STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	19804	1	1

JOB # 1
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

SOIA-SAP-7-023(037)927

FHWA Partial Involvement
Mountrail County
New Town Northeast Truck Reliever Route
Grading, Aggregate Base, Hot Bituminous Paving, Drainage,
Concrete, Traffic Signals, Lighting, and Incidentals

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota Department of Transportation October 2008; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

SOIA-SAP-7-023(037)927	NET MILES	GROSS MILES
ND 23B	3.183	3.183
ND 1804	0.413	0.413
ND 23	0.485	0.485

ND 23B - DESIGN DATA

Traffic	Average Daily			Max.Hr.
Current 2012	Pass: 910	Trucks: 2800	Total: 3710	371
Forecast 2032	Pass: 1550	Trucks: 4760	Total: 6310	631

Clear Zone Distance: 32'	Design Speed: 55 MPH
Minimum Sight Dist. for Stopping: 495'	Bridges: NA
Sight Dist. for No Passing Zone: 900'	
Pavement Design Life 20 (years)	Design ESALs (Flexible): 12,309,000
Pavement Design Life 30 (years)	Design ESALs (Rigid): 35,556,403

ND 23 - DESIGN DATA

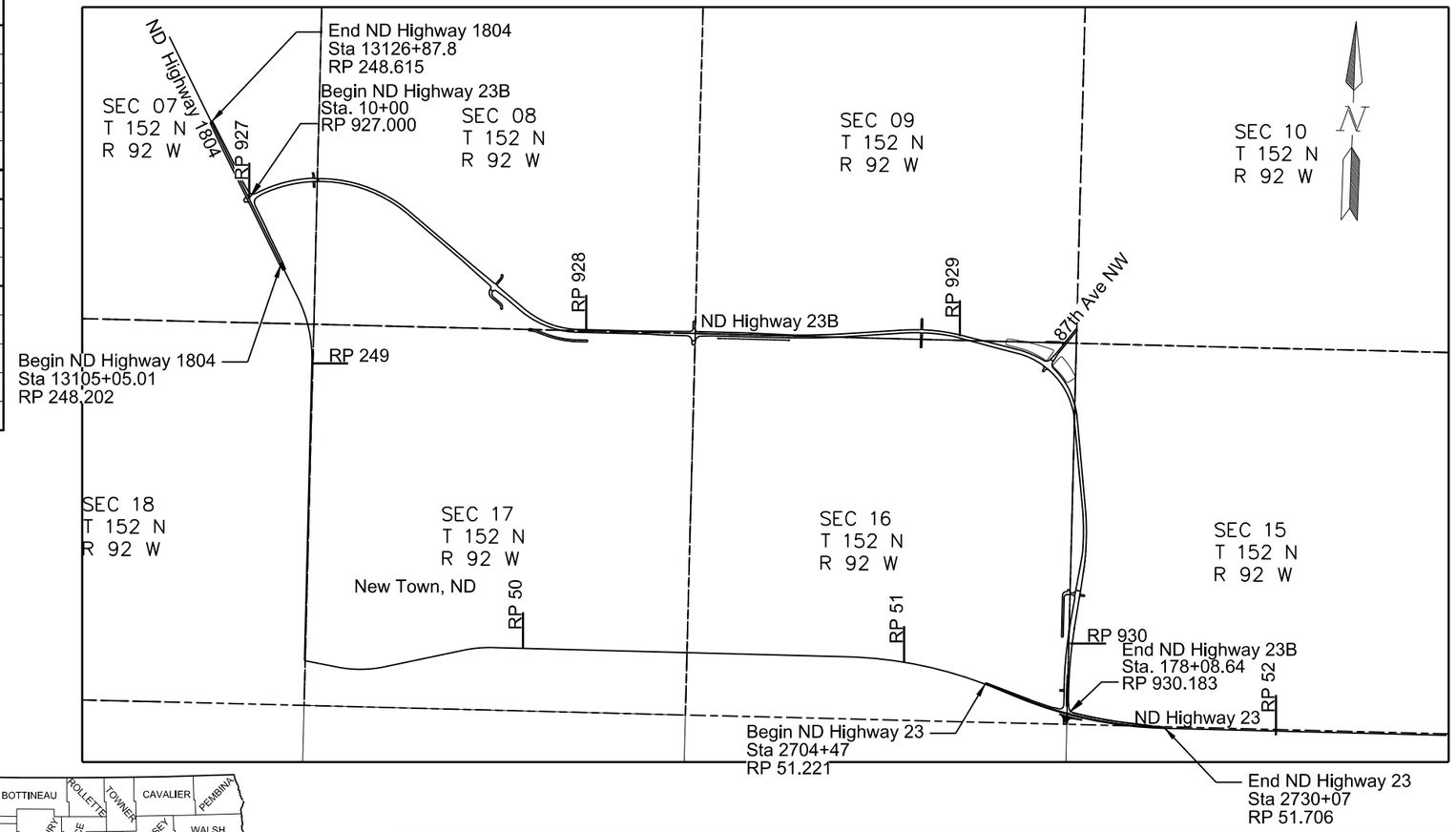
Traffic	Average Daily			Max.Hr.
Current 2012	Pass: 4630	Trucks: 2100	Total: 6730	675
Forecast 2032	Pass: 7595	Trucks: 3805	Total: 11400	1140

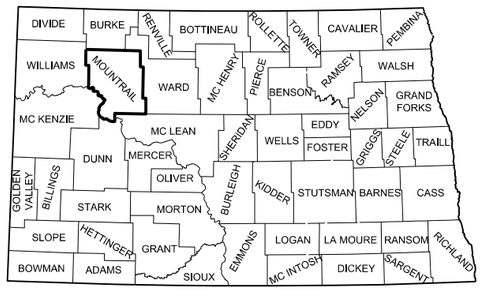
Clear Zone Distance: 32'	Design Speed: 55 MPH
Minimum Sight Dist. for Stopping: 495'	Bridges: NA
Sight Dist. for No Passing Zone: 900'	
Pavement Design Life 20 (years)	Design ESALs (Flexible): 19,856,000
Pavement Design Life 30 (years)	Design ESALs (Rigid): 35,556,403

ND 1804 - DESIGN DATA

Traffic	Average Daily			Max.Hr.
Current 2012	Pass: 1700	Trucks: 1345	Total: 3045	305
Forecast 2032	Pass: 2790	Trucks: 2435	Total: 5225	525

Clear Zone Distance: 32'	Design Speed: 55 MPH
Minimum Sight Dist. for Stopping: 495'	Bridges: NA
Sight Dist. for No Passing Zone: 900'	
Pavement Design Life 20 (years)	Design ESALs (Flexible): 11,333,250
Pavement Design Life 30 (years)	Design ESALs (Rigid): 35,556,403





STATE COUNTY MAP

DESIGNERS

Timothy Arens, PE	Ryan Ackerman, PE
Jason Hunze, PE	Jamey Prange
Mark Anderson	Dean Anderson

DISTRICT REVIEW

Joel M. Wilt /s/
WILLISTON DISTRICT

APPROVED DATE 10/25/13

Robert Fode /s/
OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

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

APPROVED DATE 10/23/13

Timothy Arens /s/
ACKERMAN-ESTVOLD

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LIST OF STANDARD DRAWINGS

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D-20-01, 02, 03	NDDOT Abbreviations
D-20-10	NDDOT Utility Company Abbreviations
D-20-20, 21	Linestyles
D-20-30, 31, 32	Symbols
D-203-07	Recovery Approaches At T-Intersections
D-203-08	Section Line & Private Drive Approaches
D-550-02	Longitudinal Joint Details
D-550-03	Transverse Contraction Joint Details
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D-704-05	Contractor Sign Detail
D-704-07	Breakaway Systems For Construction Zone Signs - Perforated Tube
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D-704-09	Construction Sign Details – Terminal and Guide Signs
D-704-10	Construction Sign Details – Regulatory Signs
D-704-11	Construction Sign Details – Warning Signs
D-704-13	Barricade Details and Channelizing Devices
D-704-14	Construction Sign and Barricade Assembly Details
D-704-15	Road Closure Layouts
D-704-17	Sign Layout for One Lane Closure Two Lane Roadway
D-704-19	Road Closure and Lane Closure on a Two Way Road Layouts
D-704-22	Construction Truck and Temporary Detour Layouts
D-704-24	Shoulder Closures and Bridge Painting Layouts
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D-706-01	Type C Field Laboratory
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D-708-06	Erosion Control Median or Ditch Inlet Protection
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D-714-01	Reinforced Concrete Pipe Culvert and End Section
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D-714-04	Corrugated Steel Pipe Culverts and End Sections
D-714-11	Traversable End Sections For Corrugated Steel Pipe Culverts
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D-714-28	Transverse Centerline Pipe Fill for New Pipe Laid on Existing Ground in Embankment Areas
D-720-01	Standard Monuments and Right of Way Markers
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D-752-01	Standard Barbed Wire Fence
D-754-01	Pipe or W-Shape Assembly Details
D-754-03	Break-Away Base and Foundation Details Stub Post Connection (Pipe)
D-754-04	Multi-Directional Break Away Base
D-754-05	Foundation Data For Steel Supports
D-754-06	Hinge Plate Details-Perforated Fuse Plate Detail
D-754-23	Assembly Details
D-754-24	Mounting Details Perforated Tube
D-754-24A	Breakaway Coupler System for Perforated Tubes
D-754-25	Mounting Details Perforated Tube
D-754-26,27,28,29,31,32,38	Sign Punching, Stringer, and Support Location Details Regulatory, Warning and Guide Signs
D-754-51,53,57,58,59	Sign Punching, Stringer, and Support Location Details – Route Marker Signs
D-754-80	Light Standard, Signal Standard, and Span Wire Mounted Sign Assembly Detail
D-754-83	Object Markers - Culverts
D-760-03	Rumble Strips Undivided Highway (Shoulders 4' or Greater)
D-762-01	Pavement Marking Message Details
D-762-04	Pavement Marking
D-762-06	Short-Term Pavement Marking
D-764-32	Three Cable Guardrail
D-766-01	MailBox Location Details
D-770-01	Concrete Foundations (Traffic Signals & Highway Lighting)
D-770-02	Feed Points (Roadway Lighting)
D-770-02A	Combination Feed Point Details
D-770-03	Pull Box Details
D-770-04	Lighting and Signal Details
D-770-05	Light Standard Details
D-772-01	Feed Point – Traffic Signals
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D-772-07	Flashing Beacon

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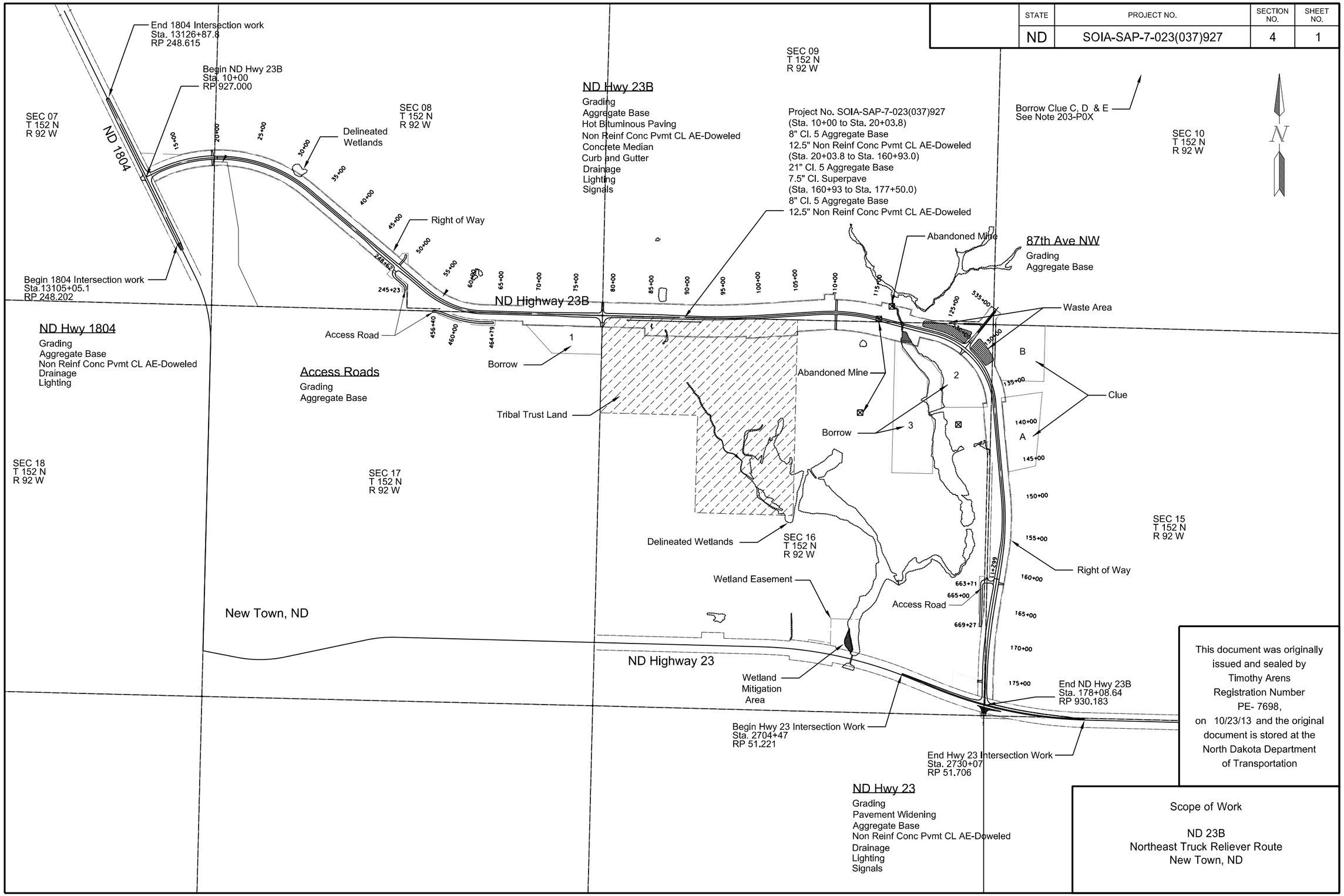

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Scope of Work

ND 23B
Northeast Truck Reliever Route
New Town, ND

NOTES

100-132 This project is within the boundaries of the Fort Berthold Indian Reservation. The contractor is advised to review any and all laws or ordinances pertaining to doing work within the boundaries of the reservation.

100-P01 **WORK SCHEDULE:** In order to minimize interference with traffic operations, a detailed schedule shall be agreed to prior to beginning work between:

Project Engineer
North Dakota Department of Transportation
NDDOT Cultural Resource Services
Three Affiliated Tribes
Tribal Historic Preservation Office
Bureau of Indian Affairs
Utility Companies
City of New Town
Mountrail County
Contractor
Subcontractors

100-P02 **WEEKLY PLANNING/REPORTING MEETING:**

Purpose of Weekly Meeting:

The Contractor shall organize the weekly meeting to coordinate the efforts between subcontractors, utilities, local authorities, and others.

Contractor's Project Manager/Superintendent - Planning and Reporting:

The Contractor will be responsible for sending a knowledgeable representative to conduct a weekly Reporting/Planning meeting. It will be the Contractor's responsibility to prepare minutes for each meeting and to make the appropriate distribution of the minutes. The minutes shall be approved by the Engineer prior to distribution.

The Contractor will be required to provide a written schedule of the next week's work and a tentative schedule of the following week.

The reporting/planning meeting will include discussion of problems encountered during the current week, information of interest to local authorities, SubContractors, utilities and next week's prospective schedule.

The Contractor shall organize the weekly meeting by contacting interested agencies. These agencies may include, but are not limited to, the following:

North Dakota Department of Transportation
NDDOT Cultural Resource Services
Three Affiliated Tribes
Tribal Historic Preservation Office
City of New Town
Mountrail County
Police, Sheriff and Highway Patrol departments
Fire Departments
Ambulance Service
Telephone Co.
Power Co.
Cable T.V.
Gas Co.
Subcontractors
Chamber of Commerce
Project Engineer
Bureau of Indian Affairs
US Corps of Engineers
Federal Highway Administration
Minot Air Force Base – Cable Affairs Office

100-P03 **PUBLIC RELATIONS COORDINATOR:** The Contractor shall provide a public relations and information coordinator. The coordinator shall not be the project superintendent or construction foreman. The coordinator should be knowledgeable in construction operations, be able to develop effective media releases, possess written and verbal communications skills and be able to organize productive meetings.

The public relations coordinator shall:

1. Organize, schedule, and conduct the weekly planning and reporting meetings (plan note 100-P03).

2. Notify NDDOT Williston District, Mountrail County, City of New Town, Three Affiliated Tribes, Police, Highway Patrol, Sheriff, emergency services, schools, and other pertinent city/county agencies of forthcoming construction activities in regard to street closures and traffic detour routes.

3. Provide news releases and necessary drawings to the local media, including TV, radio, and newsprint prior to and during construction to inform the public on construction activities, schedules, street closures, width or height restrictions to traffic and traffic detour routes. News releases on construction activities shall be updated on a timely basis (minimum two-week update).

4. Be available to give news media interviews.

5. Work directly with property owners and businesses affected by construction activities. The coordinator must have sufficient knowledge and authority to resolve property owner and business concerns regarding scheduling, maintaining access and construction operations.

The public relations coordinator shall be available at all times during the project to address questions from the public. The public relations coordinator's name, work address, and work telephone number shall be made available to the public, news media, government agencies and businesses.

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NOTES

The Contractor's public relations coordinator shall contact businesses and residents prior to start of project and on a weekly basis until completion.

All costs associated with the public relations coordinator shall be included in the price bid for other items.

100-P04 **ABANDONED MINES:** The Public Service Commission identified abandoned mines in the vicinity of the proposed roadway. The abandoned mine locations are based on historical records, actual locations and extents of potential underground facilities connected to these mines are unknown. Approximate entrance locations of the identified mine are noted on the Scope of Work in Section 4. The contractor shall be aware that there may be other abandoned mines in the area.

100-P05 **SINKHOLES AND VOIDS:** Evidence of sinkholes is in the area from Sta. 112+50 to 116+50 and additional precaution may be needed. All voids under the roadway alignment shall be filled. An additional 41,500 CY of Common Excavation – Type A, 17,800 CY of Common Excavation – Waste, and 74,130 CY of embankment have been included in the quantities to remove approximately 14' of the overburden and 6' of coal in this area.

100-P06 **ACCESS RESTRICTED PARCELS:** Tribal Trust Land: A portion of the project from Sta. 78+69 to 105+05 is on tribal trust land (see Scope of Work Sheet). Access is not granted and work shall not proceed on tribal trust land until the NDDOT receives the Grant of Easement for highway right of way from the Bureau of Indian Affairs. It is anticipated that the Grant of Easement will be obtained by May 1, 2014. The Engineer will notify the contractor once the right of way is obtained.

103-P01 **ESCROW OF BID DOCUMENTATION:** The Contractor shall provide an escrow of bid documentation for the prime contract and any sub-contract over $500,000. The escrow of bid documentation can be held in the NDDOT safe for no charge.

105-200 **UTILITY COORDINATION:** The Contractor shall arrange a Post Bid Utility Coordination Meeting with affected Utility Companies, NDDOT, and the Project Engineer. This meeting shall be in addition to the preconstruction meeting. The Post Bid Utility Coordination Meeting shall be held near the project area and shall be held no later than two weeks after the Owner and the Contractor have executed the contract, as approved by the Engineer. The Contractor shall provide an agenda for the meeting, and be prepared to discuss the items on it. Items to discuss shall include, but not be limited to; plan for constructing the project, work schedule, utility adjustment/relocates needed prior to project start, utility adjustment/relocates that can be done concurrent with project, utility locates and site access. The Contractor shall publish meeting minutes and distribute the minutes to all attendees and the NDDOT Utilities Engineer within one week after the meeting.

105-P01 **EXISTING UTILITIES:** Overhead electric lines cross the right of way and will remain in service during the construction of the project. Underground utilities (telephone, cable television, fiber optic, electric, etc.) will remain in place unless found in direct conflict with the project at the time of construction. If underground conflicts are found, they will be addressed by the impacted utility company. The Contractor shall coordinate their work with the utility companies' relocation efforts.

105-P02 **RELOCATED UTILITY LINES:** The placement of line markers on any relocated utility lines is not the responsibility of the Contractor, but that of the utility company.

107-P01 **HAUL ROAD RESTRICTIONS:** The Contractor shall contact the appropriate State, County, Township, or City officials to determine if there are any "No Haul Routes" prior to preparing a bid for this project.

107-P02 **BIA COORDINATION:** Any work conducted on land held in trust by the BIA (allotted or tribal surface ownership) must be coordinated through Environmental/Compliance (Jeff Desjarlais, Environmental/Compliance Officer, Ft. Berthold (701) 627-4707, ext.244). This includes work on material sources, staging areas, office locations and any other activities not expressly detailed in the project plans.

107-P03 **AVOIDANCE AREAS:** The avoidance areas contain cultural sites identified through the initial field review. The cultural sites within the avoidance areas shall not be disturbed. The contractor shall install the temporary fence as shown in Section 60 of the plans before starting work. NDDOT ETS CRS staff member and THPO representative shall be invited to attend the Weekly Planning/Reporting Meeting to coordinate the exact locations where the temporary fence will be installed. All costs to provide, place, maintain, and remove the fence shall be included in the price bid for Temporary Safety Fence.

Work within the avoidance areas is required for the removal of existing fence and the placement of permanent fence. The method of removal, method of installation, and location of permanent fence within the avoidance areas shall be approved by NDDOT ETS CRS.

NDDOT ETS CRS contact is:
Robert Christensen
608 E Boulevard Ave, Bismarck, ND 58505
701-328-4539

107-P04 **CULTURAL RESOURCE CONSTRUCTION MONITORING:** The Contractor shall hire a North Dakota Permitted Archaeologist to monitor the areas and items detailed in environmental commitment no. 3 of Section 6 of the plans. A representative of the Tribal Historic Preservation Office (THPO) must be present during the monitoring. The THPO may charge a fee for their portion of the oversight. Before bidding, contact Elgin Crows Breast, Tribal Historic Preservation Officer at:

Tribal Historic Preservation Office
PO Box 673
New Town, ND 58764
701-862-2474

The Contractor shall provide the Engineer and the THPO with the dates the work at the sites will start and the projected end date. All costs associated with hiring the archaeologist and any fees charged by the THPO shall be included in the bid item "Cultural Resource Construction Monitoring".

The Engineer will pay the full amount bid for the item "Cultural Resource Construction Monitoring" after the completion of topsoil removal activities in all areas which require monitoring and after the completion of existing fence removal and permanent fence installation.

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NOTES

200-010 **SHRINKAGE:** 25 percent additional volume is included for shrinkage in earth embankment.

200-060 **PAVEMENT REMOVAL**: All concrete and pavements paid for as removal have been deducted from the excavation quantity. The bituminous surfacing and concrete shall become the property of the contractor.

202-P01 **ABUTTING PAVEMENT:** Where the new pavement will abut existing pavement, a full-depth vertical saw cut shall be made along the entire length of the butt joint. The material to be removed shall then be removed without disturbing the material that is designated to remain. The new pavement shall be placed so as to match the existing pavement and so as to provide a satisfactory surface profile as approved by the Engineer.

The areas to be sawed are shown on the removal sheets. Sawing shall be paid as “Saw Concrete” or "Saw Bituminous Surfacing (Full Depth)".

202-P02 **SIGNS:** All signs and supports, which will not be reset, shall become the property of the Contractor. The costs for the above items shall be included in the prices bid for other items. The Owner will accept the removed signs if in good condition. There are a total of 5 signs that need removed.

202-P03 **REMOVAL OF EXISTING FENCE:** Prior to the removal of existing fence, the Contractor shall install permanent fence to maintain closure of pasture lands unless an agreement is made with the landowner to install the permanent fence after the removal of the existing fence. All costs associated with this requirement shall be included in the price bid for “Remove Existing Fence” and “Fence Barbed Wire 5-Strand.” Refer to note 107-P04 for additional requirements for removal of existing fence in the avoidance areas.

203-P01 **COMMON EXCAVATION – SUBCUT:** Any excavation within permanent wetland areas below the top 6” of “Topsoil – Wetland” shall be paid by unit price for “Common Excavation – Subcut”. Subcut shall be placed on site as directed by the engineer.

203-P02 **EXCAVATION AND FILL ELEVATIONS**: All ditch grades and contours are given at the top of the topsoil. Proposed centerline elevations indicated in Section 60 are top of asphalt, concrete, or finished surface.

203-P03 **TOPSOIL**: All topsoil shall be salvaged. Removal of topsoil is based on 12” depth along ND 23B, 6” depth on ND 1804 and 4” depth along ND Hwy 23. The topsoil shall be removed to its full depth and stockpiled. Upon completion of the work in these areas, a minimum of 6” of topsoil shall be spread over the areas to be seeded. All work as described above shall be paid for by the unit price bid for “Topsoil”.

203-P04 **TOPSOIL – WETLAND**: Topsoil shall be stripped to a depth of 6 inches from all wetland areas which will be permanently impacted by the project. Areas of temporary impact shall not be stripped.

The wetland topsoil shall be stockpiled separately from other topsoil. All wetland topsoil that is stripped shall be spread in the mitigated wetland areas so that it is evenly distributed to a minimum depth of 6”. Wetland topsoil should not be stockpiled for more than four weeks, with a maximum height of the stockpile of 3 feet. If the topsoil is stockpiled longer than four weeks, the following wetland seed mix shall be used for the mitigated wetland areas.

Grass			Full Seeding Rate	% Species	PLS
Common Name	Scientific Name	Varity	PLS/Acre	in Mix	lbs./Acre
Prairie Cord Grass	Spartina pectinata	Red River	7	15	1.1
American Slough Grass	Beckmannia syzigachne	Common	0.9	20	0.2
Canada Wild-rye	Elymus canadensis	Mandan	6.5	20	1.3
Fowl Blue Grass	Poa palustris	Common	1	20	0.2
Fox Sedge	Carex vulpinoidea	Common	1	15	0.2
American Manna Grass*	Glyceria grandis	Common	1.5	10	0.2
Fowl Manna Grass*	Glyceria striata	Common	1	10	0.1
Bluejoint Grass**	Calamagrostis canadensis	Common	1	10	0.1
			Total	120	3.1

** American, fowl, or both may be used. If only one is used the seeding rate of other species does not need to be increased.*

*** Seed may not be available and can be removed without increasing the seeding rate of other species*

The locations and boundaries of the impacted and mitigated wetlands are shown in Section 75 of the plans.

The costs to remove, stockpile, place, and seed the wetland topsoil shall be included in the price bid for “Topsoil – Wetland”.

203-P05 **STATE OPTIONED BORROW**: The Department’s boring logs have indicated that there is coal located in the state optioned borrow sites.

The state optioned borrow quantities and mass diagram included in the plans are based on the approximate available quantity of borrow material above the layer of coal. Additional borrow material is available below the coal layer.

- Borrow Site 1 – 14,000 CY above coal layer (157,200 CY total material estimated in borrow site including coal)
- Borrow Site 2 – 250,000 CY above coal layer (459,000 CY total material estimated in borrow site including coal)
- Borrow Site 3 – 88,000 CY above coal layer (100,000 CY total material estimated in borrow site including coal)

The coal within the state optioned borrow sites shall not be used as embankment material, and shall remain within individual borrow site in which it was discovered. No compensation will be given for any handling of coal within a borrow site.

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If the Contractor utilizes Borrow Site 1, the Contractor shall make the minimum payment shown in the proposal to the landowner regardless of the quantity of borrow material used.

- If the Contractor exhausts the material above the coal layer and chooses to abandon the borrow site, the Department will compensate the Contractor the full amount of the minimum payment.
- If the Contractor does not exhaust the material above the coal layer and chooses to abandon the borrow site, the Department will compensate the Contractor for the amount of material removed from the borrow site.
- If the Contractor chooses to excavate beneath the coal layer, the Department will compensate the Contractor for the amount of useable material removed from the borrow site.

Coal shall be covered with a minimum of 2 feet of overburden and 6 inches of topsoil.

All equipment, handling, and labor for any coal excavation and placement of overburden shall not be paid for separately, but included in the unit price bid for “Borrow-Excavation”.

203-P06 **CONTRACTOR FURNISHED BORROW**: The Contractor shall obtain the proper clearance for contractor furnished borrow per North Dakota Standard Specification 104.04 unless a Certificate of Approval has been obtained by the NDDOT. A number of potential material sources are identified as borrow clues.

The following locations have soil borings and a Certificate of Approval:

- Clues A & B - NW1/4NW1/4 of Section 15, T152N, R92W

Additional locations have been identified as potential material sources but have not been explored. These include the following:

- Clue C - S1/2E1/4W1/4 of Section 3, T152N, R92W
- Clue D - S1/2N1/2SE1/4SW1/4 of Section 3, T152N, R92W
- Clue E - NE1/4NE1/4 of Section 31, T153, R91W

203-P07 **BACKSLOPES ADJACENT TO BORROW AREAS**: The backslope shown in the cross sections at Stations 69+00 to 79+00 Rt and Stations 122+00 to 137+00 Rt may be lowered or eliminated if borrow is excavated adjacent to the right of way as approved by the Engineer and Landowner. Excavation within the right of way will be paid for as “Common Excavation - Type A” and excavation outside the right of way will be paid for as “Borrow-Excavation”.

203-P08 **COMMON EXCAVATION - WASTE**: The waste common excavation consists of coal. Coal removed from the common excavation areas shall be disposed of at the sites shown in Section 4. A minimum of 2 feet of compacted soil shall be placed over the coal disposal site and a minimum of 6” of topsoil shall be placed over the compacted soil. The cover material shall be compacted in accordance with section 203.02 I.

Include all costs for labor, materials, and equipment for the coal removal and disposal in the price bid for “Common Excavation – Waste”.

The 2 feet of cover material will be measured and paid for as “Common Excavation”.

Topsoil placed over the disposal site will be measured and paid under the “Topsoil” bid item.

203-P09 **UNSUITABLE MATERIAL**: Coal will be considered an unsuitable material for construction of earthen features. If coal is encountered in common excavation or embankment areas, it shall be disposed of in accordance with note 203-P07 “Common Excavation – Waste”. Coal shall not be imported from borrow areas.

230-P01 **SUBGRADE PREPARATION – TYPE A**: The depth of subgrade preparation is to be to a depth of 18 Inches for areas listed in the plans. Density and moisture control per Section 203.02G of the North Dakota Standard Specification shall apply for subgrade preparation.

302-P01 **AGGREGATE BASE COURSE TRIMMING:** The Aggregate Base Course shall be trimmed in accordance with ‘Surface Tolerance Type B’ Section 302.04 F.2 of the NDDOT Standard Specifications.

410-P01 **SUPERPAVE FAA 45:** The hot bituminous pavements shall consist of PG 64-34 Asphalt Cement in the top 4” and shall be placed in two equal lifts. PG 58-28 Asphalt Cement shall be used in the bottom lift(s) and shall be placed in equal lifts no greater than 2 inches.

410-P02 **CONTRACTOR MIX DESIGN:** The mix design shall be a Contractor developed mix design per NDDOT Standard Specification 410.04.A.2 and shall be submitted to the Williston District 10 days prior to the beginning of production.

410-P03 **MIX DESIGN PROPERTIES:** The aggregate and mix design properties will meet the requirements outlined in Section 410 Superpave Volumetric Mix Design. The following aggregate and mix design properties are required:

Test	Criteria	Reference
Coarse Aggregate Angularity	85% min	NDDOT Field Sampling/Testing Manual
Fine Aggregate Angularity	45% min	AASHTO T 304
Gyratory Effort, # Gyrations	N_{ini}=7, N_{des}=75,N_{max}=115	AASHTO R 35
Voids Filled with Asphalt	65-75%	AASHTO M 323, T 166
%G_{mm} @ N_{ini}	89% Max	AASHTO M 323, T 166

704-P01 **MAINTAINING ACCESS:** The Contractor will be responsible for providing access to all residential dwelling and business establishments adjacent to this project. Driveways must be constructed one half at a time unless approved otherwise by the Engineer and driveway owner.

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704-P02 **PROJECT PHASING:** Traffic control during construction will be established as shown in the Work Zone Traffic Control Section (Section 100). All areas may be constructed simultaneously provided the phasing within each area is followed and local access is maintained at all times.

At the end of each day, the Contractor shall place stackable vertical panels and supplementary traffic control devices as needed and when directed by the Engineer to delineate drop-offs, ridges, windrows and open excavations. The Contractor shall coordinate with impacted residents and businesses regarding construction hazards as changes occur.

ND Highway 23B Grading, Graveling & Paving

ND Highway 23B shall remain closed to thru traffic during construction. Access for local residences and businesses shall be maintained at all times.

Access to the oil wells and landowner access along the existing oil access road from ND 1804 to Sta. 64+00 shall be maintained by a combination of the existing road and ND 23B while under construction and the construction phasing shall be the responsibility of the contractor. The contractor shall submit the construction phasing to the Engineer for approval.

Construction phasing to maintain access along on 87th Ave is shown in the Section 100 and phased as follows:

Phase 1 includes constructing the northbound (east side) embankment of ND 23B from Sta. 161+00 to ND 23B. The aggregate base course shall be placed and compacted with a minimum width of 24' upon completion of the embankment. The new Frontage Road connection at Sta. 161+48.4 Rt shall be completed during this phase. Local traffic will use the existing 87th Ave NW roadway adjacent to the new embankment during this phase. Once the base course is in place, local traffic shall be shifted to the salvage base surface at the Frontage Road connection.

Phase 2 for ND 23B includes constructing the southbound (west side) embankment, aggregate base course, and concrete paving. The portion of the 87th Ave NW from 162+00 to ND 23 may be removed at this time but access needs to maintained for the existing access at Sta. 169+70 Rt until Access Road #3 is constructed.

Phase 3 includes the concrete paving for the northbound lanes and the concrete median. Local traffic shall be placed on the new concrete pavement for southbound ND 23B during this phase.

ND Highway 1804 Reconstruction and Widening

ND Highway 1804 shall remain open to two-way traffic at all times. Access to the existing access road at Sta. 13117+68.3 shall be maintained at all times for local traffic until access can be established with ND 23B to the existing oil wells and adjacent land. Construction phasing for the reconstruction on ND 1804 shall be constructed on the west side and east side as shown in the Section 100 and as follows:

Phase 1: Consists of embankment widening, aggregate base course, temporary embankment, and temporary aggregate base course on the east side the existing roadway. Temporary embankment and aggregate base placed on the east side is to shift two-way traffic on the temporary aggregate base during phase 2.

Phase 2: Two-way traffic shall be shifted to the east of the existing roadway during this phase. The west work zone includes removal of the existing roadway and shoulders, subgrade preparation, aggregate base course, concrete paving. Concrete paving of the center turn lane, southbound lane, and shoulder shall be completed during phase 2. The placement of temporary embankment and aggregate base is also needed on the west side during phase 2 on both the north and south ends. The temporary embankment and aggregate base placed on the west side is to transition and shift two-way traffic to the new concrete for phase 3.

Phase 3: Two-way traffic shall be shifted to the new concrete on the west side during this phase. The east work zone includes concrete paving on the east of ND 1804 and removal of the temporary embankment and aggregate base placed in phase 1. Upon completion of the concrete paving, traffic shall be returned to the center of ND 1804, and the temporary widening shall also be removed from the west side of ND 1804 that was placed in phase 2.

The temporary embankment and aggregate base course removed from ND 1804 in phase 3 shall be incorporated back into ND 23B. All costs associated with the installation, maintenance, removal and incorporation of temporary embankment and temporary aggregate base shall not be paid for separately, but included in the unit price bid for "Borrow-Excavation", "Common Excavation Type A" and "Temporary Traffic Surface Aggregate".

ND Highway 23 Widening

Work for ND Highway 23 includes removal of existing shoulder, widening, aggregate base course, and concrete paving. ND Highway 23 shall remain open to two-way traffic at all times. Traffic should be shifted away from the work area per NDDOT Standard Drawing D-704-15, Type C. For westbound traffic only, the W20-5-48 signs and the sequencing arrow panel are not required. Double yellow removable marking tape shall be placed in addition to the tubular markers that separate head to head traffic. The widened areas shall not be opened to traffic prior to the completion of final paving operations, pavement marking, and signing.

704-P03 **TRAFFIC CONTROL:** Work zone traffic control signing shall be in accordance with the NDDOT Standard Specifications. All road closures or alternate work zone traffic control plans shall be submitted to the Engineer 7 days prior to placement and shall be approved by the Project Engineer. All businesses and residents with driveways/access points affected by the reconstruction process shall be notified 7 days prior to the closure of any access and shall have a temporary access constructed, as approved by the Project Engineer and the access owner.

Should the Contractor desire to proceed on a schedule other than as proposed by the plans any cost associated with the modification of the proposed traffic control plan, provision for additional easement, lighting or other traffic control features as the revised plan may require, will become the responsibility of the Contractor. The traffic control plans shall be approved by the Engineer.

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Flagging will be required when the Contractor's traffic conflicts with public traffic and local access. Flagging shall be signed as indicated on Standard Drawing D-704-15, Type A. There will be trucks hauling materials and these trucks will be entering or crossing roadways that have public traffic. These locations will have to be signed as shown on Standard Drawings D-704-22, Type K and L.

The Contractor shall leave the work area free of all hazards during nonworking hours. The traffic control devices shall be removed at the end of each day and reinstalled when work commences.

If a hazard exists after working hours, the Contractor shall leave the required traffic control devices and provide flag persons at his own expense until the hazard has been eliminated. Hazards are steep embankment areas, less than 4:1 and a vertical drop over 2".

704-P04 **TRAFFIC CONTROL DEVICES LIST:** The Traffic Control Devices list has been developed using the following layouts and standard drawings for traffic control:

1. Standard D-704-15, Layout C: For one lane closure/shift of mutli-lane roadway
2. Standard D-704-22, layouts K and L: For trucks hauling material.
3. Standard D-704-24, layouts R: For shoulder work (tubular markers).
4. Standard D-704-26, layouts Z, BB, EE, GG, F: as applicable.
5. Standard D-704-27, Moving operations (pavement marking)
6. Traffic Control Drawings in Section 100 of the plans.
7. Standard Drawings D-704-5, 7, 8, 9, 10, 11, 13, 14, 37 and 50 are applicable.

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.

704-P05 **STACKABLE VERTICAL PANEL:** The stackable vertical panel made of hollow low density polyethylene orange plastic panel which is held in an upright position by a molded rubber base shall be provided.

The panel shall be a minimum 43 inches high with a minimum bottom dimension 15 inches x 9 inches. The panel shall be held down with a molded rubber base. The minimum weight of the panel shall be 4 pounds. The minimum weight of the molded rubber base shall be 30 pounds.

The reflective sheeting shall have a minimum width of 8 inches and 36 inches long. The reflective sheeting shall be as specified for vertical panel and shall have 6" wide stripes sloping downward at an angle of 45 degrees in the direction vehicular traffic is to pass. The reflective sheeting shall be on both sides of the Stackable Vertical Panels. The Stackable Vertical Panel shall meet the requirements of NCHRP Report 350 as a Category II Traffic Control Device.

The item "Stackable Vertical Panel" shall be measured by the number of each installed. The quantities measured will be paid for at the contract price and be shall be full compensation for all labor, equipment, materials, relocation and removal, necessary to complete the installation.

704-P06 **TRAFFIC CONTROL SUPERVISOR:** Traffic control supervisor shall be provided on this project and meet qualifications as per Section 704.03 U.1 of the NDDOT Standard Specifications. The traffic control supervisor shall be solely dedicated to traffic control duties. The traffic control supervisor shall not have any other duties on the project.

704-P07 **TRAFFIC CONTROL:** When the Engineer notifies the Contractor, Traffic Control Supervisor, or Watchperson of the need for traffic control to be furnished, installed, relocated, maintained, removed, or otherwise revised; the Contractor, Traffic Control Supervisor, or Watchperson must be on the project addressing the issue within one hour of the notification and, if additional resources or time are needed, determining an action plan and an estimated time of completion. When it's determined additional resources are needed the Engineer and the traffic control personnel onsite will agree to an estimated time of completion.

If the Contractor, Traffic Control Supervisor, or Watchperson fails to comply, the Engineer will perform any combination of the following:

1. The Engineer will apply a contract price reduction of $750 if the Contractor, Traffic Control Supervisor, or Watchperson is not on the project addressing the issue within one hour.
2. The Engineer will apply a contract price reduction of $750 for every day the work is not completed after the estimated time of completion.
3. The Engineer will have the work completed by other means, without additional notification, and deduct the cost of the work from monies due or to become due the Contractor.
4. The Engineer will direct all other work to cease until the deficiencies have been corrected.

706-P01 **FIELD OFFICE:** The Contractor shall provide a field office which meets the following requirements:

1. The field office shall be a minimum of 450 square feet.
2. Indoor bathroom facilities.
3. Air conditioner (20,000 BTU minimum)
4. Lighting (lumens required 110 foot-candles)
5. Minimum of 3 phone jacks (Engineer to pay for phone services)
6. Location where wired high-speed internet service is available.
7. Heat, electric, sewer, and water hookups to be furnished by Contractors, Contractor to pay utility bills.
8. Cabinet space of a minimum of 32 cubic feet.
9. Counter space of a minimum of 40 square feet.
10. The floor is to be free of protrusions so that it will accommodate Engineer furnished office equipment.
11. Photocopy machine capable of 11x17 photocopies and toner to last the duration of the project. Engineer will provide paper.
12. The location of the field office shall be on, or as close to the project as possible and approved by the Engineer. Any rental fees shall be paid by the Contractor.
13. The field office shall be available for occupancy one week prior to the start of the project and remain available to project completion.

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All requirements of the Field Office are subject to approval by the Engineer. Payment for the field office shall be under the bid item “Field Office”.

706-P02 **FIELD LABORATORY:** The Contractor shall place a Type B, Field Laboratory on the project site a minimum of one week before the project begins. The lab shall remain on site until the project is complete. The Type C Field Laboratories will only be required during the paving operation. The Contractor shall provide a two Gyratory Compactors. One Gyratory Compactor shall be placed Engineers laboratory and one placed in the Contractors laboratory.

706-P03 **FIELD LABORATORY TYPE-B&C:** The Contractor shall supply a copy machine with reduction capabilities for each Field Laboratory. The copy machine shall not use thermal type paper. The payment for these items will be included in the price bid for "Field Laboratory-Type B" and "Field Laboratory-Type C."

708-P01 **SEEDING:** Seeding – Type B – Class IV and V shall be used for the project. Class V seeding is a warm season mix and shall be applied between June 15 and September 1 unless approved by the Engineer.

Type V Seeding Mixture		
Grass Species	**Variety**	**Pounds Pure Live Seed per Acre**
Blue Grama	Bad River	0.6
Green Needlegrass	Lordom,Fowler, AC Mallard	1.2
Sideoats Grama	Killdeer	1.8
Western Wheatgrass	Rodan, Rosana	2.4
Big Bluestem	Bison	0.3
Little Bluestem	Itasca, Badlands	0.6
Slender Wheatgrass	Dacotah	1.0
Prairie Junegrass		0.1
Canada Wildrye		1.3
Purple prairieclover		0.05
Prairie (Yellow) Coneflower		0.19
Western Yarrow		0.02
Black-eyed Susan		0.04
Blanket flower		0.35

708-P02 **MULCHING:** All excavation and embankment areas shall be stabilized with mulch immediately following the application of Type B – Class IV and Class V seeding. Mulching may be used as a BMP to meet SP 1010(08) - Temporary Erosion and Sediment Best Management Practices, as directed by the Engineer.

709-P01 **GEOTEXTILE FABRIC – TYPE R1:** An additional quantity of 5,000 square yards of Geotextile Fabric – Type R1 has been provided for use over unstable soils when directed by the Project Engineer.

714-P01 **GROUNDWATER:** If areas of free water are encountered during construction, drainage shall be provided. No separate payment will be paid for dewatering to accommodate construction activities.

714-P02 **PIPE CONDUIT - APPROACH:** The Contractor shall verify approach pipe lengths with the Engineer prior to ordering or fabricating pipe conduit – approach.

714-P03 **PLUG PIPE – ALL TYPES & SIZES:** The Contractor shall remove the existing end sections from any pipes to be plugged and shall fill the existing pipe with controlled density “Flowable Fill” to refusal. The properties of the flowable fill shall be a blend of cement, water, pozzolanic materials, and fillers. The material shall be fluid on placement to flow through and fill the voids. The material shall be able to support normal loads after six hours and shall have a compressive strength in the range of 75 psi to 125 psi at 28 days. The material shall be such that it lends itself to easy removal with tractor backhoe. If the mix design shown is used no further testing will be required. The mix designs yield approximately one cubic yard of flowable mortar.

MIX DESIGN	
Fly Ash	300 lbs
Water	70 gals
Cement	100 lbs
Fine Aggregate	2600 lbs

All costs associated with plugging pipes shall be included in the price bid for “Plug Pipe – All Types and Sizes”.

714-P04 **JACKED OR BORED CONDUIT:** The method used to install the conduits indicated as jacked on the plans shall be left to the discretion of the contractor. The boring or jacked methods are acceptable.

If smooth walled steel pipe is to be used, this material shall be welded steel pipe of new material, meeting ASTM Specifications A-139, Grade B with a minimum yield strength of 35,000 psi. No hydrostatic testing will be performed. The following minimum wall thickness shall be used:

Diameter of Pipe	Minimum Wall Thickness Through Roadway Embankment
36 inches	0.469 inch
42 inches	0.500 inch

If the contractor opts to install reinforced concrete pipe through the roadway, the bored or jacked sections shall be CL III, except that the concrete shall have a minimum compressive strength of 6,000 psi. Sections which will not be bored or jacked, and end sections may be CL III reinforced concrete pipe.

If the contractor opts to install smooth wall steel pipe by boring, pipe sections on each end which do not require boring, and the end sections, may be either aluminum coated spiral rib corrugated steel pipe having a minimum wall thickness of 0.138 inches, with steel end sections, or CL III reinforced concrete pipe with concrete end sections. Smooth walled steel pipe shall be tied to reinforced concrete as shown on Standard Drawing D-714-16. Connections between smooth walled steel pipe and spiral rib corrugated steel pipe shall be as recommended by the pipe manufacturer, and approved by the engineer.

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Regardless of the method or type of pipe used, the price bid for jacked pipe shall be considered full compensation for the pipe and its installation. All costs for labor, equipment and materials required to install the pipe through the roadway by boring or jacking shall be included in the price bid for the items “Pipe Conduit 36 IN – Jacked or Bored” and “Pipe Conduit 42 IN – Jacked or Bored.”

714-P05 **BROKEN BACK PIPE INSTALLATION:** Pipes at the following location shall be installed as broken back pipes. Invert elevations can be found in the cross sections.

Station	Pipe Diameter (Inches)	Deflection Angle (Degree)	Sections of Pipe to Obtain Deflection
75+92.50	30	3.0	3
84+95.58	48	0.7	1
87+59.52	48	1.7	2
98+14.14	30	3.0	3
100+18.23	30	5.0	5
106+77.92	30	5.2	5
119+26.34	60	0.9	1

If reinforced concrete pipe is used, the deflection angle shall be installed gradually over the length of the number of sections listed in the table. Mortar and filter fabric shall be installed on all open joints.

If corrugated steel pipe or spiral rib pipe is used, a bend corresponding to the deflection angle listed in the table shall be fabricated and installed to provide for the change in pipe slope.

All costs of materials, equipment, and labor to install the broken back pipes as described above shall not be bid separately but be included in the price bid for the corresponding size of “Pipe Conduit”.

752-P01 **FENCE BARBED WIRE 5-STRAND:** Standard drawing D-752-1 shows the installation of 4-strand barbed wire. The additional strand of barbed wire required for the permanent 5-strand barbed wire fencing shall be installed 9” off the ground. All other strands shall be spaced at 9”. The line posts shall be steel and all other posts shall be wood. Refer to note 107-P03 for installation of permanent fencing in the avoidance areas.

754-P01 **FLEXIBLE DELINEATORS –TYPE D:** Flexible delineator base shall be surface mount attached to concrete with concrete lag bolts 3/8” x 3 ½” long. Flexible delineator shall be a minimum of 36” tall, yellow polyethylene and shall consist of either a minimum of two reflective sheeting bands or a flattened top with 3”x 9” sheeting on both sides. The 4” bands shall be placed 2” from the top with 4” between. The 3”x 9” sheeting shall be 2” from the top. The reflective sheeting shall be yellow diamond grade sheeting. All of the above material and labor shall be included in the unit price bid for “Flexible Delineators-Type D”.

770-P01 **LIGHT STANDARDS:** Light standards shall be a long radius-davit type mast arm. The pole shall be galvanized (inside and outside surfaces) steel with 40’ mounting height and mast length as indicated. All pole bases shall be transformer type breakaway. Hand hole shall be 180° from street side.

770-P02 **LUMINAIRE:** Luminaire shall be cobra-head style with constant wattage autoreg high pressure sodium ballast operating at 240-volts. An in-line fuse shall be installed on both phase conductors at the pole base. Refractor lens shall be glass with light distribution as noted on the plans.

772-100 **PAINT:** The traffic signal system components shall be painted in accordance with the following:

Transformer base – yellow
Mast arm – yellow
Signal head mounting hardware – yellow
Shaft – yellow
Signal housing – yellow
Pedestrian pushbutton housing – yellow

772-P01 **COMBINATION LIGHT AND SIGNAL STANDARD:** The luminaire extension shall be long radius davit type with 12’ mast arm and length as required for 40’ mounting height. Base of the standard shall be transformer type. Signal masts shall have the ability to be rotated. Luminaire extension shall be galvanized steel. Provide one spare 2” conduit stubbed from signal standard foundation, capped with expandable metal plug, and labeled as to which direction the stub is facing.

772-P02 **SIGNAL EQUIPMENT**: Traffic heads shall be LED type. The heads shall be cast aluminum. Signal plumbizer and pedestal adapters/collars shall be steel; aluminum equipment not acceptable. Astro brackets are approved for signal heads located at the end of the mast arm. Adjust mast arm lengths as required.

772-P03 **TRAFFIC CONTROL SYSTEM**

VOLUME DENSITY CONTROLLER: Shall be in a NEMA TS-1 cabinet. The Type P (59”x44”x27”) cabinet shall have a natural aluminum finish. Except as listed below, the controller shall be in full compliance with NDDOT Standard specifications Section 896.14.B except as modified:

896.14.B.3.d – Controller to have a minimum of 128k of RAM.
896.14.B.3.f – Controller to have an Option Module

The load switches shall be equipped with both input and output LED’s.
In addition to the required NDDOT Standard Specification labeling, the following items shall be labeled on the cabinet wiring diagram.
The video detection cameras shall be labeled on the detector panel adjacent to their termination point.
The field wire terminals for the signal head control cables shall be labeled with their respective phase number and direction.

Price bid for all labor, materials, and equipment required to install the new controller to be included in bid for “Traffic Signal System.” This shall include but not be limited to cabinet and auxiliary equipment. Connect all controller cabinet components as required to make the new controller equipment operational with the existing central control system.

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BATTERY BACKUP SYSTEM: The traffic controller shall be equipped with an “on-line” type Uninterruptible Power Supply (UPS) that provides power conditioning in both normal and backup mode. It shall be sized to provide backup power to the system for a minimum of 2 hours in full signalized operation and a minimum of 8 hours in flash operation. The UPS shall have aux contacts to put the system into flash operation. The UPS shall incorporate full power management and diagnostic function. Battery backup system equipment shall be installed in a separate natural aluminum finish cabinet, mounted to the side of the controller cabinet. Additional concrete foundation is required. Cost to be included in bid for “Traffic Signal System.”

NETWORK EQUIPMENT: A DSL modem shall be provided and installed in the controller cabinet. The modem shall be compatible with RTC (Reservation Telephone Coop) who is the City of New Town’s network service provider. The contractor shall make arrangements with the local telephone company to install a telephone line to the controller. All telephone company costs shall be included in contract as part of this pay item.
An Ethernet switch shall be provided and installed in the controller cabinet. It shall have eight 10/100megabit copper ports and two gigabit fiber optic ports. It shall be specifically designed to operate in the environment intended. Manufacturer: Ruggedcom #RS900G or equal. Cost to be included in bid for “Traffic Signal System.”

CONFLICT MONITOR TESTING: A complete controller conflict monitor test shall be performed by the contractor prior to unveiling the traffic heads. Not a separate pay item. Cost to be included in bid for “Traffic Signal System.”

FOUNDATION: Provide two spare 2” conduits stubbed from the signal controller cabinet, capped with expandable metal plugs, and labeled as to which direction the stubs are facing.

772-P04 **VIDEO DETECTION SYSTEM:** Shall have the capability to support four image sensor cameras as shown on the plans. The system shall be designed to operate satisfactorily in all weather conditions. It shall eliminate false actuations due to shadows and shall accurately detect all vehicles. The system shall be capable of transmitting continuous real-time digital video images from any camera to a remote computer over voice grade telephone lines. Image sensor cameras shall thermal imaging type high resolution with 320x240 Array Format. Camera shall be housed in a IP66 enclosure. Manufacturer: Flir FC-Series or equal. The processor shall accommodate at least five “tracking strips” per image sensor camera that detect presence of vehicles over large areas of roadway. Each tracking strip shall have 32 detection zones. The size and shape of the zones shall be user configurable. Output shall be compatible with volume density traffic controllers. Manufacturer: Econolite Autoscope Series. Cost for complete installation, setup, and programming to be included in the price bid for “Traffic Signal System.” Include one spare camera, one spare interface panel, and one spare processor.

772-P05 **PADLOCKS:** The contractor shall obtain all padlocks from the City of New Town. Padlocks shall be provided at no cost to the contractor.

772-P06 **FLASHING BEACON:** The type I controller shall be able to provide a connection between the controller and the 2 dual circuit flashers located in advance of the ND 23 and ND 23 Bypass. The flashing beacon shall begin flashing 8 seconds prior to the red signal indications being displayed for eastbound and westbound traffic on ND 23.

772-P07 **TRAFFIC CONTROL SYSTEM AND VIDEO DETECTION SYSTEM TRAINING:** The supplier(s) of the traffic control system and video detection system shall provide on-site training to representatives of the NDDOT, the Owner (City of New Town), and anyone on invitation by either. The training shall include one 8-hour session, covering all aspects of the traffic control system and video detection system reasonable for full operation of the system by the Owner. Cost for training shall be included in the price bid for “Traffic Signal System.”

894-100 **RETROREFLECTIVE SHEETING:** Provide Type IV retroreflective sheeting that meets ASTM D 4956, Type IV. Provide Type XI retroreflective sheeting that meets ASTM D 4956, Type XI

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ENVIRONMENTAL COMMITMENTS

ENVIRONMENTAL COMMITMENTS: The North Dakota Department of Transportation and the Federal Highway Administration have made several environmental commitments to various agencies and the public to secure approval of this project. The environmental commitments are as follows:

Commitment No. 1: Unavoidable impacts to wetlands will be mitigated at a NDDOT approved mitigation site. Approximately 0.37 natural/jurisdictional, 0.02 natural/non-jurisdictional, 0.00 artificial/jurisdictional, and 0.00 artificial/non-jurisdictional acres of wetlands will be impacted permanently, and 0.19 acres will be impacted temporarily.

Action taken/required: 0.39 acres of permanent impacts to wetlands will require mitigation. The NDDOT proposes to mitigate these impacts adjacent to ND Highway 23 right of way near RP 50.07 in the Missouri River Basin North Zone.

- All impacts to natural wetlands (natural/jurisdictional and natural/non-jurisdictional), regardless of size, as well as impacts greater than 0.10 acre to artificial/jurisdictional wetlands require mitigation.
- All artificial/non-jurisdictional, deep water (impacts greater than 6 feet), Other Waters less than 300 linear feet (determined by the USACE on a case by case basis), Preamble Wetlands, and temporary impacts do not require mitigation.

Wetland Impact Table

Wetland Number	Location	Long/Lat (Dec. Deg.)	Cowardin Class.	Wetland Type	Wetland Size (Acres)	Wetland Feature	USACE Jurisdictional Wetlands*	Wetland Impacts (acres)		WETLAND MITIGATION			
										Mitigation Required			
								Temp.	Perm.	11990	USACE	Location	Mitigation
1-E	Sec. 16, T152N, R92W	-102.458307 W 47.984395 N	PEMC/PEMA	Basin	14.4	Natural	Yes	0.10	0	NA	NA	NA	
1-W	Sec. 16, T152N, R92W	-102.462136 W 47.986493 N	PEMCh	Basin	9.83	Artificial	Yes	0	0	NA	NA	NA	
2	Sec. 16, T152N, R92W	-102.468384 W 47.991533 N	PEMC	Basin	0.07	Natural	No	0.01	0.01	Y	N	Onsite 1:1 @ Wetland 1-E	0.01
3	Sec. 16, T152N, R92W	-102.469202 W 47.991967 N	PEMC	Basin	0.01	Natural	No	0	0.01	Y	N	Onsite 1:1 @ Wetland 1-E	0.01
4	Sec. 8, T152N, R92W	-102.488845 W 47.997381 N	PABFh	Basin	0.47	Artificial	No	0	0	NA	NA	NA	
Stream 6	Sec. 16, T152N, R92W	-102.464242 W 47.987044 N	R4SB5/7	Stream/ Channel	.04 ac 480 ft	Natural	Yes	0	0	NA	NA	NA	
9	Sec. 16, T152N, R92W	-102.461078 W 47.980967 N	PEMCx	Basin	0.07	Artificial	No	0	0	NA	NA	NA	
11	Sec. 16, T152N, R92W	-102.465134 W 47.981271 N	PEMA	Basin	0.36	Natural	No	0	0	NA	NA	NA	
14	Sec. 9, 16, T152N, R92W	-102.453232 W 47.988752 N	PEMC	Sloped Wetland	17.62	Natural	Yes	0.08	0.37	Y	Y	Onsite 1:1 @ Wetland 1-E	0.37
15	Sec. 16, T152N, R92W	-102.450815 W 47.987855 N	PEMA	Basin	0.17	Natural	No	0	0	NA	NA	NA	
16	Sec. 16, T152N, R92W	-102.457529 W 47.991510 N	PEMC	Basin	0.14	Natural	No	0	0	NA	NA	NA	
17	Sec. 9, T152N, R92W	-102.468644 W 47.993135 N	PABFh	Basin	0.39	Artificial	Yes	0	0	NA	NA	NA	
21	Sec. 8, T152N, R92W	-102.478889 W 47.993707 N	PABFh	Basin	0.18	Artificial	No	0	0	NA	NA	NA	
				Totals	43.75 ac.			0.19	0.39				0.39

*A Wetland Jurisdictional Determinations were issued by the USACE on 3/21/2012, 8/6/2012, 12/7/2012, and 4/9/2013; NWO-2011-2398-BIS.

ENVIRONMENTAL COMMITMENTS

Potential Other Waters Impact											WETLAND MITIGATION			
				Size				Impacts to Potential Other Waters			Mitigation Required			
Number	Location	Long/Lat (Dec. Deg.)	Type	Acres	Linear Feet	Feature	USACE Jurisdictional*	Temp Linear Feet	Perm Linear Feet	Permanent Acres	11990	USACE	Location	Mitigation Acres
5-DC	Sec. 16, T152N, R92W	-102.46608 W 47.98879 N	Dry Channel	0.23	1130	Natural	Yes	0	0	0	NA	NA	NA	
13-DC	Sec. 16, T152N, R92W	-102.46307 W 47.98584 N	Dry Channel	0.09	241	Natural	Yes	0	0	0	NA	NA	NA	
			Totals	0.32	1371			0	0	0	NA	NA	NA	0

Total Permanent Impact Summary		Additional Impact Info for 404 Permit	
Wetland Type	Total (Acres)	Wetland Type	Total (Acres/Lf)
Natural/Non-JD	0.02	Permanent JD ≥ 0.10	0.37
Artificial /Non-JD	0	Temporary JD	0.18
Natural /JD	0.37	POW	0
Artificial /JD	0.00		
Totals	**0.39**		

Commitment No. 2: A Class III Cultural Resource Inventory was completed that recommended the project avoid identified sites important for preservation in place. During construction, the highway side of avoidance area will be fenced to ensure there are no impacts to sites 32MN933, 32MN852, 32MN911, 32MN989, 32MN853, 32MN988, 32MN984 and 32MN985.

Action taken/required: The contractor shall provide, place, maintain, and remove temporary safety fence as directed by NDDOT CRS. See plan note 107-P03 Avoidance Areas.

Commitment No. 3: Cultural Resource construction monitoring will occur on the project to ensure that any inadvertent discoveries will be immediately identified and handled appropriately. Construction monitoring will consist of an archaeologist and a representative of the Tribal Historic Preservation Office being present during topsoil stripping, temporary safety fence installation, existing fence removal, and permanent fence installation. Metcalf Archaeological Consultants conducted the cultural resource surveys for this project.

Action taken/required: The contractor shall hire a cultural resource firm to provide an archaeologist to conduct the cultural resource construction monitoring. The contractor shall also coordinate with the Tribal Historic Preservation Office to have a tribal representative present during the cultural resource monitoring. See Plan Note 107-P04 Cultural Resource Construction Monitoring.

Commitment No. 4: If roosting, foraging or in-flight whooping cranes are observed within one mile of the project site prior to the initiation of and/or during construction activities, construction work will cease until the U.S. Fish and Wildlife Service is contacted.

Action taken/required: The U.S. Fish and Wildlife Service will be contacted at (701)250-4042 within 24 hours or the next business day, whichever comes first. Following coordination with the USFWS, construction activities will resume if it is unlikely that the birds will be disturbed by the continuation of construction activities or after the bird(s) relocate beyond the disturbance area of the project site.

Commitment No. 5: The project is located within the migration corridor of the endangered whopping crane, and suitable stopover habitat for the whooping crane is present. Through consultation with the USFWS, measures to minimize impacts were identified.

ENVIRONMENTAL COMMITMENTS

Action taken/required: Line markers (bird diverters) will be added at a ratio of 2:1 linear feet to the relocated overhead utility lines.

Commitment No. 6: North Dakota Department of Game and Fish requested that disturbed areas be seeded with suitable native grass and forb species where appropriate.

Action taken/required: A specific seed mixture has been identified for use on all areas to be seeded permanently. See Plan Note 708-P01 for seeding mixture for Seeding Type B - Class V and associated requirements.

Commitment No. 7: The NDDOT or its agents and contractors will notify the Mandan, Hidatsa and Arikara (MHA) Environmental Division immediately if any hazardous waste spills occur within the boundaries of the MHA Nation associated with the project.

Action taken/required: The MHA Environmental Division will be contacted by phone immediately at (701) 627-4569 if a hazardous waste spill occurs during the construction of the project.

Permits Required: A Section 404 permit (US Army Corps of Engineers) and a National Pollutant Discharge and Elimination System (NPDES) Permit (through the EPA) are required.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	8	1

ESTIMATE OF QUANTITIES

Spec	Code	Item Description	Unit	State Share	Local Share	Total
103	0100	Contract Bond	L SUM	1		1
103	0200	Escrow of Bid Documentation	L SUM	1		1
107	0200	Cultural Resource Construction Monitoring	L SUM	1		1
201	0330	Clearing & Grubbing	L SUM	1		1
202	0112	Removal of Concrete	SY	2330		2330
202	0119	Saw Concrete	LF	2576		2576
202	0132	Removal of Bituminous Surfacing	SY	7,788		7,788
202	0153	Saw Bituminous Surfacing - Full Depth	LF	64		64
202	0169	Removal of End Section – All Types and Sizes	EA	4		4
202	0174	Removal of Pipe All Types and Sizes	LF	573		573
202	0312	Remove Existing Fence	LF	13,578		13,578
203	0101	Common Excavation - Type A	CY	347,630		347,630
203	0109	Topsoil	CY	101,135		101,135
203	0113	Common Excavation – Waste	CY	45,770		45,770
203	0121	Topsoil - Wetland	CY	1,700		1,700
203	0138	Common Excavation – Subcut	CY	3,400		3,400
203	0140	Borrow – Excavation	CY	613,220		613,220
216	0100	Water	M GAL	12,900		12,900
230	0300	Subgrade Preparation - Type A	STA	64		64
302	0120	Aggregate Base Course CL 5	TON	116,505		116,505
302	0314	Temporary Traffic Surface Aggregate	SY	5,950		5,950
401	0100	MC70 or 250 Liquid Asphalt	GAL	2,605		2,605
401	0150	SS1H or CSS1H or MS1 Emulsified Asphalt	GAL	7,191		7,191
401	0160	Blotter Material CL 44	TON	104		104
410	0215	Superpave FAA 45	TON	30,760		30,760
410	0445	PG 58-28 Asphalt Cement	TON	836		836
410	0464	PG 64-34 Asphalt Cement	TON	1,011		1,011
410	0910	Cored Sample	EA	126		160
550	0322	12.5IN Non Reinf Concrete Pvmt CL AE-Doweled	SY	35,551		35,551
702	0100	Mobilization	L SUM	1		1
704	0100	Flagging	MHR	200		200
704	1000	Traffic Control Signs	UNIT	2,923		2,923
704	1052	Type III Barricade	EA	37		37
704	1060	Delineator Drums	EA	130		130
704	1067	Tubular Markers	EA	140		140
704	1080	Stackable Vertical Panels	EA	255		255
704	1087	Sequencing Arrow Panel – Type C	EA	1		1
706	0200	Field Laboratory – Type B	EA	1		1
706	0300	Field Laboratory – Type C	EA	2		2
706	0400	Field Office	EA	1		1
708	1020	Rip Rap – Loose Rock	CY	403		403
708	1325	Silt Fence Supported	LF	2,755		2,755
708	1335	Removal Silt Fence Supported	LF	2,755		2,755
708	1430	Fiber Rolls 12IN	LF	59,480		59,480
708	1431	Removal Fiber Rolls 12IN	LF	30,715		30,715
708	1460	Fiber Rolls 20IN	LF	2,430		2,430
708	1461	Removal Fiber Rolls 20IN	LF	675		675
708	2260	Seeding - Type B - CL IV	ACRE	98.7		98.7
708	2280	Seeding - Type B - CL V	ACRE	98.7		98.7
708	5500	Mulching	ACRE	197.4		197.4
708	5651	ECB Type 2	SY	1,044		1,044

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	8	2

ESTIMATE OF QUANTITIES

Spec	Code	Item Description	Unit	State Share	Local Share	Total
709	0600	Geotextile Fabric – Type RR	SY	813		813
709	0701	Geotextile Fabric – Type R1	SY	21,787		21,787
714	4095	Pipe Conduit 15IN	LF	48		48
714	4106	Pipe Conduit 24IN - Approach	LF	705		705
714	4110	Pipe Conduit 30IN	LF	1,309		1,309
714	4113	Pipe Conduit 30IN – Approach	LF	240		240
714	4115	Pipe Conduit 36IN	LF	96		96
714	4116	Pipe Conduit 36IN – Approach	LF	40		40
714	4120	Pipe Conduit 42IN	LF	233		233
714	4124	Pipe Conduit 36IN – Jacked or Bored	LF	488		488
714	4125	Pipe Conduit 48IN	LF	694		694
714	4135	Pipe Conduit 60IN	LF	850		850
714	4167	Pipe Conduit 42IN – Jacked or Bored	LF	104		104
714	9680	Plug Pipe – All Types & Sizes	EA	2		2
720	0100	Monuments	EA	106		106
720	0110	Right of Way Markers	EA	70		70
722	3455	Casting Inlet – Type 1	EA	1		1
722	3500	Inlet – Type 1	EA	1		1
748	0140	Curb & Gutter Type 1	LF	816		816
750	0200	Concrete Median Paving	LF	226		226
750	0210	Concrete Median Nose Paving	LF	19		19
752	0400	Fence Barbed Wire 5-Strand	LF	30,274		30,274
752	0911	Temporary Safety Fence	LF	3,280		3,280
752	2100	Gate - Vehicle	EA	10		10
752	3140	Corner Assembly Barbed Wire	EA	65		65
754	0110	Flat Sheet for Signs - Type XI Refl Sheeting	SF	338.7		338.7
754	0112	Flat Sheet for Signs - Type IV Refl Sheeting	SF	122.4		122.4
754	0193	Flexible Delineators – Type D	EA	4		4
754	0206	Steel Galv Posts – Telescoping Perforated Tube	LF	843.7		843.7
754	0805	Object Markers – Culverts	EA	35		35
760	0005	Rumble Strips – Asphalt Shoulder	MILE	0.21		0.21
762	0110	Epoxy Pvmt Mk 4IN Line-Grooved	LF	27,301		27,301
762	0112	Epoxy Pvmt Mk Message	SF	336		336
762	0113	Epoxy Pvmt Mk 4IN Line	LF	68,721		68,721
762	0115	Epoxy Pvmt Mk 8IN Line	LF	2,634		2,634
762	0117	Epoxy Pvmt Mk 24IN Line	LF	28		28
762	0132	Epoxy Pvmt Mk 8IN Line-Grooved	LF	5,626		5,626
762	0135	Epoxy Pvmt Mk 24IN Line-Grooved	LF	93		93
762	0136	Epoxy Pvmt Mk Message-Grooved	SF	488		488
762	0420	Short Term 4In Line - Type R	LF	13,346		13,346
762	1140	Pvmt Mk Painted Curb Top & Face	LF	816		816
762	1500	Obliteration of Pvmt Mk	SF	5,329		5,329
764	0115	3-Cable Guardrail	LF	962.5		962.5
766	0100	Reset Mailbox	EA	1		1
770	0001	Lighting System	EA	2		2
770	0003	Lighting System A	EA	-	1	1
772	0001	Traffic Signals System	L SUM	1		1
980	0050	Cattle Guard	EA	1		1

BASIS OF ESTIMATE

Highway 23B & Highway 1804

Surfacing:

Tack Coat: SS1H or CSS1H or MS1 @ 0.05 Gal/SY

Aggregate Base Course CL 5 @ 1.875 Ton/CY

Superpave FAA 45 @ 2.000 Ton/CY

PG 58-28 Asphalt Cement @ 6.0% of Superpave FAA 45 (Bottom Lifts)
PG 64-34 Asphalt Cement @ 6.0% of Superpave FAA 45 (Top Lifts)

160 cores are included for the Superpave FAA 45 in the “Cored Sample” quantity.

12.5” Non-Reinforced Concrete Pavement CL AE - Doweled

Highway 23 & 1804

Surfacing:

MC70 or 250 Liquid Asphalt @ 0.25 Gal/SY

Blotter Material CL 44 @ 20 LBS/SY

Aggregate Base Course CL 5 @ 1.875 Ton/CY

12.5” Non-Reinforced Concrete Pavement CL AE - Doweled

Highway 23B, Highway 23, Highway 1804

Water:

200 MGal/Mi for Dust Palliative
25 MGal/Mi for Subgrade Preparation
10 Gal/CY of embankment quantity for earthwork
20 Gal/Ton of aggregate base course

Topsoil:

Existing topsoil depths assumed as 12” for ND 23B, 6” for ND 1804, and 4” for ND 23.

Wetland Topsoil:

Existing topsoil depth assumed as 6” for all wetlands.

Common Excavation - Subcut:

“Common Excavation – Subcut” has been estimated for unsuitable material encountered within the roadway template in permanent wetland areas to an estimated depth of 3 feet.

Common Excavation – Waste

Location	Above Subgrade	Below Subgrade
Sta. 70+00 to 82+00 (Hwy 23B)	27,750 CY	-
Sta. 70+00 to 72+00 (Hwy 23B)	-	220 CY
Sta. 112+50 to 114+50 (Hwy 23B)	-	17,800 CY

Shrinkage:

25% additional volume has been added to Common Excavation –Type A and Borrow Excavation to account for shrinkage.

Cored Sample:

Location	Station	Bottom Lift	Middle Lift	Top Lift	District Cores	Total
ND 23B	20+34 to 160+93	40	40	40	6	126

Contractor Coring = 2 cores/sublot/lane/lift
District Cores = 1 full depth core/mile/lane

Subgrade Preparation Type A:

Location	Route	STA.
25+00 to 35+00	ND 23B	10
68+00 to 70+00	ND 23B	2
72+00 to 81+00	ND 23B	9
93+00 to 97+00	ND 23B	4
104+00 to 106+00	ND 23B	2
108+00 to 112+00	ND 23B	4
123+00 to 136+00	ND 23B	13
144+00 to 146+00	ND 23B	2
155+00 to 160+00	ND 23B	5
171+00 to 178+00	ND 23B	7
528+75 to 534+75	87th Ave NW	6
Total Subgrade Preparation - Type A		**64**

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BASIS OF ESTIMATE

Temporary Safety Fence:

Site (SITS Number)	Stationing	Temporary Safety Fence
32MN933	93+24 Lt to 97+80 Lt	510 LF
32MN852 & 32MN911	90+30 Rt to 97+80 Rt	876 LF
32MN989	102+73 Lt to 106+77 Lt	466 LF
32MN853	106+86 Rt to 109+92 Rt	438 LF
32MN988	107+73 Lt to 111+28 Lt	406 LF
32MN984	134+00 Lt to 137+00 Lt	300 LF
32MN985	147+72 Lt to 150+29 Lt	284 LF

Exact location of temporary safety fence will be determined in the field by an archaeologist and representative of the Tribal Historic Preservation Office (THPO).

Temporary Pavement Marking (Type R):

Location	Basis	Quantity
ND 1804 Phasing	4IN Center Line	6,406 LF
ND 23 Phasing	4IN Center Line	6,940 LF

Temporary pavement markings may be added or deleted at the discretion of the Project Engineer.

Temporary Surfacing:

				Temp. Traffic Surface Aggregate	Aggregate Base CL 5	MC70 or 250 Liquid Asphalt	Blotter Material CL 44
Location			Offset	Route	SY	SY	GAL	TON
13100+66	to	13105+05	Lt	ND 1804	214	-	54	2
13098+63	to	13133+30	Rt	ND 1804	5720	-	1430	57
13126+60	to	13127+54	Lt	ND 1804	16	-	4	0
13105+05	to	13126+88	12'-34' RT	ND 1804	-	4467	1117	45
				Pay Totals	5950	-	2605	104

Erosion Control Measures:

An additional 1,000 linear feet of Silt Fence Supported, 2,000 linear feet of 12” Fiber Rolls, and 500 linear feet of 20” Fiber Rolls have been provided to be used at the discretion of the Project Engineer.

Mulching:

Description	Quantity
Temporary Seeding and Erosion Control	98.7 ACRE
Permanent Seeding	98.7 ACRE

Flowable Fill:

Location	Description	Quantity
11315+55 (ND1804)	Plug CL Pipe	15 CY
2716+72 (ND 23)	Plug CL Pipe	48 CY

Mailboxes:

Location	Description	Quantity
532+30.9 Lt (87th Ave NW)	Reset	1 EA

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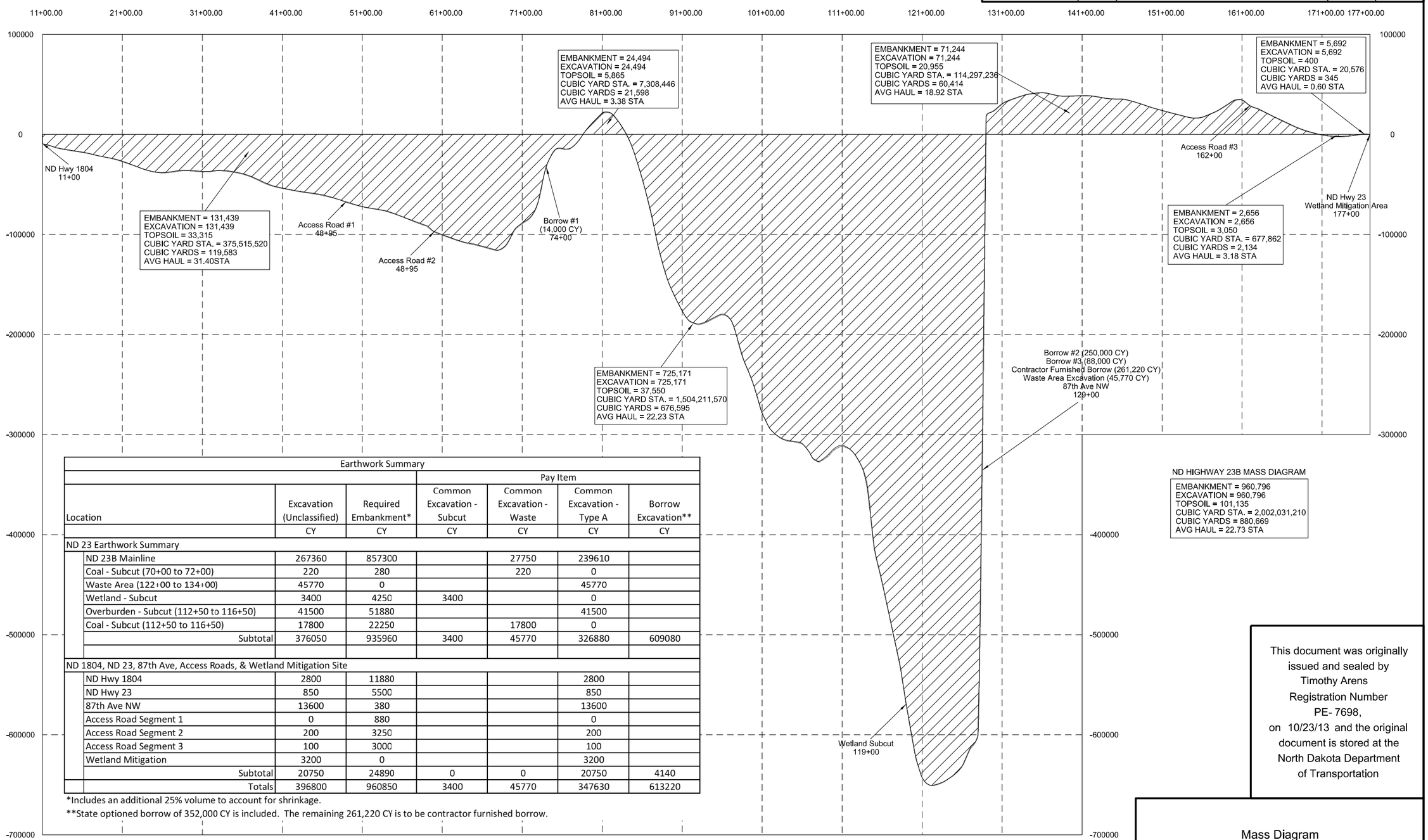
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	11	1



ND HIGHWAY 23B MASS DIAGRAM

EMBANKMENT = 960,796
EXCAVATION = 960,796
TOPSOIL = 101,135
CUBIC YARD STA. = 2,002,031,210
CUBIC YARDS = 880,669
AVG HAUL = 22.73 STA

Earthwork Summary

Location	Excavation (Unclassified)	Required Embankment*	Pay Item: Common Excavation - Subcut	Pay Item: Common Excavation - Waste	Pay Item: Common Excavation - Type A	Borrow Excavation**
	CY	CY	CY	CY	CY	CY
ND 23 Earthwork Summary						
ND 23B Mainline	267360	857300		27750	239610	
Coal - Subcut (70+00 to 72+00)	220	280		220	0	
Waste Area (122+00 to 134+00)	45770	0			45770	
Wetland - Subcut	3400	4250	3400		0	
Overburden - Subcut (112+50 to 116+50)	41500	51880			41500	
Coal - Subcut (112+50 to 116+50)	17800	22250		17800	0	
Subtotal	376050	935960	3400	45770	326880	609080
ND 1804, ND 23, 87th Ave, Access Roads, & Wetland Mitigation Site						
ND Hwy 1804	2800	11880			2800	
ND Hwy 23	850	5500			850	
87th Ave NW	13600	380			13600	
Access Road Segment 1	0	880			0	
Access Road Segment 2	200	3250			200	
Access Road Segment 3	100	3000			100	
Wetland Mitigation	3200	0			3200	
Subtotal	20750	24890	0	0	20750	4140
Totals	396800	960850	3400	45770	347630	613220

*Includes an additional 25% volume to account for shrinkage.

**State optioned borrow of 352,000 CY is included. The remaining 261,220 CY is to be contractor furnished borrow.

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Mass Diagram
Sta 11+00 to 177+10
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-023(037)927	11	2

Earthwork Summary

Station	End Area (SF)		Volume (CY)				
	Excavation	Fill	Excavation	Fill	Excavation (Other)	Fill (Other)	Mass Ordinate
11+00.00	155.6	504.1	0	0	2400	11880	-9480
11+16.00	136.3	506.3	86	299	0	0	-9693
12+00.00	0.0	742.0	212	1942	0	0	-11423
12+12.00	0.0	815.1	0	346	0	0	-11769
12+44.00	169.1	818.5	100	968	0	0	-12637
12+79.00	150.2	686.1	207	975	0	0	-13405
13+00.00	139.7	612.1	113	505	0	0	-13797
14+00.00	133.1	503.3	505	2066	0	0	-15358
15+00.00	112.9	444.0	456	1754	0	0	-16656
16+00.00	39.2	363.1	282	1495	0	0	-17869
16+87.00	0.0	510.9	63	1408	0	0	-19214
17+00.00	0.0	527.9	0	250	0	0	-19464
17+16.00	0.0	535.0	0	315	0	0	-19779
17+41.00	0.0	517.0	0	487	0	0	-20266
18+06.00	0.0	408.9	0	1115	0	0	-21381
19+00.00	0.0	417.8	0	1439	0	0	-22820
19+16.00	0.0	450.4	0	257	0	0	-23077
20+00.00	0.0	618.5	0	1663	0	0	-24740
20+45.00	0.0	695.5	0	1095	0	0	-25835
20+96.00	0.0	761.4	0	1376	0	0	-27211
21+00.00	0.0	758.4	0	113	0	0	-27324
22+00.00	0.0	715.6	0	2730	0	0	-30054
22+16.00	0.0	778.1	0	443	0	0	-30497
23+00.00	0.0	794.4	0	2446	0	0	-32943
23+61.00	0.0	752.1	0	1747	0	0	-34690
24+00.00	0.0	629.5	0	998	0	0	-35688
25+00.00	45.3	394.9	84	1897	0	0	-37501
26+00.00	229.8	264.5	509	1221	0	0	-38213
27+10.00	415.4	17.0	1314	573	0	0	-37472
28+00.00	289.1	18.3	1174	59	0	0	-36357
28+73.00	187.4	184.6	644	274	0	0	-35987
29+00.00	152.5	242.4	170	214	0	0	-36031
29+90.00	100.8	296.3	422	898	0	0	-36507
31+00.00	50.9	176.1	309	962	0	0	-37160
31+90.00	409.9	86.9	768	438	0	0	-36830
32+56.00	269.3	84.3	830	209	0	0	-36209
33+06.00	132.7	130.9	372	199	0	0	-36036
33+10.00	125.4	137.1	19	20	0	0	-36037
33+95.00	67.4	300.3	303	689	0	0	-36423
34+00.00	71.3	310.4	13	57	0	0	-36467
35+00.00	65.3	485.9	253	1475	0	0	-37689
35+23.00	83.8	484.5	64	413	0	0	-38038
36+00.00	34.3	576.9	168	1513	0	0	-39383
37+00.00	51.6	929.1	159	2789	0	0	-42013
37+12.00	43.7	956.8	21	419	0	0	-42411
37+26.00	34.5	991.4	20	505	0	0	-42896
37+58.00	0.0	1023.8	20	1194	0	0	-44070
37+92.00	0.0	1045.9	0	1303	0	0	-45373
38+00.00	0.0	1047.0	0	310	0	0	-45683
39+00.00	0.0	942.6	0	3684	0	0	-49367
40+00.00	0.0	511.6	0	2693	0	0	-52060
41+00.00	0.0	407.6	0	1702	0	0	-53762
42+00.00	0.0	425.8	0	1543	0	0	-55305
43+00.00	0.0	382.9	0	1498	0	0	-56803
44+00.00	0.0	296.5	0	1258	0	0	-58061
45+00.00	0.0	343.1	0	1184	0	0	-59245
46+00.00	0.0	462.0	0	1491	0	0	-60736
47+00.00	0.0	539.5	0	1855	0	0	-62591
48+00.00	0.0	543.3	0	2005	0	0	-64596
48+95.00	0.0	653.0	0	2105	0	880	-67581
49+88.00	0.0	608.6	0	2173	0	0	-69754

Earthwork Summary

Station	End Area (SF)		Volume (CY)				
	Excavation	Fill	Excavation	Fill	Excavation (Other)	Fill (Other)	Mass Ordinate
51+05.00	0.0	482.9	0	2365	0	0	-72119
52+00.00	0.0	347.8	0	1461	0	0	-73580
52+42.00	0.0	349.0	0	542	0	0	-74122
53+00.00	0.0	393.0	0	797	0	0	-74919
53+70.00	0.0	526.0	0	1191	0	0	-76110
54+00.00	0.0	587.1	0	618	0	0	-76728
54+87.00	0.0	720.3	0	2106	0	0	-78834
55+00.00	0.0	739.5	0	351	0	0	-79185
56+00.00	0.0	879.3	0	2998	0	0	-82183
57+00.00	0.0	916.1	0	3325	0	0	-85508
57+90.00	0.0	766.9	0	2805	0	0	-88313
58+57.00	0.0	788.1	0	1929	0	0	-90242
58+62.00	0.0	786.0	0	146	0	0	-90388
58+70.00	0.0	783.0	0	232	0	0	-90620
59+00.00	0.0	781.9	0	869	0	0	-91489
60+00.00	0.0	794.5	0	2919	200	3250	-97458
61+00.00	0.0	823.1	0	2996	0	0	-100454
62+00.00	0.0	798.3	0	3003	0	0	-103457
62+01.00	0.0	796.4	0	30	0	0	-103487
63+00.00	0.0	662.5	0	2675	0	0	-106162
63+17.00	0.0	630.0	0	407	0	0	-106569
63+85.00	0.0	626.3	0	1582	0	0	-108151
64+00.00	15.4	515.5	4	317	0	0	-108464
64+46.00	27.0	383.3	36	766	0	0	-109194
65+00.00	33.9	549.1	61	932	0	0	-110065
65+15.00	33.3	563.3	19	309	0	0	-110355
66+00.00	50.6	604.4	132	1838	0	0	-112061
67+00.00	0.0	627.5	94	2281	0	0	-114248
68+00.00	153.8	224.9	285	1579	0	0	-115542
69+00.00	3036.1	0.0	5907	416	0	0	-110051
70+00.00	4712.6	0.0	14349	0	0	0	-95702
71+00.00	859.5	0.0	10319	0	0	3166	-88549
72+00.00	5376.0	0.0	11547	0	0	5820	-82822
72+90.00	6847.5	0.0	20373	0	0	6490	-68939
74+00.00	6357.9	0.0	26900	0	14000	4082	-32121
75+10.00	2024.8	0.0	17076	0	0	550	-15595
75+59.00	68.8	192.8	1900	175	0	0	-13870
75+66.00	107.6	299.0	23	64	0	0	-13911
75+88.00	102.9	466.1	86	312	0	0	-14137
76+00.00	0.0	519.3	23	219	0	0	-14333
76+12.00	172.3	509.8	38	229	0	0	-14524
76+15.00	177.9	503.0	19	56	0	0	-14561
77+00.00	839.1	152.9	1601	1032	0	0	-13992
78+00.00	3261.5	0.0	7594	283	0	0	-6681
79+00.00	4003.6	0.0	13454	0	0	2152	4621
80+00.00	2539.7	0.0	12117	0	0	3330	13408
80+80.00	2787.4	0.0	7892	0	0	1499	19801
81+00.00	2089.6	0.0	1806	0	0	263	21344
82+00.00	0.0	1618.0	3870	2996	0	620	21598
83+00.00	0.0	2957.3	0	8473	0	0	13125
83+20.00	0.0	3159.6	0	2266	0	0	10859
84+00.00	0.0	3923.4	0	10493	0	0	366
84+48.00	0.0	4855.1	0	7803	0	0	-7437
84+56.00	0.0	5072.9	0	1471	0	0	-8908
84+92.00	0.0	6238.9	0	7541	0	0	-16449
85+00.00	0.0	6535.1	0	1892	0	0	-18341
85+47.00	0.0	7506.3	0	12221	0	0	-30562
86+00.00	0.0	6914.4	0	14154	0	0	-44716
87+00.00	0.0	9130.6	0	29713	0	0	-74429
87+47.00	0.0	11068.6	0	17581	0	0	-92010
87+50.00	0.0	11141.4	0	1234	0	0	-93244

Earthwork Summary

Station	End Area (SF)		Volume (CY)				
	Excavation	Fill	Excavation	Fill	Excavation (Other)	Fill (Other)	Mass Ordinate
87+66.00	0.0	10782.1	0	6496	0	0	-99740
88+00.00	0.0	9676.1	0	12881	0	0	-112621
89+00.00	0.0	6022.4	0	29071	0	0	-141692
90+00.00	0.0	4425.4	0	19348	0	0	-161040
90+30.00	0.0	4336.4	0	4868	0	0	-165908
91+00.00	0.0	3850.4	0	10613	0	0	-176521
91+57.00	0.0	2806.1	0	7026	0	0	-183547
92+00.00	0.0	1572.8	0	3487	0	0	-187034
93+00.00	274.6	133.9	509	3161	0	0	-189686
94+00.00	1070.6	0.0	2491	248	0	0	-187443
95+00.00	1182.1	0.0	4172	0	0	0	-183271
96+00.00	505.9	3.9	3126	7	0	0	-180152
97+00.00	0.0	3014.9	937	5590	0	0	-184805
97+76.00	0.0	8125.4	0	15679	0	0	-200484
98+00.00	0.0	8407.8	0	7348	0	0	-207832
98+79.00	0.0	5603.3	0	20498	0	0	-228330
99+00.00	0.0	4969.5	0	4112	0	0	-232442
99+53.00	0.0	4826.0	0	9614	0	0	-242056
100+00.00	0.0	7529.6	0	10754	0	0	-252810
100+77.00	0.0	7026.0	0	20755	0	0	-273565
100+81.00	0.0	6805.5	0	1025	0	0	-274590
101+00.00	0.0	5842.8	0	4450	0	0	-279040
101+80.00	0.0	3165.4	0	13345	0	0	-292385
102+00.00	0.0	2757.8	0	2194	0	0	-294579
103+00.00	0.0	1263.3	0	7446	0	0	-302025
104+00.00	345.9	1210.3	641	4581	0	0	-305965
105+00.00	386.7	176.3	1357	2568	0	0	-307176
105+76.00	151.1	1260.4	757	2022	0	0	-308441
106+00.00	0.0	1358.4	67	1164	0	0	-309538
106+15.00	0.0	1566.6	0	813	0	0	-310351
106+81.00	0.0	3843.4	0	6612	0	0	-316963
107+00.00	0.0	4078.3	0	2787	0	0	-319750
107+16.00	0.0	3653.8	0	2291	0	0	-322041
107+19.00	0.0	3464.8	0	395	0	0	-322436
107+45.00	0.0	2116.4	0	2687	0	0	-325123
108+00.00	140.3	42.8	143	2199	0	0	-327179
108+06.00	308.8	0.0	50	5	0	0	-327134
109+00.00	2349.1	0.0	4627	0	0	0	-322507
110+00.00	1865.3	0.0	7804	0	0	0	-314703

Note: 25% additional volume included in earthen embankment due to shrinkage.

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Earthwork Summary

ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-023(037)927	11	3

Earthwork Summary

Station	End Area (SF)		Volume (CY)				
	Excavation	Fill	Excavation	Fill	Excavation (Other)	Fill (Other)	Mass Ordinate
110+80.00	519.3	230.9	3533	342	0	0	-311512
111+00.00	354.2	423.5	324	242	0	0	-311430
112+00.00	0.0	2027.4	656	4539	0	0	-315313
113+00.00	0.0	3557.3	0	10342	0	0	-325655
114+00.00	0.0	7987.6	0	21379	0	0	-347034
115+00.00	0.0	9759.1	0	32864	41500	74130	-412528
115+65.00	0.0	9673.9	0	23392	0	0	-435920
116+00.00	0.0	9884.5	0	12677	0	0	-448597
116+26.00	0.0	9575.3	0	9370	0	0	-457967
117+00.00	0.0	10497.4	0	27507	0	0	-485474
117+74.00	0.0	9542.6	0	27462	0	0	-512936
118+00.00	0.0	9810.8	0	9318	0	0	-522254
118+21.00	0.0	10729.4	0	7988	0	0	-530242
119+00.00	0.0	13530.8	0	35492	0	4250	-569984
120+00.00	0.0	10768.8	0	44999	0	0	-614983
120+23.00	0.0	9637.4	0	8692	0	0	-623675
120+30.00	0.0	9331.8	0	2459	0	0	-626134
121+05.00	0.0	3775.0	0	18204	0	0	-644338
122+00.00	87.2	276.1	153	7127	0	0	-651312
123+00.00	0.0	161.9	161	811	1878	0	-650084
123+30.00	29.6	88.6	16	139	1022	0	-649185
123+68.00	288.7	0.0	224	62	1125	0	-647898
123+95.00	532.6	0.0	411	0	929	0	-646558
124+00.00	554.5	0.0	101	0	182	0	-646275
124+50.00	677.5	0.0	1141	0	1538	0	-643596
125+00.00	960.1	0.0	1516	0	1383	0	-640697
126+00.00	1400.6	0.0	4372	0	4165	0	-632160
127+00.00	1836.0	0.0	5994	0	11648	0	-614518
128+00.00	1712.6	0.0	6571	0	8988	0	-598959
129+00.00	895.7	0.0	4830	0	612820	380	18311
130+00.00	737.8	0.0	3025	0	2472	0	23808
131+00.00	495.7	14.6	2284	27	4440	0	30505
131+50.00	372.3	80.3	804	88	1571	0	32792
131+95.00	206.0	72.1	482	127	976	0	34123
133+00.00	347.5	15.6	1076	171	2278	0	37306
134+00.00	434.2	83.5	1448	184	1175	0	39745
135+00.00	444.2	131.8	1627	399	0	0	40973
135+50.00	360.5	105.1	745	219	0	0	41499
136+00.00	192.1	206.3	512	288	0	0	41723
136+38.00	0.0	338.8	135	384	0	0	41474
137+00.00	0.0	488.5	0	950	0	0	40524
137+58.00	0.0	487.8	0	1049	0	0	39475
138+00.00	0.0	465.3	0	741	0	0	38734
138+86.00	506.5	396.0	807	1372	0	0	38169
139+00.00	485.7	385.5	257	203	0	0	38223
140+00.00	313.6	300.8	1480	1271	0	0	38432
141+00.00	292.4	170.4	1122	873	0	0	38681
142+00.00	0.0	226.1	541	734	0	0	38488
143+00.00	0.0	312.5	0	997	0	0	37491
144+00.00	0.0	418.4	0	1354	0	0	36137
145+00.00	79.4	6.4	147	787	0	0	35497
146+00.00	39.7	271.2	221	514	0	0	35204
147+00.00	0.0	536.0	74	1495	0	0	33783
148+00.00	0.0	720.3	0	2326	0	0	31457
148+16.00	0.0	722.8	0	428	0	0	31029
149+00.00	0.0	764.8	0	2314	0	0	28715
149+44.00	0.0	686.1	0	1182	0	0	27533
149+93.00	0.0	599.8	0	1167	0	0	26366
150+00.00	0.0	599.4	0	155	0	0	26211
151+00.00	0.0	584.1	0	2192	0	0	24019
152+00.00	0.0	609.1	0	2210	0	0	21809

Earthwork Summary

Station	End Area (SF)		Volume (CY)				
	Excavation	Fill	Excavation	Fill	Excavation (Other)	Fill (Other)	Mass Ordinate
152+25.00	0.0	584.8	0	553	0	0	21256
153+00.00	0.0	544.9	0	1569	0	0	19687
153+75.00	0.0	539.1	0	1506	0	0	18181
154+00.00	0.0	527.3	0	494	0	0	17687
155+00.00	54.4	251.1	101	1441	0	0	16347
156+00.00	651.6	4.5	1307	473	0	0	17181
157+00.00	973.9	0.0	3010	8	0	0	20183
157+67.00	999.2	0.0	2448	0	0	0	22631
158+00.00	1153.1	0.0	1315	0	0	0	23946
158+16.00	1283.4	0.0	722	0	0	0	24668
159+00.00	1380.1	0.0	4143	0	0	0	28811
159+45.00	1438.1	0.0	2349	0	0	0	31160
160+00.00	1155.8	0.0	2642	0	0	0	33802
161+00.00	0.0	764.9	2140	1416	0	0	34526
162+00.00	181.4	986.0	336	3242	100	3000	28720
163+00.00	184.9	1082.5	678	3831	0	0	25567
164+00.00	198.2	1324.9	709	4458	0	0	21818
164+16.00	172.8	1292.4	110	775	0	0	21153
165+00.00	95.3	1146.9	417	3794	0	0	17776
165+44.00	67.5	1103.9	133	1834	0	0	16075
165+47.00	66.0	1104.3	7	123	0	0	15959
165+94.00	45.0	1096.5	97	1916	0	0	14140
166+00.00	42.2	1096.5	10	244	0	0	13906
167+00.00	0.3	1002.6	79	3887	0	0	10098
168+00.00	0.0	858.8	1	3447	0	0	6652
169+00.00	0.0	733.8	0	2949	0	0	3703
170+00.00	0.0	522.0	0	2326	0	0	1377
171+00.00	0.0	401.0	0	1709	0	0	-332
172+00.00	0.0	280.6	0	1262	0	0	-1594
173+00.00	83.4	94.1	154	694	0	0	-2134
173+38.00	115.1	77.3	140	121	0	0	-2115
173+42.00	118.1	75.8	17	11	0	0	-2109
174+00.00	190.1	42.0	331	127	0	0	-1905
174+70.00	310.4	11.3	649	69	0	0	-1325
175+00.00	334.5	19.3	358	17	0	0	-984
175+40.00	356.2	11.6	512	23	0	0	-495
176+00.00	283.0	41.3	710	59	0	0	156
176+20.00	301.2	17.1	216	22	0	0	350
177+00.00	282.9	55.9	865	108	4400	5500	7

Note: 25% additional volume included in earthen embankment due to shrinkage.

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Earthwork Summary

ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	20	1

Curve T23-1

PI Station	=	23+96.10
Delta	=	66°41'23" (Rt.)
Tangent	=	1250.20'
Radius	=	1900.00'
Length	=	2211.52'
Runout	=	64.29'
Runoff	=	153.06'
Full Super	=	5.0%

Station	Left Slope	Right Slope
11+03.82	+1.0	-1.0
PC 11+45.89	+1.0	-1.0
12+00.00	+1.0	-1.0
13+00.00	+2.1	-2.1
18+10.00	+2.1	-2.1
19+00.00	+3.0	-3.0
20+00.00	+4.0	-4.0
21+00.00	+5.0	-5.0
33+06.40	+5.0	-5.0
PT 33+57.42	+3.3	-3.3
34+59.46	0	-2.1
35+23.75	-2.1	-2.1

Curve T23-2

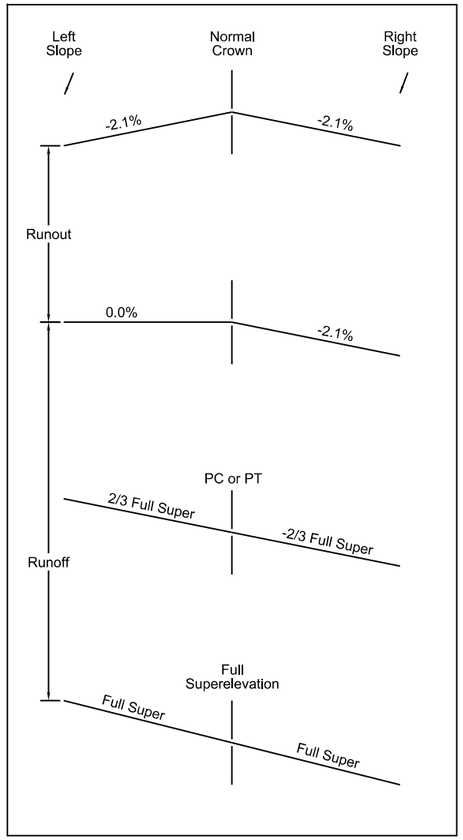
PI Station	=	58+60.91
Delta	=	38°52'43" (Lt.)
Tangent	=	434.10'
Radius	=	1230.00'
Length	=	834.63'
Runout	=	64.28'
Runoff	=	180.61'
Full Super	=	5.9%

Station	Left Slope	Right Slope
52+42.11	-2.1	-2.1
53+06.40	-2.1	0
PC 54+26.81	-3.9	+3.9
54+87.01	-5.9	+5.9
62+01.24	-5.9	+5.9
PT 62+61.44	-3.9	+3.9
63+81.85	-2.1	0
64+46.14	-2.1	-2.1

Curve T23-3

PI Station	=	95+56.53
Delta	=	5°09'14" (Lt.)
Tangent	=	418.55'
Radius	=	9300.02'
Length	=	836.54'
Runout	=	64.29'
Runoff	=	64.29'
Full Super	=	2.1%

Station	Left Slope	Right Slope
90+30.82	-2.1	-2.1
90+95.12	-2.1	0
PC 91+37.98	-2.1	+1.4
91+59.40	-2.1	+2.1
99+53.08	-2.1	+2.1
PT 99+74.51	-2.1	+1.4
100+17.37	-2.1	0
100+81.66	-2.1	-2.1



Curve T23-4

PI Station	=	111+89.43
Delta	=	17°52'18" (Rt.)
Tangent	=	424.54'
Radius	=	2700.00'
Length	=	842.18'
Runout	=	64.29'
Runoff	=	125.51'
Full Super	=	4.1%

Station	Left Slope	Right Slope
106+16.92	-2.1	-2.1
106+81.22	0	-2.1
PC 107+64.89	+2.7	-2.7
108+06.72	+4.1	-4.1
115+65.24	+4.1	-4.1
PT 116+07.07	+2.7	-2.7
116+90.74	0	-2.1
117+55.04	-2.1	-2.1

Curve T23-5

PI Station	=	131+42.19
Delta	=	70°32'42" (Rt.)
Tangent	=	753.30'
Radius	=	1065.00'
Length	=	1311.28'
Runout	=	64.28'
Runoff	=	183.67'
Full Super	=	6.0%

Station	Left Slope	Right Slope
122+02.16	-2.1	-2.1
122+66.44	0	-2.1
PC 123+88.89	+4.0	-4.0
124+50.12	+6.0	-6.0
136+38.95	+6.0	-6.0
PT 137+00.17	+4.0	-4.0
138+22.62	0	-2.1
138+86.91	-2.1	-2.1

Curve T23-6

PI Station	=	153+83.08
Delta	=	14°44'33" (Rt.)
Tangent	=	426.91'
Radius	=	3300.00'
Length	=	849.10'
Runout	=	64.29'
Runoff	=	113.27'
Full Super	=	3.7%

Station	Left Slope	Right Slope
148+16.36	-2.1	-2.1
148+80.66	0	-2.1
PC 149+56.17	+2.5	-2.5
149+93.92	+3.7	-3.7
157+67.51	+3.7	-3.7
PT 158+05.27	+2.5	-2.5
158+80.78	0	-2.1
159+45.07	-2.1	-2.1

Curve T23-7

PI Station	=	169+44.08
Delta	=	8°07'09" (Lt.)
Tangent	=	418.73'
Radius	=	5900.01'
Length	=	836.07'
Runout	=	64.29'
Runoff	=	67.35'
Full Super	=	2.2%

Station	Left Slope	Right Slope
164+16.16	-2.1	-2.1
164+80.45	-2.1	0
PC 165+25.35	-2.2	+1.4
165+47.80	-2.2	+2.2
173+38.97	-2.2	+2.2
PT 173+61.42	-2.1	+1.4
174+06.32	-2.1	0
174+70.61	-2.1	-2.1

Note: Calculations based on AASHTO method five. A design speed of 55 mph and maximum superelevation of 6% were used.

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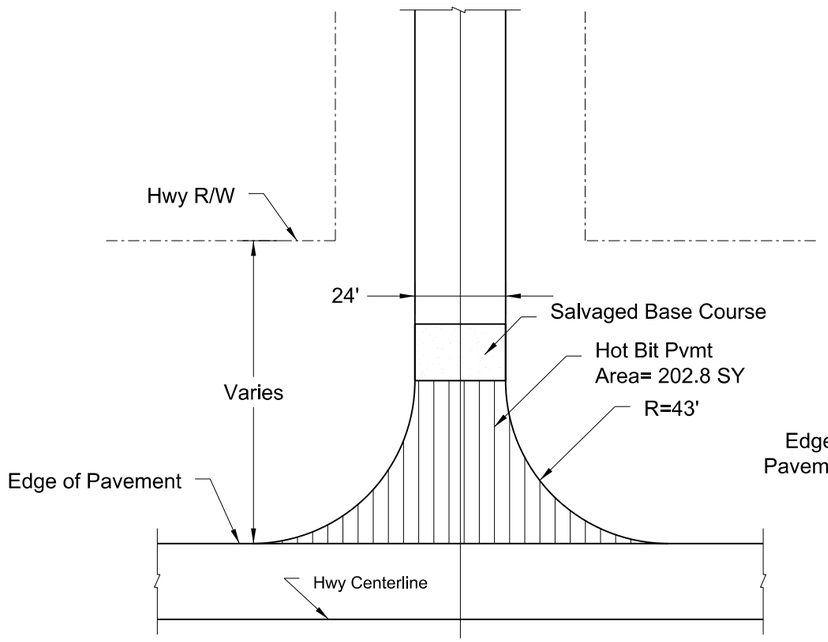
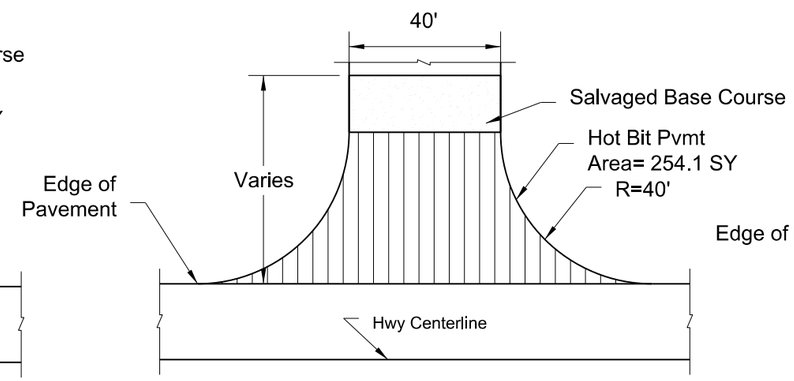
Superelevation Detail

ND 23B - Northeast Truck Reliever Route
New Town, ND

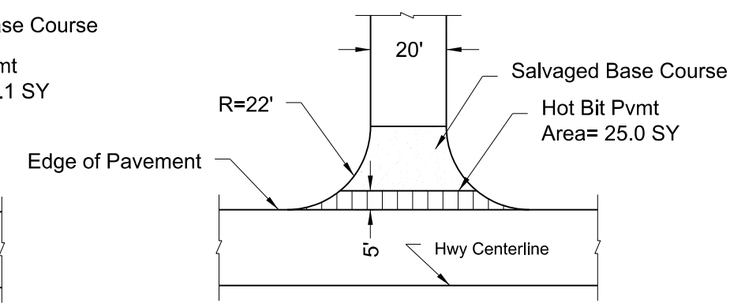
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	20	2



Section Line or Public Road Approach

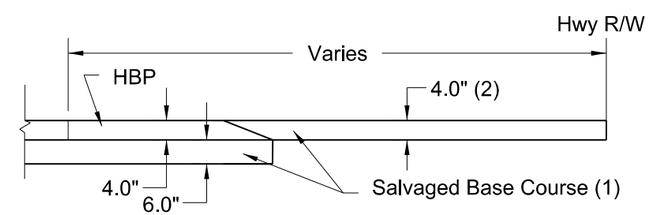


Commercial/Industrial Drive Approach



Field Drive Approach

Station	to	Station	O/S	Route	Access Type	Salvaged Base Course	SS1H or CSS1H or MS1 Emuls Asphalt	Superpave FAA 45	PG 64-34 Asphalt Cement
						TON	GAL	TON	TON
19+30			LT	ND 23B	Field	39.9	1.25	5.6	0.33
19+40			RT	ND 23B	Field	44.3	1.25	5.6	0.33
48+99			LT	ND 23B	Field	90.3	1.25	5.6	0.33
49+25		52+04	RT	ND 23B	Com/Access	410.7	12.71	56.5	3.39
56+41		64+02	RT	ND 23B	Access Rd	708.2	-	-	-
78+70			LT	ND 23B	Sec Line	125.6	10.14	45.1	2.70
78+70			RT	ND 23B	Sec Line	111.7	10.14	45.1	2.70
110+25			LT	ND 23B	Field	79.1	1.25	5.6	0.33
110+25			RT	ND 23B	Field	102.2	1.25	5.6	0.33
161+49			LT	ND 23B	Field	44.5	1.25	5.6	0.33
161+49		167+58	RT	ND 23B	Public/Access	763.2	10.14	45.1	2.70
174+85			RT	ND 23B	Field	36.6	1.25	5.6	0.33
2716+64			RT	ND 23	Sec Line	368.0	57.06	229.8	13.12
528+65		534+92	CL	87th Ave	Public/Township	624.2	10.14	45.1	2.70



Notes:
1. All approaches to include HBP on 6" salvaged base course.
2. Refer to typical sections for Access and Township Road (6" depth).

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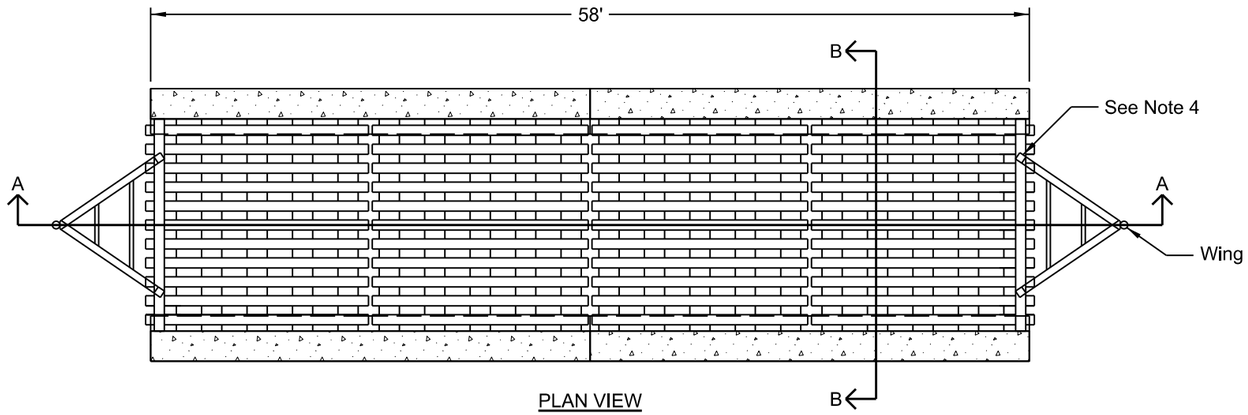
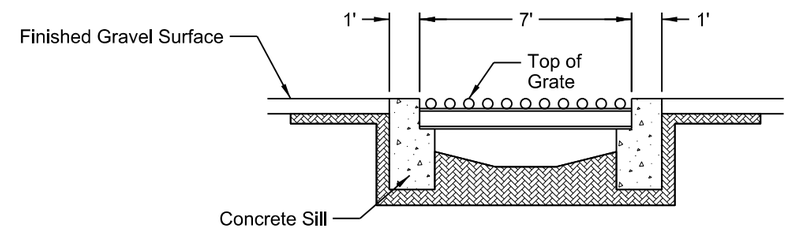
Approach Details

ND 23B - Northeast Truck Reliever Route
New Town, ND

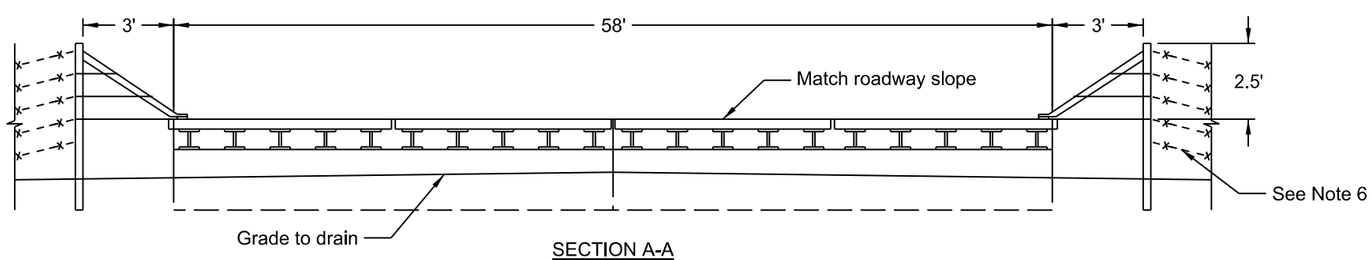
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	20	3



PLAN VIEW



SECTION B-B



SECTION A-A

NOTES:
1. Cattle Guard and supports to be designed for HS-25 loading.
2. Concrete Sill may be cast in place or precast. Place on minimum 6" aggregate bedding compacted to 95% density.
3. Round or flat tubing may be used for the top of grate.
4. Each end of the cattle guard shall have an attached wing.
5. Commercial or alternative cattle guard desgins may be used upon meeting the above requirements. Manufacturer's specifications and shop drawings to be submitted to the Engineer for approval.
6. Connect 5 strand barbed wire fence to wing. Refer to plans and NDDOT Standard Specifications for spacing of wire.
7. Location of cattle guard to be outside state right of way with 1' separation between right of way and edge of cattle guard.
8. All costs associated with the installation of the the cattle guard shall be included in the price bid for "Cattle Guard".
7. Drawing is not to scale.

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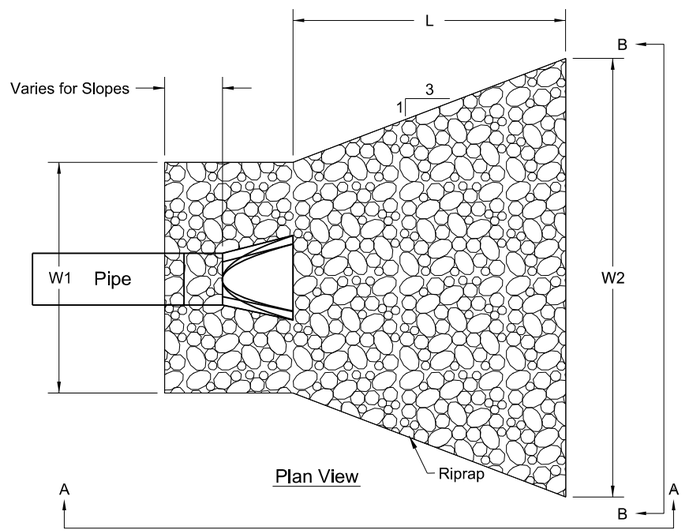
Cattle Guard Detail

ND 23B
Northeast Truck Reliever Route
New Town, ND

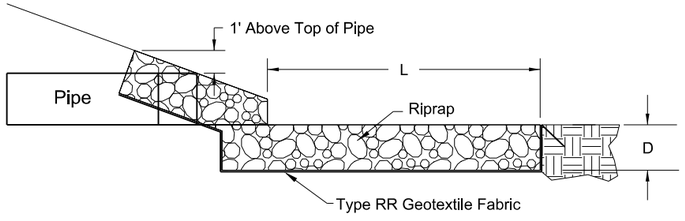
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	20	4



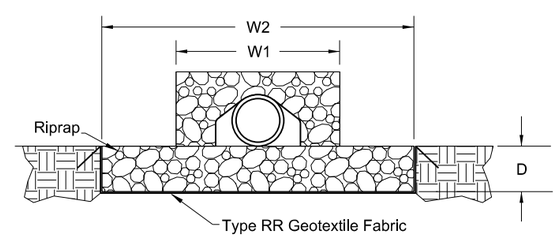
Plan View

Riprap Dimensions					
Culvert Diameter (inches)	L (feet)	W1 (feet)	W2 (feet)	Riprap Depth, D (inches)	Riprap Size, D50 (inches)
30	10	7.5	14.2	18	5
36	15	9	19	24	10
42	24.5	10.5	26.8	36	20
48	28	12	30.7	36	20

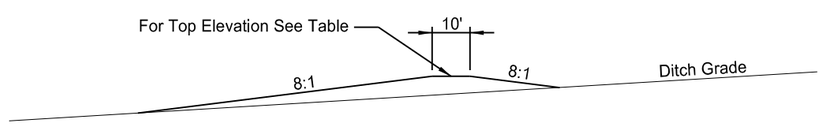
Installation Locations			
Station/Offset	Pipe Size	Riprap Quantity	Geotextile Fabric
ND 1804 13115+74	42"	62.4 CY	118.8 SY
17+21 Rt.	48"	81.1 CY	144 SY
20+62 Rt.	42"	62.4 CY	118.8 SY
37+60 Rt.	42"	62.4 CY	118.8 SY
58+63 Rt.	36"	22.2 CY	64.3 SY
84+96 Rt.	48"	81.1 CY	144 SY
161+50 Rt. (Approach)	30"	9.8 CY	39.5 SY
462+87 Rt. (Approach)	36"	22.2 CY	64.3 SY



Profile View - Section A-A



End View - Section B-B



Ditch Block

Installation Locations	
Station/Offset	Elevation
12+75 Lt.	1948.4
21+40 Lt.	1945.2
463+25 Lt.	1953.5

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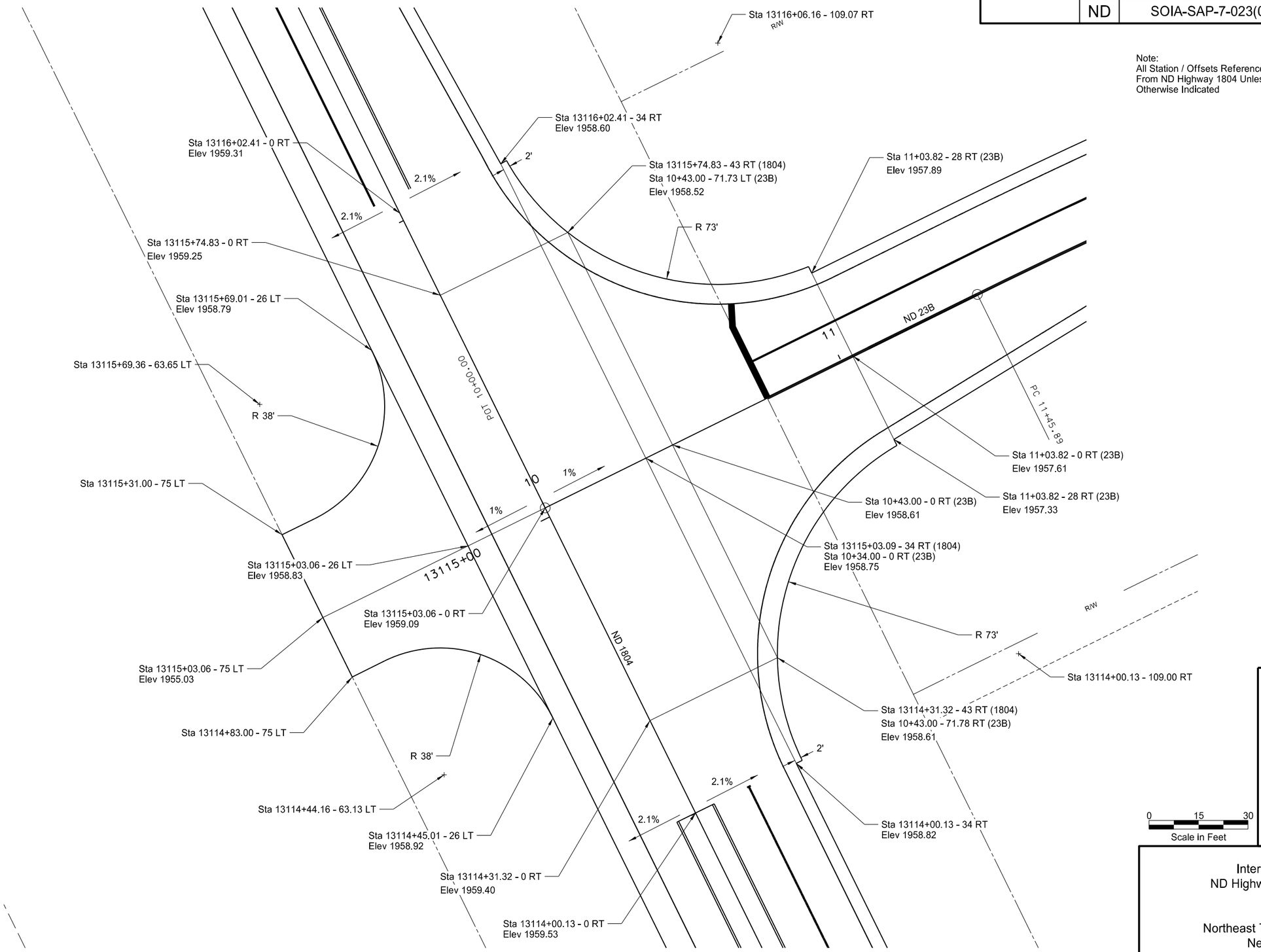
Pipe Outlet Riprap and Ditch Block Details

ND 23B - Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	20	5

Note:
All Station / Offsets Referenced
From ND Highway 1804 Unless
Otherwise Indicated



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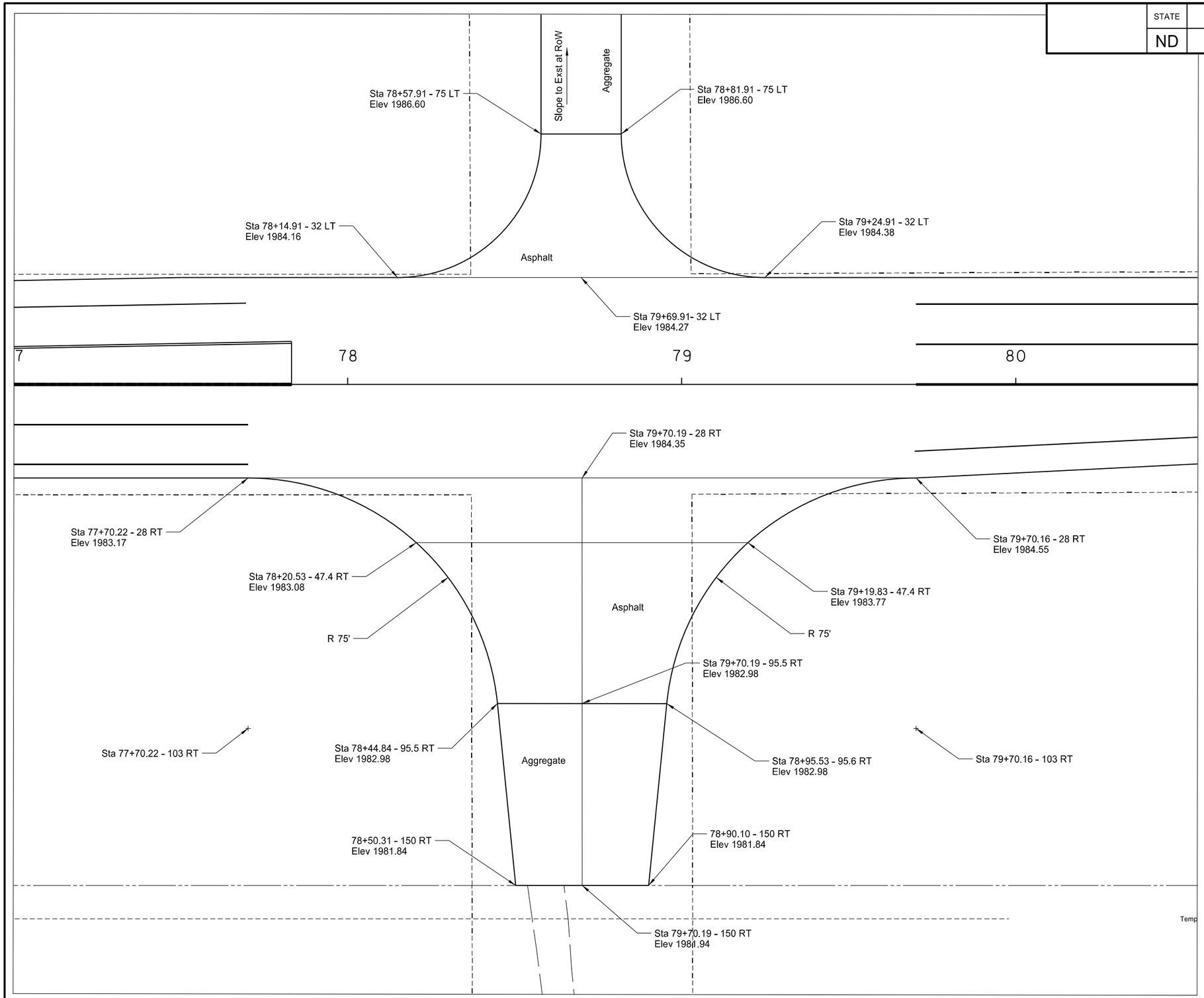
Intersection Details
ND Highway 1804 & ND 23B

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	20	6



N

0 15 30
Scale in Feet

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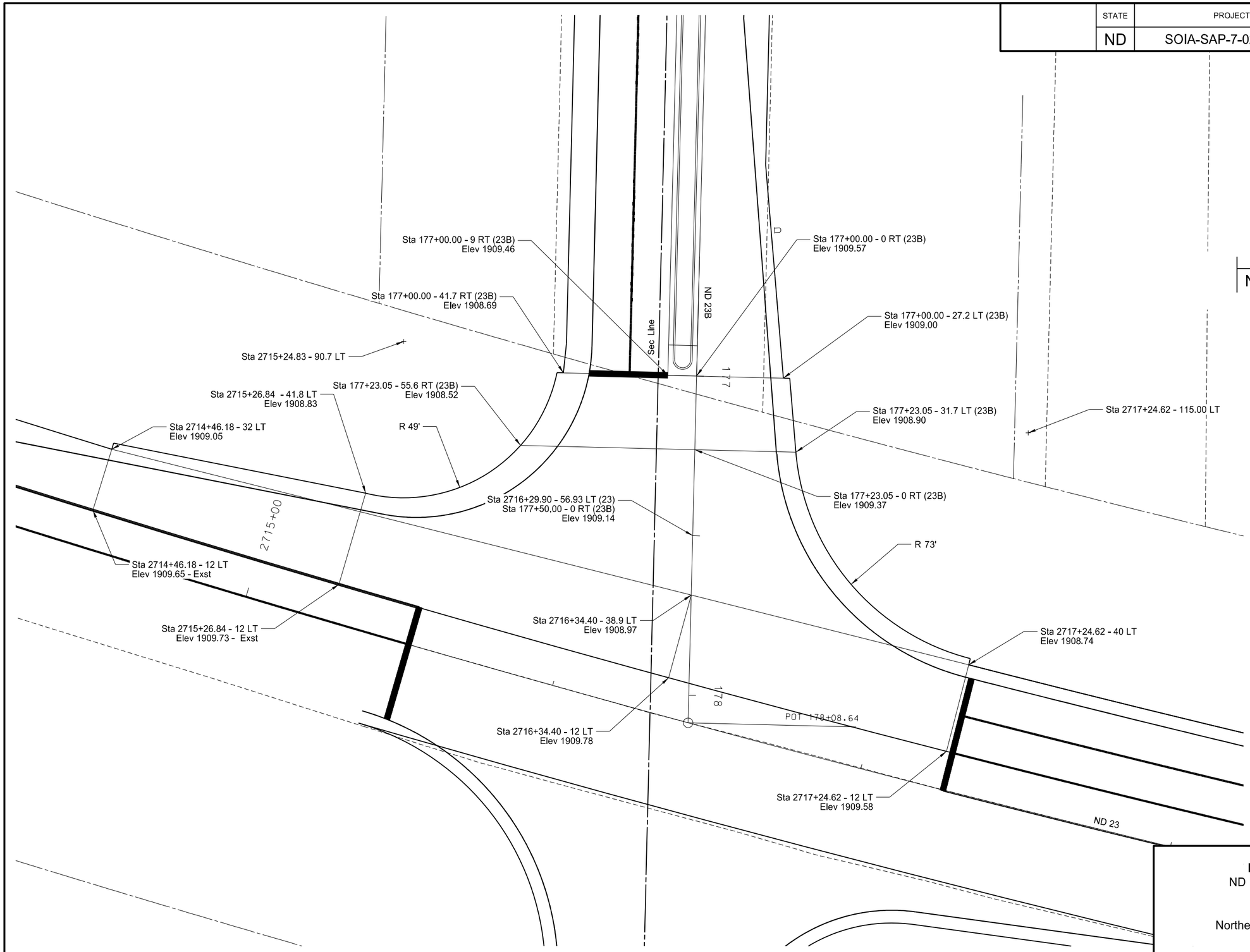
Intersection Details
ND 23B and College Dr

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	20	7

Note:
All Station / Offsets Referenced From ND Highway 23 Unless Otherwise Noted.



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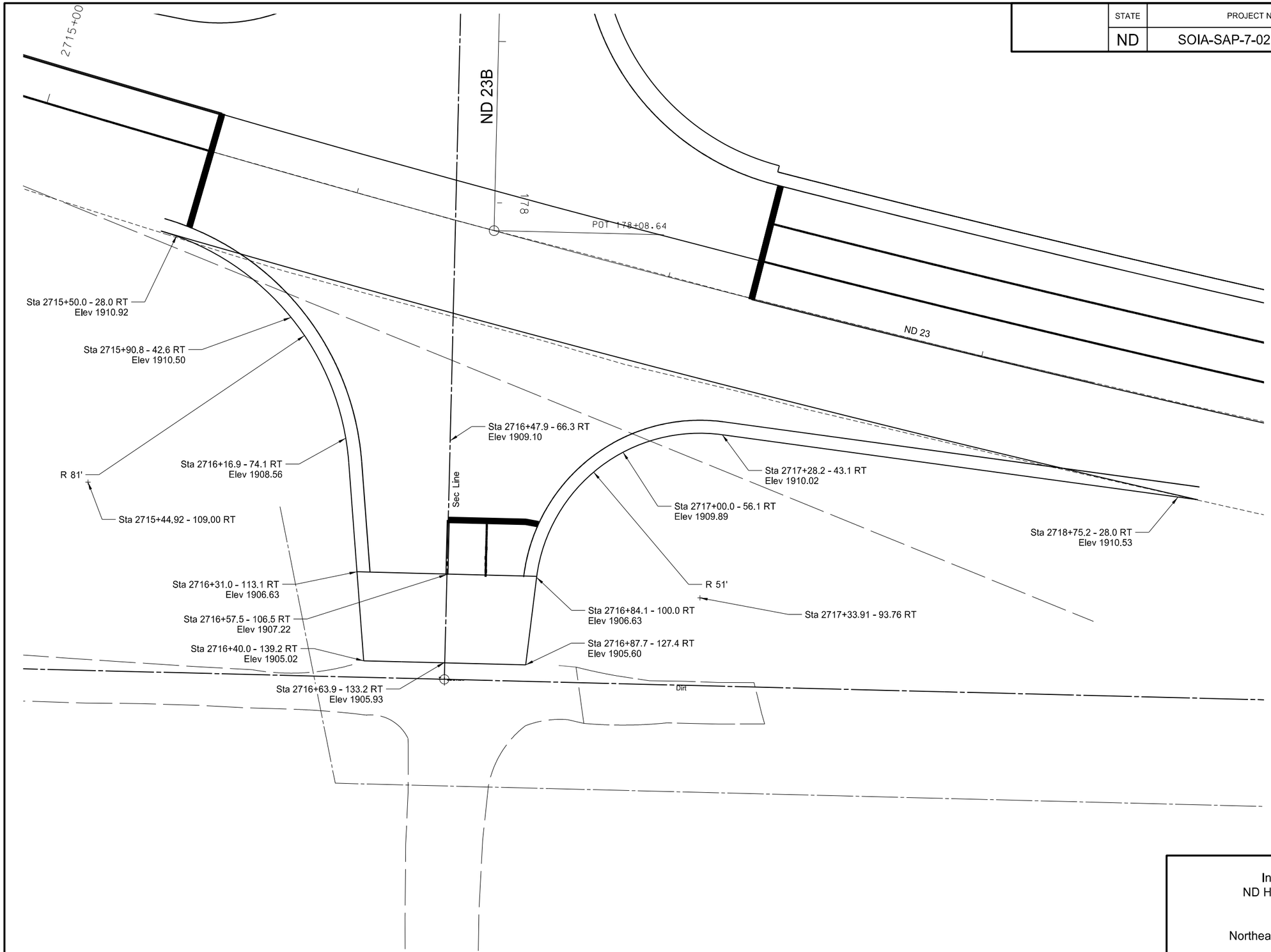
Intersection Details
ND Highway 23 & ND 23B
North Side

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	20	8

Note:
All Station / Offsets Referenced From ND Highway 23 Unless Otherwise Noted.



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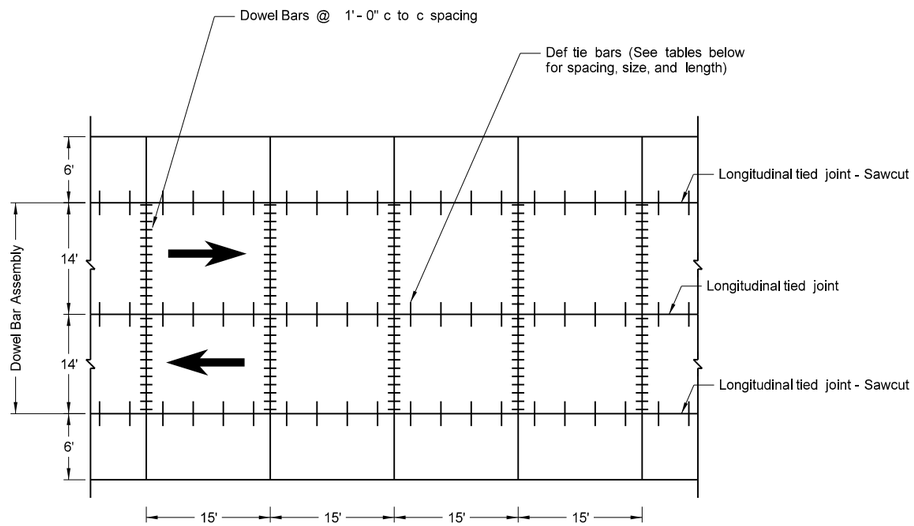
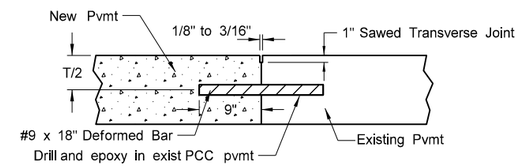
Intersection Details
ND Highway 23 & ND 23B
South Side

Northeast Truck Reliever Route
New Town, ND

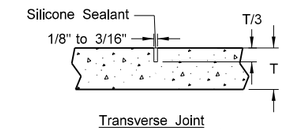
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	20	9



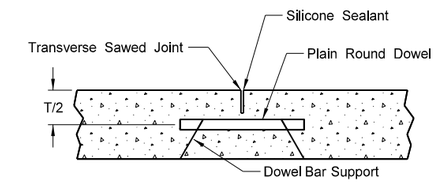
Mainline Joints
(For joint layout details see section 90 of the plans.)



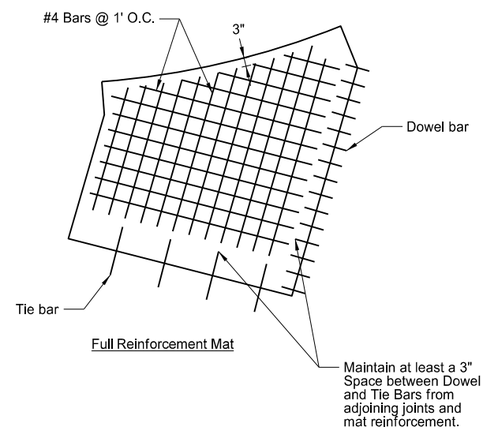
Deformed Bar Installation (2'-0" c to c)
(Transverse Joints)



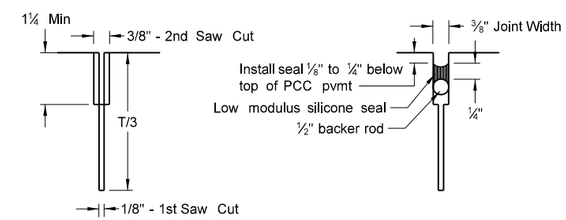
Transverse Joint
(non-doweled shoulder joints)



Tranverse Joint - Doweled
(see plans)

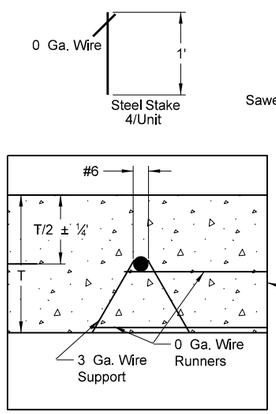


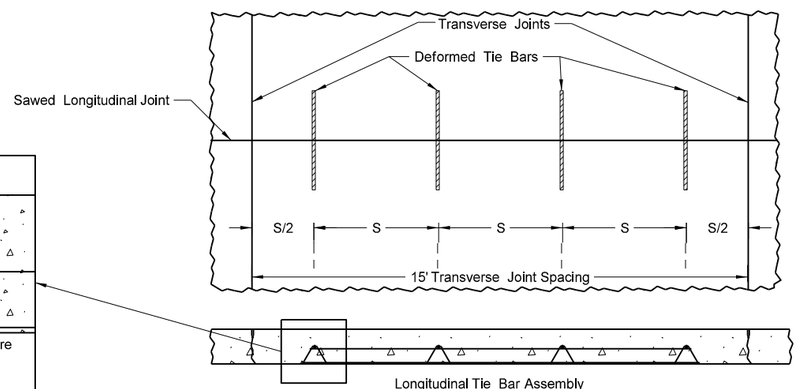
Full Reinforcement Mat



Transverse Joint Sawing
(2 Cuts)

Transverse Joint Sealing





Longitudinal Tie Bar Assembly
One unit shown

Longitudinal Joint Tie Bar Size and Length**	
12.5" PCC Depth (Mainline)	# 6 Bar x 36"

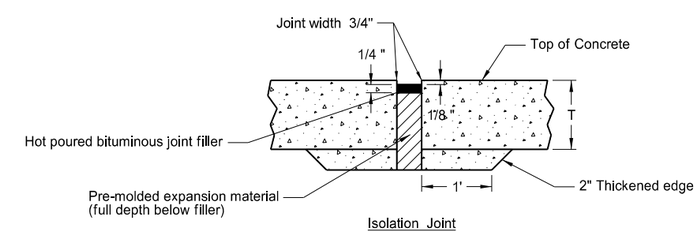
**Tie Bar Lengths listed are for Grade 40 Steel.
See Std D-550-2 for Grade 60 Steel.

Notes:

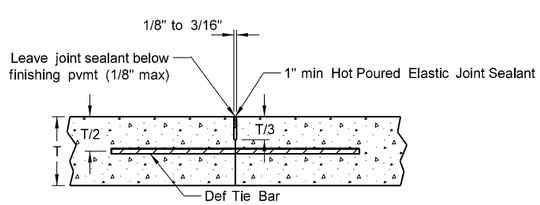
T = Pavement Thickness

Dowel bars shall be 1¼" x 18" for T = 10" or less.
Dowel bars shall be 1½" x 18" for T greater than 10".

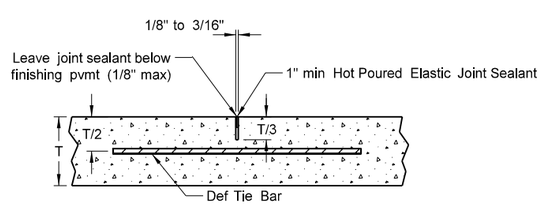
S = Tiebar Spacing. See Std D-550-2.



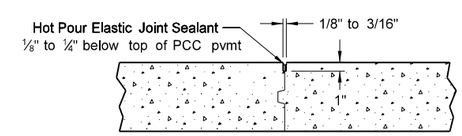
Isolation Joint



Longitudinal Tied Joint



Longitudinal Tied Joint - Sawcut



Longitudinal Keyed Joint

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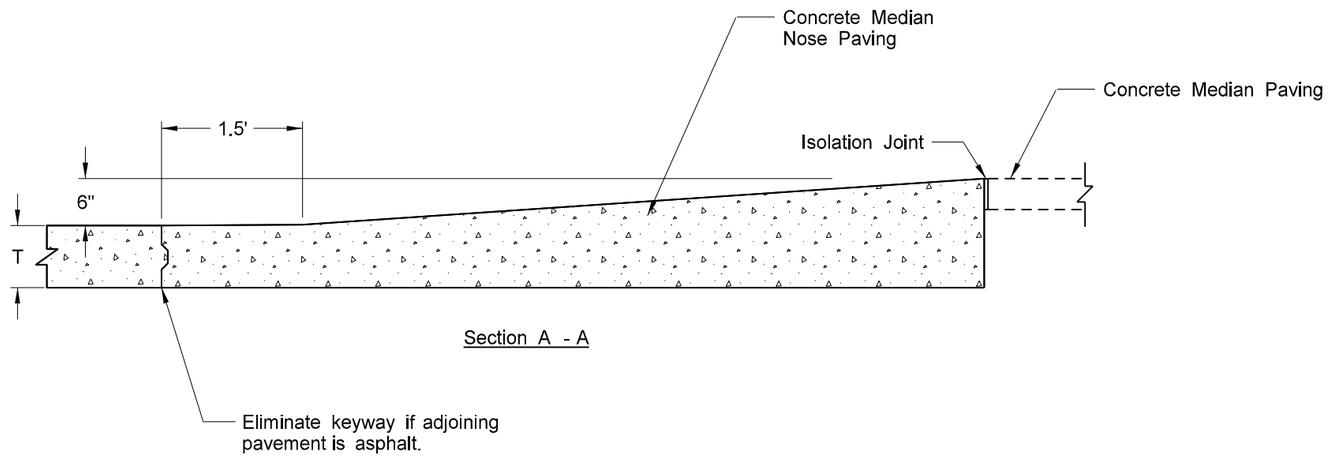
PCC Pavement Joint Details

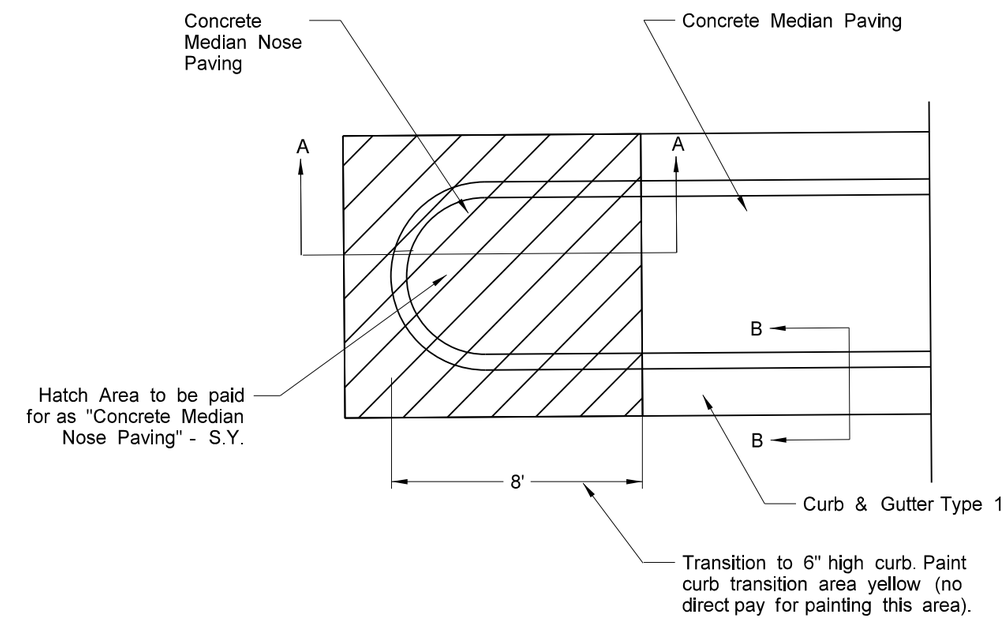
Perpendicular With 15' Joint Width

Northeast Truck Reliever Route
New Town, ND

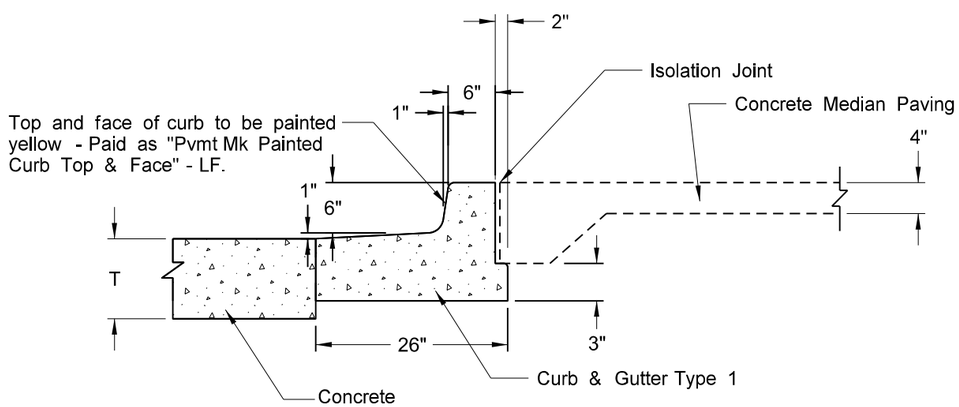
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	20	10



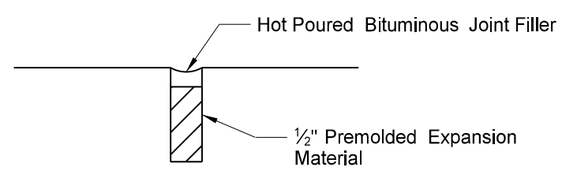
Section A - A



Median Plan View



Section B - B



Curb Isolation Joint

T = Adjoining pavement thickness is shown on the plans.

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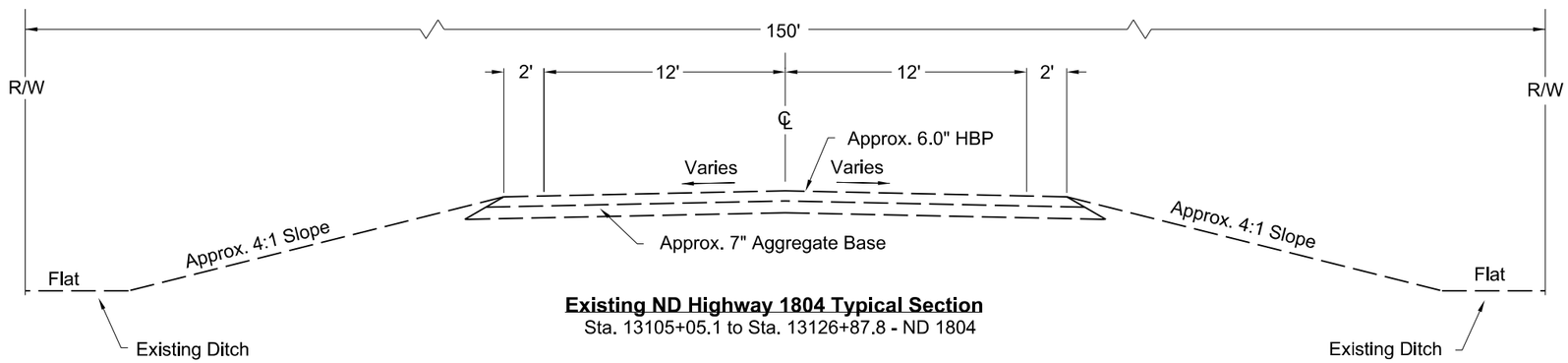
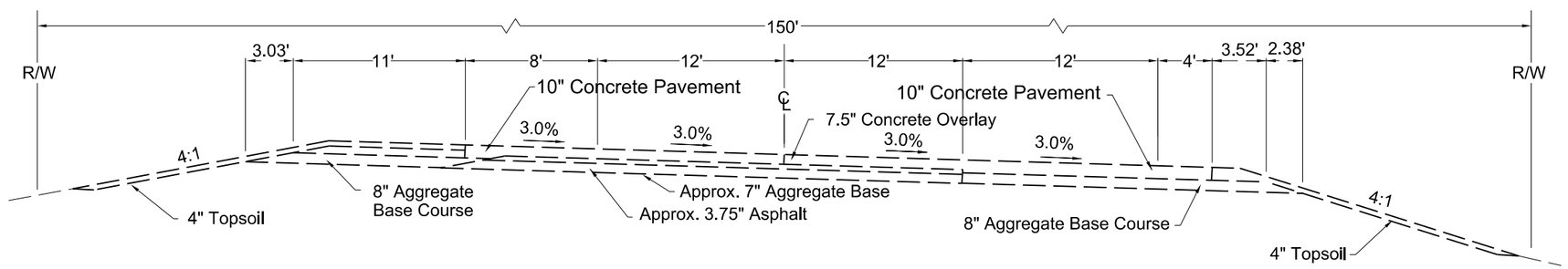
Concrete Median & Curb & Gutter Detail

ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	30	1



Existing ND Highway 1804 Typical Section
Sta. 13105+05.1 to Sta. 13126+87.8 - ND 1804



Existing ND Highway 23 Typical Section
Sta. 2704+47 to Sta. 2705+05 - ND 23

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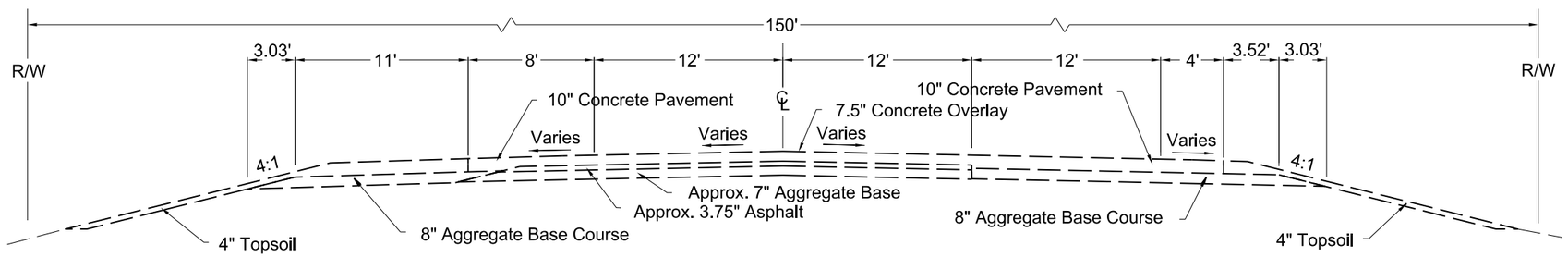
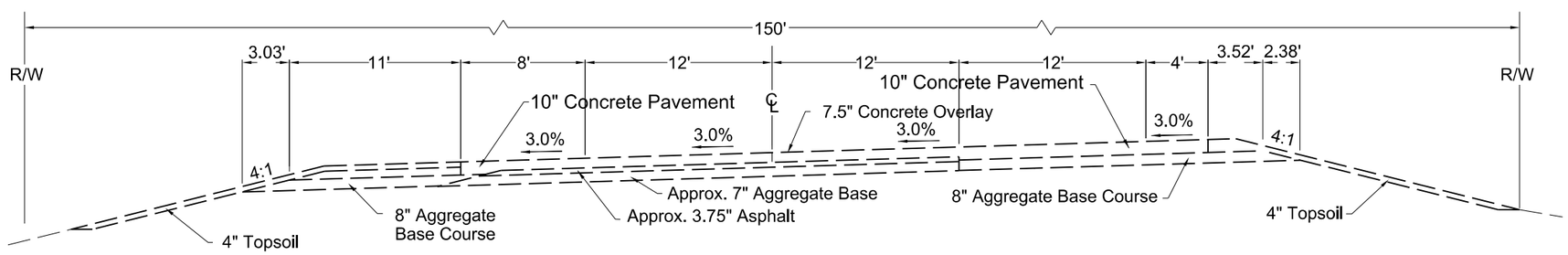
ND Highway 1804 & ND Highway 23
ExistingTypical Sections

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	30	2



Existing ND Highway 23 Typical Section
Sta. 2705+05 to Sta. 2709+99 - ND 23
Sta. 2728+50 to Sta. 2730+07 - ND 23



Existing ND Highway 23 Typical Section
Sta. 2709+99 to Sta. 2728+50 - ND 23

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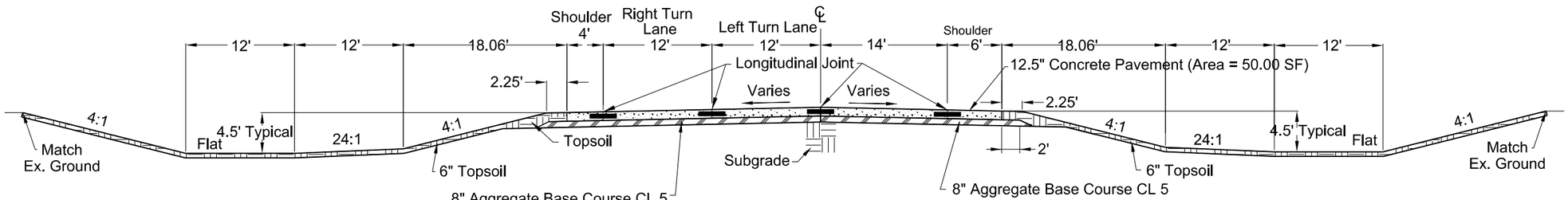
ND Highway 23
ExistingTypical Sections

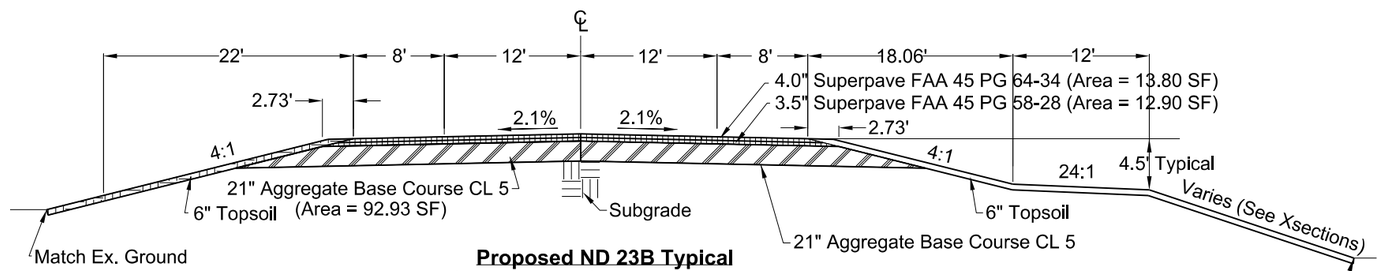
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	30	3



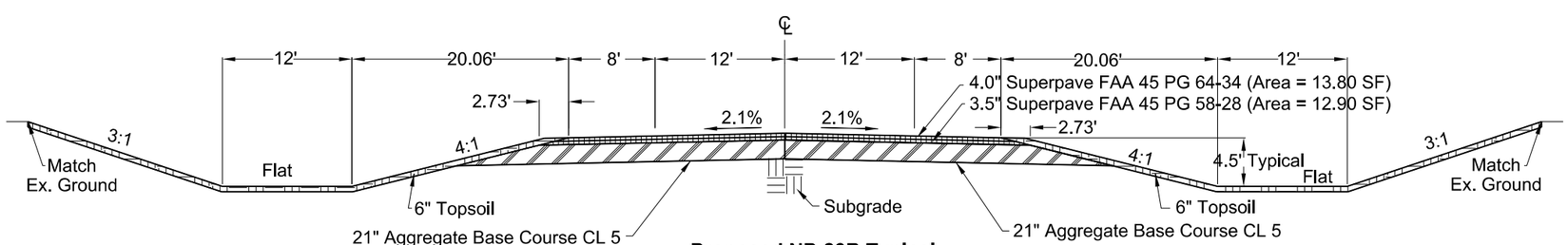
Proposed ND 23B Typical

Sta. 10+50 to Sta. 20+03.8 - ND 23B



Proposed ND 23B Typical

Sta. 20+03.8 to Sta. 92+50 - ND 23B
Sta. 96+10 to Sta. 103+30 - ND 23B
Sta. 105+85 to Sta. 108+20 - ND 23B
Sta. 111+20 to Sta. 111+85 - ND 23B
Sta. 121+30 to Sta. 160+93 - ND 23B



Proposed ND 23B Typical

Sta. 92+50 to Sta. 96+10 - ND 23B
Sta. 103+30 to Sta. 105+85 - ND 23B
Sta. 108+20 to Sta. 111+20 - ND 23B

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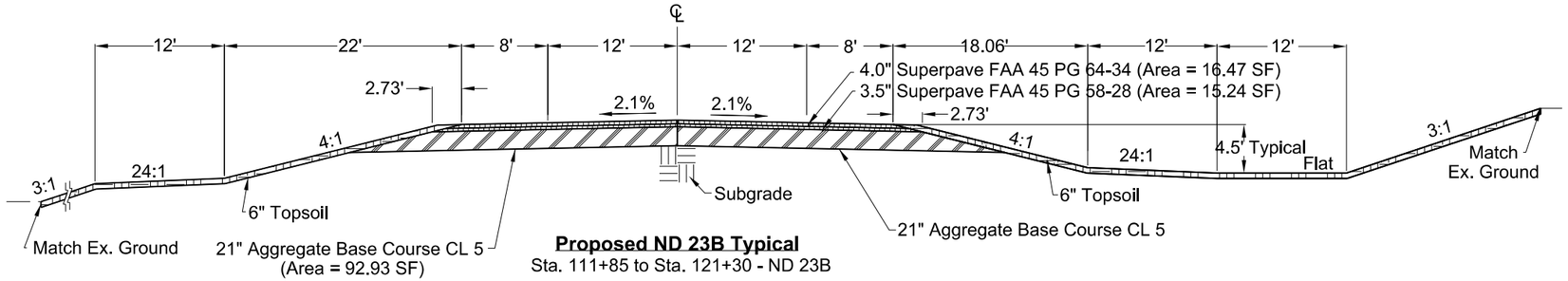
NOTE: All asphalt sloughs shall be at a 4:1 slope

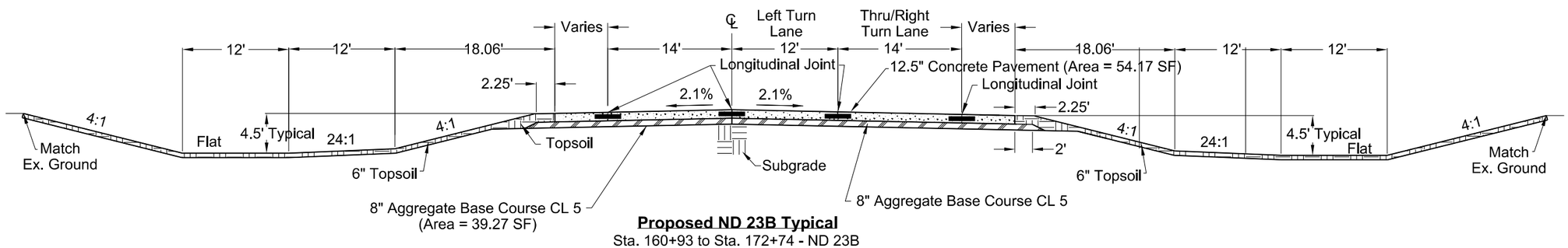
ND Highway 23B
Typical Sections

Northeast Truck Reliever Route
New Town, ND

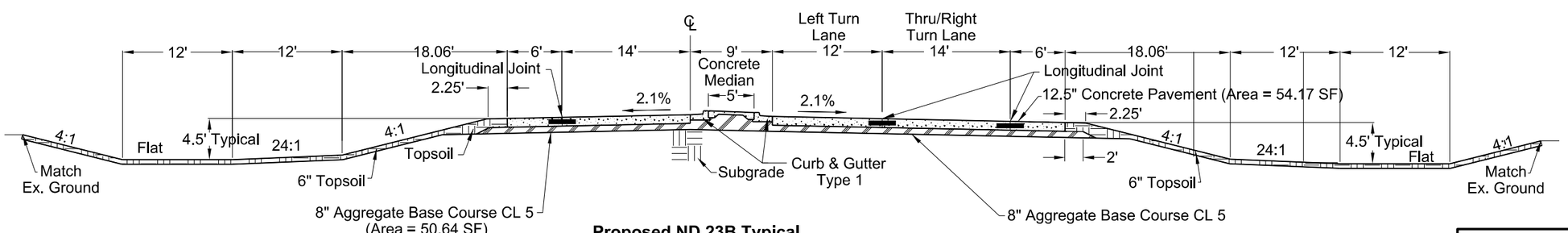
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	30	4



Proposed ND 23B Typical
Sta. 111+85 to Sta. 121+30 - ND 23B



Proposed ND 23B Typical
Sta. 160+93 to Sta. 172+74 - ND 23B



Proposed ND 23B Typical
Sta. 172+74 to Sta. 177+50 - ND 23B

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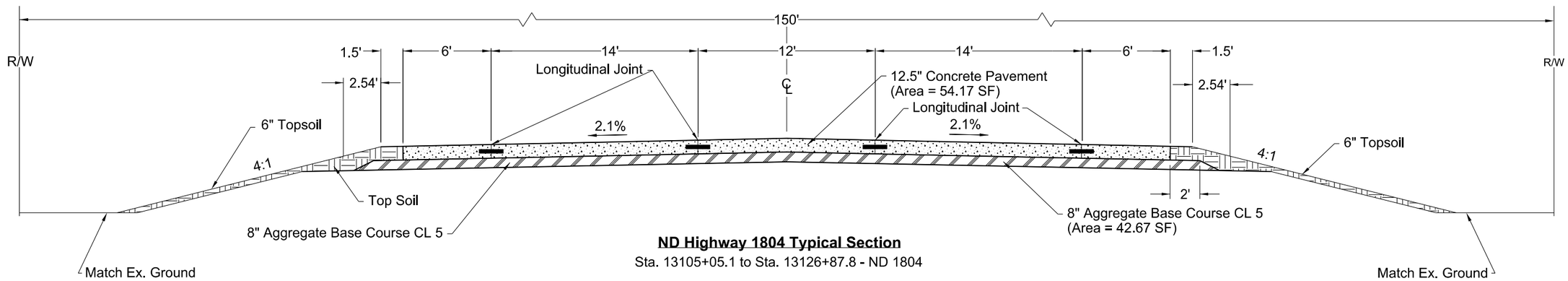
NOTE: All asphalt sloughs shall be at a 4:1 slope

ND Highway 23B
Typical Sections

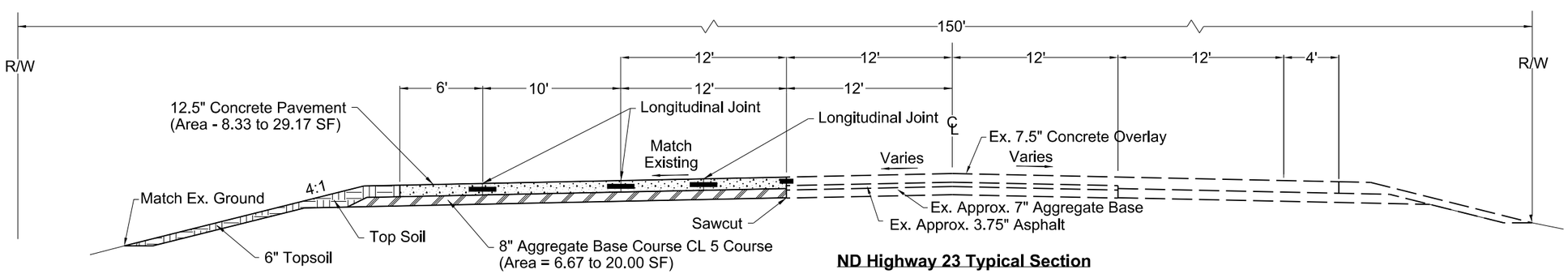
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	30	5



ND Highway 1804 Typical Section

Sta. 13105+05.1 to Sta. 13126+87.8 - ND 1804



ND Highway 23 Typical Section

Sta. 2704+47 to Sta. 2730+07 - ND 23

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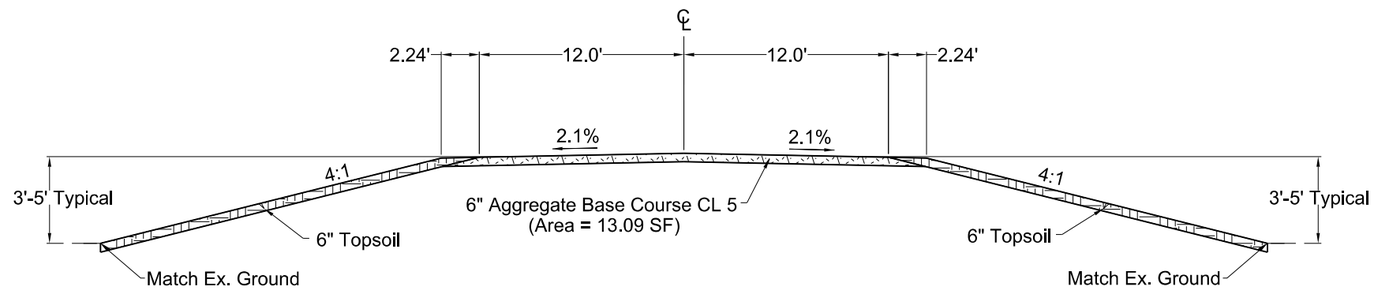
ND Highway 1804 & ND Highway 23
Typical Sections

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	30	6



Township & Access Roads Typical Section

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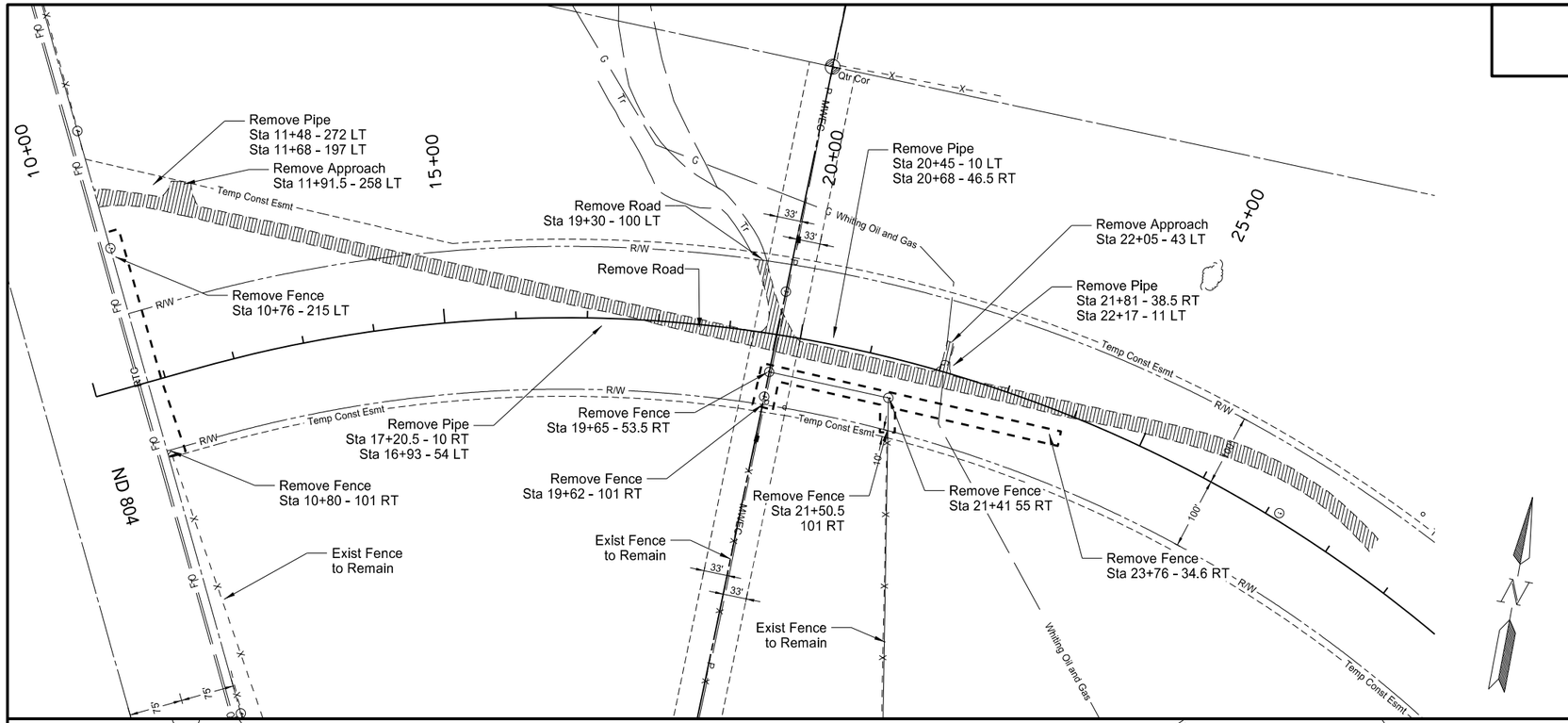
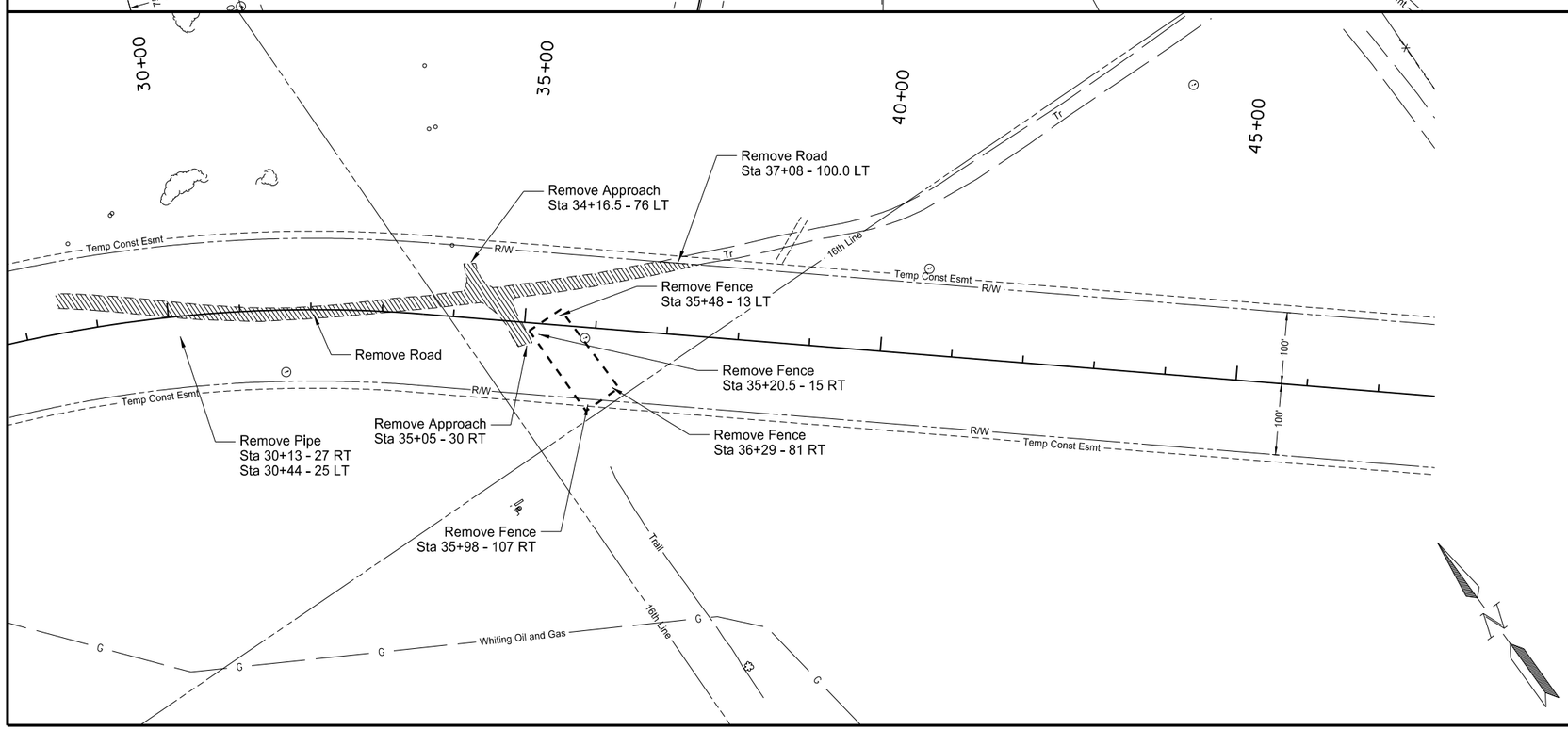
NOTE: All asphalt sloughs shall be at a 4:1 slope

ND Highway 23
Township & Access Roads
Typical Sections

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	40	1





Description	Spec #	Code #	Qty	Unit
Removal of Pipe - All Types and Sizes				
Sta 10+00 to 47+50	202	174	330	LF
Remove Existing Fence				
Sta 10+00 to 47+50	202	312	1,134	LF

LEGEND

Fence Removal Area

Remove Road
(Common Excavation-Type A)

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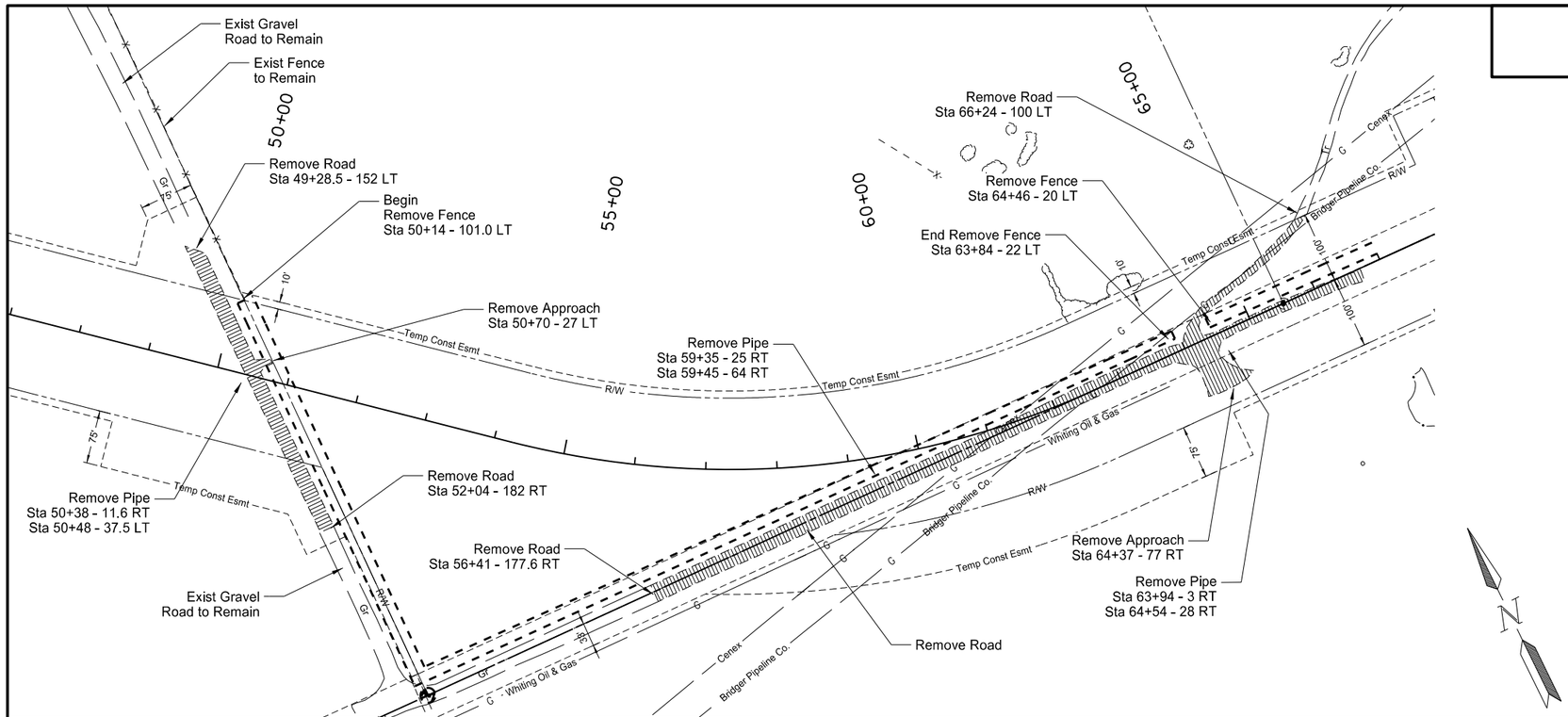
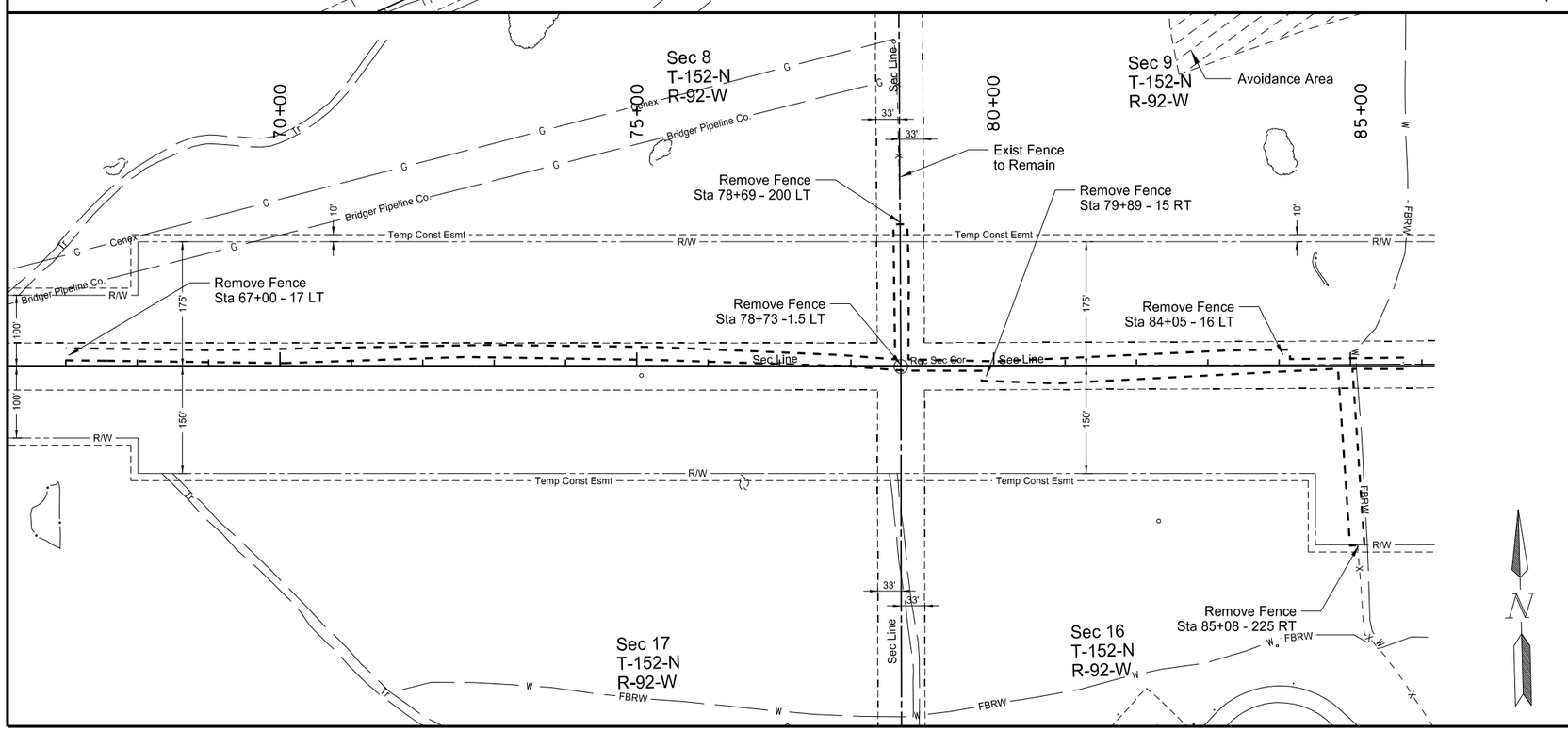
0 100 200
Scale in Feet

Removals
Sta 10+00 to 47+50
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	40	2





Description	Spec #	Code #	Qty	Unit
Removal of Pipe - All Types and Sizes				
Sta 47+50 to 85+75	202	174	151	LF
Remove Existing Fence				
Sta 47+50 to 85+75	202	312	4,757	LF

LEGEND

Fence Removal Area

Remove Road (Common Excavation-Type A)

0 100 200
Scale in Feet

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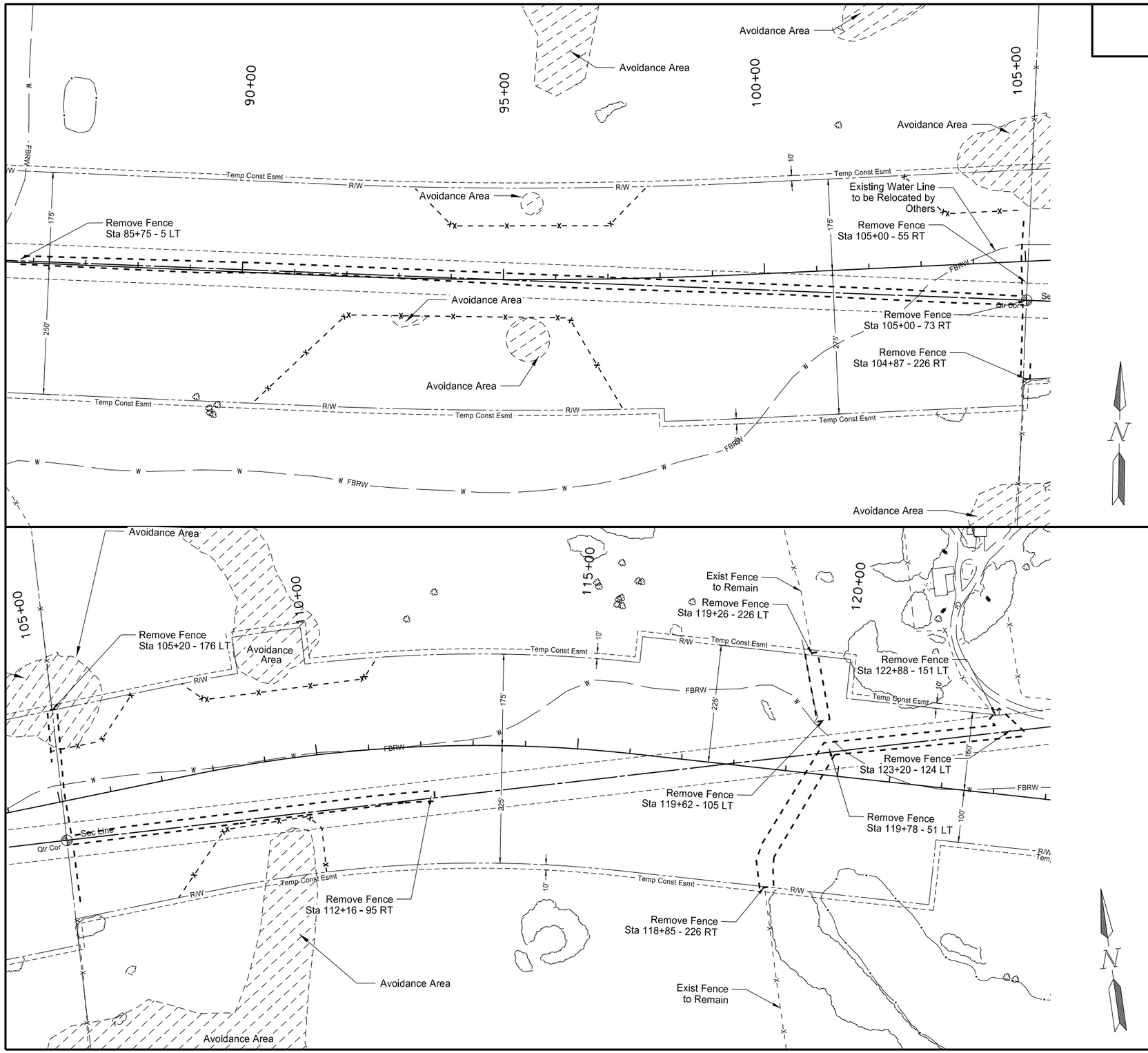
Removals
Sta 47+50 to 85+75
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	40	3

Description	Spec #	Code #	Qty	Unit
Remove Existing Fence				
Sta 85+75 to 123+50	202	312	3,876	LF



LEGEND

Fence Removal Area

Remove Road
(Common Excavation-Type A)

0 100 200
Scale in Feet

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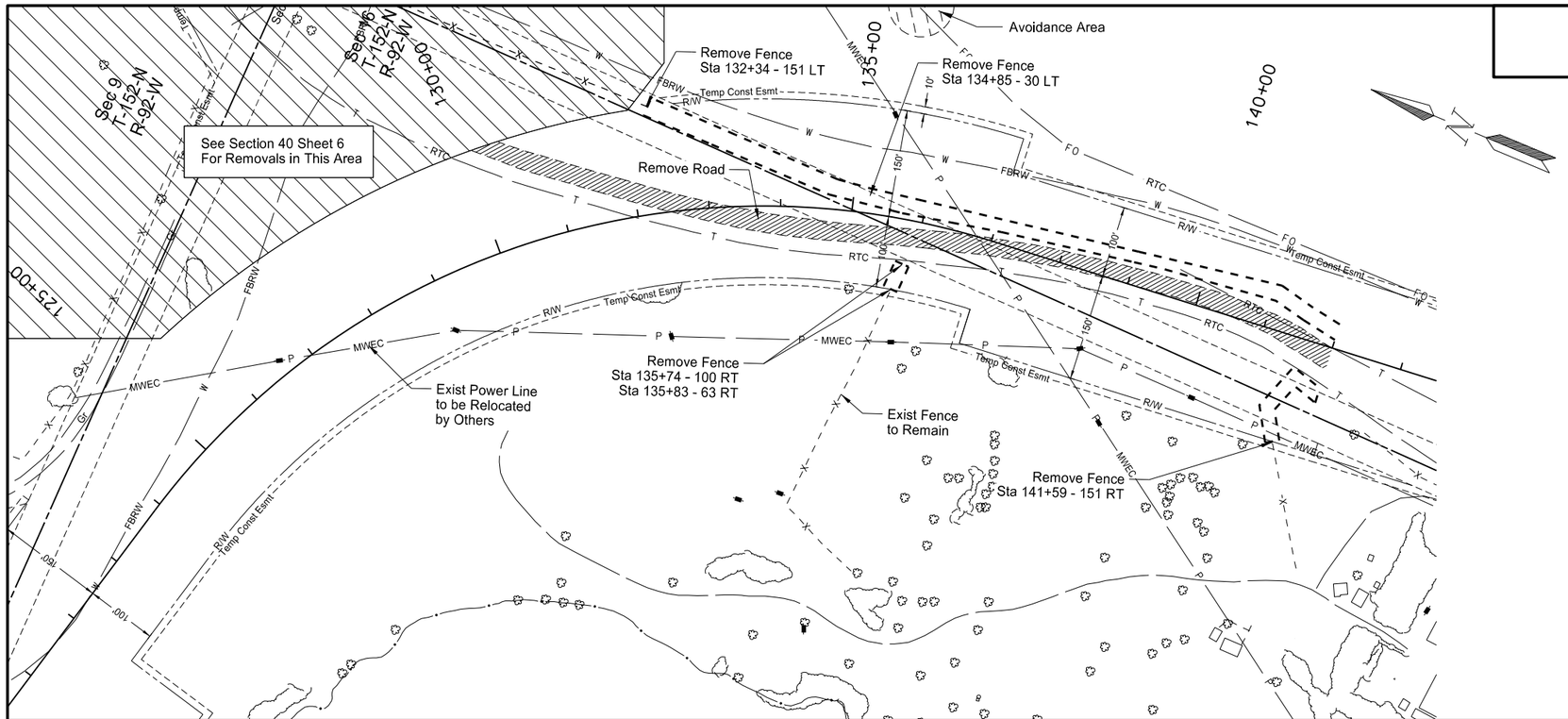
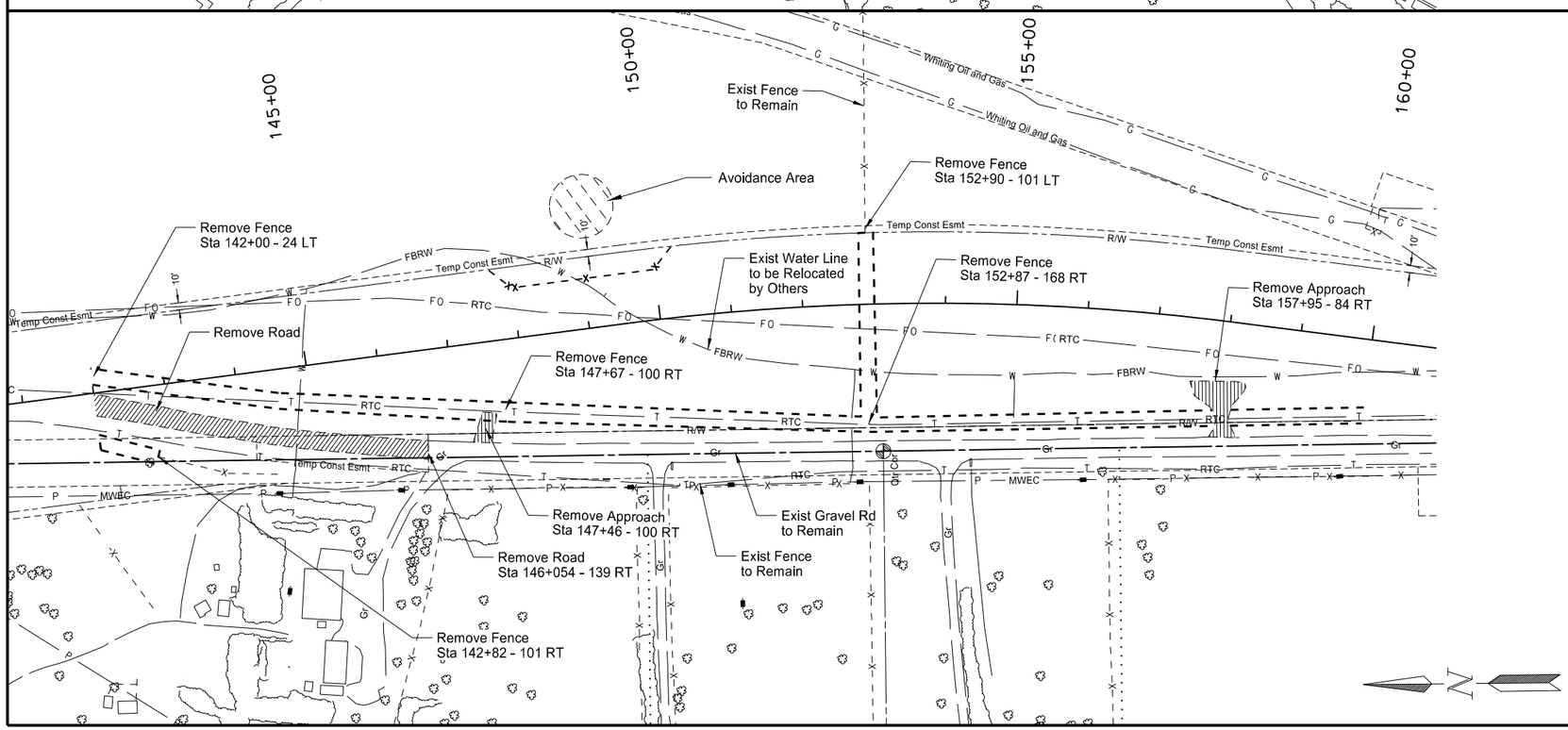
Removals
Sta 85+75 to 123+50
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	40	4





Description	Spec #	Code #	Qty	Unit
Remove Existing Fence				
Sta 123+50 to 160+00	202	312	3,332	LF

LEGEND

Fence Removal Area

Remove Road
(Common Excavation-Type A)

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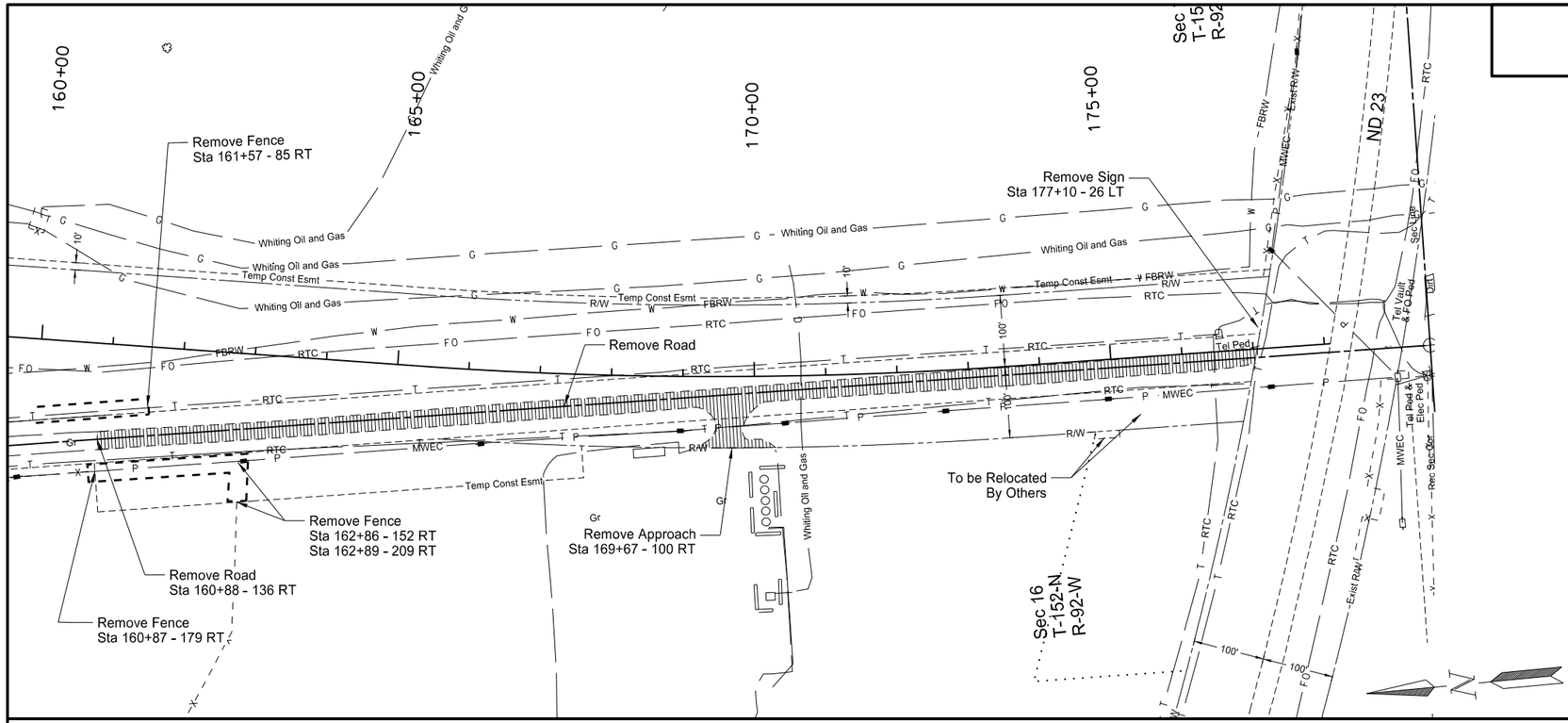
0 100 200
Scale in Feet

Removals
Sta 123+50 to 160+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	40	5



Description	Spec #	Code #	Qty	Unit
Remove Existing Fence				
Sta 160+00 to 178+00	202	312	369	LF

LEGEND

Fence Removal Area

Remove Road
(Common Excavation-Type A)

0 100 200
Scale in Feet

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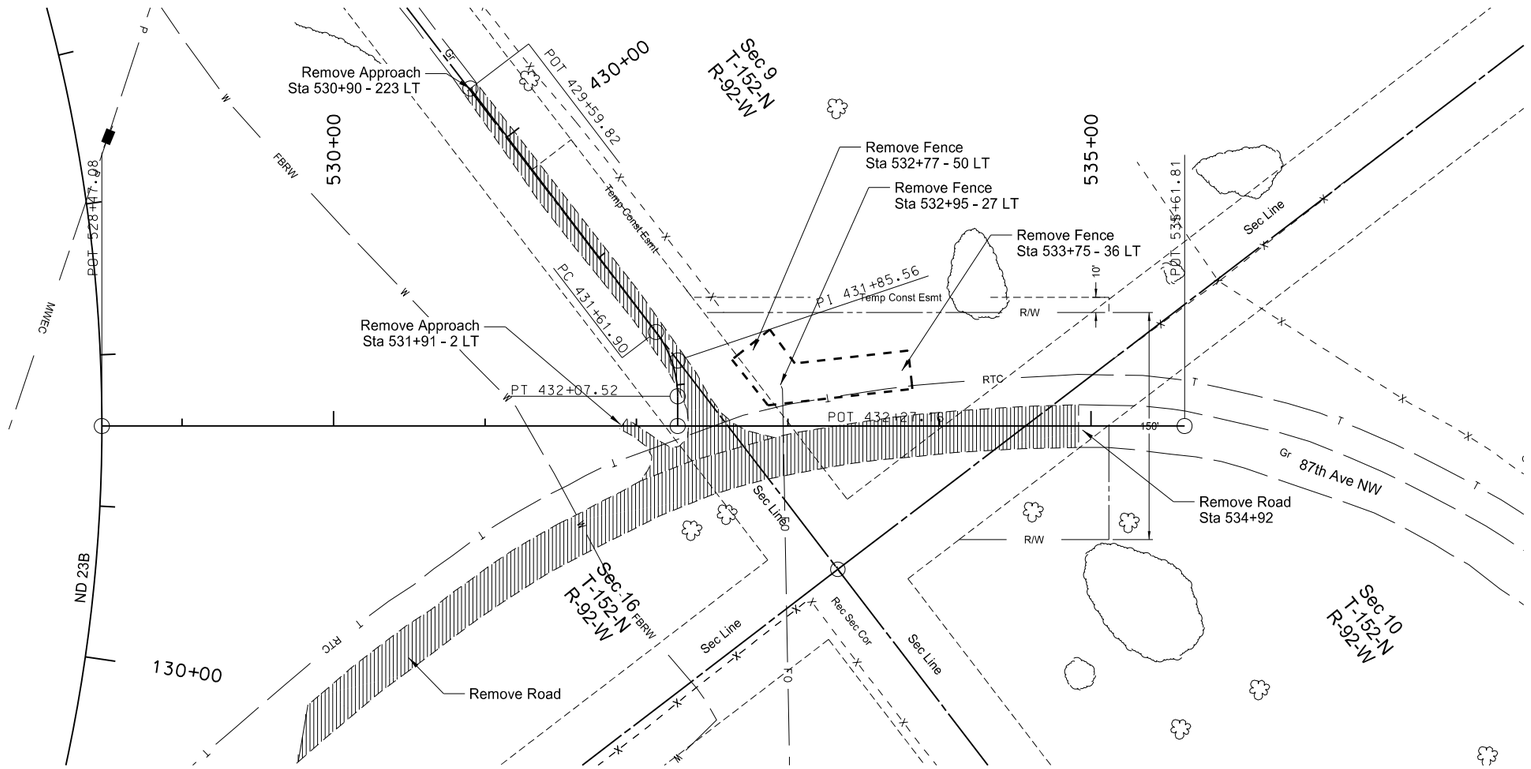
Removals
Sta 160+00 to 178+00

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	40	6

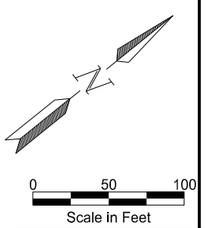
Description	Spec #	Code #	Qty	Unit
Remove Existing Fence				
Sta 528+47.08 to 534+91.81	202	312	110	LF



LEGEND

Fence Removal Area

Remove Road
(Common Excavation-Type A)



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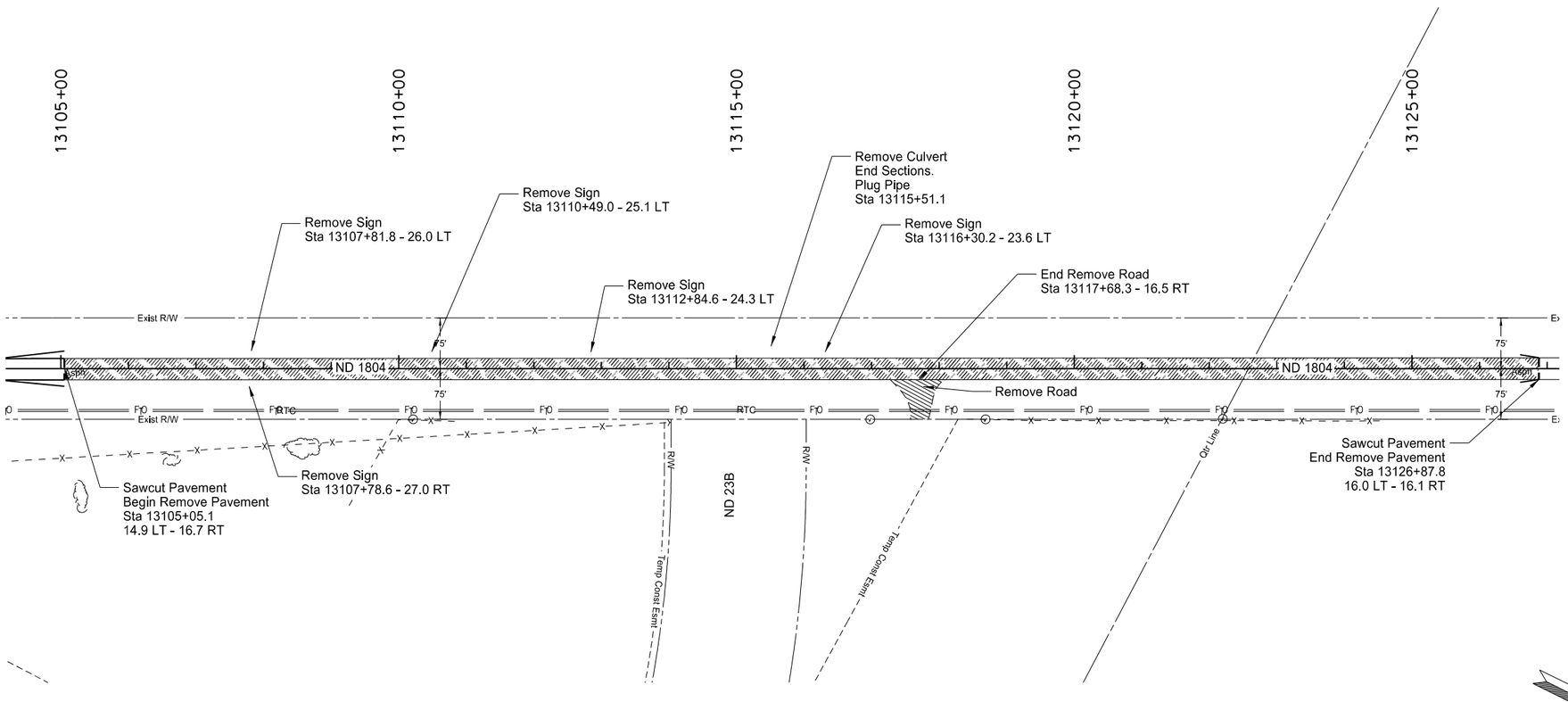
Removals
87th Avenue North West
Sta 528+47.08 to 534+91.81

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	40	7

Description	Spec #	Code #	Qty	Unit
Removal of Bituminous Surfacing				
Sta 13105+05 to 13126+88	202	132	7,788	SY
Saw Bituminous Surfacing - Full Depth				
Sta 13105+05 to 13126+88	202	153	64	LF
Removal of End Sections - All Types and Sizes				
Sta 13105+05 to 13126+88	202	169	2	EA
Removal of Pipe - All Types and Sizes				
Sta 13105+05 to 13126+88	202	174	16	LF
Plug Pipe - All Types and Sizes				
Sta 13105+05 to 13126+88	714	9680	1	EA



LEGEND

Fence Removal Area

Remove Road
(Common Excavation-Type A)

Removal of Bituminous Surfacing

0 100 200
Scale in Feet

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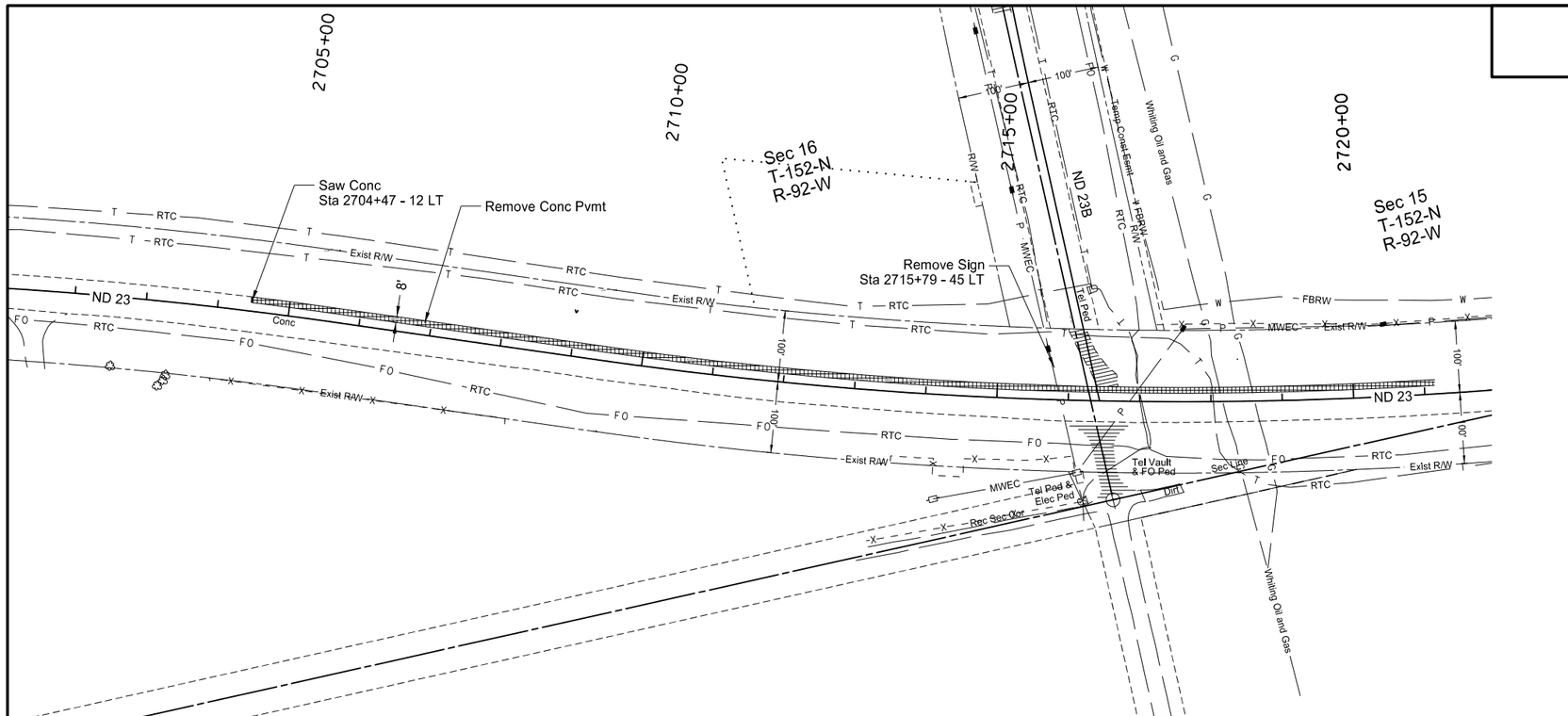
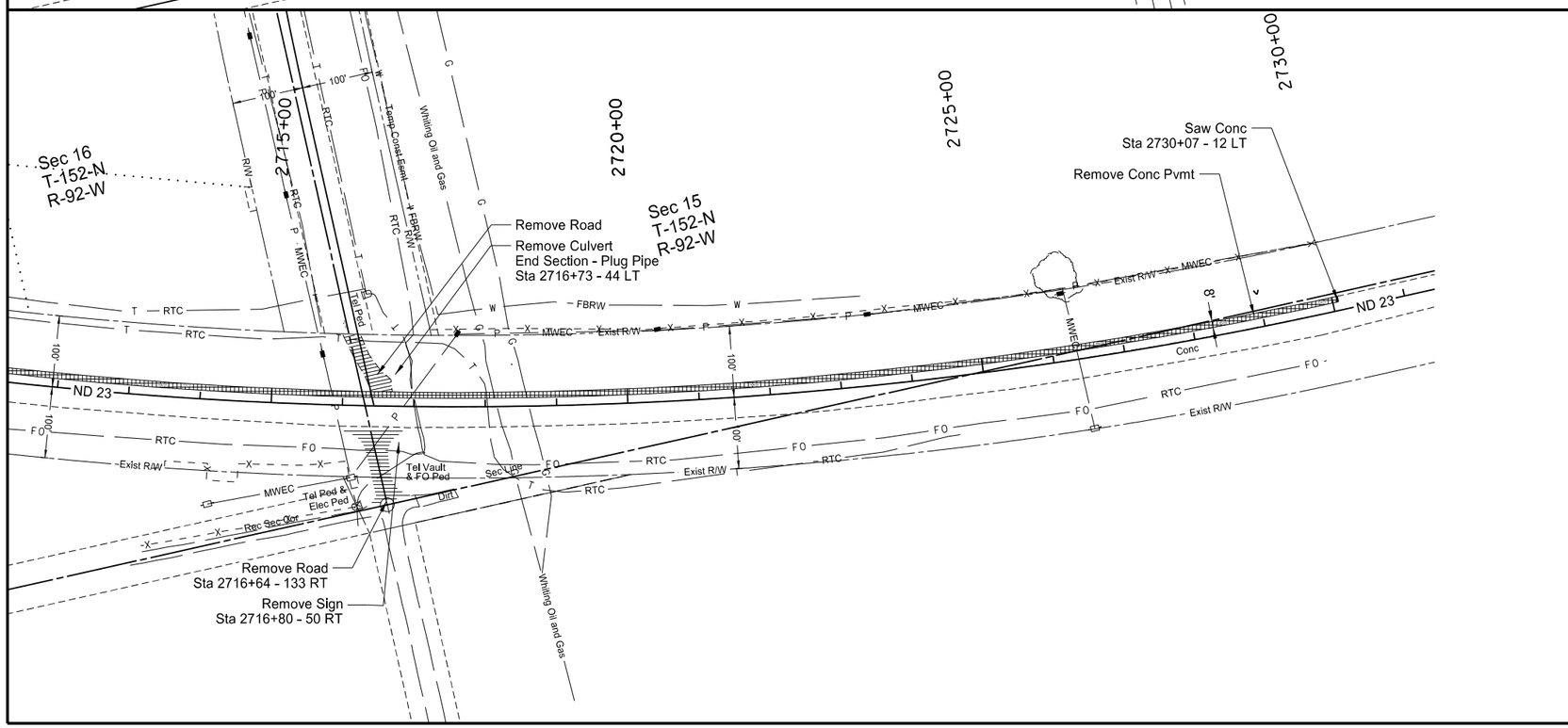
Removals
ND Hwy 1804
Sta 13105+05 to 13126+88

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	40	8





Description	Spec #	Code #	Qty	Unit
Removal of Concrete				
Sta 2704+47 to 2730+07	202	112	2330	SY
Saw Concrete				
Sta 2704+47 to 2730+07	202	119	2576	LF
Removal of End Section - All Types and Sizes				
Sta 2704+00 to 2730+00	202	169	2	EA
Removal of Pipe - All Types and Sizes				
Sta 2704+00 to 2730+00	202	174	76	LF
Plug Pipe - All Types and Sizes				
Sta 2704+00 to 2730+00	714	9680	1	EA

LEGEND

Fence Removal Area

Remove Road
(Common Excavation-Type A)

Removal of Concrete

N

0 100 200
Scale in Feet

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Removals
ND Highway 23
Sta 2704+00 to 2730+07

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	50	1

HYDRAULIC DATA

STATION	EXISTING PIPE	PROPOSED PIPE SIZE	VERTICAL DEFL. ANGLE	DRAINAGE AREA (ACRES)	25-YEAR DATA				100-YEAR DATA	
					DESIGN DISCHARGE (CFS)	DESIGN HEADWATER (FT)	DESIGN VELOCITY (FPS)	DESIGN STAGE (NAVD 88)	100-YEAR DISCHARGE (CFS)	100-YEAR STAGE (NAVD 88)
ND 1804 13115+74	30" RCP	42"		126	60	4.1	10.2 (E)	1955.7	98	1958.1
12+47	N/A	30" (B)		372	11	1.7	8.0	1948.5 (D)	12	1948.6 (D)
17+21	N/A	48"			93	5.0	13.2 (E)	1944.6	131	1946.7
20+62	N/A	42"			58	4.0	12.6 (E)		93	
23+61	N/A	30" (B)			3	0.9	7.8	1945.3 (D)	18	
37+60	N/A	42"		155	98	6.5	11.5 (E)	1956.1	105	1956.7 (D)
58+63	N/A	36"		82	55	4.4	10.3(E)	1958.1	87	1961.7
75+92	N/A	30" (B) (C)	3.0 Deg.	20	21	2.5	6.5	1980.4	34	1981.4
84+96	N/A	48" (C)	0.7 Deg.	601	146	8.0	12.4 (E)	1972.6	198	1977.1
87+60	N/A	48" (C)	1.7 Deg.		77	4.4	8.7		158	
98+14	N/A	30" (B) (C)	3.0 Deg.	19	23	2.7	6.8	2015.9	37	2017.1
100+18	N/A	30" (B) (C)	5.0 Deg.	7	12	1.8	5.4	2028.0	19	2028.6
106+78	N/A	30" (B) (C)	5.2 Deg.	7	12	1.8	5.4	2051.6	18	2052.1
119+26	N/A	2 - 60" (C)	0.9 Deg.	374	166	4.1	8.1	1983.0	264	1984.4
174+05	N/A	15"		0.1	0.54	0.29	4.85	1910.8	0.75	1910.9
ND 23 2717+37	30" RCP	4 - 36"		729	170	3.5	8.7	1907.0	242	1908.3
ND 23 2728+99	36" RCP	36" RCP (UNMODIFIED)			63	5.1	13.5		75	

(A) Hydraulic data provided is for smooth-walled type conduits (n=0.012).
(B) Culvert diameter given at this location is the NDDOT Policy minimum diameter and exceeds hydraulic requirements.
(C) Broken back culvert - see Cross Section for details.
(D) Water overtops ditch block.
(E) Riprap required at outlet location.

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Hydraulic Data

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	50	2

Inlet No.	1	
Inlet Type	Type 1 Single	
Grate Style	L	
Manhole Size	N/A	
Northing	363347.23	
Easting	1491125.89	
Sta.	174+05.00 – 8.0' Rt	
Grate Elev.	1914.90	
Frame Height	N/A	Ft.
Adj. Rings	N/A	Ft.
Cover Thick.	N/A	Ft.
Inv. Elev.	1911.50	15" E
Bottom Elev.	1911.29	
H – Dist.	3.61	Ft.

End Sect. No.	Outfall	
End Sect. Size	15	In.
Northing	393346.01	Coordinates are to the center of the most downstream portion of the end section
Easting	1491175.93	
Inv. Elev.	1910.52	

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Storm Drain Inlet and End Section Summary

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	51	1

(A) Begin Station / Location	(A) Begin Offset	(A) End Station / Location	(A) End Offset	Pay Length (LF)	Pipe Conduit Pay Size (In.)	Pipe Conduit Approach Pay Size (In.)	Pipe Conduit Jacked or Bored Pay Size (In.)	Allowable Material	Required Diameter (In.)	Minimum Thickness (In.)	(C) R1 Fabric Pay Item (SY)	(B) End Sections Begin (EA)	(B) End Sections End (EA)	Applicable Backfill Detail
ND 1804 13115+74	44' Lt	ND 1804 13115+74	70' Rt	104			42	Reinforced Concrete Pipe - Class III (barrel length=98LF)	42		0	1 (Traversable)	1	N/A
								Welded Steel Pipe	42	0.500				
12+07	67' Lt	12+82	54' Rt	133	30			Reinforced Concrete Pipe - Class III (barrel length=126LF)	30		713	1	1	D-714-28
								Aluminum Coated Spiral Rib Steel (Type 2)	30	0.138				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	36	0.138				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	36	0.064				
16+91	58' Lt	17+46	46' Rt	106	48			Reinforced Concrete Pipe - Class III (barrel length=98LF)	48		613	1	1	D-714-28
								Aluminum Coated Spiral Rib Steel (Type 2)	48	0.138				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	48	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	54	0.138				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	54	0.064				
20+32	57' Lt	20+62	56' Rt	103	42			Reinforced Concrete Pipe - Class III (barrel length=98LF)	42		574	1	1	D-714-28
								Aluminum Coated Spiral Rib Steel (Type 2)	42	0.138				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	42	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	48	0.138				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	48	0.064				
23+61	61' Lt	23+62	67' Rt	119	30			Reinforced Concrete Pipe - Class III (barrel length=112LF)	30		630	1	1	D-714-28
								Aluminum Coated Spiral Rib Steel (Type 2)	30	0.138				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	36	0.138				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	36	0.064				
37+97	57' Lt	37+21	62' Rt	130	42			Reinforced Concrete Pipe - Class III (barrel length=124LF)	42		745	1	1	D-714-28
								Aluminum Coated Spiral Rib Steel (Type 2)	42	0.138				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	42	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	48	0.138				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	48	0.064				
58+63	46' Lt	58+63	61' Rt	96	36			Reinforced Concrete Pipe - Class III (barrel length=90LF)	36		513	1 (Traversable)	1	D-714-28
								Aluminum Coated Spiral Rib Steel (Type 2)	36	0.138				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	36	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	42	0.138				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	42	0.064				

(A) Beginning and ending station and offset locations are to end of flared end section, as applicable.
(B) Not paid for separately, to be included in the price bid for Pipe Conduit.
(C) Quantity of fabric is based on the larger diameter pipe being installed.

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Allowable Pipe List

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	51	2

(A) Begin Station / Location	(A) Begin Offset	(A) End Station / Location	(A) End Offset	Pay Length (LF)	Pipe Conduit Pay Size (In.)	Pipe Conduit Approach Pay Size (In.)	Pipe Conduit Jacked or Bored Pay Size (In.)	Allowable Material	Required Diameter (In.)	Minimum Thickness (In.)	(C) R1 Fabric Pay Item (SY)	(B) End Sections Begin (EA)	(B) End Sections End (EA)	Applicable Backfill Detail
75+71	48' Lt	76+21	63' Rt	112	30			Reinforced Concrete Pipe - Class IIII (barrel length=110LF)	30		568	1 (Traversable)	1	D-714-28
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	30	0.064				
								Spiral Rib Aluminum Alloy	30	0.079				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								Corrugated Aluminum Alloy	30	0.079				
84+53	135' Lt	85+46	141' Rt	278	48			Reinforced Concrete Pipe - Class V (barrel length=274LF)	48		1735	1	1	D-714-28
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	48	0.064				
								Spiral Rib Aluminum Alloy	48	0.079				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	54	0.064				
								Corrugated Aluminum Alloy	54	0.079				
87+67	155' Lt	87+50	171' Rt	310	48			Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	48	0.079	1944	1	1	D-714-28
								Spiral Rib Aluminum Alloy	48	0.109				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	54	0.079				
								Corrugated Aluminum Alloy	54	0.109				
97+72	140' Lt	98+68	187' Rt	332	30			Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	30	0.064	1817	1	1	D-714-28
								Spiral Rib Aluminum Alloy	30	0.079				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								Corrugated Aluminum Alloy	30	0.079				
100+87	133' Lt	99+13	189' Rt	355	30			Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	30	0.064	1948	1	1	D-714-28
								Spiral Rib Aluminum Alloy	30	0.079				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								Corrugated Aluminum Alloy	30	0.079				
107+25	87' Lt	105+99	147' Rt	258	30			Reinforced Concrete Pipe - Class V (barrel length=254LF)	30		1397	1	1	D-714-28
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	30	0.064				
								Spiral Rib Aluminum Alloy	30	0.079				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								Corrugated Aluminum Alloy	30	0.079				
118+20 118+29	178' Lt 183' Lt	120+41 120+51	191' Rt 185' Rt	850 (2 Pipes)	60			Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	60	0.109	3374	2	2	D-714-28
								Spiral Rib Aluminum Alloy	60	0.138				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	66	0.109				
								Corrugated Aluminum Alloy	66	0.138				
174+05	42' Lt	174+05	8' Rt	48	15			Reinforced Concrete Pipe - Class III (barrel length=44LF)	15		216	N/A	1 (Traversable)	D-714-28
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	15	0.064				
								Spiral Rib Aluminum Alloy	15	0.079				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	15	0.064				
								Corrugated Aluminum Alloy	15	0.079				
ND 23 2717+50 2717+76	64' Lt 64' Lt	ND 23 2717+50 2717+75	70' Rt 66' Rt	488 (4 Pipes)			36	Reinforced Concrete Pipe - Class III (barrel length=464LF)	36		0	4	4	N/A
								Welded Steel Pipe	36	0.469				

(A) Beginning and ending station and offset locations are to end of flared end section, as applicable.
(B) Not paid for separately, to be included in the price bid for Pipe Conduit.
(C) Quantity of fabric is based on the larger diameter pipe being installed.

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Allowable Pipe List

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	51	3

(A) Begin Station / Location	(A) Begin Offset	(A) End Station / Location	(A) End Offset	Pay Length (LF)	Pipe Conduit Pay Size (In.)	Pipe Conduit Approach Pay Size (In.)	Pipe Conduit Jacked or Bored Pay Size (In.)	Allowable Material	Required Diameter (In.)	Minimum Thickness (In.)	R1 Fabric Pay Item (SY)	(B) End Sections Begin (EA)	(B) End Sections End (EA)	Applicable Backfill Detail
ND 1804 13114+56	59' Lt	ND 1804 13115+57	59' Lt	93		24		Reinforced Concrete Pipe - Class III (barrel length=86LF)	24		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	24	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	24	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	24	0.064				
								Zinc Coated Corrugated Steel	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	30	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								High Density Polyethylene	24	Mfr. Rec.				
Access Road 462+84	25' Lt	Access Road 462+87	25' Rt	40		36		Reinforced Concrete Pipe - Class III (barrel length=36LF)	36		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	36	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	36	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	36	0.064				
								Zinc Coated Corrugated Steel	42	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	42	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	42	0.064				
								High Density Polyethylene	36	Mfr. Rec.				
78+35	72' Lt	79+05	72' Lt	64		24		Reinforced Concrete Pipe - Class III (barrel length=58LF)	24		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	24	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	24	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	24	0.064				
								Zinc Coated Corrugated Steel	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	30	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								High Density Polyethylene	24	Mfr. Rec.				
78+09	61' Rt	79+37	61' Rt	122		24		Reinforced Concrete Pipe - Class III (barrel length=116LF)	24		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	24	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	24	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	24	0.064				
								Zinc Coated Corrugated Steel	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	30	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								High Density Polyethylene	24	Mfr. Rec.				

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Allowable Pipe List

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	51	4

(A) Begin Station / Location	(A) Begin Offset	(A) End Station / Location	(A) End Offset	Pay Length (LF)	Pipe Conduit Pay Size (In.)	Pipe Conduit Approach Pay Size (In.)	Pipe Conduit Jacked or Bored Pay Size (In.)	Allowable Material	Required Diameter (In.)	Minimum Thickness (In.)	R1 Fabric Pay Item (SY)	(B) End Sections Begin (EA)	(B) End Sections End (EA)	Applicable Backfill Detail
109+91	49' Lt	110+62	49' Lt	64		24		Reinforced Concrete Pipe - Class III (barrel length=58LF)	24		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	24	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	24	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	24	0.064				
								Zinc Coated Corrugated Steel	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	30	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								High Density Polyethylene	24	Mfr. Rec.				
109+91	52' Rt	110+63	52' Rt	64		24		Reinforced Concrete Pipe - Class III (barrel length=58LF)	24		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	24	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	24	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	24	0.064				
								Zinc Coated Corrugated Steel	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	30	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								High Density Polyethylene	24	Mfr. Rec.				
129+97	73' Lt	128+99	73' Lt	102		24		Reinforced Concrete Pipe - Class III (barrel length=96LF)	24		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	24	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	24	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	24	0.064				
								Zinc Coated Corrugated Steel	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	30	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								High Density Polyethylene	24	Mfr. Rec.				
128+10	68' Rt	128+85	68' Rt	64		24		Reinforced Concrete Pipe - Class III (barrel length=58LF)	24		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	24	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	24	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	24	0.064				
								Zinc Coated Corrugated Steel	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	30	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								High Density Polyethylene	24	Mfr. Rec.				

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Allowable Pipe List

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	51	5

(A) Begin Station / Location	(A) Begin Offset	(A) End Station / Location	(A) End Offset	Pay Length (LF)	Pipe Conduit Pay Size (In.)	Pipe Conduit Approach Pay Size (In.)	Pipe Conduit Jacked or Bored Pay Size (In.)	Allowable Material	Required Diameter (In.)	Minimum Thickness (In.)	R1 Fabric Pay Item (SY)	(B) End Sections Begin (EA)	(B) End Sections End (EA)	Applicable Backfill Detail
160+40	64' Rt	162+87	87' Rt	240		30		Reinforced Concrete Pipe - Class III (barrel length=232LF)	30		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	30	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	30	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	30	0.064				
								Zinc Coated Corrugated Steel	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	30	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								High Density Polyethylene	30	Mfr. Rec.				
160+95	55' Lt	161+84	63' Rt	82		24		Reinforced Concrete Pipe - Class III (barrel length=76LF)	24		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	24	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	24	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	24	0.064				
								Zinc Coated Corrugated Steel	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	30	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								High Density Polyethylene	24	Mfr. Rec.				
174+57	77' Rt	175+13	77' Rt	50		24		Reinforced Concrete Pipe - Class III (barrel length=44LF)	24		0	1	1	D-203-08
								Zinc Coated Spiral Rib Steel	24	0.064				
								Aluminum Coated Spiral Rib Steel (Type 2)	24	0.064				
								Polymeric Coated Spiral Rib Steel (over zinc or aluminum coated steel)	24	0.064				
								Zinc Coated Corrugated Steel	30	0.064				
								Aluminum Coated Corrugated Steel (Type 2)	30	0.064				
								Polymeric Coated Corrugated Steel (over zinc or aluminum coated steel)	30	0.064				
								High Density Polyethylene	24	Mfr. Rec.				

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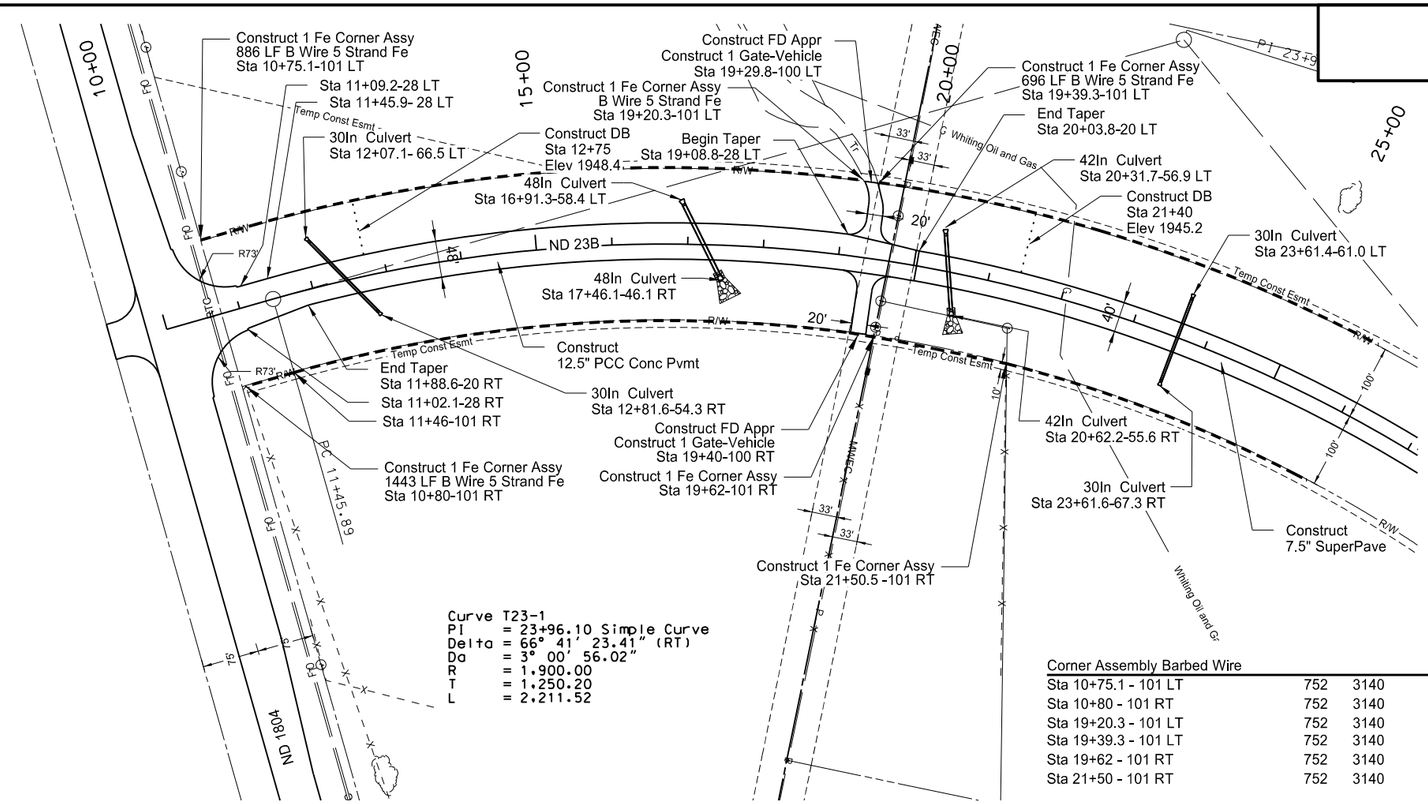
Allowable Pipe List

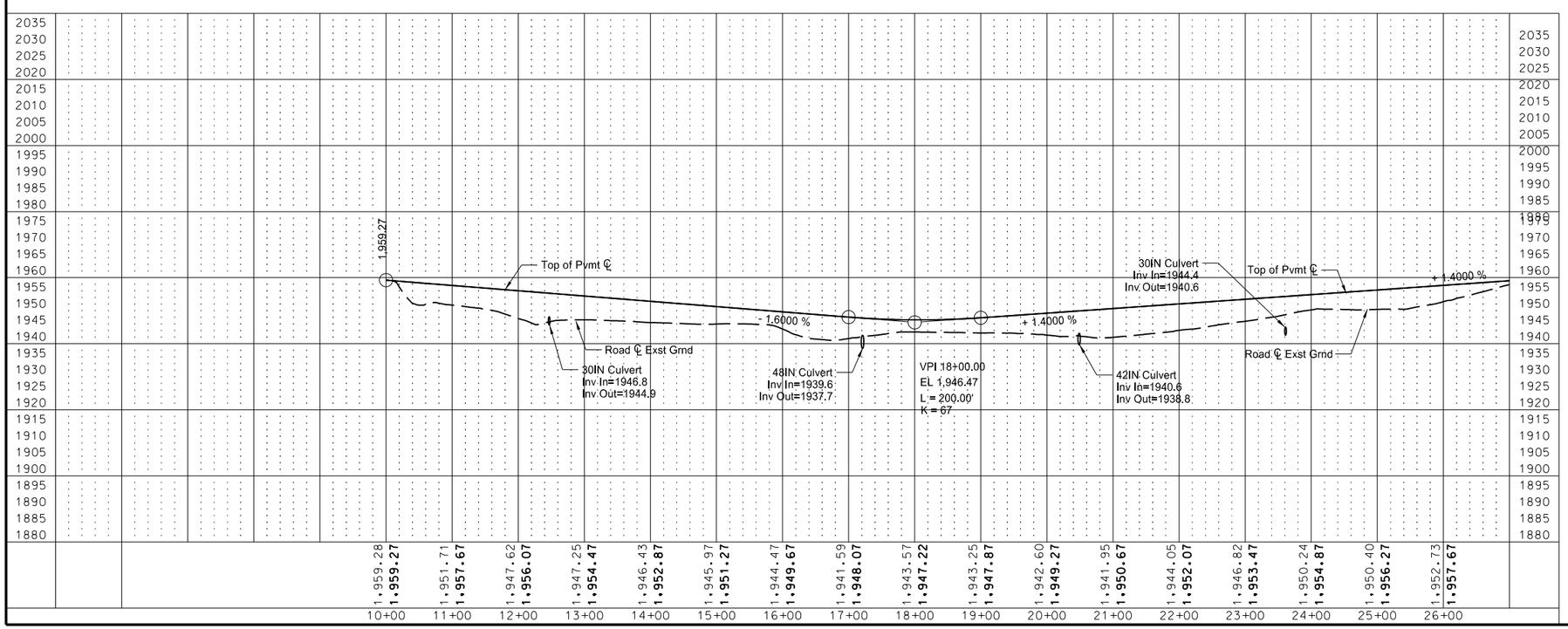
Northeast Truck Reliever Route
New Town, ND

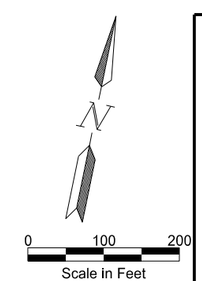
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	1



Corner Assembly Barbed Wire				
Sta 10+75.1 - 101 LT	752	3140	1	EA
Sta 10+80 - 101 RT	752	3140	1	EA
Sta 19+20.3 - 101 LT	752	3140	1	EA
Sta 19+39.3 - 101 LT	752	3140	1	EA
Sta 19+62 - 101 RT	752	3140	1	EA
Sta 21+50 - 101 RT	752	3140	1	EA

Description	Spec #	Code #	Qty	Unit
Subgrade Preparation - Type A				
Sta 25+00 to 26+00	230	300	1	STA
Aggregate Base Course CL 5				
Sta 10+00 to 26+00	302	120		
Main Line			3,510	TON
Shoulders			2,710	TON
Approaches			84	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
Sta 10+00 to 26+00	401	150	265	GAL
Superpave FAA 45				
Sta 10+00 to 26+00	410	215		
Main Line			670	TON
Shoulders			500	TON
Approaches			11	TON
PG 58-28 Asphalt Cement				
Sta 10+00 to 26+00	410	445	33	TON
PG 64-34 Asphalt Cement				
Sta 10+00 to 26+00	410	464	37	TON
12.5 In Non Reinf Concrete Pvmt CL AE-Dowled				
Sta 10+00 to 26+00	550	322		
Main Line			4,265	SY
Shoulders			1,242	SY
Riprap - Loose Rock				
Sta 10+00 to 26+00	708	1020	144	CY
Geotextile Fabric - Type RR				
Sta 10+00 to 26+00	709	600	263	SY
Geotextile Fabric - Type R1				
Sta 10+00 to 26+00	709	701	2,530	SY
Pipe Conduit 30In				
Sta 12+07 - 67 LT - 12+82 - 54 RT	714	4110	133	LF
Sta 23+61 - 61 LT - 23+62 - 67 RT	714	4110	119	LF
Pipe Conduit 42In				
Sta 20+62 - 57 LT - 20+62 - 56 RT	714	4120	103	LF
Pipe Conduit 48In				
Sta 16+91 - 58 LT - 17+46 - 46 RT	714	4125	106	LF
Fence Barbed Wire 5-Strand				
Sta 19+62 to 21+50	752	0400	3025	LF
Gate - Vehicle				
Sta 19+29.8 - 101 LT	752	2100	1	EA
Sta 19+40 - 101 RT	752	2100	1	EA





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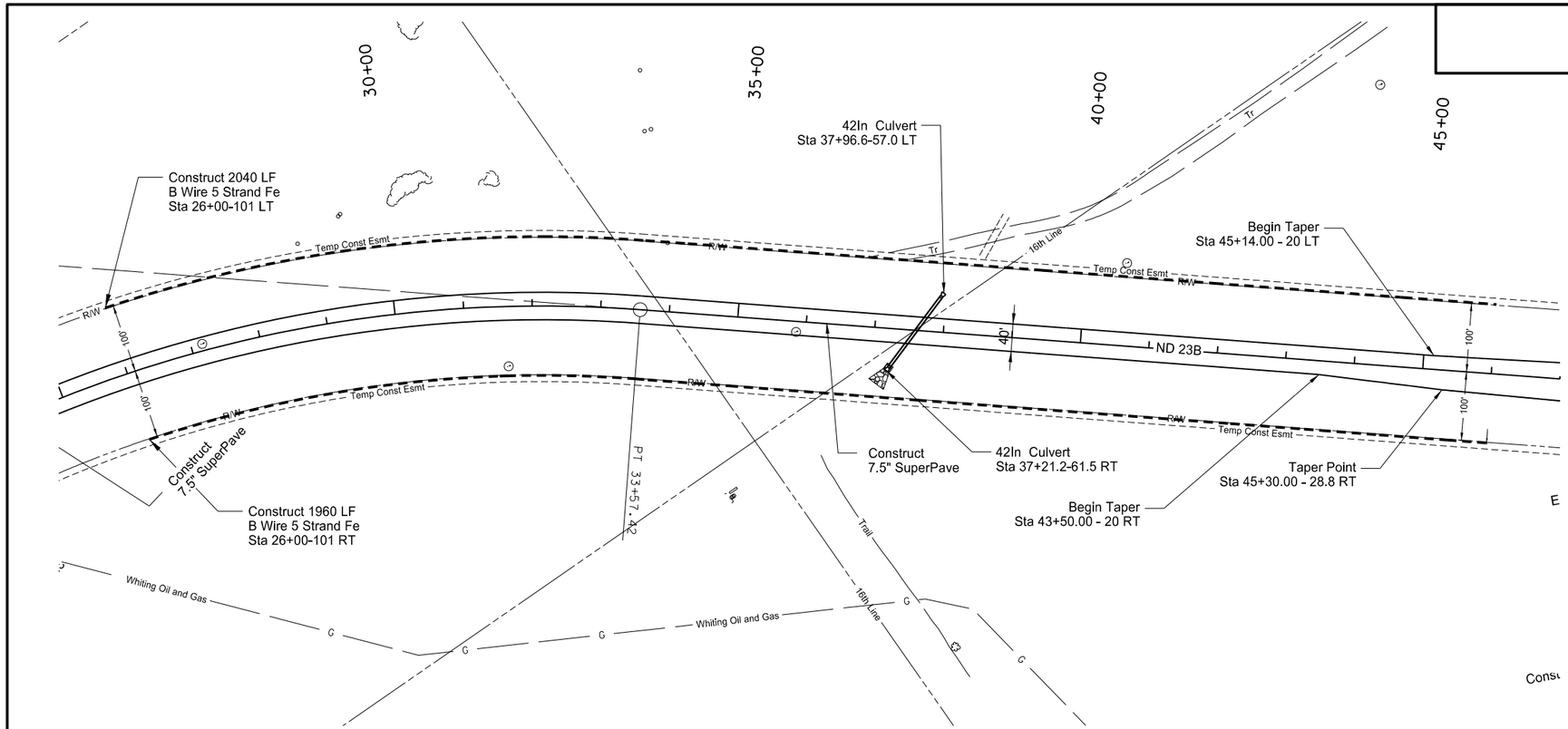
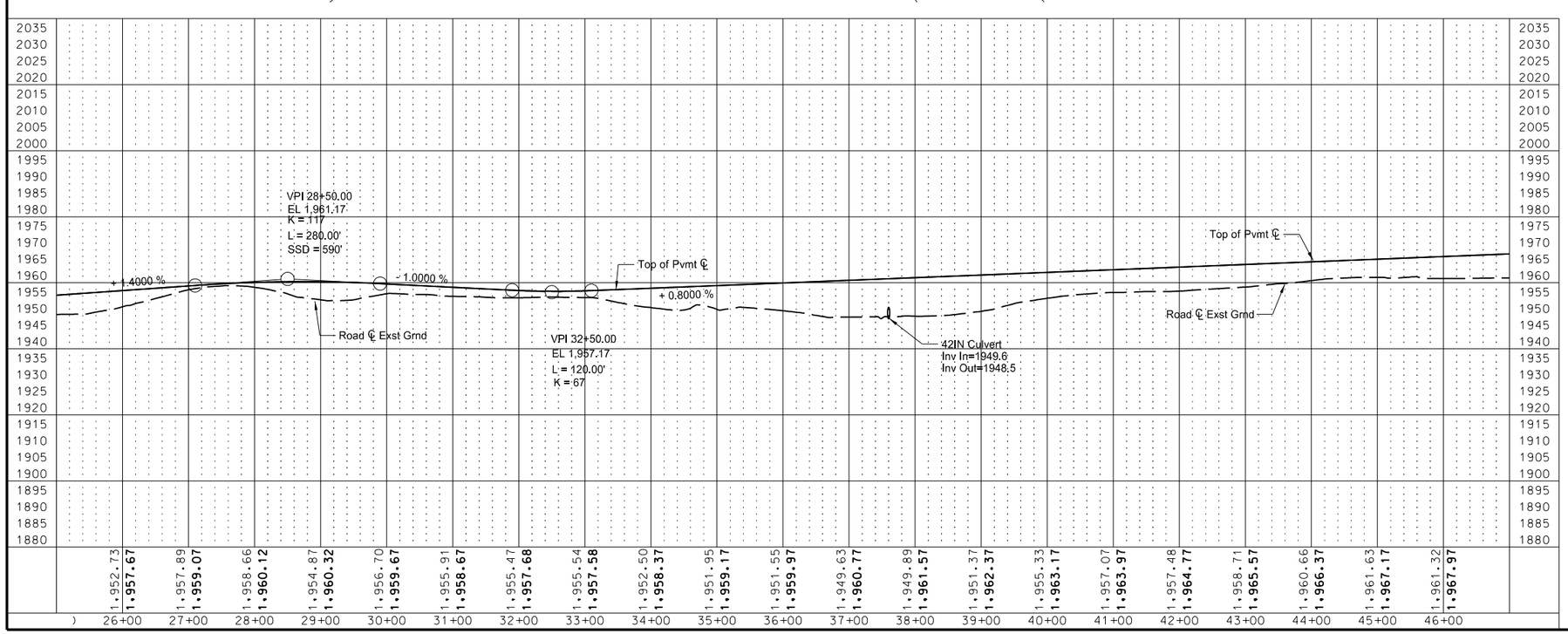
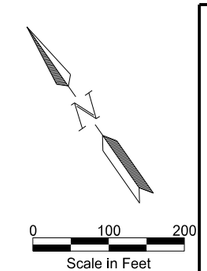
Plan & Profile
Sta 10+00 to 26+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	2



Description	Spec #	Code #	Qty	Unit
Subgrade Preparation - Type A				
Sta 26+00 to 35+00	230	300	9	STA
Aggregate Base Course CL 5				
Sta 26+00 to 46+00	302	120		
Main Line			6,190	TON
Shoulders			6,450	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
Sta 26+00 to 46+00	401	150	915	GAL
Superpave FAA 45				
Sta 26+00 to 46+00	410	215		
Main Line			2,360	TON
Shoulders			1,560	TON
PG 58-28 Asphalt Cement				
Sta 26+00 to 46+00	410	445	110	TON
PG 64-34 Asphalt Cement				
Sta 26+00 to 46+00	410	464	125	TON
Riprap - Loose Rock				
Sta 26+00 to 46+00	708	1020	62	CY
Geotextile Fabric - Type RR				
Sta 26+00 to 46+00	709	600	119	SY
Geotextile Fabric - Type R1				
Sta 26+00 to 46+00	709	701	745	SY
Pipe Conduit 42In				
Sta 37+97 - 57 LT - 37+21 - 62 RT	714	4120	130	LF
Fence Barbed Wire 5-Strand				
Sta 26+00 to 46+00	752	0400	4,000	LF





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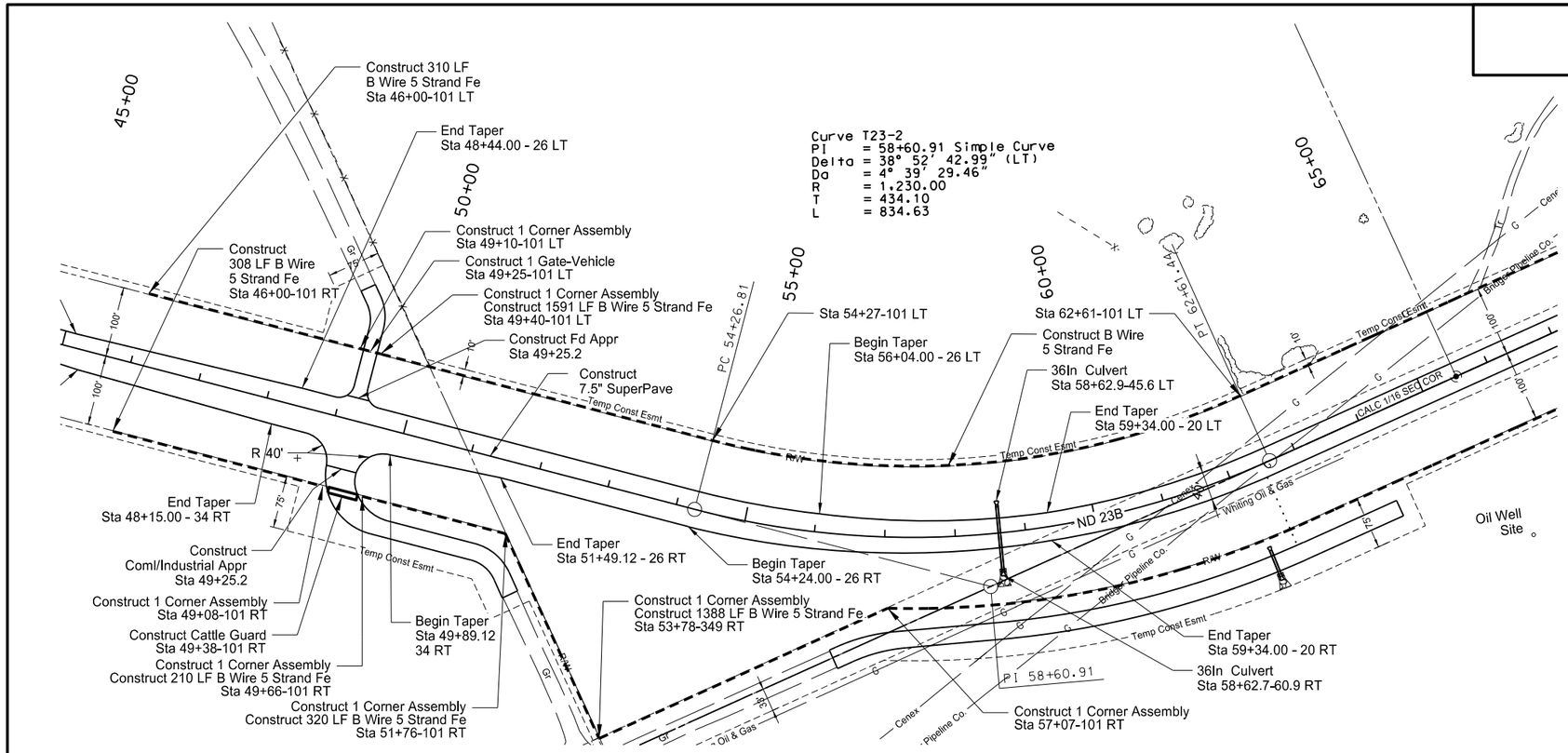
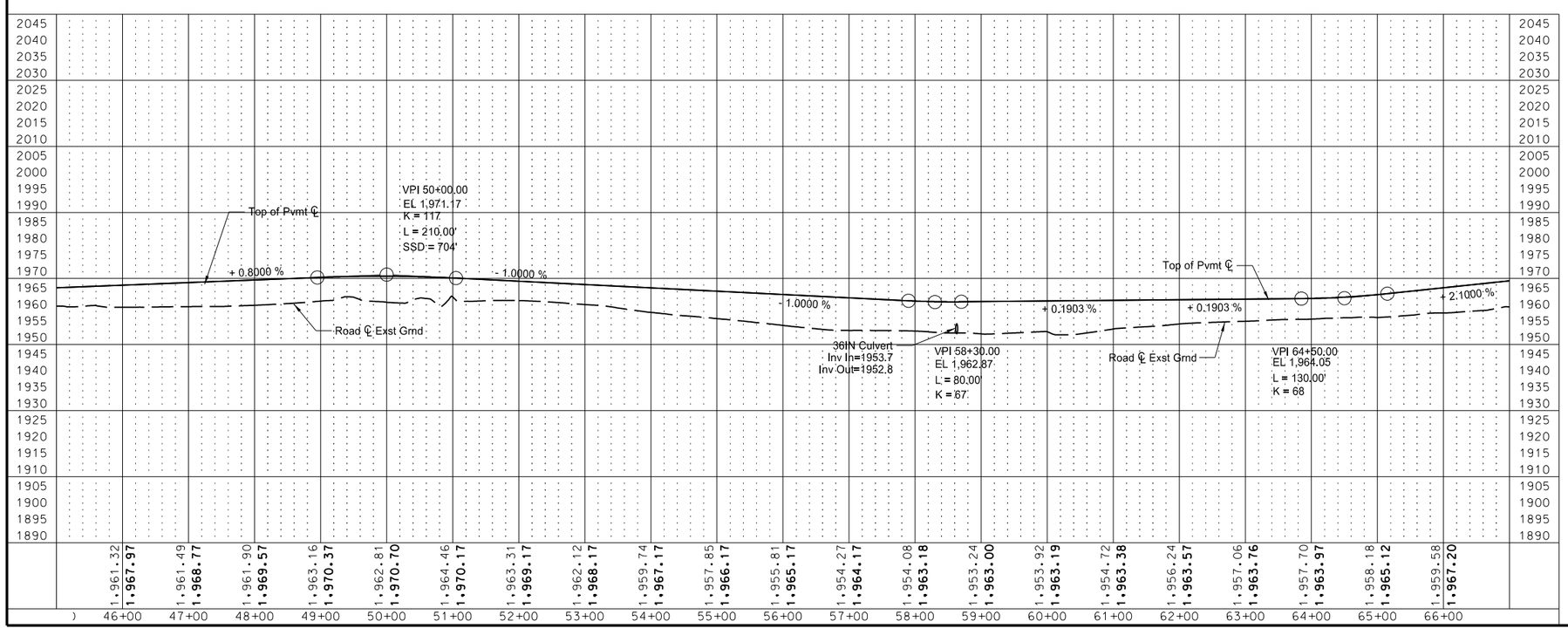
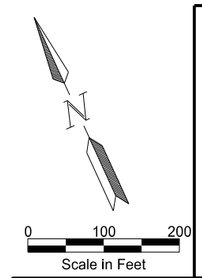
Plan & Profile
Sta 26+00 to 46+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	3





Description	Spec #	Code #	Qty	Unit
Aggregate Base Course CL 5				
Sta 46+00 to 66+00	302	120		
Main Line			8,020	TON
Shoulders			6,250	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
Sta 46+00 to 66+00	401	150	1075	GAL
Superpave FAA 45				
Sta 46+00 to 66+00	410	215		
Main Line			3,060	TON
Shoulders			1,490	TON
PG 58-28 Asphalt Cement				
Sta 46+00 to 66+00	410	445	127	TON
PG 64-34 Asphalt Cement				
Sta 46+00 to 66+00	410	464	152	TON
Riprap - Loose Rock				
Sta 46+00 to 66+00	708	1020	22	CY
Geotextile Fabric - Type RR				
Sta 46+00 to 66+00	709	600	64	SY
Geotextile Fabric - Type R1				
Sta 46+00 to 66+00	709	701	513	SY
Pipe Conduit 36In				
Sta 58+63 - 46 LT - 58+63 - 61 RT	714	4115	96	LF
Fence Barbed Wire 5-Strand				
Sta 46+00 to 66+00 LT	752	0400	1,901	LF
Sta 46+00 to 66+00 RT	752	0400	2,226	LF
Gate - Vehicle				
Sta 49+25 - 101 LT	752	2100	1	EA
Corner Assembly Barbed Wire				
Sta 49+08 - 101 RT	752	3140	1	EA
Sta 49+10 - 101 LT	752	3140	1	EA
Sta 49+40 - 101 LT	752	3140	1	EA
Sta 49+66 - 101 RT	752	3140	1	EA
Sta 51+76 - 101 RT	752	3140	1	EA
Sta 53+78 - 349 RT	752	3140	1	EA
Sta 57+07 - 101 RT	752	3140	1	EA
Cattle Guard				
Sta 49+36 - 101 RT	980	0050	1	EA



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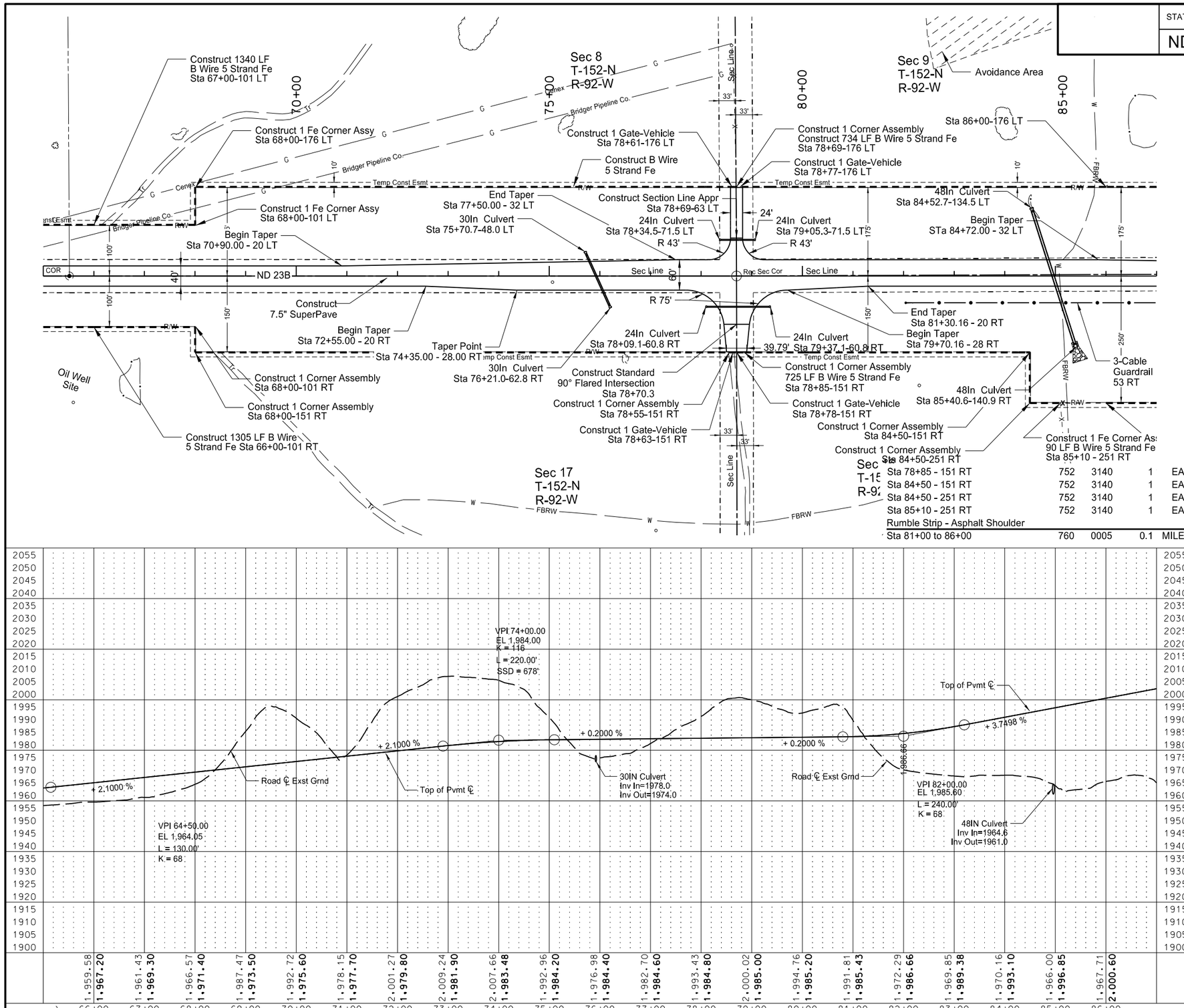
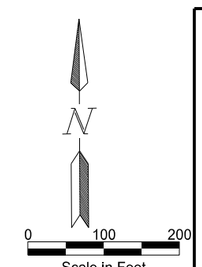
Plan & Profile
Sta 46+00 to 66+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	4



Description	Spec #	Code #	Qty	Unit
Subgrade Preparation - Type A				
Sta 72+00 to 81+00	230	300	9	STA
Aggregate Base Course CL 5				
Sta 66+00 to 86+00	302	120		
Main Line			8,490	TON
Shoulders			6,150	TON
Approaches			925	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
Sta 66+00 to 86+00	401	150	1109	GAL
Superpave FAA 45				
Sta 66+00 to 86+00	410	215		
Main Line			3,230	TON
Shoulders			1,170	TON
Approaches			350	TON
PG 58-28 Asphalt Cement				
Sta 66+00 to 86+00	410	445	123	TON
PG 64-34 Asphalt Cement				
Sta 66+00 to 86+00	410	464	162	TON
Riprap - Loose Rock				
Sta 66+00 to 86+00	708	1020	81	CY
Geotextile Fabric - Type RR				
Sta 66+00 to 86+00	709	600	144	SY
Geotextile Fabric - Type R1				
Sta 66+00 to 86+00	709	701	2,303	SY
Pipe Conduit 24In - Approach				
Sta 78+35 - 72 LT - 79+05 - 72 LT	714	4106	64	LF
Sta 78+09 - 61 RT - 79+37 - 61 RT	714	4106	122	LF
Pipe Conduit 30In				
Sta 75+71 - 48 LT - 76+21 - 63 RT	714	4110	112	LF
Pipe Conduit 48In				
Sta 84+53 - 135 LT to Sta 85+41 - 141 RT	714	4125	278	LF
Fence Barbed Wire 5-Strand				
Sta 66+00 to 86+00 LT	752	0400	2,074	LF
Sta 66+00 to 86+00 RT	752	0400	2,120	LF
Gate - Vehicle				
Sta 78+55 - 151 RT	752	2100	1	EA
Sta 78+61 - 176 LT	752	2100	1	EA
Sta 78+77 - 176 LT	752	2100	1	EA
Sta 78+78 - 151 RT	752	2100	1	EA
Corner Assembly Barbed Wire				
Sta 68+00 - 101 LT	752	3140	1	EA
Sta 68+00 - 176 LT	752	3140	1	EA
Sta 68+00 - 101 RT	752	3140	1	EA
Sta 68+00 - 151 RT	752	3140	1	EA
Sta 78+55 - 151 RT	752	3140	1	EA
Sta 78+69 - 176 LT	752	3140	1	EA
Sta 78+85 - 151 RT	752	3140	1	EA
Sta 84+50 - 151 RT	752	3140	1	EA
Sta 84+50 - 251 RT	752	3140	1	EA
Sta 85+10 - 251 RT	752	3140	1	EA
Rumble Strip - Asphalt Shoulder				
Sta 81+00 to 86+00	760	0005	0.1	MILE



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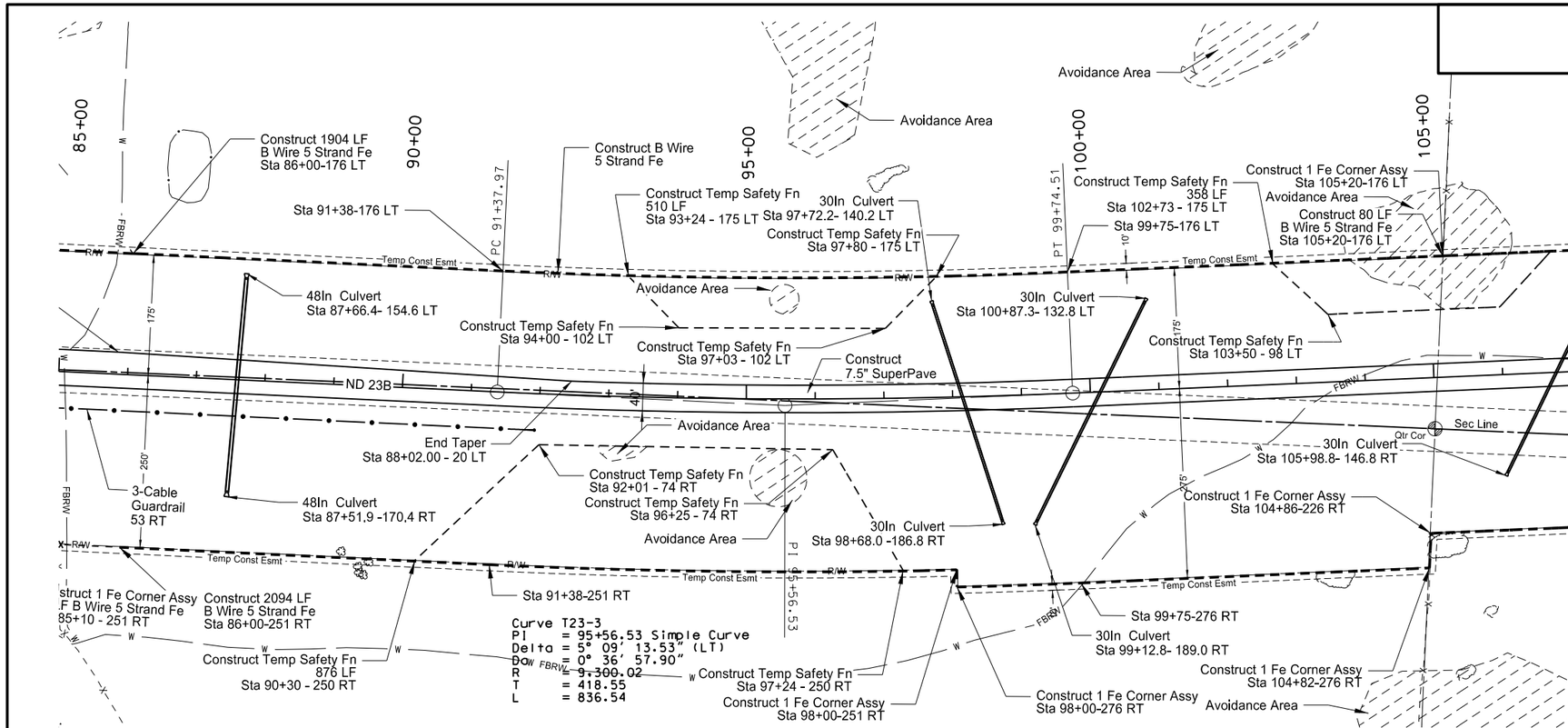
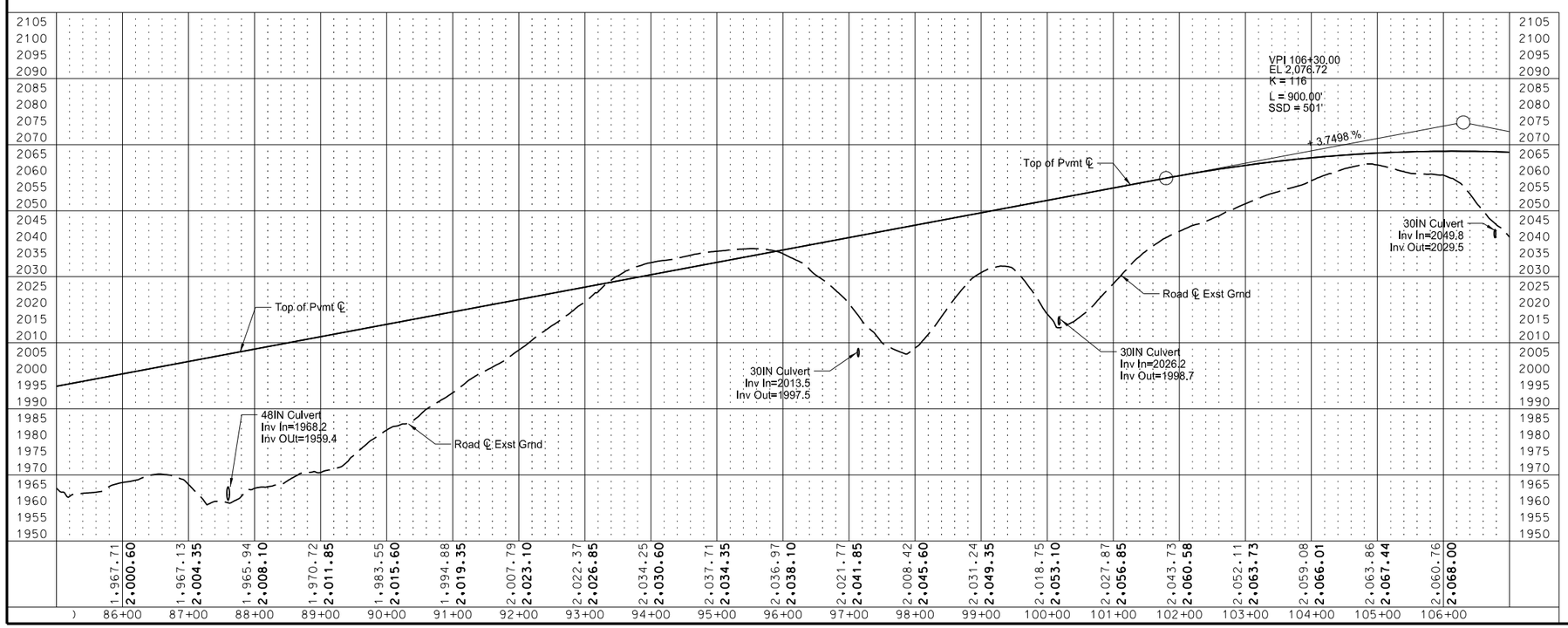
Plan & Profile
Sta 66+00 to 86+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	5





Description	Spec #	Code #	Qty	Unit
Subgrade Preparation - Type A				
Sta 93+00 to 97+00	230	300	4	STA
Sta 104+00 to 106+00			2	STA
Aggregate Base Course CL 5				
Sta 86+00 to 106+00	302	120		
Main Line			6,320	TON
Shoulders			6,490	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
Sta 86+00 to 106+00	401	150	932	GAL
Superpave FAA 45				
Sta 86+00 to 106+00	410	215		
Main Line			2,405	TON
Shoulders			1,590	TON
PG 58-28 Asphalt Cement				
Sta 86+00 to 106+00	410	445	112	TON
PG 64-34 Asphalt Cement				
Sta 86+00 to 106+00	410	464	128	TON
Geotextile Fabric - Type R1				
Sta 86+00 to 106+00	709	701	5,709	SY
Pipe Conduit 30In				
Sta 97+72 - 140 LT to	714	4110		
Sta 98+68 - 187 RT			332	LF
Sta 100+87 - 133 LT to	714	4110		
Sta 99+13 - 189 RT			355	LF
Sta 105+99 - 147 RT (See Sheet 6 For Quantities)				
Pipe Conduit 48In				
Sta 87+66 - 155 LT to	714	4125		
Sta 87+52 - 171 RT			310	LF
Fence Barbed Wire 5-Strand				
Sta 86+00 to 106+00 LT	752	0400	1,984	LF
Sta 86+00 to 106+00 RT	752	0400	2,094	LF
Temporary Safety Fence				
Sta 90+30 to 97+24 RT	752	0911	876	LF
Sta 93+24 to 97+80 LT	752	0911	510	LF
Sta 102+73 to 106+77 LT	752	0911	358	LF
Corner Assembly Barbed Wire				
Sta 98+00 - 251 RT	752	3140	1	EA
Sta 98+00 - 276 RT	752	3140	1	EA
Sta 104+82 - 276 RT	752	3140	1	EA
Sta 104+86 - 226 RT	752	3140	1	EA
Sta 105+20 - 176 LT	752	3140	1	EA
Rumble Strip - Asphalt Shoulder				
Sta 86+00 to 92+00	760	0005	0.11	MILE

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Scale in Feet

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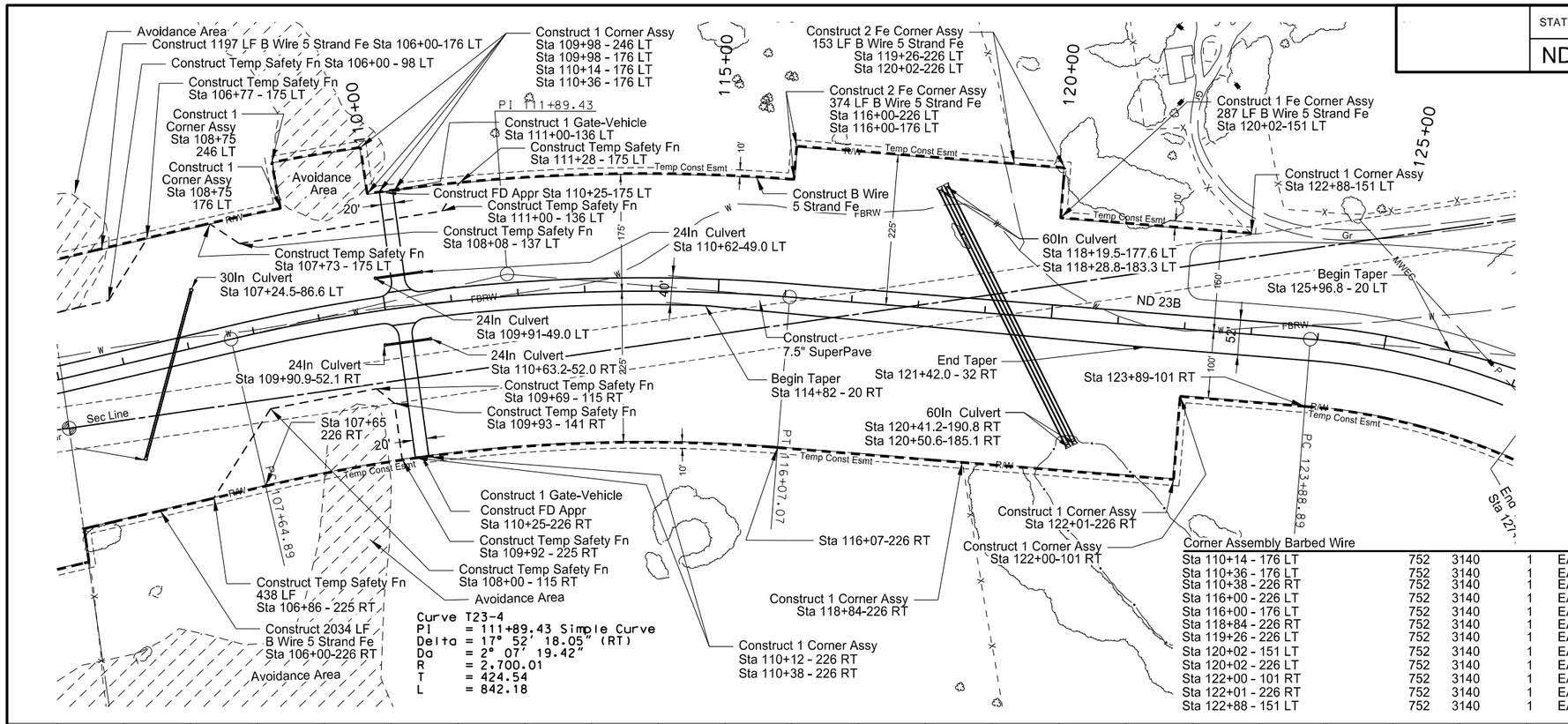
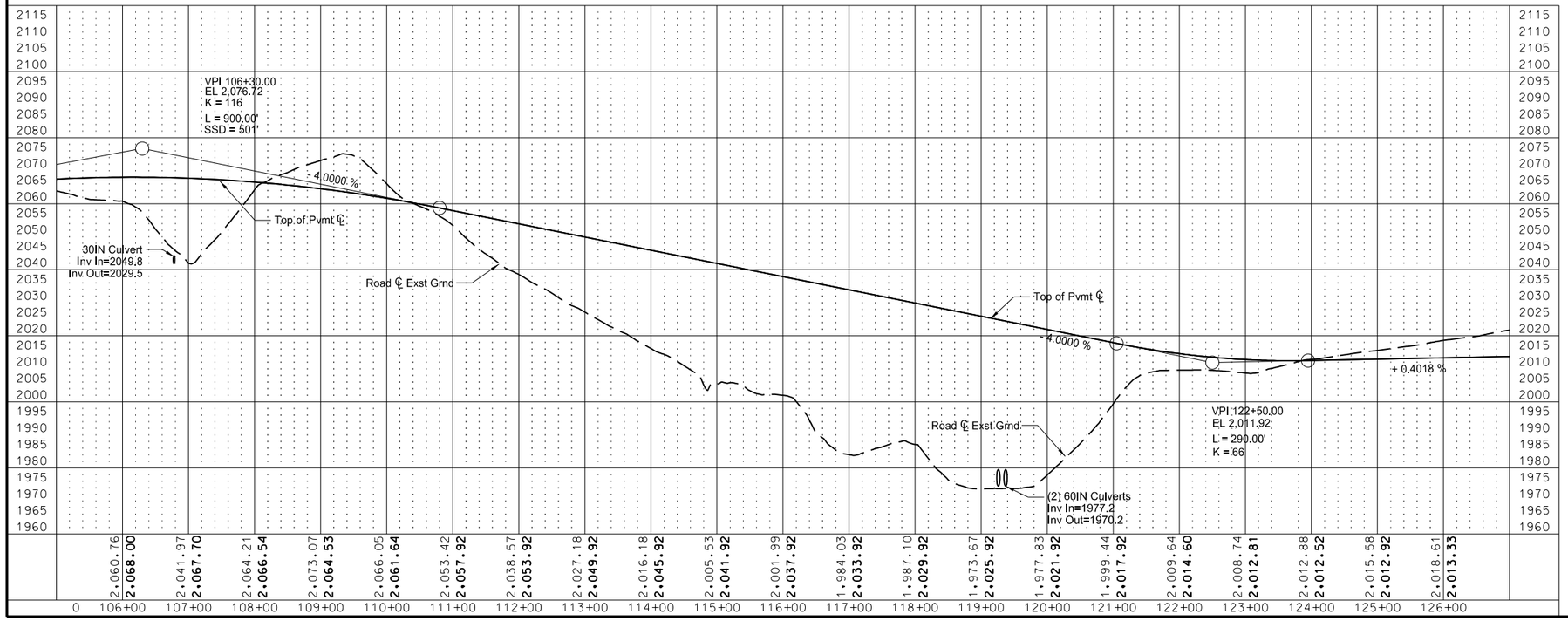
Plan & Profile
Sta 86+00 to 106+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

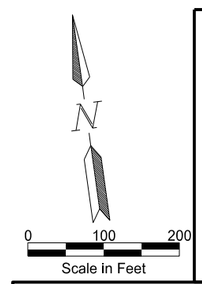
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	6



Corner Assembly Barbed Wire				
Sta 110+14 - 176 LT	752	3140	1	EA
Sta 110+36 - 176 LT	752	3140	1	EA
Sta 110+38 - 226 RT	752	3140	1	EA
Sta 116+00 - 226 LT	752	3140	1	EA
Sta 116+00 - 176 LT	752	3140	1	EA
Sta 118+84 - 226 RT	752	3140	1	EA
Sta 119+26 - 226 LT	752	3140	1	EA
Sta 120+02 - 151 LT	752	3140	1	EA
Sta 120+02 - 226 LT	752	3140	1	EA
Sta 122+00 - 101 RT	752	3140	1	EA
Sta 122+01 - 226 RT	752	3140	1	EA
Sta 122+88 - 151 LT	752	3140	1	EA

Description	Spec #	Code #	Qty	Unit
Subgrade Preparation - Type A				
Sta 108+00 to 112+00	230	300	4	STA
Sta 123+00 to 126+00	230	300	3	STA
Aggregate Base Course CL 5				
Sta 106+00 to 126+00	302	120		
Main Line			7,080	TON
Shoulders			6,350	TON
Approaches			181	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
Sta 106+00 to 126+00	401	150	1003	GAL
Superpave FAA 45				
Sta 106+00 to 126+00	410	215		
Main Line			2,700	TON
Shoulders			1,570	TON
Approaches			20	TON
PG 58-28 Asphalt Cement				
Sta 106+00 to 126+00	410	445	115	TON
PG 64-34 Asphalt Cement				
Sta 106+00 to 126+00	410	464	124	TON
Geotextile Fabric - Type R1				
Sta 106+00 to 126+00	709	701	4,771	SY
Pipe Conduit 24In - Approach				
Sta 109+91 - 52 RT to Sta 110+63 - 52 RT	714	4106	64	LF
Sta 109+91 - 49 LT to Sta 110+62 - 49 LT	714	4106	64	LF
Pipe Conduit 30In				
Sta 107+25 - 87 LT to Sta 105+99 - 147 RT	714	4110	258	LF
Pipe Conduit 60In				
Sta 118+20 - 178 LT to Sta 120+51 - 185 RT	714	4135	850	LF
Fence Barbed Wire 5-Strand				
Sta 106+00 to 122+88 LT	752	0400	2,011	LF
Sta 106+00 to 118+84 RT	752	0400	2,034	LF
Temporary Safety Fence				
Sta 106+00 to 106+77 LT	752	0911	108	LF
Sta 106+86 to 109+92 RT			438	LF
Sta 107+73 to 111+28 LT			406	LF
Gate - Vehicle				
Sta 110+25 - 226 RT	752	2100	1	EA
Sta 111+28 - 175 LT	752	2100	1	EA
Corner Assembly Barbed Wire				
Sta 108+75 - 176 LT	752	3140	1	EA
Sta 108+75 - 246 LT	752	3140	1	EA
Sta 109+98 - 176 LT	752	3140	1	EA
Sta 109+98 - 246 LT	752	3140	1	EA
Sta 110+12 - 226 RT	752	3140	1	EA





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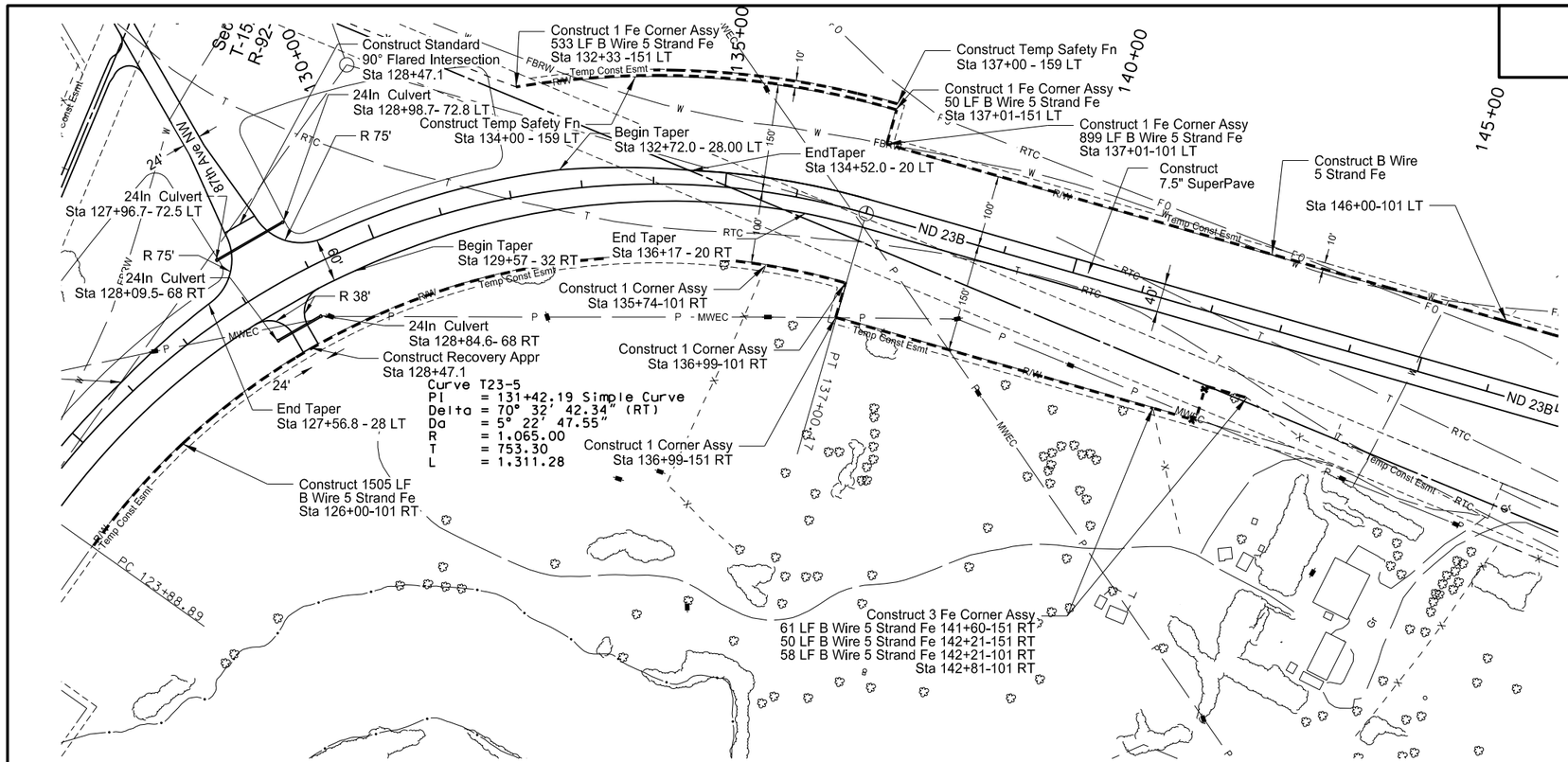
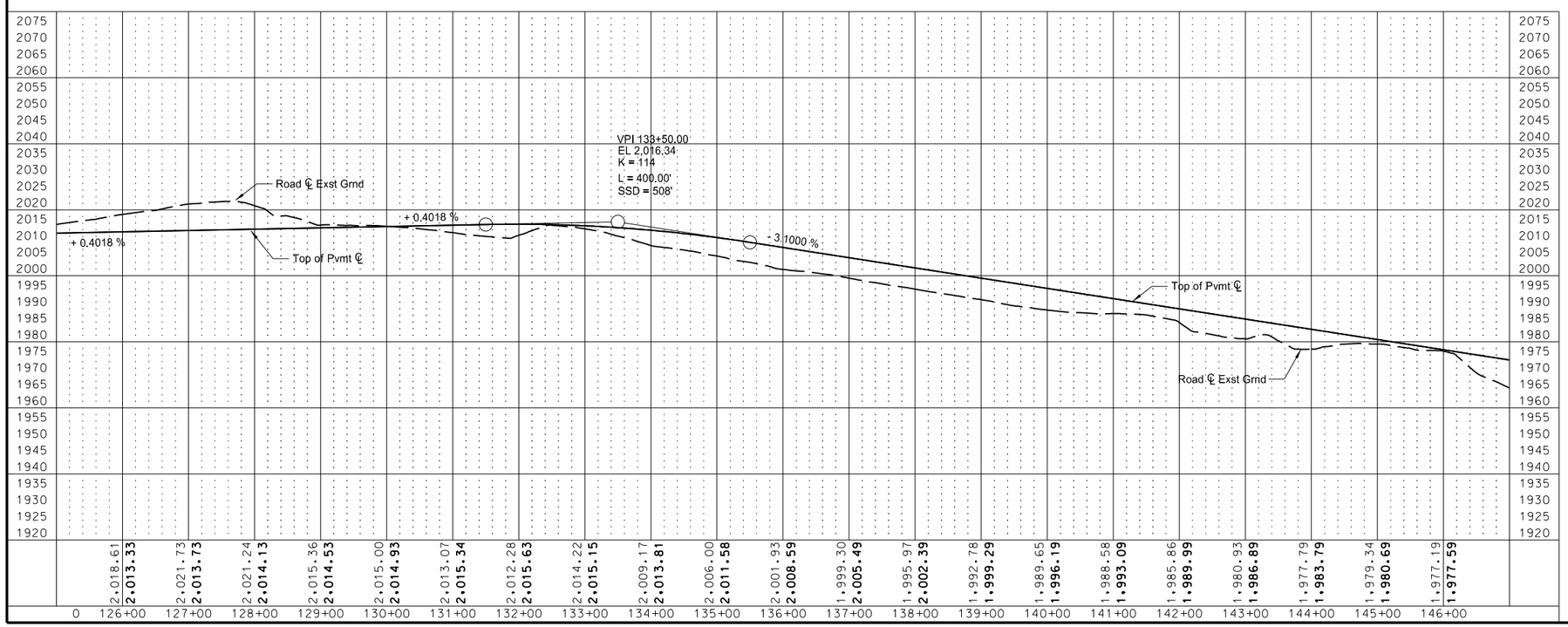
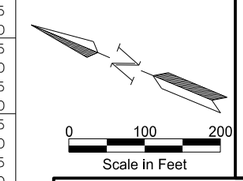
Plan & Profile
Sta 106+00 to 126+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	7



Description	Spec #	Code #	Qty	Unit
Subgrade Preparation - Type A				
Sta 126+00 to 136+00	230	300	10	STA
Sta 144+00 to 146+00	230	300	2	STA
Aggregate Base Course CL 5				
Sta 126+00 to 146+00	302	120		
Main Line			7,800	TON
Shoulders			5,990	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
Sta 126+00 to 146+00	401	150	1047	GAL
Superpave FAA 45				
Sta 126+00 to 146+00	410	215		
Main Line			2,970	TON
Shoulders			1,430	TON
PG 58-28 Asphalt Cement				
Sta 126+00 to 146+00	410	445	123	TON
PG 64-34 Asphalt Cement				
Sta 126+00 to 146+00	410	464	155	TON
Pipe Conduit 24In - Approach				
Sta 127+97 - 73 LT to Sta 128+99 - 73 LT	714	4106	102	LF
Sta 128+10 - 68 RT to Sta 128+85 - 68 RT	714	4106	64	LF
Fence Barbed Wire 5-Strand				
Sta 132+33 to 146+00 LT	752	0400	1,482	LF
Sta 126+00 to 142+81 RT			1,674	LF
Temporary Safety Fence				
Sta 134+00 to 137+00 LT	752	0911	300	LF
Corner Assembly Barbed Wire				
Sta 132+33 - 151 LT	752	3140	1	EA
Sta 135+74 - 101 RT	752	3140	1	EA
Sta 136+99 - 101 RT	752	3140	1	EA
Sta 136+99 - 151 RT	752	3140	1	EA
Sta 137+01 - 151 LT	752	3140	1	EA
Sta 137+01 - 101 LT	752	3140	1	EA
Sta 141+60 - 151 RT	752	3140	1	EA
Sta 142+21 - 151 RT	752	3140	1	EA
Sta 142+21 - 101 RT	752	3140	1	EA
Sta 142+81 - 101 RT	752	3140	1	EA





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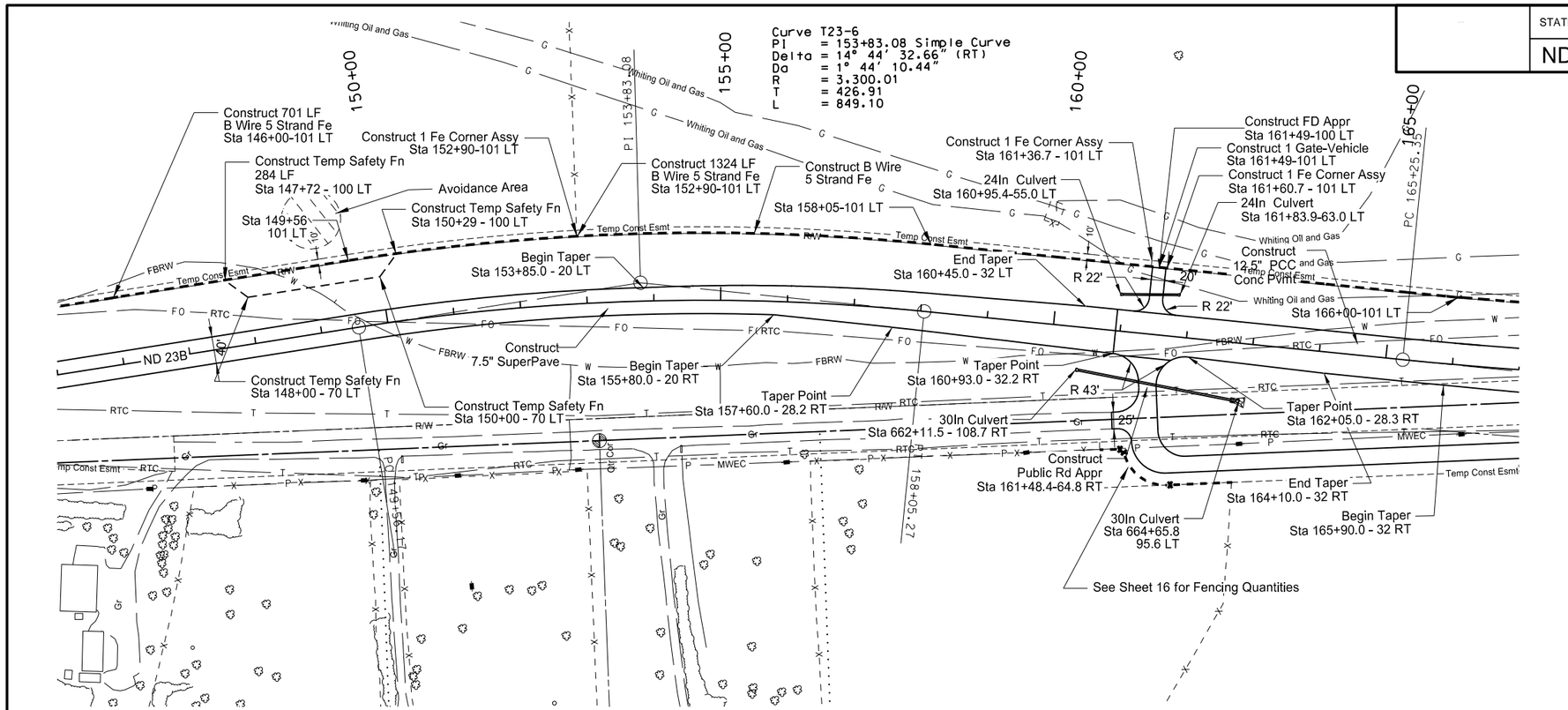
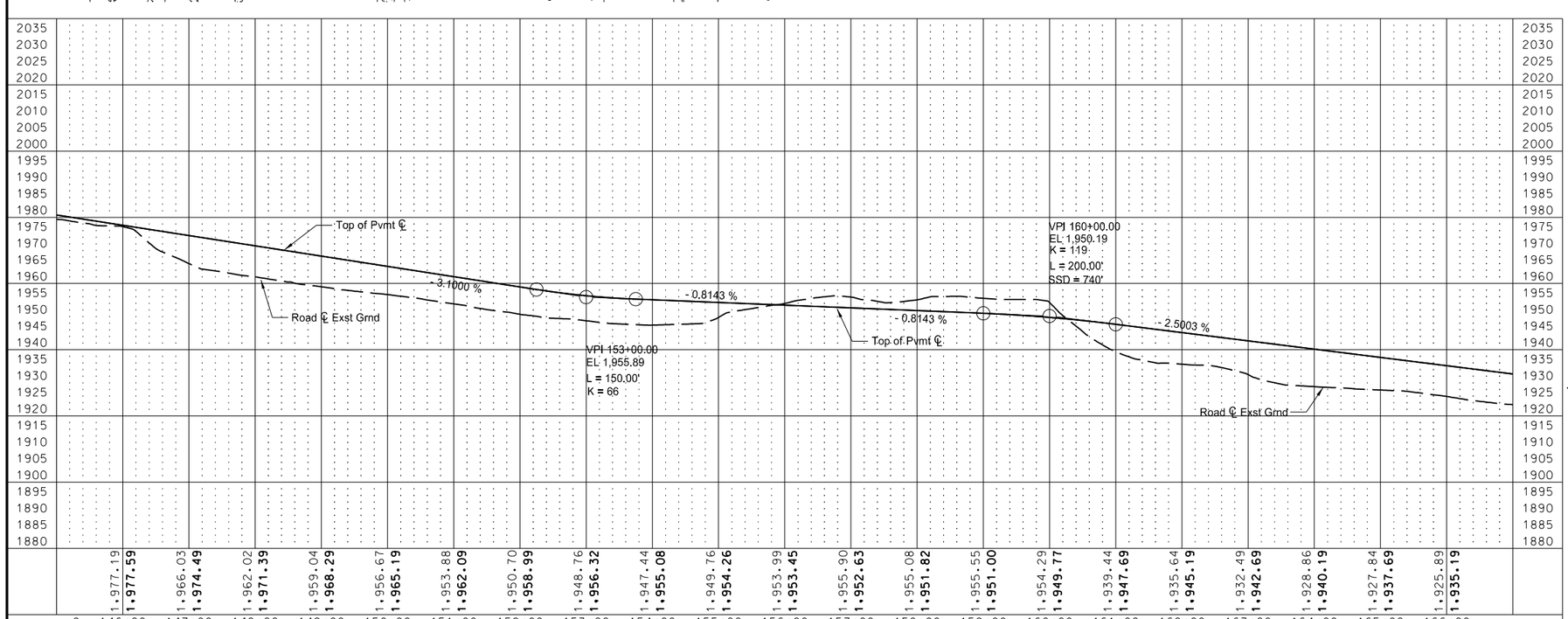
Plan & Profile
Sta 126+00 to 146+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	8





Description	Spec #	Code #	Qty	Unit
Subgrade Preparation - Type A				
Sta 155+00 to 160+00	230	300	5	STA
Aggregate Base Course CL 5				
Sta 146+00 to 166+00	302	120		
Main Line			6,790	TON
Shoulders			5,100	TON
Approaches			45	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
Sta 146+00 to 166+00	401	150	765	GAL
Superpave FAA 45				
Sta 146+00 to 166+00	410	215		
Main Line			2,160	TON
Shoulders			1,150	TON
Approaches			6	TON
PG 58-28 Asphalt Cement				
Sta 146+00 to 166+00	410	445	93	TON
PG 64-34 Asphalt Cement				
Sta 146+00 to 166+00	410	464	106	TON
Riprap - Loose Rock				
Sta 146+00 to 166+00	708	1020	10	CY
12.5 In Non Reinf Concrete Pvmt CL AE-Dowled				
Sta 146+00 to 166+00	550	322		
Main Line			2,680	SY
Shoulders			880	SY
Geotextile Fabric - Type RR				
Sta 146+00 to 166+00	709	600	40	SY
Pipe Conduit 24In - Approach				
Sta 160+95 - 55 LT to Sta 161+84 - 63 LT	714	4106	82	LF
Pipe Conduit 30In - Approach				
Sta 160+40 - 64 RT to Sta 162+87 - 87 RT	714	4113	240	LF
Fence Barbed Wire 5-Strand				
Sta 146+00 to 166+00 LT	752	0400	2,025	LF
Temporary Safety Fence				
Sta 147+72 to 150+29 LT	752	0911	284	LF
Gate - Vehicle				
Sta 161+49 - 101 LT	752	2100	1	EA
Corner Assembly Barbed Wire				
Sta 152+90 - 101 LT	752	3140	1	EA
Sta 161+36.7 - 101 LT	752	3140	1	EA
Sta 161+60.7 - 101 LT	752	3140	1	EA

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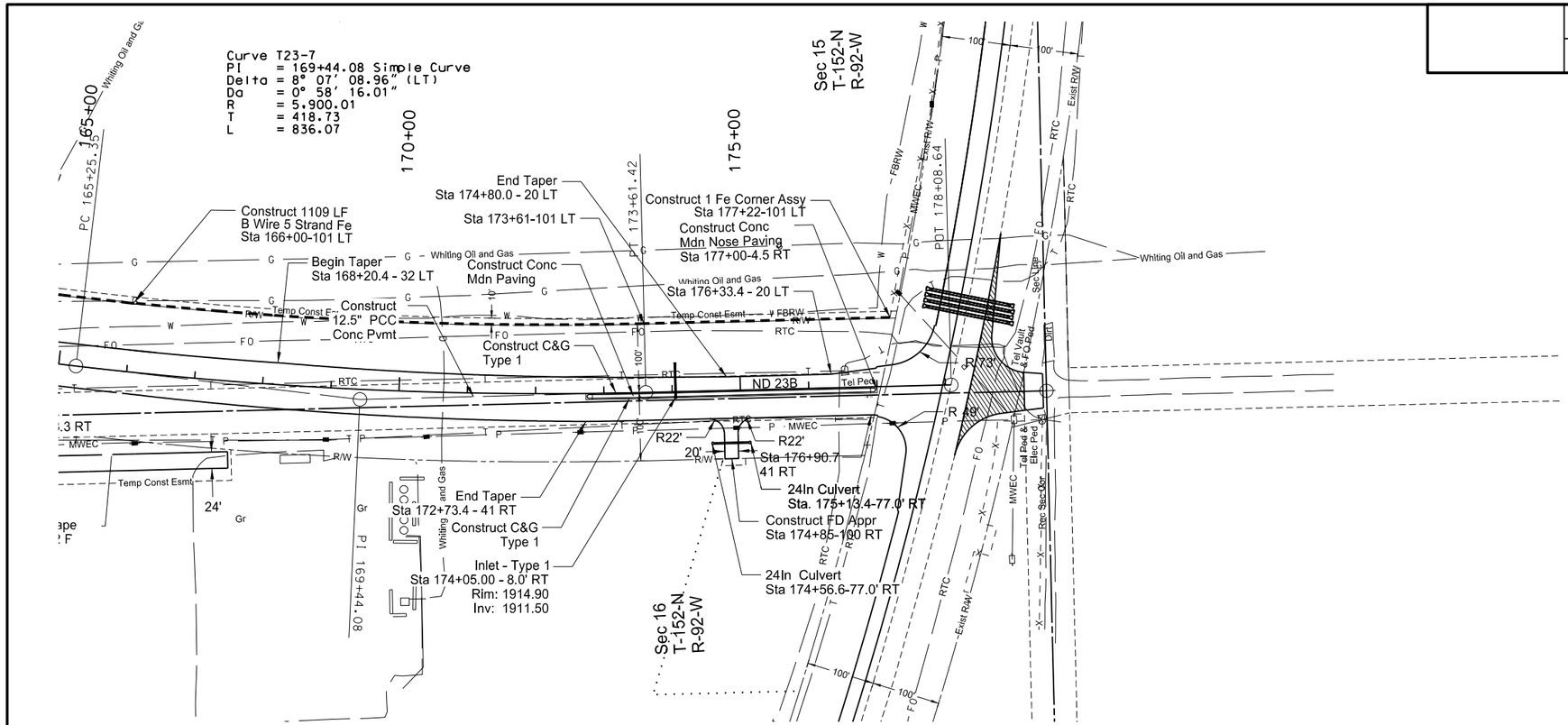
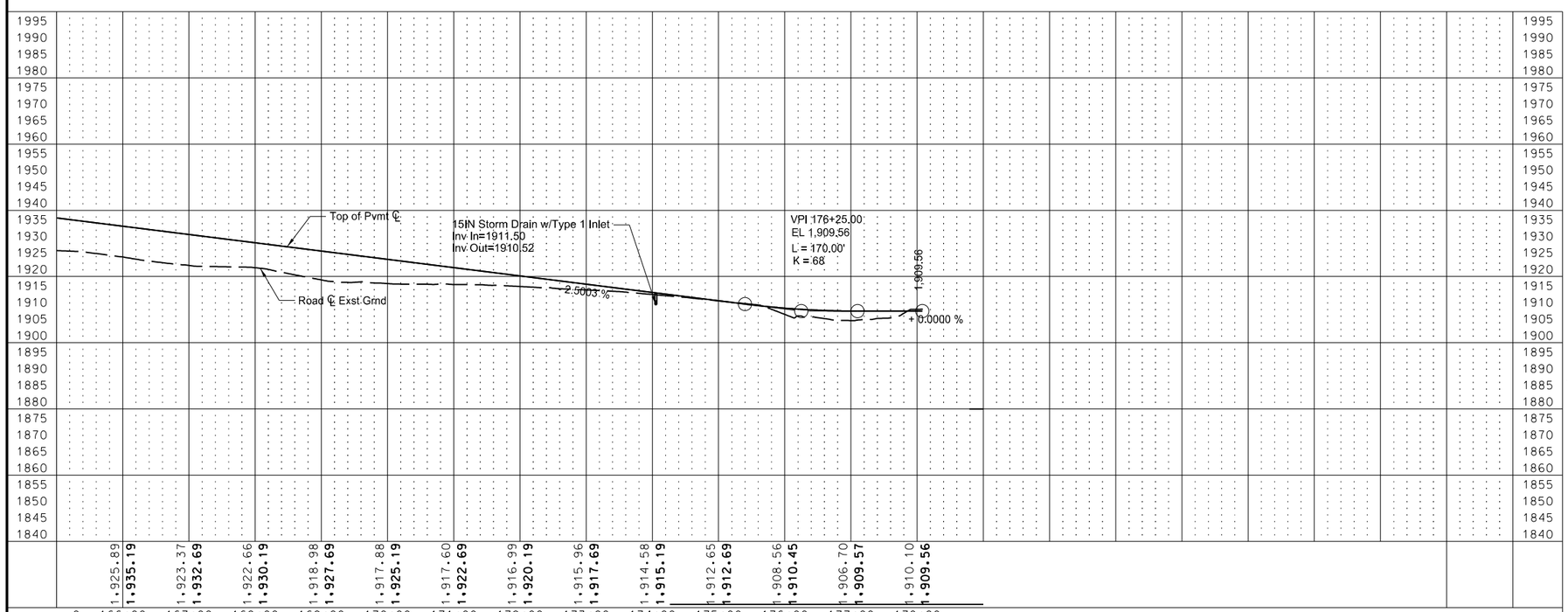
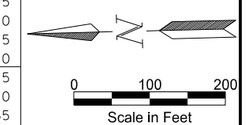
Plan & Profile
Sta 146+00 to 166+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	9



Description	Spec #	Code #	Qty	Unit
Subgrade Preparation - Type A				
Sta 171+00 to 178+00	230	300	7	STA
Aggregate Base Course CL 5				
	302	120		
Main Line			2,600	TON
Shoulders			1,750	TON
12.5 In Non Reinf Concrete Pvmt CL AE-Dowled				
Sta 166+00 to 178+00	550	322		
Main Line			6,560	SY
Shoulders			2,010	SY
Geotextile Fabric - Type R1				
Sta 166+00 to 178+00	709	701	216	SY
Pipe Conduit 15 IN				
Sta 174+05 - 8 RT to Sta 174+05 - 40 RT	714	4095	48	LF
Pipe Conduit 24In - Approach				
Sta 174+57 - 77 RT to Sta 175+13 - 77 RT	714	4106	50	LF
Casting, Inlet - Type 1				
Sta 174+05 - 8 RT	722	3455	1	EA
Inlet - Type 1				
Sta 174+05 - 8 RT	722	3500	1	EA
Curb & Gutter - Type 1				
Sta 172+74 to 177+00	748	140	816	LF
Concrete Median Paving				
Sta 172+74 to 177+00	750	200	226	SY
Concrete Median Nose Paving				
Sta 172+74 to 177+00	750	210	19	SY
Fence Barbed Wire 5-Strand				
Sta 166+00 to 177+22 LT	752	400	1,109	LF
Corner Assembly Barbed Wire				
Sta 177+22 - 101 LT	752	3140	1	EA





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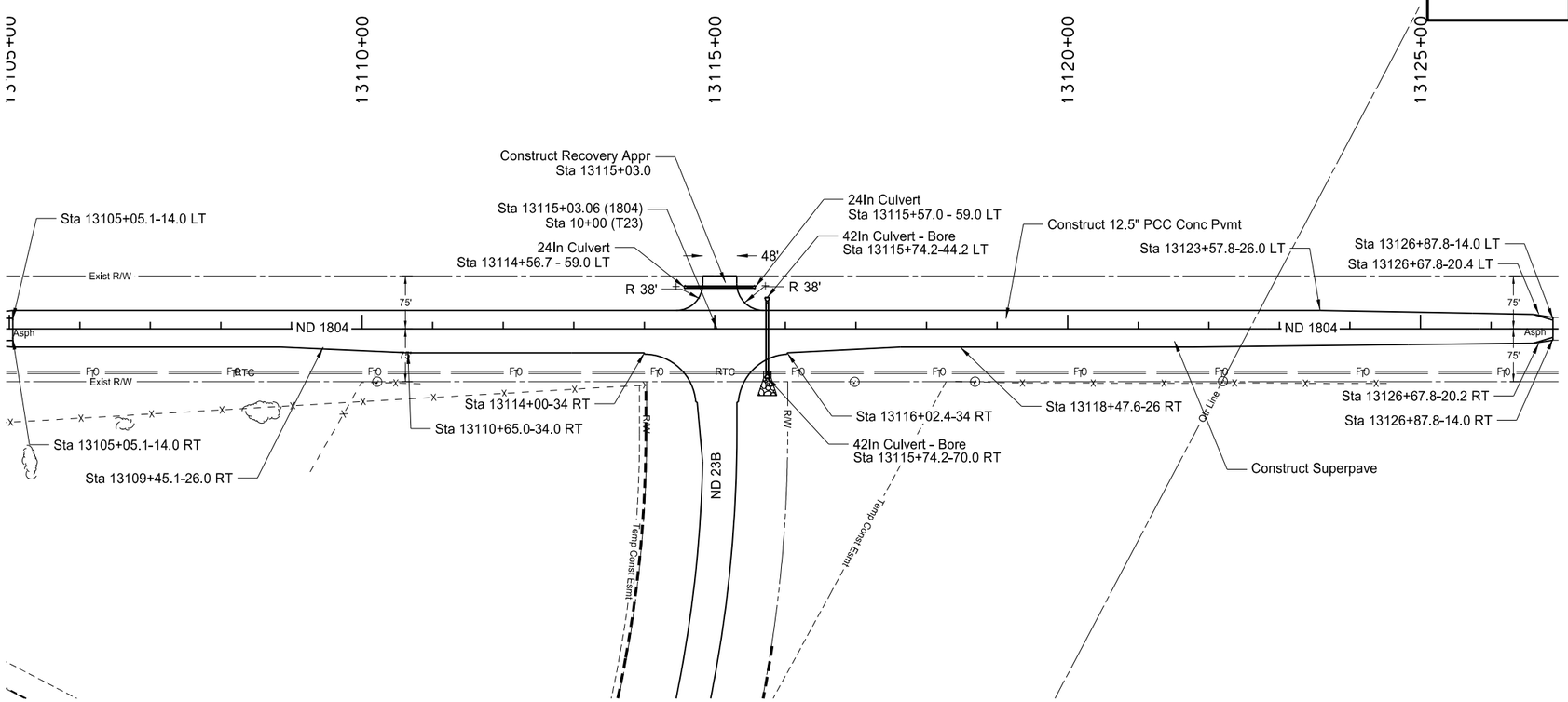
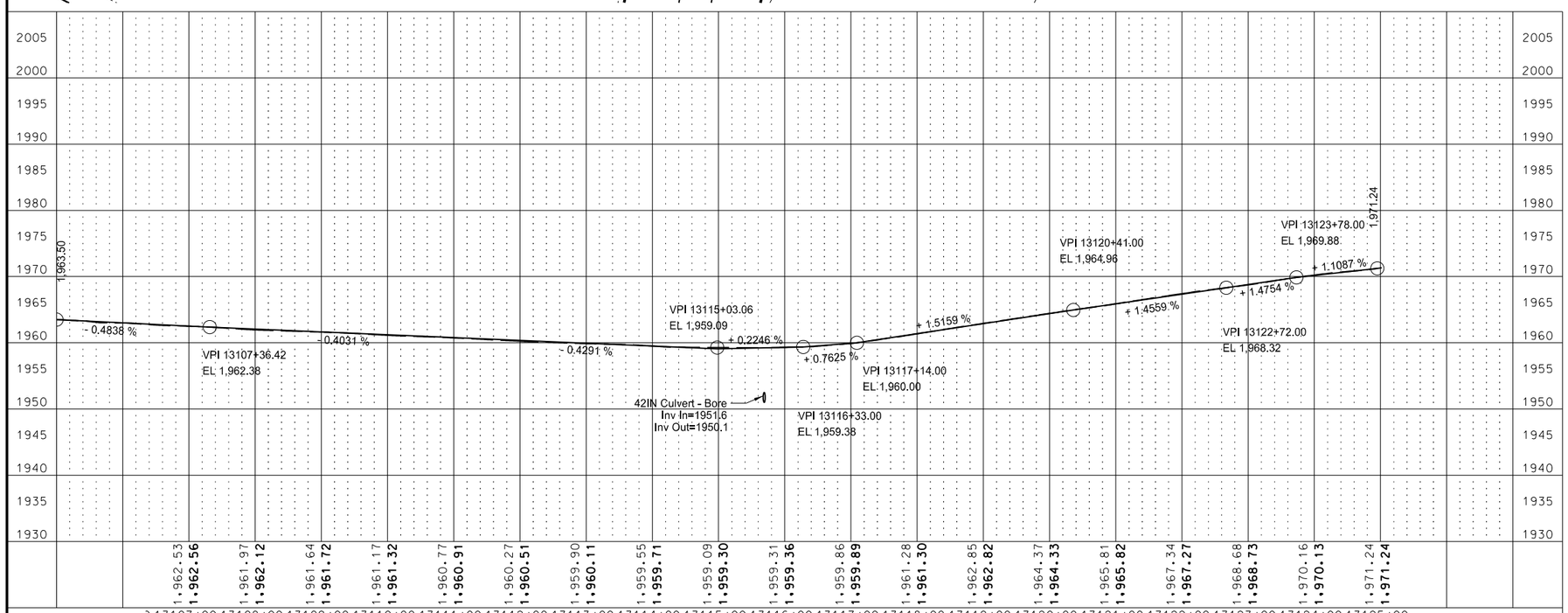
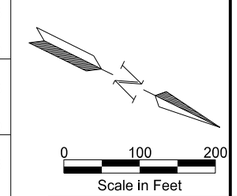
Plan & Profile
Sta 166+00 to 178+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	10



Description	Spec #	Code #	Qty	Unit
Aggregate Base Course CL 5				
Sta 13105+05 to 13126+88	302	120		
Main Line			3,850	TON
Shoulders			1,940	TON
12.5 In Non Reinf Concrete Pvmt CL AE-Dowled				
Sta 10+00 to 26+00	550	322		
Main Line			9,248	SY
Shoulders			3,687	SY
Riprap - Loose Rock				
Sta 13115+74 - RT	708	1020	62	CY
Geotextile Fabric - Type RR				
Sta 13105+05 to 13126+88	709	600	119	SY
Pipe Conduit 24In - Approach				
Sta 13114+57 - 59 LT to Sta 13115+57 - 59 LT	714	4106	93	LF
Pipe Conduit 42In - Jacked or Bored				
Sta 13115+74 - 44 LT to Sta 13115+74 - 70 RT	714	4167	104	LF





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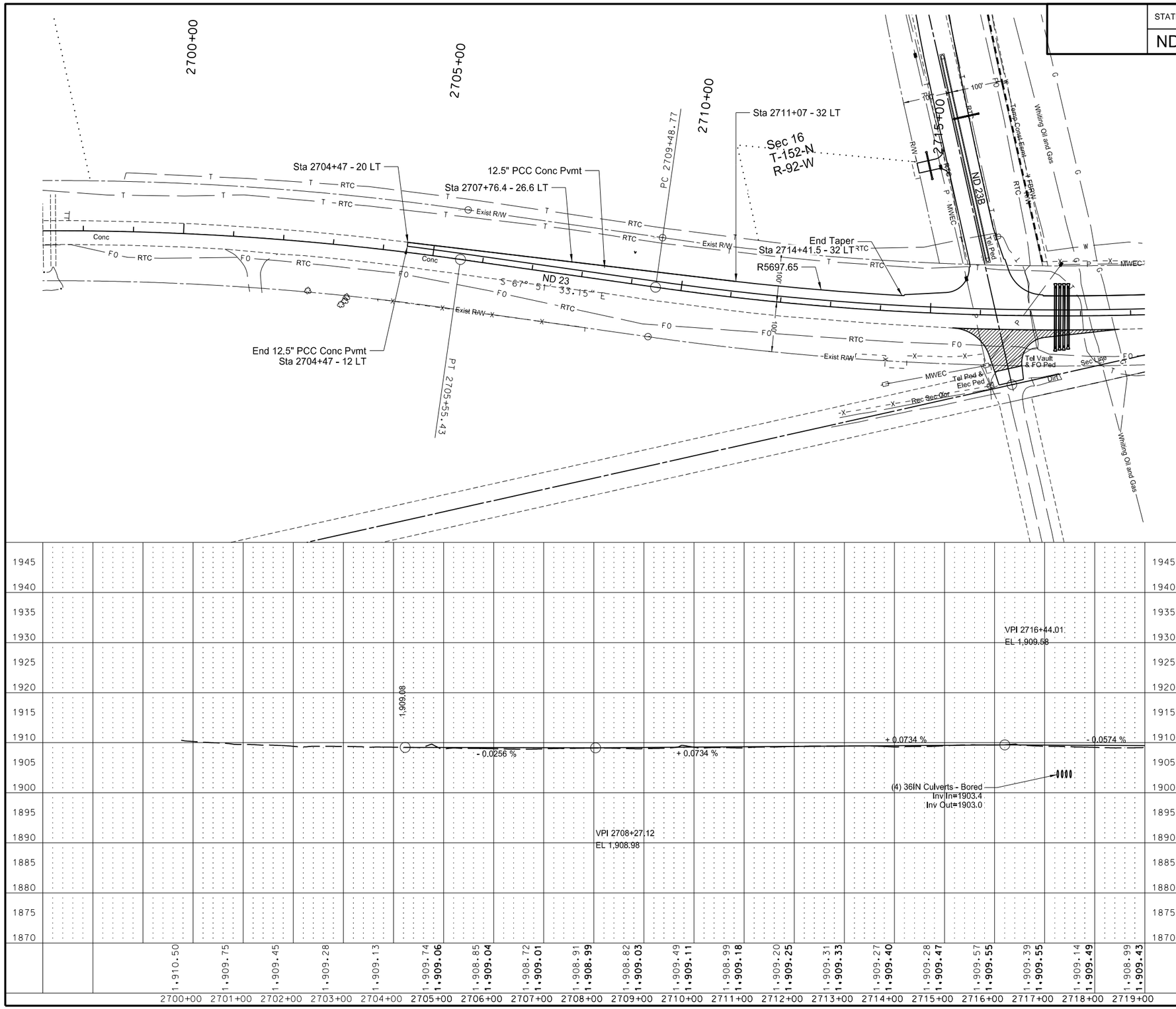
Plan & Profile
ND Hwy 1804
Sta 13107+36.42 to 13124+89.73
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	11

Description	Spec #	Code #	Qty	Unit
Aggregate Base Course CL 5				
Sta 2700+00 to 2714+41.5	302	120		
Main Line			179	TON
Shoulders			519	TON
12.5 In Non Reinf Concrete Pvmt CL AE-Dowled				
Sta 2700+00 to 2714+41.5	550	322		
Main Line			430	SY
Shoulders			856	SY



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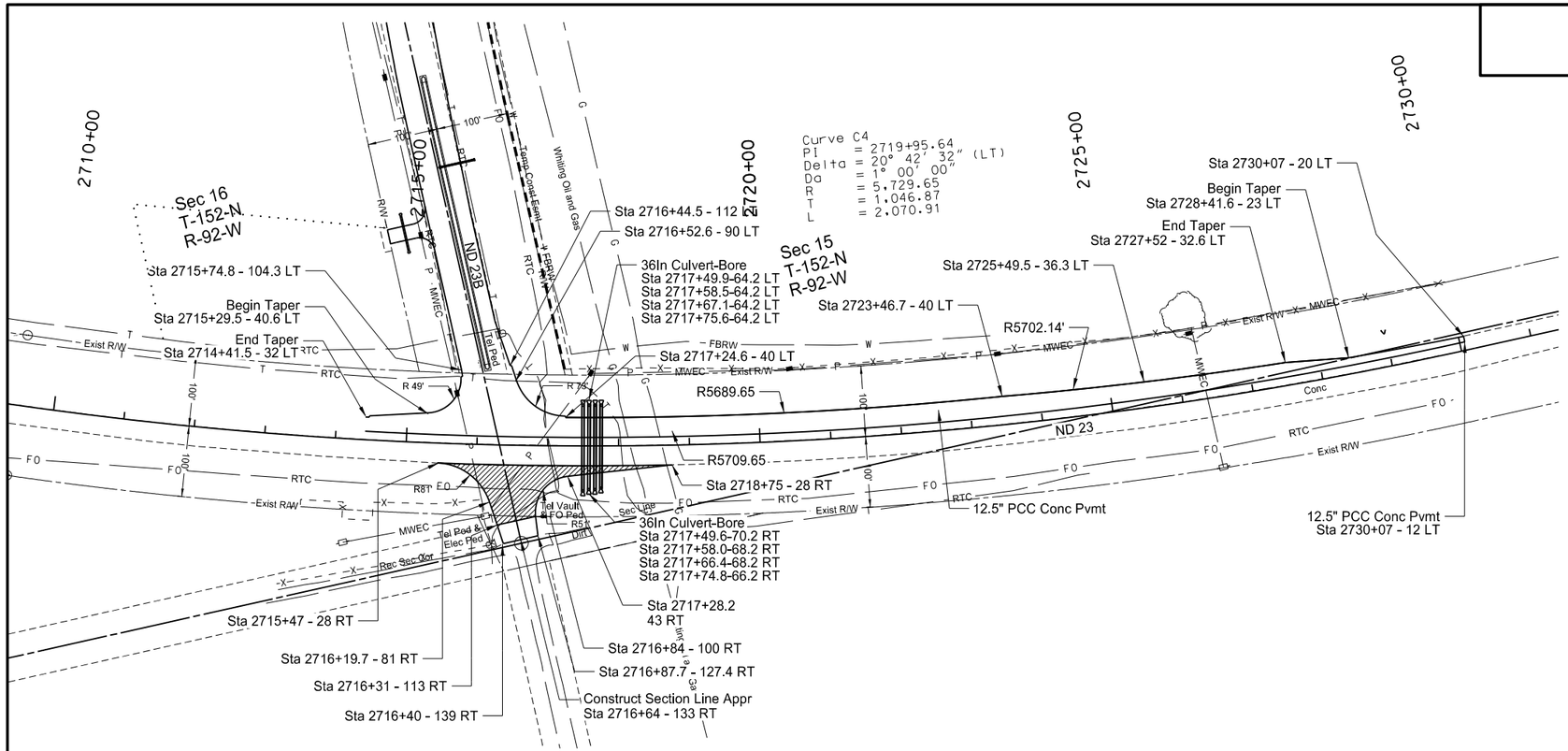
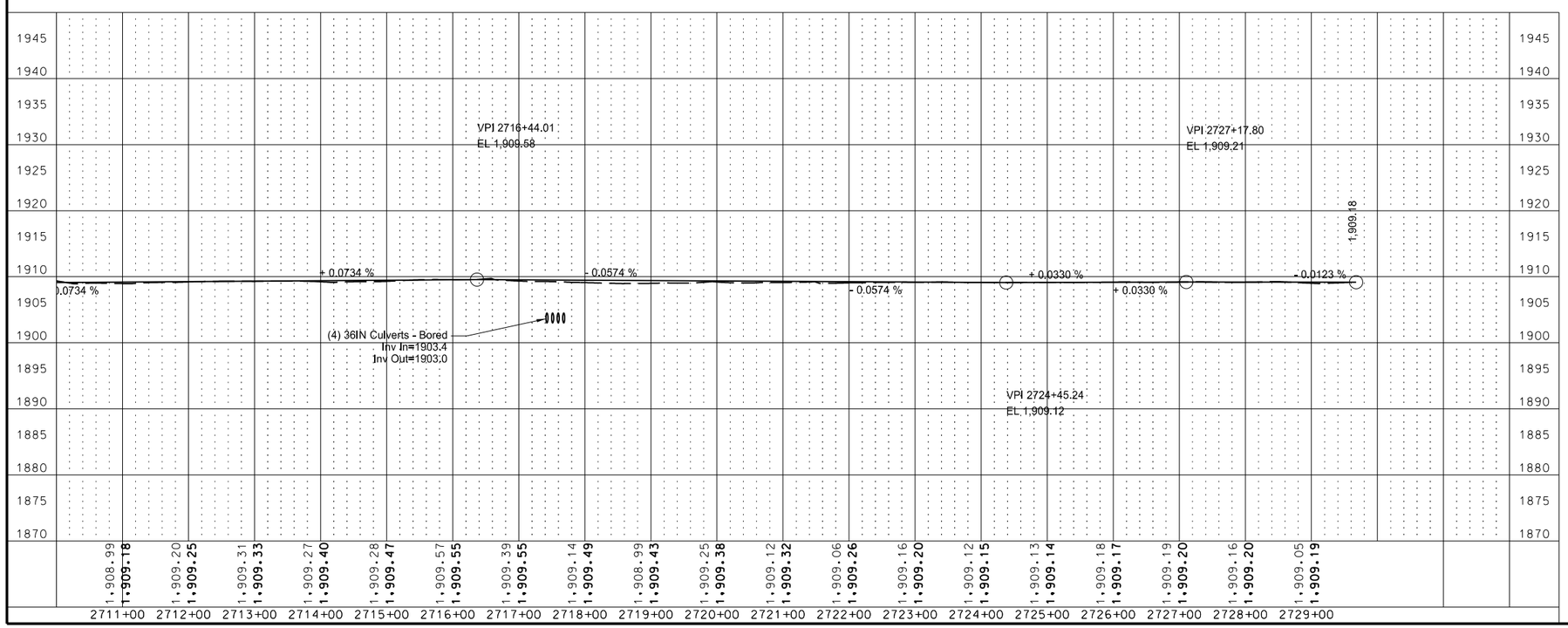
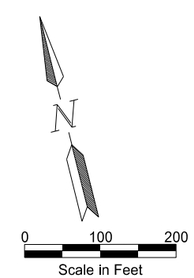
Plan & Profile
Sta 2700+00 to 2714+41.5
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	12



Description	Spec #	Code #	Qty	Unit
Aggregate Base Course CL 5				
Sta 2714+41.5 to 2730+08.0	302	120		
Main Line			1,210	TON
Shoulders			568	TON
Approach			323	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
Sta 2714+41.5 to 2730+08.0	401	150	46	GAL
Superpave FAA 45				
Sta 2714+41.5 to 2730+08.0	410	215		
Approach			206	TON
PG 64-34 Asphalt Cement				
Sta 2714+41.5 to 2730+08.0	410	464	12	TON
12.5 In Non Reinf Concrete Pvmt CL AE-Dowled				
Sta 2714+41.5 to 2730+08.0	550	322		
Main Line			2,903	SY
Shoulders			750	SY
Pipe Conduit 36In (Jacked or Bored)				
Sta 2717+50 - 64 LT to Sta 2717+50 - 66 RT - 70 RT	714	4124	488	LF





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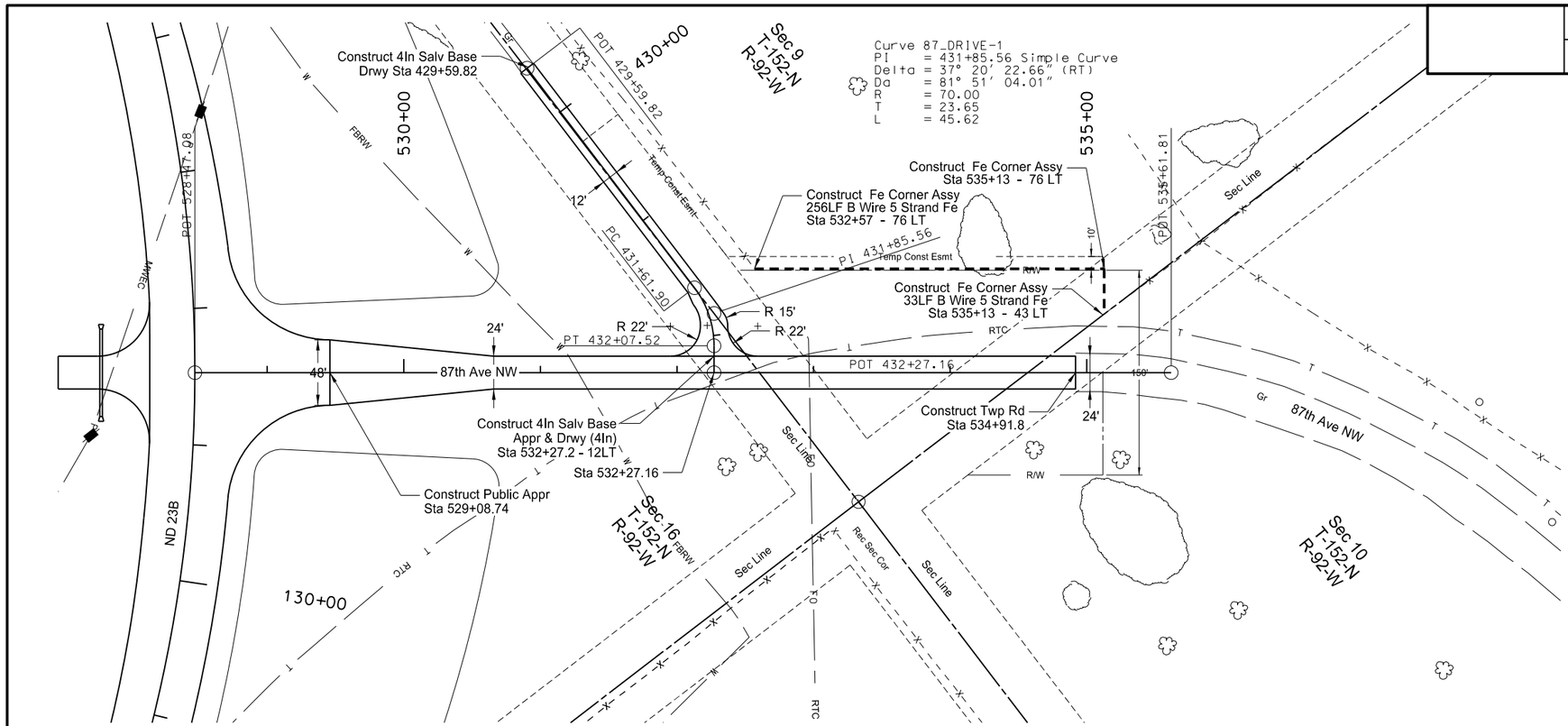
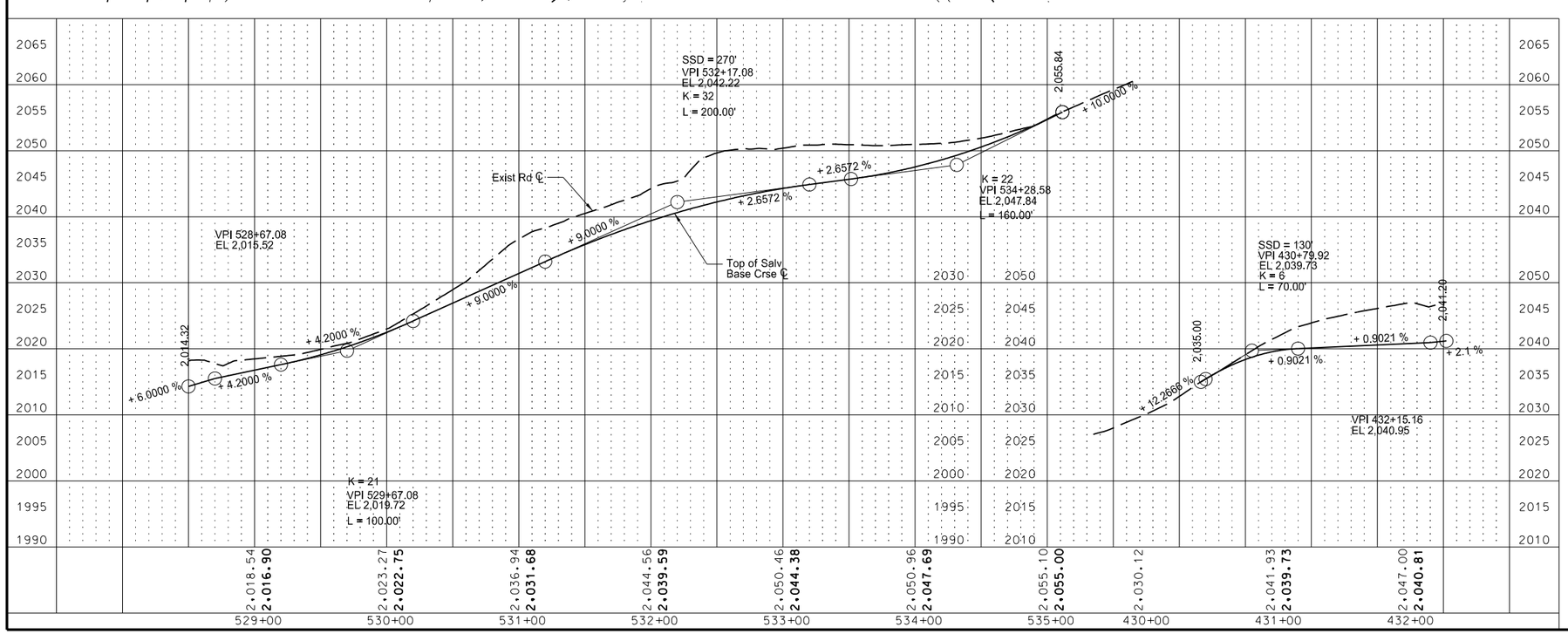
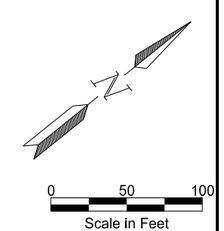
Plan & Profile
Sta 2714+41.5 to 2730+08.0
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	13



Description	Spec #	Code #	Qty	Unit
Subgrade Preparation - Type A				
Sta 528+75 to 534+75	230	300	6	STA
Aggregate Base Course CL 5				
Twp Road	302	120	669	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
Sta 528+47 to 534+92	401	150	10	GAL
Superpave FAA 45				
Approaches	410	215	45	TON
PG 64-34 Asphalt Cement				
Sta 528+47 to 534+92	410	464	3	TON
Fence Barbed Wire 5-Strand				
Sta 532+57 to 535+13 LT	752	0400	289	LF
Corner Assembly Barbed Wire				
Sta 532+57 - 50 LT	752	3140	1	EA
Sta 535+13 - 50 LT	752	3140	1	EA
Sta 535+13 - 43 LT	752	3140	1	EA





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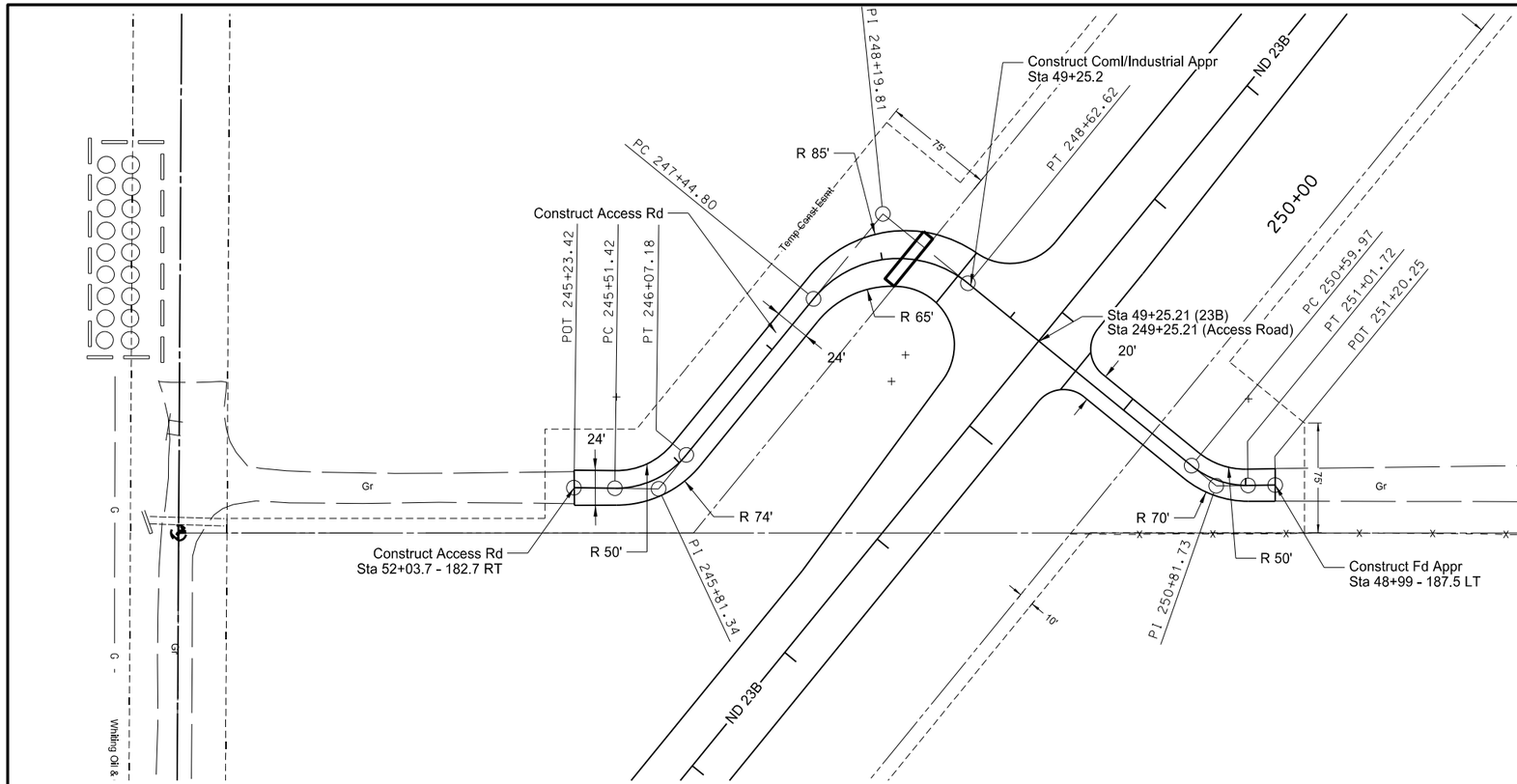
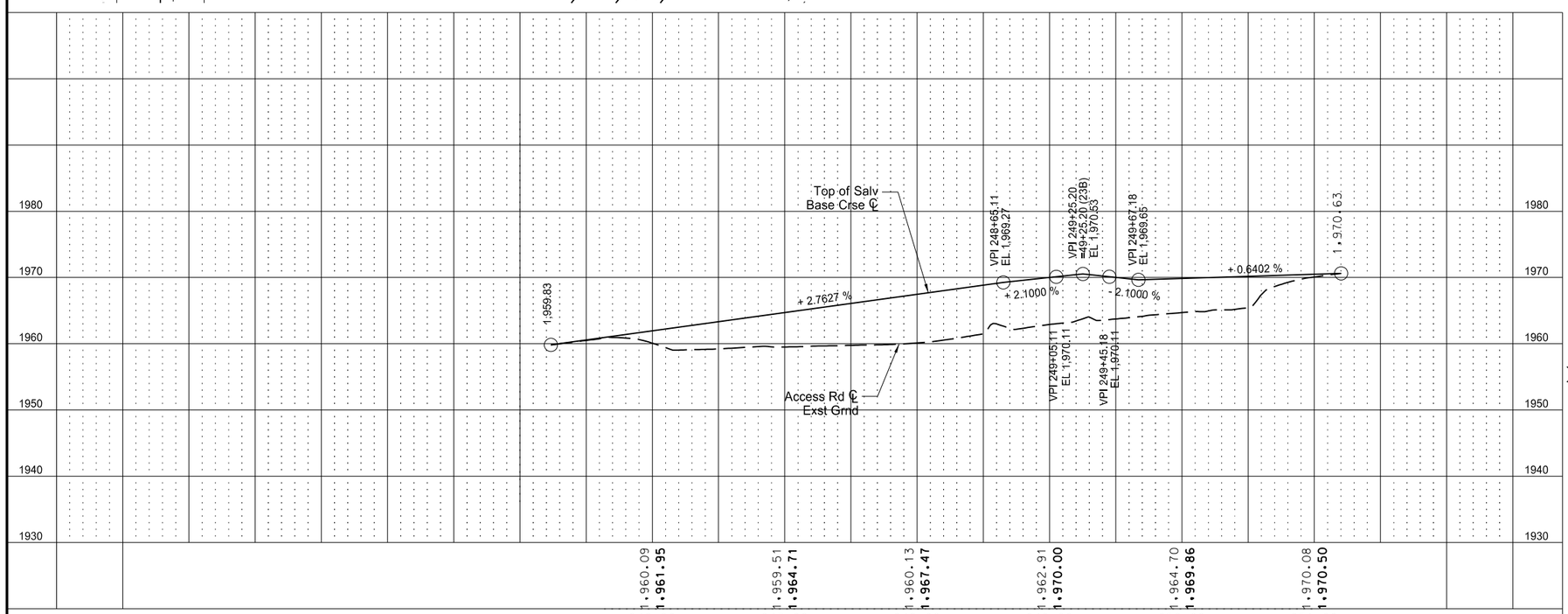
Plan & Profile
87th Avenue North West
Sta 528+47.08 to 534+91.81
Sta 429+59.82 to 432+27.16 (Driveway)
ND 23B
Northeast Truck Reliever Route
New Town, ND

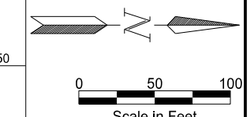
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	14



Description	Spec #	Code #	Qty	Unit
Aggregate Base Course CL 5				
Access Road	302	120	501	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
	401	150	14	GAL
Superpave FAA 45				
Access Road	410	215	62	TON
PG 64-34 Asphalt Cement				
	410	464	4	TON

See Sheet 3 for Fencing Quantities for this area





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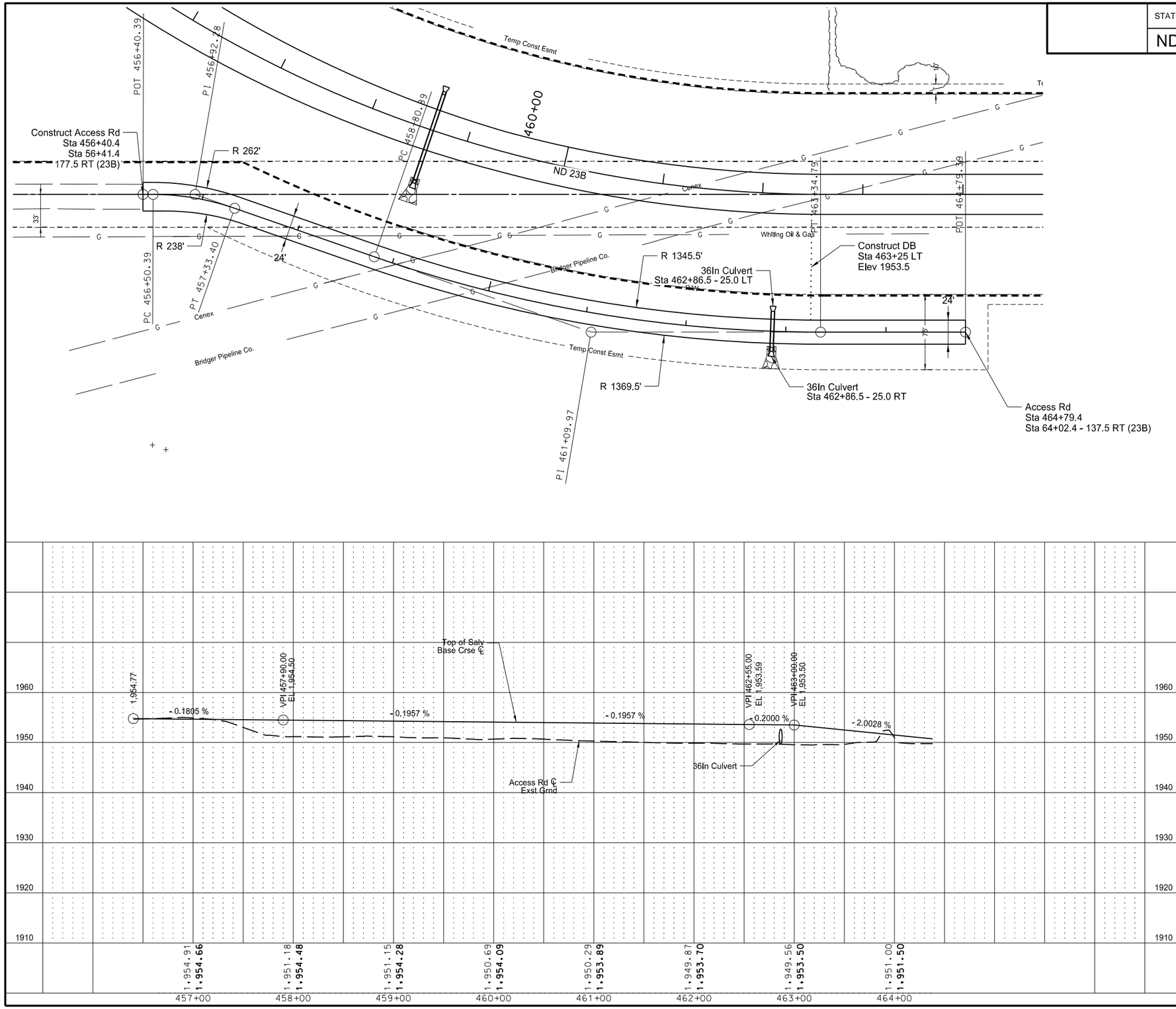
Plan & Profile
Access Road
Sta 245+23.42 to 251+20.25
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	15

Description	Spec #	Code #	Qty	Unit
Aggregate Base Course CL 5				
Access Road	302	120	708	TON
Riprap - Loose Rock				
Sta 146+00 to 166+00	708	1020	22	CY
Geotextile Fabric - Type RR				
Sta 146+00 to 166+00	709	600	64	SY
Pipe Conduit 36In - Approach				
Sta 462+86.5	714	4116	40	LF



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Scale in Feet

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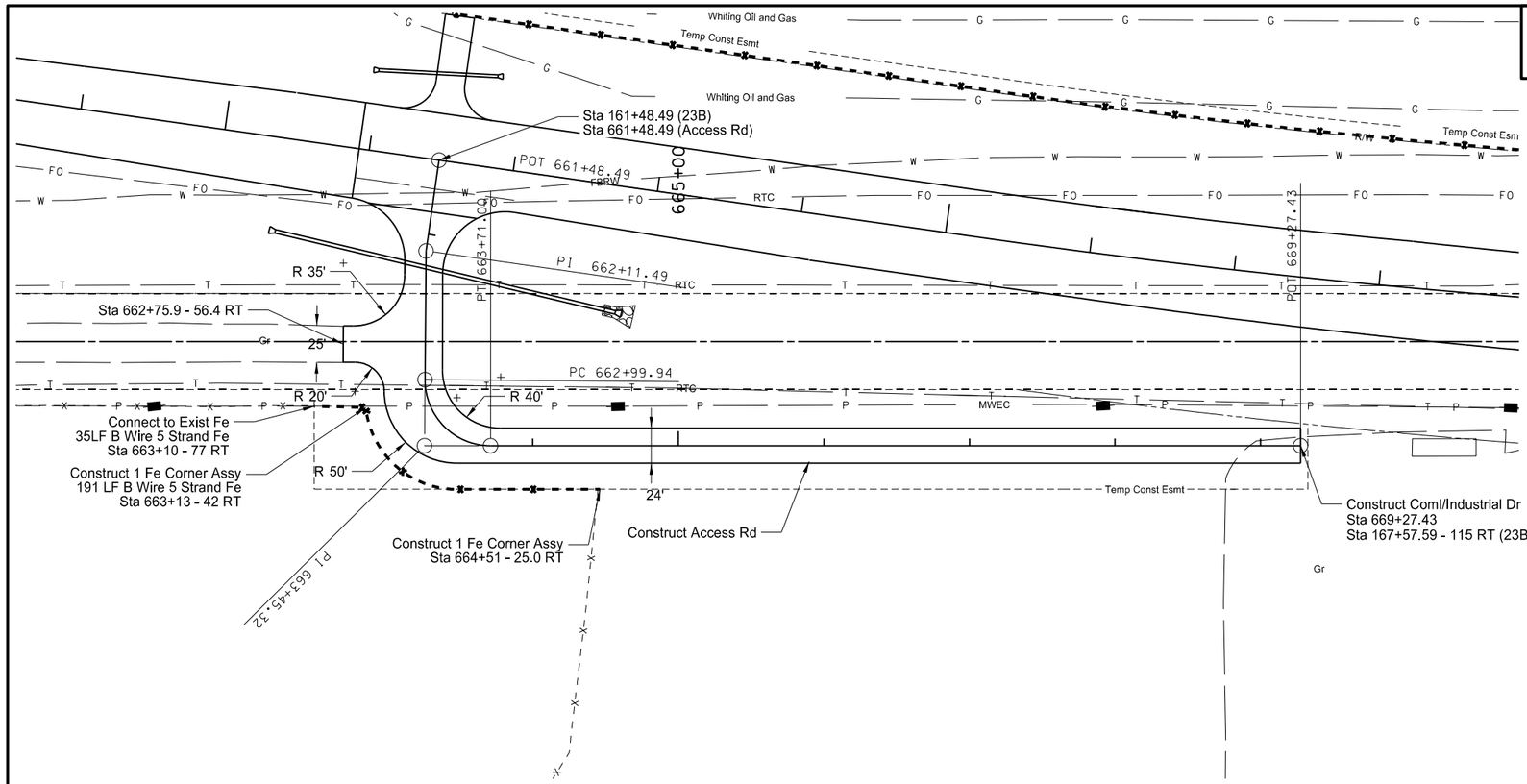
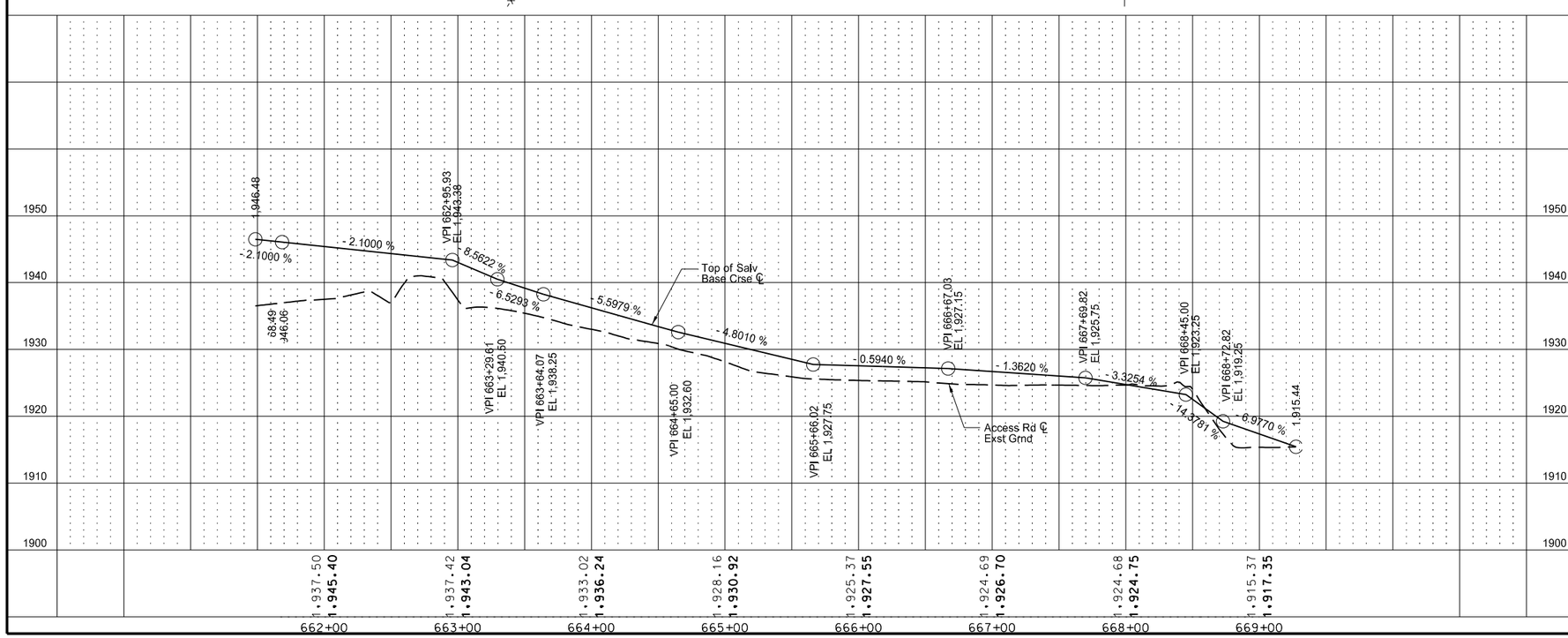
Plan & Profile
Access Road
Sta 456+40.39 to 464+79.39
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	60	16



Description	Spec #	Code #	Qty	Unit
Aggregate Base Course CL 5				
Approach / Access Road	302	120	763	TON
SS1H or CSS1H or MS1 Emulsified Asphalt				
	401	150	10	GAL
Superpave FAA 45				
Approach	410	215	45	TON
PG 64-34 Asphalt Cement				
	410	464	3	TON
Fence Barbed Wire 5-Strand				
Sta 663+10 to 664+51 RT	752	0400	226	LF
Corner Assembly Barbed Wire				
Sta 663+10 - 77 RT	752	3140	1	EA
Sta 663+13 - 42 RT	752	3140	1	EA
Sta 664+51 - 25 RT	752	3140	1	EA



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Scale in Feet

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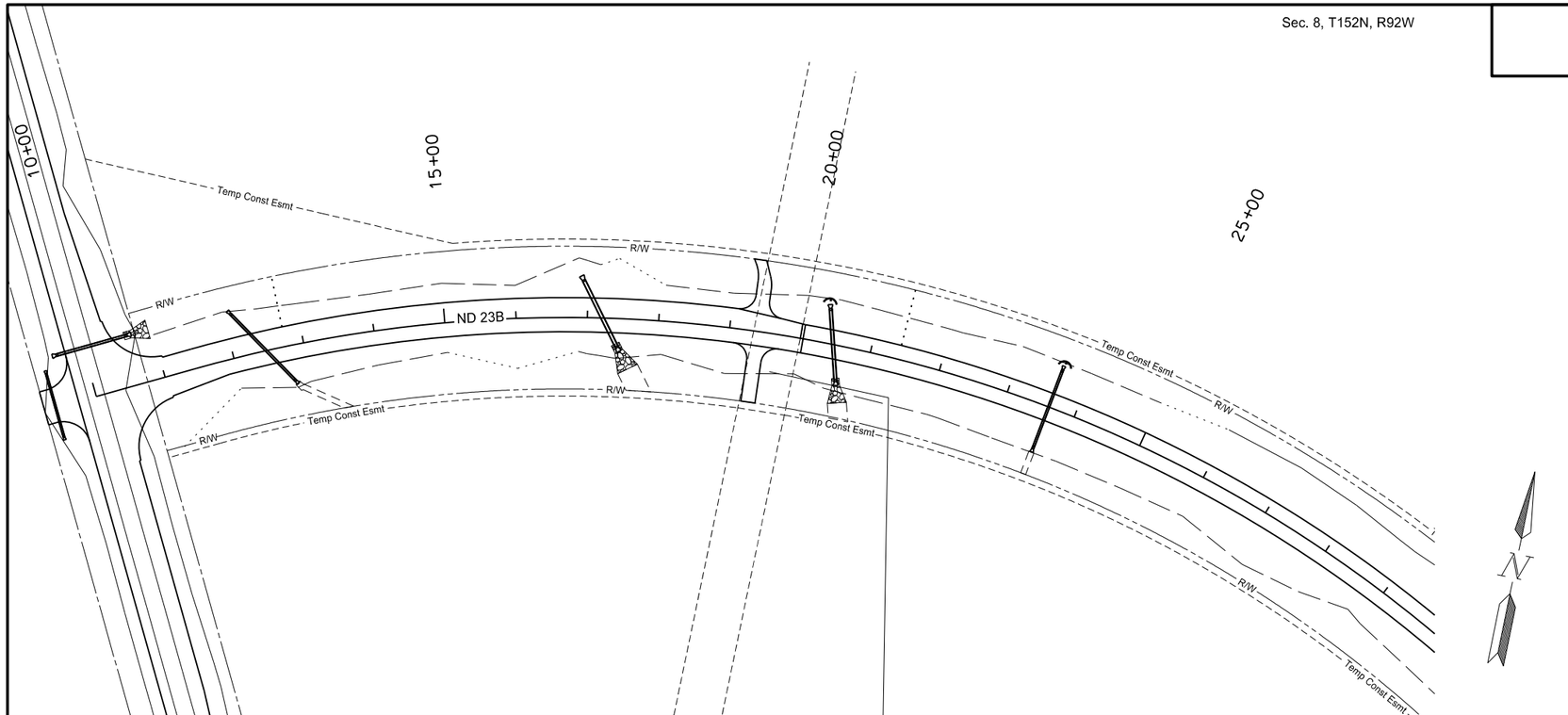
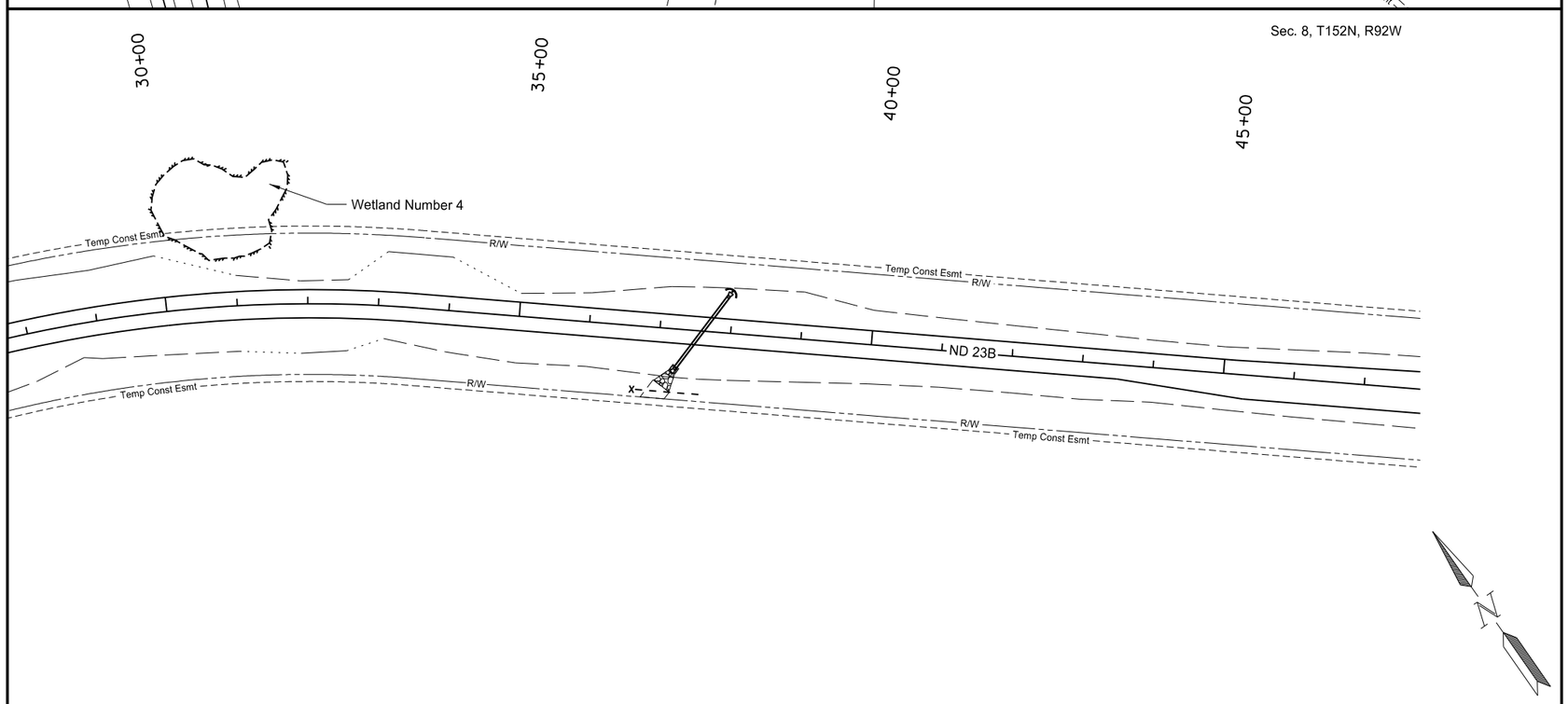
Plan & Profile
Access Road
Sta 661+48.49 to 669+27.43
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	1





Legend

Permanent Impact Areas

Temporary Impact Areas

Mitigation Areas

0 100 200
Scale in Feet

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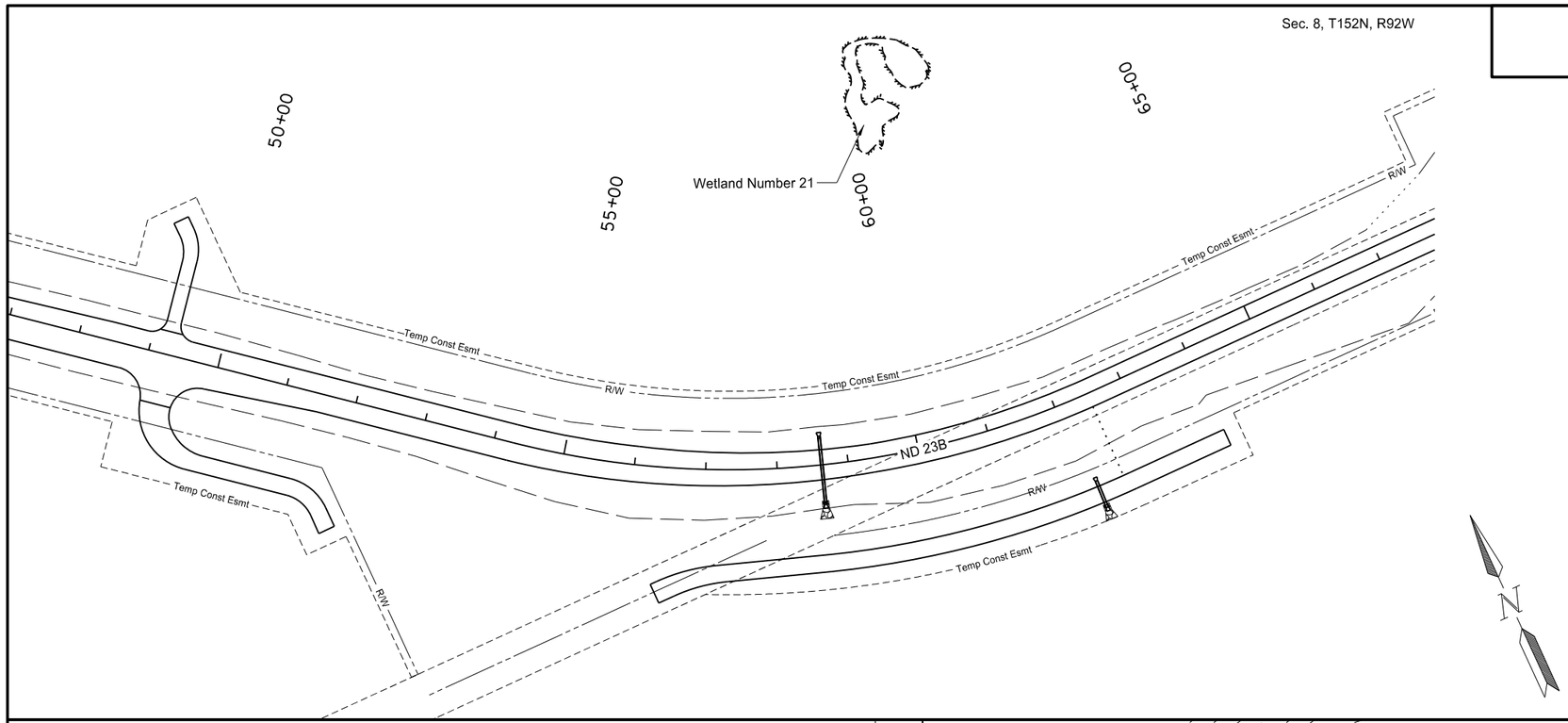
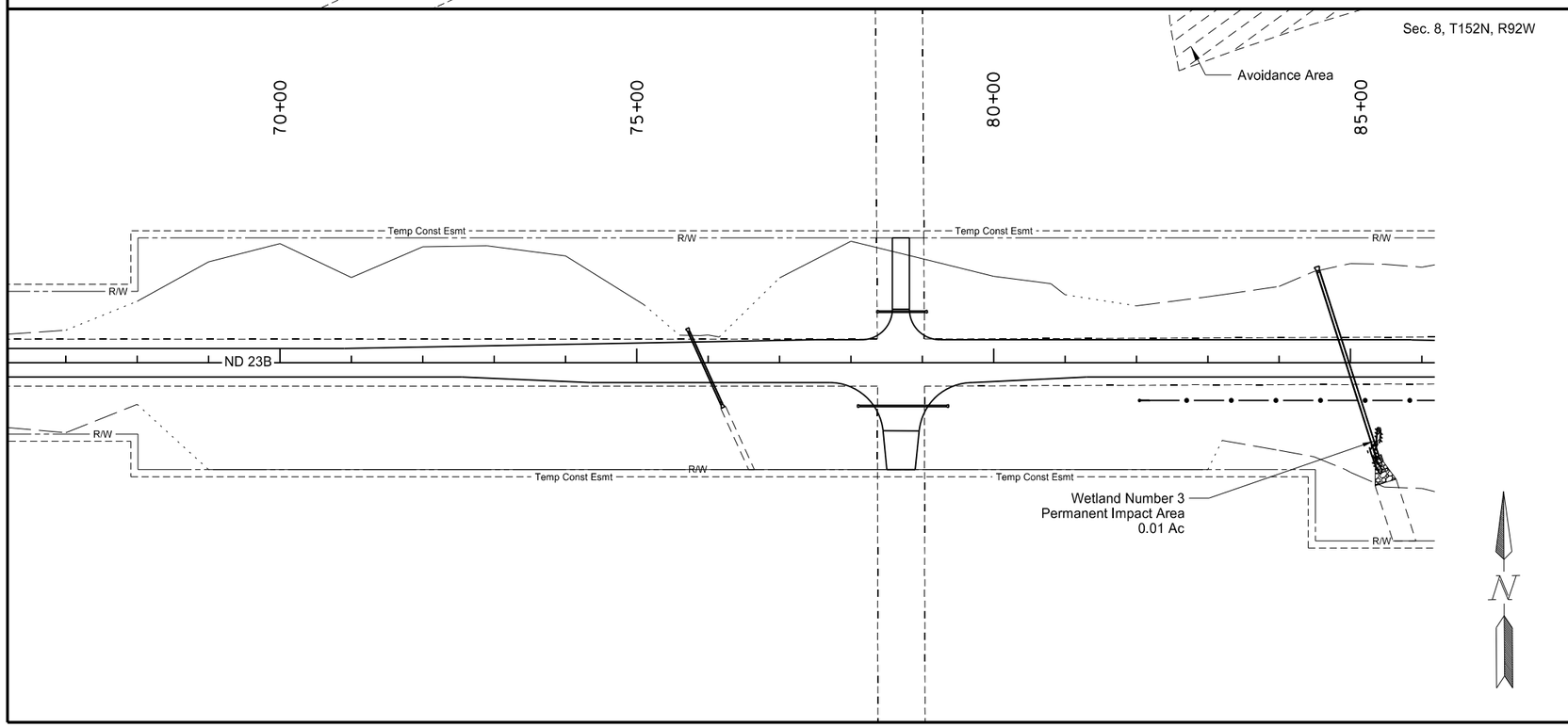
Wetland Impacts
Sta 10+00 to 47+50
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	2





Temporary Wetland Impacts

Sta 45+00 to 85+00	0.00	Ac

Permanent Wetland Impacts

Sta 45+00 to 85+00	0.01	Ac

Legend

Permanent Impact Areas

Temporary Impact Areas

Mitigation Areas

0 100 200
Scale in Feet

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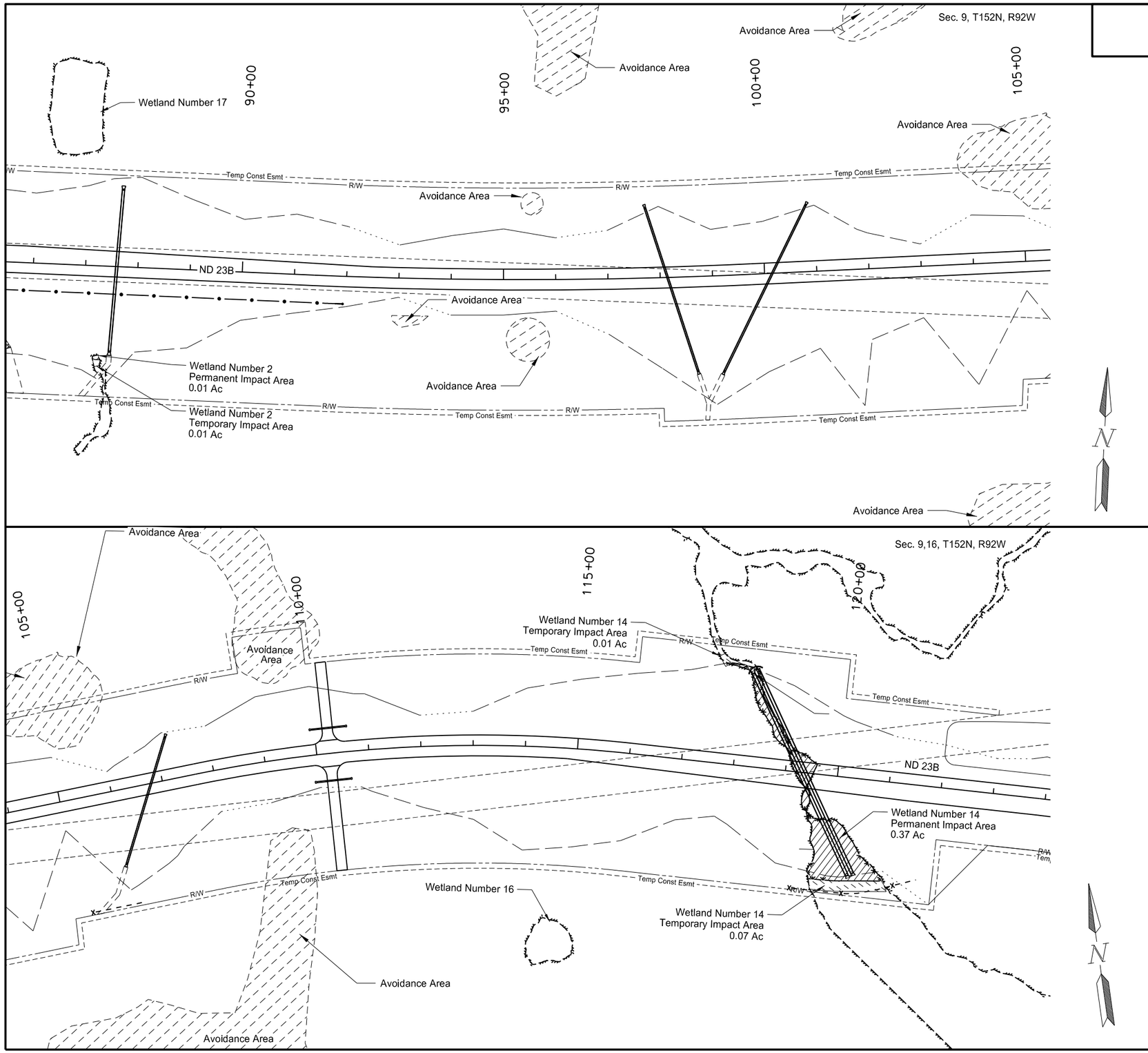
Wetland Impacts
Sta 47+50 to 85+75
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	3



Temporary Wetland Impacts

Sta 85+75 to 123+50	0.09	Ac

Permanent Wetland Impacts

Sta 85+75 to 123+50	0.38	Ac

Legend

Permanent Impact Areas

Temporary Impact Areas

Mitigation Areas

0 100 200
Scale in Feet

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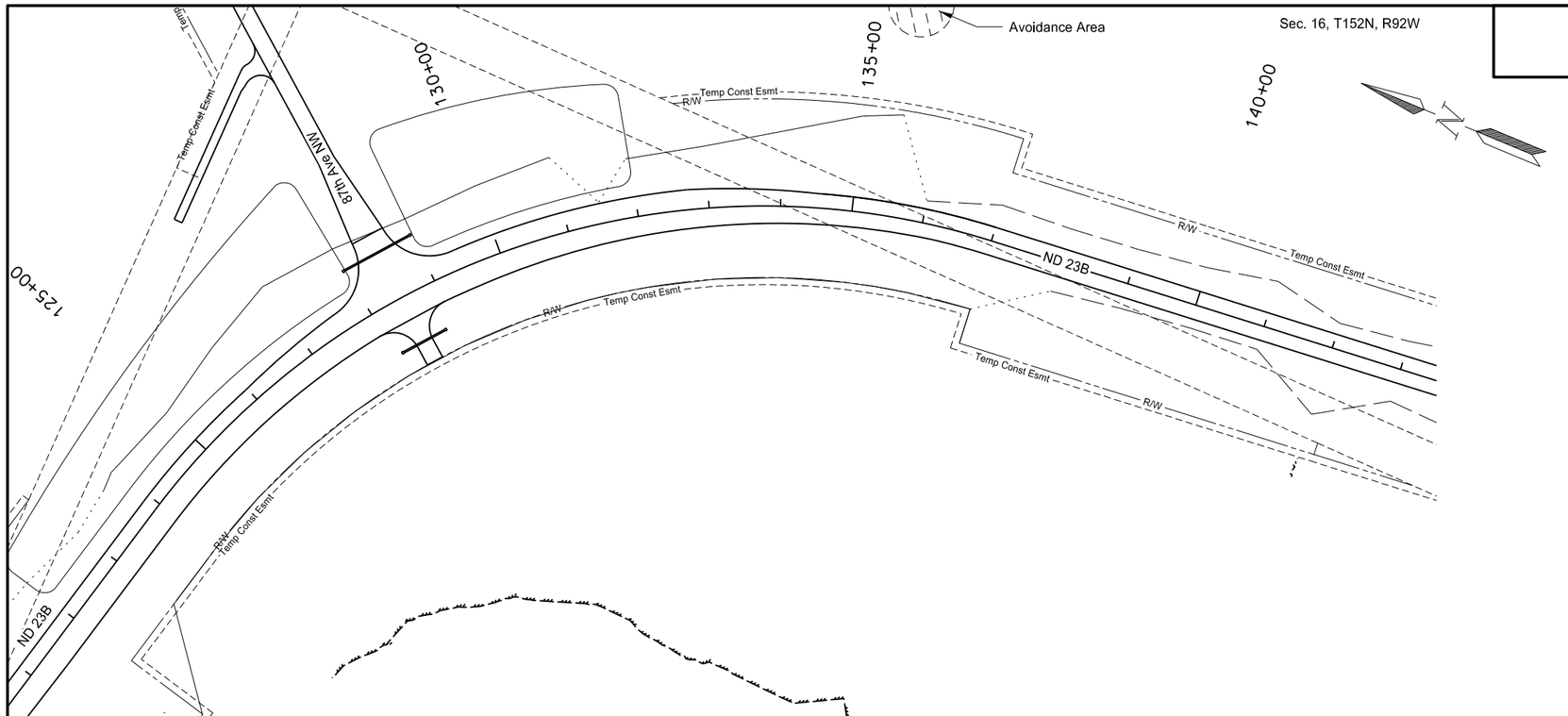
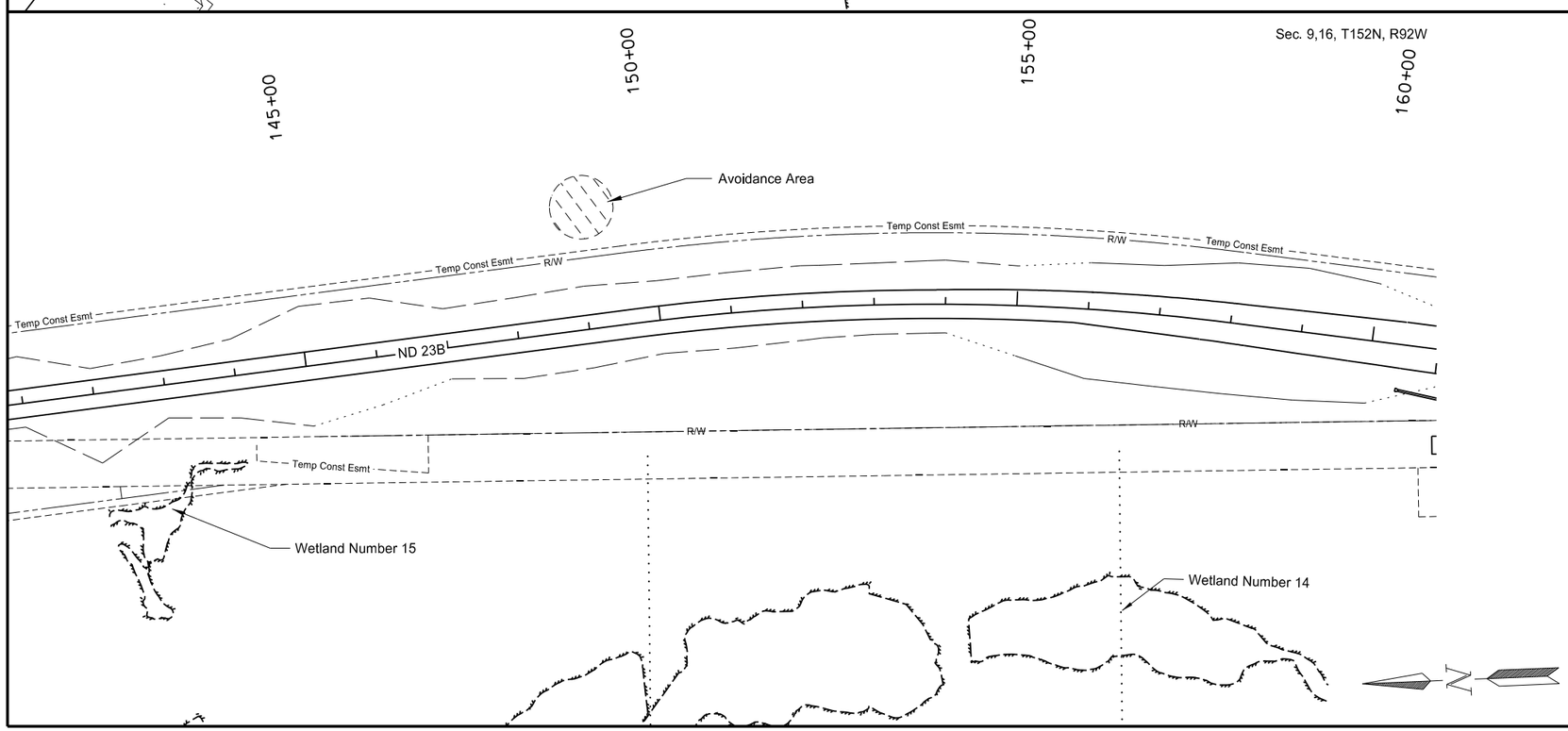
Wetland Impacts
Sta 85+75 to 123+50
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	4





Legend

Permanent Impact Areas

Temporary Impact Areas

Mitigation Areas

0 100 200
Scale in Feet

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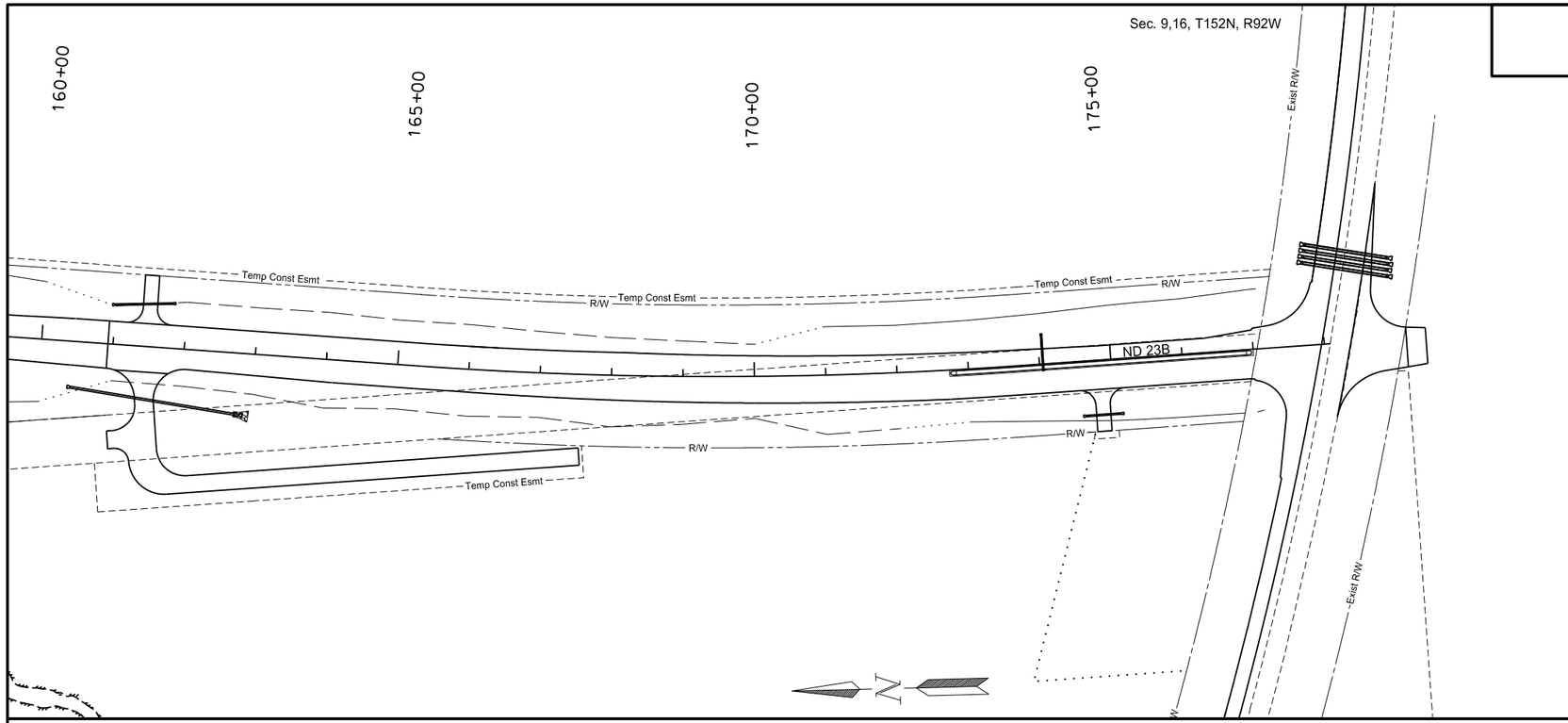
Wetland Impacts
Sta 123+50 to 160+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	5



Legend

Permanent Impact Areas

Temporary Impact Areas

Mitigation Areas

0 100 200
Scale in Feet

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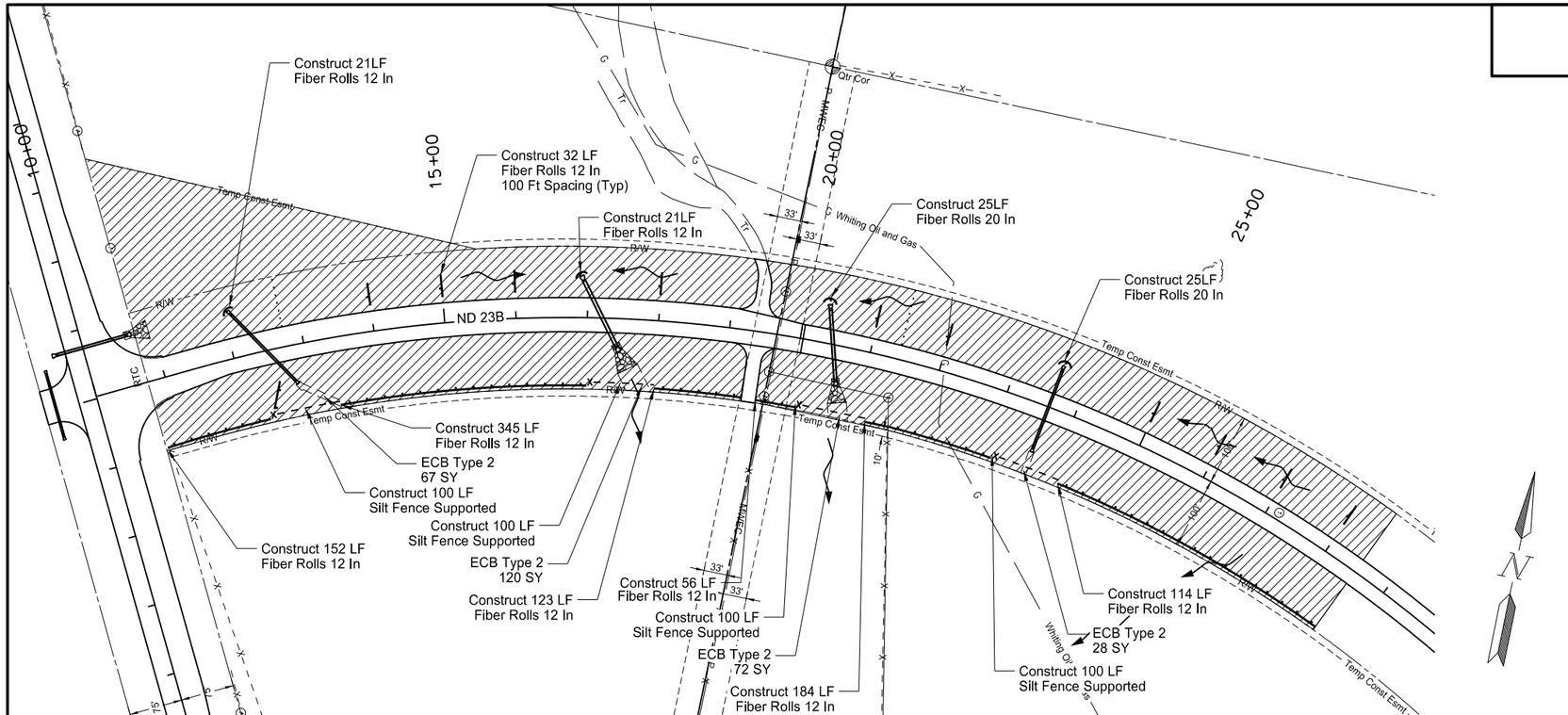
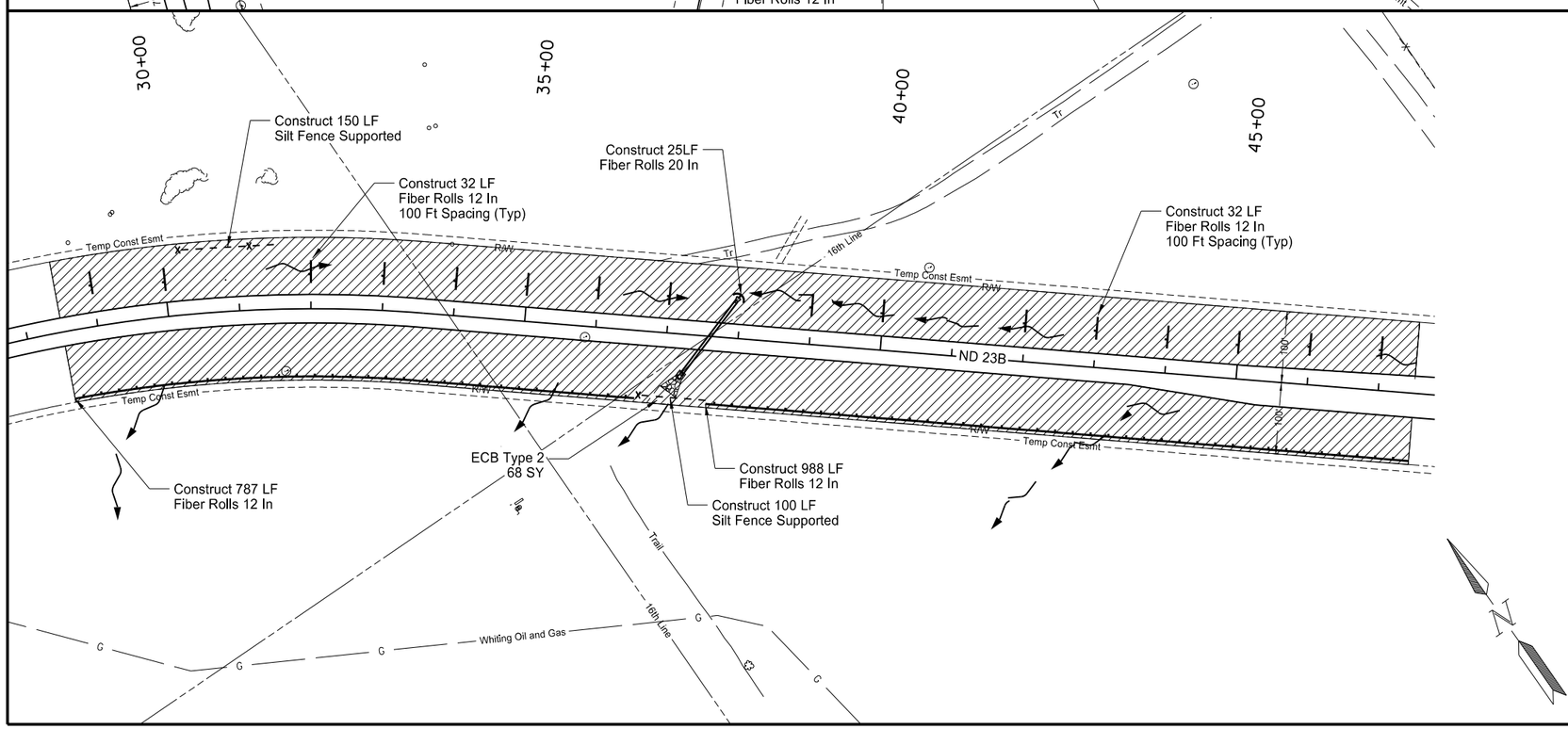
Wetland Impacts
Sta 160+00 to 178+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	6





Description	Spec #	Code #	Qty	Unit
Temporary Erosion Control				
Silt Fence Supported				
Sta 10+00 to 47+50	708	1325	650	LF
Removal Silt Fence Supported				
Sta 10+00 to 47+50	708	1335	650	LF
Fiber Rolls 12 In				
Sta 10+00 to 47+50	708	1430	3158	LF
Removal Fiber Rolls 12 In				
Sta 10+00 to 47+50	708	1431	3158	LF
Fiber Rolls 20 In				
Sta 10+00 to 47+50	708	1460	75	LF
Remove Fiber Rolls 20 In				
Sta 10+00 to 47+50	708	1461	75	LF
Seeding - Class IV				
Sta 10+00 to 47+50	708	2260	14.30	Ac
Mulching				
Sta 10+00 to 47+50	708	5500	14.30	Ac
Permanent Erosion Control				
Fiber Rolls 12 In				
Sta 10+00 to 47+50	708	1430	3158	LF
Fiber Rolls 20 In				
Sta 10+00 to 47+50	708	1460	650	LF
Seeding - Class V				
Sta 10+00 to 47+50	708	2280	14.30	Ac
Mulching				
Sta 10+00 to 47+50	708	5500	14.30	Ac
ECB Type 2				
Sta 10+00 to 47+50	708	5651	355	SY

NOTE:
The Permanent Fiber Rolls 20 IN is to Replace the Silt Fence Supported Once it is Removed.

Legend

- Fiber Roll 12 In (Permanent Erosion Control)
- Fiber Roll 20 In (Permanent Erosion Control)
- Sit Fence Supported (Temporary Erosion Control)
- Seeding Areas
- Flow Direction

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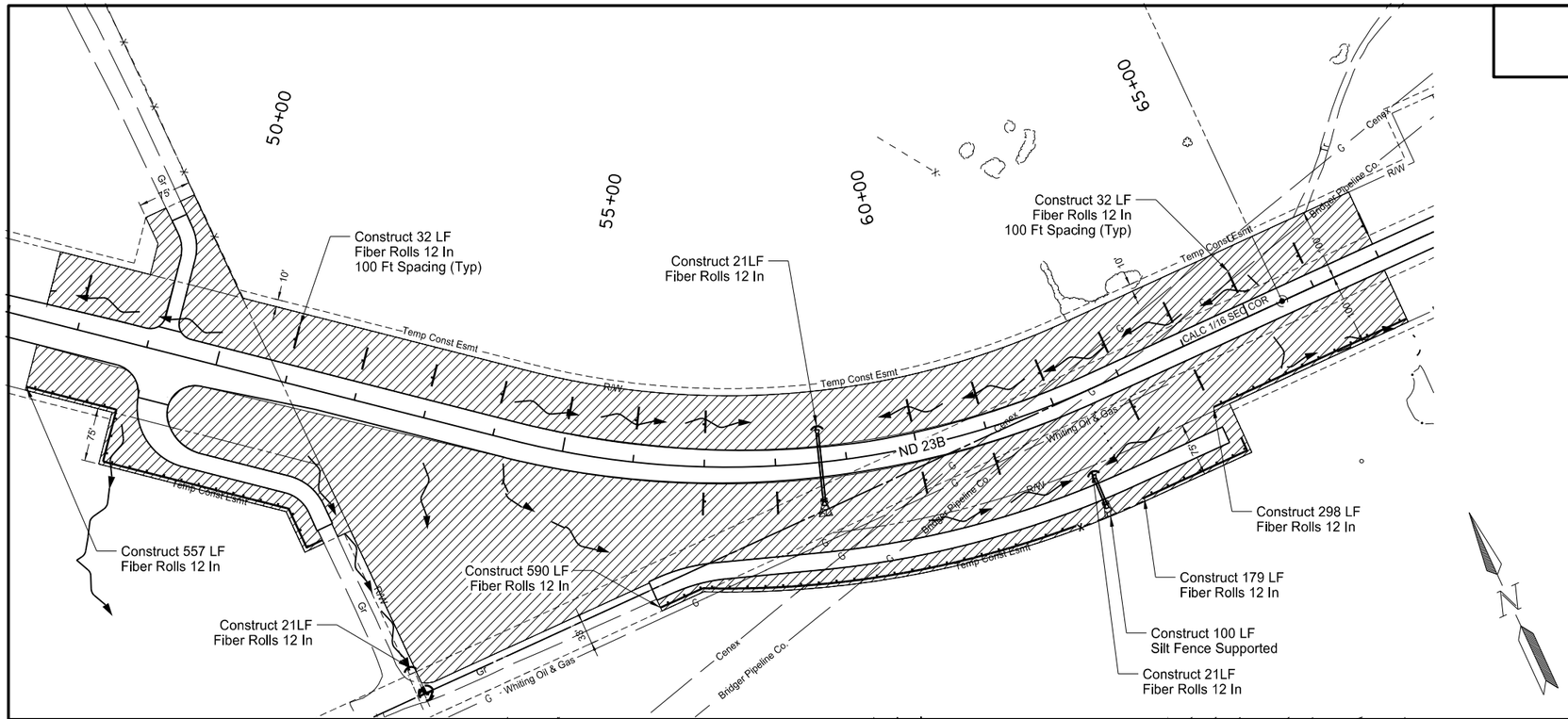
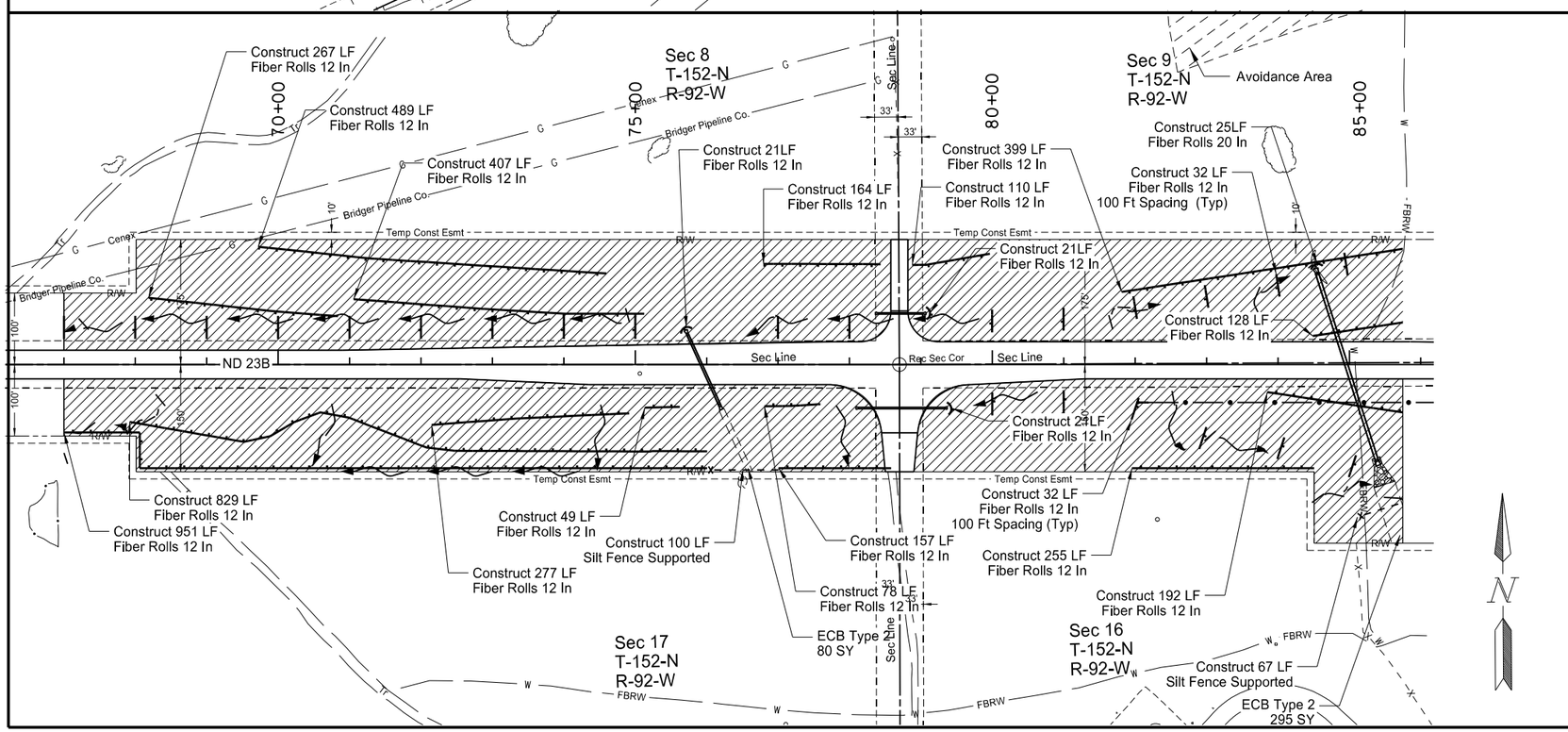
0 100 200
Scale in Feet

Erosion Control & Seeding
Sta 10+00 to 47+50
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	7





Description	Spec #	Code #	Qty	Unit
Temporary Erosion Control				
Silt Fence Supported				
Sta 47+50 to 85+75	708	1325	367	LF
Removal Silt Fence Supported				
Sta 47+50 to 85+75	708	1335	367	LF
Fiber Rolls 12 In				
Sta 47+50 to 85+75	708	1430	7942	LF
Removal Fiber Rolls 12 In				
Sta 47+50 to 85+75	708	1431	7942	LF
Fiber Rolls 20 In				
Sta 47+50 to 85+75	708	1460	25	LF
Remove Fiber Rolls 20 In				
Sta 47+50 to 85+75	708	1461	25	LF
Seeding - Class IV				
Sta 47+50 to 85+75	708	2260	21.53	Ac
Mulching				
Sta 47+50 to 85+75	708	5500	21.53	Ac
Permanent Erosion Control				
Fiber Rolls 12 In				
Sta 47+50 to 85+75	708	1430	7942	LF
Fiber Rolls 20 In				
Sta 47+50 to 85+75	708	1460	367	LF
Seeding - Class V				
Sta 47+50 to 85+75	708	2280	21.53	Ac
Mulching				
Sta 47+50 to 85+75	708	5500	21.53	Ac
ECB Type 2				
Sta 47+50 to 85+75	708	5651	375	SY

NOTE:
The Permanent Fiber Rolls 20 IN is to Replace the Silt Fence Supported Once it is Removed.

Legend

- Fiber Roll 12 In (Permanent Erosion Control)
- Fiber Roll 20 In (Permanent Erosion Control)
- Sit Fence Supported (Temporary Erosion Control)
- Seeding Areas
- Flow Direction

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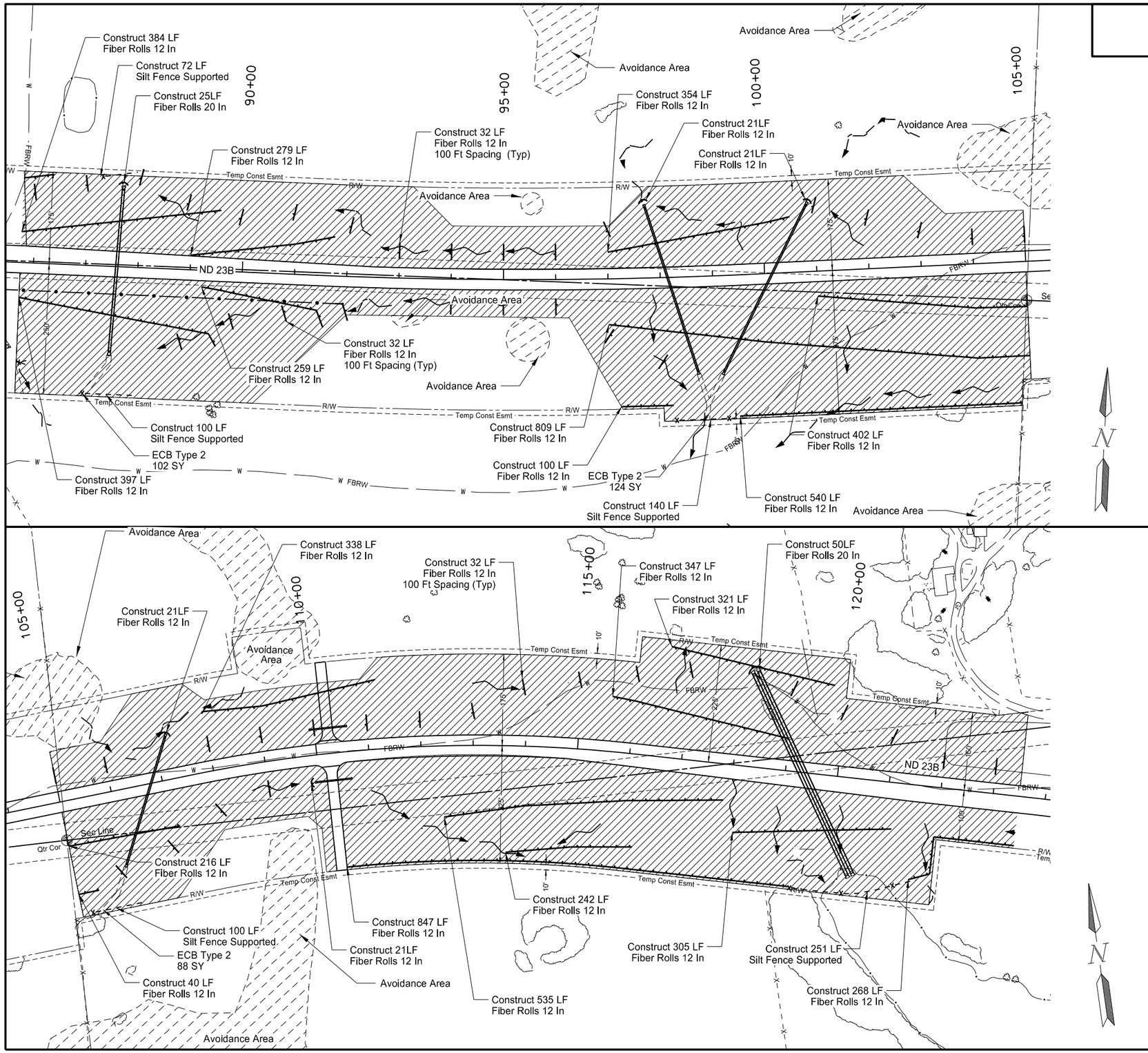
0 100 200
Scale in Feet

Erosion Control & Seedlng
Sta 47+50 to 85+75
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	8



Description	Spec #	Code #	Qty	Unit
Temporary Erosion Control				
Silt Fence Supported				
Sta 85+75 to 123+50	708	1325	663	LF
Removal Silt Fence Supported				
Sta 85+75 to 123+50	708	1335	663	LF
Fiber Rolls 12 In				
Sta 85+75 to 123+50	708	1430	8038	LF
Removal Fiber Rolls 12 In				
Sta 85+75 to 123+50	708	1431	8038	LF
Fiber Rolls 20 In				
Sta 85+75 to 123+50	708	1460	75	LF
Remove Fiber Rolls 20 In				
Sta 85+75 to 123+50	708	1461	75	LF
Seeding - Class IV				
Sta 85+75 to 123+50	708	2240	27.72	Ac
Mulching				
Sta 85+75 to 123+50	708	5500	27.72	Ac
Permanent Erosion Control				
Fiber Rolls 12 In				
Sta 85+75 to 123+50	708	1430	8038	LF
Fiber Rolls 20 In				
Sta 85+75 to 123+50	708	1460	663	LF
Seeding - Class V				
Sta 85+75 to 123+50	708	2280	27.72	Ac
Mulching				
Sta 85+75 to 123+50	708	5500	27.72	Ac
ECB Type 2				
Sta 85+75 to 123+50	708	5651	314	SY

NOTE:
The Permanent Fiber Rolls 20 IN is to Replace the Silt Fence Supported Once it is Removed.

Legend

- Fiber Roll 12 In (Permanent Erosion Control)
- Fiber Roll 20 In (Permanent Erosion Control)
- Sit Fence Supported (Temporary Erosion Control)
- Seeding Areas
- Flow Direction

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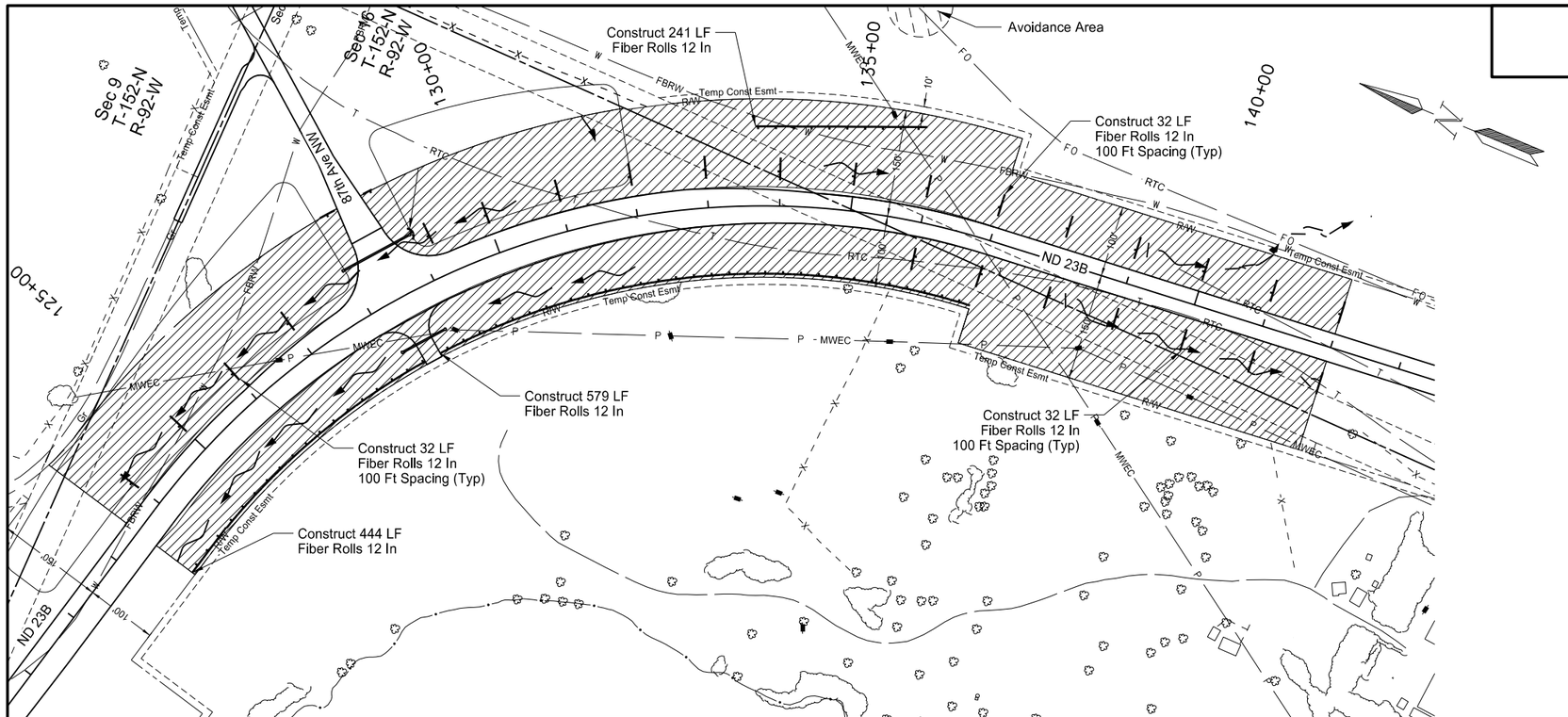
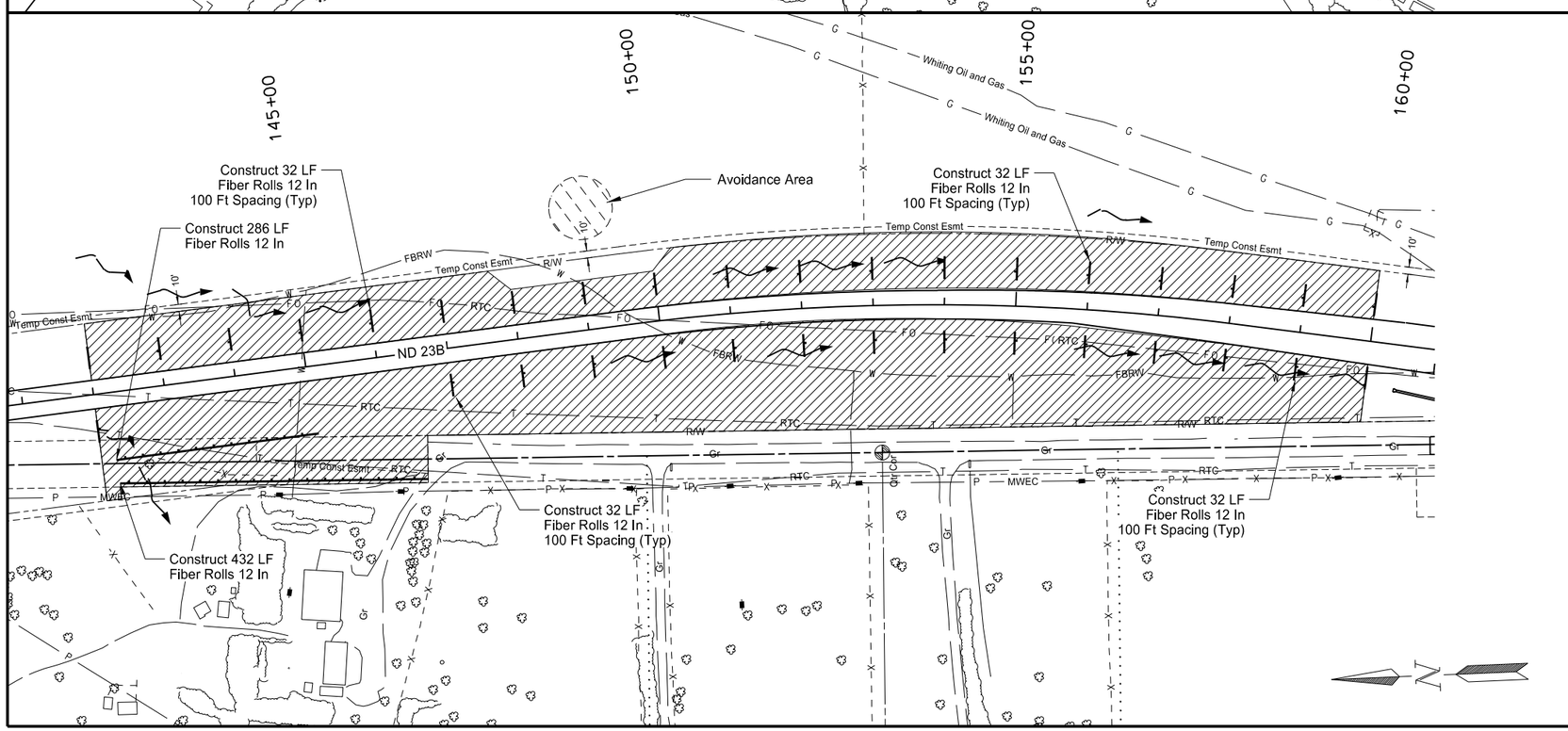
0 100 200
Scale in Feet

Erosion Control & Seedlng
Sta 85+75 to 123+50
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	9





Description	Spec #	Code #	Qty	Unit
Temporary Erosion Control				
Fiber Rolls 12 In				
Sta 123+50 to 160+00	708	1430	3923	LF
Removal Fiber Rolls 12 In				
Sta 123+50 to 160+00	708	1431	3923	LF
Seeding - Class IV				
Sta 123+50 to 160+00	708	2260	16.97	Ac
Mulching				
Sta 123+50 to 160+00	708	5500	16.97	Ac
Permanent Erosion Control				
Fiber Rolls 12 In				
Sta 123+50 to 160+00	708	1430	3923	LF
Seeding - Class V				
Sta 123+50 to 160+00	708	2280	16.97	Ac
Mulching				
Sta 123+50 to 160+00	708	5500	16.97	Ac

Legend

- Fiber Roll 12 In (Permanent Erosion Control)
- Sit Fence Supported (Temporary Erosion Control)
- Seeding Areas
- Flow Direction

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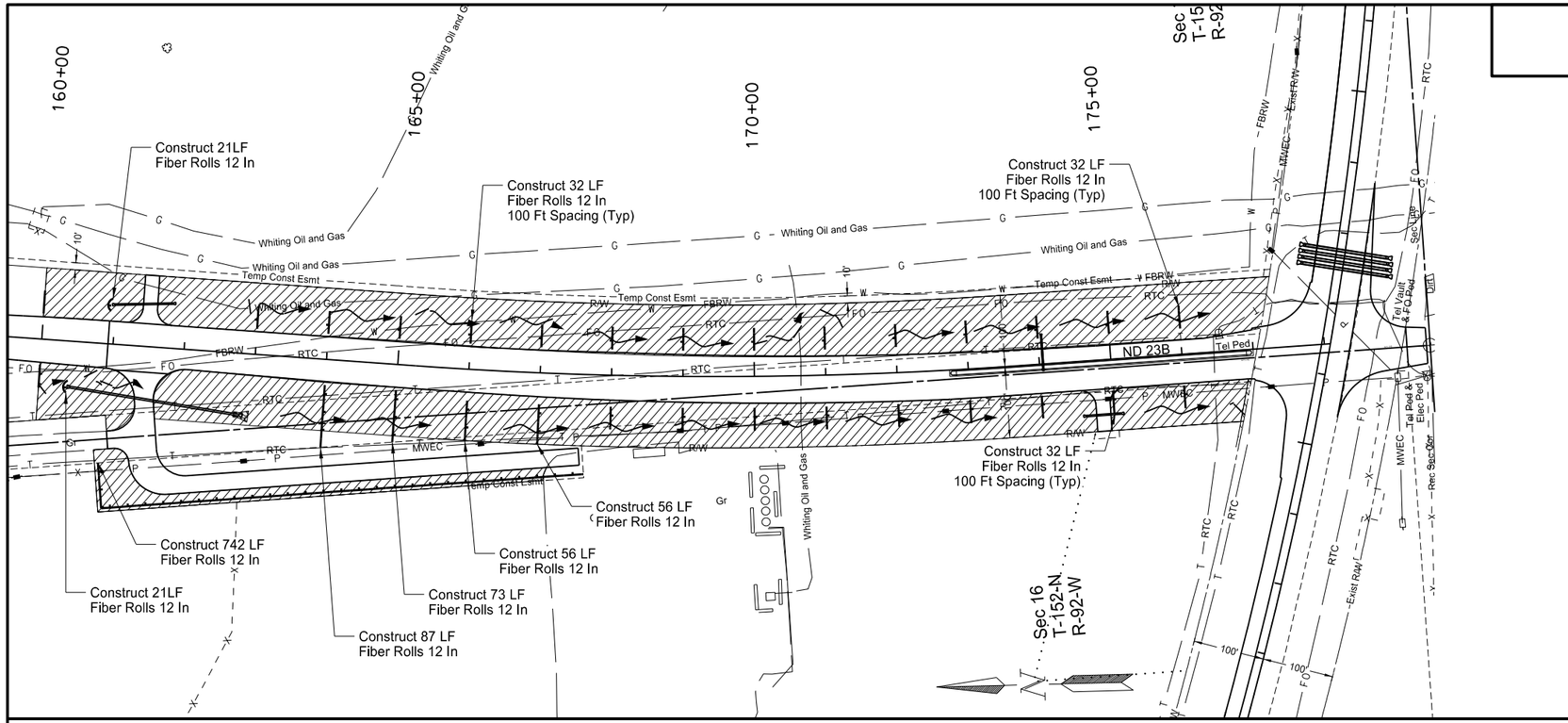
0 100 200
Scale in Feet

Erosion Control & Seeding
Sta 123+50 to 160+00
ND 23B
Northeast Truck Reliever Route
New Town, ND



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	10

Description	Spec #	Code #	Qty	Unit
Temporary Erosion Control				
Fiber Rolls 12 In				
Sta 160+00 to 178+00	708	1430	1856	LF
Removal Fiber Rolls 12 In				
Sta 160+00 to 178+00	708	1431	1856	LF
Seeding - Class IV				
Sta 160+00 to 178+00	708	2260	5.31	Ac
Mulching				
Sta 160+00 to 178+00	708	5500	5.31	Ac
Permanent Erosion Control				
Fiber Rolls 12 In				
Sta 160+00 to 178+00	708	1430	1856	LF
Seeding - Class V				
Sta 160+00 to 178+00	708	2280	5.31	Ac
Mulching				
Sta 160+00 to 178+00	708	5500	5.31	Ac

Legend

- Fiber Roll 12 In (Permanent Erosion Control)
- Sit Fence Supported (Temporary Erosion Control)
- Seeding Areas
- Flow Direction

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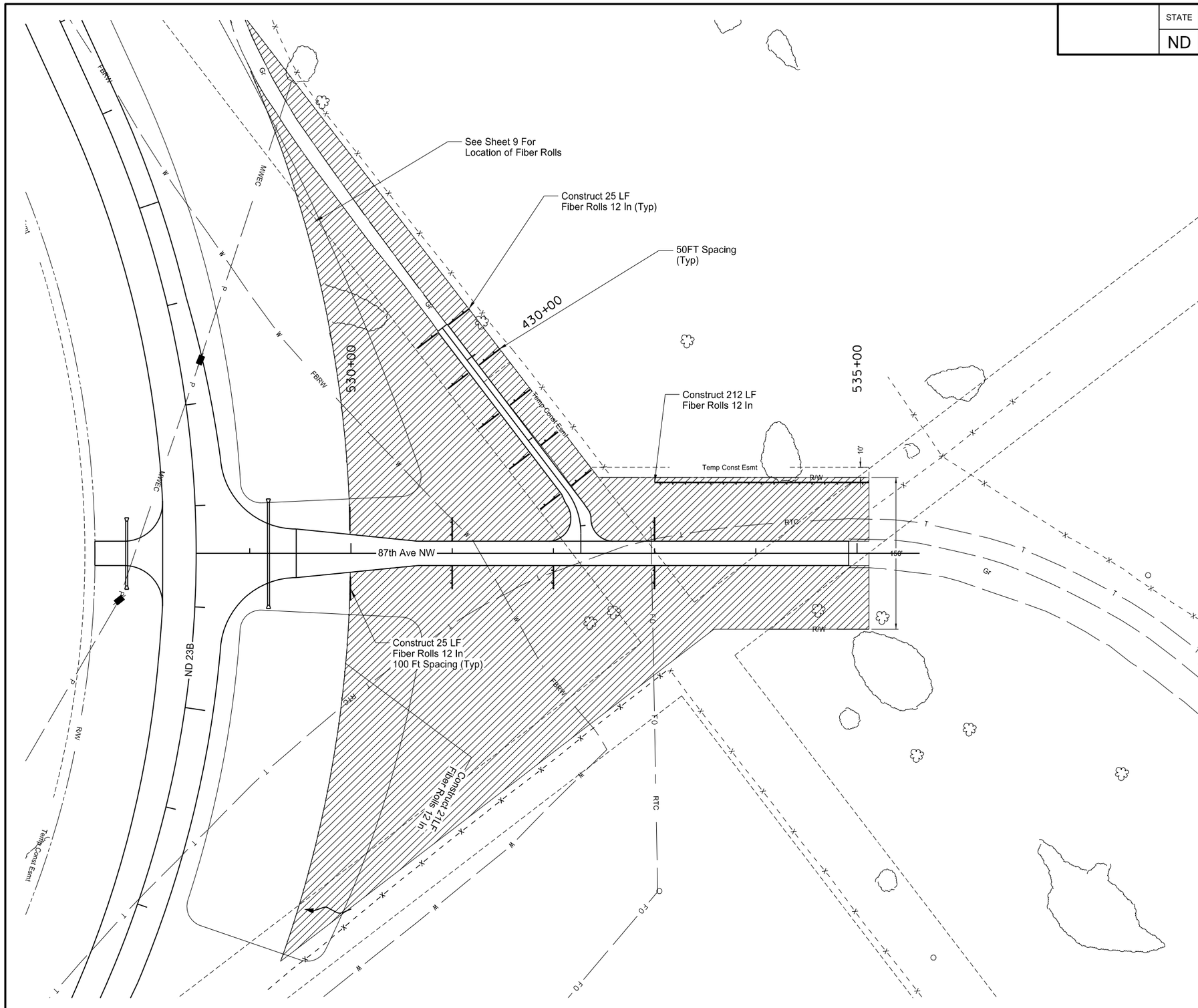
0 100 200
Scale in Feet

Erosion Control & Seeding
Sta 160+00 to 178+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	11



Description	Spec #	Code #	Qty	Unit
Temporary Erosion Control				
Fiber Rolls 12 In				
Sta 528+47.8 to 534+91.81	708	1430	637	LF
Remove Fiber Rolls 12 In				
Sta 528+47.8 to 534+91.81	708	1431	637	LF
Seeding - Class IV				
Sta 528+47.8 to 534+91.81	708	2260	3.80	Ac
Mulching				
Sta 528+47.8 to 534+91.81	708	5500	3.80	Ac
Permanent Erosion Control				
Fiber Rolls 12 In				
Sta 528+47.8 to 534+91.81	708	1430	637	LF
Seeding - Class V				
Sta 528+47.8 to 534+91.81	708	2280	3.80	Ac
Mulching				
Sta 528+47.8 to 534+91.81	708	5500	3.80	Ac

Legend

- Fiber Roll 12 In (Permanent Erosion Control)
- Sit Fence Supported (Temporary Erosion Control)
- Seeding Areas
- Flow Direction

N

0 50 100
Scale in Feet

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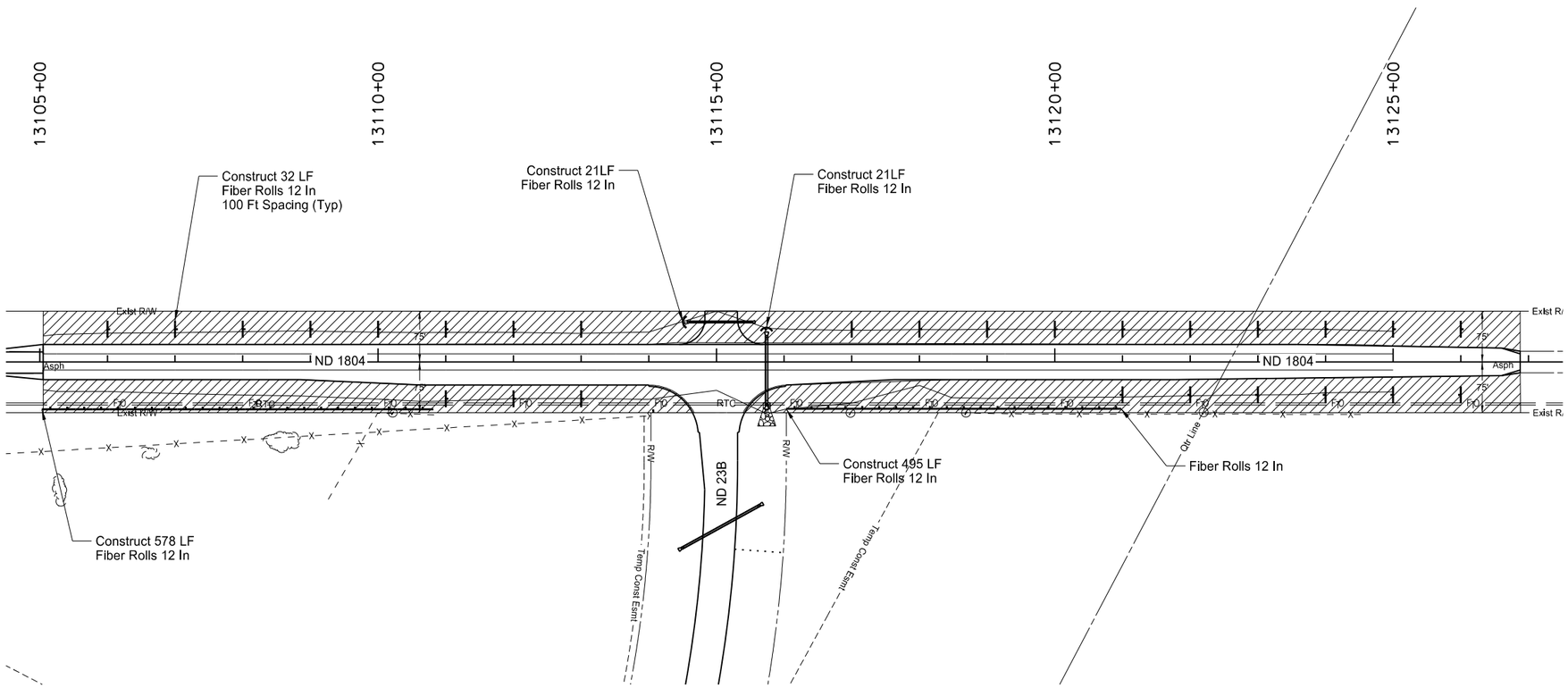
Erosion Control & Seeding
87th Avenue North West
Sta 528+47.08 to 534+91.81
ND 23B
Northeast Truck Reliever Route
New Town, ND

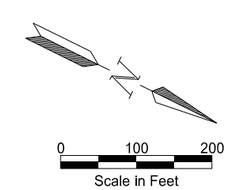
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	12

Description	Spec #	Code #	Qty	Unit
Temporary Erosion Control				
Fiber Rolls 12 In				
Sta 13105+05 to 13126+88	708	1430	1979	LF
Removal Fiber Rolls 12 In				
Sta 13105+05 to 13126+88	708	1431	1979	LF
Seeding - Class IV				
Sta 13105+05 to 13126+88	708	2260	4.70	Ac
Mulching				
Sta 13105+05 to 13126+88	708	5500	4.70	Ac
Permanent Erosion Control				
Fiber Rolls 12 In				
Sta 13105+05 to 13126+88	708	1430	1979	LF
Seeding - Class V				
Sta 13105+05 to 13126+88	708	2280	4.70	Ac
Mulching				
Sta 13105+05 to 13126+88	708	5500	4.70	Ac



Legend

- Fiber Roll 12 In (Permanent Erosion Control)
- Sit Fence Supported (Temporary Erosion Control)
- Seeding Areas
- Flow Direction



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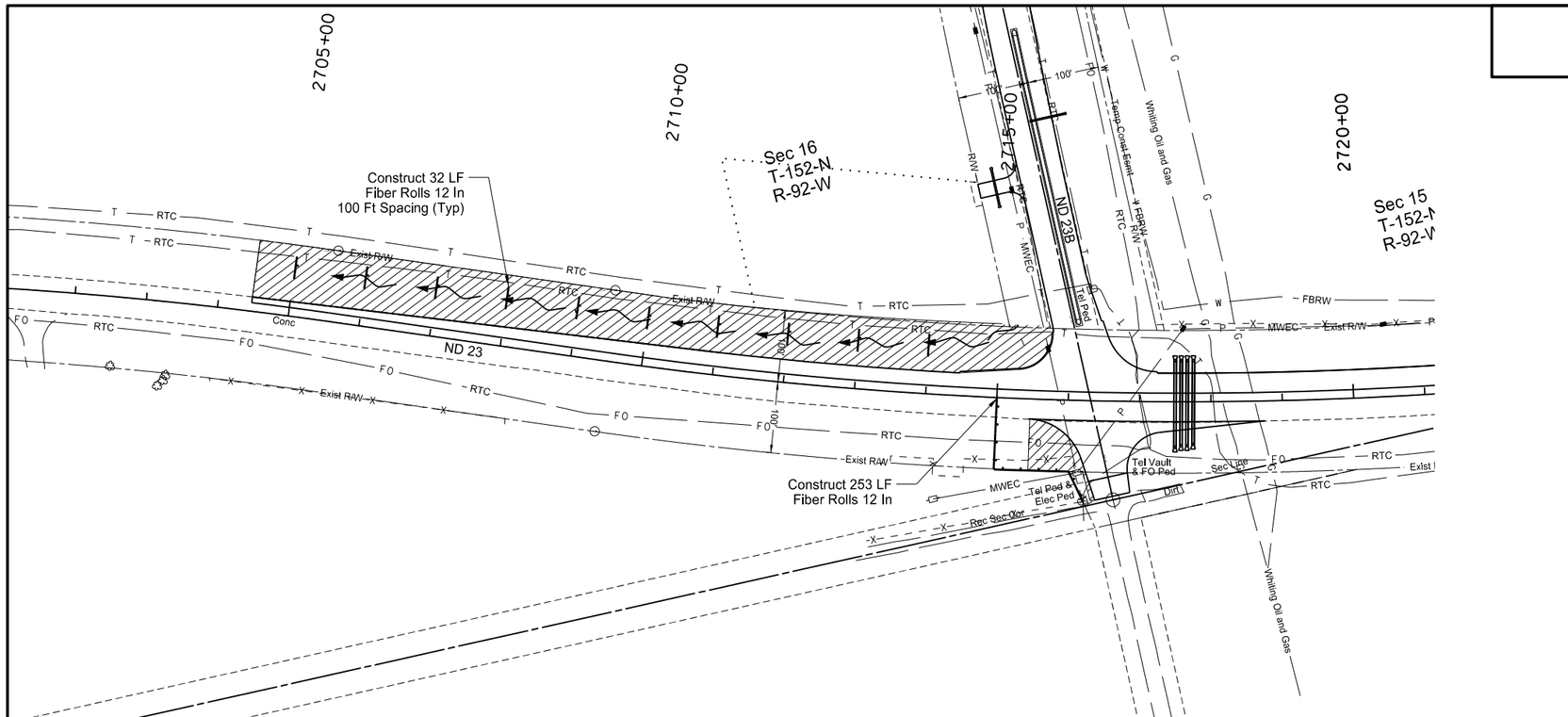
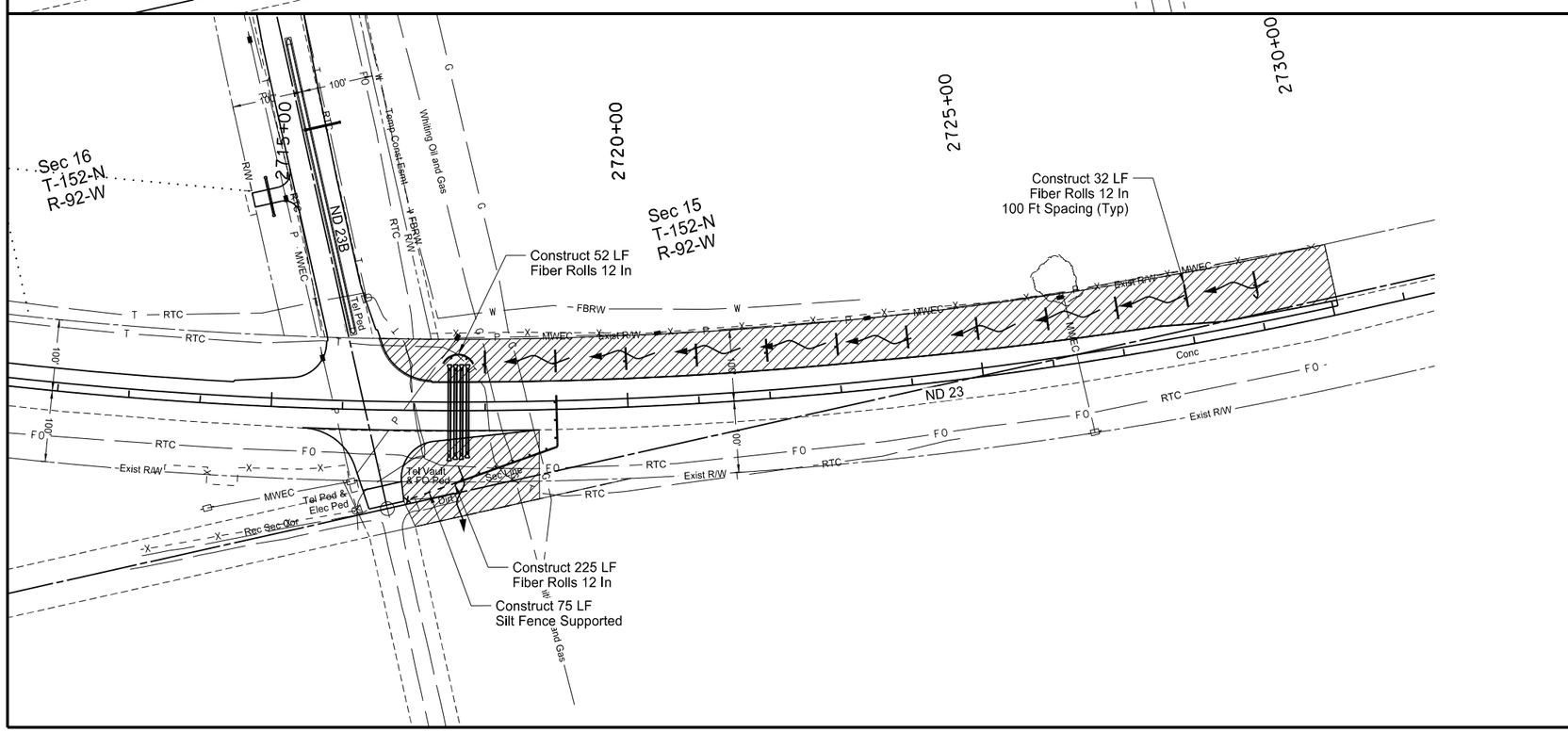
Erosion Control & Seeding
ND Hwy 1804
Sta 13105+05 to 13126+88
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	13





Description	Spec #	Code #	Qty	Unit
Temporary Erosion Control				
Silt Fence Supported				
Sta 2704+00 to 2727+00	708	1325	75	LF
Removal Silt Fence Supported				
Sta 2704+00 to 2727+00	708	1335	75	LF
Fiber Rolls 12 In				
Sta 2704+00 to 2727+00	708	1430	1182	LF
Removal Fiber Rolls 12 In				
Sta 2704+00 to 2727+00	708	1431	1182	LF
Seeding - Class IV				
Sta 2704+00 to 2727+00	708	2260	4.34	Ac
Mulching				
Sta 2704+00 to 2727+00	708	5500	4.34	Ac
Permanent Erosion Control				
Fiber Rolls 12 In				
Sta 2704+00 to 2727+00	708	1430	1182	LF
Fiber Rolls 20 In				
Sta 2704+00 to 2727+00	708	1460	75	LF
Seeding - Class V				
Sta 2704+00 to 2727+00	708	2280	4.34	Ac
Mulching				
Sta 2704+00 to 2727+00	708	5500	4.34	Ac

NOTE:
The Permanent Fiber Rolls 20 IN is to Replace the Silt Fence Supported Once it is Removed.

Legend

- Fiber Roll 12 In (Permanent Erosion Control)
- Sit Fence Supported (Temporary Erosion Control)
- Seeding Areas
- Flow Direction

N

0 100 200
Scale in Feet

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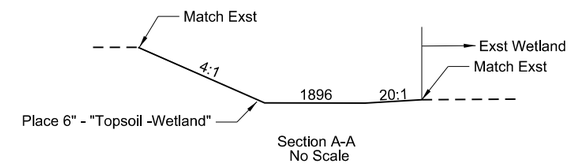
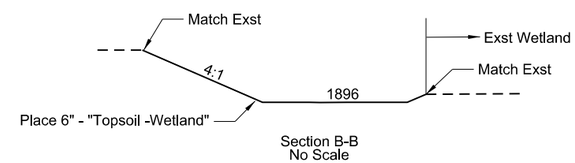
Erosion Control & Seeding
ND Highway 23
Sta 2704+00 to 2730+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	75	14

Common Excavation - Type A				
Sta 2695+26 to Sta 2697+17 LT	203	0101	3,200	CY
Fiber Roll 12 In				
Sta 2697+28.5 - 82 LT	708	1430	50	LF



Section A-A
No Scale



Section B-B
No Scale

Legend

Permanent Impact Areas

Temporary Impact Areas

Mitigation Areas

N

0 50 100
Scale in Feet

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Wetlands, Erosion Control & Seeding
Wetland Mitigation Site
ND 23B
Northeast Truck Reliever Route
New Town, ND

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - ND 23B

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
ND Hwy 1804			
PI	13049+25.60	363,681.29	1,480,579.67
PC	13090+61.78	367,816.20	1,480,682.58
PI	13095+32.17	368,286.44	1,480,694.28
PT	13099+84.20	368,708.34	1,480,486.29
PI	13140+05.75	372,315.36	1,478,708.00
ND Hwy 23			
PI	2609+37.59	363,681.29	1,480,579.67
PI	2611+53.88	363,639.43	1,480,790.87
PC	2613+99.56	363,591.87	1,481,032.91
PI	2617+32.62	363,527.41	1,481,359.66
PT	2620+56.71	363,595.74	1,481,685.63
PC	2631+92.67	363,828.81	1,482,797.43
PI	2633+84.05	363,868.07	1,482,984.74
PT	2635+73.69	363,863.08	1,483,176.05
PC	2684+90.96	363,734.67	1,488,091.64
PI	2695+34.51	363,707.42	1,489,134.83
PT	2705+55.43	363,314.12	1,490,101.43
PC	2709+48.77	363,165.88	1,490,465.76
PI	2719+95.64	362,771.33	1,491,435.44
PT	2730+19.67	362,745.17	1,492,481.99
PI	2769+23.29	362,647.61	1,496,384.38

CURVE DATA

ARC DEFINITION

Curve 23-1		Curve 23-3	
PI =	2617+32.62	PI =	2695+34.51
Delta =	23° 00' 00" (LT)	Delta =	20° 38' 40" (RT)
D_a =	3° 30' 00"	D_a =	1° 00' 00"
R =	1,637.02	R =	5,729.65
T =	333.06	T =	1,043.55
L =	657.14	L =	2,064.47

Curve 23-2		Curve 23-4	
PI =	2633+84.05	PI =	2719+95.64
Delta =	13° 20' 09" (RT)	Delta =	20° 42' 32" (LT)
D_a =	3° 30' 00"	D_a =	1° 00' 00"
R =	1,637.02	R =	5,729.65
T =	191.38	T =	1,046.87
L =	381.02	L =	2,070.91

Curve 1804-1	
PI =	13095+32.17
Delta =	27° 40' 10" (LT)
D_a =	2° 59' 59"
R =	1910.08
T =	470.39
L =	922.42

US PUBLIC LAND SURVEY DATA

DESC.	SEC-TWP-RGE	NORTHING	EASTING
NW Cor	18 152 92	368471.65	1475613.53
NE Cor	18 152 92	368341.98	1480695.67
SE Cor	18 152 92	363064.33	1480564.31
SW Cor	18 152 92	363192.10	1475471.29
S 1/4 Cor	18 152 92	363130.34	1477925.69
N 1/4 Cor	18 152 92	368409.50	1478057.01
NW Cor	7 152 92	373964.77	1475758.17
W 1/4 Cor	7 152 92	370849.05	1475680.07
NE Cor	7 152 92	373821.41	1480827.44
NE Cor	8 152 92	373686.53	1486101.65
SE Cor	17 152 92	362938.79	1485835.54
E 1/4 Cor	17 152 92	365579.70	1485901.51
SE Cor	16 152 92	362804.56	1491108.65
E 1/4 Cor	16 152 92	365430.11	1491172.50
NE Cor	16 152 92	368080.24	1491237.76
SE Cor	8 152 92	368202.38	1485967.04
S 1/4 Cor	16 152 92	362870.17	1488469.66
N 1/4 Cor	16 152 92	368143.27	1488598.12
E 1/4 Cor	9 152 92	370438.67	1491300.06
E 1/4 Cor	8 152 92	370576.06	1486016.66
CNTR SEC	8 152 92	370644.95	1483380.75
E 1/4 Cor	7 152 92	370714.13	1480744.00
E 1/4 Cor	10 152 92	370302.20	1496578.71
SE Cor	10 152 92	367948.95	1496515.58
S 1/4 Cor	10 152 92	368013.47	1493880.25
E 1/4 Cor	15 152 92	365313.30	1496448.81

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	CONTROL POINT DESCRIPTION
100	365740.47	1485644.47	2006.75			Rebar (Punched)
101	368169.04	1474089.56	1932.69			Rebar (Punched)
102	363293.50	1474613.68	1922.01			Rebar (Punched)
103	362602.53	1494253.12	1950.10			Rebar (Punched)
104	370246.63	1493759.14	2123.01			Rebar (Punched)

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

NOTES:

Date Survey Completed 10/31/12

☐ Assumed Coordinates

☒ All coordinates on this sheet are Mountrail County ground coordinates. They are derived from the "North Dakota Coordinate System of 1983", NAD83(CORS96).North Zone Combination Factor (cf) = 0.9998350

INITIALIZING BENCH MARK NDGPS Stations (OPUS)

☒ NAVD-88
☐ NGVD-29

☒ English Units ☐ _____
☐ Metric Units

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	81	2

Alignment Monuments (ND 23B)			
Station	Offset	Lt/Rt	Description
10+00.00	0.00		PI
11+45.89	0.00		PC
19+75.32	-196.62	LT	Section
22+51.66	374.42	LT	PI
33+57.42	0.00		PT
50+94.47	0.00		Section
54+26.81	0.00		PC
58+44.13	74.36	RT	PI
62+61.44	0.00		PT
78+70.02	0.00		Section Cor
91+37.97	0.00		PC
95+56.24	9.41	RT	PI
99+74.51	0.00		PT
105+04.94	0.00		Section
107+64.89	0.00		PC
111+85.98	33.17	LT	PI
116+07.07	0.00		PT
117+86.02	0.00		Section
123+88.89	0.00		PC
130+44.53	239.49	LT	PI
133+71.02	52.97	LT	Section
137+00.17	0.00		PT
149+56.17	0.00		PC
153+09.66	19.02	LT	Section
153+80.72	27.50	LT	PI
158+05.27	0.00		PT
165+25.35	0.00		PC
169+43.38	14.84	RT	PI
173+61.42	0.00		PT
178+08.64	0.00		PI

Iron Pin R/W Monument (ND 23B)							
Station	Offset	Lt/Rt	Include R/W Marker	Station	Offset	Lt/Rt	Include R/W Marker
10+74.91	100.00	RT	Y	109+97.37	245.00	LT	Y
10+75.09	100.00	LT	Y	109+97.37	175.00	LT	Y
11+45.89	100.00	LT	Y	116+00.72	225.01	LT	Y
11+45.89	100.00	RT	Y	116+00.72	175.00	LT	Y
33+57.42	100.00	LT	Y	116+07.07	225.00	RT	Y
33+57.42	100.00	RT	Y	120+00.72	225.00	LT	Y
51+76.04	100.00	RT	Y	120+00.72	150.00	LT	Y
53+77.69	347.22	RT	Y	122+00.72	100.00	RT	Y
54+26.81	100.00	LT	Y	122+00.72	225.00	RT	Y
58+69.36	100.00	RT	Y	122+94.50	150.00	LT	Y
62+61.44	100.00	RT	Y	123+88.89	100.00	RT	Y
62+61.44	100.00	LT	Y	127+92.51	399.20	LT	Y
68+01.12	150.00	RT	Y	128+00.63	655.16	LT	Y
68+01.12	175.00	LT	Y	128+46.76	664.73	LT	Y
68+01.12	100.00	RT	Y	128+93.22	666.37	LT	Y
68+01.12	100.00	LT	Y	128+96.02	567.59	LT	Y
84+50.71	250.00	RT	Y	132+64.72	150.00	LT	Y
84+50.71	150.00	RT	Y	137+00.17	100.00	RT	Y
91+37.97	175.00	LT	Y	137+00.17	150.00	LT	Y
91+37.98	250.00	RT	Y	137+00.17	100.00	LT	Y
98+00.71	275.00	RT	Y	137+00.17	150.00	RT	Y
98+00.71	250.00	RT	Y	143+64.71	150.00	RT	Y
99+74.51	275.00	RT	Y	149+56.17	100.00	LT	Y
99+74.51	175.00	LT	Y	158+05.27	100.00	LT	Y
104+80.64	275.00	RT	Y	165+25.35	100.00	LT	Y
104+85.05	225.00	RT	Y	165+63.58	100.00	RT	Y
107+64.89	225.00	RT	Y	173+61.42	100.00	RT	Y
107+64.89	175.00	LT	Y	173+61.42	100.00	LT	Y
108+75.59	245.00	LT	Y	176+79.64	100.00	RT	Y
108+75.59	175.00	LT	Y	177+29.65	100.00	LT	Y

Iron Pin R/W Monument (ND 23)			
Station	Offset	Lt/Rt	Include R/W Marker
2691+25.00	120.00	LT	N
2691+25.00	150.00	LT	N
2693+69.07	475.65	LT	N
2694+18.70	150.00	LT	N
2697+01.96	546.63	LT	N
2698+12.89	100.00	LT	N

Iron Pin Refernce Monument (ND 23B)			
Station	Offset	Lt/Rt	Include R/W Marker
50+94.47	100.00	LT	Y
50+94.47	100.00	RT	Y
76+95.02	175.00	LT	Y
77+20.02	150.00	RT	Y
80+20.02	150.00	RT	Y
80+45.02	175.00	LT	Y
105+04.94	175.00	LT	Y
105+04.94	225.00	RT	Y
117+86.02	225.00	LT	Y
117+86.02	225.00	RT	Y

Totals	EA
Monuments	106
Right of Way Markers	70

Note: All monuments, iron pins, and right of way markers to be installed per NDDOT Standard Drawing D-720-01.

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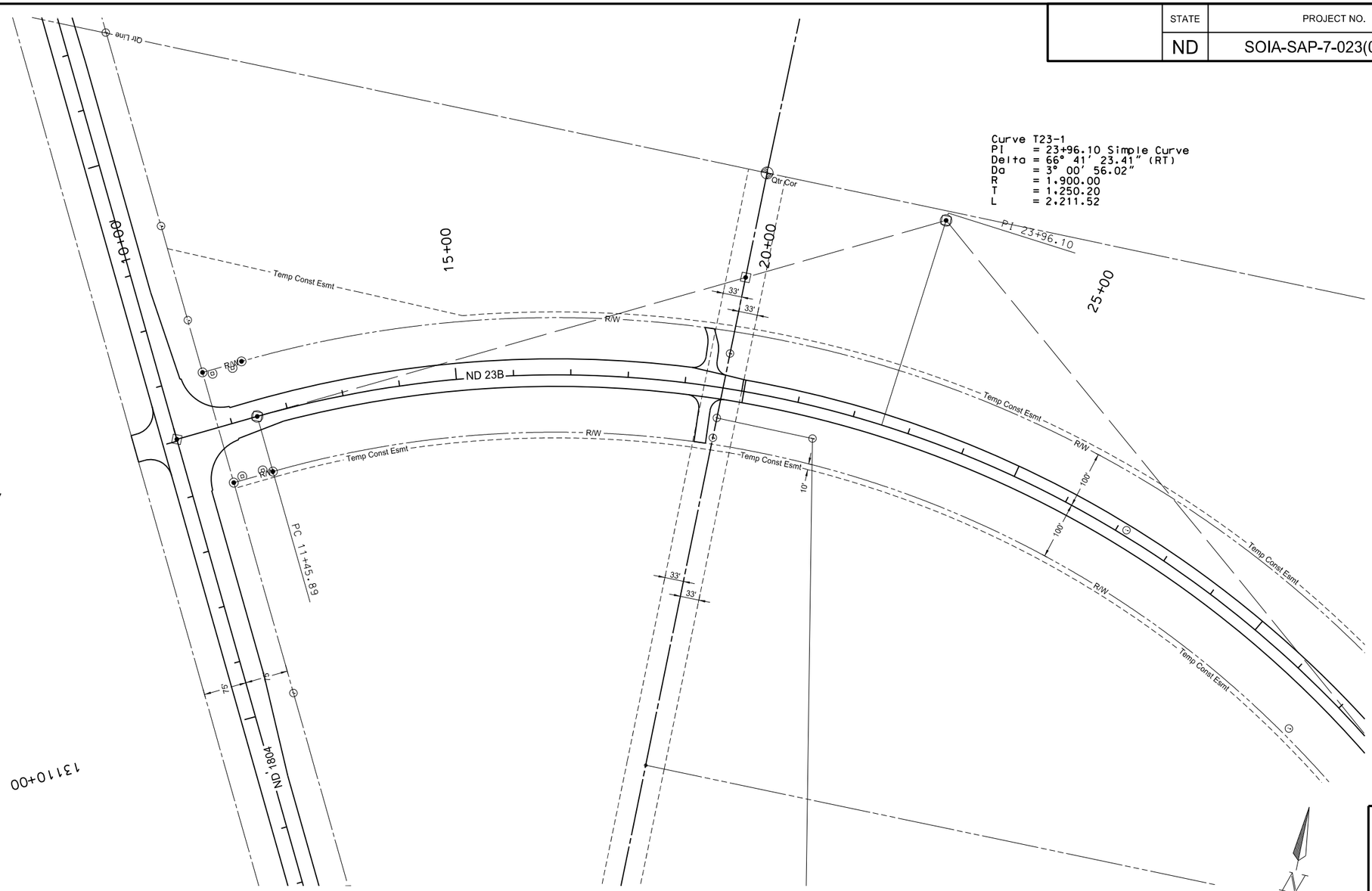
Monuments, Iron Pins, and Right of Way Markers

ND Highway 23B

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	82	1



LEGEND

- R/W Marker
- Iron Pin R/W Monument
- Alignment Monument
- Iron Pin Reference Monument

N

0 100 200
Scale in Feet

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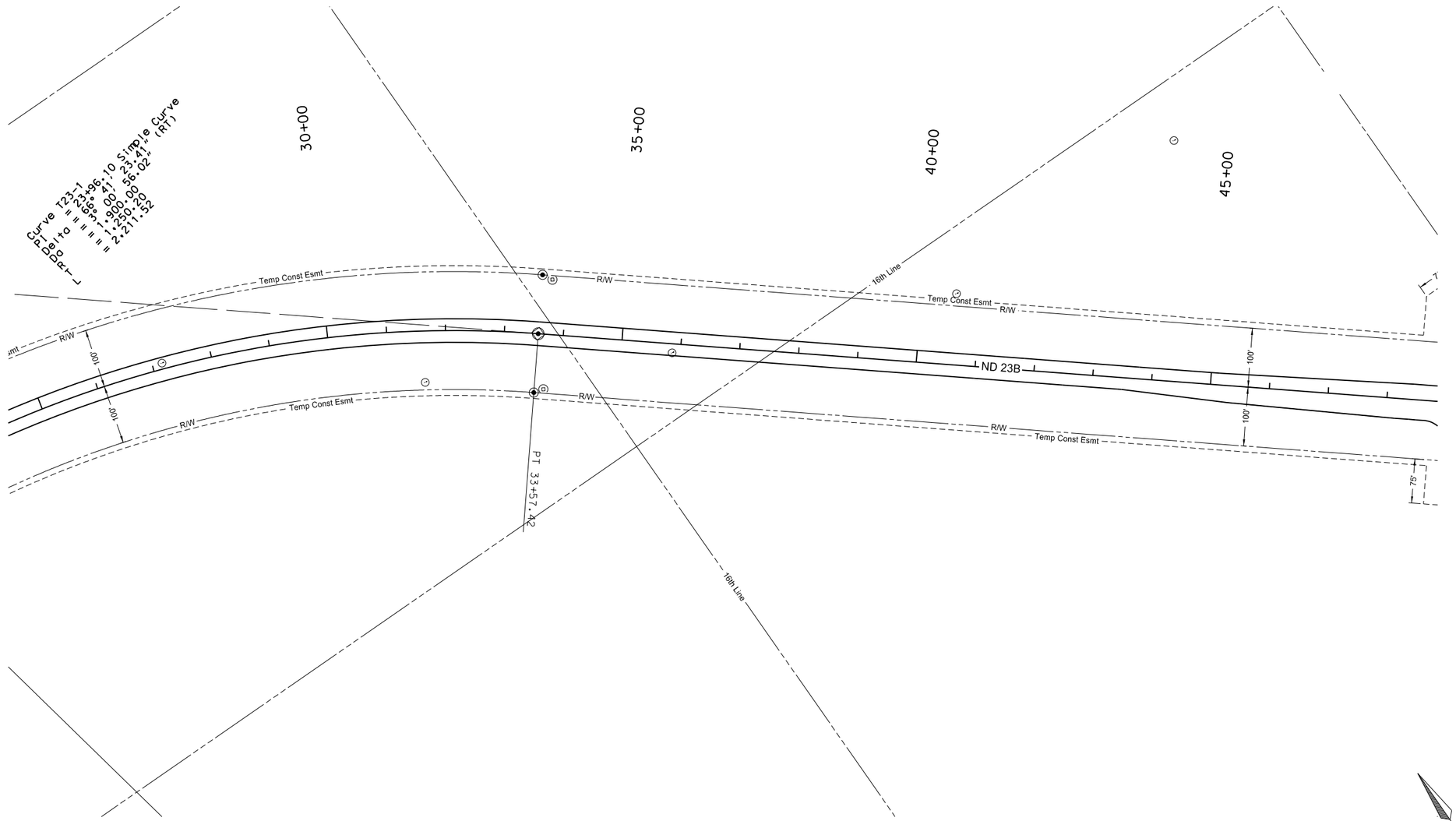
———

Curve T23-1
P.I. Station 23+96.096 N 370,689.082 E 1,481,066.306
Delta = 66°41' 23" (RT)
Degree = 3°00' 56"
Tangent = 1,250.203
Length = 2,211.523
Radius = 1,900.004
External = 374.424
Long Chord = 2,088.780
Mid. Ord. = 312.785
P.C. Station 11+45.894 N 370,135.266 E 1,479,945.461
P.T. Station 33+57.417 N 369,878.874 E 1,482,018.445
C.C. N 368,431.853 E 1,480,787.126
Back = N 63°42' 21" E
Ahead = S 49°36' 16" E
Chord Bear = S 82°56' 58" E

Course from PT T23-1 to PC T23-2 S 49°36' 16" E Dist 2,069.394

Survey Data Layout
Sta 10+00 to 26+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	82	2



LEGEND

- R/W Marker
- Iron Pin R/W Monument
- Alignment Monument
- Iron Pin Reference Monument

-_____

Curve T23-1
P.I. Station 23+96.096 N 370,689.082 E 1,481,066.306
Delta = 66°41' 23" (RT)
Degree = 3°00' 56"
Tangent = 1,250.203
Length = 2,211.523
Radius = 1,900.004
External = 374.424
Long Chord = 2,088.780
Mid. Ord. = 312.785
P.C. Station 11+45.894 N 370,135.266 E 1,479,945.461
P.T. Station 33+57.417 N 369,878.874 E 1,482,018.445
C.C. N 368,431.853 E 1,480,787.126
Back = N 63°42' 21" E
Ahead = S 49°36' 16" E
Chord Bear = S 82°56' 58" E

Course from PT T23-1 to PC T23-2 S 49°36' 16" E Dist 2,069.394

N

0 100 200
Scale in Feet

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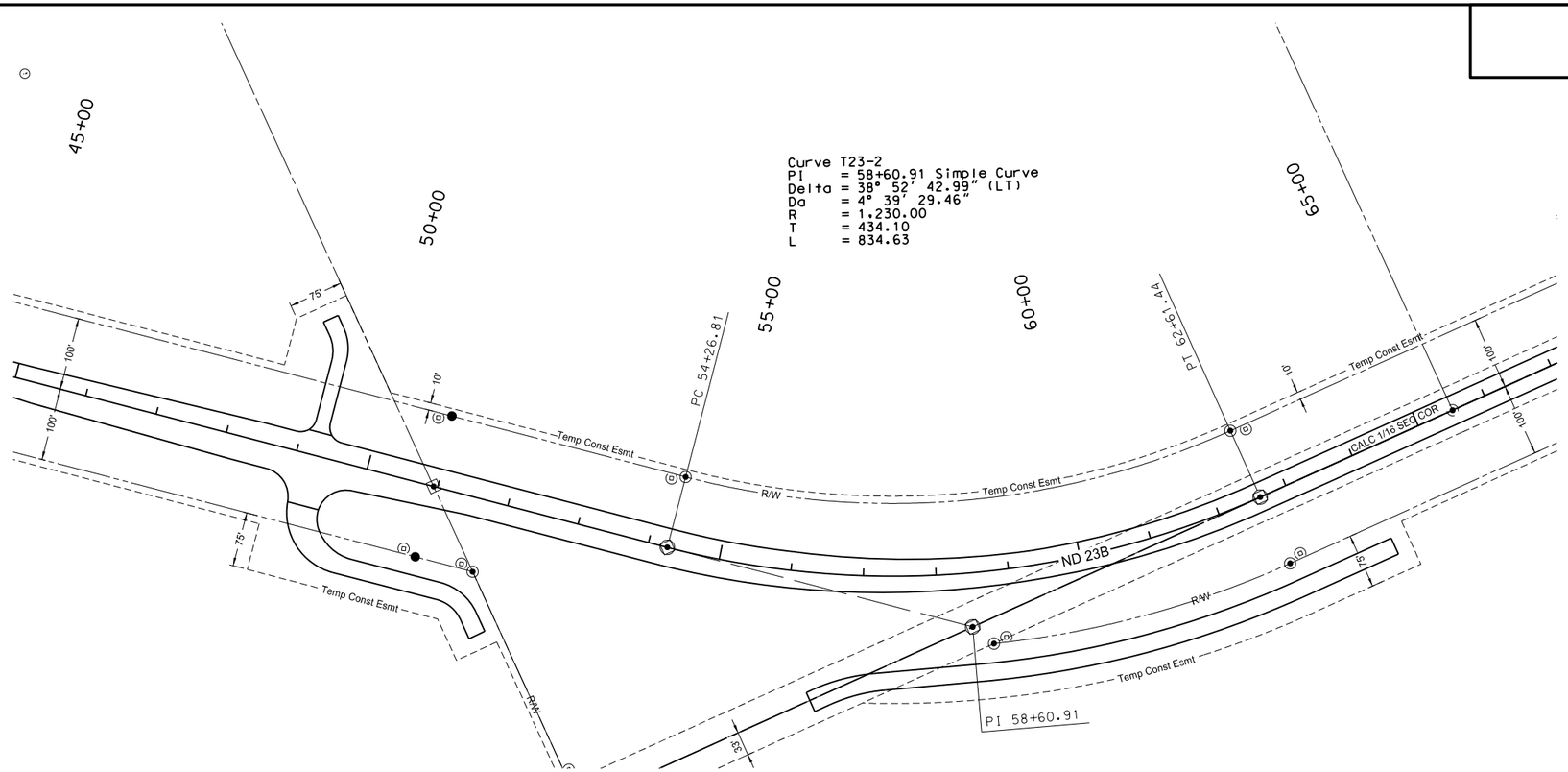
Survey Data Layout
Sta 26+00 to 46+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	82	3



Curve Data

Curve T23-2			
P.I. Station	58+60.912 N	368,256.455 E	1,483,925.077
Delta =	38°52' 43" (LT)		
Degree =	4°39' 29"		
Tangent =	434.101		
Length =	834.630		
Radius =	1,230.002		
External =	74.355		
Long Chord =	818.710		
Mid. Ord. =	70.117		
P.C. Station	54+26.811 N	368,537.779 E	1,483,594.471
P.T. Station	62+61.441 N	368,244.963 E	1,484,359.026
C.C.	N	369,474,534 E	1,484,391.588

Back = S 49°36' 16" E
Ahead = S 88°28' 59" E
Chord Bear = S 69°02' 37" E

Course from PT T23-2 to PC T23-3 S 88°28' 59" E Dist 2,876.534

LEGEND

- R/W Marker
- Iron Pin R/W Monument
- Alignment Monument
- Iron Pin Reference Monument

N

0 100 200
Scale in Feet

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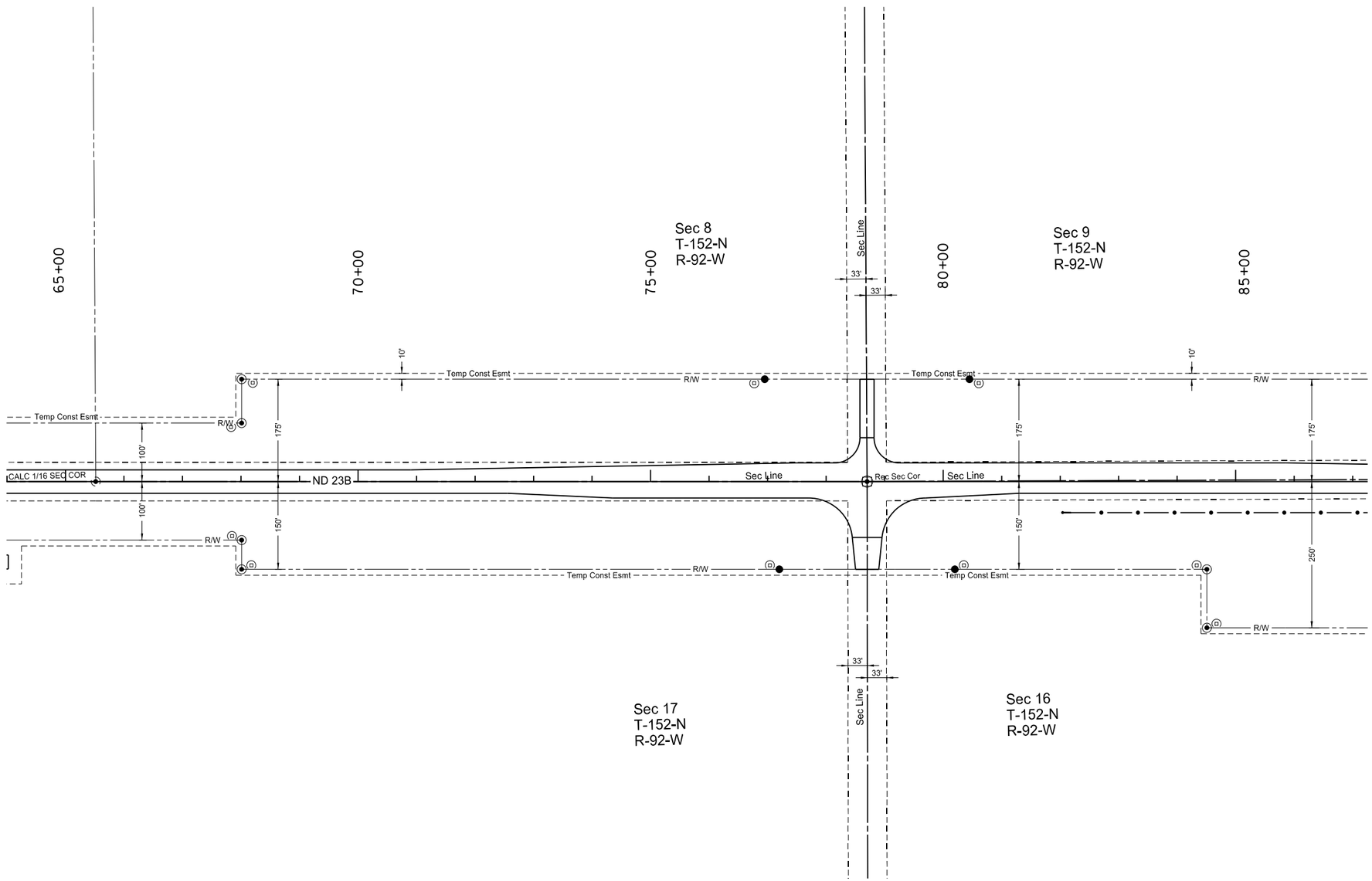
Survey Data Layout
Sta 46+00 to 66+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	82	4



LEGEND

- R/W Marker
- Iron Pin R/W Monument
- Alignment Monument
- Iron Pin Reference Monument

N

0 100 200
Scale in Feet

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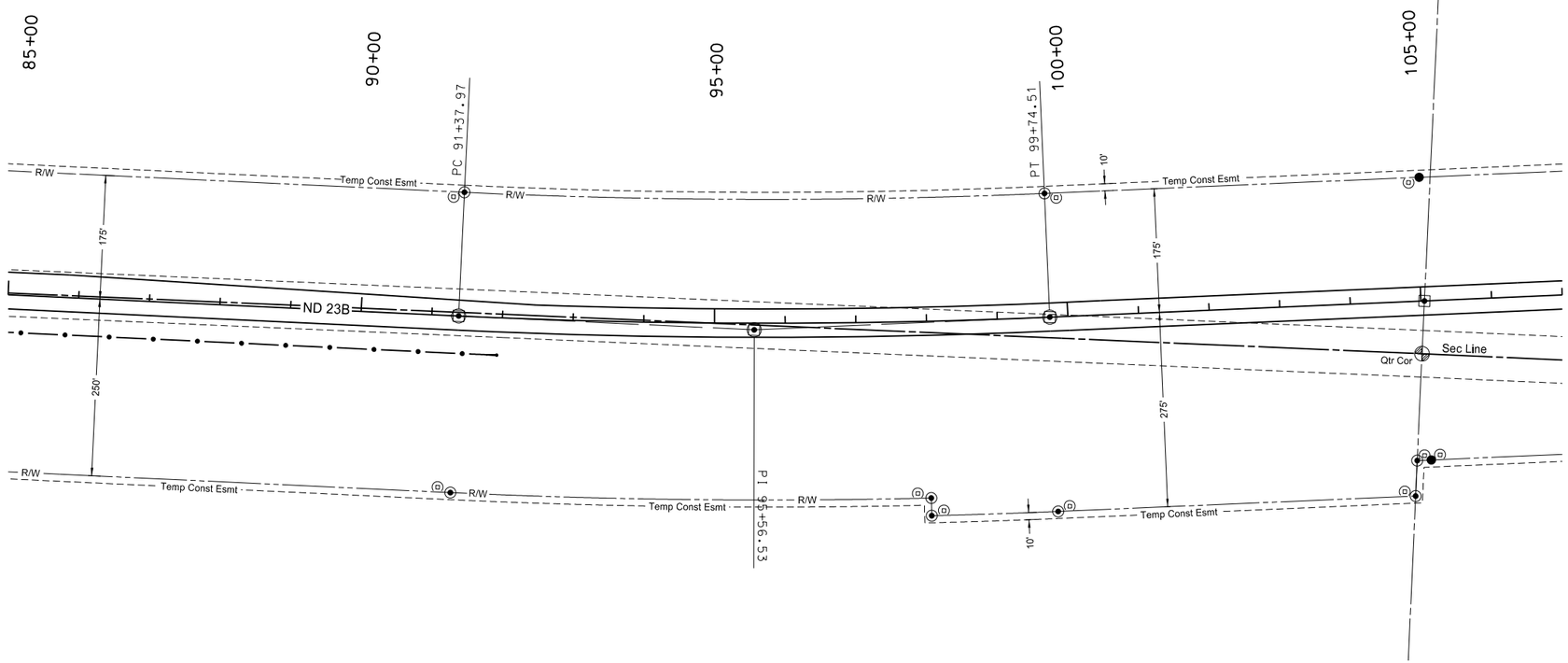
Survey Data Layout
Sta 66+00 to 86+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	82	5



Curve Data

Curve T23-3
P.I. Station 95+56.526 N 368,157.731 E 1,487,652.956
Delta = 5°09' 14" (LT)
Degree = 0°36' 58"
Tangent = 418.551
Length = 836.537
Radius = 9,300.019
External = 9.414
Long Chord = 836.255
Mid. Ord. = 9.404
P.C. Station 91+37.975 N 368,168.811 E 1,487,234.552
P.T. Station 99+74.512 N 368,184.280 E 1,488,070.664
C.C. N 377,465.570 E 1,487,480.755
Back = S 88°28' 59" E
Ahead = N 86°21' 48" E
Chord Bear = N 88°56' 24" E

Course from PT T23-3 to PC T23-4 N 86°21' 48" E Dist 790.375

LEGEND

- R/W Marker
- Iron Pin R/W Monument
- Alignment Monument
- Iron Pin Reference Monument

N

0 100 200
Scale in Feet

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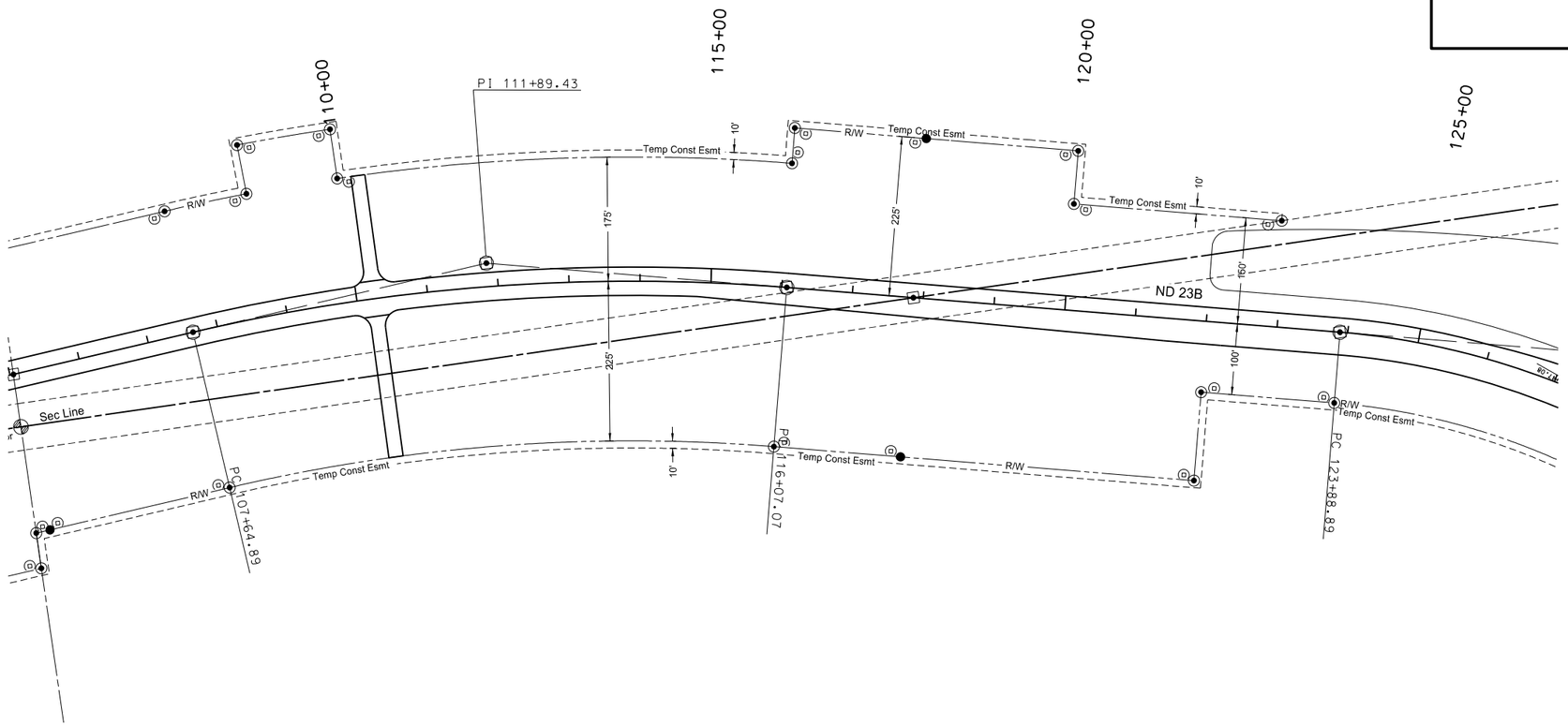
Survey Data Layout
Sta 86+00 to 106+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	82	6



Curve Data

Curve T23-4
P.I. Station 111+89.427 N 368,261.343 E 1,489,283.132
Delta = 17°52' 18" (RT)
Degree = 2°07' 19"
Tangent = 424.540
Length = 842.185
Radius = 2,700.005
External = 33.173
Long Chord = 838.775
Mid. Ord. = 32.770
P.C. Station 107+64.887 N 368,234.414 E 1,488,859.447
P.T. Station 116+07.072 N 368,156.950 E 1,489,694.637
C.C. N 365,539.846 E 1,489,030.711
Back = N 86°21' 48" E
Ahead = S 75°45' 54" E
Chord Bear = S 84°42' 03" E

Course from PT T23-4 to PC T23-5 S 75°45' 54" E Dist 781.820

Curve Data

Curve T23-5
P.I. Station 131+42.190 N 367,779.467 E 1,491,182.620
Delta = 70°32' 42" (RT)
Degree = 5°22' 48"
Tangent = 753.298
Length = 1,311.278
Radius = 1,065.002
External = 239.485
Long Chord = 1,230.006
Mid. Ord. = 195.519
P.C. Station 123+88.892 N 367,964.701 E 1,490,452.452
P.T. Station 137+00.170 N 367,029.293 E 1,491,251.155
C.C. N 366,932.399 E 1,490,190.570
Back = S 75°45' 54" E
Ahead = S 5°13' 12" E
Chord Bear = S 40°29' 33" E

Course from PT T23-5 to PC T23-6 S 5°13' 12" E Dist 1,255.997

LEGEND

- R/W Marker
- Iron Pin R/W Monument
- Alignment Monument
- Iron Pin Reference Monument

N

0 100 200
Scale in Feet

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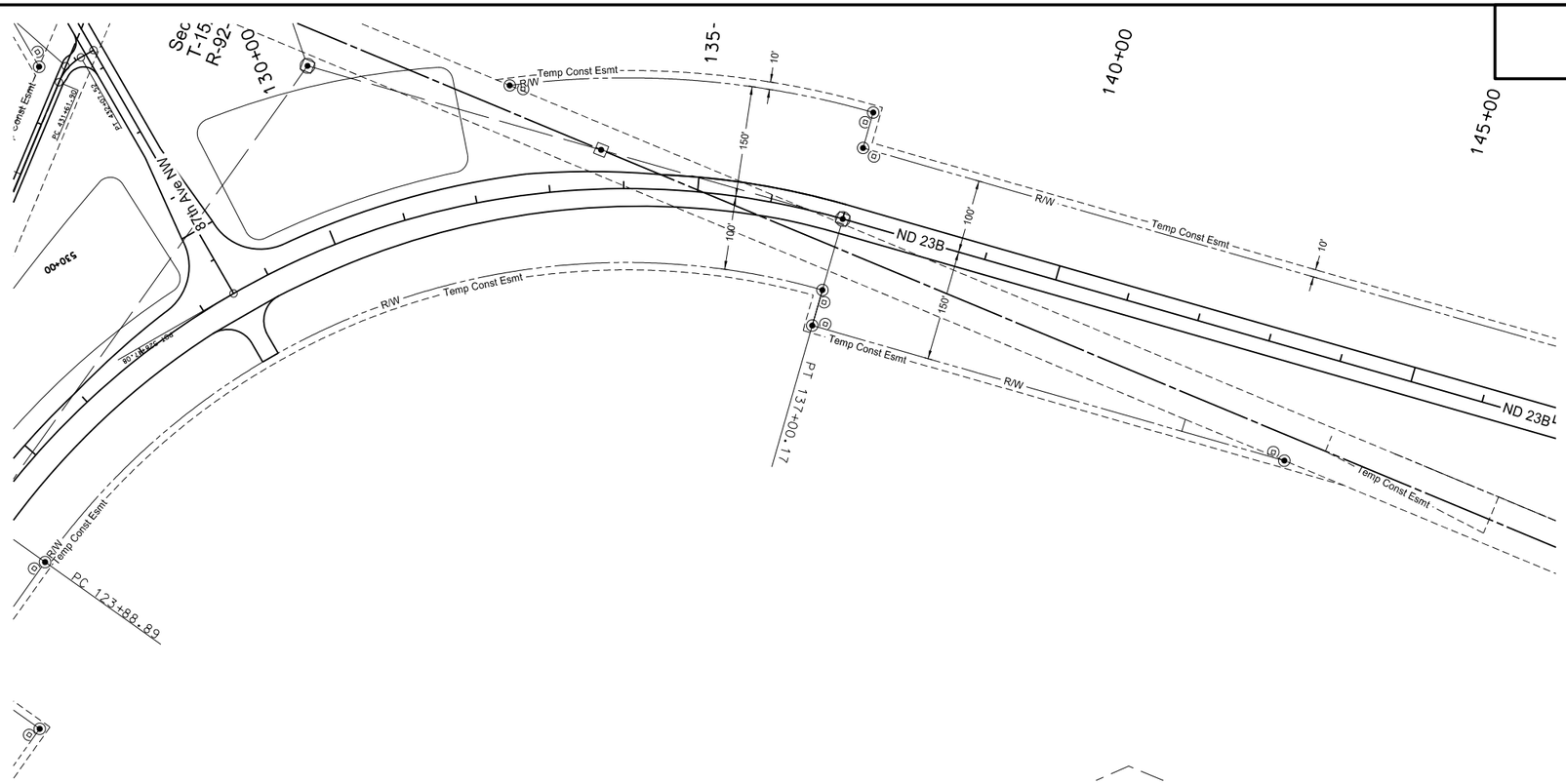
Survey Data Layout
Sta 106+00 to 126+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	82	7



Curve Data

Curve T23-5
P.I. Station 131+42.190 N 367,779.467 E 1,491,182.620
Delta = 70°32' 42" (RT)
Degree = 5°22' 48"
Tangent = 753.298
Length = 1,311.278
Radius = 1,065.002
External = 239.485
Long Chord = 1,230.006
Mid. Ord. = 195.519
P.C. Station 123+88.892 N 367,964.701 E 1,490,452.452
P.T. Station 137+00.170 N 367,029.293 E 1,491,251.155
C.C. N 366,932.399 E 1,490,190.570
Back = S 75°45' 54" E
Ahead = S 5°13' 12" E
Chord Bear = S 40°29' 33" E

Course from PT T23-5 to PC T23-6 S 5°13' 12" E Dist 1,255.997

LEGEND

- R/W Marker
- Iron Pin R/W Monument
- Alignment Monument
- Iron Pin Reference Monument

0 100 200
Scale in Feet

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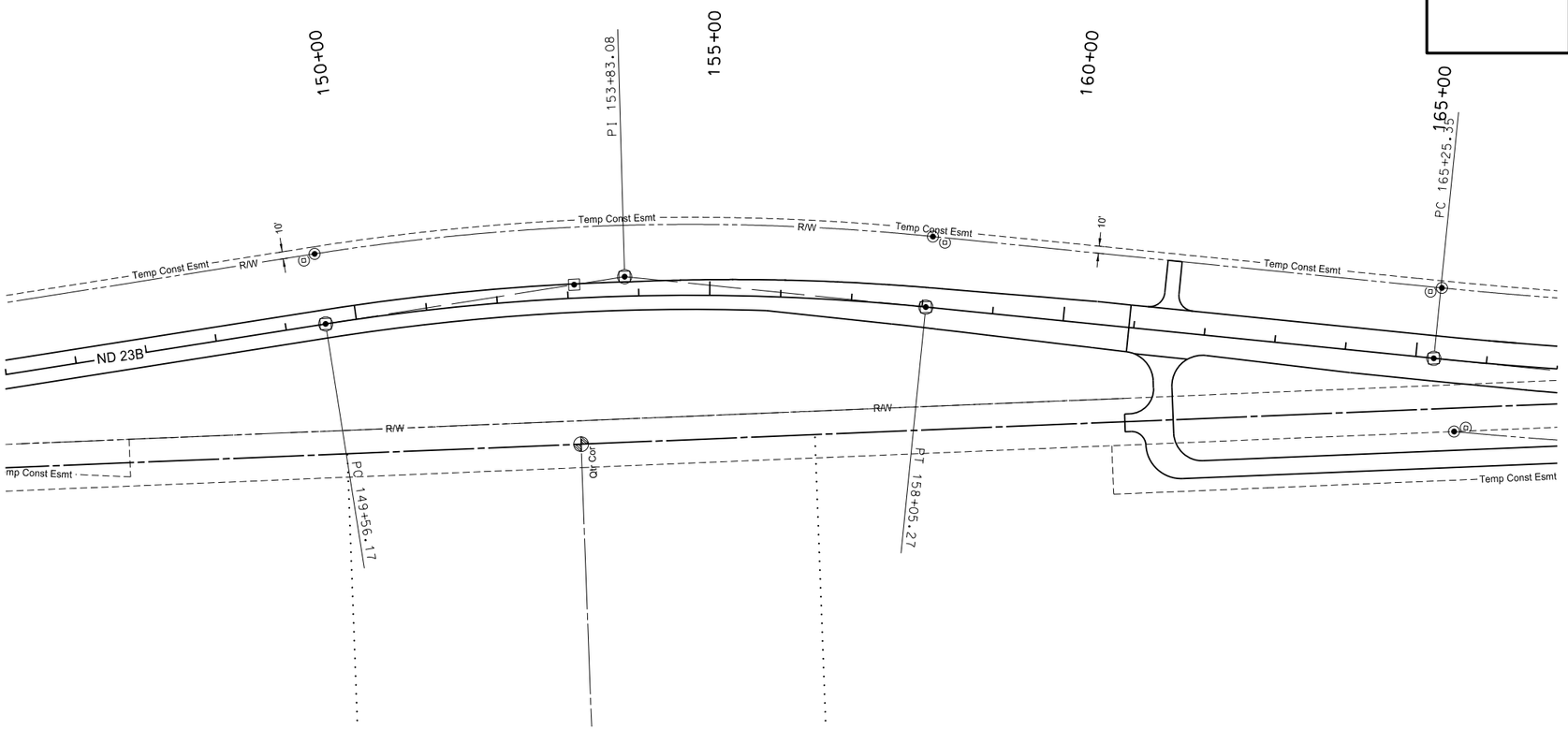
Survey Data Layout
Sta 126+00 to 146+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	82	8



Curve Data

Curve T23-6
P.I. Station 153+83.076 N 365,353.367 E 1,491,404.266
Delta = 14°44' 33" (RT)
Degree = 1°44' 10"
Tangent = 426.910
Length = 849.103
Radius = 3,300.007
External = 27.499
Long Chord = 846.763
Mid. Ord. = 27.272
P.C. Station 149+56.166 N 365,778.506 E 1,491,365.426
P.T. Station 158+05.270 N 364,932.340 E 1,491,333.641
C.C. N 365,478.271 E 1,488,079.106
Back = S 5°13' 12" E
Ahead = S 9°31' 21" W
Chord Bear = S 2°09' 04" W

Course from PT T23-6 to PC T23-7 S 9°31' 21" W Dist 720.079

Curve Data

Curve T23-7
P.I. Station 169+44.083 N 363,809.218 E 1,491,145.243
Delta = 8°07' 09" (LT)
Degree = 0°58' 16"
Tangent = 418.734
Length = 836.067
Radius = 5,900.012
External = 14.841
Long Chord = 835.368
Mid. Ord. = 14.803
P.C. Station 165+25.348 N 364,222.183 E 1,491,214.516
P.T. Station 173+61.415 N 363,390.609 E 1,491,134.989
C.C. N 363,246.124 E 1,497,033.231
Back = S 9°31' 21" W
Ahead = S 1°24' 12" W
Chord Bear = S 5°27' 46" W

Course from PT T23-7 to 8001 S 1°24' 12" W Dist 447.224

LEGEND

- R/W Marker
- Iron Pin R/W Monument
- Alignment Monument
- Iron Pin Reference Monument

0 100 200
Scale in Feet

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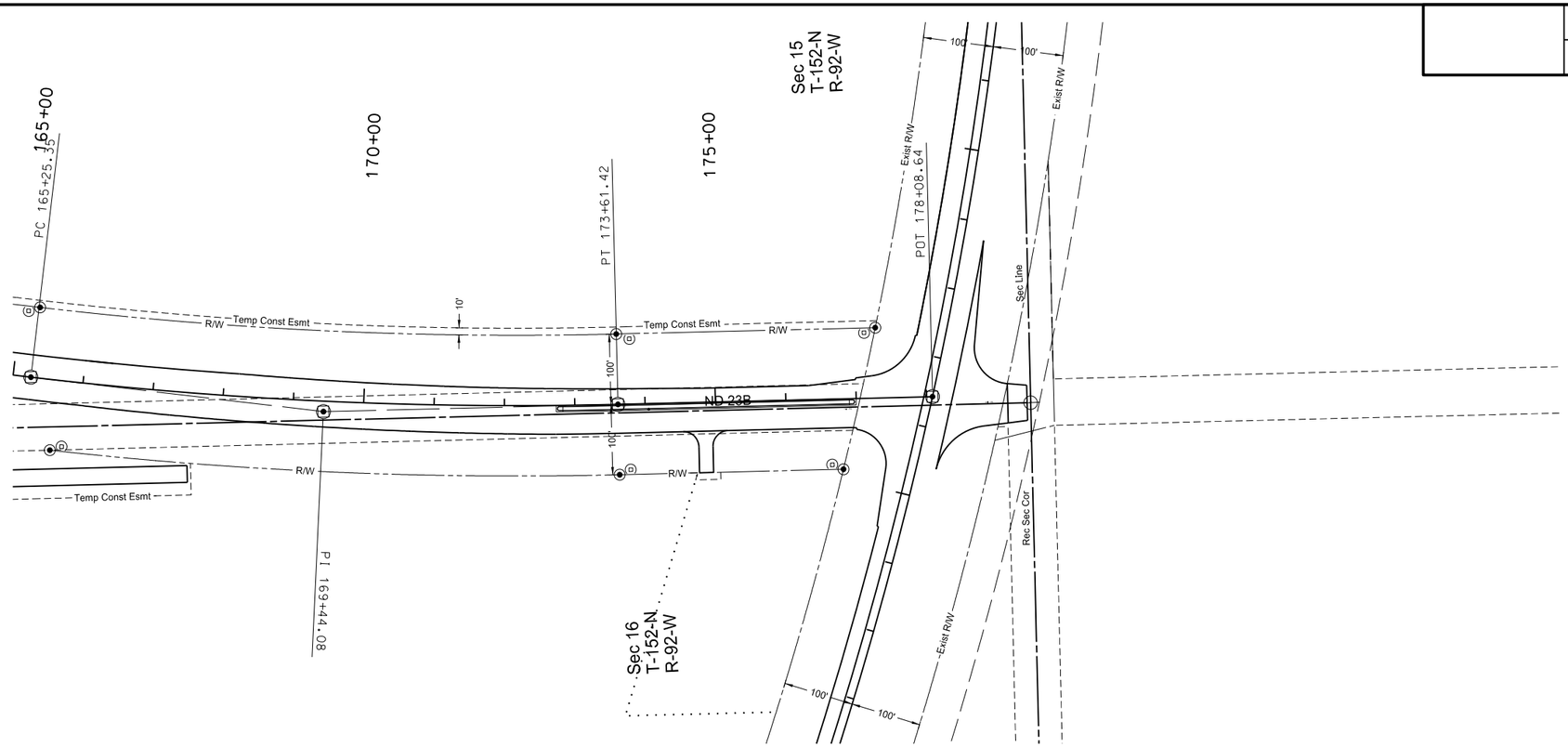
Survey Data Layout
Sta 146+00 to 166+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	82	9



Curve Data

Curve T23-7

P.I. Station	169+44.083 N	363,809.218 E	1,491,145.243
Delta =	8°07' 09" (LT)		
Degree =	0°58' 16"		
Tangent =	418.734		
Length =	836.067		
Radius =	5,900.012		
External =	14.841		
Long Chord =	835.368		
Mid. Ord. =	14.803		
P.C. Station	165+25.348 N	364,222.183 E	1,491,214.516
P.T. Station	173+61.415 N	363,390.609 E	1,491,134.989
C.C.	N	363,246.124 E	1,497,033.231

Back = S 9°31' 21" W
Ahead = S 1°24' 12" W
Chord Bear = S 5°27' 46" W

Course from PT T23-7 to 8001 S 1°24' 12" W Dist 447.224

LEGEND

- R/W Marker
- Iron Pin R/W Monument
- Alignment Monument
- Iron Pin Reference Monument

0 100 200
Scale in Feet

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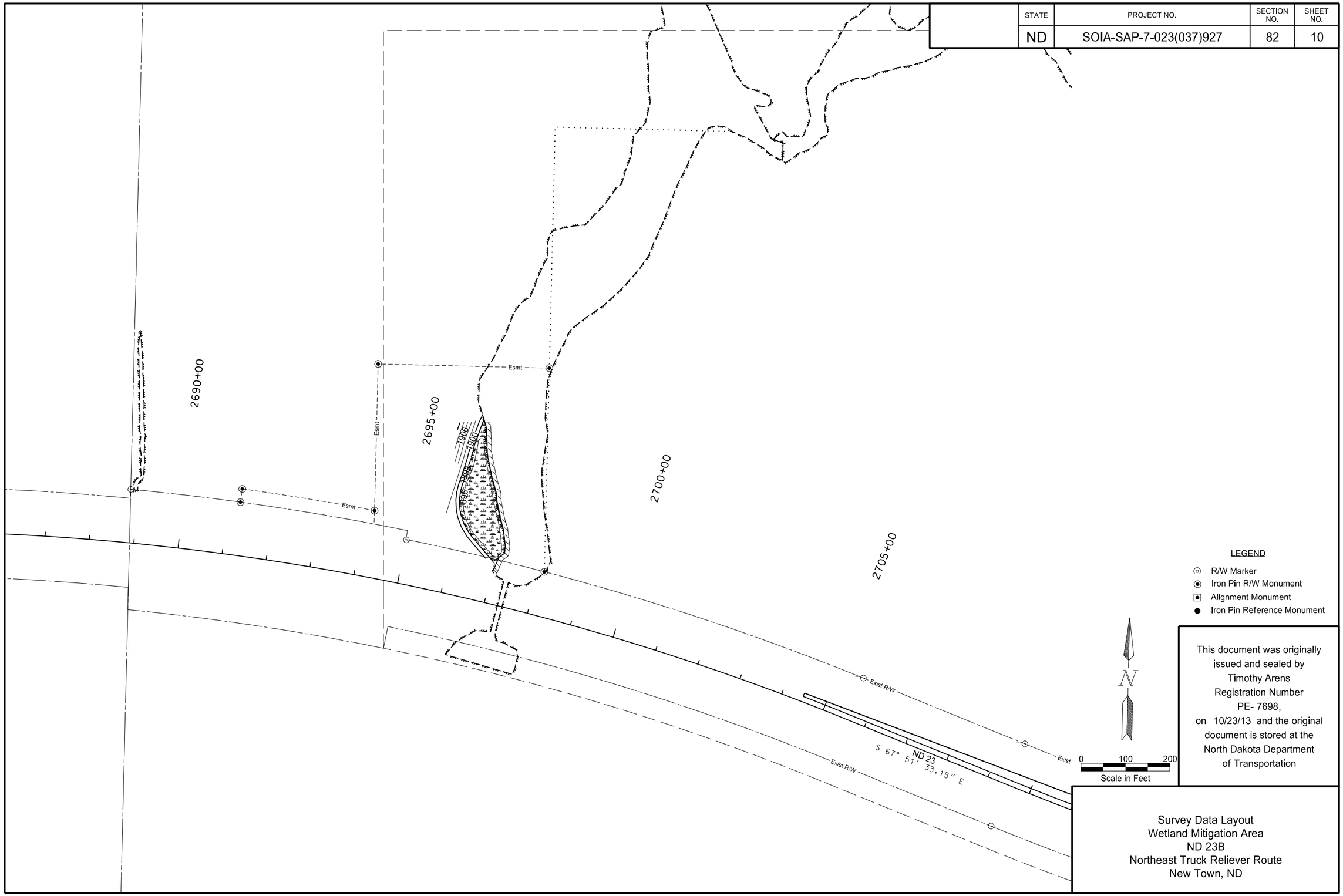
Survey Data Layout
Sta 166+00 to 178+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	82	10



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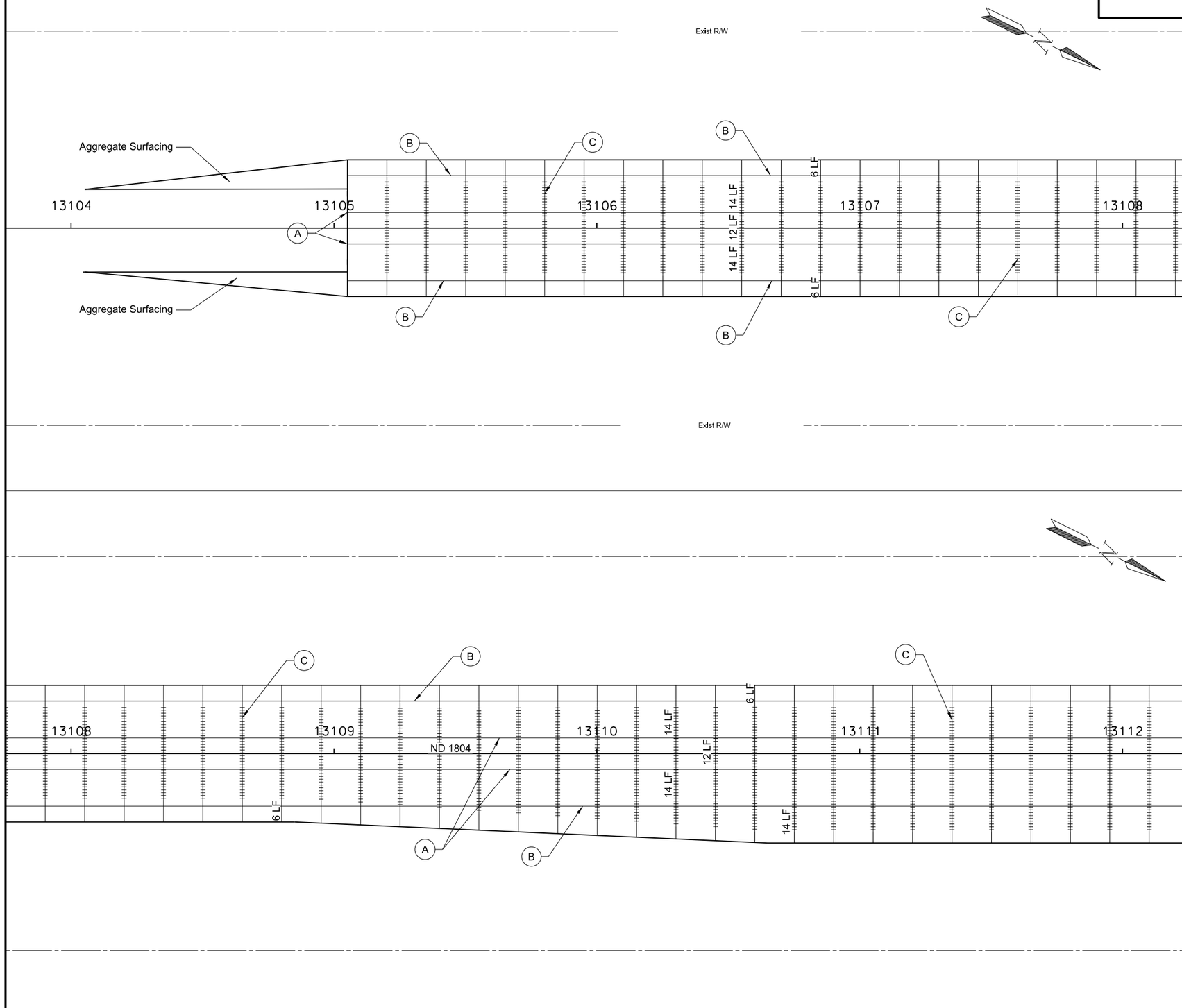
Survey Data Layout
Wetland Mitigation Area
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	1



Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

(C) Transverse Joint

Note: Transverse joint spacing approximately 15', unless shown otherwise.

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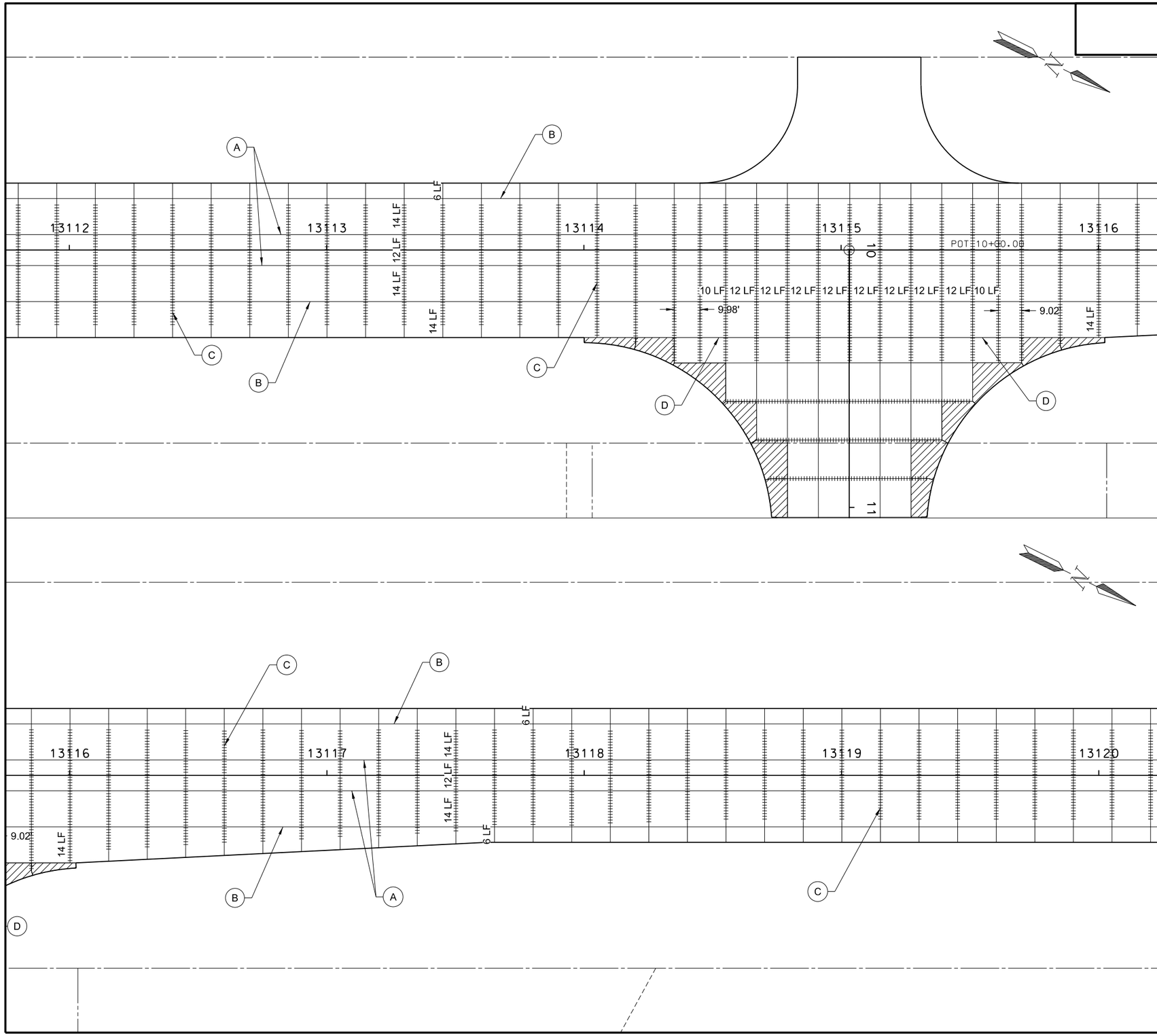
Paving Layouts
Sta 13104+00 to Sta 13112+00
ND Hwy 1804
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	2



Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

(C) Transverse Joint

(D) Longitudinal Keyed Joint (no Tie)

(E) Isolation Joint

Reinforced Panel - Full Steel Mat

Note: Transverse joint spacing approximately 15', unless shown otherwise.

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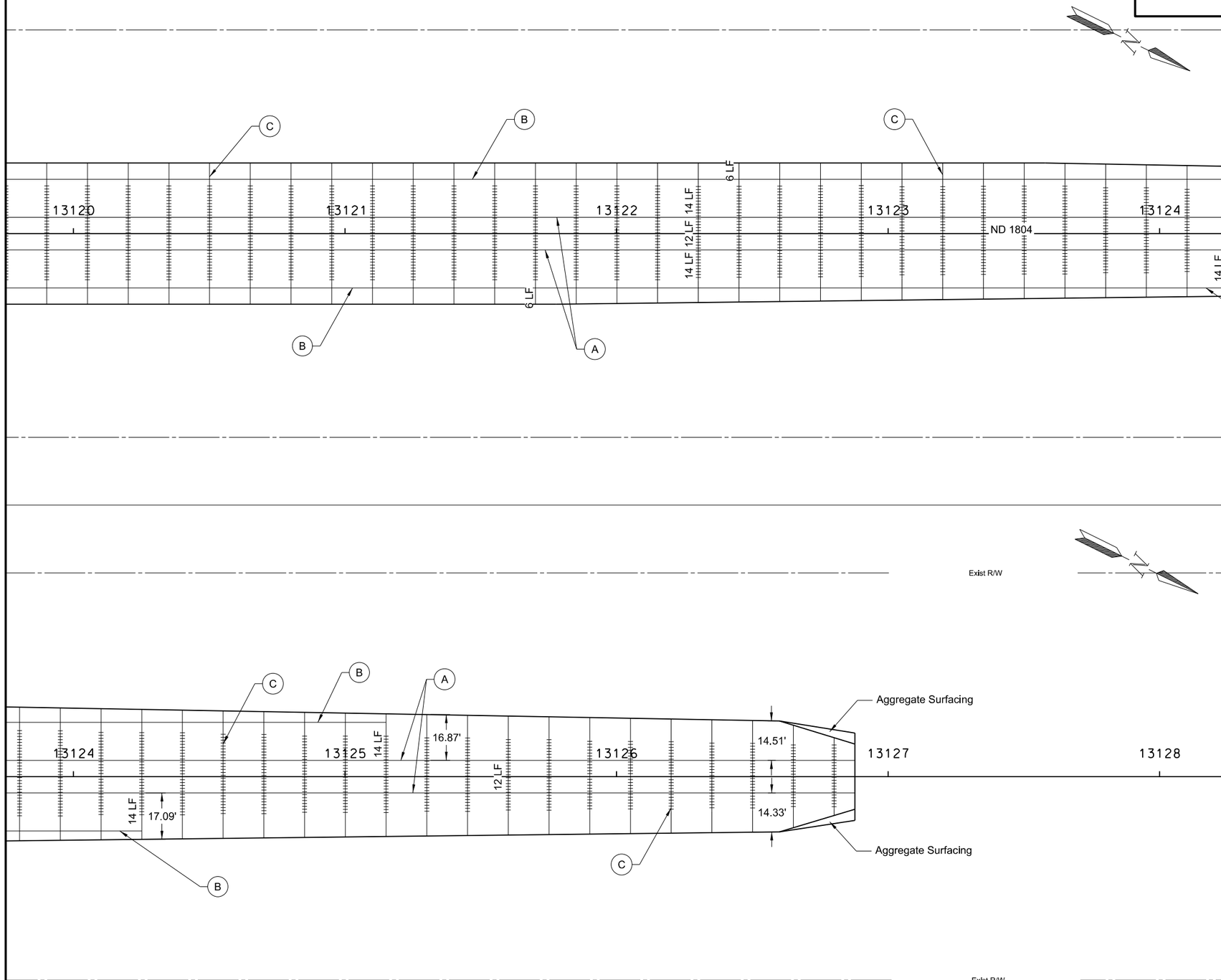
Paving Layouts
Sta 13112+00 to Sta 13120+00
ND Hwy 1804
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	3



Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

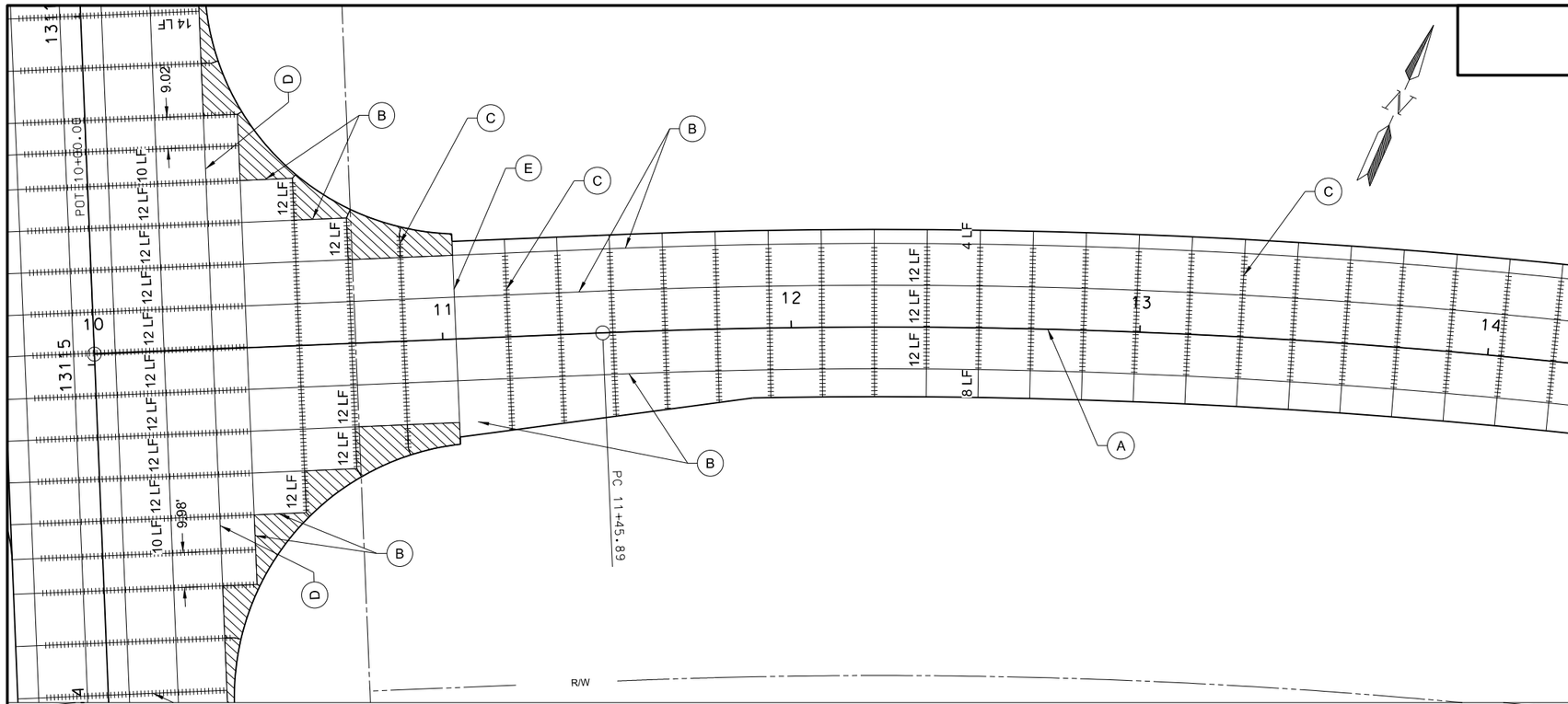
(C) Transverse Joint

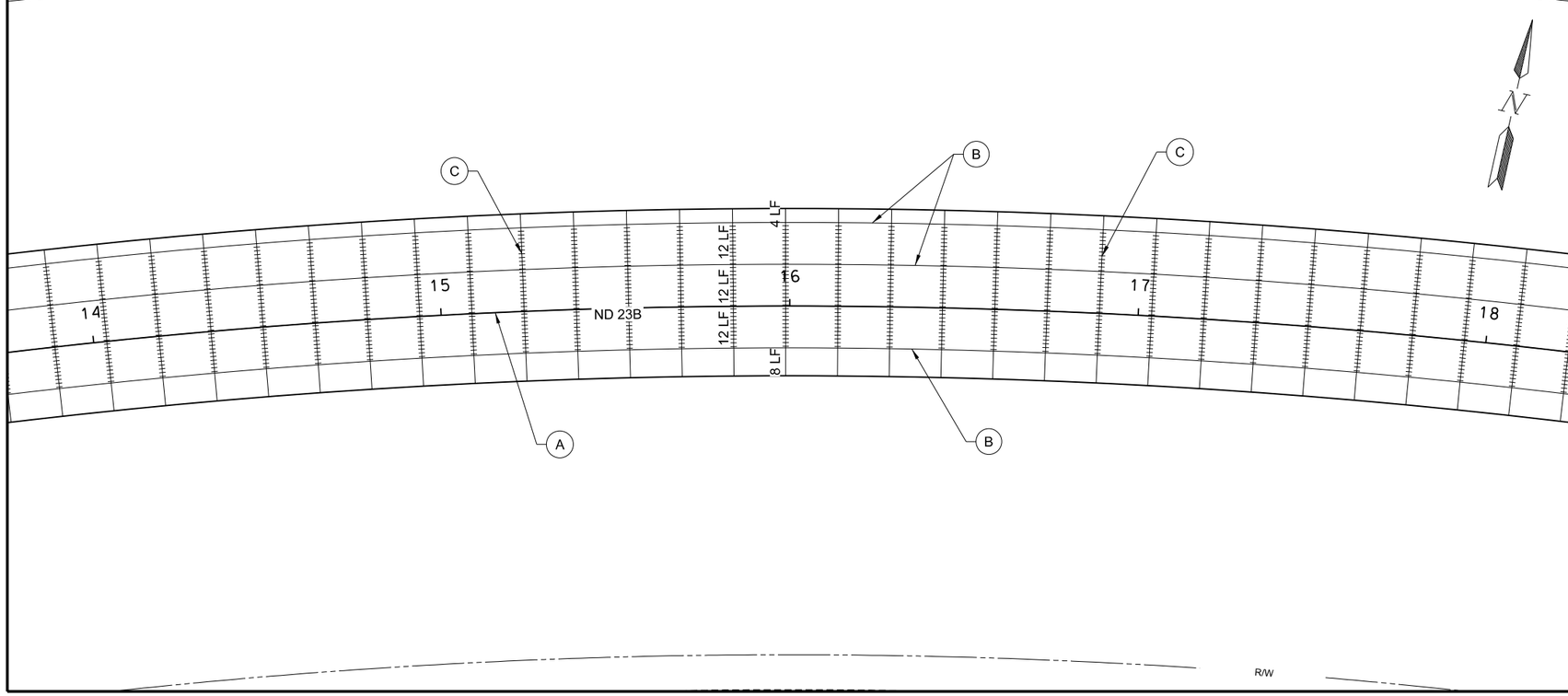
Note: Transverse joint spacing approximately 15', unless shown otherwise.

This document was originally issued and sealed by Timothy Arens Registration Number PE- 7698, on 10/23/13 and the original document is stored at the North Dakota Department of Transportation

Paving Layouts
Sta 13120+00 to Sta 13128+00
ND Hwy 1804
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	4





Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

(C) Transverse Joint

(D) Longitudinal Keyed Joint (no Tie)

(E) Isolation Joint

Reinforced Panel - Full Steel Mat

Note: Transverse joint spacing approximately 15', unless shown otherwise.

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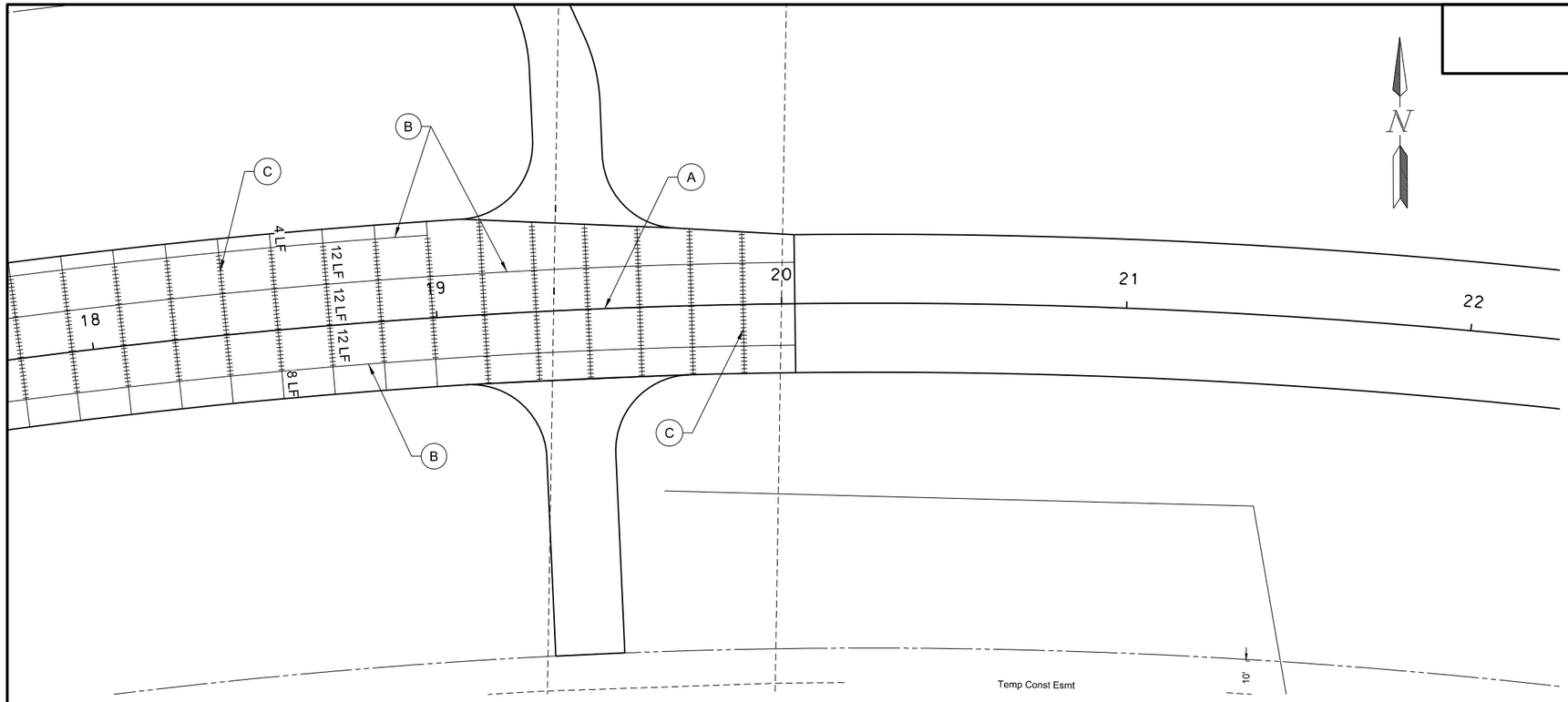
Paving Layouts
Sta 10+00 to Sta 18+00
ND Highway 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	5



Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

(C) Transverse Joint

Note: Transverse joint spacing approximately 15', unless shown otherwise.

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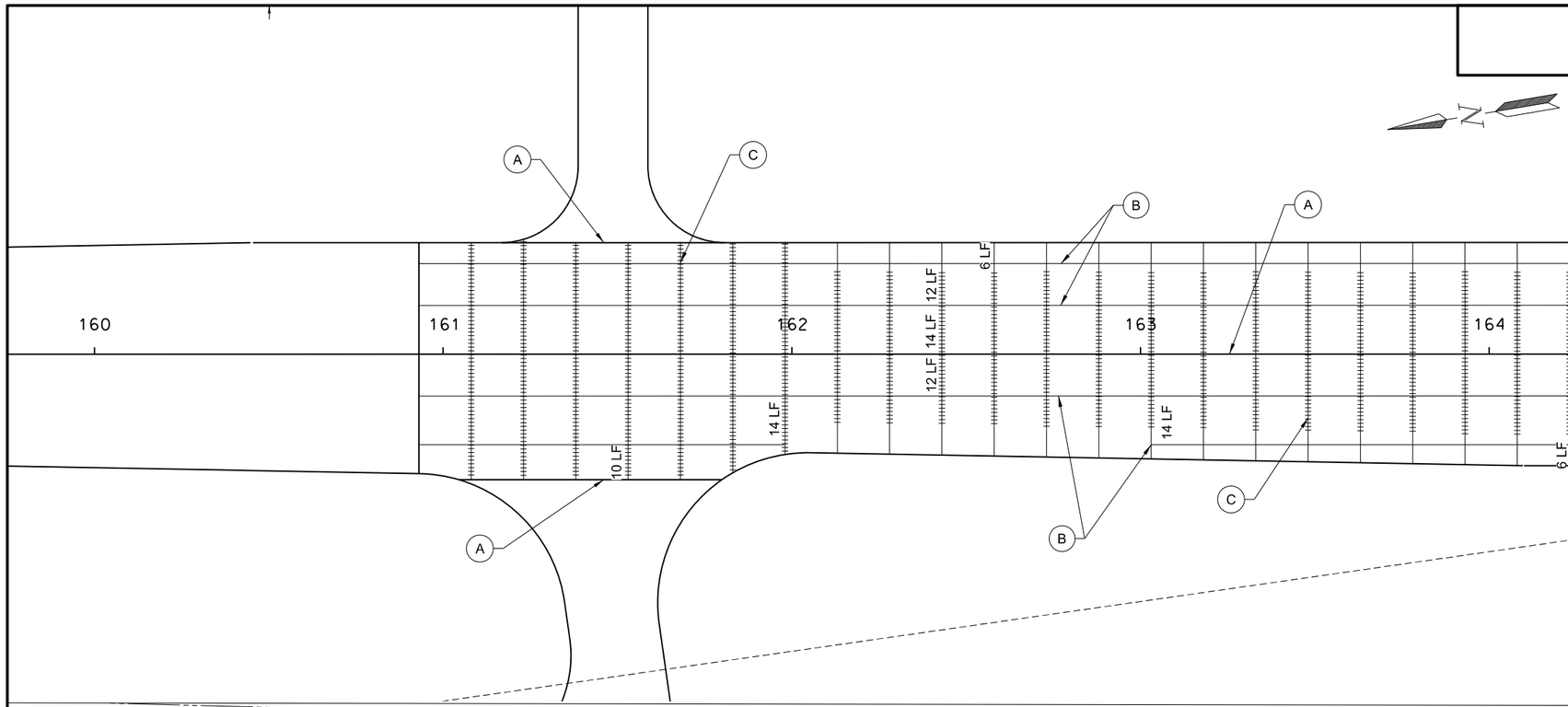
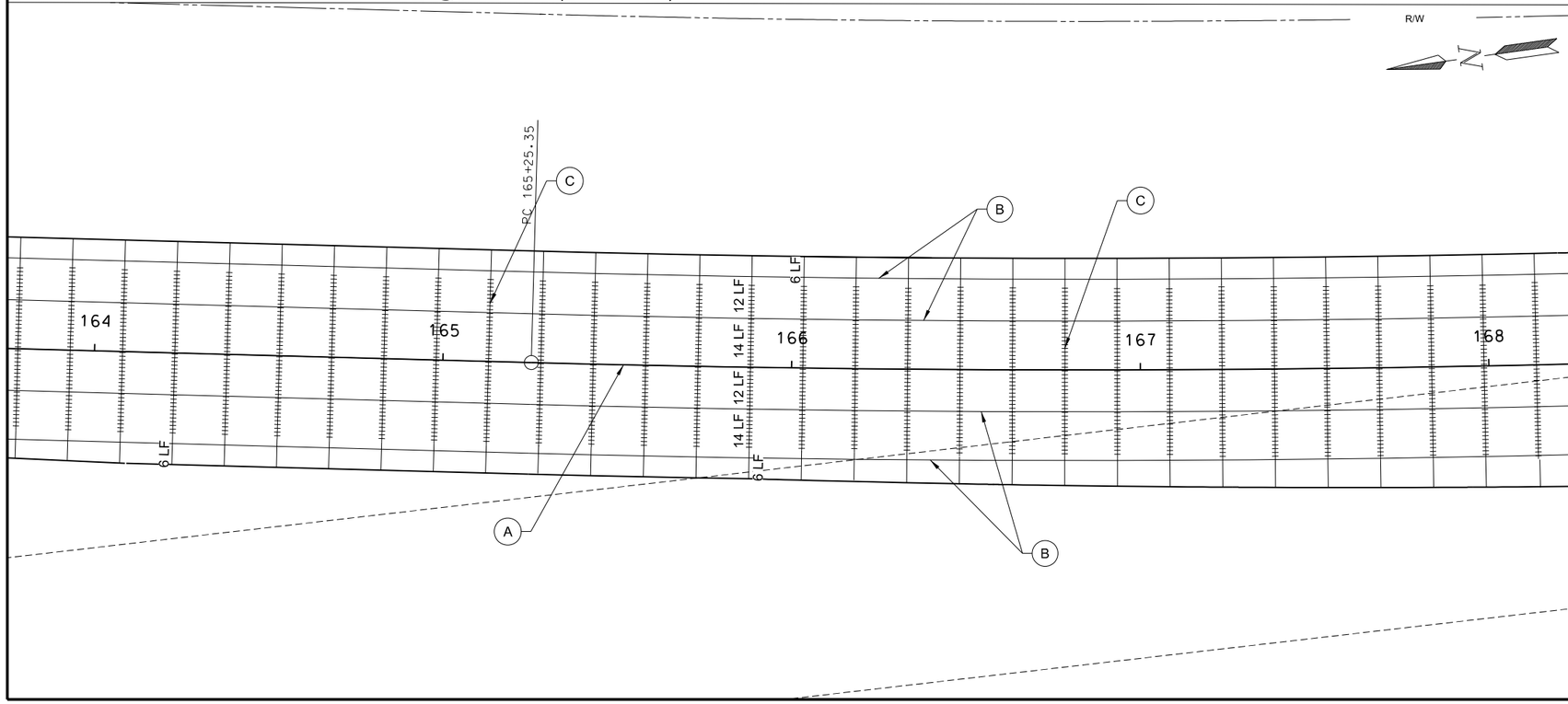
Paving Layouts
Sta 18+00 to Sta 20+04
ND Hwy 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	6





Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

(C) Transverse Joint

Note: Transverse joint spacing approximately 15', unless shown otherwise.

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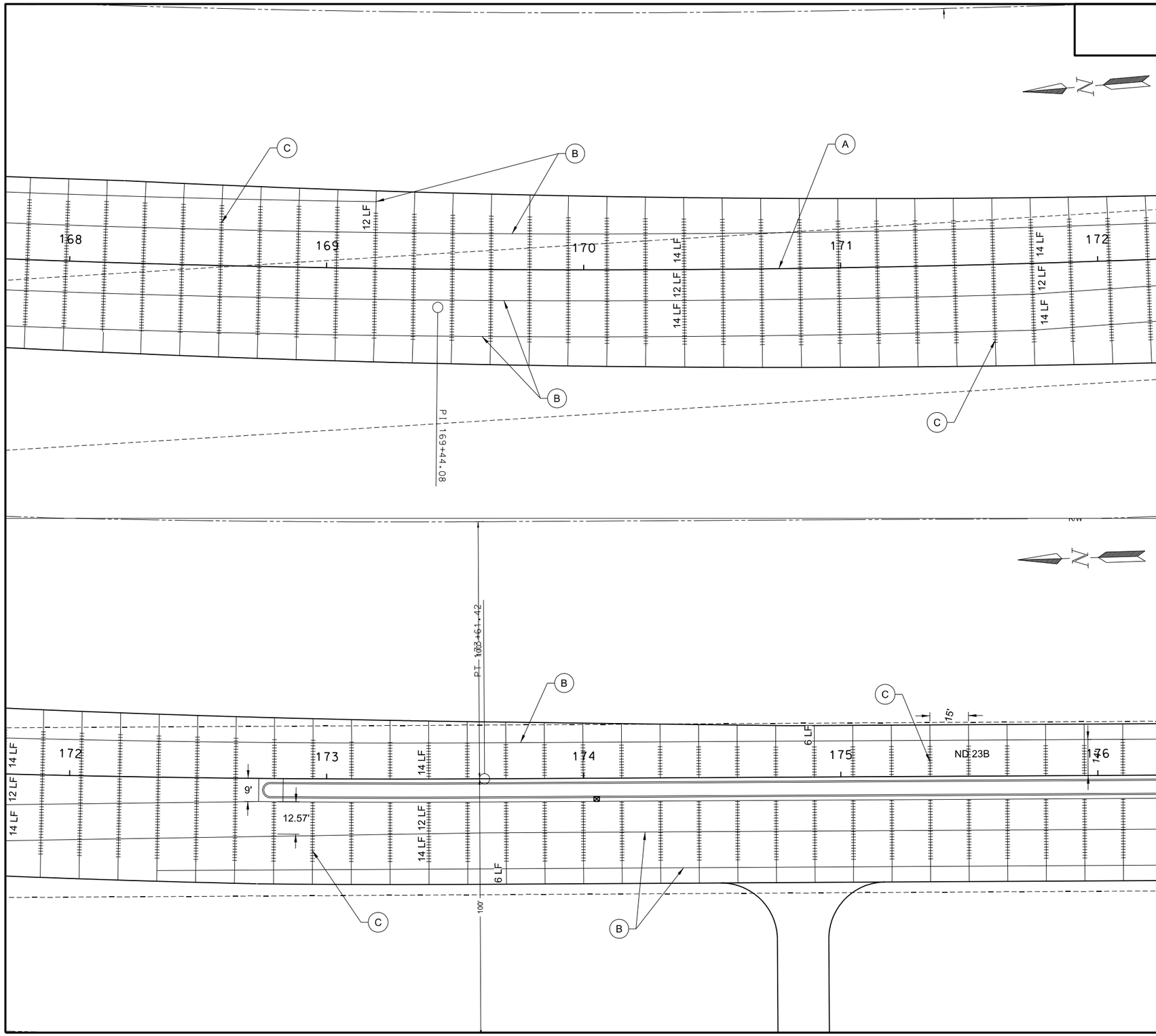
Paving Layouts
Sta 160+00 to Sta 168+00
ND Hwy 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	7



Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

(C) Transverse Joint

Note: Transverse joint spacing approximately 15', unless shown otherwise.

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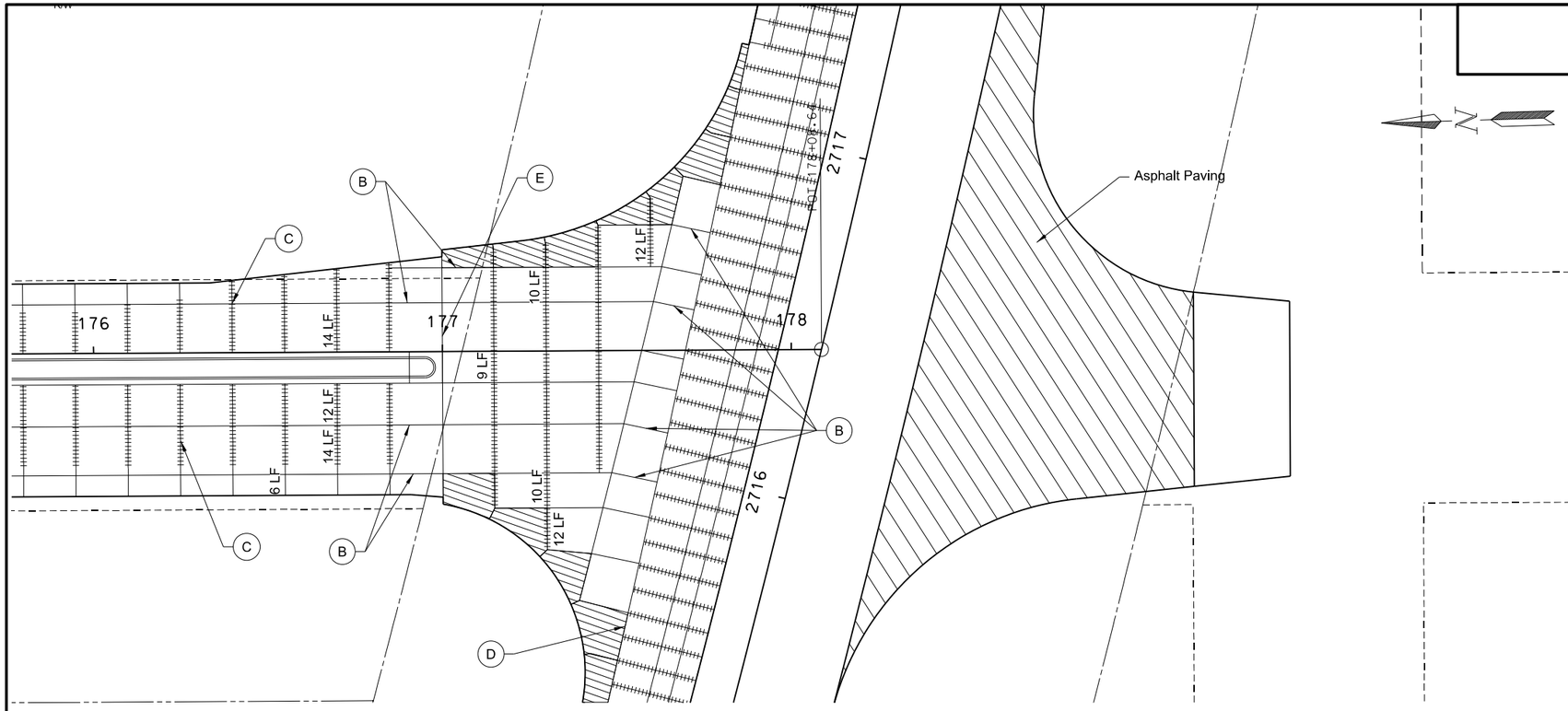
Paving Layouts
Sta 168+00 to Sta 176+00
ND Hwy 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	8



Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

(C) Transverse Joint

(D) Longitudinal Keyed Joint (no Tie)

(E) Isolation Joint

Reinforced Panel - Full Steel Mat

Note: Transverse joint spacing approximately 15', unless shown otherwise.

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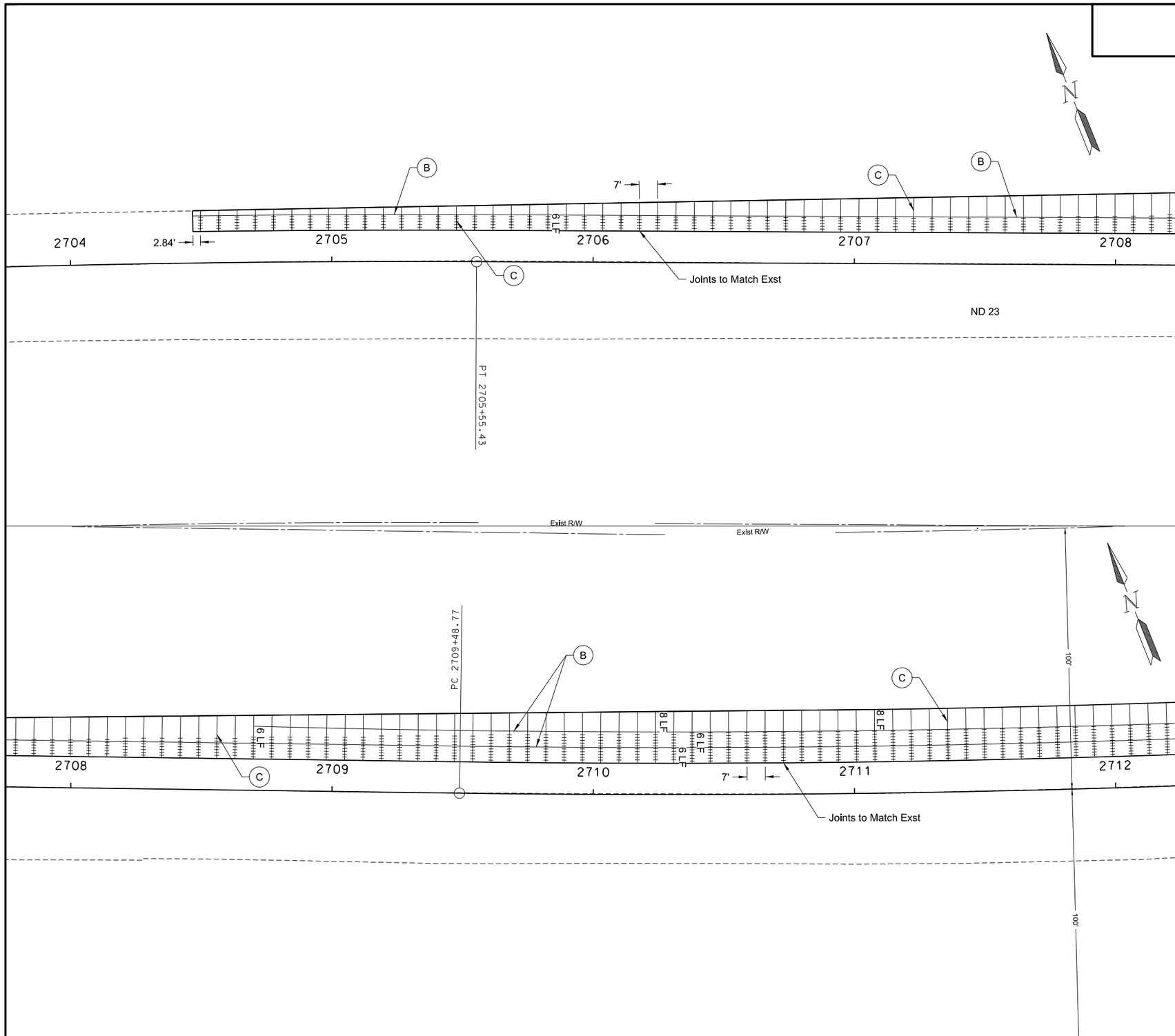
Paving Layouts
Sta 176+00 to Sta 178+08
ND Hwy 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	9



Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

(C) Transverse Joint

Note: Transverse joint spacing approximately 15', unless shown otherwise.

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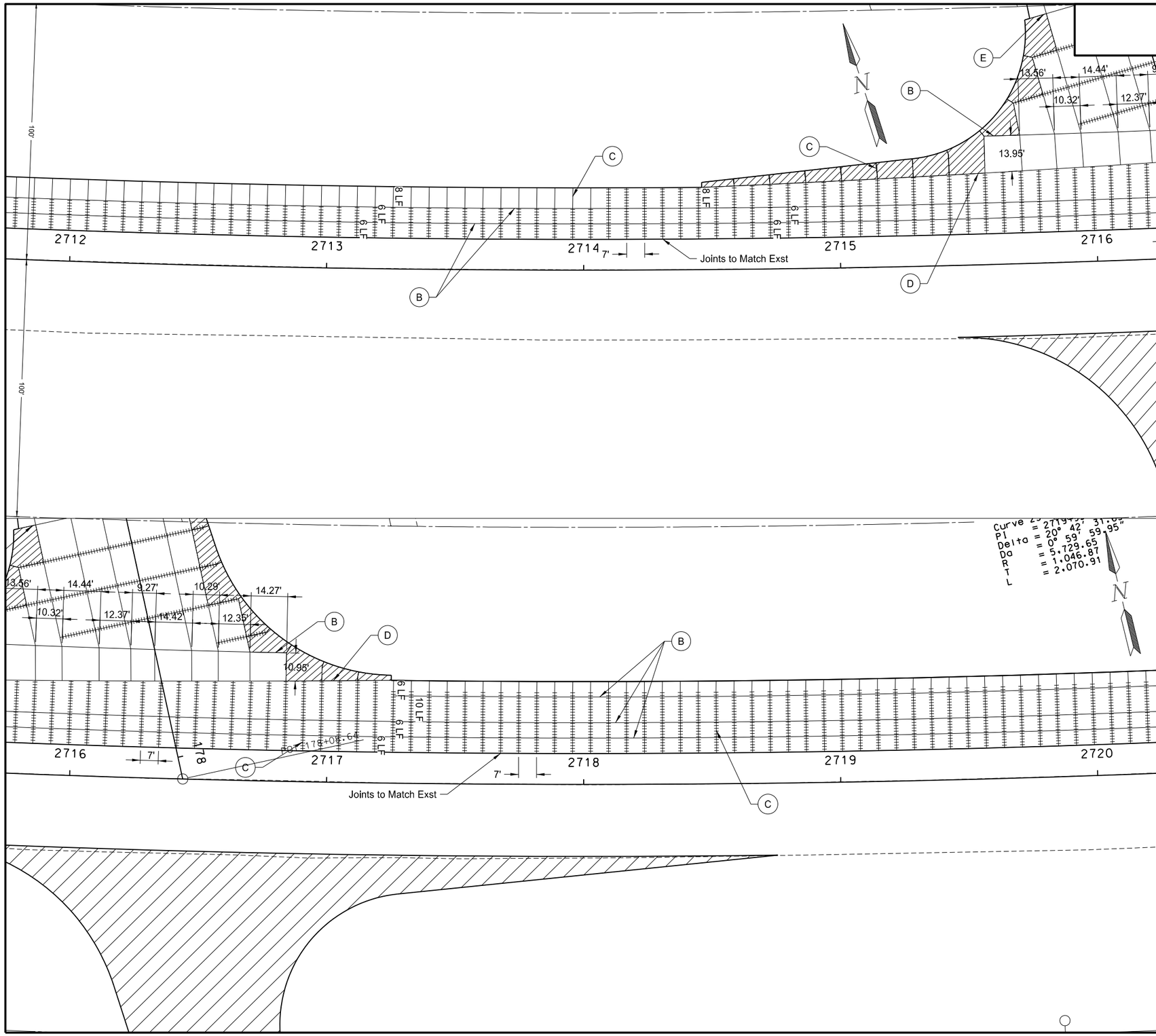
Paving Layouts
Sta 2704+00 to Sta 2712+00
ND Hwy 23
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	10



Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

(C) Transverse Joint

(D) Longitudinal Keyed Joint (no Tie)

(E) Isolation Joint

Reinforced Panel - Full Steel Mat

Note: Transverse joint spacing approximately 15', unless shown otherwise.

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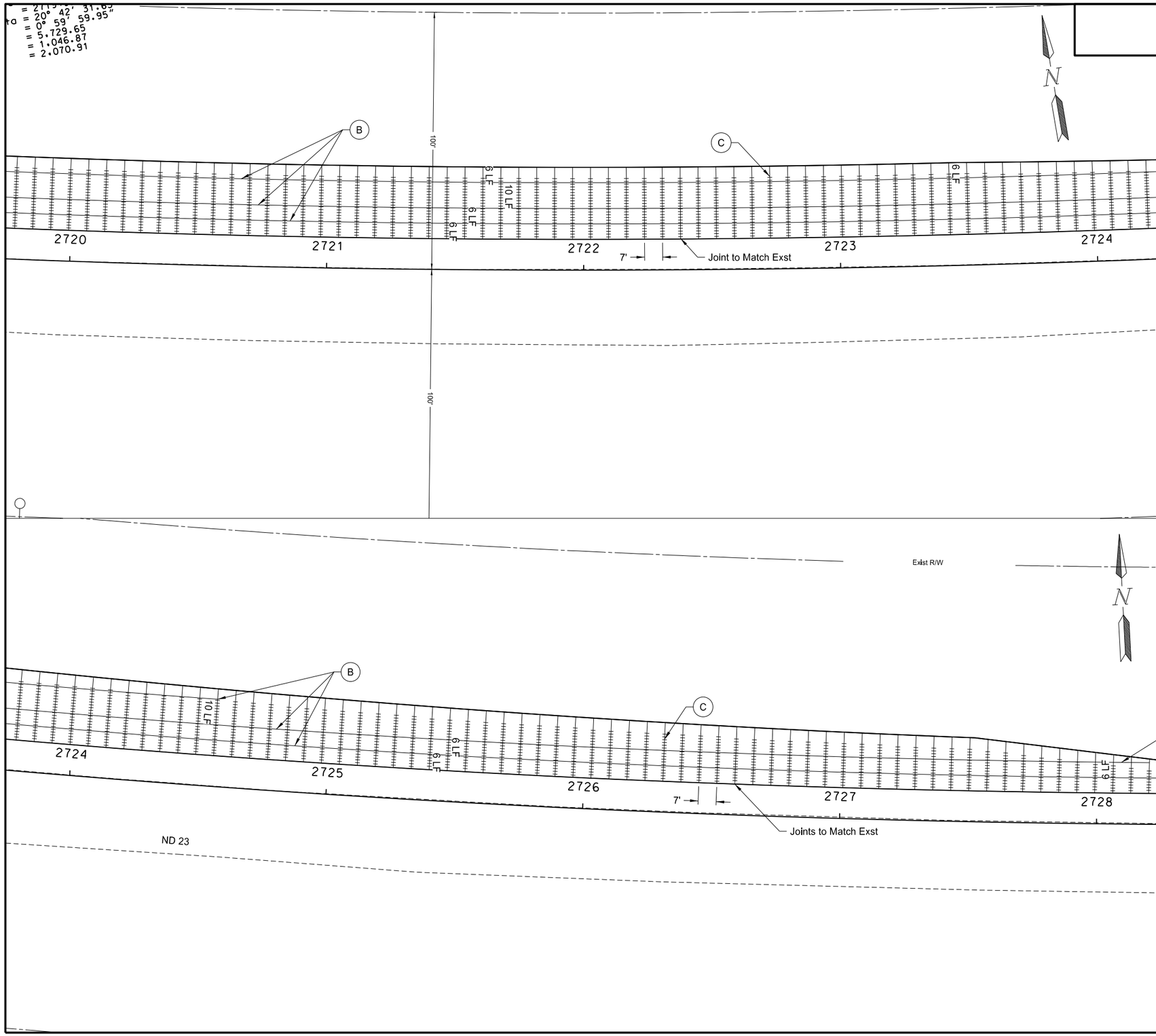
Paving Layouts
Sta 2712+00 to Sta 2720+00
ND Hwy 23
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	11



Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

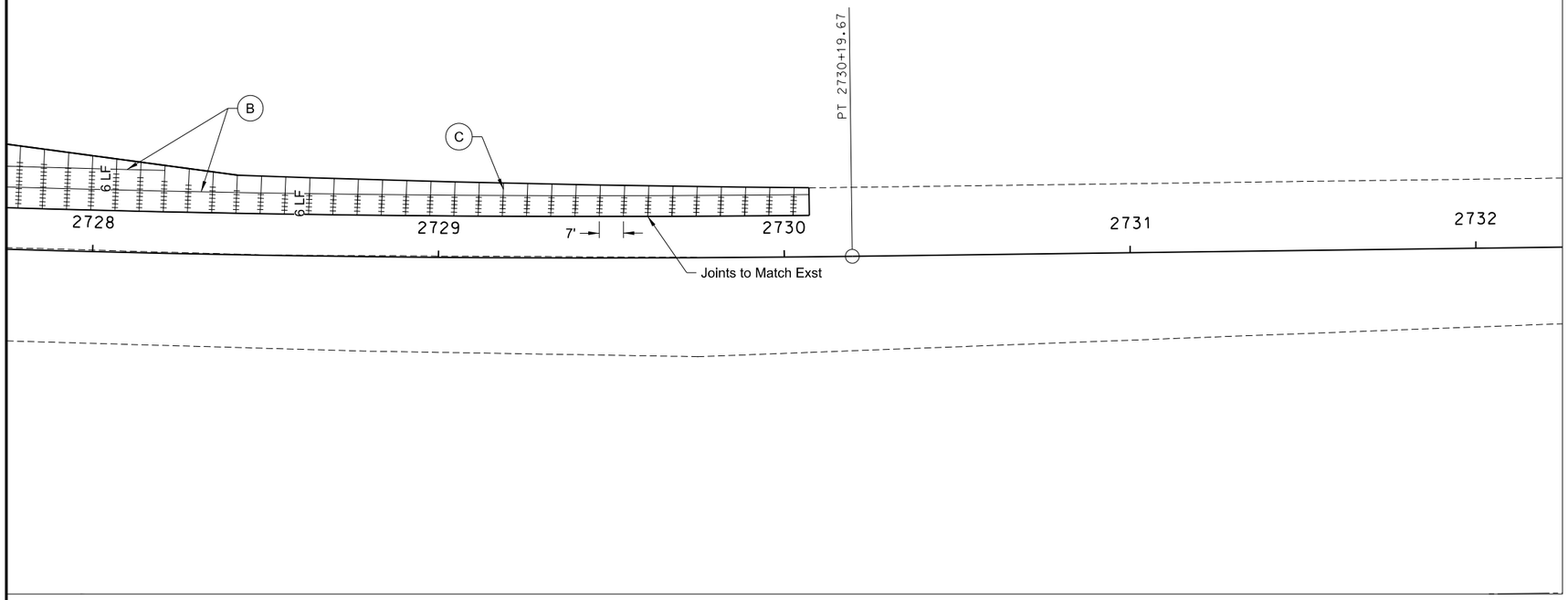
(C) Transverse Joint

Note: Transverse joint spacing approximately 15', unless shown otherwise.

This document was originally issued and sealed by Timothy Arens Registration Number PE- 7698, on 10/23/13 and the original document is stored at the North Dakota Department of Transportation

Paving Layouts
Sta 2720+00 to Sta 2728+00
ND Hwy 23
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	90	12



Dowel Bars

(A) Longitudinal Tied Joint

(B) Longitudinal Tied Joint - Sawcut

(C) Transverse Joint

Note: Transverse joint spacing approximately 15', unless shown otherwise.

This document was originally issued and sealed by Timothy Arens Registration Number PE- 7698, on 10/23/13 and the original document is stored at the North Dakota Department of Transportation

Paving Layouts
Sta 2728+00 to Sta 2732+00
ND Hwy 23
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4	5	TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
D3-36	36"x6"	STREET NAME SIGN (Sign and installation only)							6	
G20-1a-60	60"x24"	ROAD WORK NEXT __ MILES							34	
G20-1b-60	60"x24"	WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)							26	
G20-2a-48	**48"x24"**	**END ROAD WORK**	**6**					**6**	**19**	**114**
G20-4-36	36"x18"	PILOT CAR FOLLOW ME							18	
G20-10-108	**108"x48"**	**CONTRACTOR SIGN**	**2**					**2**	**64**	**128**
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS							37	
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW							30	
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT**	**4**					**4**	**59**	**236**
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)							10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)							10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)							10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)							7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)							7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)							7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)							7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)							7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT							15	
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT							23	
M5-1-21	21"x15"	ARROW AHD AND RT or LT(Mounted on route marker post)							7	
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)							7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)							7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)							7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)							7	
R1-1-48	**48"x48"**	**STOP**	**2**					**2**	**32**	**64**
R1-1a-18	**18"x18"**	**STOP and SLOW PADDLE Back to Back**	**4**					**4**	**5**	**20**
R1-2-60	60"x60"	YIELD							29	
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**10**					**10**	**39**	**390**
R2-1a-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**4**					**4**	**10**	**40**
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT							35	
R4-1-48	48"x60"	DO NOT PASS							39	
R4-7-48	48"x60"	KEEP RIGHT SYMBOL							39	
R5-1-48	48"x48"	DO NOT ENTER							35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT							13	
R7-1-12	12"x18"	NO PARKING							11	
R10-6-24	24"x36"	STOP HERE ON RED							16	
R11-2-48	**48"x30"**	**ROAD CLOSED**	**1**					**1**	**28**	**28**
R11-2a-48	48"x30"	STREET CLOSED							28	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY							31	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY							31	
R11-4a-60	**60"x30"**	**STREET CLOSED TO THRU TRAFFIC**	**13**					**13**	**31**	**403**
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW							35	
W1-4-48	**48"x48"**	**RIGHT or LEFT REVERSE CURVE ARROW**	**2**					**2**	**35**	**70**
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW							35	
W1-6-48	**48"x24"**	**LARGE ARROW**	**2**					**2**	**26**	**52**
W3-1-48	48"x48"	STOP AHEAD SYMBOL							35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL							35	
W3-4-48	**48"x48"**	**BE PREPARED TO STOP**	**4**					**4**	**35**	**140**
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**4**					**4**	**35**	**140**
W4-2-48	**48"x48"**	**RIGHT or LEFT LANE TRANSITION SYMBOL**	**1**					**1**	**35**	**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 SYMBOL							35	
W8-1-48	**48"x48"**	**BUMP**	**4**					**4**	**35**	**140**
W8-3-48	48"x48"	PAVEMENT ENDS							35	
W8-7-48	48"x48"	LOOSE GRAVEL							35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF							35	
W8-11-48	**48"x48"**	**UNEVEN LANES**	**2**					**2**	**35**	**70**
W8-12-48	**48"x48"**	**NO CENTER STRIPE**	**2**					**2**	**35**	**70**
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY							35	
W8-54-48	**48"x48"**	**TRUCKS ENTERING AHEAD or __ FT.**	**2**					**2**	**35**	**70**
W8-55-48	**48"x48"**	**TRUCKS CROSSING AHEAD or __ FT.**	**2**					**2**	**35**	**70**
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY							35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL							35	
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL							35	
W13-1-24	**24"x24"**	**__ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)**	**1**					**1**	**11**	**11**
W13-4-48	48"x60"	RAMP ARROW							39	
W14-3-48	48"x36"	NO PASSING ZONE							23	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**7**					**7**	**35**	**245**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT							35	
W20-3-48	**48"x48"**	**ROAD or STREET CLOSED AHEAD or __ FT.**	**1**					**1**	**35**	**35**
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT.							35	
W20-5-48	**48"x48"**	**RIGHT or LEFT LANE CLOSED AHEAD or __ FT.**	**2**					**2**	**35**	**70**
W20-7a-48	**48"x48"**	**FLAGGING SYMBOL**	**4**					**4**	**35**	**140**
W20-7k-24	**24"x18"**	**__ FEET (Mounted on warning sign post)**	**4**					**4**	**10**	**40**
W20-8-48	48"x48"	STREET CLOSED							35	
W20-51-48	48"x48"	EQUIPMENT WORKING							35	
W20-52-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)							12	
W21-1a-48	48"x48"	WORKERS SYMBOL							35	
W21-2-48	48"x48"	FRESH OIL							35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT							35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4	5	TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-5-48	**48"x48"**	**SHOULDER WORK**	**2**					**2**	**35**	**70**
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED							35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT.							35	
W21-6a-48	48"x48"	SURVEY CREW AHEAD							35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT.							35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY							35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK							35	
	24"x24"	TAKE TURNS (6" D letters) (Mounted on stop sign post)							11	

SPECIAL SIGNS

	24"x36"	**NDPES Permit**	**2**					**2**	**16**	**32**

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS 2923**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2	3	4	5	TOTAL QUANTITY
704-0100	**FLAGGING**	MHR	**200**					**200**
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH						
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH						
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH						
704-1050	TYPE I BARRICADES	EACH						
704-1051	TYPE II BARRICADES	EACH						
704-1052	**TYPE III BARRICADES**	EACH	**37**					**37**
704-1060	**DELINEATOR DRUMS**	EACH	**130**					**130**
704-1065	TRAFFIC CONES	EACH						
704-1067	**TUBULAR MARKERS**	EACH	**140**					**140**
704-1070	DELINEATOR	EACH						
704-1072	FLEXIBLE DELINEATORS	EACH						
704-1080	**STACKABLE VERTICAL PANELS**	EACH	**255**					**255**
704-1081	VERTICAL PANELS - BACK TO BACK	EACH						
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH						
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH						
704-1087	**SEQUENCING ARROW PANEL - TYPE C**	EACH	**1**					**1**
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH						
704-1095	TYPE B FLASHERS	EACH						
704-1185	PILOT CAR	HR						
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	**13346**					**13346**
762-1500	**OBLITERATION OF PVMT MK**	SF	**5329**					**5329**
772-2110	FLASHING BEACON - POST MOUNTED	EACH						

NOTE:
If additional signs are required, units will be calculated using the formula from Section III-19.06 of the Design Manual.
http://www.dot.nd.gov/

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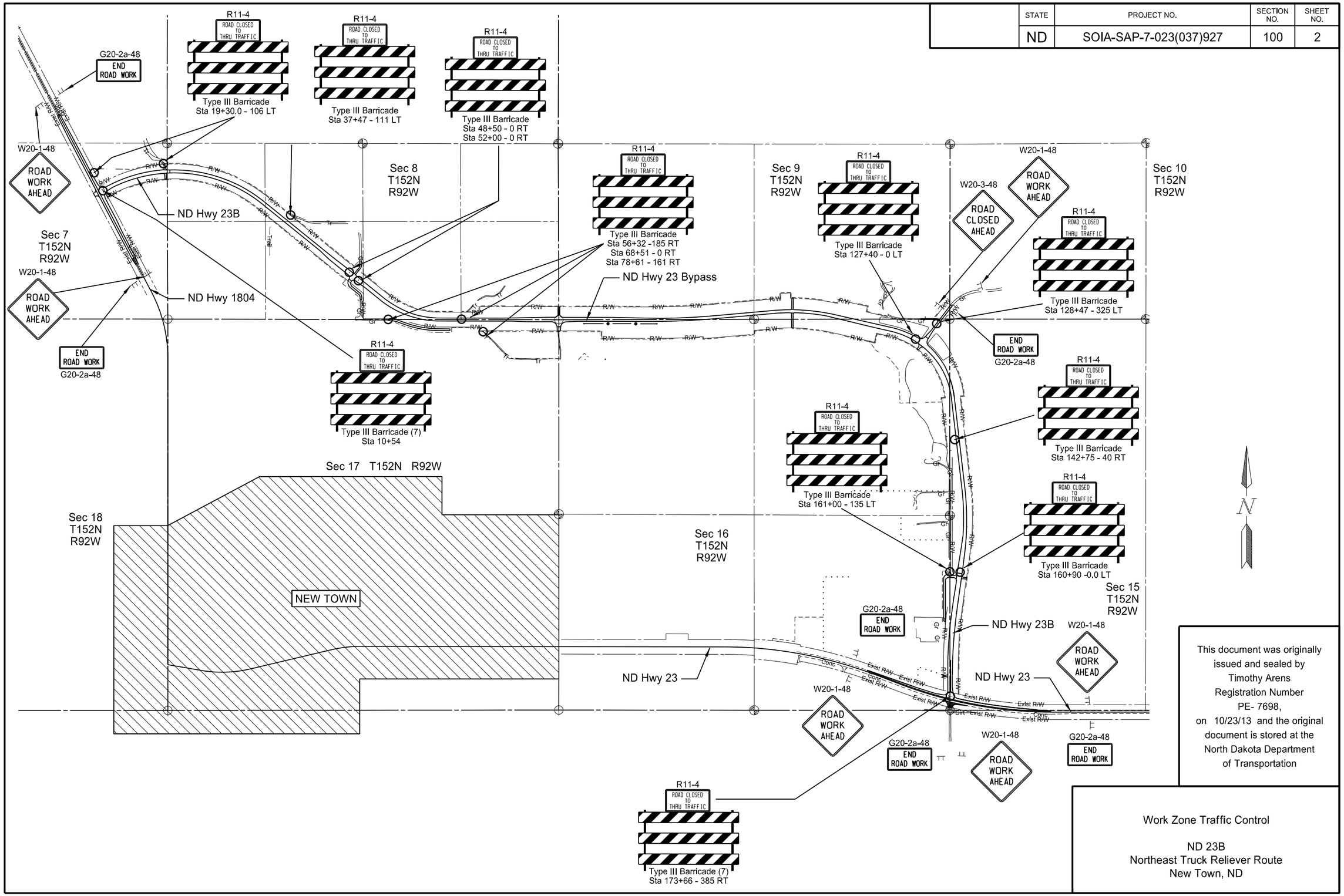
Traffic Control Devices List

ND 23B

Northeast Truck Reliever Route

New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	2



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Work Zone Traffic Control

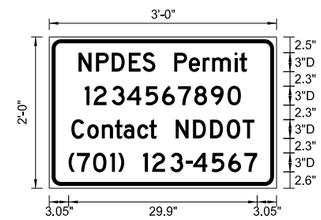
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	3

SIGN NUMBER	NPDES Permit
WIDTH x HEIGHT	3'-0" x 2'-0"
BORDER WIDTH	0.63" (inset 0.38")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: Diamond Grade
	COLOR: Fluorescent Orange
LEGEND/BORDER	TYPE: Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE

AREA: 6.0 Sq.Ft.



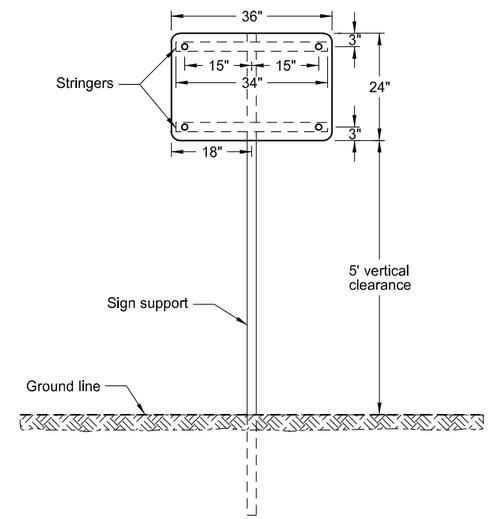
Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
N	P	D	E	S		P	e	r	m	i	t								26.7	3/2.3	D 2000
4.7	7.4	9.9	12.6	14.8	16.8	19.8	22.1	24.3	25.8	29.3	30.2										
1	2	3	4	5	6	7	8	9	0		See	Note								3	D 2000
C	o	n	t	a	c	t		N	D	D	O	T							29	3/2.3	D 2000
3.5	6	8.3	10.4	11.8	13.9	15.8	17	20	22.8	25.5	28.1	30.6									
(	7	0	1	)		1	2	3	-	4	5	6	7		See	Note				3	D 2000

One sign shall be placed at each end of the project. The signs shall be placed 60' from roadway centerline, on the right hand side visable to traffic entering the project. There shall be a maximum of 2 signs per project.

Note: Permit number shall be obtained from the NDPES permit and phone number shall be obtained from the NDDOT District Office.



NDPES Permit Sign
at construction site

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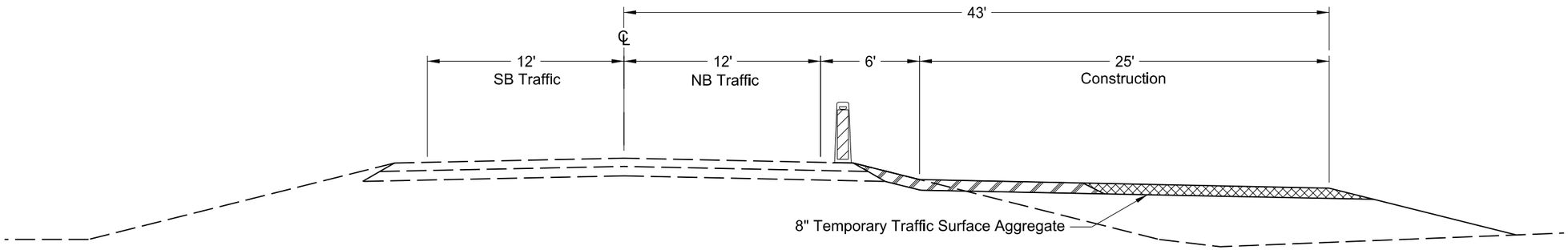
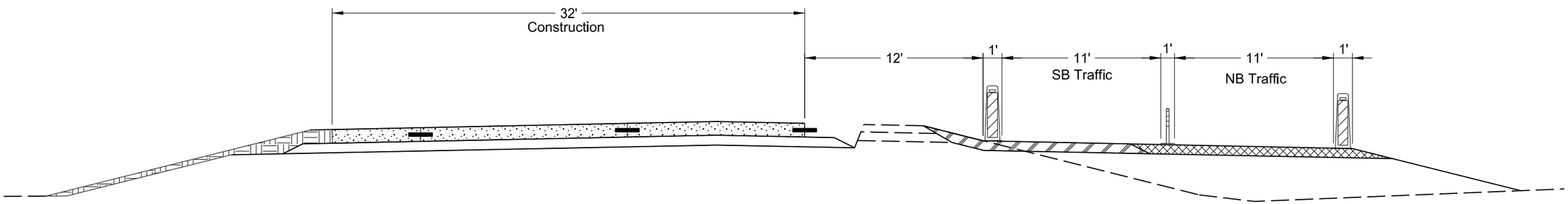
Special Sign Detail

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	4



Phase 1



Phase 2

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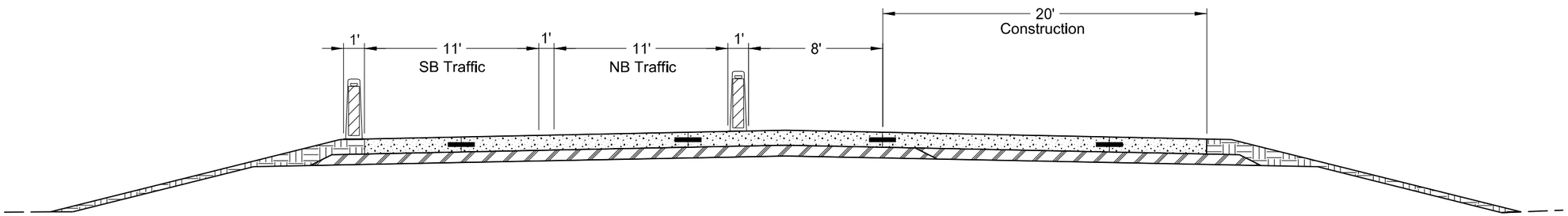
ND Highway 1804
Traffic Phasing

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	5



Phase 3

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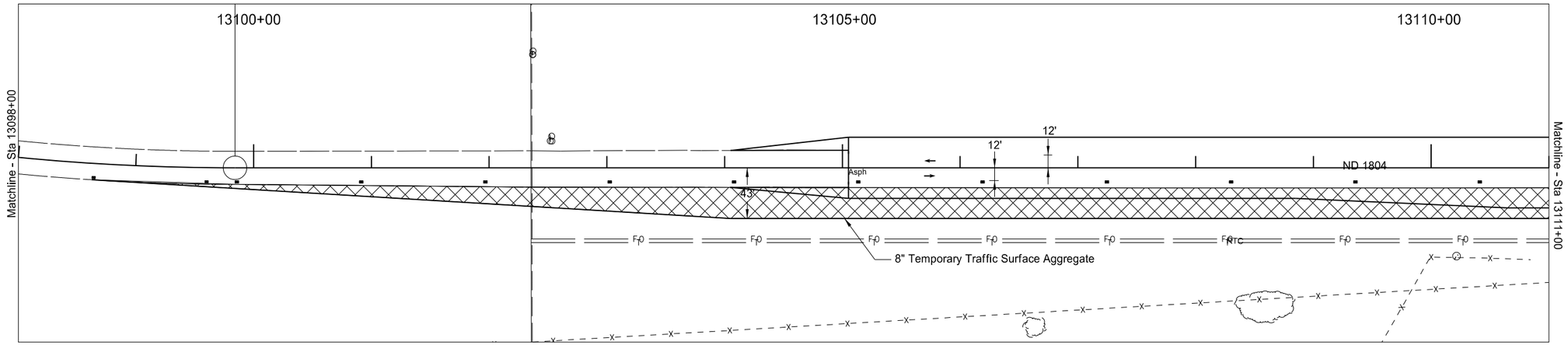
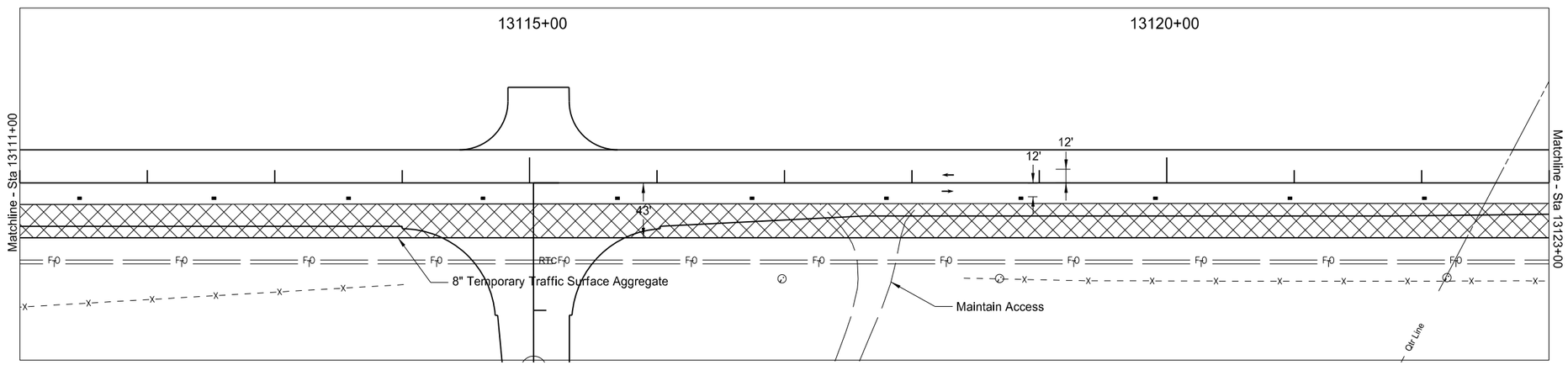
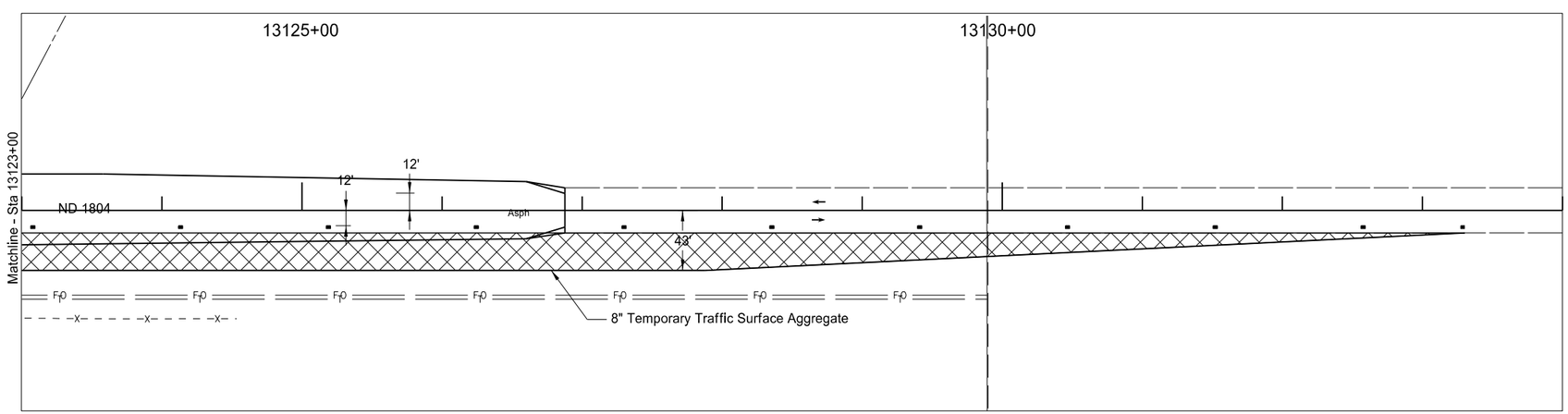
ND Highway 1804
Traffic Phasing

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	6







LEGEND

- Work Area
- Delineator Drums
- Stackable Vertical Panels
- Tubular Markers

NOTE:

For Signing and Spacing,
see Std Det D-704-24,
Type R Shoulder work,
set work zone speed limit of 45mph

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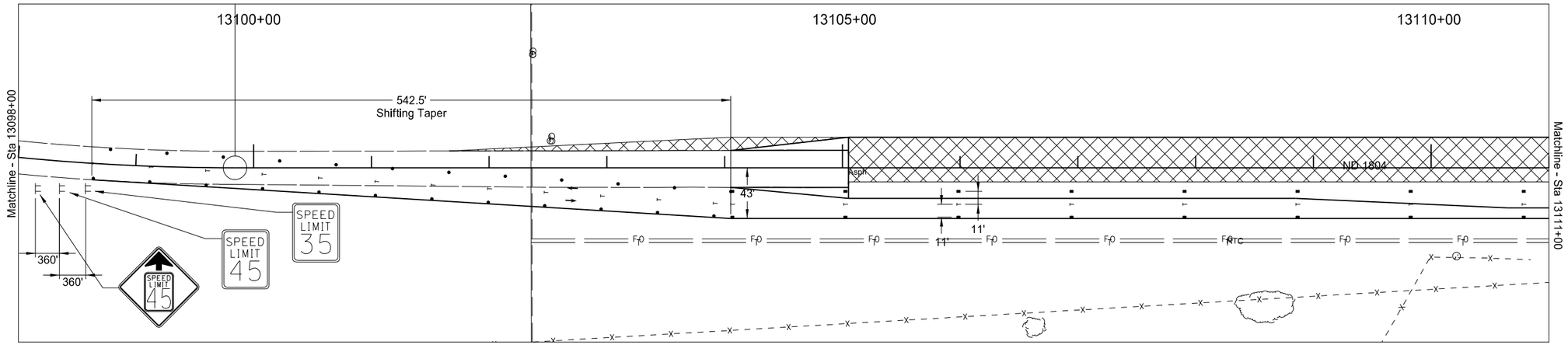
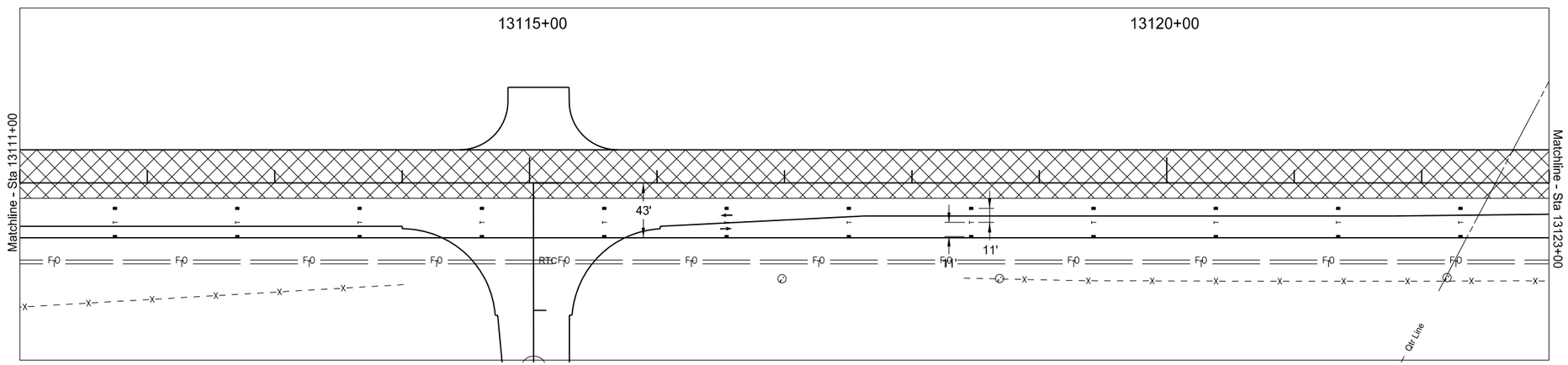
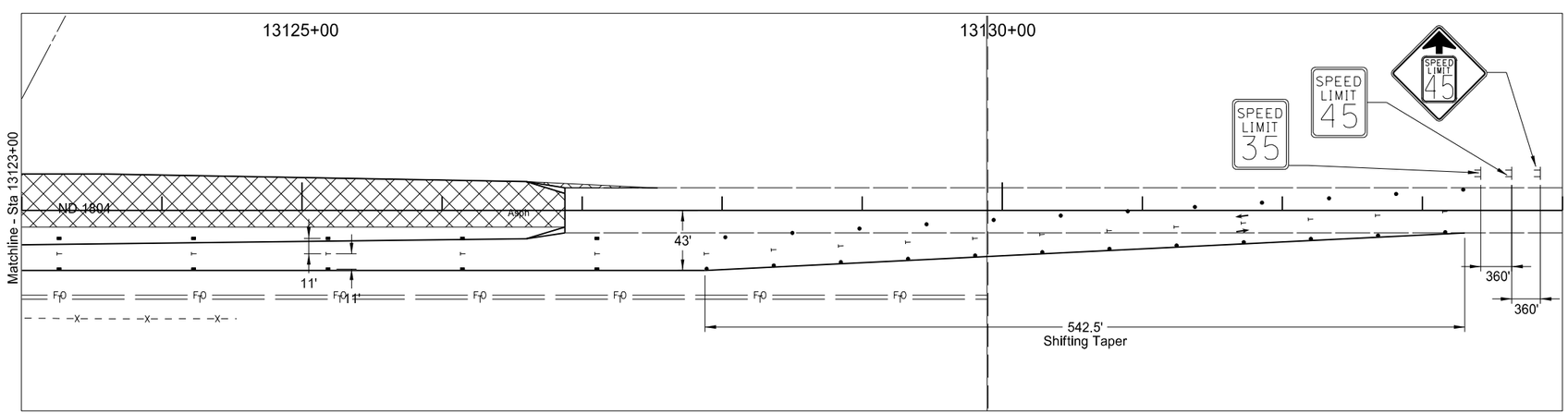
Phasing Plan - Phase 1
ND Highway 1804

ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	7







LEGEND

- Work Area
- Delineator Drums
- Stackable Vertical Panels
- Tubular Markers

NOTE:

For Signing and Spacing, see Std Det D-704-35A.

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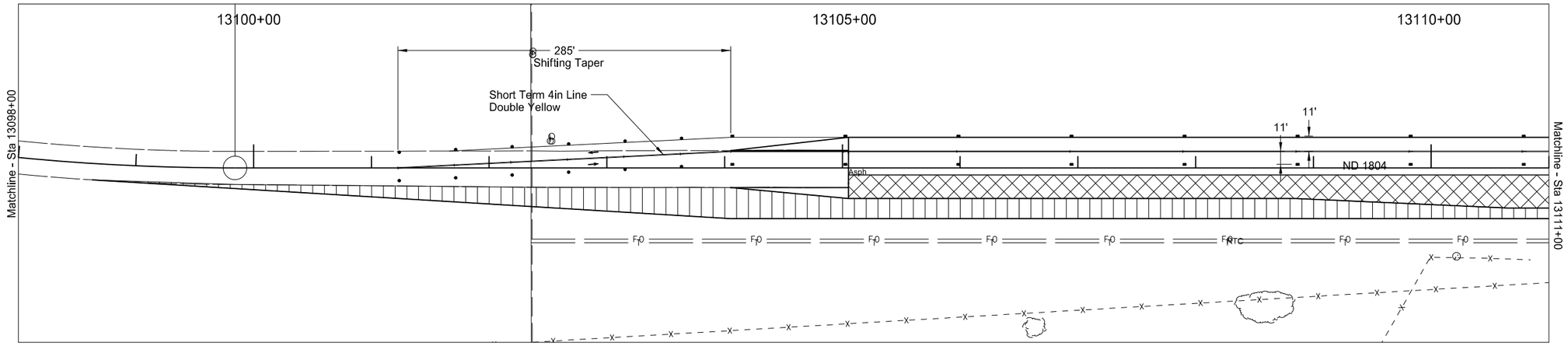
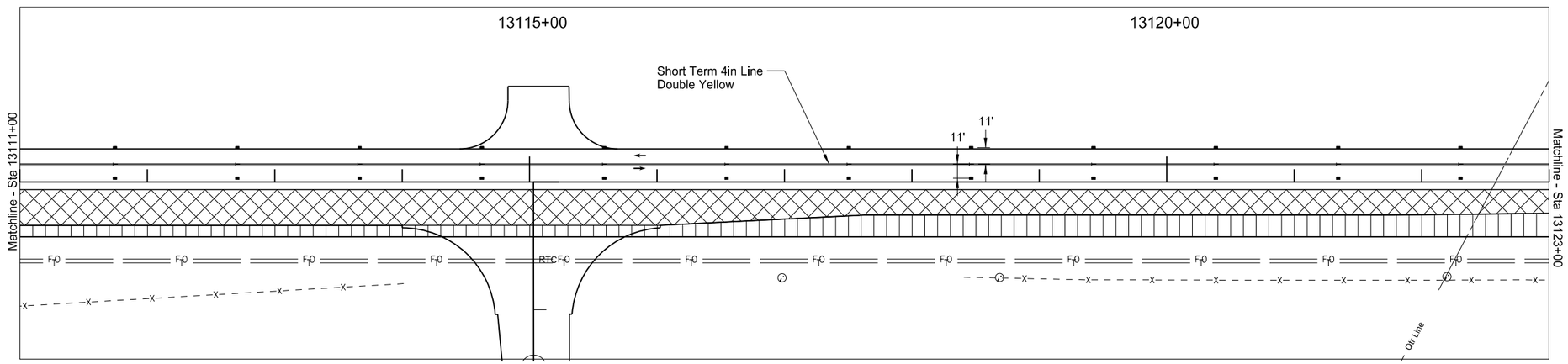
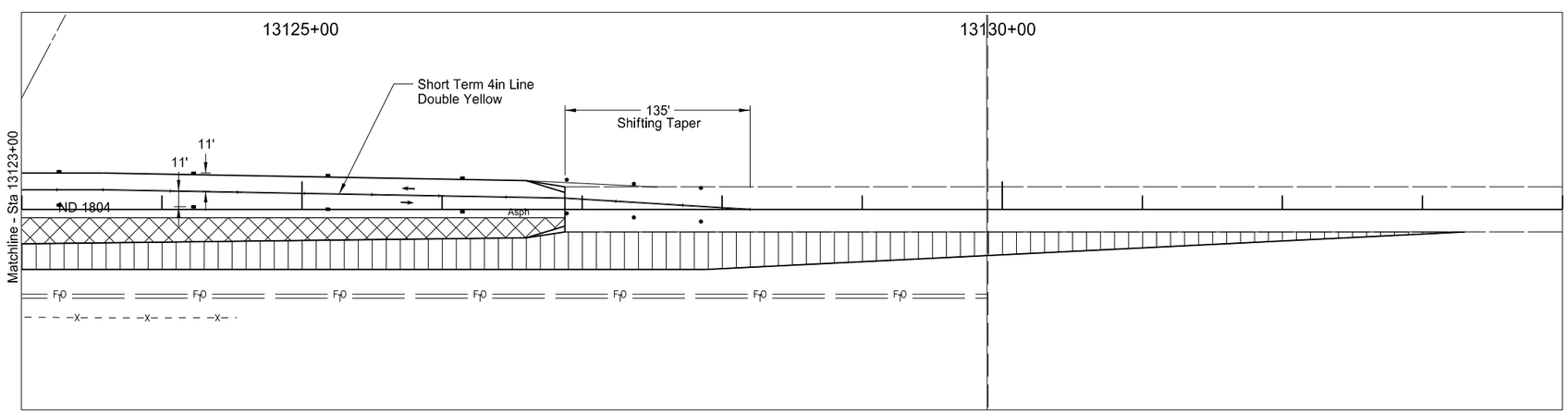
Phasing Plan - Phase 2
ND Highway 1804

ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	8







LEGEND

- Work Area
- Delineator Drums
- Stackable Vertical Panels
- Tubular Markers
- Temp Base Course to Remove

NOTE:

For Signing and Spacing, see Std Det D-704-15.

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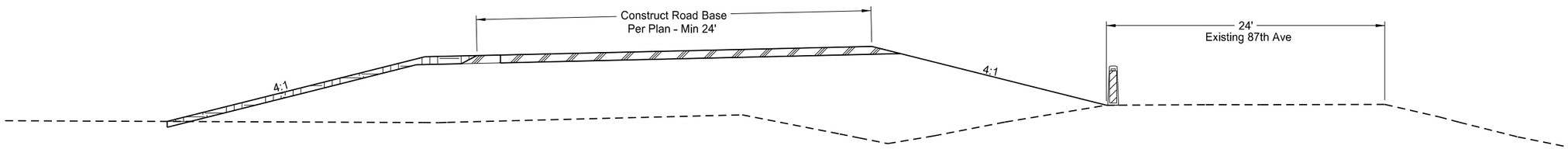
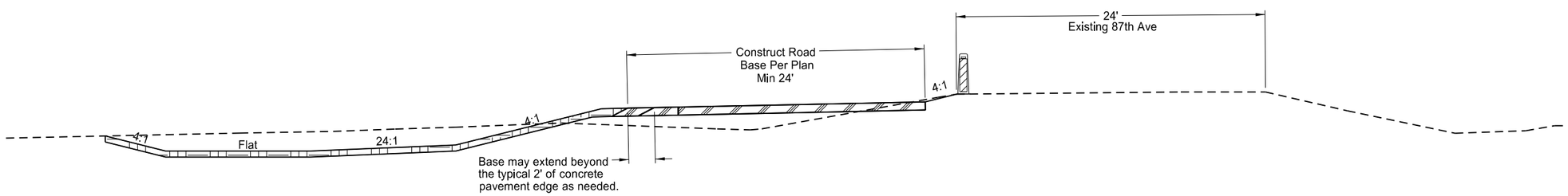
Phasing Plan - Phase 3
ND Highway 1804

ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	9



Phase 1
Example at Sta 169+00



Phase 1
Example at Sta 174+00

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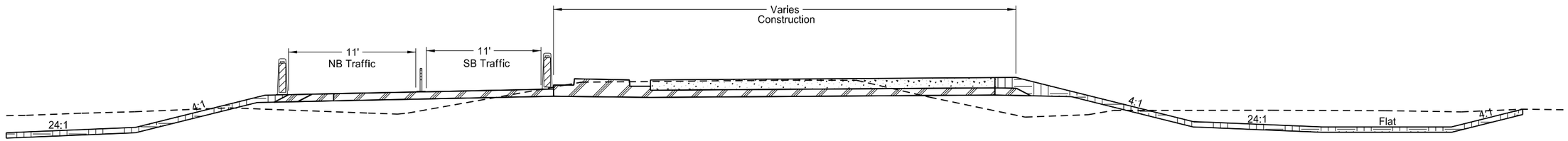
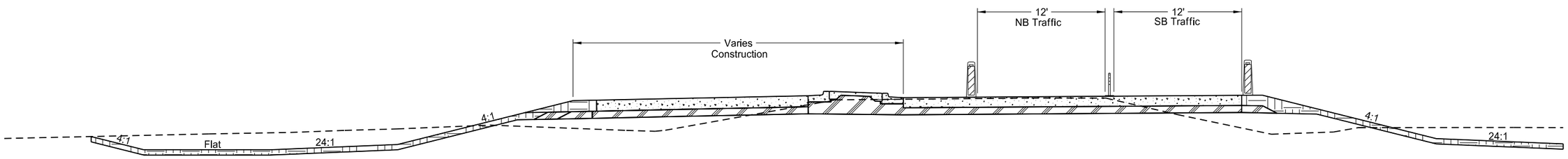
ND Highway 23B
Traffic Phasing

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	10



Phase 2



Phase 3

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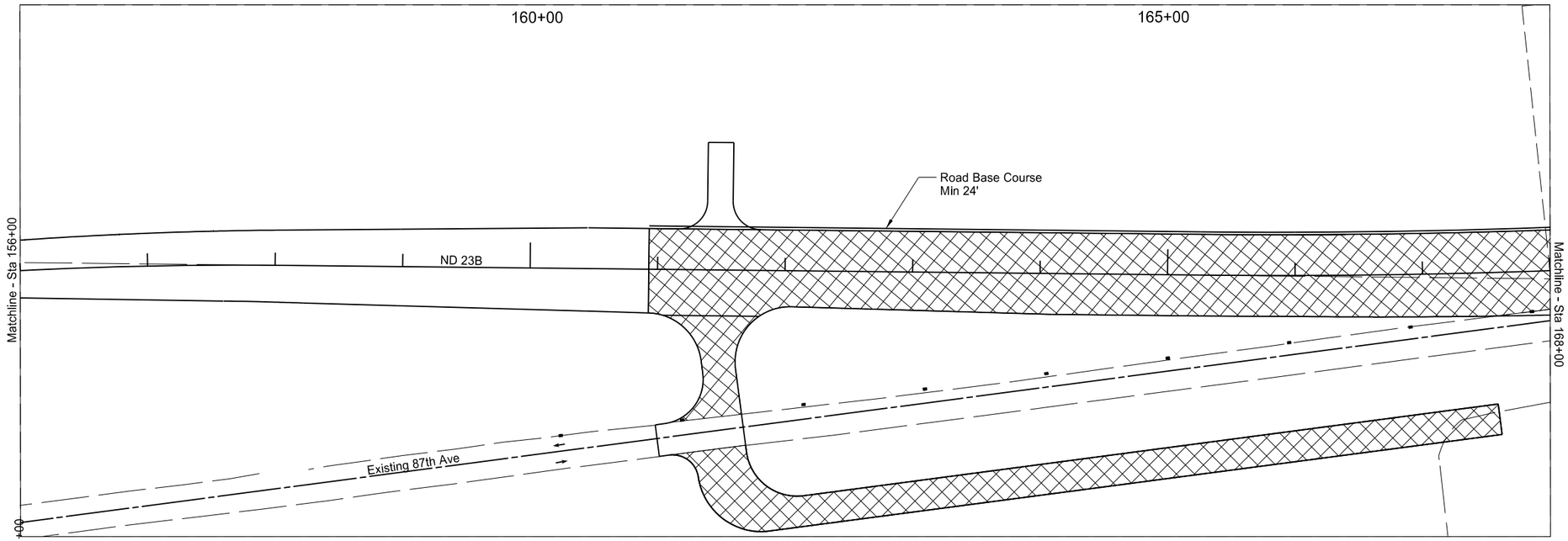
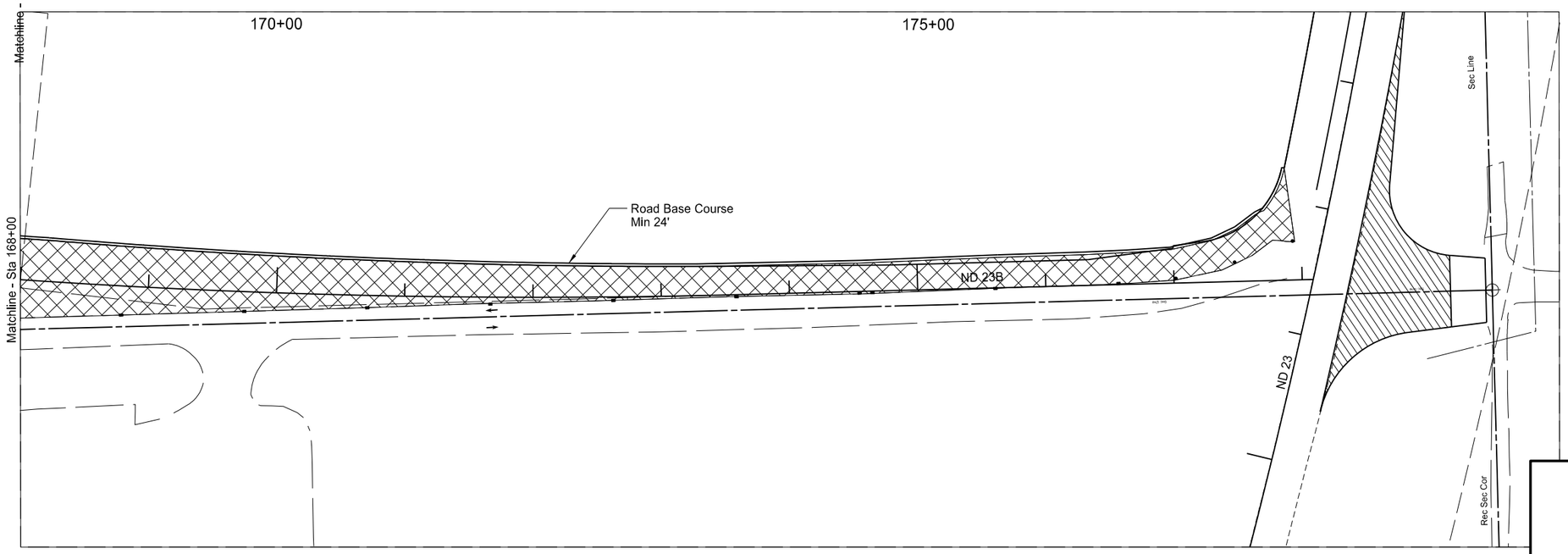
ND Highway 23B
Traffic Phasing

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	11





LEGEND

- Work Area
- Delineator Drums
- Stackable Vertical Panels
- Tubular Markers

NOTE:

For Signing and Spacing, see Std Det D-704-24, Type R Shoulder work.

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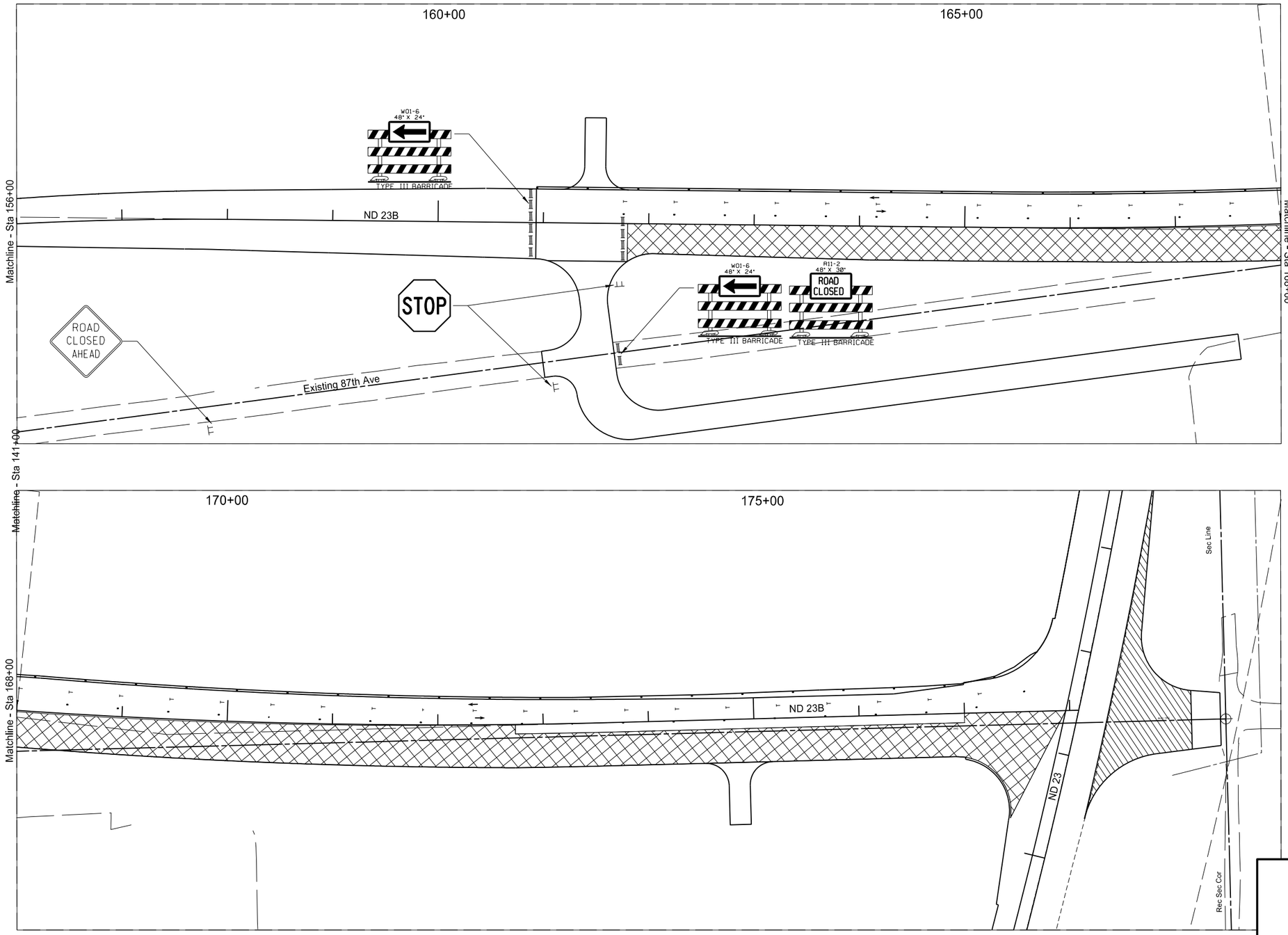
Phasing Plan - Phase 1
ND Highway 23B

ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	12



LEGEND

- Work Area
- Delineator Drums
- Stackable Vertical Panels
- Tubular Markers

NOTE:

For Signing and Spacing, see Std Det D-704-15

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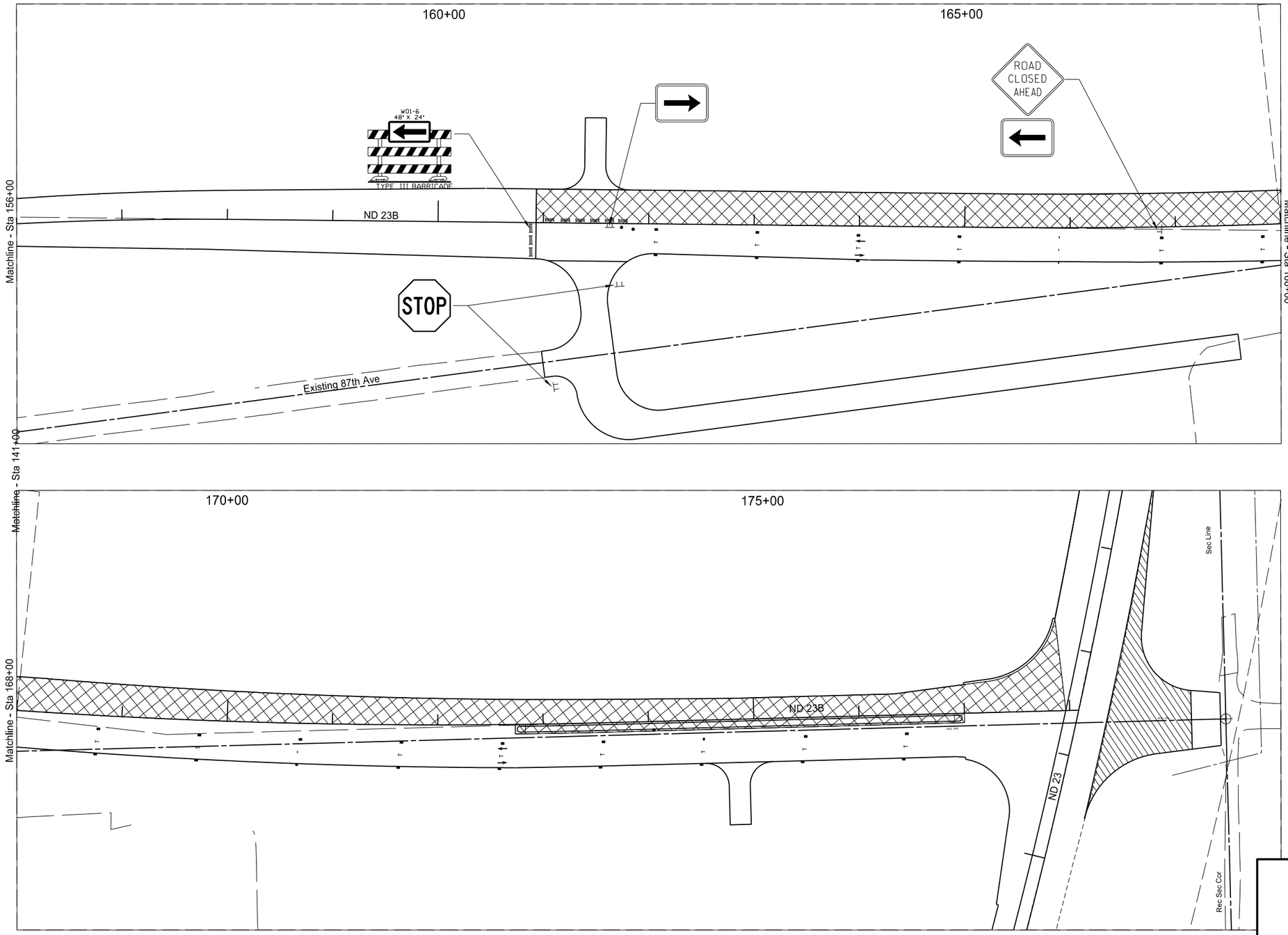
Phasing Plan - Phase 2
ND Highway 23B

ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	100	13



LEGEND

- Work Area
- Delineator Drums
- Stackable Vertical Panels
- Tubular Markers

NOTE:

For Signing and Spacing, see Std Det D-704-15

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Phasing Plan - Phase 3
ND Highway 23B

ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SOIA-SAP-7-023(037)927	110	1

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	Support Size	Max Post Len LF	Sleeve Length 1st LF	Sleeve Length 2nd LF	Sleeve Length 3rd LF	Sleeve Length 4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
State Highway 23 Bypass																						
10+75 Lt	R1-1	2		7.5	9.2				2.25 x 2.25 12 ga	9.6						1	4	2.5 x 2.5 12 ga				
12+34 Rt	M1-5	372	7.0		12.7				2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga				
120+00 Lt	1	16		9.0	12.0				2.5 x 2.5 10 ga	12.5						1	4	3 x 3 7 ga			1	
122+89 Rt	W1-2	20		9.0	13.1				2.25 x 2.25 12 ga	14.1	4.3				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
128+00 Rt	W6-4	380		9.2	13.5				2.5 x 2.5 10 ga	13.9						1	4	3 x 3 7 ga			1	
128+12 Lt	R1-1	2		7.5	9.4				2.25 x 2.25 12 ga	9.6						1	4	2.5 x 2.5 12 ga				
128+40 Rt	W1-7	34		8.0	9.0				2.5 x 2.5 12 ga	11.3						1	4	3 x 3 7 ga				
138+00 Lt	W1-2	20		9.0	13.1				2.25 x 2.25 12 ga	14.1	4.3				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
16+75 Rt	1	16		9.0	12.0				2.5 x 2.5 10 ga	12.5						1	4	3 x 3 7 ga			1	
161+02 Rt	W3-3	19		6.3	12.8				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
161+21 Rt	R1-1	2		7.5	9.1				2.25 x 2.25 12 ga	9.6						1	4	2.5 x 2.5 12 ga				
161+75 Rt	R1-1	2		7.5	9.2				2.25 x 2.25 12 ga	9.6						1	4	2.5 x 2.5 12 ga				
167+02 Lt	1	16		9.0	12.0				2.5 x 2.5 10 ga	12.5						1	4	3 x 3 7 ga			1	
169+02 Rt	M1-5	391	6.2		13.2				2.5 x 2.5 12 ga	15.9						1	4	3 x 3 7 ga				
171+02 Lt	R2-1	9		5.0	12.1				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
172+85 Rt	R4-7	9		5.0	7.7				2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
172+85. Rt	R3-4			4.0																		Mount on back of R4-7.
173+02 Rt	M1-5	399	6.2		13.1				2.5 x 2.5 12 ga	15.9						1	4	3 x 3 7 ga				
174+89 Rt	R6-1	27		3.0	6.2				2 x 2 12 ga	13.2						1	4	2.25 x 2.25 12 ga				
175+02 Lt	M1-5	3	6.0		12.6				2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga				
176+88 Rt	R4-7	9		5.0	7.7				2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
20+75 Rt	R2-1	9		5.0	12.1				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
22+75 Lt	M1-5	372	7.0		12.7				2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga				
25-75 Lt	W3-1	19		6.3	12.4				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
34+57 Lt	W1-2	20		9.0	15.1				2.5 x 2.5 10 ga	17.4	4.5				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1	
49+02 Lt	R1-1	2		7.5	9.0				2.25 x 2.25 12 ga	9.6						1	4	2.5 x 2.5 12 ga				
49+63 Rt	R1-1	2		7.5	9.3				2.25 x 2.25 12 ga	9.6						1	4	2.5 x 2.5 12 ga				
53+27 Rt	W1-2	20		9.0	13.1				2.25 x 2.25 12 ga	14.1	4.3				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
63+61 Lt	W1-2	20		9.0	13.1				2.25 x 2.25 12 ga	14.1	4.3				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
87+00 Rt	1	16		9.0	12.0				2.5 x 2.5 10 ga	12.5						1	4	3 x 3 7 ga			1	
Sub Total			32.4	182.8		**Total**	328.3									**Total**	116		0	0	10	

Basis of Estimate
Sign Support Lengths

The sign support lengths have been calculated
using the following vertical clearances:

Urban/rural expressway and freeway - 84" (Offset - 60")
Rural Roadway - 60"

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Sign Summary
Perforated Tube

ND23B - New Town Northeast Truck Reliever Route

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SOIA-SAP-7-023(037)927	110	2

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	Support Size	Max Post Len LF	Sleeve Length 1st LF	Sleeve Length 2nd LF	Sleeve Length 3rd LF	Sleeve Length 4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
State Highway 1804																						
13106+75 Rt	M1-5	392	7.2		12.9				2.5 x 2.5 12 ga	13.9						1	4	3 x 3 7 ga				
13114+15 Rt	M1-5	379	8.2		13.7				2.5 x 2.5 10 ga	15.3						1	4	3 x 3 7 ga			1	
13115+03 Lt	W1-7	34		8.0	9.0				2.5 x 2.5 12 ga	11.3						1	4	3 x 3 7 ga				
13115+46 Lt	M1-5	400	7.2		13.0				2.5 x 2.5 12 ga	13.9						1	4	3 x 3 7 ga				
13115+56 Lt	M1-5	379	8.2		13.5				2.5 x 2.5 10 ga	15.3						1	4	3 x 3 7 ga			1	
13123+31 Lt	M1-5	392	7.2		12.8				2.5 x 2.5 12 ga	13.9						1	4	3 x 3 7 ga				
13169+38 Lt	R2-1	9		5.0	12.0				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
13169+38 Rt	R2-1	9		5.0	12.0				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
NB ND 1804 Rt	R2-1	9		5.0	12.0				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
Sub Total			38.0	23.0		**Total**	110.7									**Total**	36		0	0	2	

Basis of Estimate
Sign Support Lengths

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using the following vertical clearances:

Urban/rural expressway and freeway - 84" (Offset - 60")
Rural Roadway - 60"

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Sign Summary
Perforated Tube

ND23B - New Town Northeast Truck Reliever Route

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SOIA-SAP-7-023(037)927	110	3

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	Support Size	Max Post Len LF	Sleeve Length 1st LF	Sleeve Length 2nd LF	Sleeve Length 3rd LF	Sleeve Length 4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
State Highway 23																						
2700+45 Rt	W3-3	19		6.3	13.0				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
2707+08 Rt	M1-5	392	7.2		13.1				2.5 x 2.5 12 ga	13.9						1	4	3 x 3 7 ga				
2709+08 Rt	W3-4			12.0	16.3	16.8			2.25 x 2.25 12 ga	18.3	4.8	5.3			2 x 2 12 ga	2	4	3 x 3 7 ga			2	
2711+44 Rt	M1-5	380	9.2		13.5				2.5 x 2.5 10 ga	13.9						1	4	3 x 3 7 ga			1	
2714+45 Lt	M1-5	371	6.0		12.9				2.5 x 2.5 12 ga	16.2						1	4	3 x 3 7 ga				
2715+68 Lt	R10	10		7.5																		Mount on Mast Arm
2715+68. Lt	R3-5L	10		7.5																		Mount on Mast Arm
2715+68.. Lt	R3-5R	10		7.5																		Mount on Mast Arm
2715+98 Rt	R10	10		7.5																		Mount on Mast Arm
2715+98. Rt	R3-5L	10		7.5																		Mount on Mast Arm
2715+98.. Rt	R3-6R	10		7.5																		Mount on Mast Arm
2716+76 Lt	R10	10		7.5																		Mount on Mast Arm
2716+76. Lt	R3-5L	10		7.5																		Mount on Mast Arm
2716+76.. Lt	R3-6R	10		7.5																		Mount on Mast Arm
2717+35 Rt	R10	10		7.5																		Mount on Mast Arm
2717+35. Rt	R3-5L	10		7.5																		Mount on Mast Arm
2717+35.. Rt	R3-6R	10		7.5																		Mount on Mast Arm
2719+27 Rt	M1-5	371	6.0		12.8				2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga				
2721+27 Lt	M1-5	380	9.2		13.9				2.25 x 2.25 12 ga	15.2	4.3				2 x 2 12 ga	1	4	3 x 3 7 ga			1	Use with flashing beacon
2723+70 Lt	W3-4			12.0	16.3	16.8			2.25 x 2.25 12 ga	18.3	4.8	5.3			2 x 2 12 ga	2	4	3 x 3 7 ga			2	
2725+70 Lt	M1-5	392	7.2		13.1				2.5 x 2.5 12 ga	13.9						1	4	3 x 3 7 ga				
2733+27 Lt	W3-3	19		6.3	12.8				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
Sub Total			44.8	126.6		**Total**	171.2									**Total**	48		0	0	6	
87th Ave NW																						
534+95 Lt	M1-5	392	7.2		12.8				2.5 x 2.5 12 ga	13.9						1	4	3 x 3 7 ga				
536+95 Lt	W3-1	19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
Sub Total			7.2	6.3		**Total**	25.5									**Total**	8		0	0	0	
Grand Total			122.4	338.7		**Total**	635.7									**Total**	208		0	0	18	

Basis of Estimate
Sign Support Lengths

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Urban/rural expressway and freeway - 84" (Offset - 60")
Rural Roadway - 60"

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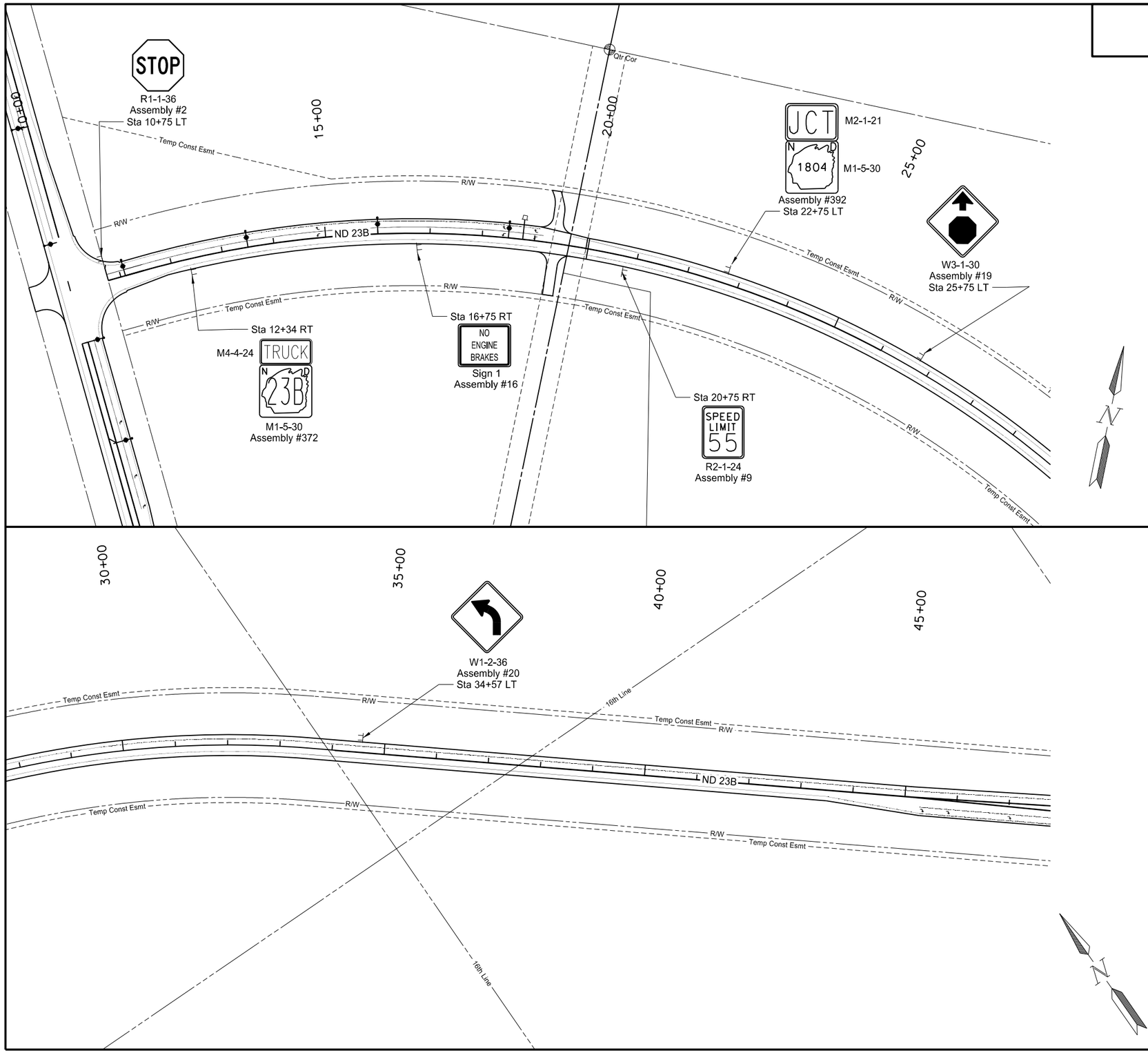
Sign Summary
Perforated Tube

ND23B - New Town Northeast Truck Reliever Route

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	110	4

See Sign Summary Sheet or Traffic Control Devices List for Quantities



0 100 200
Scale in Feet

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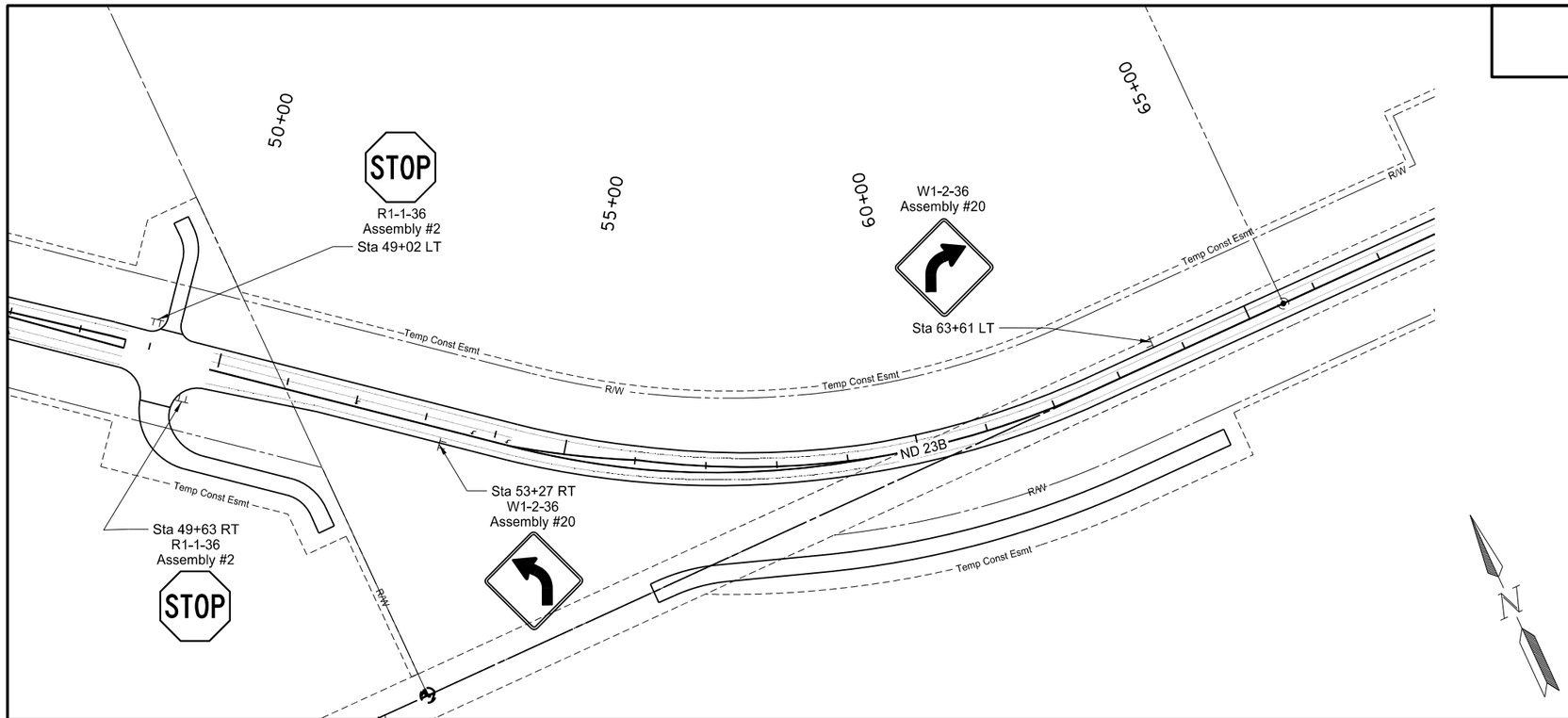
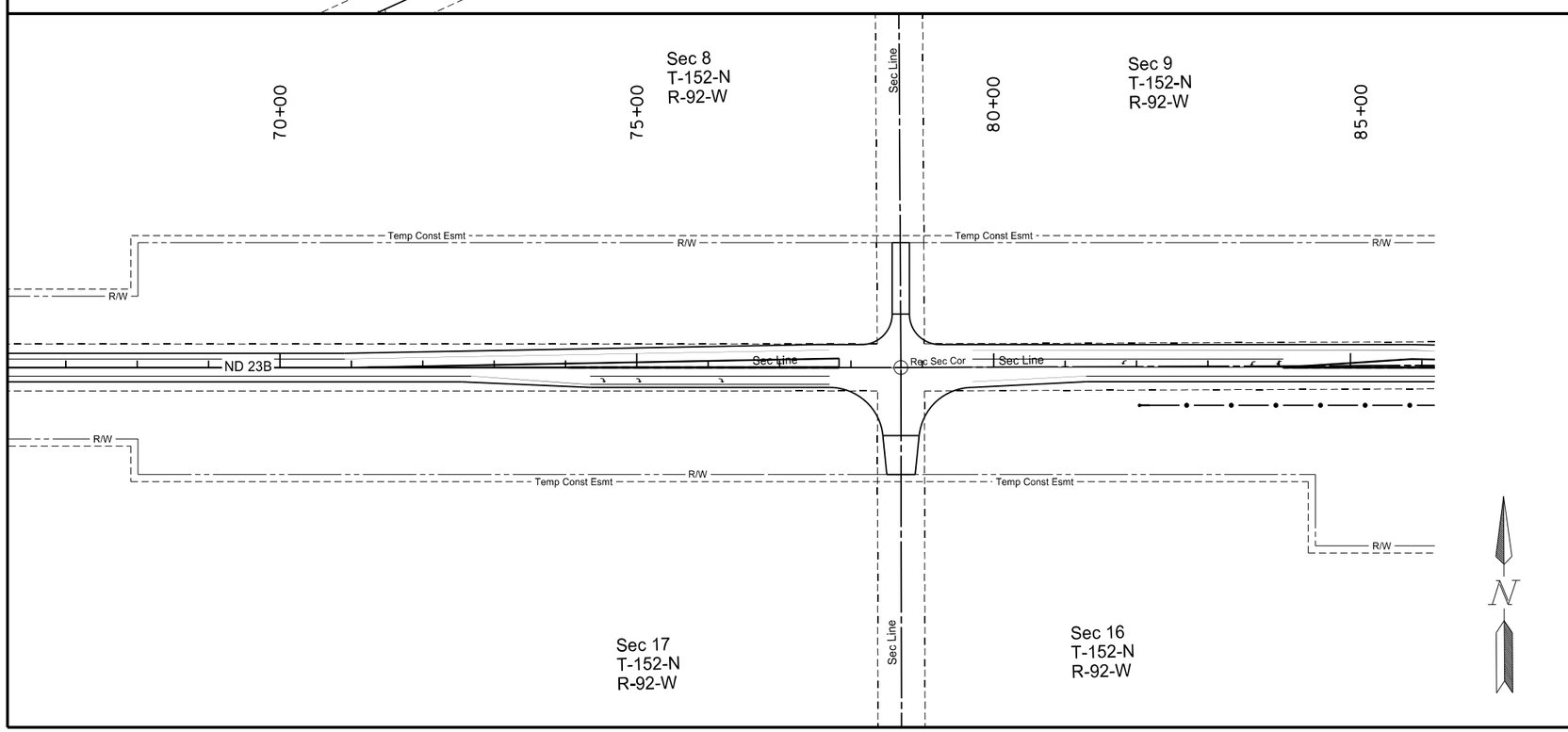
Signing
Sta 10+00 to 47+50
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	110	5

See Sign Summary Sheet or Traffic Control Devices List for Quantities





0 100 200
Scale in Feet

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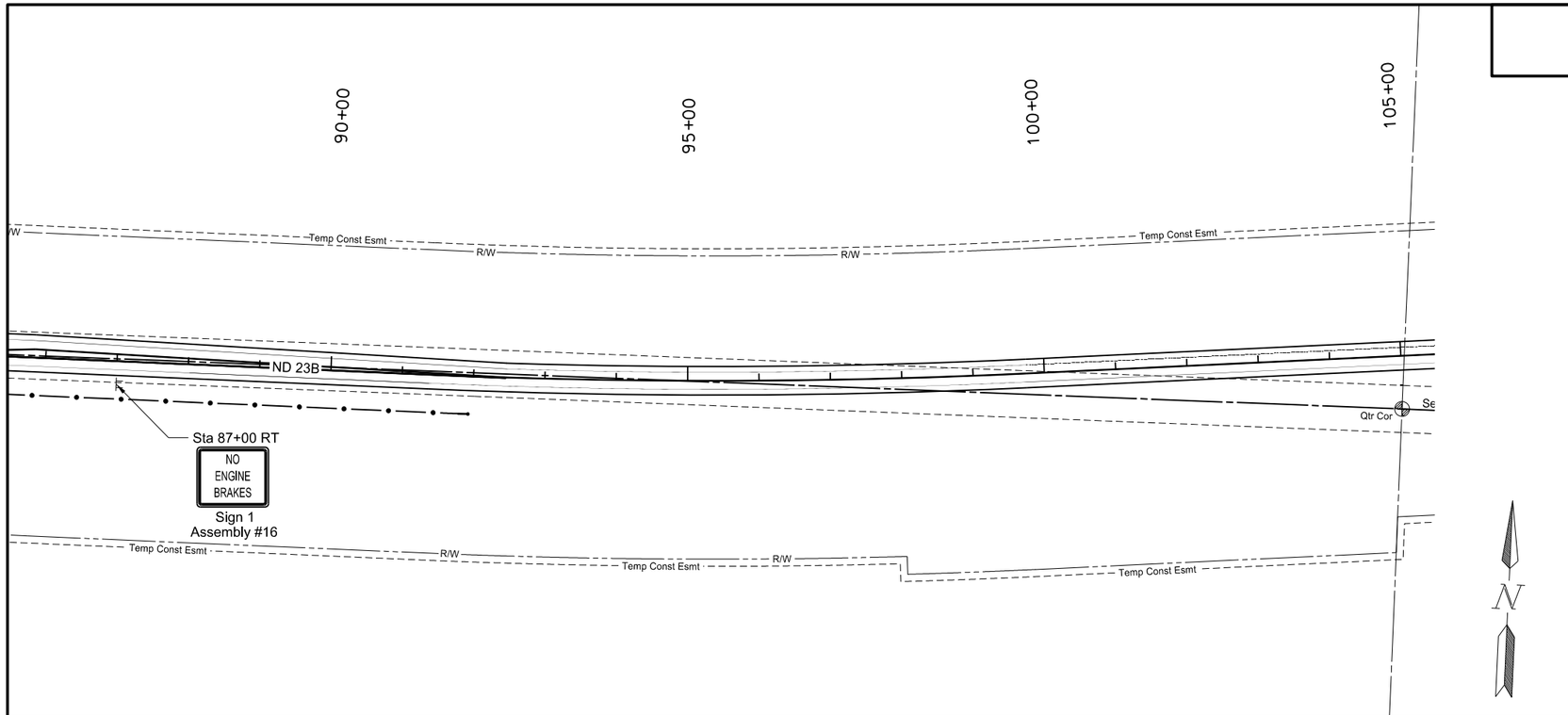
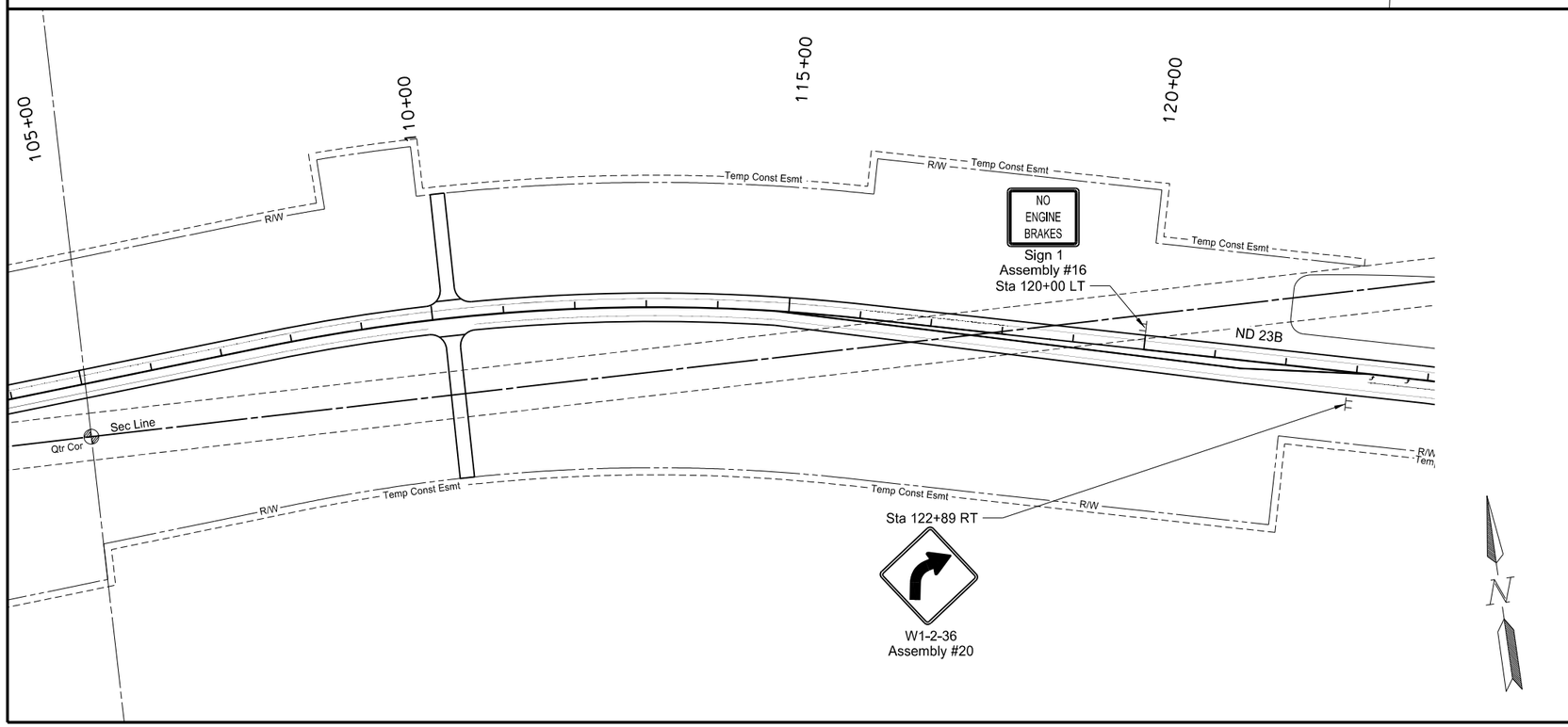
Signing
Sta 47+50 to 85+75
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	110	6

See Sign Summary Sheet or Traffic Control Devices List for Quantities





0 100 200
Scale in Feet

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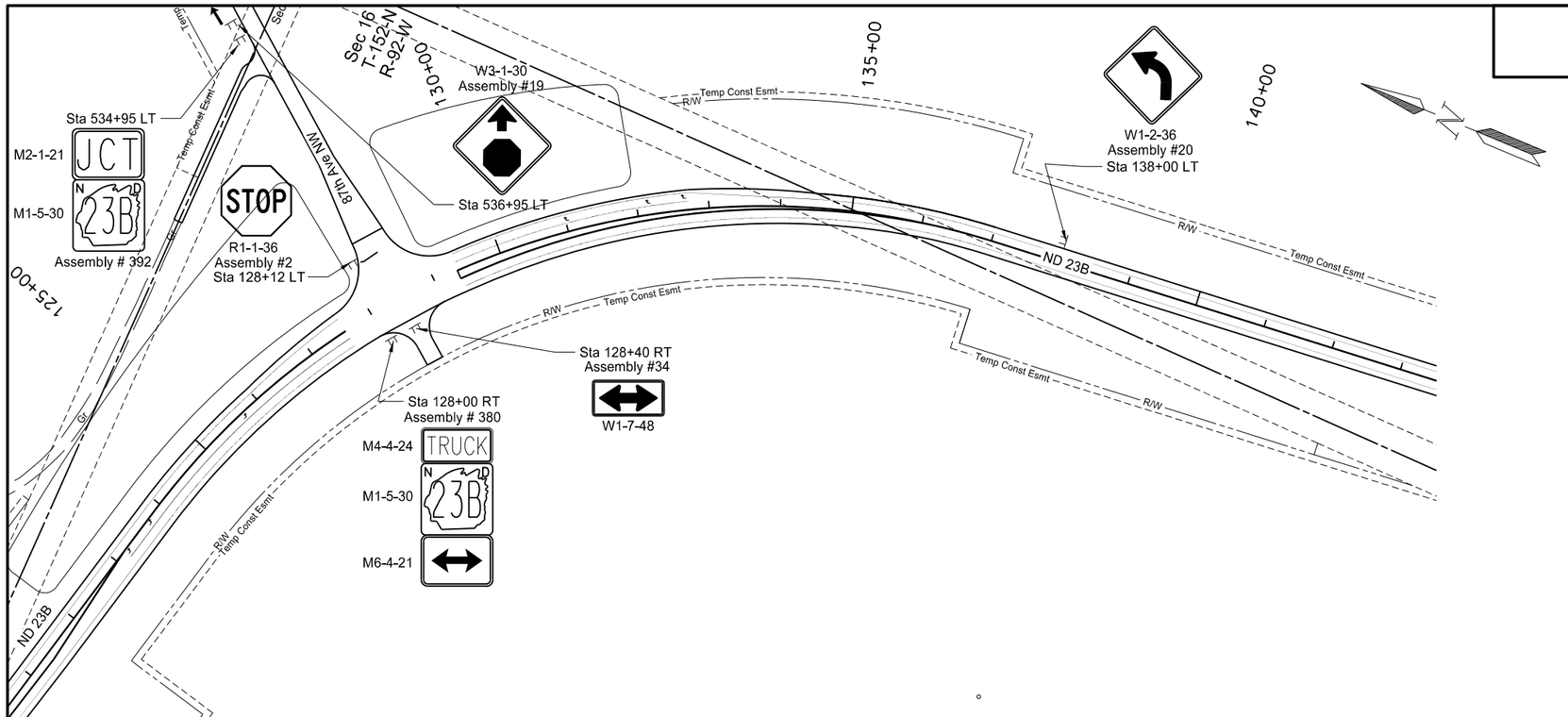
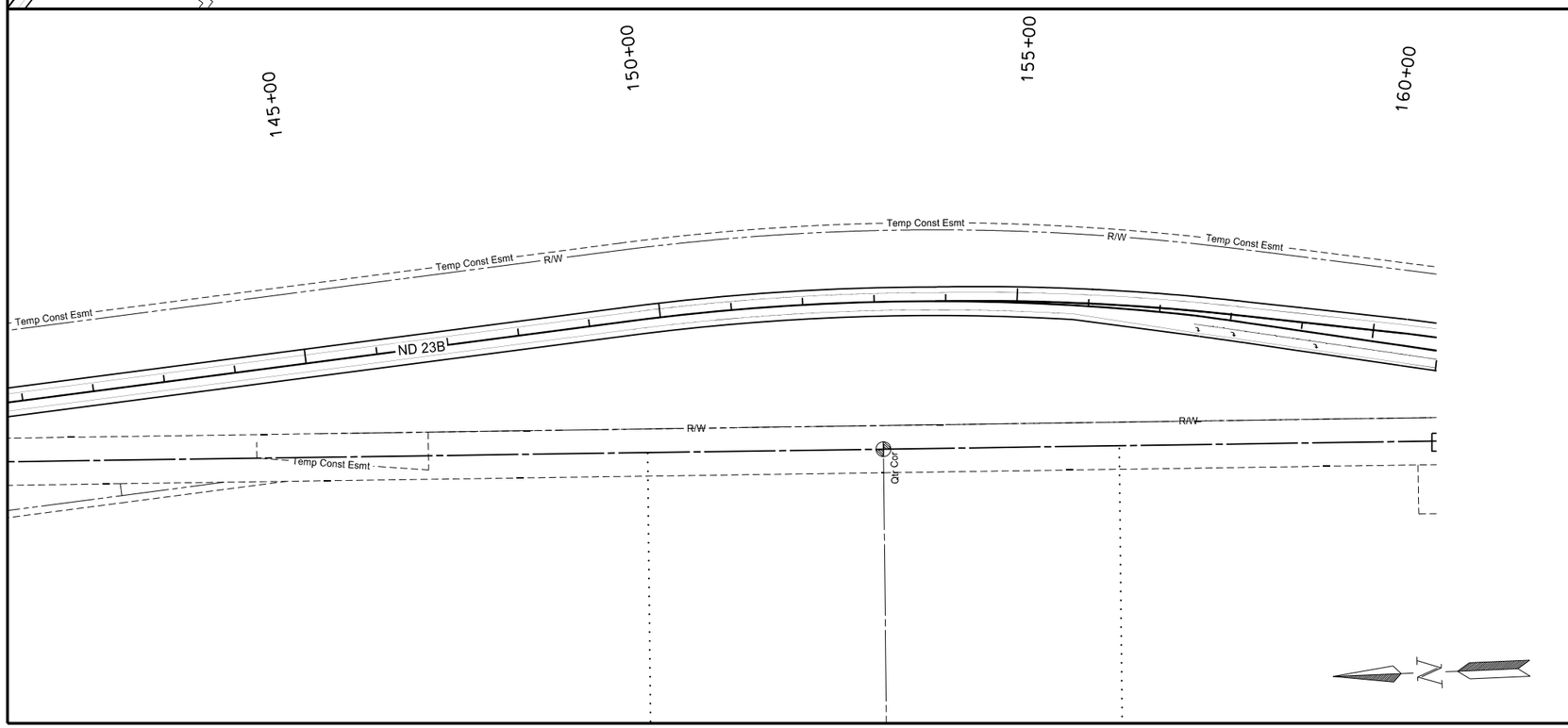
Signing
Sta 85+75 to 123+50
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	110	7

See Sign Summary Sheet or Traffic Control Devices List for Quantities





0 100 200
Scale in Feet

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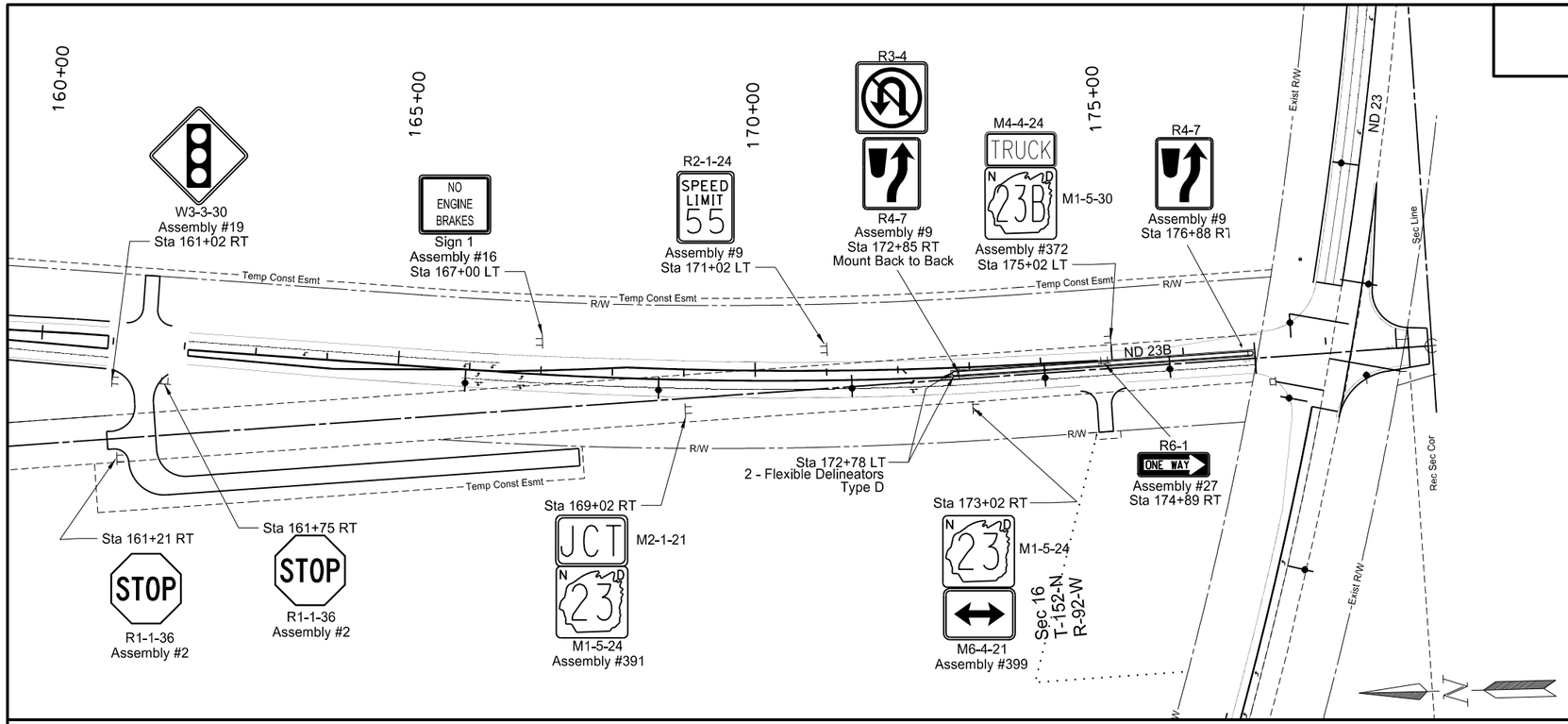
Signing
Sta 123+50 to 160+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	110	8



See Sign Summary Sheet or Traffic Control Devices List for Quantities

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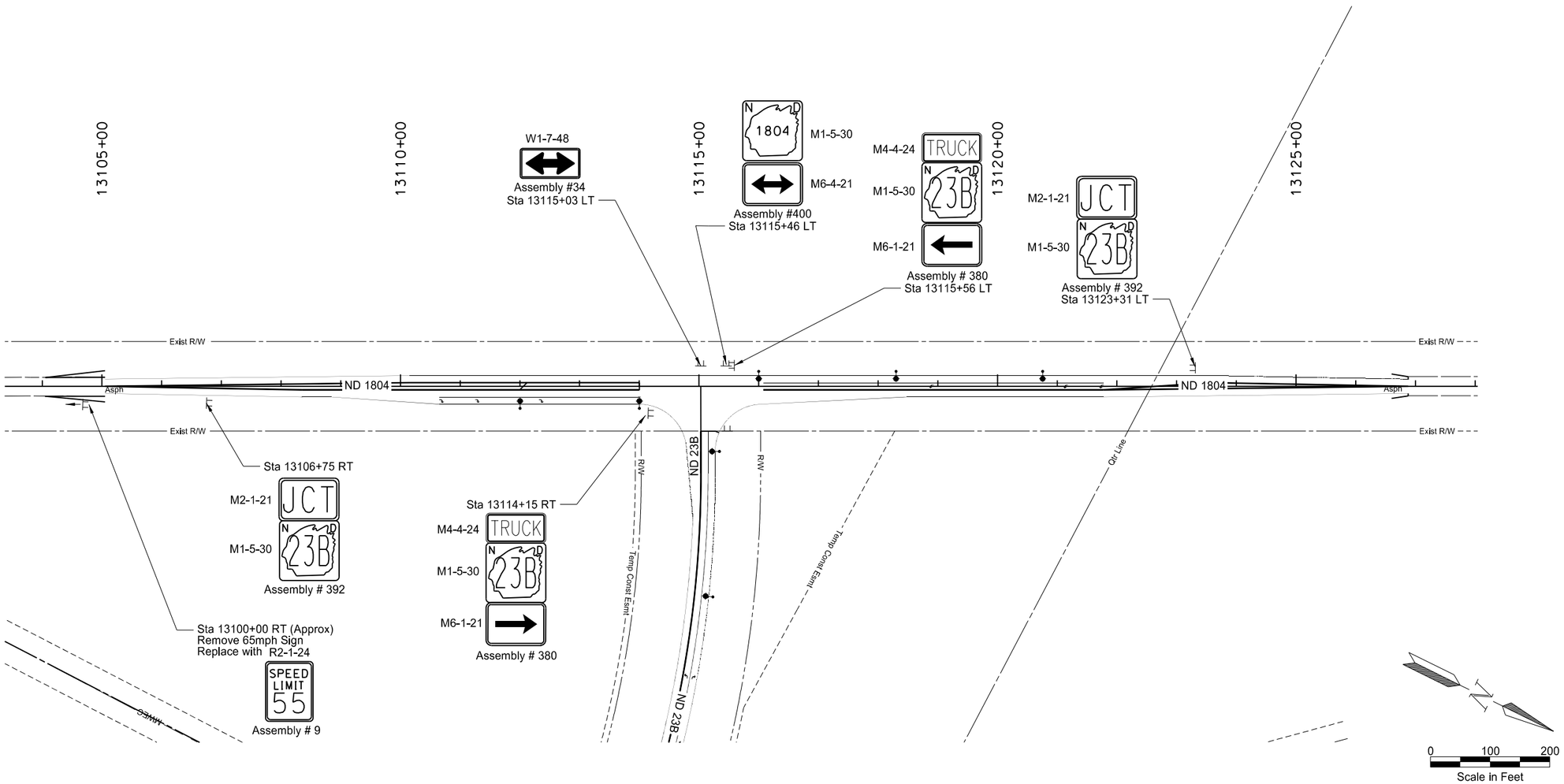
0 100 200
Scale in Feet

Signing
Sta 160+00 to 178+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	110	9

See Sign Summary Sheet or Traffic Control Devices List for Quantities



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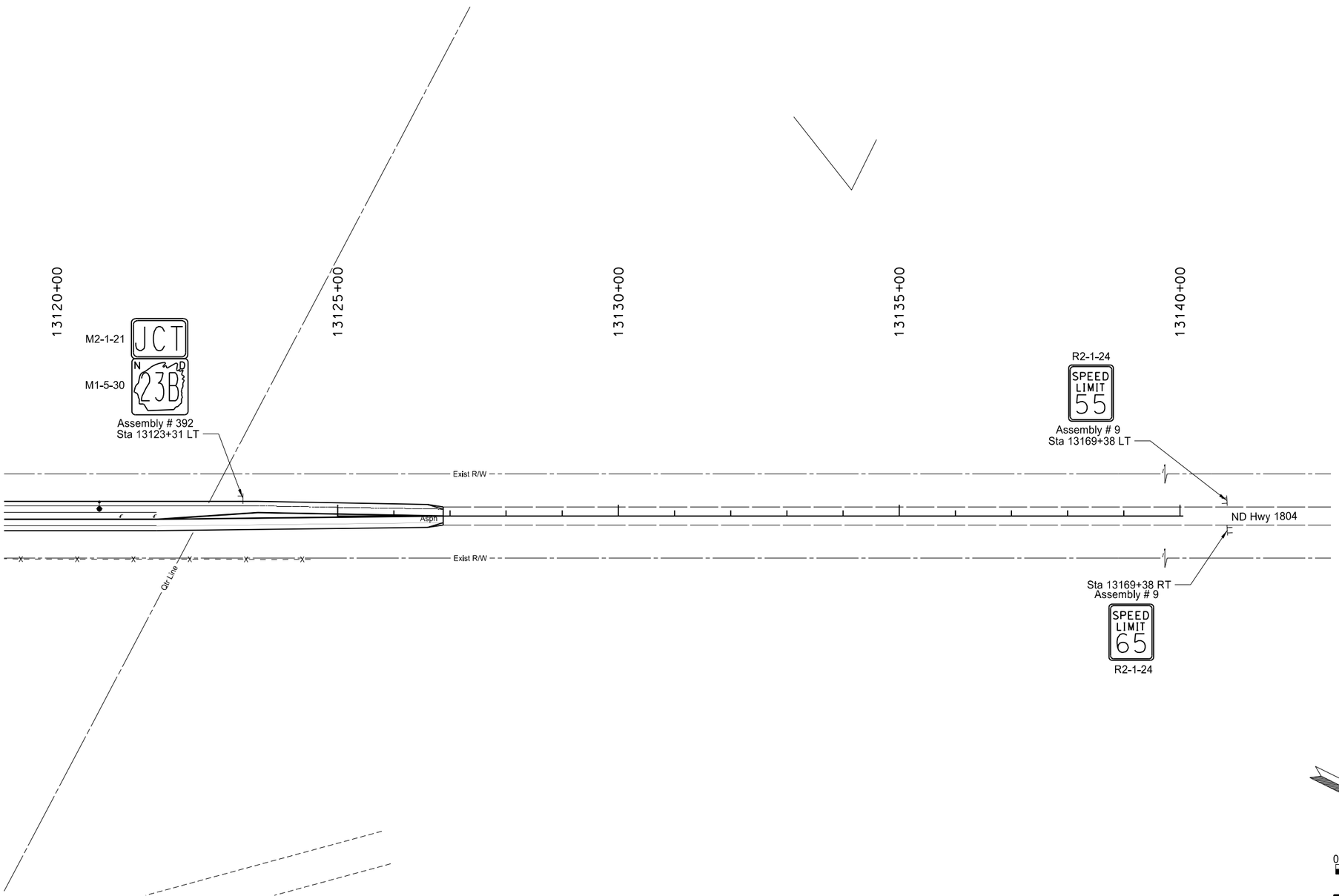
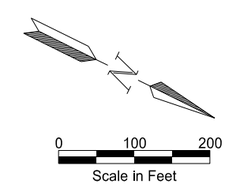
Signing
ND Hwy 1804
Sta 13107+36.42 to 13124+89.73
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	110	10

See Sign Summary Sheet or Traffic Control Devices List for Quantities





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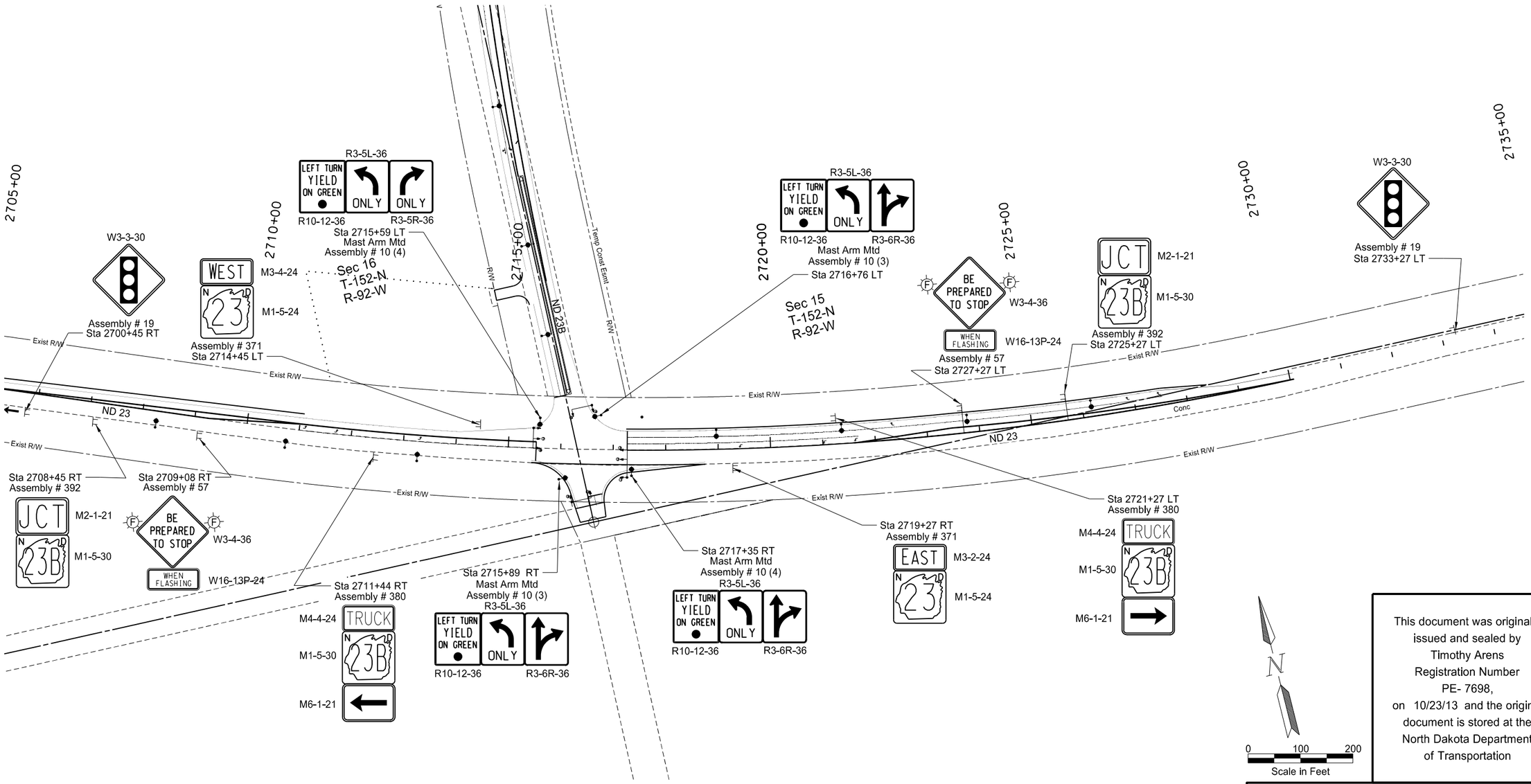
Signing
ND Hwy 1804
Sta 13124+89.73 to 13145+06
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	110	11

See Sign Summary Sheet or Traffic Control Devices List for Quantities



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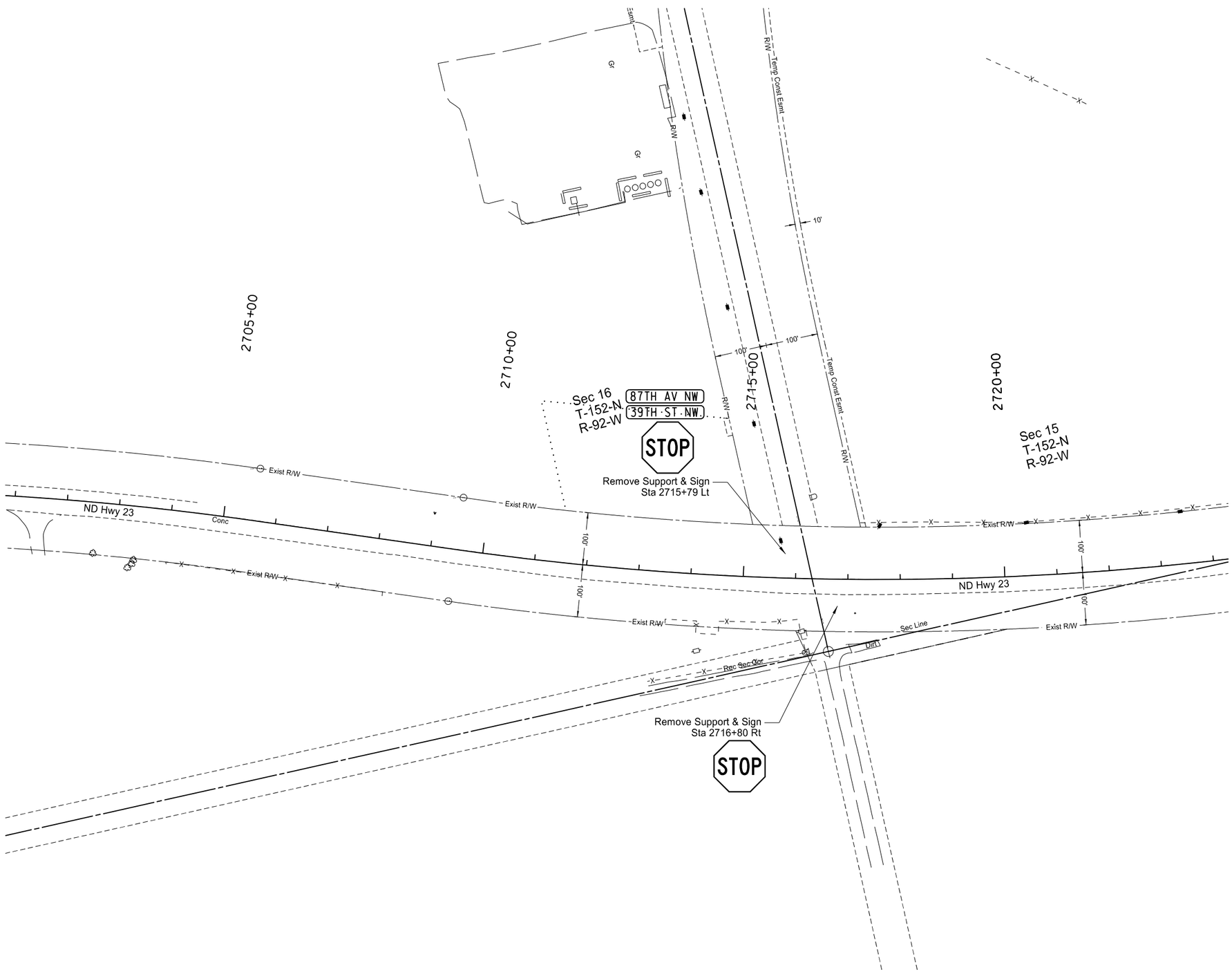
Signing
ND Highway 23
Sta 2709+00 to 2736+44
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	110	12



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Signing Removal Layouts
ND Highway 23
Sta 2587+24 to 2716+80
ND 23B
Northeast Truck Reliever Route
New Town, ND

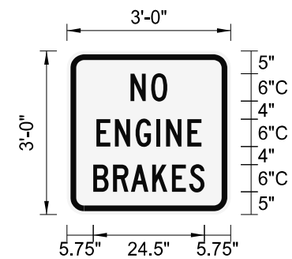
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	110	13

SIGN NUMBER	1
WIDTH x HEIGHT	3'-0" x 3'-0"
BORDER WIDTH	1.25" (inset 0.75")
CORNER RADIUS	3"
MOUNTING	Overhead
BACKGROUND	TYPE: IV Reflective
	COLOR: White
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
20+75
120+00
137+00
167+02

AREA: 9.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: regulatory_no engine brakes.ssi

LETTER POSITION (X)																		LENGTH	SIZE	SERIES
N	O																	8.1	6	C 2000
13.9	18.5																			
E	N	G	I	N	E													23.1	6	C 2000
6.5	10.5	15.1	19.7	21.8	26.5															
B	R	A	K	E	S													24.5	6	C 2000
5.8	10.1	14	18.7	23.1	26.9															

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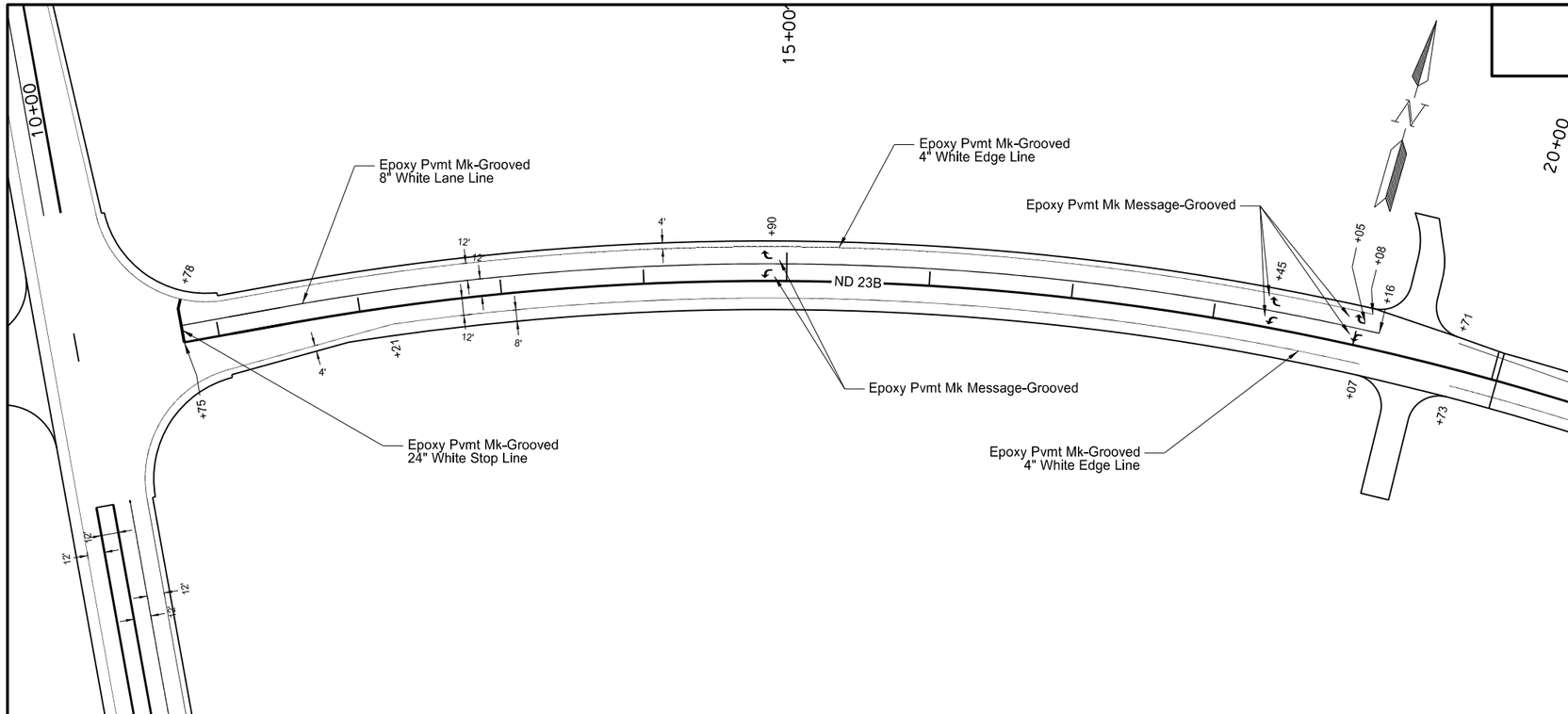
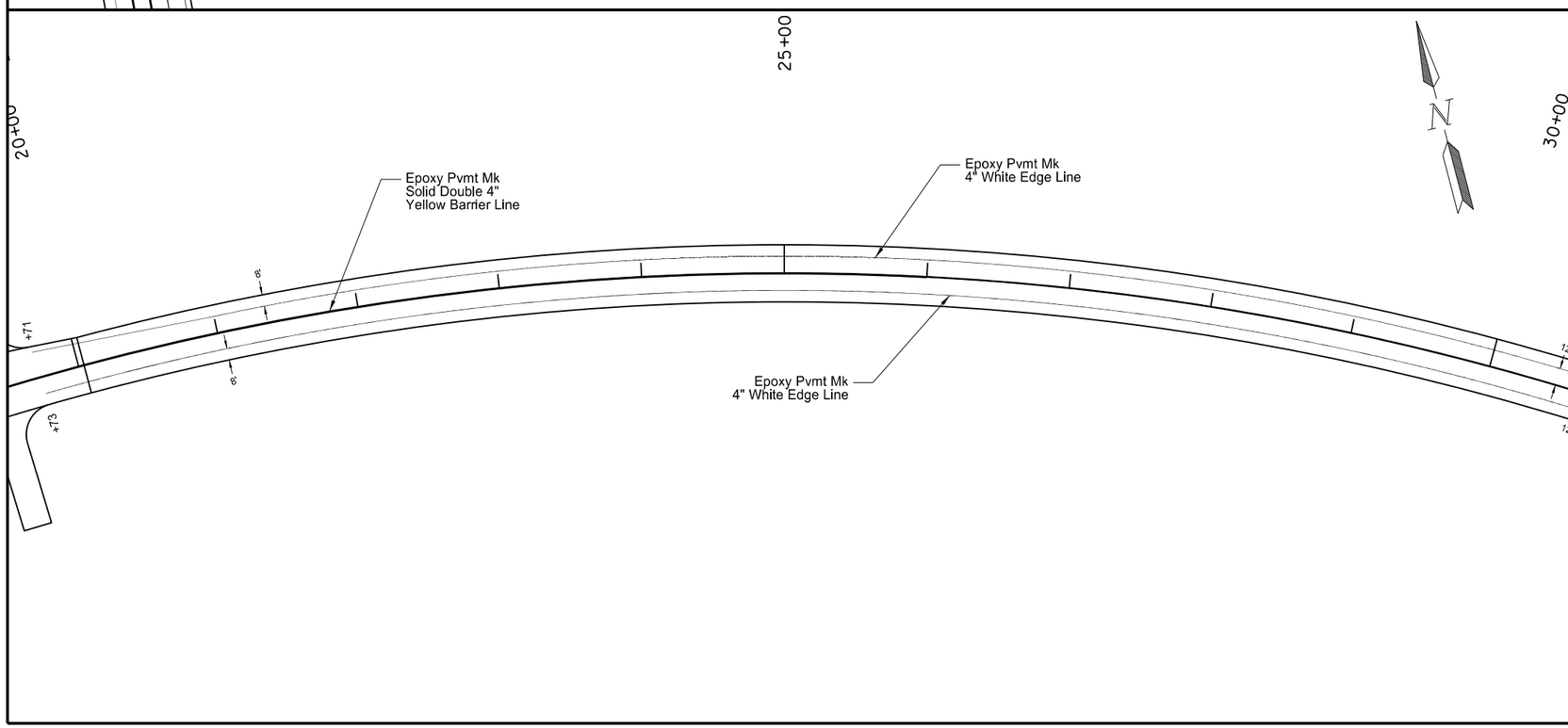
Sign Details

Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	1





Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk 4 In Line-Grooved				
Sta 10+00 to 30+00	762	110		
4 In White Line			1,682	LF
4 In Yellow Barrier			1,682	LF
Epoxy Pvmt Mk 4 In Line				
Sta 10+00 to 30+00	762	113		
4 In White Line			2,138	LF
4 In Yellow Barrier			2,268	LF
Epoxy Pvmt Mk 8 In Line-Grooved				
Sta 10+00 to 30+00	762	132		
8 In White Line			841	LF
Epoxy Pvmt Mk 24 In Line-Grooved				
Sta 10+00 to 30+00	762	135		
8 In White Line			32	LF
Epoxy Pvmt Mk Message-Grooved				
Sta 10+00 to 30+00	762	136		
White Arrow			96	SF

0 50 100
Scale In Feet

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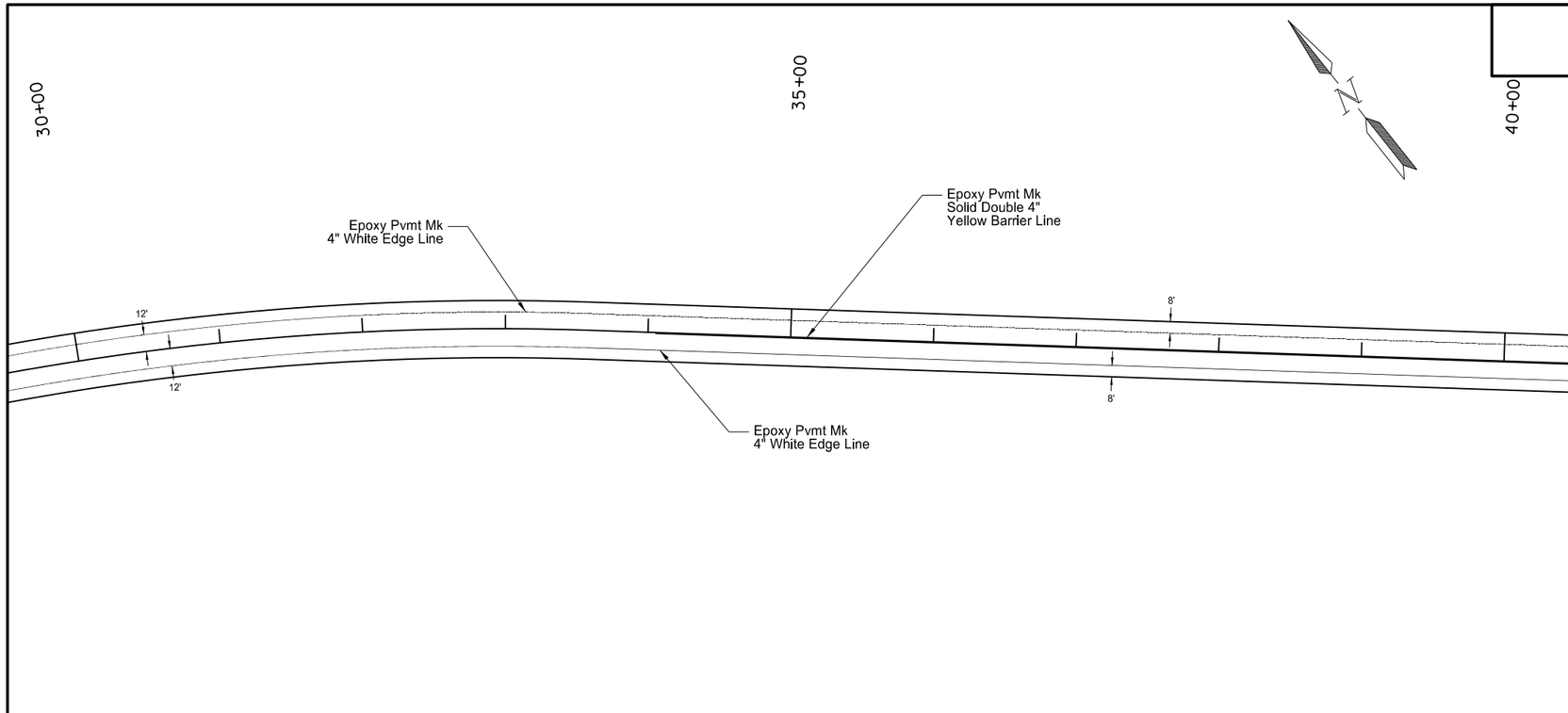
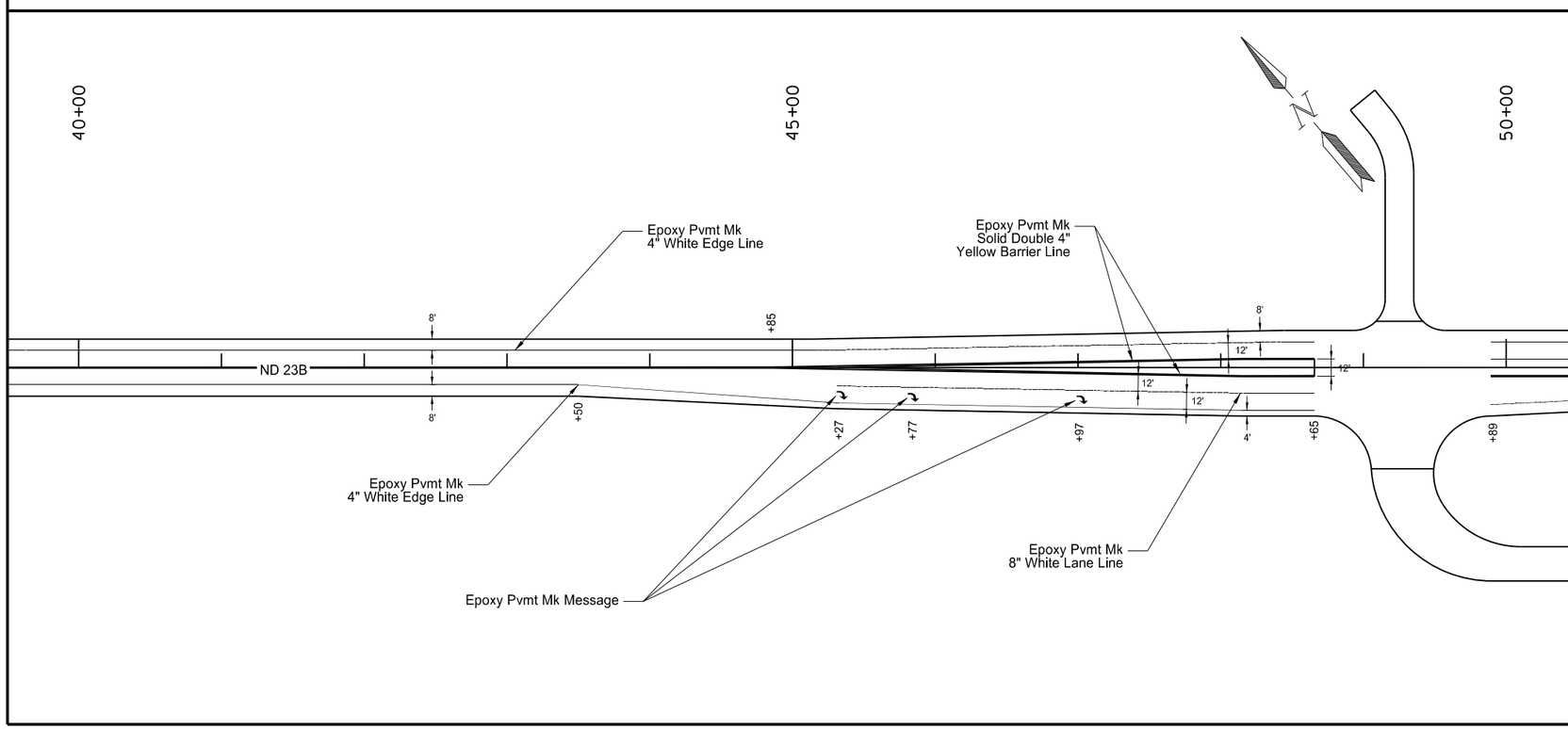
Pavement Marking
Sta 10+00 to 30+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	2





Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk Message				
Sta 30+00 to 50+00	762	112		
White Arrow			48	SF
Epoxy Pvmt Mk 4 In Line				
Sta 30+00 to 50+00	762	113		
4 In White Line			3,732	LF
4 In Yellow Barrier			4,444	LF
Epoxy Pvmt Mk 8 In Line				
Sta 30+00 to 50+00	762	115		
8 In White Line			335	LF

0 50 100
Scale In Feet

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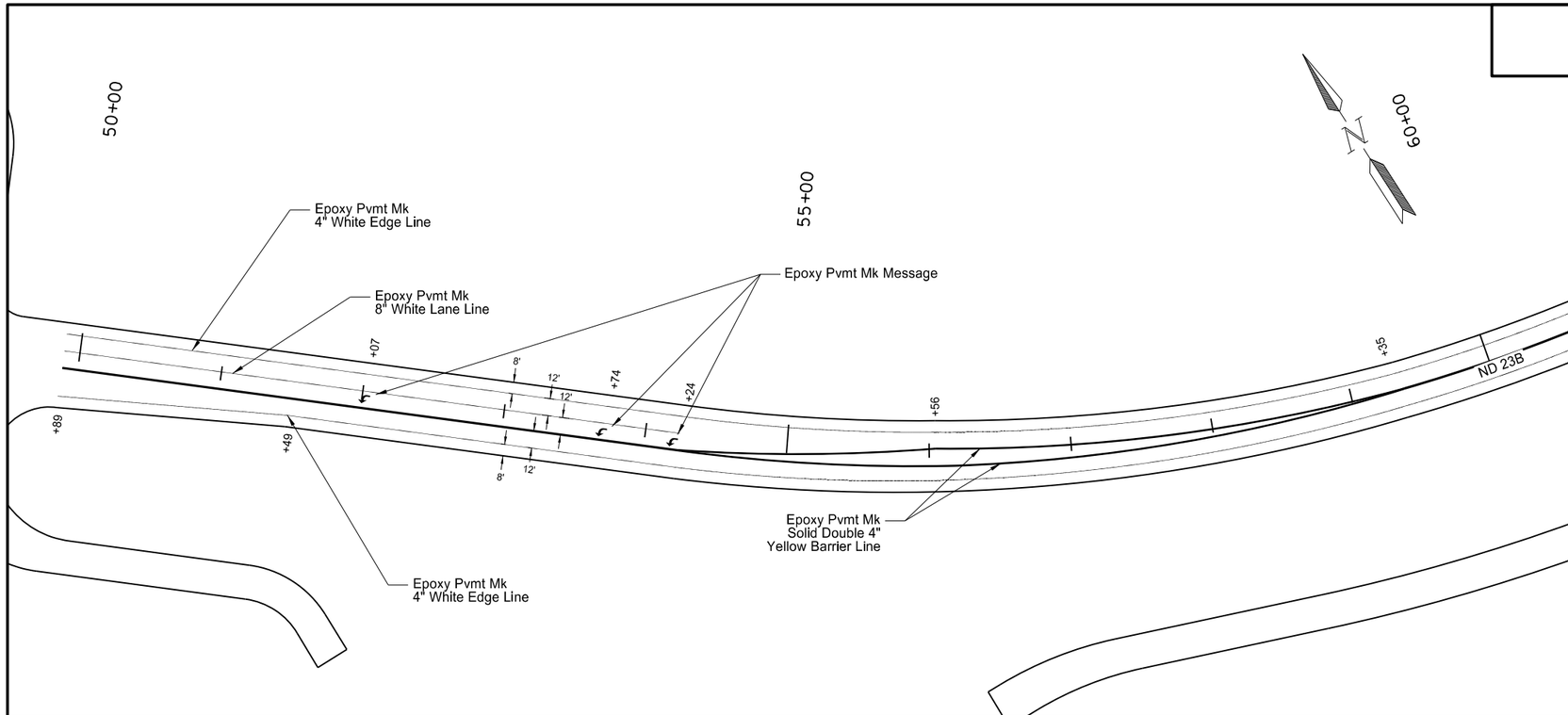
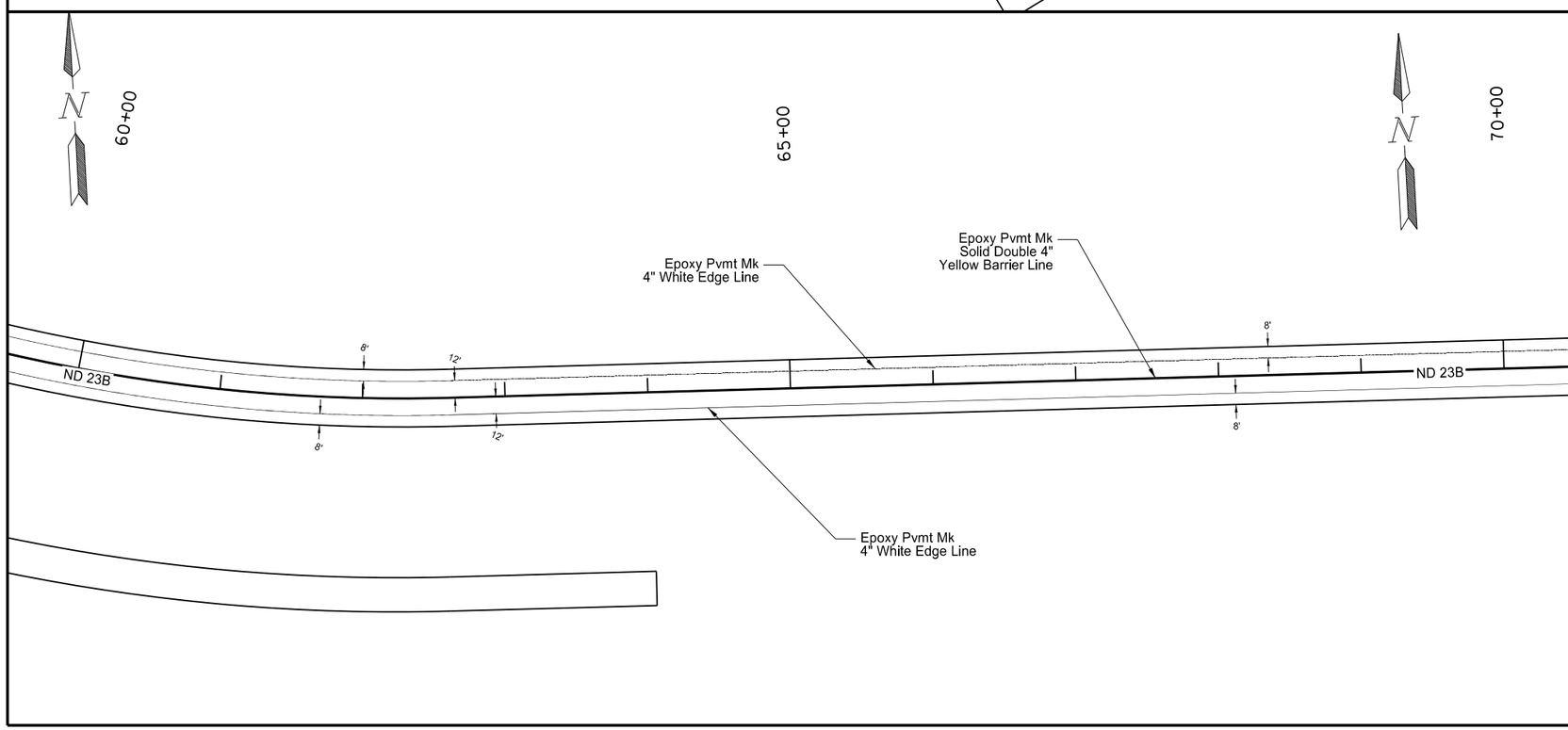
Pavement Marking
Sta 30+00 to 50+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	3





Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk Message				
Sta 50+00 to 70+00	762	112		
White Arrow			48	SF
Epoxy Pvmt Mk 4 In Line				
Sta 50+00 to 70+00	762	113		
4 In White Line			4,000	LF
4 In Yellow Barrier			4,510	LF
Epoxy Pvmt Mk 8 In Line				
Sta 50+00 to 70+00	762	115		
8 In White Line			424	LF

0 50 100
Scale In Feet

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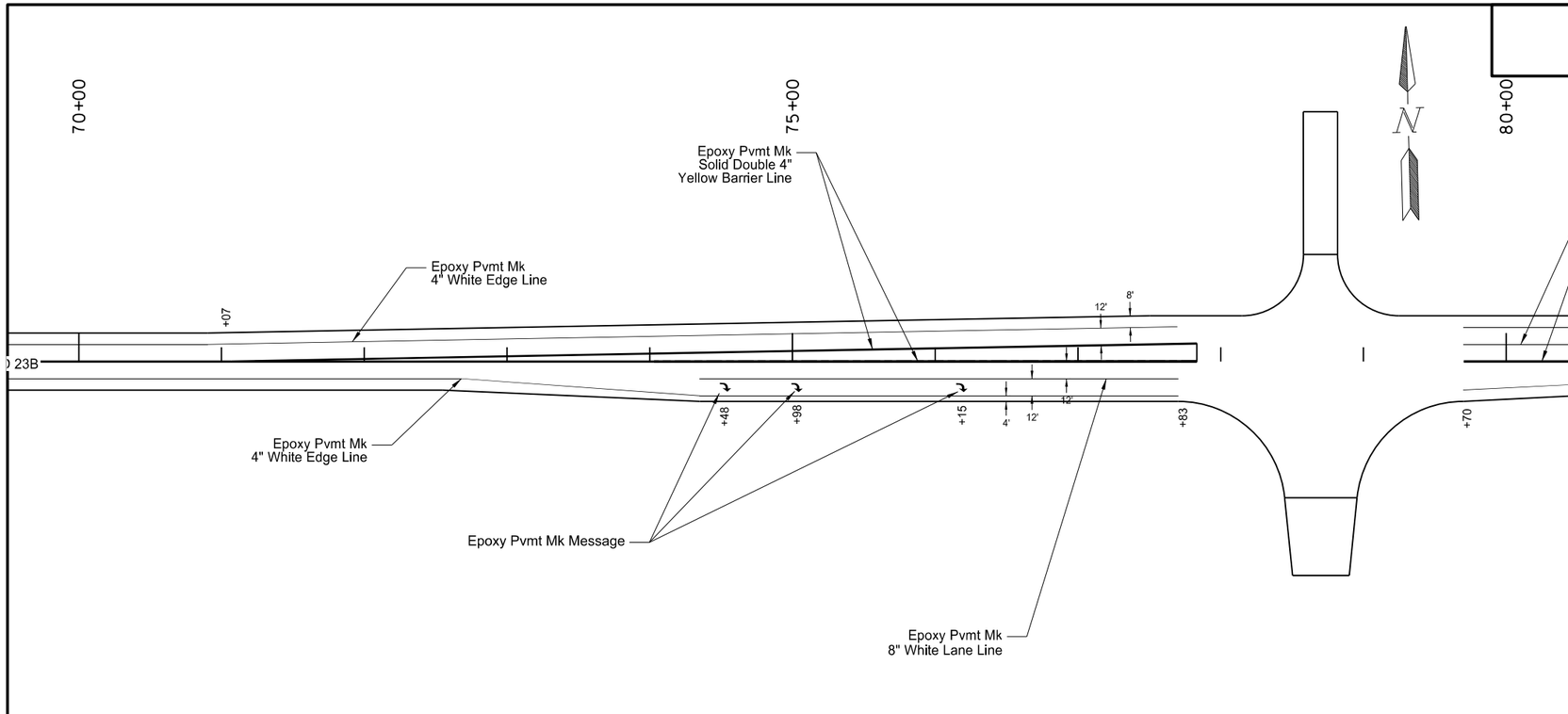
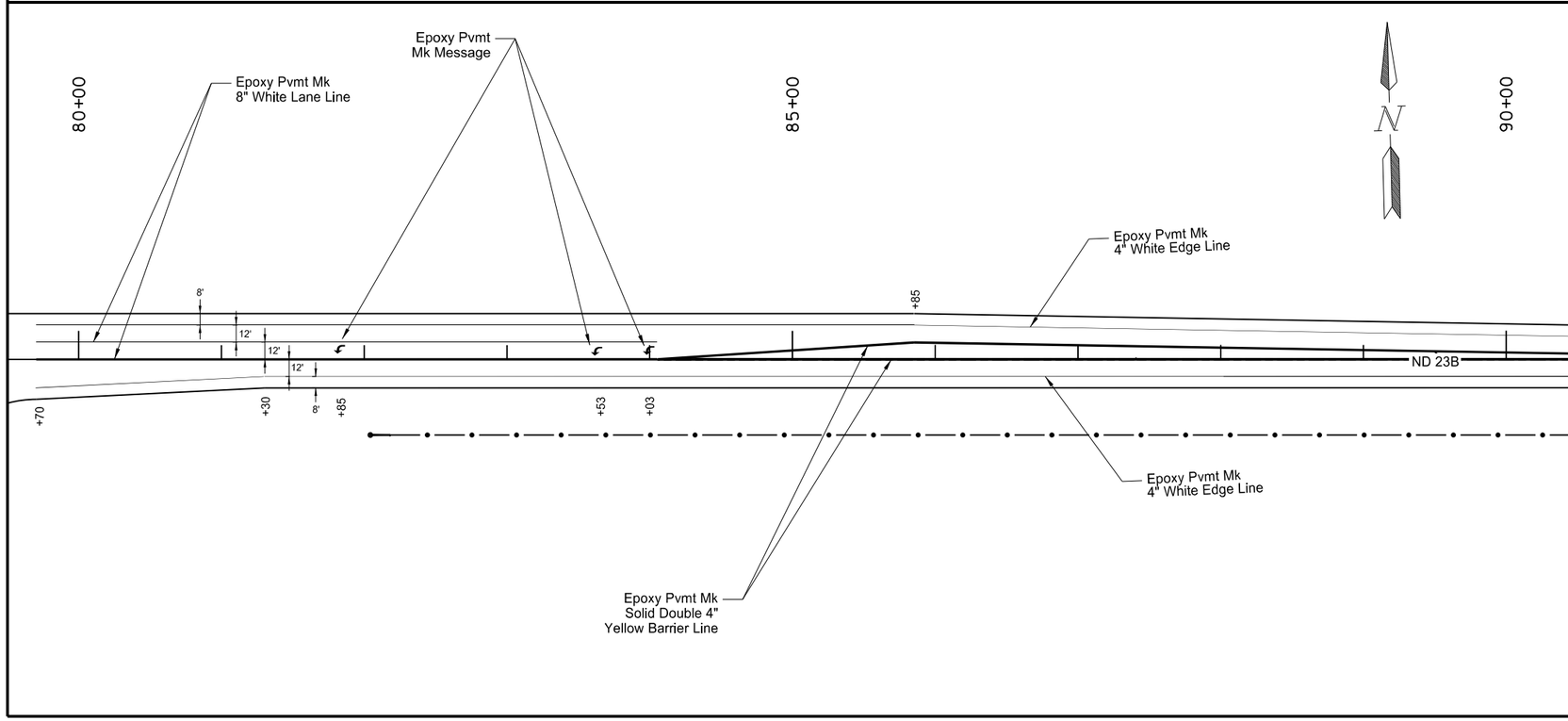
Pavement Marking
Sta 50+00 to 70+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	4





Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk Message				
Sta 70+00 to 90+00	762	112		
White Arrow			96	SF
Epoxy Pvmt Mk 4 In Line				
Sta 70+00 to 90+00	762	113		
4 In White Line			3,600	LF
4 In Yellow Barrier			6,162	LF
Epoxy Pvmt Mk 8 In Line				
Sta 70+00 to 90+00	762	115		
8 In White Line			770	LF

0 50 100
Scale In Feet

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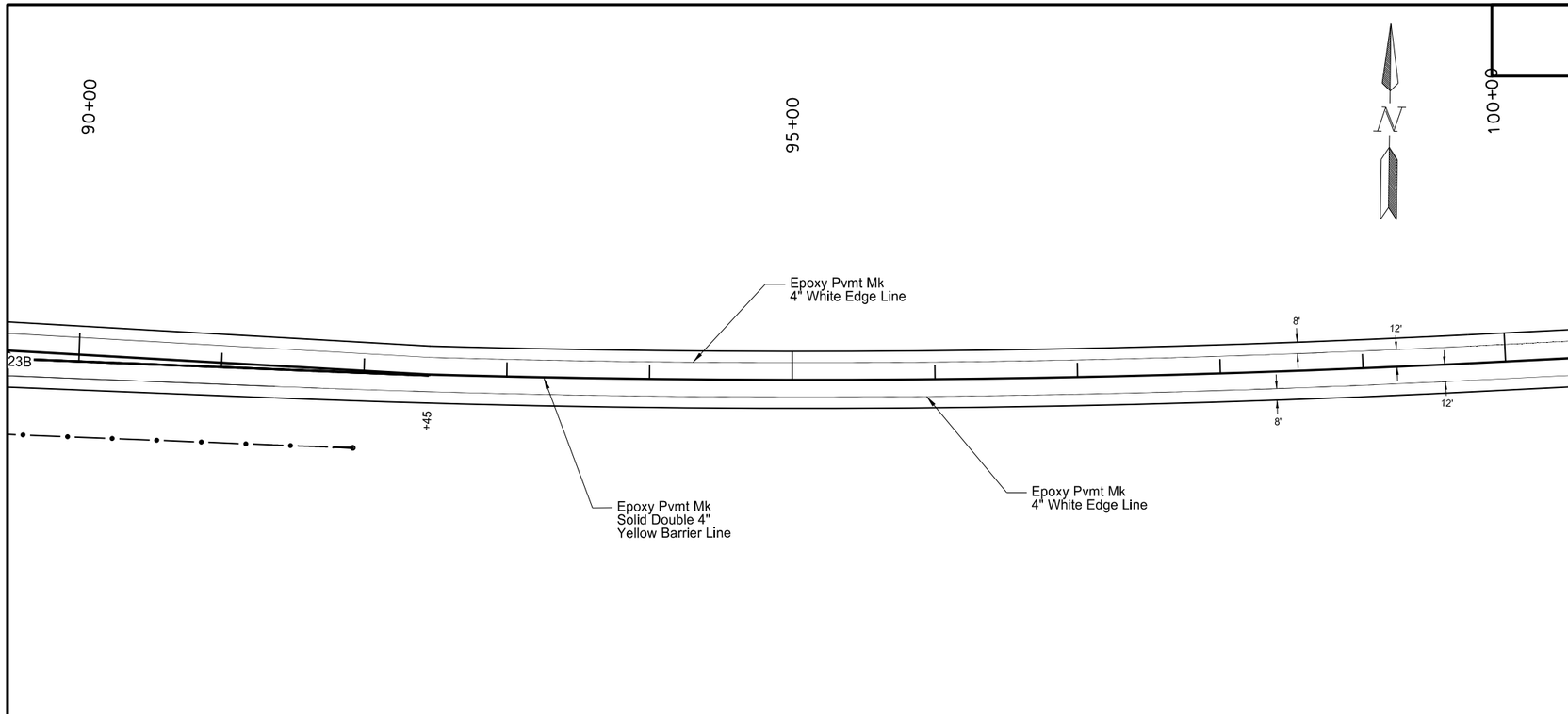
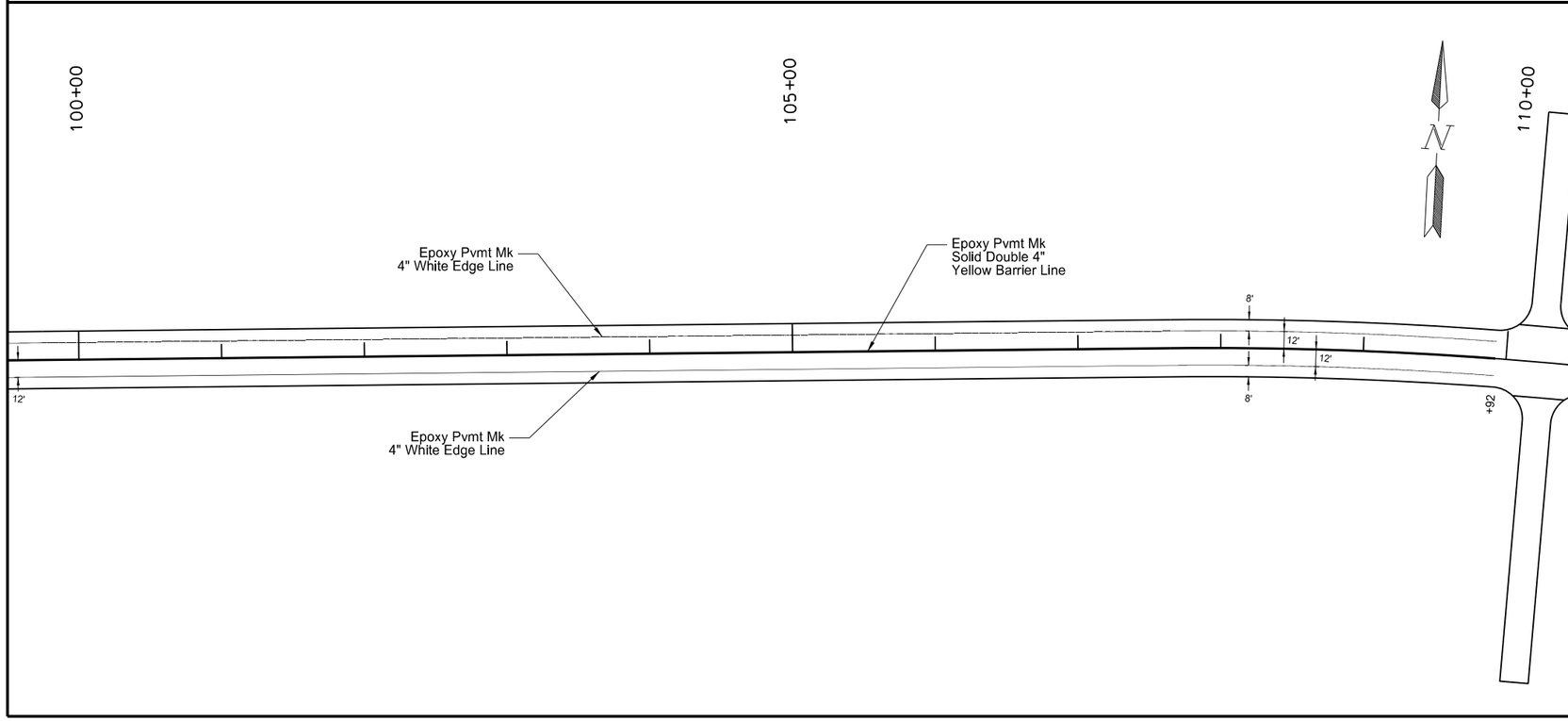
Pavement Marking
Sta 70+00 to 90+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	5





Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk 4 In Line				
Sta 90+00 to 110+00	762	113		
4 In White Line			4,000	LF
4 In Yellow Barrier			4,500	LF

0 50 100
Scale In Feet

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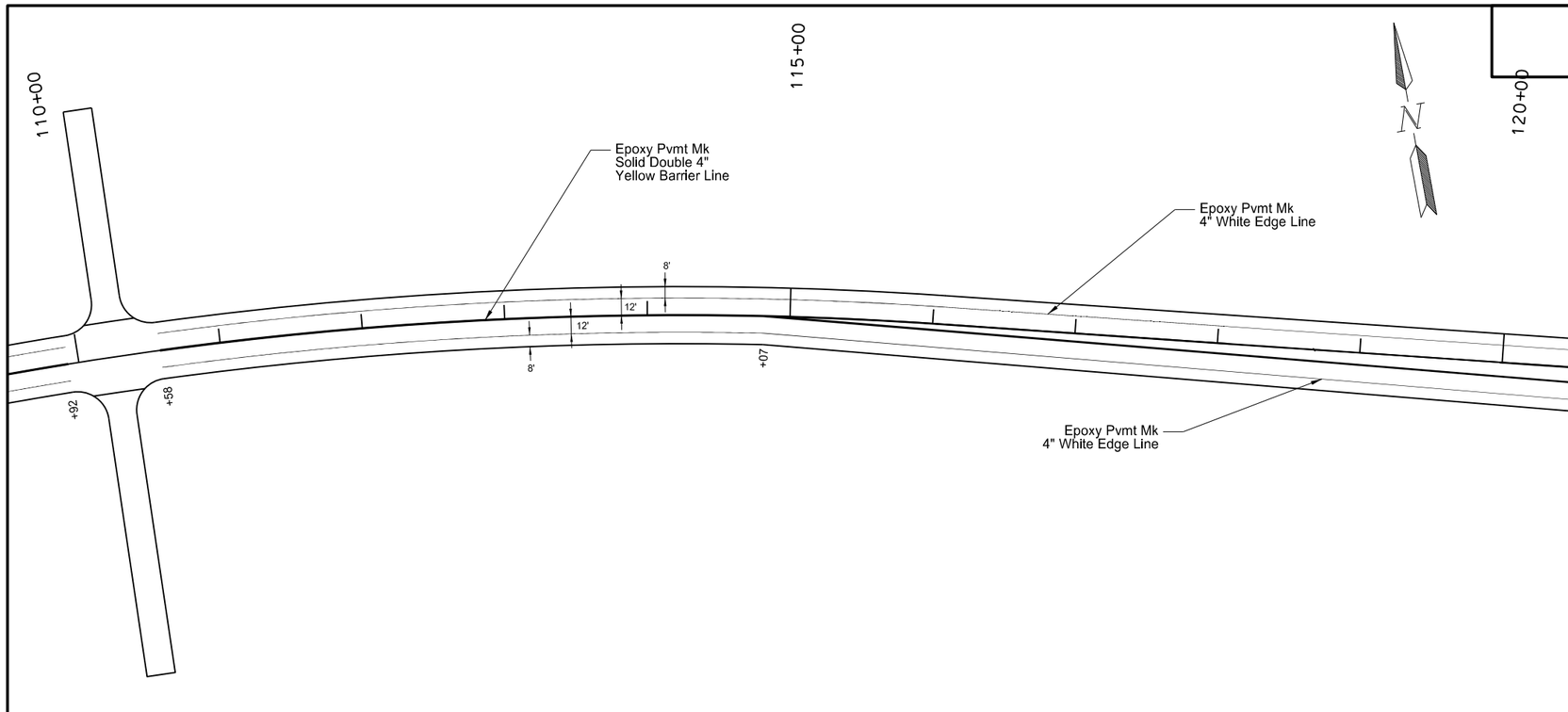
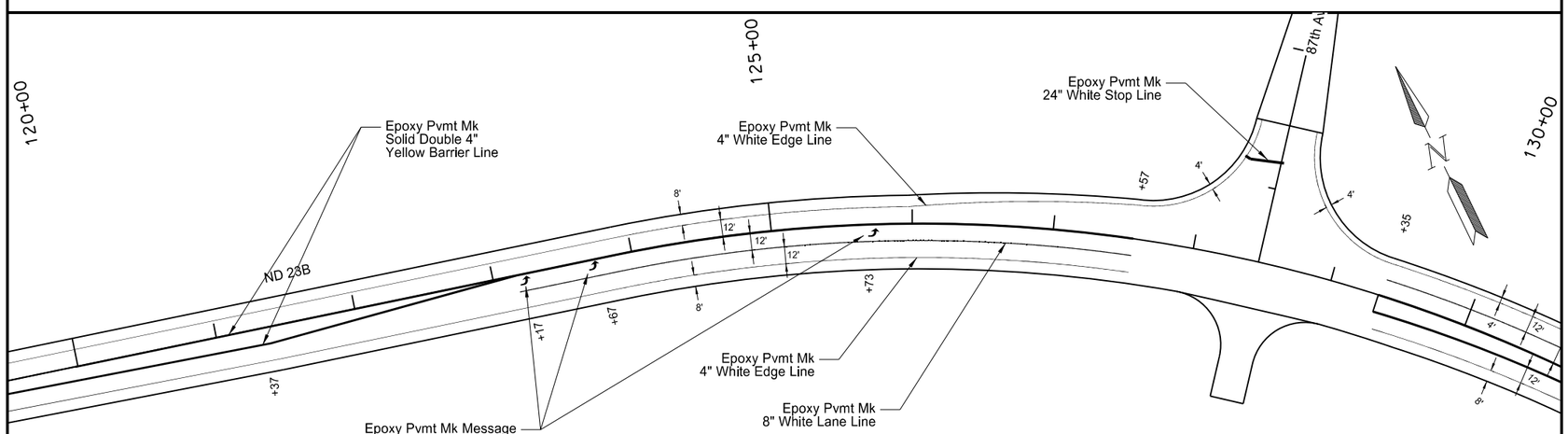
Pavement Marking
Sta 90+00 to 110+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	6





Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk Message				
Sta 110+00 to 130+00	762	112		
White Arrow			48	SF
Epoxy Pvmt Mk 4 In Line				
Sta 110+00 to 130+00	762	113		
4 In White Line			3,632	LF
4 In Yellow Barrier			5,494	LF
Epoxy Pvmt Mk 8 In Line				
Sta 110+00 to 130+00	762	115		
8 In White Line			398	LF
Epoxy Pvmt Mk 24 In Line				
Sta 110+00 to 130+00	762	117		
8 In White Line			28	LF

0 50 100
Scale In Feet

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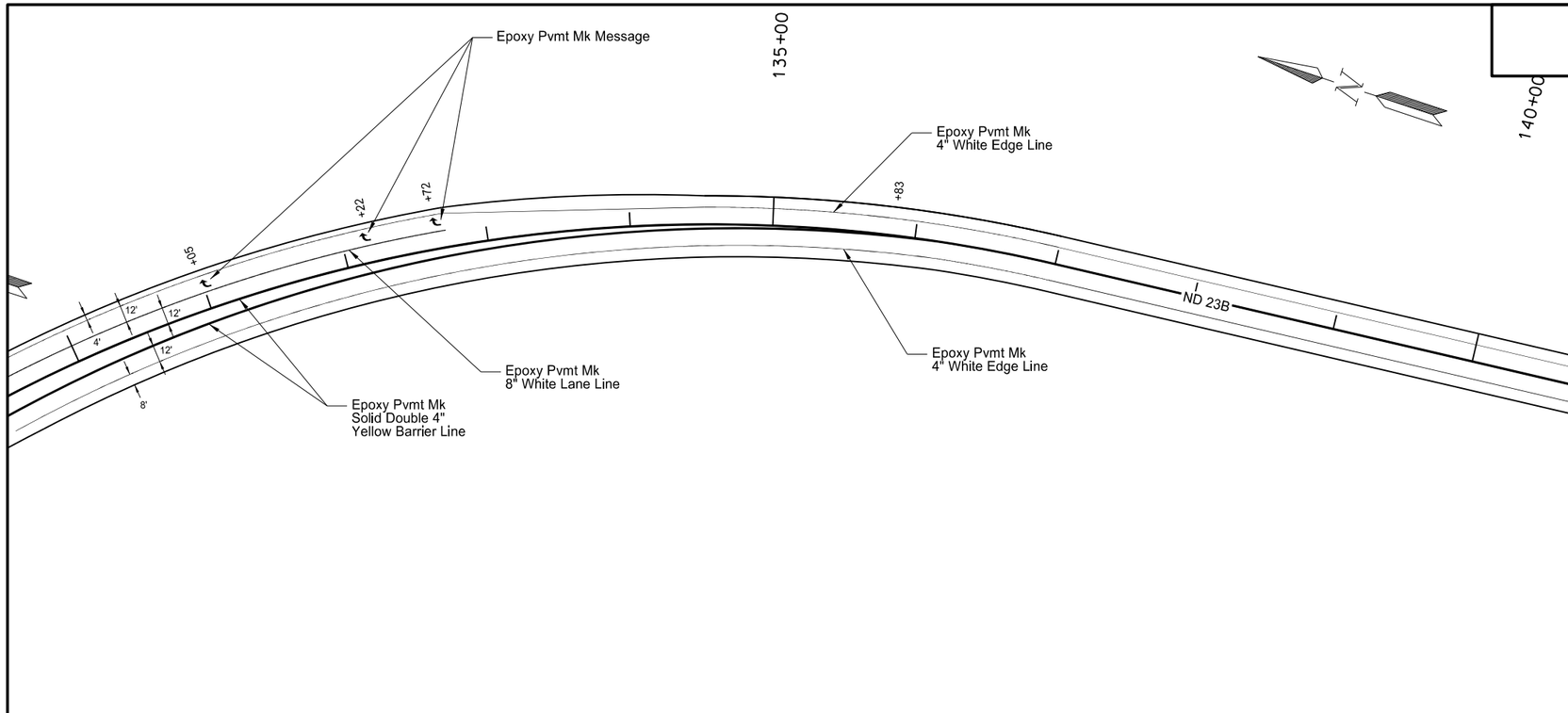
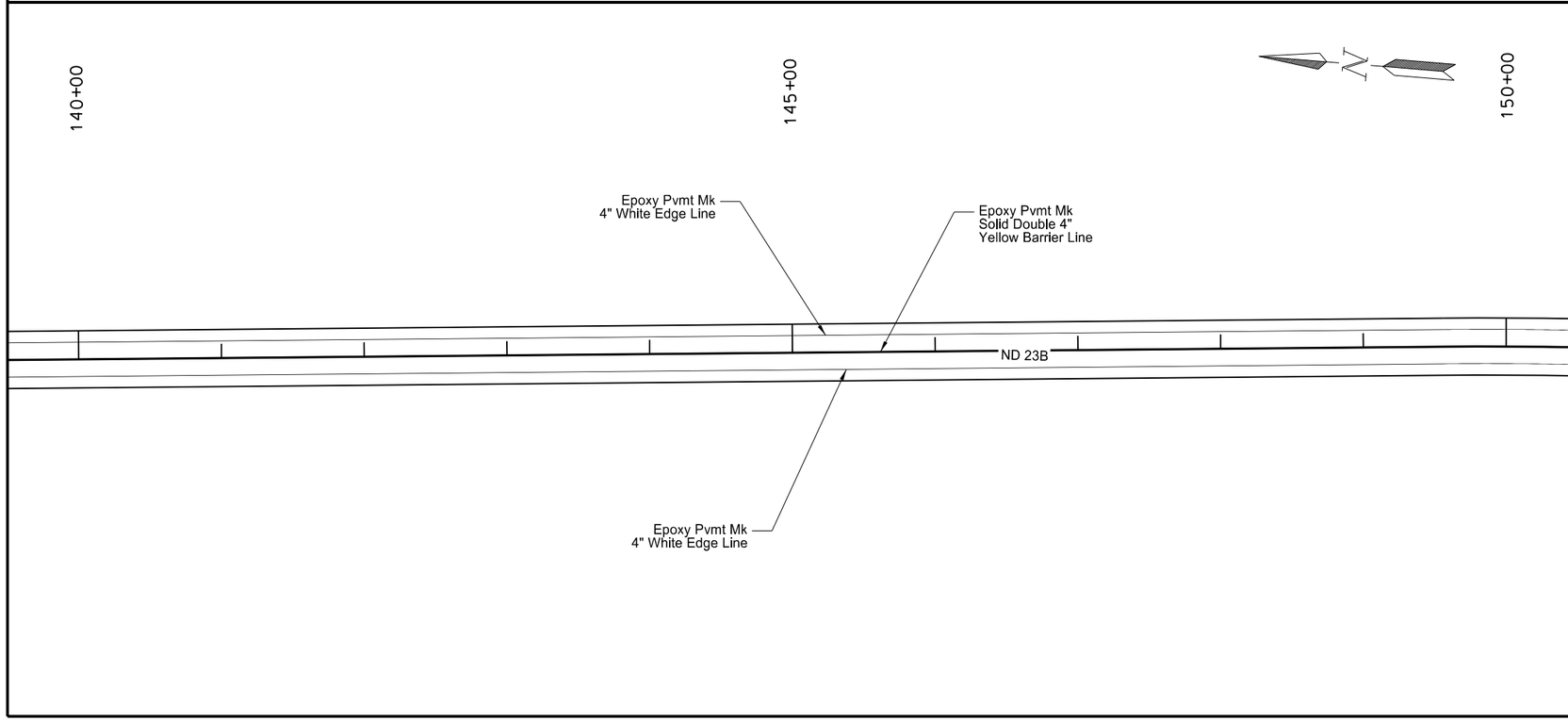
Pavement Marking
Sta 110+00 to 130+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	7





Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk Message				
Sta 130+00 to 150+00	762	112		
White Arrow			48	SF
Epoxy Pvmt Mk 4 In Line				
Sta 130+00 to 150+00	762	113		
4 In White Line			4,000	LF
4 In Yellow Barrier			5,230	LF
Epoxy Pvmt Mk 8 In Line				
Sta 130+00 to 150+00	762	115		
8 In White Line			372	LF

0 50 100
Scale In Feet

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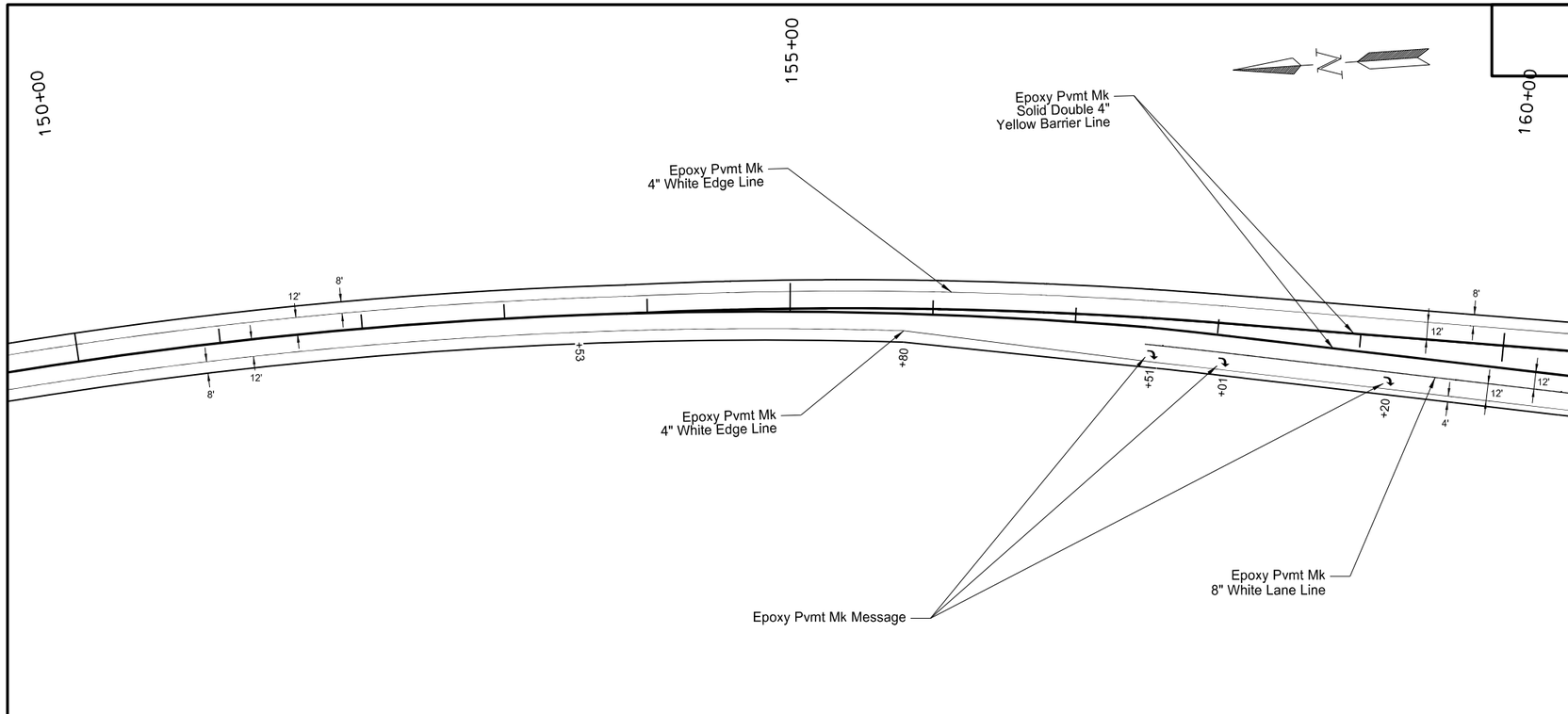
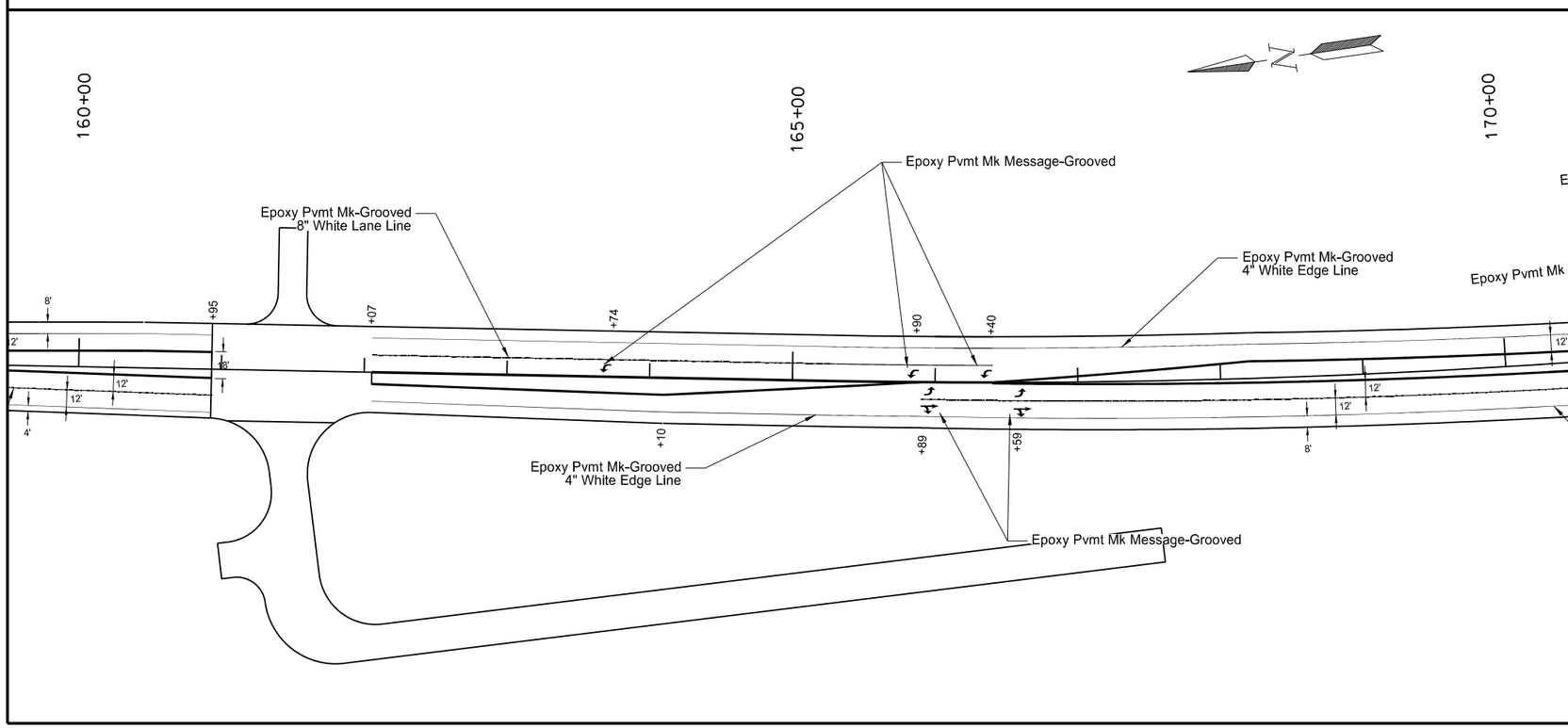
Pavement Marking
Sta 130+00 to 150+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	8





Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk 4 In Line-Grooved				
Sta 160+95 to 170+00	762	110		
4 In White Line			1,590	LF
4 In Yellow Barrier			3,080	LF
Epoxy Pvmt Mk Message				
Sta 150+00 to 160+95	762	112		
White Arrow			48	SF
Epoxy Pvmt Mk 4 In Line				
Sta 150+00 to 160+95	762	113		
4 In White Line			2,190	LF
4 In Yellow Barrier			3,674	LF
Epoxy Pvmt Mk 8 In Line				
Sta 150+00 to 161+95	762	115		
8 In White Line			335	LF
Epoxy Pvmt Mk 8 In Line-Grooved				
Sta 161+50 to 170+00	762	132		
8 In White Line			845	LF
Epoxy Pvmt Mk Message-Grooved				
Sta 161+50 to 170+00	762	136		
White Arrow			116	SF

0 50 100
Scale In Feet

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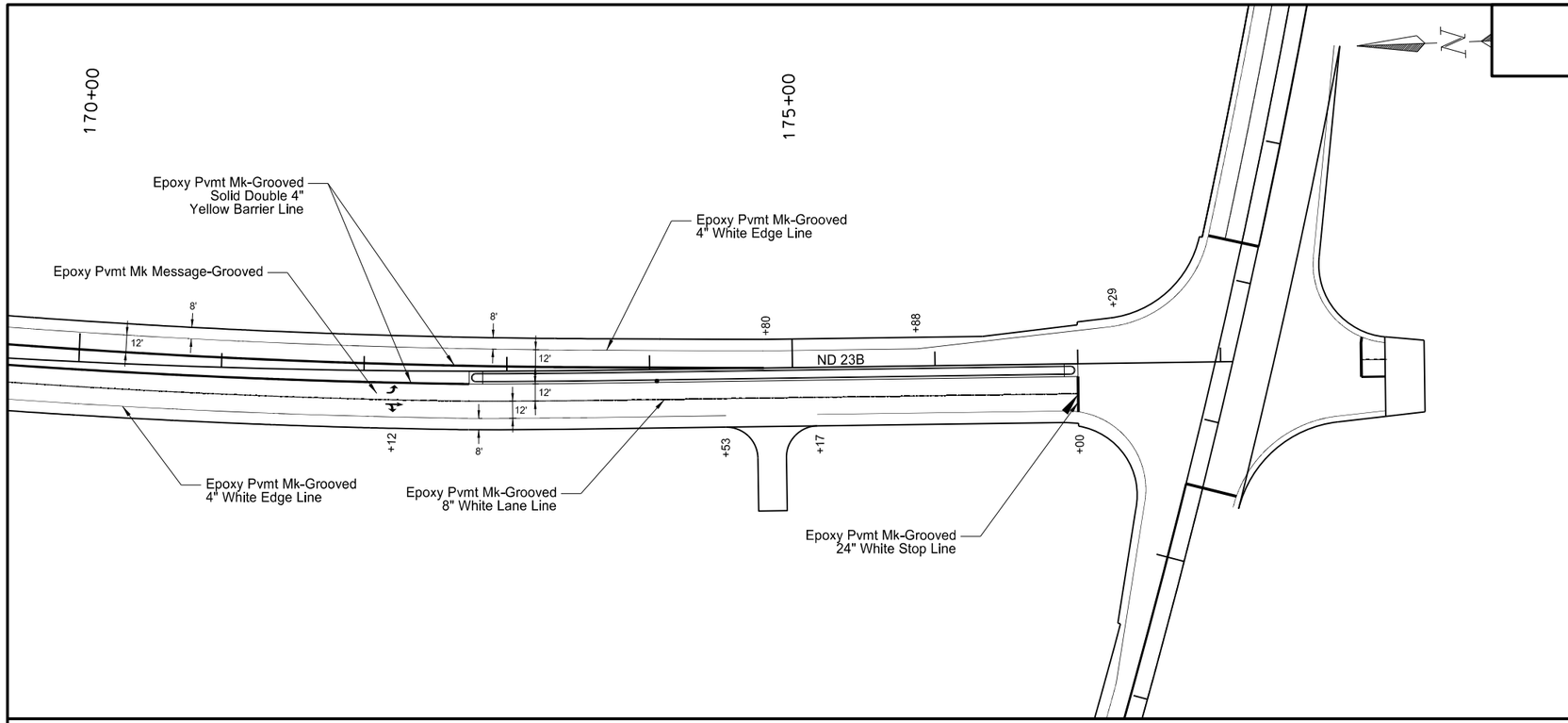
Pavement Marking
Sta 150+00 to 170+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	9



Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk 4 In Line-Grooved				
Sta 170+00 to 178+00	762	110		
4 In White Line			1,358	LF
4 In Yellow Barrier			1,514	LF
Epoxy Pvmt Mk 8 In Line-Grooved				
Sta 170+00 to 178+00	762	132		
8 In White Line			700	LF
Epoxy Pvmt Mk 24 In Line-Grooved				
Sta 170+00 to 178+00	762	135		
8 In White Line			24	LF
Epoxy Pvmt Mk Message-Grooved				
Sta 170+00 to 178+00	762	136		
White Arrow			32	SF
Pvmt Mk Painted Curb Top and Face				
Sta 170+00 to 178+00	762	1140	816	LF

0 50 100
Scale In Feet

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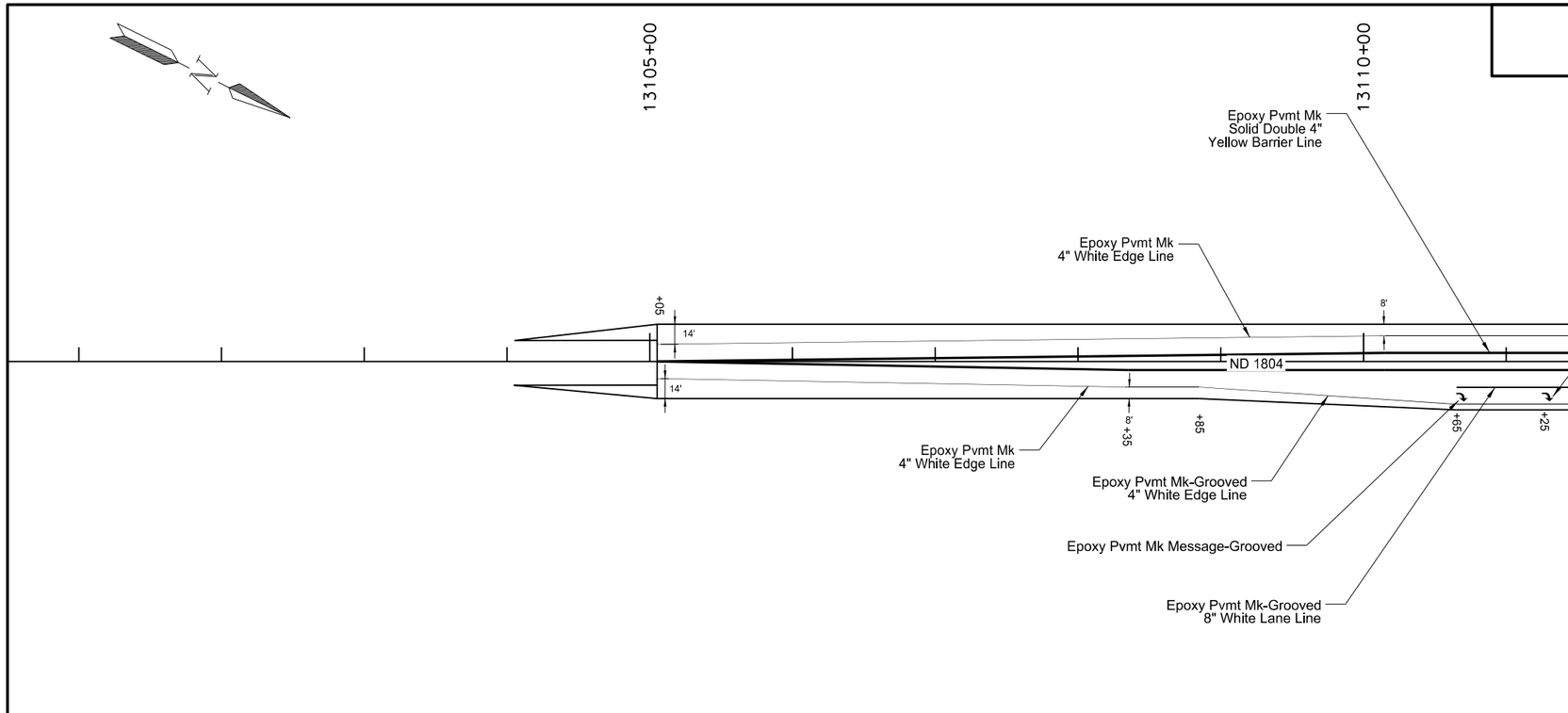
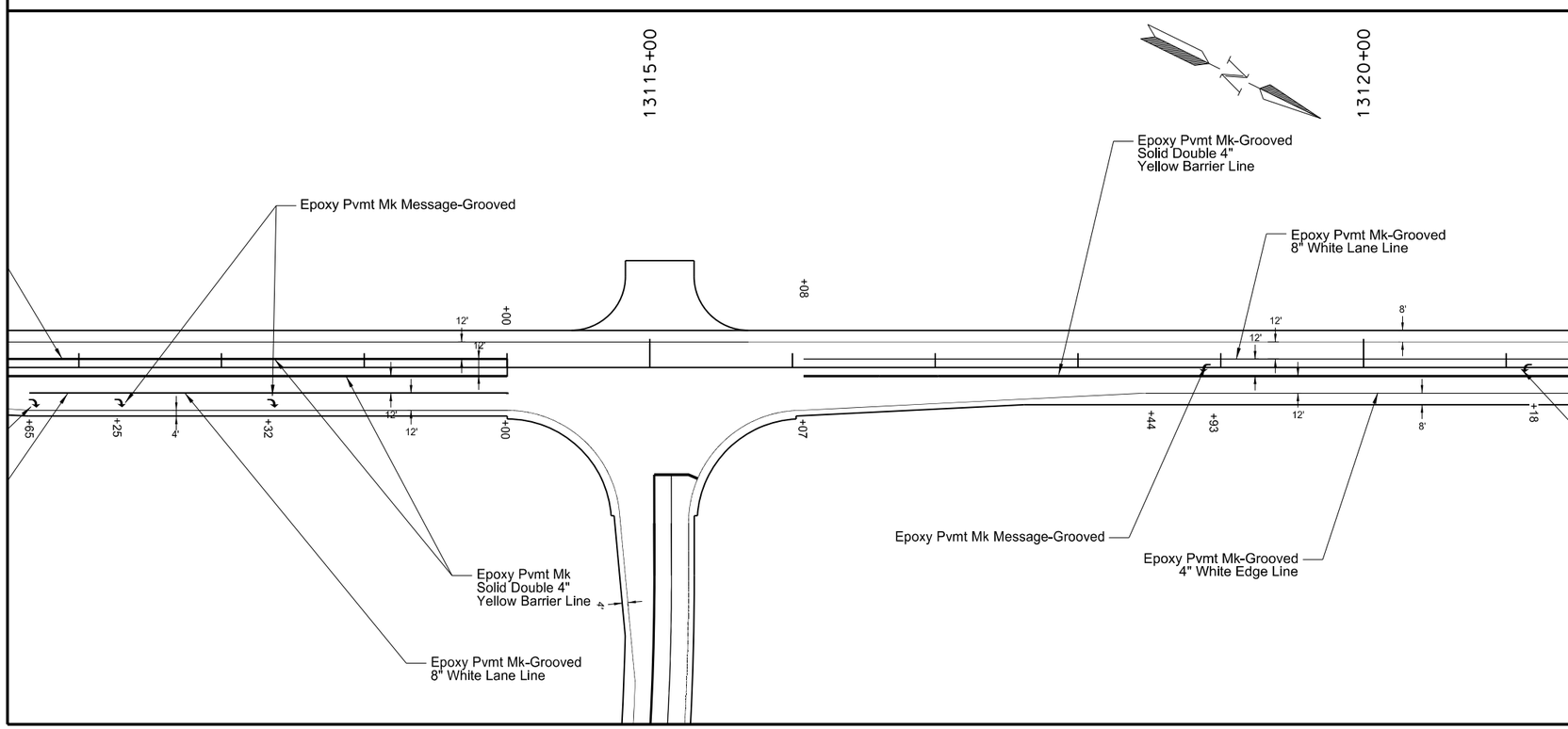
Pavement Marking
Sta 170+00 to Sta 178+00
ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	10





Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk 4 In Line-Grooved				
Sta 13101+00 to 13121+00	762	110		
4 In White Line			1,598	LF
4 In Yellow Barrier			984	LF
Epoxy Pvmt Mk 4 In Line				
Sta 13101+00 to 13121+00	762	113		
4 In White Line			1,555	LF
4 In Yellow Barrier			3,592	LF
Epoxy Pvmt Mk 8 In Line-Grooved				
Sta 13101+00 to 13121+00	762	132		
8 In White Line			693	LF
Epoxy Pvmt Mk Message-Grooved				
Sta 13101+00 to 13121+00	762	136		
White Arrow			64	SF

0 50 100
Scale In Feet

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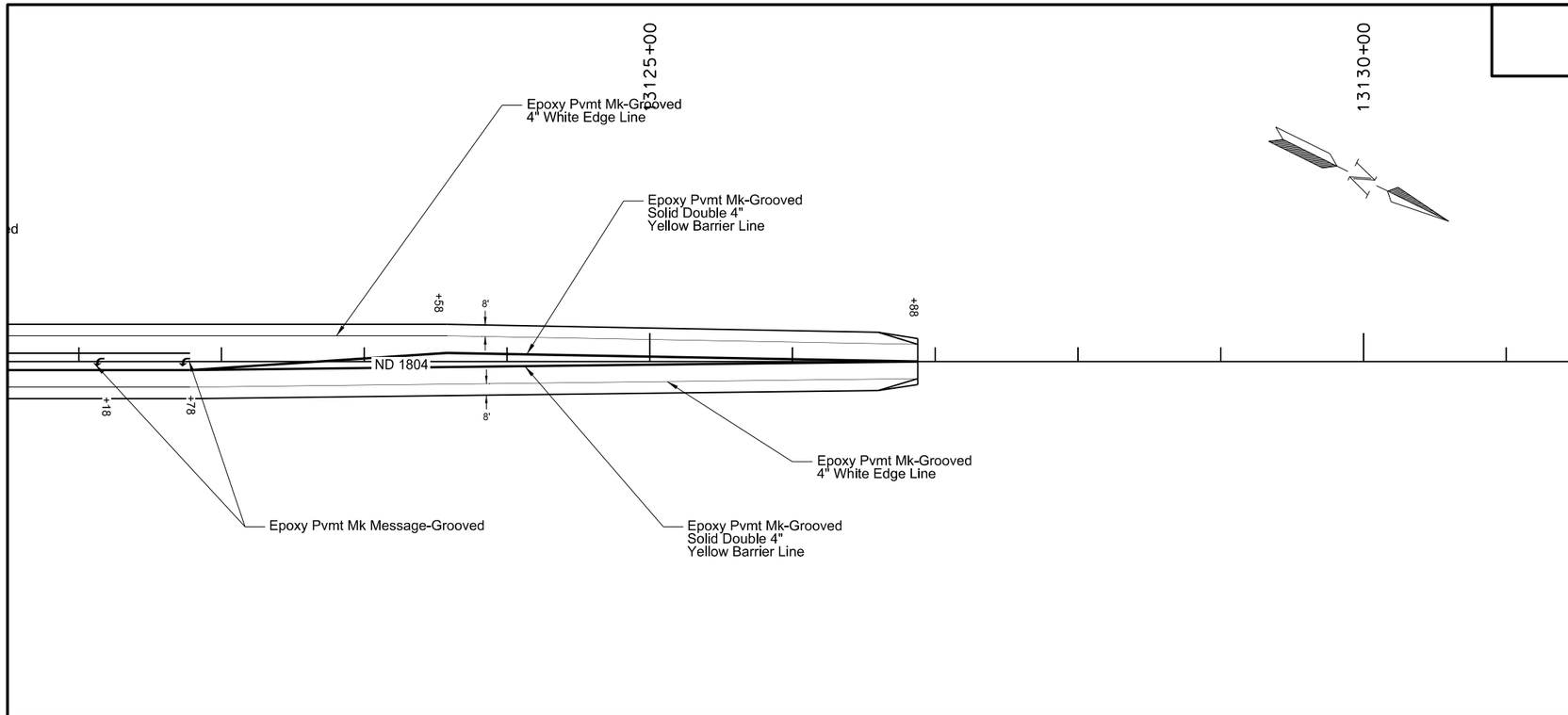
Pavement Marking
Sta 13101+00 to 13121+00
ND 1804
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	11



Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk 4 In Line-Grooved				
Sta 13121+00 to 13131+00	762	110		
4 In White Line			1,176	LF
4 In Yellow Barrier			2,352	LF
Epoxy Pvmt Mk 8 In Line-Grooved				
Sta 13121+00 to 13131+00	762	132		
8 In White Line			77	LF
Epoxy Pvmt Mk Message-Grooved				
Sta 13121+00 to 13131+00	762	136		
White Arrow			32	SF

0 50 100
Scale In Feet

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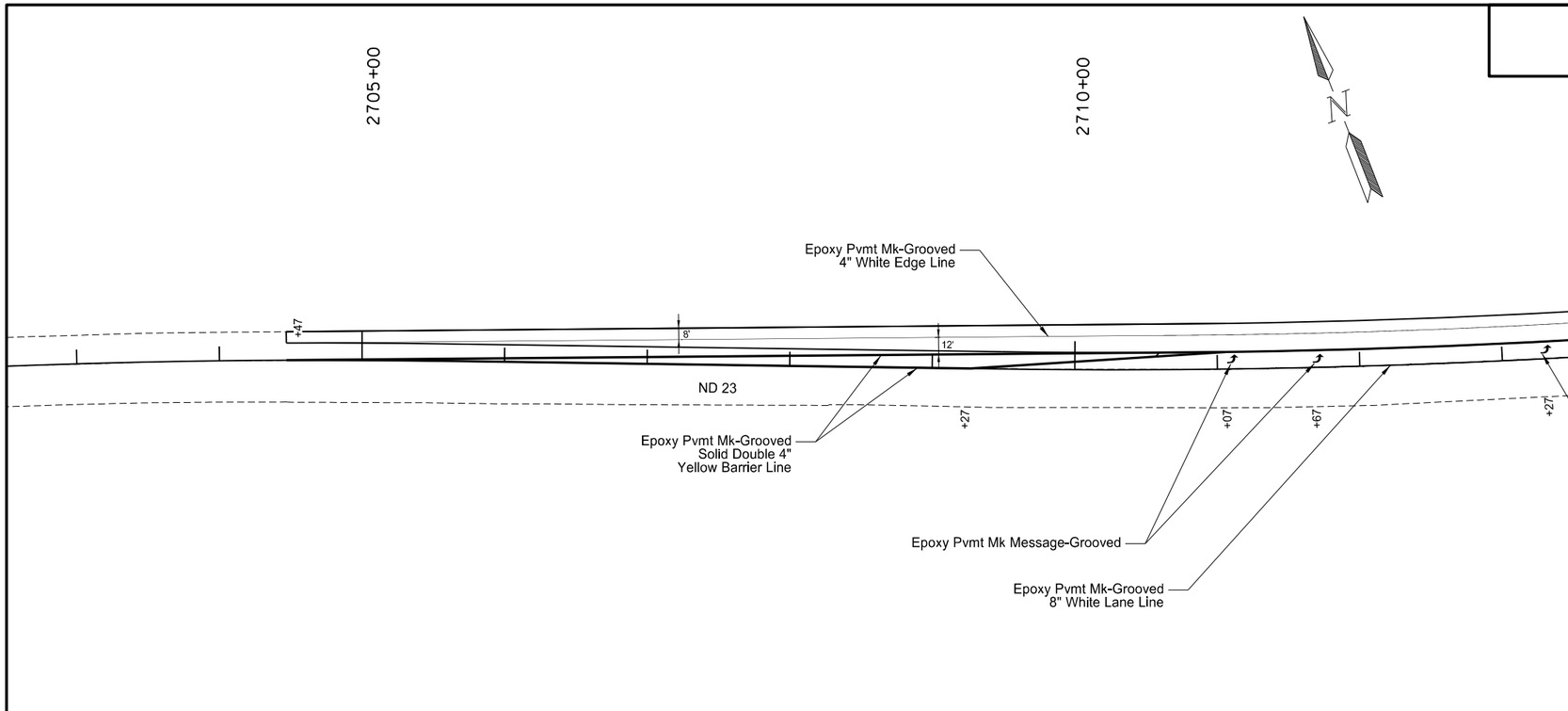
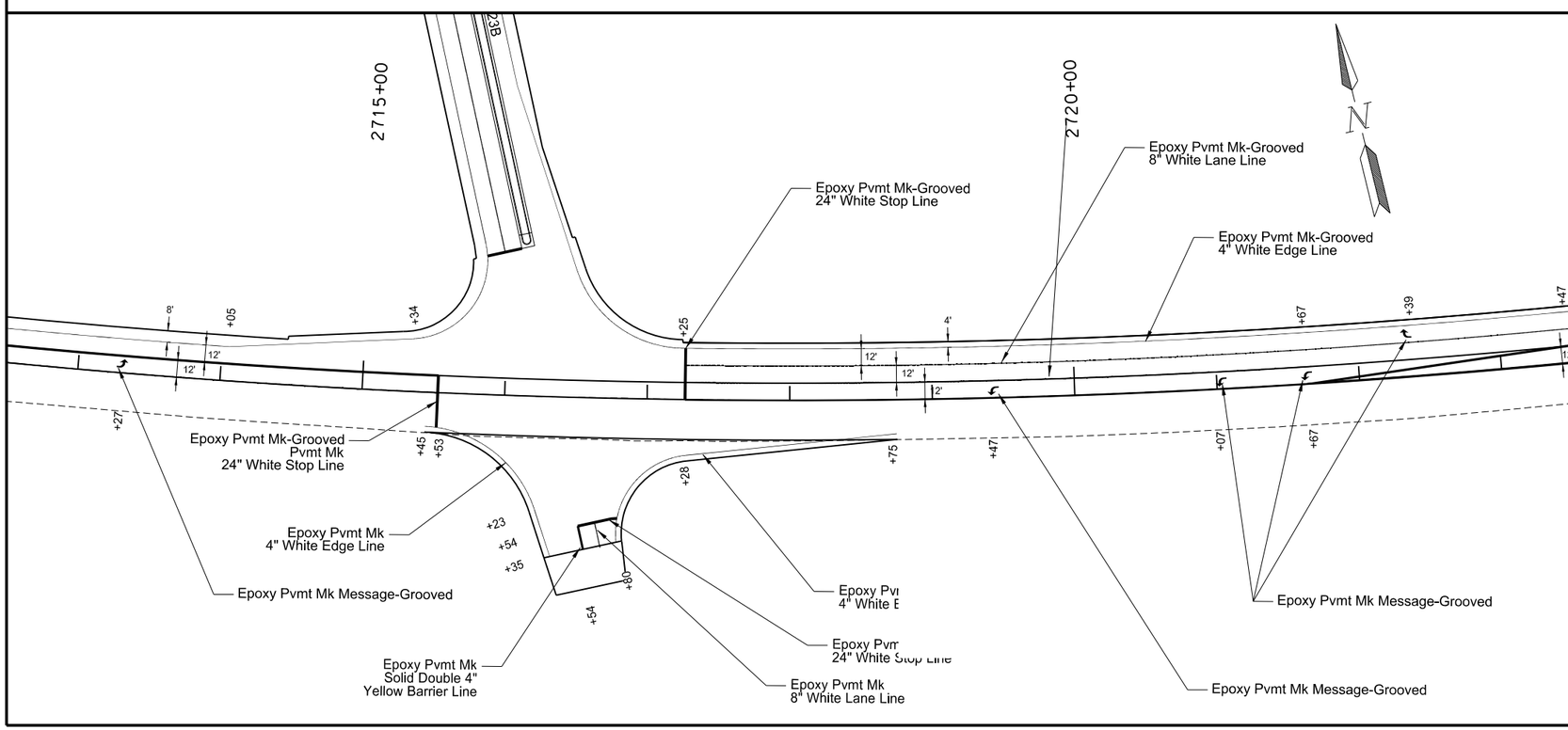
Pavement Marking
Sta 13121+00 to 13131+00
ND 1804
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	12





Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk 4 In Line-Grooved				
Sta 2703+00 to 2723+00	762	110		
4 In White Line			1,828	LF
4 In Yellow Barrier			4,932	LF
Epoxy Pvmt Mk 8 In Line-Grooved				
Sta 2703+00 to 2723+00	762	132		
8 In White Line			2,020	LF
Epoxy Pvmt Mk 24 In Line-Grooved				
Sta 2703+00 to 2723+00	762	135		
8 In White Line			36	LF
Epoxy Pvmt Mk Message-Grooved				
Sta 2703+00 to 2723+00	762	136		
White Arrow			116	SF

0 50 100
Scale In Feet

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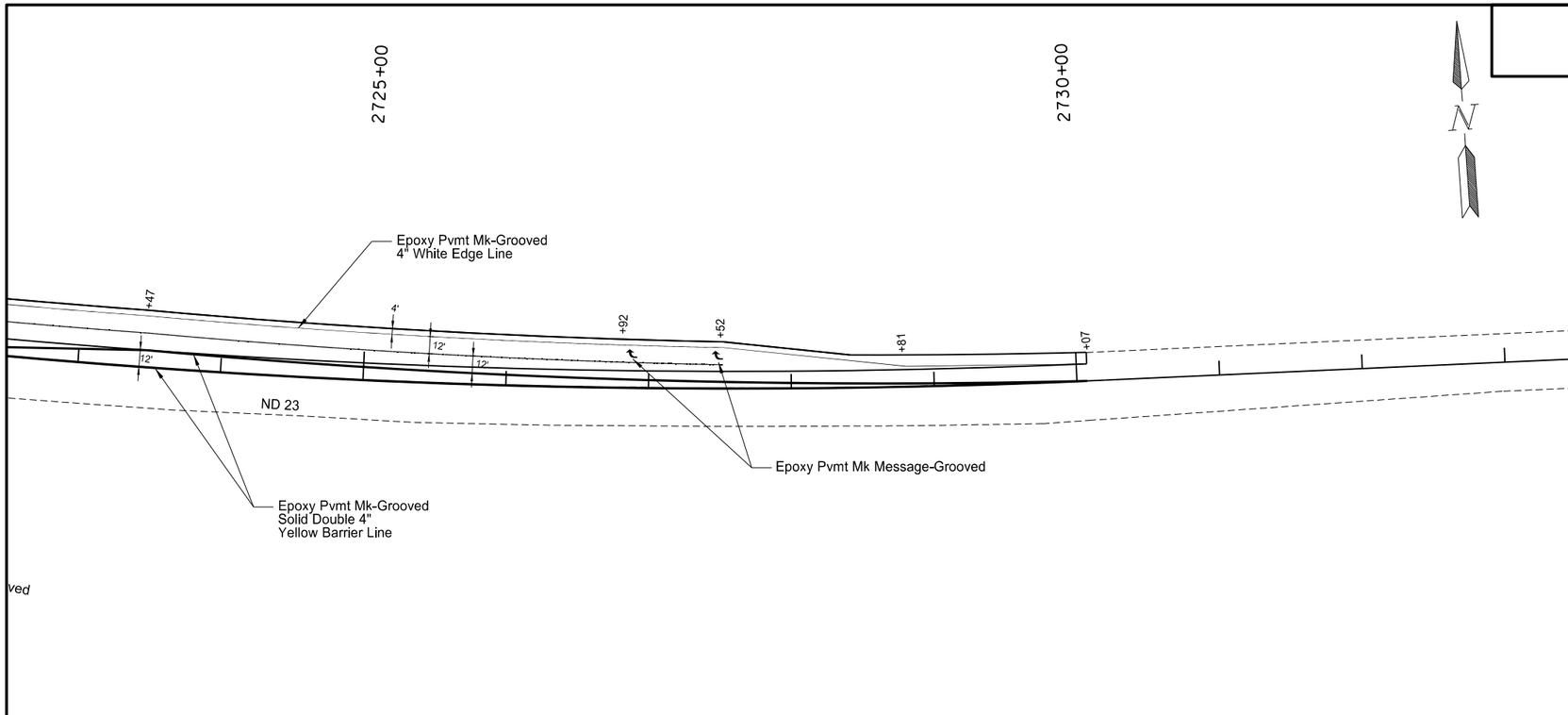
Pavement Marking
Sta 2703+00+00 to 2723+00
ND 23
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	120	13



Description	Spec #	Code #	Qty	Unit
Epoxy Pvmt Mk 4 In Line-Grooved				
Sta 10+00 to 47+50	762	110		
4 In White Line			705	LF
4 In Yellow Barrier			2,820	LF
Epoxy Pvmt Mk 8 In Line-Grooved				
Sta 10+00 to 47+50	762	132		
8 In White Line			450	LF
Epoxy Pvmt Mk Message-Grooved				
Sta 10+00 to 47+50	762	136		
White Arrow			32	SF

0 50 100
Scale In Feet

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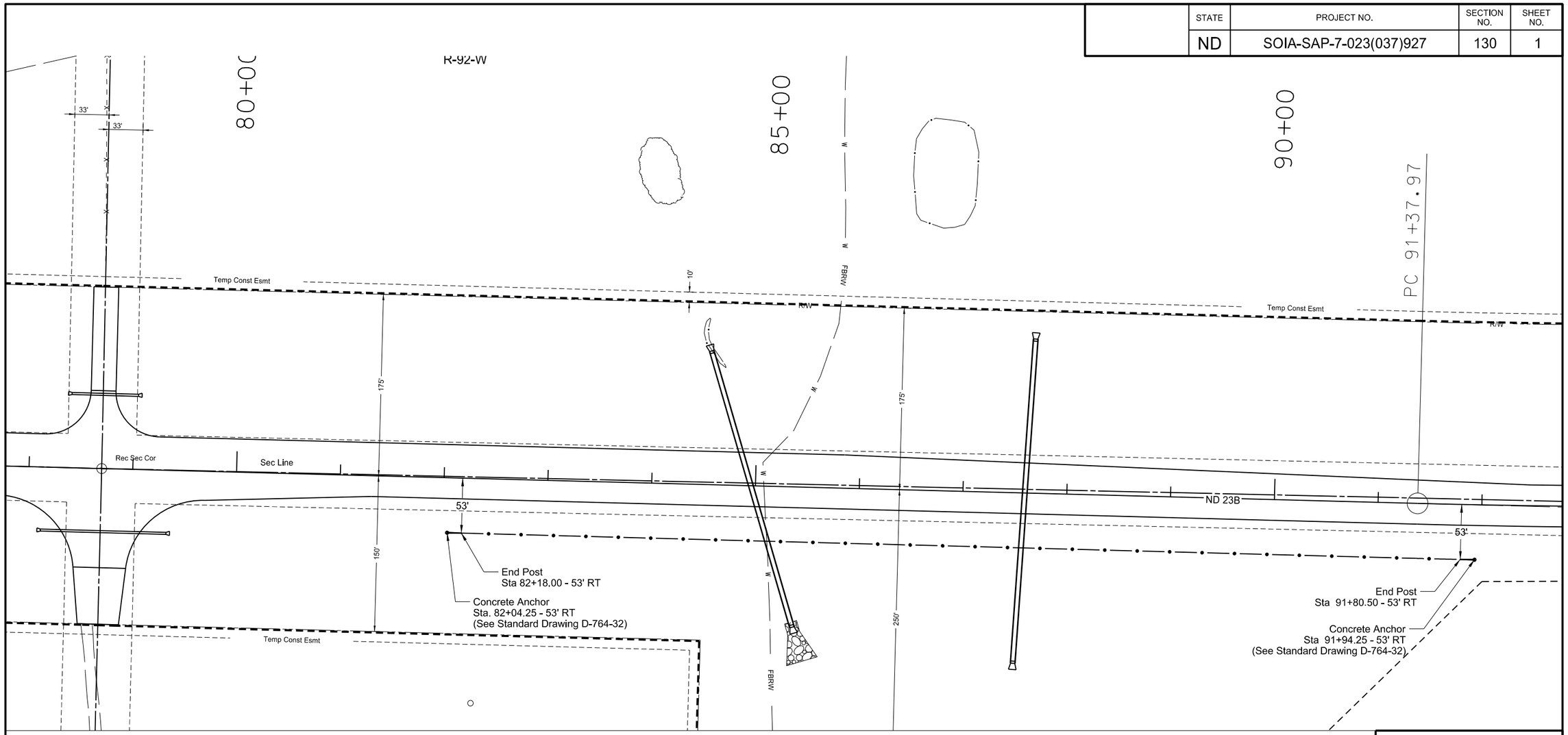
Pavement Marking
Sta 2723+00+00 to 2733+00
ND 23
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	130	1



Three Cable Guardrail Summary of Quantities											
Location	18"x18"x6" Precast Concrete Bearing Block	Line Post	End Post	Cable Splice Assembly	Concrete Anchor	Breakaway Anchor Angle	Steel Turnbuckle Cable End Assembly	5/16" Hook Bolt	3/4" Dia. Steel Cable	Reflectorized Plates	Line Post Plate Washer
	Each	Each	Each	Each	Each	Each	Each	Each	LF	Each	Each
Sta. 82+18.00 to 91+80.50 Rt	2	76	2	NA	2	2	6	234	2958	21	78
Note: These items are not to be bid separately, but shall be included in the price bid for the item "Three Cable Guardrail".											

Three Cable Guardrail	LF
Sta. 82+18.00 to 91+80.50 Rt	962.5

N

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23 USC § 409 Documents
NDDOT Reserves All Objections

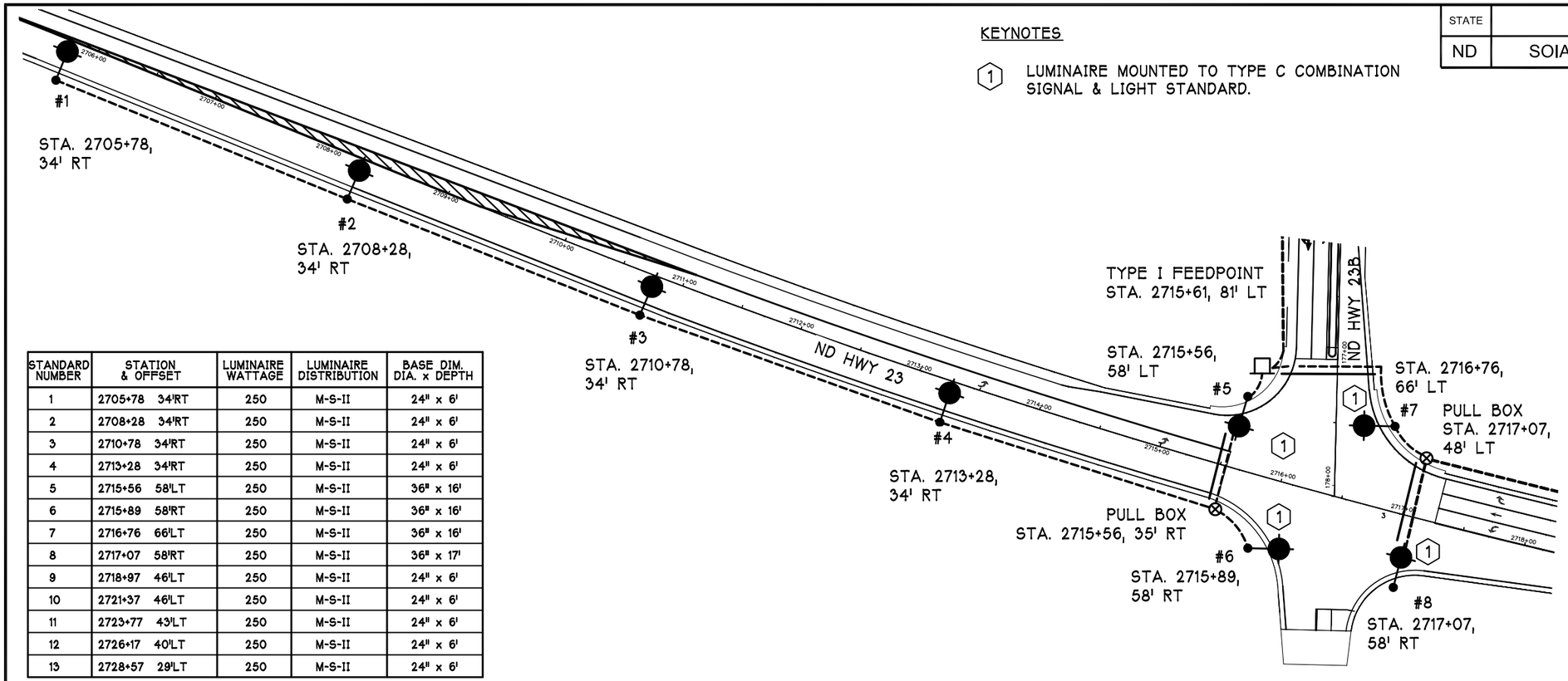
Guardrail Layout

ND 23B
Northeast Truck Reliever Route
New Town, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	140	1

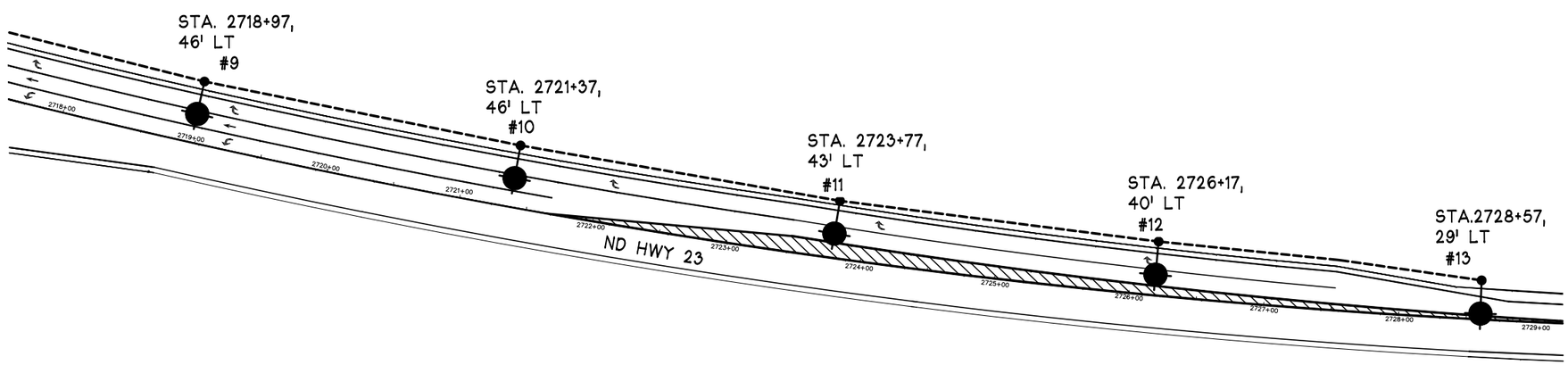
KEYNOTES

1 LUMINAIRE MOUNTED TO TYPE C COMBINATION SIGNAL & LIGHT STANDARD.



STANDARD NUMBER	STATION & OFFSET	LUMINAIRE WATTAGE	LUMINAIRE DISTRIBUTION	BASE DIM. DIA. x DEPTH
1	2705+78 34'RT	250	M-S-II	24" x 6'
2	2708+28 34'RT	250	M-S-II	24" x 6'
3	2710+78 34'RT	250	M-S-II	24" x 6'
4	2713+28 34'RT	250	M-S-II	24" x 6'
5	2715+56 58'LT	250	M-S-II	36" x 16'
6	2715+89 58'RT	250	M-S-II	36" x 16'
7	2716+76 66'LT	250	M-S-II	36" x 16'
8	2717+07 58'RT	250	M-S-II	36" x 17'
9	2718+97 46'LT	250	M-S-II	24" x 6'
10	2721+37 46'LT	250	M-S-II	24" x 6'
11	2723+77 43'LT	250	M-S-II	24" x 6'
12	2726+17 40'LT	250	M-S-II	24" x 6'
13	2728+57 29'LT	250	M-S-II	24" x 6'

STATION & OFFSET	CABLE TRENCH TYPE II	2" DIAMETER RIGID CONDUIT	MULTIPLE UNDERGROUND CABLE 2NO4-1NO6 STYLE USE
2715+61 81'LT TO 2716+55 102'LT TO 2716+76 66'LT	42 LF	94 LF	150 LF
2716+76 66'LT TO 2717+07 48'LT TO 2717+07 58'RT	38 LF	106 LF	164 LF
2717+07 48'LT TO 2718+97 46'LT	190 LF		200 LF
2718+97 46'LT TO 2721+37 46'LT	240 LF		248 LF
2721+37 46'LT TO 2723+77 43'LT	240 LF		248 LF
2723+77 43'LT TO 2726+17 40'LT	240 LF		248 LF
2726+17 40'LT TO 2728+57 29'LT	241 LF		249 LF
2715+61 81'LT TO 2715+56 58'LT	24 LF		38 LF
2715+56 58'LT TO 2715+56 35'RT TO 2715+89 58'RT	42 LF	93 LF	155 LF
2715+59 35'RT TO 2713+28 34'RT	231 LF		241 LF
2713+28 34'RT TO 2710+78 34'RT	250 LF		258 LF
2710+78 34'RT TO 2708+28 34'RT	250 LF		258 LF
2708+28 34'RT TO 2705+78 34'RT	250 LF		258 LF



N

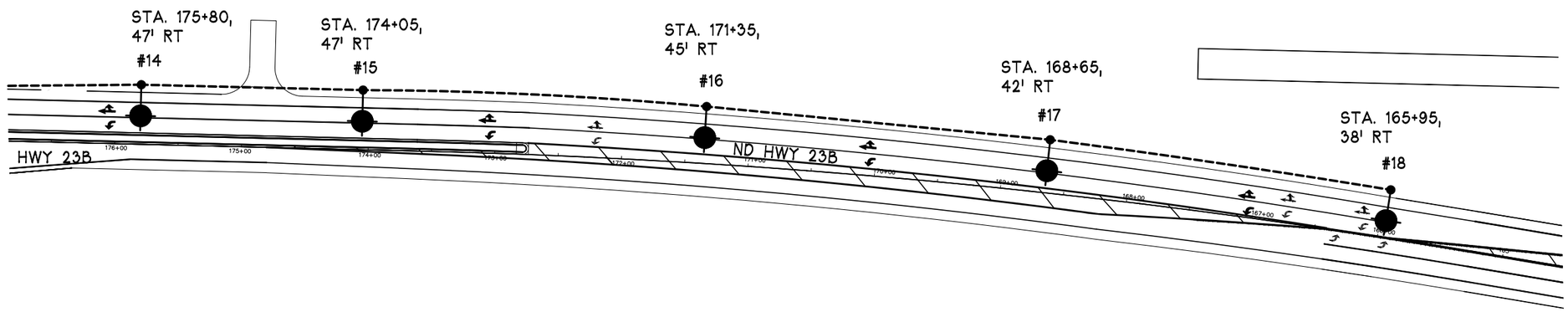
This document was originally issued and sealed by Jason L. Hunze registration number 4879, on October 23, 2013 and is stored at the office of the North Dakota Dept. of Transportation.

SCALE (H): 1" = 100'
SCALE (V): NA

50' 25' 0 50' 100'

Northeast Truck Reliever Route
New Town, North Dakota
LIGHTING PLAN
ND HWY #23 AND ND HWY #23B

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	140	2



STANDARD NUMBER	STATION & OFFSET	LUMINAIRE WATTAGE	LUMINAIRE DISTRIBUTION	BASE DIM. DIA. x DEPTH
14	175+80 47'RT	250	M-S-II	24" x 6'
15	174+05 47'RT	250	M-S-II	24" x 6'
16	171+35 45'RT	250	M-S-II	24" x 6'
17	168+65 42'RT	250	M-S-II	24" x 6'
18	165+95 38'RT	250	M-S-II	24" x 6'

STATION & OFFSET	CABLE TRENCH TYPE II	MULTIPLE UNDERGROUND CABLE 2N04-1N06 STYLE USE
2715+61 81'LT TO 2715+79 84'LT 175+80 47'RT	145 LF	159 LF
175+80 47'RT TO 174+05 47'RT	175 LF	183 LF
174+05 47'RT TO 171+35 45'RT	270 LF	278 LF
171+35 45'RT TO 168+65 42'RT	270 LF	278 LF
168+65 42'RT TO 165+95 38'RT	270 LF	278 LF

QUANTITIES INCLUDED IN BID ITEM "LIGHTING SYSTEM"	
CONCRETE FOUNDATION-HIGHWAY LIGHTING	14 EA
CONCRETE FOUNDATION-FEEDPOINT-TYPE B	1 EA
CABLE TRENCH-TYPE II	3408 LF
2" DIAMETER RIGID CONDUIT	293 LF
MULTIPLE UNDERGROUND CABLE 2N04-1N06 STYLE USE	3891 LF
FEED POINT-TYPE I-PAD MOUNTED	1 EA
LT STD 12FT MA 40FT MT HT BREAKAWAY	14 EA
HP SODIUM VAPOR LUMINAIRE-250 WATT	18 EA

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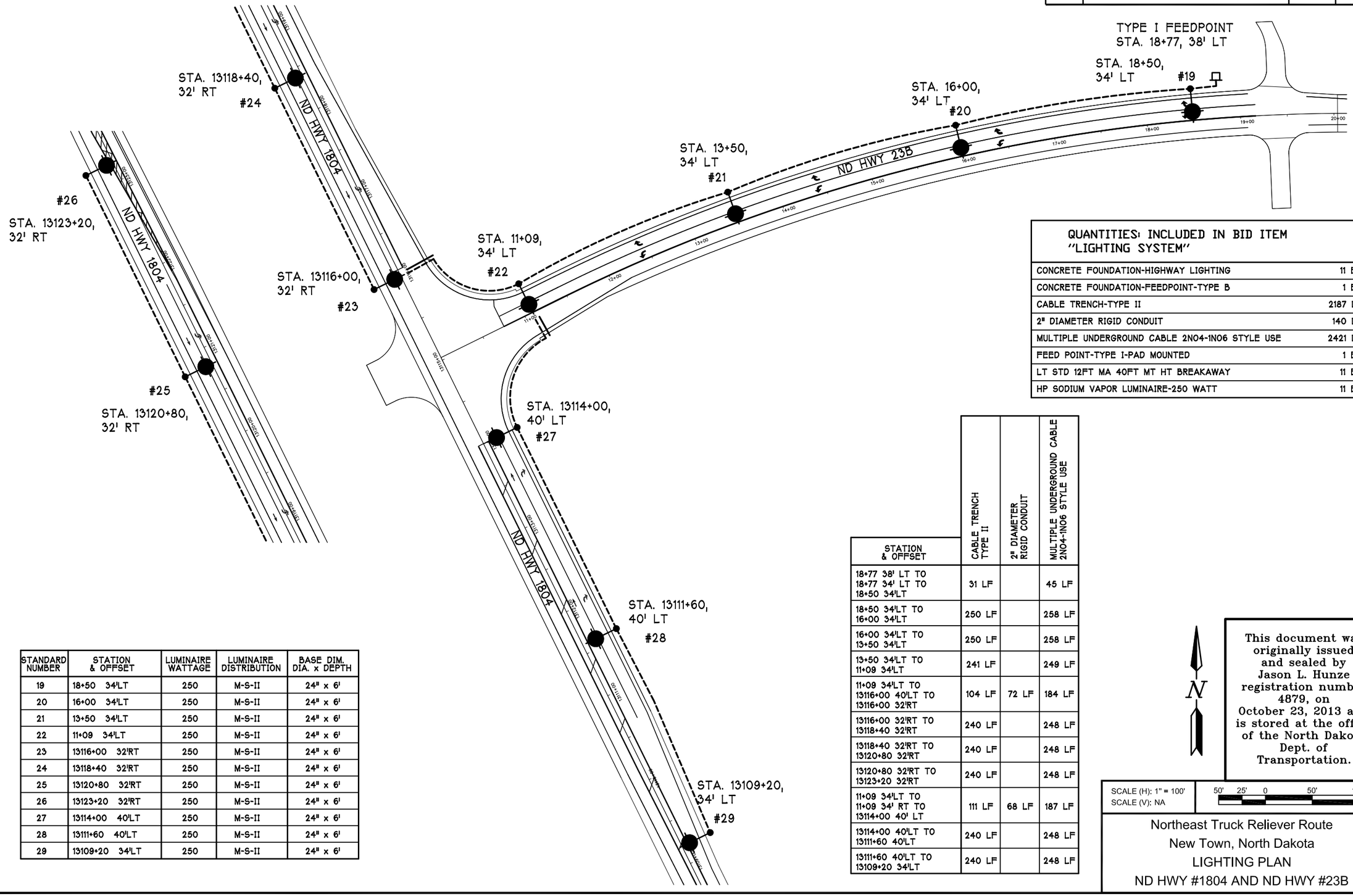
Northeast Truck Reliever Route
New Town, North Dakota
LIGHTING PLAN
ND HWY #23 AND ND HWY #23B

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	140	3



QUANTITIES INCLUDED IN BID ITEM "LIGHTING SYSTEM"	
CONCRETE FOUNDATION-HIGHWAY LIGHTING	11 EA
CONCRETE FOUNDATION-FEEDPOINT-TYPE B	1 EA
CABLE TRENCH-TYPE II	2187 LF
2" DIAMETER RIGID CONDUIT	140 LF
MULTIPLE UNDERGROUND CABLE 2N04-1N06 STYLE USE	2421 LF
FEED POINT-TYPE I-PAD MOUNTED	1 EA
LT STD 12FT MA 40FT MT HT BREAKAWAY	11 EA
HP SODIUM VAPOR LUMINAIRE-250 WATT	11 EA

STANDARD NUMBER	STATION & OFFSET	LUMINAIRE WATTAGE	LUMINAIRE DISTRIBUTION	BASE DIM. DIA. x DEPTH
19	18+50 34'LT	250	M-S-II	24" x 6'
20	16+00 34'LT	250	M-S-II	24" x 6'
21	13+50 34'LT	250	M-S-II	24" x 6'
22	11+09 34'LT	250	M-S-II	24" x 6'
23	13116+00 32'RT	250	M-S-II	24" x 6'
24	13118+40 32'RT	250	M-S-II	24" x 6'
25	13120+80 32'RT	250	M-S-II	24" x 6'
26	13123+20 32'RT	250	M-S-II	24" x 6'
27	13114+00 40'LT	250	M-S-II	24" x 6'
28	13111+60 40'LT	250	M-S-II	24" x 6'
29	13109+20 34'LT	250	M-S-II	24" x 6'

STATION & OFFSET	CABLE TRENCH TYPE II	2" DIAMETER RIGID CONDUIT	MULTIPLE UNDERGROUND CABLE 2N04-1N06 STYLE USE
18+77 38' LT TO 18+77 34' LT TO 18+50 34'LT	31 LF		45 LF
18+50 34'LT TO 16+00 34'LT	250 LF		258 LF
16+00 34'LT TO 13+50 34'LT	250 LF		258 LF
13+50 34'LT TO 11+09 34'LT	241 LF		249 LF
11+09 34'LT TO 13116+00 40'LT TO 13116+00 32'RT	104 LF	72 LF	184 LF
13116+00 32'RT TO 13118+40 32'RT	240 LF		248 LF
13118+40 32'RT TO 13120+80 32'RT	240 LF		248 LF
13120+80 32'RT TO 13123+20 32'RT	240 LF		248 LF
11+09 34'LT TO 11+09 34' RT TO 13114+00 40' LT	111 LF	68 LF	187 LF
13114+00 40'LT TO 13111+60 40'LT	240 LF		248 LF
13111+60 40'LT TO 13109+20 34'LT	240 LF		248 LF

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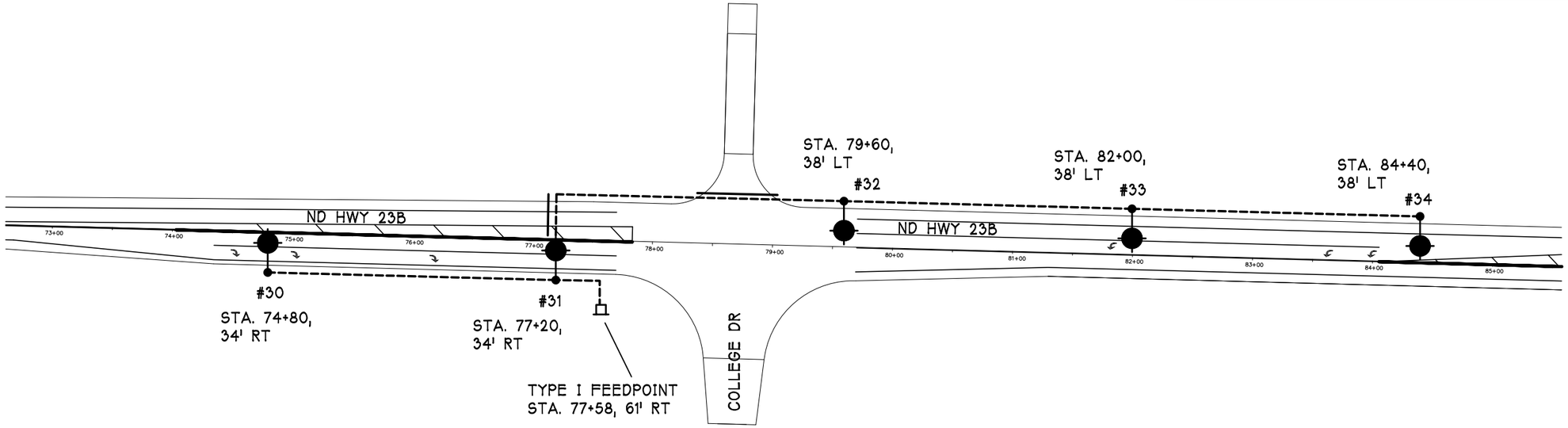
SCALE (V): NA

50' 25' 0 50' 100'

Northeast Truck Reliever Route
New Town, North Dakota
LIGHTING PLAN
ND HWY #1804 AND ND HWY #23B

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	140	4



STATION & OFFSET	CABLE TRENCH TYPE II	2" DIAMETER RIGID CONDUIT	MULTIPLE UNDERGROUND CABLE 2NO4-1NO6 STYLE USE
77+58 61' RT TO 77+58 34' RT TO 77+20 34'RT	65 LF		79 LF
77+20 34'RT TO 74+80 34'RT	240 LF		248 LF
77+20 34'RT TO 77+20 38'LT TO 78+36 38'LT TO 79+03 38'LT TO 79+60 38'LT	173 LF	139 LF	320 LF
79+60 38'LT TO 82+00 38'LT	240 LF		248 LF
82+00 38'LT TO 84+40 38'LT	240 LF		248 LF

STANDARD NUMBER	STATION & OFFSET	LUMINAIRE WATTAGE	LUMINAIRE DISTRIBUTION	BASE DIM. DIA. x DEPTH
30	74+80 34'RT	250	M-S-II	24" x 6'
31	77+20 34'RT	250	M-S-II	24" x 6'
32	79+60 38'LT	250	M-S-II	24" x 6'
33	82+00 38'LT	250	M-S-II	24" x 6'
34	84+40 38'LT	250	M-S-II	24" x 6'

QUANTITIES: INCLUDED IN BID ITEM "LIGHTING SYSTEM A"	
CONCRETE FOUNDATION-HIGHWAY LIGHTING	5 EA
CONCRETE FOUNDATION-FEEDPOINT-TYPE B	1 EA
CABLE TRENCH-TYPE II	958 LF
2" DIAMETER RIGID CONDUIT	139 LF
MULTIPLE UNDERGROUND CABLE 2NO4-1NO6 STYLE USE	1143 LF
FEED POINT-TYPE I-PAD MOUNTED	1 EA
LT STD 12FT MA 40FT MT HT BREAKAWAY	5 EA
HP SODIUM VAPOR LUMINAIRE-250 WATT	5 EA

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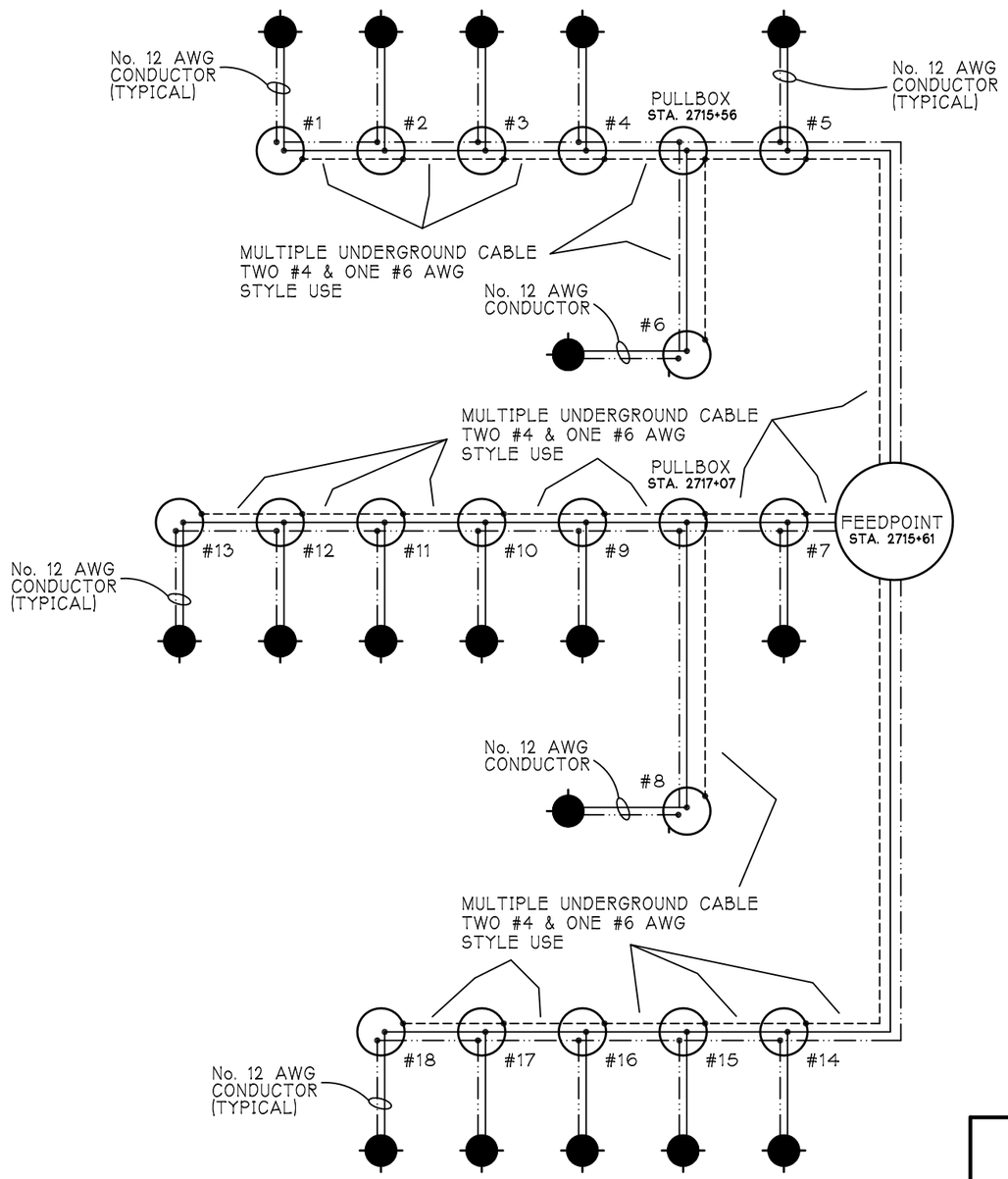
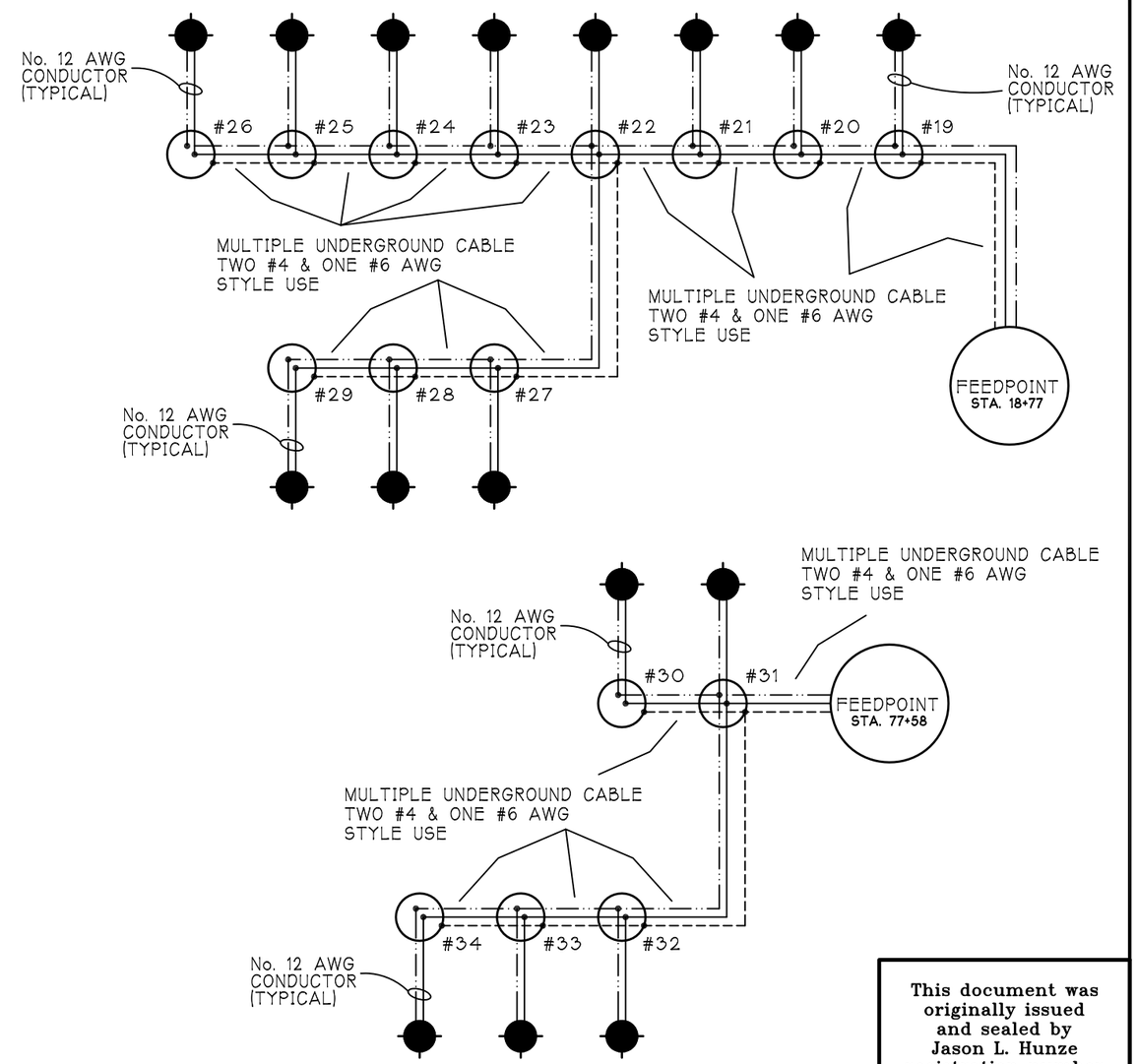
SCALE (V): NA

50' 25' 0 50' 100'

Northeast Truck Reliever Route
New Town, North Dakota
LIGHTING PLAN
COLLEGE DRIVE AND ND HWY #23B

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	140	5





SCHEMATIC LEGEND

LIGHT STANDARD

LIGHTING CIRCUIT PHASE "A" CONDUCTOR

LIGHTING CIRCUIT PHASE "B" CONDUCTOR

GROUND CONDUCTOR

LUMINAIRES ARE 120V x 240V OPERATING AT 240 VOLTS

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SCALE (H): NA
SCALE (V): NA

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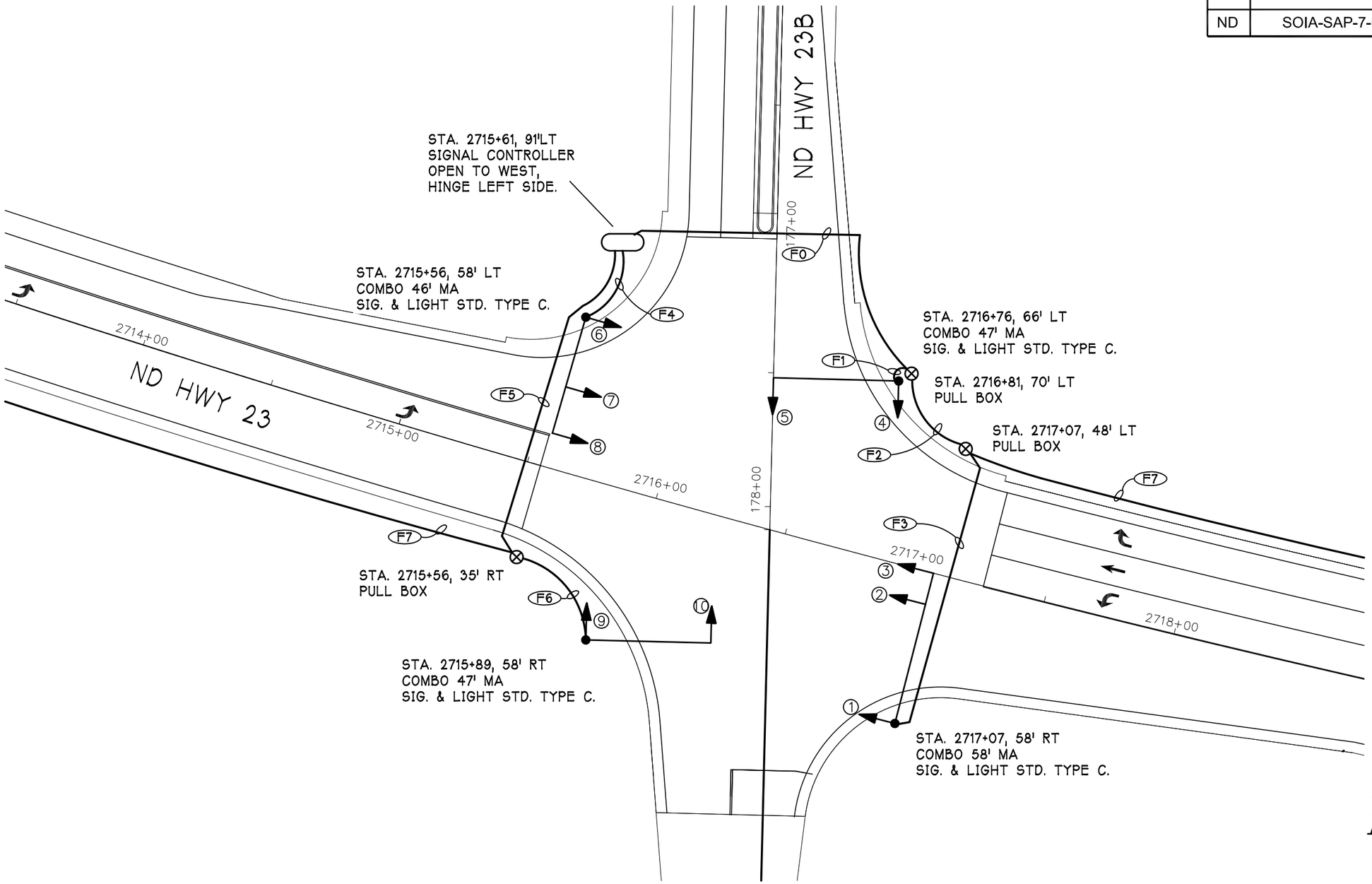
Northeast Truck Reliever Route
New Town, North Dakota
LIGHTING SCHEMATICS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	150	1



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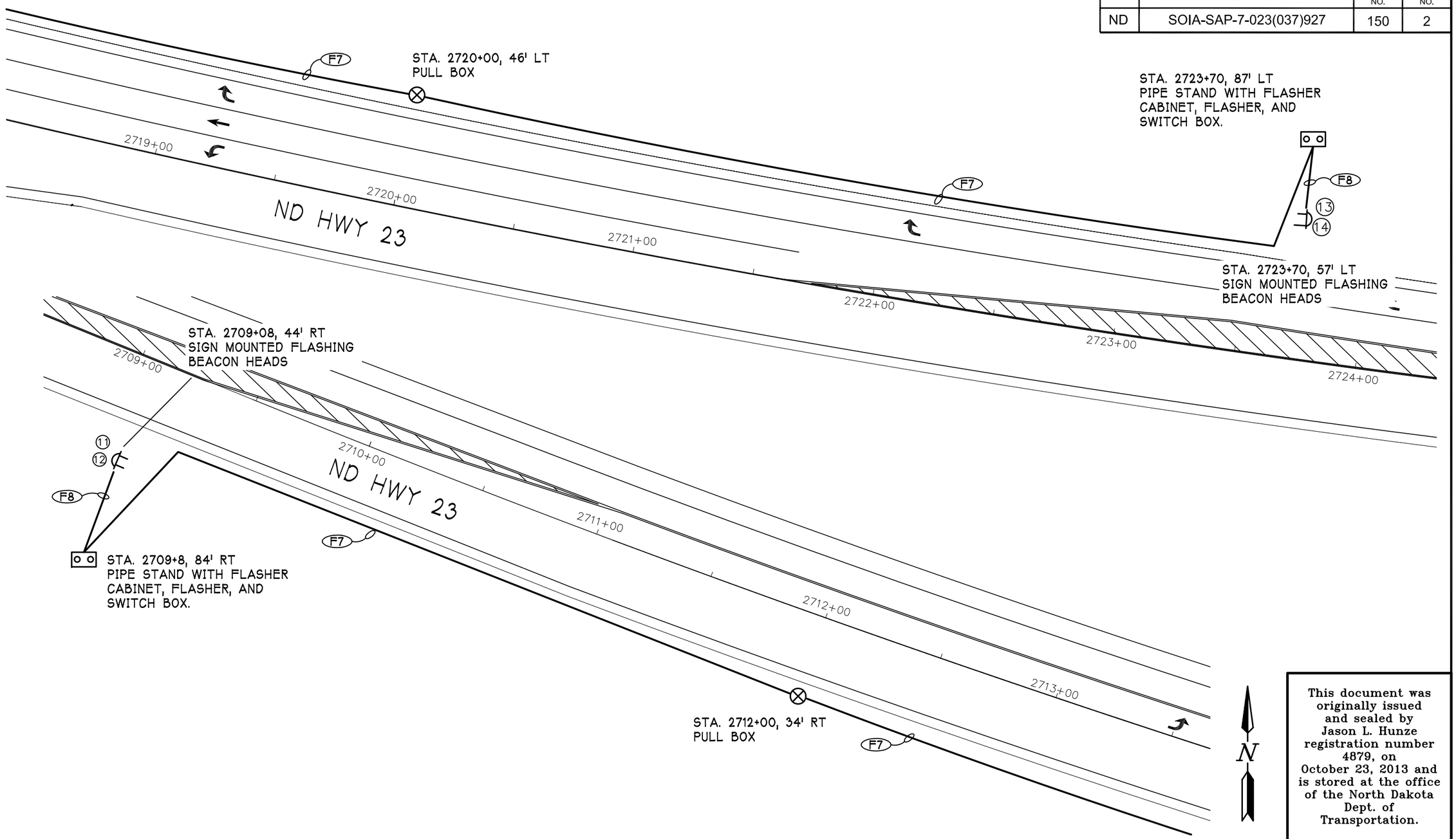
SCALE (H): 1" = 40'
SCALE (V): NA

20' 10' 0 20' 40'

Northeast Truck Reliever Route
New Town, North Dakota
TRAFFIC SIGNAL PLAN

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	150	2



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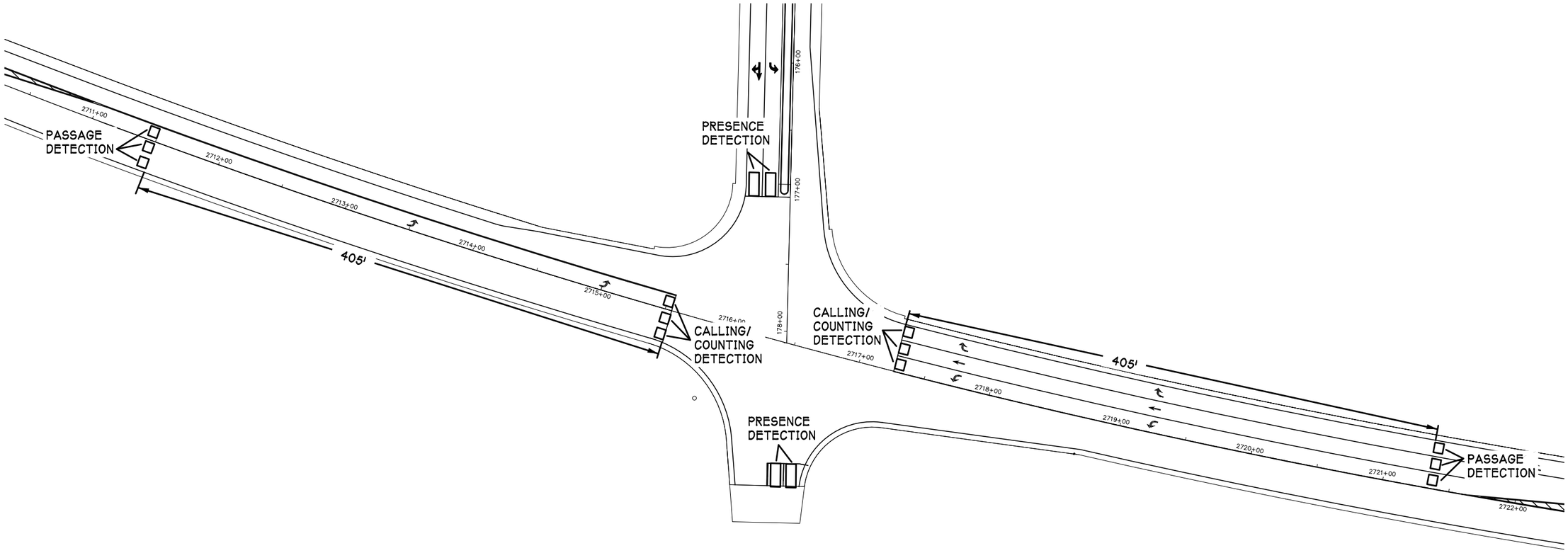
SCALE (H): 1" = 40'
SCALE (V): NA

20' 10' 0 20' 40'

Northeast Truck Reliever Route
New Town, North Dakota
FLASHING BEACONS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	150	3



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SCALE (H): 1" = 80'
SCALE (V): NA

40' 20' 0 40' 80'

Northeast Truck Reliever Route
New Town, North Dakota
VIDEO DETECTION ZONE LAYOUT

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	150	4

SIGNAL CABLE CONDUCTOR SCHEDULE

CONDUCTORS			CABLE NO.1		CABLE NO.2		CABLE NO.3		CABLE NO.4	
NO.	COLOR	TRACER	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION	HEAD	INDICATION
1	BLACK			SPARE		SPARE		SPARE		SPARE
2	WHITE		4, 5	NEUTRAL	1, 2, 3	NEUTRAL	6, 7, 8	NEUTRAL	9, 10	NEUTRAL
3	RED		4, 5	RED	1, 2, 3	RED	6, 7, 8	RED	9, 10	RED
4	GREEN			GROUND		GROUND		GROUND		GROUND
5	ORANGE		4, 5	YELLOW	1, 2, 3	YELLOW	6, 7, 8	YELLOW	9, 10	YELLOW
6	BLUE		4, 5	GREEN	1, 2, 3	GREEN	6, 7, 8	GREEN	9, 10	GREEN
7	WHITE	BLACK		SPARE		SPARE		SPARE		SPARE
8	RED	BLACK		SPARE		SPARE		SPARE		SPARE
9	GREEN	BLACK		SPARE		SPARE		SPARE		SPARE
10	ORANGE	BLACK		SPARE		SPARE		SPARE		SPARE
11	BLUE	BLACK		SPARE		SPARE		SPARE		SPARE
12	BLACK	WHITE		SPARE		SPARE		SPARE		SPARE

SIGNAL CABLE CONDUCTOR SCHEDULE

CONDUCTORS			CABLE NO.5		CABLE NO.6	
NO.	COLOR	TRACER	HEAD	INDICATION	HEAD	INDICATION
1	BLACK		11	YELLOW	13	YELLOW
2	WHITE		11, 12	NEUTRAL	13, 14	NEUTRAL
3	RED		12	YELLOW	14	YELLOW
4	GREEN			GROUND		GROUND
5	ORANGE			SPARE		SPARE

CABLE RUN DESIGNATION	CABLE RUN DESCRIPTION	STATION & OFFSET	2" DIAMETER RIGID CONDUIT	3" DIAMETER RIGID CONDUIT	CABLE NO. 1 NO12 AWG 12 CONDUCTOR CABLE	CABLE NO. 2 NO12 AWG 12 CONDUCTOR CABLE	CABLE NO. 3 NO12 AWG 12 CONDUCTOR CABLE	CABLE NO. 4 NO12 AWG 12 CONDUCTOR CABLE	CABLE NO. 5 NO12 AWG 5 CONDUCTOR CABLE	CABLE NO. 6 NO12 AWG 5 CONDUCTOR CABLE	VIDEO DETECTION CABLE (AS REQUIRED BY MANUFACTURER)	FLASHER CONTROL CABLE NO12 AWG 2 CONDUCTOR CABLE	FLASHER POWER CONDUCTORS (3) UNDERGROUND COND. NO6-TYPE RHW
F0	CONTROLLER TO NNE PULL BOX	2715+61 91'LT TO 2716+51 112'LT 2716+81 70'LT		144 LF	156 LF	156 LF					312 LF	156 LF	468 LF
F1	NNE PULL BOX TO NE SIGNAL	2716+81 70'LT TO 2716+76 66'LT		5 LF	75 LF						63 LF		
F2	NNE PULL BOX TO NE PULL BOX	2716+81 70'LT TO 2717+07 48'LT		37 LF		43 LF					43 LF	43 LF	129 LF
F3	NE PULL BOX TO SE SIGNAL	2716+07 48'LT 2717+07 58'RT		106 LF		190 LF					164 LF		
F4	CONTROLLER TO NW SIGNAL	2715+61 91'LT TO 2715+56 58'LT		34 LF			112 LF				98 LF		
F5	CONTROLLER TO SW PULL BOX	2715+61 91'LT TO 2715+56 56'LT TO 2715+56 35'RT		129 LF				141 LF			141 LF	141 LF	423 LF
F6	SW PULL BOX TO SW SIGNAL	2715+56 35'RT TO 2715+89 58'RT		42 LF				115 LF			100 LF		
F7	SW PULL BOX TO W FLSHNG CABINET	2715+56 35'RT TO 2712+00 34'RT TO 2709+08 34'RT TO 2709+08 84'RT	698 LF									722 LF	2166 LF
F8	W FLSHNG CAB. TO W FLSHNG BEACON	2709+08 84'RT TO 2709+08 44'RT	40 LF						70 LF				
F7	NE PULL BOX TO E FLSHNG CABINET	2717+07 48'LT TO 2720+00 46'LT TO 2723+70 46'LT TO 2723+70 87'LT	663 LF									687 LF	2061 LF
F8	E FLSHNG CAB. TO E FLSHNG BEACON	2723+70 87'LT TO 2723+70 57'LT	30 LF							60 LF			

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SCALE (H): NA
SCALE (V): NA

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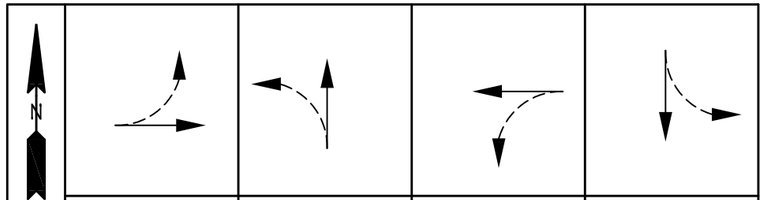
Northeast Truck Reliever Route
New Town, North Dakota
CABLE RUNS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	150	5



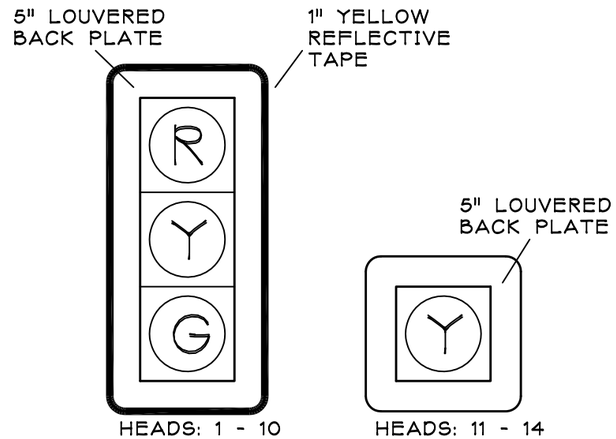
HEAD NO.	PHASE 2 R/W	PHASE 2 CLEAR TO ø 4	PHASE 2 CLEAR TO ø 6	PHASE 2 CLEAR TO ø 8	PHASE 4 R/W	PHASE 4 CLEAR TO ø 6	PHASE 4 CLEAR TO ø 8	PHASE 4 CLEAR TO ø 2	PHASE 6 R/W	PHASE 6 CLEAR TO ø 8	PHASE 6 CLEAR TO ø 2	PHASE 6 CLEAR TO ø 4	PHASE 8 R/W	PHASE 8 CLEAR TO ø 2	PHASE 8 CLEAR TO ø 4	PHASE 8 CLEAR TO ø 6
1	G	Y	G	Y												
2	G	Y	G	Y												
3	G	Y	G	Y												
4					G	Y	G	Y								
5					G	Y	G	Y								
6									G	Y	G	Y				
7									G	Y	G	Y				
8									G	Y	G	Y				
9													G	Y	G	Y
10													G	Y	G	Y

BLANK SQUARES DENOTE A RED INDICATION

◄ ——— PROTECTED MOVEMENT

◄ – – – – PERMITTED MOVEMENT

CHART A	
ON PHASE	NON-CONFLICTING PHASE ALLOWED TO OPERATE CONCURRENTLY
2	6
4	8
6	2
8	4



QUANTITIES: INCLUDED IN BID ITEM "TRAFFIC SIGNAL SYSTEM"	
CONCRETE FOUNDATION-TRAFFIC SIGNALS	4 EA
CONCRETE FOUNDATION-FEED POINT-TYPE B	1 EA
PULL BOX	5 EA
2IN DIAMETER RIGID CONDUIT	1431 LF
3IN DIAMETER RIGID CONDUIT	497 LF
UNDERGROUND CONDUCTOR NO6-TYPE RHW	5247 LF
NO12 AWG 2 CONDUCTOR CABLE	1749 LF
NO12 AWG 5 CONDUCTOR CABLE	130 LF
NO12 AWG 12 CONDUCTOR CABLE	988 LF
COMBO 46FT MA SIG & LT STD-TYPE C	1 EA
COMBO 47FT MA SIG & LT STD-TYPE C	2 EA
COMBO 58FT MA SIG & LT STD-TYPE C	1 EA
1-WAY 3 SEC HEAD W/12IN LENS-POST MTD	4 EA
1-WAY 3 SEC HEAD W/12IN LENS-MA MTD	6 EA
FLASHING BEACON-POST MOUNTED	2 EA
VIDEO DETECTION CABLE	921 LF
VIDEO DETECTION SYSTEM	1 EA
CONTROLLER TYPE 1	1 EA

		Ø 2	Ø 4	Ø 6	Ø 8
BASIC INTERVALS (or FUNCTIONS)					
Minimum Green/Initial		10.0	5.0	10.0	10.0
Vehicle Extension/Passage Time		5.0	3.0	5.0	3.0
Maximum Green		47.0	26.0	47.0	26.0
Yellow Change		5.0	5.0	5.0	5.0
Red Clearance		3.0	4.0	3.0	4.0
Walk					
Pedestrian Clearance					
VOLUME DENSITY TIMING FUNCTIONS					
Variable Initial Timing Options					
Added Initial Per Acutation		2.0		2.0	
Maximum Initial		30.0		30.0	
Time Waiting Gap Reduction Options					
Time Before Reduction		30.0		30.0	
Time to Reduce to Minimum Gap		20.0		20.0	
Minimum Gap		3.0		3.0	
Locking Memory		X		X	
Non-Locking Memory			X		X
Flashing-Normal & Conflict Monitor		Y	R	Y	R
Start-Up Phasing		G	R	G	R
Type of Detector	Presence		X		X
	Calling (A)	X		X	
	Passage	X		X	
	Counting				
Emergency Vehicle Pre-emption					

(A) Calling loops shall place one call into the controller on the yellow or red interval. Calling loops shall be disconnected during the green interval

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SCALE (H): NA
SCALE (V): NA

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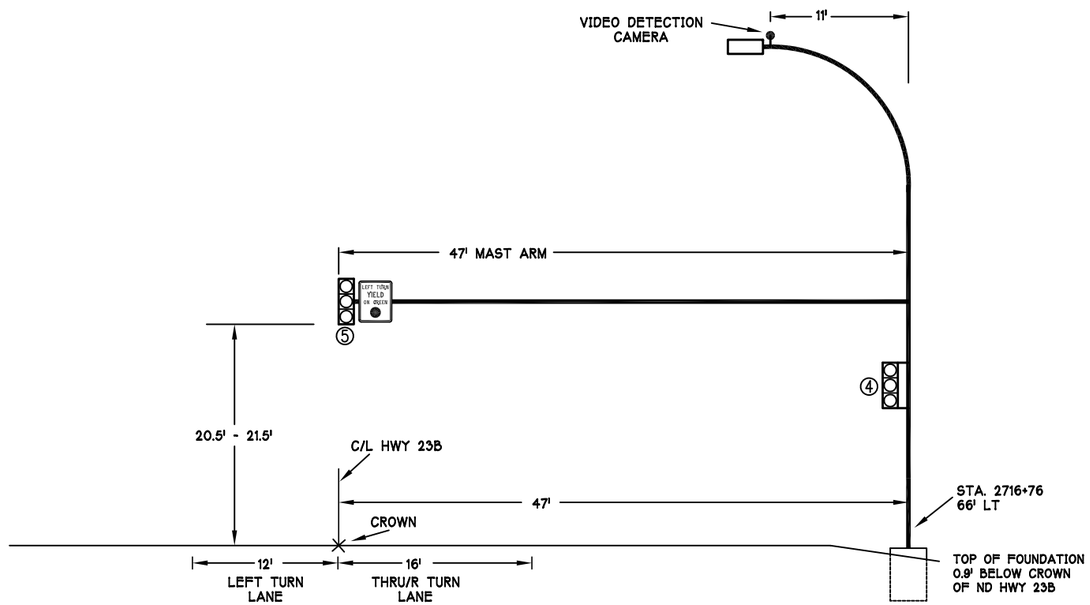
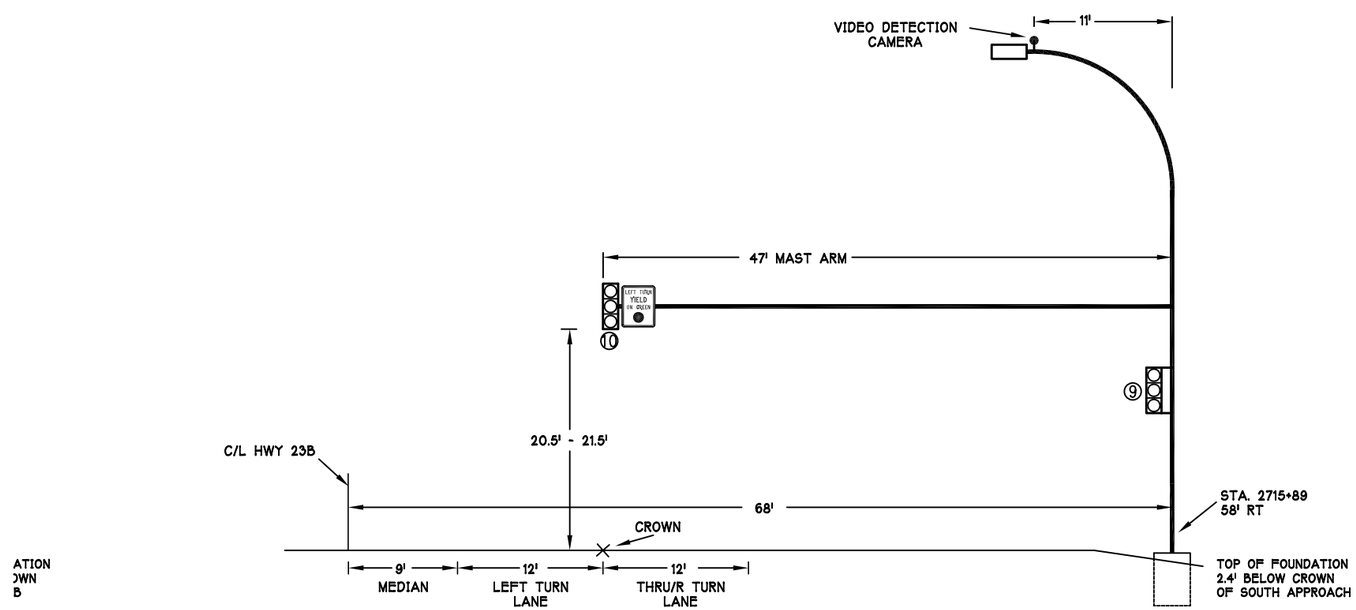
Northeast Truck Reliever Route
New Town, North Dakota
PHASING AND QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	150	6



NORTHBOUND - VIEWED FROM STOP BAR AT STA. 178+99



SOUTHBOUND - VIEWED FROM STOP BAR AT STA. 177+00

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SCALE (H): NA
SCALE (V): NA

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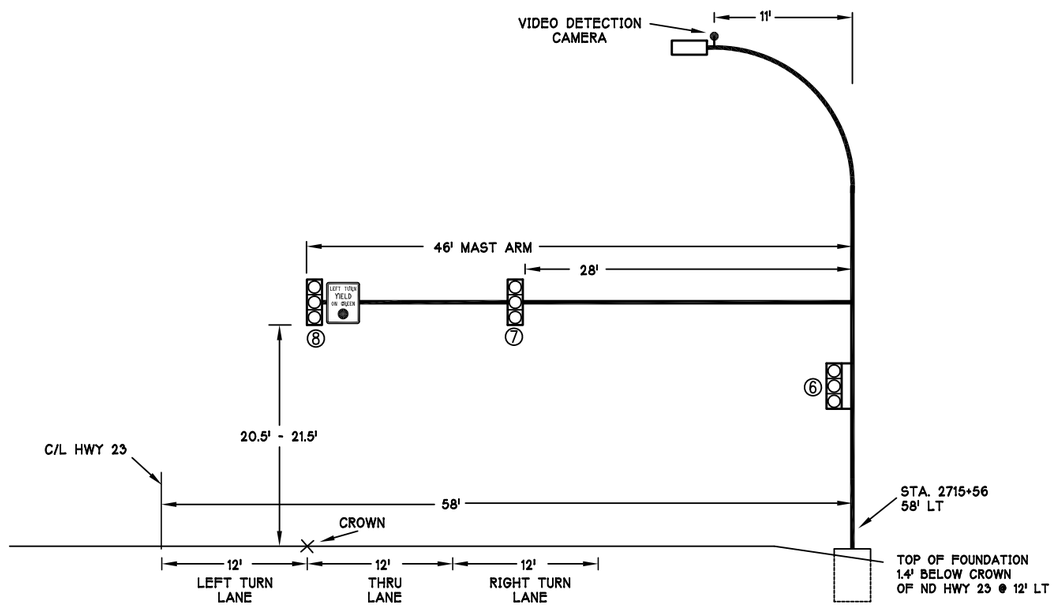
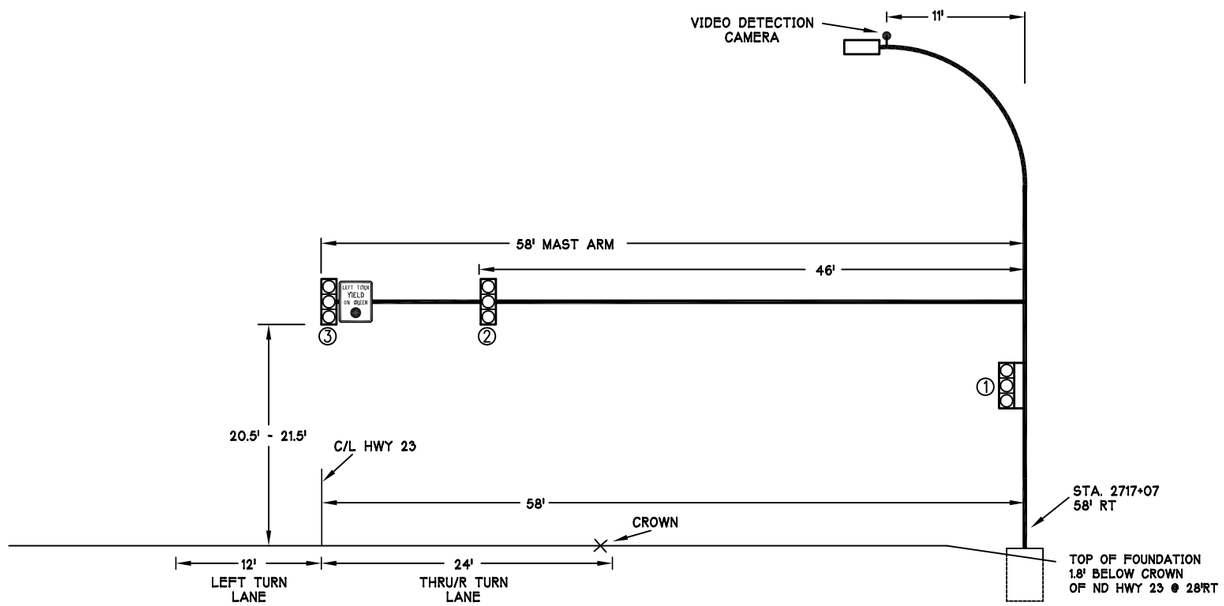
Northeast Truck Reliever Route
New Town, North Dakota
TRAFFIC SIGNAL DETAILS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	150	7



HIGHWAY 23 WESTBOUND - VIEWED FROM STOP BAR AT STA. 2717+27



HIGHWAY 23 EASTBOUND - VIEWED FROM STOP BAR AT STA. 2715+55

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SCALE (H): NA
SCALE (V): NA

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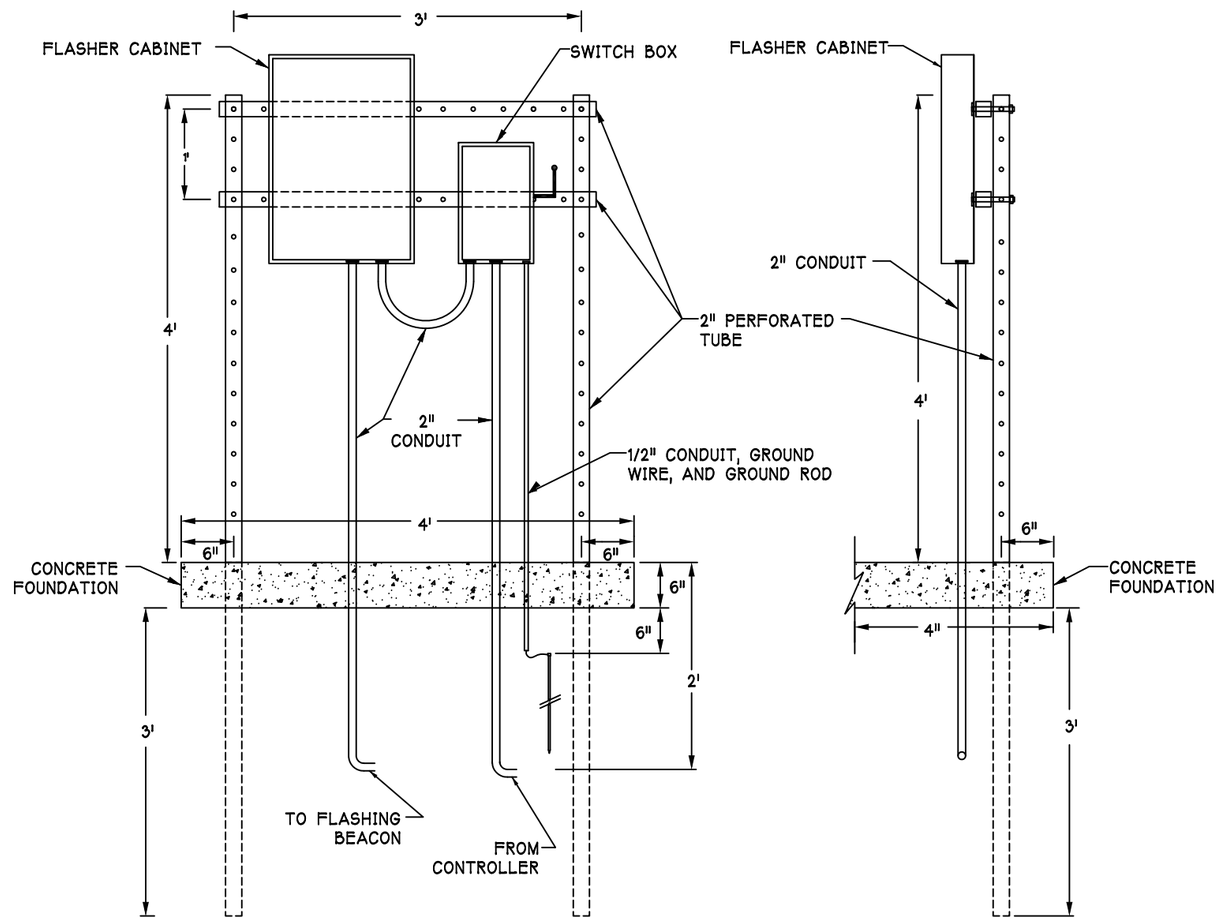
Northeast Truck Reliever Route
New Town, North Dakota
TRAFFIC SIGNAL DETAILS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	150	8



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SCALE (H): NA
SCALE (V): NA

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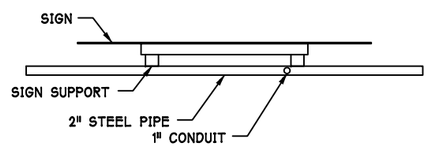
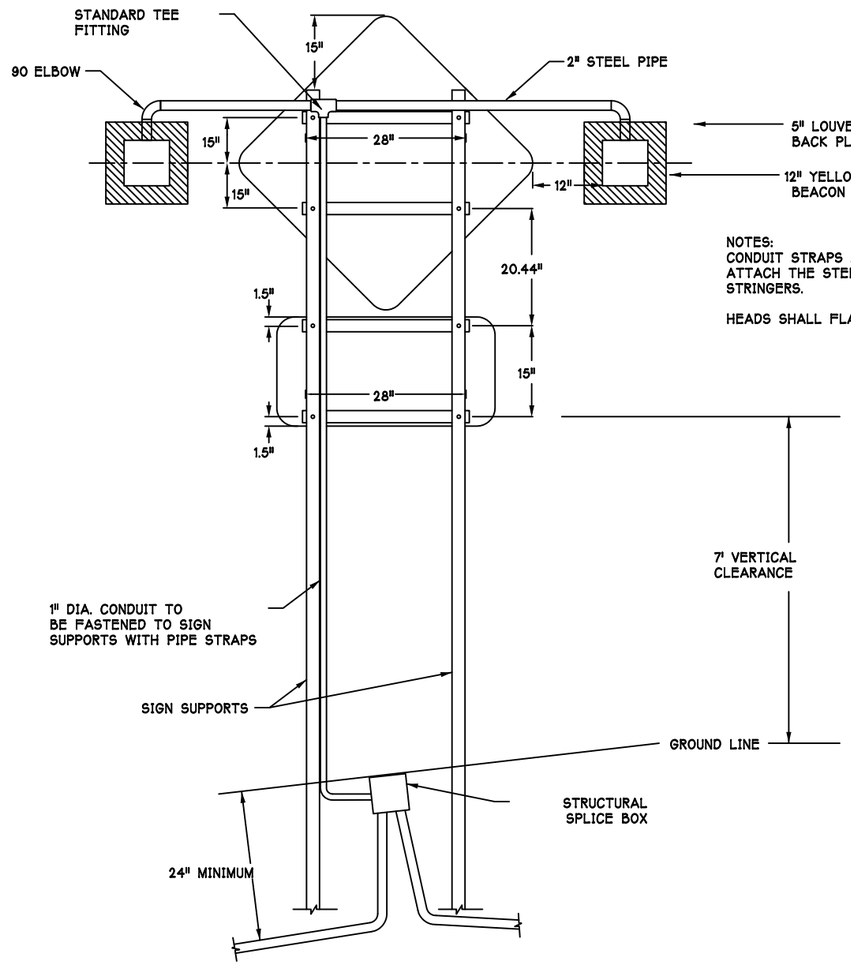
Northeast Truck Reliever Route
New Town, North Dakota
PIPE STAND DETAILS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	150	9

TOP VIEW





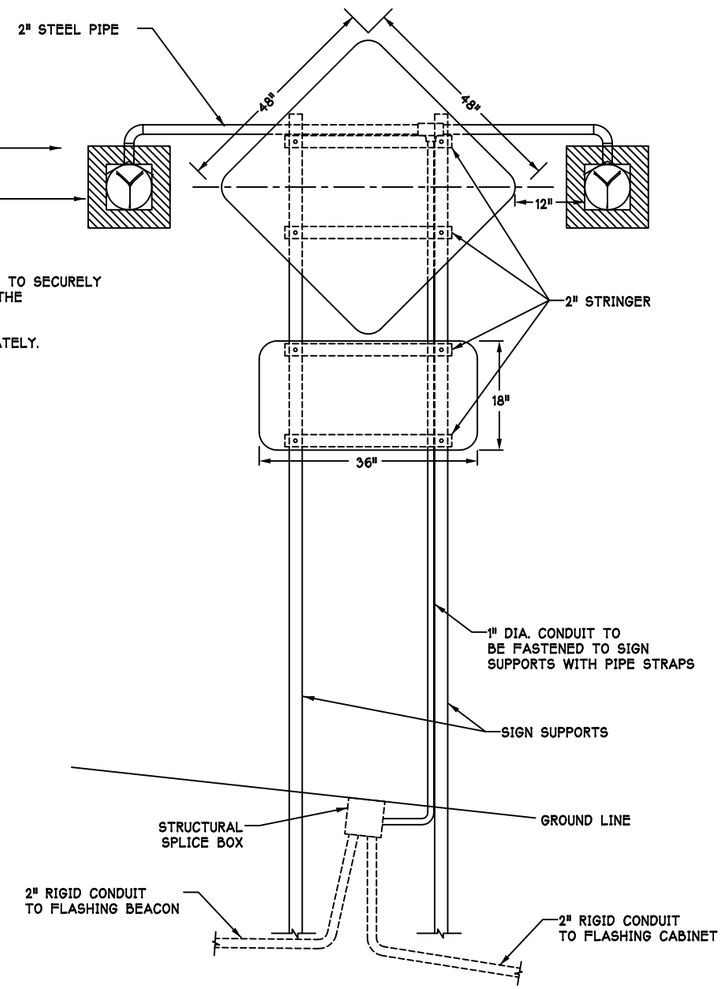
BACK VIEW

5" LOUVERED BACK PLATE

12" YELLOW LED BEACON HEAD

NOTES:
CONDUIT STRAPS AS REQUIRED TO SECURELY ATTACH THE STEEL PIPE TO THE STRINGERS.

HEADS SHALL FLASH ALTERNATELY.



FRONT VIEW
RIGHT SIDE OF ROAD

This document was originally issued and sealed by Jason L. Hunze registration number 4879, on October 23, 2013 and is stored at the office of the North Dakota Dept. of Transportation.

SCALE (H): NA
SCALE (V): NA

0

Northeast Truck Reliever Route
New Town, North Dakota
FLASHING BEACON DETAILS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	180	1

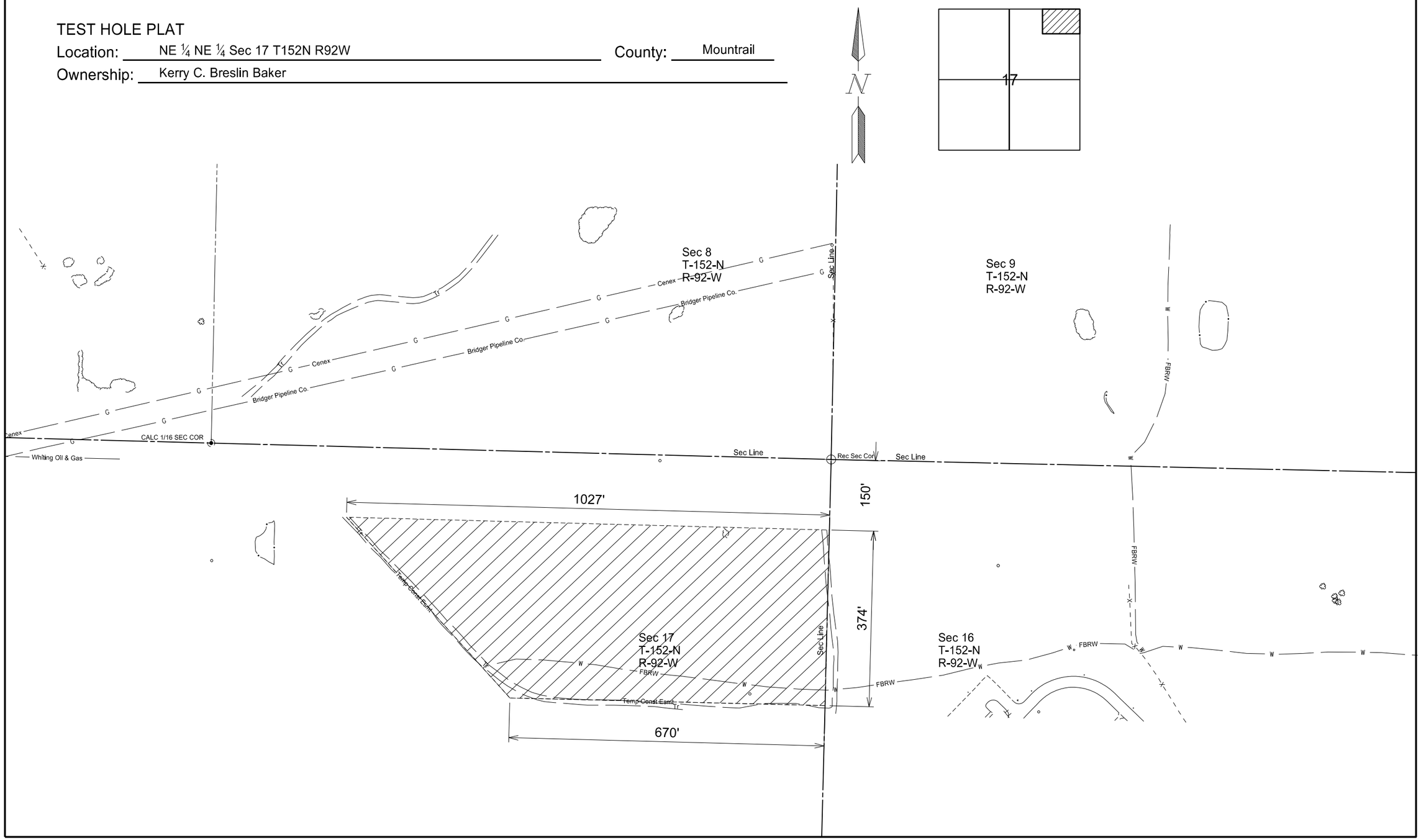
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

TEST HOLE PLAT

Location: NE ¼ NE ¼ Sec 17 T152N R92W County: Mountrail

Ownership: Kerry C. Breslin Baker

LOCATION OF PIT IN SECTION

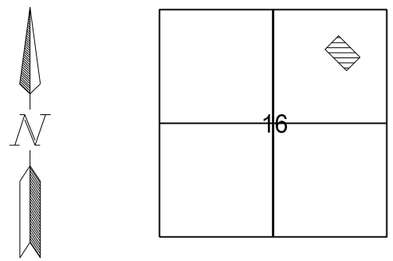


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-SAP-7-023(037)927	180	2

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

TEST HOLE PLAT

Location: NE ¼ NE ¼ Sec 16 T152N R92W County: Mountrail

Ownership: Robert L & Sheila P Turner

LOCATION OF PIT IN SECTION