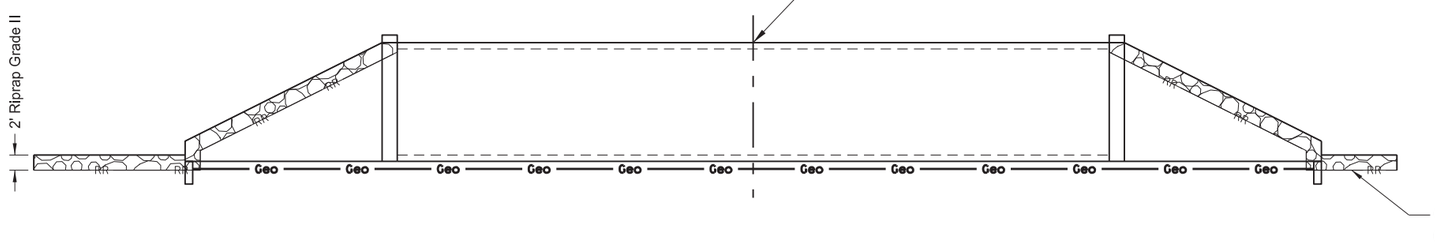


END SECTION FENCE
ANCHOR INSERT DETAIL



END VIEW

3'-0" Cutoff Wall



HYDRAULIC DATA:

Drainage Area	24.9	sq mi
Stream Gradient	0.0016	ft/ft
Design Frequency	15	yr
Design Discharge	994	cfs
Design Headwater Stage	2872.51	ft
Design Tailwater Stage	2872.01	ft
Velocity Through Culvert	3.01	fps
100-Year Frequency Discharge	2035	cfs
100-Year Frequency Headwater	2874.58	ft
Overtopping Stage	2884.95	ft
Overtopping Discharge	7925	cfs

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0105	REMOVAL OF STRUCTURE	L SUM	1
210	0050	BOX CULVERT EXCAVATION	EA	1
210	0210	FOUNDATION FILL	CY	404
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
256	0200	RIPRAP GRADE II	CY	106
606	3414	DBL 14FT X 14FT PRECAST RCB CULVERT	LF	94
606	7414	DBL 14FT X 14FT PRECAST RCB END SECTION	EA	2
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	589
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	160

SPECIAL PROVISIONS	
SSP 2	MIGRATORY BIRD TREATY ACT

STANDARD DRAWINGS
D-714-22

HL-93 DESIGN LOADING

Hestekin Bridge
Bowman County

Clear Span 3' x 10'
Clear Height 10'
Maximum Fill 5'
Precast Concrete
Double Box Culvert Layout

NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRJ-0006(052)	170	2

23 U.S.C. 407
NDDOT Reserves All Objections

100-P01 **SCOPE OF WORK:** Work at this site consists of removing the existing 30 ft single span bridge and installing a new Double barrel 14’ x 14’ x 94’-0” precast concrete box culvert with precast concrete end sections.

202-P01 **REMOVAL OF STRUCTURE:** The existing structure is a 30 ft single span bridge consisting of concrete beams, timber deck and abutments, and gravel surfacing.

The bid item “Removal of Structure” includes all work required to remove all structure components.

210-P01 **FOUNDATION FILL:** Use CL 5 as specified in Section 816 of the Standard Specifications, “Aggregates.”

“Foundation Fill” will be paid at plan quantity. Include any additional material required by the manufacturer in the bid price for “Foundation Fill.”

606-P01 **PRECAST SECTION:** Tie the barrel sections together with 1” diameter as shown in Standard Drawing D-714-22. Place two ties per exterior wall at each joint located at third points of the wall clear height.

Cast holes at 3’-0” centers through the last end section and into the cutoff wall to receive 3/4" diameter reinforcing bars. Cast holes in the first end section at 2’-0” centers for 3/4” diameter reinforcing bars to attach the parapet. Cast parapet against the sections. Install the bars according to the manufacturer's recommendations, with a high strength adhesive specifically intended for concrete anchorage, in accordance with Section 806.02. Payment for the end sections includes the cutoff wall and parapet.

Install the barrel section with a maximum gap of 3/4” wide.

Separate single or double cell precast units may be used as alternates to a multi cell culvert. Provide a distance of 1'-0" between separate precast units. Fill this gap with a controlled density backfill. Include the controlled density backfill used for the 12” gap in the price bid for the Precast RCB Culvert. Plan quantity will be paid for the box culvert and end sections.

606-P02 **JOINTS:** Provide joints in accordance with Section 606.04.E.3, with the exception that a 12” minimum width waterproof membrane is allowable around the exterior surfaces of the box culvert walls and roof.

910-P01 **CONTROLLED DENSITY BACKFILL**: Controlled density backfill consists of cement, water, fly ash and aggregate at the ratio specified below. Place controlled density backfill as shown in the plans. Mix the material continuously during pumping or placement to keep the solution from separating.

MIX DESIGN 1

Cement	75 lbs
Fly Ash	125 lbs
Fine Aggregate	2600 lbs
Water	416.5 gals

Include the controlled density backfill and materials used for the 12” gap in the price bid for “DBL 14Ft X 14Ft Precast RCB Culvert.”

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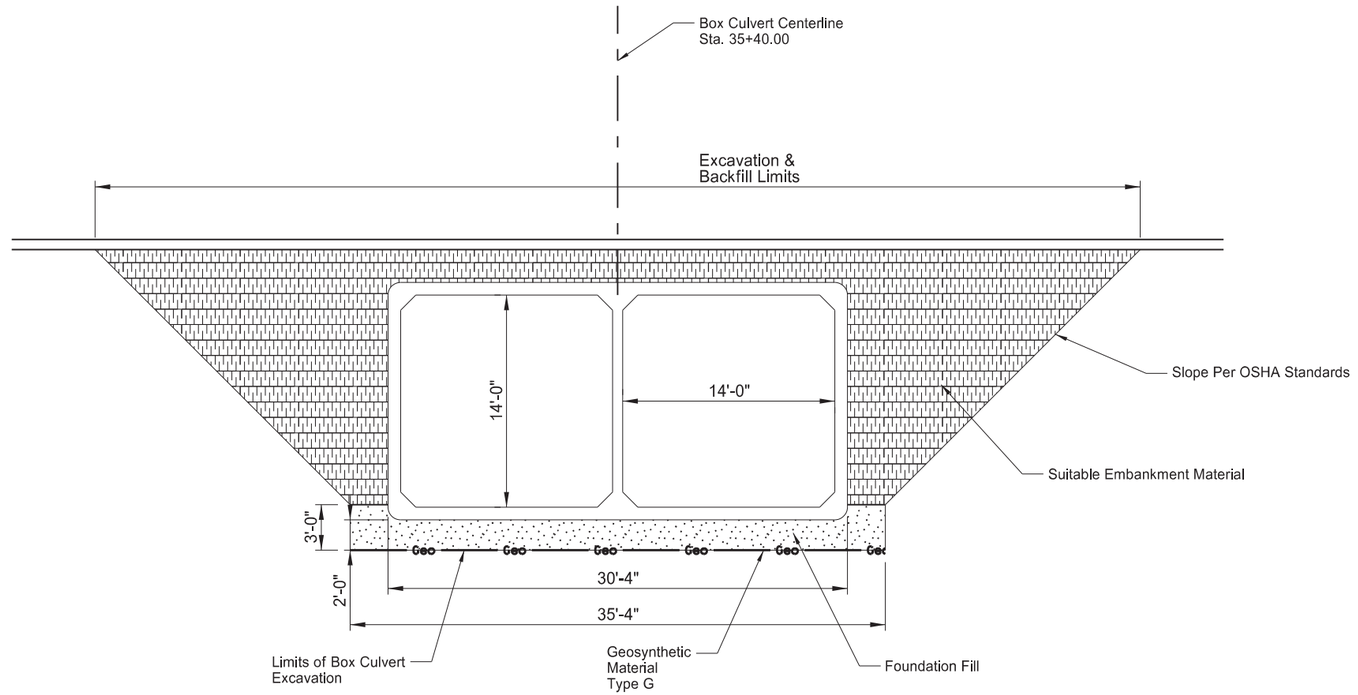
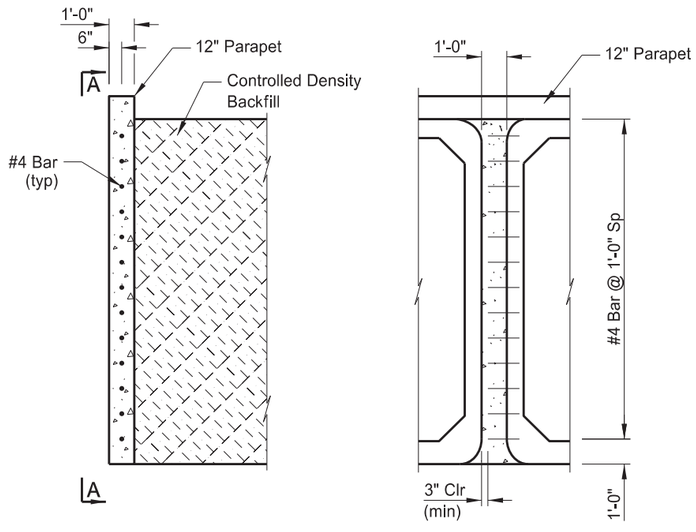
ND	BRP-BRJ-0006(052)	170	3





ELEVATION A-A

CONTROLLED DENSITY BACKFILL DETAIL

NOTES:

The intent of this detail is to show only the placement of the controlled density backfill between adjacent barrels. The representation of the size of barrels is arbitrary.

Embed the #4 bar 6" into the side of one of the box culvert end sections maintaining a 3" minimum clearance from the other box culvert. Spacing measured 1'-0" from bottom of box and spaced at 1'-0" up the front face.

Install the #4 bars according to the manufacturer's recommendations, with a high strength adhesive specifically intended for concrete anchorage and that meets the requirements of Section 806.02.

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DATE 12/06/24
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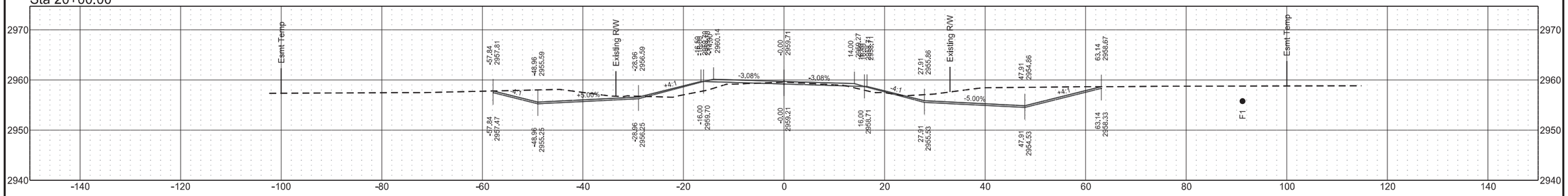
Hestekin Bridge
Bowman County

Excavation & Foundation
Fill Detail

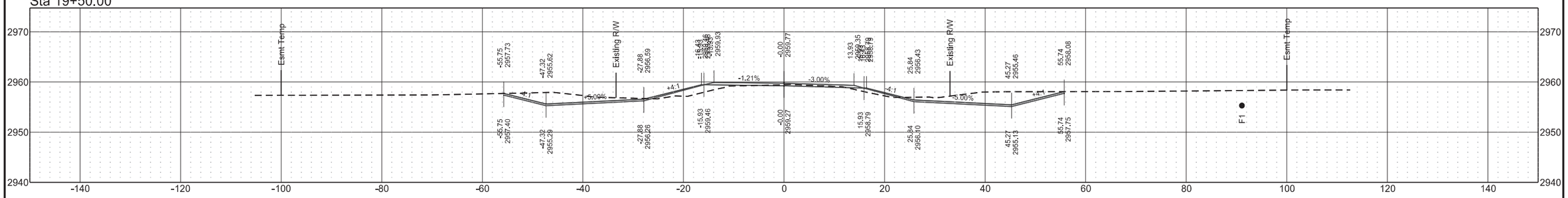
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	1

169th Ave SW

Sta 20+00.00



Sta 19+50.00



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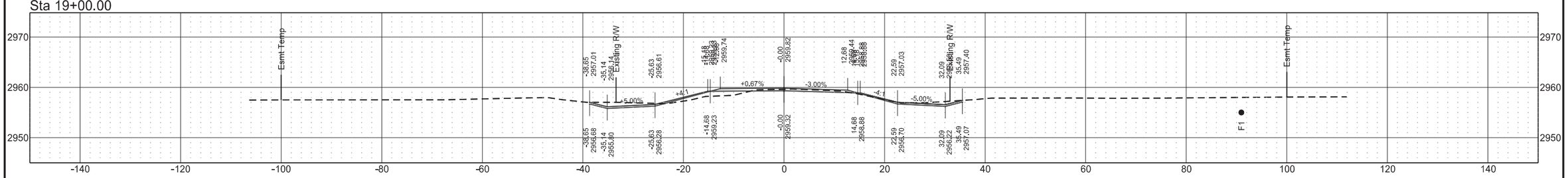
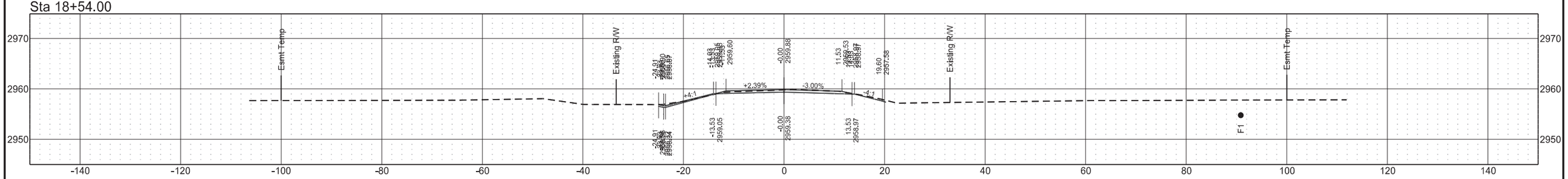


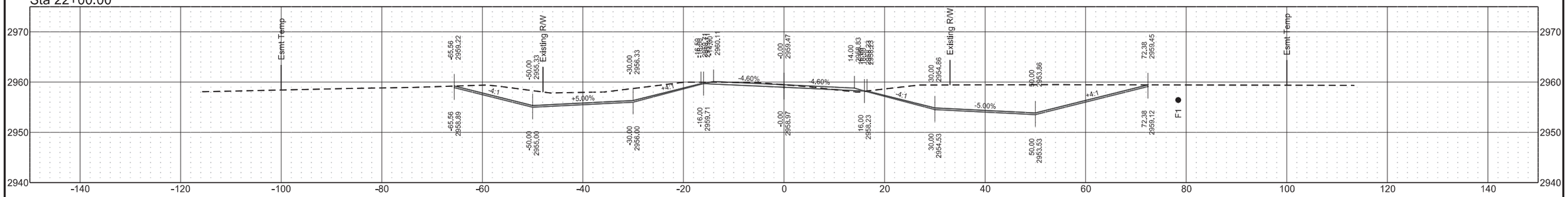
Sta 18+54.00



169th Ave SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	2

Sta 22+00.00



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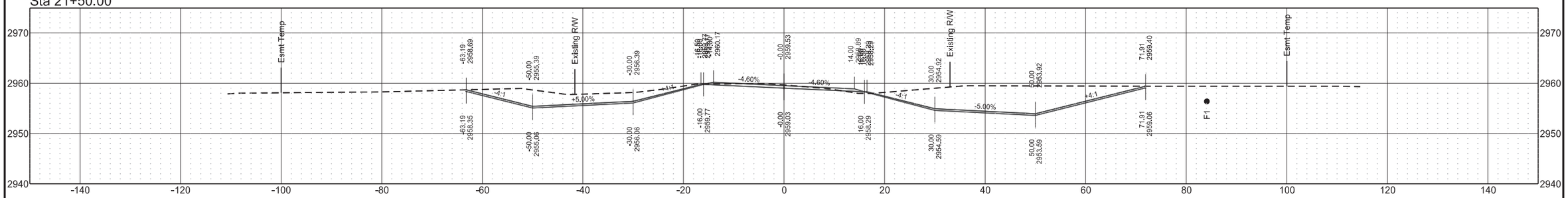

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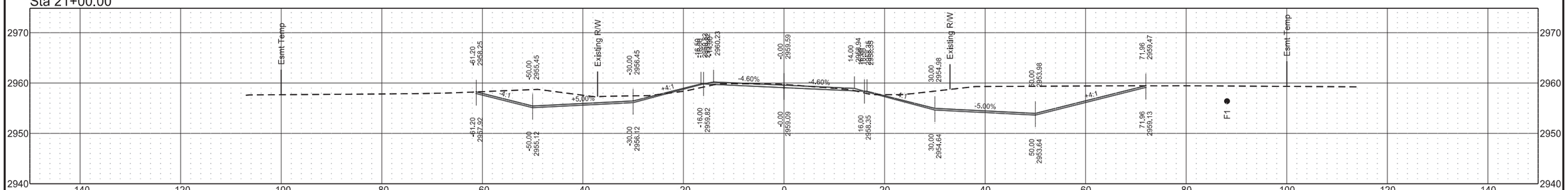
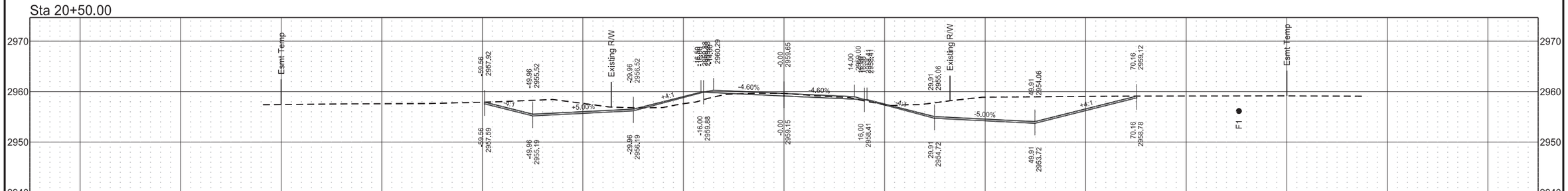


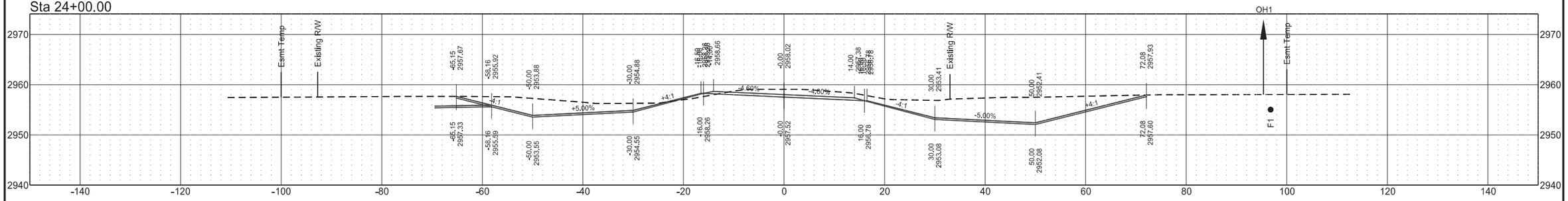
Sta 20+50.00



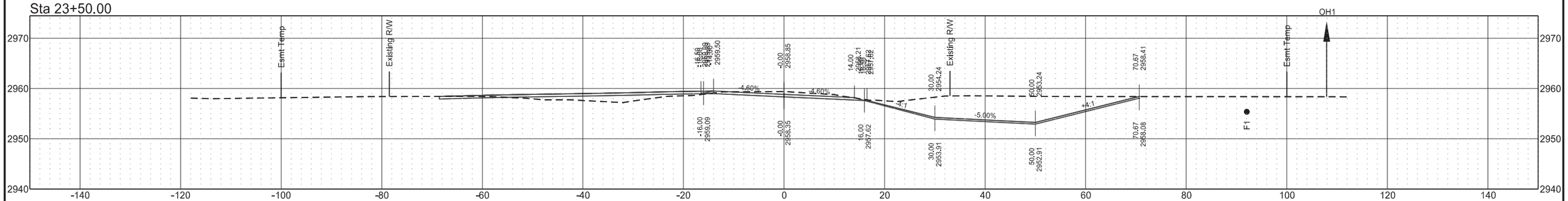
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	3

169th Ave SW

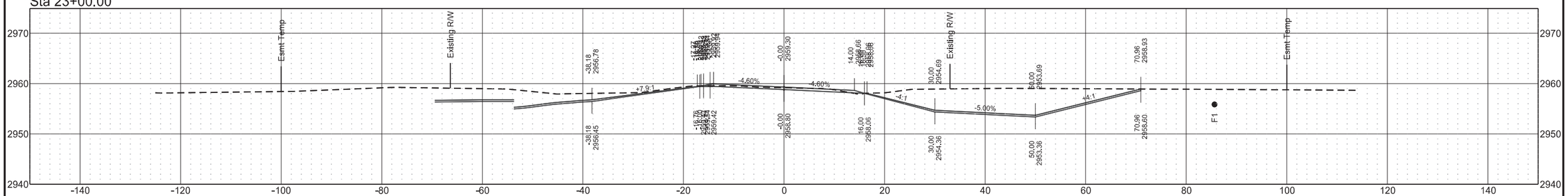
Sta 24+00.00



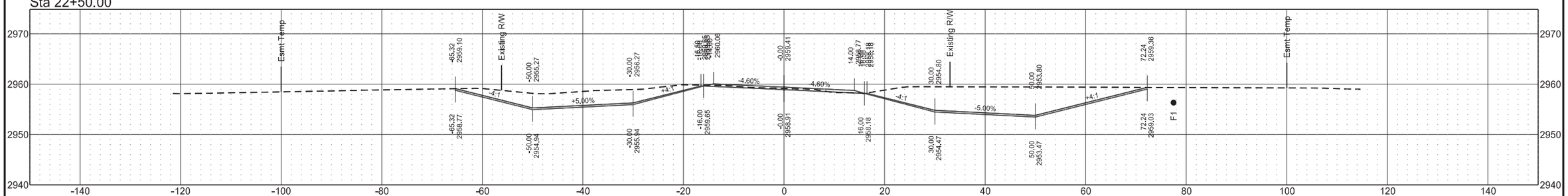
Sta 23+50.00



Sta 23+00.00



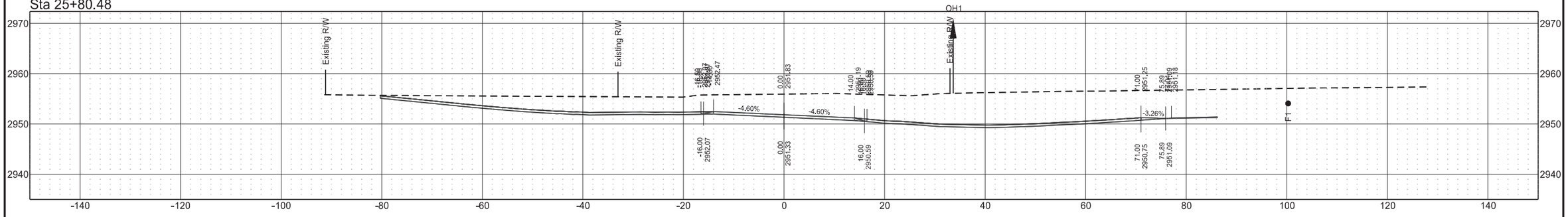
Sta 22+50.00



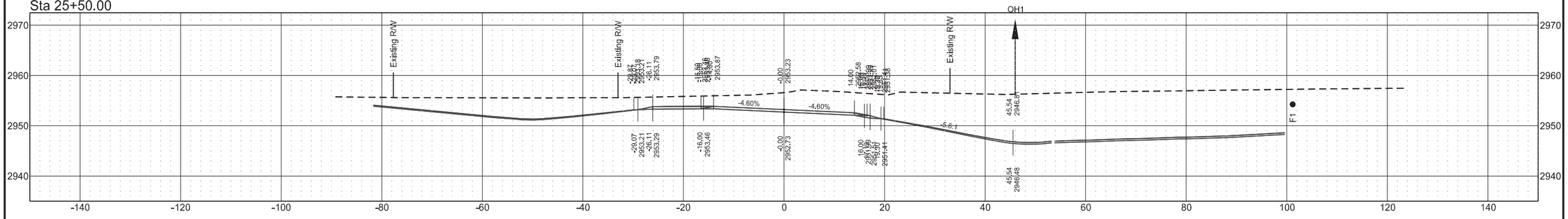
169th Ave SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	4

Sta 25+80.48



Sta 25+50.00



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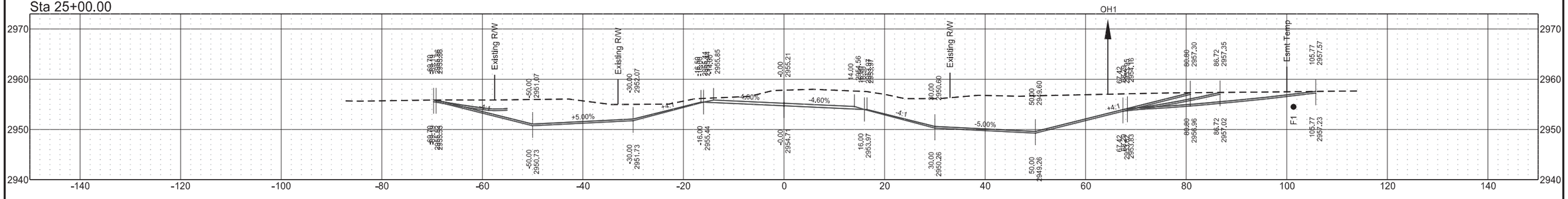
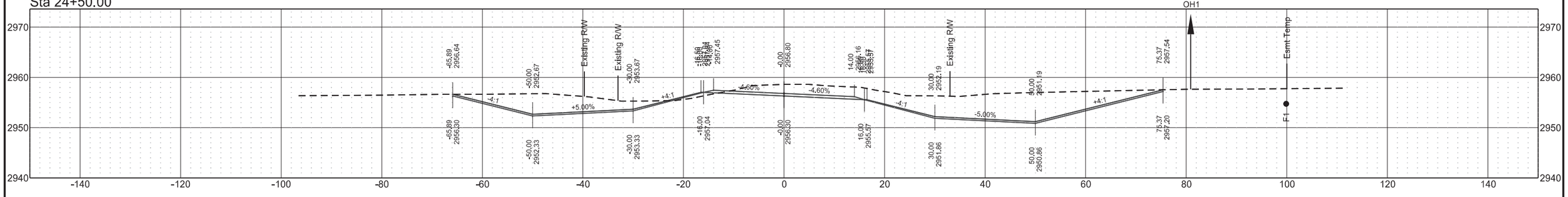


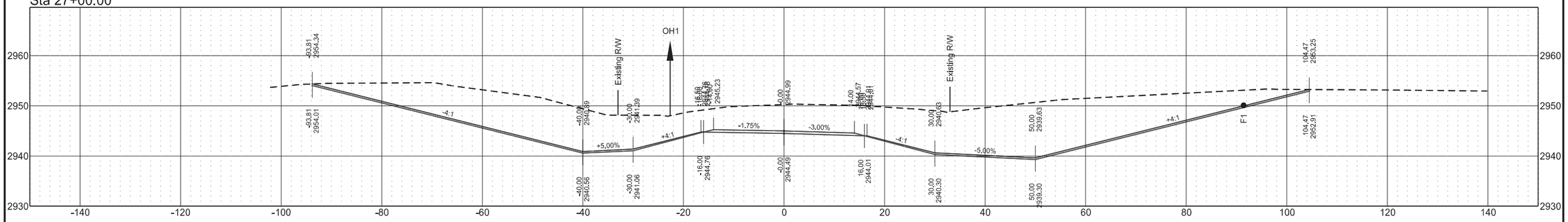
Sta 24+50.00



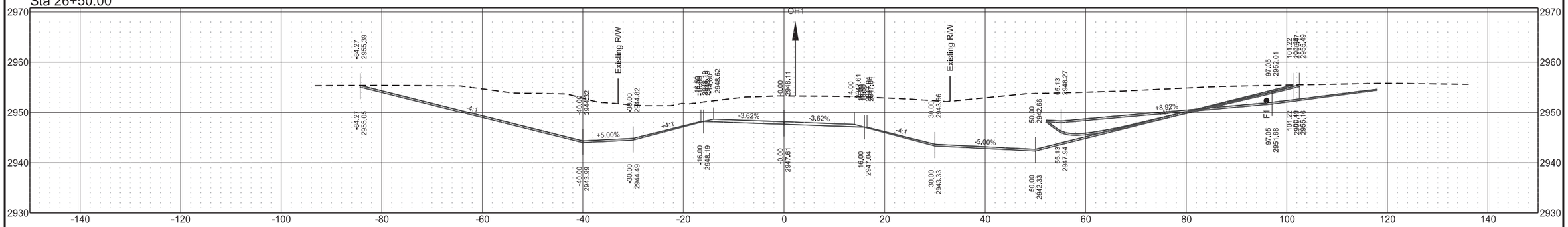
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	5

169th Ave SW

Sta 27+00.00



Sta 26+50.00



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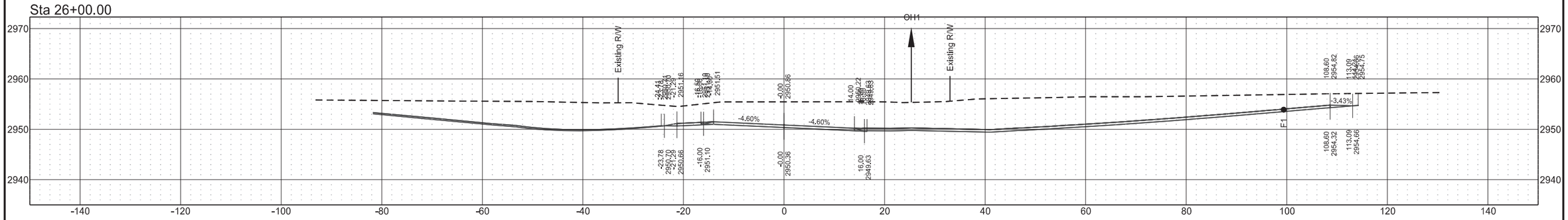
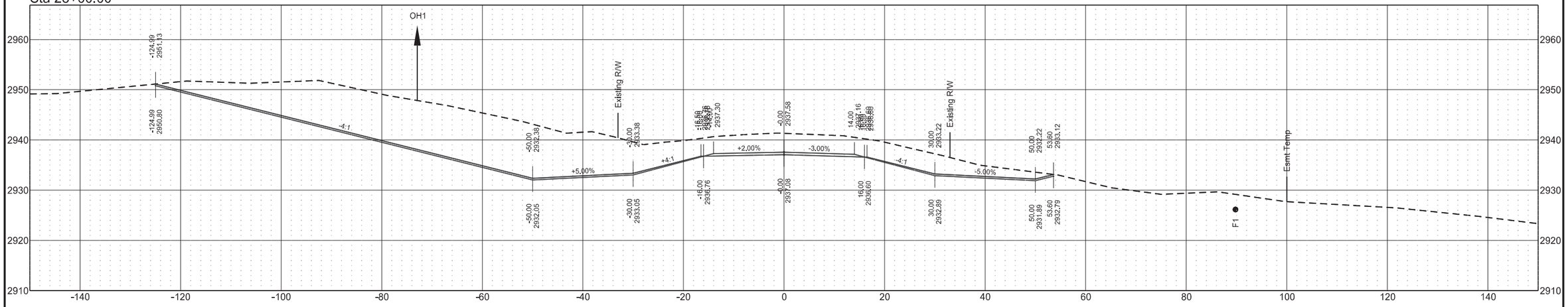


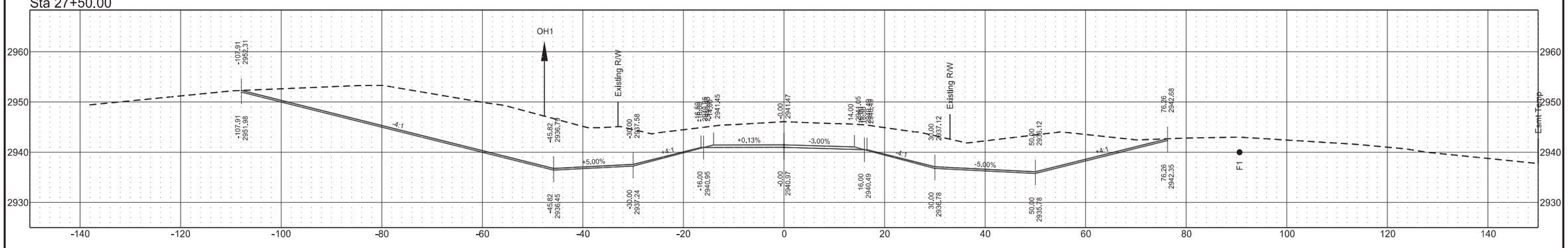
169th Ave SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	6

Sta 28+00.00



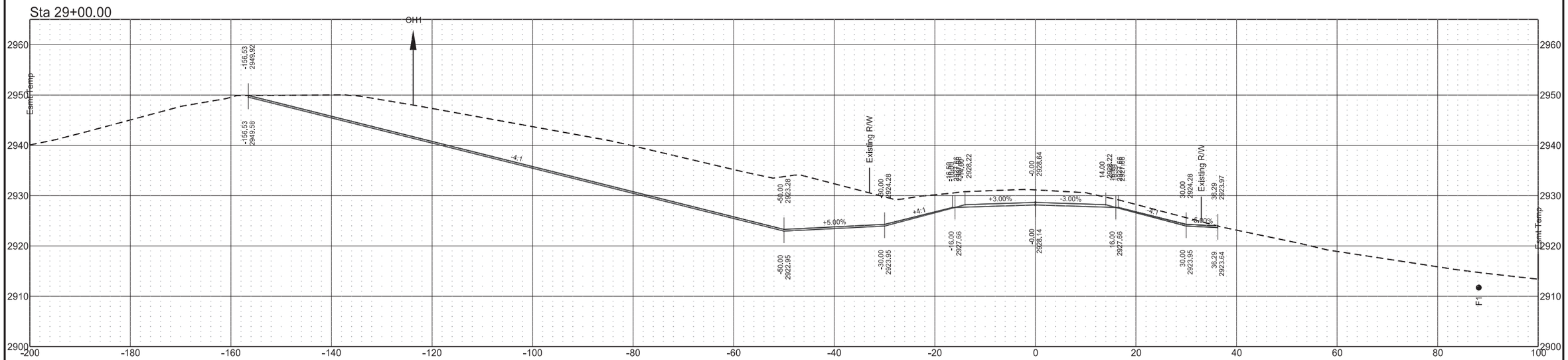
Sta 27+50.00



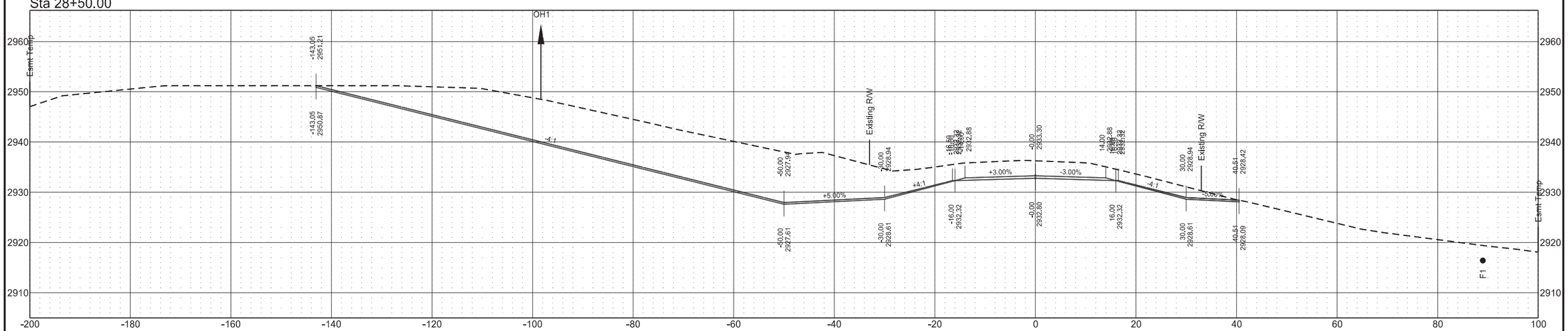
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	7

169th Ave SW

Sta 29+00.00



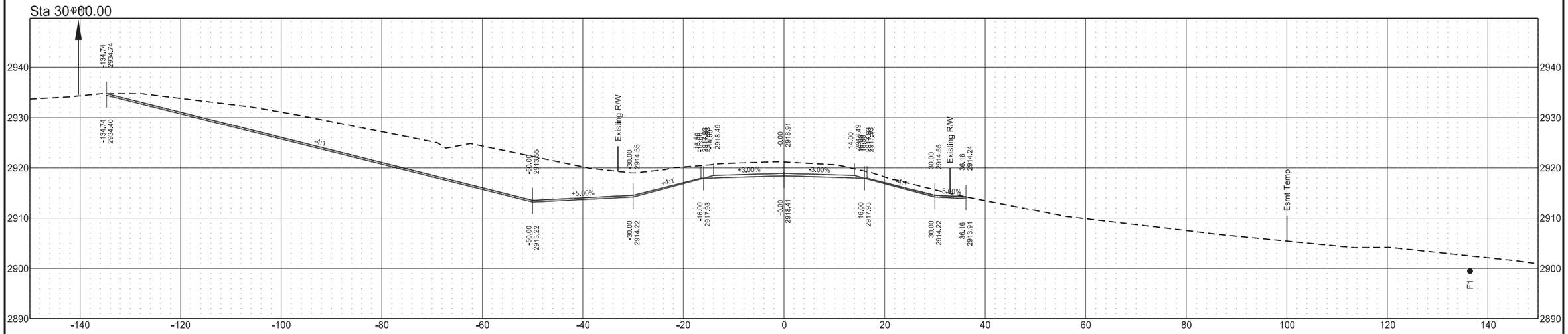
Sta 28+50.00



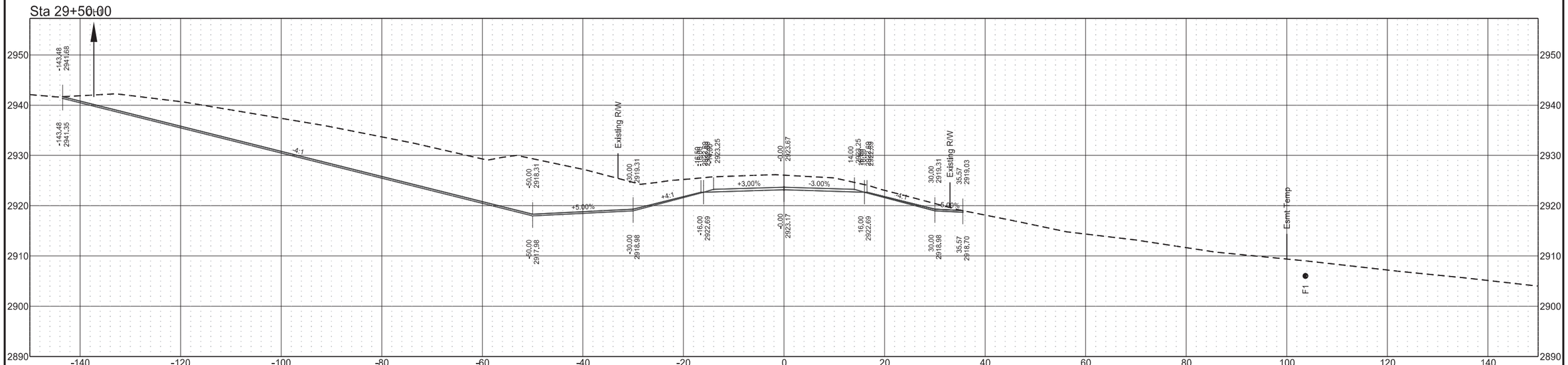
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	8

169th Ave SW

Sta 30+00.00



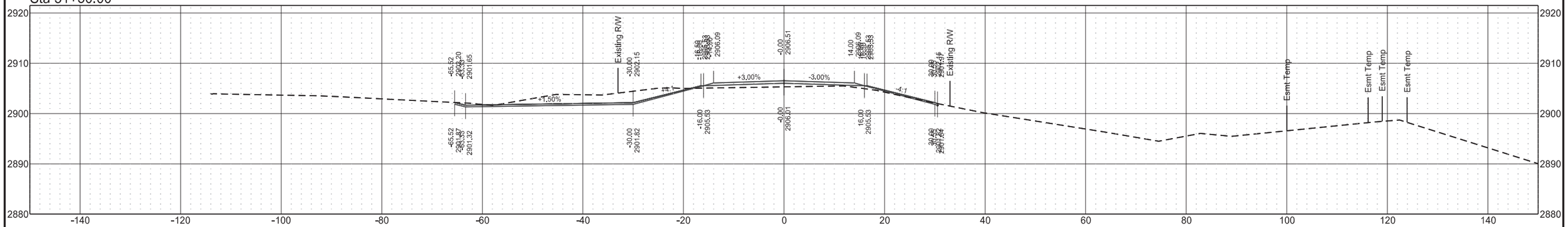
Sta 29+50.00



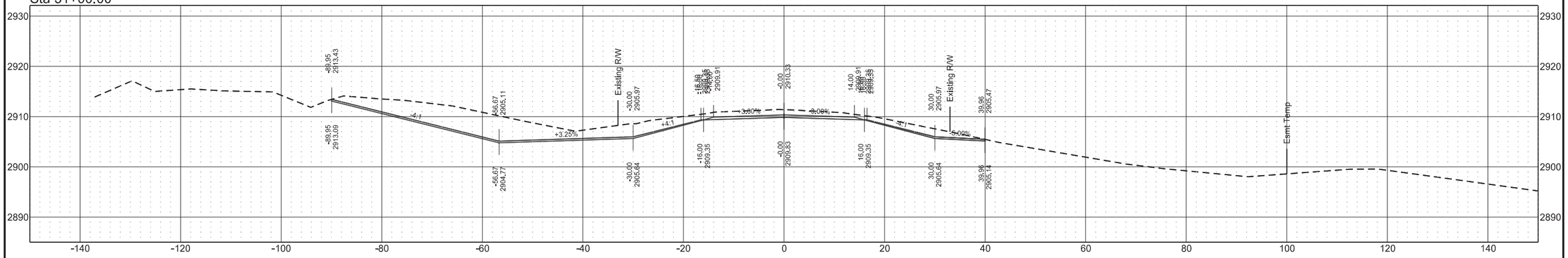
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	9

169th Ave SW

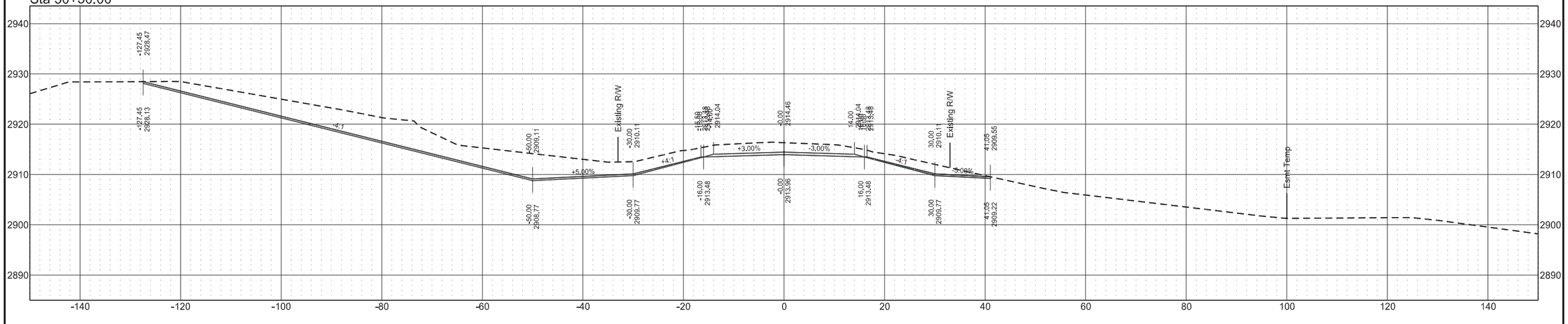
Sta 31+50.00



Sta 31+00.00



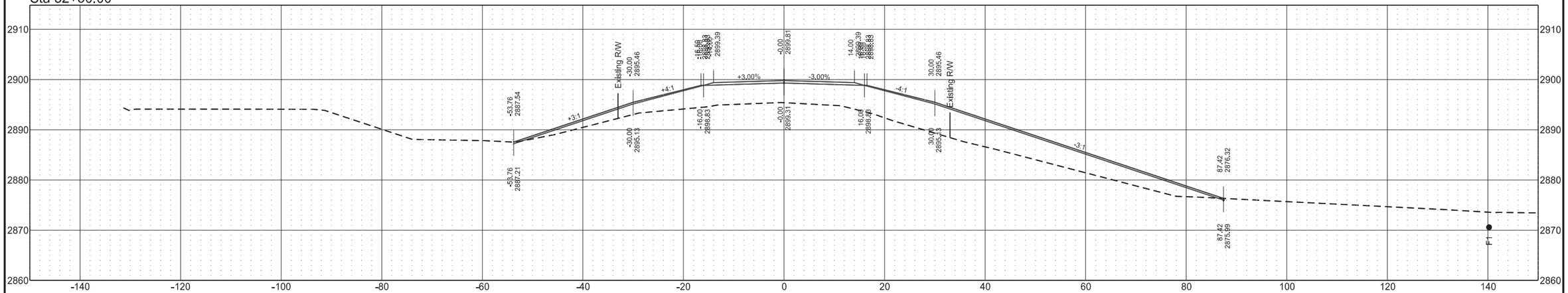
Sta 30+50.00



169th Ave SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	10

Sta 32+50.00



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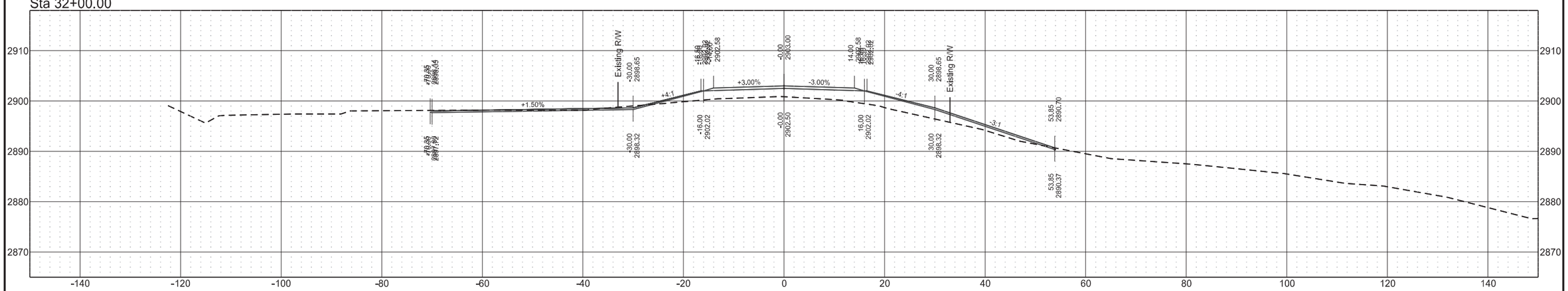
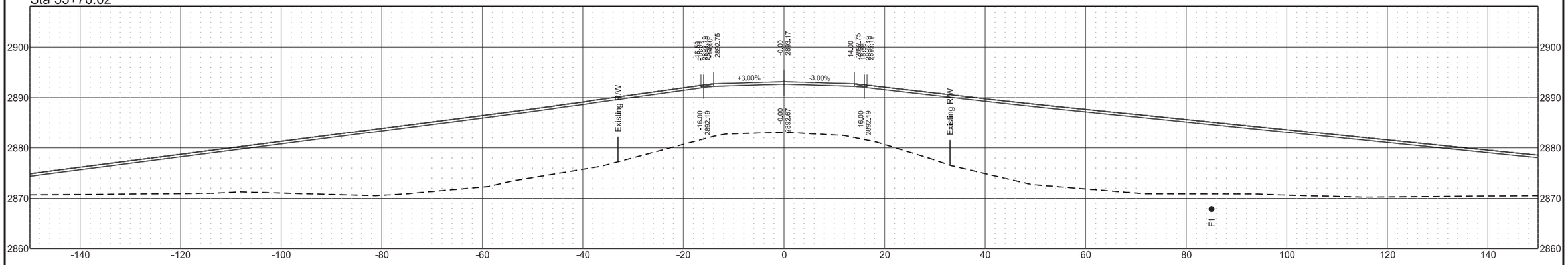


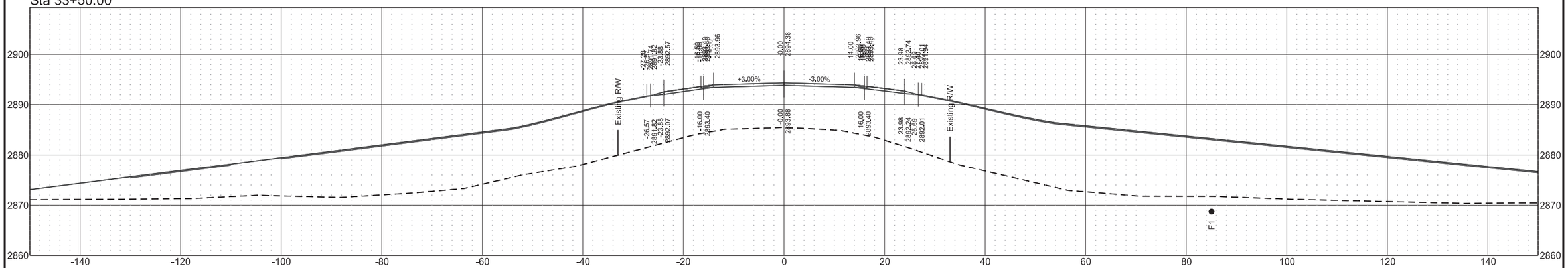
169th Ave SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	11

Sta 33+76.02



Sta 33+50.00



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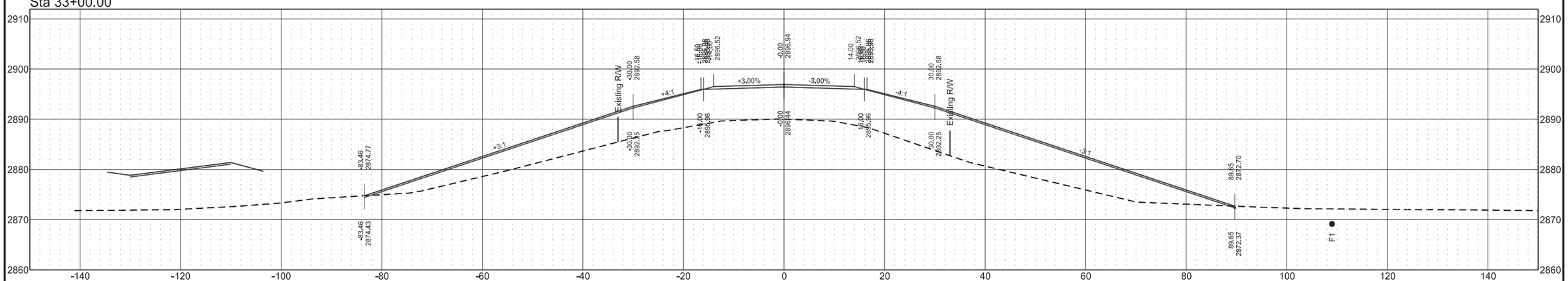
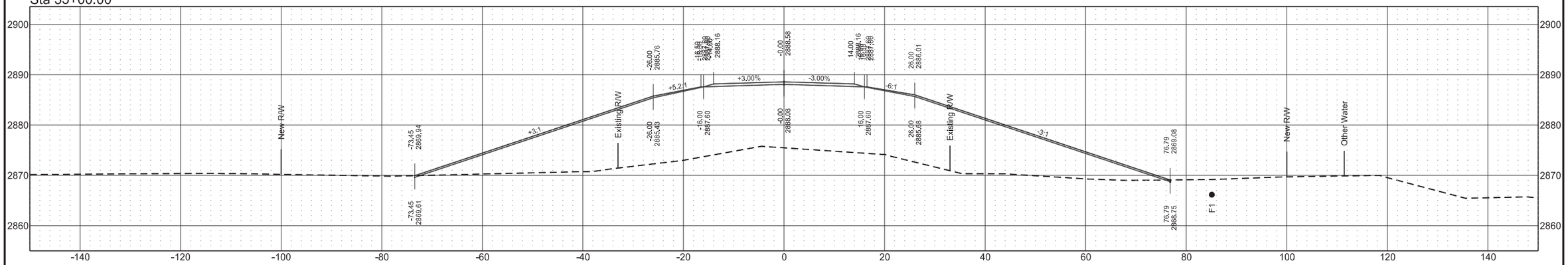


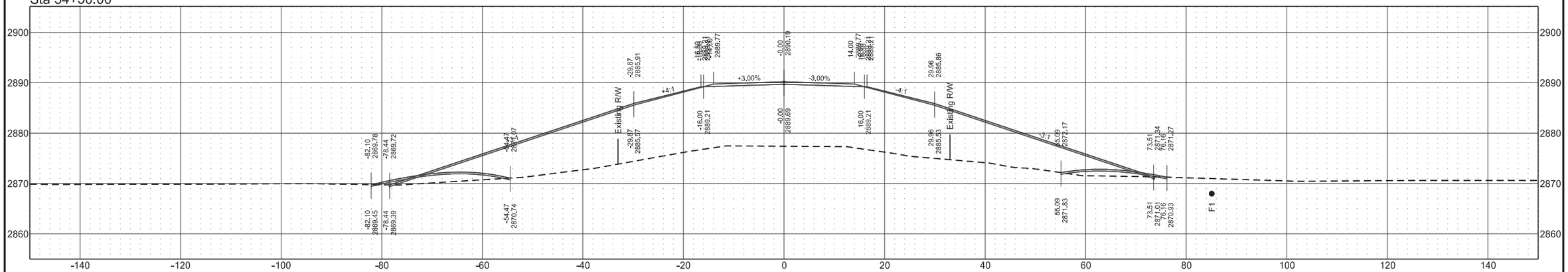
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	12

169th Ave SW

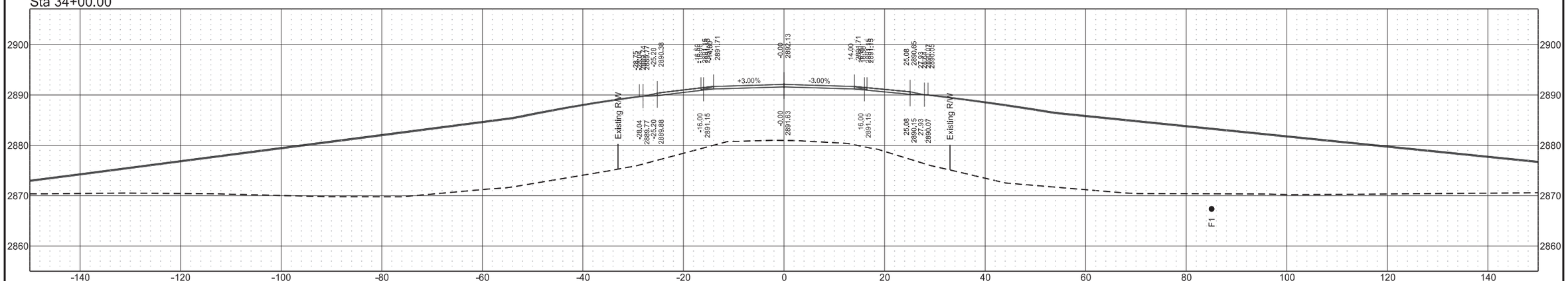
Sta 35+00.00



Sta 34+50.00



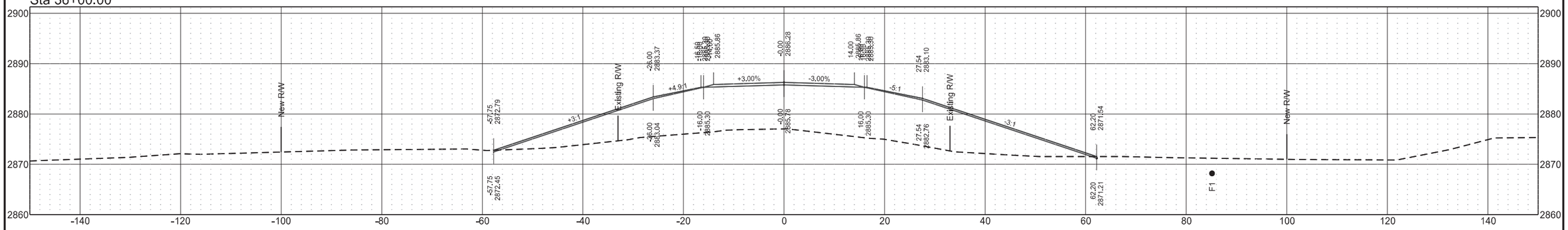
Sta 34+00.00



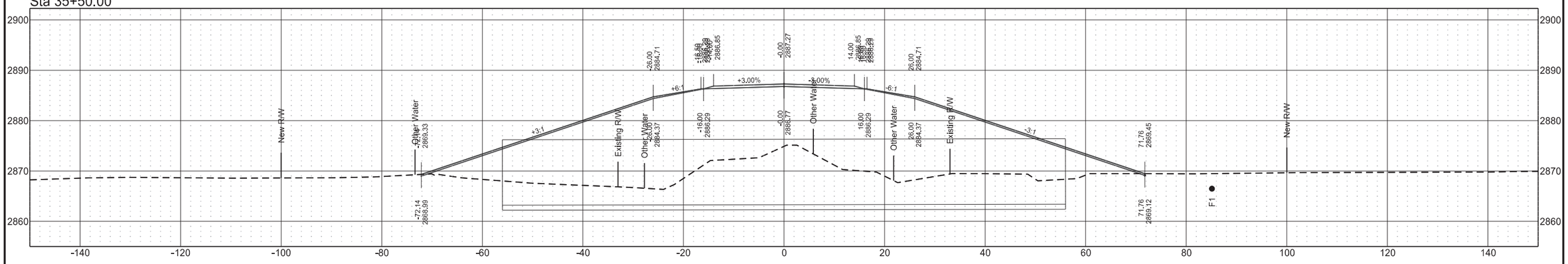
169th Ave SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	13

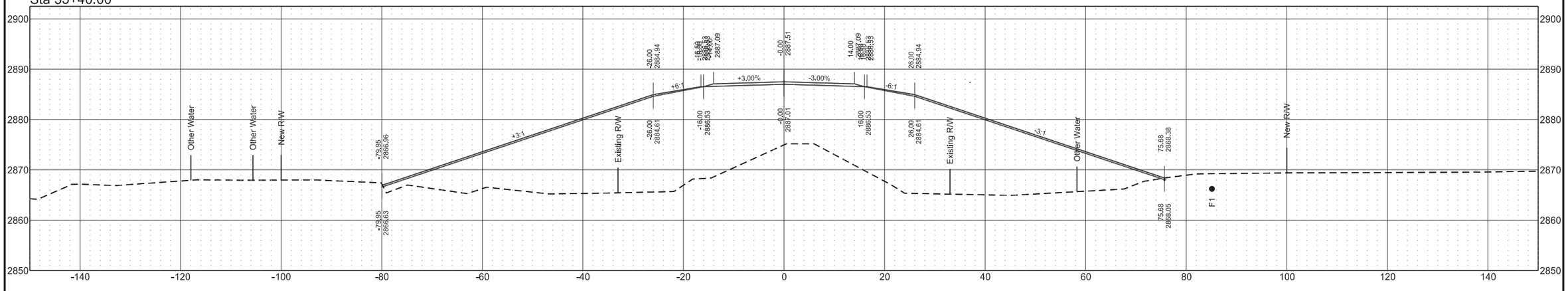
Sta 36+00.00



Sta 35+50.00



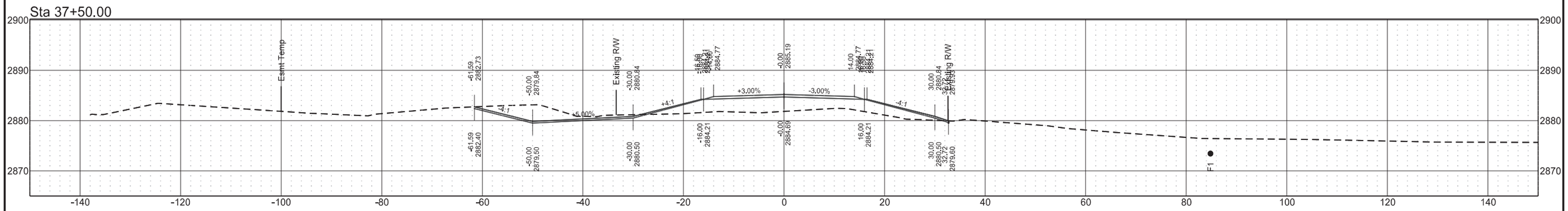
Sta 35+40.00



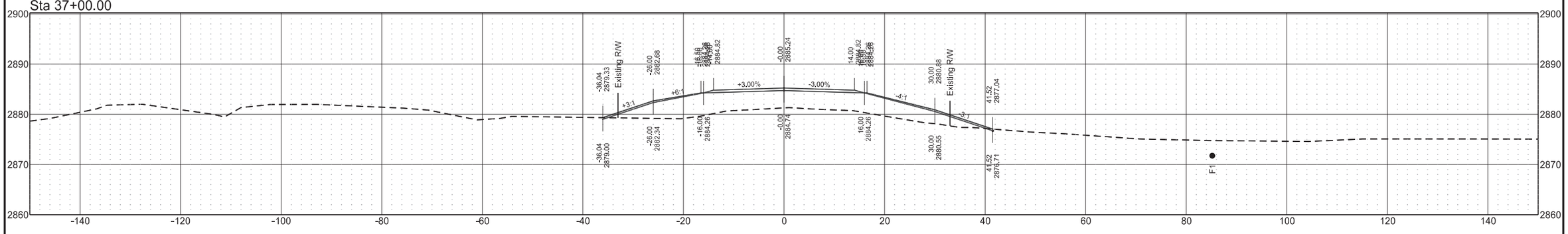
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	14

169th Ave SW

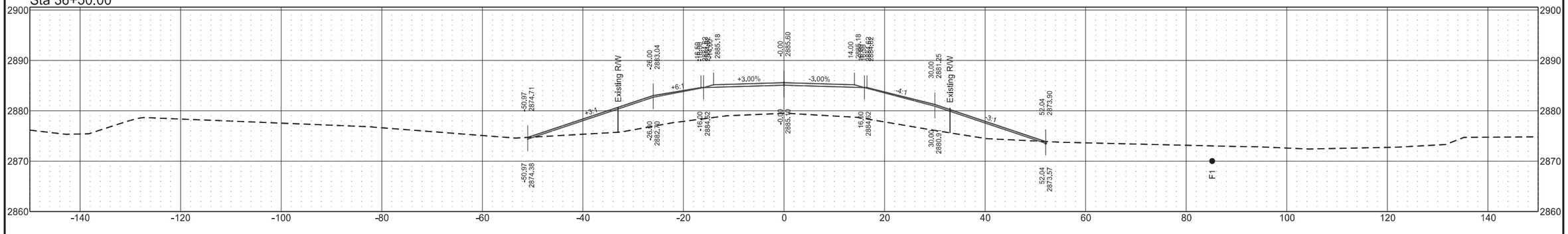
Sta 37+50.00



Sta 37+00.00



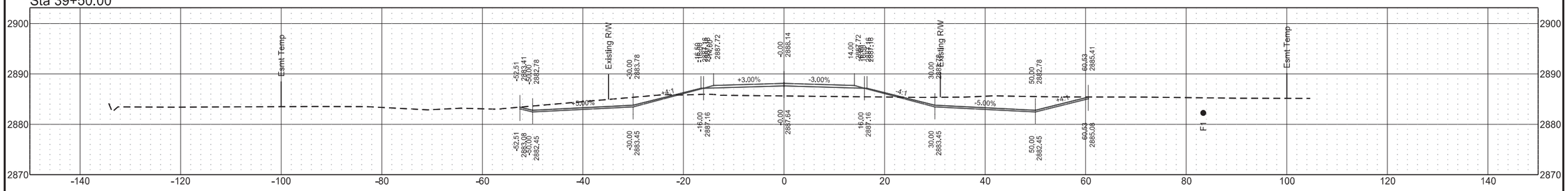
Sta 36+50.00



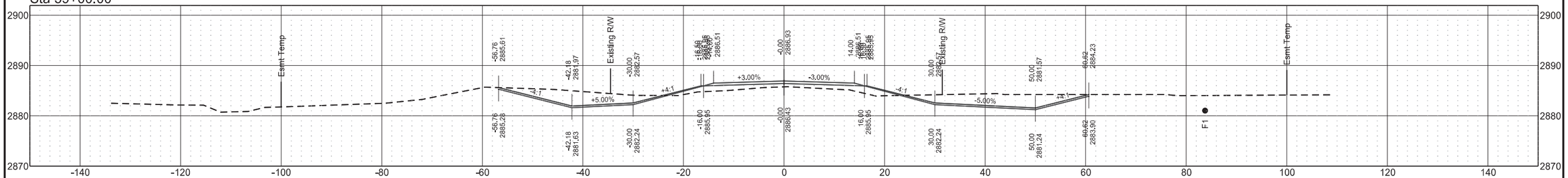
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	15

169th Ave SW

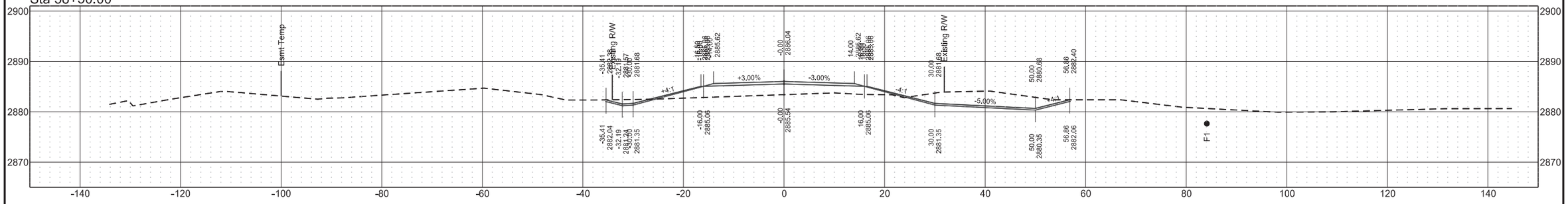
Sta 39+50.00



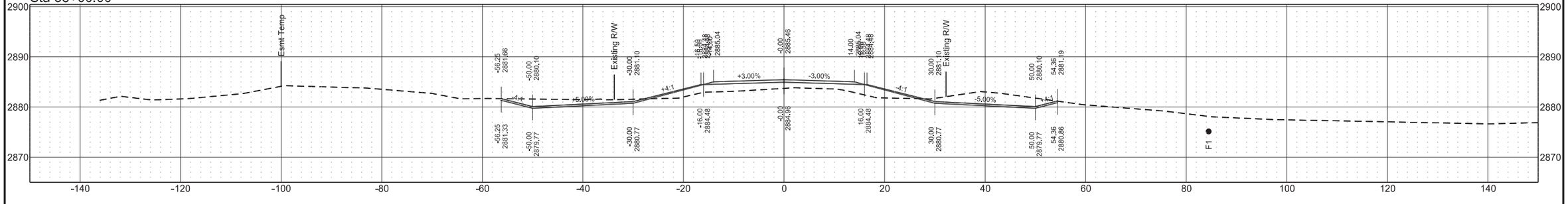
Sta 39+00.00



Sta 38+50.00



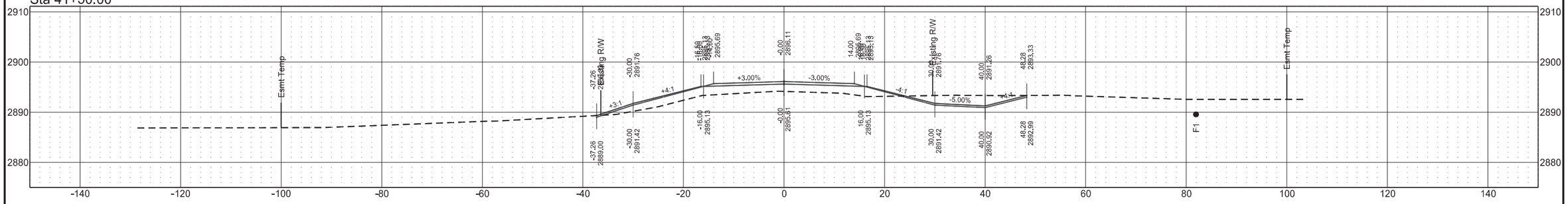
Sta 38+00.00



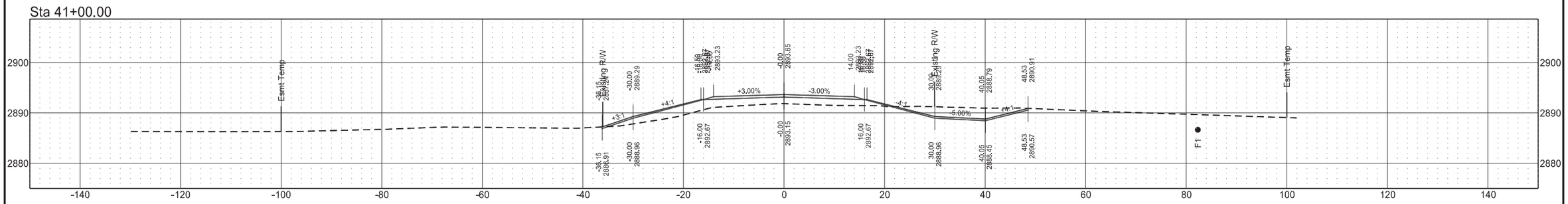
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	16

169th Ave SW

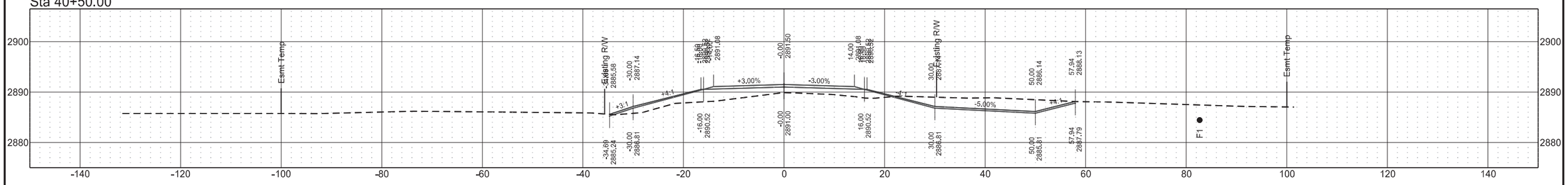
Sta 41+50.00



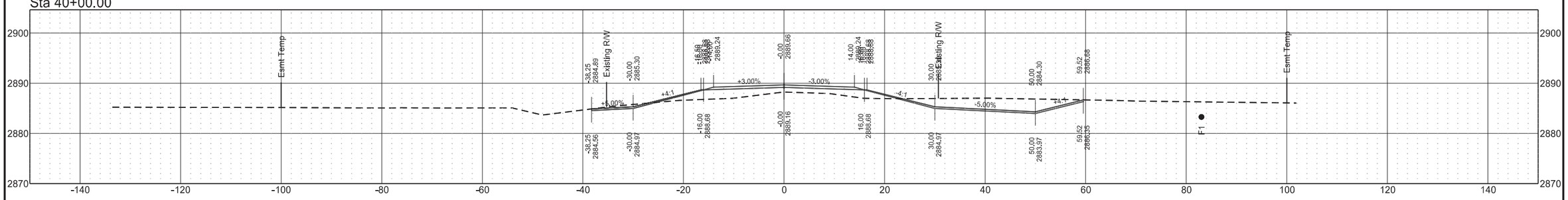
Sta 41+00.00



Sta 40+50.00



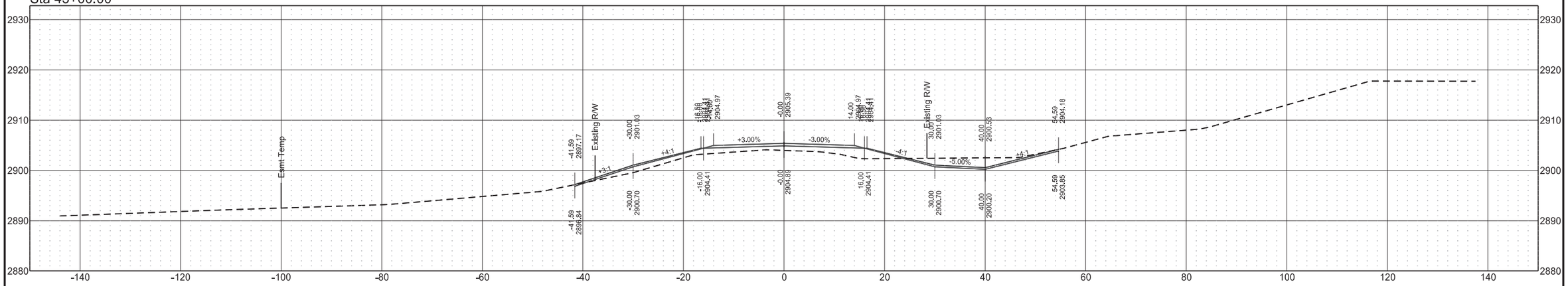
Sta 40+00.00



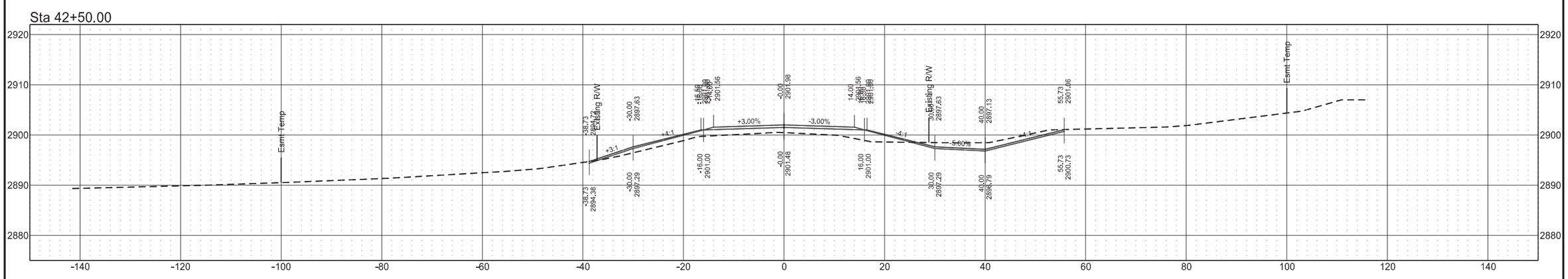
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	17

169th Ave SW

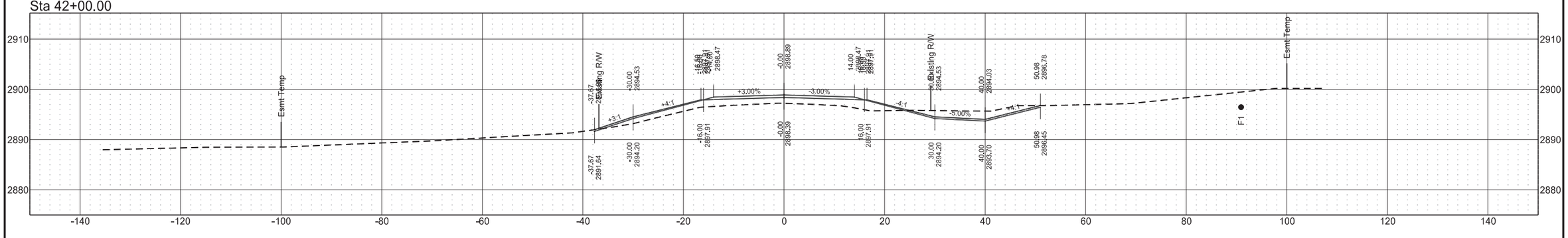
Sta 43+00.00



Sta 42+50.00



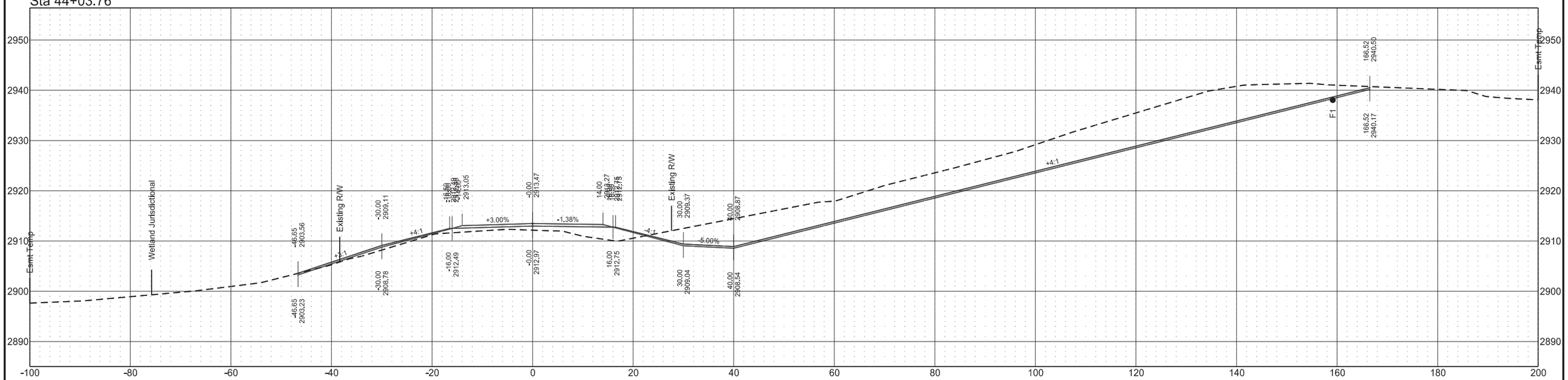
Sta 42+00.00



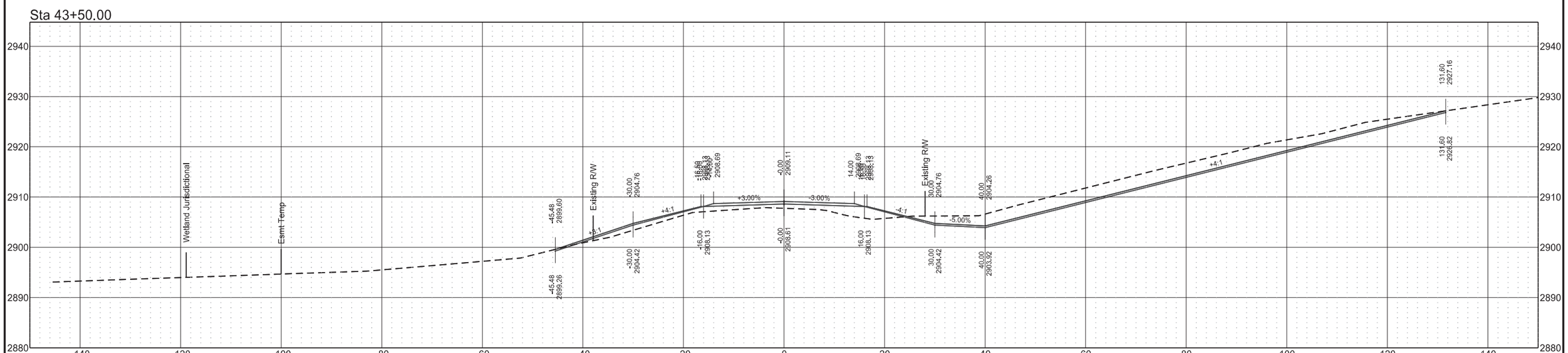
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	18

169th Ave SW

Sta 44+03.76



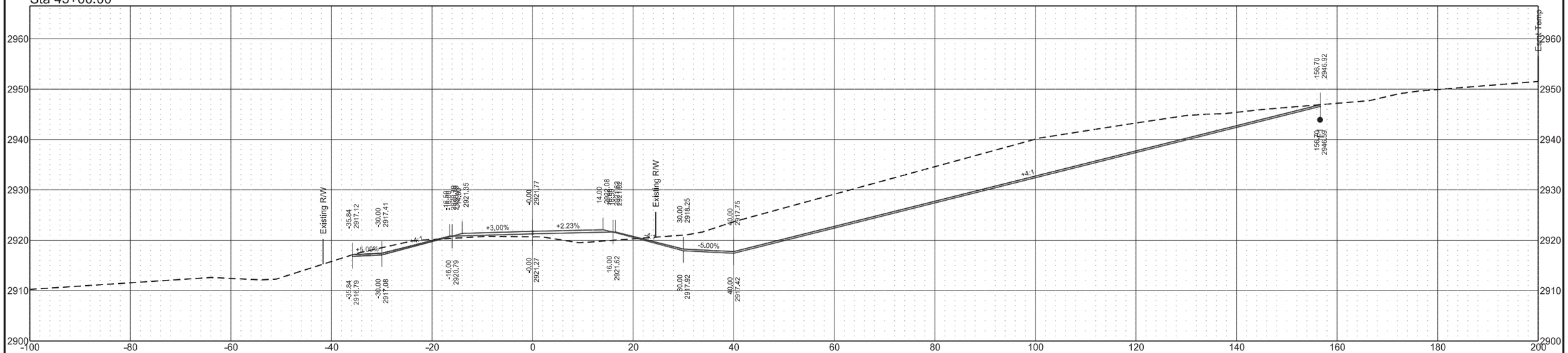
Sta 43+50.00



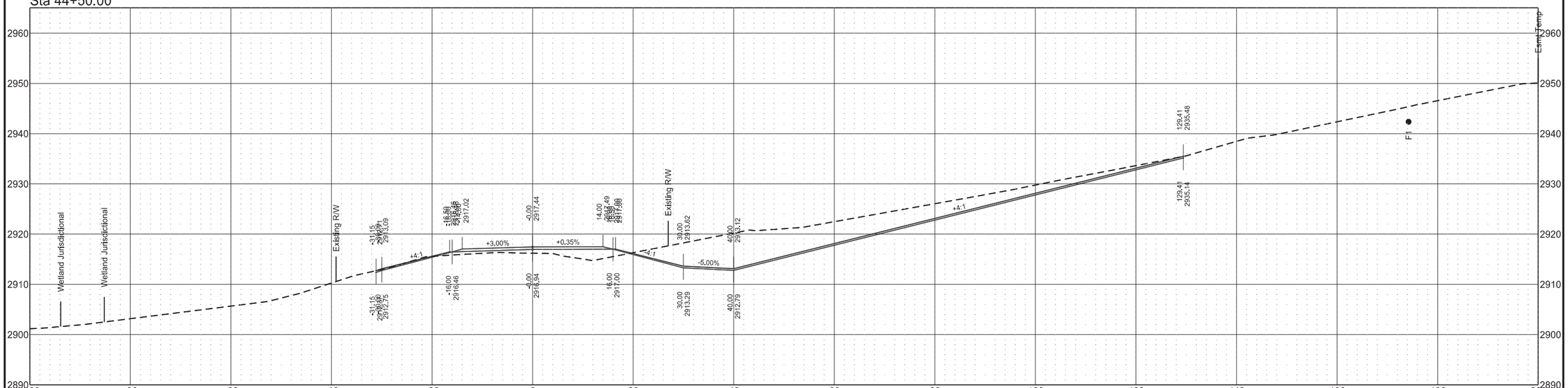
169th Ave SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	19

Sta 45+00.00



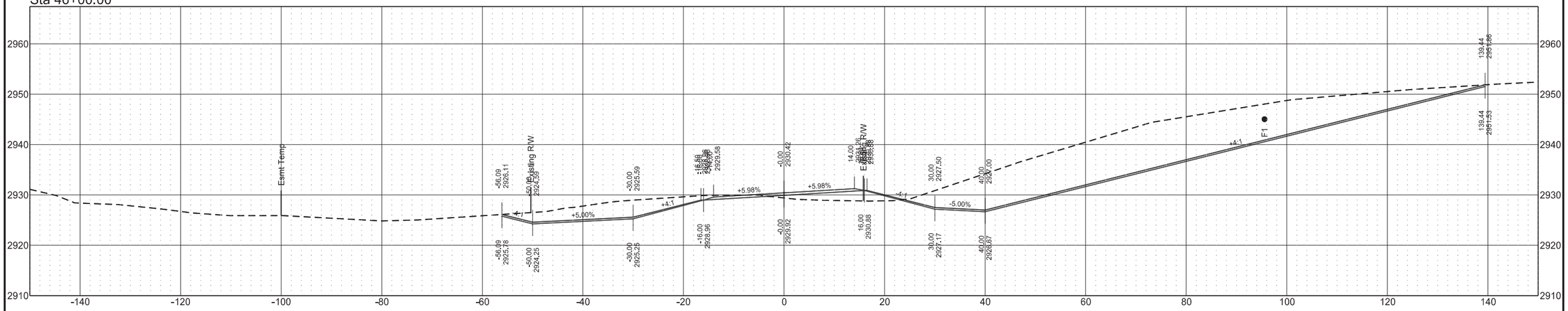
Sta 44+50.00



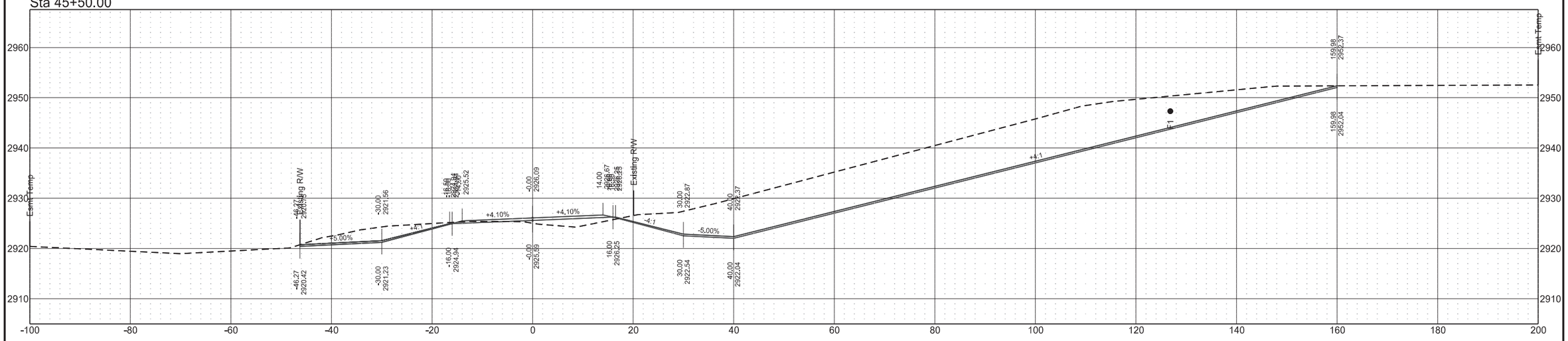
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	20

169th Ave SW

Sta 46+00.00



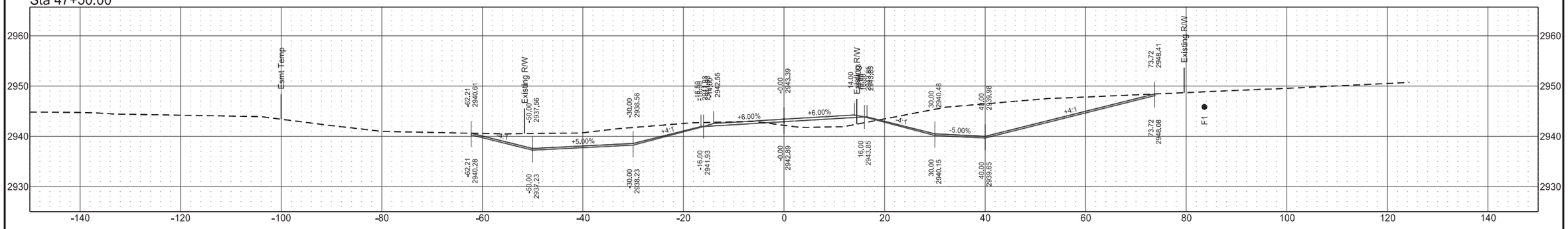
Sta 45+50.00



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	21

169th Ave SE

Sta 47+50.00



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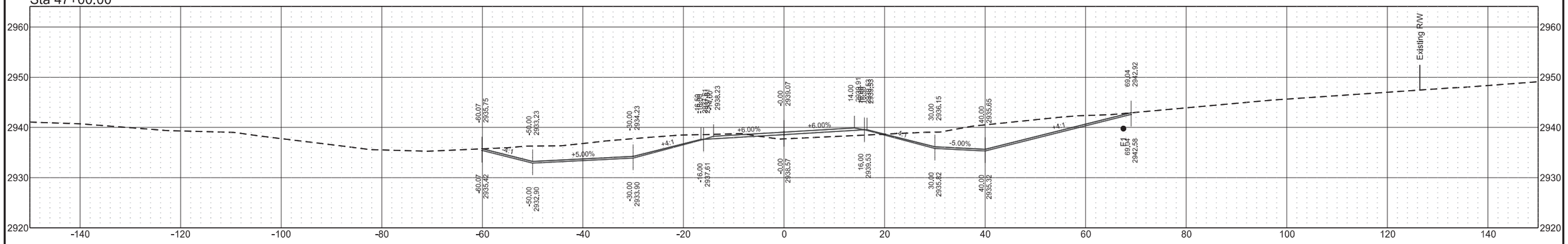

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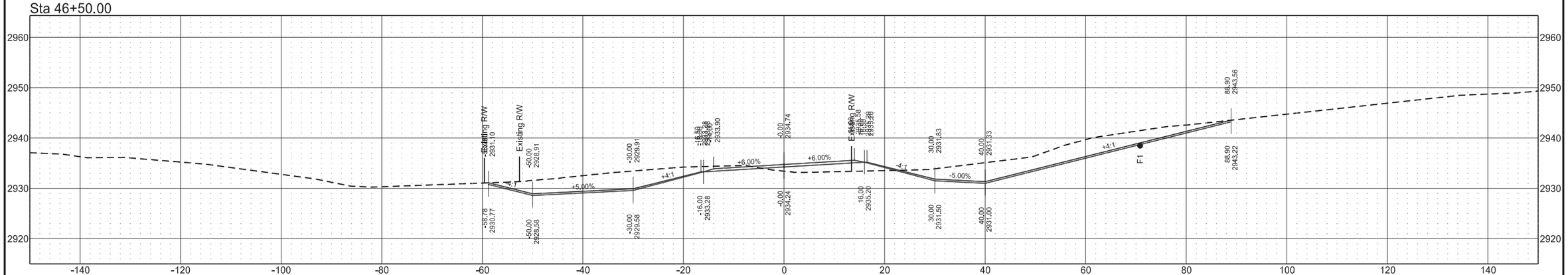
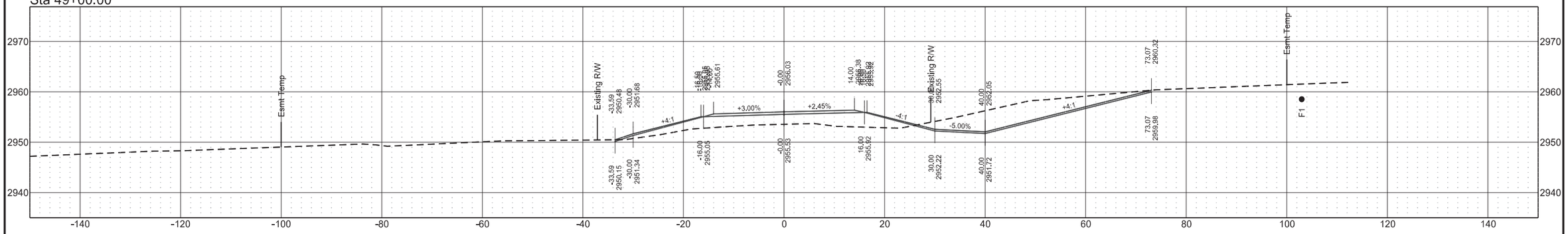


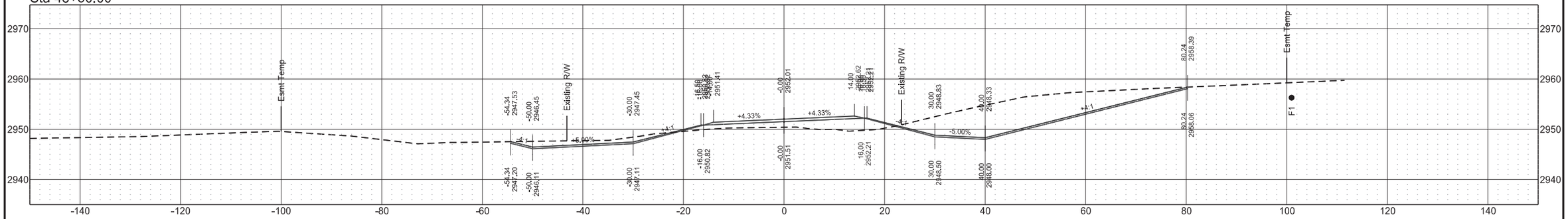
169th Ave SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	22

Sta 49+00.00



Sta 48+50.00



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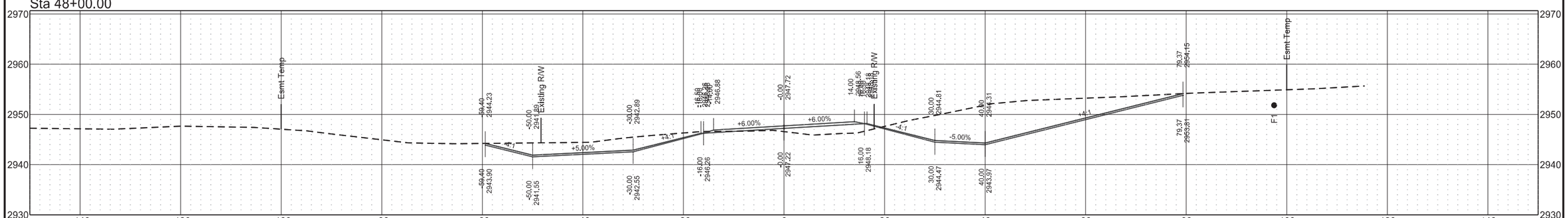
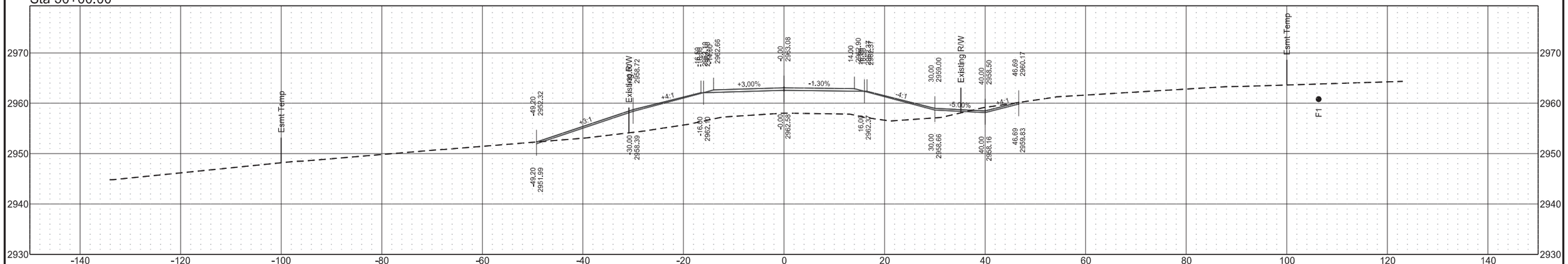


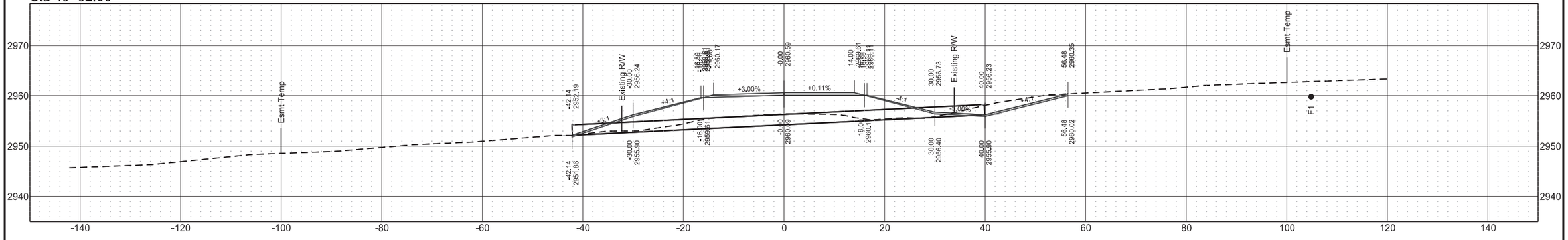
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	23

169th Ave SW

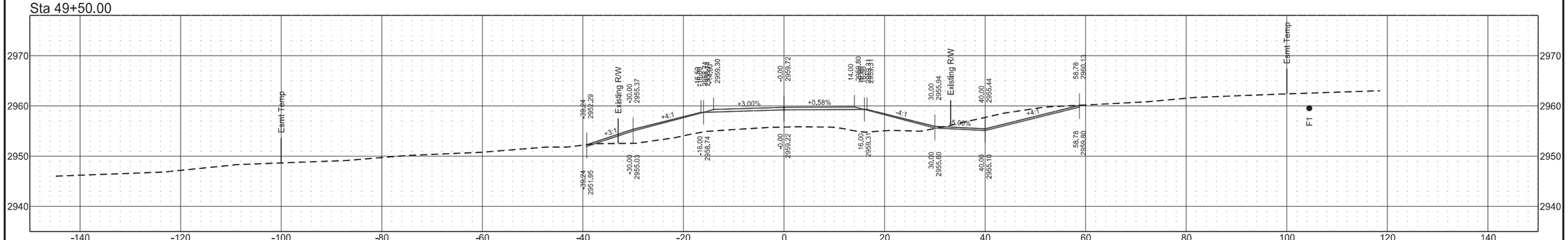
Sta 50+00.00



Sta 49+62.50



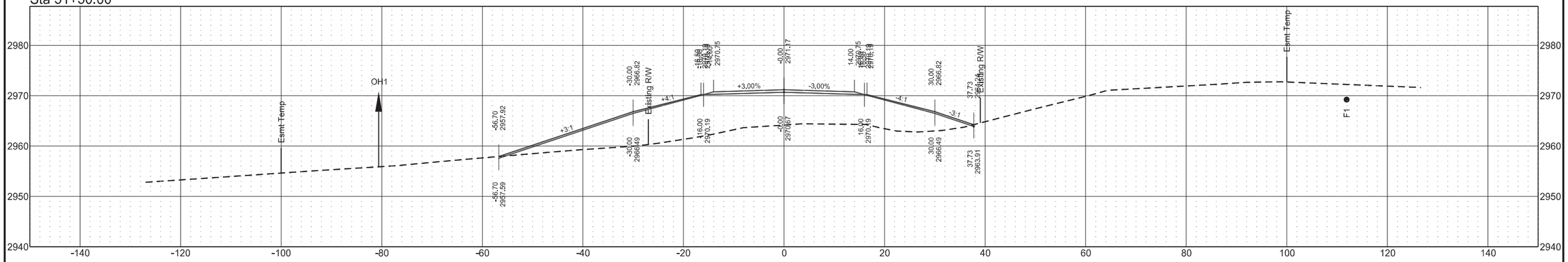
Sta 49+50.00



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	24

169th Ave SW

Sta 51+50.00



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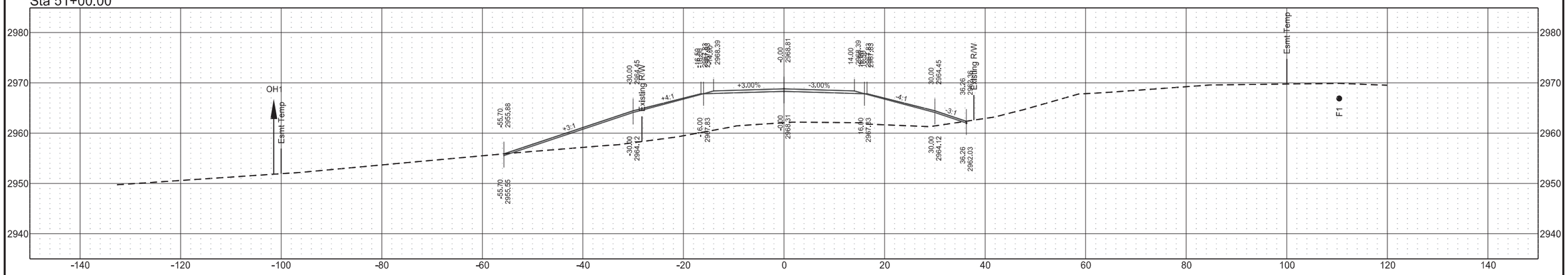

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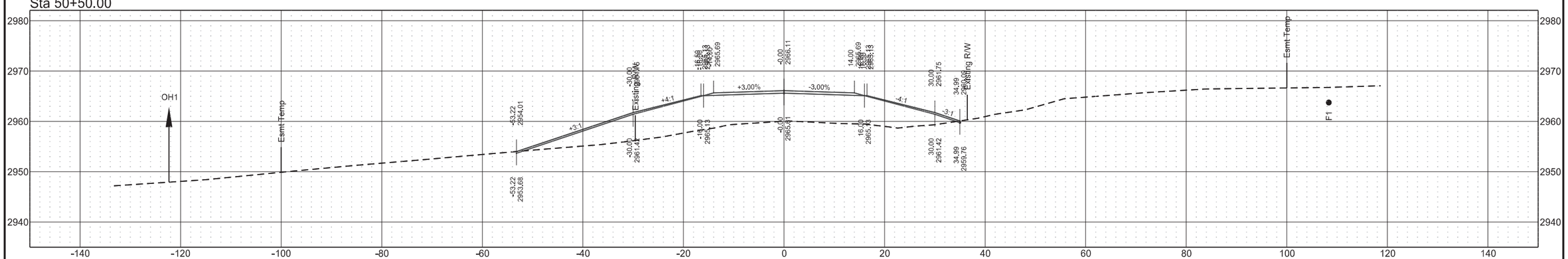
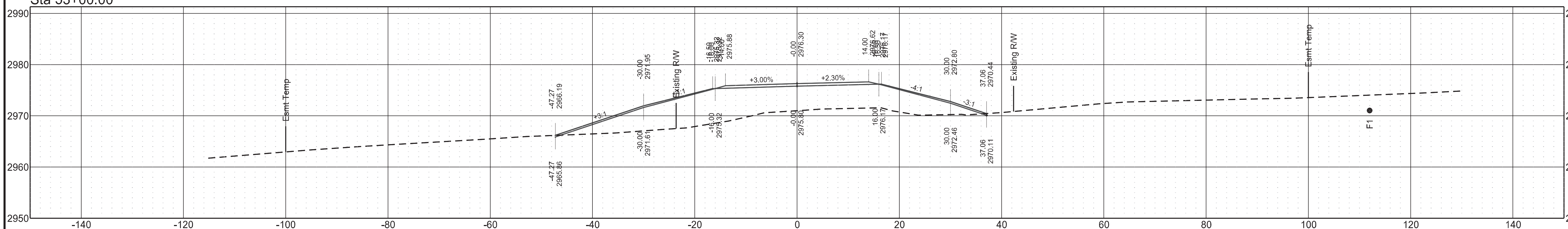


169th Ave SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	25

Sta 53+00.00



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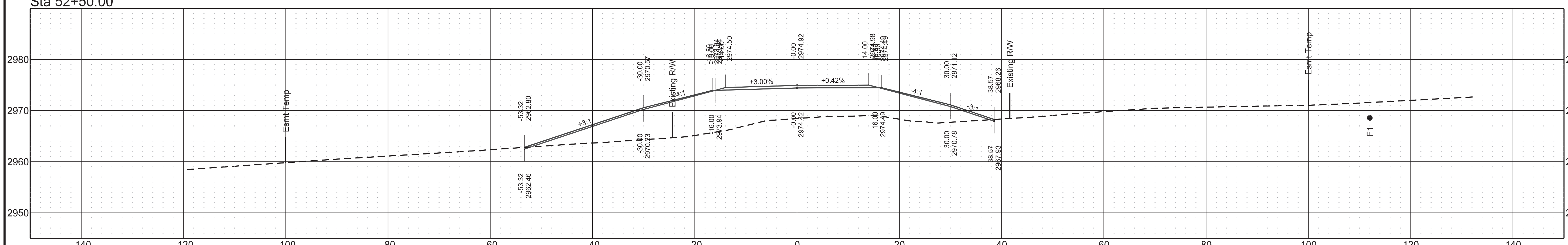
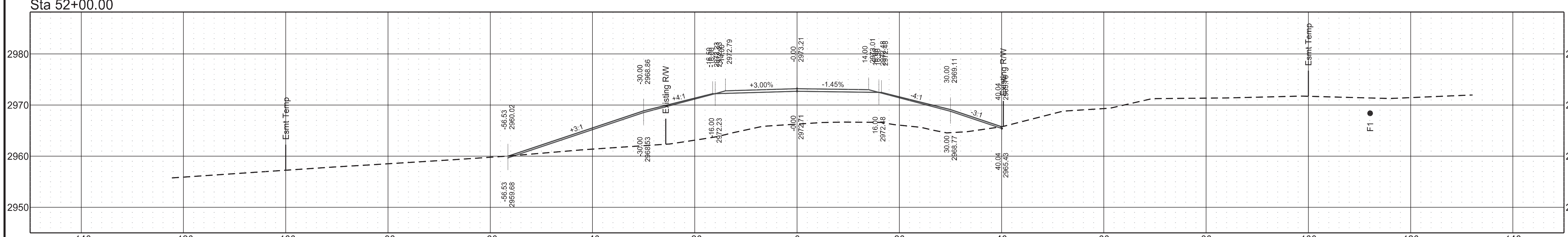


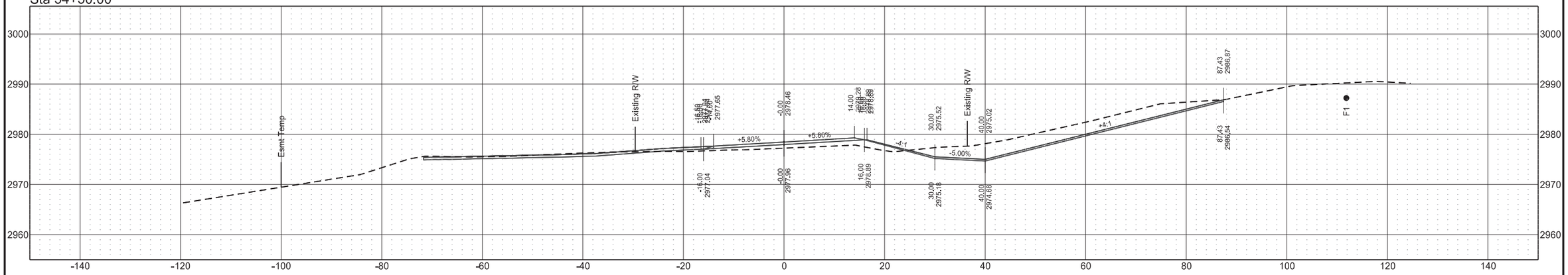
Sta 52+00.00



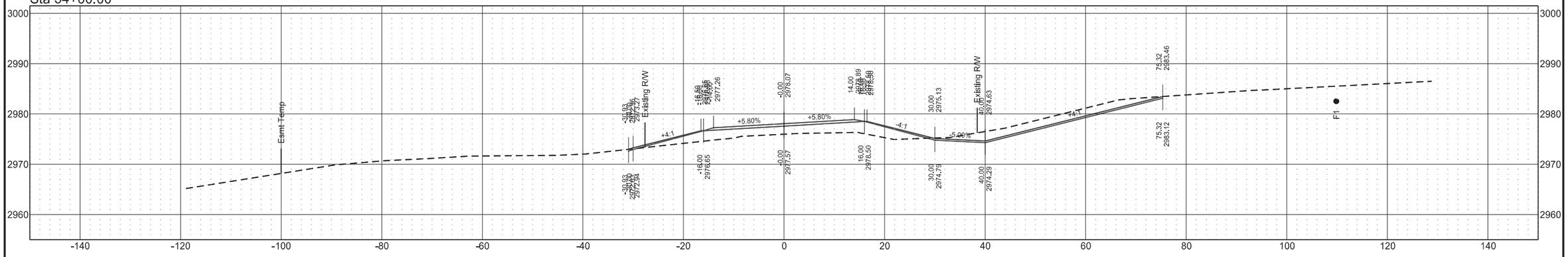
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	26

169th Ave SW

Sta 54+50.00



Sta 54+00.00



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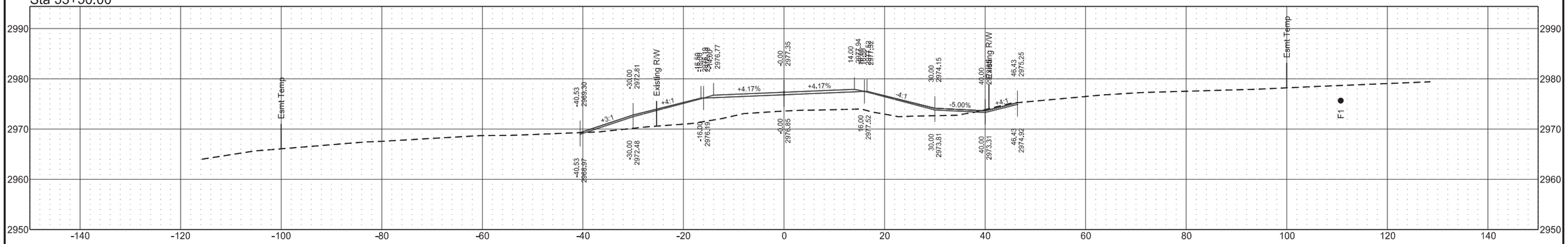
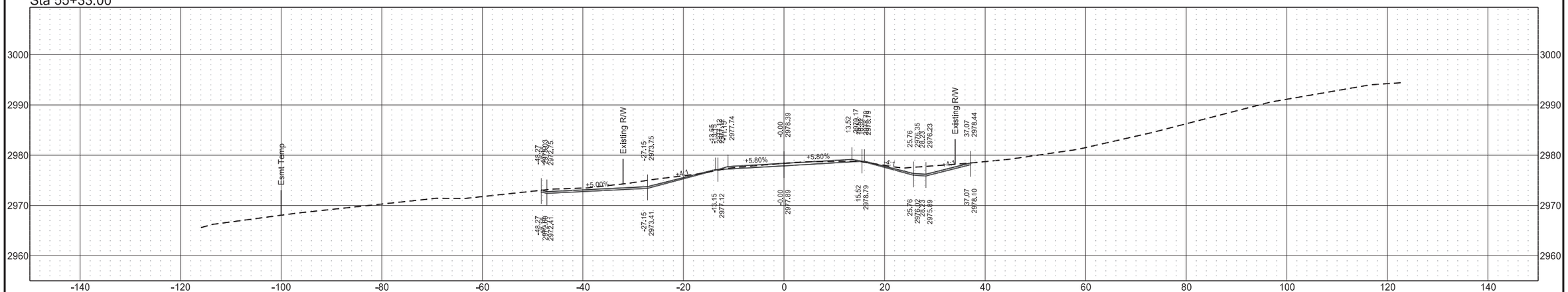


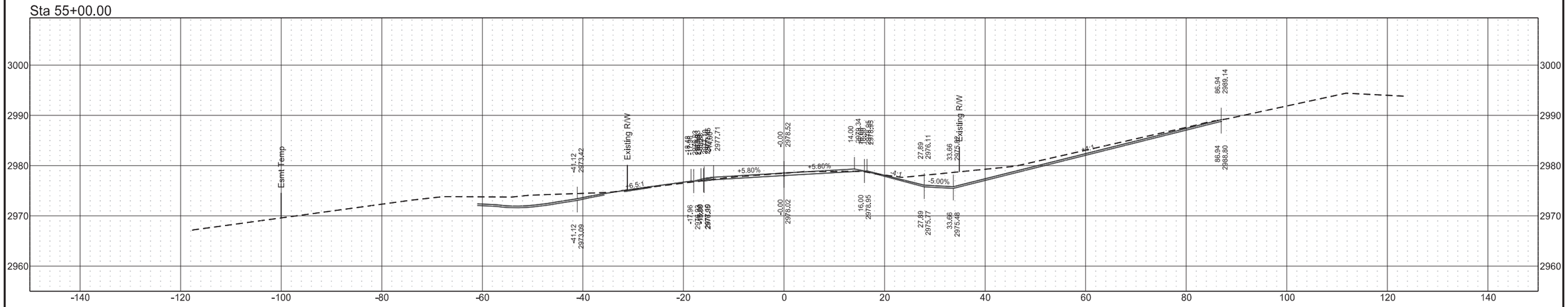
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	27

169th Ave SW

Sta 55+33.00



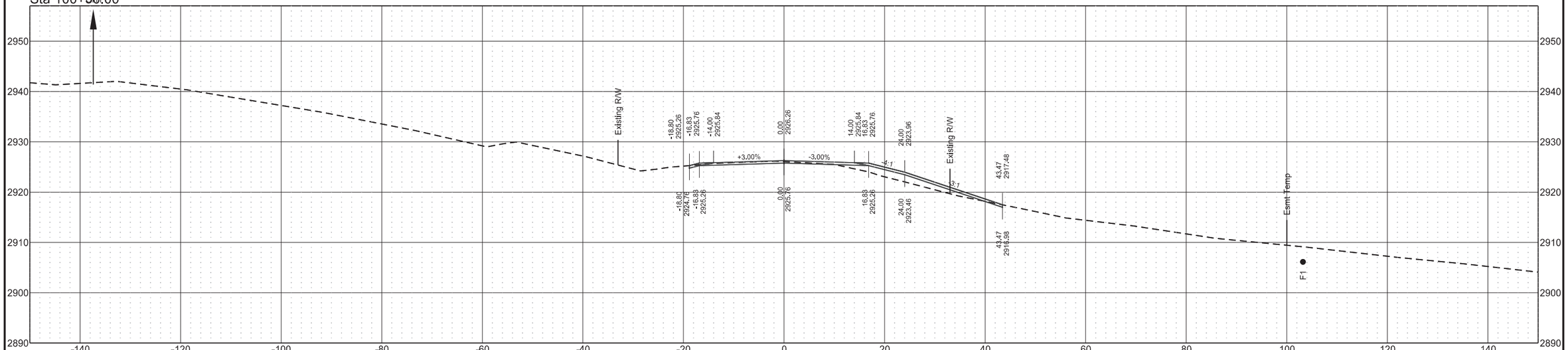
Sta 55+00.00



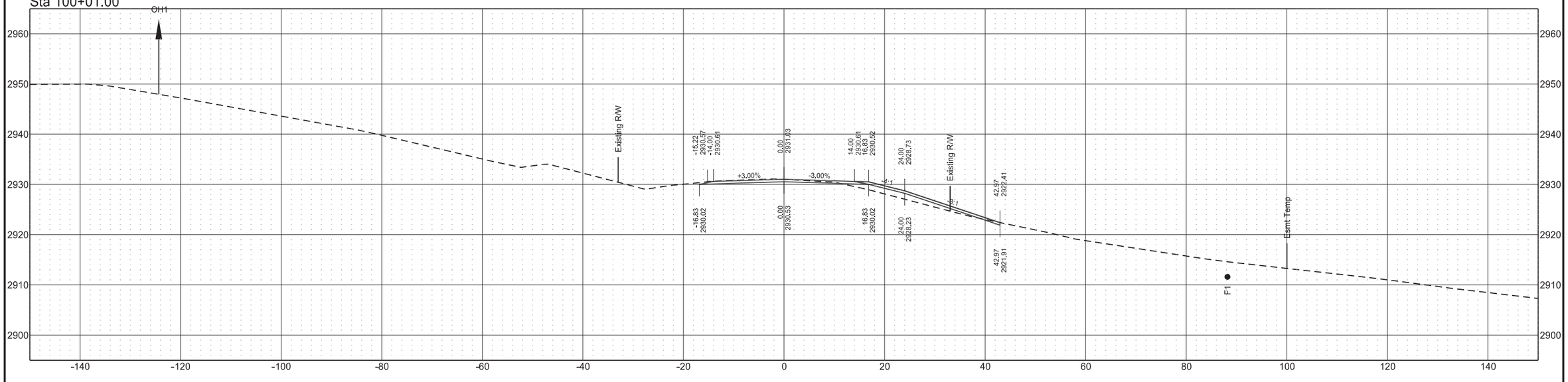
Temporary Bypass

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	28

Sta 100+50.00



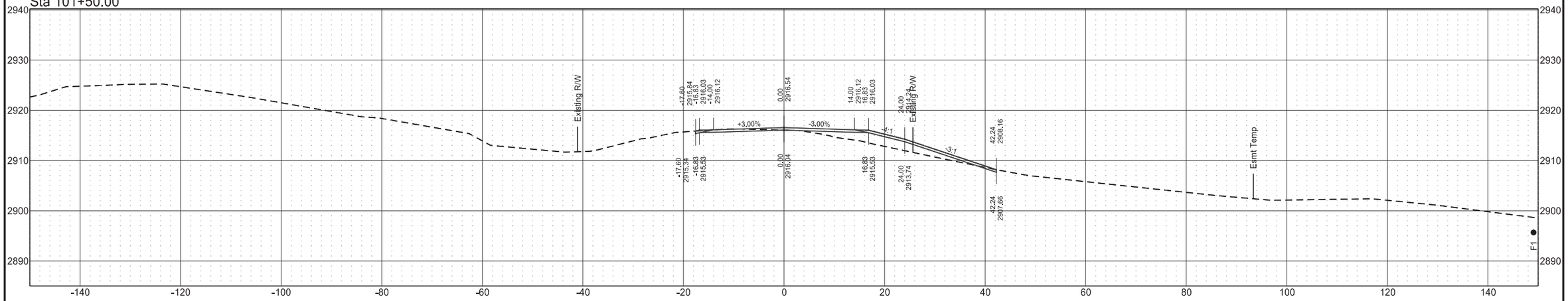
Sta 100+01.00



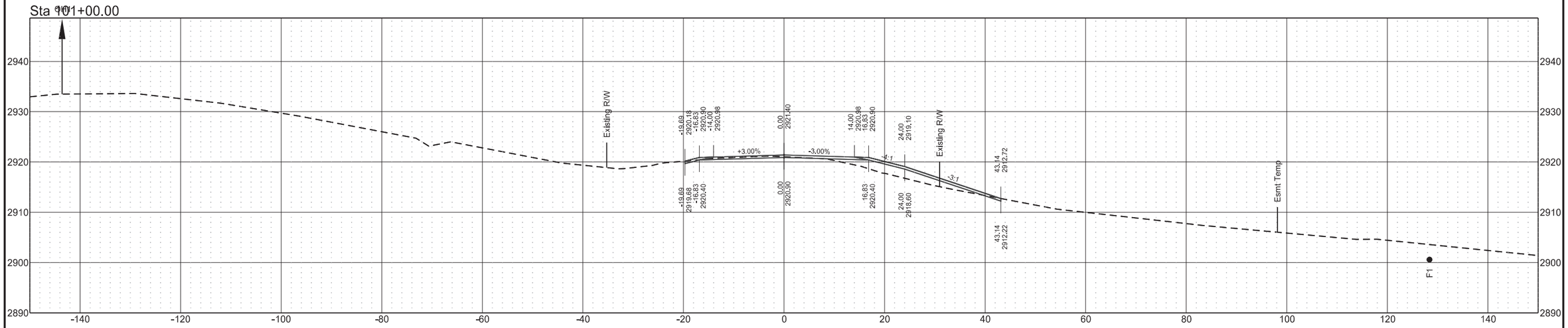
Temporary Bypass

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	29

Sta 101+50.00



Sta 101+00.00

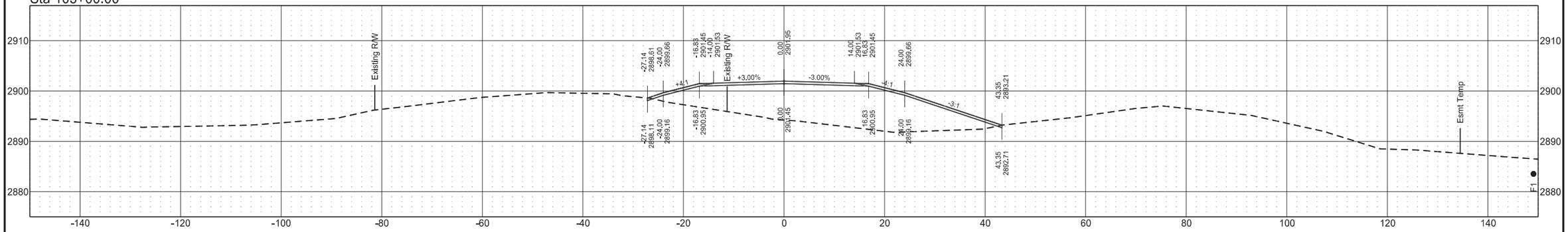


12/3/2024 11:19:07 AM ryank S:\2022proj\Bowman\2201234\Design\Plan Sheets\200XS_Bypass_028-037.dgn

Temporary Bypass

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	30

Sta 103+00.00



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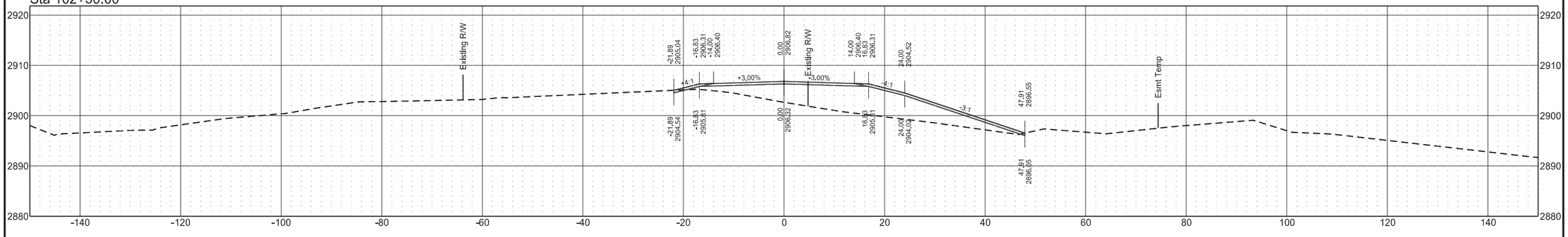

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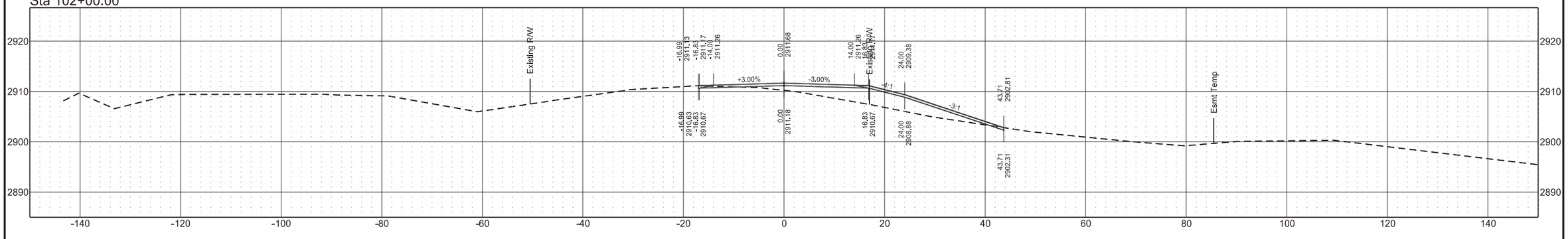
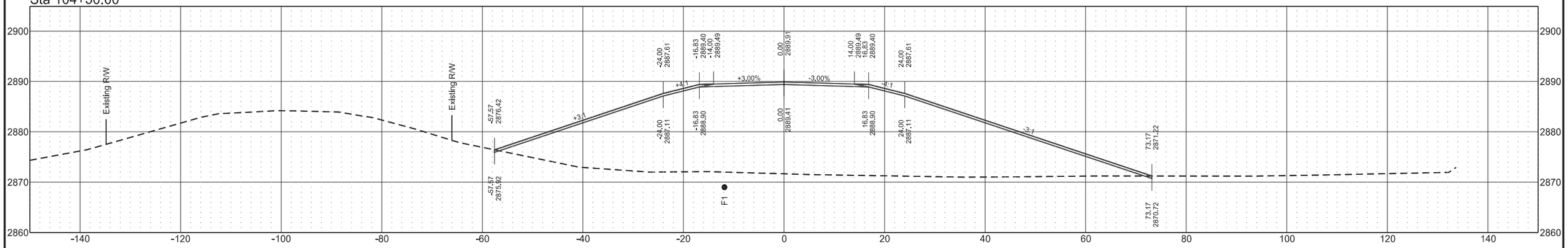


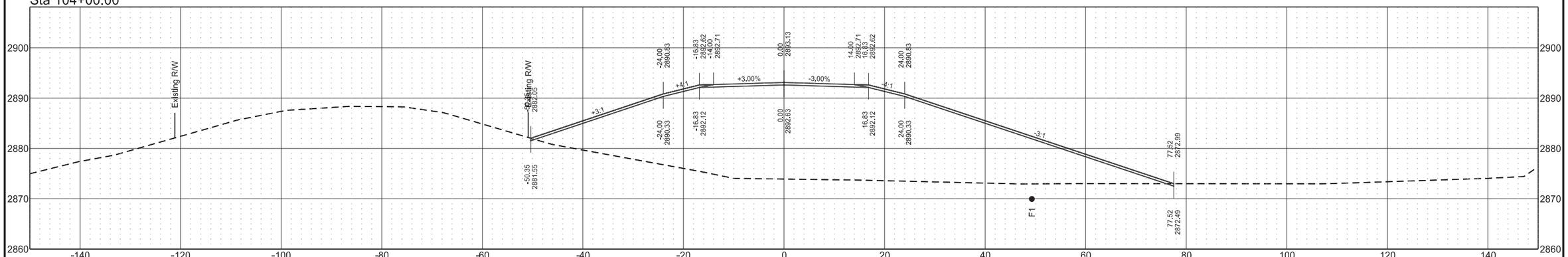
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	31

Temporary Bypass

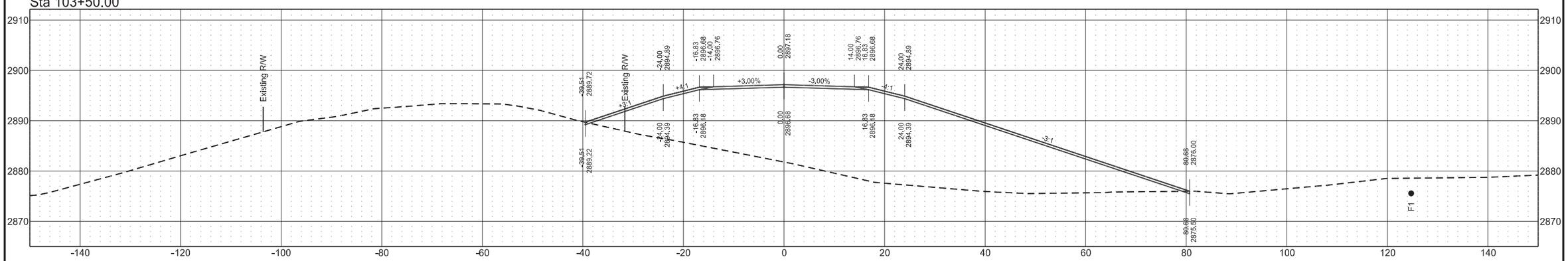
Sta 104+50.00



Sta 104+00.00



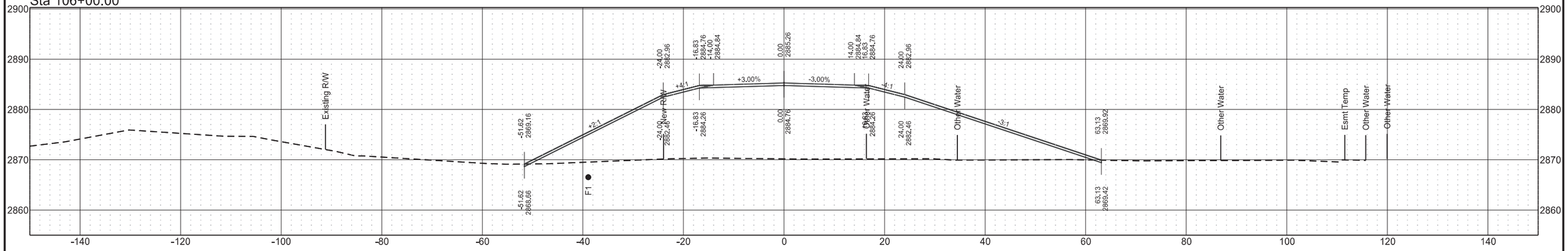
Sta 103+50.00



Temporary Bypass

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	32

Sta 106+00.00



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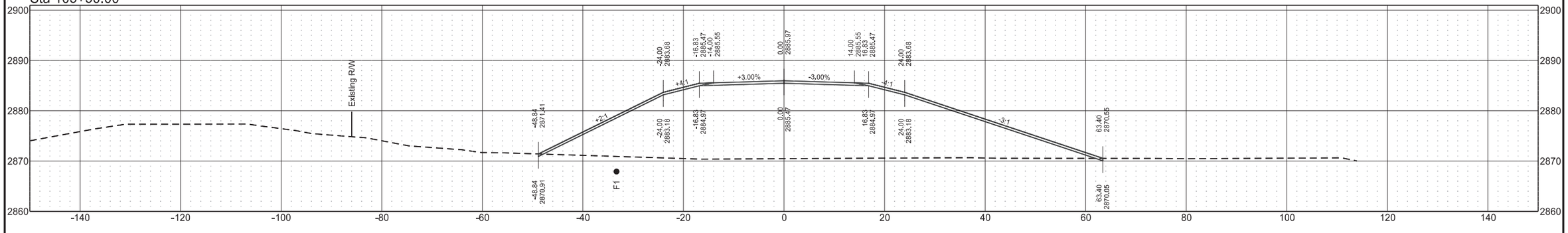

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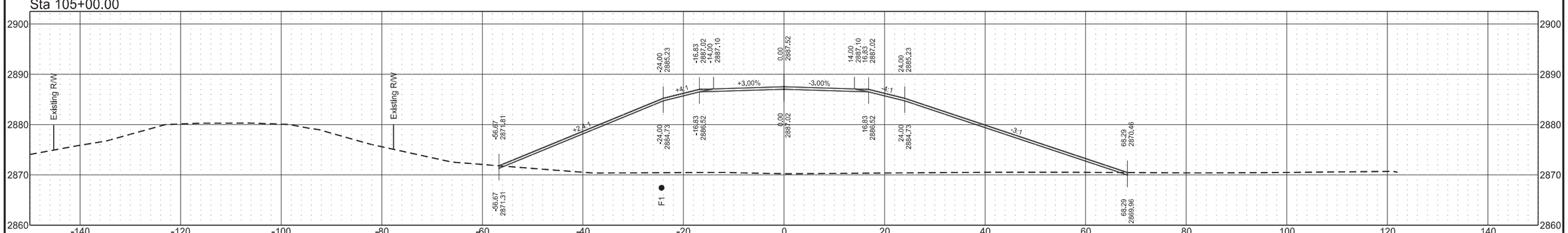
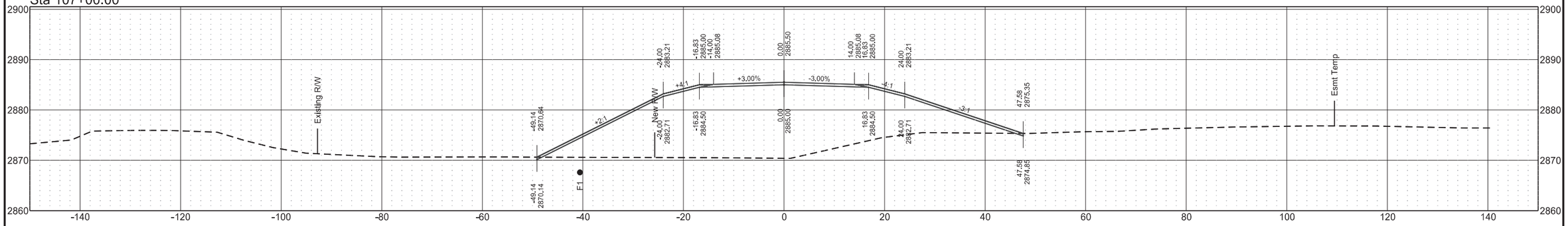


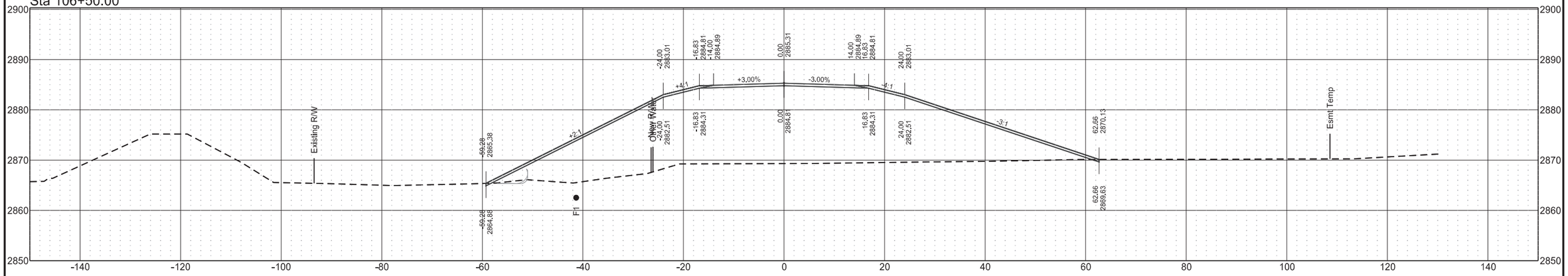
Temporary Bypass

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	33

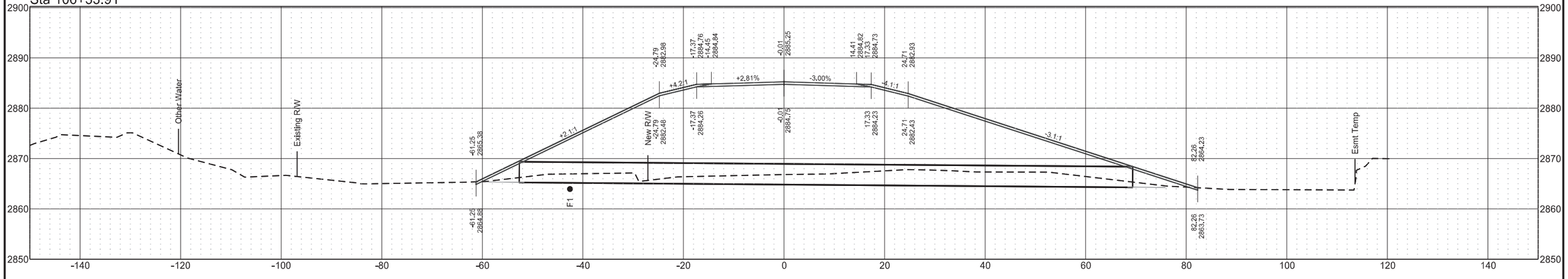
Sta 107+00.00



Sta 106+50.00



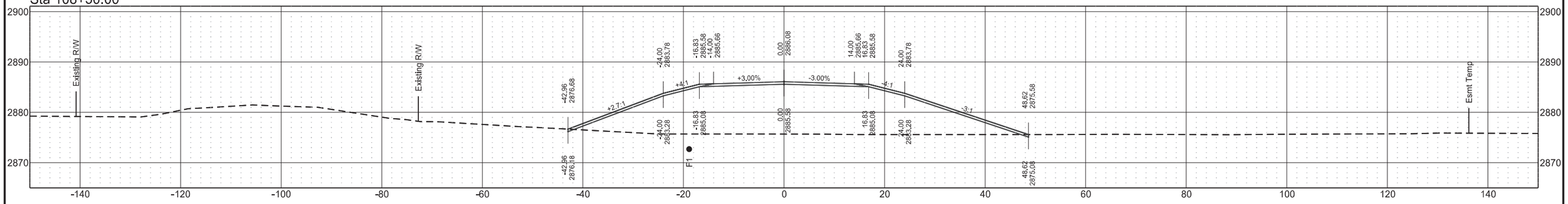
Sta 106+33.91



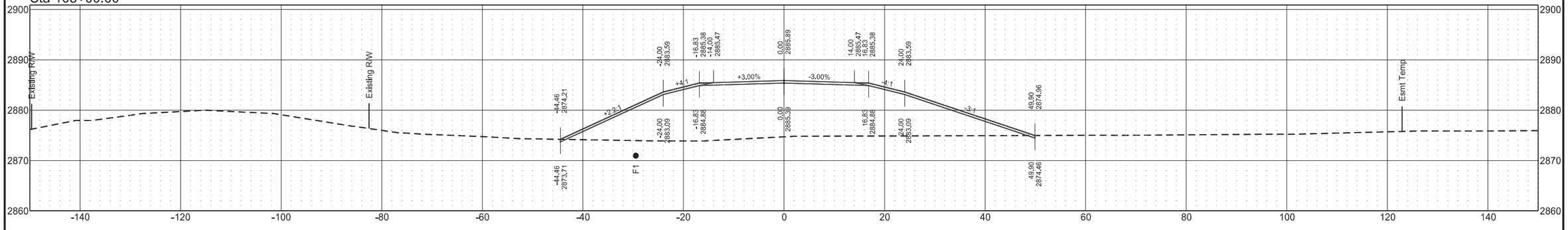
Temporary Bypass

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	34

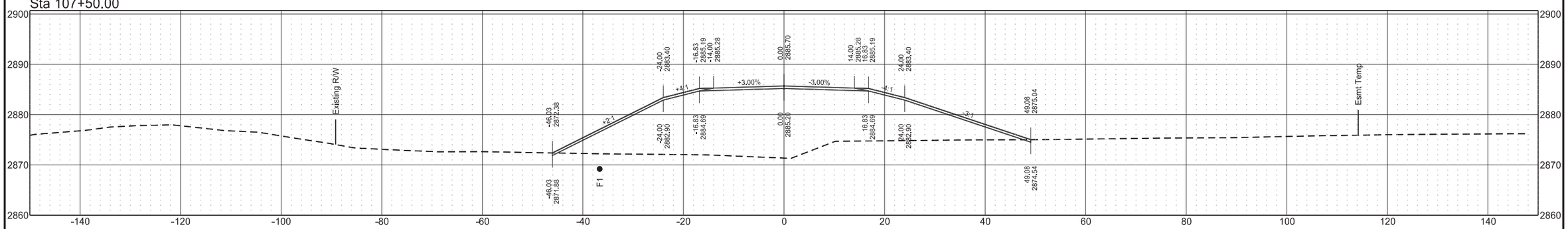
Sta 108+50.00



Sta 108+00.00



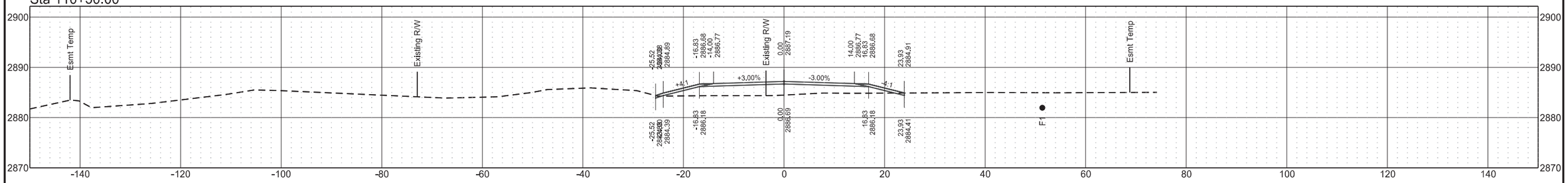
Sta 107+50.00



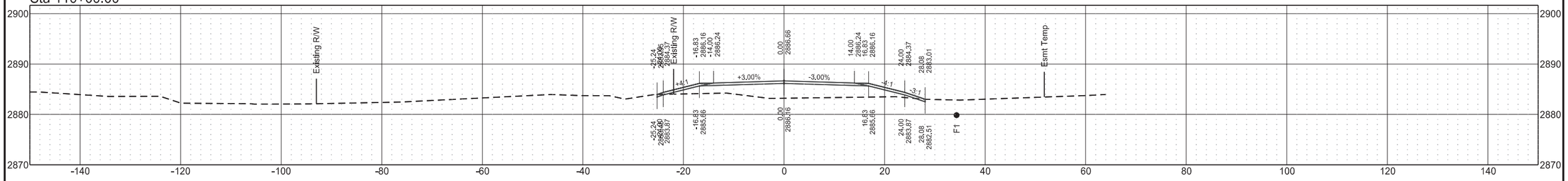
Temporary Bypass

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	35

Sta 110+50.00



Sta 110+00.00



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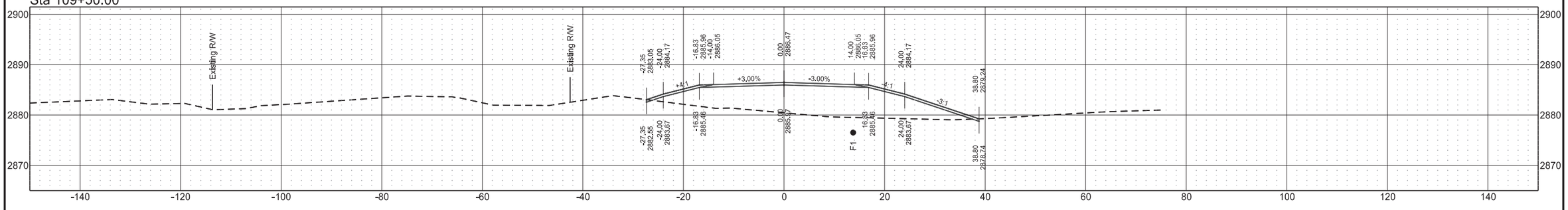
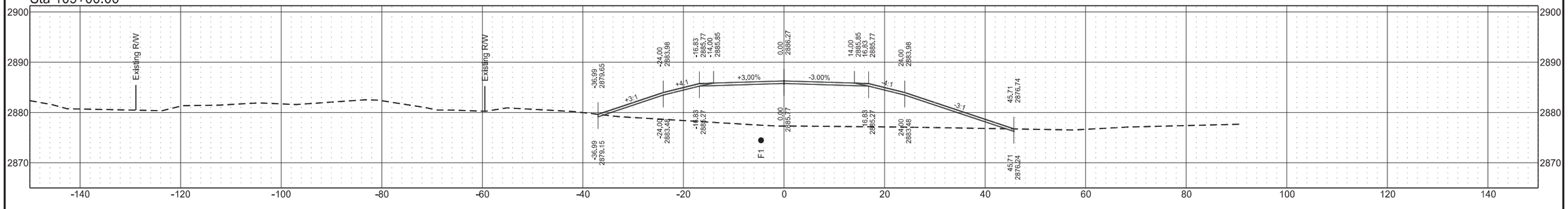


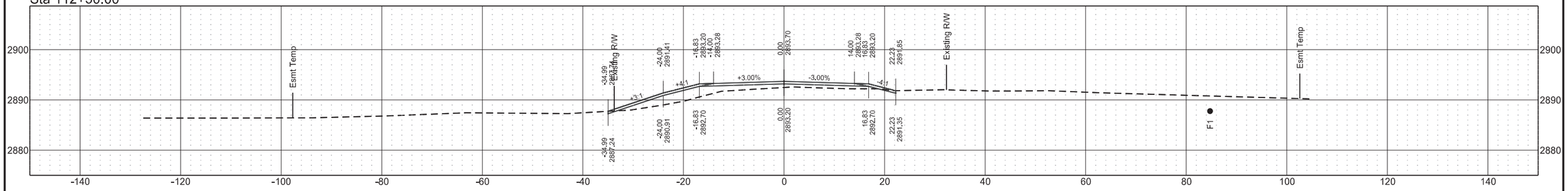
Sta 109+00.00



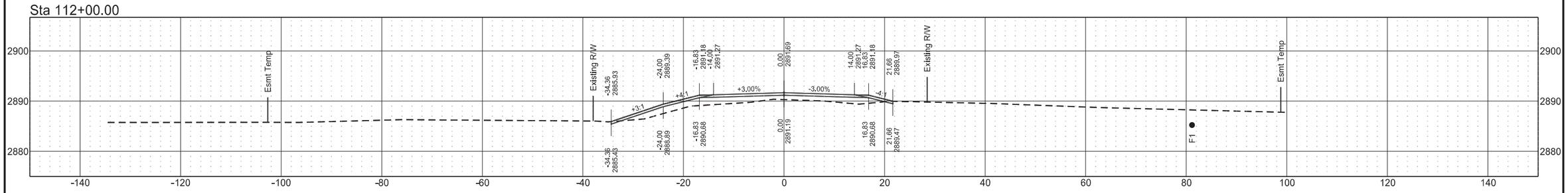
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	36

Temporary Bypass

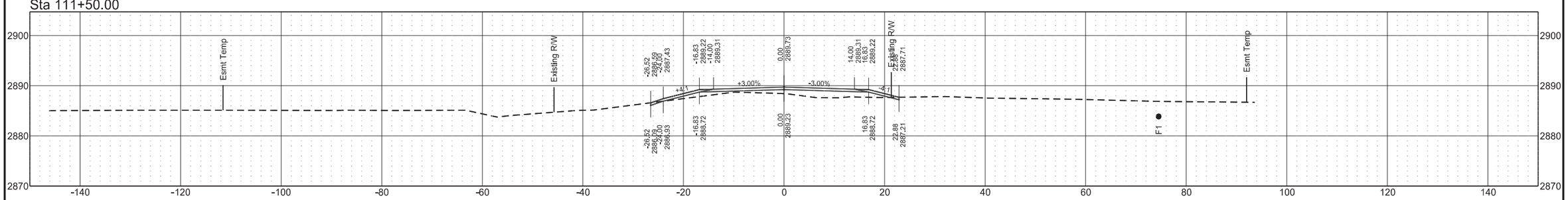
Sta 112+50.00



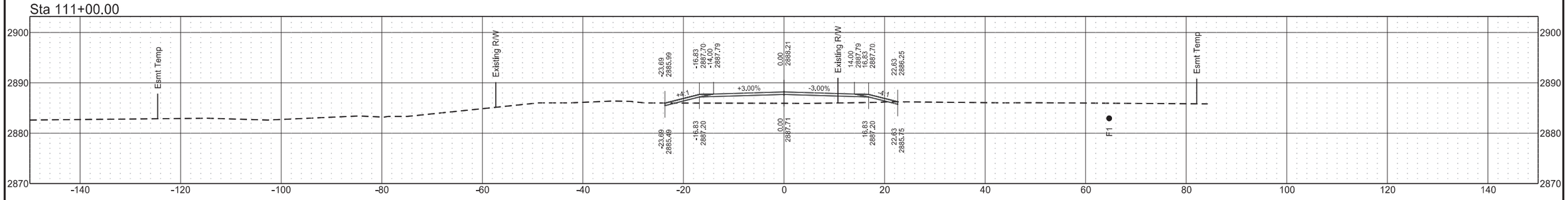
Sta 112+00.00



Sta 111+50.00



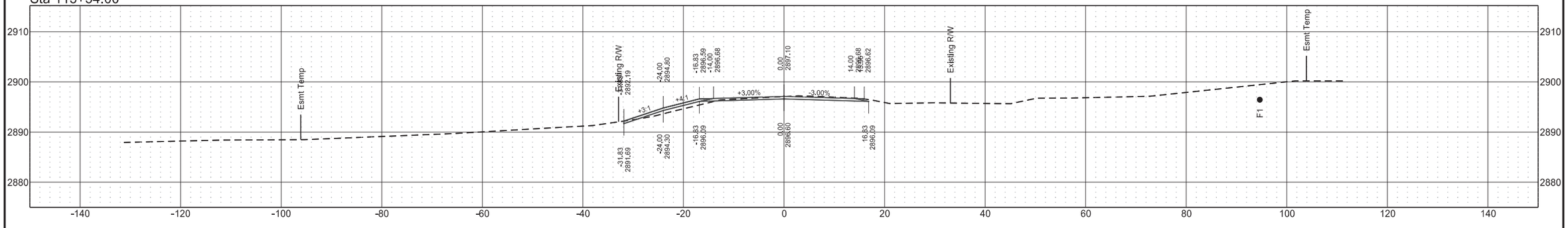
Sta 111+00.00



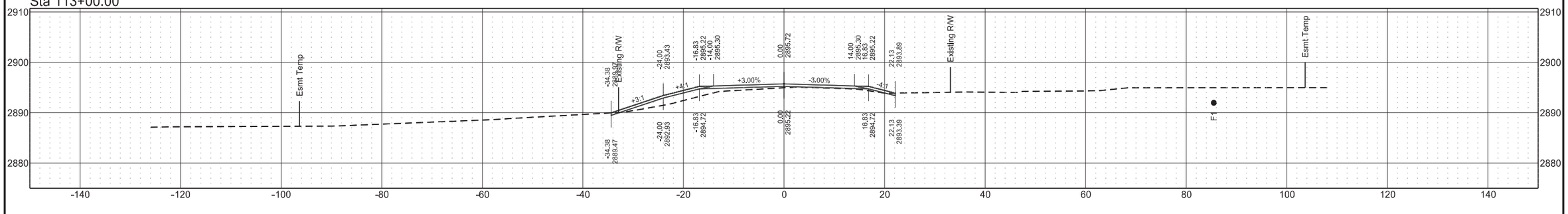
Temporary Bypass

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRJ-0006(052)	200	37

Sta 113+34.00



Sta 113+00.00



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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
09-20-18	General Revisions
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NDDOT ABBREVIATIONS

D-101-2

Galv	galvanized
Gar	garage
Gs L	gas line
G Reg	gas line regulator
GMV	gas main valve
G Mtr	gas meter
GSV	gas service valve
GVP	gas vent pipe
GV	gate valve
Ga	gauge
Gov	government
Grd	graded/grade
Grnd	ground
GWM	ground water monitor
Gdrl	guardrail
Gtr	gutter
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
Ln	lane
Lg	large
Lat	latitude
Lt	left
Lens	lenses
Lvl	level
Lvlng	leveling
Lht	light
LP	light pole
Ltg	lighting
Liq	liquid
LL	liquid limit
Loc	location
Long.	longitude
Lp	loop
LD	loop detector
Lum	luminaire
Mb	mailbox
ML	main line
MH	manhole
Mkd	marked
Mkr	marker
Mkg	marking
MA	mast arm
Matl	material
Max	maximum
MC	meander corner
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	North East
NW	North West
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 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
Prop Ln	property line
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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
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NDDOT ABBREVIATIONS

Salv	salvage(d)
San	sanitary sewer line
Sec	section
SL	section line
Sep	separation
Seq	sequence
Serv	service
Sht	sheet
Shtng	sheeting
Shldr	shoulder
Sw or Sdwk	sidewalk
SD	sight distance
SN	sign number
Sig	signal
Sgl	single
SRCP	slotted reinforced concrete pipe
SC	slow curing
SS	slow setting
Sm	small
S	South
SE	South East
SW	South West
SB	Southbound
Sp	spaces
Spcl	special
SA	special assembly
SP	special provisions
G	specific gravity
Spk	spike
SB	split barrel sample
SH	sprinkler head
SV	sprinkler valve
Sq	square
Stk	stake
Std	standard
N	standard penetration test
Std Specs	standard specifications
Stm L	steam line
SEC	steel encased concrete
SMA	stone matrix asphalt
SSD	stopping sight distance
SD	storm drain
St	street
SPP	structural plate pipe
SPPA	structural plate pipe arch
Str	structure
Subd	subdivision
Sub	subgrade
Sub Prep	subgrade preperation
Ss	subsoil
SS	supplement specification
Supp	supplemental
Surf	surfacing
Surv	survey
Sym	symmetrical

Tel	telephone
Tel B	Telephone Booth
Tel P	telephone pole
Tv	television
Temp	temperature
Temp	temporary
TBM	temporary bench mark
T	thinwall tube sample
Ts	topsoil
Traf	traffic
TSCB	traffic signal control box
Tr	trail
Transf	transformer
Trans	transition
TT	transmission tower
TES	traversable end section
Trans	transverse
Trtd	treated
Trmt	treatment
Qc	triaxial compression
TERO	tribal employment rights ordinance
Tpl	triple
Typ	typical
Qu	unconfined compressive strength
Ugrnd	underground
Util	utility
VG	valley gutter
Vap	vapor
Vert	vertical
VCP	vitrified clay pipe
Vol	volume
VSFS	vehicle speed feedback sign
Wkwy	walkway
W	water content
WGV	water gate valve
WL	water line
WM	water main
WMV	water main valve
W Mtr	water meter
WSV	water service valve
WW	water well
Wrng	wearing
WIM	weigh in motion
W	west
WB	westbound
Wrng	wiring
W/	with
W/o	without
WC	witness corner

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07-01-14	
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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
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
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
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
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

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
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REVISIONS	
DATE	CHANGE
12-18-20	Sheet Added - Continued from D-101-3

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM	702 Communications
ACCENT	Accent Communications
AGASSIZ WU	Agassiz Water Users Incorporated
AGC	Assiociated General Contractors of America
ALL PL	Alliance Pipeline
ALL SEAS WU	All Seasons Water Users Association
AMOCO PI	Amoco Pipeline Company
AMRDA HESS	Amerada Hess Corporation
AT&T	AT&T Corporation
B PAW	Bear Paw Energy Incorporated
BAKER ELEC	Baker Electric
BASIN ELEC	Basin Electric Cooperative Incorporated
BEK TEL	Bek Communications Cooperative
BELLE PL	Belle Fourche Pipeline Company
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe Railway
BOEING	Boeing
BRNS RWD	Barnes Rural Water District
BURK-DIV ELEC	Burke-Divide Electric Cooperative
BURL WU	Burleigh Water Users
CABLE ONE	Cable One
CABLE SERV	Cable Services
CAP ELEC	Capital Electric Cooperative Incorporat
CASS CO ELEC	Cass County Electric Cooperative
CASS RWU	Cass Rural Water Users Incorporated
CAV ELEC	Cavalier Rural Electric Cooperative
CBLCOM	Cablecom Of Fargo
CENEX PL	Cenex Pipeline
CENT PL WATER DIST	Central Pipe Line Water District
CENT PWR ELEC	Central Power Electric Cooperative
CENTURYLINK	CenturyLink
COE	Corps of Engineers
CONS TEL	Consolidated Telephone
CONT RES	Continental Resource Inc
CPR	Canadian Pacific Railway
D O E	Department Of Energy
DAK CARR	Dakota Carrier Network
DAK CENT TEL	Dakota Central Telephone
DAK RWD	Dakota Rural Water District
DGC	Dakota Gasification Company
DICKEY R NET	Dickey Rural Networks
DICKEY RWU	Dickey Rural Water Users Association
DICKEY TEL	Dickey Telephone
DNRR	Dakota Northern Railroad
DOME PL	Dome Pipeline Company
DVELEC	Dakota Valley Electric Cooperative
DVMW	Dakota, Missouri Valley & Western
ENBRDG	Enbridge Pipelines Incorporated
ENVENTIS	Enventis Telephone
EQUINOR	Equinor Pipeline
FALK MNG	Falkirk Mining Company
FHWA	Federal Highway Administration
G FKS-TRL WD	Grand Forks-traill Water District
GETTY TRD & TRAN	Getty Trading & Transportation
GLDN W ELEC	Golden West Electric Cooperative
GRGS CO TEL	Griggs County Telephone
GTR RAMSEY WD	Greater Ramsey Water District
GT PLNS NAT GAS	Great Plains Natural Gas Company
HALS TEL	Halstad Telephone Company
IDEA1	Idea1
INT-COMM TEL	Inter-Community Telephone Company
KANEB PL	Kaneb Pipeline Company
KEM ELEC	Kem Electric Cooperative Incorporated
KOCH GATH SYS	Koch Gathering Systems Incorporated
LKHD PL	Lakehead Pipeline Company
LNGDN RWU	Langdon Rural Water Users Incorporated
LWR YELL R ELEC	Lower Yellowstone Rural Electric
MCKNZ CON	McKenzie Consolidated Telcom
MCKNZ ELEC	McKenzie Electric Cooperative
MCKNZ WRD	McKenzie County Water Resource District
MCLEOD	McLeod USA
MCLN ELEC	McLean Electric Cooperative
MCLN-SHRDN R WAT	McLean-Sheridan Rural Water
MDU	Montana-dakota Utilities
MIDCO	MidContinent Communications
MIDSTATE TEL	Midstate Telephone Company
MINOT CABLE	Minot Cable Television
MINOT TEL	Minot Telephone Company
MISS VALL COMM	Missouri Valley Communications
MISS W W S	Missouri West Water System
MNKOTA PWR	Minnkota Power
MOR-GRAN-SOU ELEC	Mor-gran-sou Electric Cooperative
MOUNT-WILLI ELEC	Mountrail-williams Electric Cooperative
MRE LBTY TEL	Moore & Liberty Telephone
MUNICIPAL	City Water And Sewer
MUNICIPAL	City Of '.....'
N CENT ELEC	North Central Electric Cooperative
N VALL W DIST	North Valley Water District
ND PKS & REC	North Dakota Parks And Recreation
ND TEL	North Dakota Telephone Company
NDDOT	North Dakota Department of Transportation
NDSU SOIL SCI DEPT	NDSU Soil Science Department
NEMONT TEL	Nemont Telephone
NODAK R ELEC	Nodak Rural Electric Cooperative
NOON FRMS TEL	Noonan Farmers Telephone Company
NPR	Northern Plains Railroad
NSP	Northern States Power
NTH PRAIR RW	Northern Prairie Rural Water Association
NTHN BRDR PL	Northern Border Pipeline
NTHN PLNS ELEC	Northern Plains Electric Cooperative Incorporated
NTHWSTRN REF	Northwestern Refinery Company
NW COMM	Northwest Communication Cooperation
NWRWD	Northwest Rural Water District
ONEOK	Oneok gas
OSHA	Occupational Safety and Health Administration
OTTR TL PWR	Otter Tail Power Company
PAAP	Plains All American Pipeline
P L E M	Prairielands Energy Marketing
POLAR COM	Polar Communications
PVT ELEC	Private Electric
QWEST	Qwest Communications
R&T W SUPPLY	R & T Water Supply Association
RED RIV COMM	Red River Rural Communications
RESVTN TEL	Reservation Telephone
ROBRTS TEL	Roberts Company Telephone
R-RIDER ELEC	Roughrider Electric Cooperative
RRVW	Red River Valley & Western Railroad
S CENT REG WD	South Central Regional Water District
S E W U	South East Water Users Incorporated
SCOTT CABLE	Scott Cable Television Dickinson
SHERDN ELEC	Sheridan Electric Cooperative
SHEYN VLY ELEC	Sheyenne Valley Electric Cooperative
SKYTECH	Skyland Technologies Incorporated
SLOPE ELEC	Slope Electric Cooperative Incorporated
SOURIS RIV TELCOM	Souris River Telecommunications
ST WAT COMM	State Water Commission
STATE LN WATER	State Line Water Cooperative
STER ENG	Sterling Energy
STUT RWU	Stutsman Rural Water Users
SW PL PRJ	Southwest Pipeline Project
T M C	Turtle Mountain Communications
TCI	TCI of North Dakota
TESORO HGH PLNS PL	Tesoro High Plains Pipeline
TRI-CNTY WU	Tri-County Water Users Incorporated
TRL CO RWU	Traill County Rural Water Users
UNTD TEL	United Telephone
UPPR SOUR WUA	Upper Souris Water Users Association
US SPRINT	U.S. Sprint
USAF MSL CABLE	U.S.A.F. Missile Cable
USFWS	US Fish and Wildlife Service
USW COMM	U.S. West Communications
VRNDRY ELEC	Verendrye Electric Cooperative
W RIV TEL	West River Telephone Incorporated
WAPA	Western Area Power Administration
WAWSA	Western Area Water Supply Authority
WEB	W. E. B. Water Development Association
WILLI RWA	Williams Rural Water Association
WILSTN BAS PL	Williston Basin Interstate Pipeline Company
WLSH RWD	Walsh Water Rural Water District
WOLVRTN TEL	Wolverton Telephone
XLENER	Xcel Energy
YSVR	Yellowstone Valley Railroad

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

07-01-14

REVISIONS

DATE	CHANGE
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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

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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) (void — void — void — v)
- 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 (D — D)
- Geogrid (Geo — Geo)
- Geotextile Fabric Type R (R — R)
- Geotextile Fabric Type R1 (R — R)
- Geotextile Fabric Type RR (RR — RR)
- Geotextile Fabric Type S (S — 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 (S — S)
- Silt Fence (SF — SF)
- 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	
REVISIONS	
DATE	CHANGE
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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12 18 2020

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

CSB Continuous Split Barrel Sample

FA Flight Auger Sample

SB Split Barrel Sample

T Thinwall Tube Sample

N Standard Penetration Test

Incl Inclinometer Tube

Excavation Unit

Existing Ground Water Well Bore Hole

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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12 18 2020

SYMBOLS

D-101-31

- Flexible Delineator
- Flexible Delineator Type A (Exst, Ppsd)
- Flexible Delineator Type B (Exst, Ppsd)
- Flexible Delineator Type C (Exst, Ppsd)
- Flexible Delineator Type D (Exst, Ppsd)
- Flexible Delineator Type E (Exst, Ppsd)
- Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)
- Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)
- Delineator Type C (Exst, Ppsd, Diamond Grade)
- Delineator Type D (Exst, Ppsd, Diamond Grade)
- Delineator Type E (Exst, Ppsd, Diamond Grade)
- Barricade (Type I, Type II, Type III}
- Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)
- Attenuation Device
- Truck Mounted Attenuator
- Delineator Drums
- Flagger
- Tubular Marker
- Traffic Cone
- Back to Back Vertical Panel Sign

- Highway Sign (Exst, Ppsd)
- Mile Post Type A (Exst-Ppsd-Reset)
- Mile Post Type B (Exst, Ppsd)
- Mile Post Type C (Exst, Ppsd)
- Object Marker Type I (Exst, Ppsd)
- Object Marker Type II (Exst, Ppsd)
- Object Marker Type III (Exst, Ppsd)
- Existing Reference Marker
- Road Closure Gate 18 Ft (Exst, Ppsd)
- Road Closure Gate 28 Ft (Exst, Ppsd)
- Road Closure Gate 40 Ft (Exst, Ppsd)
- Existing Railroad Battery Box
- Existing RR Profile Spot
- Existing Railroad Crossbuck
- Existing Railroad Frog
- Existing Mailbox (Private, Federal)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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Kirk J Hoff

12 18 2020

SYMBOLS

D-101-32

- Existing Luminaire
- Luminaire LED
- Existing Light Standard Luminaire
- Relocate Light Standard
- Light Standard Light LED Luminaire
- Light Standard 35 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 50 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 70 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 100 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 150 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 200 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 250 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 310 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 400 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 700 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire
- Emergency Vehicle Detector
- Video Detection Camera

- High Mast Light Standard 3 Luminaire (Exst, Ppsd)
- High Mast Light Standard 4 Luminaire (Exst, Ppsd)
- High Mast Light Standard 5 Luminaire (Exst, Ppsd)
- High Mast Light Standard 6 Luminaire (Exst, Ppsd)
- High Mast Light Standard 7 Luminaire (Exst, Ppsd)
- High Mast Light Standard 8 Luminaire (Exst, Ppsd)
- High Mast Light Standard 9 Luminaire (Exst, Ppsd)
- High Mast Light Standard 10 Luminaire (Exst, Ppsd)
- Overhead Sign Structure Load Center (Exst, Ppsd)
- Traffic Signal Controller (Exst, Ppsd)
- Pad Mounted Traffic Signal Controller (Exst, Ppsd)
- Flashing Beacon (Exst, Ppsd)
- Concrete Foundation (Exst, Ppsd)
- Pipe Mounted Flasher (Exst, Ppsd)
- Pad Mounted Feed Point (Exst, Ppsd)
- Pipe Mounted Feed Point with Pad (Exst, Ppsd)
- Pole Mounted Feed Point (Exst, Ppsd)
- Junction Box (Exst, Ppsd)
- Existing Pedestrian Head with Number
- Existing Signal Head
- Pole Mounted Head
- Existing Lighting Standard Pole

- Existing Traffic Signal Standard
- Pull Box (Exst-Ppsd-Undefined)
- Intelligent Transportation Pull Box (Exst, Ppsd)
- Transformer (Exst, Ppsd)
- Power Pole (Exst-Ppsd-with Transformer)
- Wood Pole (Exst, Ppsd)
- Pedestrian Push Button Post (Exst, Ppsd)
- Existing Pole
- Existing Telephone Pole
- Existing Post
- Connection Conductor (Ground, Neutral, Phase 1, Phase 2)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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SYMBOLS

D-101-33

Existing Manhole (Electrical, Gas, Telephone)

Water Manhole (Exst, Exst with Valve)

Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)

Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)

Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)

Force Main Storm Drain Manhole (Exst, Exst with Valve)

Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)

Existing Water Appurtenance

Sprinkler Head (Exst, Ppsd)

Fire Hydrant (Exst, Ppsd)

Cleanout (Exst Sanitary, Underdrain)

Existing Catch Basin Inlet (Round, Square)

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 Vegitation Barrier, Ppsd Double with Vegitation Barrier)

Cap or Stub
Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water

Existing Pedestal
Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined

Existing Pipe Vent
Gas, Fuel, Sanitary, Storm Drain, Water, Undefined

Valve
Exst Gas, Exst Water, Ppsd Water, Exst Undefined

Pump
Sanitary, Storm Drain, Exst Water

Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)

Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)

Existing Utility Marker

Existing Meter

Existing Fuel Dispensers

Existing Fuel Filler Pipes

Existing Fuel Leak Sensors

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

Cross Section Legend

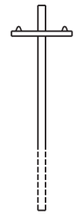
D-101-40

Description	Longitudinal Parallel to Roadway	Transverse Perpendicular to Roadway*
Cable Line	CBL1	CBL2
Conduit Line	CDU1	CDU2
Electric Line	E1	E2
Fiber Optic Line	F1	F2
Gas Main Line	GM1	GM2
Gas Service Line	GS1	GS2
Gas Transmission Line	GT1	GT2
Fuel Pipeline	PL1	PL2
Sanitary Sewer Force Main	SSF1	SSF2
Sanitary Sewer	SS1	SS2
Steam Line	STE1	STE2
Storm Drain (Assumed Depth)	SD1	SD2
Telephone Line	T1	T2
TV Line	TV1	TV2
Water Main Line	WM1	WM2
Water Service Line	WS1	WS2

Description	Longitudinal Parallel to Roadway	Transverse Perpendicular to Roadway*
Overhead Power Transmission Line	OHT1	OHT2
Overhead Line	OH1	OH2

Light Standard - Multiple Variations
- Concrete
- Steel
- Wood
- with Traffic Signal

Pole - Multiple Variations
- Utility
- Brace
- Feed Point
- Guy
- Power
- Power Structure
- Power with Light
- Power with Transformer



Manhole - Multiple Variations
- Electric
- Fiber Optic
- Gas
- Inlet
- Sanitary Force Main
- Sanitary
- Sanitary with Valve
- Steam
- Storm
- Storm Force Main
- Storm with Valve
- Telephone
- Water
- Water with Meter
- Water with Valve
- Water with Air Release Valve

Anchor

High Tension Cable Guardrail

* Usually the transverse utilities are shown on a cross section with 2 or more symbols. The utility runs from one symbol to the other, but the connection may not be shown.

Connection to infer that probably will not be displayed

When storm drain invert elevations are NOT used to draw pipe, they will appear as shown to the left. When invert elevations are used to draw pipe, they will be a cross section similar to the graphics shown below.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-20-18	
REVISIONS	
DATE	CHANGE
6/14/2023	CADD Standards Update

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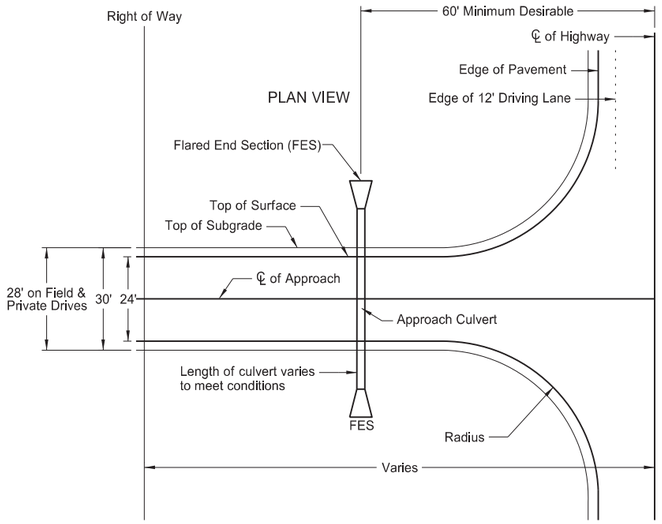
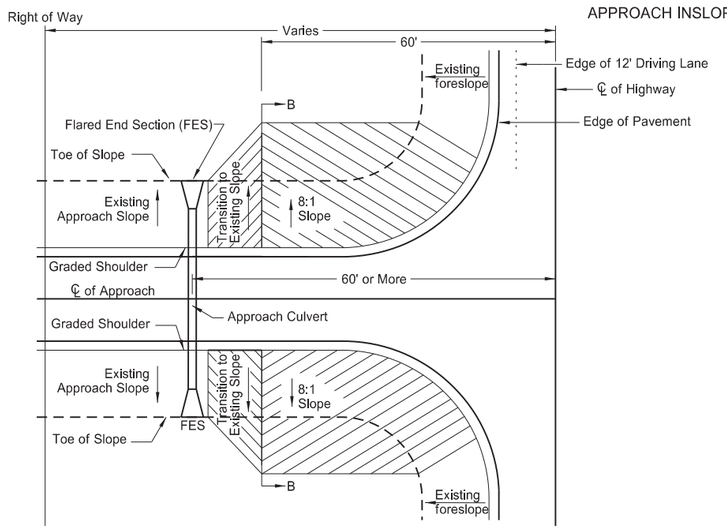
06/14/23

STANDARD RURAL APPROACHES

D-203-8

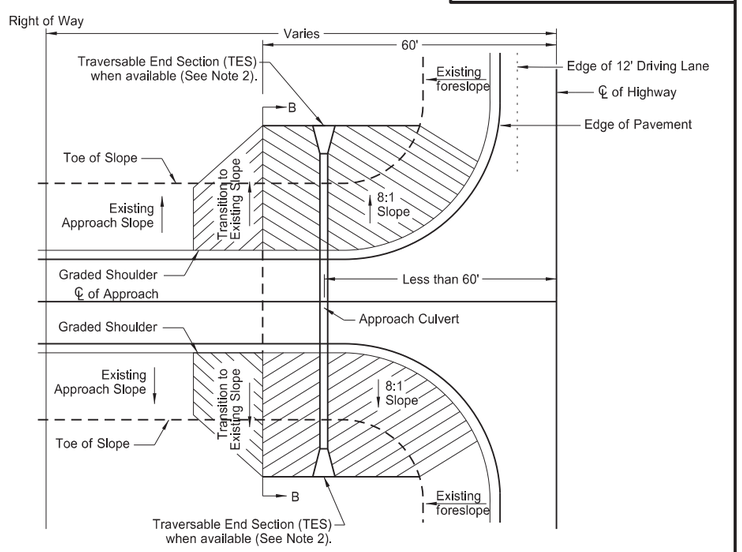


APPROACH INSLOPES



CASE 1

APPROACH PIPE LOCATED
60' OR MORE FROM ℄



CASE 2

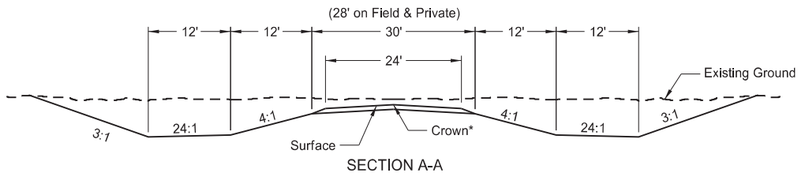
APPROACH PIPE LOCATED
LESS THAN 60' FROM ℄

Approach Pipe Traversable End Sections (TES)

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

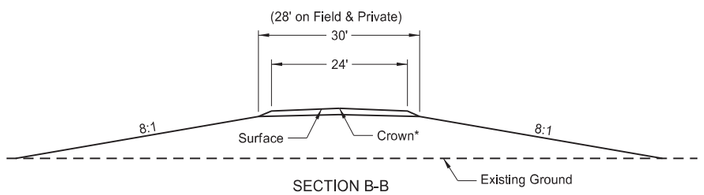
CRITERIA FOR RURAL APPROACH TYPES

	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)

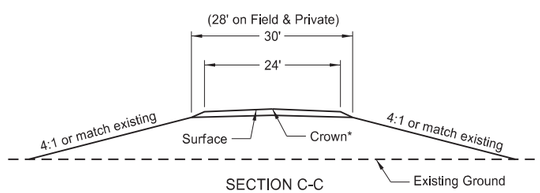


SECTION A-A

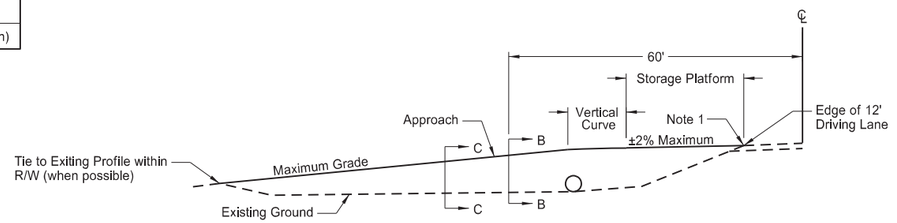
*2.1% crown for paved surface
*3.0% crown for gravel surface



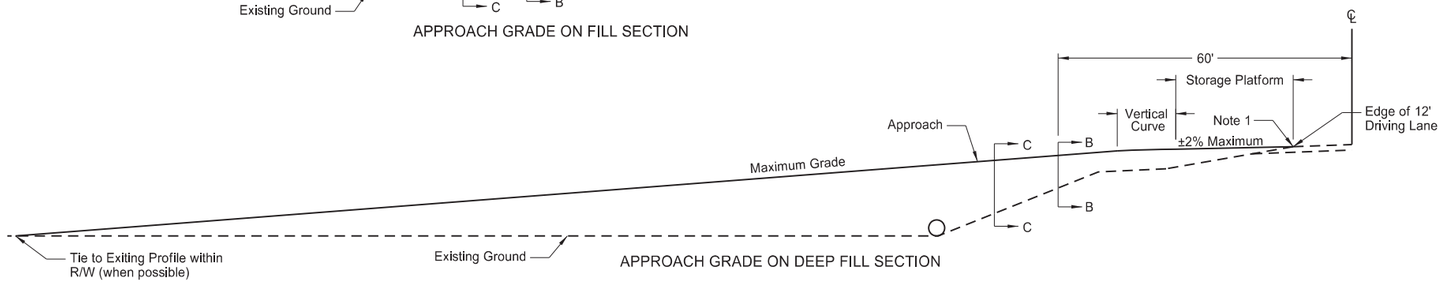
SECTION B-B



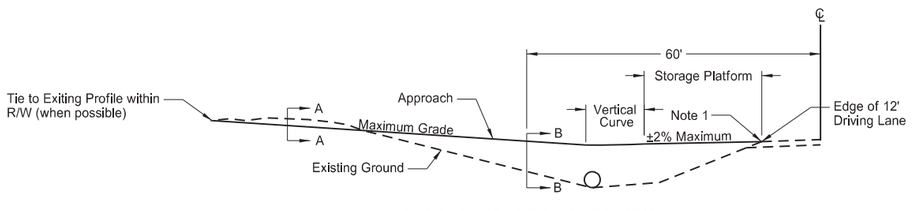
SECTION C-C



APPROACH GRADE ON FILL SECTION



APPROACH GRADE ON DEEP FILL SECTION



APPROACH GRADE ON CUT SECTION

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 06-29-22	Changed "Inslope" to "Foreslope" Added "TES", Table, and Note 2

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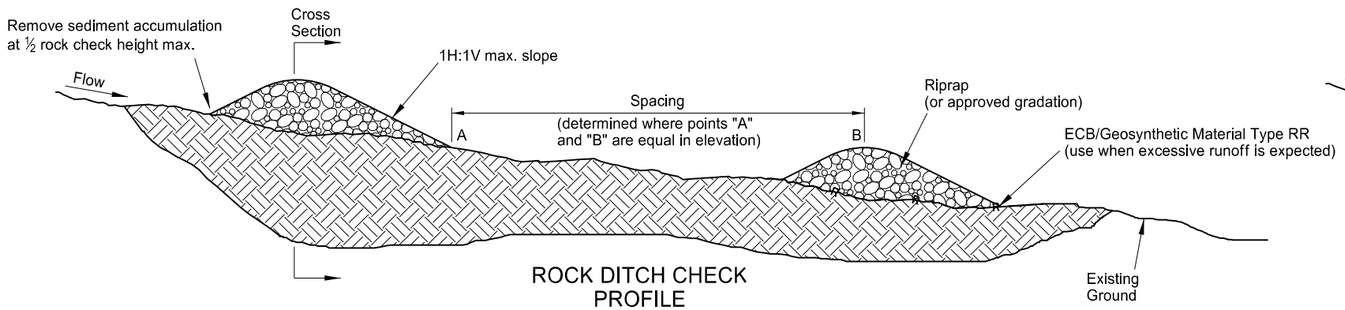
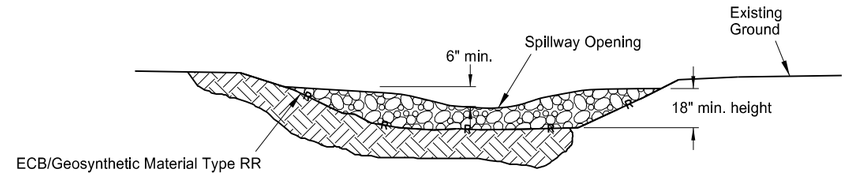
06/29/22

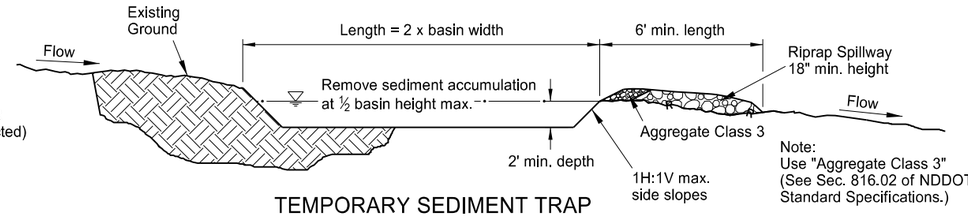
EROSION AND SILTATION CONTROLS



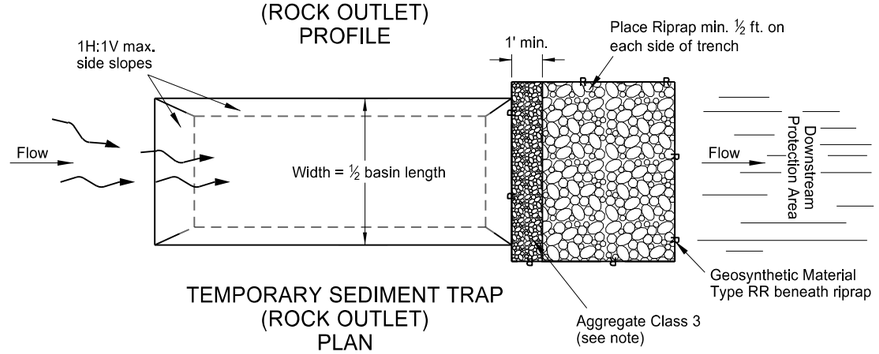
ROCK DITCH CHECK
PROFILE



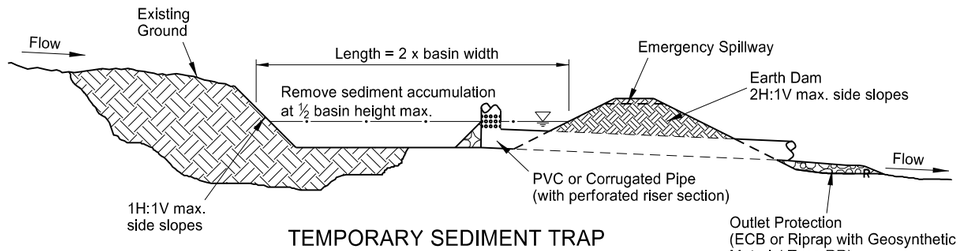
ROCK DITCH CHECK
CROSS SECTION



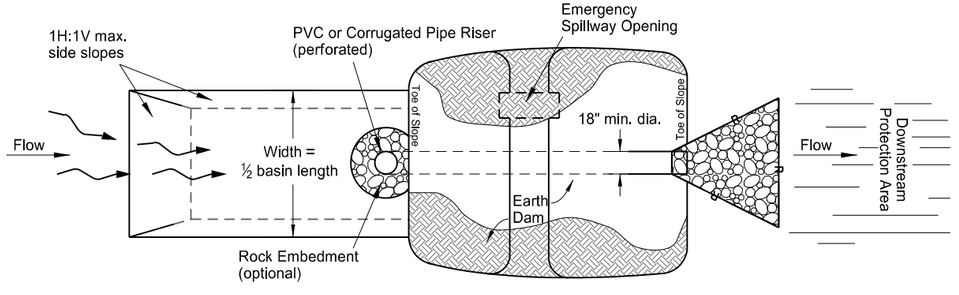
TEMPORARY SEDIMENT TRAP
(ROCK OUTLET)
PROFILE



TEMPORARY SEDIMENT TRAP
(ROCK OUTLET)
PLAN



TEMPORARY SEDIMENT TRAP
(RISER PIPE OUTLET)
PROFILE

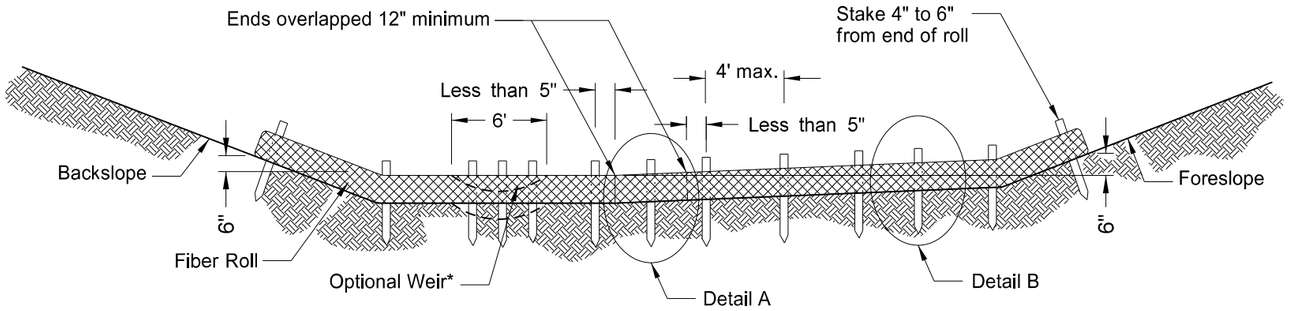


TEMPORARY SEDIMENT TRAP
(RISER PIPE OUTLET)
PLAN

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Changed standard drawing number from D-708-2 to D-256-1. Deleted silt fence details.
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp

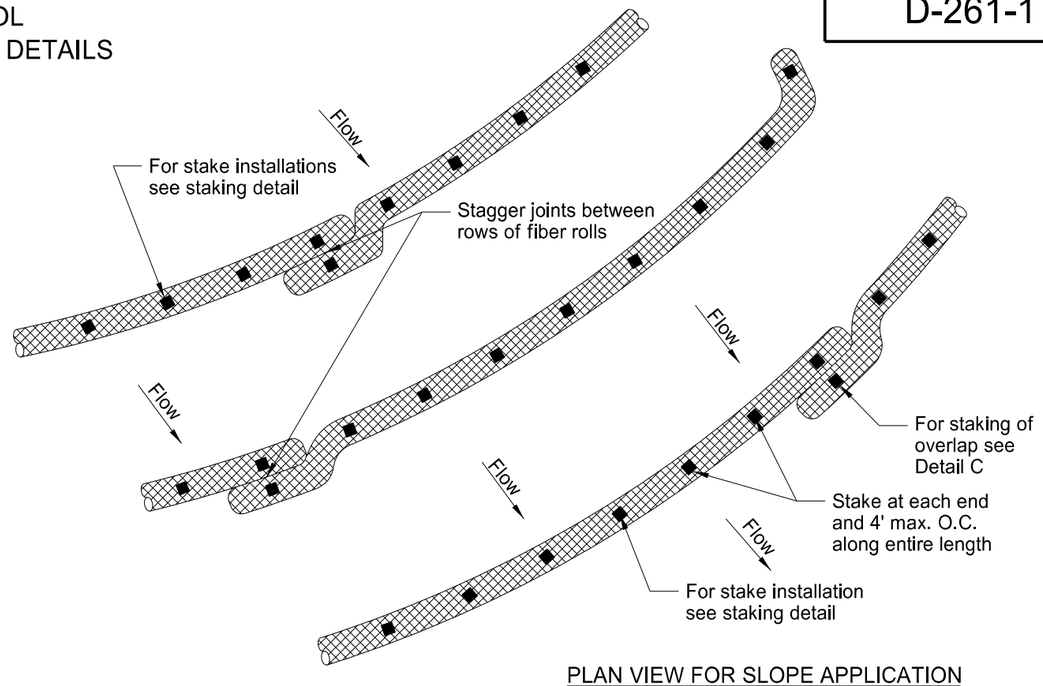
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8-27-2019 and the original document is stored at the North Dakota Department of Transportation

EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS

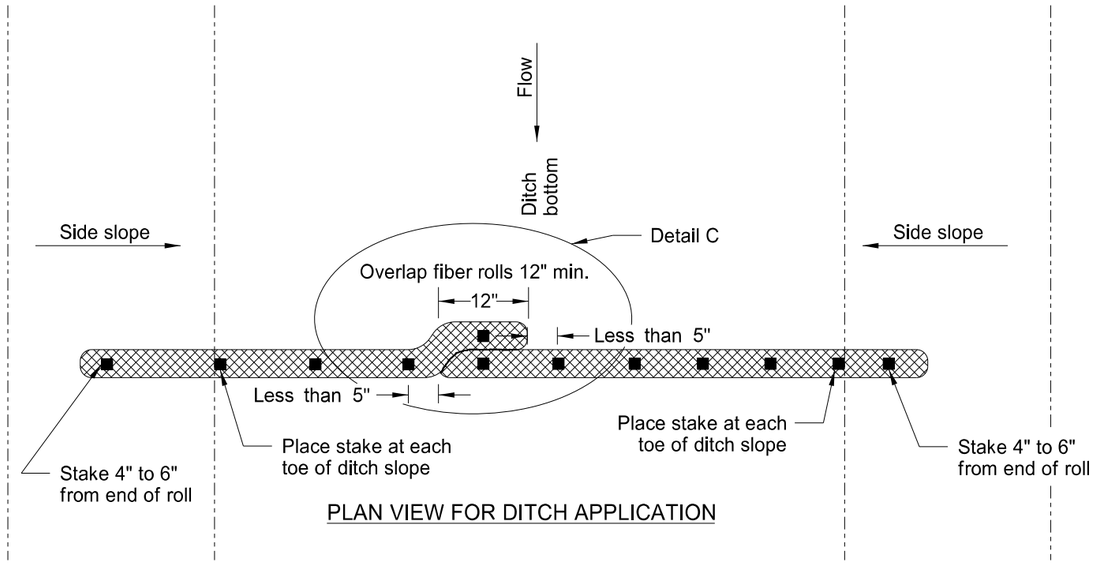


*Optional Weir. Use in flat areas, such as the Red River Valley, where there is potential for water to back up on adjacent property. Lower fiber roll enough to prevent water from backing up on adjacent property. Do not use 20-inch fiber rolls in flat areas where there is potential for water to back up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

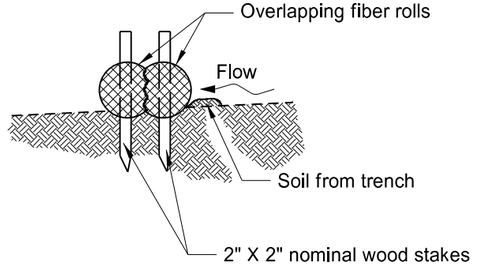
12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



PLAN VIEW FOR SLOPE APPLICATION

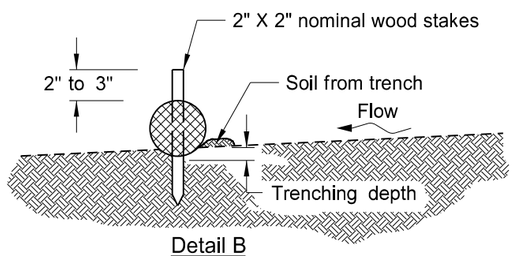


PLAN VIEW FOR DITCH APPLICATION



Detail A

Fiber Roll Overlapping Staking Detail



Detail B

Fiber Roll Staking Detail

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

11-18-10

REVISIONS

DATE	CHANGE
06-10-13	Added plan view for ditch and slope application. Added table with values for stake and trench dimensions.
10-04-13	Revised fiber roll overlap detail.
06-26-14	Changed standard drawing number from D-708-7 to D-261-1.
08-27-19	New Design Engineer PE Stamp

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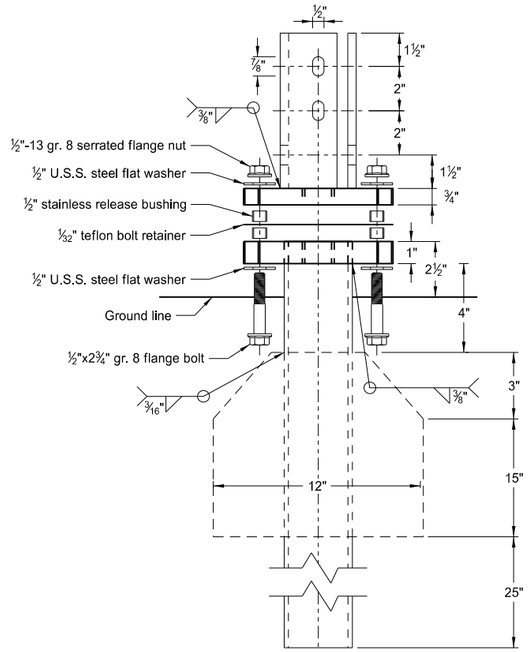
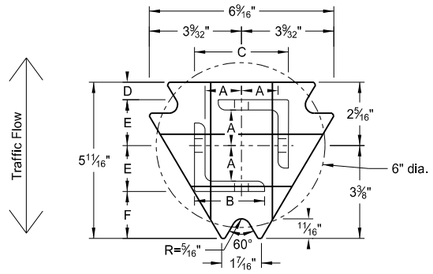
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

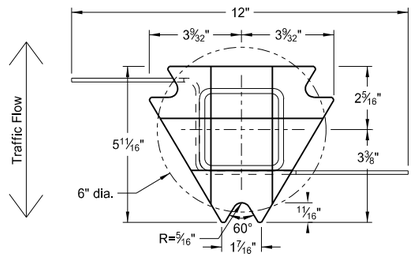


Multi-Directional
Slip Base Assembly

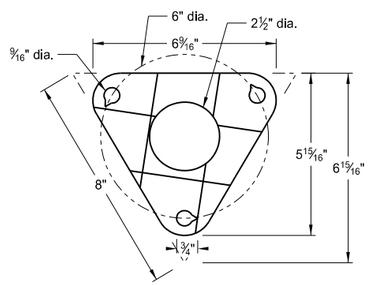
Perforated Tube



Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2½"x2½"x⅜" ASTM A36 structural angle



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



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

Notes:

1. Torque slip base bolts as specified by manufacturer.
2. Use anchor with 43.9 KSI yield strength and 59.3 KSI tensile strength.
3. Provide 4" vertical clearance for anchor or breakaway base. Measure the 4"x60" measurement above and below post location and back and ahead of post.
4. In concrete sidewalk, use same anchor without wings.
5. Provide more than 7' between the first and fourth posts of a four post sign.

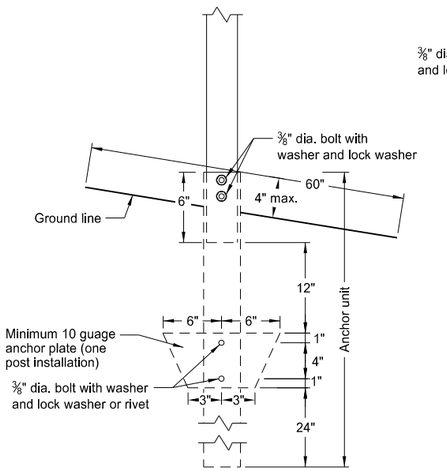
Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thick-ness Gauge	Sleeve Size in.	Wall Thick-ness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2¼
1	2¼	12			No	2½
1	2½	12			(A)	3
1	2½	10			Yes	
1	2¼	12	2	12	Yes	
1	2½	12	2¼	12	Yes	
2	2	12			No	2¼
2	2¼	12			No	2½
2	2½	12			Yes	
2	2½	12			Yes	
2	2¼	10	2	12	Yes	
2	2½	12	2¼	12	Yes	
3 & 4	2½	12			Yes	
3 & 4	2½	10			Yes	
3 & 4	2½	12	2¼	12	Yes	
3 & 4	2¼	12	2	12	Yes	
3 & 4	2½	10	2³/16	10	Yes	

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in.⁴	Cross Sec. Area in.²	Section Modulus in.³
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2³/16 x 2³/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.785

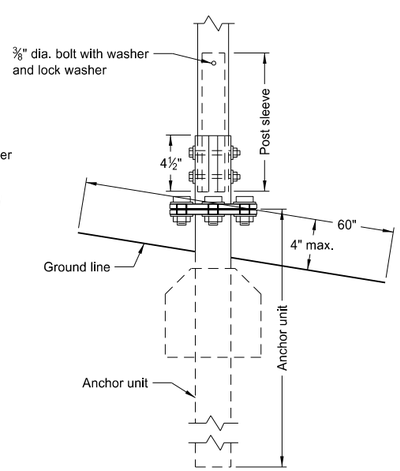
Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2³/16"x10 ga.	1⁹/64"	2½"	3¹/32"	2⁵/32"	1³³/64"	1⅞"
2½"x10 ga.	1⁹/32"	2½"	3⁵/16"	⅝"	1²¹/32"	1¾"

(A) Use breakaway base when support is placed in weak soils. Engineer determines if soils are weak.

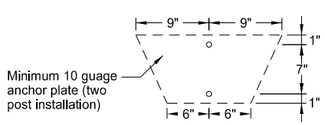
(B) For additional wind load, insert the 2³/16"x10 ga. into 2½"x10 ga.



Anchor Unit and Post Assembly



Multi-Directional
Slip Base Anchor Unit
and Post Sleeve Assembly



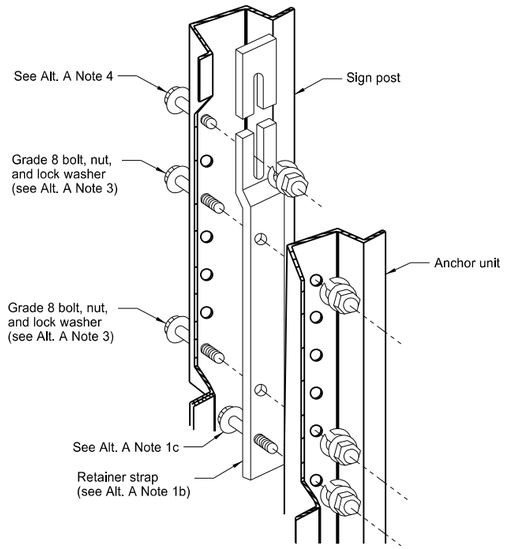
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 10/03/19 and the original document is stored at the North Dakota Department of Transportation

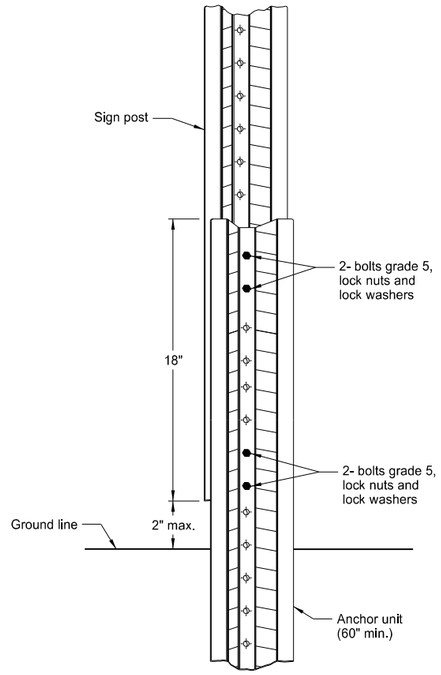
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post

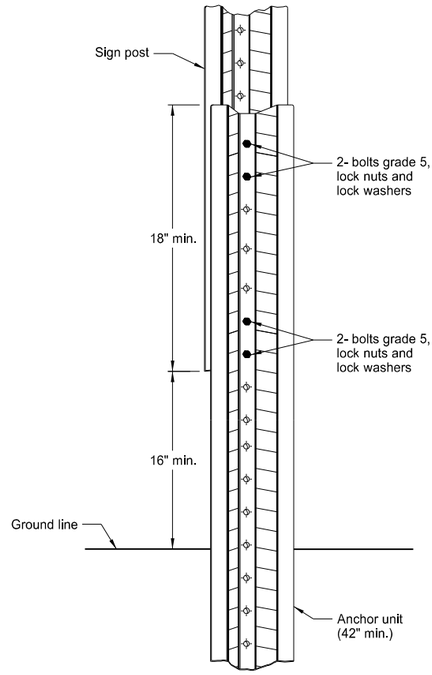


Detail A



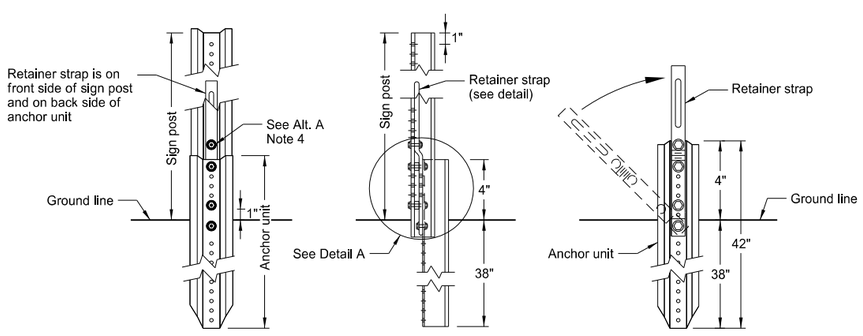
Breakaway U-Channel Splice Detail
Alternate B
(2.5 and 3 lb/ft)

Install a maximum of 3 posts within 7'.



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

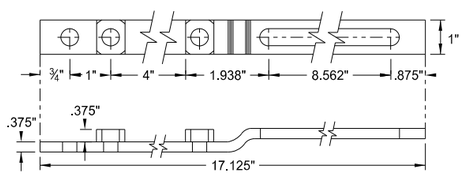
Install a maximum of 3 posts within 7'.



Front View Side View Back View

Breakaway U-Channel Detail
Alternate A

Install a maximum of 2 posts within 7'.



Retainer Strap Detail

Alternate A Steps of Installation:

1. 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.
2. a) Drive anchor unit to 4" above ground.
   b) Rotate strap to vertical position.
3. 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.
4. Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
5. 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

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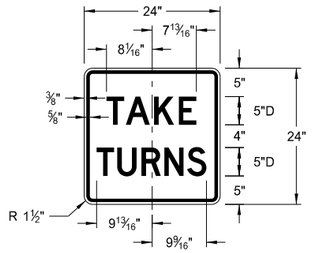
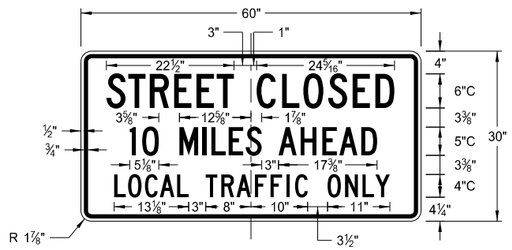
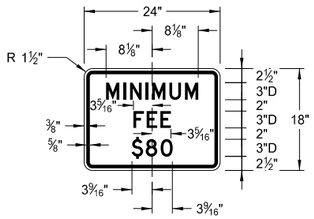
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



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



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



R2-1aP-24
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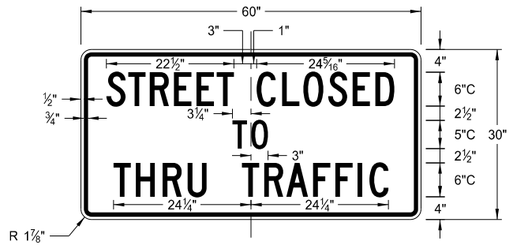


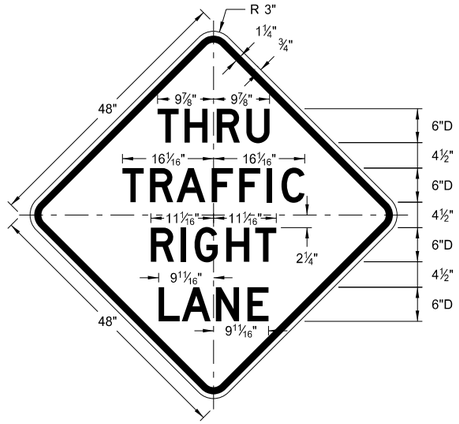
R11-4a-60
Legend: black (non-refl)
Background: white

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 10/03/19 and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN DETAILS
WARNING SIGNS



W5-8-48
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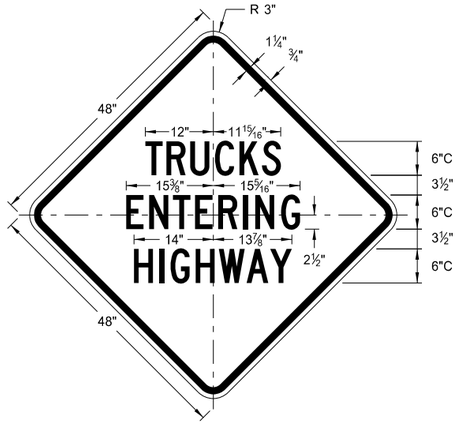
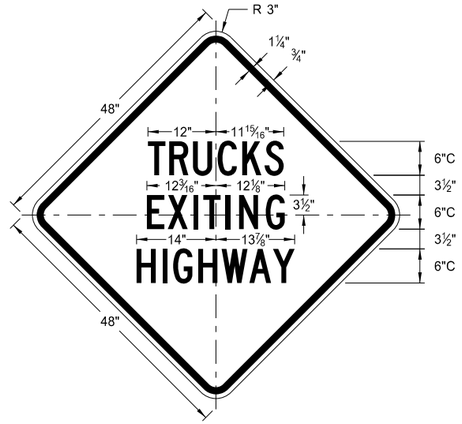
Background: orange



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



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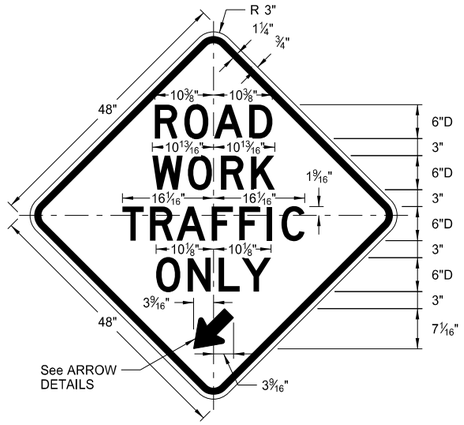
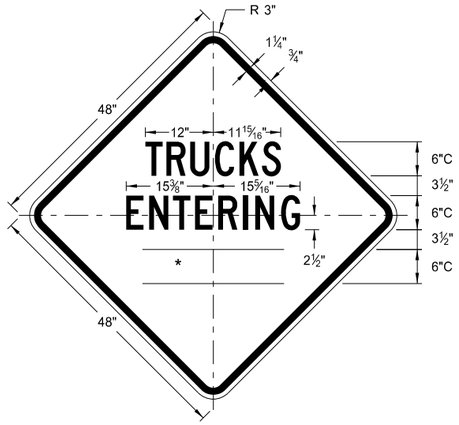


W5-9-48
Legend: black (non-refl)
Background: orange



W8-54-48
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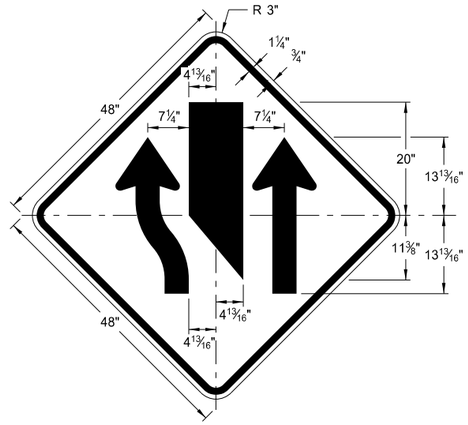
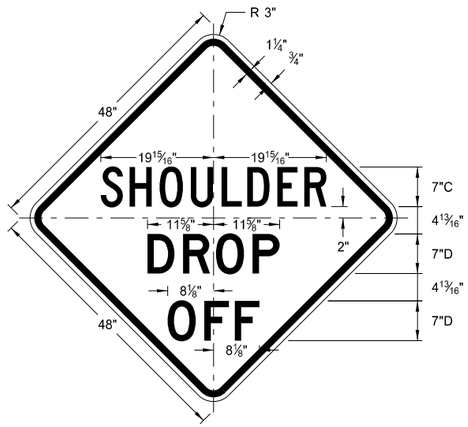
Background: orange



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



W8-9a-48
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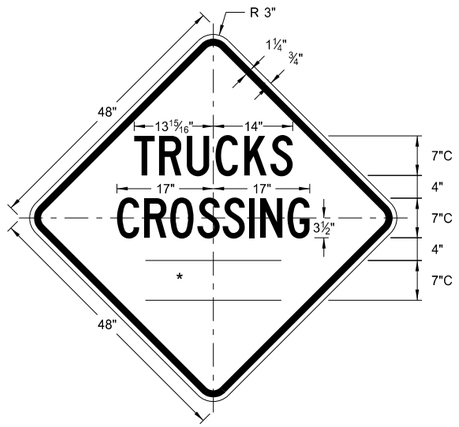
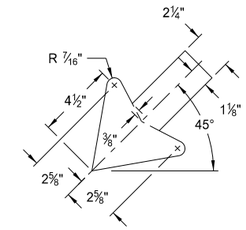
Background: orange



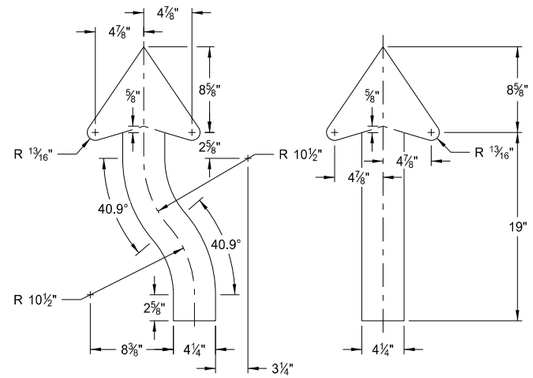
W8-55-48
Legend: black (non-refl)
Background: orange

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



W5-9-48



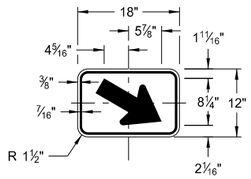
W9-3a-48

ARROW DETAILS

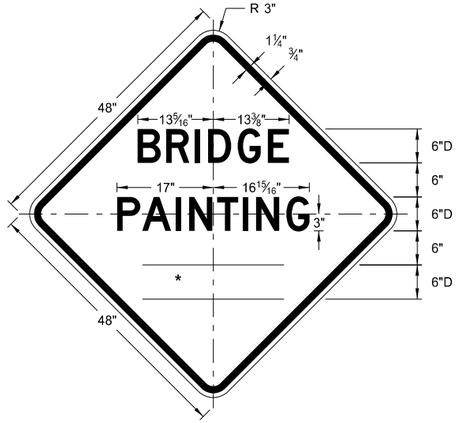
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 10/03/19 and the original document is stored at the North Dakota Department of Transportation

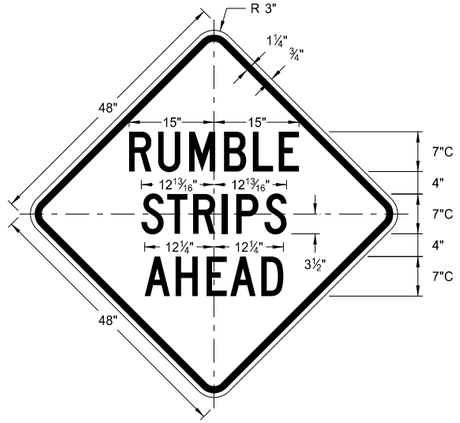
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



W16-7aP-18
Legend: black (non-refl)
Background: orange



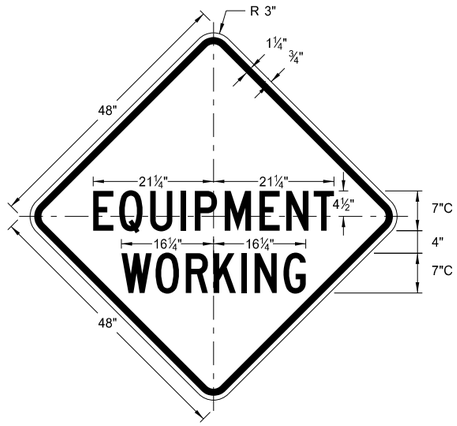
W21-50-48
Legend: black (non-refl)
Background: orange



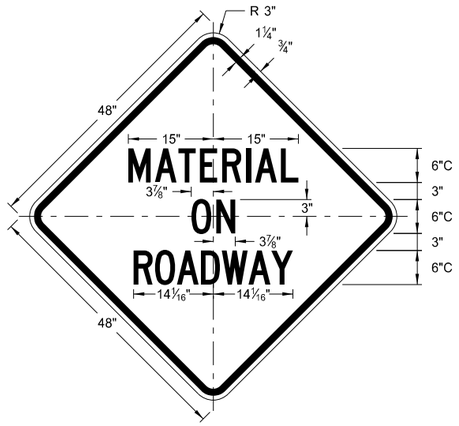
W21-53-48
Legend: black (non-refl)
Background: orange

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

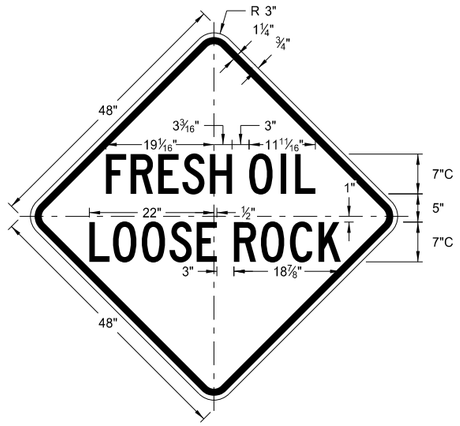
* DISTANCE MESSAGES



W20-51-48
Legend: black (non-refl)
Background: orange



W21-51-48
Legend: black (non-refl)
Background: orange



W22-8-48
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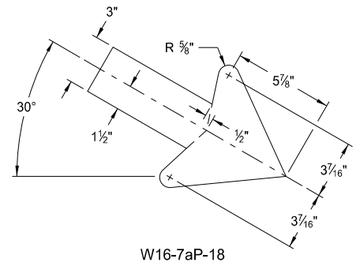
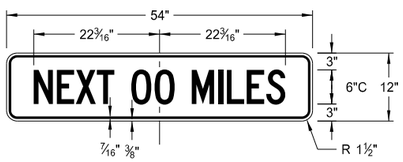
Background: orange



W16-7aP-18



W20-52P-54
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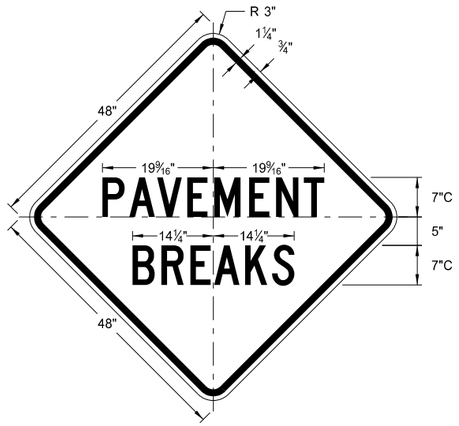
Background: orange



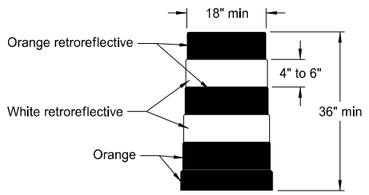
W21-52-48
Legend: black (non-refl)
Background: orange

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

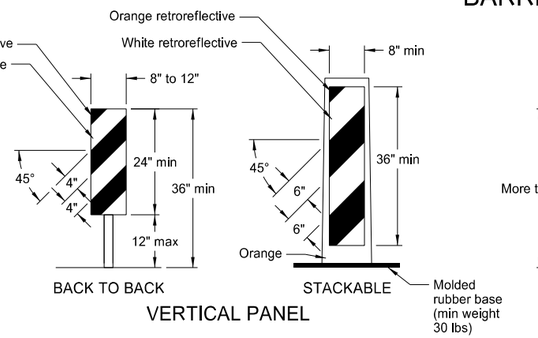
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



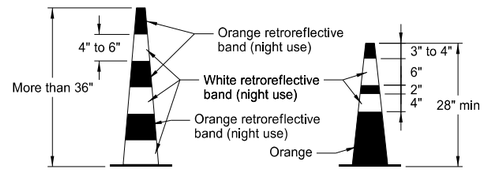
DELINEATOR DRUM

Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflectorized spaces between the horizontal orange and white stripes. Avoid placement of stripes on drum ribs or indentations. Use closed top drums that will not allow collection of debris. Do not place ballast on the top of drum.



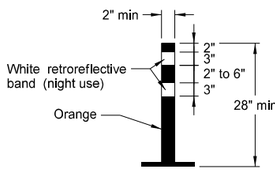
VERTICAL PANEL

Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, use a stripe width of 6 inches.



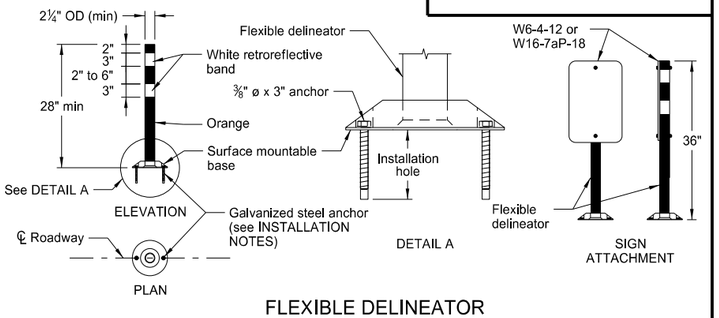
TRAFFIC CONE

Provide retroreflectorization of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflectorized space between the orange and white stripes.



TUBULAR MARKER

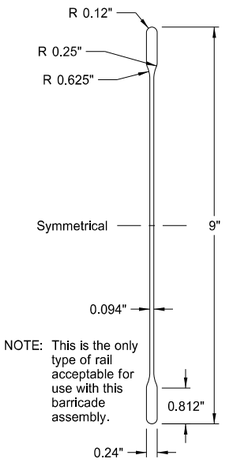
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



FLEXIBLE DELINEATOR

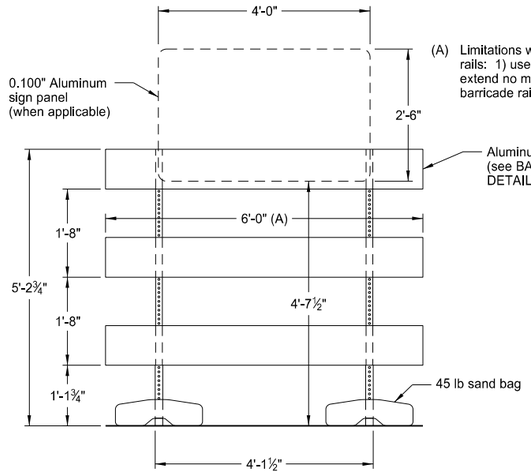
INSTALLATION NOTES:

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.



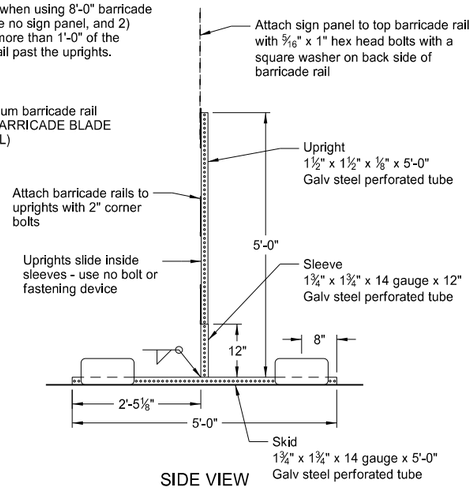
NOTE: This is the only type of rail acceptable for use with this barricade assembly.

BARRICADE BLADE DETAIL



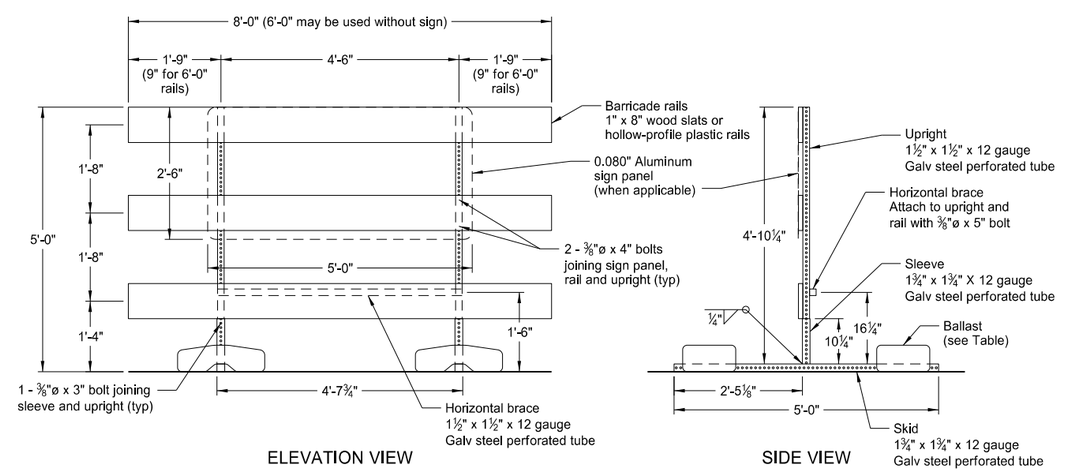
(A) Limitations when using 8'-0" barricade rails: 1) use no sign panel, and 2) extend no more than 1'-0" of the barricade rail past the uprights.

ELEVATION VIEW



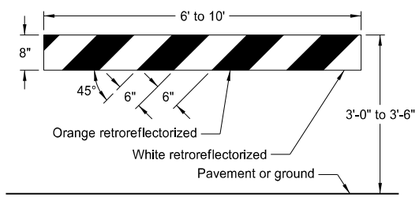
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

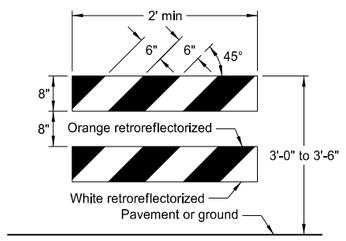


BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

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 I BARRICADE



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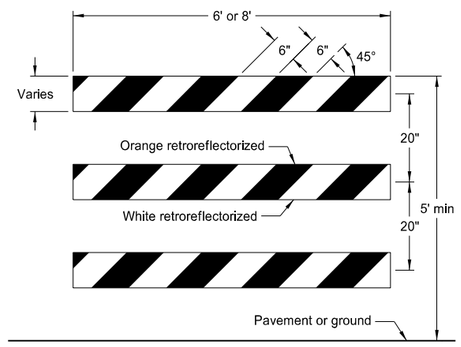
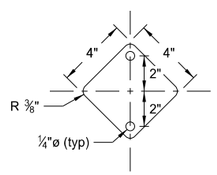
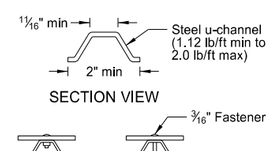
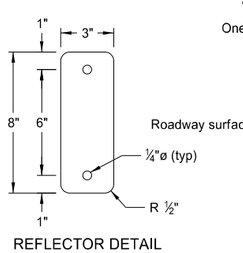


TYPE III BARRICADE

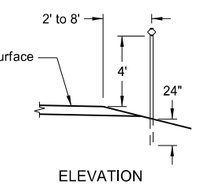
BARRICADE RAIL DETAILS







REFLECTOR DETAIL



ELEVATION

DELINEATORS

MINIMUM BALLAST
(For each side of barricade support)

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

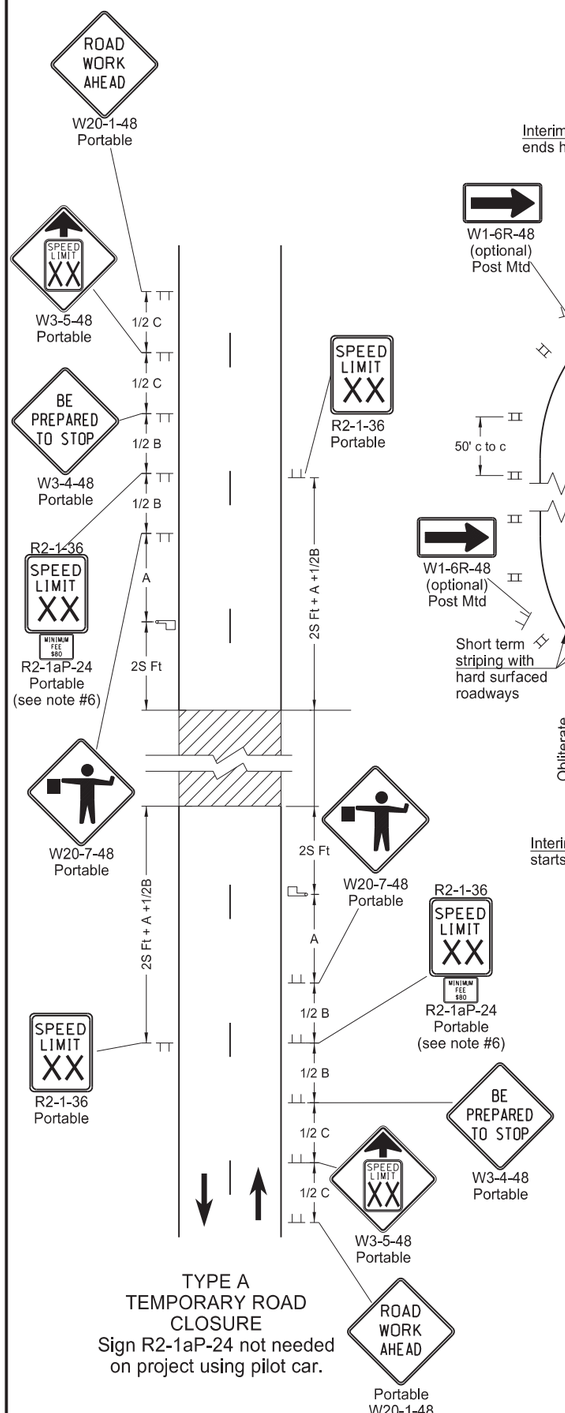
Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

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

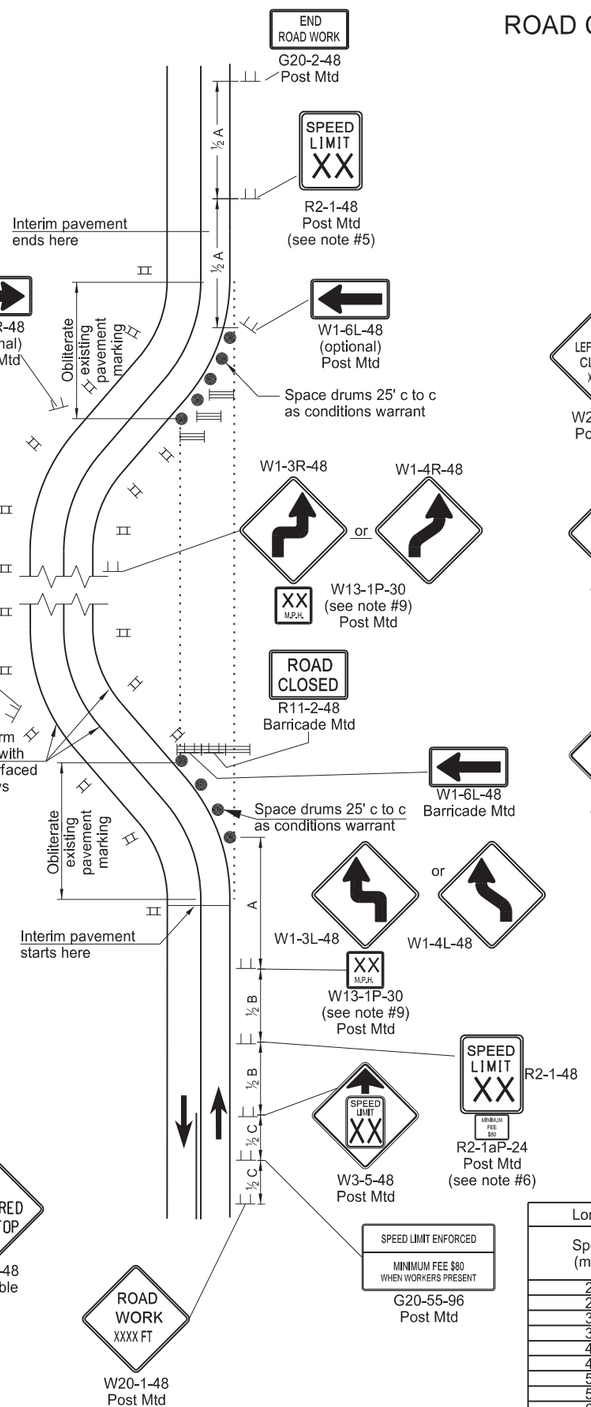
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

ROAD CLOSURE LAYOUTS

D-704-15



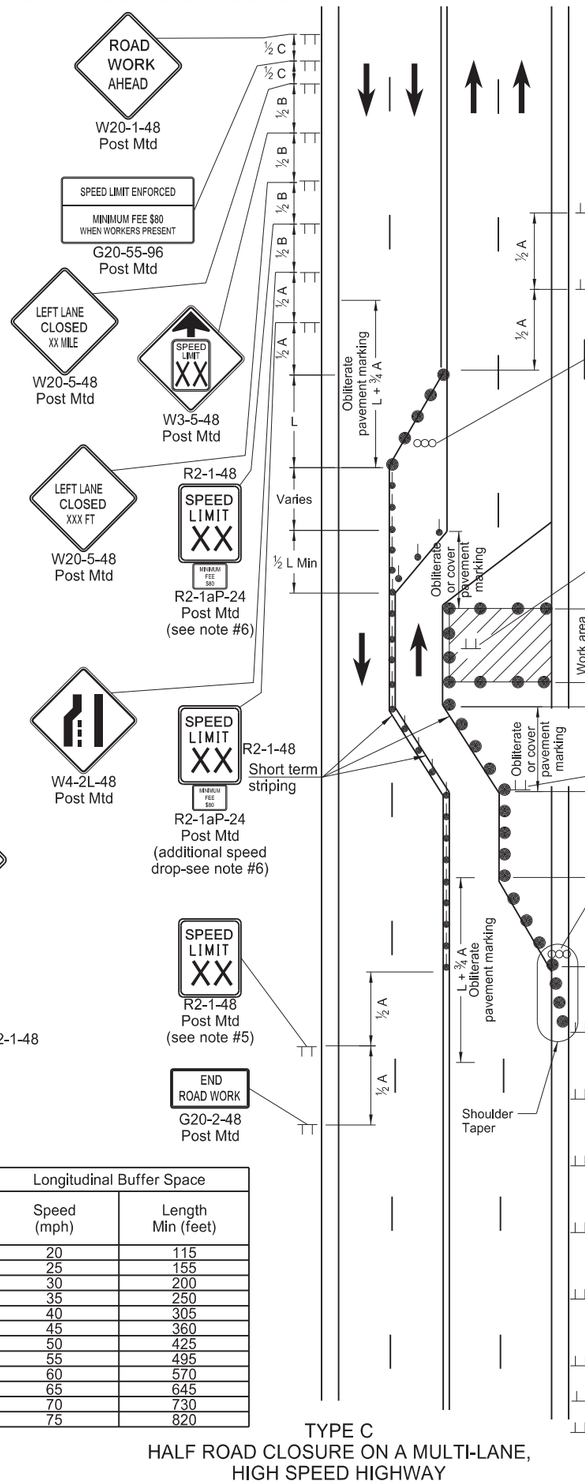
TYPE A
TEMPORARY ROAD CLOSURE
Sign R2-1aP-24 not needed on project using pilot car.



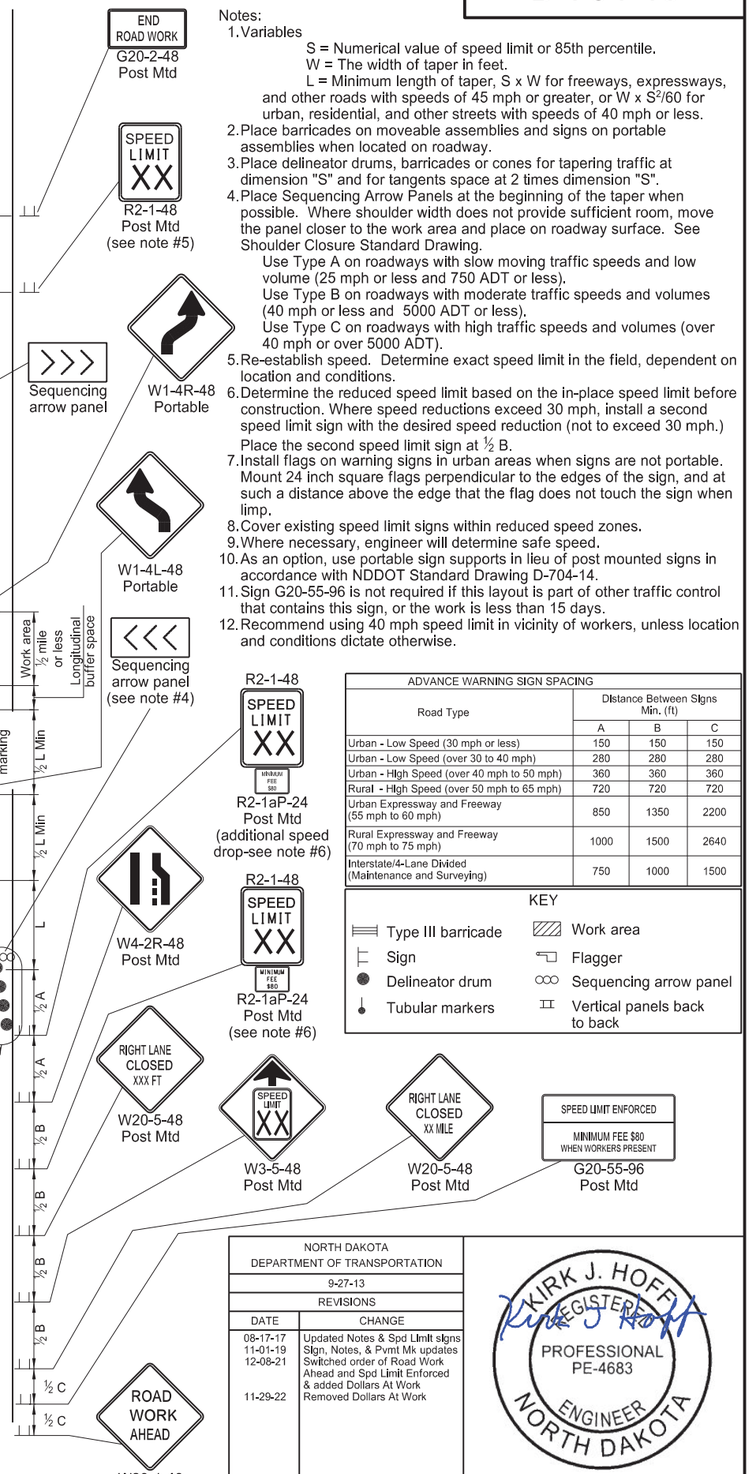
TYPE B
ROAD CLOSURE WITH A DIVERSION

Two lane highway where roadway is closed and detour provided (signing shown for one direction only). Use on bridge and culvert installation with ½ mile or less closure.

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



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



Notes:

1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper in feet.
   L = Minimum length of taper, S x W for freeways, expressways, and other roads with speeds of 45 mph or greater, or W x $S^2/60$ for urban, residential, and other streets with speeds of 40 mph or less.
2. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
3. Place delineator drums, barricades or cones for tapering traffic at dimension "S" and for tangents space at 2 times dimension "S".
4. Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on roadway surface. See Shoulder Closure Standard Drawing.
   Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
   Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
5. Re-establish speed. Determine exact speed limit in the field, dependent on location and conditions.
6. 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.
7. 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.
8. Cover existing speed limit signs within reduced speed zones.
9. Where necessary, engineer will determine safe speed.
10. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
11. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
12. 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 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

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

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

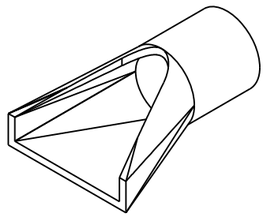
DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pvmt Mk updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

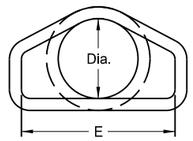
11/29/22

REINFORCED CONCRETE PIPE CULVERTS AND END SECTIONS
(Round Pipe)

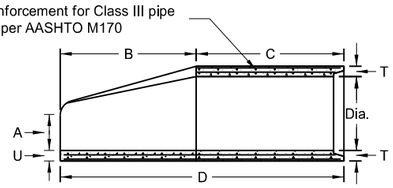
FLARED END SECTION						
TERMINAL DIMENSIONS						
DIA	A	B	C	D	E	U
12	0'-4"	2'-0"	4'-0⅞"	6'-0⅞"	2'-0"	2"
15	0'-6"	2'-3"	3'-10"	6'-1"	2'-6"	2¼"
18	0'-9"	2'-3"	3'-10"	6'-1"	3'-0"	2½"
21	0'-9"	3'-0"	3'-1"	6'-1"	3'-6"	2¾"
24	0'-9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3"
27	0'-10½"	4'-0"	2'-1½"	6'-1½"	4'-6"	3¼"
30	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3½"
36	1'-3"	5'-3"	2'-9"	8'-0"	6'-0"	4"
42	1'-9"	5'-3"	2'-9"	8'-0"	6'-6"	4½"
48	2'-0"	6'-0"	2'-0"	8'-0"	7'-0"	5"
54	2'-3"	5'-5"	2'-9¼"	8'-2¼"	7'-6"	5½"
60	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"
66	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5½"
72	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"
78	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6½"
84	3'-0"	7'-6½"	1'-9"	9'-3½"	10'-0"	6½"
90	3'-5"	7'-3½"	2'-0"	9'-3½"	11'-0"	6½"



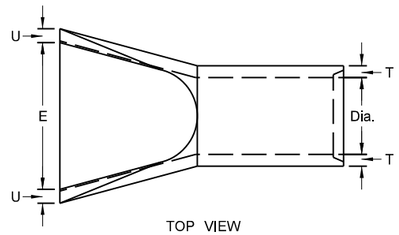
PERSPECTIVE



END VIEW



SIDE VIEW



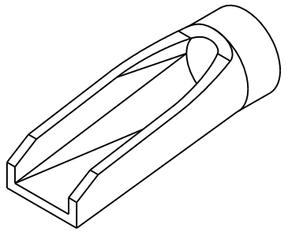
TOP VIEW

REINFORCED CONCRETE PIPE - FLARED END SECTION
Reinforcement to be equivalent to Class III RCP

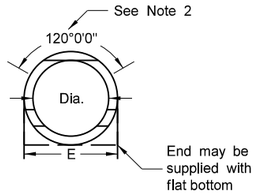
NOTES:

1. All reinforcing steel shall meet AASHTO M170 requirements.
2. All circular, longitudinal, and elliptical reinforcement shall be assembled and securely fastened in cage fashion so as to maintain reinforcement in exact shape and correct positions within the forms.
3. Laying length of pipe: 12" to 66" (incl.) = not less than 4 feet
   66" to 108" (incl.) = not less than 6 feet
4. Joints shall be sealed with rubber gaskets or with sealer approved by the engineer whenever pipe are specified for storm drain or sanitary sewers.
5. For Class IV and Class V reinforced concrete pipe and end section sizes which do not have reinforcement specified by AASHTO M170, shop drawings and design calculations shall be prepared and sealed by a Professional Engineer and submitted for the Engineer's review.

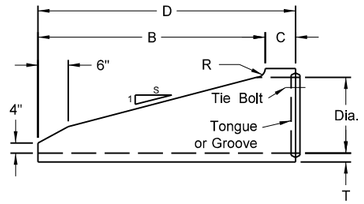
TRAVERSABLE END SECTION						
DIA	B	C	D	E	R	S
15"	4'	9"	4'-9"	1'-7½"	3"	6
18"	5'-9"	9"	6'-6"	1'-11"	3"	6
24"	6'	1'	7'	2'-6"	3"	4
30"	7'-6"	1'	8'-6"	3'-1"	3½"	4
36"	7'-3"	15"	8'-6"	3'-8"	3"	4



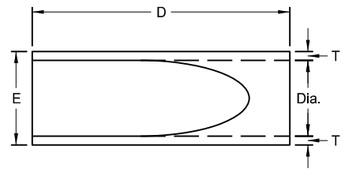
PERSPECTIVE



END VIEW



SIDE VIEW



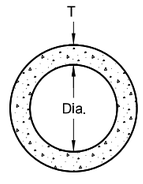
TOP VIEW

REINFORCED CONCRETE PIPE - TRAVERSABLE END SECTION
Reinforcement to be equivalent to Class III RCP

NOTES (Traversable End Section):

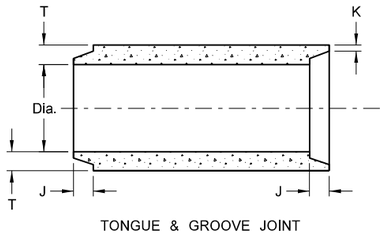
1. Manufactured in accordance with applicable portions of ASTM C76/AASHTO M170.
2. Reinforcement per Class III RCP with double reinforcement in the upper 120° of the full barrel portion.

All Classifications of Round Concrete Pipe					
Internal Dia. of pipe in Inches	Cross-Sectional Water Area	Weight per lin. foot of Pipe Std. Wall	Joint J Groove End Min./Max.	Joint K Tongue End Min.	Minimum Wall Thickness (T)
Dia	Sq. ft.	Lbs.	In.	In.	In.
12	0.79	92	1⅛-2⅛	¾	2
15	1.23	127	1⅛-2¼	⅞	2¼
18	1.77	168	1⅛-2⅛	1	2½
21	2.40	214	1⅛-3⅛	1⅛	2¾
24	3.14	265	2¾-3¾	1⅛	3
27	3.98	322	2¾-4	1¼	3¼
30	4.91	384	3¼-4¼	1¼	3½
33	5.94	452	3¼-4¼	1½	3¾
36	7.07	524	3¼-4¼	1½	4
42	9.62	685	3¾-4¾	1¾	4½
48	12.57	685	3⅞-4¾	1⅞	5
54	15.90	1070	4⅛-5¼	2	5½
60	19.63	1296	4½-5½	2¼	6
66	23.76	1542	5-6	2⅝	6½
72	28.27	1810	5⅛-6¾	2⅞	7
78	33.18	2098	6¼-7¼	2⅞	7½
84	38.48	2410	5⅛-7¾	3⅜	8
90	44.18	2793	6¾-8½	3⅛	8½
96	50.27	3092	7-8¼	3½	9
102	56.75	3466	7-8¼	3½	9½
108	63.62	3864	7¼-8½	3¾	10

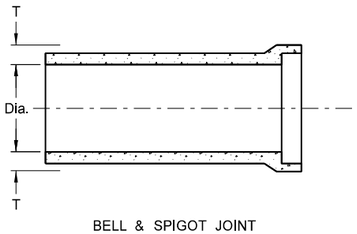


END VIEW

CIRCULAR PIPE

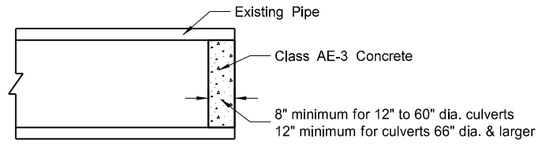


TONGUE & GROOVE JOINT



BELL & SPIGOT JOINT

JOINTS FOR REINFORCED CONCRETE PIPE



CONCRETE PIPE PLUG

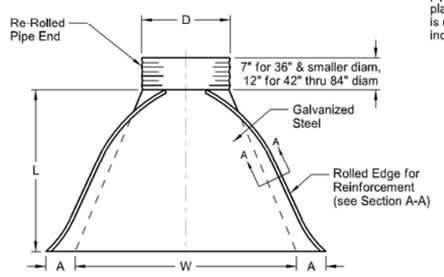
SEE STANDARD DRAWING D-714-22 FOR DETAILS OF CONCRETE PIPE TIES (TIE BOLTS).

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-12-14	
REVISIONS	
DATE	CHANGE
01-21-15	Revised Note 5
11-21-16	Revised End Section Dimensions
09-18-19	Updated Perspective View Details

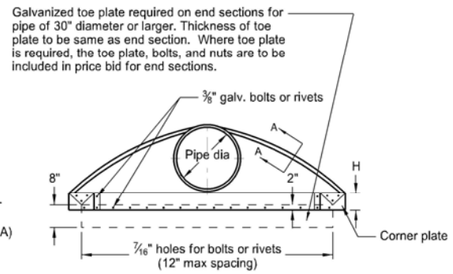
This document was originally issued and sealed by Jon Ketterling Registration Number PE-4684, on 9/18/19 and the original document is stored at the North Dakota Department of Transportation

ROUND CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS

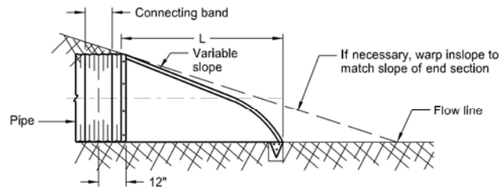
D-714-4



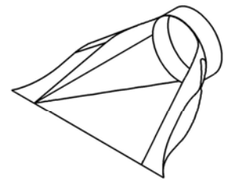
PLAN VIEW



ELEVATION VIEW



TYPICAL CROSS SECTION
(showing connector section)



PERSPECTIVE VIEW

* * PIPE DIA.	GALVANIZED THICKNESS	END SECTION DIMENSIONS A	B	H	L	W	APPROX. SLOPE	BODY
IN	IN	IN	IN	IN	IN	IN	RATE	PIECE
15	0.064 - 0.079	7	8	6	26	30	2½:1	1
18	0.064 - 0.109	8	10	6	31	36	2½:1	1
24	0.064 - 0.109	10	13	6	41	48	2½:1	1
30	0.064 - 0.109	12	16	8	51	60	2½:1	1 or 2
36	0.064 - 0.109	14	19	9	60	72	2½:1	2
42	0.064 - 0.138	16	22	11	69	84	2½:1	2
48	0.064 - 0.168	18	27	12	78	90	2¼:1	2
54	0.064 - 0.168	18	30	12	84	102	2:1	2
* 60	0.064 - 0.168	18	33	12	87	114	1¾:1	3
* 66	0.064 - 0.168	18	36	12	87	120	1½:1	3
* 72	0.064 - 0.168	18	39	12	87	126	1½:1	3
* 78	0.064 - 0.168	18	42	12	87	132	1¼:1	3
* 84	0.064 - 0.168	18	45	12	87	138	1⅛:1	3

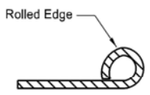
* These sizes have 0.109" sides and 0.138" center panels.

* * Pipe diameter is equal to dimension "D" of end section.

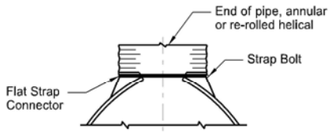
Manufacturers tolerances of above dimensions will be allowed.

Splices to be the lap riveted type.

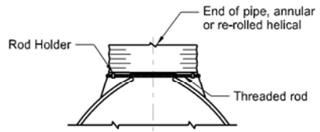
Multiple panel bodies shall have lap seams which are to be tightly joined with ⅜" dia. galv. bolts or rivets. Nuts to be torqued to 25 foot-lbs ±.



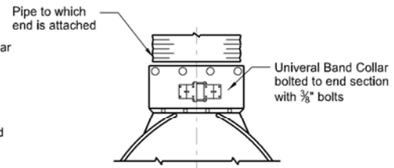
SECTION A-A



TYPE #1
For circular pipes with diameter 24" & smaller



TYPE #2
For circular pipes with diameter 30" through 36"

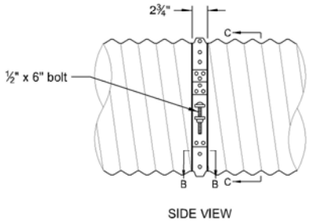


TYPE #3
For all pipe sizes

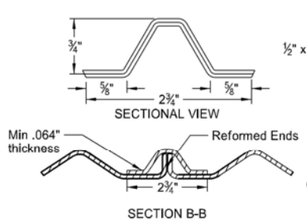
COUPLING BAND DIMENSIONS				
COUPLING TYPE	CORRUGATION PITCH x DEPTH	PIPE SIZE	COUPLING BAND LENGTH	MIN. BAND THICKNESS
Hat Band	2⅔" x ½"	12" - 48"	2¾"	.064"
Annular Band	2⅔" x ½"	12" - 72"	12"	.052"
		78" - 84"	12"	.079"
	3" x 1"	48" - 120"	14"	.052"
Hugger Band	2⅔" x ½" Rerolled End	12" - 72"	10½"	.052"
		78" - 84"	10½"	.079"
	3" x 1" Rerolled End	48" - 120"	10½"	.052"
	5" x 1" Rerolled End	48" - 120"	12"	.064"

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 ¼" galv. angle for 60" through 72" dia. and 2½" x 2½" x ¼" galv. angle for 78" and 84" dia.. Angles to be attached by galv. ⅜" 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. ½" x 8" bolts may be used as a substitute for the ½" x 6" bolts shown in the details.
6. Coupling bands wider than 14" may be used if a minimum of four ½" bolts with maximum spacing of 5½" are used for the connection.
7. Length of spot welds shall be minimum ½".



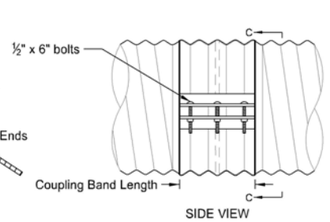
SIDE VIEW



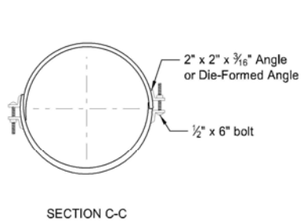
SECTIONAL VIEW

SECTION B-B

HAT BAND FOR FLANGED END PIPE

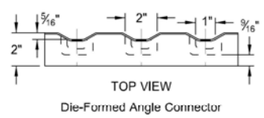


SIDE VIEW

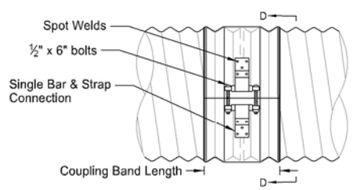


SECTION C-C
Angle Connection

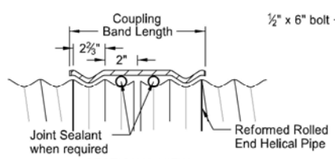
ANNULAR BAND



TOP VIEW
Die-Formed Angle Connector

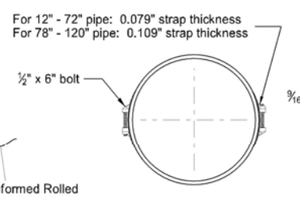


SIDE VIEW

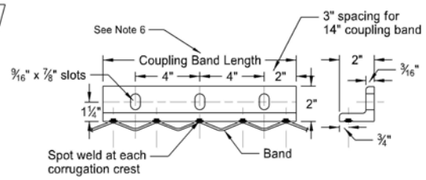


SECTIONAL VIEW

HUGGER COUPLING BAND



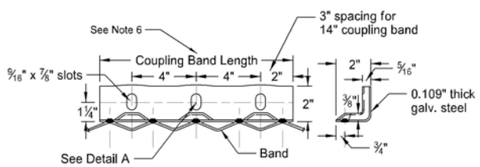
SECTION D-D
Bar & Strap Connection



SIDE VIEW

END VIEW

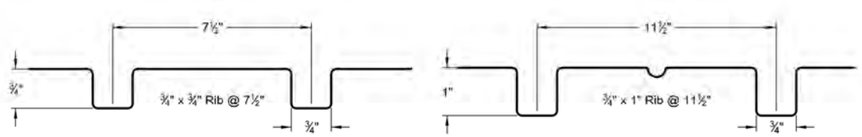
2" x 2" x 3/16" Angle Connector



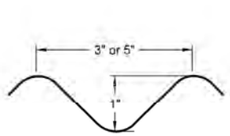
SIDE VIEW

END VIEW

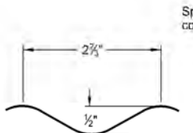
Die-Formed Angle Connector



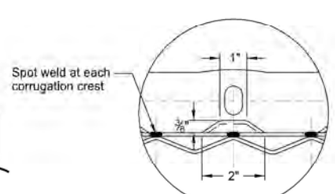
SPIRAL RIB CORRUGATIONS



3" x 1" CORRUGATIONS or
5" x 1" CORRUGATIONS



2⅔" x ½" CORRUGATIONS



Detail A

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
08-15-13	
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

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ENGINEER
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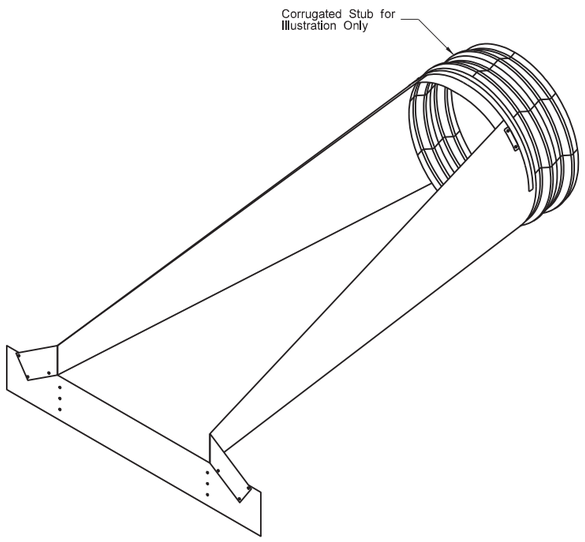
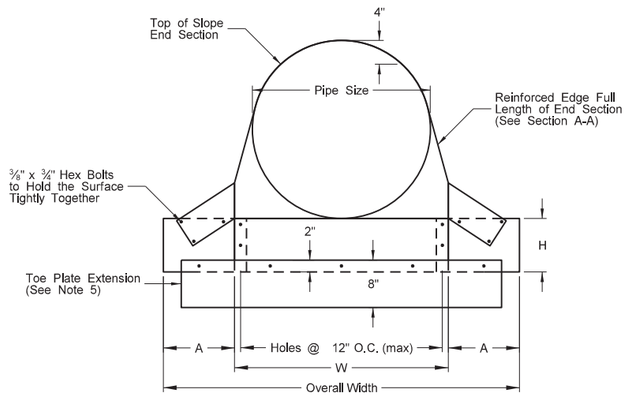
09/23/22

DocuSign

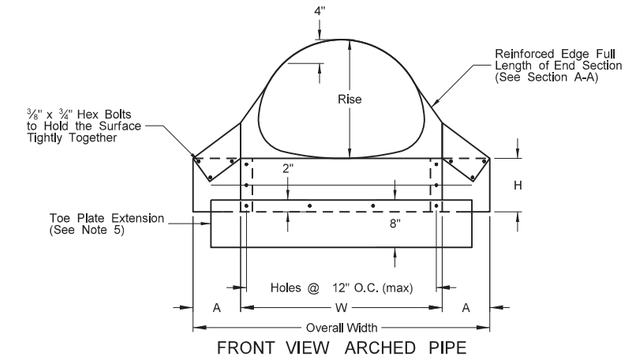
TRAVERSABLE END SECTIONS FOR CORRUGATED STEEL PIPE CULVERTS



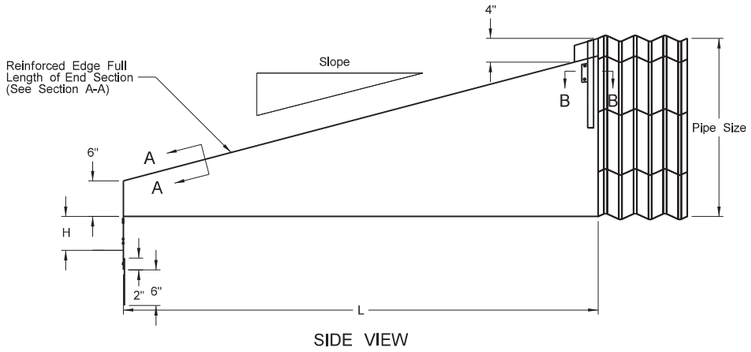
ISOMETRIC VIEW



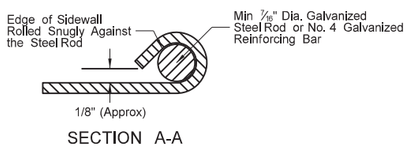
FRONT VIEW CIRCULAR PIPE



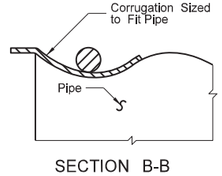
FRONT VIEW ARCHED PIPE



SIDE VIEW



SECTION A-A



SECTION B-B

TRAVERSABLE END SECTIONS FOR CIRCULAR PIPES										
Pipe Dia. (in.)	Min. Thick.		Dimensions (inches)				L Dimensions			
	in.	Gauge	A	H	W	Overall Width	Slope	Length (in.)	Slope	Length (in.)
15	.064	16	8	6	21	37	4:1	20	6:1	30
18	.064	16	8	6	24	40	4:1	32	6:1	48
24	.064	16	8	6	30	46	4:1	56	6:1	84
30	.109	12	12	9	36	60	4:1	80	6:1	120

TRAVERSABLE END SECTIONS FOR ARCHED PIPES												
Equiv. Dia. (in.)	(inches)		Min. Thick.		Dimensions (inches)				L Dimensions			
	Span	Rise	in.	Gauge	A	H	W	Overall Width	Slope	Length (in.)	Slope	Length (in.)
18	21	15	.064	16	8	6	27	43	4:1	20	6:1	30
21	24	18	.064	16	8	6	30	46	4:1	32	6:1	48
24	28	20	.064	16	8	6	34	50	4:1	40	6:1	60

NOTES:

1. See Standard Drawing D-714-04 for end section to pipe details.
2. Use a ½" diameter rod or strap type connection for 15", 18", and 24" diameter end sections to attach to corrugated steel pipe.
3. Use a ⅝" diameter rod type connection for 30" diameter round end sections to attach to corrugated steel pipe.
4. Use a ½" diameter rod type connection for all sizes of arched pipe end sections to attach to corrugated steel pipe.
5. Use the same gauge material for the toe plate extension as the end section. Use a dimension with a width 6" less than the overall width.
6. For centerline crossings, use end sections with a dimension "W" of 36" or less where a single culvert is required to convey the flow and a dimension "W" of 30" or less where multiple culverts are required to convey the flow.
7. For approach crossings, use end sections with a dimension "W" of 24" or less where a single culvert is required to convey the flow and a dimension "W" of 21" where multiple culverts are required to convey the flow.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-23-09	
REVISIONS	
DATE	CHANGE
8-6-21	Notes 2-7, Lables

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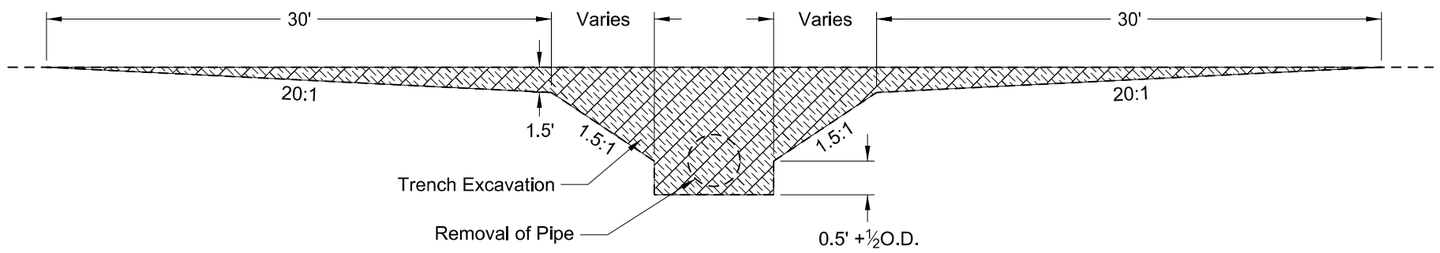
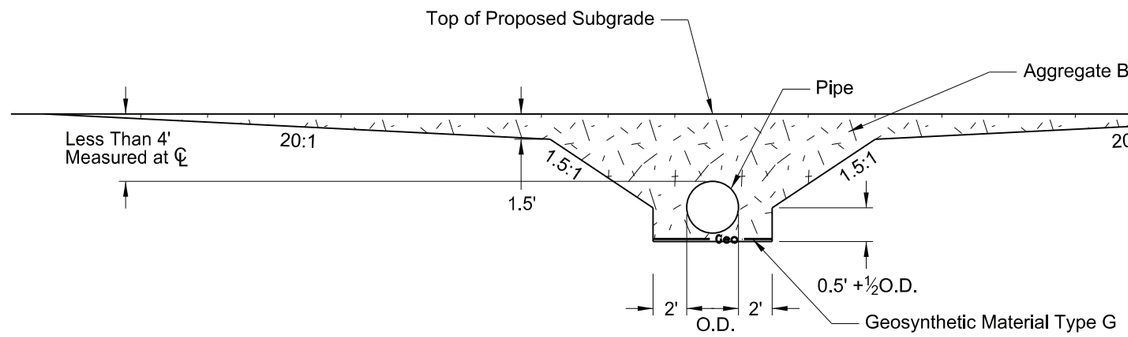
TRANSVERSE MAINLINE PIPE INSTALLATION DETAIL
PIPES 4 FEET OR LESS BELOW TOP OF SUBGRADE

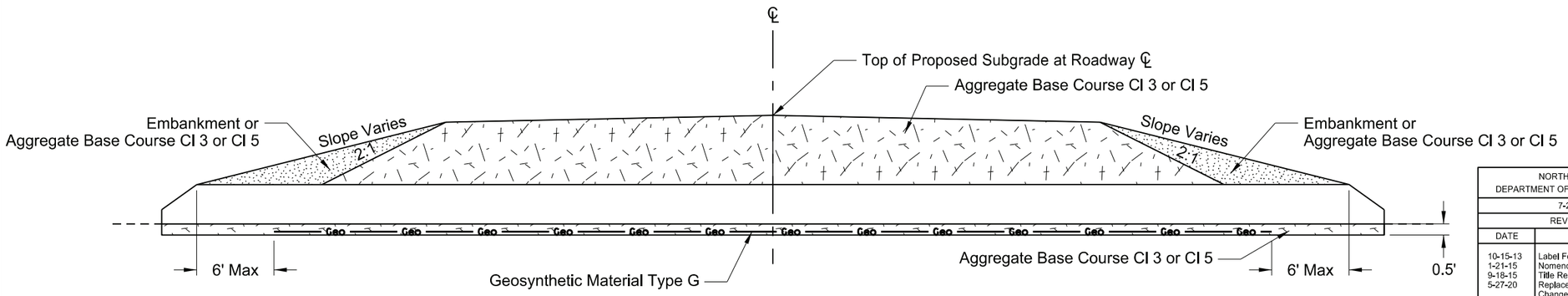
D-714-26



EXCAVATION DETAIL



INSTALLATION DETAIL



CROSS SECTION

Pay Items
1) Pipe*
2) Geosynthetic Material Type G
3) Removal of Pipe (if required)

*Included in Pipe Pay Item
1) Pipe
2) Trench Excavation
3) Aggregate Base Course Cl 3 or Cl 5
4) Embankment

NOTES:

1) This drawing applies to new/replaced mainline and paved intersection roadway pipes only (including ramps). It does not include pipes in approaches.

2) Embankment may be either borrow Excavation or Common Excavation - Type A

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

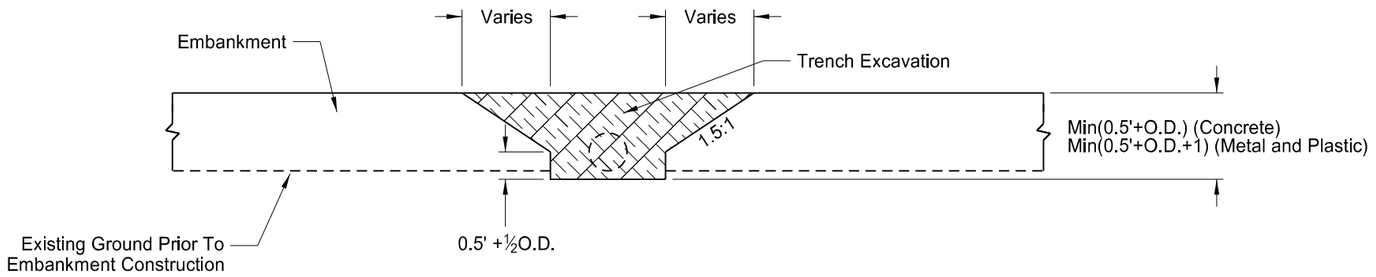
7-26-13

REVISIONS

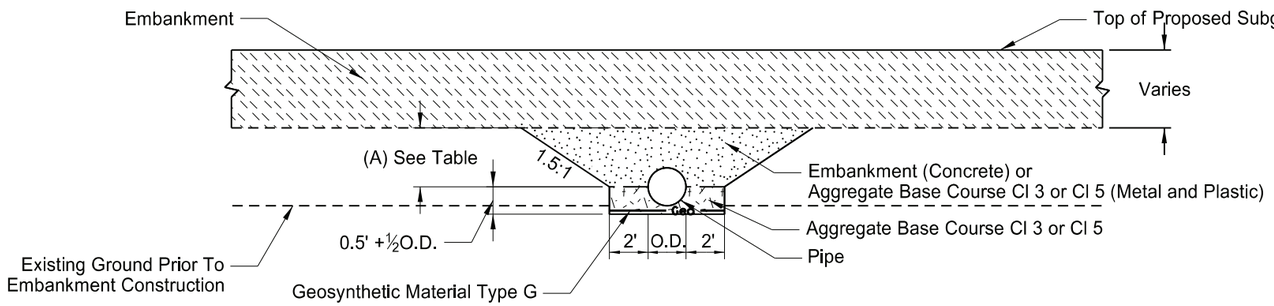
DATE	CHANGE
10-15-13	Label Formatting
1-21-15	Nomenclature
9-18-15	Title Rewording
5-27-20	Replaced R1 Fabric with Geogrid Changed bedding depth

REGISTERED PROFESSIONAL ENGINEER
MATTHEW C KURLE
PE-8777
DATE
05/27/20
NORTH DAKOTA
DocuSign

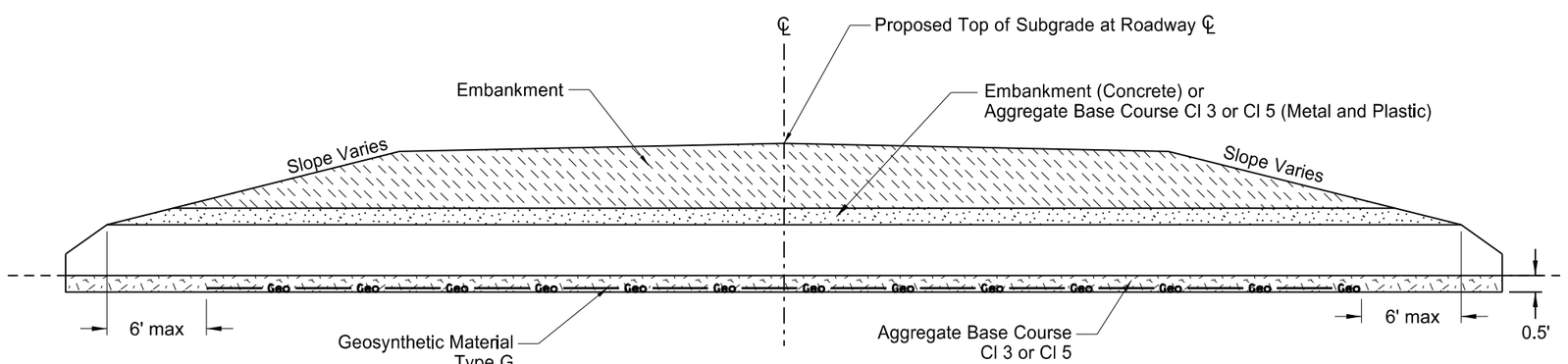
TRANSVERSE MAINLINE PIPE INSTALLATION DETAIL FOR PIPES INSTALLED IN NEW EMBANKMENT AREAS



EXCAVATION DETAIL



INSTALLATION DETAIL



CROSS SECTION

Pay Items
1) Pipe*
2) Geosynthetic Material Type G

*Included in Pipe Pay Item
1) Pipe
2) Trench excavation
3) Aggregate base course Cl 3 or Cl 5
4) Embankment

NOTES:

1) This drawing applies to new/extended mainline and paved intersection roadway pipes only (including ramps). It does not include pipes in approaches
2) Embankment may be either Borrow Excavation or Common Excavation - Type A

Backfill Dimensions	
Pipe Materials	Dimension (A)
Concrete	0.5 O.D.
Metal and Plastic	0.5 O.D. + 1 Foot

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

7-26-13

REVISIONS

DATE	CHANGE
10-15-13	Label Formatting
1-21-15	Nomenclature
12-10-15	Added Plastic Pipe
5-27-20	Replaced R1 fabric with Geogrid Changed bedding depth

REGISTERED PROFESSIONAL ENGINEER
MATTHEW C KURLE
PE-8777
DATE
05/27/20
NORTH DAKOTA
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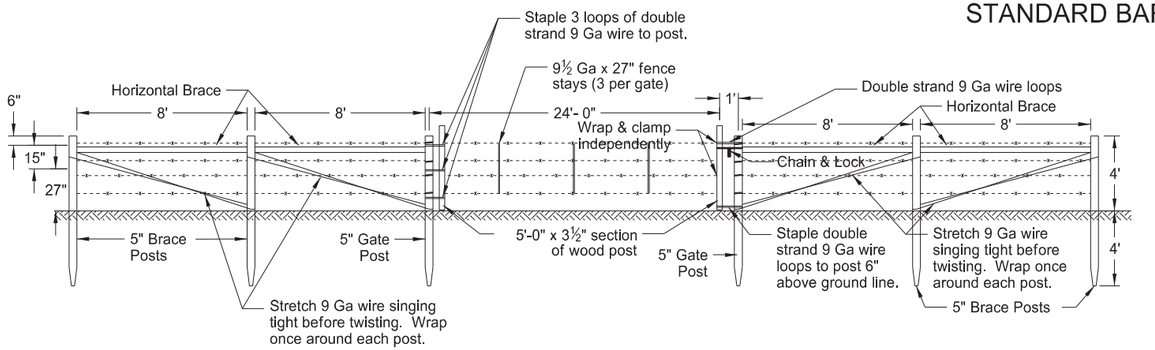
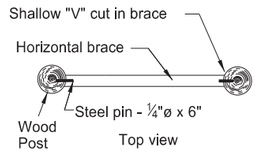
STANDARD BARBED WIRE FENCE

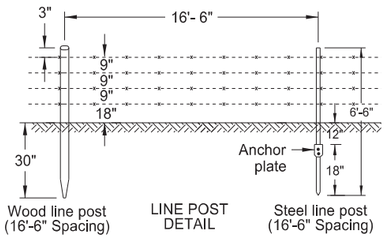
D-752-1



VEHICLE GATE



HORIZONTAL BRACE DETAIL



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.

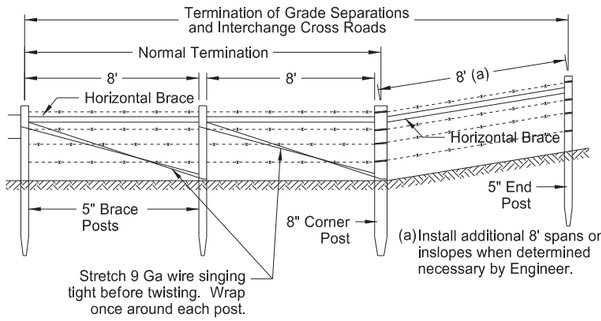
2. Install double brace assemblies at locations shown on the plans or established by the Engineer. Place adjacent fence terminals, corner assemblies, or double brace assemblies at a maximum spacing of 1,320 feet.

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 ⅝" diameter threaded eyebolt, when installed in concrete.

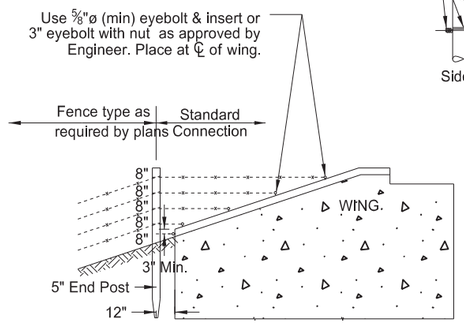
4. Determine post type used, either wood or steel, unless otherwise specified in the plans.

5. Include the cost of bracing at vehicle gates in the price bid for "Vehicle Gate."

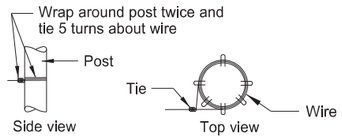
POST SIZES					
	TREATED WOOD		STEEL		
USE OF POST	Post dia.	Post length	Post length	Post wt. Lbs/Ft	Anchor wt. Lbs.
Line post	3½"	6'-6"	6'-6"	1.33	0.67
Corner post	8"	8'	7'	4.10	(Conc.)
End post	5"	8'			
Brace post	5"	8'	7'	3.19	(Conc.)
Gate post	5"	8'			
Horizontal brace	4"	8'	As appoved by the Engineer		



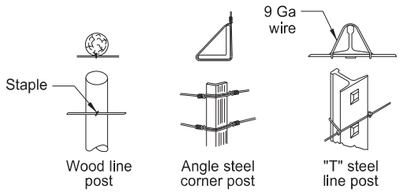
FENCE TERMINAL



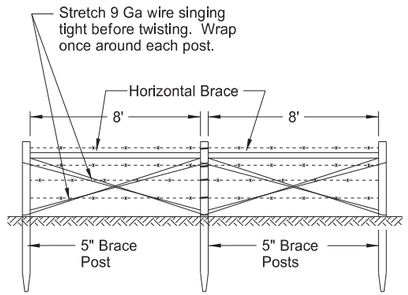
DETAIL FOR TYING FENCE TO WINGS OF ABUTMENTS



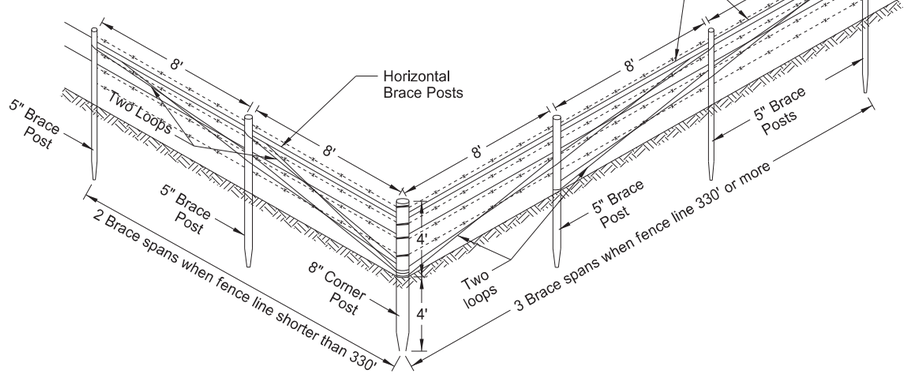
WRAP-AROUND DETAIL



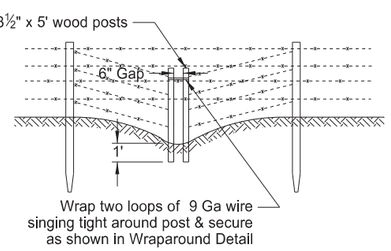
FASTENING TO POSTS



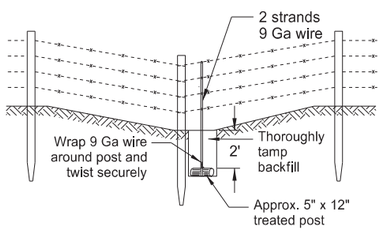
DOUBLE BRACE ASSEMBLY



CORNER ASSEMBLY

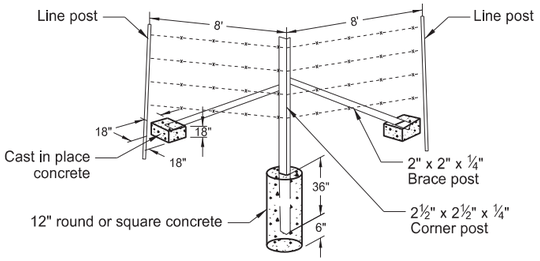


BREAK-AWAY FENCE FOR NARROW DEPRESSIONS SUBJECT TO FLOODING

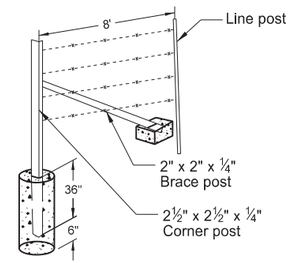


DETAIL FOR ANCHORING FENCES IN DEPRESSIONS*

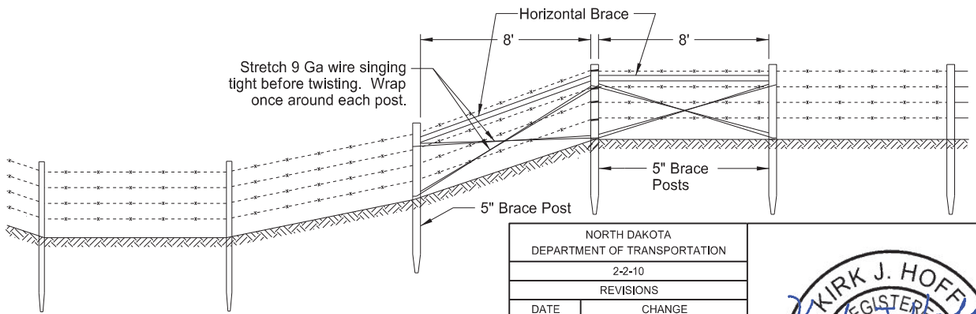
*Determine locations in the field and include in price bid for fencing. Use other methods of anchoring fence if approved by the Engineer.



CORNER AND DOUBLE BRACE ASSEMBLY STEEL POSTS



FENCE TERMINAL STEEL POSTS



FENCING FOR WIDE DEPRESSIONS

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.

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REGISTERED
PROFESSIONAL
PE-4683
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NORTH DAKOTA

02/23/23