DESIGN DATA				
Traffic	Average Daily (Eastbound)			
Current 2020	Pass: 3,100	Trucks: 1,280	Total: 4,380	
Forecast 2040	Pass: 4,185	Trucks: 1,730	Total: 5,915	
Clear Zone Dist. 38 Ft.		Design Speed: 80 Mph		
Minimum Sight Dist. for Stopping: 910 Ft		Bridges: N/A		
Full Control of Access, No Point of Access Other Than at Interchange Ramps				
Pavement Design Life 30 (years)				
Design Accumulated One-way Rigid ESALs: 17,076,200				

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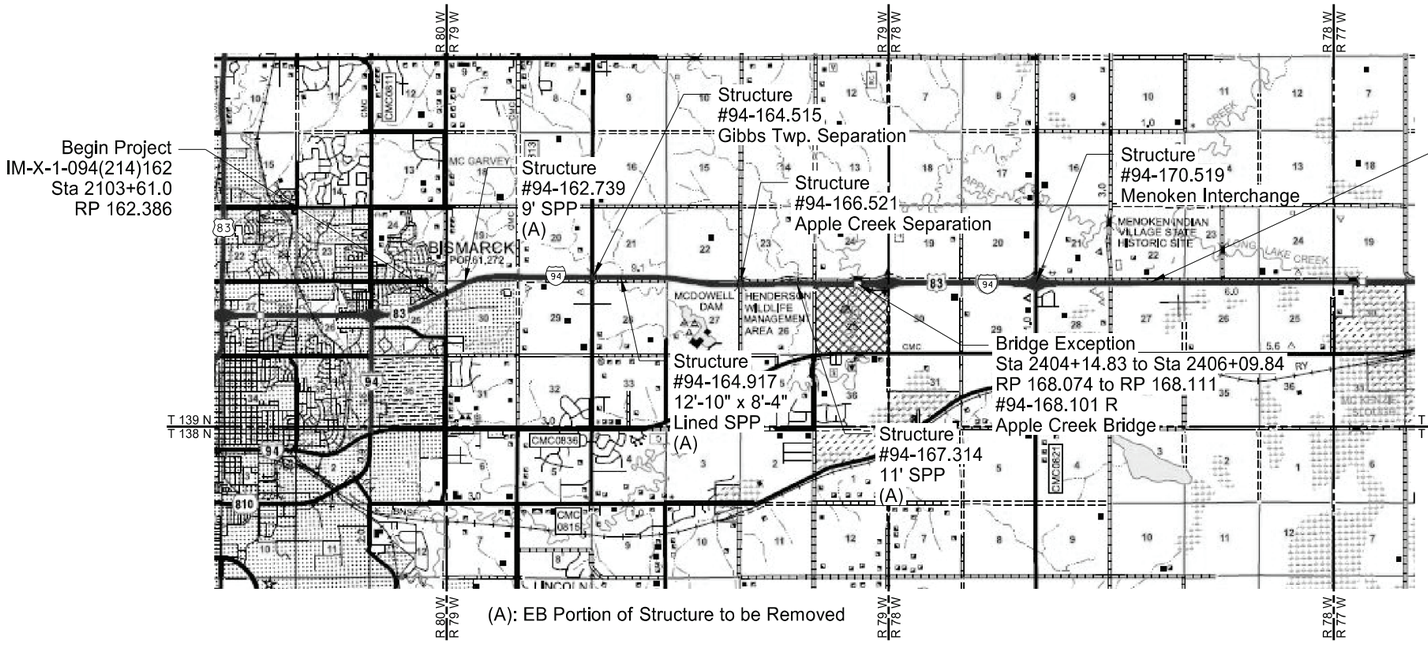
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

IM-X-1-094(214)162
Burleigh County

Interstate 94 Eastbound Reconstruction
Bismarck to E of Menoken Interchange - EB
Grading, Salvaged Base Course, Doweled PCC Pavement,
Mill and HMA Overlay, Bridge Approach Slabs, Culverts,
Guardrail, and Fencing

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

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
IM-X-1-094(214)162	9.703	9.740



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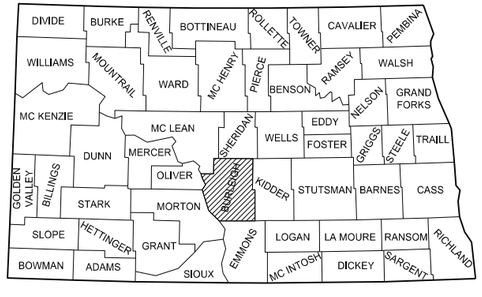

STATE COUNTY MAP

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ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT

Kirk Hoff
08/13/24

APEX ENGINEERING GROUP

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 08/13/24
NORTH DAKOTA

7/16/2024 1:44:37 PM Sarah.Osland K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\001\001TS_EB.dgn

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PLAN SECTIONS

SPECIAL PROVISIONS

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LIST OF STANDARD DRAWINGS

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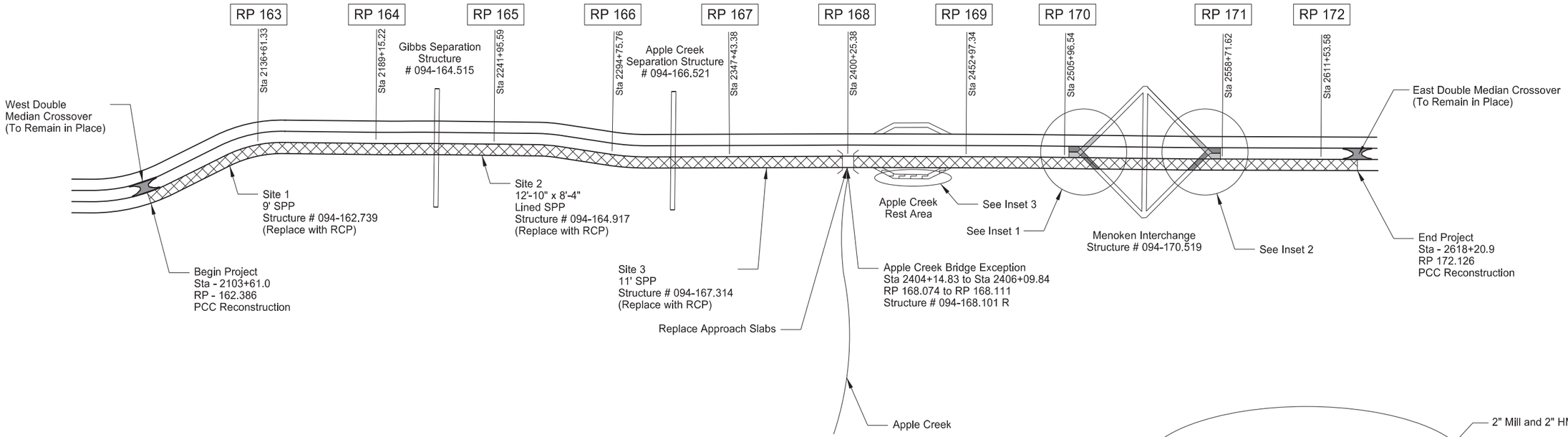
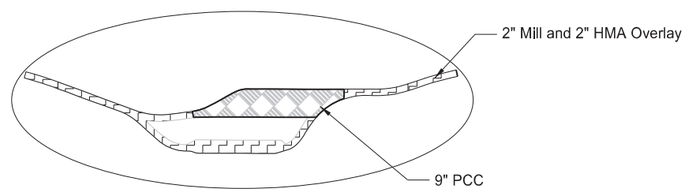
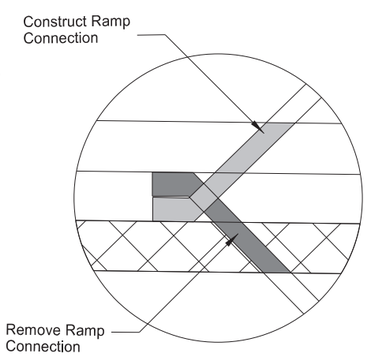




Inset 3

LEGEND

- 9" PCC on 8" Salvaged Base Course
- 2" Mill & 2" HMA Overlay (Apple Creek Rest Area)
- 9" PCC
- In Place Temporary Ramp Connections and Double Median Crossover
- Construct Temporary Ramp Connections



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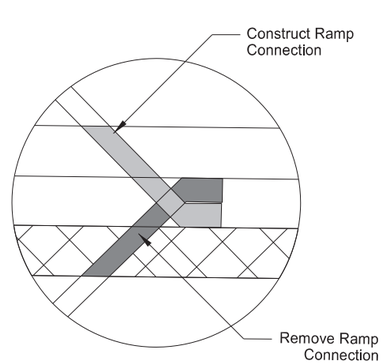

Inset 2

Stationing is based off EX94EB unless stated otherwise.

Scope of Work

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

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NOTES

GENERAL NOTES

105-P01 UTILITIES: No utility relocations or adjustments are planned. All utilities on the project need to be protected and remain in existing location.

107-300 CONSTRUCTION TRAFFIC ACCESS: Access areas within the right of way only at interchanges. The Engineer may allow temporary access at other locations.

To obtain temporary access, provide an access plan containing the following information:

- A traffic control plan;
- A traffic impact analysis;
- A safety analysis;
- A COA; and
- An environmental impact analysis.

To be considered for approval, the following minimum conditions must be met in the access plan:

- Construction traffic will not be allowed to cross the interstate median or lanes of traffic being used by the public at grade;
- The access plan must show that there will be methods in place, at all times, to prevent public traffic from using the access;
- A plan to restore the area disturbed by the access, including right of way fences, to preexisting or better condition.

All work necessary to provide the access plan, comply with the plan, and to restore the area to its pre-exiting condition must be completed at no additional cost to the Department.

108-100 WEEKLY PLANNING & REPORTING MEETING: A weekly planning and reporting meeting is required.

109-P01 MEASUREMENT OF QUANTITIES: A prismoidal method was used for volume calculations of the earthwork items.

202-P01 REMOVAL OF PAVEMENT: Removal of pavement consists of removing and salvaging concrete pavement, reinforced concrete pavement, doweled jointed pavement, and approximately 2” aggregate base underneath the concrete.

Do not stockpile concrete chunks, rebar, or fabric on the highway right of way. Include the cost for removal of reinforcing steel in the price bid for “Removal of Pavement.”

The existing continuous reinforcement details are included in the supplemental data.

202-P02 REMOVE AGGREGATE BASE & SURFACING: The existing bituminous pavement thicknesses are averages based on previous construction plans and maintenance data. Actual thicknesses may vary.

202-P03 EXISTING UNDERDRAIN: Remove the existing underdrain system as indicated in the typical sections, including the pipe, aggregate, fabric and headwalls. Include the cost for removal of existing underdrain in the price bid for “Remove Aggregate Base & Surfacing.”

202-P04 REMOVAL OF TEMPORARY BYPASS: Remove the eastbound temporary ramp connections and ramp connection detours when no longer needed to maintain traffic.

This work consists of:

1. Saw cutting the pavement to be removed at the edge of the finished shoulder.
2. Constructing an aggregate slough at the edge of the saw cut.
3. Shaping the median foreslopes to 6:1 and placing topsoil. This includes the topsoil stockpiled in the Interstate median and on the backslope.
4. Removal, hauling, and disposal of all materials.
5. Reshaping existing slopes on ditch blocks as shown on the Ditch Block Detail.

Include all labor and equipment costs for removing, hauling, and disposing off materials, removal and replacement of topsoil, and shaping of median slopes, foreslopes, and ditch block slopes in the unit price bid for “Removal of Temporary Bypass”.

202-P05 REMOVAL OF STRUCTURE-SITE 1: At Station 2122+11, remove the south half of the existing 9’ diameter structural plate pipe with concrete headwall (Structure 0094-162.739), from the median to the outlet (south) end of the structure, with the upper portion of the pipe cut and removed from 3’ south of the median centerline, and the lower portion removed beginning at 1’ north of the median centerline to allow for insertion of the new 84” diameter RCP into the structural plate pipe, as shown in the plans.

To protect the excavation from runoff from the interstate median, construct a median block and install a 12” conduit, as shown in the plans, to convey median flows through the site from east to west. The 12” conduit has been sized to convey the discharge from a 2-year storm event. The 12” conduit may be RCP, PVC, HDPE, CSP or spiral rib CSP pipe. Install the 12” conduit to a length as necessary to accommodate median flow past the shoring and excavation operations.

After shoring has been installed, excavate to allow removal of the south half of the structural plate pipe and installation of the 84” RCP culvert as shown in the plans.

Provide dewatering if necessary according to site conditions.

Make neat vertical and horizontal cuts in the existing structural plate pipe end to remove the south half of the structure, and to provide for the installation of the new 84” diameter RCP culvert into the end of the structural plate pipe, with a 4’ overlap of the pipes. Remove bedding or soils from

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NOTES

under the existing SPP to a depth of 1’ below the proposed 84” RCP, from 2’ north of the median centerline to 1’ south of the median centerline and fill the resulting void with grout as shown in the plans to provide a seal between the lower end of the new RCP and the structural plate pipe. Protect the joint of the 84” diameter RCP from intrusion of grout to allow for future extension of the pipe through the westbound roadway.

Form and fill the void between the new 84” diameter RCP and the structural plate pipe with Class AE-3 concrete, as shown in the plans.

Upon completion of the culvert installation and backfill, relocate the 12” conduit to the south side of the shoring and leave the temporary median block in place. Fill the median ditch to provide a flat ditch bottom with 6” of cover over the shoring and temporary 12” drainage conduit, with 6:1 eastbound and westbound median inslopes. Transition the fill down to the ditch bottom at each end with 10:1 longitudinal slopes.

Include all costs to remove the structural plate pipe with concrete headwall, and to furnish and install 12” conduit, median block, grout and dewatering in the price bid for the item “Removal of Structure – Site 1.”

202-P06 REMOVAL OF STRUCTURE-SITE 2: The existing structural plate pipe with concrete headwall at Station 2236+85 (Structure 0094-164.917) was previously lined by placing 84” diameter and 36” diameter spiral rib corrugated steel pipes through the structure, and filling of the remaining void with grout through the entire length of the structure. Portions of the structural plate pipe floor were also removed, and voids below the invert of the structural plate pipe were filled with grout.

Excavate to remove the south half of the 12’-10” x 8’-4” structural plate pipe, headwall, and liner pipes as shown in the plans. Make neat vertical cuts at the median centerline through the existing structural plate pipe, grout and spiral rib liner pipes to remove the south half of the structure and to provide for the installation of the new 90” diameter RCP culvert.

Provide dewatering if necessary according to site conditions.

Remove bedding, or soils or grout from under the existing SPP to a depth of 6” below the proposed 90” RCP, from 6” north of the median centerline to 6” south of the median centerline. Fill the resulting void with grout as shown in the plans to provide a 1’ wide seal across the joint between the lower end of the new RCP and the structural plate pipe, before setting the 90” RCP pipe section in place to the end of the 84” diameter spiral rib liner pipe. Protect the joint of the 90” diameter RCP from intrusion of grout to allow for future extension of the pipe through the westbound roadway. Place a minimum 6” thick by 1’ wide seal of grout around the joint between the end of the 84” spiral rib liner pipe and the new 90” diameter RCP.

Plug the cut end of the existing 36” diameter spiral rib liner pipe as shown on the concrete pipe plug detail on Standard Drawing D-714-1. Either grout or Class AE-3 concrete may be used to plug this pipe end.

Include all costs to remove the structural plate pipe with headwall, and to furnish and place Class AE-3 concrete or grout, and dewatering in the price bid for the item “Removal of Structure – Site 2.”

202-P07 REMOVAL OF STRUCTURE-SITE 3: At Station 2363+83, remove the south half of the existing 11’ diameter structural plate pipe with concrete headwall, Structure 0094-167.314), from the median to the outlet (south) end of the structure, with the upper portion of the pipe cut and removed from 3’ south of the median centerline, and the lower portion removed beginning at 1’ north of the median centerline to allow for insertion of the new 108” diameter RCP into the structural plate pipe, as shown in the plans.

To protect the excavation from runoff from the interstate median, construct a median block and install a 12” conduit, as shown in the plans, to convey median flows through the site from west to east. The 12” conduit has been sized to convey the discharge from a 2-year storm event. The 12” conduit may be RCP, PVC, HDPE, CSP or spiral rib CSP pipe. Install the 12” conduit to a length as necessary to accommodate median flow past the shoring and excavation operations.

After shoring has been installed, excavate to allow removal of the south half of the structural plate pipe and installation of the 108” diameter RCP culvert as shown in the plans.

Provide dewatering if necessary according to site conditions.

Make neat vertical and horizontal cuts in the existing structural plate pipe end to remove the south half of the structure, and to provide for the installation of the new 108” diameter RCP culvert into the end of the structural plate pipe, with a 4’ overlap of the pipes. Remove bedding or soils from under the existing SPP to a depth of 1’ below the proposed 108” RCP, from 2’ north of the median centerline to 1’ south of the median centerline and fill the resulting void with grout as shown in the plans to provide a seal between the lower end of the new RCP and the structural plate pipe. Protect the joint of the 108” RCP from intrusion of grout to allow for future extension of the pipe through the westbound roadway.

Form and fill the void between the new 108” RCP and the structural plate pipe with Class AE-3 concrete, as shown in the plans.

Upon completion of the culvert installation and backfill, relocate the 12” conduit to the south side of the shoring and leave the temporary median block in place. Fill the median ditch to provide a flat ditch bottom with 6” of cover over the shoring and temporary 12” drainage conduit, with 6:1 eastbound and westbound median inslopes. Transition the fill down to the ditch bottom at each end with 10:1 longitudinal slopes.

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Include all costs to remove the structural plate pipe with concrete headwall and to furnish and install 12” conduit, median block, grout and dewatering in the price bid for the item “Removal of Structure – Site 3.”

202-P08 REMOVE FENCE: The number of strands on the existing fence vary along the project and may contain up to five strands of wire. The bottom wires are buried in grass and topsoil in some locations. Remove the posts and wire completely in the locations shown in section 80. Include the cost of all equipment, material, and labor to remove the existing fence in the price bid for “Remove Existing Fence".

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

203-P01 SUBGRADE SURFACE TOLERANCE: Construct the final subgrade elevation to within 0.08 feet of the proposed subgrade elevation.

261-P01 PERMANENT FIBER ROLLS: If fiber rolls are to remain on the project, use fiber rolls that are composed of 100 percent bio- or photo-degradable netting that has a life expectancy between 6 to 24 months.

302-115 BASE COURSE: Trim base course as specified in 302.04 C.3, "Surface Tolerance Type C."

302-P01 HAULING: The shoulder of eastbound I-94 can be used as a haul route. Do not drive on the base course and/or geosynthetic material, except when the haul vehicle is dumping. When dumping, the haul vehicle is allowed to drive on the base course in the immediate vicinity of where the load is dumped.

Repair any subgrade damage from hauling operations per 203.04D. Scarify, shape and compact the damaged subgrade to a depth specified by the Engineer. Re-establish subgrade tolerance per contract requirements prior to placement of the salvaged base course. Repair any base course damage from hauling operations per 302.04B and re-establish base course tolerance per contractor requirements.

Repair any base course or subgrade damage from hauling operations at no additional cost to the Department.

401-P01 TRIMMING AND PRIME: Prime shoulders within one mile or within 48 hours of the trimming operations unless HMA paving is to take place within 24 hours of trimming.

430-P01 MAINTENANCE OF TRAVELED ROADWAY USING HOT MIX ASPHALT: The Contractor will be fully responsible for monitoring the condition of the traveled roadway, crossovers and ramp connections within the limits of the project.

Patch with an approved mix any areas that have subsided more than one inch from the adjacent pavement, any rutting, sponginess and/or breakups as directed by the Engineer. Compact patched areas in accordance with Section 430.04 I.3 of the Standard Specifications. Include all cost of equipment, labor, and materials, including asphalt cement and tack coat in the unit price bid for "Patching".

Provide a traffic control plan that minimizes disruption to traffic. Necessary traffic control devices and flagging will be paid for under the normal contract bid item. Additionally, the contractor will be required to perform an initial inspection of the roadway, used by the traveling public before construction begins, and make all repairs in accordance with the above requirements or as directed by the Engineer.

A quantity of 500 Tons of "Patching" has been provided for this purpose.

430-P02 RAP SUPERPAVE: Incorporate RAP at a rate between 10 and 35 percent of the mix, by weight.

430-P03 SPECIFIED DENSITY: Section 430.04 I.2, calculated density, will apply to mainline shoulder pavement.

550-P01 CONCRETE PAVEMENT: The Department will waive the requirement to place the reinforcing steel, tie bars and dowel bar assemblies a minimum of 2,000 feet ahead of the paving operation as stated in Sections 550.04 B.1 and 550.04 F.2 and allow the use of the roadway as a haul road at the Contractor’s request, provided the following conditions are met:

- Repair all damaged areas.
- Provide an additional trimmer in advance of the paving operation.
- Construct the finished surface to within 0.10 feet of the proposed elevation with the first pass of trimming equipment.
- Construct the finished surface to the specified surface tolerance prior to the placement of reinforcing steel, tie bars and dowel bar assemblies.
- Place the reinforcing steel and tie bars on approved supports securely, properly and accurately in advancing of the paving operation.

550-P02 3IN EXPANSION JOINT: Install expansion joints consisting of a pre-compressed polymer impregnated self-expanding polyurethane foam joint seal coated with a silicone surface providing a permanent weather tight seal. The joint seal may be:

1. Wabo FS Bridge Seal (Watson Bowman Acme);
2. BEJS Bridge Expansion Joint System (EMSEAL);
3. Iso-Flex Silfast XL (LymTal International),

Prepare the joint opening and install the joint seal according to the manufacturer's recommendations.

Follow the manufacturer's recommendation for attaching the expansion joint seal to the concrete and for splicing foam together. Install the membrane sealant material into the joint, positioning it with the manufacturer's recommended recess from the top surface of the concrete. Do not stretch or compress the membrane sealant material.

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Fabricate and install protection armor angles on each side of the expansion joint as shown in the Sec 20 Details. Galvanize the armor angles according to Section 854.01, "Galvanizing". Splices are permitted. Weld spliced ends. Coat weld splices or damaged coating areas with galvanizing paint according to Section 854.02, "Damaged Galvanized Coatings".

Include all work and materials associated with the expansion joint seal and protection armor angles in the contract unit price of "3 IN Expansion Joint."

550-P03 CONCRETE SLEEPER SLAB: This work consists of constructing a concrete sleeper slab at the location of an expansion joint in the PCC pavement.

Finish the surface of the sleeper slab smooth. Allow the sleeper slab to cure for 24 hours before performing additional work on or adjacent to the slab. Cover the sleeper slab with a double layer of 4 or 6 mil polyethylene sheeting before covering the slab with the concrete roadway.

Include all costs for any excavation, removal of existing sleeper slab, aggregate base, reinforcing steel, labor, and equipment in the contract unit price of "Concrete Sleeper Slab".

704-100 TRAFFIC CONTROL SUPERVISOR: Provide a Traffic Control Supervisor.

704-300 FLASHING BEACON: Provide solar powered flashing beacons that meet the requirements of the MUTCD and ITE. Provide beacons that are visible for a distance of 0.25 miles (1,320 feet) and are capable of operating for 20 days without a solar charge.

Include all costs for materials, equipment, labor, and incidentals in the contract unit price for "Flashing Beacon".

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

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

704-P01 STATE FURNISHED MEDIAN BARRIER: Obtain (284) 2.5’ x 10’ concrete barriers. They can be picked up and returned to the Casselton yard at 15482 37th St SE in Casselton ND 58012. The hardware can be picked up and returned to the Fargo District yard at 503 38th St S in Fargo ND 58103. Contact the Fargo District office at 701-239-8900 to facilitate the exchanges.

If returning barriers with connection components, coordinate the delivery location for the connecting components with the Engineer. Some 4 inch x 4 inch boards are available at the return location. Provide any additional 4 inch x 4 inch boards necessary to stack barriers. The boards will become property of the Department.

Include all costs associated with median barriers in the contract unit price for “State Furnished Median Barrier”.

704-P02 OBLITERATION OF PAVEMENT MARKINGS: Obliterate the white centerline marking and white and yellow edge lines at the begin and end project locations where the roadway alignment is changed.

Mask the dashed white centerline markings throughout the two-lane, two-way area, designated for obliteration using removable, non-reflective preformed tape that is approximately the same color as the pavement surface and that overlaps the marking a minimum of 1 inch on each side.

Include the cost of all equipment, material, and labor, including the removal of tape, if used, in the unit price bid for "Obliteration of Pavement Marking."

704-P03 TRAFFIC CONTROL: The traffic control devices list for each phase has been developed using traffic control signing layouts (shown in Section 100 of the plans) and Standard Drawings listed below:

D-704-24, Layouts Type HH, Type S, and Type T for shoulder closure on interstate, work beyond the shoulder, and mobile operation on shoulder.

D-704-35 for outside or inside single lane closures on interstate, for work described in Note 704-P03 for Phases 1A, 1B, 3A, and 3B. Two sign layouts for one lane closure have been provided in the plans.

D-704-45 for construction traffic median crossover under head-to-head traffic.

D-704-49 for construction traffic median crossing.

D-704-57 for installation of new pipe at RP 162.739, RP 164.917, and RP 167.314. Layouts for two locations have been provided in the plans.

The Department will pay for all necessary devices, regardless of the length of the lane closure.

704-P04 TRAFFIC CONTROL PHASING: The Contractor is responsible for removing and resetting devices for each phase of construction. The cost associated with removing and resetting each traffic control device is included in the price bid for the respective traffic control device. The traffic control details, as indicated in the plans, have been developed based on the premise that this project will be constructed as follows.

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NOTES

The construction phasing plan is listed below.

Phase 1A: Close the outside westbound lane of I-94.
- Install temporary guardrail at Apple Creek Bridge and Menoken Interchange as shown in the plans.

Phase 1B: Close the inside westbound lane of I-94.
- Rotate existing median pier protection at Gibbs Separation, Apple Creek Separation, and Menoken Interchange.
- Install temporary guardrail at Apple Creek Bridge as shown in the plans.
- Obliterate existing pavement marking and install new temporary traffic control pavement marking.

Phase 2: Close eastbound I-94, implement head-to-head traffic on westbound I-94.
- Activate the temporary ramp connections and median crossovers for the reconstruction of eastbound I-94.
- Reconstruct eastbound mainline I-94 and ramp connections at Apple Creek Rest Area and Menoken Interchange.
- Install new pipe at RP 162.739, RP 164.917, and RP 167.314.
- Install new eastbound approach slabs at Apple Creek Bridge.
- Complete 9” PCC surfacing of truck parking area and 2” mill and HMA overlay and pavement markings at Apple Creek Rest Area.
- Install pavement marking on eastbound I-94.
- Modify existing median pier protection at Gibbs Separation, Apple Creek Separation, and Menoken Interchange to permanent configuration.

Phase 3A: Return eastbound I-94 traffic to its normal flow.
- Close the inside lanes of westbound and eastbound I-94.
- Install flexible delineators at the west and east median crossovers.
- Remove temporary guardrail and end terminals at Apple Creek Bridge.
- Remove eastbound temporary ramp connections in southwest and southeast quadrants at Menoken Interchange within the interstate median.
- Construct portion of temporary ramp connection in interstate median for northwest and northeast quadrants of Menoken Interchange (for future I-94 WB reconstruction project).

Phase 3B: Close the outside lanes of westbound and eastbound I-94.
- Remove temporary guardrail and end terminals at Apple Creek Bridge and Menoken Interchange.
- Remove eastbound temporary ramp connections in southwest and southeast quadrants at Menoken Interchange within the infield areas.
- Construct portion of temporary ramp connection within infield areas for northwest and northeast quadrants of Menoken Interchange (for future I-94 WB reconstruction project).
- Install flexible delineators at the temporary ramp connections.

Install pavement marking on westbound I-94.

Install pavement marking on eastbound I-94.

704-P05 MEDIAN CROSSOVER AND RAMP CONNECTIONS REMOVAL: For exiting and entering median when removing ramp connections and median crossovers, use standard drawing D-704-49 in conjunction with one lane closures. If trucks will be entering or exiting roadway from the 10 foot shoulder, Trucks Entering Highway (W8-53-48) or Trucks Exiting Highway (W8-56-48) signs should be used respectively. Scrapers will not be allowed on Interstate roadway with public traffic.

704-P06 FLEXIBLE DELINEATORS: Salvage the 121 existing flexible delineators located at the existing double median crossovers and ramp connections. Remove just prior to changing traffic flow and salvage for reuse after the eastbound roadway reconstruction and the construction of the new temporary ramp connections in preparation for future westbound I-94 reconstruction.

Upon completion of the eastbound reconstruction project, reset flexible delineators at 5’ spacing block off the median crossovers and ramp connections.

Include the cost for removing, salvaging, and resetting the existing 121 flexible delineators in the contract unit price bid for “Flexible Delineators” that will be set.

706-P01 FIELD OFFICE: Provide a field office which meets the following requirements:
1. Minimum total area of 800 square feet
2. Indoor bathroom facilities and supplies with weekly cleaning services
3. Hookups for heat, electricity, sewer, and potable water.
4. Minimum cabinet space of 32 cubic feet
5. Minimum counter space of 40 square feet
6. Air conditioner with a minimum of 20,000 BTUs
7. Lighting with a minimum of 110 foot-candles
8. DSL broadband internet and a router that broadcasts Wi-Fi and will allow for hard wiring of a computer.
9. Photocopy/Printer with scanning capabilities capable of 11x17 photocopies and toner to last the duration of the project. Other features to include digital copying and scanning. Copier/printer machine with operating software compatible with that used by the NDDOT.

Place the field office on the project, or as close to the project as possible. The Contractor is responsible for furnishing the office equipment and for the pay for the following:
- Rental fees;
- Heating;
- Electrical;
- Sewer, and
- Potable water.

Make the field office available for occupancy one week before the start of the project. The Engineer will approve

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the location and the condition of the office. Do not remove the field office until the Engineer releases the field office.

All requirements of the Field Office are subject to approval by the Engineer. Include the costs for the field office in the bid item "Field Office".

Schedule for Payments:
25% when set up on site.
50% when 30% of the work is complete.
75% when 60% of the work is complete.
100% when project is complete.

710-P01 INTERCHANGE RAMP CONNECTION DETOURS: Route public ramp traffic around gap paving areas with ramp connection detours during the gap reconstruction and paving at ramp connections. Include all costs for embankment, salvaged base course, drainage items, and water to construct and maintain ramp connection detours in the unit price bid for "Temporary Bypass."

714-P01 PIPE WORK: Provide dewatering for pipe culvert installations if necessary according to site conditions. Include all costs associated with dewatering in the price bid for pipe installation.

714-P02 PLUG PIPE: After removal of the 24" diameter RCP and traversable end section from the median tee section of the 30" diameter RCP centerline culvert at Station 2215+09 Lt, plug the 24" diameter tee opening as shown on Standard Drawing D-714-1 and maintain full flow capacity through the existing 30" RCP. Include all costs for materials, equipment and labor to plug the pipe opening in the unit price bid for the item "Remove & Relay Pipe – All Types & Sizes."

714-P03 CULVERT BEND SECTIONS AND DEFLECTED CULVERT JOINT INSTALLATION: Install culverts at the locations described below with a bend section or deflected joints as shown in the plans. Locations and invert elevations of these installations have been noted on the cross sections.

Station	Pipe Diameter (Inches)	Vertical Deflection Angle (Degrees)
2131+27 Lt	30"	7.5
2177+54 Lt	24"	2
2448+12 Lt	18"	7.5

At Station 2131+27, install a new 30" diameter RCP centerline culvert with a 4' long 7.5 degree long-radius precast vertical bend section, as shown in the plans.

At Station 2177+54, extend the existing 24" diameter RCP culvert into the median with 2 degrees of vertical deflection, using one 8' long pipe section with 1 degree of deflection at each of the joints between the existing pipe and extension, and between the extension section and traversable end section. Fill the two deflected joints with mortar and wrap these two joint openings externally with a filter fabric. Install longer tie bars at the deflected joints if standard length tie bars are not long enough.

At Station 2448+12, extend the existing 18" diameter RCP culvert into the median with a 4' long 7.5 degree long-radius precast vertical bend section, and tie this bend section to the existing RCP and traversable end section.

Include all costs for materials, equipment and labor to install the vertically deflected pipe sections and vertical bend pipe sections as described above in the prices bid for the items "Pipe Conduit 30IN", "Pipe Conc Reinf 24IN CL III" and "Pipe Conc Reinf 18IN CL III."

714-P04 ADJUST INLET: Adjust two existing precast concrete median drains at locations listed below. Remove the existing 12" height top section and grate, install adjusting rings and relay the top section with grate onto the adjusted riser at each location in accordance with Standard Drawing D-722-7.

Station	Adjustment (increase in riser height)	Number of adjusting rings required
2394+86 Lt	1.5'	3
2413+12 Lt	1'	2

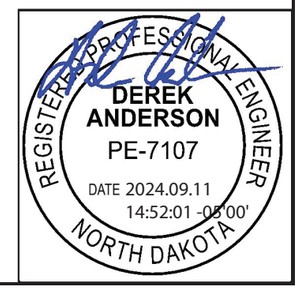
Include all costs for removing and relaying the top section of the median drains, furnishing and installing adjusting rings and sealing of joints in the price bid for "Adjust Inlet."

714-P05 TEMPORARY PRECAST CULVERT STOPPERS: Install precast concrete caps (to male pipe ends) and plugs (to female ends) of RCP culverts at the left (median) end of the pipes at locations described below, which will be backfilled and remain in place until the westbound roadway is reconstructed. Manufacture the precast caps and plugs to be suitable for the height of fill associated with the class of RCP.

Station	Pipe Diameter (In.)	RCP Class	Stopper Type
2214+99	36"	III	Cap
2257+21	36"	III	Plug
2264+77	36"	III	Plug
2287+75	36"	III	Plug
2333+03	30"	III	Cap
2394+76	30"	III	Plug

Include all costs for labor, materials, and equipment to furnish and install the precast concrete caps and plugs in the unit prices bid for the items "Pipe Conduit 30IN" and "Pipe Conduit 36IN."

714-P06 UNDERDRAIN SYSTEM: The underdrain system shall consist of a fabric wrapped 4" drainage pipe placed in a trench and backfilled with drainage aggregate and earth fill. All work and materials required to install the underdrain system shall be included in the unit price bid for "Underdrain Pipe PVC Perforated 4IN".



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754-P01 REMOVE SIGNS & SUPPORTS: Remove and dispose of all existing telescoping perforated tube, w-shape post supports, signs and extruded aluminum sign panels. Salvage and deliver the existing round pipe supports to the NDDOT Bismarck District Yard, 218 Airport Road, Bismarck, ND. Contact the Bismarck District 24 hours prior to delivery at 701-328-6950. Include all costs associated with the removal and delivery of the sign panels and supports in the price bid for the item “Remove Sign Foundation.”

754-P02 DELINEATOR-TYPE A-SINGLE SIDED: Provide 3” x 9” reflectors on delineator posts. Install Delineators-Type A as shown in the signing plans. The NDDOT currently owns a stockpile of Type A delineator posts and white reflectors at the Bismarck District Yard. Obtain the delineators at the NDDOT Bismarck District Yard, 218 Airport Road, Bismarck, ND. Provide new yellow reflectors and fastening hardware.

At least two weeks before obtaining the stockpiled materials, notify the Engineer and contact Larry Gangl, (District Engineer) of the date that the materials will be obtained. Contact the District Office at 701-328-6950. Notify the District staff 24 hours in advance to verify the time of pickup. Before obtaining materials, perform an inventory of materials to be received with the district staff, and document the results. Both parties must sign and date the inventory. Each party must retain a signed copy of the inventory. Provide necessary equipment to load and deliver the materials to the project work site. Include all costs for this described work in the contract unit price bid for “DELINEATOR-TYPE A-SINGLE SIDED”

754-P03 DELINEATORS: Remove the existing delineators within the I-94 project limits. Furnish and install new delineators per plans. Include the cost for removal and disposal of the delineators in the price bid for “Delineators-Type_”.

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

770-P01 REMOVAL OF PULL BOX: There is an existing weigh in motion site (WIM) located at RP 165.0. NDIT will disconnect the roadway sensors at the pull box prior to construction. Remove two pull boxes and cap the associated conduit at the pull box locations. Contact the Project Engineer two weeks prior to working in area. Project Engineer will contact NDIT at 701-328-6973 to coordinate the disconnecting of the roadway sensors. Include all costs for this described work in the contract unit price bid for “Remove Pull Box”.

772-P01 FEED POINT – FLASHING BEACON: This pay item is for the installation of the new control switch, flasher cabinet, work within the rest area building, bollards, concrete pad, mounting structures, and all associated basic electrical materials as shown on the detail drawings.

772-P02 FLASHING BEACON: This pay item is for the installation of the new Flashing Beacons and all related conduit, conductor, hardware, confirmation light, and other incidental items mounted to the new sign structure. The Flasher Cabinet/Beacons are to be wired so the flashing beacons become activated once the switch at the rest area is turned on. The confirmation light is also to turn on to indicate beacons are operational and is to be aimed as directed in the field.

930-P01 SHORING: Obtain the services of a registered professional engineer to design shoring for the excavations to remove the south half of the existing 9’ diameter structural plate pipe (Structure 0094-162.739) at Station 2122+11, and the south half of the existing 11’ diameter structural plate pipe (Structure 0094-167.314) at Station 2363+83.

Design the shoring systems to allow for excavation of the eastbound roadway and removal of the south half of the structural plate pipes and installation of the 84” diameter and 108” diameter RCP centerline culverts as shown in the plans. Design the shoring systems to also support the eastbound roadway embankment during future excavation of the westbound roadway to allow removal of the north half of each of the structural plate pipes, and extension of the 84” diameter RCP and 108” diameter RCP culverts through the westbound roadway. Leave the shoring systems in place, and they will become the property of the NDDOT upon completion of the project. Submit design calculations and working drawings for each of the shoring installations to the Engineer for review.

Install the shoring as necessary in the median, with maximum elevation of the top of the shoring no higher than 1’ above the profile of the median ditch bottom.

Include all costs for design, materials, equipment and labor to install the shoring in the price bid for the item “Shoring.”

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.09.11 14:52:12 -05'00'
NORTH DAKOTA

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SECTION 130

764-P01 REMOVED W-BEAM GUARDRAIL MATERIAL: Deliver the removed guardrail materials to the District Office in Bismarck, and neatly stack them at a location designated by the Engineer. The address of the Bismarck District Office is:

NDDOT Bismarck District Office
218 Airport Road
Bismarck, ND 58504

Include all costs for delivery of the removed guardrail materials in the contract unit prices bid for the items “Remove W-Beam Guardrail & Posts,” and “Remove End Treatment & Transition.”

764-P02 MODIFY BARREL ATTENUATION DEVICE: Prior to head to head traffic operation on the westbound roadway, remove and reset existing attenuation devices at the Menoken Interchange (Str No. 094-170.519), Apple Creek Separation (Str No. 094-166.531) and Gibbs Separation (Str No. 094-164.527). Place attenuation device to 10° toward the westbound roadway measured from centerline.

At the conclusion of the project remove and reset the barrel attenuation to 10° toward the eastbound roadway measured from centerline. Include all costs to perform this work in the price bid for “Modify Barrel Attenuation Device”.

764-P03 W-BEAM GUARDRAIL END TERMINALS FOR TWO-WAY TRAFFIC: Three W-Beam guardrail end terminals are required for protection of bridge ends and an outside bridge pier on the westbound roadway during two-way traffic operation.

At Apple Creek Bridge (Str No. 094-168.101 L), install two sets of thrie beam terminal connector, a 12’-6” thrie beam section (double thickness), a 6’-3” thrie to W-beam transition section (double thickness), two 12’-6” W-beam rail sections, and a W-beam guardrail end terminal, on the bridge as shown in the plans.

At Menoken Interchange (Str No. 094-170.519 L), install a W-beam end terminal, a 12’-6” double rail section, two 12’-6” W-beam rail sections and a Sequential Kinking End Terminal at the outside pier protection, on the north side of the roadway as shown in the plans.

During Phase 3A & 3B construction, remove all temporary guardrail installed in Phase 1.

The W-beam guardrail end terminals and additional guardrail materials, required for two-way traffic will remain the property of the contractor and be removed when no longer needed for two-way traffic operation. The W-beam guardrail end terminals will be measured and paid for by the number of W-beam guardrail end terminals required and accepted by the engineer and include all materials, including thrie beam terminal connectors, thrie beam rail sections, thrie to W-beam rail transition sections, W-beam rail sections, W-beam terminal connectors, and all necessary posts, blocks, hardware, equipment, and labor in the price bid for “W-Beam Guardrail End Terminal”.

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.09.11 14:52:25 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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ENVIRONMENTAL NOTES

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

EN-1 SPAWNING RESTRICTION: Do not work within the Apple Creek from April 15 to June 1.

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

EN-3 THREATENED AND ENDANGERED SPECIES: The project is located near/within suitable habitat for the species listed in the following table.

SPECIES	HABITAT	PRESENCE
Whooping Crane	Cropland/Wetland Associations	Spring: April 1 - May 15* Fall: September 10 – October 31
Northern Long-Eared Bat	Forested/Wooded Areas/Bridges/Box Culverts/Caves/Mines	Active Season: April 1 - October 31* Inactive Season: November 1 - March 31*

*Time frames can differ slightly, depending on the year

If any of the above threatened and endangered species are identified within 1 mile of the project, the Contractor will notify the Engineer immediately and cease construction activities in the vicinity until an avoidance area is established. The Engineer will establish an avoidance area that is at least a 0.5 mile and immediately coordinate with the USFWS (701-355-8513), FHWA (701-221-9464), and NDDOT Environmental and Transportation Services (701-328-2592). The Contractor will not resume work within the avoidance area until the Engineer has confirmed with the agencies that work may proceed (either the species have left the area, or approved avoidance/minimization measures have been implemented).

EN-4 TEMPORARY WETLAND IMPACT: Temporary impact areas within wetlands and or other waters are incorporated into the plans for this project. Remove temporary fill placed and sedimentation in wetlands or other waters. Restore these wetlands to preconstruction contours.

EN-5 WETLAND MITIGATION: Wetland mitigation is required for unavoidable permanent wetland impacts. The wetland mitigation plan is incorporated into the plans for this project. After completion of the mitigation area, the Engineer will complete the Onsite Mitigation Certification Form SFN 61042. Any sedimentation occurring within the mitigation area will be removed.

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.09.11 14:52:36 -05'00'
NORTH DAKOTA

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Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline:				TOTAL
103	0100	CONTRACT BOND	L SUM	1				1
109	1000	E-TICKETING	L SUM	1				1
201	0330	CLEARING & GRUBBING	L SUM	1				1
202	0021	REMOVE AGGREGATE BASE & SURFACING	TON	110166				110166
202	0108	REMOVAL OF STRUCTURE-SITE 1	L SUM	1				1
202	0109	REMOVAL OF STRUCTURE-SITE 2	L SUM	1				1
202	0110	REMOVAL OF STRUCTURE-SITE 3	L SUM	1				1
202	0111	REMOVAL OF CONCRETE	L SUM	1				1
202	0130	REMOVAL OF CURB & GUTTER	LF	70				70
202	0136	REMOVAL OF PAVEMENT	TON	60850				60850
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES	EA	10				10
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES	LF	1783				1783
202	0312	REMOVE EXISTING FENCE	LF	53533				53533
202	0350	REMOVAL OF TEMPORARY BYPASS	EA	4				4
203	0101	COMMON EXCAVATION-TYPE A	CY	79935				79935
203	0109	TOPSOIL	CY	59034				59034
203	0140	BORROW-EXCAVATION	CY	2537				2537
216	0100	WATER	M GAL	3895				3895
220	0100	PREPARE STOCKPILE SITE	L SUM	1				1
220	0200	RESTORE STOCKPILE SITE	L SUM	1				1
251	0200	SEEDING CLASS II	ACRE	112.7				112.7
251	2000	TEMPORARY COVER CROP	ACRE	112.8				112.8
253	0061	SOIL STABILIZATION	ACRE	225.5				225.5
255	0103	ECB TYPE 3	SY	5540				5540
256	0100	RIPRAP GRADE I	CY	227				227
256	0200	RIPRAP GRADE II	CY	277				277
256	0300	RIPRAP GRADE III	CY	195				195
260	0100	SILT FENCE UNSUPPORTED	LF	3664				3664
260	0101	REMOVE SILT FENCE UNSUPPORTED	LF	3664				3664
261	0112	FIBER ROLLS 12IN	LF	39230				39230
261	0113	REMOVE FIBER ROLLS 12IN	LF	18822				18822
302	0100	SALVAGED BASE COURSE	TON	141394				141394
401	0050	TACK COAT	GAL	2619				2619
401	0060	PRIME COAT	GAL	11508				11508
411	0114	MILLING PAVEMENT SURFACE - 2 INCH	SY	6034				6034
430	0143	RAP - SUPERPAVE FAA 43	TON	10772				10772
430	1000	CORED SAMPLE	EA	118				118
430	2000	PATCHING	TON	500				500
430	5815	PG 58S-34 ASPHALT CEMENT	TON	382				382
550	0112	8IN NON-REINF CONCRETE PAVEMENT CL AE	SY	1008				1008
550	0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED	SY	187025				187025
550	1013	3 IN EXPANSION JOINT	LF	74				74
550	1031	CONCRETE SLEEPER SLAB	SY	50				50
602	1130	CLASS AE-3 CONCRETE	CY	4.1				4.1
602	1135	BRIDGE APPROACH SLAB-REMOVE & REPLACE	SY	164.4				164.4
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	940				940
602	2105	CURB REPAIR	SF	50				50

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SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline:				TOTAL
602	7000	SPECIAL SURFACE FINISH	SF	1045				1045
624	3001	DOUBLE BOX BEAM RAIL RETROFIT-FREE STANDING	LF	392				392
624	3005	CONNECTION PLATE MODIFICATION	EA	2				2
702	0100	MOBILIZATION	L SUM	1				1
704	0100	FLAGGING	MHR	3300				3300
704	1000	TRAFFIC CONTROL SIGNS	UNIT	6803				6803
704	1045	ATTENUATION DEVICE-TYPE B-75	EA	8				8
704	1052	TYPE III BARRICADE	EA	52				52
704	1060	DELINEATOR DRUMS	EA	240				240
704	1067	TUBULAR MARKERS	EA	368				368
704	1070	DELINEATOR	EA	195				195
704	1072	FLEXIBLE DELINEATORS	EA	609				609
704	1081	VERTICAL PANELS-BACK TO BACK	EA	6				6
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	4				4
704	1088	SEQUENCING ARROW PANEL-TYPE C-CROSSOVER	EA	2				2
704	1090	FLASHING BEACON	EA	2				2
704	1500	OBLITERATION OF PAVEMENT MARKING	SF	5767				5767
704	3511	STATE FURNISHED MEDIAN BARRIER	LF	2840				2840
704	8015	VEHICLE SPEED FEEDBACK SIGN	EA	2				2
706	0400	FIELD OFFICE	EA	1				1
706	0500	AGGREGATE LABORATORY	EA	1				1
706	0550	BITUMINOUS LABORATORY	EA	1				1
706	0600	CONTRACTOR'S LABORATORY	EA	1				1
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	323873				323873
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	1094				1094
710	0100	TEMPORARY BYPASS	EA	2				2
714	0310	PIPE CONC REINF 18IN CL III	LF	122				122
714	0615	PIPE CONC REINF 24IN CL III	LF	16				16
714	0820	PIPE CONC REINF 30IN CL III	LF	28				28
714	0905	PIPE CONC REINF 36IN CL III	LF	10				10
714	1005	PIPE CONC REINF 42IN CL III	LF	22				22
714	1510	PIPE CONC REINF 72IN CL III	LF	14				14
714	3013	END SECT-TRAVERSABLE REINF. CONC.18IN	EA	9				9
714	3023	END SECT-TRAVERSABLE REINF. CONC.24IN	EA	1				1
714	3150	HEADWALL-PRECAST CONCRETE 4IN	EA	76				76
714	4090	PIPE CONDUIT 12IN	LF	256				256
714	4095	PIPE CONDUIT 15IN	LF	356				356
714	4105	PIPE CONDUIT 24IN	LF	625				625
714	4110	PIPE CONDUIT 30IN	LF	1009				1009
714	4115	PIPE CONDUIT 36IN	LF	876				876
714	4155	PIPE CONDUIT 84IN	LF	158				158
714	4160	PIPE CONDUIT 90IN	LF	106				106
714	4172	PIPE CONDUIT 108IN	LF	165				165
714	9630	RELAY END SECTION-ALL TYPES & SIZES	EA	1				1
714	9659	REMOVE & RELAY PIPE-ALL TYPES & SIZES	LF	12				12
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES	EA	13				13
714	9720	UNDERDRAIN PIPE PVC PERFORATED 4IN	LF	21332				21332

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SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline:				TOTAL
720	0110	RIGHT OF WAY MARKERS	EA	7				7
720	0125	ALIGNMENT MONUMENTS	EA	7				7
720	0130	IRON PIN R/W MONUMENTS	EA	2				2
720	0135	IRON PIN REFERENCE MONUMENTS	EA	10				10
722	6160	ADJUST INLET	EA	2				2
748	0140	CURB & GUTTER-TYPE I	LF	70				70
748	0141	CURB & GUTTER-TYPE 1 SPECIAL	LF	20				20
750	0115	SIDEWALK CONCRETE 4IN	SY	69				69
750	2115	DETECTABLE WARNING PANELS	SF	40				40
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST	LF	51752				51752
752	0600	FENCE CHAIN LINK	LF	1302				1302
752	0993	FENCE TERMINAL	EA	4				4
752	2100	VEHICLE GATE	EA	5				5
752	2120	REMOVE VEHICLE GATE	EA	5				5
752	2995	CORNER ASSEMBLY-WOOD POST	EA	32				32
752	3100	CORNER ASSEMBLY CHAIN LINK	EA	4				4
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST	EA	43				43
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	89				89
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	52				52
754	0154	DELINEATORS-TYPE A-SINGLE SIDED	EA	102				102
754	0160	DELINEATORS-TYPE B	EA	40				40
754	0166	DELINEATORS-TYPE E	EA	12				12
754	0168	DELINEATORS-TYPE D	EA	9				9
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	215				215
754	0210	GALV STEEL POST-STANDARD PIPE	LF	116				116
754	0214	GALV STEEL POSTS-W-SHAPE POSTS(TWO OR MORE)	LF	517				517
754	0530	PANEL FOR SIGNS-TYPE XI REFLECTIVE SHEETING	SF	62				62
754	0534	PANEL FOR SIGNS-TYPE IV REFLECTIVE SHEETING	SF	775				775
754	0557	INTERSTATE MILE POSTS-TYPE C	EA	10				10
754	0805	OBJECT MARKERS - CULVERTS	EA	82				82
754	1100	CLASS AE CONCRETE-SIGN FOUNDATIONS	CY	4				4
754	1104	REMOVE SIGN FOUNDATION	EA	26				26
760	0021	SINUSOIDAL RUMBLE STRIP - CONCRETE SHOULDER	MILE	19.492				19.492
762	0113	EPOXY PVMT MK 4IN LINE	LF	2624				2624
762	0114	EPOXY PVMT MK 6IN LINE	LF	3837				3837
762	0131	EPOXY PVMT MK 6IN LINE-GROOVED	LF	4186				4186
762	0134	EPOXY PVMT MK 12IN LINE-GROOVED	LF	49				49
762	0200	RAISED PAVEMENT MARKERS	EA	22799				22799
762	0432	SHORT TERM 6IN LINE-TYPE NR	LF	7210				7210
762	1104	PVMT MK PAINTED 4IN LINE	LF	51010				51010
762	1106	PVMT MK PAINTED 6IN LINE	LF	232808				232808
762	1124	PVMT MK PAINTED 24IN LINE	LF	87				87
762	1140	PVMT MK PAINTED CURB TOP & FACE	LF	66				66
764	0131	W-BEAM GUARDRAIL	LF	656				656
764	0145	W-BEAM GUARDRAIL END TERMINAL	EA	6				6
764	0151	REMOVE W-BEAM GUARDRAIL & POSTS	LF	581				581
764	2081	REMOVE END TREATMENT & TRANSITION	EA	3				3

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Estimated Quantities

Mainline:

SPEC	CODE	ITEM DESCRIPTION	UNIT					TOTAL
764	8080	MODIFY BARREL ATTENUATION DEVICE	EA	3				3
770	4579	REMOVE PULL BOX	EA	2				2
772	0520	FEED POINT-FLASHING BEACON	EA	1				1
772	2160	FLASHING BEACON	EA	1				1
900	1000	TEMPORARY STREAM DIVERSION	EA	3				3
930	8230	SHORING	EA	2				2
930	9223	CRACK SEALING	LF	1600				1600

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		I-94											
		Typical Section 1		Typical Section 2 (4.2% SE)		Typical Section 3 (3.3% SE)		Typical Section 4 (2.3% SE)		Typical Section 5 Widening for ramps	
		Stations	# of Sta	Stations	# of Sta	Stations	# of Sta	Stations	# of Sta	Stations	# of Sta
		2103+61 to 2121+22	17.610	2121+22 to 2147+13	25.910	2261+03 to 2270+85	9.820	2293+56 to 2310+65	17.090	2408+35 to 2415+60	7.250
		2147+13 to 2261+03	113.900							2434+13 to 2444+25	10.120
		2270+85 to 2293+56	22.710							2517+19 to 2524+44	7.250
		2310+65 to 2400+33	89.680							2541+28 to 2549+85	8.570
		2415+60 to 2434+13	18.530								
		2444+25 to 2517+19	72.940								
		2524+44 to 2529+23	4.790								
		2532+62 to 2541+28	8.660								
		2549+85 to 2618+21	68.360								
		Total Stations =	417.18	Total Stations =	25.91	Total Stations =	9.82	Total Stations =	17.09	Total Stations =	33.19
Material	Unit	Area (SF) or Width (LF)	Quantity per Station	Area (SF) or Width (LF)	Quantity per Station	Area (SF) or Width (LF)	Quantity per Station	Area (SF) or Width (LF)	Quantity per Station	Area (SF) or Width (LF)	Quantity per Station
302 0100 SALVAGED BASE COURSE @ 1.875 Ton/CY	Ton	38.05	264.24	39.58	274.86	39.10	271.53	37.43	259.93	39.00	270.83
401 0050 TACK COAT @ 0.05 Gal/SY (1)	Gal	8.30	4.61	8.30	4.61	8.30	4.61	8.30	4.61	-	-
401 0060 PRIME @ 0.25 Gal/SY	Gal	8.60	23.89	8.60	23.89	8.60	23.89	8.60	23.89	-	-
430 0143 RAP-SUPERPAVE FAA 43 @ 2 Ton/CY	Ton	2.77	20.52	2.77	20.52	2.77	20.52	2.76	20.44	-	-
430 5815 PG 58S-34 ASPHALT CEMENT @ 3.5%	Ton		0.72		0.72		0.72		0.72	-	-
550 0305 9IN NON-REINF CONCRETE PVMT CL	SY	30.00	333.33	30.00	333.33	30.00	333.33	30.00	333.33	43.50	483.33
709 0100 GEOSYNTHETIC MATERIAL TYPE G	SY	55.00	611	55.00	611	55.00	611	55.00	611	58.00	644

		I-94									
		Typical Section 6 Ramp Connections		Typical Section 7 Guardrail Widening (see 10-2 for add quantities)		Typical Section 8 Guardrail Widening (see 10-2 for add quantities)		Typical Section 9 Guardrail Widening		Typical Section 10 Guardrail Widening (see 10-2 for add quantities)	
		Stations	# of Sta	Stations	# of Sta	Stations	# of Sta	Stations	# of Sta	Stations	# of Sta
		8+83 to 9+73	0.900	2400+33 to 2401+14	0.810	2401+14 to 2403+95	2.810	2406+30 to 2408+35	2.050	2529+23 to 2532+62	3.390
		27+64 to 28+09	0.450								
		8+04 to 9+25	1.210								
		8+60 to 9+05	0.450								
		Total Stations =	3.01	Total Stations =	0.81	Total Stations =	2.81	Total Stations =	2.05	Total Stations =	3.39
Material	Unit	Area (SF) or Width (LF)	Quantity per Station	Area (SF) or Width (LF)	Quantity per Station	Area (SF) or Width (LF)	Quantity per Station	Area (SF) or Width (LF)	Quantity per Station	Area (SF) or Width (LF)	Quantity per Station
302 0100 SALVAGED BASE COURSE @ 1.875 Ton/CY	Ton	23.44	162.78	37.10	257.64	31.65	219.79	32.82	227.92	38.05	264.24
401 0050 TACK COAT @ 0.05 Gal/SY (1)	Gal		-	8.30	4.61	-	-	-	-	8.30	4.61
401 0060 PRIME @ 0.25 Gal/SY	Gal		-	8.60	4.78	-	-	-	-	8.60	4.78
430 0143 RAP-SUPERPAVE FAA 43 @ 2 Ton/CY	Ton		-	2.76	20.44	-	-	-	-	-	-
430 5815 PG 58S-34 ASPHALT CEMENT @ 3.5%	Ton		-	-	0.72	-	-	-	-	-	-
550 0305 9IN NON-REINF CONCRETE PVMT CL	SY	24.00	266.67	30.00	333.33	38.00	422.22	38.00	422.22	30.00	333.33
709 0100 GEOSYNTHETIC MATERIAL TYPE G	SY	33.00	367	55.00	611	57.00	633	55.00	611	55.00	611

Basis of Estimate

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 14:53:07 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	10	2

		I-94					
		Addl qty for guardrail widening at obstruction (D-764-23)	Addl qty for decal lane widening	Addl qty for accel lane widening	Addl qty for decal lane widening	Addl qty for accel lane widening	Addl qty for Rest Area Parking Lot
		Stations	Stations	Stations	Stations	Stations	Stations
		Sta 2400+33 to 2403+95	Sta 2408+35 to 2415+60	Sta 2434+13 to 2444+25	Sta 2517+19 to 2524+44	Sta 2541+28 to 2549+85	Sta 16+75 to 23+18
		Sta 2529+23 to 2532+62					
Material	Unit	Total Quantity	Total Quantity	Total Quantity	Total Quantity	Total Quantity	Total Quantity
302 0100 SALVAGED BASE COURSE @ 1.875 Ton/CY	Ton	438	642	909	643	726	
401 0060 PRIME @ 0.25 Gal/SY	Gal	260					
430 0143 RAP-SUPERPAVE FAA 43 @ 2 Ton/CY	Ton	115					
430 5815 PG 58S-34 ASPHALT CEMENT @ 3.5%	Ton	7					
550 0305 9IN NON-REINF CONCRETE PVMT CL	SY		916	1307	918	1023	5901
709 0100 GEOSYNTHETIC MATERIAL TYPE G	SY		1181	1679	1184	1338	

Summary Table (1 of 3): Mainline Paving Tables		
Material	Unit	Total
302 0100 SALVAGED BASE COURSE @ 1.875 Ton/CY	Ton	139,491
401 0050 TACK COAT @ 0.05 Gal/SY (1)	Gal	2,186
401 0060 PRIME @ 0.25 Gal/SY	Gal	11,508
430 0143 RAP-SUPERPAVE FAA 43 @ 2 Ton/CY	Ton	9,775
430 5815 PG 58S-34 ASPHALT CEMENT @ 3.5%	Ton	346
550 0305 9IN NON-REINF CONCRETE PVMT CL	SY	187,025
709 0100 GEOSYNTHETIC MATERIAL TYPE G	SY	320,629

Summary Table (2 of 3): Subtotals from Section 20		
Material	Unit	Total
302 0100 SALVAGED BASE COURSE @ 1.875 Ton/CY	Ton	50
430 0143 RAP-SUPERPAVE FAA 43 @ 2 Ton/CY	Ton	3

Summary Table (3 of 3): Subtotals from Section 90		
Material	Unit	Total
302 0100 SALVAGED BASE COURSE @ 1.875 Ton/CY	Gal	1,853
401 0050 TACK COAT	Gal	433
411 0114 MILLING PAVEMENT SURFACE - 2 INCH	SY	6,034
430 0143 RAP-SUPERPAVE FAA 43 @ 2 Ton/CY	Ton	994
430 5815 PG 58S-34 ASPHALT CEMENT @ 3.5%	Ton	36
550 0112 8IN NON-REINF CONCRETE PVMT CL AE	SY	1,008
709 0100 GEOSYNTHETIC MATERIAL TYPE G	SY	778

Cumulative Paving Summary Table: Summation of Summary Tables 1-3		
Material	Unit	Total
302 0100 SALVAGED BASE COURSE @ 1.875 Ton/CY	Ton	141,394
401 0050 TACK COAT @ 0.05 Gal/SY (1)	Gal	2,619
401 0060 PRIME @ 0.25 Gal/SY	Ton	11,508
411 0114 MILLING PAVEMENT SURFACE - 2 INCH	SY	6,034
430 0143 RAP-SUPERPAVE FAA 43 @ 2 Ton/CY	Ton	10,772
430 5815 PG 58S-34 ASPHALT CEMENT @ 3.5%	Ton	382
550 0112 8IN NON-REINF CONCRETE PVMT CL AE	SY	1,008
550 0305 9IN NON-REINF CONCRETE PVMT CL	SY	187,025
709 0100 GEOSYNTHETIC MATERIAL TYPE G	SY	321,407

Salvaged Aggregate Summary			
	SY	TON	TON
Milling Pavement Surface	6,034	670	
Removal of Aggregate Base & Surfacing		110,163	
Removal of Pavement		60,843	
Subtotal		171,676	
5% Less for Crushing and Handling		8,584	
Total Salvaged Material Available			163,092
Total Salvaged Base Course needed		141,394	
Total Salvaged Material needed for 100% blend			141,436
Total Salvage need for RAP-SUPERPAVE 43 (35% Maximum)			3,770
Salvage Material Excess			17,885

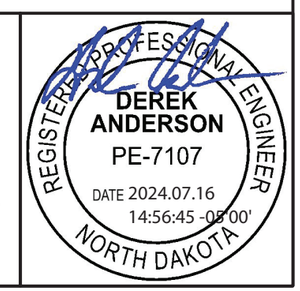
Note: This is not a balance sheet. The contractor must balance their own materials. Material may not be available when needed.

Removals	
Asphalt Pavement	2.0 Ton/CY
Concrete Pavement	2.0 Ton/CY
Aggregate Base	1.875 Ton/CY

Basis of Estimate

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	10	3

754 0805 OBJECT MARKERS - CULVERTS		
Alignment	Station	EA
PR94EB	2110+07	1
	2119+38	2
	2122+11	1
	2131+27	2
	2140+17	2
	2140+27	2
	2153+64	2
	2153+74	2
	2177+54	2
	2214+84	1
	2214+99	1
	2215+09	1
	2227+10	2
	2236+85	1
	2239+60	2
	2249+11	2
	2257+11	1
	2257+21	1
	2264+67	1
	2264+77	1
	2287+65	1
	2287+75	1
	2294+26	2
	2294+36	2
	2321+13	1
	2333+03	1
	2333+13	1
	2353+13	2
	2363+71	1
	2366+47	2
	2375+18	1
	2385+13	2
	2394+76	1
	2394+86	1
	2401+88	2
	2407+52	2
	2413+12	1
	2426+12	2
	2439+11	2
	2448+12	2
	2468+12	2
	2476+12	1
	2500+14	1
	2508+13	2
	2519+12	2
	2534+13	2
	2547+14	2
	2566+16	2
	2576+15	2
	2586+08	2
MNW	10+52 - 11+60	2
MNE	32+14 - 30+94	2
Total:		82

Note: Refer to Standard Drawing D-754-83

430 1000 CORED SAMPLE										
Specification Section	Location	Begin Station	End Station	A	B		C			
				Distance (Ft) /1000	Lanes	Joints	Lifts	Quantity (A * B * C)	Quantity (1 per mile)	Unit
430.04 I.2.b(2), "Pavement Density Cores"										
Rest Area	RP 168.469	9+75	27+60	2	2	N/A	1	4	N/A	EA
HMA Mainline Shoulder		2103+61	2618+21	51	1	N/A	2	102		
SSP 4 Longitudinal Joint Density in HMA Pavments (Centerline)										
Rest Area	RP 168.469	9+75	27+60	2	N/A	1	1	2	N/A	EA
430.04 I.2.b(3), "Pavement Thickness Determination Cores"										
HMA Mainline Shoulder		2103+61	2618+21	N/A	N/A	N/A	N/A	N/A	10	EA
							Subtotal:	108	10	EA
							Total:	118		EA

714 9720 UNDERDRAIN PIPE PVC PERFORATED 4IN		
Begin Station	End Station	Quantity (LF)
2103+61	2210+27	21,332
	Total:	21,332

Delineators			
Item	Unit	subtotal	Total
754 0154 DELINEATOR -TYPE A-SINGLE SIDED (White)	EA	102	102
754 0160 DELINEATOR - TYPE B (White)	EA	24	40
754 0160 DELINEATOR - TYPE B (Yellow)	EA	16	
754 0166 DELINEATOR - TYPE E (White) (From Section 110)	EA	12	12
754 0168 DELINEATOR - TYPE D (White)	EA	6	9
754 0168 DELINEATOR - TYPE D (Yellow)	EA	3	

760 0021 SINUSOIDAL RUMBLE STRIP - CONCRETE SHOULDER			
Begin Station	End Station	Basis	Quantity (Mile)
2103+61	2618+21	10,560 LF/Mile	19.492
		Total:	19.492 Mile

216 0100 WATER			
Material	Basis	Basis Quantity	Quantity (MGAL)
Dust Palliative	25 MGal/Mile	10 Mile	243
Embankment	10 Gal/CY	82,472 CY	825
Aggregates	20 Gal/Ton	141,394 Ton	2,828
		Total:	3,895 MGal

714 3150 HEADWALL-PRECAST CONCRETE 4IN			
Median (Lt Ditch)		Right Ditch	
Station	Station	Station	Station
2123+41	2170+90	2123+41	2170+90
2125+90	2175+90	2125+90	2175+90
2128+40	2178+40	2128+40	2178+40
2130+90	2180+90	2130+90	2180+90
2133+40	2183+40	2133+40	2183+40
2135+90	2185+90	2135+90	2185+90
2138+40	2188+40	2138+40	2188+40
2140+90	2190+90	2140+90	2190+90
2143+40	2193+40	2143+40	2193+40
2145+90	2195+90	2145+90	2195+90
2148+40	2198+40	2148+40	2198+40
2150+90	2200+90	2150+90	2200+90
2153+40	2203+40	2153+40	2203+40
2155+90	2205+90	2155+90	2205+90
2158+40	2208+40	2158+40	2208+40
2160+90	2210+90	2160+90	2210+90
2163+40	2213+40	2163+40	2213+40
2165+90	2215+90	2165+90	2215+90
2168+40	2219+15	2168+40	2219+15
		Total:	76

Basis of Estimate

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 14:56:57 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	11	1

Earthwork Summary

Location	203 0101 COMMON EXCAVATION-TYPE A (CY)	Embankment (CY)	203 0140 BORROW-EXCAVATION	203 0109 TOPSOIL (CY) (available)
	A	B	C = B - A	
I94EB	78,185	80,272	2,087	59,034
Temporary Ramps	1,750	2,200	450	
TOTAL	79,935	82,472	2,537	59,034

Notes:
1. This computation report is not a balance sheet. The Contractor shall calculate their own balance of materials.
2. An additional volume of 25% to allow for shrinkage is included in all embankment volumes.
3. Prismoidal Method used to calculate earthwork.

Data Tables

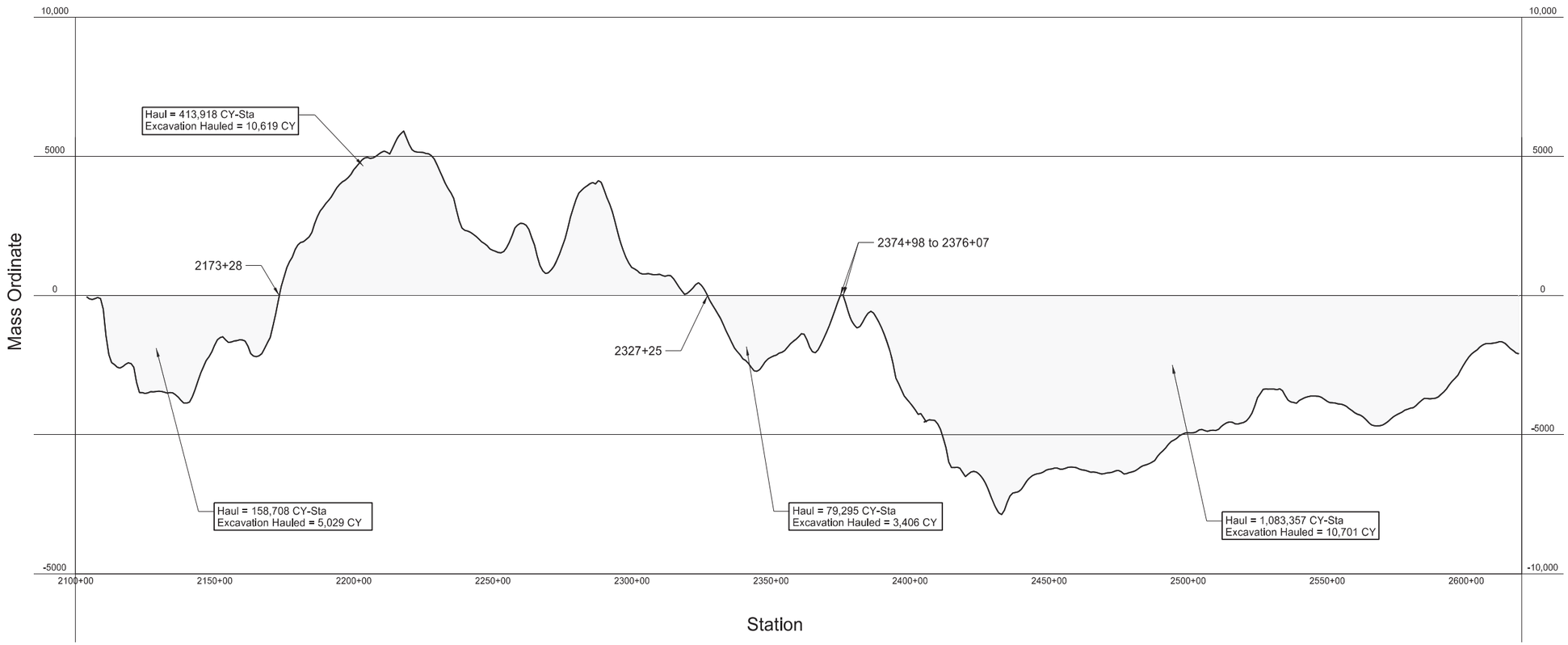
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 10:56:46 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	11	2

Mass Haul Diagram



Average Haul for the Project = 58.32 Sta

Mass Diagram

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 10:59:36 -05'00'
NORTH DAKOTA

7/16/2024 10:02:04 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\011\011DT_002_Mass Haul.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	1

PC = 2120+64.06
PI = 2134+42.96
Delta = 27°03'46.86" (RT)
Da = 00°59'59.96"
R = 5729.65
T = 1378.90'
L = 2706.34
PT = 2147+70.40

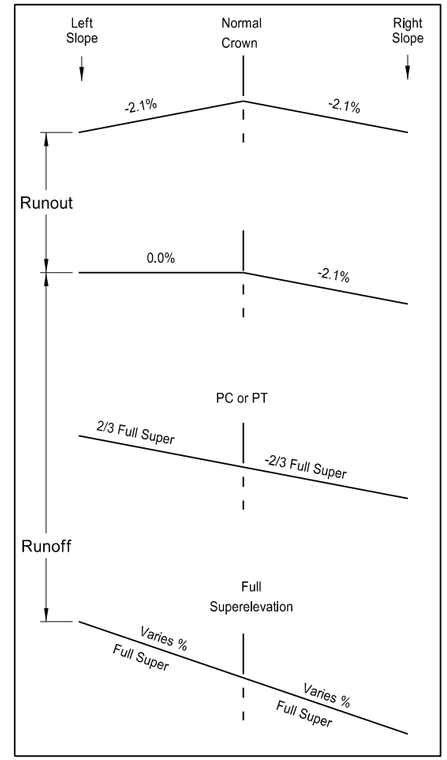
Station			Left Driving Lane & Shoulder	Right Driving Lane	Right Shoulder	Point Type
2118+62.69	PC	-201	-2.10%	-2.10%	-2.90%	Normal Crown
2119+48.99	PC	-115	0.00%	-2.10%	-2.90%	Level/Normal Crown
2120+35.29	PC	-29	2.10%	-2.10%	-2.90%	Reverse Crown
2120+64.06	PC		PC			
2120+68.17			-2.90%	-2.90%	-2.90%	
2121+21.59	PC	58	4.20%	-4.20%	-4.20%	Full Super
2147+12.87	PT	-58	4.20%	-4.20%	-4.20%	Full Super
2147+66.29			-2.90%	-2.90%	-2.90%	
2147+70.40	PT		PT			
2147+99.17	PT	29	2.10%	-2.10%	-2.90%	Reverse Crown
2148+85.47	PT	115	0.00%	-2.10%	-2.90%	Level/Normal Crown
2149+71.77	PT	201	-2.10%	-2.10%	-2.90%	Normal Crown

PC = 2260+57.71
PI = 2265+94.99
Delta = 08°02'45.13" (RT)
Da = 00°44'59.99"
R = 7639.49
T = 537.28'
L = 1072.79
PT = 2271+30.60

Station			Left Driving Lane & Shoulder	Right Driving Lane	Right Shoulder	Point Type
2258+80.99	PC	-177	-2.10%	-2.10%	-2.90%	Normal Crown
2259+67.29	PC	-90	0.00%	-2.10%	-2.90%	Level/Normal Crown
2260+53.59	PC	-4	2.10%	-2.10%	-2.90%	Reverse Crown
2260+57.71	PC					
2260+86.47			-2.90%	-2.90%	-2.90%	
2261+02.91	PC	45	3.30%	-3.30%	-3.30%	Full Super
2270+85.29	PT	-45	3.30%	-3.30%	-3.30%	Full Super
2271+01.73			-2.90%	-2.90%	-2.90%	
2271+30.60	PT					
2271+34.61	PT	4	2.10%	-2.10%	-2.90%	Reverse Crown
2272+20.91	PT	86	0.00%	-2.10%	-2.90%	Level/Normal Crown
2273+07.21	PT	177	-2.10%	-2.10%	-2.90%	Normal Crown

PC = 2293+24.82
PI = 2302+12.64
Delta = 08°51'37.80" (LT)
Da = 00°30'00.00"
R = 11459.19
T = 887.82'
L = 1772.11
PT = 2310+96.92

Station			Left Driving Lane & Shoulder	Right Driving Lane	Right Shoulder	Point Type
2291+45.22					-2.90%	
2291+75.50	PC	-173	-2.10%	-2.10%	-2.10%	Normal Crown
2292+61.80	PC	-86	-2.10%	0.00%	0.00%	Normal/Level Crown
2293+24.82	PC					
2293+48.10	PC	23	-2.10%	2.10%	2.10%	Normal Crown
2293+56.32	PC	32	-2.30%	2.30%	2.30%	Full Super
2310+65.42	PT	-32	-2.30%	2.30%	2.30%	Full Super
2310+73.64	PT	-23	-2.10%	2.10%	2.10%	Normal Crown
2310+96.92	PT					
2311+59.94	PT	63	-2.10%	0.00%	0.00%	Normal/Level Crown
2312+46.24	PT	173	-2.10%	-2.10%	-2.10%	Normal Crown
2312+76.52					-2.90%	



Note: Calculations based on NDDOT CADD Manual and Superelevation Table.
A design speed of 80 mph and maximum superelevation of 6% were used.

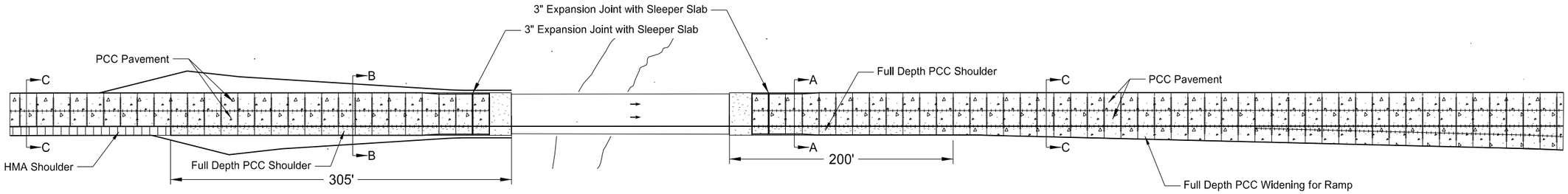
Superelevation Table

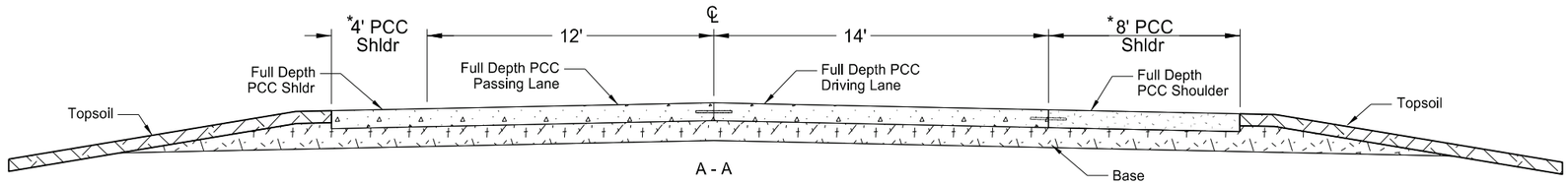
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

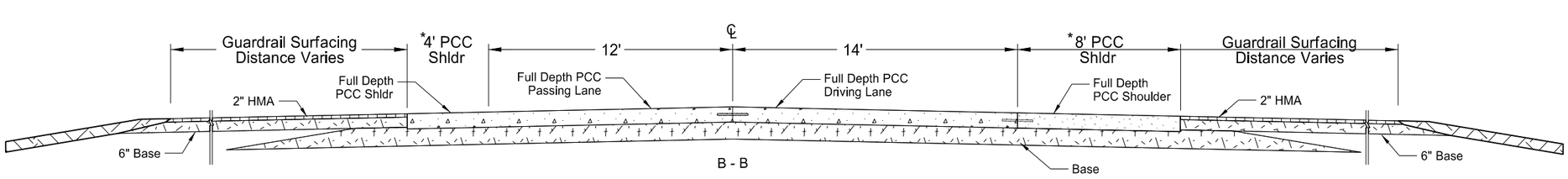
REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.09.16 07:44:01 -05'00'
NORTH DAKOTA

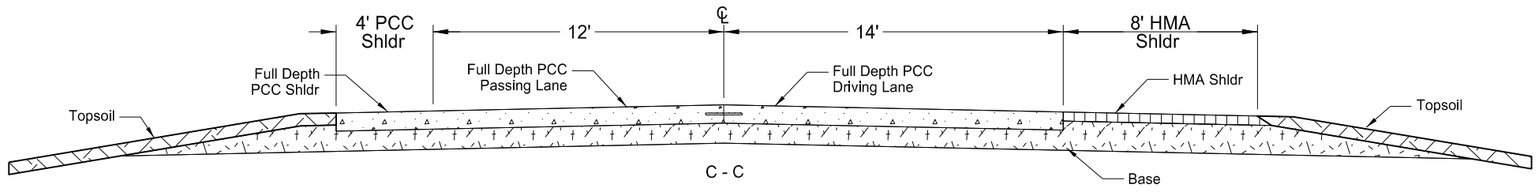
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	2





* See sheet 90-2 for shoulder width transition





Interstate Paving at Bridge Ends Detail

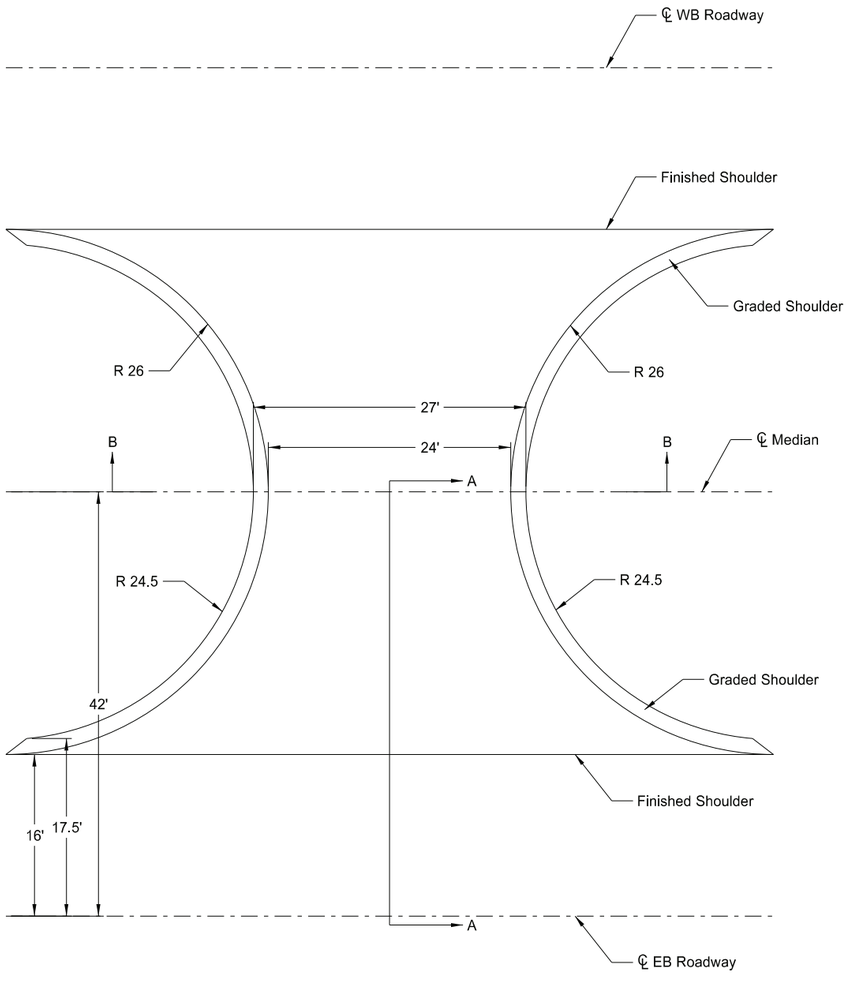
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

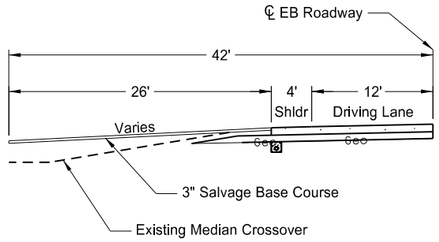
REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.09.16 07:44:27 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	3

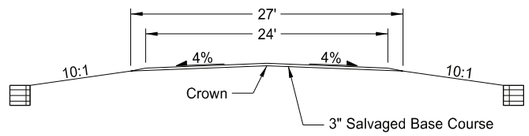
SPEC	CODE	BID ITEM	QTY	UNIT
302	0100	SALVAGED BASE COURSE		
		Sta 2248+60	14	TON
		Sta 2385+60	14	TON
		Sta 2487+64	14	TON



PLAN



Section A-A



SECTION B-B

Note: Include the cost of the labor, equipment and materials to install interstate median crossings for authorized vehicles, except for topsoil and salvaged base course, in the price bid for "Common Excavation Type-A." See Section 60 for construction limits of each Interstate Median Crossing for Authorized Vehicles.

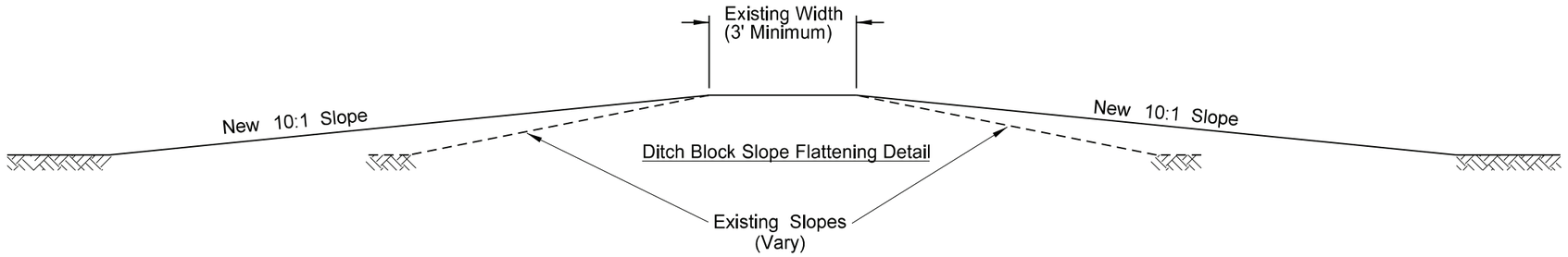
Interstate Median Crossings for Authorized Vehicles

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.09.16 07:44:59 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	4

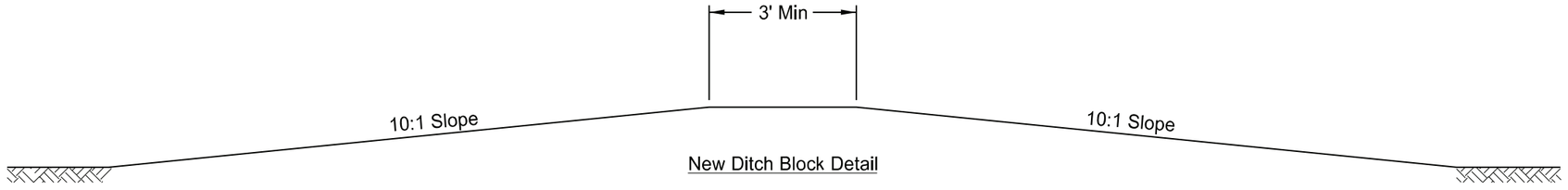


Ditch Block Slope Flattening Detail

Note: Flatten all existing ditch blocks to 10:1.

DITCH BLOCKS	
Location	Top Elevation
2119+06 Lt	1747.9 (A)
2130+94 Lt	1775.2
2139+74 Lt	1794.8
2139+77 Rt	1794.8
2146+75 Lt	1812.3 (A)
2153+27 Lt	1826.1 (A)
2163+30 Lt	1852.1 (A)
2177+87 Rt	1868.0 (A)
2177+88 Lt	1862.4 (A)
2186+90 Lt	1843.9 (A)
2195+44 Lt	1820.2 (A)
2204+39 Lt	1795.6 (A)
2227+34 Lt	1776.4 (A)
2256+99 Lt	1771.6 (A)
2264+54 Lt	1775.2 (A)
2287+86 Lt	1766.9 (A)
2294+64 Lt	1756.5 (A)
2307+81 Lt	1739.3 (A)
2333+28 Lt	1730.2 (A)
2342+33 Lt	1729.7 (A)
2353+38 Lt	1724.0 (A)
2366+74 Lt	1708.9 (A)
2375+43 Lt	1699.0 (A)
2395+25 Lt	1681.0
2412+82 Lt	1680.6 (A)
2425+80 Lt	1669.8
2438+85 Lt	1717.4
2447+91 Lt	1718.6 (A)
2468+37 Lt	1719.1 (A)
2507+85 Lt	1722.3 (A)
2518+88 Lt	1723.6 (A)
2546+88 Lt	1726.3 (A)
2566+41 Lt	1725.6 (A)
2576+36 Lt	1724.2 (A)
2586+35 Lt	1722.2
2599+37 Lt	1716.6 (A)
2612+46 Lt	1711.8 (A)

(A) Match Existing Elevation



New Ditch Block Detail

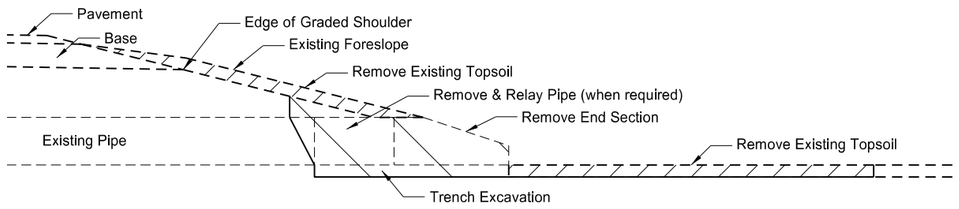
Ditch Block Detail

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

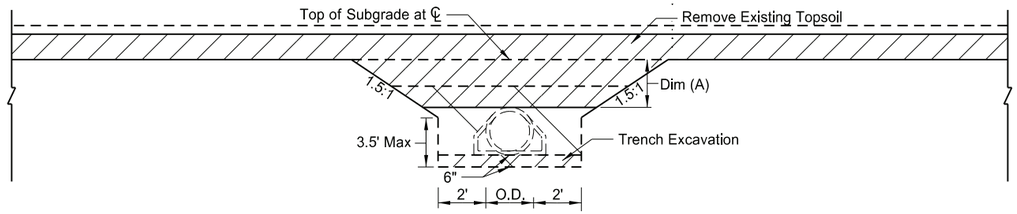
BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.09.11 14:04:04 -05'00'
ENGINEER
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	5



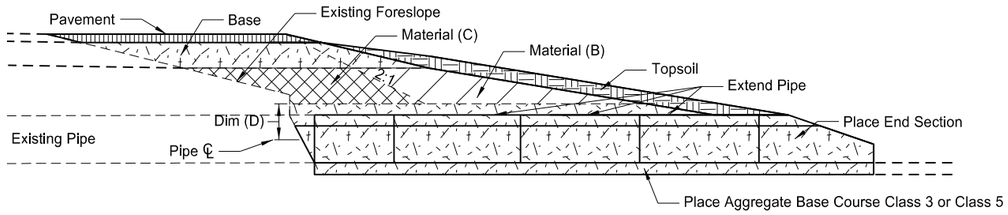
Removal Section

Cross Section View



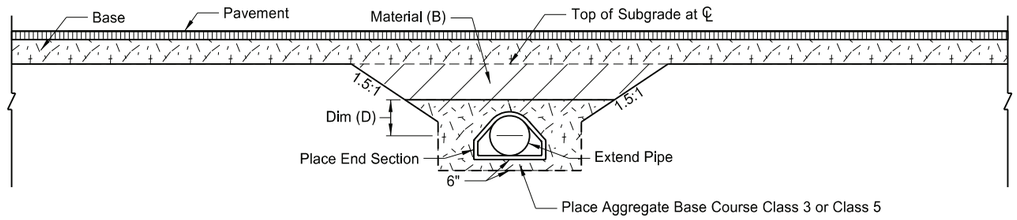
Removal Detail

Side View



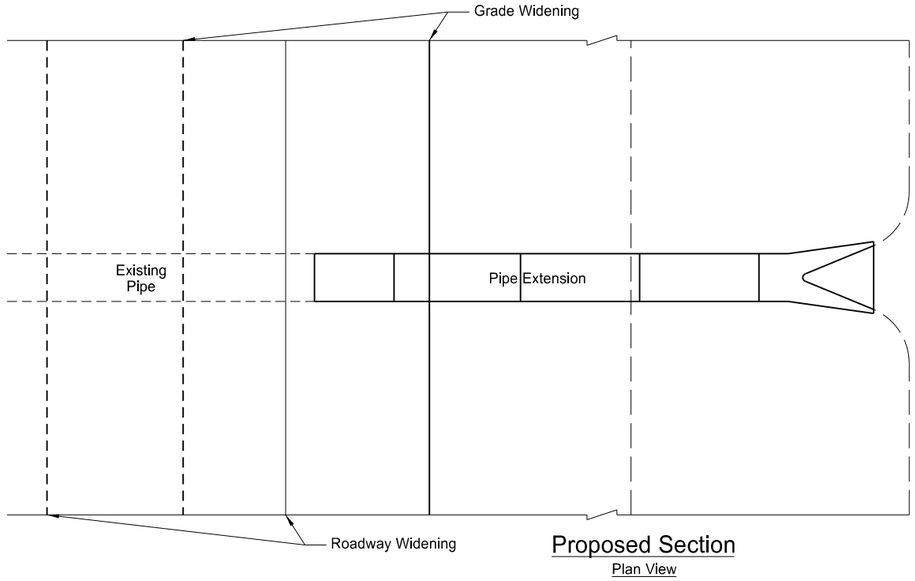
Proposed Section

Cross Section View



Backfill Detail

Side View (Topsoil not shown)



Proposed Section

Plan View

Pay Items
1) Pipe*
2) Remove & Relay Pipe - All Types & Sizes (when required)
3) Remove & Reset End Section or
   Remove End Section and Place New End Section
4) Borrow Excavation or Common Excavation
5) Topsoil
6) Seeding
7) Mulching

*Included in Pipe Pay Item
1) Pipe
2) Trench excavation
3) Aggregate Base Course Class 3 or Class 5

Pipe Materials	Dim (A)<=4 Feet		Backfill Dimension
	Material (B)	Material (C)	Dim (D)
Concrete	Embank or Aggr	Aggregate	0.5 O.D.
Metal	Embank or Aggr	Aggregate	0.5 O.D.+1 Foot

Pipe Materials	Dim (A)>4 Feet		Backfill Dimension
	Material (B)	Material (C)	Dim (D)
Concrete	Embankment	Embankment	0.5 O.D.
Metal	Embankment	Embankment	0.5 O.D.+1 Foot

NOTES:
1. Embankment may be either Borrow Excavation or Common Excavation

2. Aggregate may be either Class 3 or Class 5 Aggregate Base Course.

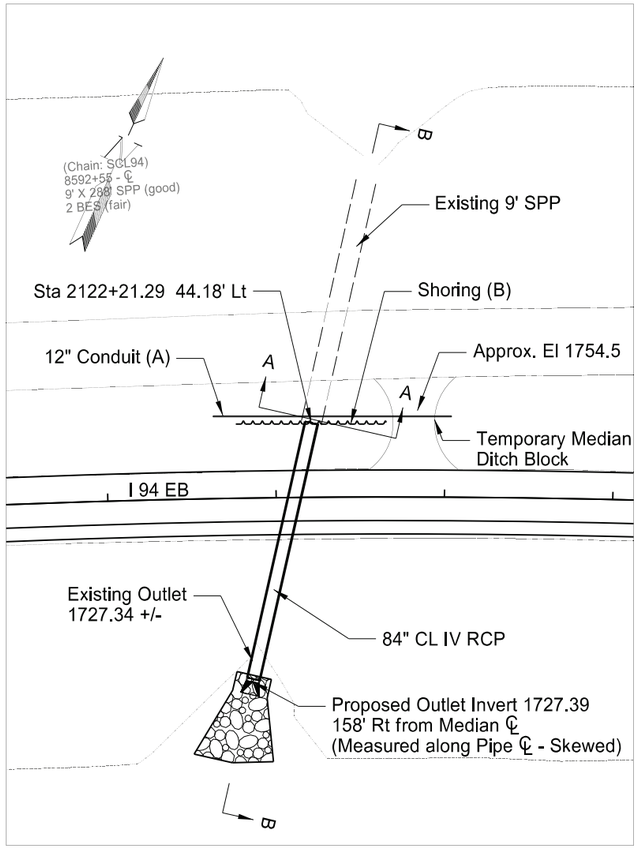
Mainline Widening CL Pipe Extension Detail

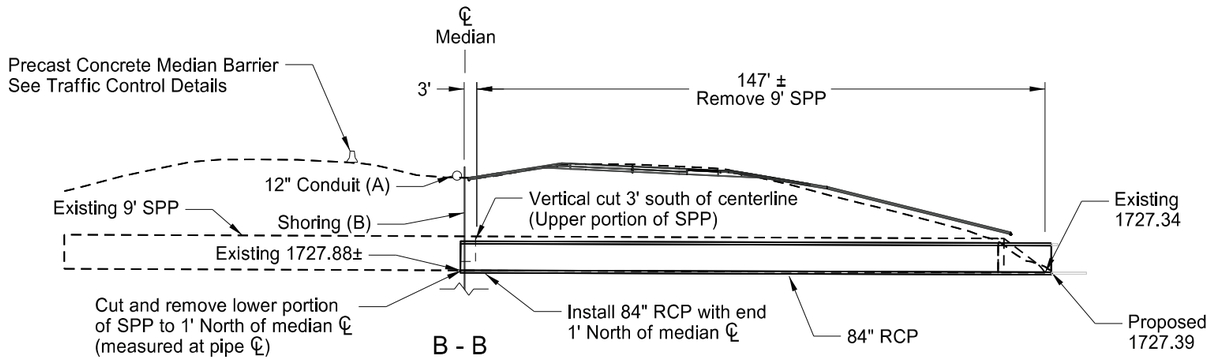
I-94 Reconstruction

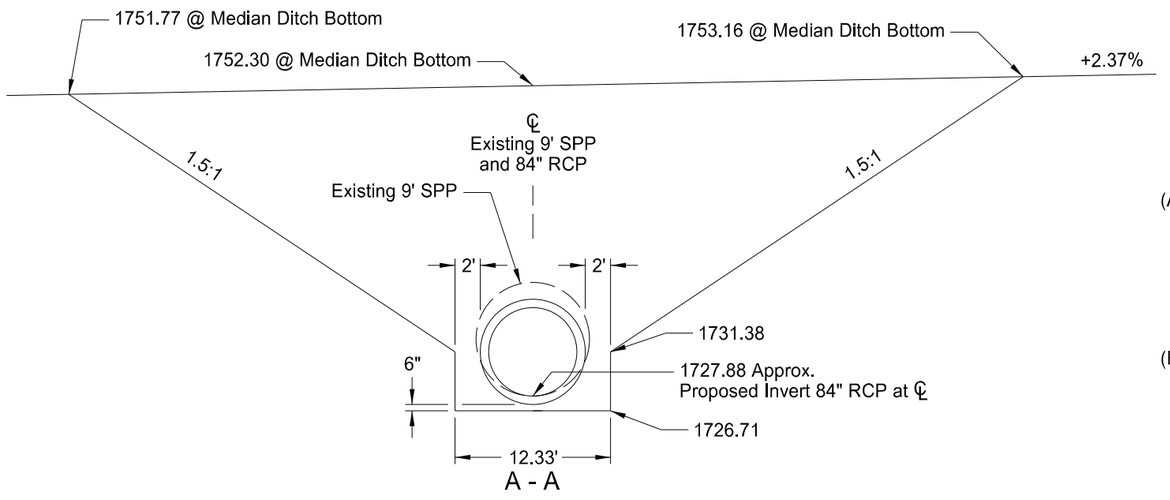
Bismarck to E of Menoken Interchange - EB

BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.09.11 14:04:49 -05'00'
ENGINEER
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	6





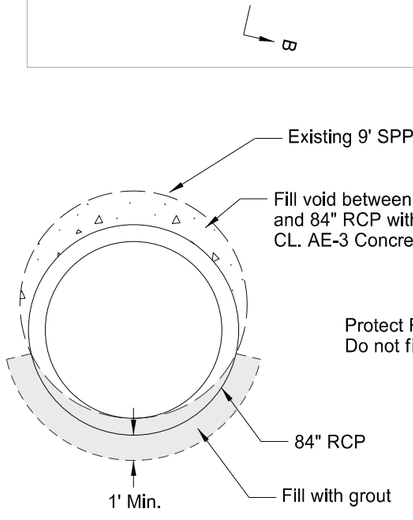


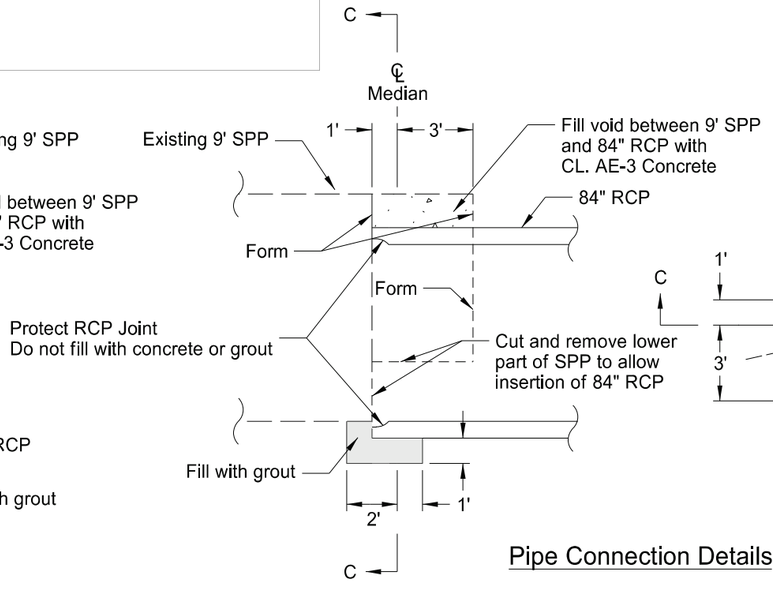
NOTES:

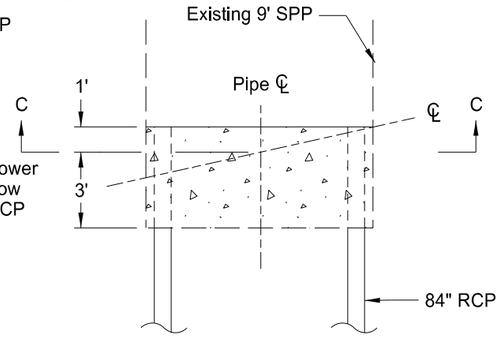
See Standard Drawing D-714-25 for pipe installation details

(A) Length of 12" dia conduit to be determined by contractor to accomodate shoring and excavation operations. 12" conduit may be RCP, CSP, Spiral Rib CSP, HDPE, PVC

(B) Shoring is shown parallel to the median centerline. Location and alignment of shoring to be determined by contractor to accomodate his operations.







Pipe Connection Details

SPEC	CODE	BID ITEM	QTY	UNIT
202	0108	REMOVAL OF STRUCTURE-SITE 1		
		Sta 2122+11	1	L SUM
602	1130	CLASS AE-3 CONCRETE		
		Sta 2122+11	2.0	CY
930	8230	SHORING		
		Sta 2122+11	1	EA

Removal of Structural Plate Pipe and Culvert Installation Details

Structure 0094-162.739

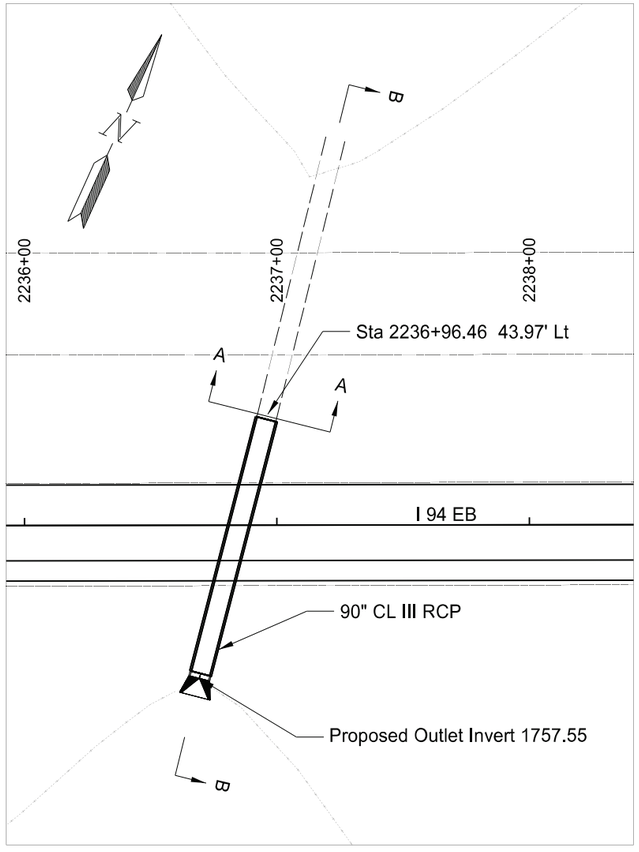
Sta 2122+11

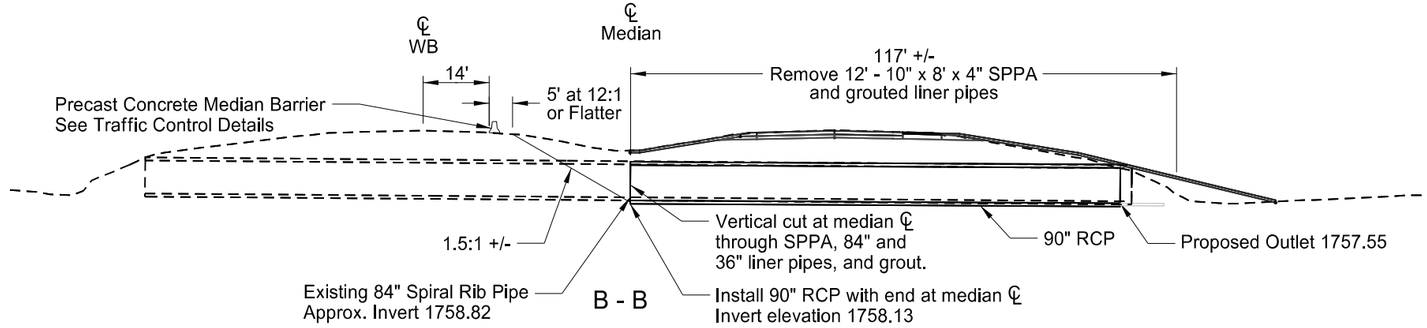
I-94 Reconstruction

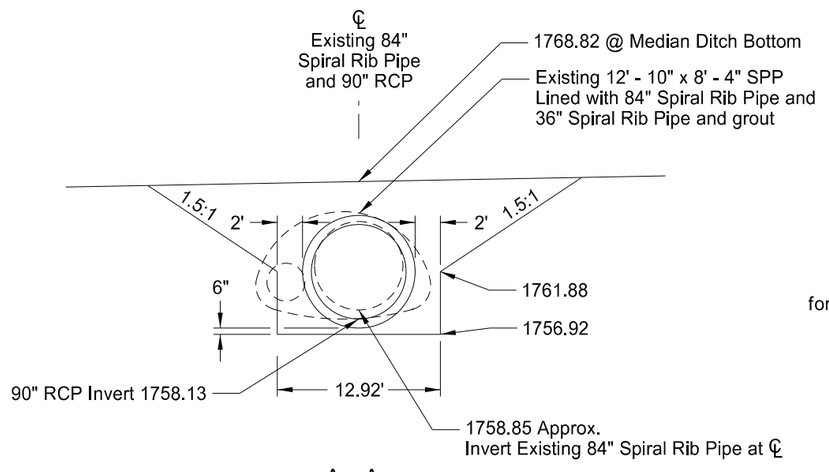
Bismarck to E of Menoken Interchange - EB

BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.09.11 14:05:36 -05'00'
ENGINEER
NORTH DAKOTA

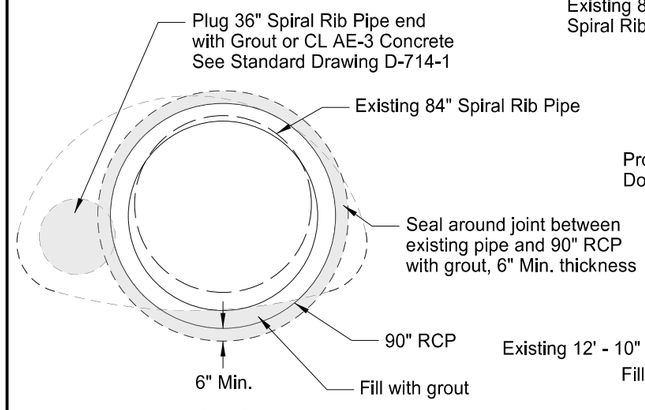
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	7

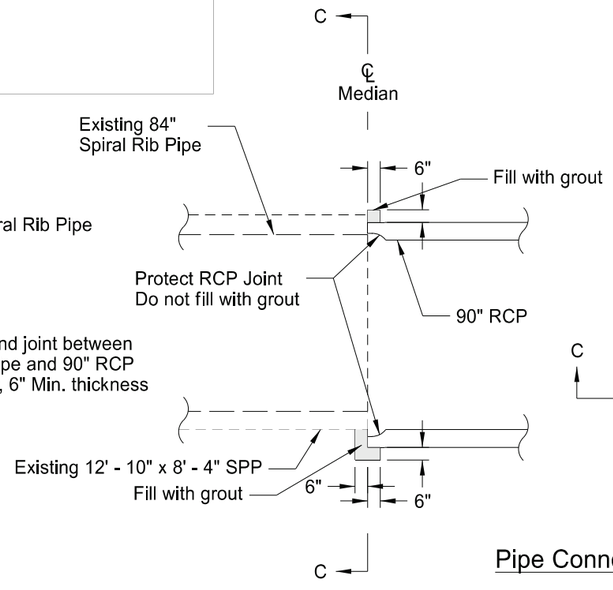


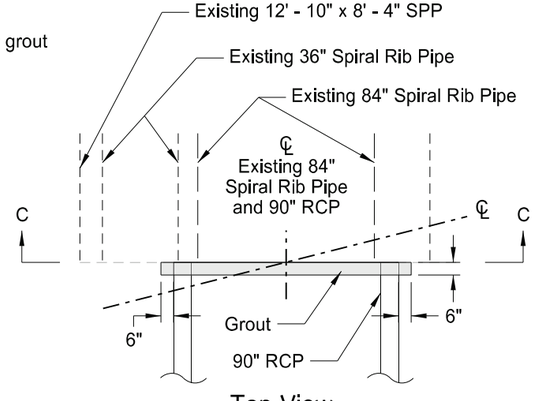




See Standard Drawing D-714-25 for pipe installation details







Pipe Connection Details

SPEC	CODE	BID ITEM	QTY	UNIT
202	0109	REMOVAL OF STRUCTURE-SITE 2 Sta 2236+85	1	L SUM

Removal of Structural Plate Pipe and Culvert Installation Details

Structure 0094-164.917

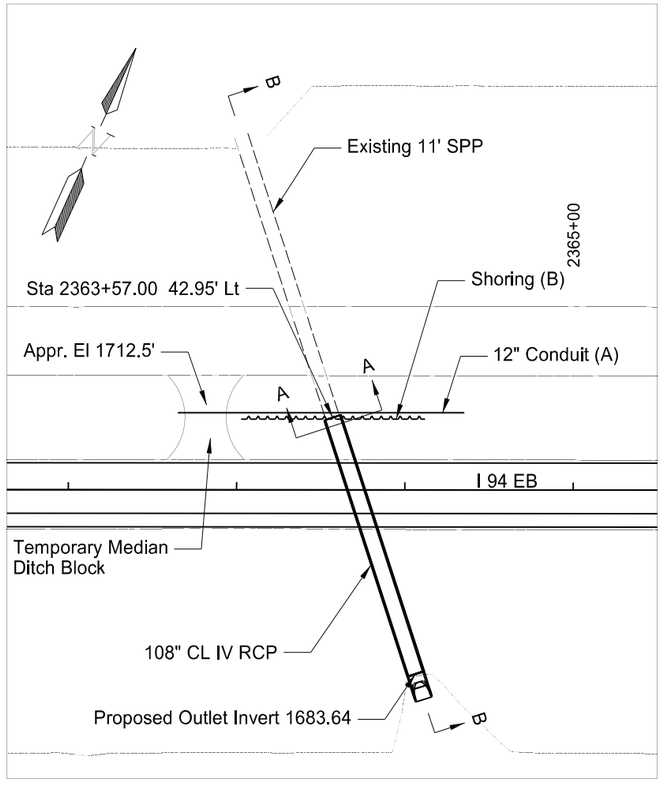
Sta 2236+85

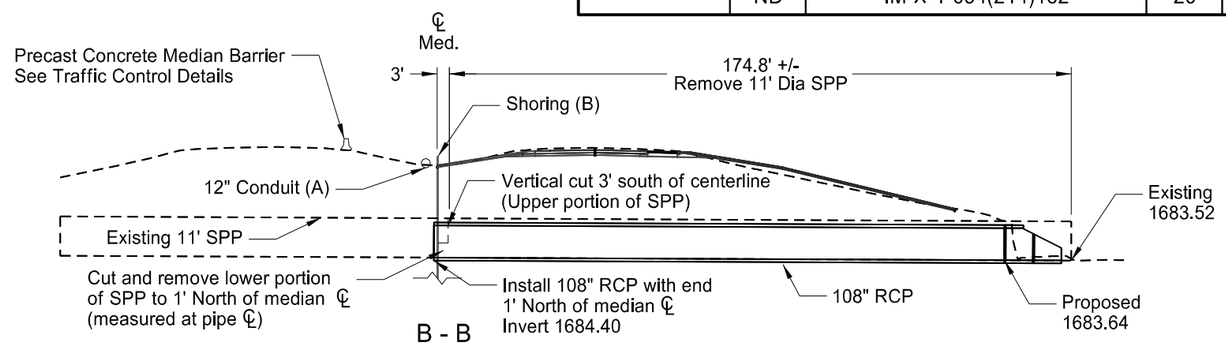
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

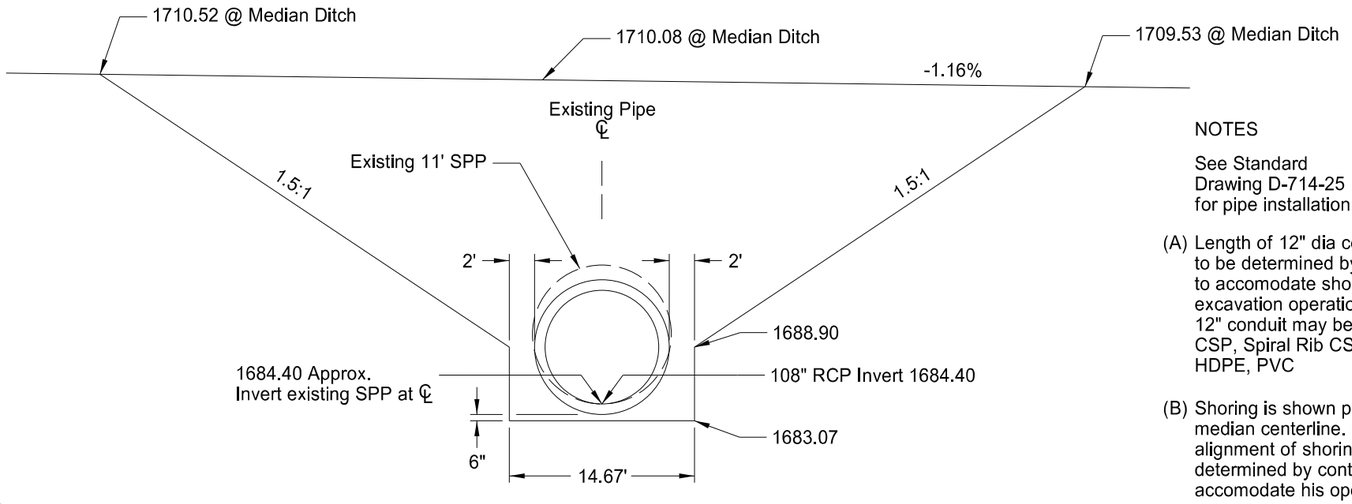
BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.09.11 14:06:22 -05'00'
ENGINEER
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	8





B - B



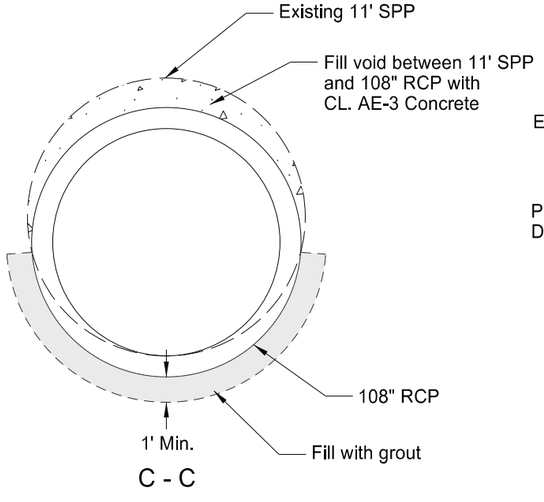
A - A

NOTES

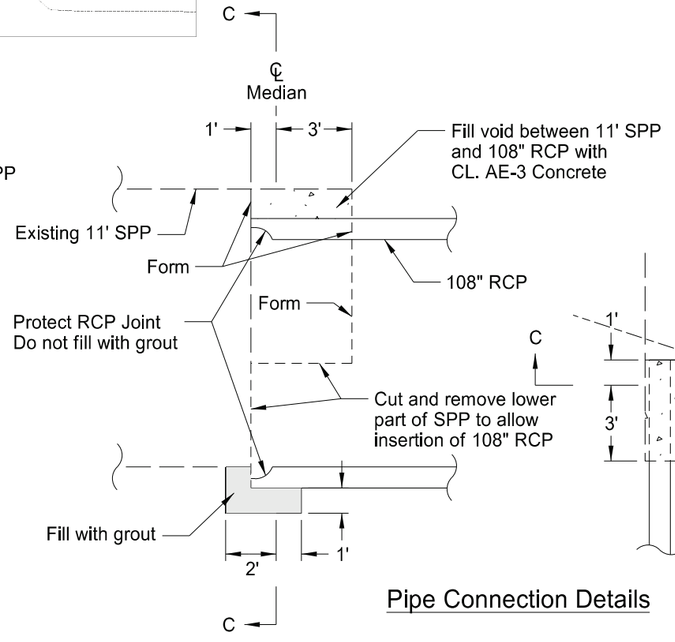
See Standard Drawing D-714-25 for pipe installation details

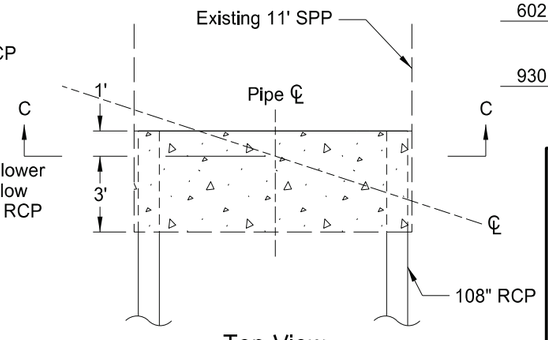
(A) Length of 12" dia conduit to be determined by contractor to accomodate shoring and excavation operations. 12" conduit may be RCP, CSP, Spiral Rib CSP, HDPE, PVC

(B) Shoring is shown parallel to the median centerline. Location and alignment of shoring to be determined by contractor to accomodate his operations.



C - C





Top View

Pipe Connection Details

SPEC	CODE	BID ITEM	QTY	UNIT
202	0110	REMOVAL OF STRUCTURE-SITE 3		
		Sta 2363+83	1	L SUM
602	1130	CLASS AE-3 CONCRETE		
		Sta 2363+83	2.1	CY
930	8230	SHORING		
		Sta 2363+83	1	EA

Removal of Structural Plate Pipe and Culvert Installation Details

Structure 0094-167.314

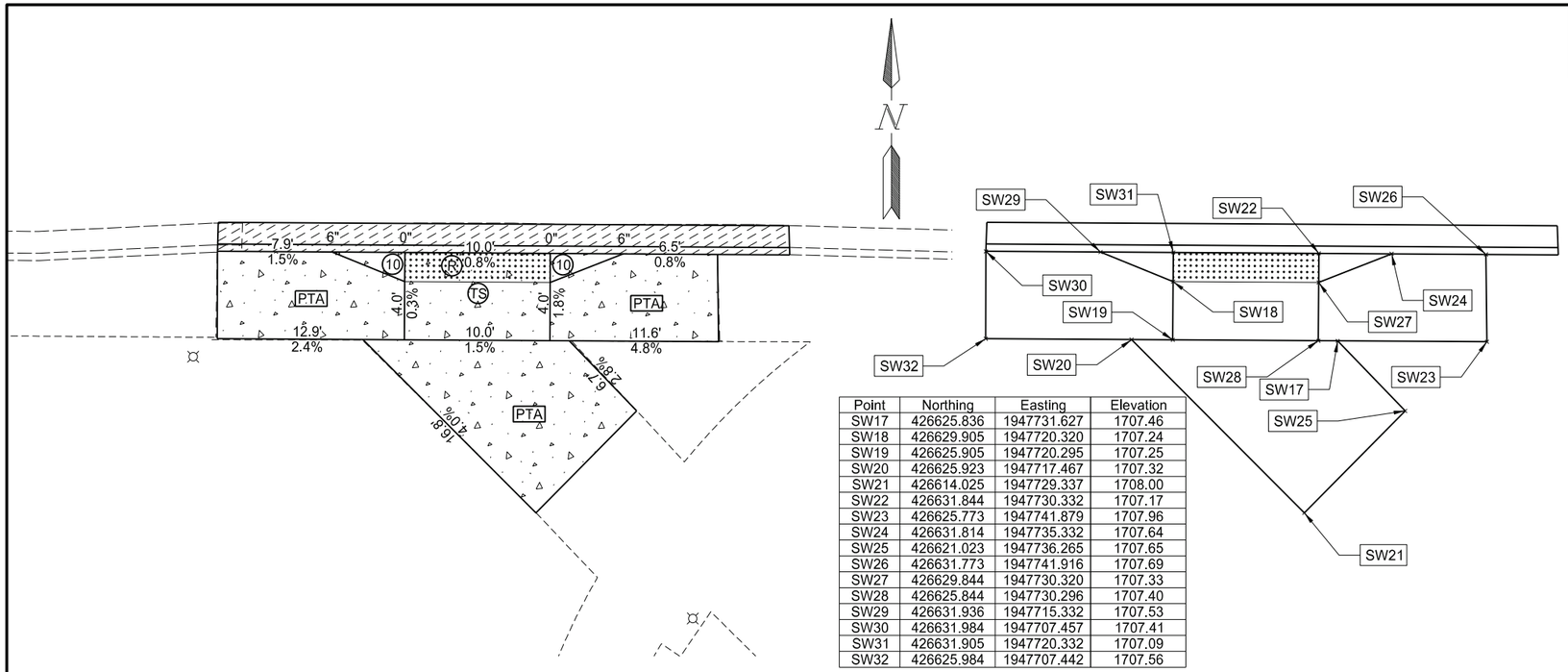
Sta 2363+83

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

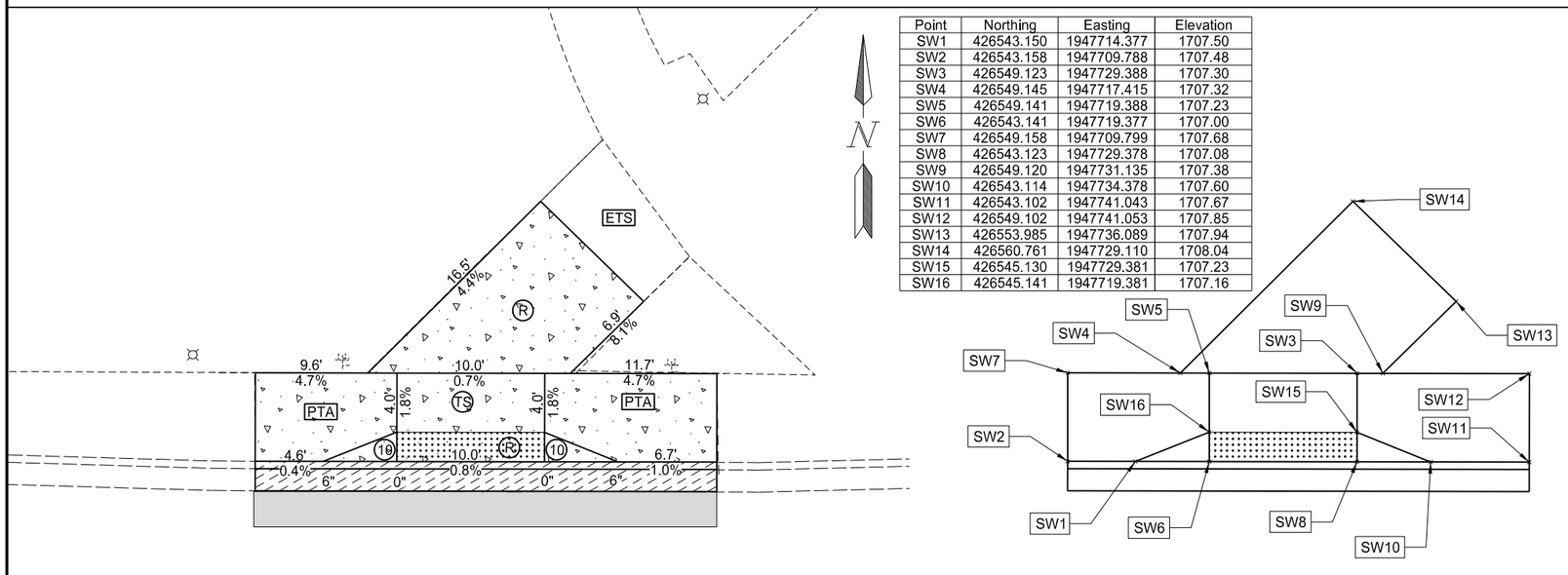
BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.09.11 14:07:11 -05'00'
ENGINEER
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	20	9



Point	Northing	Easting	Elevation
SW17	426625.836	1947731.627	1707.46
SW18	426629.905	1947720.320	1707.24
SW19	426625.905	1947720.295	1707.25
SW20	426625.923	1947717.467	1707.32
SW21	426614.025	1947729.337	1708.00
SW22	426631.844	1947730.332	1707.17
SW23	426625.773	1947741.879	1707.96
SW24	426631.814	1947735.332	1707.64
SW25	426621.023	1947736.265	1707.65
SW26	426631.773	1947741.916	1707.69
SW27	426629.844	1947730.320	1707.33
SW28	426625.844	1947730.296	1707.40
SW29	426631.936	1947715.332	1707.53
SW30	426631.984	1947707.457	1707.41
SW31	426631.905	1947720.332	1707.09
SW32	426625.984	1947707.442	1707.56

ADA Ramp on North Side of Rest Area



Point	Northing	Easting	Elevation
SW1	426543.150	1947714.377	1707.50
SW2	426543.158	1947709.788	1707.48
SW3	426549.123	1947729.388	1707.30
SW4	426549.145	1947717.415	1707.32
SW5	426549.141	1947719.388	1707.23
SW6	426543.141	1947719.377	1707.00
SW7	426549.158	1947709.799	1707.68
SW8	426543.123	1947729.378	1707.08
SW9	426549.120	1947731.135	1707.38
SW10	426543.114	1947734.378	1707.60
SW11	426543.102	1947741.043	1707.67
SW12	426549.102	1947741.053	1707.85
SW13	426553.985	1947736.089	1707.94
SW14	426560.761	1947729.110	1708.04
SW15	426545.130	1947729.381	1707.23
SW16	426545.141	1947719.381	1707.16

ADA Ramp on South Side of Rest Area

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		South Side of Rest Area	3	TON
202	0130	REMOVAL OF CURB & GUTTER		
		North Side of Rest Area	39	LF
		South Side of Rest Area	31	LF
202	0136	REMOVAL OF PAVEMENT		
		South Side of Rest Area	7	TON
302	0100	SALVAGED BASE COURSE		
		North Side of Rest Area (@ 4" Depth Under Concrete)	4	TON
		South Side of Rest Area (@ 4" Depth Under Concrete)	4	TON
430	0143	RAP - SUPERPAVE FAA 43		
		South Side of Rest Area	3	TON
748	0140	CURB & GUTTER-TYPE I		
		North Side of Rest Area	39	LF
		South Side of Rest Area	31	LF
750	0115	SIDEWALK CONCRETE 4IN		
		North Side of Rest Area	36	SY
		South Side of Rest Area	33	SY
750	2115	DETECTABLE WARNING PANELS		
		North Side of Rest Area	20	SF
		South Side of Rest Area	20	SF

LEGEND

ETS — Existing Turning Space

TS — Turning Space
-Slope Maximum of 2.0% / 1.5% Preferred
-All Directions

R — Ramp
-Running Slope Less Than 8.3% / 5% to 7.5% Preferred
-Cross Slope Maximum of 2.0% / 1.5% Preferred

PTA — Pedestrian Access Transition Area
-Running Slope less than 4.9%
-Transition Cross Slope from Existing to Maximum of 2.0% / 1.5% Preferred

10 — Flare Slope Maximum of 10:1

DETECTABLE WARNING PANELS

Remove & Install Sidewalk Concrete

Remove & Install Curb & Gutter

Remove & Install Bituminous Srufacing
(RAP Superpave FAA 43)

Notes:
1. Any ramp found to be in noncompliance will be removed and replaced by the contractor at their own expense.
2. See Standard Drawing D-750-3 for more details.

Rest Area ADA Ramp Details

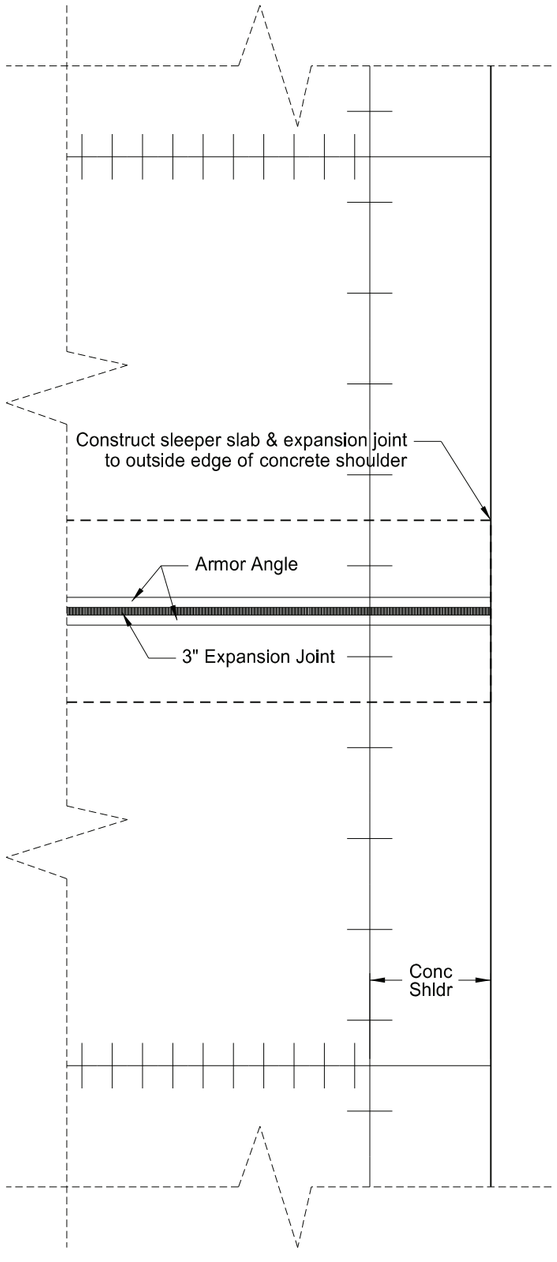
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.09.11 14:53:21 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	10

SPEC	CODE	BID ITEM	QTY	UNIT
550	1013	3 IN EXPANSION JOINT		
		Apple Creek - West Approach	37	LF
		Apple Creek - East Approach	37	LF



Top View
Roadway w/Concrete Shoulder

3 Inch Expansion Joint Shoulder Alternatives

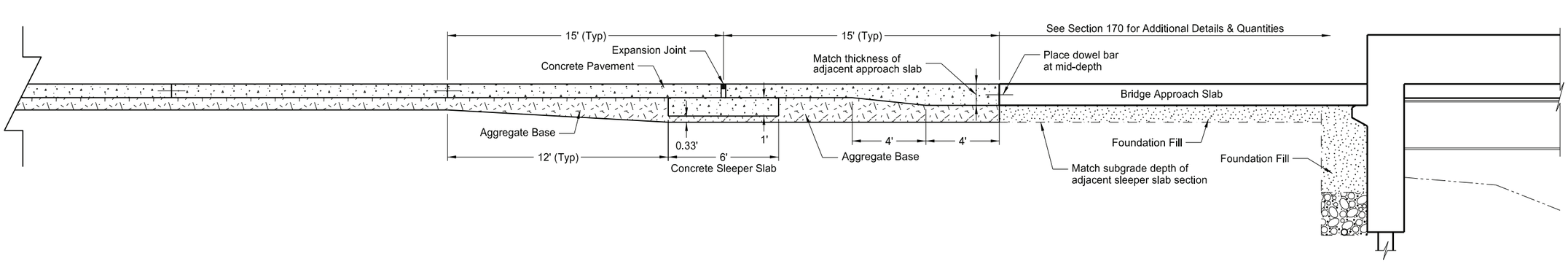
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.09.11 14:53:39 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	11

SPEC	CODE	BID ITEM	QTY	UNIT
550	1031	CONCRETE SLEEPER SLAB		
		Apple Creek - West Approach	25	SY
		Apple Creek - East Approach	25	SY



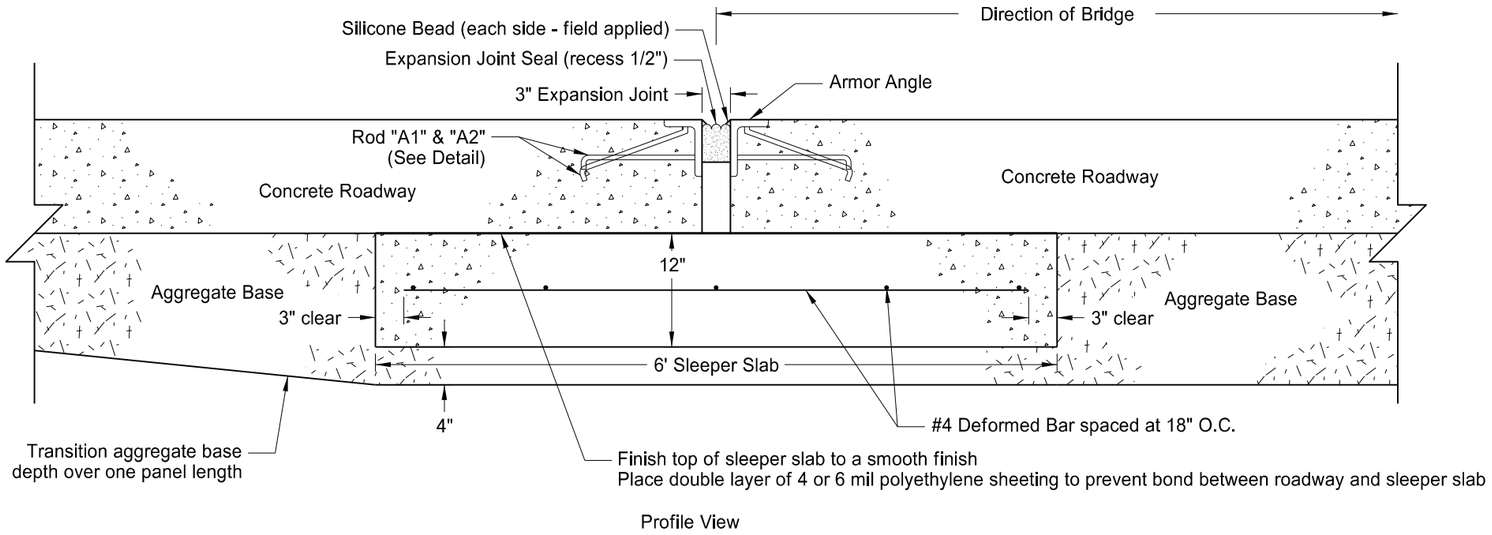
Concrete Pavement to Bridge Approach Panel Transition Detail

I-94 Reconstruction

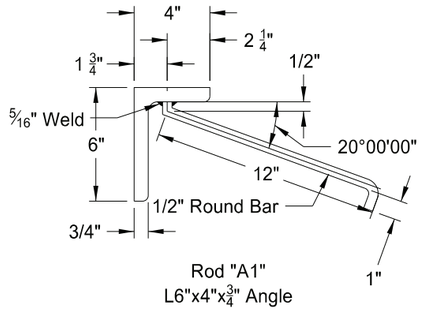
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.09.11 14:53:57 -05'00'
NORTH DAKOTA

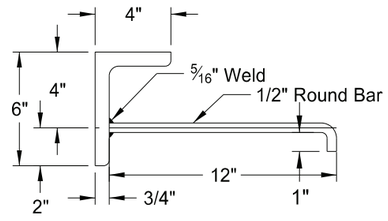
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	12



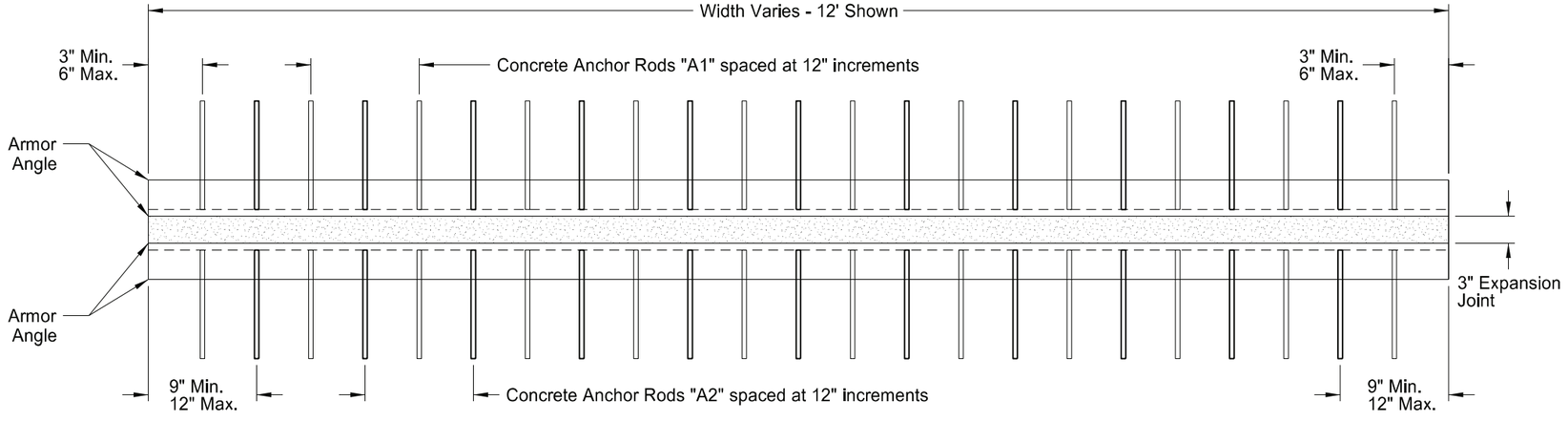
Profile View



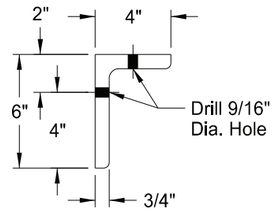
Rod "A1"
L6"x4"x3/4" Angle



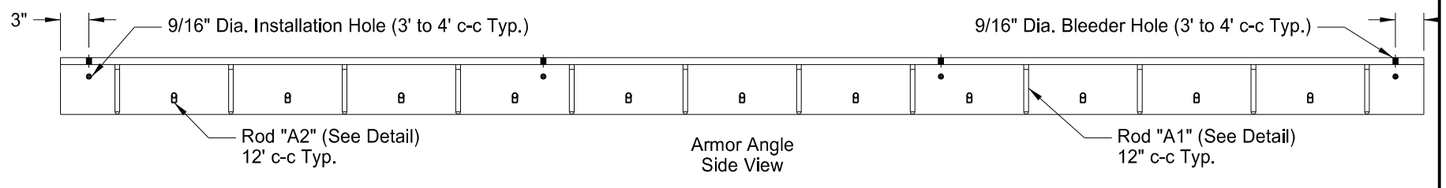
Rod "A2"
L6"x4"x3/4" Angle



Armor Angle
Top View



9/16" Drilled Holes
L6"x4"x3/4" Angle



Armor Angle
Side View

3 Inch Expansion Joint Detail

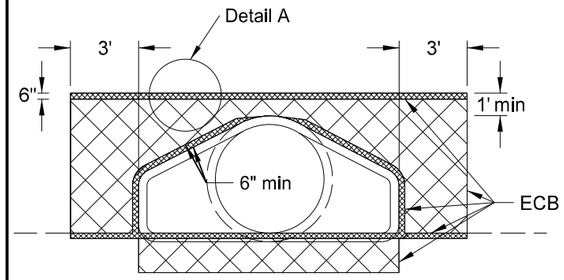
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

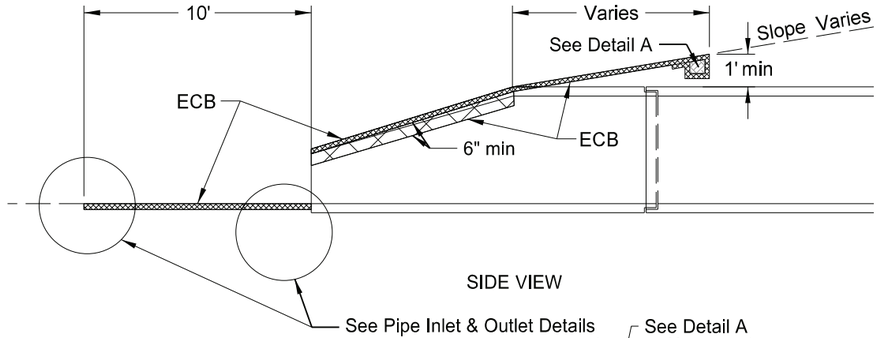
REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.09.11 14:54:15 -05'00'
NORTH DAKOTA

9/11/2024 12:17:31 PM Sarah.Osland K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\020\020GD_012_3_Inch_Expansion_Joint_Detail.dgn

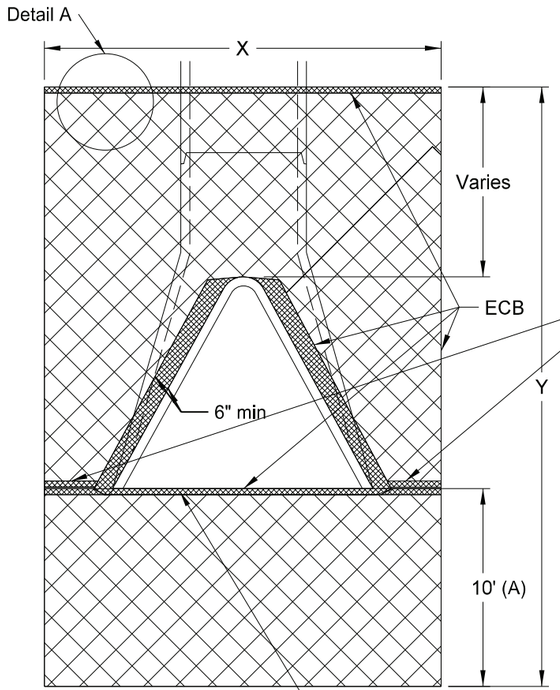
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	20	13



FRONT VIEW



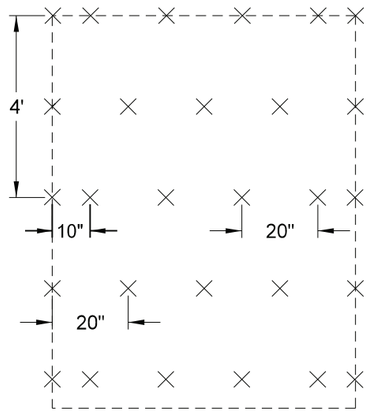
SIDE VIEW



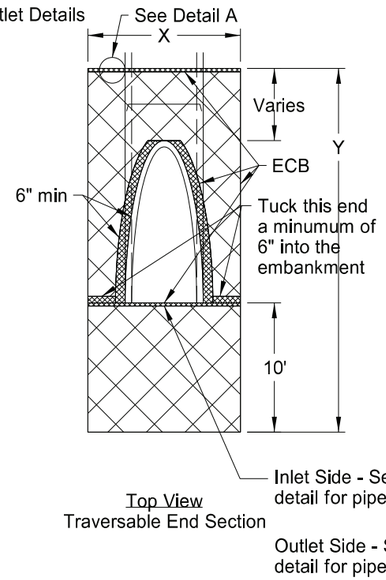
TOP VIEW

Inlet side - see applicable detail for pipe inlet.
Outlet side - see applicable detail for pipe outlet.

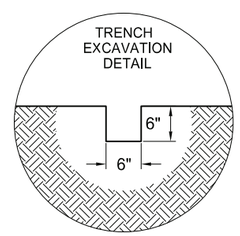
NOTE: Tuck the ECB a minimum of 6" into the embankment (against the flared end section) around the opening of the flared end section.

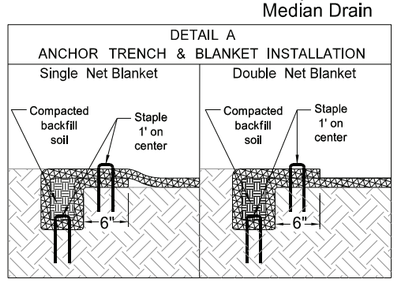


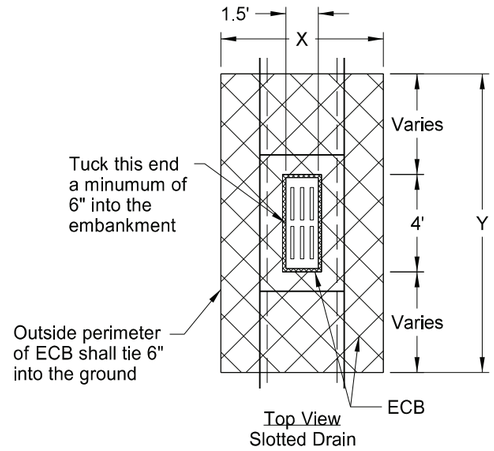
STAPLE PATTERN



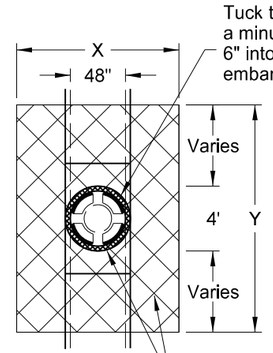
Top View
Traversable End Section



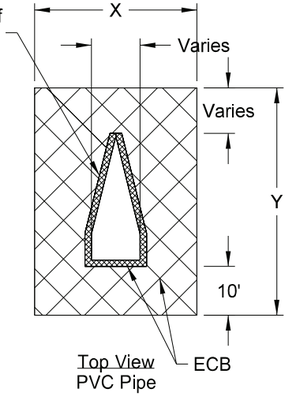




Top View
Slotted Drain

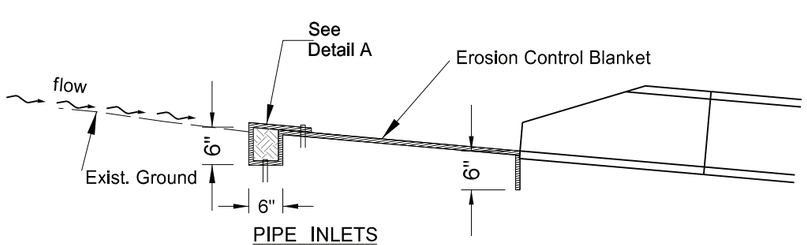


Top View
Median Drain

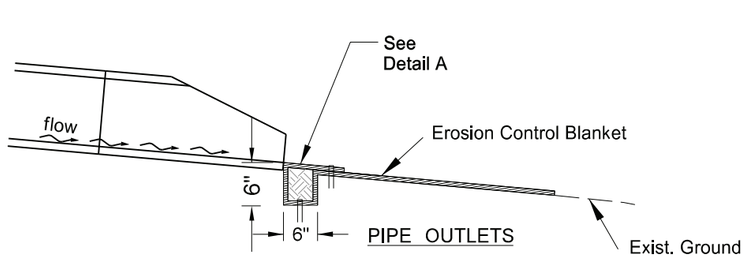


Top View
PVC Pipe

(A) At Sta 2366+47 Rt, omit ECB from end of End Section, install riprap at outlet. See riprap details.



PIPE INLETS



PIPE OUTLETS

Erosion Control at Culvert Flared End Sections

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.09.16 08:54:43 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	14

255 0103 ECB TYPE 3
CENTERLINE CULVERTS

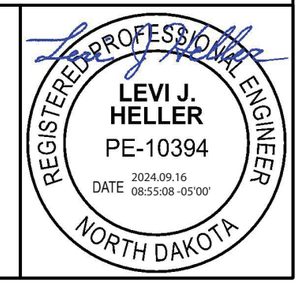
Location of Surface Area to be Protected			Pipe Diameter	No.	X	Y	Unit Quantity	Total Quantity
Chain	Station	Offset	(IN)		(FT)	(FT)	(SY)	(SY)
PR94EB	2110+07	CL	Median Drain	1	24.0	24.0	63	63
	2119+38	Lt & Rt	30*	2	9.1	23.5	23	46
	2131+27	Lt	30*	1	9.1	23.5	23	23
	2140+17	Lt & Rt	Dbl 36*	2	19.7	23.2	51	102
	2140+27	Lt & Rt		2	19.7	23.2	51	102
	2153+64	Lt & Rt	Dbl 36	2	23.8	19.2	43	86
	2153+74	Lt & Rt		2	23.8	19.2	43	86
	2177+54	Lt	24	1	10.5	17.6	20	20
		Rt	24*	1	8.5	22.0	20	20
	2214+99	Rt	36	1	12.7	19.2	24	24
		CL	24" T Connection*	1	8.5	26.0	24	24
	2215+09	Rt	36	1	12.7	19.2	24	24
	2227+10	Lt & Rt	30*	2	9.1	23.5	23	46
	2239+60	Lt	18*	1	8.0	21.8	19	19
		Rt	18	1	9.5	16.7	17	17
	2249+11	Lt & Rt	24*	2	8.5	22.0	20	40
	2257+11	Rt	36	1	12.7	19.2	24	24
		CL	Slotted Drain	1	21.5	24.0	57	57
	2257+21	Rt	36	1	12.7	19.2	24	24
		CL	Slotted Drain	1	21.5	24.0	57	57
	2264+67	CL	Median Drain	1	24.0	24.0	63	63
	2287+65	Rt	36	1	12.7	19.2	24	24
		CL	Median Drain	1	24.0	24.0	63	63
	2287+75	Rt	36	1	12.7	19.2	24	24
	2294+26	Lt & Rt	Dbl 30*	2	19.1	23.5	49	98
	2294+36	Lt & Rt		2	19.1	23.5	49	98
	2321+13	Rt	58x36	1	14.0	19.2	26	26
		CL	18" T Connection*	1	8.0	25.8	23	23
	2333+03	Rt	Dbl 30	1	23.3	18.5	42	42
	2333+13	Rt		1	23.3	18.5	42	42
		CL	Median Drain	1	24.0	24.0	63	63
	2353+13	Lt & Rt	24*	2	8.5	22.0	20	40
	2366+47	Lt	30*	1	9.1	23.5	23	23
		Rt	30**	1	11.6	8.5	9	9
	2375+18	CL	Median Drain	1	24.0	24.0	63	63
	2385+13	Lt & Rt	30*	2	9.1	23.5	23	46
	2394+76	Rt	Dbl 30	1	23.3	18.5	42	42
	2394+86	Rt		1	23.3	18.5	42	42
		CL	Median Drain	1	24.0	24.0	63	63
	2401+88	Lt	18*	1	8.0	21.8	19	19
	2407+52	Lt	18*	1	8.0	21.8	19	19
	2413+12	Rt	42	1	13.3	19.2	25	25
		CL	Median Drain	1	24.0	24.0	63	63
	2426+12	Lt	24*	1	8.5	22.0	20	20
	2439+11	Lt	18*	1	8.0	21.8	19	19
		Rt	18	1	9.5	16.7	17	17
	2448+12	Lt	18*	1	8.0	21.8	19	19
		Rt	18	1	9.5	16.7	17	17
	2468+12	Lt & Rt	24*	2	8.5	22.0	20	40
	2476+12	Lt & Rt	30*	2	9.1	23.5	23	46
	2500+14	Lt & Rt	30*	2	9.1	23.5	23	46
	2508+13	Lt & Rt	24*	2	8.5	22.0	20	40
	2519+12	Lt & Rt	24*	2	8.5	22.0	20	40
	2534+13	Lt & Rt	18*	2	8.0	21.8	19	38
	2547+14	Lt	24*	1	8.5	22.0	20	20
		Rt	24	1	10.5	17.6	20	20
	2566+16	Lt & Rt	18*	2	8.0	21.8	19	38
	2576+15	Lt & Rt	24*	2	8.5	22.0	20	40
	2586+08	Lt & Rt	30*	2	9.1	23.5	23	46
							TOTAL =	2,430

Notes:
1. Quantites based on 10:1 inslopes for T Connections within median.
2. Quantites based on 6:1 inslopes for centerline culverts within 38 ft Clear Zone.
3. Quantites based on 4:1 inslopes for centerline culverts beyond 38 ft Clear Zone.
4. Tuck the ECB a minimum of 6" into the embankment (against the flared end section) around the opening of the flared end section.
5. * = Traversable End Section
6. ** ECB installed from pipe outlet to 1 foot above top of pipe.

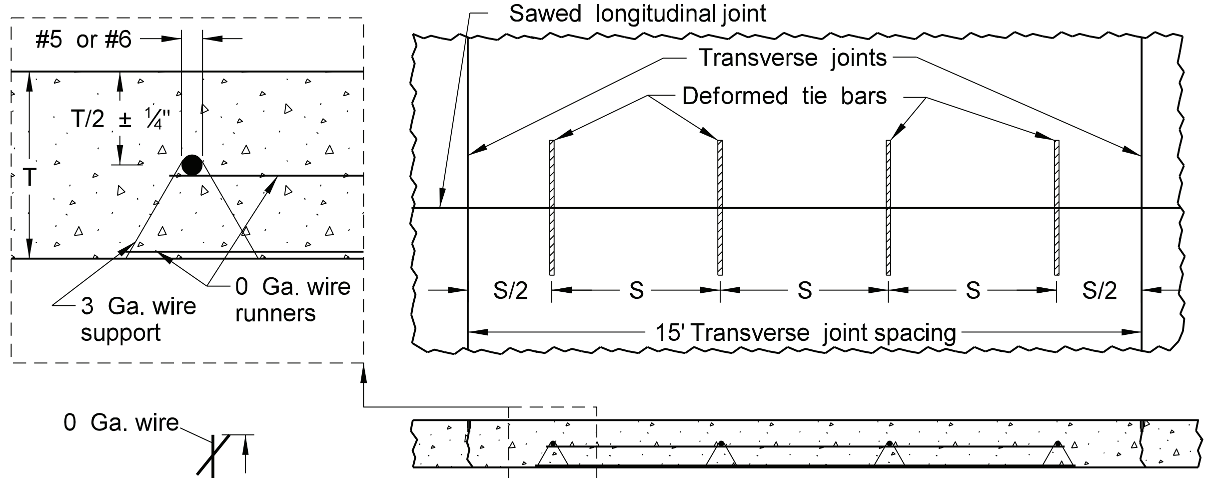
ECB Tables

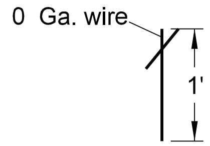
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB



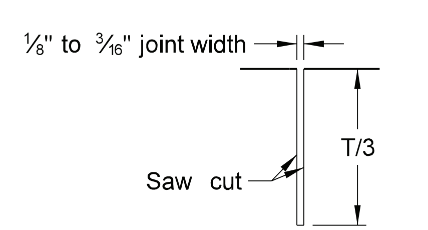
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	20	15



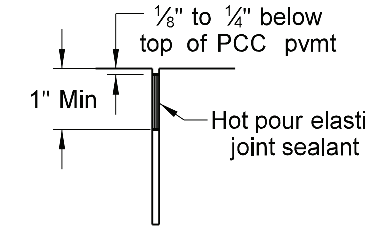


Steel stake

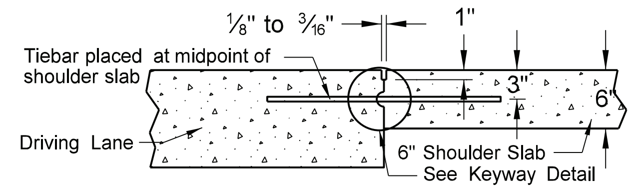
Longitudinal Tie Bar Assembly
(One unit shown)



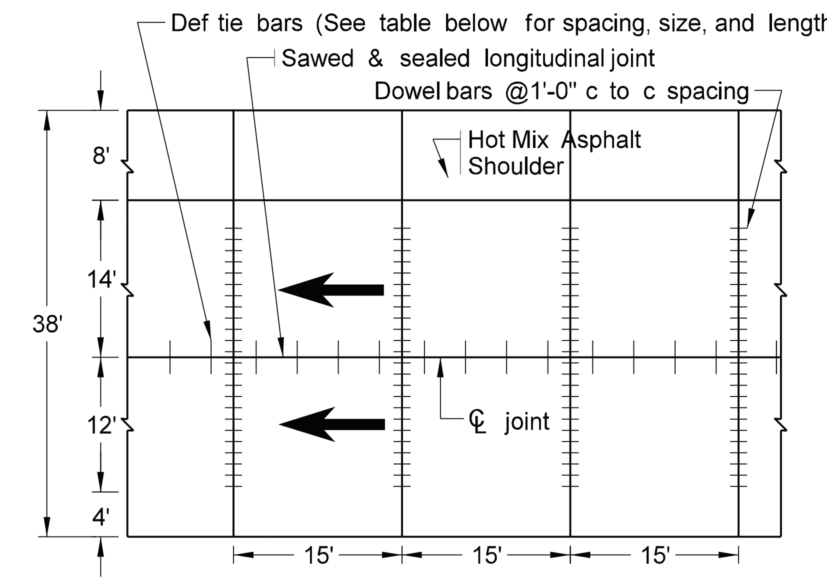
Transverse Joint Sawing



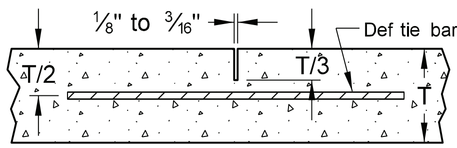
Transverse Joint Sealing



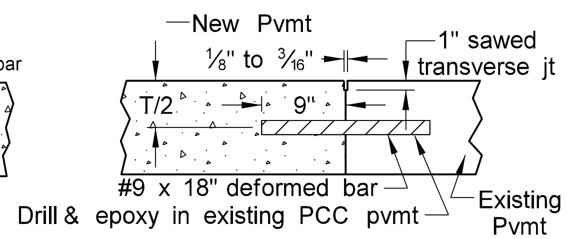
Longitudinal shoulder construction joint
(tied keyed joint)



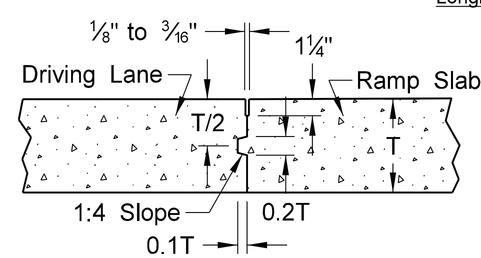
Mainline Joints
15' joint spacing



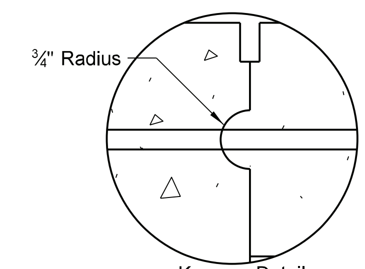
Longitudinal Joint Sawing Detail
(sawed and tied joints)



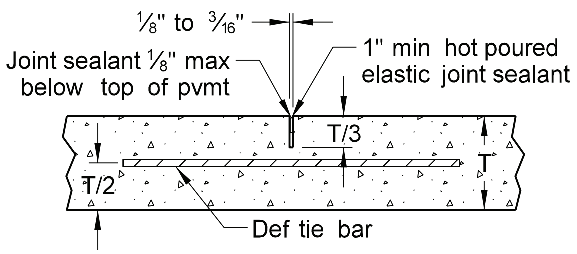
Deformed Bar Installation (2' c to c)
(Transverse Joints)



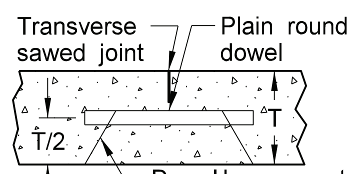
Longitudinal Joint Sawing Detail
(at ramps - non-tied keyed joints)



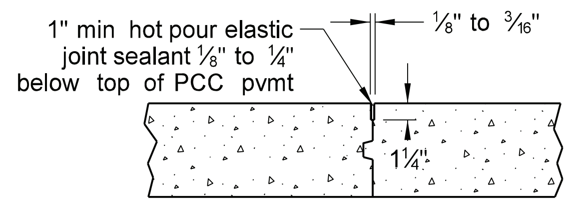
Keyway Detail



Longitudinal Joint Sealing Detail
(sawed and tied joints)



Doweled Transverse Joint



Longitudinal Joint Sealing Detail
(non-tied keyed joints)

Notes:
1. S = Tiebar spacing
2. T = Pavement thickness
3. Place dowels in ramp tapers also.
4. Place no tie bar within 15" of a transverse joint.

Transverse Joint Dowel Bars

Joint Location	Dia x Length
ML	1.25" x 18"

Grade 40 Longitudinal Joint Tie Bars

PCC Depth	6"	8"	8 1/2"	9"	9 1/2"	10"	10 1/2"	11"	11 1/2"	12"	12 1/2"	13"	13 1/2"	14"	14 1/2"	15"
Mainline Centerline																
Bar Size x Length (S=30")		#5 x 30"							#6 x 36"							
Bar Size x Length (S=45")		#6 x 36"								Grade 60 Required						
Ramp/Loop Centerline																
Bar Size x Length (S=30")		#4 x 24"		#5 x 30"										#6 x 36"		
Bar Size x Length (S=45")		#5 x 30"			#6 x 36"									Grade 60 Required		

Grade 60 Longitudinal Joint Tie Bars

PCC Depth	6"	8"	8 1/2"	9"	9 1/2"	10"	10 1/2"	11"	11 1/2"	12"	12 1/2"	13"	13 1/2"	14"	14 1/2"	15"
Mainline Centerline																
Bar Size x Length (S=30")		#4 x 36"						#5 x 42"								
Bar Size x Length (S=45")		#5 x 42"								#6 x 48"						
Ramp/Loop Centerline																
Bar Size x Length (S=30")		#4 x 36"										#5 x 42"				
Bar Size x Length (S=45")		#4 x 36"		#5 x 42"										#6 x 48"		

PCC Pavement - Perpendicular Joints@15' Spacing

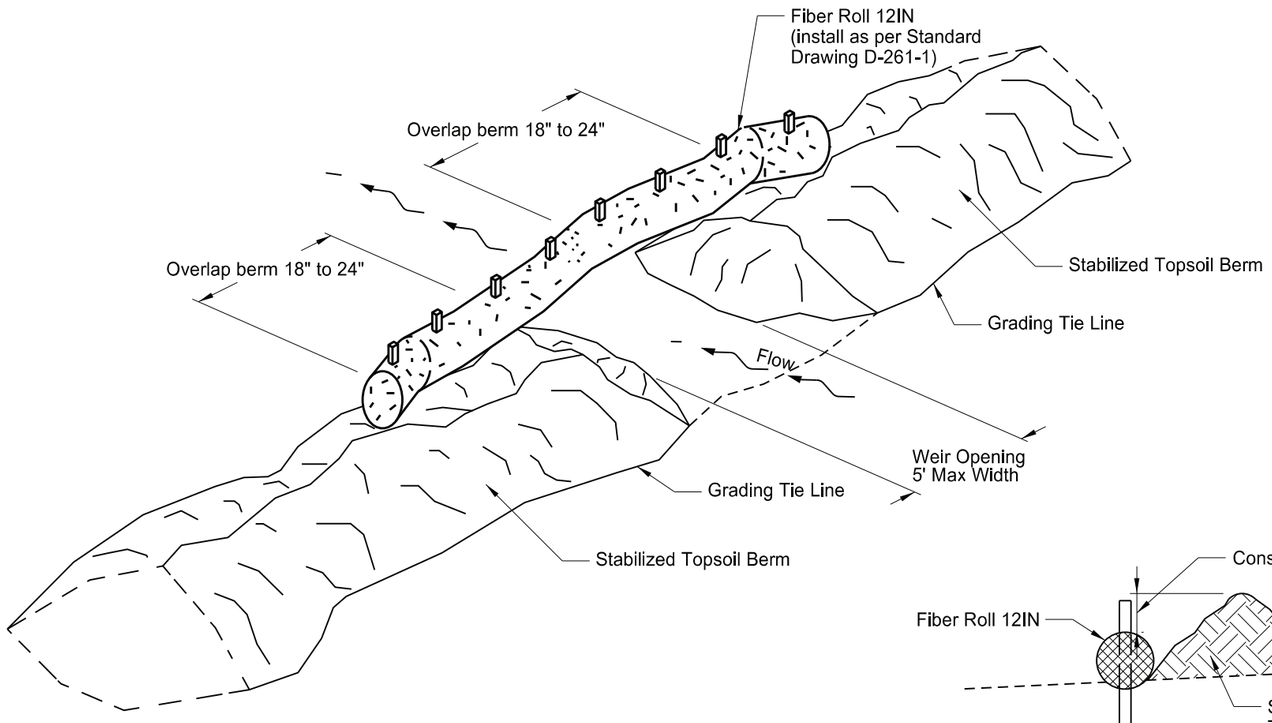
I-94 Reconstruction

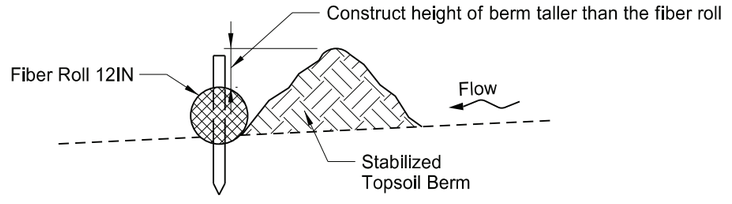
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.09.11 14:54:37 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	16

SPEC	CODE	BID ITEM	QTY	UNIT
261	0112	FIBER ROLLS 12IN		
		Weir Locations	600	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Weir Locations	600	LF





Topsoil Berm Detail

Notes:

1. Windrow the existing topsoil from the foreslope to create a berm at the grading tie line.
2. Stabilize berms in accordance with the Construction General Permit.
3. Place weirs intermittently throughout the length of the berm to allow stormwater to drain through the berm.
4. Avoid placing weirs adjacent to waterbodies.
5. Install fiber rolls as the weirs are created in the topsoil berm.
6. The Engineer will measure and pay for fiber rolls separately.
7. The Engineer will measure and pay for removal of fiber rolls separately when required by the specifications.
8. The Engineer will measure and pay for soil stabilization and temporary cover crop separately.
9. Include the costs to create, maintain, and dismantle the berm in the unit price bid for "Topsoil".

Temporary Topsoil and Weir Detail

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
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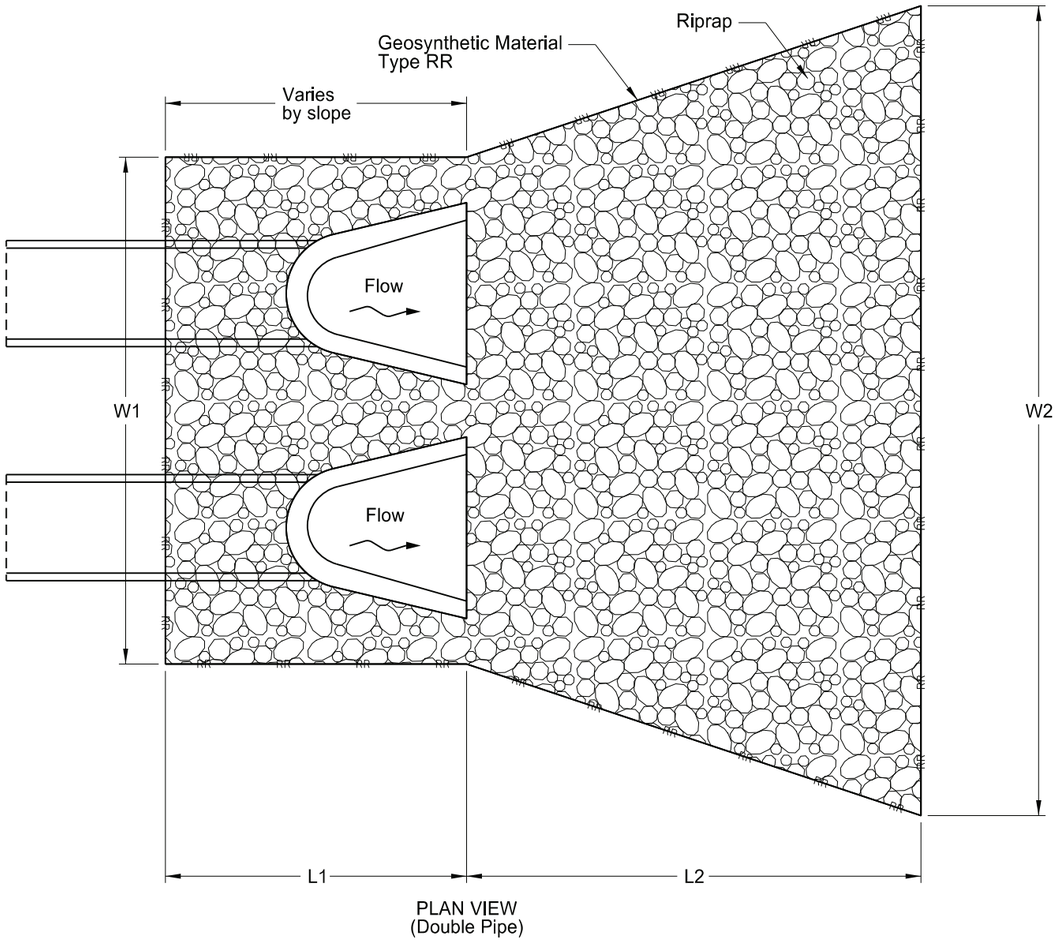
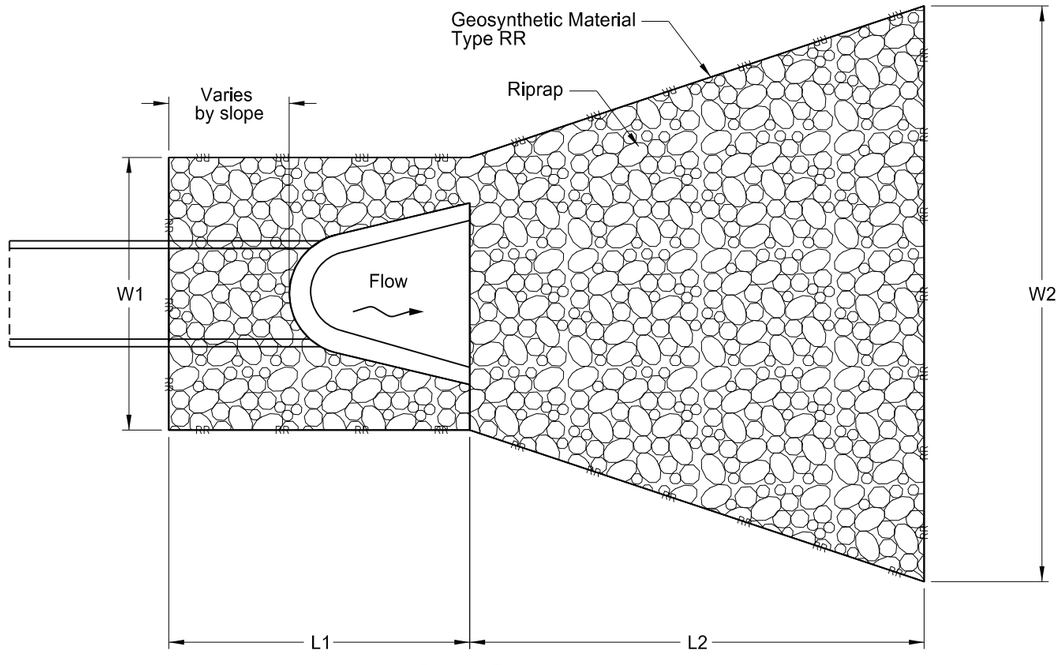
DATE 2024.09.16 08:55:38 -05'00'
NORTH DAKOTA

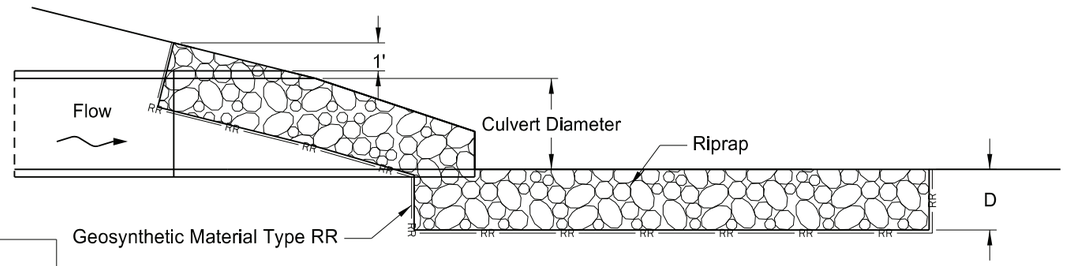
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	17



PLAN VIEW
(Double Pipe)



PLAN VIEW
(Single Pipe)



PROFILE VIEW

RIPRAP AND GEOSYNTHETIC MATERIAL

Location of Surface Area to be Protected			Pipe Diameter	L1	L2	W1	W2	D	Riprap Grade	256 0100 RIPRAP GRADE I	256 0200 RIPRAP GRADE II	256 0300 RIPRAP GRADE III	709 0155 GEOSYNTHETIC MATERIAL TYPE RR
Chain	Station	Offset	(IN)	(FT)	(FT)	(FT)	(FT)	(FT)		(CY)	(CY)	(CY)	(SY)
PR85NB	2110+07	Rt	72	10.5	33.3	18.0	40.2	2.7	II	-	116	-	174
	2122+11	Rt	84	11.5	42.0	21.0	49.0	2.2	I	140	-	-	235
	2236+85	Rt	90	11.3	41.0	22.5	49.8	2.5	II	-	161	-	244
	2264+67	Rt	Dbl 36	9.3	13.2	19.0	27.8	2.1	I	38	-	-	76
	2363+71	Rt	108	14.7	35.0	27.0	50.3	3.0	III	-	-	195	255
	2366+47	Rt	30	0.0	8.1	7.5	12.9	2.0	I	7	-	-	18
	2375+18	Rt	42	9.3	15.7	10.5	21.0	2.5	I	32	-	-	62
	2401+88	Rt	18	6.3	5.1	4.5	7.9	2.0	I	5	-	-	15
	2407+52	Rt	18	6.3	5.1	4.5	7.9	2.0	I	5	-	-	15
									TOTAL =	227	277	195	1,094

Note: At Sta 2366+47 Rt, riprap is only to extend from the outlet of the pipe. Install no riprap up the inslope.

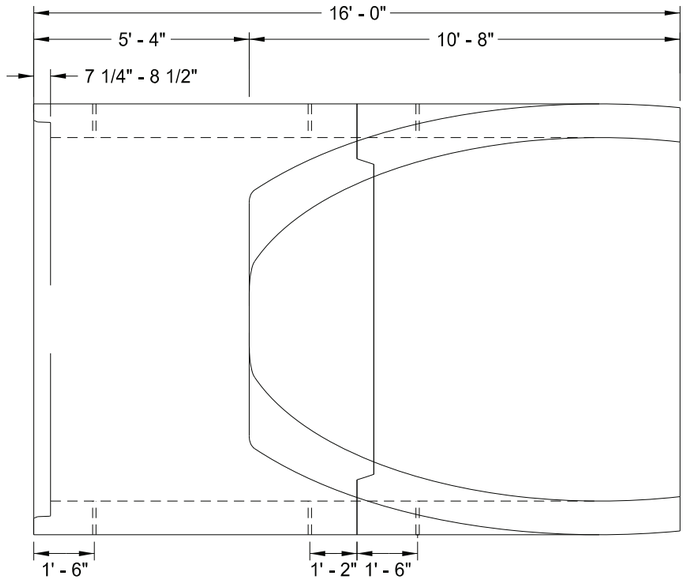
Riprap Detail

I-94 Reconstruction

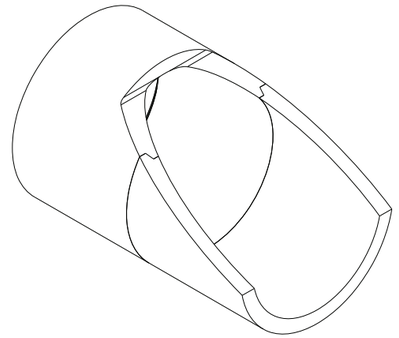
Bismarck to E of Menoken Interchange - EB

BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.09.11 14:07:58 -05'00'
ENGINEER
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	18



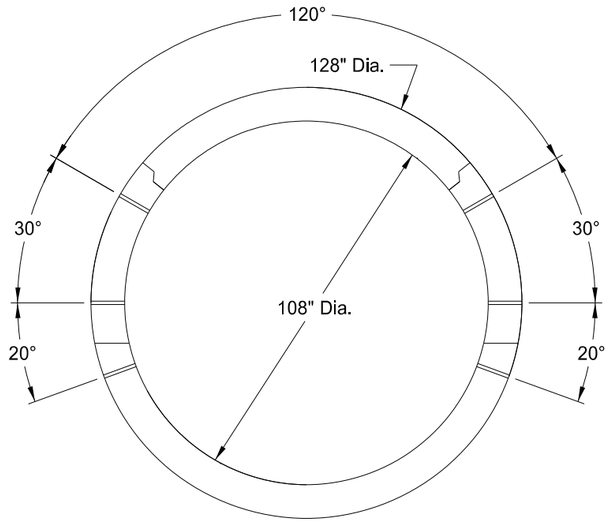
TOP VIEW



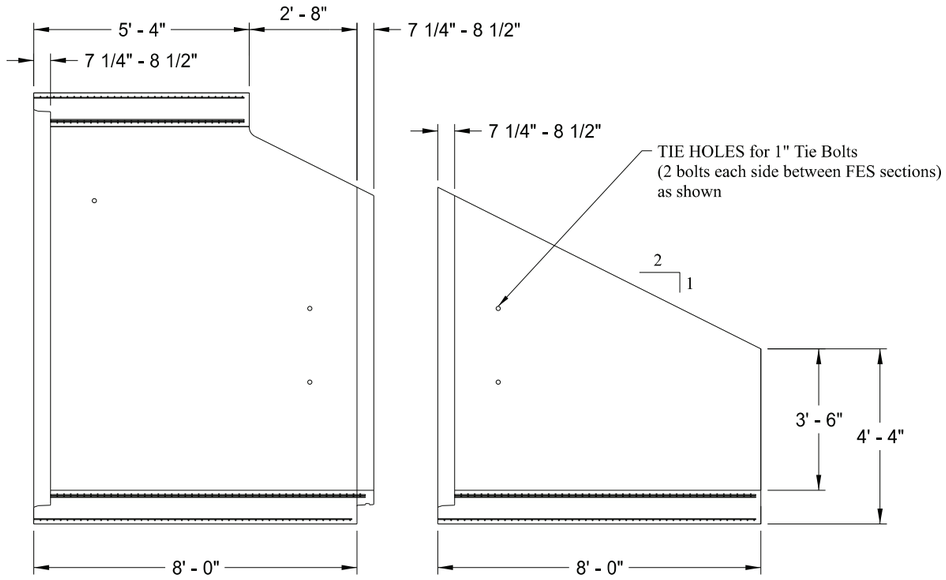
PERSPECTIVE

NOTES:

1. All reinforcing steel shall meet AASHTO M170 requirements.
2. All circular, longitudinal, and elliptical reinforcement shall be assembled and securely fastened in cage fashion so as to maintain reinforcement in exact shape and correct positions within the forms.
3. Reinforcement to be equivalent to Class III RCP.
4. Lift anchors if required, to be designed and located by the manufacturer.



END VIEW



Section B Profile

SIDE VIEW

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

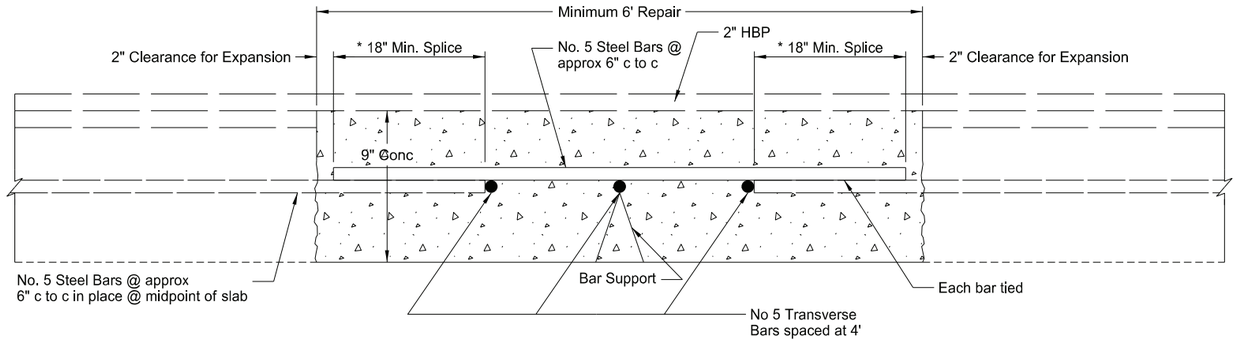
Reinforced Concrete Pipe - 108" End Section

I-94 Reconstruction

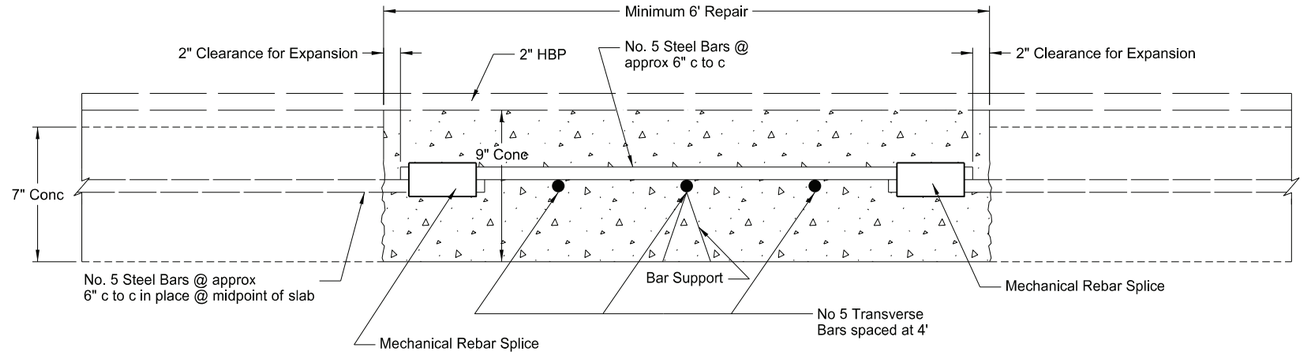
Bismarck to E of Menoken Interchange - EB

BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.09.11 14:08:35 -05'00'
ENGINEER
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	20	19



WITHOUT MECHANICAL REBAR SPLICES



WITH MECHANICAL REBAR SPLICES

Full Depth Repair Locations

Begin RP	Begin STATION	LANE	Passing Lane			Driving Lane		
			LENGTH	x	WIDTH	LENGTH	x	WIDTH
			FT	x	FT	FT	x	FT
162.4078	2104+99.00	Both	16.0		12.0	16.0		12.0
163.0913	2141+41.00	Both	16.0		12.0	12.0		12.0
163.4786	2161+76.00	Both	16.0		12.0	12.0		12.0
163.5600	2166+04.00	Both	16.0		12.0	12.0		12.0
163.8778	2182+73.00	Both	16.0		12.0	16.0		12.0
164.0500	2191+79.00	Both	16.0		12.0	12.0		12.0
164.2828	2204+08.00	Both	18.0		12.0	16.0		12.0
164.4436	2212+57.00	Both	16.0		12.0	12.0		12.0
164.9222	2241+96.00	Both	16.0		12.0	12.0		12.0
165.2739	2256+42.00	Passing	12.0		12.0			
165.6028	2273+79.00	Both	13.5		12.0	14.0		12.0
165.7184	2279+89.00	Both	16.0		12.0	12.0		12.0
165.8504	2286+86.00	Both	16.0		12.0	12.0		12.0
167.1167	2353+60.00	Both	16.0		12.0	12.0		12.0
167.7309	2386+04.00	Both	18.0		12.0	17.0		12.0

NOTE: Mechanical Rebar Splices were used for the first 12' lane repaired at locations where both lanes were repaired.

The longitudinal centerline was tied with No. 4 x 2'0" tie bars at 4' centers. The tie bars were drilled and epoxied.

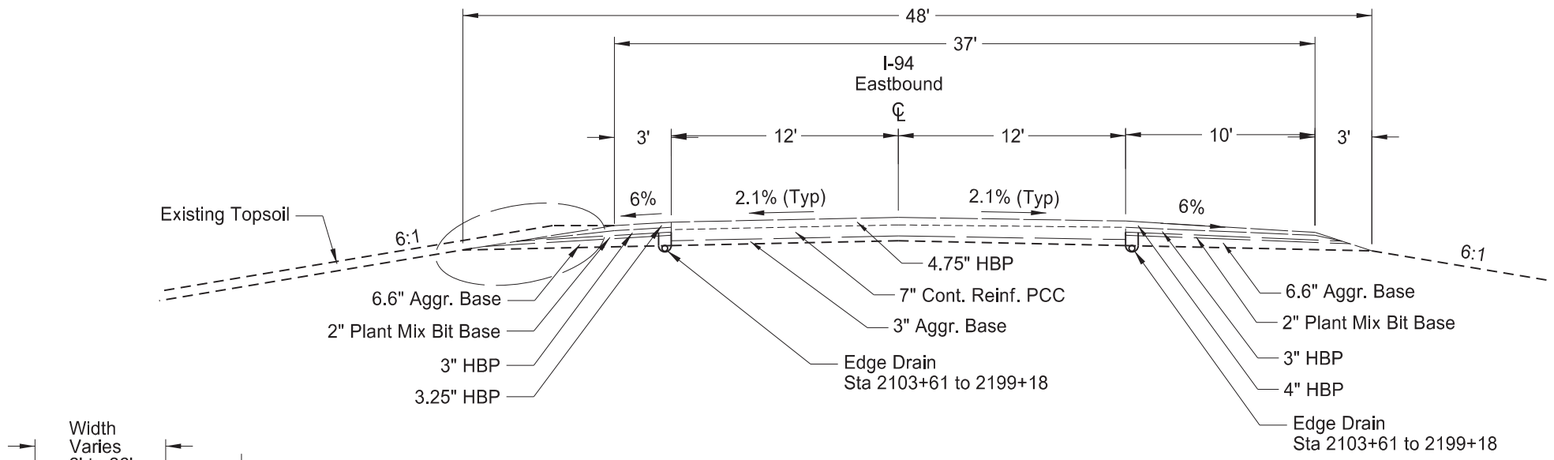
Existing Full Depth Patch Details

I-94 Reconstruction

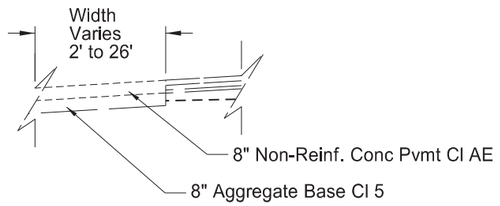
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.09.16 07:45:44 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	30	1



EB - Existing Typical Mainline
Sta 2103+61 to 2618+21



West and East Median Crossover
Sta 2103+61 to Sta 2107+91
Sta 2613+90 to Sta 2618+21

Existing Typical Sections
EB Mainline and Menoken Interchange

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:00:33 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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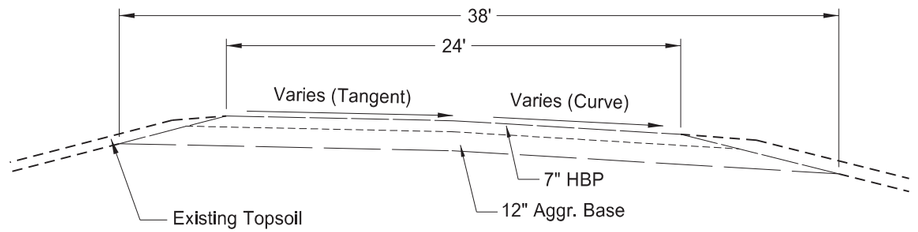
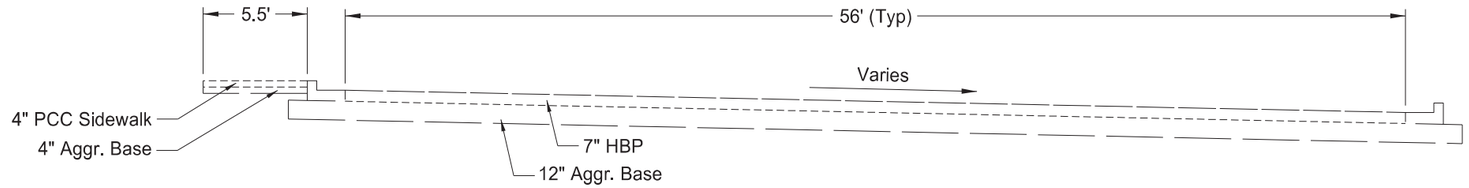
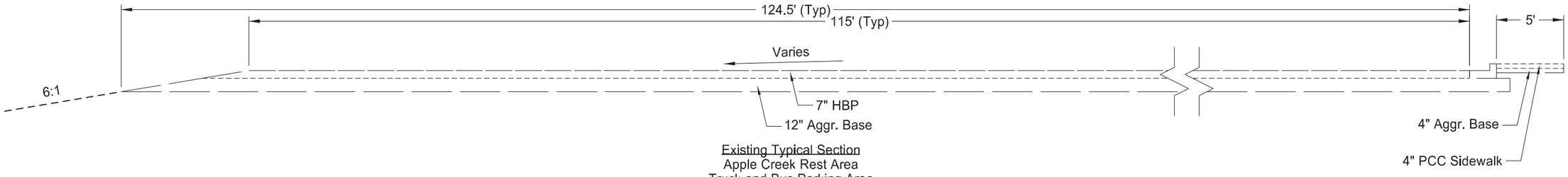


Existing Typical Section
Apple Creek Rest Area SW Ramp (PR_RA Alignment) 8+75 to 14+00
Apple Creek Rest Area SE Ramp (PR_RA Alignment) 25+66 to 28+17



Existing Typical Section
Apple Creek Rest Area
Car Parking Area



Existing Typical Section
Apple Creek Rest Area
Truck and Bus Parking Area

Existing Typical Sections
Apple Creek Rest Area and Gibbs Separation

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:00:55 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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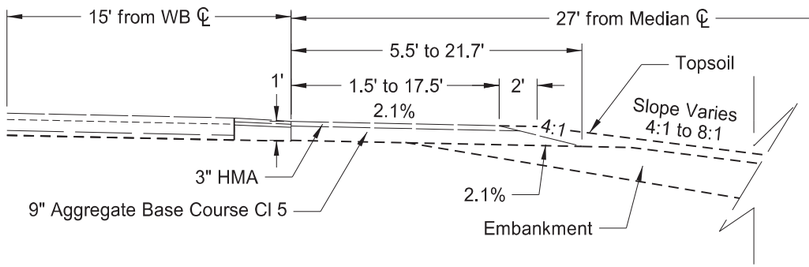
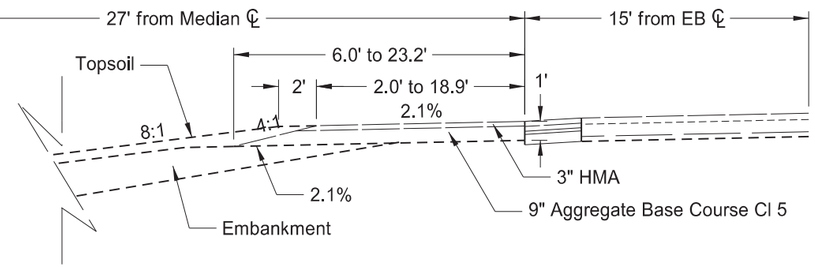


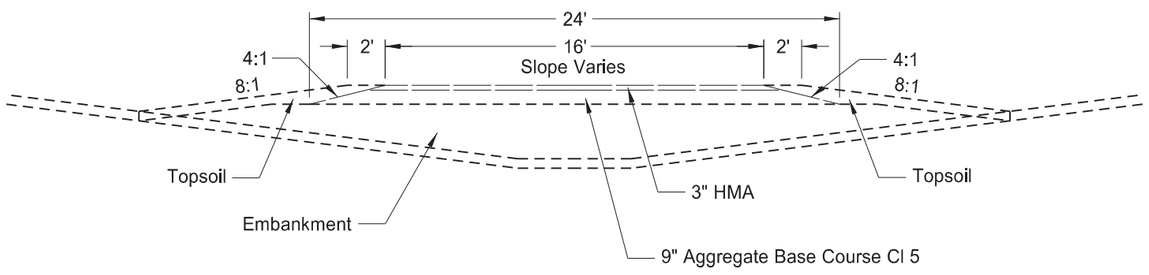
Existing Typical Section - Westbound Median Shoulder

Sta 20+38 to Sta 26+09 (MSW Alignment)
Sta 44+75 to Sta 52+39 (MSE Alignment)



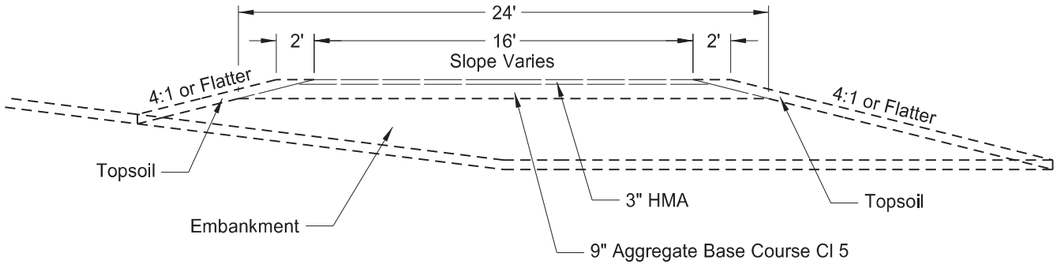
Existing Typical Section - Eastbound Median Shoulder

Sta 27+52 to Sta 27+95 (MSW Alignment)
Sta 42+90 to Sta 43+31 (MSE Alignment)



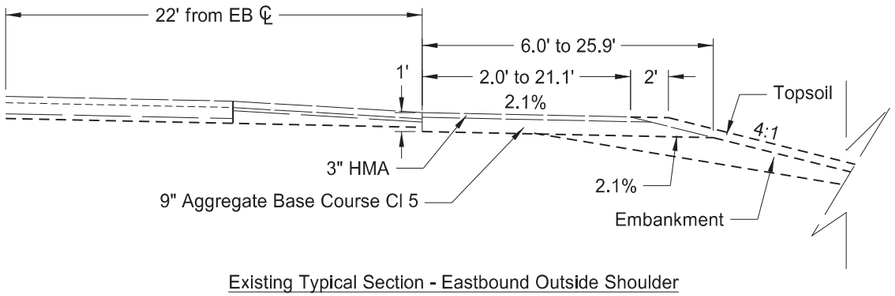
Existing Ramp Connection Typical in the Median

Sta 26+09 to Sta 27+52 (MSW Alignment)
Sta 43+31 to Sta 44+75 (MSE Alignment)



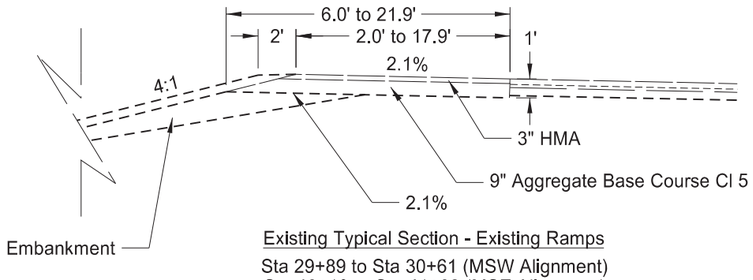
Existing Ramp Connection Typical in the Existing Ramp Area

Sta 28+76 to Sta 29+89 (MSW Alignment)
Sta 41+02 to Sta 42+09 (MSE Alignment)



Existing Typical Section - Eastbound Outside Shoulder

Sta 28+45 to Sta 28+76 (MSW Alignment)
Sta 42+09 to Sta 42+40 (MSE Alignment)



Existing Typical Section - Existing Ramps

Sta 29+89 to Sta 30+61 (MSW Alignment)
Sta 40+19 to Sta 41+02 (MSE Alignment)

Existing Typical Sections
EB Menoken Temporary Ramp Connections

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:01:12 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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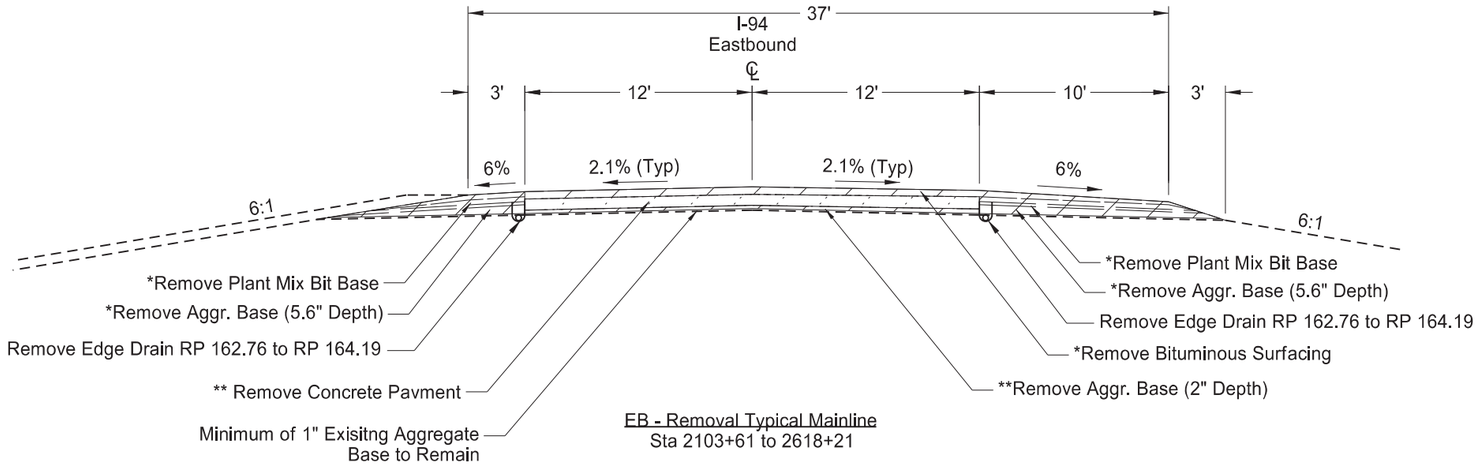

EB - Removal Typical Mainline
Sta 2103+61 to 2618+21

Note: Actual depths may vary.

*Removal to be included in the bid item "Remove Aggregate Base & Surfacing."

**Removal to be included in the bid item "Removal of Pavement."

Removal and Milling Typical Sections
EB Mainline and Menoken Interchange

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:01:33 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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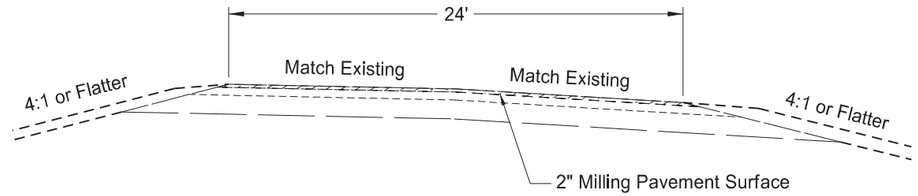
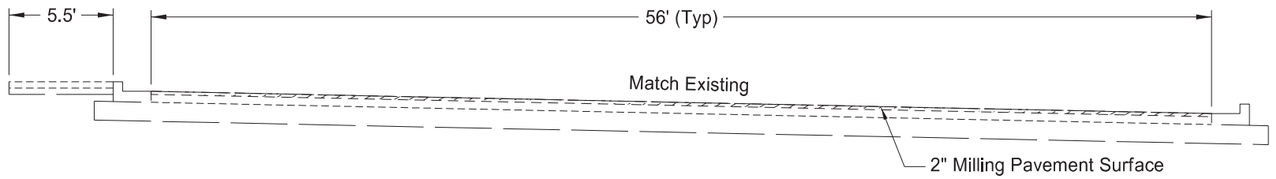
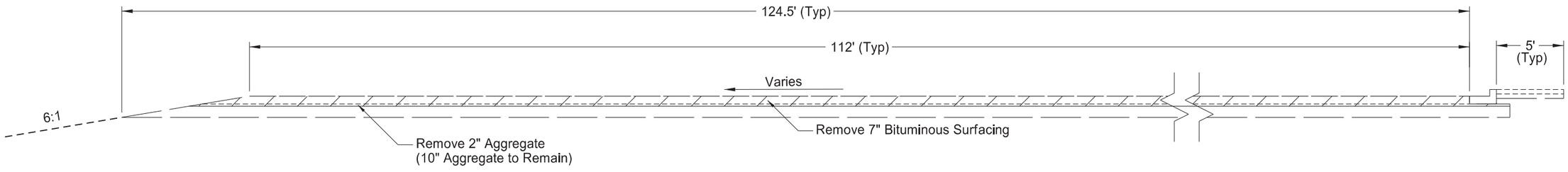


Milling Typical Section
Apple Creek Rest Area SW Ramp 8+75 to 9+75
Apple Creek Rest Area SE Ramp 27+17 to 28+17



Milling Typical Section
Apple Creek Rest Area
Car Parking Area



Removal Typical Section
Apple Creek Rest Area
Truck and Bus Parking Area
Sta 16+75 to 23+18

Milling and Removal Typical Sections
Apple Creek Rest Area and Gibbs Separation

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:01:50 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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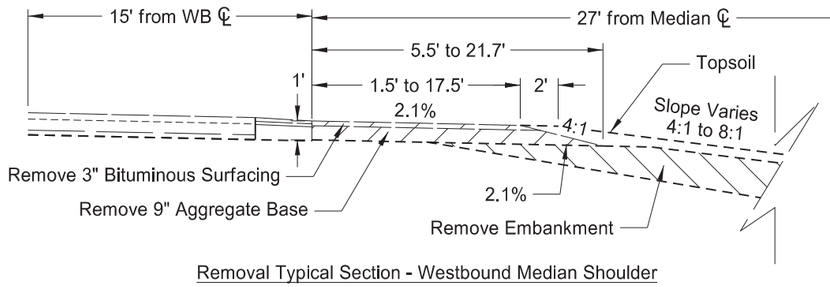
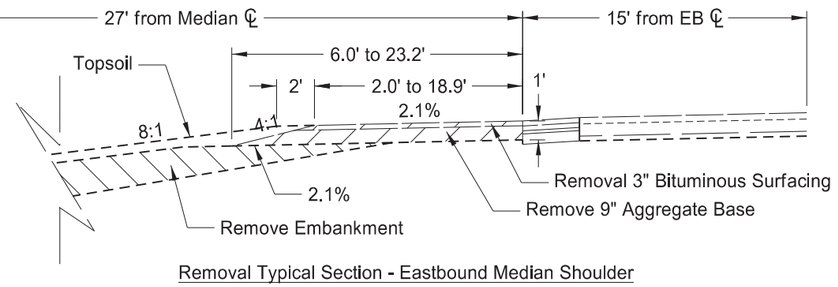


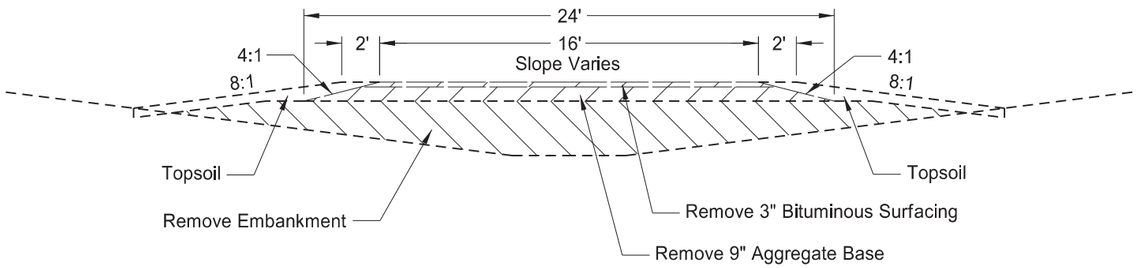
Removal Typical Section - Westbound Median Shoulder

Sta 20+38 to Sta 26+09 (MSW Alignment)
Sta 44+75 to Sta 52+39 (MSE Alignment)



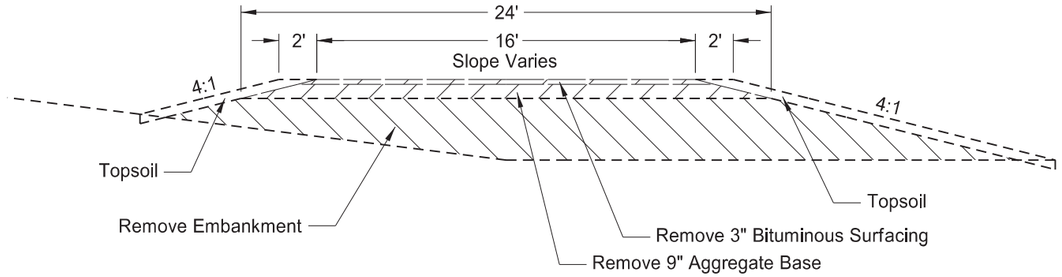
Removal Typical Section - Eastbound Median Shoulder

Sta 27+52 to Sta 27+95 (MSW Alignment)
Sta 42+90 to Sta 43+31 (MSE Alignment)



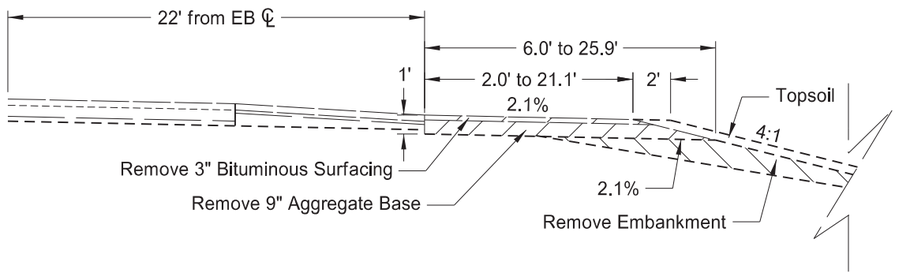
Removal Ramp Connection Typical in the Median

Sta 26+09 to Sta 27+52 (MSW Alignment)
Sta 43+31 to Sta 44+75 (MSE Alignment)



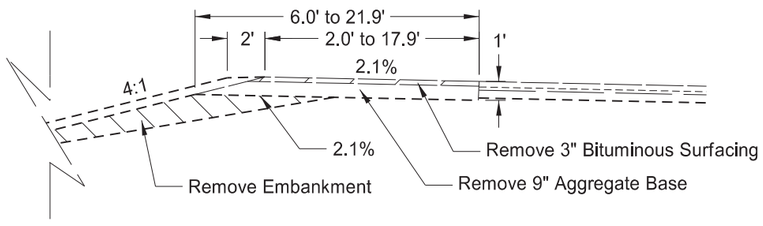
Removal Ramp Connection Typical in the Existing Ramp Area

Sta 28+76 to Sta 29+89 (MSW Alignment)
Sta 41+02 to Sta 42+09 (MSE Alignment)



Removal Typical Section - Eastbound Outside Shoulder

Sta 28+45 to Sta 28+76 (MSW Alignment)
Sta 42+09 to Sta 42+40 (MSE Alignment)



Removal Typical Section - Existing Ramps

Sta 29+89 to Sta 30+61 (MSW Alignment)
Sta 40+19 to Sta 41+02 (MSE Alignment)

Note: See Section 40 for estimated removal quantities. Pavement and aggregate removal quantities are included in the unit price for "Removal of Temporary Bypass."

Where the temporary ramp connection is removed adjacent to pavement that is to remain in place, restore enough embankment to allow for 6" of topsoil and approximate 6:1 inslope.

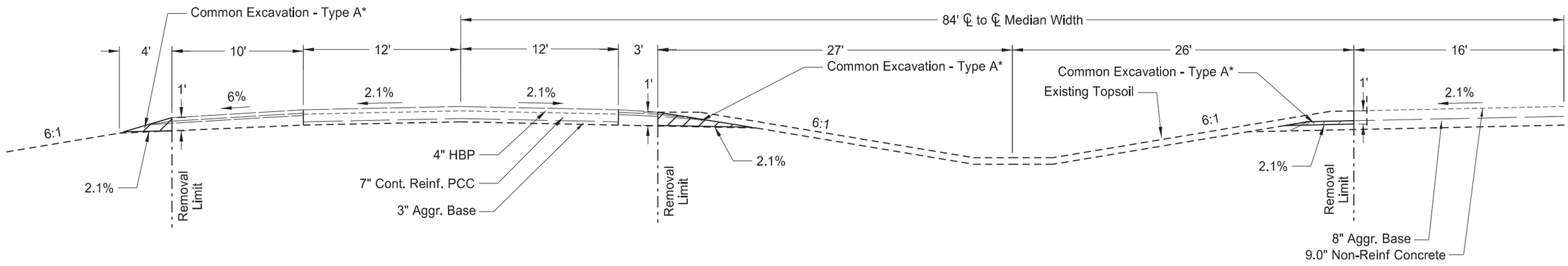
Removal Typical Sections
EB Menoken Temporary Ramp Connections

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:02:10 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	30	7

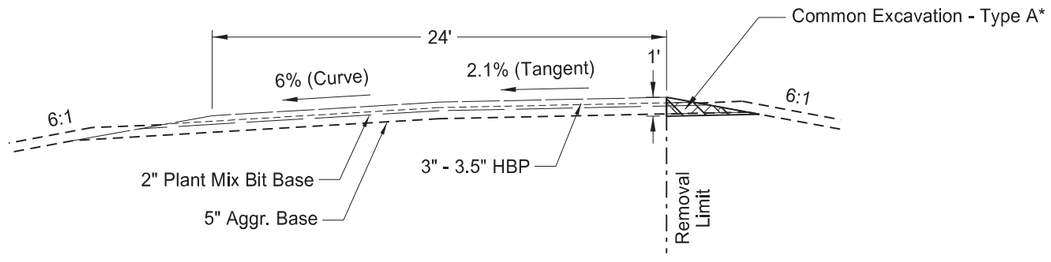


Westbound Outside Shoulder
Sta 2525+34 to Sta 2525+69
Sta 2539+75 to Sta 2540+10

Westbound Median Shoulder
Sta 2524+51 to Sta 2524+96
Sta 2540+48 to Sta 2540+93

Removal Typical Section
Menoken NW & NE Ramp Connections

Eastbound Median Shoulder
Sta 2515+44 to Sta 2523+13
Sta 2542+32 to Sta 2548+10



Removal Typical Section
Menoken NW & NE Ramp

*Included in Earthwork

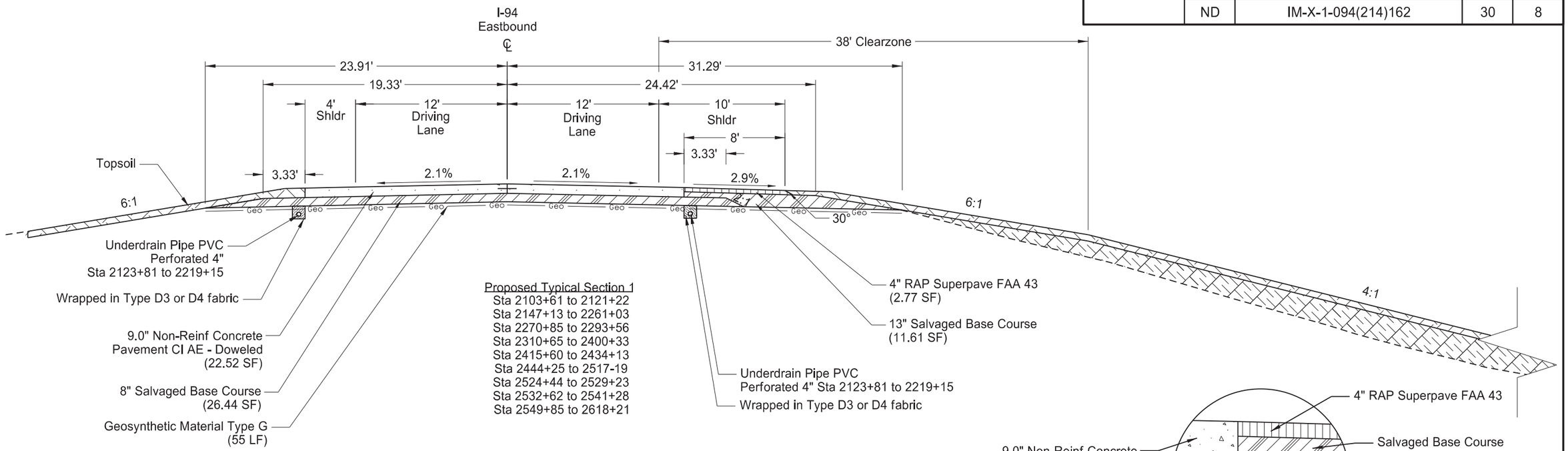
Removal Typical Sections
WB Menoken Ramp Connections

I-94 Reconstruction

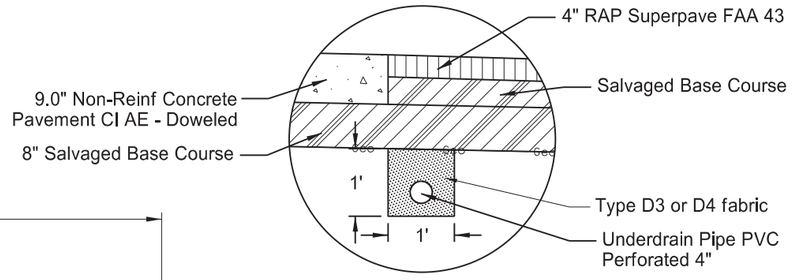
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:02:38 -05'00'
NORTH DAKOTA

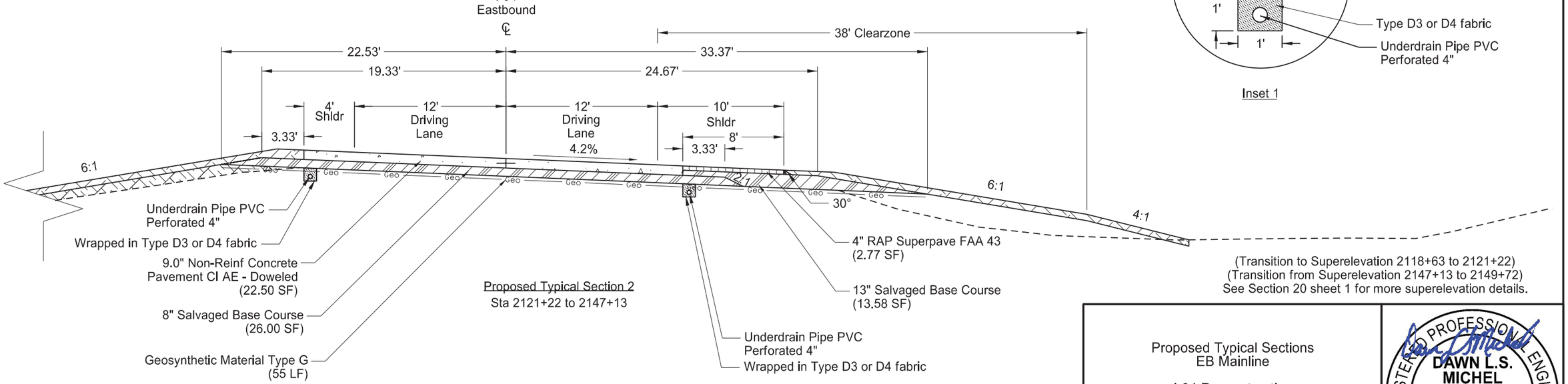
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	30	8



Proposed Typical Section 1
Sta 2103+61 to 2121+22
Sta 2147+13 to 2261+03
Sta 2270+85 to 2293+56
Sta 2310+65 to 2400+33
Sta 2415+60 to 2434+13
Sta 2444+25 to 2517-19
Sta 2524+44 to 2529+23
Sta 2532+62 to 2541+28
Sta 2549+85 to 2618+21



Inset 1



Proposed Typical Section 2
Sta 2121+22 to 2147+13

(Transition to Superelevation 2118+63 to 2121+22)
(Transition from Superelevation 2147+13 to 2149+72)
See Section 20 sheet 1 for more superelevation details.

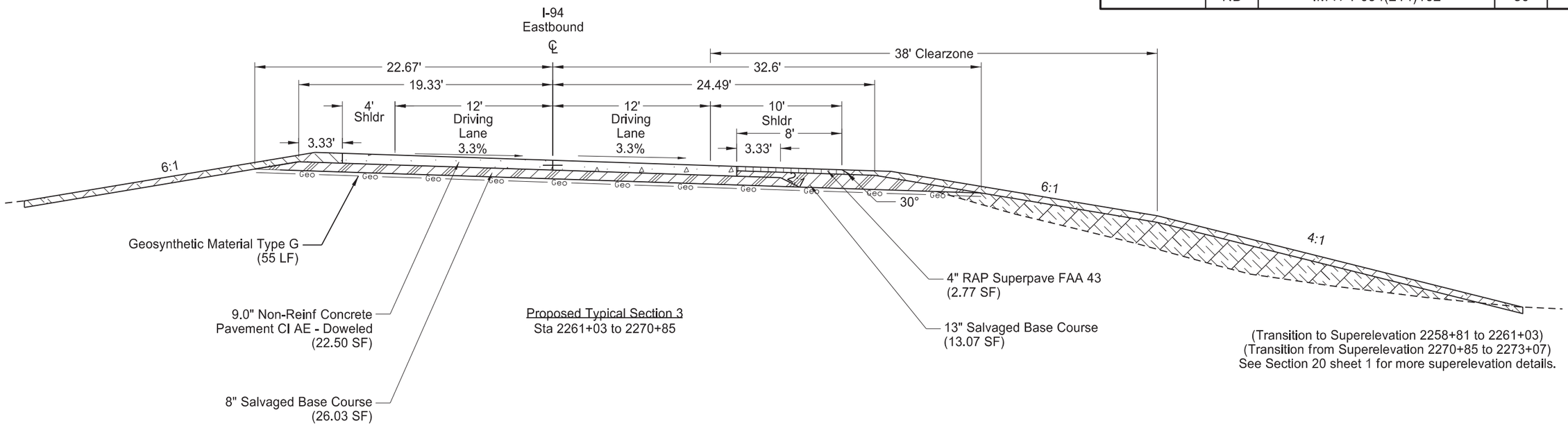
Proposed Typical Sections
EB Mainline

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

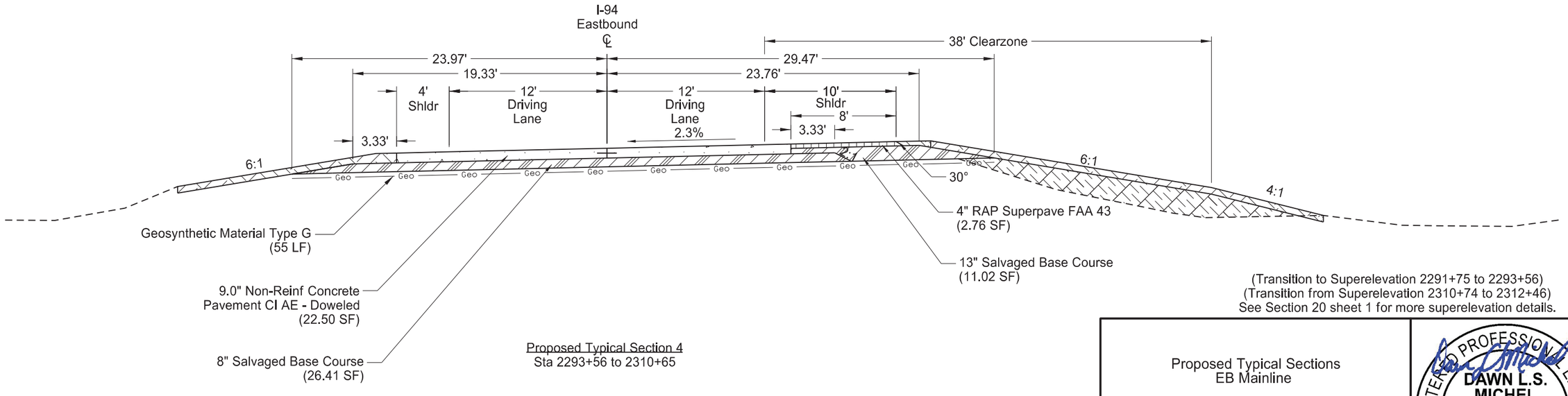
REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:02:54 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	30	9



Proposed Typical Section 3
Sta 2261+03 to 2270+85

(Transition to Superelevation 2258+81 to 2261+03)
(Transition from Superelevation 2270+85 to 2273+07)
See Section 20 sheet 1 for more superelevation details.



Proposed Typical Section 4
Sta 2293+56 to 2310+65

(Transition to Superelevation 2291+75 to 2293+56)
(Transition from Superelevation 2310+74 to 2312+46)
See Section 20 sheet 1 for more superelevation details.

Proposed Typical Sections
EB Mainline

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:03:11 -05'00'
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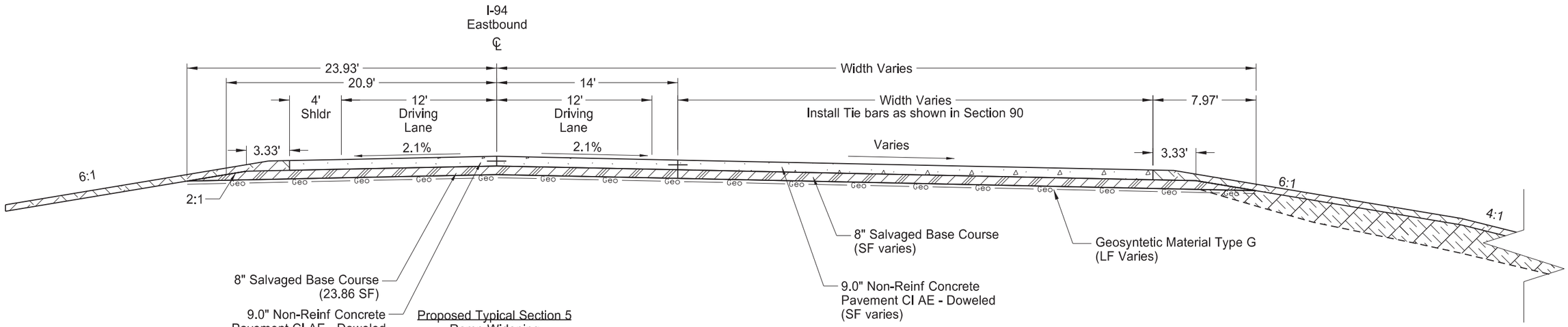


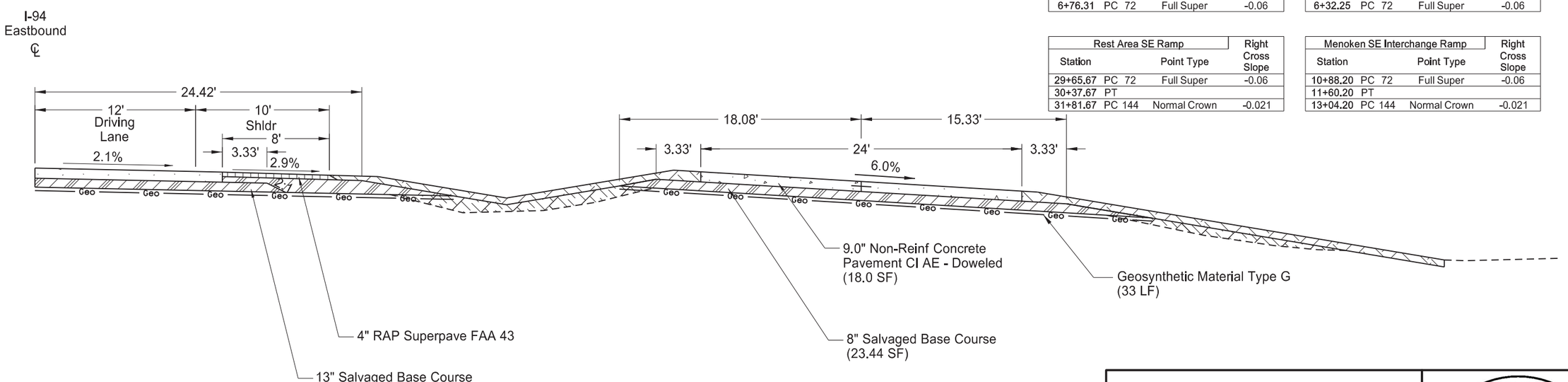
Proposed Typical Section 5
Ramp Widening
Sta 2408+35 to 2415+60
Sta 2434+13 to 2444+25
Sta 2517+19 to 2524+44
Sta 2541+28 to 2549+85

Rest Area SW Ramp			Right Cross Slope
Station		Point Type	
4+60.31	PC 144	Normal Crown	-0.021
6+04.31	PC		
6+76.31	PC 72	Full Super	-0.06

Menoken SW Interchange Ramp			Right Cross Slope
Station		Point Type	
4+16.25	PC 144	Normal Crown	-0.021
5+60.25	PC		
6+32.25	PC 72	Full Super	-0.06

Rest Area SE Ramp			Right Cross Slope
Station		Point Type	
29+65.67	PC 72	Full Super	-0.06
30+37.67	PT		
31+81.67	PC 144	Normal Crown	-0.021

Menoken SE Interchange Ramp			Right Cross Slope
Station		Point Type	
10+88.20	PC 72	Full Super	-0.06
11+60.20	PT		
13+04.20	PC 144	Normal Crown	-0.021



Proposed Typical Section 6
Rest Area SW Ramp 8+83 to 9+73
Rest Area SE Ramp 27+64 to 28+09
Menoken SW Interchange Ramp 8+04 to 9+25
Menoken SE Interchange Ramp 8+60 to 9+05

Proposed Typical Sections
EB Mainline

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
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DATE 2024.07.16 11:03:29 -05'00'
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7/16/2024 10:10:05 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\030\030TP_008-013.dgn

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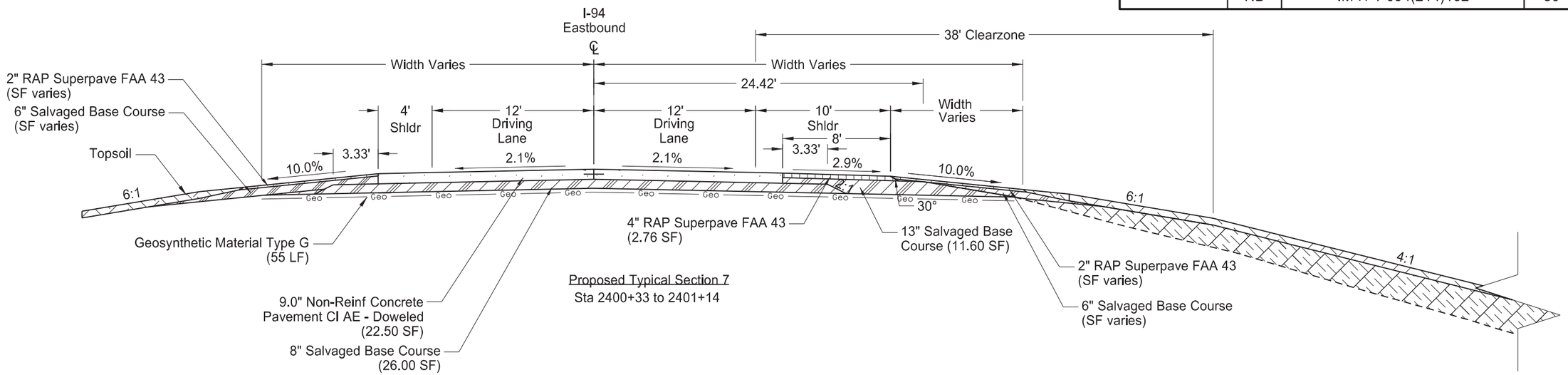
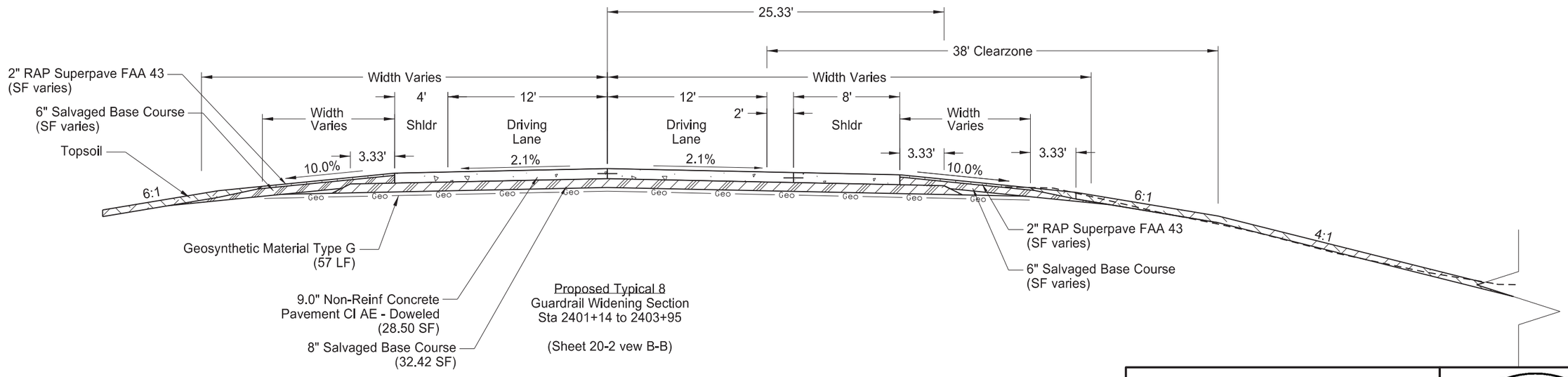


Proposed Typical Section 7
Sta 2400+33 to 2401+14



Proposed Typical 8
Guardrail Widening Section
Sta 2401+14 to 2403+95

(Sheet 20-2 vew B-B)

Proposed Typical Sections
Guardrail Widening

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

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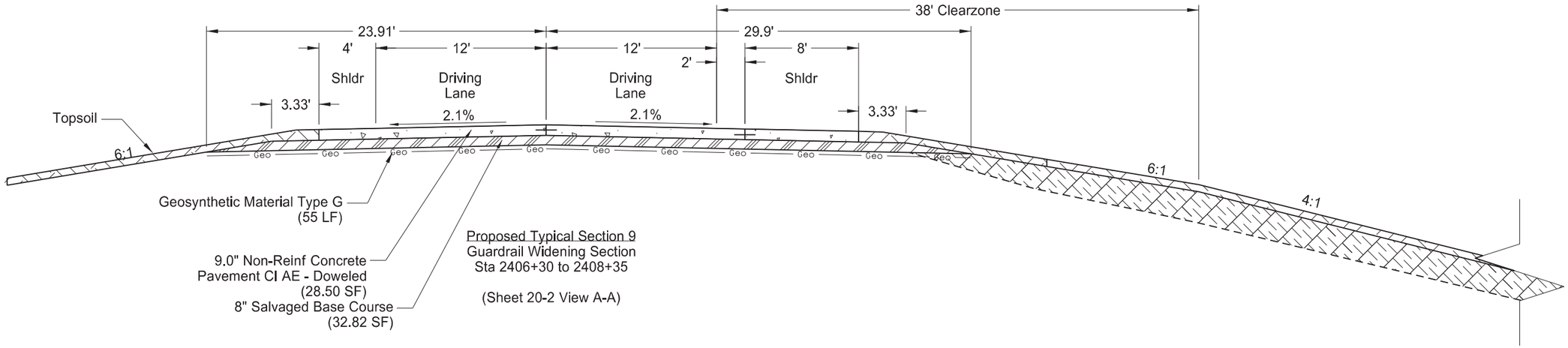

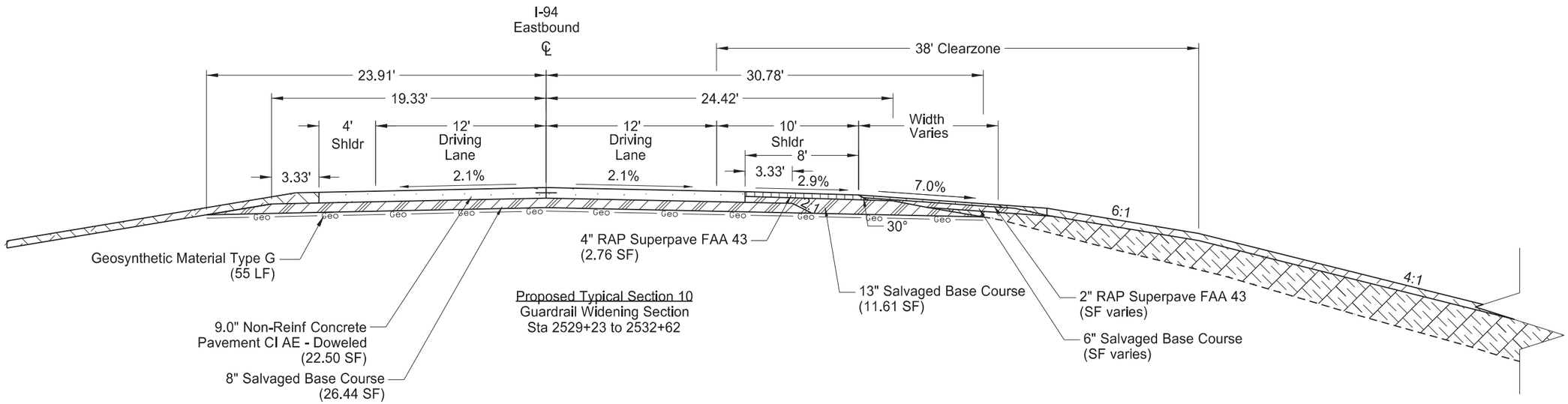

Proposed Typical Sections
Guardrail Widening

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
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DATE 2024.07.16 11:04:04 -05'00'
NORTH DAKOTA

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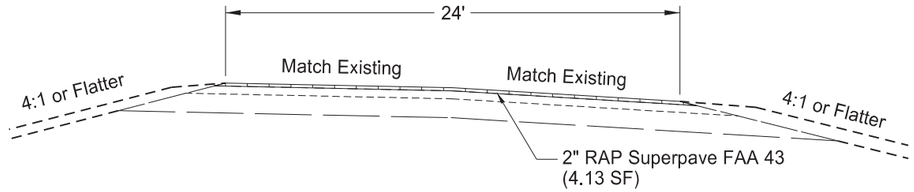
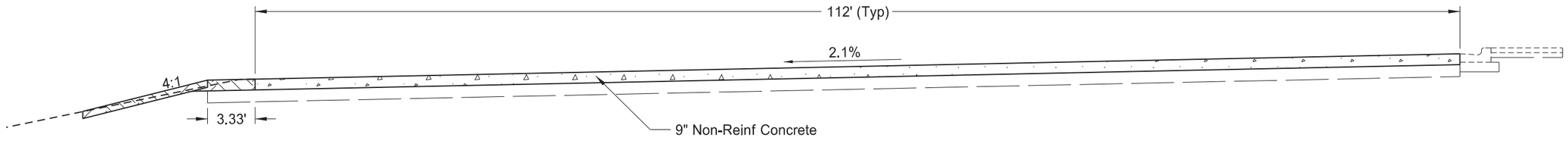
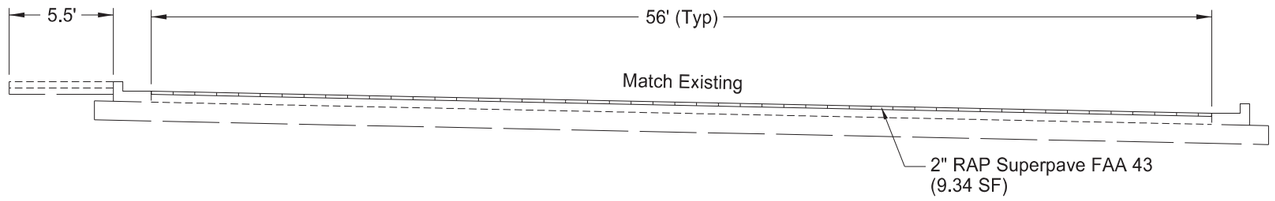


Proposed Typical Section 11
Apple Creek Rest Area SW Ramp 8+75 to 9+75
Apple Creek Rest Area SE Ramp 27+17 to 28+17



Proposed Typical Section 12
Apple Creek Rest Area
Truck and Bus Parking Area
Sta 16+75 to 23+18



Proposed Typical Section 13
Apple Creek Rest Area
Car Parking Area

Proposed Typical Sections
Apple Creek Rest Area

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

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NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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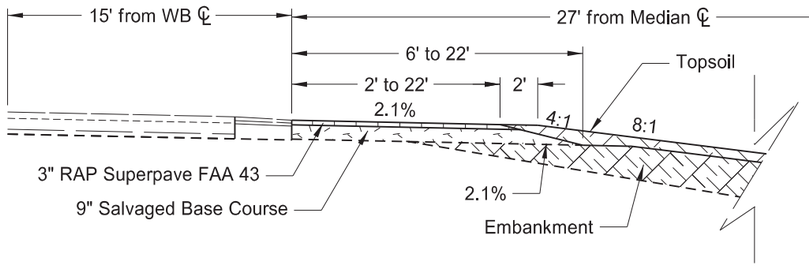
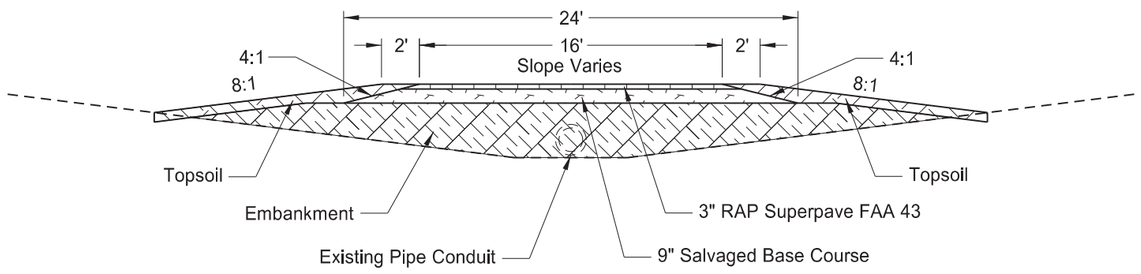
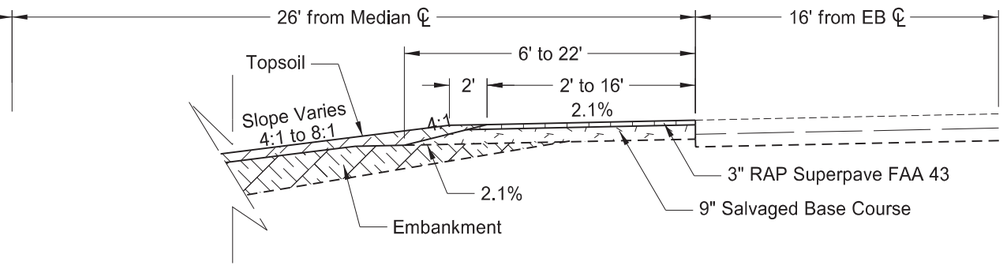


Proposed Typical Section 14 - Westbound Median Shoulder

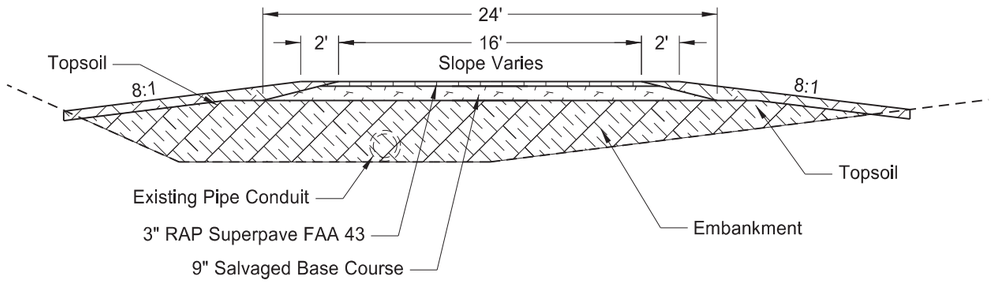
Sta 9+30 to Sta 9+71 (Proposed MNW Alignment)
Sta 32+94 to Sta 33+35 (Proposed MNE Alignment)





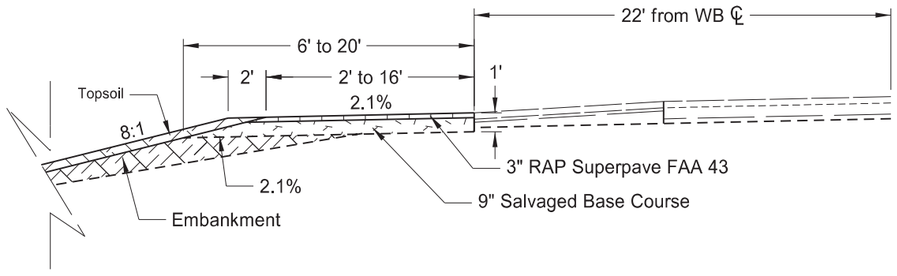
Proposed Typical Section 15 - Eastbound Median Shoulder

Sta 0+39 to Sta 7+85 (Proposed MNW Alignment)
Sta 34+80 to Sta 40+28 (Proposed MNE Alignment)



Proposed Typical Section 16 - Ramp Connection in the Median

Sta 7+85 to Sta 9+30 (Proposed MNW Alignment)
Sta 33+35 to Sta 34+80 (Proposed MNE Alignment)

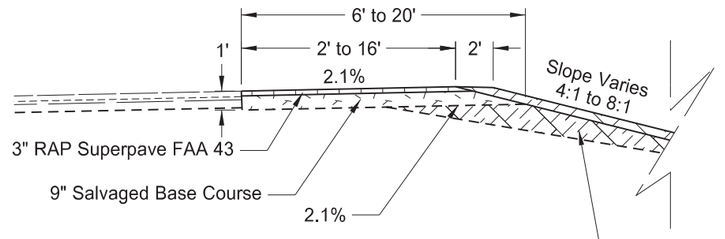


Proposed Typical Section 18 - Westbound Outside Shoulder

Sta 10+21 to Sta 10+52 (Proposed MNW Alignment)
Sta 32+13 to Sta 32+43 (Proposed MNE Alignment)

Proposed Typical Section 17 - Ramp Connection in the Existing Ramp Area

Sta 10+52 to Sta 11+44 (Proposed MNW Alignment)
Sta 31+00 to Sta 32+13 (Proposed MNE Alignment)



Proposed Typical Section 19 - Existing Ramps

Sta 11+44 to Sta 12+16 (Proposed MNW Alignment)
Sta 30+18 to Sta 31+00 (Proposed MNE Alignment)

Proposed Typical Sections
WB Menoken Ramp Connections

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
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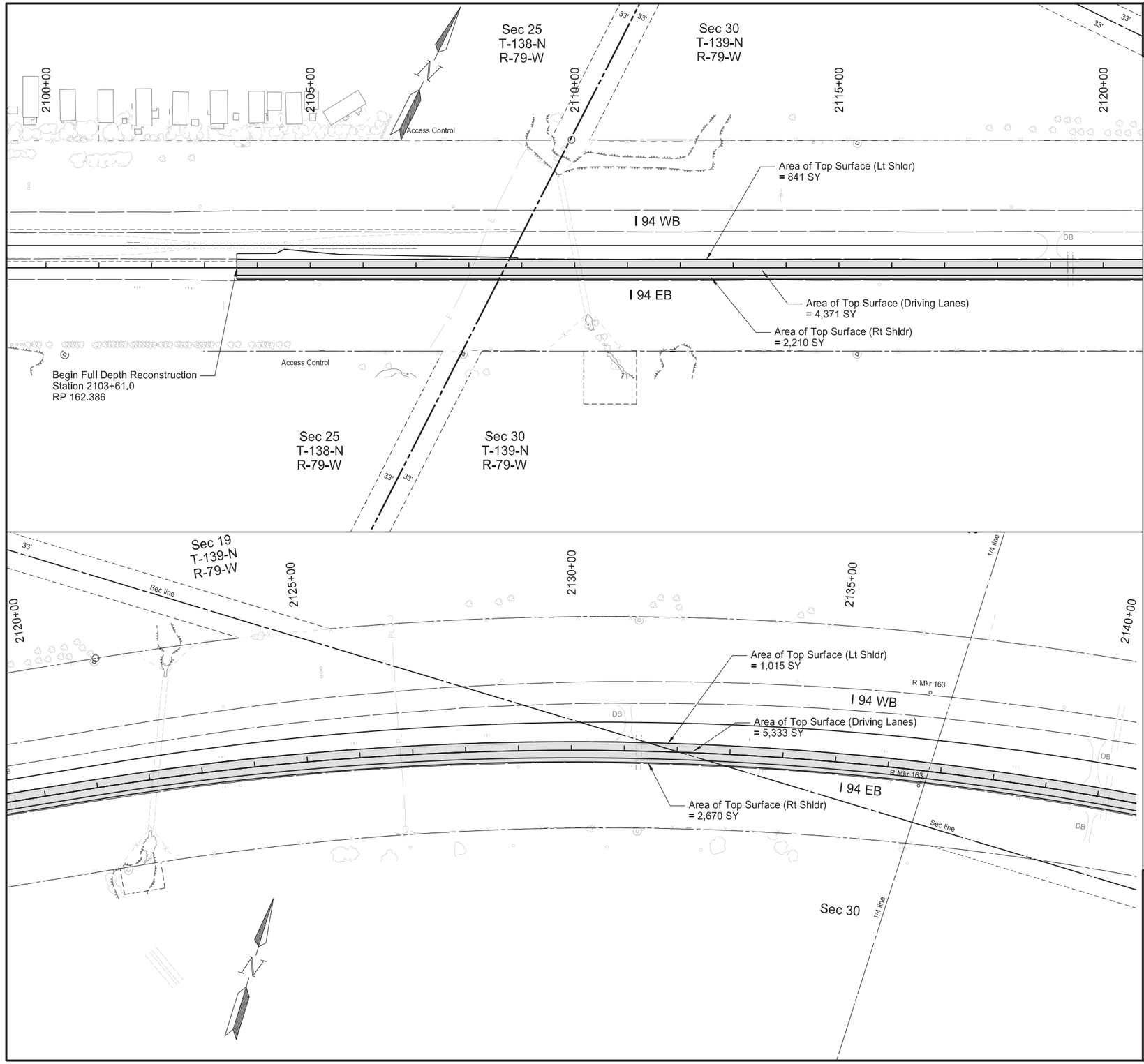
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	40	1

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2103+61 to 2140+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	809	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	693	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2588	TON
		Rt Shoulder Aggregate (Avg. Depth = 0.37')	1207	TON
		Rt Shoulder Asphalt (Avg. Depth = 0.52')	1692	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2103+61 to 2140+00		
		Mainline Concrete (7" Depth)	3753	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	607	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.



LEGEND

Removal of Concrete and Bituminous Pavement

Station based on EX94EB alignment

Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
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PE-7107
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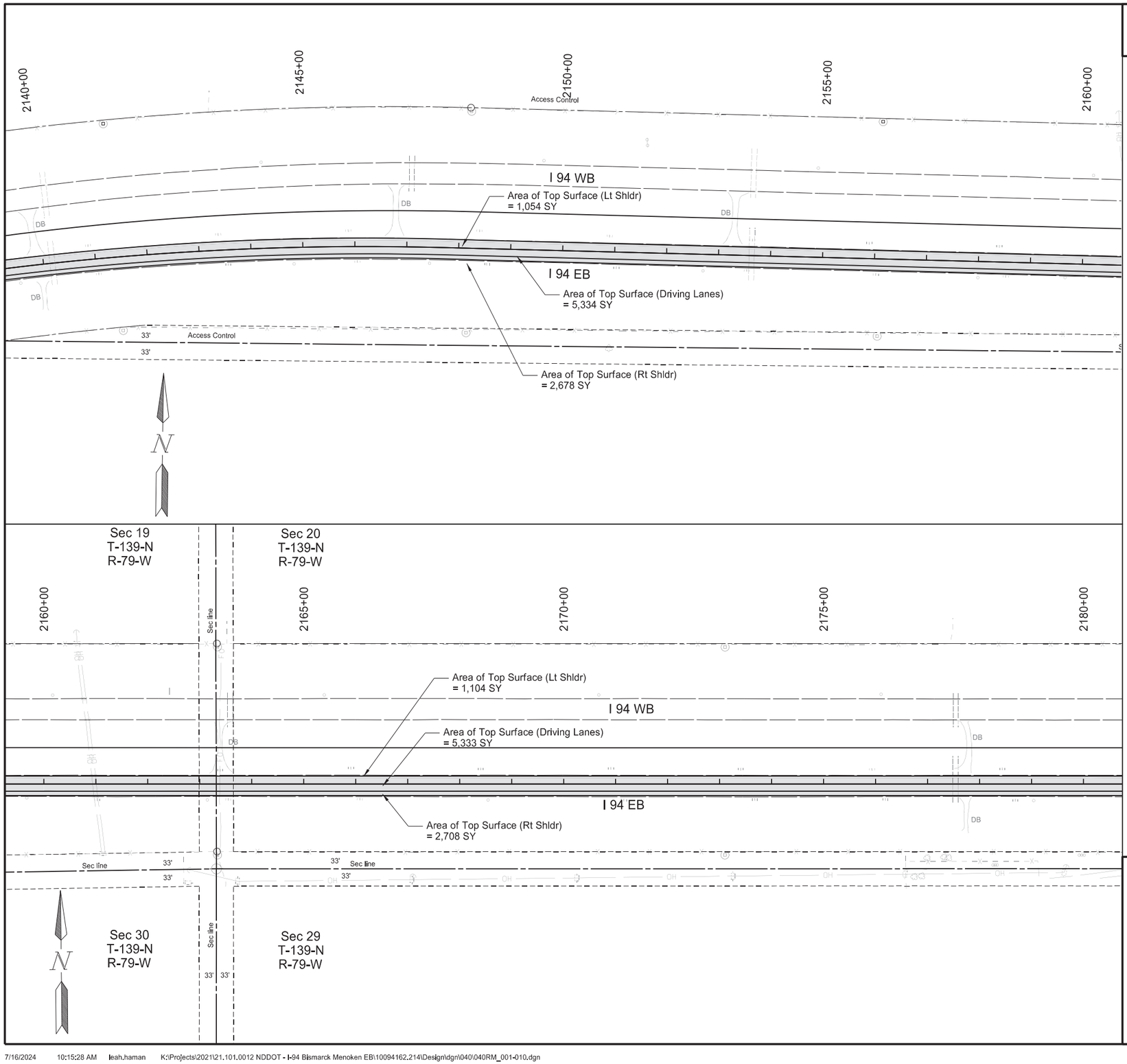
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	40	2

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2140+00 to 2180+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	925	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	806	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2844	TON
		Rt Shoulder Aggregate (Avg. Depth = 0.37')	1332	TON
		Rt Shoulder Asphalt (Avg. Depth = 0.52')	1867	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2140+00 to 2180+00		
		Mainline Concrete (7" Depth)	4124	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	667	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.

LEGEND

Removal of Concrete and Bituminous Pavement

Station based on EX94EB alignment

Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
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PE-7107
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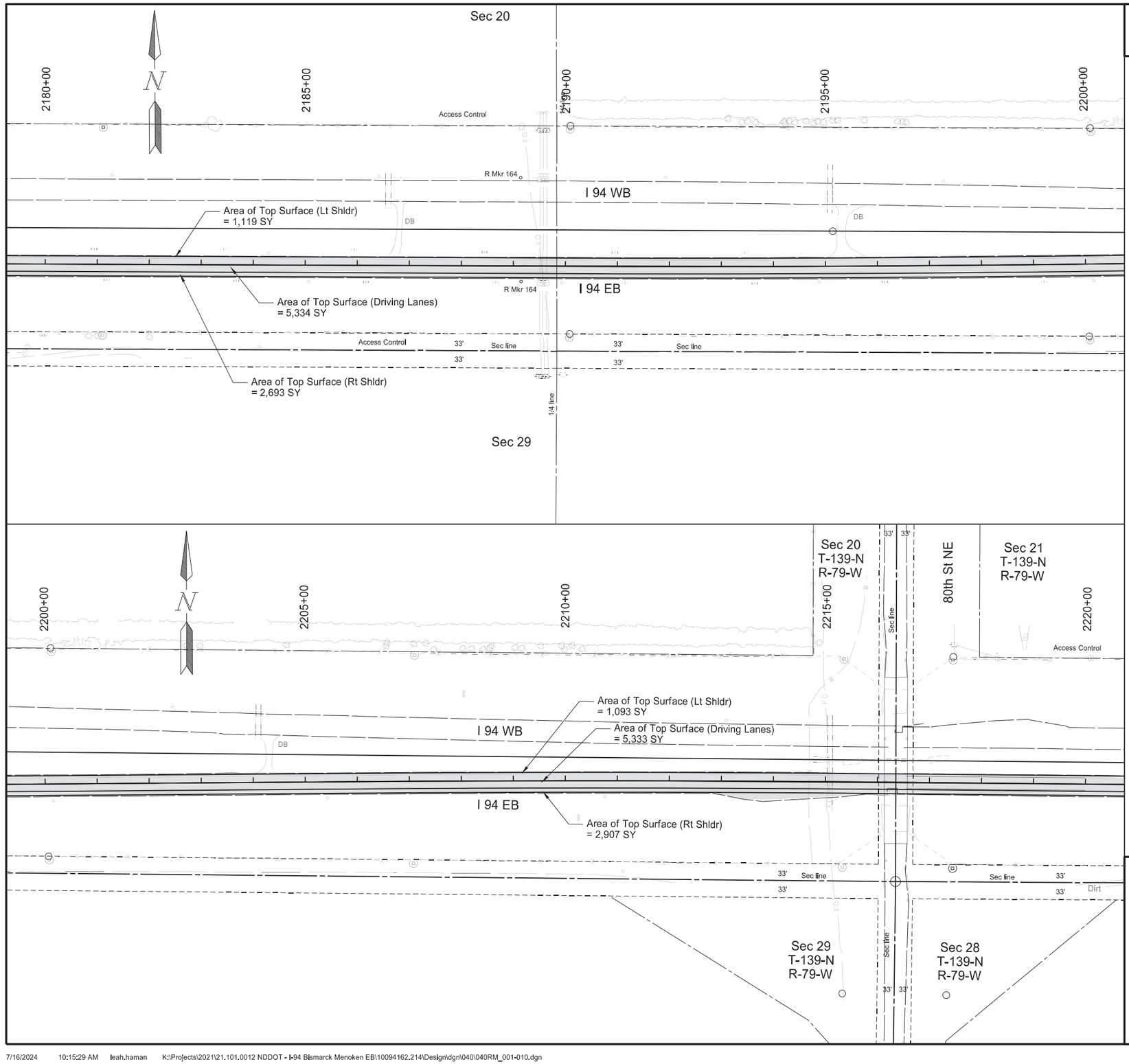

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	40	3

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2180+00 to 2220+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	934	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	817	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2815	TON
		Rt Shoulder Aggregate (Avg. Depth = 0.37')	1373	TON
		Rt Shoulder Asphalt (Avg. Depth = 0.52')	1929	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2180+00 to 2220+00		
		Mainline Concrete (7" Depth)	4082	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	660	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.
Note 4: See Sec 90 sheet 1 for overpass Milling.

LEGEND

Removal of Concrete and Bituminous Pavement

Station based on EX94EB alignment

Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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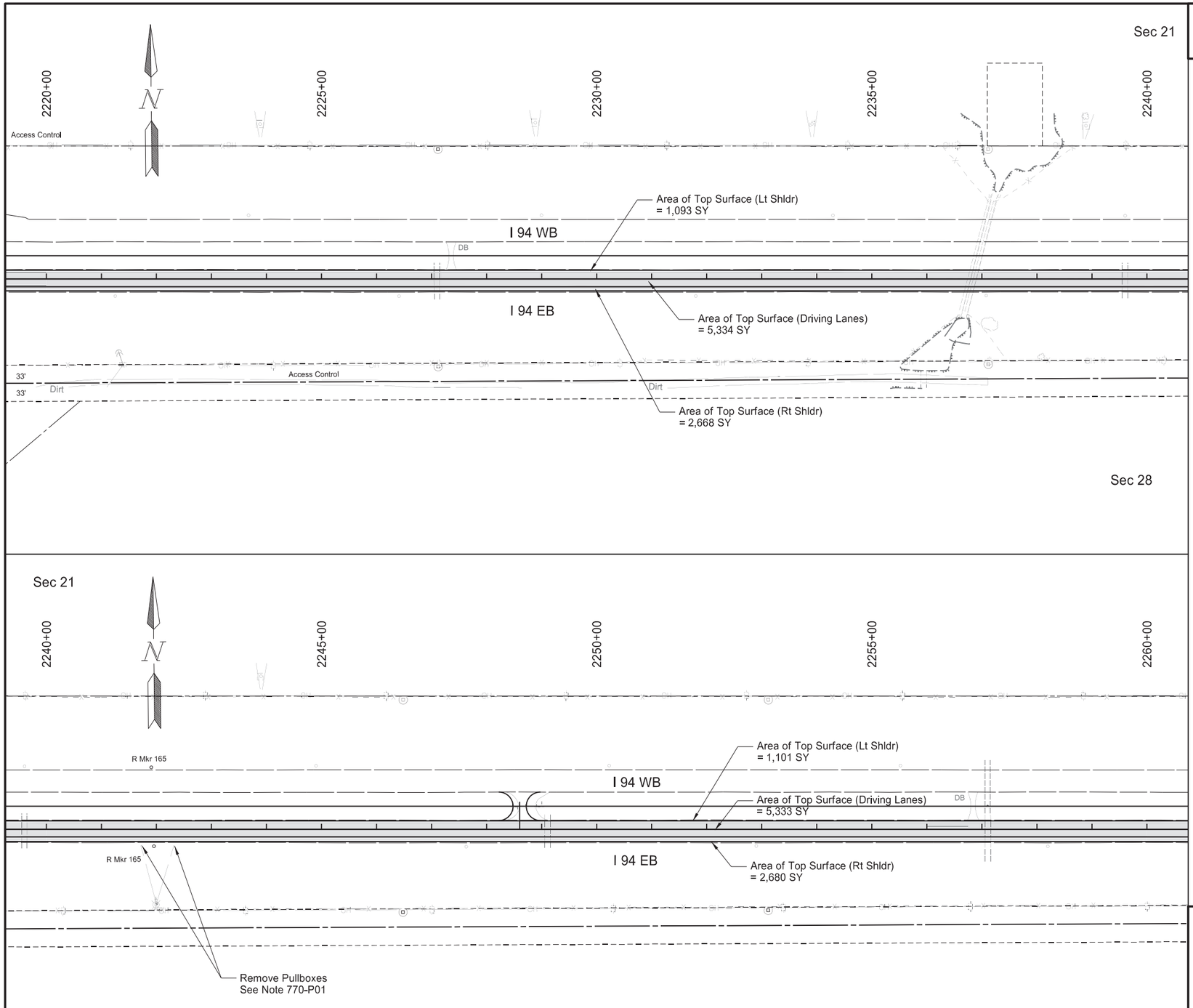

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2220+00 to 2260+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	935	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	819	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2844	TON
		Rt Shoulder Aggregate (Avg. Depth = 0.37')	1323	TON
		Rt Shoulder Asphalt (Avg. Depth = 0.52')	1854	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2220+00 to 2260+00		
		Mainline Concrete (7" Depth)	4124	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	667	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.

LEGEND

Removal of Concrete and Bituminous Pavement

Station based on EX94EB alignment

Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
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PE-7107
DATE 2024.07.16 14:59:06 -05'00'
NORTH DAKOTA

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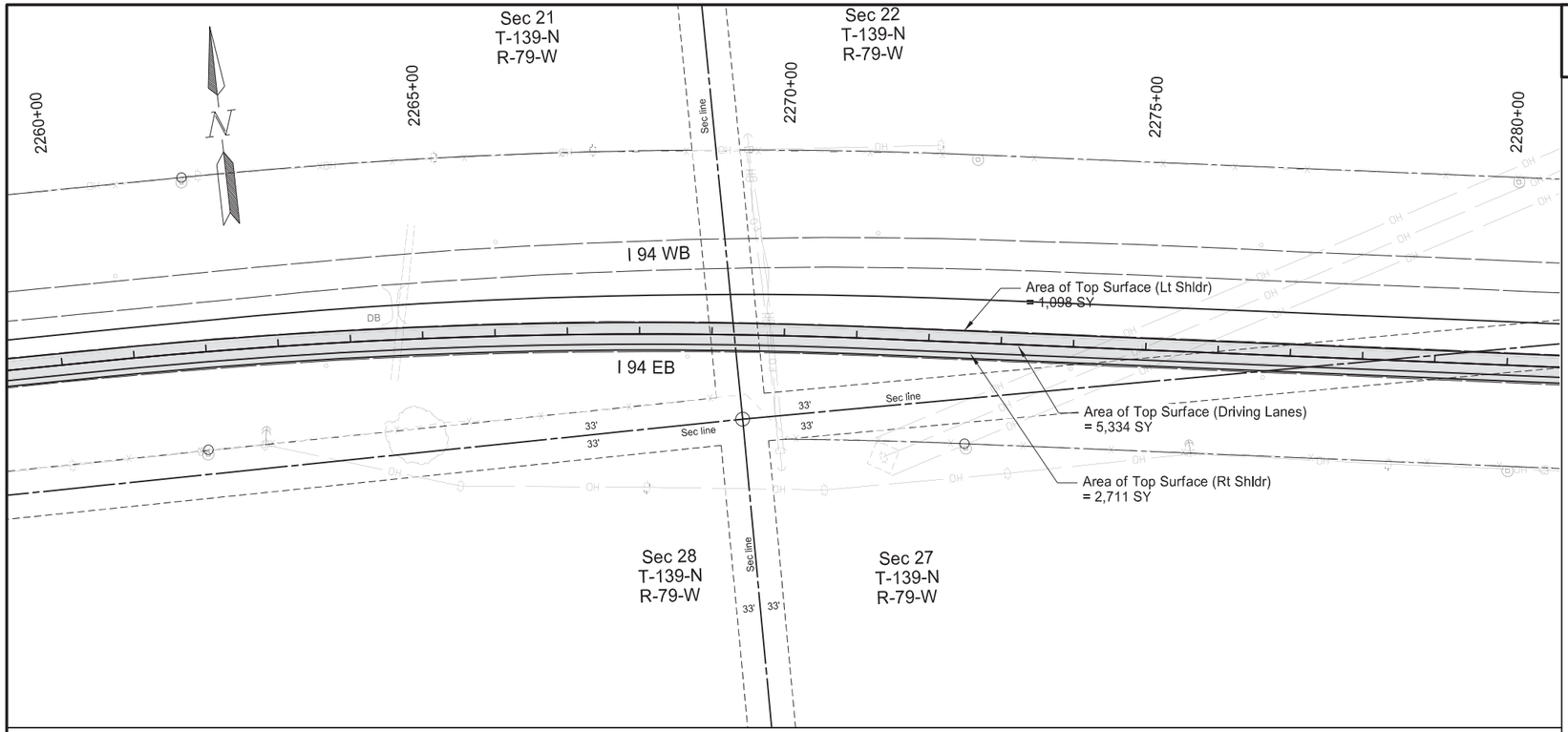

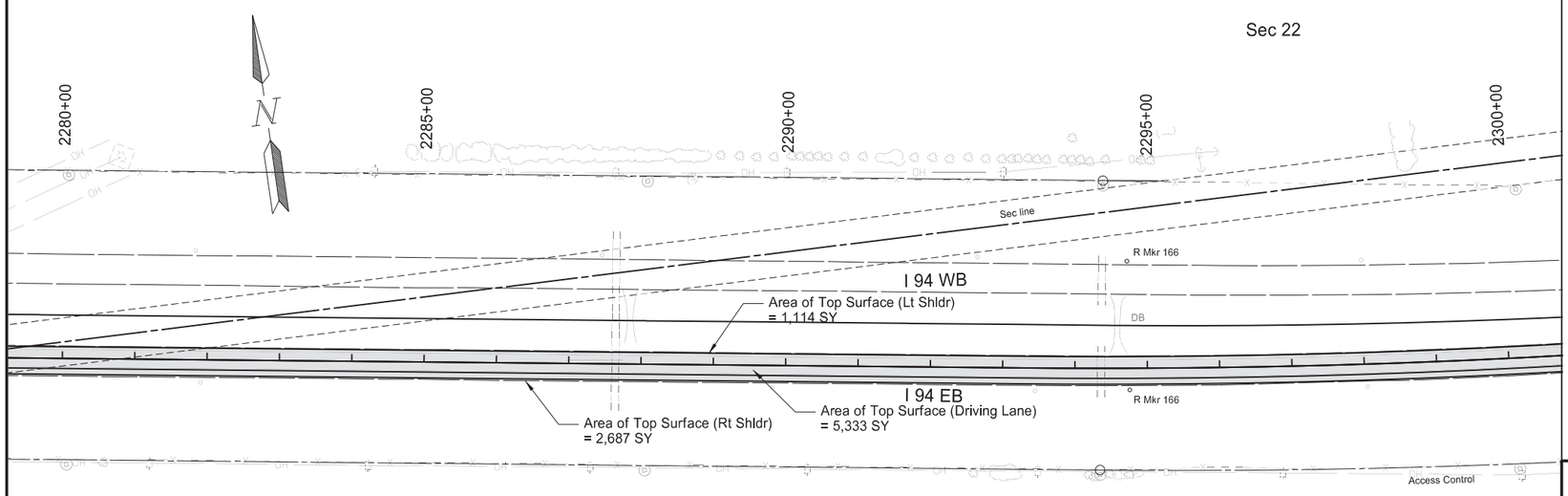

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	40	5

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2260+00 to 2300+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	941	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	826	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2844	TON
		Rt Shoulder Aggregate (Avg. Depth = 0.37')	1335	TON
		Rt Shoulder Asphalt (Avg. Depth = 0.52')	1871	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2260+00 to 2300+00		
		Mainline Concrete (7" Depth)	4124	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	667	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.

LEGEND

Removal of Concrete and Bituminous Pavement

Station based on EX94EB alignment

Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
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NORTH DAKOTA

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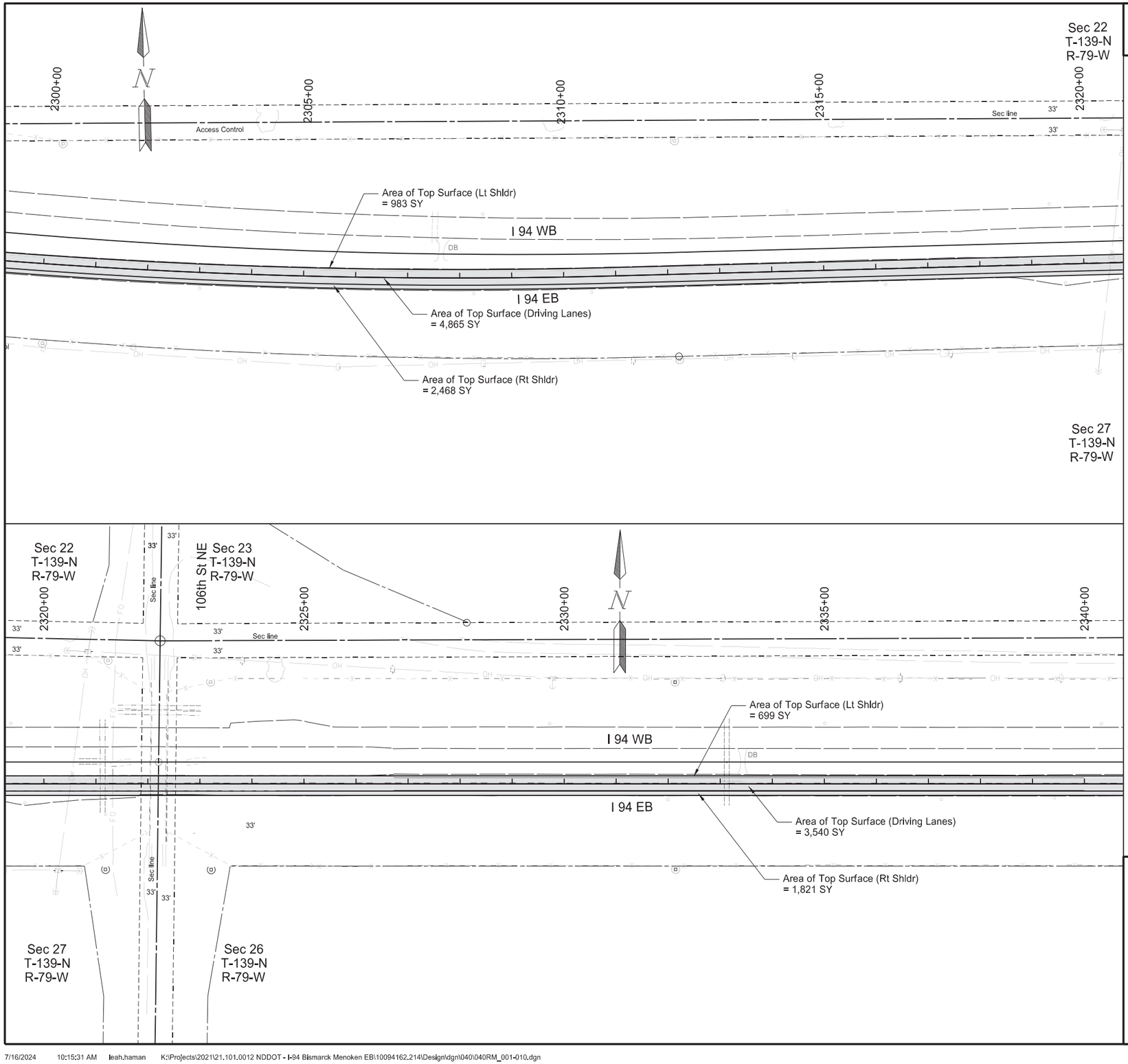

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2300+00 to 2340+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	654	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	628	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2242	TON
		Rt Shoulder Aggregate (Avg. Depth = 0.37')	2964	TON
		Rt Shoulder Asphalt (Avg. Depth = 0.52')	4317	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2300+00 to 2340+00		
		Mainline Concrete (7" Depth)	3250	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	525	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.

LEGEND

Removal of Concrete and Bituminous Pavement

Station based on EX94EB alignment

Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
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DATE 2024.07.16 14:59:41 -05'00'
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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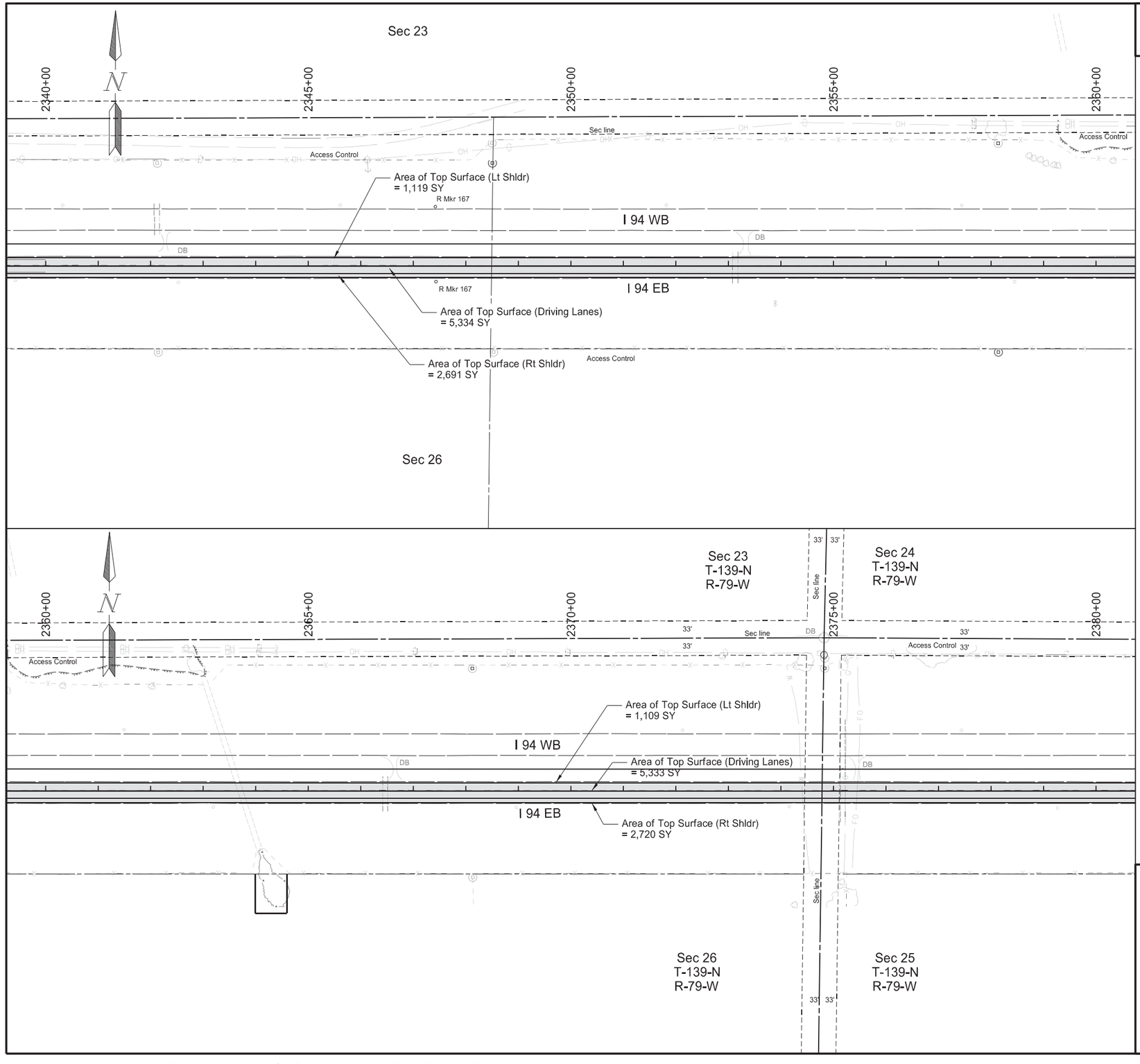


SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2340+00 to 2380+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	946	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	832	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2845	TON
		Rt Shoulder Aggregate (Avg. Depth = 0.37')	1338	TON
		Rt Shoulder Asphalt (Avg. Depth = 0.52')	1876	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2340+00 to 2380+00		
		Mainline Concrete (7" Depth)	4125	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	667	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.

LEGEND

Removal of Concrete and Bituminous Pavement

Station based on EX94EB alignment

Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

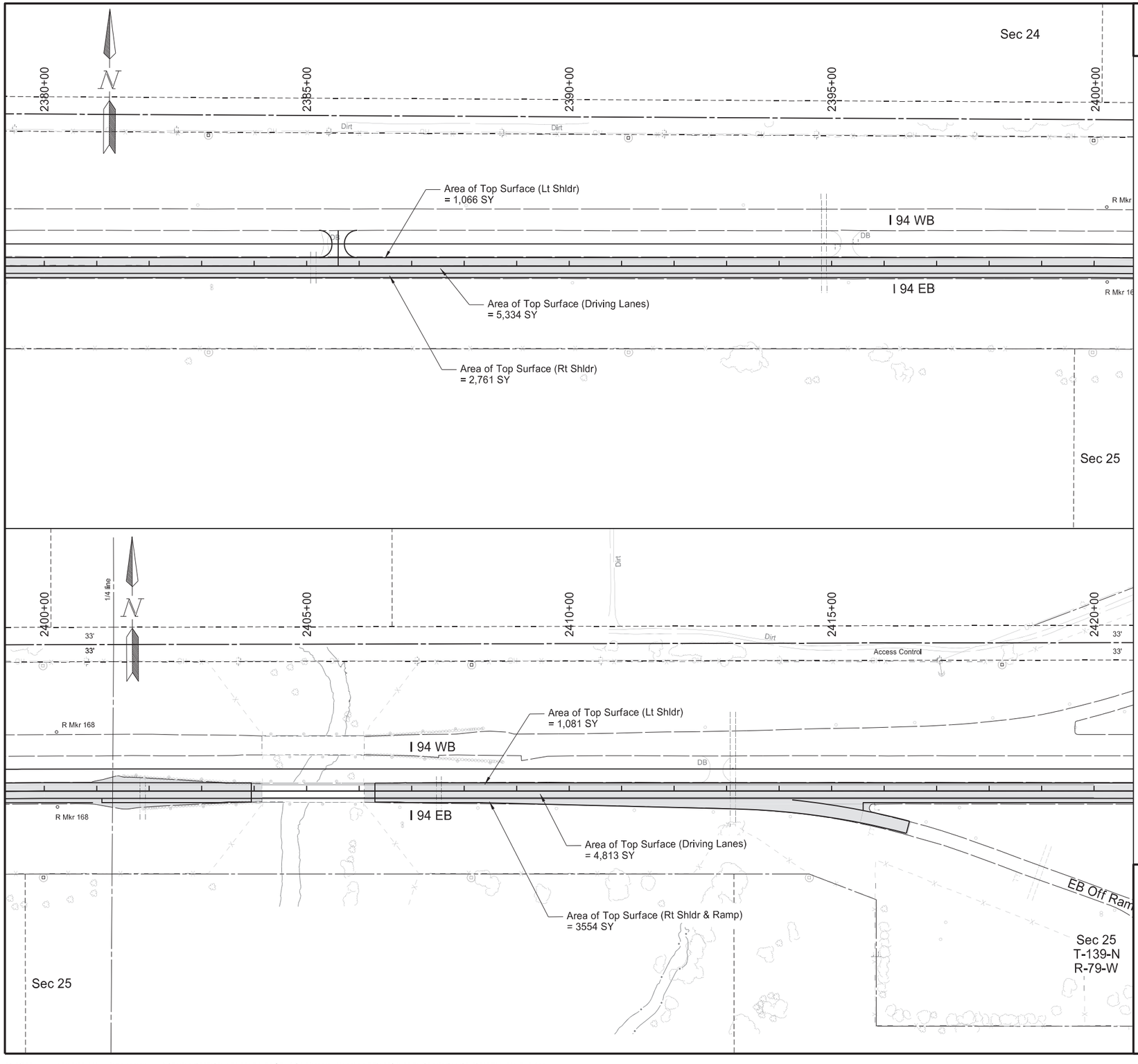
REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 14:59:59 -05'00'
NORTH DAKOTA

7/16/2024 10:15:32 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\040\040RM_001-010.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	40	8

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2380+00 to 2420+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	764	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	802	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2706	TON
		Rt Shoulder & Ramp Aggregate (Avg. Depth = 0.37')	1559	TON
		Rt Shoulder & Ramp Asphalt (Avg. Depth = 0.52')	2189	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2380+00 to 2420+00		
		Mainline Concrete (7" Depth)	3923	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	634	TON
		Existing Expansion Joints	14	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.



LEGEND

Removal of Concrete and Bituminous Pavement

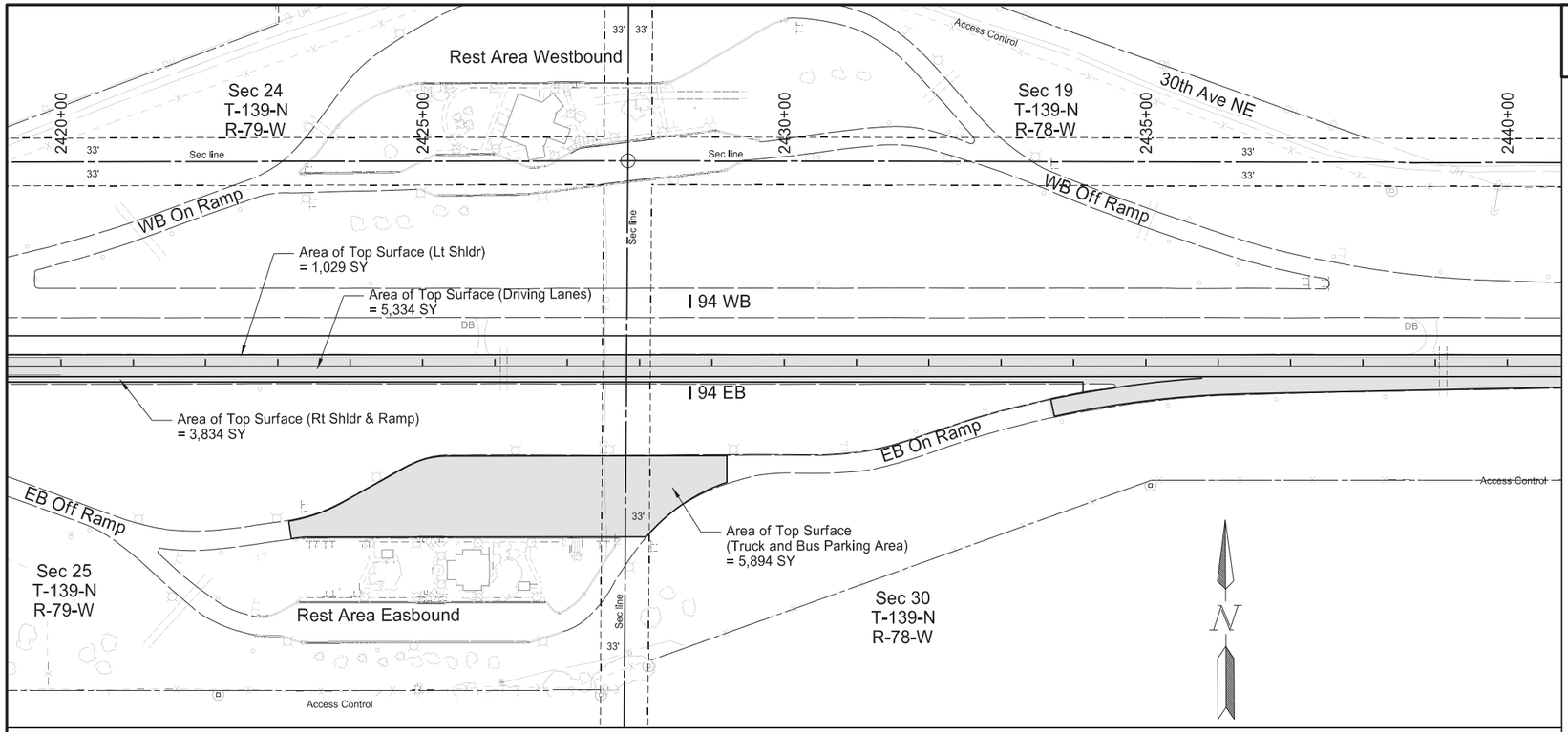
Station based on EX94EB alignment

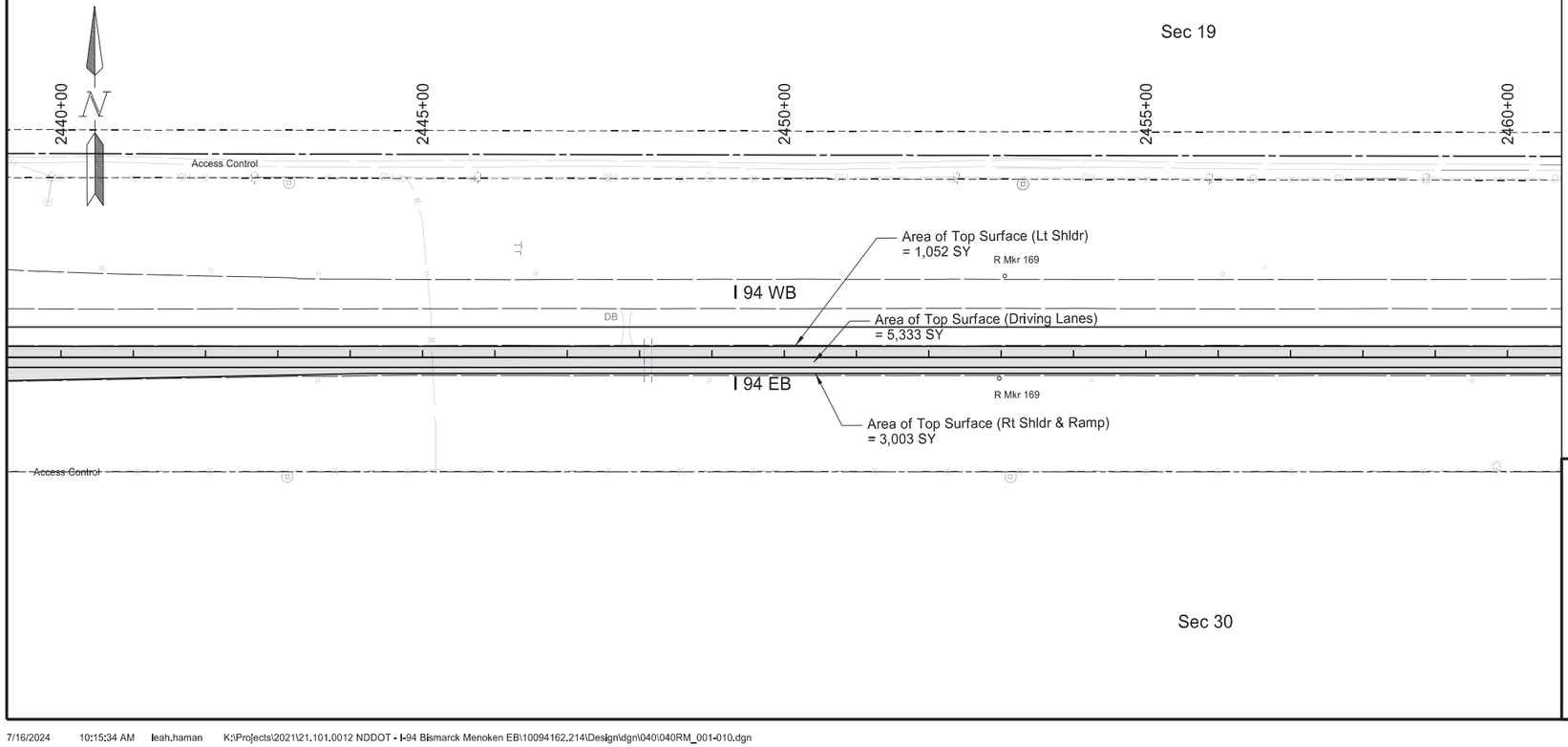
Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:00:15 -05'00'
NORTH DAKOTA





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	40	9

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2420+00 to 2460+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	902	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	777	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2844	TON
		Rt Shoulder & Ramp Aggregate (Avg. Depth = 0.37')	1667	TON
		Rt Shoulder & Ramp Asphalt (Avg. Depth = 0.52')	2370	TON
		Rest Area Truck Parking Area Agg. (Avg. Depth = 0.17')	626	TON
		Rest Area Truck Parking Area Asph (Avg. Depth = 0.58')	2279	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2420+00 to 2460+00		
		Mainline Concrete (7" Depth)	4124	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	667	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.
Note 4: See Sec 90 sheets 2-4 for Rest Area Milling.

LEGEND

Removal of Concrete and Bituminous Pavement

Station based on EX94EB alignment

Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:00:33 -05'00'
NORTH DAKOTA

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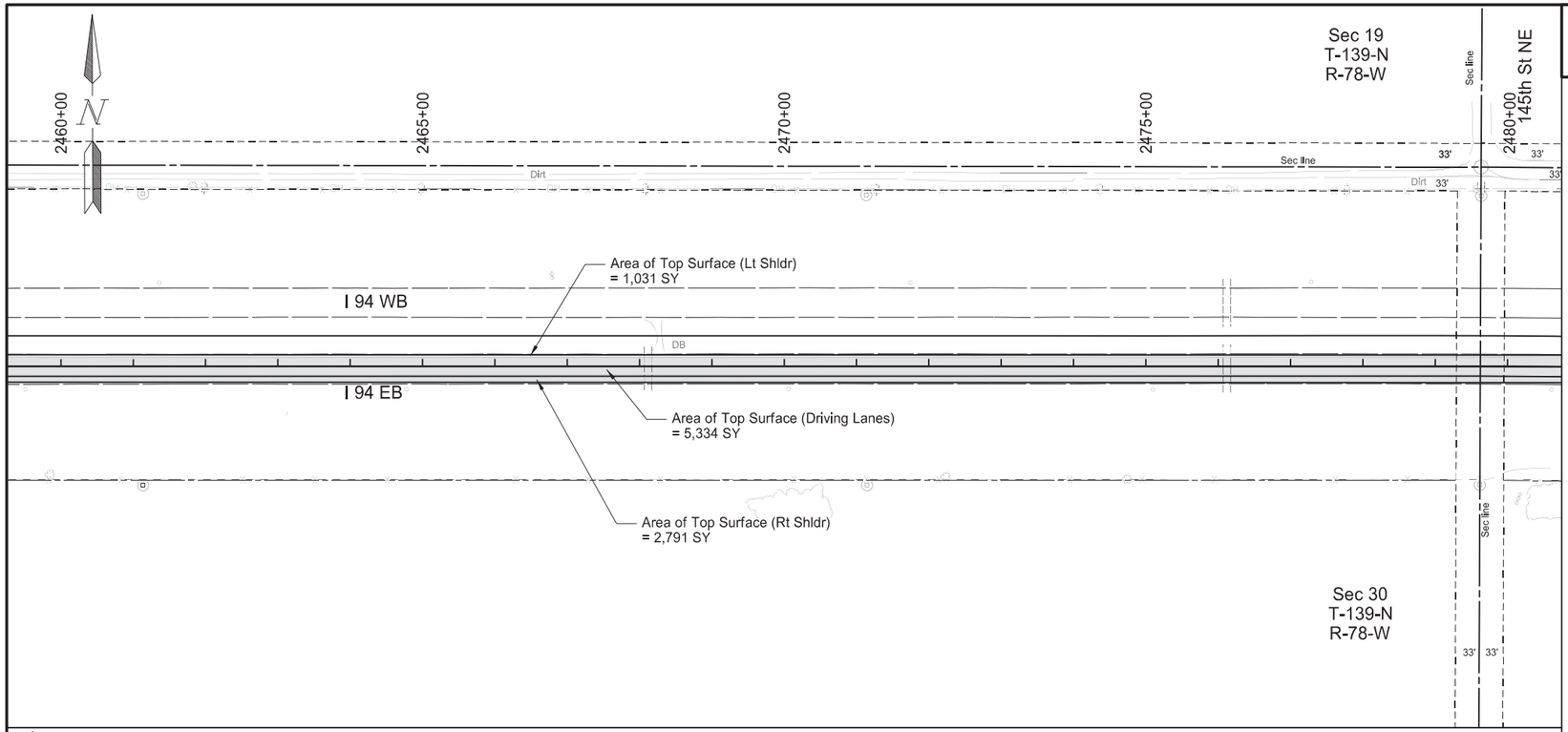
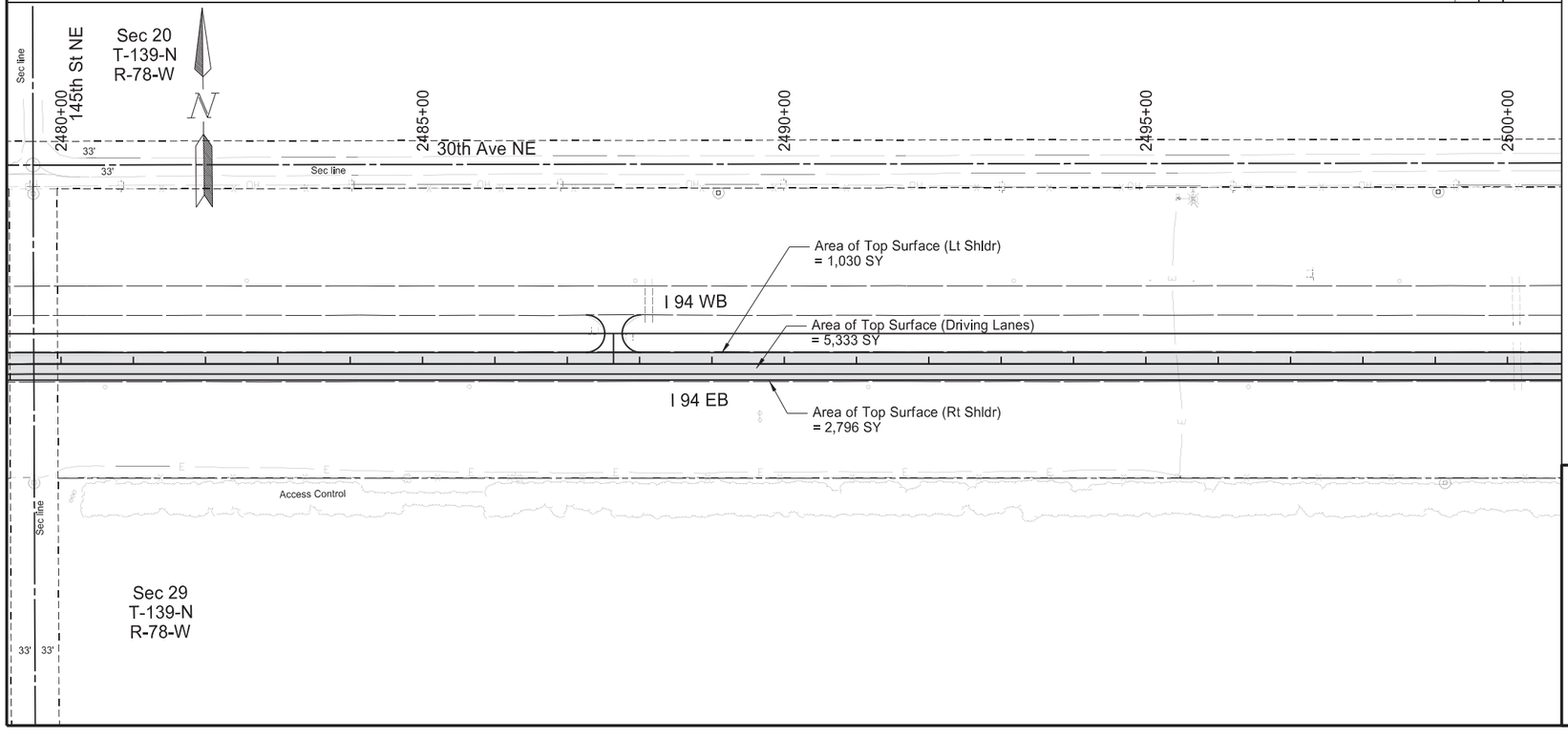




	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	40	10

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2460+00 to 2500+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	896	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	770	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2844	TON
		Rt Shoulder Aggregate (Avg. Depth = 0.37')	1378	TON
		Rt Shoulder Asphalt (Avg. Depth = 0.52')	1937	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2460+00 to 2500+00		
		Mainline Concrete (7" Depth)	4124	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	667	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.

LEGEND

Removal of Concrete and Bituminous Pavement

Station based on EX94EB alignment

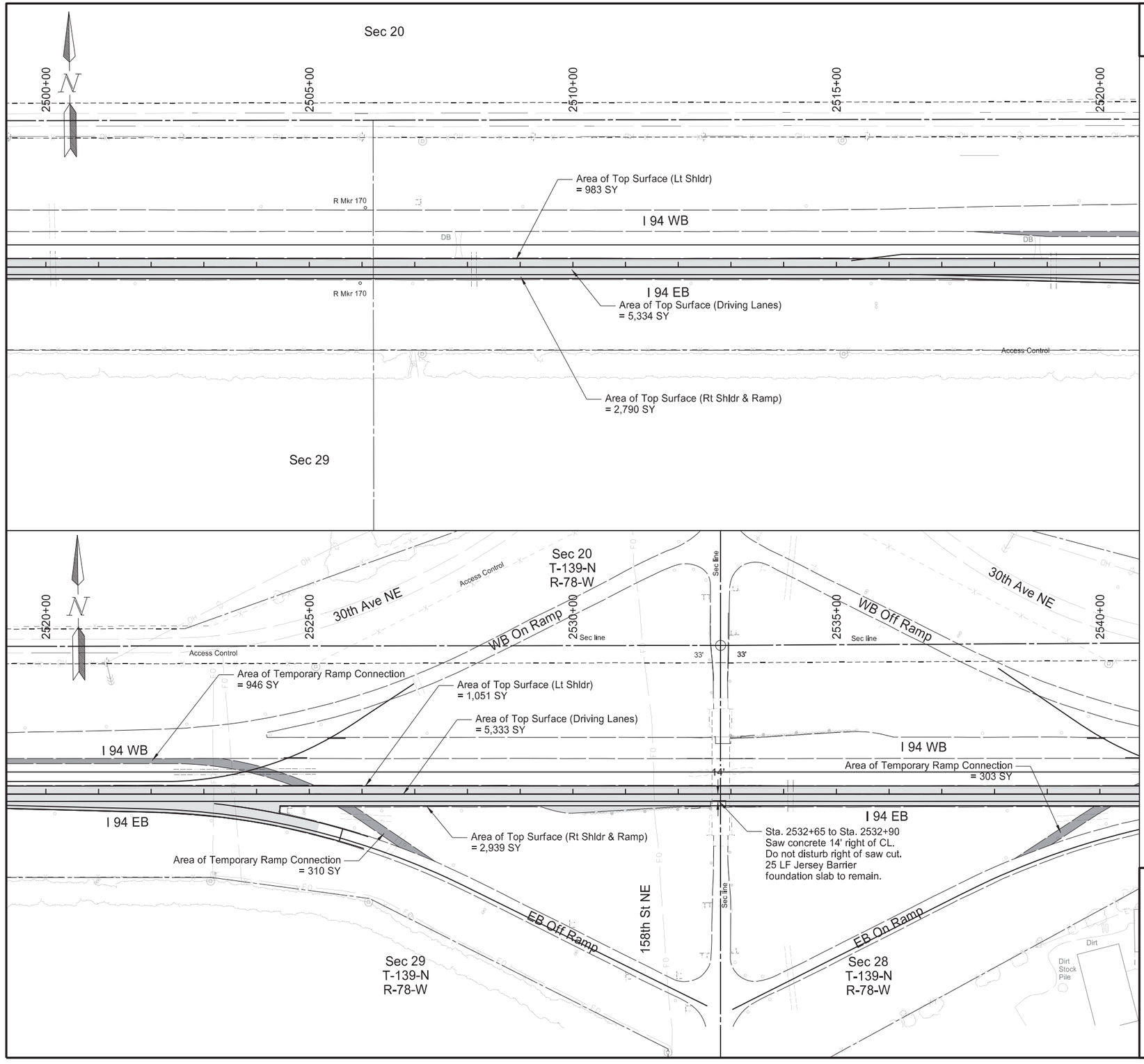
Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:00:48 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	40	11



SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2500+00 to 2540+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	888	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	759	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2844	TON
		Rt Shoulder & Ramp Aggregate (Avg. Depth = 0.37')	1630	TON
		Rt Shoulder & Ramp Asphalt (Avg. Depth = 0.52')	2314	TON
		Temporary Ramp Connection (9" Depth)	892	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2500+00 to 2540+00		
		Mainline Concrete (7" Depth)	4124	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	667	TON
		Temporary Ramp Connection (3" Depth)	275	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.

LEGEND

Removal of Concrete and Bituminous Pavement

Removal of Temporary Ramp Connection

Station based on EX94EB alignment

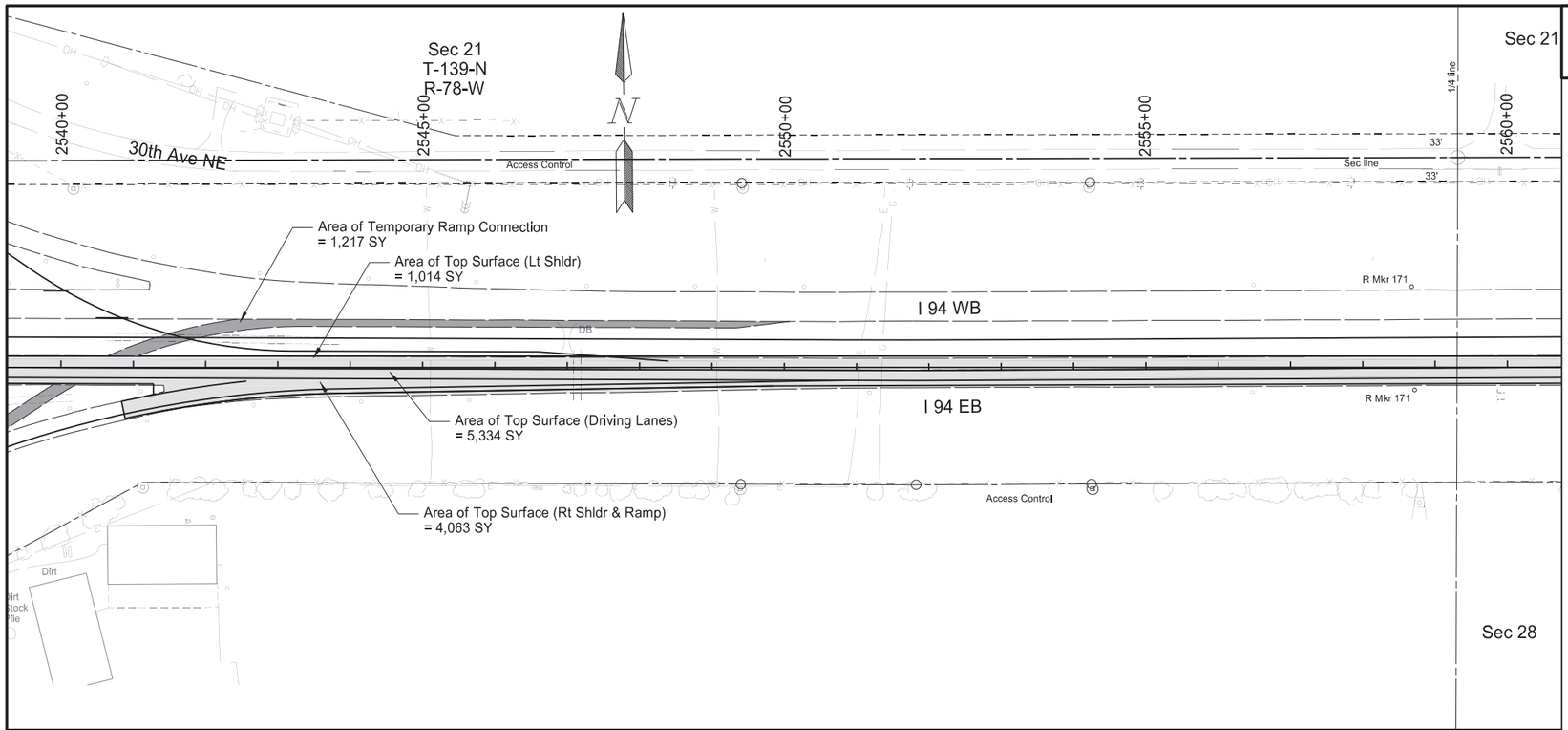
Removals

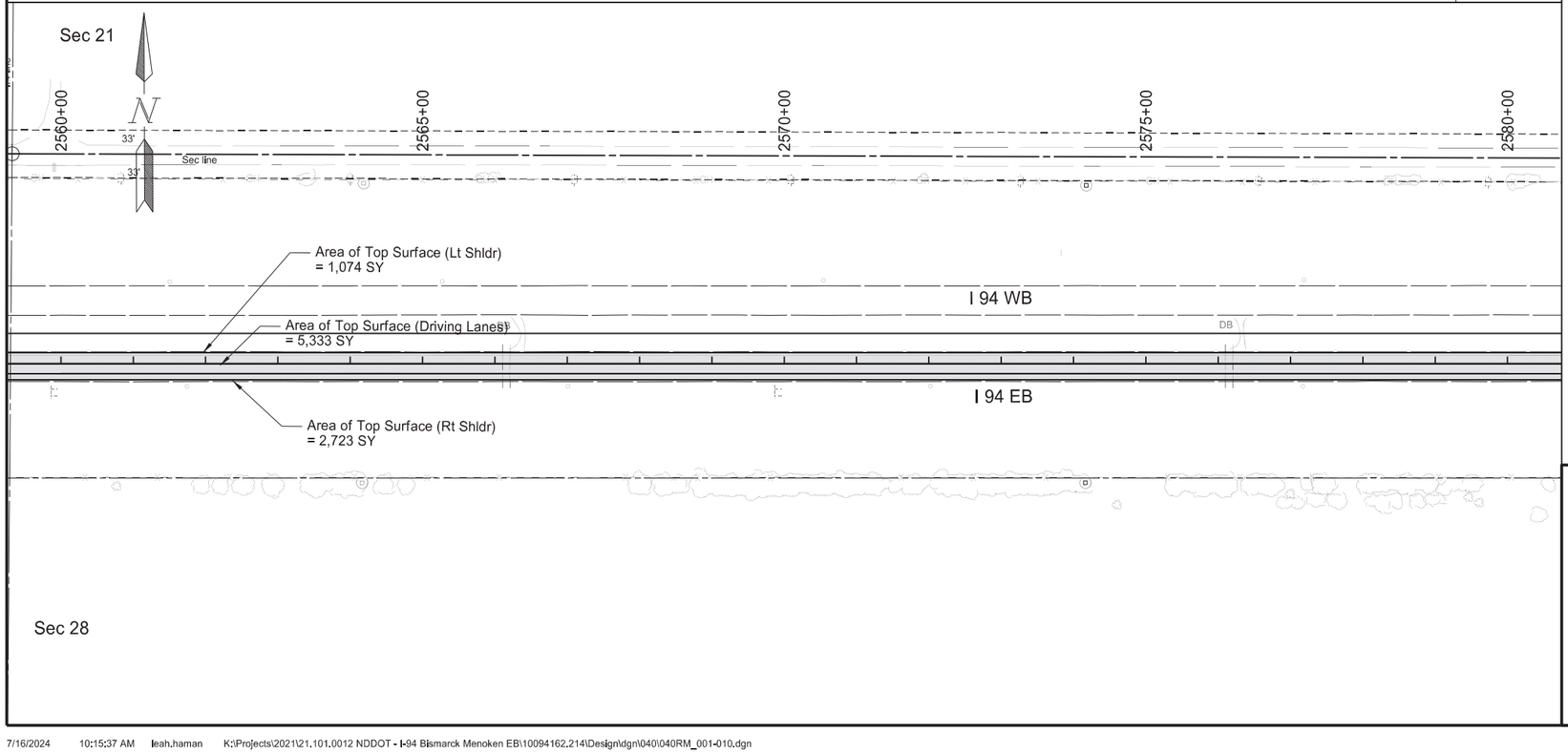
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:01:04 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	40	12





SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 2540+00 to 2580+00		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	904	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	780	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2844	TON
		Rt Shoulder & Ramp Aggregate (Avg. Depth = 0.37')	1655	TON
		Rt Shoulder & Ramp Asphalt (Avg. Depth = 0.52')	2352	TON
		Temporary Ramp Connection (9" Depth)	684	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 2540+00 to 2580+00		
		Mainline Concrete (7" Depth)	4124	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	667	TON
		Temporary Ramp Connection (3" Depth)	213	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.

LEGEND

Removal of Concrete and Bituminous Pavement

Removal of Temporary Ramp Connection

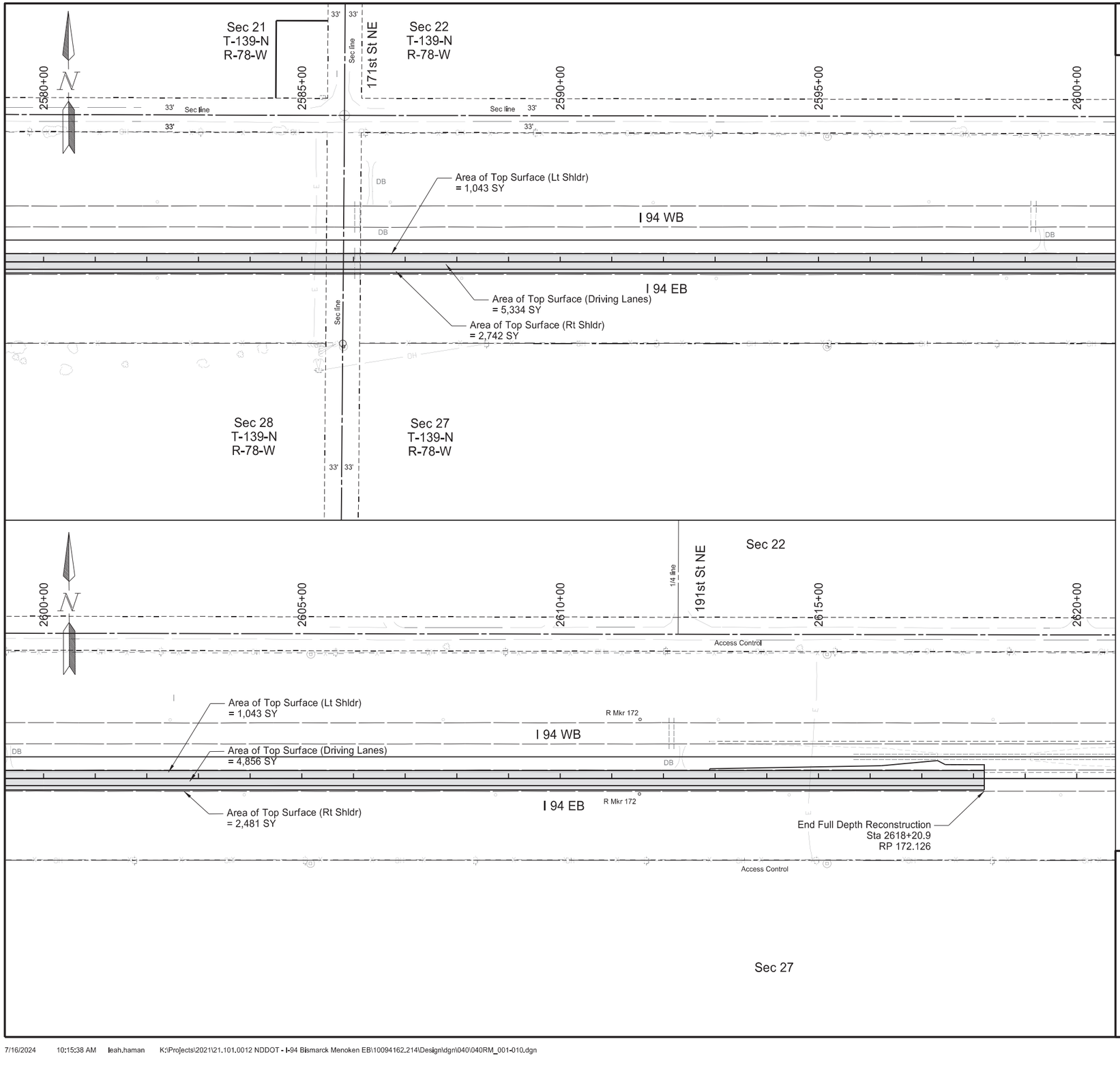
Station based on EX94EB alignment

Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:01:20 -05'00'
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	40	13

SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Sta 25800+00 to 2618+21		
		Lt Shoulder Aggregate (Avg. Depth = 0.48')	871	TON
		Lt Shoulder Asphalt (Avg. Depth = 0.56')	754	TON
		Mainline Asphalt (Avg. Depth = 0.40')	2717	TON
		Rt Shoulder Aggregate (Avg. Depth = 0.37')	1290	TON
		Rt Shoulder Asphalt (Avg. Depth = 0.52')	1811	TON
202	0136	REMOVAL OF PAVEMENT		
		Sta 25800+00 to 2618+21		
		Mainline Concrete (7" Depth)	3940	TON
		Mainline Aggr. Base (Avg. Depth = 0.10')	637	TON

Note 1: All slough material is included in the estimated quantities.
Note 2: Average asphalt and aggregate depths are based off of existing typical sections.
Note 3: See Sec 60 for pipe removal quantities.

LEGEND

Removal of Concrete and Bituminous Pavement

Station based on EX94EB alignment

Removals

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:01:34 -05'00'
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	50	1

HYDRAULIC DATA FOR IM-X-1-094(214)162 (A)									
				50-YEAR DATA				100-YEAR DATA	
STATION	EXISTING PIPE	PROPOSED PIPE SIZE	DRAINAGE AREA (ACRES)	DESIGN DISCHARGE (CFS)	DESIGN HEADWATER (FT)	DESIGN VELOCITY (FPS)	DESIGN STAGE (NAVD 88)	100-YEAR DISCHARGE (CFS)	100-YEAR STAGE (NAVD 88)
2110+07	72" RCP	72" (B)	629.9	185.2	5.71	10.78	1729.54	229.3	1730.48
2119+38	18" RCP	30"	2.8	22.4	2.46	9.93	1747.79	27.4	1748.20
2122+11	9' SPP	84"	1494.8	286.6	6.75	11.11	1735.16	355.7	1736.13
2131+27	18" RCP	30"	2.6	20.9	2.38	9.16	1774.90	25.9	1775.28
2140+17	24" RCP	Dbl 36"	24.8	76.3	3.29	7.57	1794.75	94.9	1795.05
2153+64	30" RCP	Dbl 36"	31.2	49.8	2.40	7.08	1826.00	61.8	1826.34
2177+54	24" RCP	24"	2.3	14.0	2.09	4.46	1867.39	17.4	1867.76
2215+09	36" RCP	Dbl 36" (B)	87.9	84.9	3.54	7.95	1785.67	105.2	1786.31
2227+10	18" RCP	30"	2.3	11.9	1.67	9.48	1776.36	14.6	1776.58
2236+85	84"&36" SR CSP	90"	2733.9	370.9	7.85	14.00	1766.52	459.3	1767.99
2239+60	18" RCP	18"	4.1	7.2	1.62	9.01	1769.35	8.8	1769.75
2249+11	18" RCP	24"	1.6	6.8	1.36	7.41	1770.21	8.3	1770.32
2257+11	36" RCP	Dbl 36" (B)	47.0	55.8	2.57	8.64	1770.31	69.2	1770.60
2264+67	36" RCP	Dbl 36" (B)	51.1	73.1	3.06	11.42	1771.14	90.9	1771.58
2287+65	36" RCP	Dbl 36" (B)	34.8	46.0	2.24	8.50	1763.63	57.1	1763.85
2294+36	24" RCP	Dbl 30"	10.5	27.1(C)	1.80	9.25	1756.12	36.9 (C)	1756.51
2321+13	58"x36" RCP Arch	58"x36" Arch (B)	174.2	88.3	1.85	4.75	1731.11	108.9	1731.28
2333+13	30" RCP	Dbl 30" (B)	60.4	44.0	2.78	6.66	1727.77	54.7	1728.12
2353+13	18" RCP	24"	2.2	11.3	1.80	8.36	1723.99	13.8	1724.21
2363+71	11' SPP	108"	3703.4	572.2	9.57	14.88	1694.72	707.3	1696.88
2366+47	18" RCP	30"	2.7	15.2	1.89	12.08	1708.75	18.6	1709.03
2375+18	42" RCP	42" (B)	39.2	56.3	3.69	11.94	1693.68	69.8	1694.19
2385+13	18" RCP	30"	2.0	13.0	1.75	9.50	1688.84	15.9	1689.08
2394+86	30" RCP	Dbl 30" (B)	19.5	58.2	2.67	6.52	1674.87	72.1	1675.02
2401+88	18" RCP	18"	1.7	5.1	1.27	10.89	1679.71	6.3	1679.87
2407+52	18" RCP	18"	1.3	5.6	1.43	10.42	1679.77	6.9	1679.95
2413+12	42" RCP	42" (B)	186.2	76.1(D)	4.93	9.45	1674.13	94.0 (D)	1675.41
2426+12	18" RCP	24"	2.6	16.5	2.37	9.38	1699.60	20.2	1700.00
2439+11	18" RCP	18"	1.8	7.6	1.81	9.30	1717.30	9.3	1717.49
2448+12	18" RCP	18"	2.2	7.3	1.62	9.10	1718.80	9.0	1718.94
2468+12	18" RCP	24"	1.9	7.3	1.36	6.91	1718.63	9.0	1718.85
2476+12	24" RCP	30"	18.8	31.0 (E)	1.22	4.18	1716.22	38.2 (E)	1716.31
2500+14	24" RCP	30"	23.6	26.5	1.42	4.63	1718.72	32.4	1718.77
2508+13	18" RCP	24"	2.3	7.4	1.34	9.28	1721.55	9.1	1721.78
2519+12	18" RCP	24"	2.6	6.6	1.34	9.50	1723.17	8.1	1723.29
2534+13	18" RCP	18"	3.1	6.5	1.63	8.22	1724.82	8.0	1725.00
2547+14	18" RCP	24"	1.5	6.7	1.35	7.89	1725.68	8.3	1725.80
2566+16	18" RCP	18"	2.4	7.3	1.62	8.75	1725.34	8.9	1725.61
2576+15	18" RCP	24"	2.0	6.9	1.35	8.04	1724.15	8.5	1724.25
2586+08	24" RCP	30"	16.4	15.1	2.05	5.78	1722.15	18.5	1722.33

(A) Hydraulic data provided is for smooth-walled (Manning's n=0.012) type conduits.
(B) Median Drain or Slotted RCP Section.
(C) 50-year and 100-year discharges include 1.3 CFS and 4.8 CFS respectively to account for breakout flow from Sta. 2287+65.
(D) 50-year and 100-year discharges include 25.8 CFS and 32.1 CFS respectively to account for breakout flow from Sta. 2476+12.
(E) 50-year and 100-year discharges include 19.6 CFS and 24.2 CFS respectively to account for breakout flow from Sta. 2500+14.

Hydraulic Data

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.07.16 15:34:33 -05'00'
ENGINEER
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	51	1

Alignment	Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	Geosynthetic Material - Type G (Pay Item)	(*) End Sections		Applicable Backfill
					In	Bid Item	LF		In	Type		In	SY	Begin EA	End EA	
PR94EB	2110+25	86.1' Rt	2110+27	99.8' Rt	72	Pipe Conc. Reinf. CL III (Extension)	14	Reinforced Concrete Pipe - Class III (barrel length = 14 LF)	72						Remove & Relay	Section 20 Sheet 7
	2119+38	28.7' Lt	2119+38	39.3' Rt	30	Pipe Conduit	68	Reinforced Concrete Pipe - Class III (barrel length = 66 LF)	30				45	TES (4:1)	TES (4:1)	D-714-26
	2122+21	44.2' Lt	2121+85	107.6' Rt	84	Pipe Conduit	158	Reinforced Concrete Pipe - Class IV (barrel length = 156 LF)	84				209 (A)		FES	D-714-25
	2131+27	32.9' Lt	2131+27	38.6' Rt	30	Pipe Conduit	72	Reinforced Concrete Pipe - Class III (barrel length = 70 LF) (includes 4 LF 7.5° bend)	30				48	TES (4:1)	TES (4:1)	D-714-26
	2140+18	44.8' Lt	2140+18	41.7' Rt	36	Pipe Conduit	87	Reinforced Concrete Pipe - Class III (barrel length = 84 LF)	36				74	TES (4:1)	TES (4:1)	D-714-26M
	2140+28	44.8' Lt	2140+28	41.7' Rt	36	Pipe Conduit	87	Reinforced Concrete Pipe - Class III (barrel length = 84 LF)	36				74	TES (4:1)	TES (4:1)	D-714-26M
	2153+64	60.9' Lt	2153+64	62.9' Rt	36	Pipe Conduit	124	Reinforced Concrete Pipe - Class III (barrel length = 118 LF)	36				110	FES	FES	D-714-25M
	2153+74	60.9' Lt	2153+74	62.9' Rt	36	Pipe Conduit	124	Reinforced Concrete Pipe - Class III (barrel length = 118 LF)	36				110	FES	FES	D-714-25M
	2177+54	61.9' Lt	2177+54	53.9' Lt	24	Pipe Conc. Reinf. CL III (Extension)	8	Reinforced Concrete Pipe - Class III (barrel length = 8 LF)	24					Remove & Relay		Section 20 Sheet 7
	2177+54	35.8' Rt	2177+54	43.8' Rt	24	Pipe Conc. Reinf. CL III (Extension)	8	Reinforced Concrete Pipe - Class III (barrel length = 8 LF)	24						TES (4:1)	Section 20 Sheet 7
	2214+84	41.7' Lt	2214+96	41.7' Lt	24	Remove & Relay Pipe-All Types & Sizes	12							Remove & Relay		D714-27
	2214+99	44.7' Lt	2214+99	60.2' Rt	36	Pipe Conduit	105	Reinforced Concrete Pipe - Class III (barrel length = 102 LF) (Includes 24IN Tee Section)	36				85 (A)	Precast Conc. Cap	FES	D-714-26
	2227+10	31.9' Lt	2227+10	48.0' Rt	30	Pipe Conduit	80	Reinforced Concrete Pipe - Class III (barrel length = 78 LF)	30				54	TES (4:1)	TES (4:1)	D-714-26
	2236+95	42.1' Lt	2236+70	58.8' Rt	90	Pipe Conduit	106	Reinforced Concrete Pipe - Class III (barrel length = 104 LF)	90				144 (A)		FES	D-714-25
	2239+60	33.3' Lt	2239+60	29.3' Lt	18	Pipe Conc. Reinf. CL III (Extension)	4	Reinforced Concrete Pipe - Class III (barrel length = 4 LF)	18					TES (6:1)		Section 20 Sheet 7
	2239+60	34.7' Rt	2239+60	46.7' Rt	18	Pipe Conc. Reinf. CL III (Extension)	12	Reinforced Concrete Pipe - Class III (barrel length = 12 LF)	18						Remove & Relay	Section 20 Sheet 7
	2249+11	30.0' Lt	2249+11	42.0' Rt	24	Pipe Conduit	72	Reinforced Concrete Pipe - Class III (barrel length = 70 LF)	24				44	TES (4:1)	TES (4:1)	D-714-26
	2257+21	41.9' Lt	2257+21	61.0' Rt	36	Pipe Conduit	103	Reinforced Concrete Pipe - Class III (barrel length = 100 LF)	36				83 (A)	Precast Conc. Plug	FES	D-714-26
	2264+58	56.1' Rt	2264+57	66.0' Rt	36	Pipe Conc. Reinf. CL III (Extension)	10	Reinforced Concrete Pipe - Class III (barrel length = 10 LF)	36						Remove & Relay	Section 20 Sheet 7
	2264+84	46.7' Lt	2264+66	68.9' Rt	36	Pipe Conduit	117	Reinforced Concrete Pipe - Class III (barrel length = 114 LF)	36				95 (A)	Precast Conc. Plug	FES	D-714-25
	2287+75	61.2' Lt	2287+75	67.7' Rt	36	Pipe Conduit	129	Reinforced Concrete Pipe - Class III (barrel length = 126 LF)	36				105 (A)	Precast Conc. Plug	FES	D-714-25
	2294+26	37.6' Lt	2294+26	56.4' Rt	30	Pipe Conduit	94	Reinforced Concrete Pipe - Class III (barrel length = 92 LF)	30				78	TES (4:1)	TES (4:1)	D-714-26M
	2294+36	37.6' Lt	2294+36	56.4' Rt	30	Pipe Conduit	94	Reinforced Concrete Pipe - Class III (barrel length = 92 LF)	30				78	TES (4:1)	TES (4:1)	D-714-26M
			2321+13	55.0' Rt	58 x 36	Remove & Relay End Section-All Type & Sizes									Remove & Relay	Section 20 Sheet 7
	2333+03	40.3' Lt	2333+03	57.4' Rt	30	Pipe Conduit	98	Reinforced Concrete Pipe - Class III (barrel length = 96 LF)	30				73 (A)	Precast Conc. Cap	FES	D-714-25
	2333+13	41.6' Rt	2333+13	55.6' Rt	30	Pipe Conc. Reinf. CL III (Extension)	14	Reinforced Concrete Pipe - Class III (barrel length = 14 LF)	30						Remove & Relay	Section 20 Sheet 7
	2353+13	31.1' Lt	2353+13	42.9' Rt	24	Pipe Conduit	74	Reinforced Concrete Pipe - Class III (barrel length = 72 LF)	24				45	TES (4:1)	TES (4:1)	D-714-26
	2363+57	43.0' Lt	2364+08	114.0' Rt	108	Pipe Conduit	165	Reinforced Concrete Pipe - Class IV (barrel length = 160 LF)	108				260 (A)		FES	D-714-25

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

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

(A) Geosynthetic Material - Type G to be placed to left pipe end at the joint between the end section and first barrel section.

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

Allowable Pipe List

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.07.16 15:37:19 -05'00'
ENGINEER
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	51	2

Alignment	Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	Geosynthetic Material - Type G (Pay Item)	(*) End Sections		Applicable Backfill
					In	Bid Item	LF		In	Type		In	SY	Begin EA	End EA	
PR94EB	2366+47	25.6' Lt	2366+47	50.4' Rt	30	Pipe Conduit	77	Reinforced Concrete Pipe - Class III (barrel length = 74 LF)	30				52	TES (4:1)	FES	D-714-26
	2375+18	59.1' Rt	2375+18	69.1' Rt	42	Pipe Conc. Reinf. CL III (Extension)	10	Reinforced Concrete Pipe - Class III (barrel length = 10 LF)	42						Remove & Relay	Section 20 Sheet 7
	2385+12	26.3' Lt	2385+12	41.6' Rt	30	Pipe Conduit	68	Reinforced Concrete Pipe - Class III (barrel length = 66 LF)	30				45	TES (4:1)	TES (4:1)	D-714-26
	2394+76	42.8' Lt	2394+76	66.9' Rt	30	Pipe Conduit	110	Reinforced Concrete Pipe - Class III (barrel length = 108 LF)	30				82 (A)	Precast Conc. Plug	FES	D-714-25
	2394+86	51.2' Rt	2394+86	65.2' Rt	30	Pipe Conc. Reinf. CL III (Extension)	14	Reinforced Concrete Pipe - Class III (barrel length = 14 LF)	30						Remove & Relay	Section 20 Sheet 7
	2401+88	37.7' Lt	2401+88	31.7' Lt	18	Pipe Conc. Reinf. CL III (Extension)	6	Reinforced Concrete Pipe - Class III (barrel length = 6 LF)	18					TES (6:1)		Section 20 Sheet 7
	2401+88	54.5' Rt	2401+88	60.5' Rt	18	Pipe Conc. Reinf. CL III (Extension)	6	Reinforced Concrete Pipe - Class III (barrel length = 6 LF)	18						Remove & Relay	Section 20 Sheet 7
	2407+52	31.4' Lt	2407+52	27.4' Lt	18	Pipe Conc. Reinf. CL III (Extension)	4	Reinforced Concrete Pipe - Class III (barrel length = 4 LF)	18					TES (6:1)		Section 20 Sheet 7
	2407+52	41.5' Rt	2407+52	53.5' Rt	18	Pipe Conc. Reinf. CL III (Extension)	12	Reinforced Concrete Pipe - Class III (barrel length = 12 LF)	18						Remove & Relay	Section 20 Sheet 7
	2413+12	67.8' Rt	2413+12	79.8' Rt	42	Pipe Conc. Reinf. CL III (Extension)	12	Reinforced Concrete Pipe - Class III (barrel length = 12 LF)	42						Remove & Relay	Section 20 Sheet 7
	2426+12	32.1' Lt	2426+12	45.9' Rt	24	Pipe Conduit	78	Reinforced Concrete Pipe - Class III (barrel length = 76 LF)	24				48	TES (4:1)	TES (4:1)	D-714-26
	2439+11	33.1' Lt	2439+11	27.1' Lt	18	Pipe Conc. Reinf. CL III (Extension)	6	Reinforced Concrete Pipe - Class III (barrel length = 6 LF)	18					TES (6:1)		Section 20 Sheet 7
	2439+11	41.1' Rt	2439+11	53.1' Rt	18	Pipe Conc. Reinf. CL III (Extension)	12	Reinforced Concrete Pipe - Class III (barrel length = 12 LF)	18						Remove & Relay	Section 20 Sheet 7
	2448+12	30.5' Lt	2448+12	26.5' Lt	18	Pipe Conc. Reinf. CL III (Extension)	4	Reinforced Concrete Pipe - Class III (barrel length = 4 LF) (includes 4 LF 7.5□° bend)	18					TES (6:1)		Section 20 Sheet 7
	2448+12	33.9' Rt	2448+12	47.9' Rt	18	Pipe Conc. Reinf. CL III (Extension)	14	Reinforced Concrete Pipe - Class III (barrel length = 14 LF)	18						Remove & Relay	Section 20 Sheet 7
	2468+12	34.0' Lt	2468+12	46.0' Rt	24	Pipe Conduit	80	Reinforced Concrete Pipe - Class III (barrel length = 78 LF)	24				50	TES (4:1)	TES (4:1)	D-714-26
	2476+12	40.2' Lt	2476+12	47.8' Rt	30	Pipe Conduit	88	Reinforced Concrete Pipe - Class III (barrel length = 86 LF)	30				65 (A)	TES (4:1)	TES (4:1)	D-714-26
	2500+14	39.9' Lt	2500+14	46.1' Rt	30	Pipe Conduit	86	Reinforced Concrete Pipe - Class III (barrel length = 84 LF)	30				63 (A)	TES (4:1)	TES (4:1)	D-714-26
	2508+13	29.7' Lt	2508+13	48.3' Rt	24	Pipe Conduit	78	Reinforced Concrete Pipe - Class III (barrel length = 76 LF)	24				48	TES (4:1)	TES (4:1)	D-714-26
	2519+12	33.4' Lt	2519+12	50.5' Rt	24	Pipe Conduit	84	Reinforced Concrete Pipe - Class III (barrel length = 82 LF)	24				52	TES (4:1)	TES (4:1)	D-714-26
	2534+13	33.0' Lt	2534+13	27.0' Lt	18	Pipe Conc. Reinf. CL III (Extension)	6	Reinforced Concrete Pipe - Class III (barrel length = 6 LF)	18					TES (6:1)		Section 20 Sheet 7
	2534+13	33.4' Rt	2534+13	47.4' Rt	18	Pipe Conc. Reinf. CL III (Extension)	14	Reinforced Concrete Pipe - Class III (barrel length = 14 LF)	18						TES (6:1)	Section 20 Sheet 7
	2547+14	34.5' Lt	2547+14	51.0' Rt	24	Pipe Conduit	86	Reinforced Concrete Pipe - Class III (barrel length = 82 LF)	24				54	TES (4:1)	FES	D-714-26
	2566+16	32.7' Lt	2566+16	26.7' Lt	18	Pipe Conc. Reinf. CL III (Extension)	6	Reinforced Concrete Pipe - Class III (barrel length = 6 LF)	18					TES (6:1)		Section 20 Sheet 7
	2566+16	33.5' Rt	2566+16	49.5' Rt	18	Pipe Conc. Reinf. CL III (Extension)	16	Reinforced Concrete Pipe - Class III (barrel length = 16 LF)	18						TES (6:1)	Section 20 Sheet 7
	2576+15	29.1' Lt	2576+15	42.9' Rt	24	Pipe Conduit	72	Reinforced Concrete Pipe - Class III (barrel length = 70 LF)	24				44	TES (4:1)	TES (4:1)	D-714-26
	2586+08	33.3' Lt	2586+08	40.6' Rt	30	Pipe Conduit	74	Reinforced Concrete Pipe - Class III (barrel length = 72 LF)	30				49	TES (4:1)	TES (4:1)	D-714-26

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

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

(A) Geosynthetic Material - Type G to be placed to left pipe end at the joint between the end section and first barrel section.

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

Allowable Pipe List

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.07.16 15:38:58 -05'00'
ENGINEER
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	51	3

Alignment	Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item) In	Bid Item	LF	Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	Geosynthetic Material - Type G (Pay Item)	(*) End Sections Begin	End	Applicable Backfill
					In	Bid Item	LF		In	Type		In	SY	EA	EA	
EX94EB	2520+62	40.7' Lt	2522+43	41.0' Lt	15	Pipe Conduit	181	High-Density Polyethylene	15							Specification 714.04.A
MNW	10+52	12.9' Lt	11+60	44.9' Rt	12	Pipe Conduit	122	Reinforced Concrete Pipe - Class III (barrel length = 114 LF)	12							Specification 714.04.A
								Polyvinyl Chloride (PVC)								
								High-Density Polyethylene								
								Spiral Rib Steel Pipe		P	3/4,1	0.064				
					15		118	Corrugated Steel Pipe	15	P	2	0.064				
MNE	32+14	16.7' Lt	30+94	45.3' Rt	12	Pipe Conduit	134	Reinforced Concrete Pipe - Class III (barrel length = 106 LF)	12							Specification 714.04.A
								Polyvinyl Chloride (PVC)								
								High-Density Polyethylene								
								Spiral Rib Steel Pipe		P	3/4,1	0.064				
								Corrugated Steel Pipe		P	2	0.064				
EX94EB	2543+87	38.0' Lt	2545+62	39.0' Lt	15	Pipe Conduit	175	High-Density Polyethylene	15							Specification 714.04.A

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

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

(A) Geosynthetic Material - Type G to be placed to left pipe end at the joint between the end section and first barrel section.

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

Allowable Pipe List

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

BRAD PFEIFER
REGISTERED
PROFESSIONAL
PE 5247
2024.07.16 15:39:44 -05'00'
ENGINEER
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	1

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2119+38 CL	62	LF
714	1510	PIPE CONC REINF 72IN CL III		
		Sta 2110+07 CL - Rt	14	LF
714	4110	PIPE CONDUIT 30IN		
		Sta 2119+38 CL	68	LF
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES		
		Sta 2110+07 CL - Rt	1	EA

Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:05:59 -05'00'
NORTH DAKOTA

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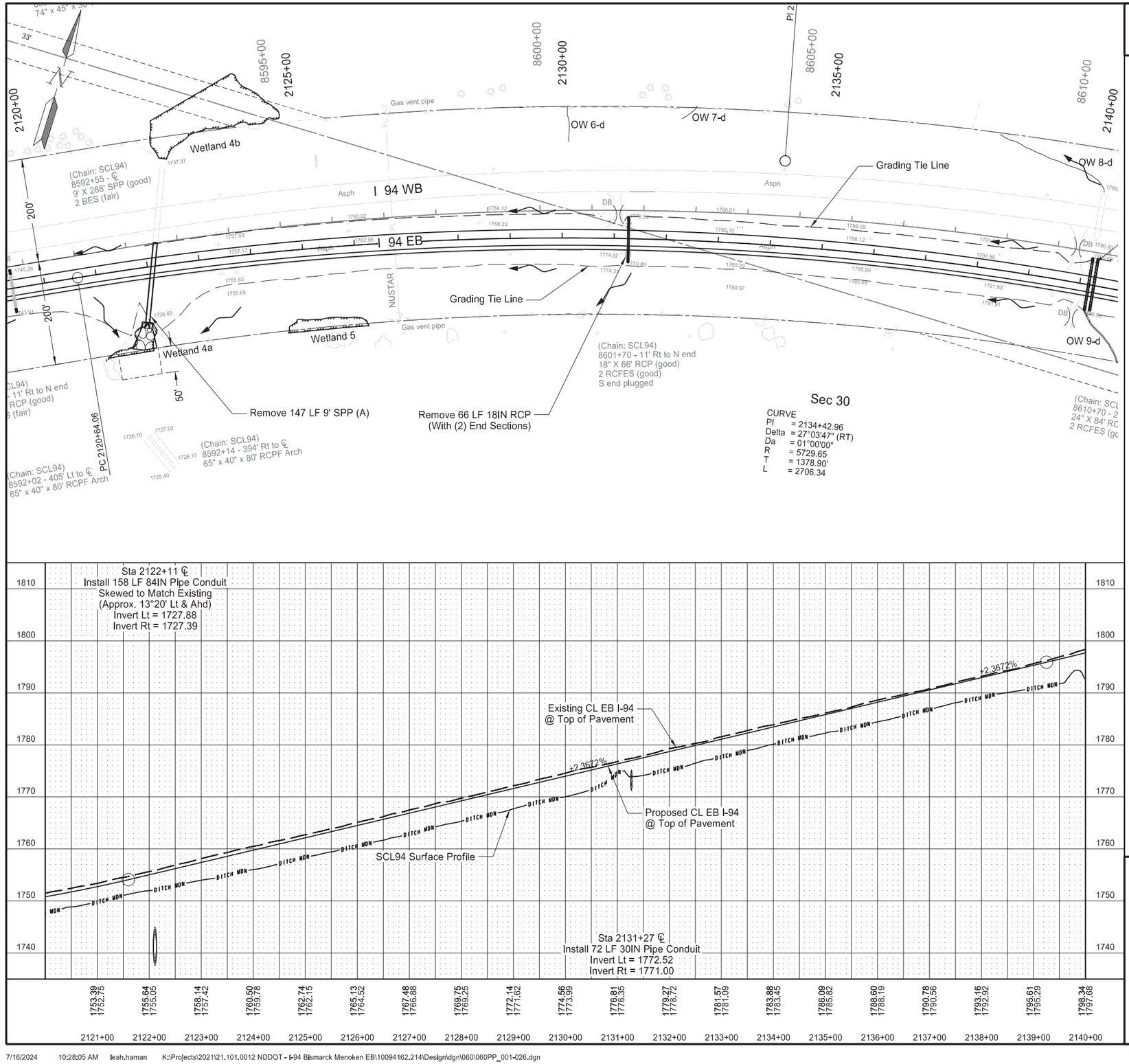
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	2

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2131+27 ℄	66	LF
714	4110	PIPE CONDUIT 30IN		
		Sta 2131+27 ℄	72	LF
714	4155	PIPE CONDUIT 84IN		
		Sta 2122+11 ℄	158	LF
900	1000	TEMPORARY STREAM DIVERSION		
		Sta 2122+11	1	EA



(A) To Be Measured and Paid for as "Removal of Structure - Site 1"
See "Removal of Structural Plate Pipe and Culvert Installation Details" Sheet

Station Based on EX94EB alignment

Plan & Profile

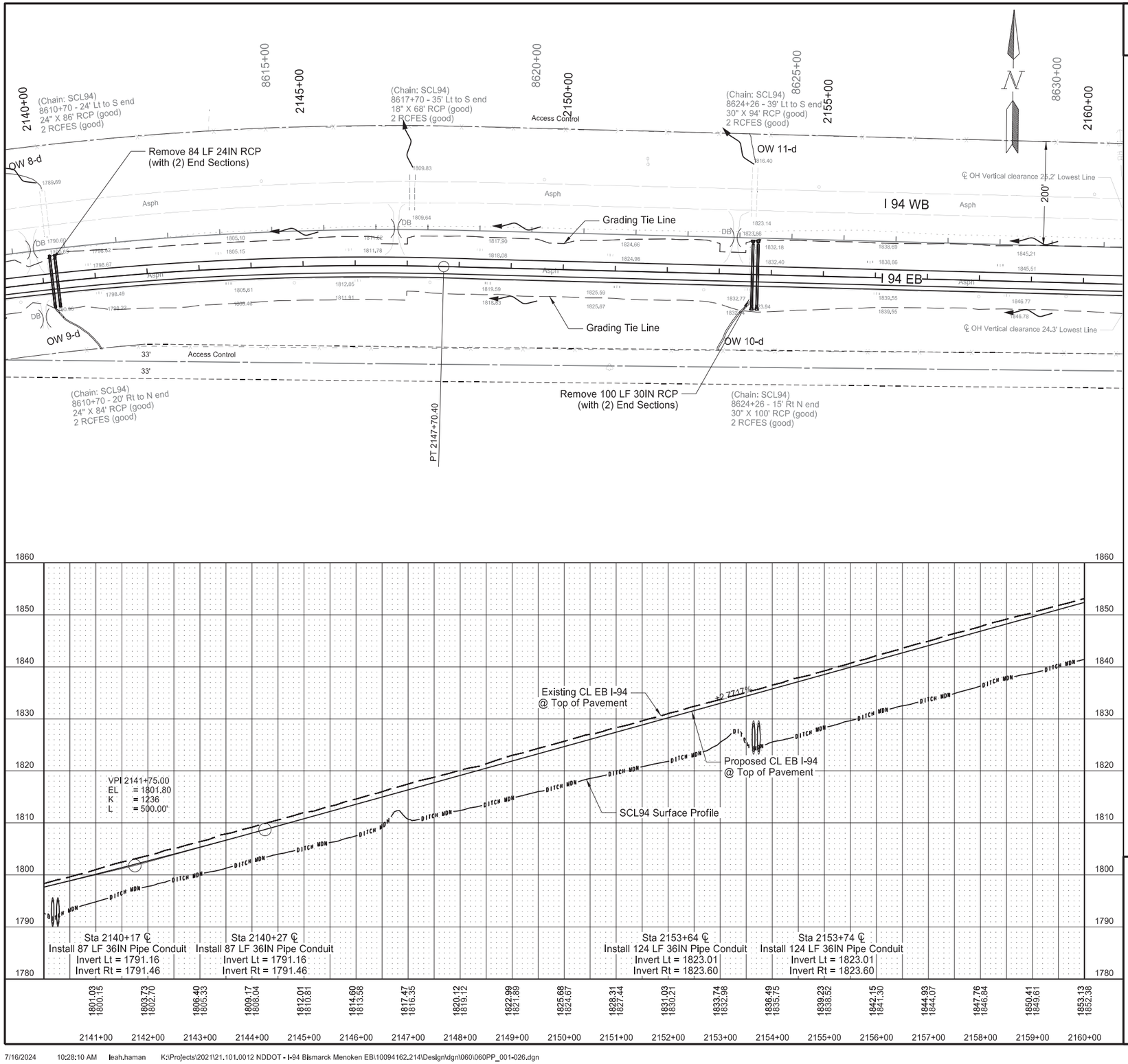
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:06:21 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	3

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2140+17 ℄	84	LF
		Sta 2153+64 ℄	100	LF
714	4115	PIPE CONDUIT 36IN		
		Sta 2140+17 ℄	87	LF
		Sta 2140+27 ℄	87	LF
		Sta 2153+64 ℄	124	LF
		Sta 2153+74 ℄	124	LF



Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:07:26 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	60	4

SPEC	CODE	BID ITEM	QTY	UNIT
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES		
		Sta 2177+54 ℄ - Rt	1	EA
714	0615	PIPE CONC REINF 24IN CL III		
		Sta 2177+54 ℄ - Lt	8	LF
		Sta 2177+54 ℄ - Rt	8	LF
714	3023	END SECT-TRAVERSABLE REINF. CONC.24IN		
		Sta 2177+54 ℄ - Rt	1	EA
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES		
		Sta 2177+54 ℄ - Lt	1	EA

Station based on EX94EB alignment

Plan & Profile

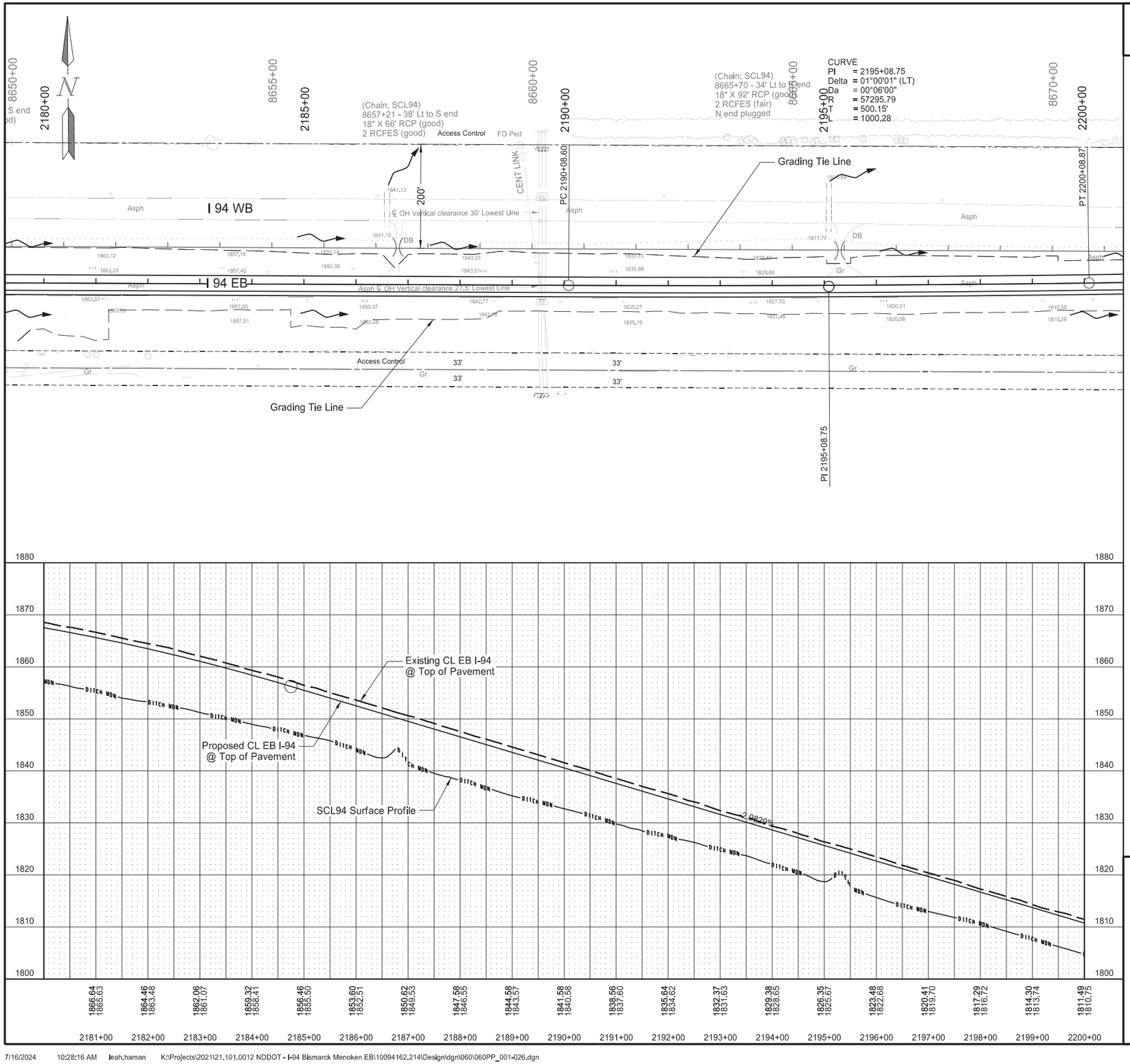
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:07:46 -05'00'
NORTH DAKOTA

7/16/2024 10:28:15 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_001-026.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	5



Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:08:05 -05'00'
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	6

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES Sta 2214+90 - 42.1' Lt to Sta 2215+06 - 42.2' Lt	16	LF
714	4105	PIPE CONDUIT 24IN Sta 2214+96 - 41.7' Lt to 2214+97 - 41.7' Lt	1	LF (A)
714	4115	PIPE CONDUIT 36IN Sta 2214+99 ℄	105	LF
714	9630	RELAY END SECTION-ALL TYPES & SIZES Sta 2214+84 - 41.7' Lt	1	EA
714	9659	REMOVE & RELAY PIPE-ALL TYPES & SIZES Sta 2214+84 - 41.7' Lt to 2214+96 - 41.7' Lt	12	LF

(A) 24IN Portion of Tee Section at Sta 2214+99

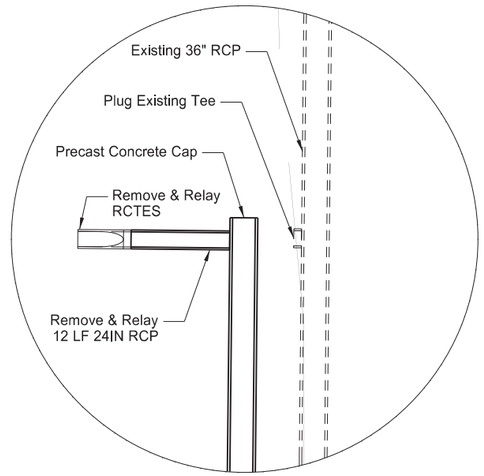


Figure A

Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:09:00 -05'00
NORTH DAKOTA

7/16/2024 10:28:22 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_001-026.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	7

SPEC	CODE	BID ITEM	QTY	UNIT
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES		
		Sta 2239+60 ℄ Lt	1	EA
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2227+10 ℄	66	LF
714	0310	PIPE CONC REINF 18IN CL III		
		Sta 2239+60 ℄ - Lt	4	LF
		Sta 2239+60 ℄ - Rt	12	LF
714	3013	END SECT-TRAVERSABLE REINF. CONC.18IN		
		Sta 2239+60 ℄ - Rt	1	EA
714	4110	PIPE CONDUIT 30IN		
		Sta 2227+10 ℄	80	LF
714	4160	PIPE CONDUIT 90IN		
		Sta 2236+85 ℄	106	LF
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES		
		Sta 2239+60 ℄ - Rt	1	EA
900	1000	TEMPORARY STREAM DIVERSION		
		Sta 2236+85	1	EA

(A) To Be Measured and Paid for as "Removal of Structure - Site 2."
See "Removal of Structural Plate Pipe and Culvert Installation Details" Sheet
Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

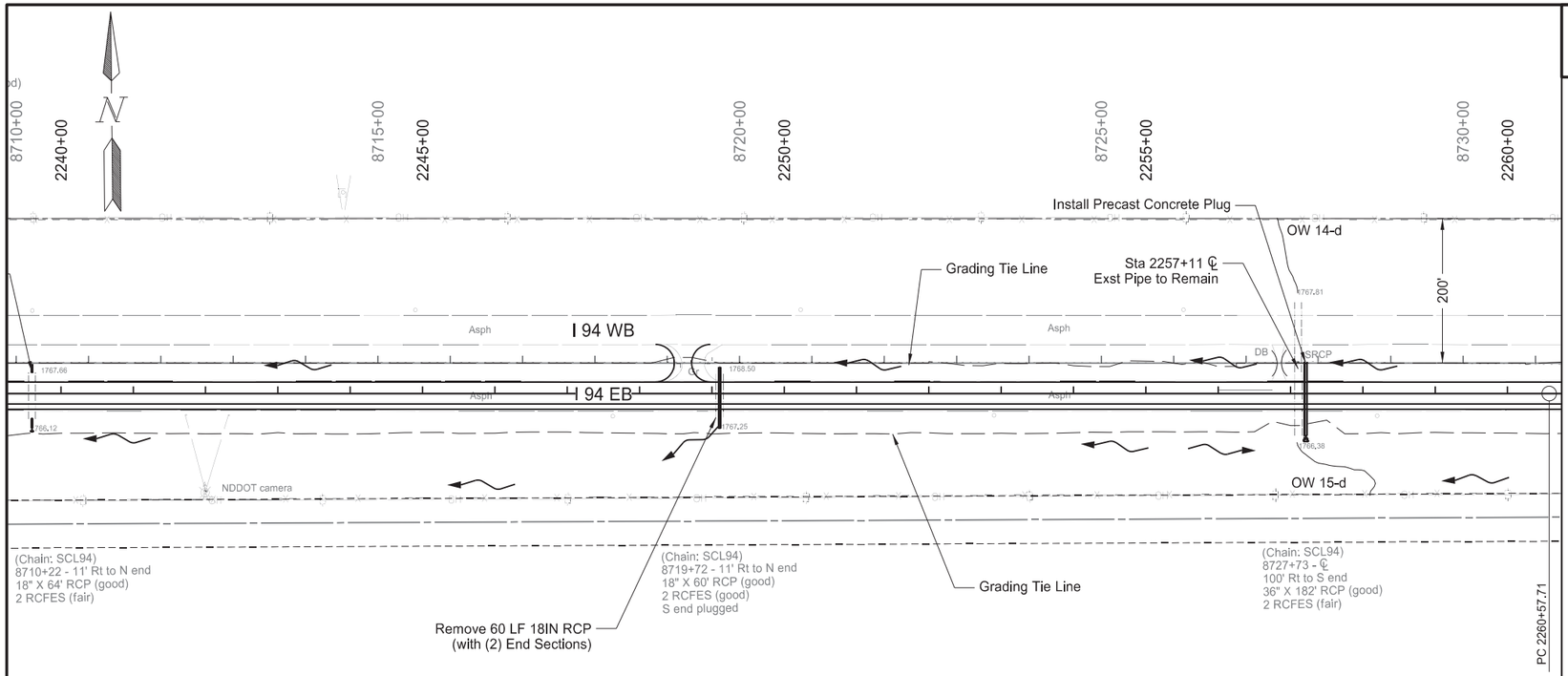
Bismarck to E of Menoken Interchange - EB

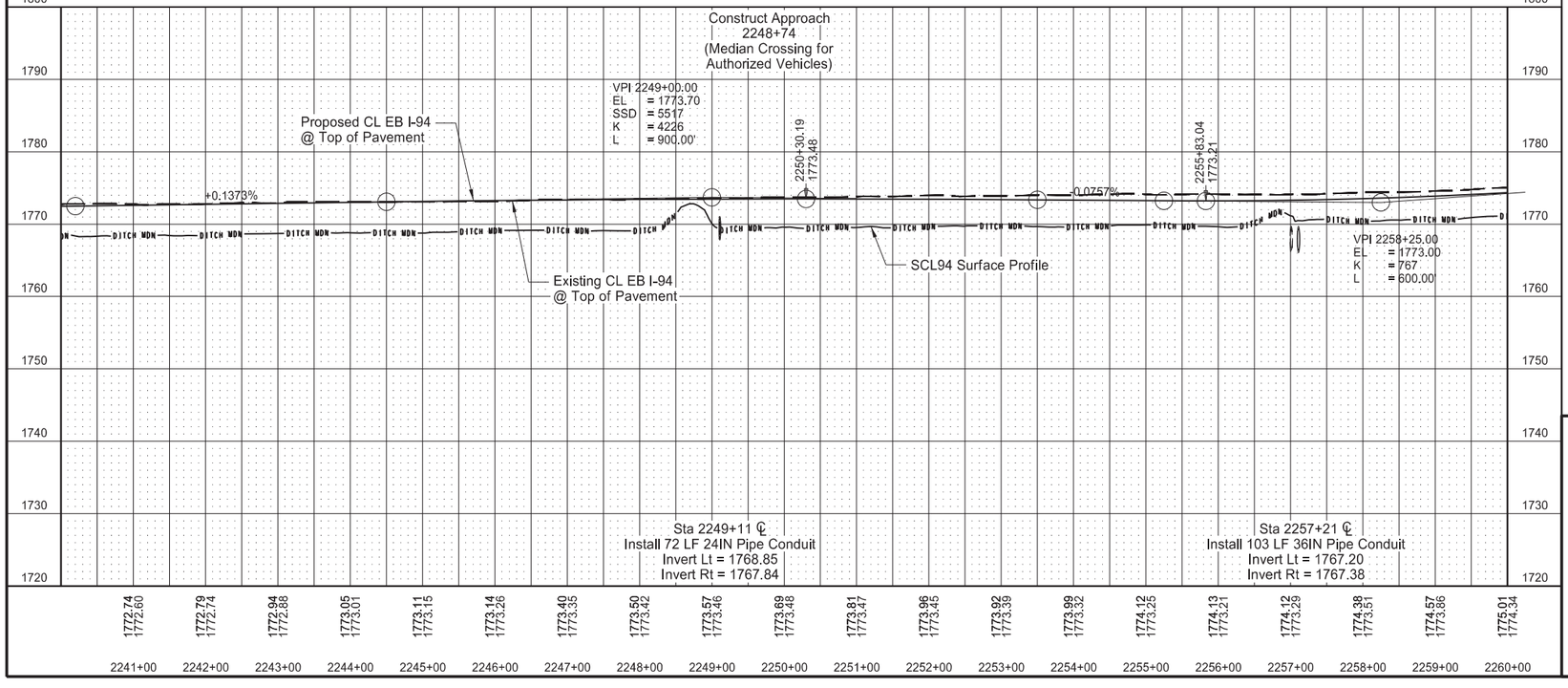
REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:09:21 -05'00'
NORTH DAKOTA

7/16/2024 10:28:27 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_001-026.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	8

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2249+11℄	60	LF
714	4105	PIPE CONDUIT 24IN		
		Sta 2249+11℄	72	LF
714	4115	PIPE CONDUIT 36IN		
		Sta 2257+21℄	103	LF





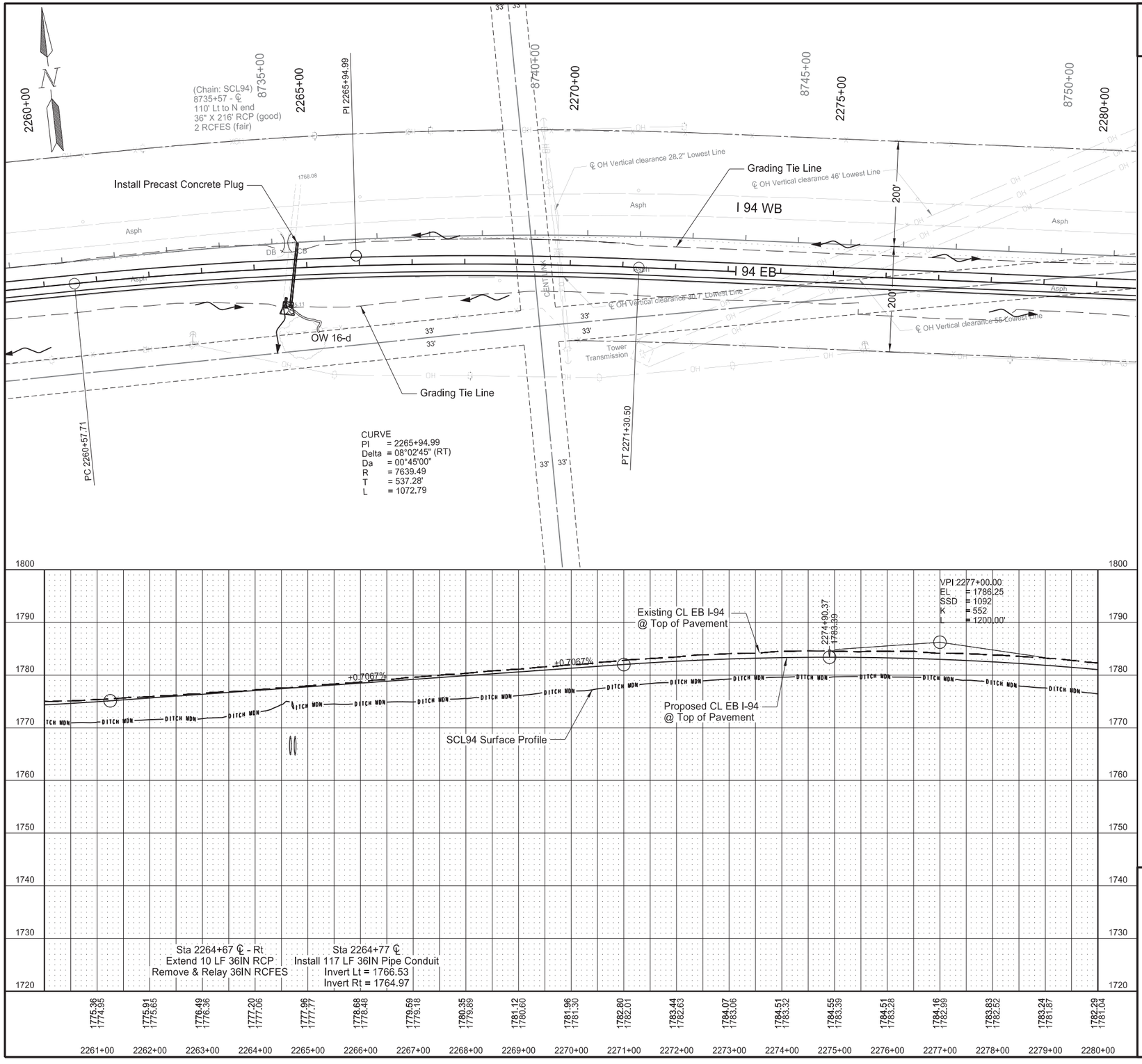
Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:09:57 -05'00'
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	60	9

SPEC	CODE	BID ITEM	QTY	UNIT
714	0905	PIPE CONC REINF 36IN CL III		
		Sta 2264+67 ℄ - Rt	10	LF
714	4115	PIPE CONDUIT 36IN		
		Sta 2264+77 ℄	117	LF
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES		
		Sta 2264+67 ℄ - Rt	1	EA

Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

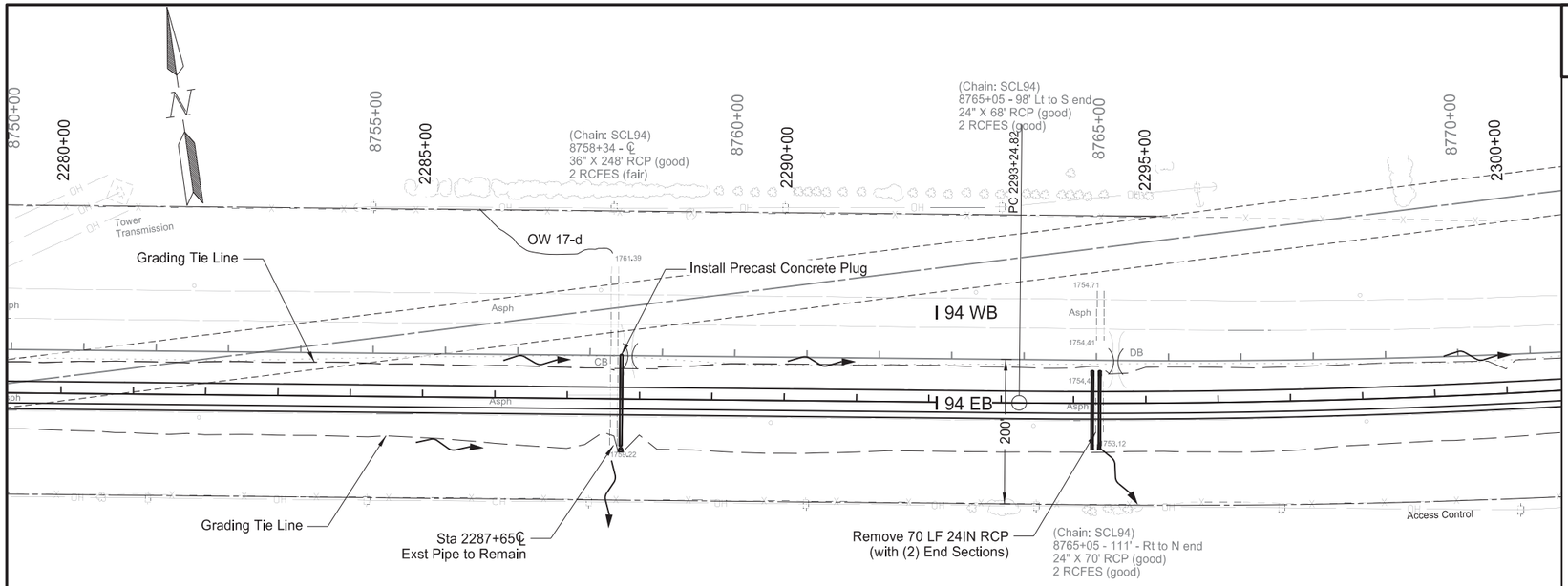
Bismarck to E of Menoken Interchange - EB

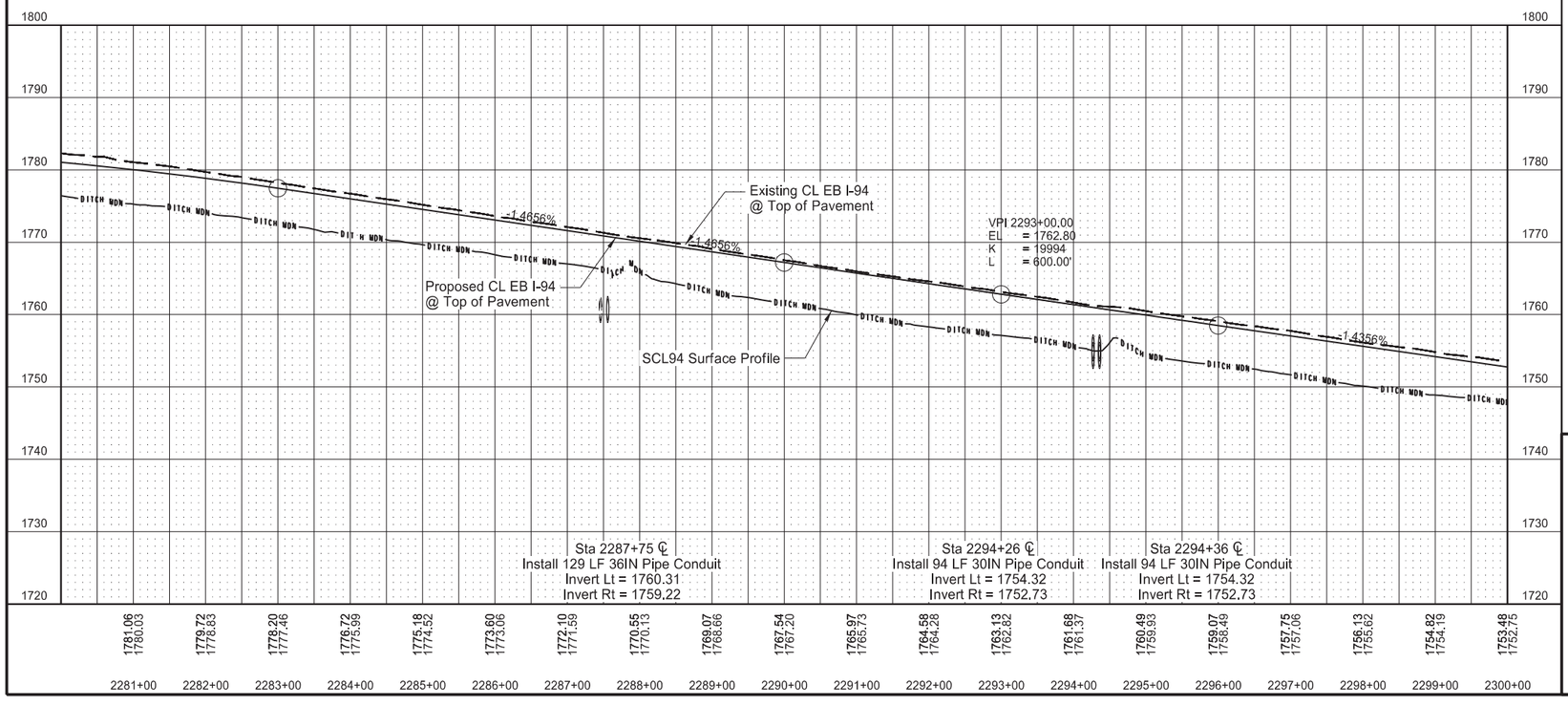
REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:10:19 -05'00'
NORTH DAKOTA

7/16/2024 10:28:37 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_001-026.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	10

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2294+36 ℄	70	LF
714	4110	PIPE CONDUIT 30IN		
		Sta 2294+26 ℄	94	LF
		Sta 2294+36 ℄	94	LF
714	4115	PIPE CONDUIT 36IN		
		Sta 2287+75 ℄	129	LF





Station based on EX94EB alignment

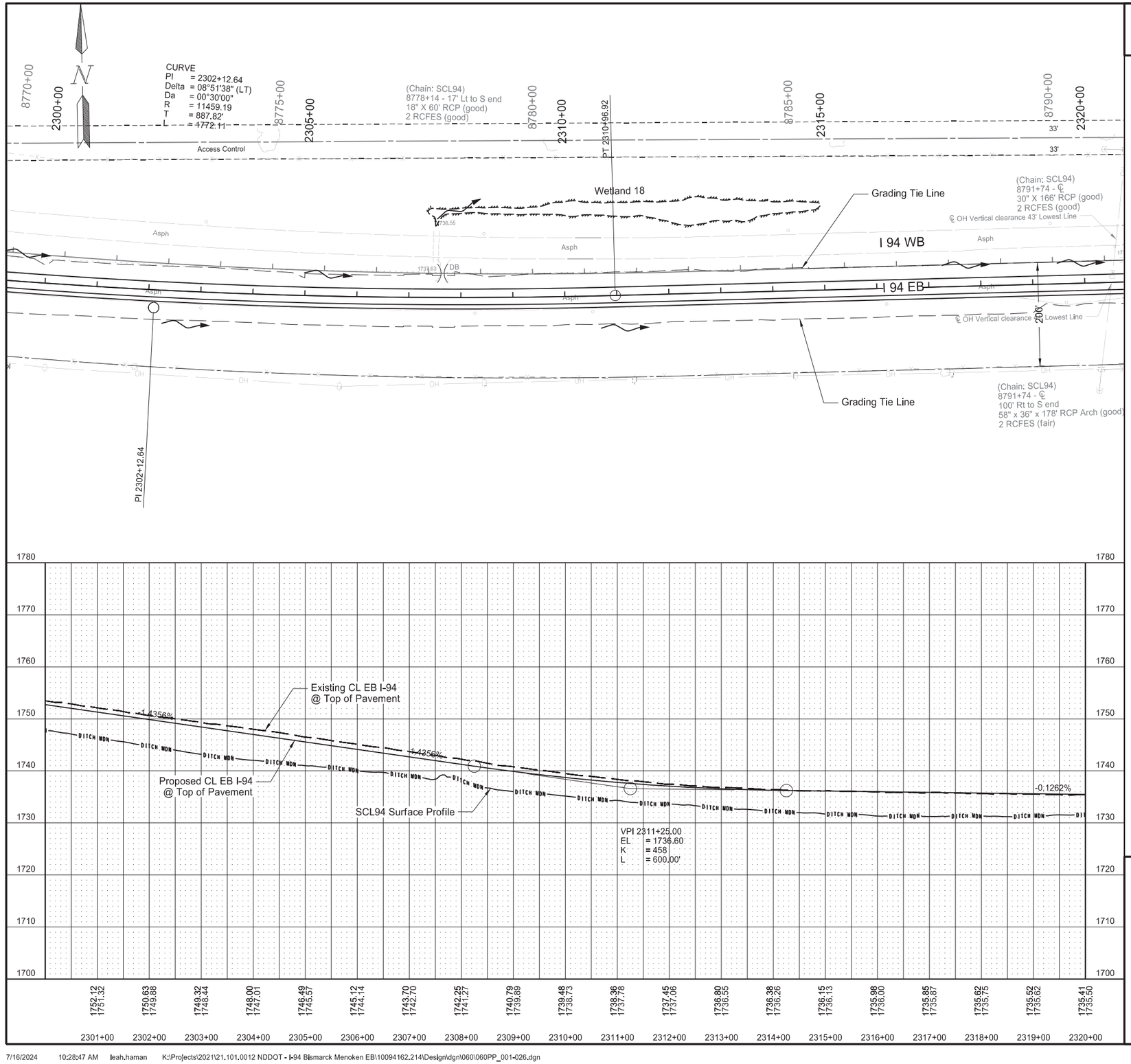
Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:10:43 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	11



Station based on EX94EB alignment

Plan & Profile

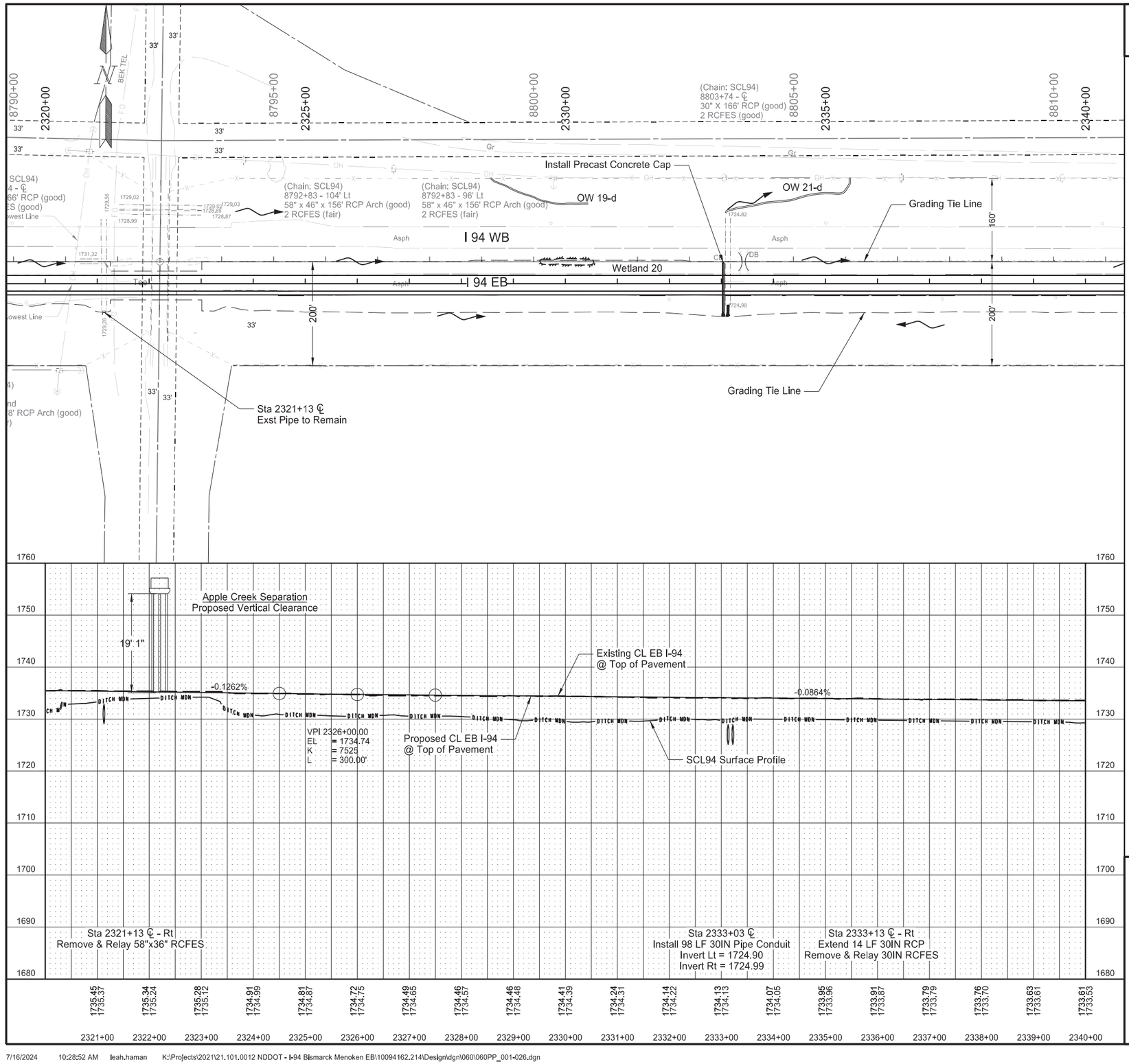
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:11:08 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	12

SPEC	CODE	BID ITEM	QTY	UNIT
714	0820	PIPE CONC REINF 30IN CL III		
		Sta 2333+13 ℄ - Rt	14	LF
714	4110	PIPE CONDUIT 30IN		
		Sta 2333+03 ℄	98	LF
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES		
		Sta 2321+13 ℄ - Rt	1	EA
		Sta 2333+13 ℄ - Rt	1	EA



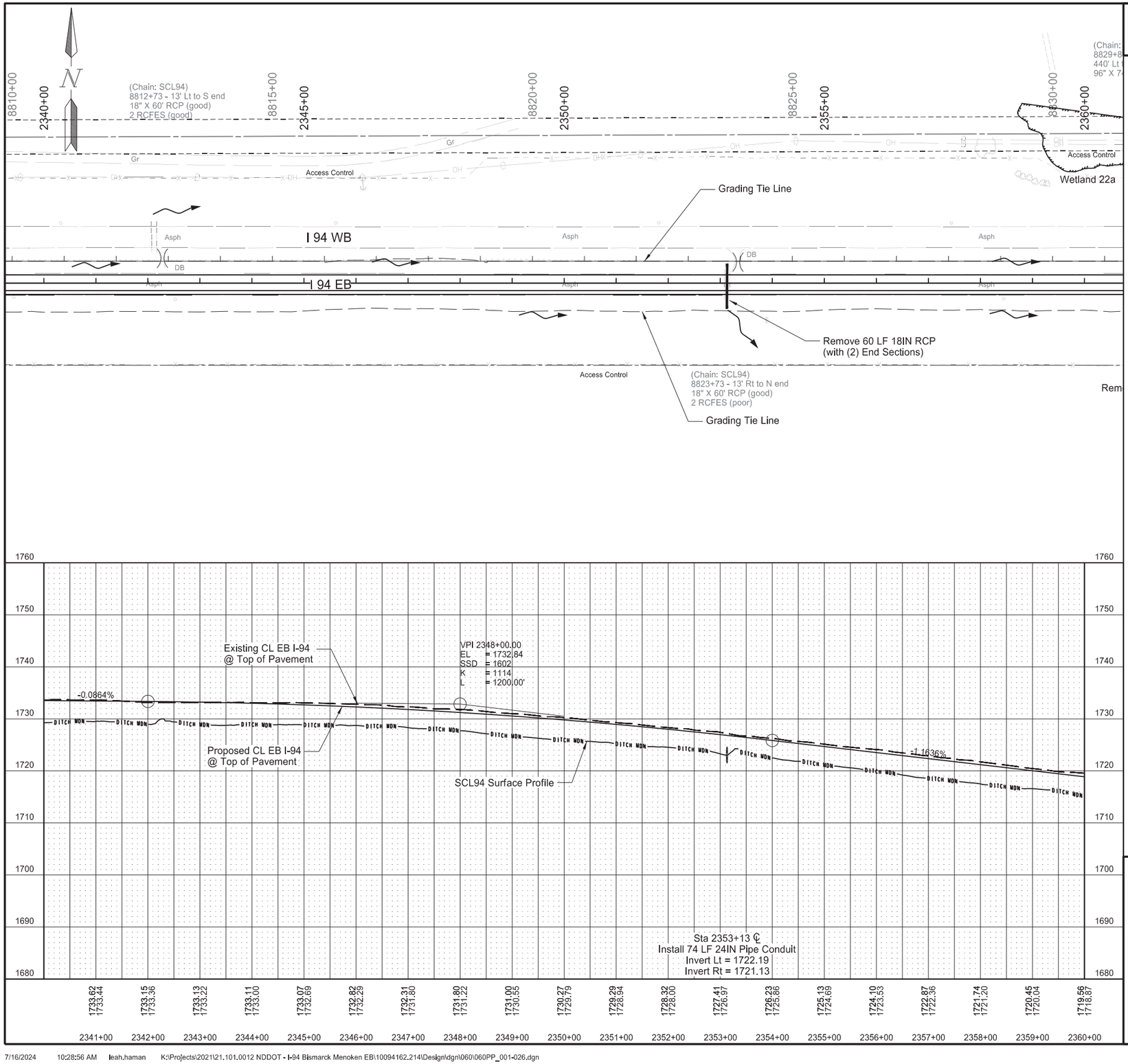
Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:11:31 -05'00'
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	60	13

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2353+13 ℄	60	LF
714	4105	PIPE CONDUIT 24IN		
		Sta 2353+13 ℄	74	LF

Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:11:54 -05'00'
NORTH DAKOTA

7/16/2024 10:28:56 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_001-026.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	14

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2366+47 ℄	66	LF
714	1005	PIPE CONC REINF 42IN CL III		
		Sta 2375+18 ℄ - Rt	10	LF
714	4110	PIPE CONDUIT 30IN		
		Sta 2366+47 ℄	77	LF
714	4172	PIPE CONDUIT 108IN		
		Sta 2363+71 ℄	165	LF
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES		
		Sta 2375+18 ℄ - Rt	1	EA
900	1000	TEMPORARY STREAM DIVERSION		
		Sta 2363+71	1	EA

(A) To Be Measured and Paid for as "Removal of Structure - Site 3"
See "Removal of Structural Plate Pipe and Culvert Installation Details" Sheet
Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:12:16 -05'00'
NORTH DAKOTA

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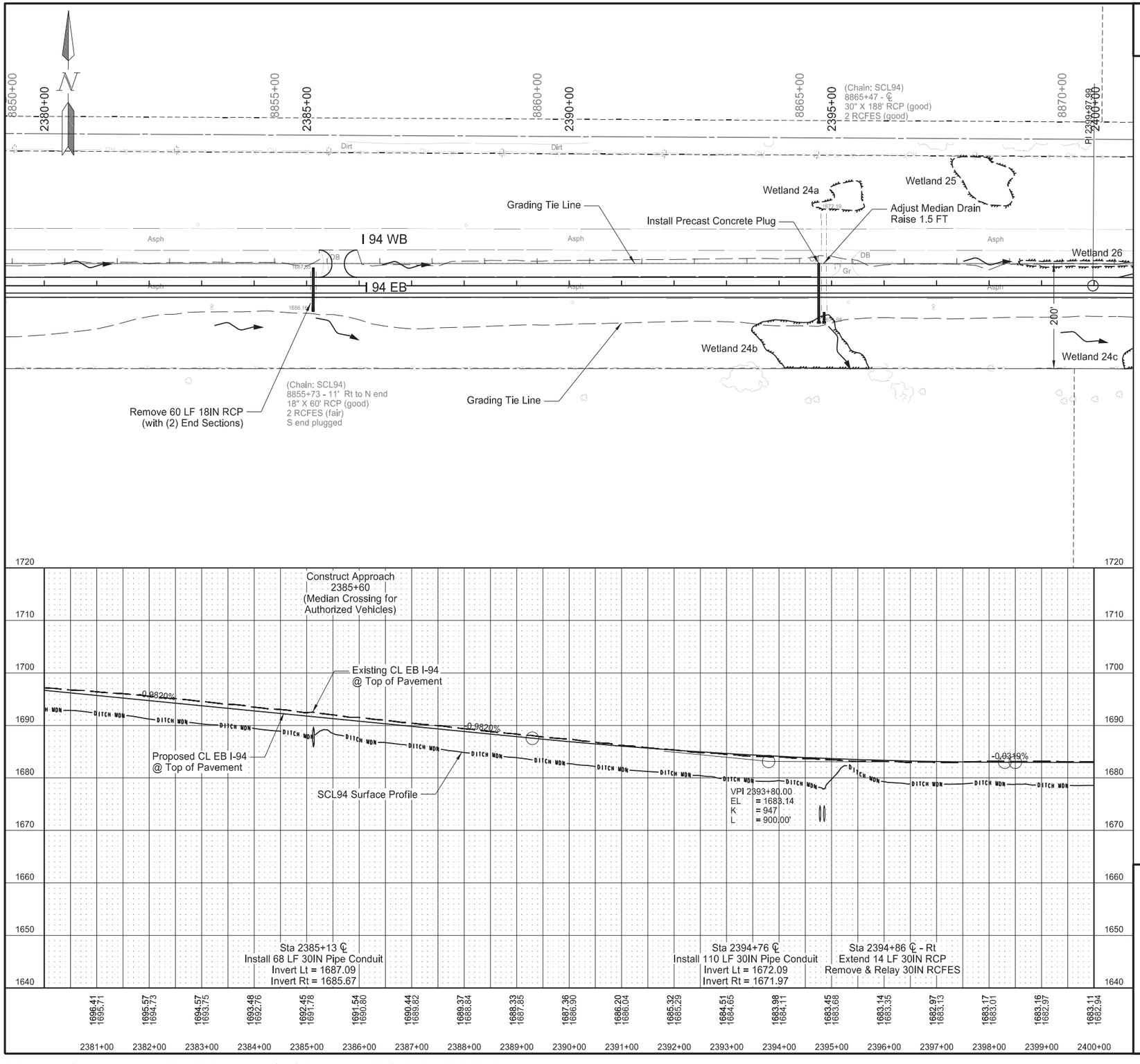


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	60	15

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2385+13 ℄	60	LF
714	0820	PIPE CONC REINF 30IN CL III		
		Sta 2394+86 ℄ - Rt	14	LF
714	4110	PIPE CONDUIT 30IN		
		Sta 2385+13 ℄	68	LF
		Sta 2394+76 ℄	110	LF
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES		
		Sta 2394+86 ℄ - Rt	1	EA
722	6160	ADJUST INLET		
		Sta 2394+86 ℄ - Lt	1	EA

Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:16:05 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	16

SPEC	CODE	BID ITEM	QTY	UNIT
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES		
		Sta 2401+88 ℄ - Lt	1	EA
		Sta 2407+52 ℄ - Lt	1	EA
714	0310	PIPE CONC REINF 18IN CL III		
		Sta 2401+88 ℄ - Lt	6	LF
		Sta 2401+88 ℄ - Rt	6	LF
		Sta 2407+52 ℄ - Lt	4	LF
		Sta 2407+52 ℄ - Rt	12	LF
714	1005	PIPE CONC REINF 42IN CL III		
		Sta 2413+12 ℄ - Rt	12	LF
714	3013	END SECT-TRAVERSABLE REINF. CONC.18IN		
		Sta 2401+88 ℄ - Lt	1	EA
		Sta 2407+52 ℄ - Lt	1	EA
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES		
		Sta 2401+88 ℄ - Rt	1	EA
		Sta 2407+52 ℄ - Rt	1	EA
		Sta 2413+12 ℄ - Rt	1	EA
722	6160	ADJUST INLET		
		Sta 2413+12 ℄ - Lt	1	EA

Station based on EX94EB alignment

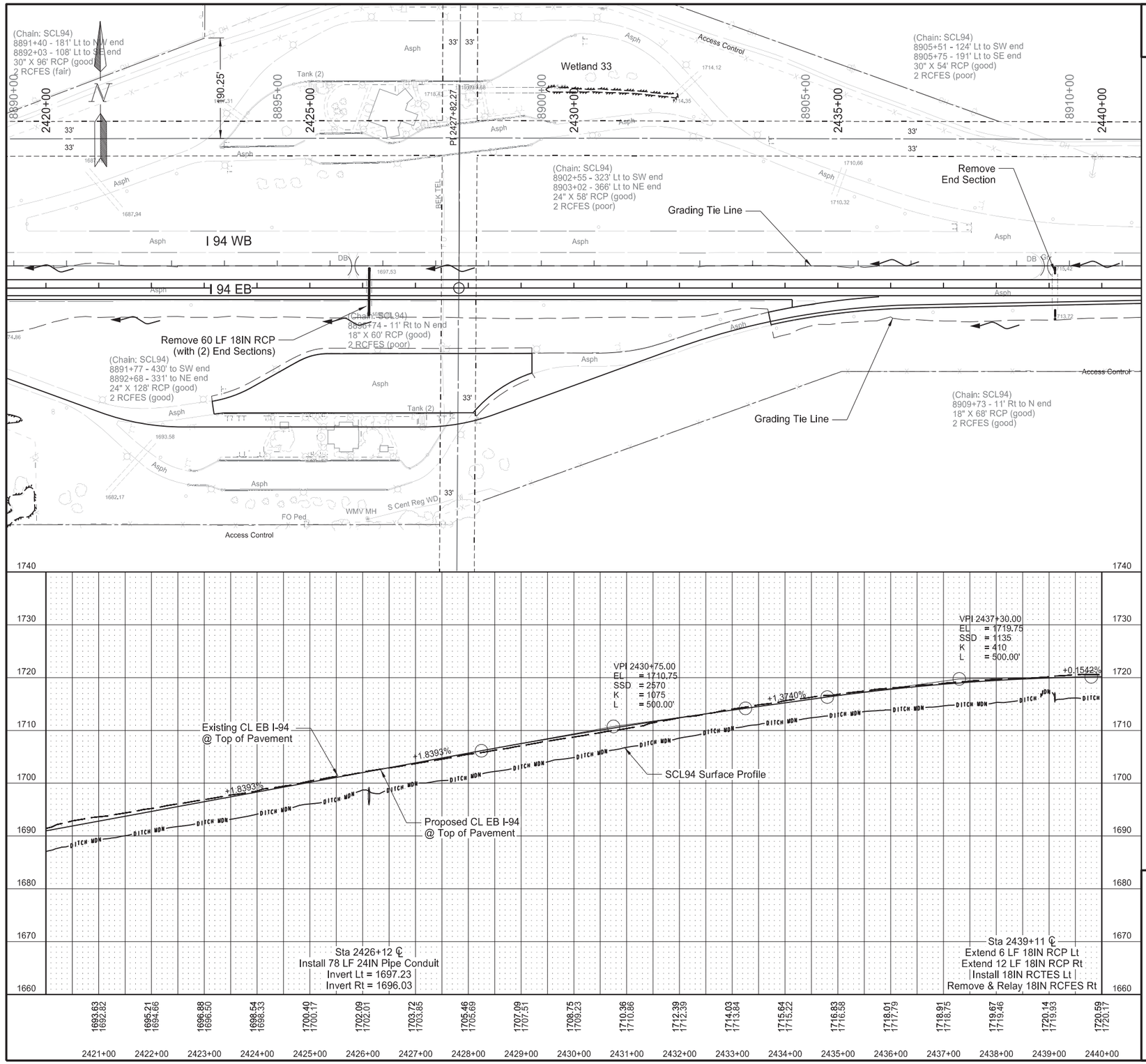
Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:16:35 -05'00'
NORTH DAKOTA

7/16/2024 10:29:11 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_001-026.dgn



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	60	17

SPEC	CODE	BID ITEM	QTY	UNIT
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES		
		Sta 2439+11 ℄ - Lt	1	EA
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2426+12 ℄	60	LF
714	0310	PIPE CONC REINF 18IN CL III		
		Sta 2439+11 ℄ - Lt	6	LF
		Sta 2439+11 ℄ - Rt	12	LF
714	3013	END SECT-TRAVERSABLE REINF. CONC.18IN		
		Sta 2439+11 ℄ - Lt	1	EA
714	4105	PIPE CONDUIT 24IN		
		Sta 2426+12 ℄	78	LF
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES		
		Sta 2439+11 ℄ - Rt	1	EA

Station based on EX94EB alignment

Plan & Profile

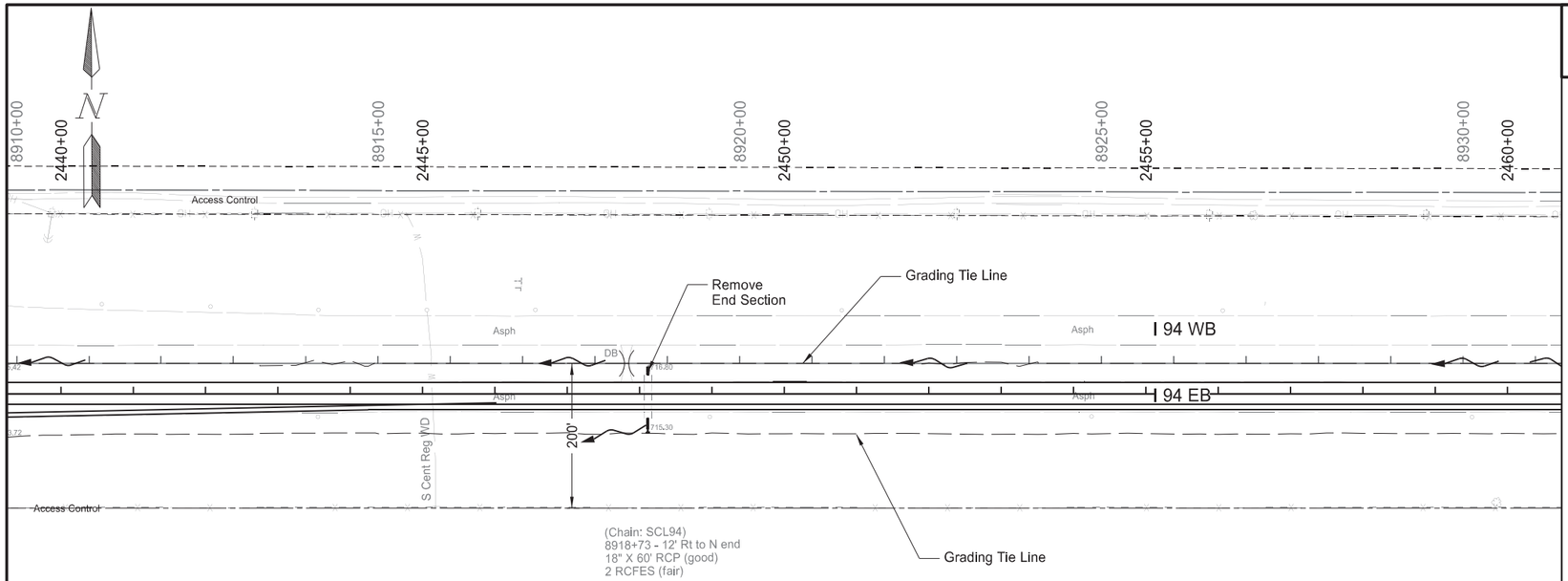
I-94 Reconstruction

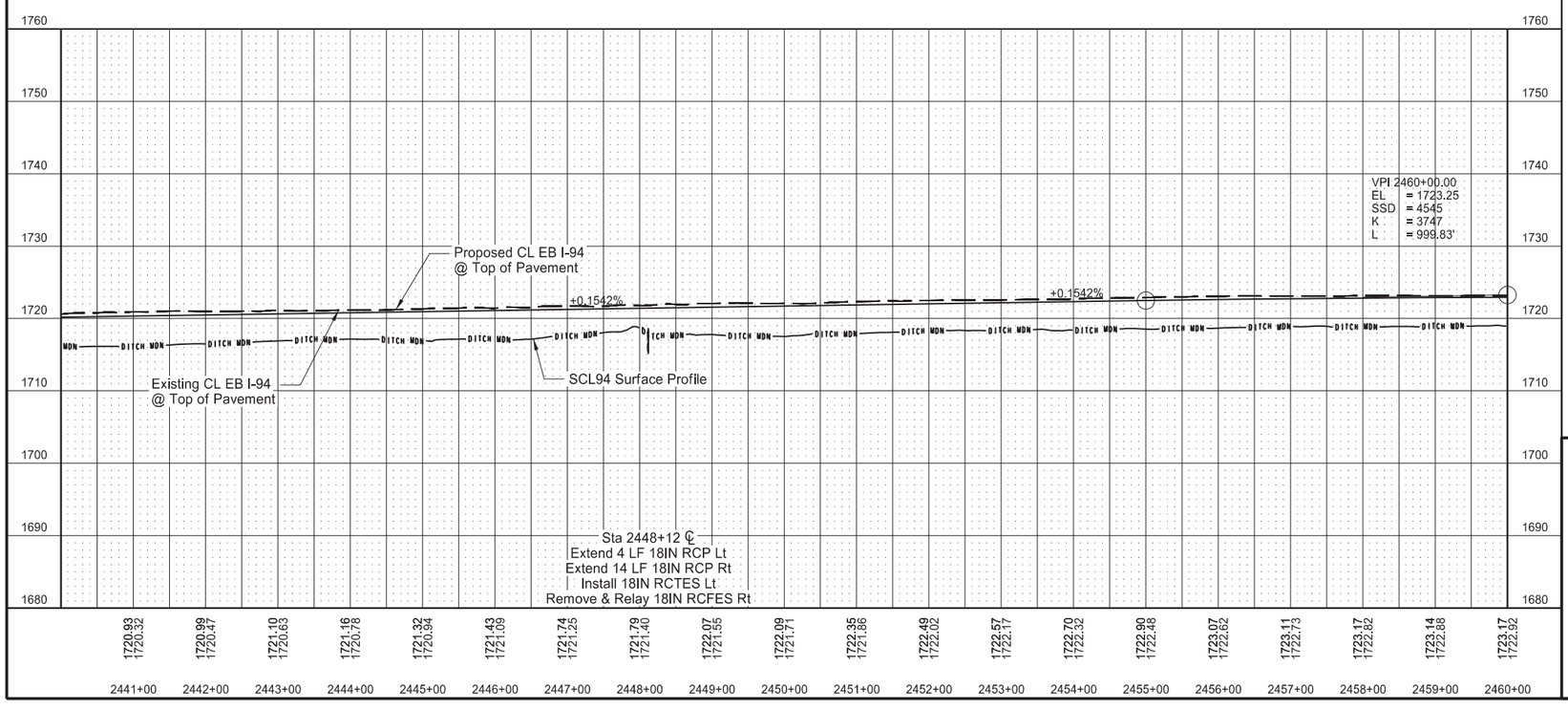
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:17:14 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	18

SPEC	CODE	BID ITEM	QTY	UNIT
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES		
		Sta 2448+12 ℄ - Lt	1	EA
714	0310	PIPE CONC REINF 18IN CL III		
		Sta 2448+12 ℄ - Lt	4	LF
		Sta 2448+12 ℄ - Rt	14	LF
714	3013	END SECT-TRAVERSABLE REINF. CONC.18IN		
		Sta 2448+12 ℄ - Lt	1	EA
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES		
		Sta 2448+12 ℄ - Rt	1	EA





Station based on EX94EB alignment

Plan & Profile

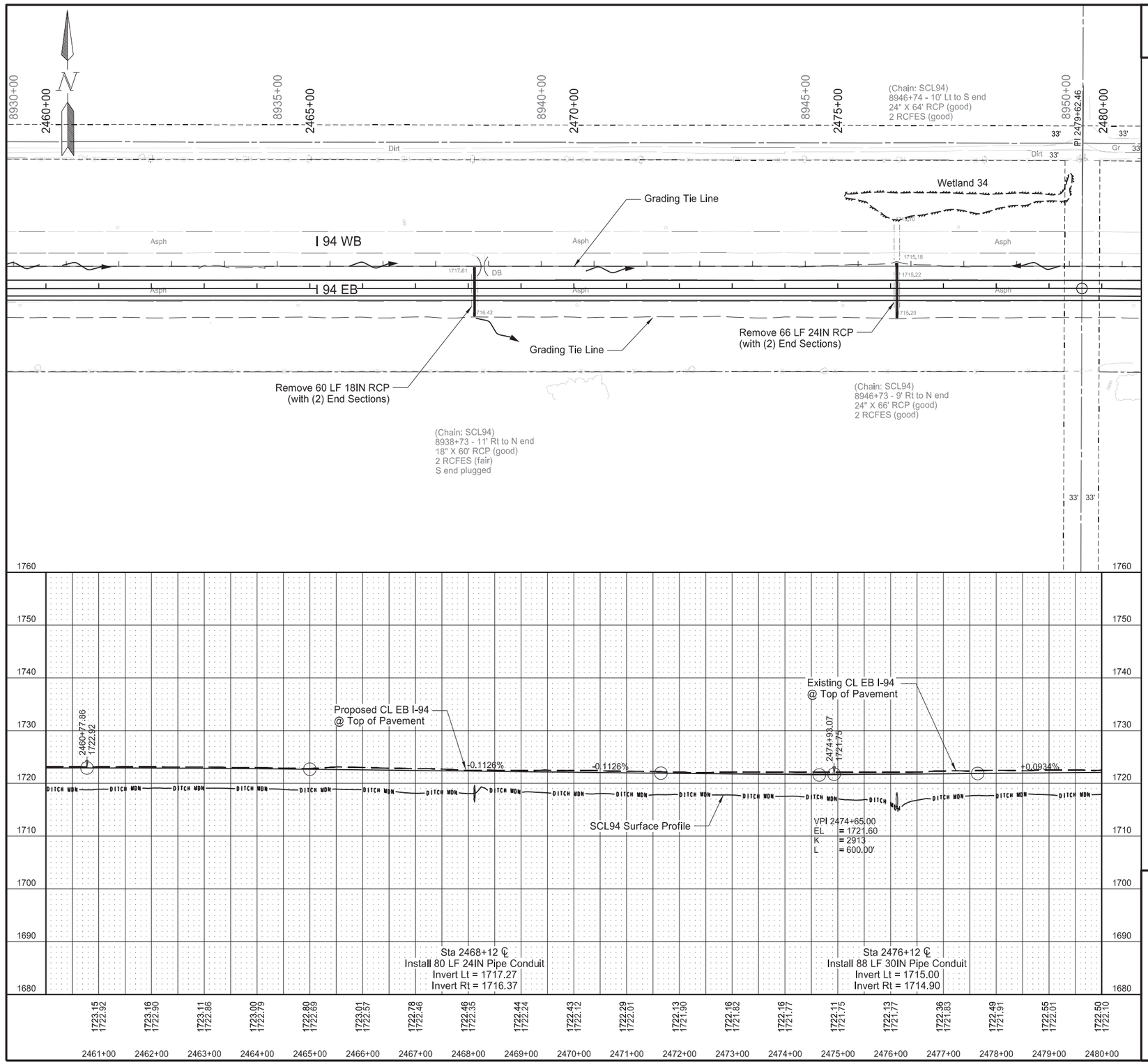
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:17:50 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	19

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2468+12 ℄	60	LF
		Sta 2476+12 ℄	66	LF
714	4105	PIPE CONDUIT 24IN		
		Sta 2468+12 ℄	80	LF
714	4110	PIPE CONDUIT 30IN		
		Sta 2476+12 ℄	88	LF



Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:18:24 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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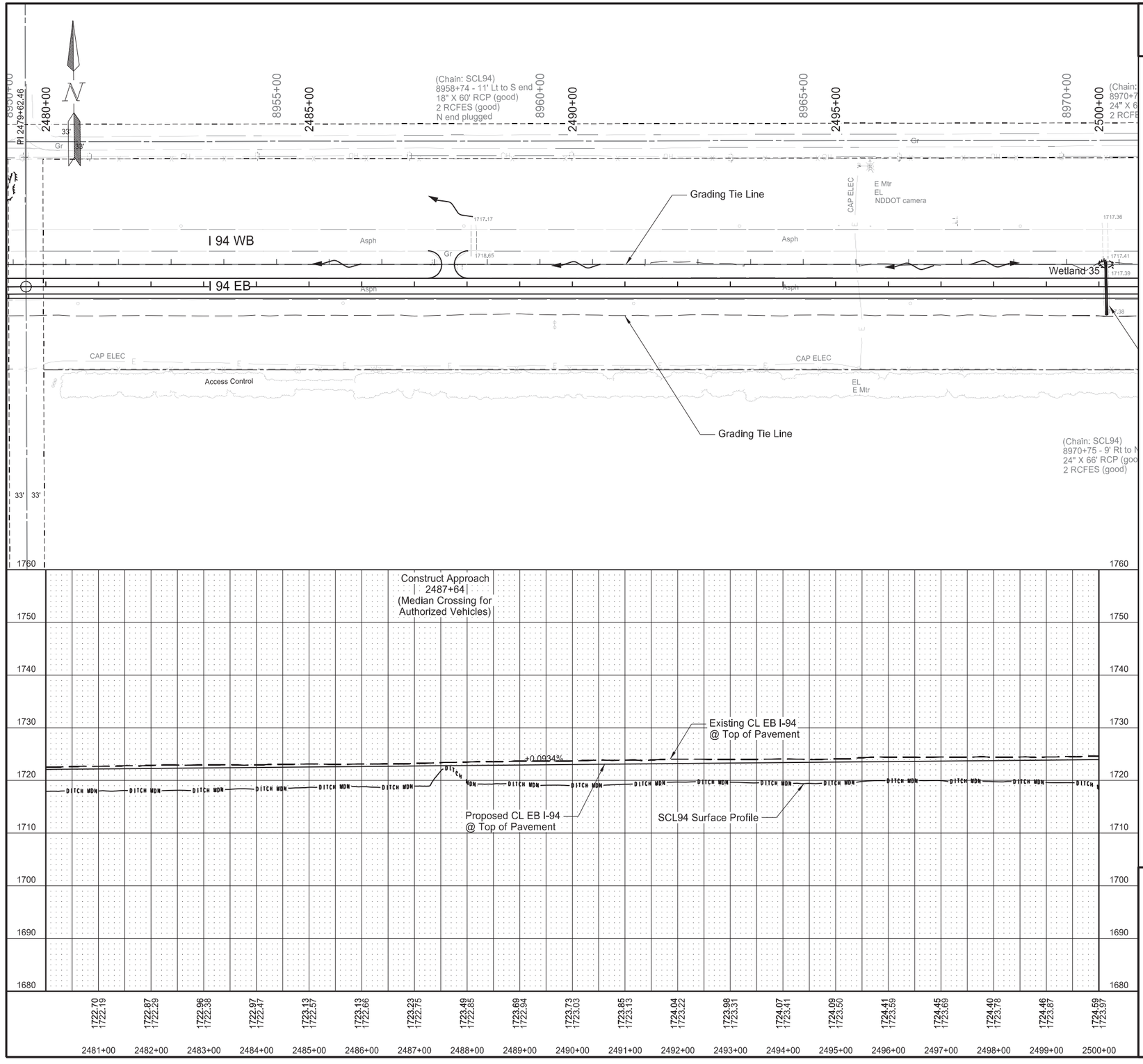


Station based on EX94EB alignment

Plan & Profile

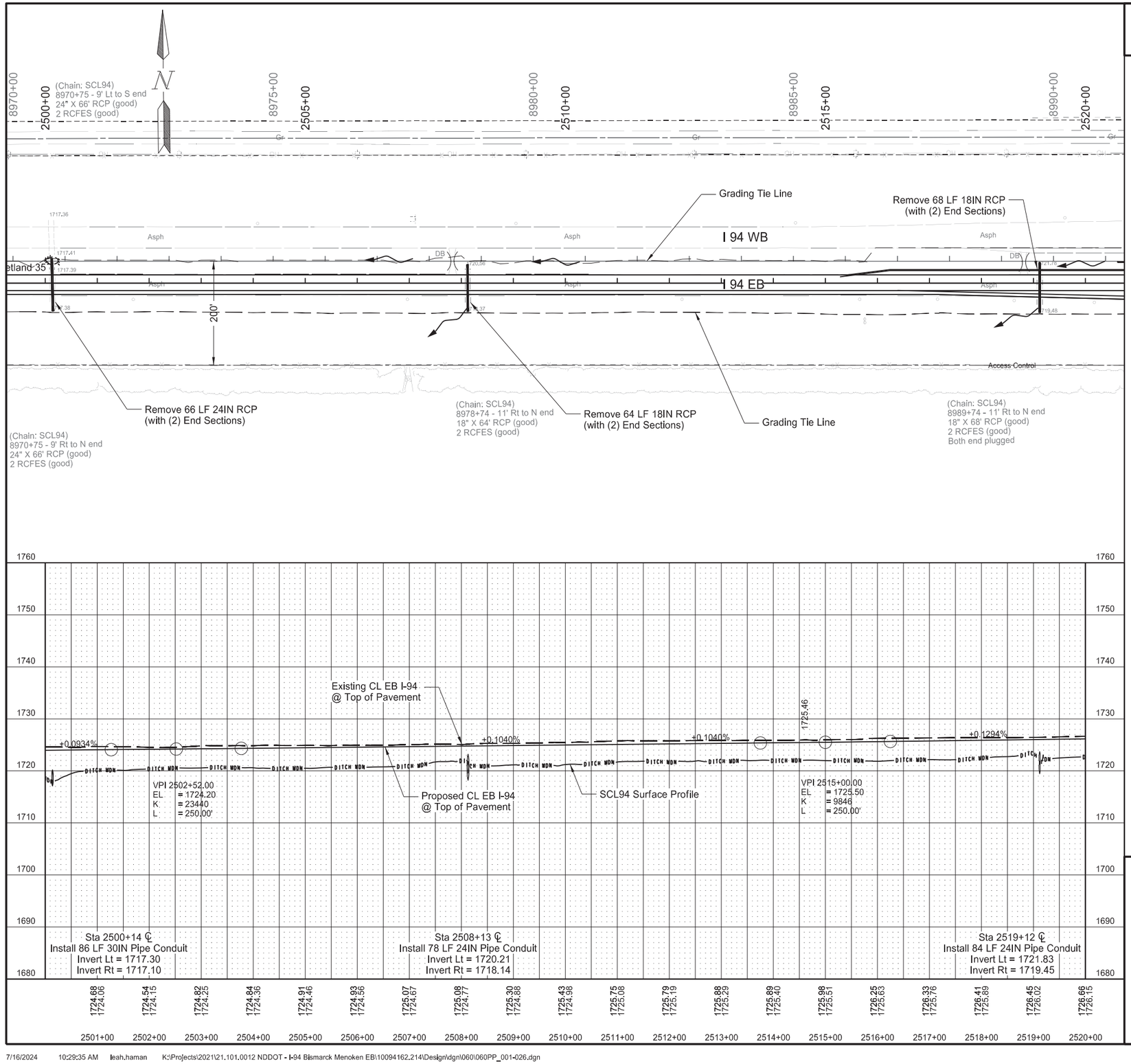
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:18:56 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	21

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2500+14 ℄	66	LF
		Sta 2508+13 ℄	64	LF
		Sta 2519+12 ℄	68	LF
714	4105	PIPE CONDUIT 24IN		
		Sta 2508+13 ℄	78	LF
		Sta 2519+12 ℄	84	LF
714	4110	PIPE CONDUIT 30IN		
		Sta 2500+14 ℄	86	LF



Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:19:30 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	22

SPEC	CODE	BID ITEM	QTY	UNIT
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES		
		Sta 2534+13 ℄ - Lt & Rt	2	EA
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2520+93 - 40.2' Lt to 2522+43 - 41.0' Lt	150	LF
714	0310	PIPE CONC REINF 18IN CL III		
		Sta 2534+13 ℄ - Lt	6	LF
		Sta 2534+13 ℄ - Rt	14	LF
714	3013	END SECT-TRAVERSABLE REINF. CONC.18IN		
		Sta 2534+13 ℄ - Lt	1	EA
		Sta 2534+13 ℄ - Rt	1	EA
714	4095	PIPE CONDUIT 15IN		
		Sta 2520+62 - 40.7' Lt to 2522+43 - 41.0' Lt	181	LF

Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

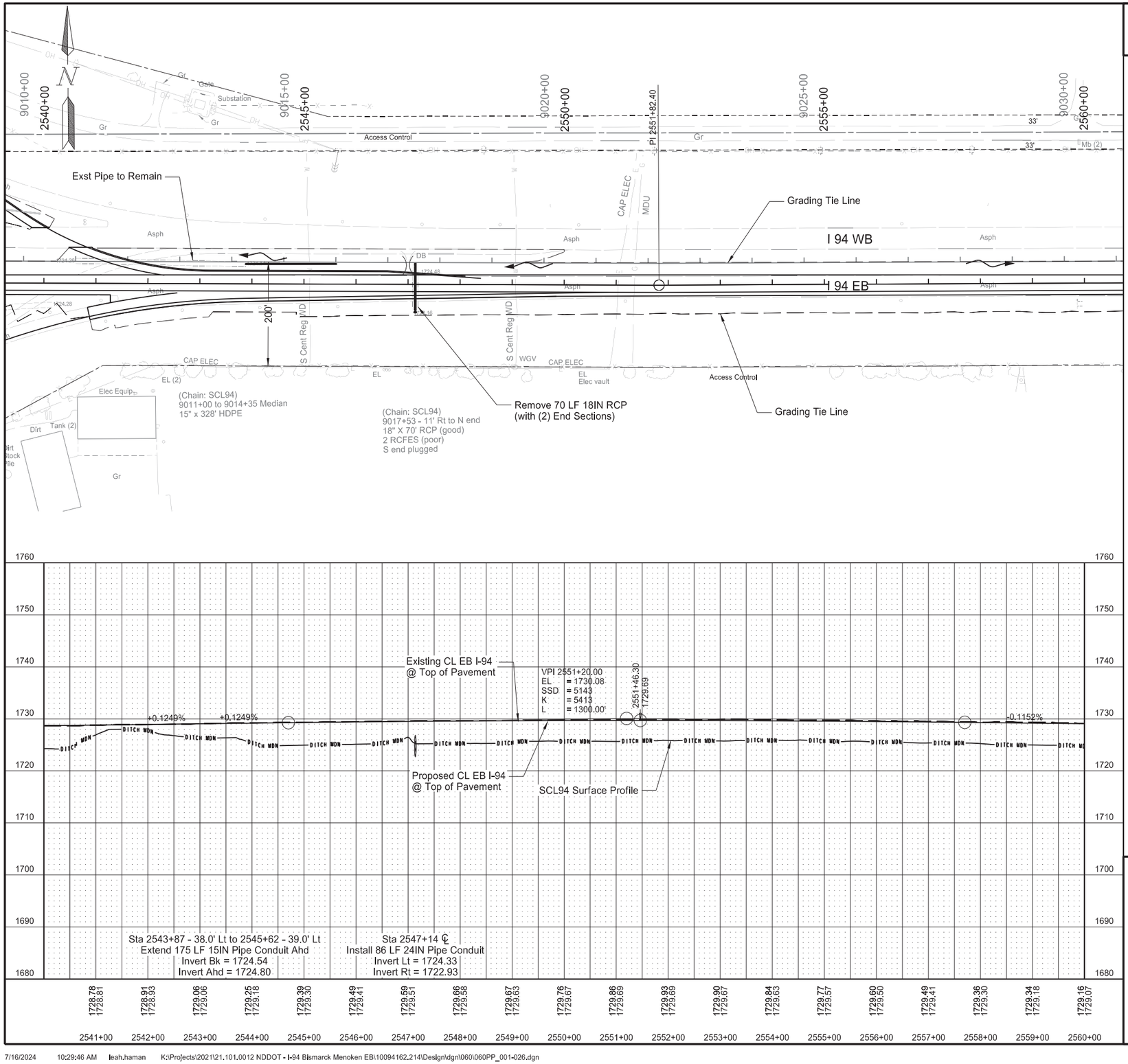
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:20:21 -05'00'
NORTH DAKOTA

7/16/2024 10:29:40 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162,214\Design\dgn\060\060PP_001-026.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	23

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2547+14 ℄	70	LF
		Sta 2543+87 - 38.0' Lt to 2545+40 - 36.0' Lt	153	LF
714	4105	PIPE CONDUIT 24IN		
		Sta 2547+14 ℄	86	LF
714	4095	PIPE CONDUIT 15IN		
		Sta 2543+87 - 38.0' Lt to 2545+62 - 39.0' Lt	175	LF



Station based on EX94EB alignment

Plan & Profile

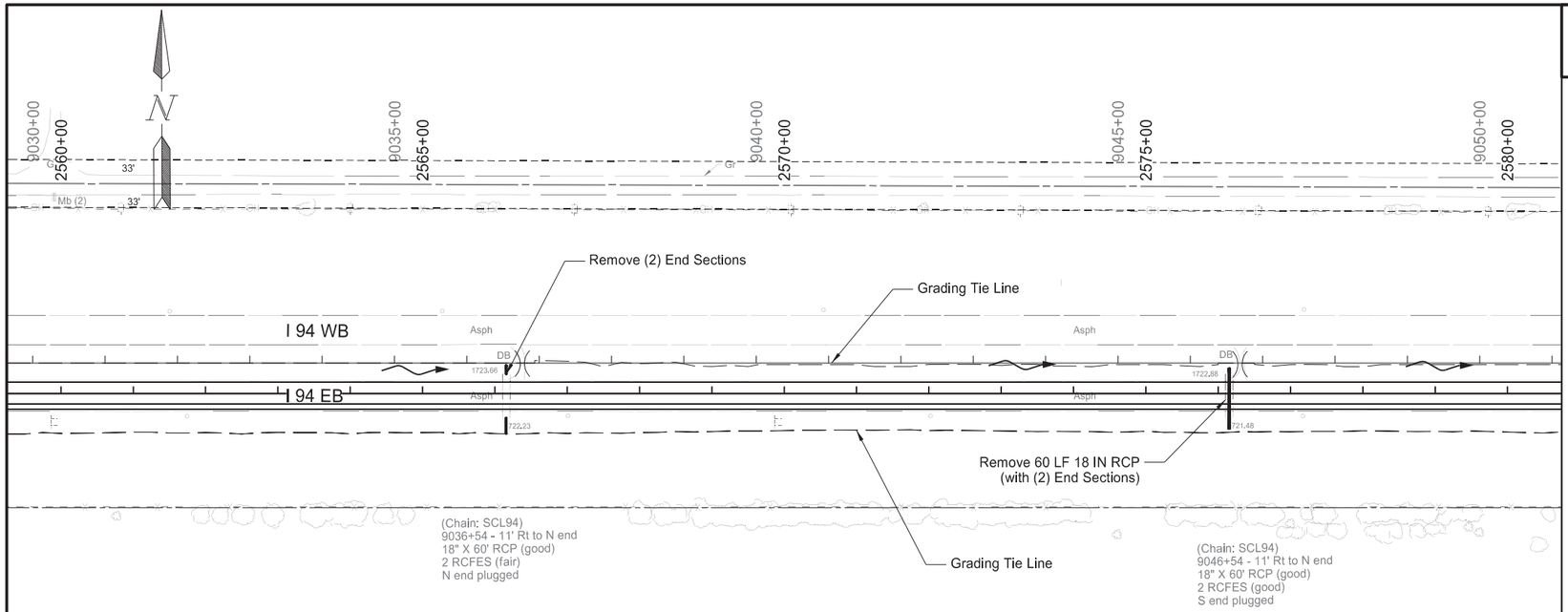
I-94 Reconstruction

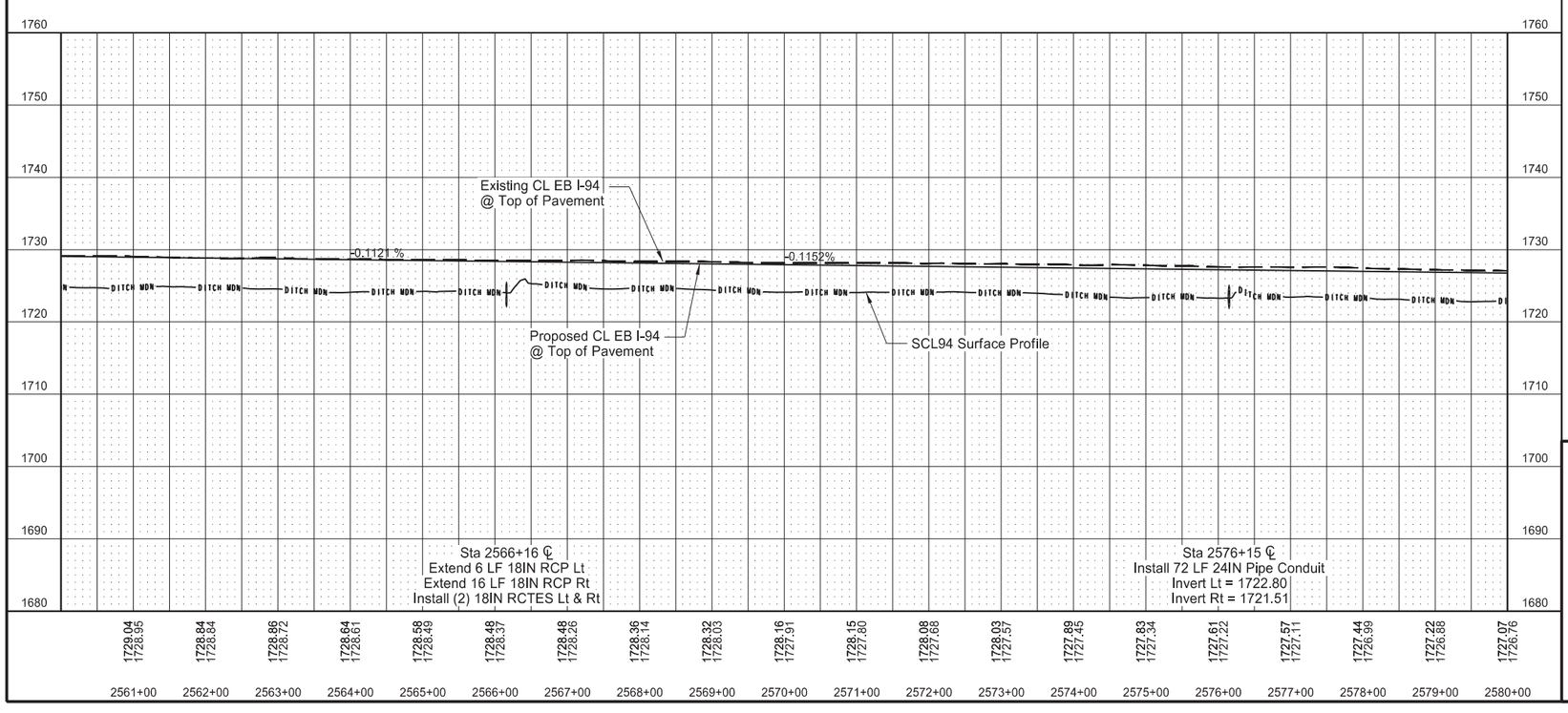
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:20:52 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	24

SPEC	CODE	BID ITEM	QTY	UNIT
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES		
		Sta 2566+16 ℄ - Lt & Rt	2	EA
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2576+15 ℄	60	LF
714	0310	PIPE CONC REINF 18IN CL III		
		Sta 2566+16 ℄ - Lt	6	LF
		Sta 2566+16 ℄ - Rt	16	LF
714	3013	END SECT-TRAVERSABLE REINF. CONC.18IN		
		Sta 2566+16 ℄ - Lt	1	EA
		Sta 2566+16 ℄ - Rt	1	EA
714	4105	PIPE CONDUIT 24IN		
		Sta 2576+15 ℄	72	LF





Station based on EX94EB alignment

Plan & Profile

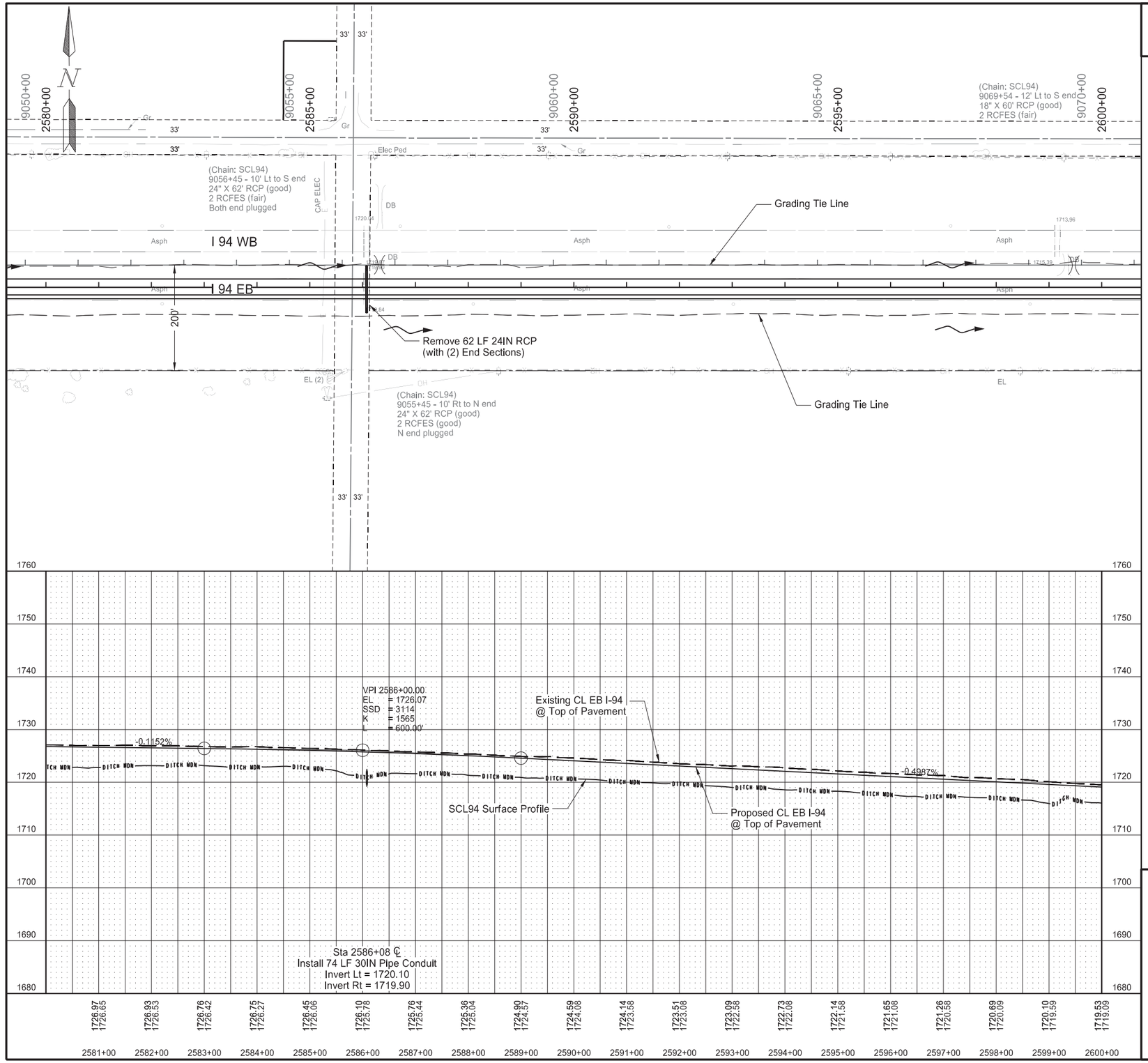
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:21:23 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	25

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 2586+08 ℄	62	LF
714	4110	PIPE CONDUIT 30IN		
		Sta 2586+08 ℄	74	LF



Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:21:53 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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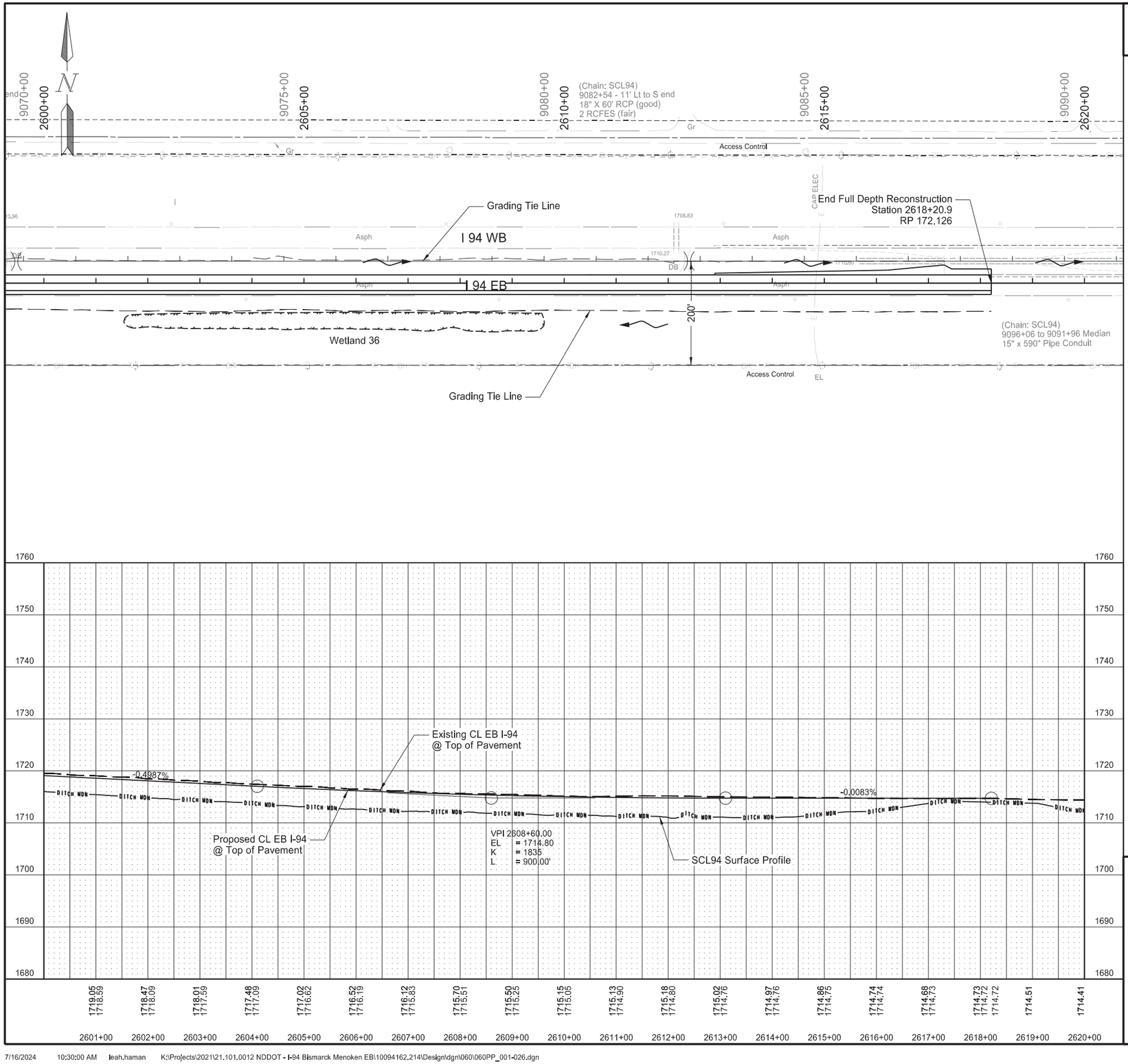

Station based on EX94EB alignment

Plan & Profile

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:22:25 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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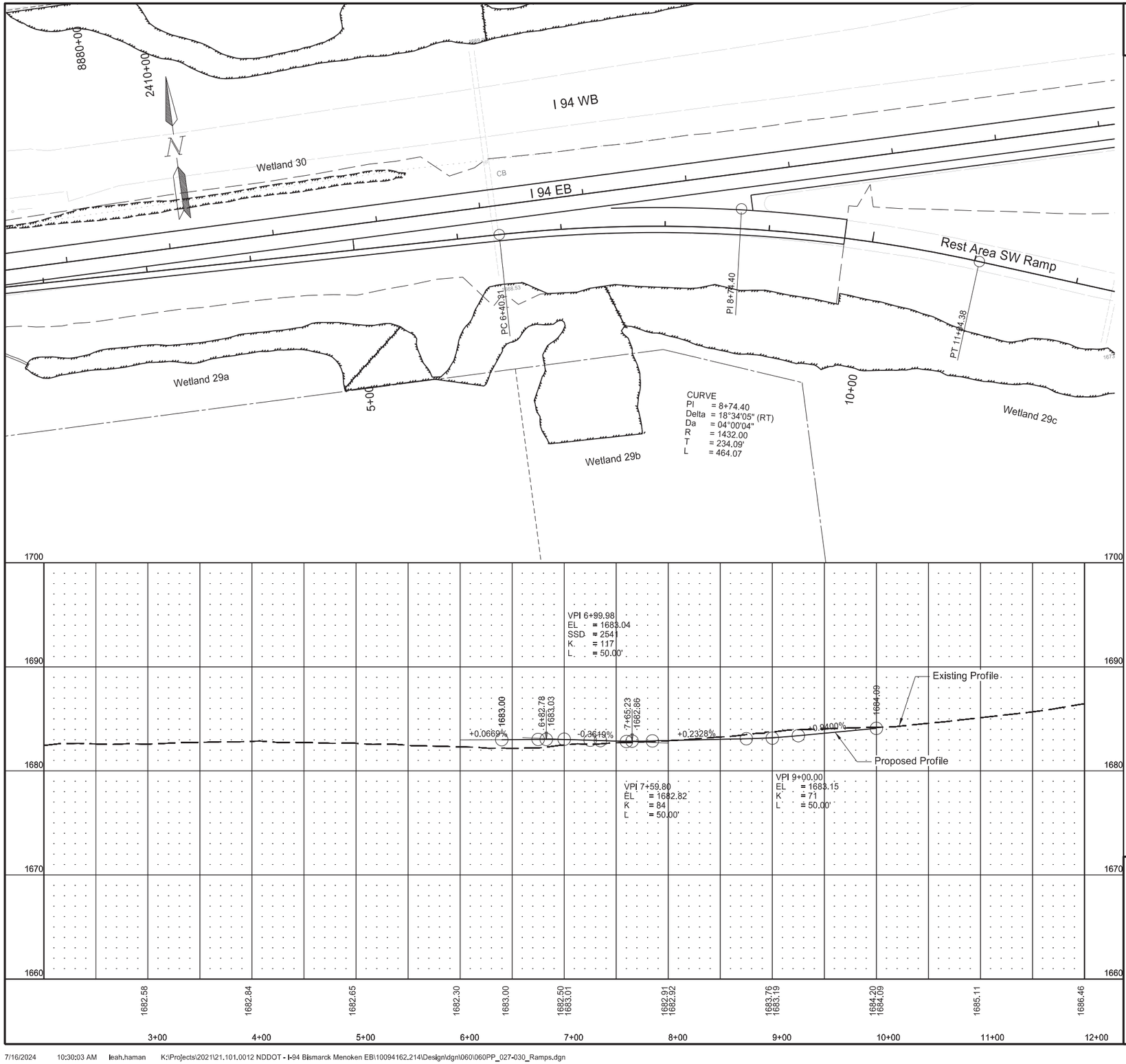

Station based on PR_RA alignment

Plan & Profile Ramps
Rest Area SW Ramp

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:22:55 -05'00'
NORTH DAKOTA

7/16/2024 10:30:03 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_027-030_Ramps.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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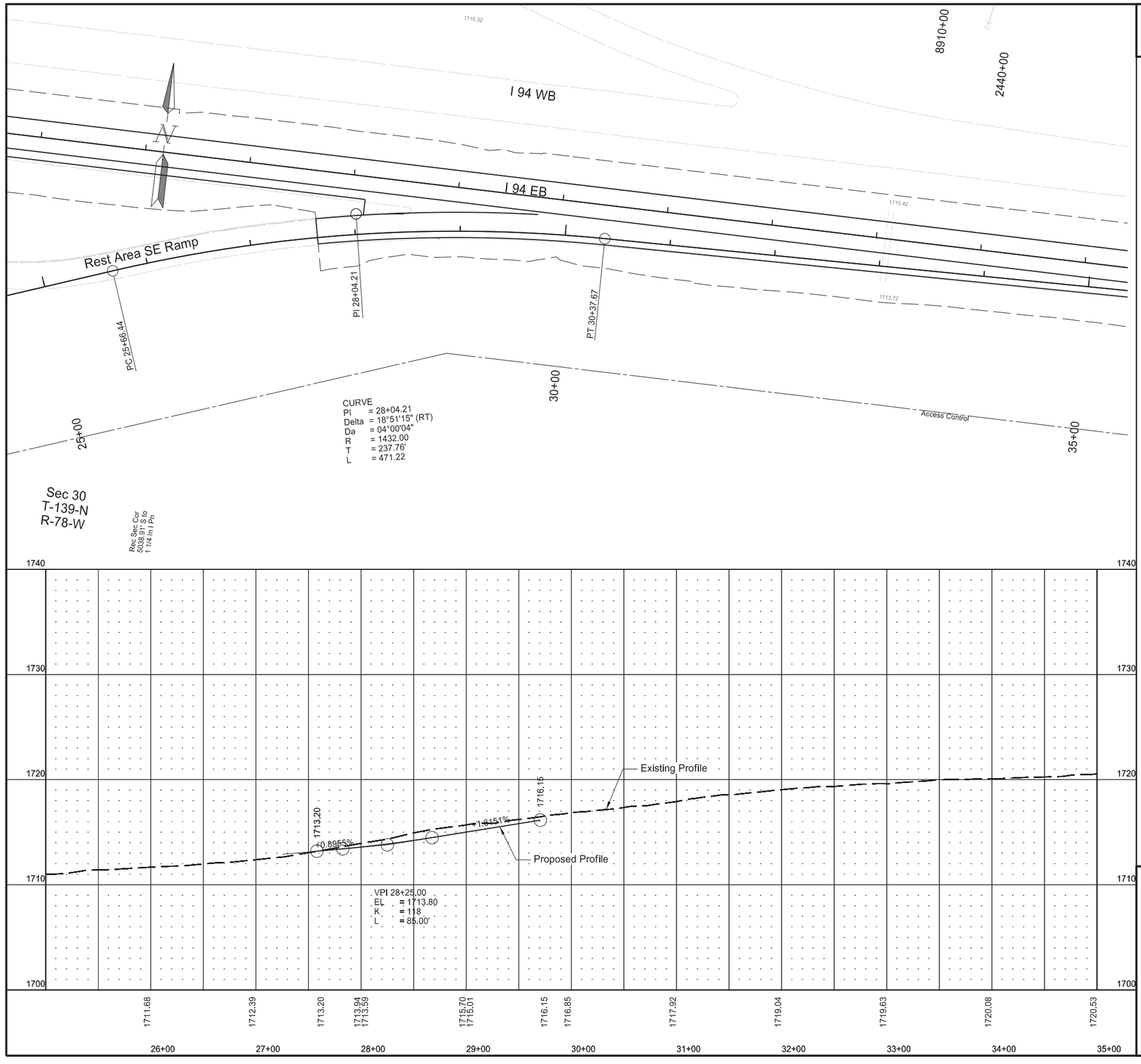


Station based on PR_RA alignment

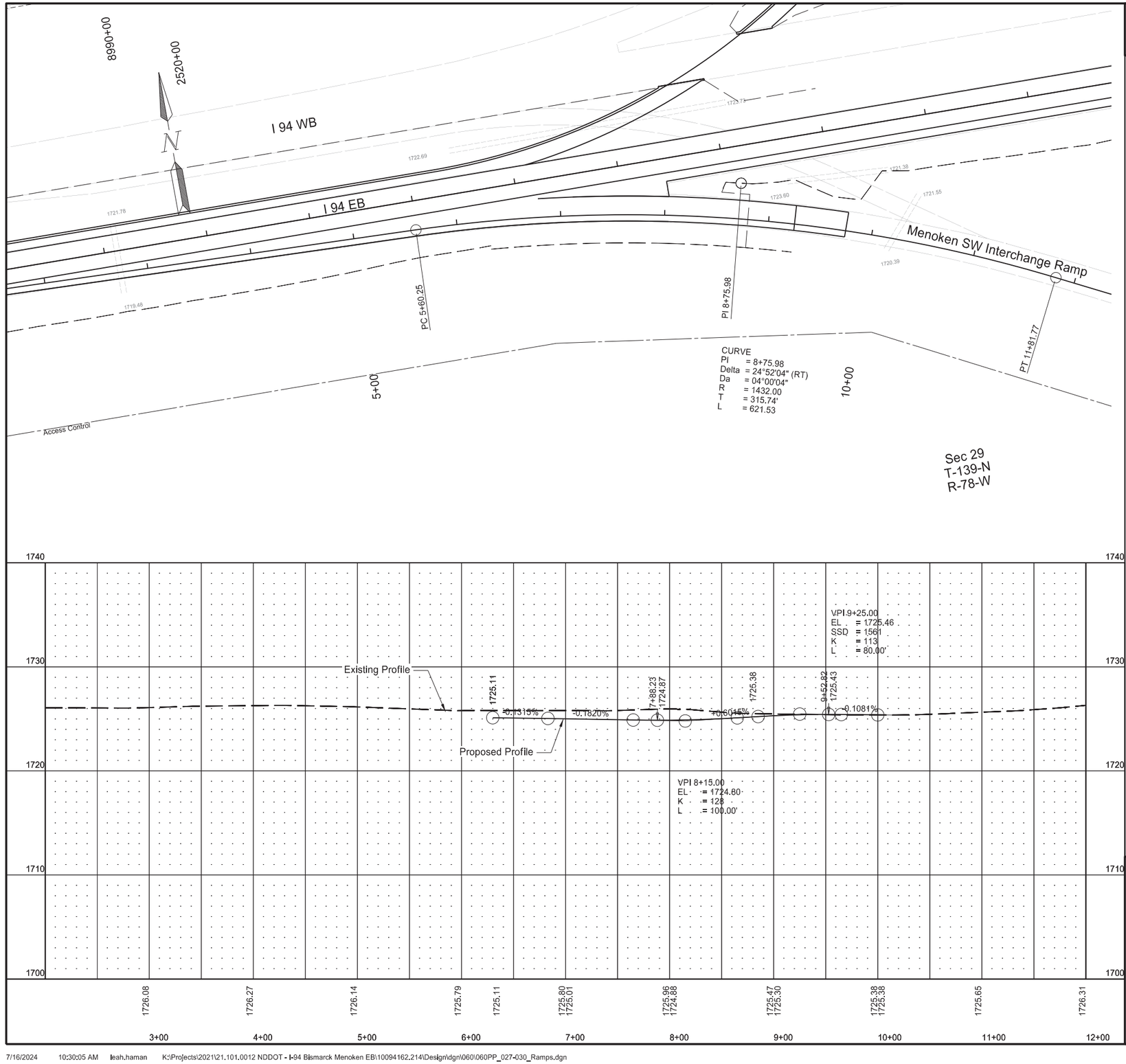
Plan & Profile Ramps
Rest Area SE Ramp

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:23:26 -05'00'
NORTH DAKOTA

7/16/2024 10:30:04 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_027-030_Ramps.dgn



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	29

Station based on PR94SWR alignment

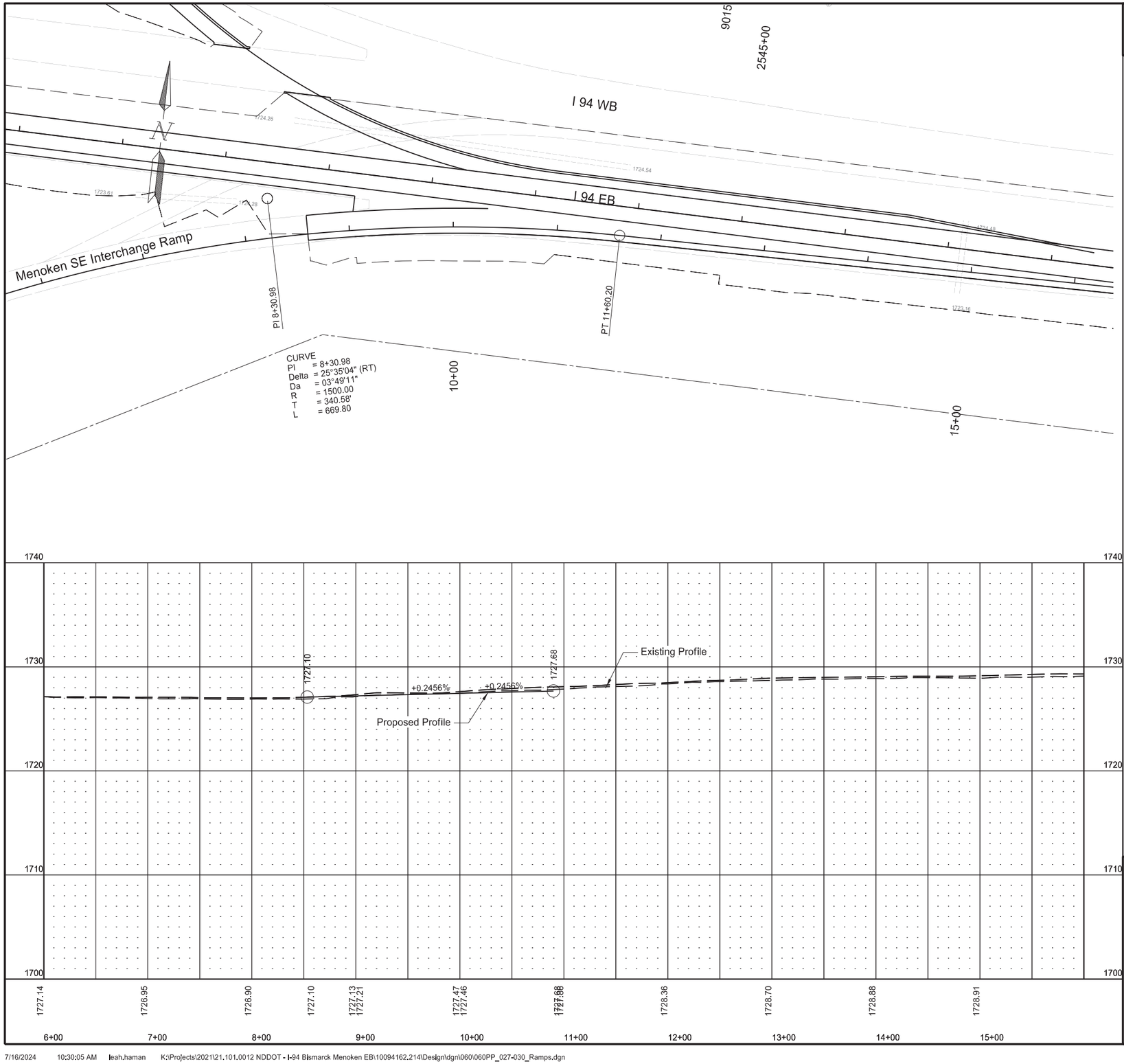
Plan & Profile Ramps
Menoken SW Interchange Ramp

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:24:01 -05'00'
NORTH DAKOTA

7/16/2024 10:30:05 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_027-030_Ramps.dgn



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	60	30

Station based on PR94SER alignment

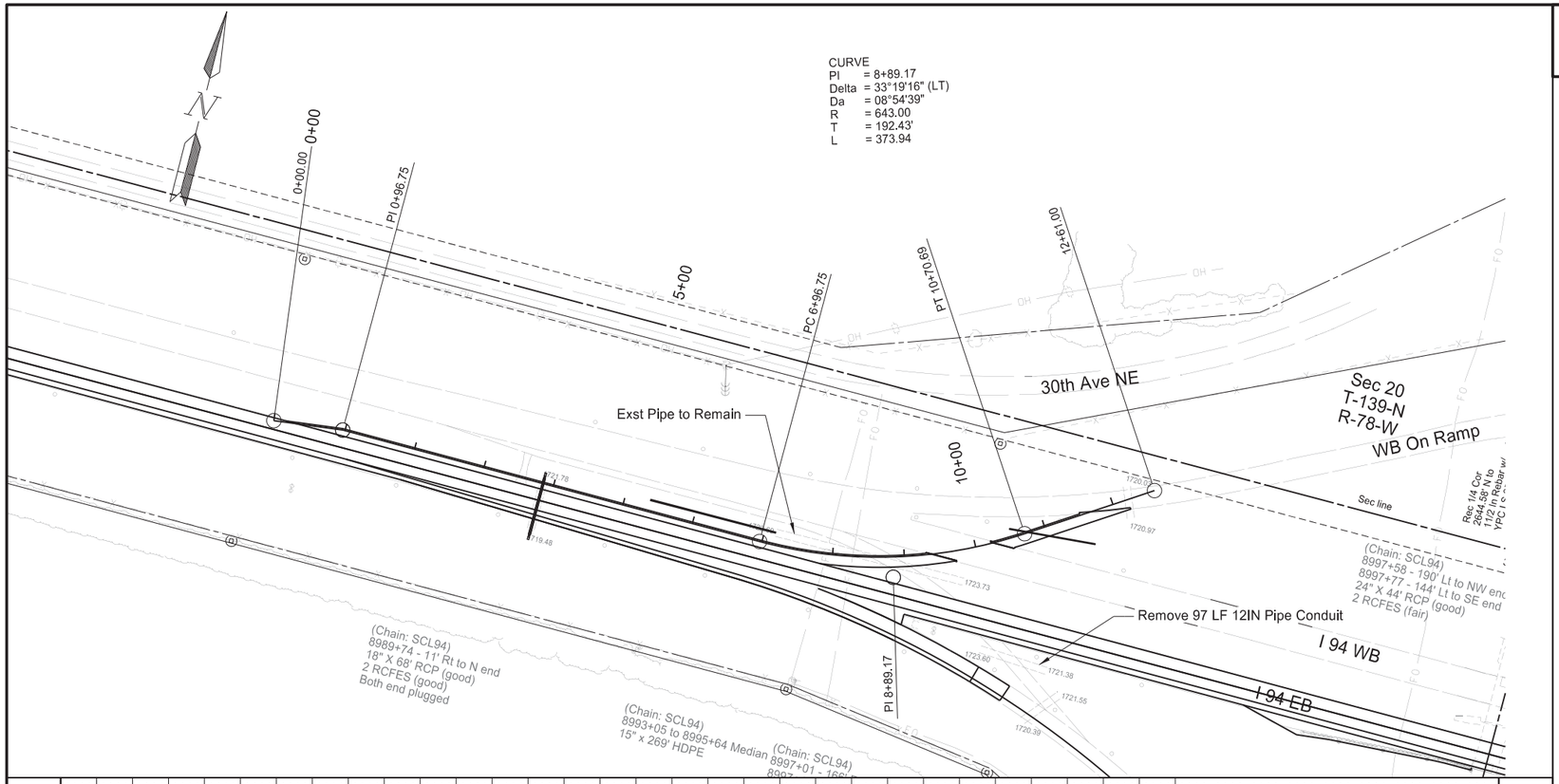
Plan & Profile Ramps
Menoken SE Interchange Ramp

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:24:33 -05'00'
NORTH DAKOTA

7/16/2024 10:30:05 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_027-030_Ramps.dgn



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	60	31

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 9+81 - 140.7' Rt to Sta 10+47 - 191.2' Rt	97	LF
714	4090	PIPE CONDUIT 12IN		
		Sta 10+52 - 12.9' Lt to Sta 11+60 - 44.9' Rt	122	LF

Station based on MNW alignment

Plan & Profile Temporary Ramps

I-94 Reconstruction

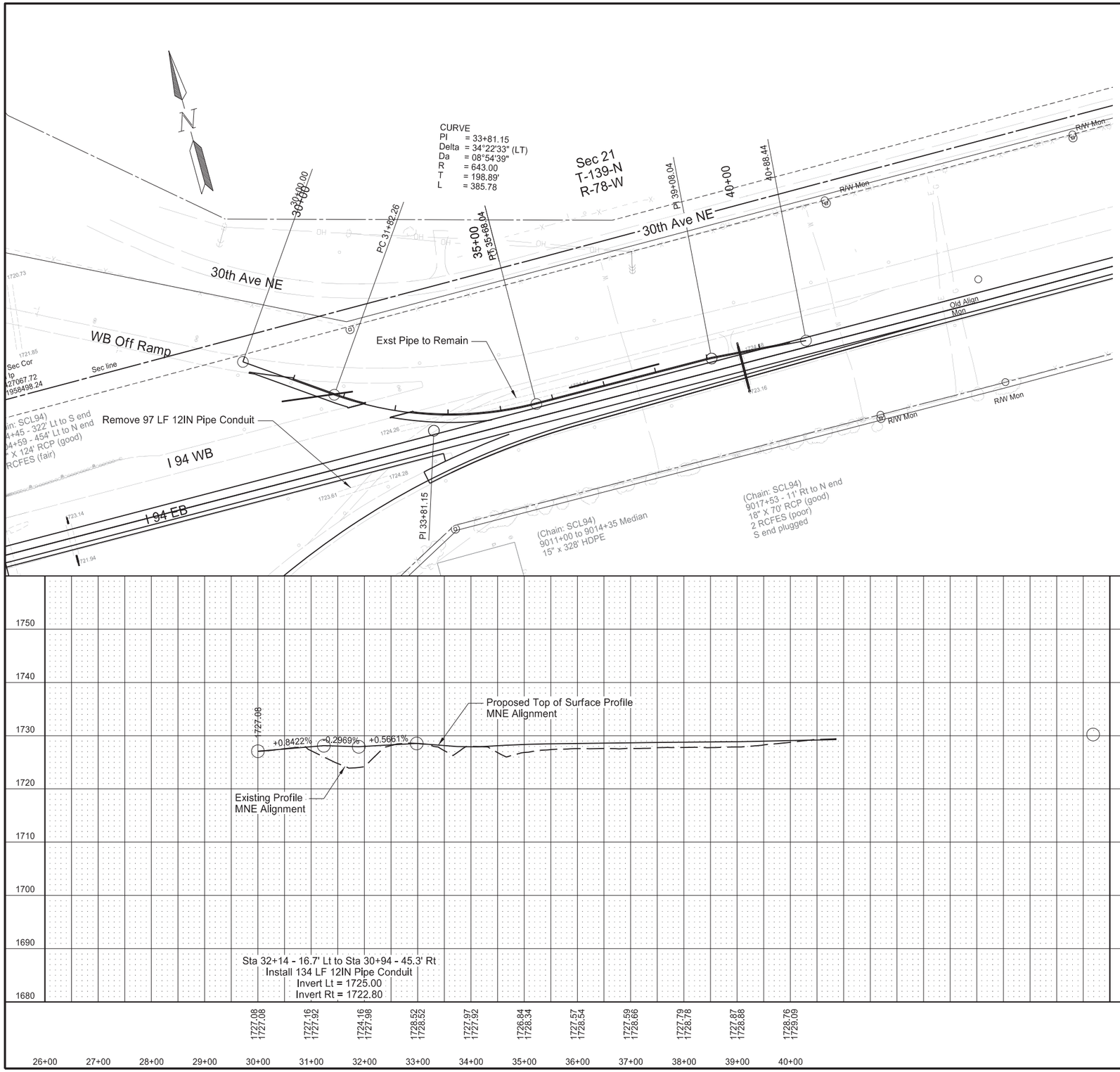
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:25:06 -05'00'
NORTH DAKOTA

7/16/2024 10:30:07 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_031-032_Temporary Ramps.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	60	32

SPEC	CODE	BID ITEM	QTY	UNIT
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES		
		Sta 32+39 - 176.1' Rt to Sta 33+07 - 128.0' Rt	97	LF
714	4090	PIPE CONDUIT 12IN		
		Sta 32+14 - 16.7' Lt to Sta 30+94 - 45.3' Rt	134	LF



Station based on MNE alignment

Plan & Profile Temporary Ramps

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 16:25:43 -05'00'
NORTH DAKOTA

7/16/2024 10:30:08 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\060\060PP_031-032_Temporary Ramps.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	75	1

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact			Wetland Mitigation			
					Wetland Impacts Acre(s)			Mitigation Proposed		USACE/11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	EO 11990	USACE	Location	Acre(s)
#1	Sec.25, T139N, R80W	Slope	Natural	Yes				N	N		
#2a	Sec.25, T139N, R80W	Slope	Natural	Yes				N	N		
#2b	Sec.25, T139N, R80W	Slope	Natural	Yes				N	N		
#3a	Sec.30, T139N, R79W; Sec. 25, T139N, R80W	Slope	Natural	Yes				N	N		
#3b	Sec.30, T139N, R79W	Slope	Natural	Yes	0.004	0.022		Y	Y	Koenig Bank	0.022
#4a	Sec.30, T139N, R79W	Slope	Natural	Yes	0.007	0.040		Y	Y	Koenig Bank	0.040
#4b	Sec.19 & 30, T139N, R79W	Slope	Natural	Yes				N	N		
#5	Sec.30, T139N, R79W	Slope	Natural	Yes				N	N		
#13a	Sec.21, T139N, R79W	Slope	Natural	Yes				N	N		
#13b	Sec.21, T139N, R79W	Slope	Natural	Yes	0.068	0.008		Y	Y	Koenig Bank	0.008
#18	Sec.27, T139N, R79W	Ditch	Created	No				N	N		
#20	Sec.26, T139N, R79W	Ditch	Created	No	0.006	0.020		N	N		
#22a	Sec.23 & 26, T139N, R79W	Slope	Natural	Yes				N	N		
#22b	Sec.26, T139N, R79W	Slope	Natural	Yes	0.016	0.025		N	Y	Koenig Bank	0.025
#24a	Sec.25, T139N, R79W	Ditch	Created	No				N	N		
#24b	Sec.25, T139N, R79W	Slope	Natural	Yes	0.055	0.032		Y	Y	Koenig Bank	0.032
#24c	Sec.25, T139N, R79W	Slope	Natural	Yes				N	N		
#25	Sec.25, T139N, R79W	Basin	Natural	No				N	N		
#26	Sec.25, T139N, R79W	Ditch	Created	No	0.026	0.040		N	N		
#29a	Sec.25, T139N, R79W	Ditch	Created	Yes				N	N		
#29b	Sec.25, T139N, R79W	Slope	Natural	Yes	0.049	0.018		Y	Y	Koenig Bank	0.018
#29c	Sec.25, T139N, R79W	Ditch	Created	Yes	0.085			N	Y	Koenig Bank	0.000
#29d	Sec.25, T139N, R79W	Slope	Natural	Yes				N	N		
#29e	Sec.25, T139N, R79W	Ditch	Created	Yes				N	N		
#30	Sec.25, T139N, R79W	Ditch	Created	No	0.003	0.098		N	N		
#32	Sec.25, T139N, R79W	Slope	Natural	No				N	N		
#33	Sec.19, T139N, R78W	Ditch	Created	No				N	N		
#34	Sec.30, T139N, R78W	Ditch	Created	No				N	N		
#35	Sec.29, T139N, R78W	Ditch	Created	No	0.001	0.005		N	N		
#36	Sec.27, T139N, R78W	Ditch	Created	No	0.205			N	N		
				Totals	0.525	0.308					0.145

[1] A wetland Jurisdictional Determination was received 12/13/2021 (NWO-2021-01865-BIS)

Other Waters Impact Table

Number	Location	Type	Feature	USACE Jurisdictional[1]	Impacts to Other Waters				Other Water Mitigation	
					Acres				Mitigation Proposed	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Perm. (Cut)	EO 11990	USFWS
#OW 27	Sec.25, T139N, R79W	Natural Straightened Stream	Natural	Y	0	0			N	N
				Totals	0	0				

Wetlands, Mitigation, and Environmental

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:06:41 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	75	2

Other Waters-d Impact Table

Number	Location	Type	Feature	USACE Jurisdictional	Impacts to Other Waters			Other Water Mitigation	
					Acres			Mitigation Proposed	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	EO 11990	USFWS
#OW 6-D	Sec.19, T139N, R79W	Ephemeral Swale	Natural	N				N	N
#OW 7-D	Sec.19, T139N, R79W	Ephemeral Swale	Natural	N				N	N
#OW 8-D	Sec.19, T139N, R79W	Ephemeral Swale	Natural	N				N	N
#OW 9-D	Sec.19, T139N, R79W	Ephemeral Swale	Natural	N	0.001			N	N
#OW 10-D	Sec.19, T139N, R79W	Ephemeral Swale	Natural	N	0.001	0.002		N	N
#OW 11-D	Sec.19, T139N, R79W	Ephemeral Swale	Natural	N				N	N
#OW 12-D	Sec.20, T139N, R79W	Ephemeral Swale	Natural	N				N	N
#OW 14-D	Sec.21, T139N, R79W	Ephemeral Swale	Natural	N				N	N
#OW 15-D	Sec.21, T139N, R79W	Ephemeral Swale	Natural	N				N	N
#OW 16-D	Sec.21, T139N, R79W	Ephemeral Swale	Natural	N	0.001	0.002		N	N
#OW 17-D	Sec.22, T139N, R79W	Ephemeral Swale	Natural	N				N	N
#OW 19-D	Sec.26, T139N, R79W	Ephemeral Swale	Natural	N				N	N
#OW 21-D	Sec.26, T139N, R79W	Ephemeral Swale	Natural	N				N	N
#OW 23-D	Sec.25, T139N, R79W	Ephemeral Swale	Natural	N	0.004	0.005		N	N
#OW 28-D	Sec.25, T139N, R79W	Ephemeral Swale	Natural	N	0.001	0.001		N	N
				Totals	0.008	0.010			

Impact Summary Table

Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	Total Acre(s)	WaterType	Total Acre(s)
Natural/JD (Fill/Drain)	0.145	Temporary Wetland JD	0.284
Natural/Non-JD (Fill/Drain)	0	Non-JD Wetland Temporary	0.241
Created/JD (Fill/Drain)	0	Total	0.525
Created /Non-JD (Fill/Drain))	0.163	Permanent OW	
Total	0.308	Temporary OW	
JD Natural (Cut)		Permanent OW-d	0.010
JD Created (Cut)		Temporary OW-d	0.008
Non-JD Natural (Cut)			
Non-JD Created (Cut)			
Total	0		

Mitigation Summary Table

	USACE/11990 Bank
Koenig Bank	0.145
	0.145

Wetlands, Mitigation, and Environmental

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:06:56 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	75	3

Wetland Impacts			
Sta 2103+61 to 2140+00			
Wetland #	Temporary Wetland Impact	Permanent Wetland Impact	
		Fill / Drain	Cut
#3a	0 Acre	0 Acre	0 Acre
#3b	0.004 Acre	0.022 Acre	0 Acre
#4a	0.007 Acre	0.040 Acre	0 Acre
#4b	0 Acre	0 Acre	0 Acre
#5	0 Acre	0 Acre	0 Acre

Sec 25
T-138-N
R-79-W

Sec 30
T-139-N
R-79-W

2100+00 2105+00 2110+00 2115+00 2120+00

Access Control

Begin Full Depth Reconstruction
Station 2103+61
RP 162.386

Wetland 3a

Grading Tie Line

Grading Tie Line

Access Control

2b

Wetland 3b

Sec 25
T-138-N
R-79-W

Sec 30
T-139-N
R-79-W

Sec 19
T-139-N
R-79-W

2120+00 2125+00 2130+00 2135+00 2140+00

OW 6-d

OW 7-d

OW 8-d

OW 9-d

Wetland 4b

Wetland 4a

Wetland 5

Grading Tie Line

Grading Tie Line

Sec 30

Legend
- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

Wetlands, Mitigation, and Environmental

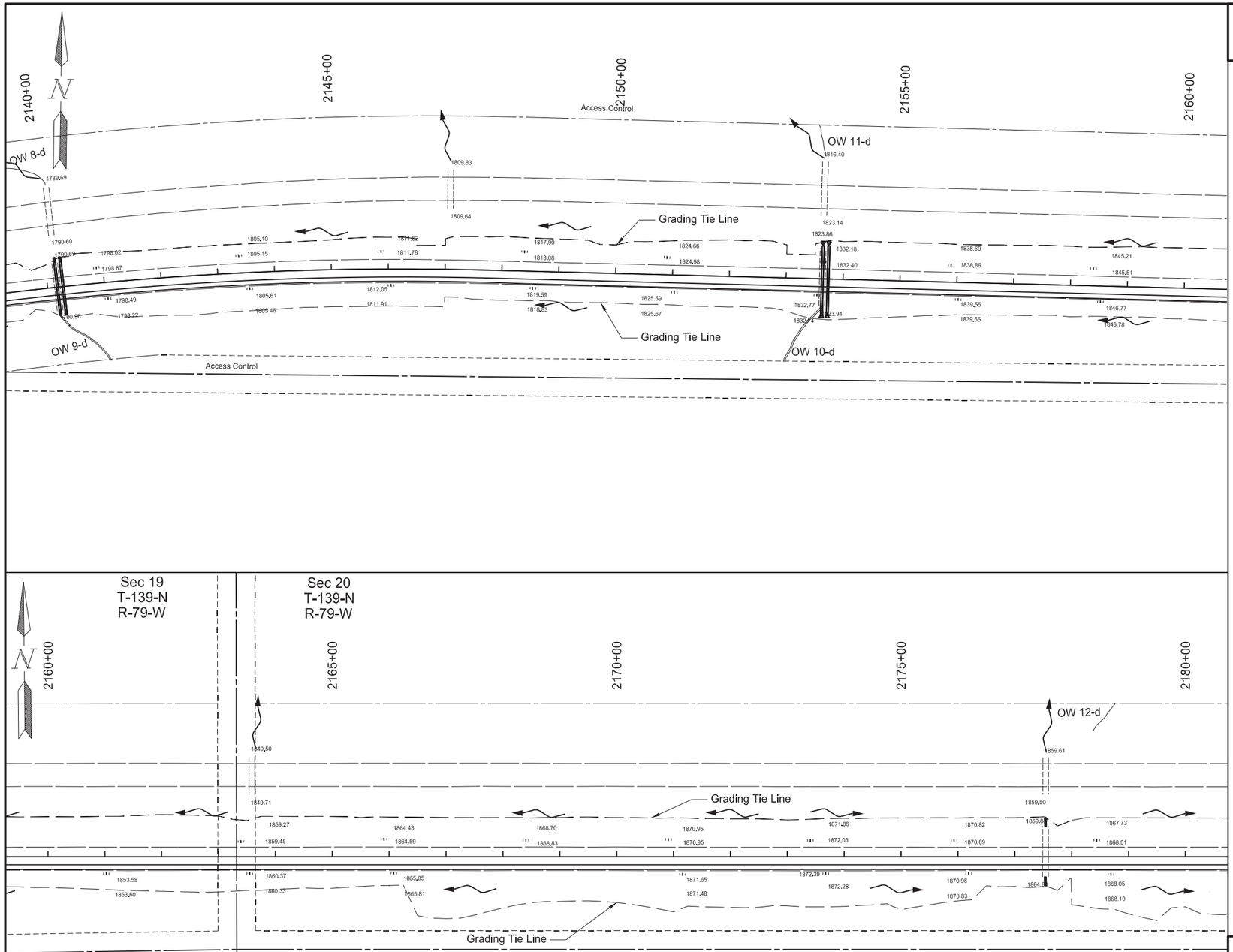
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:16:01 -05'00'
NORTH DAKOTA

7/3/2024 1:09:35 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\075\075WL_003-015.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	75	4



Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

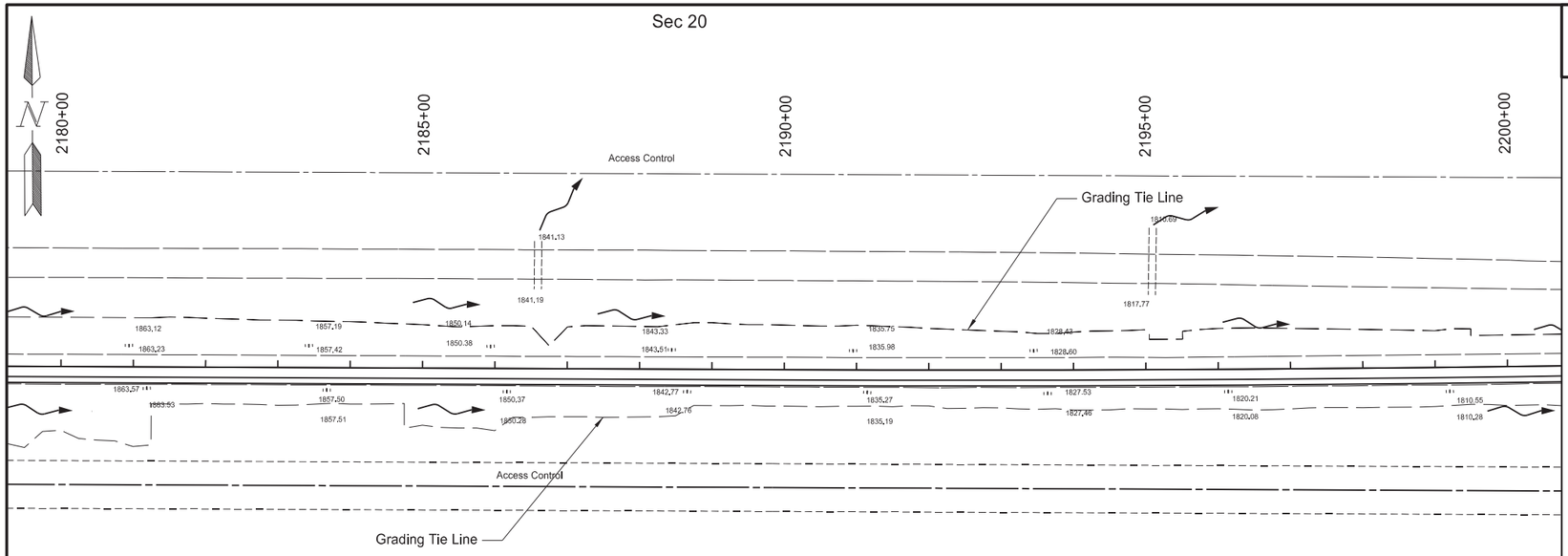
Wetlands, Mitigation, and Environmental

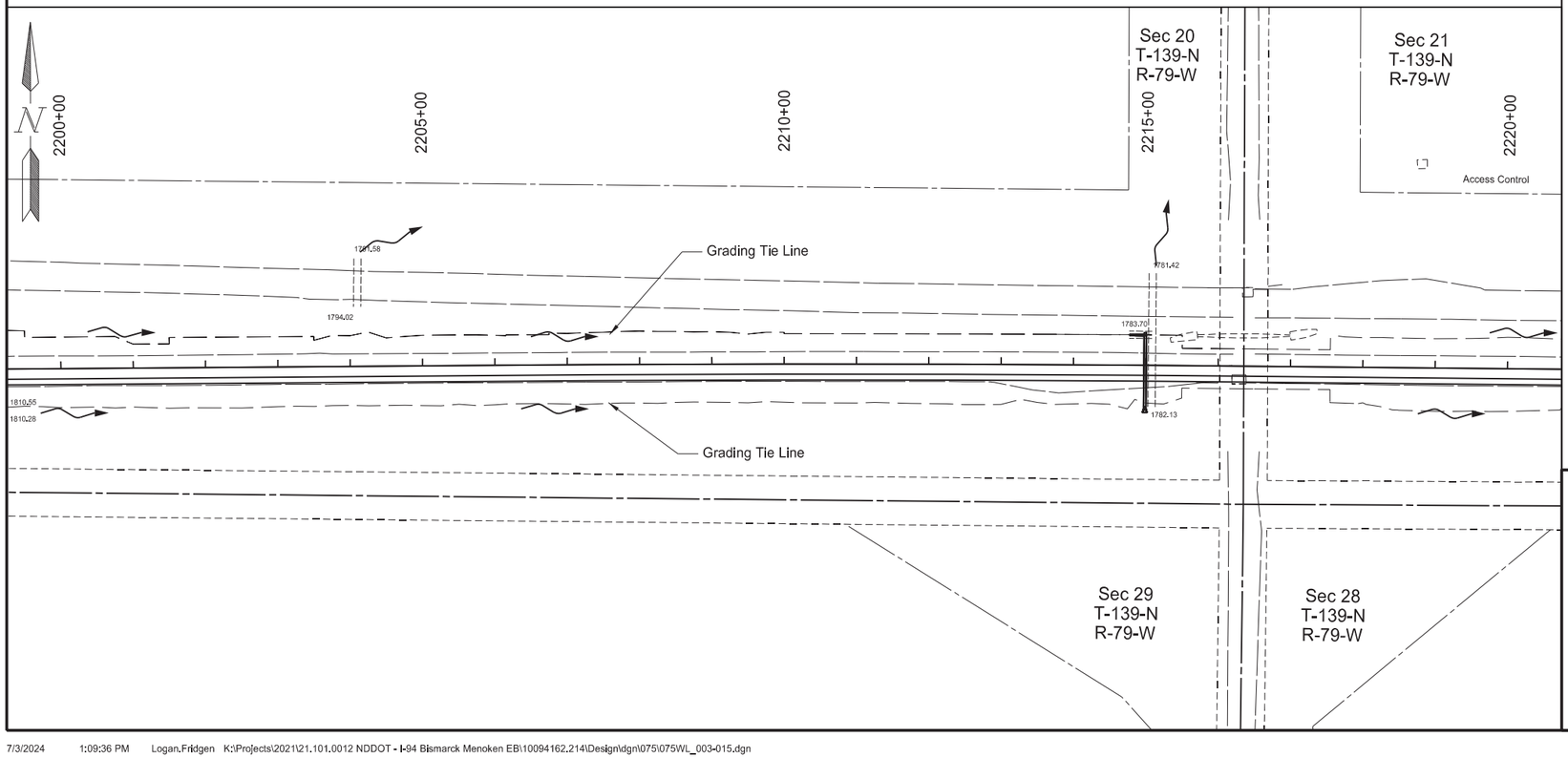
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:16:25 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	75	5





Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

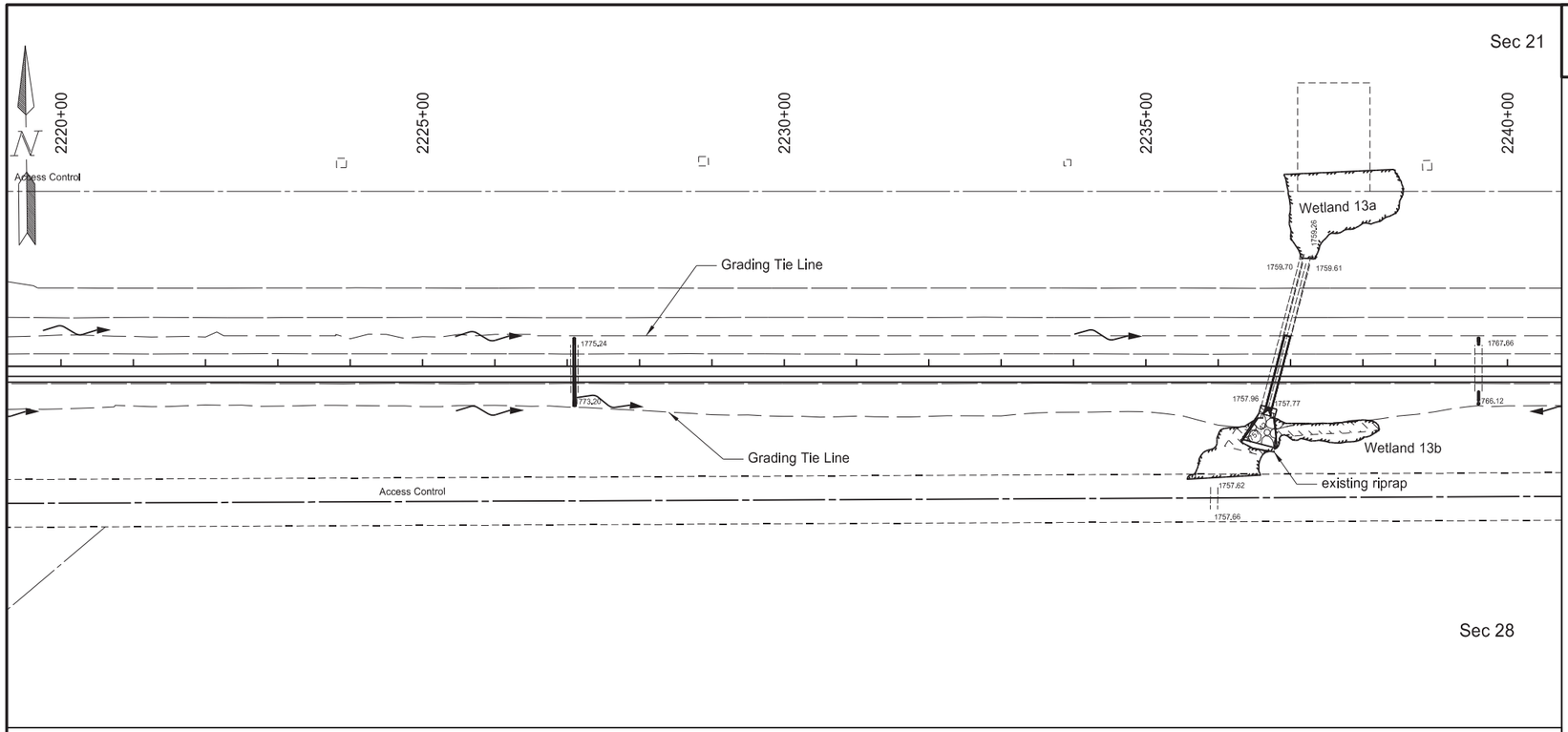
Wetlands, Mitigation, and Environmental

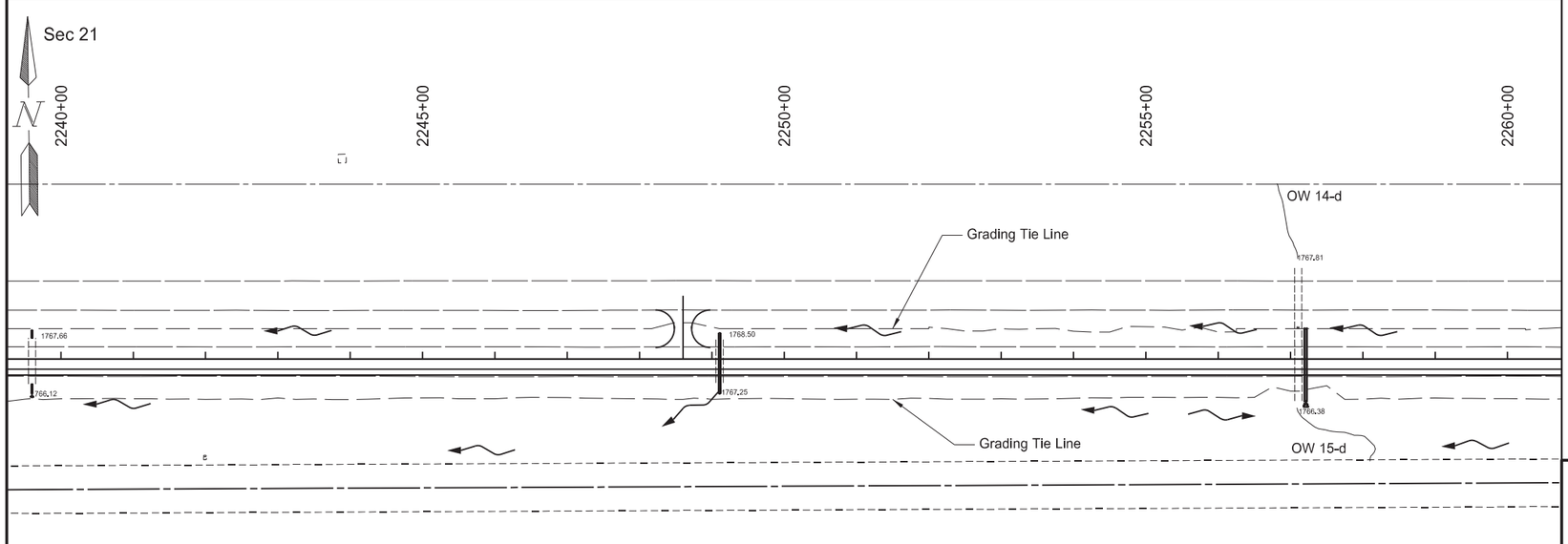
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:16:42 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	75	6





Wetland Impacts			
Sta 2220+00 to 2260+00			
Wetland #	Temporary Wetland Impact	Permanent Wetland Impact	
		Fill / Drain	Cut
#13a	0 Acre	0 Acre	0 Acre
#13b	0.068 Acre	0.008 Acre	0 Acre

Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

Wetlands, Mitigation, and Environmental

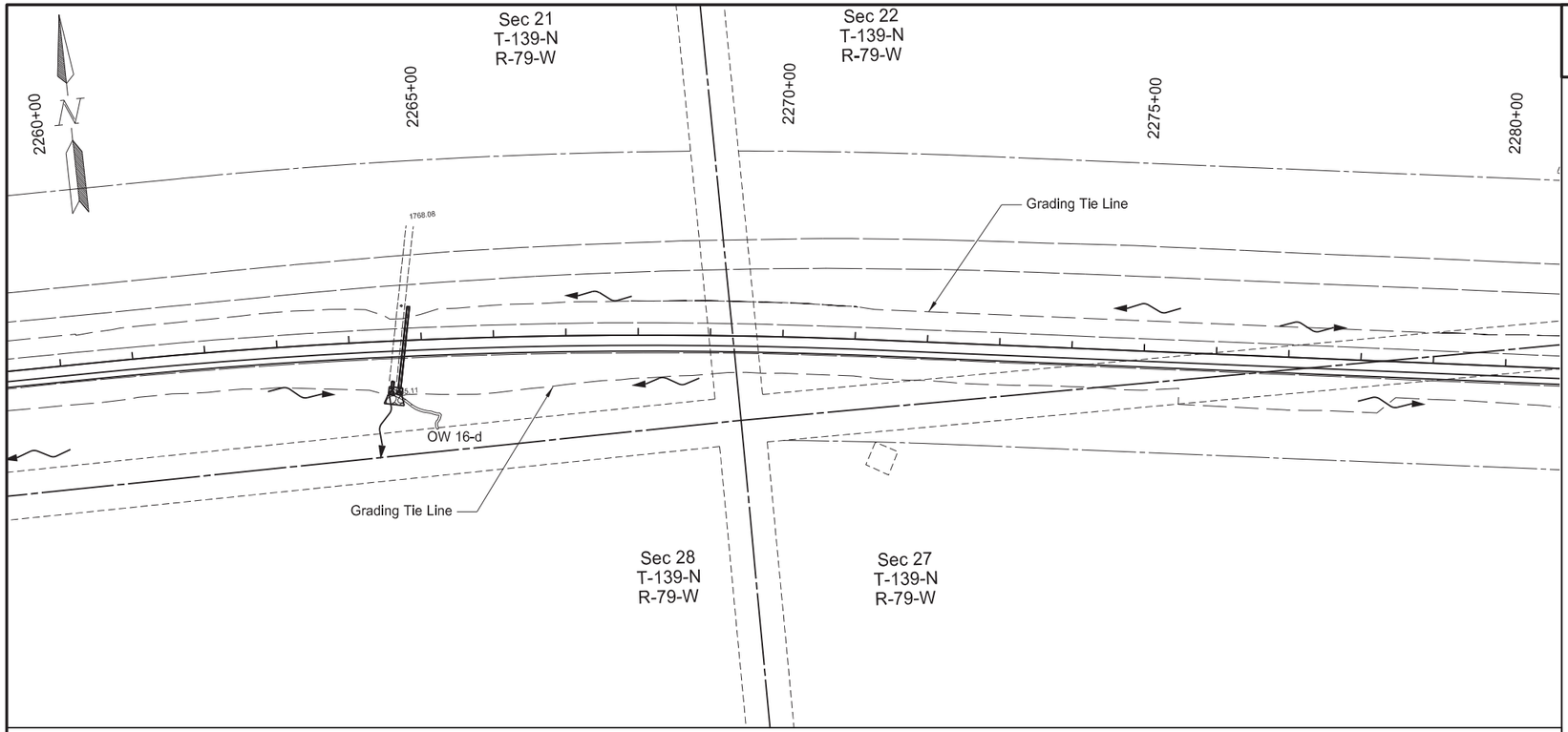
I-94 Reconstruction

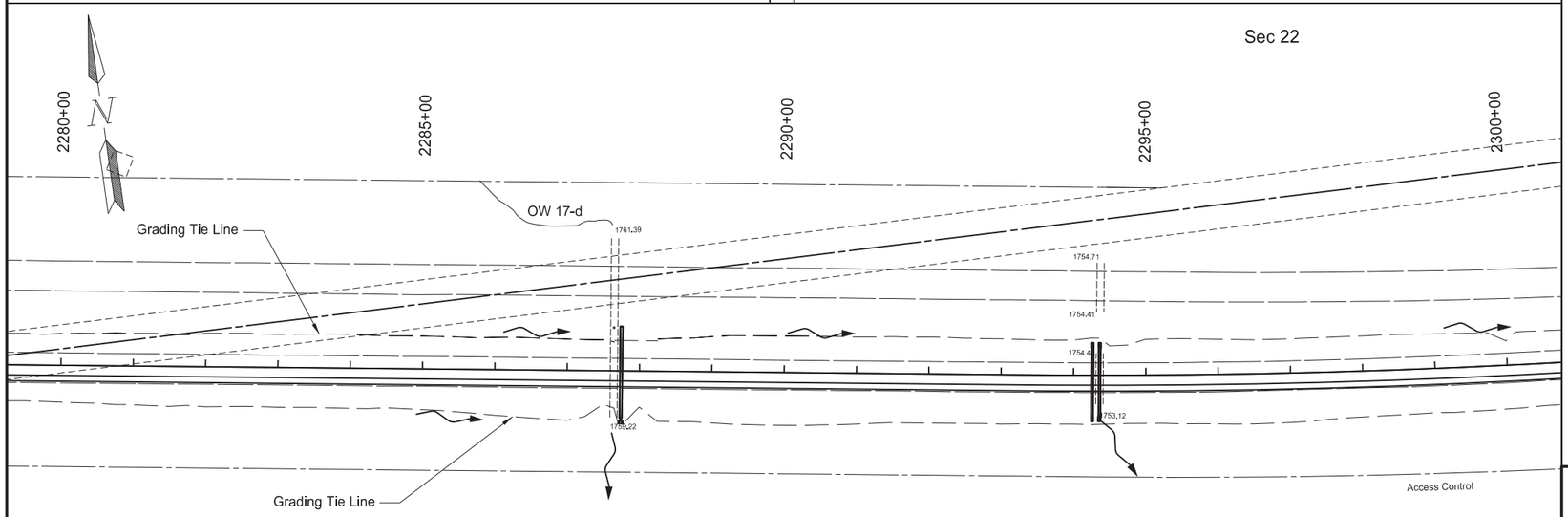
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:17:06 -05'00'
NORTH DAKOTA

7/3/2024 1:09:38 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\075\075WL_003-015.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	75	7





Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

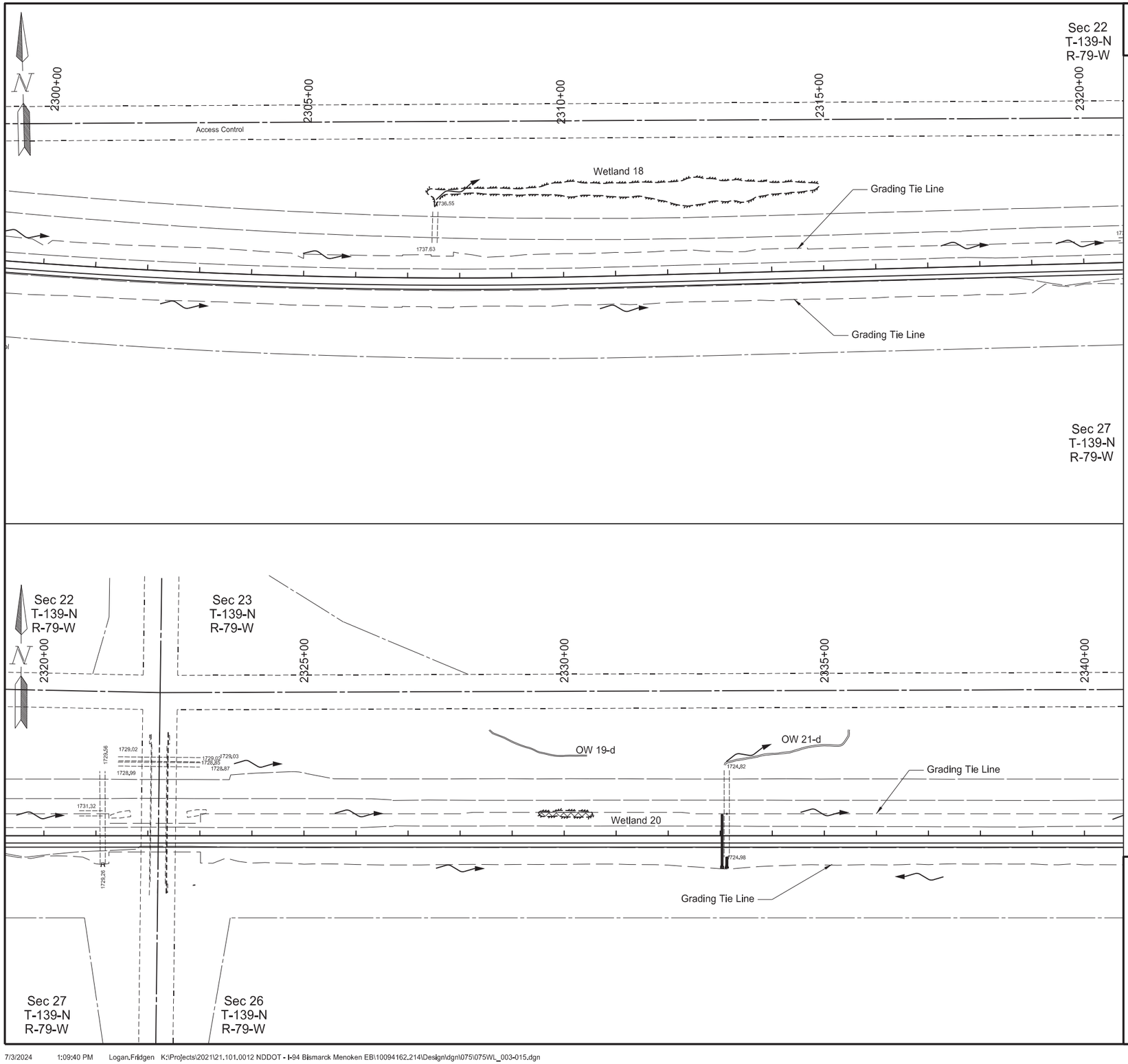
Wetlands, Mitigation, and Environmental

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:17:21 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	75	8



Wetland Impacts			
Sta 2300+00 to 2340+00			
Wetland #	Temporary Wetland Impact	Permanent Wetland Impact	
		Fill / Drain	Cut
#18	0 Acre	0 Acre	0 Acre
#20	0.006 Acre	0.020 Acre	0 Acre
#22a	0 Acre	0 Acre	0 Acre

Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

Wetlands, Mitigation, and Environmental

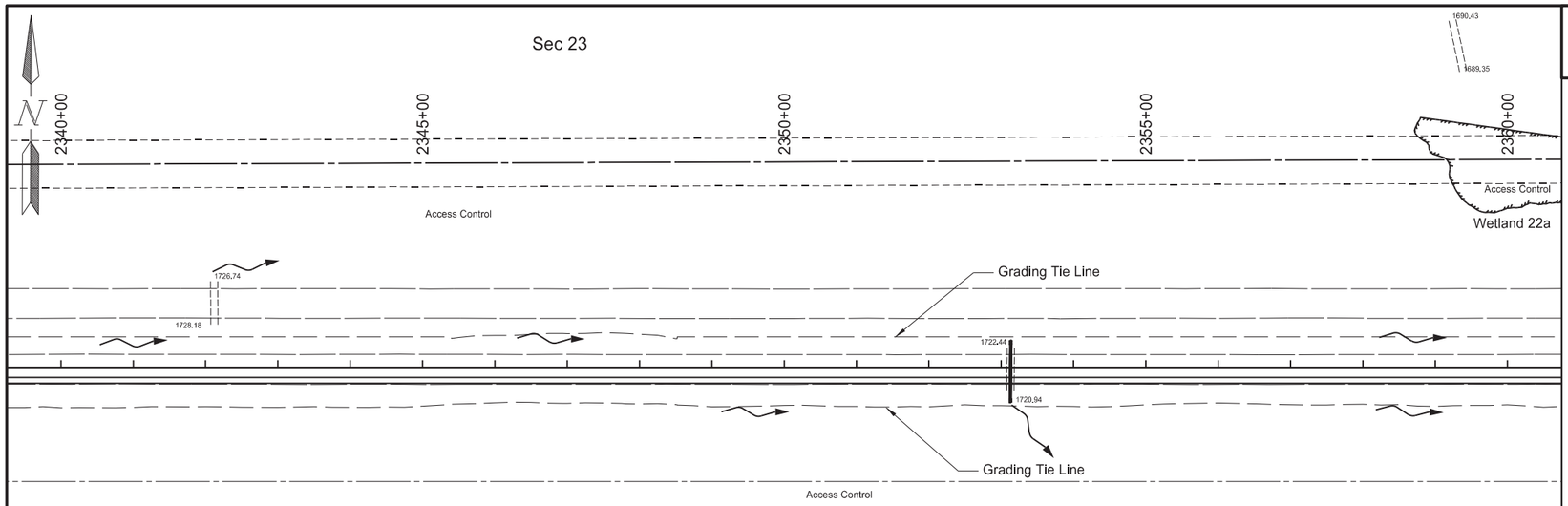
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

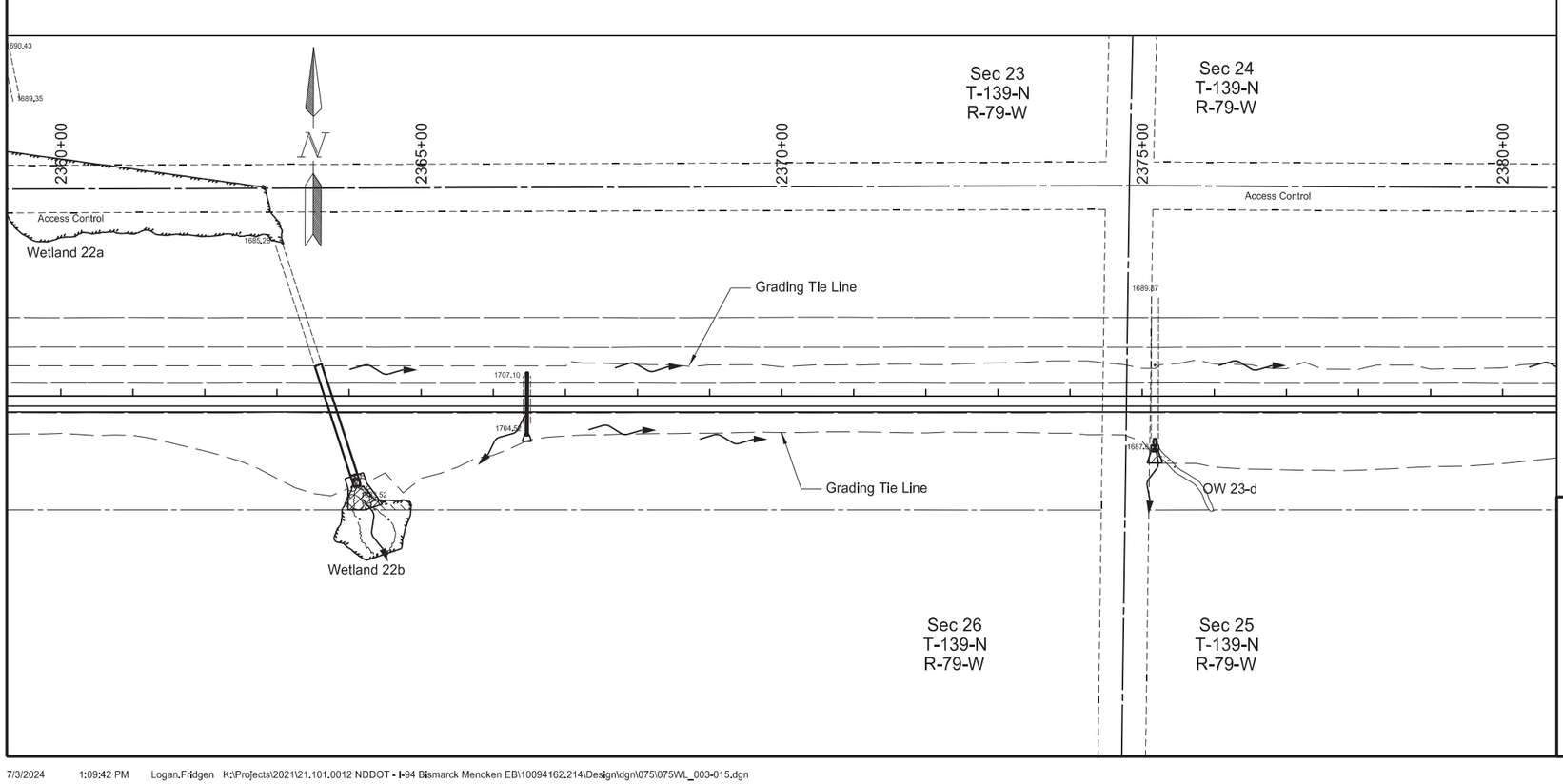
REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:17:38 -05'00'
NORTH DAKOTA

7/3/2024 1:09:40 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\075\075WL_003-015.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	75	9



Sec 26



Wetland Impacts			
Sta 2340+00 to 2380+00			
Wetland #	Temporary Wetland Impact	Permanent Wetland Impact	
		Fill / Drain	Cut
#22b	0.016 Acre	0.025 Acre	0 Acre
#24a	0 Acre	0 Acre	0 Acre
#24b	0.055 Acre	0.032 Acre	0 Acre
#25	0 Acre	0 Acre	0 Acre

Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

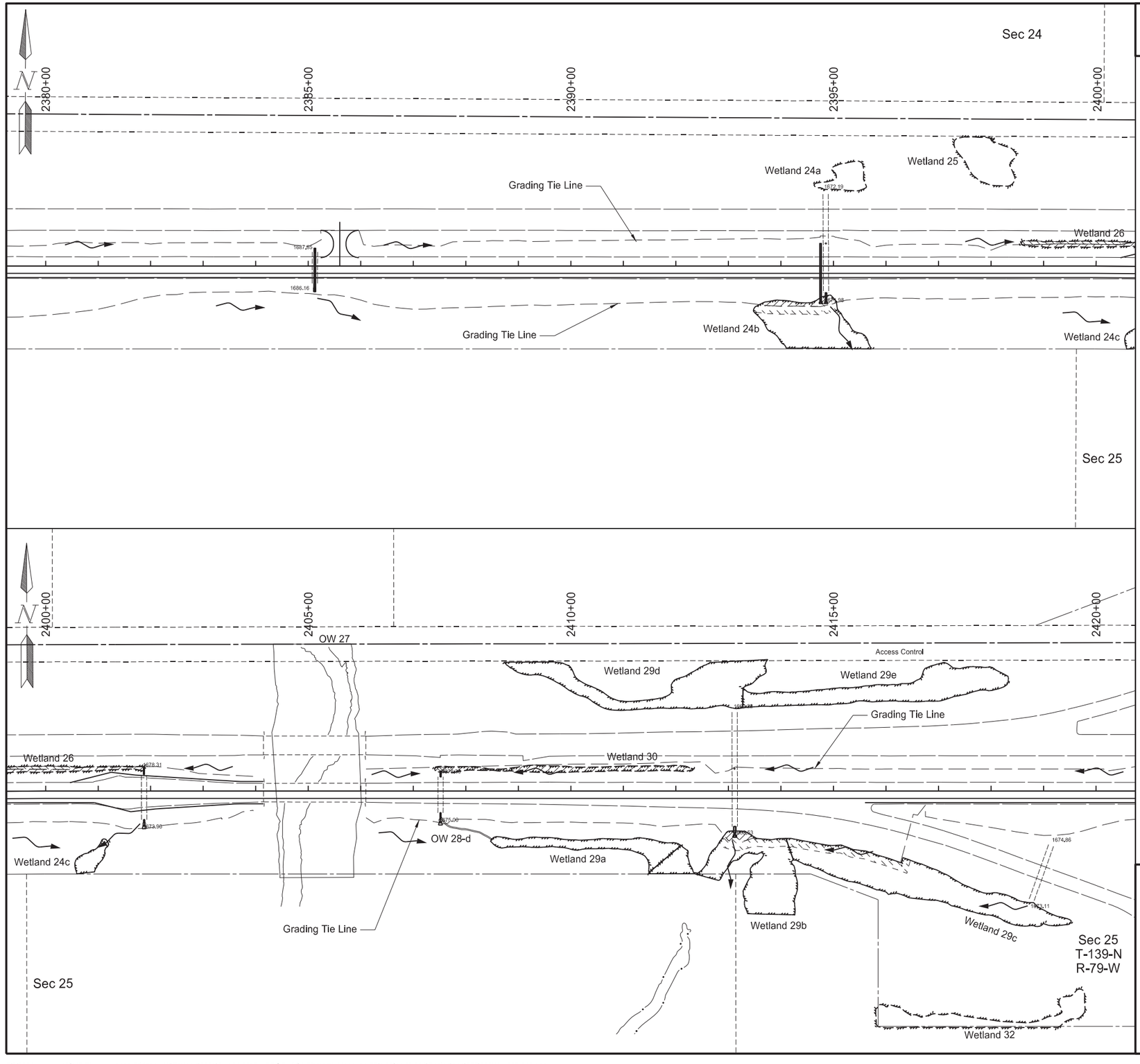
Wetlands, Mitigation, and Environmental

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:17:56 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	75	10



Wetland Impacts			
Sta 2380+00 to 2420+00			
Wetland #	Temporary Wetland Impact	Permanent Wetland Impact	
		Fill / Drain	Cut
#24c	0 Acre	0 Acre	0 Acre
#25	0 Acre	0 Acre	0 Acre
#26	0.026 Acre	0.040 Acre	0 Acre
#29a	0 Acre	0 Acre	0 Acre
#29b	0.049 Acre	0.018 Acre	0 Acre
#29c	0.085 Acre	0 Acre	0 Acre
#29d	0 Acre	0 Acre	0 Acre
#29e	0 Acre	0 Acre	0 Acre
#30	0.003 Acre	0.098 Acre	0 Acre
#32	0 Acre	0 Acre	0 Acre

Other Water Impacts			
Sta 2380+00 to 2420+00			
Other Waters #	Temporary Other Waters Impact	Permanent Other Waters Impact	
		Fill / Drain	Cut
#OW 27	0 Acre	0 Acre	0 Acre

Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

Wetlands, Mitigation, and Environmental

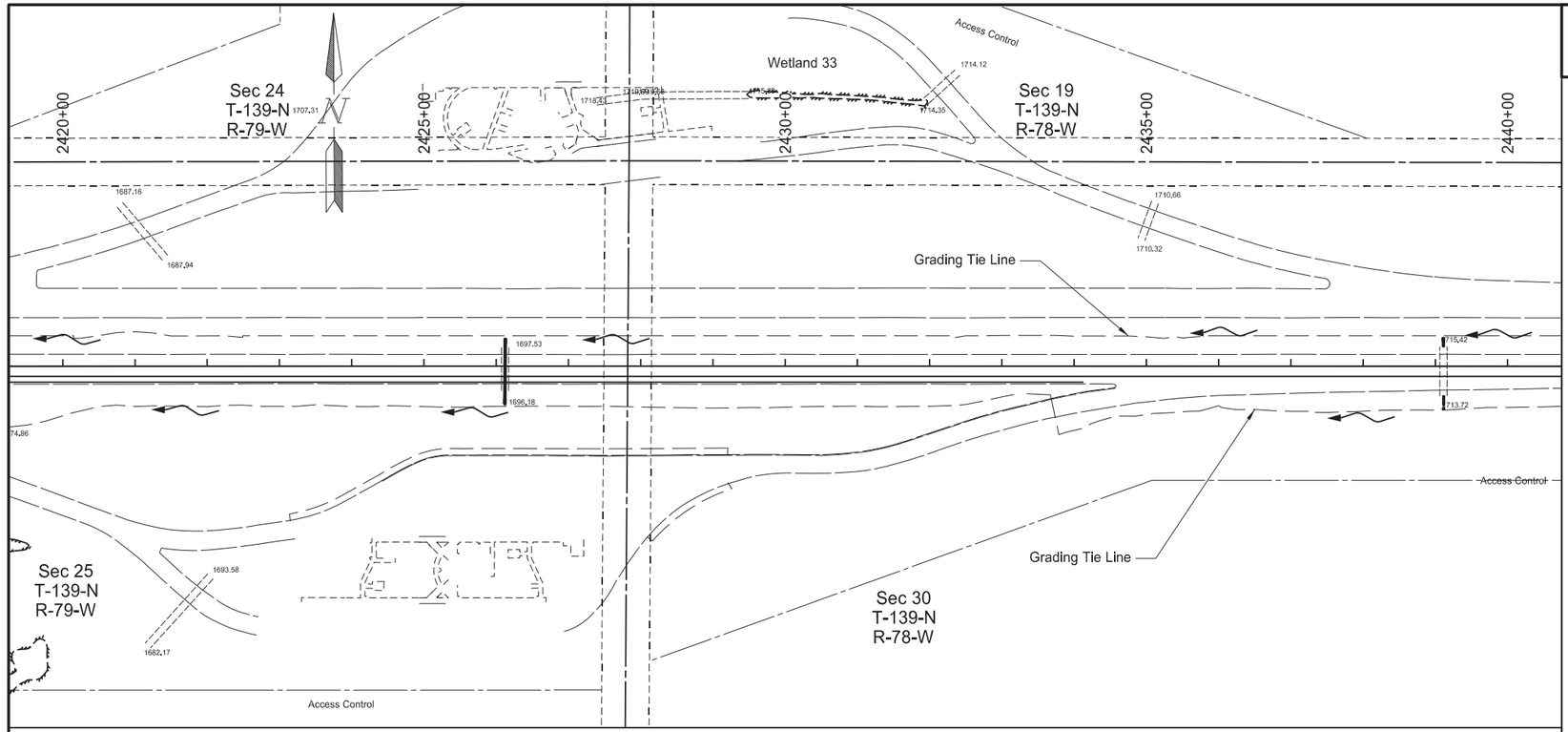
I-94 Reconstruction

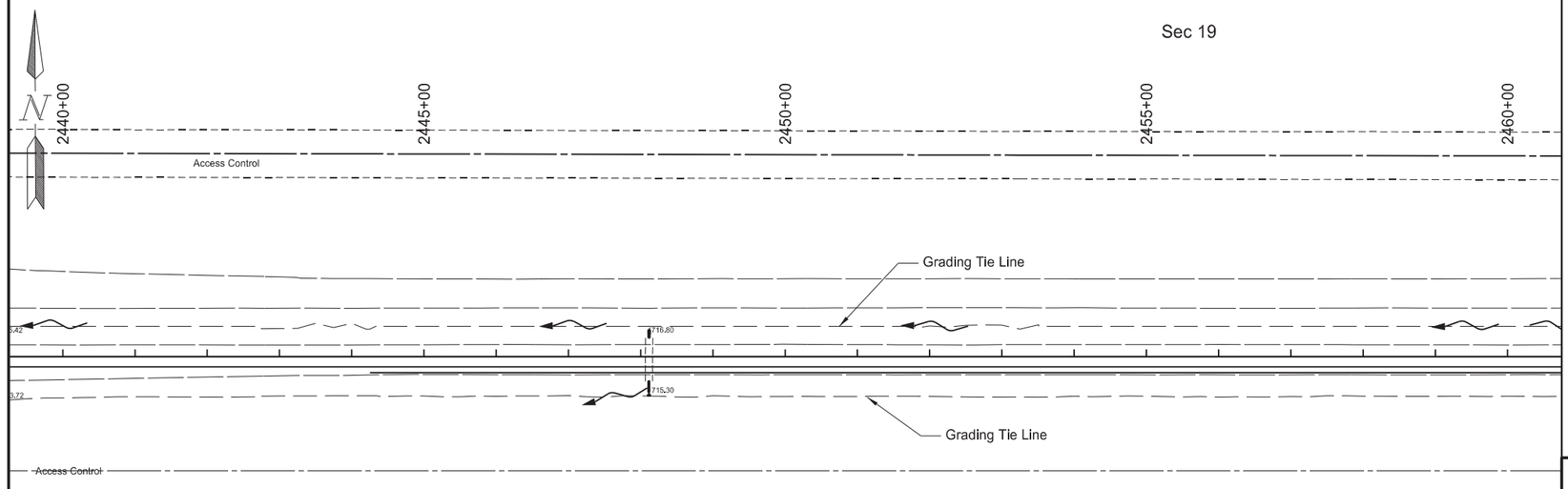
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:18:13 -05'00'
NORTH DAKOTA

7/3/2024 1:09:42 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\075\075WL_003-015.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	75	11





Wetland Impacts			
Sta 2420+00 to 2460+00			
Wetland #	Temporary Wetland Impact	Permanent Wetland Impact	
		Fill / Drain	Cut
#33	0 Acre	0 Acre	0 Acre

Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

Wetlands, Mitigation, and Environmental

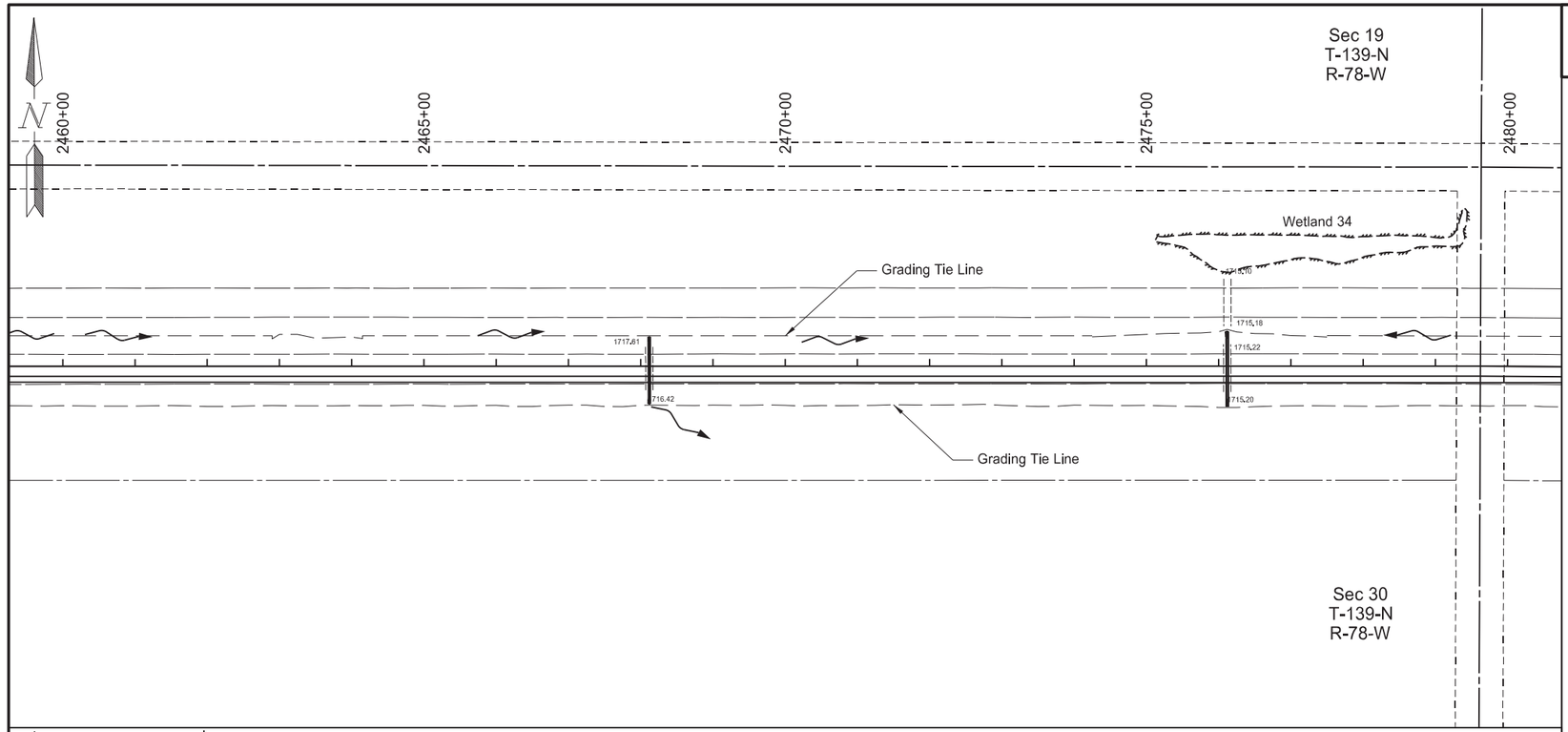
I-94 Reconstruction

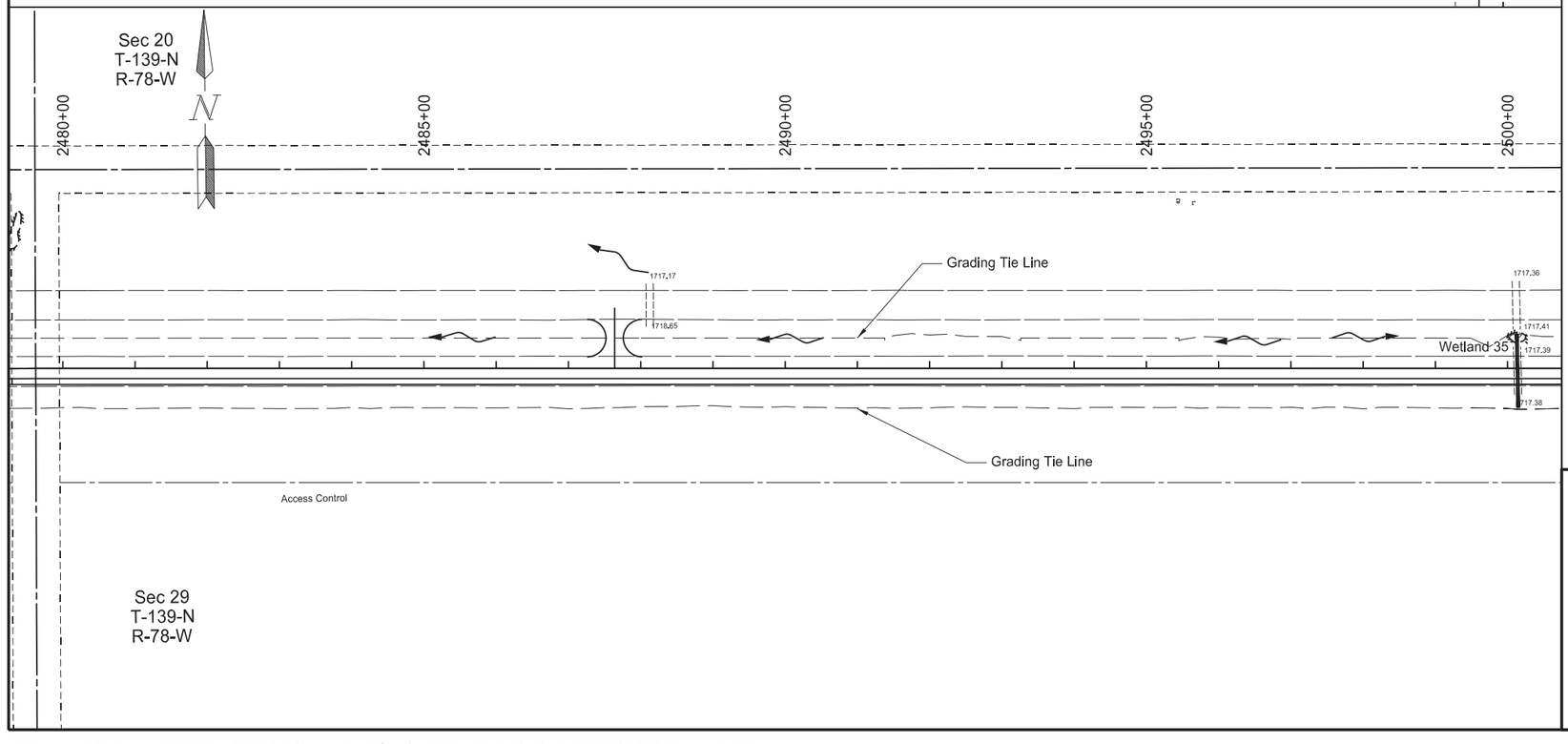
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:18:29 -05'00'
NORTH DAKOTA

7/3/2024 1:09:44 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\075\075WL_003-015.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	75	12





Wetland Impacts			
Sta 2460+00 to 2500+00			
Wetland #	Temporary Wetland Impact	Permanent Wetland Impact	
		Fill / Drain	Cut
#34	0 Acre	0 Acre	0 Acre
#35	0.001 Acre	0.005 Acre	0 Acre

Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

Wetlands, Mitigation, and Environmental

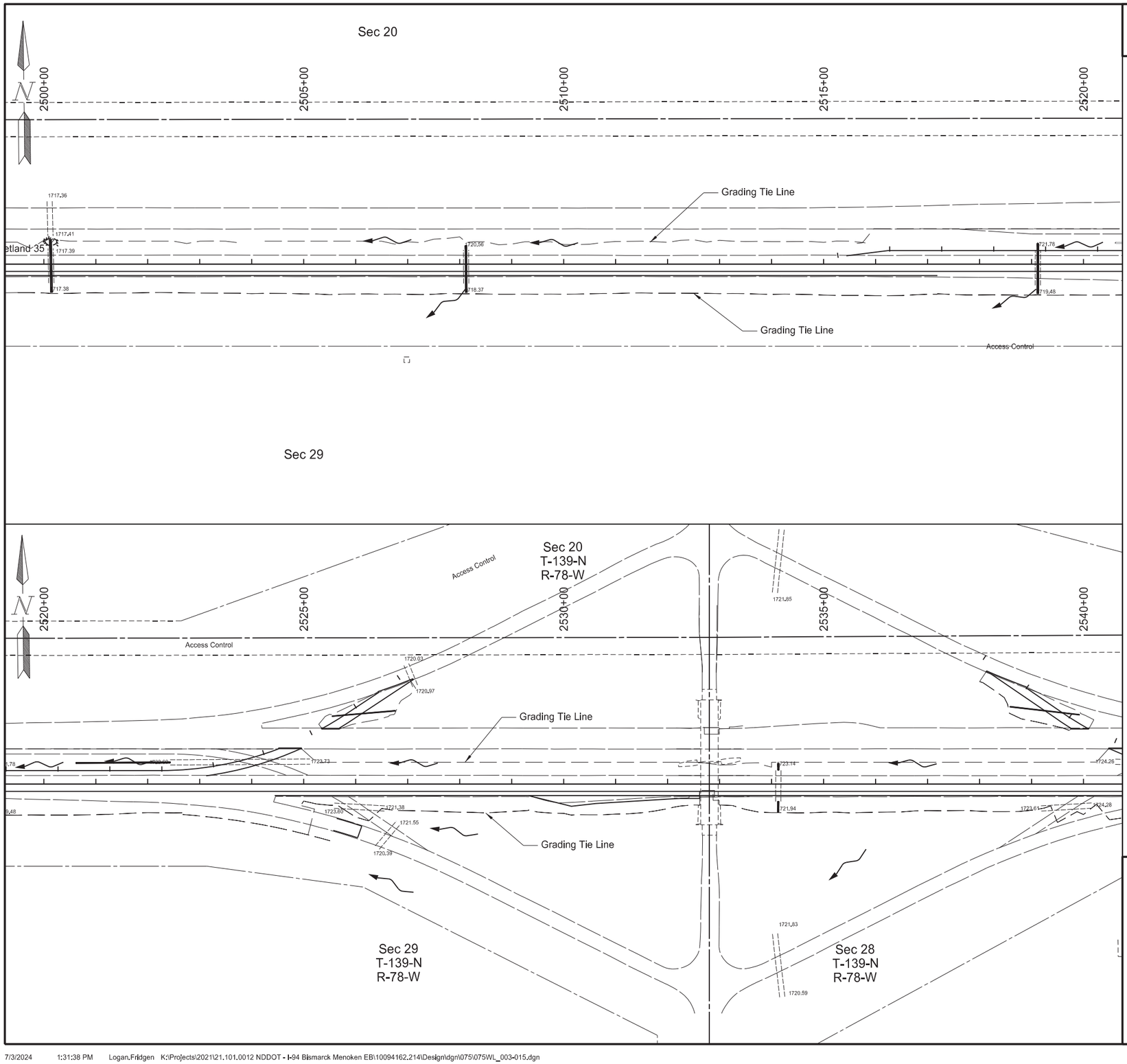
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:18:43 -05'00'
NORTH DAKOTA

7/3/2024 1:09:46 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\075\075WL_003-015.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	75	13



Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

Wetlands, Mitigation, and Environmental

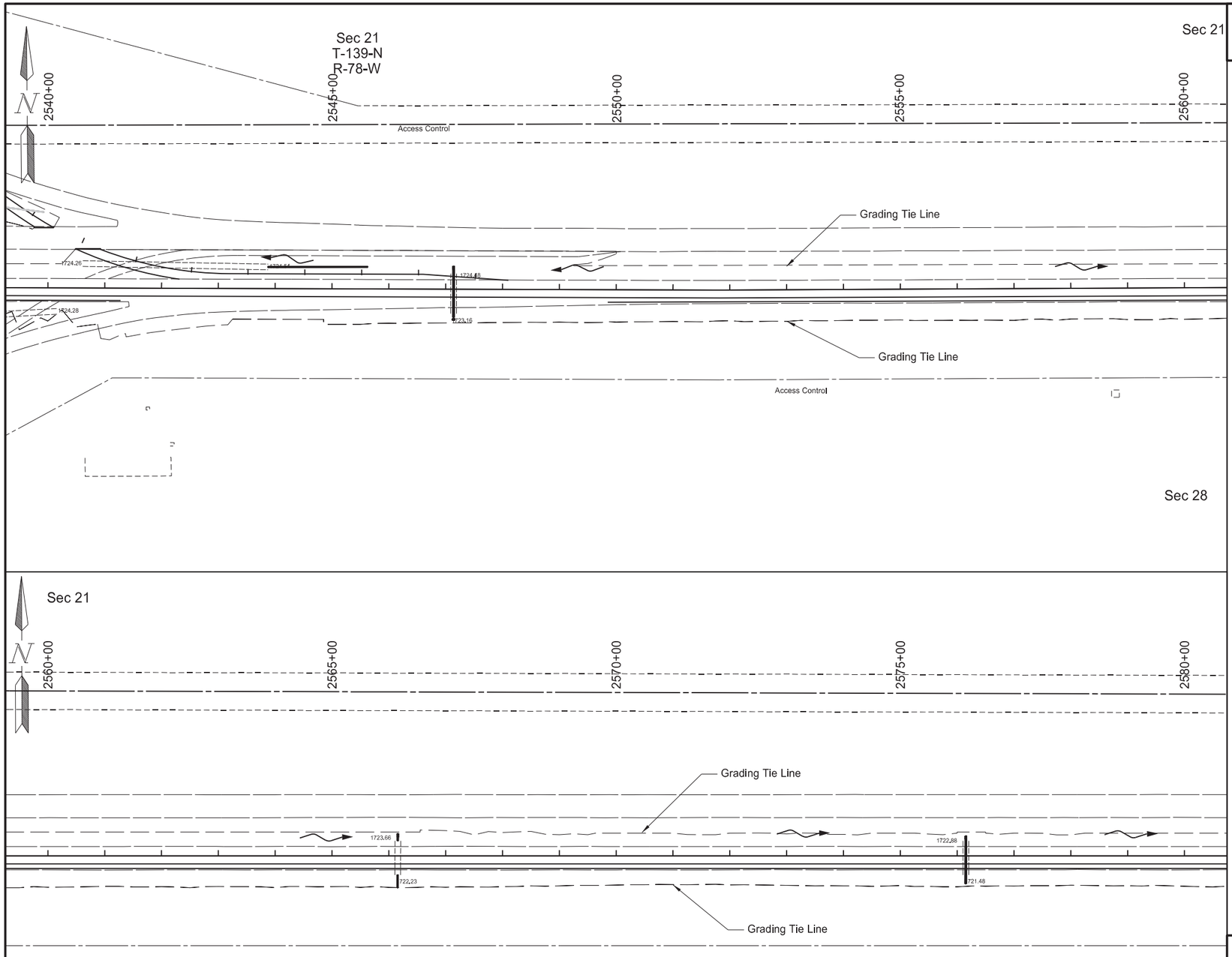
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:18:59 -05'00'
NORTH DAKOTA

7/3/2024 1:31:38 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\075\075WL_003-015.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	75	14



Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

Wetlands, Mitigation, and Environmental

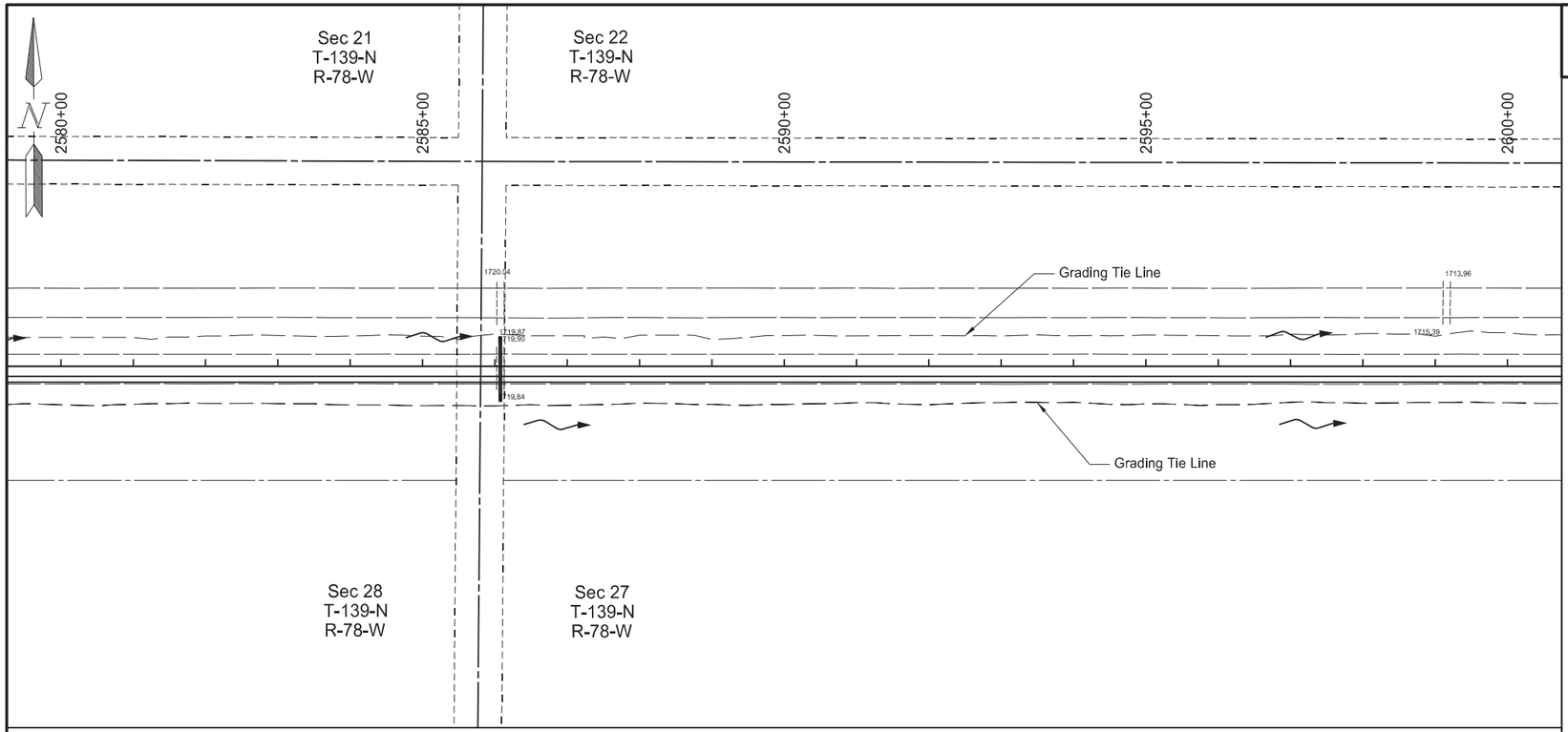
I-94 Reconstruction

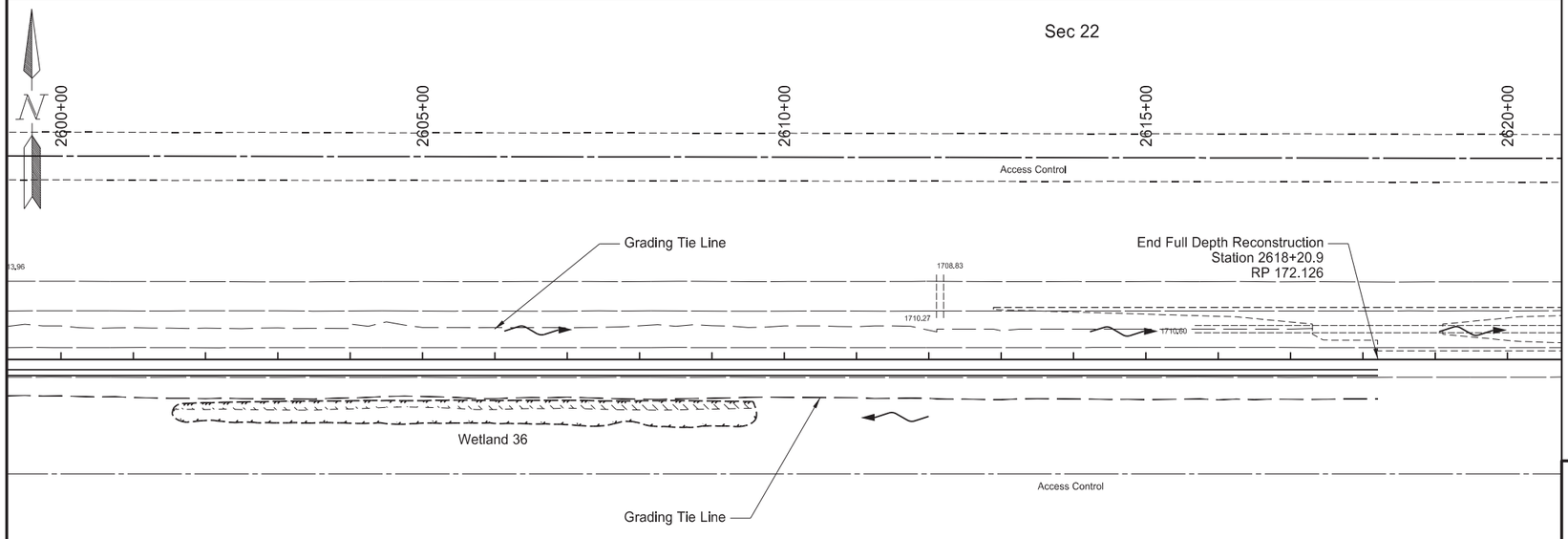
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:19:16 -05'00'
NORTH DAKOTA

7/3/2024 1:32:22 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\075\075WL_003-015.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	75	15





Wetland Impacts			
Sta 2580+00 to 2618+20.90			
Wetland #	Temporary Wetland Impact	Permanent Wetland Impact	
		Fill / Drain	Cut
#36	0.205 Acre	0 Acre	0 Acre

Legend

- Temporary Impact
- Permanent Fill / Drain Impact
- Permanent Cut Impact
- Permanent Fill/Drain Impact Other Waters
- Temporary Impact Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Other Waters/Other Waters - D
- Exst Delineated Wetland - JD
- Exst Delineated Wetland - Non-JD

Wetlands, Mitigation, and Environmental

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.16 11:19:31 -05'00'
NORTH DAKOTA

7/3/2024 1:09:49 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\075\075WL_003-015.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	76	1

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	8.86	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.86	ACRE
260	0100	SILT FENCE UNSUPPORTED		
		Sta 2110+69 - 144' Rt to Sta 2112+32 - 98' Rt	172	LF
		Sta 2120+91 - 105' Rt to Sta 2121+36 - 155' Rt	72	LF
		Sta 2122+98 - 154' Rt to Sta 2122+33 - 129' Rt	43	LF
260	0101	REMOVE SILT FENCE UNSUPPORTED		
		Sta 2110+69 - 144' Rt to Sta 2112+32 - 98' Rt	172	LF
		Sta 2120+91 - 105' Rt to Sta 2121+36 - 155' Rt	72	LF
		Sta 2122+98 - 154' Rt to Sta 2122+33 - 129' Rt	43	LF
261	0112	FIBER ROLLS 12IN		
		Sta 2103+00 to Sta 2123+00 Lt	96	LF
		Sta 2103+00 to Sta 2123+00 Rt	1,288	LF
		Sta 2123+00 to Sta 2143+00 Lt	750	LF
		Sta 2123+00 to Sta 2143+00 Rt	496	LF
		Culvert Inlet Locations (32 LF EA)	128	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 2103+00 to Sta 2123+00 Lt	96	LF
		Sta 2103+00 to Sta 2123+00 Rt	1,288	LF
		Sta 2123+00 to Sta 2143+00 Lt	750	LF
		Sta 2123+00 to Sta 2143+00 Rt	496	LF
		Culvert Inlet Locations (32 LF EA)	128	LF

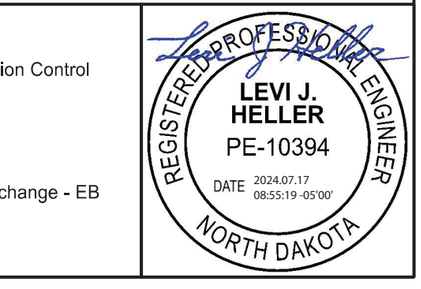
Legend

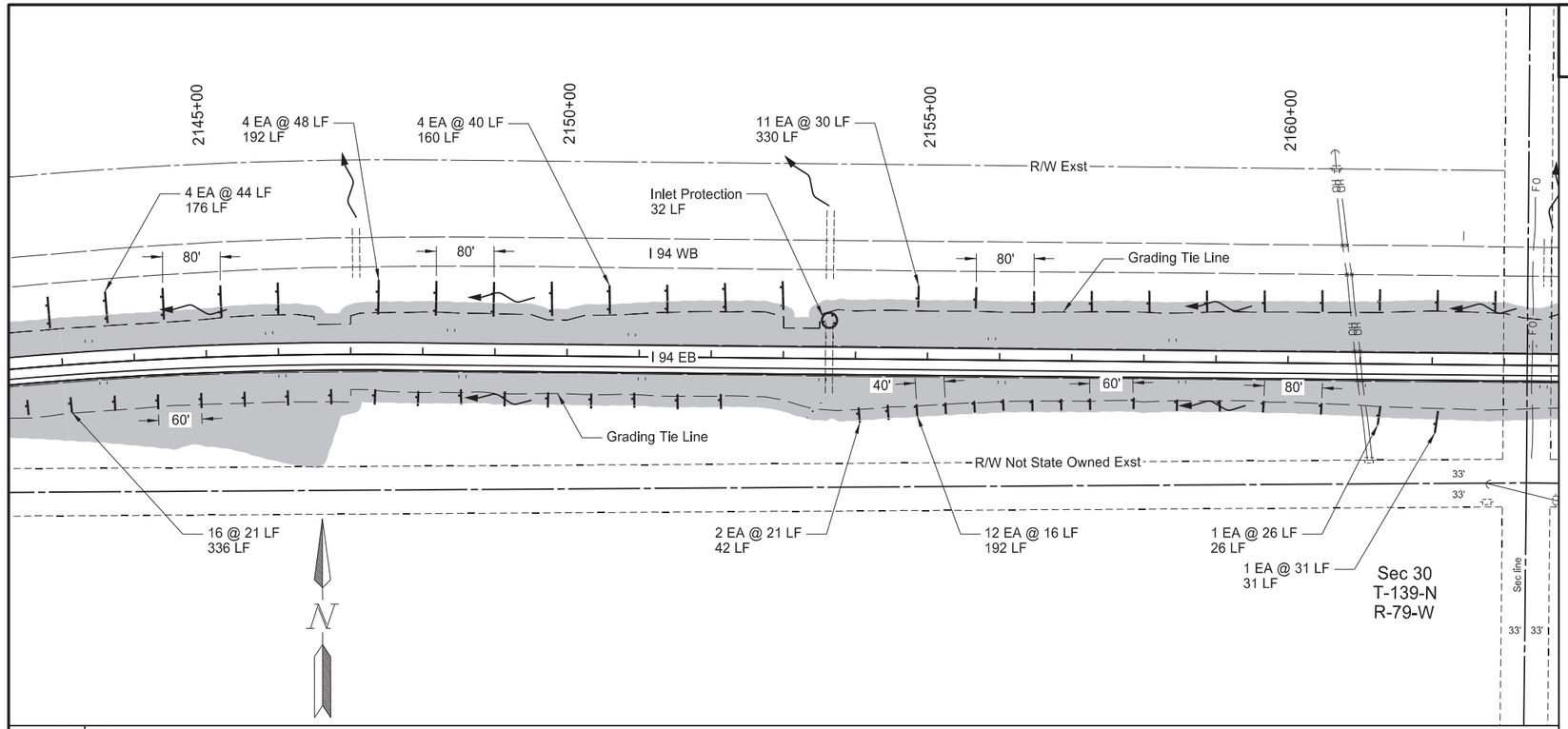
- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

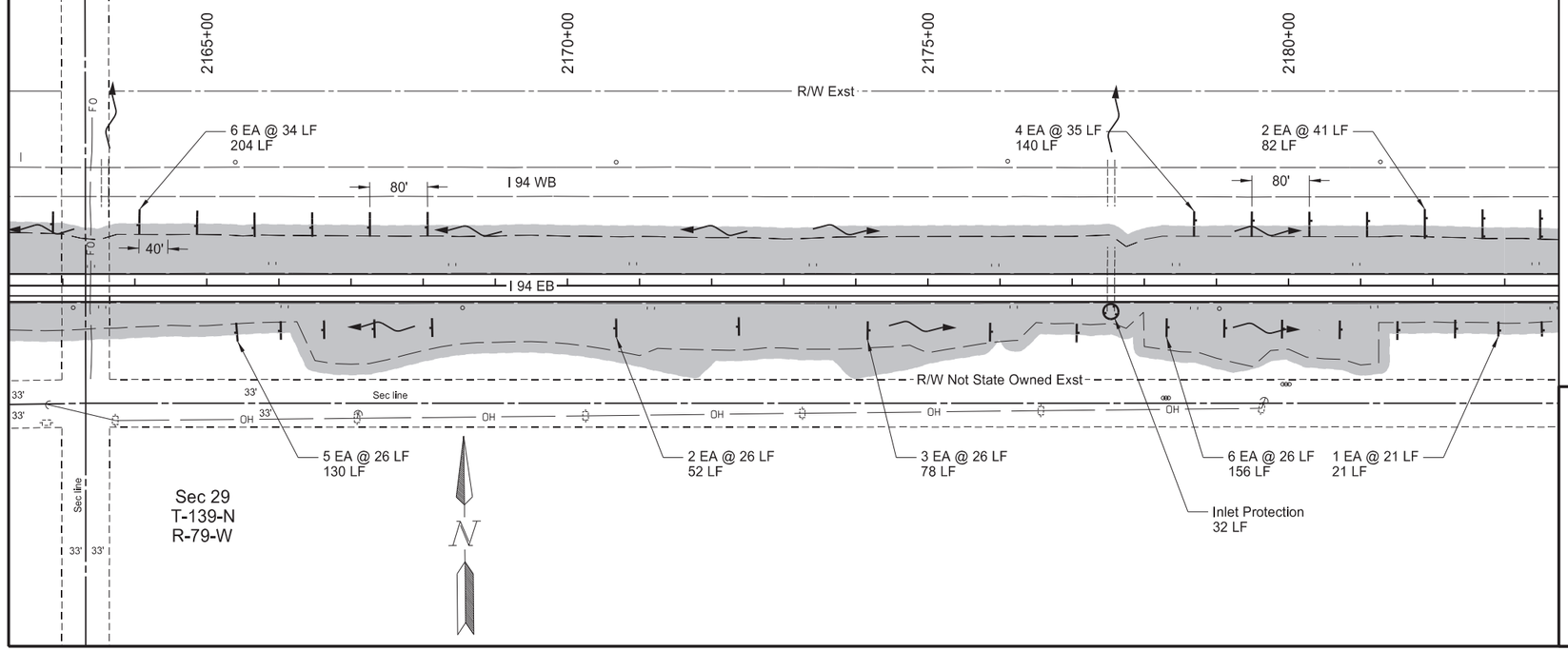
Temporary Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB







	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	76	2

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	12.07	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	12.07	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 2143+00 to Sta 2163+00 Lt	858	LF
		Sta 2143+00 to Sta 2163+00 Rt	627	LF
		Sta 2163+00 to Sta 2183+00 Lt	426	LF
		Sta 2163+00 to Sta 2183+00 Rt	437	LF
		Culvert Inlet Locations (32 LF EA)	64	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 2143+00 to Sta 2163+00 Lt	858	LF
		Sta 2143+00 to Sta 2163+00 Rt	627	LF
		Sta 2163+00 to Sta 2183+00 Lt	426	LF
		Sta 2163+00 to Sta 2183+00 Rt	437	LF
		Culvert Inlet Locations (32 LF EA)	64	LF

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

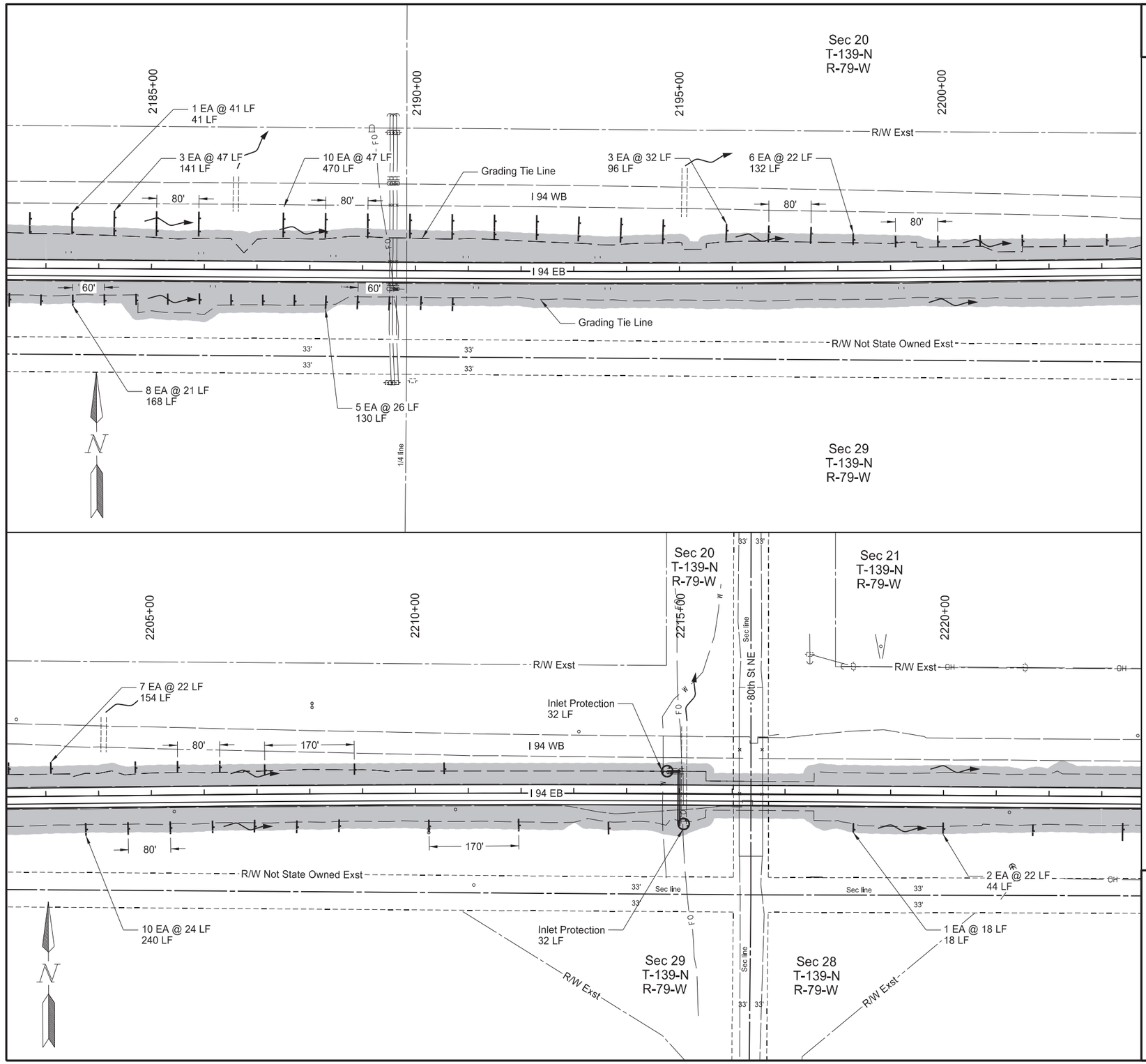
Temporary Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 08:55:59 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	76	3



SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	8.68	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.68	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 2183+00 to Sta 2203+00 Lt	880	LF
		Sta 2183+00 to Sta 2203+00 Rt	298	LF
		Sta 2203+00 to Sta 2223+00 Lt	154	LF
		Sta 2203+00 to Sta 2223+00 Rt	302	LF
		Culvert Inlet Locations (32 LF EA)	64	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 2183+00 to Sta 2203+00 Lt	880	LF
		Sta 2183+00 to Sta 2203+00 Rt	298	LF
		Sta 2203+00 to Sta 2223+00 Lt	154	LF
		Sta 2203+00 to Sta 2223+00 Rt	302	LF
		Culvert Inlet Locations (32 LF EA)	64	LF

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

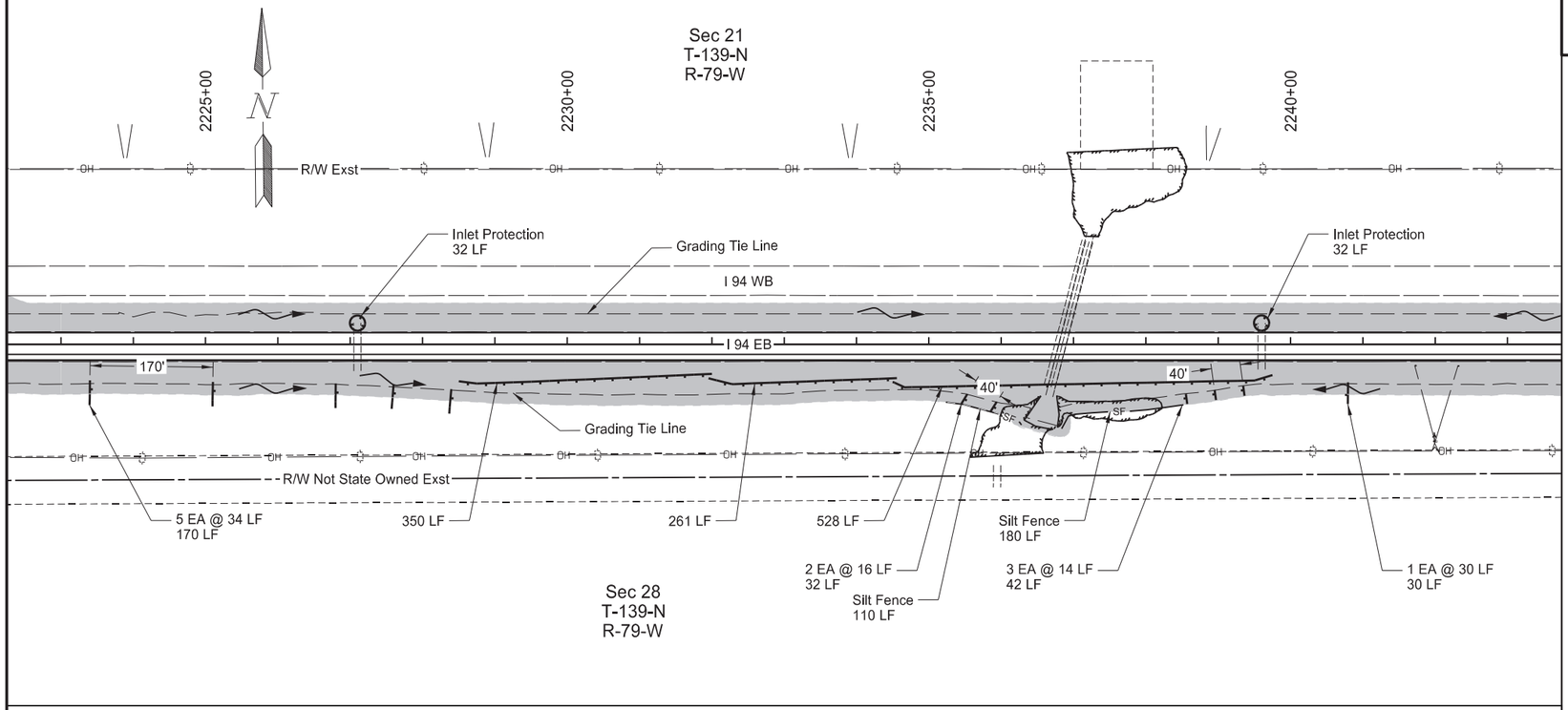
Temporary Sediment and Erosion Control

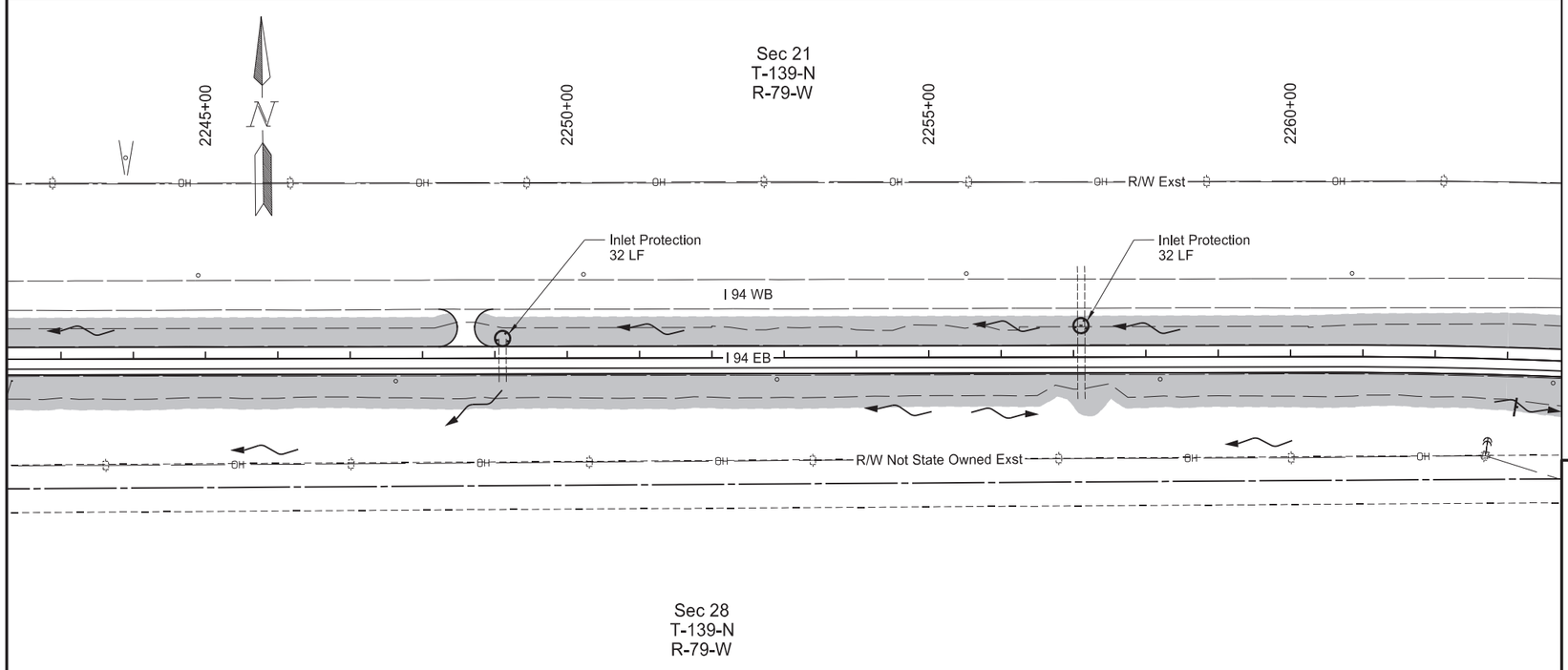
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 08:58:22 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	76	4





SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	8.56	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.56	ACRE
260	0100	SILT FENCE UNSUPPORTED		
		Sta 2235+23 - 80' Rt to Sta 2236+28 - 110' Rt	110	LF
		Sta 2236+84 - 115' Rt to Sta 2238+52 - 84' Rt	180	LF
260	0101	REMOVE SILT FENCE UNSUPPORTED		
		Sta 2235+23 - 80' Rt to Sta 2236+28 - 110' Rt	110	LF
		Sta 2236+84 - 115' Rt to Sta 2238+52 - 84' Rt	180	LF
261	0112	FIBER ROLLS 12IN		
		Sta 2223+00 to Sta 2243+00 Rt	1,413	LF
		Culvert Inlet Locations (32 LF EA)	128	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 2223+00 to Sta 2243+00 Rt	1,413	LF
		Culvert Inlet Locations (32 LF EA)	128	LF

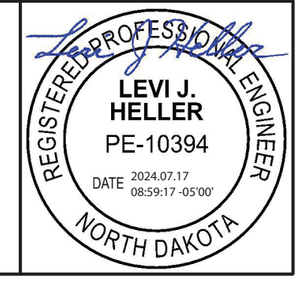
Legend

- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

Temporary Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	76	5

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	9.44	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	9.44	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 2263+00 to Sta 2283+00 Lt	88	LF
		Sta 2263+00 to Sta 2283+00 Rt	574	LF
		Sta 2283+00 to Sta 2303+00 Lt	264	LF
		Sta 2283+00 to Sta 2303+00 Rt	1,659	LF
		Culvert Inlet Locations (32 LF EA)	96	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 2263+00 to Sta 2283+00 Lt	88	LF
		Sta 2263+00 to Sta 2283+00 Rt	574	LF
		Sta 2283+00 to Sta 2303+00 Lt	264	LF
		Sta 2283+00 to Sta 2303+00 Rt	1,659	LF
		Culvert Inlet Locations (32 LF EA)	96	LF

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

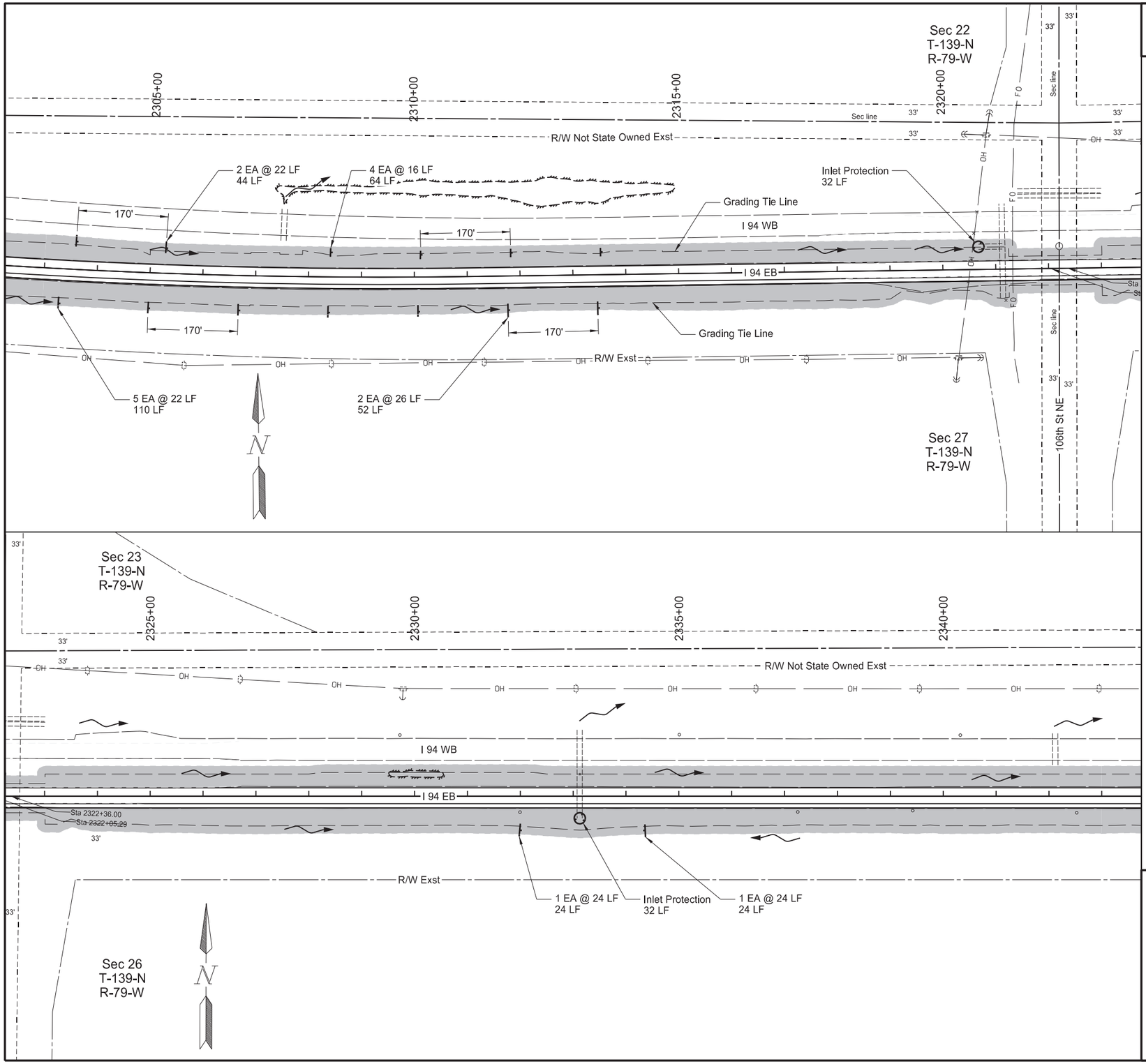
Temporary Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 09:00:17 -05'00'
NORTH DAKOTA

7/3/2024 1:50:23 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\076\076TE.dgn



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	76	6

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	8.05	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.05	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 2303+00 to Sta 2323+00 Lt	108	LF
		Sta 2303+00 to Sta 2323+00 Rt	162	LF
		Sta 2323+00 to Sta 2343+00 Rt	48	LF
		Culvert Inlet Locations (32 LF EA)	64	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 2303+00 to Sta 2323+00 Lt	108	LF
		Sta 2303+00 to Sta 2323+00 Rt	162	LF
		Sta 2323+00 to Sta 2343+00 Rt	48	LF
		Culvert Inlet Locations (32 LF EA)	64	LF

Legend

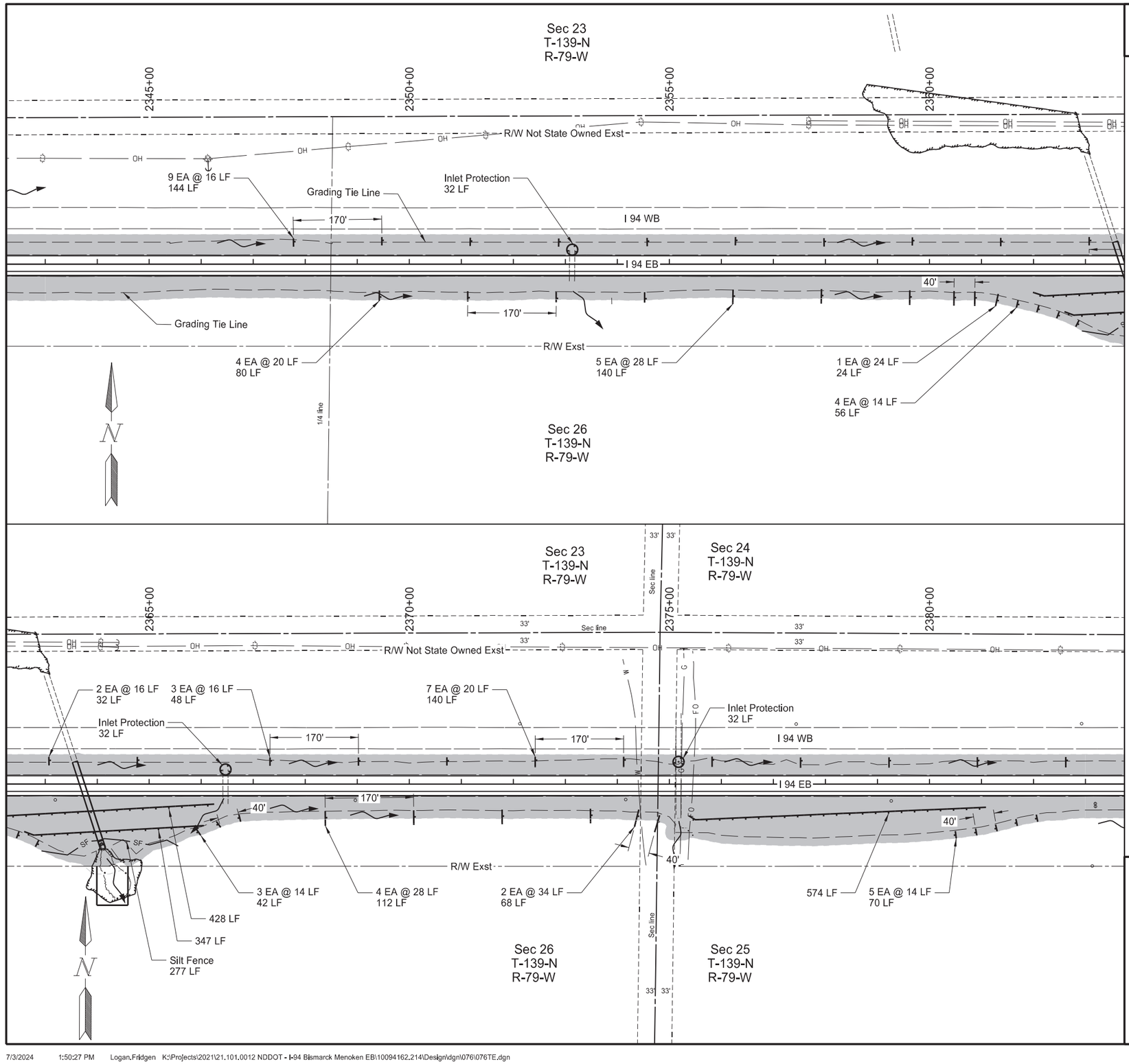
- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

Temporary Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 09:00:50 -05'00'
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	76	7

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	9.27	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	9.27	ACRE
260	0100	SILT FENCE UNSUPPORTED		
		Sta 2362+93 - 128' Rt to Sta 2365+56 - 119' Rt	277	LF
260	0101	REMOVE SILT FENCE UNSUPPORTED		
		Sta 2362+93 - 128' Rt to Sta 2365+56 - 119' Rt	277	LF
261	0112	FIBER ROLLS 12IN		
		Sta 2343+00 to Sta 2363+00 Lt	144	LF
		Sta 2343+00 to Sta 2363+00 Rt	300	LF
		Sta 2363+00 to Sta 2383+00 Lt	220	LF
		Sta 2363+00 to Sta 2383+00 Rt	1,641	LF
		Culvert Inlet Locations (32 LF EA)	96	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 2343+00 to Sta 2363+00 Lt	144	LF
		Sta 2343+00 to Sta 2363+00 Rt	300	LF
		Sta 2363+00 to Sta 2383+00 Lt	220	LF
		Sta 2363+00 to Sta 2383+00 Rt	1,641	LF
		Culvert Inlet Locations (32 LF EA)	96	LF

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

Temporary Sediment and Erosion Control

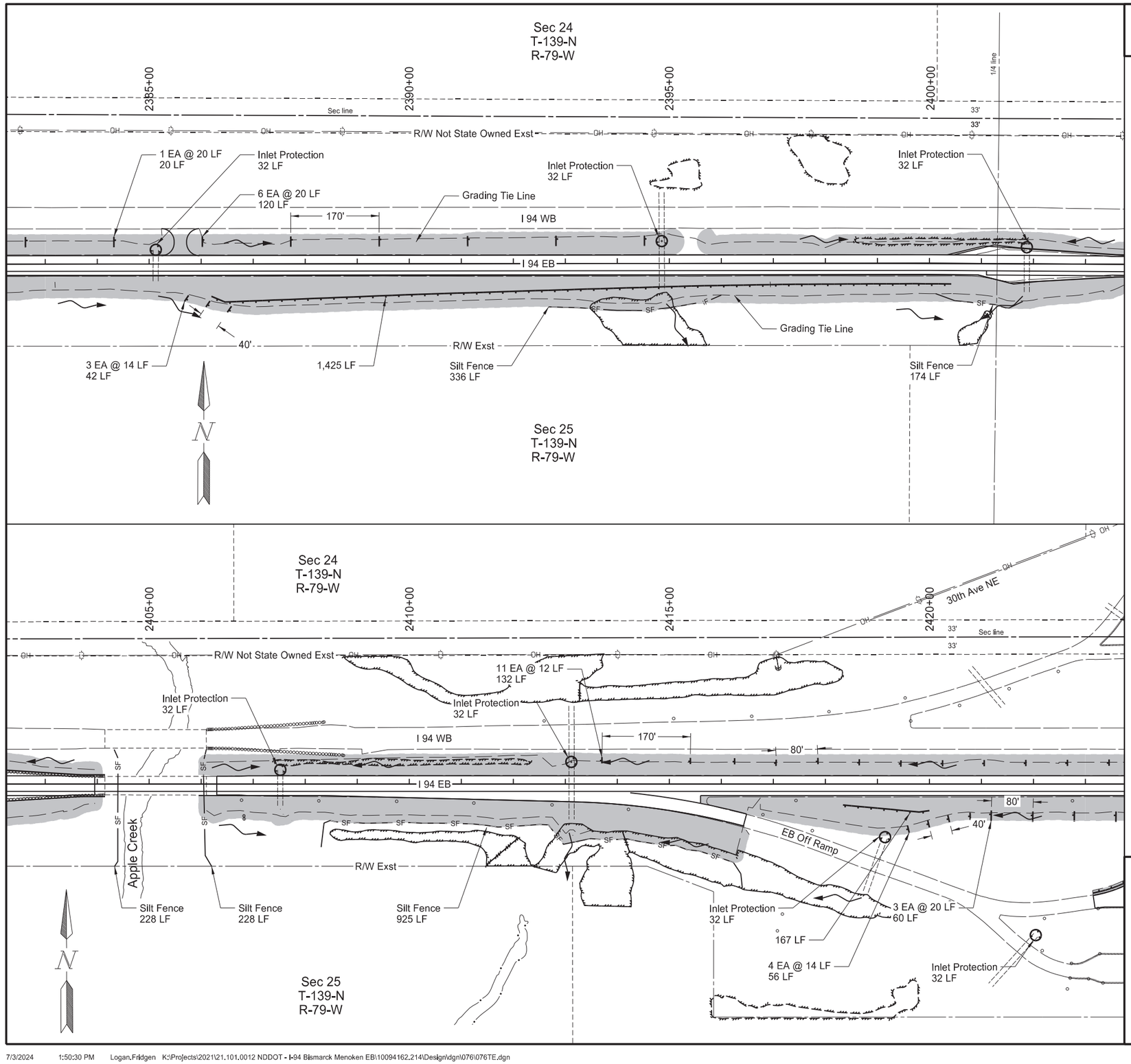
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 09:01:24 -05'00'
NORTH DAKOTA

7/3/2024 1:50:27 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\076\076TE.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	76	8



SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	8.53	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.53	ACRE
260	0100	SILT FENCE UNSUPPORTED		
		Sta 2392+68 - 83' Rt to Sta 2396+00 - 61' Rt	336	LF
		Sta 2400+12 - 59' Rt to Sta 2401+80 - 73' Rt	174	LF
		Sta 2404+33 - 66' Lt to Sta 2404+33 - 158' Rt	228	LF
		Sta 2406+10 - 67' Lt to Sta 2406+20 - 158' Rt	228	LF
		Sta 2408+30 - 121' Rt to Sta 2416+41 - 208' Rt	925	LF
260	0101	REMOVE SILT FENCE UNSUPPORTED		
		Sta 2392+68 - 83' Rt to Sta 2396+00 - 61' Rt	336	LF
		Sta 2400+12 - 59' Rt to Sta 2401+80 - 73' Rt	174	LF
		Sta 2404+33 - 66' Lt to Sta 2404+33 - 158' Rt	228	LF
		Sta 2406+10 - 67' Lt to Sta 2406+20 - 158' Rt	228	LF
		Sta 2408+30 - 121' Rt to Sta 2416+41 - 208' Rt	925	LF
261	0112	FIBER ROLLS 12IN		
		Sta 2383+00 to Sta 2403+00 Lt	140	LF
		Sta 2383+00 to Sta 2403+00 Rt	1,467	LF
		Sta 2403+00 to Sta 2423+00 Lt	132	LF
		Sta 2403+00 to Sta 2423+00 Rt	283	LF
		Culvert Inlet Locations (32 LF EA)	224	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 2383+00 to Sta 2403+00 Lt	140	LF
		Sta 2383+00 to Sta 2403+00 Rt	1,467	LF
		Sta 2403+00 to Sta 2423+00 Lt	132	LF
		Sta 2403+00 to Sta 2423+00 Rt	283	LF
		Culvert Inlet Locations (32 LF EA)	224	LF

Legend

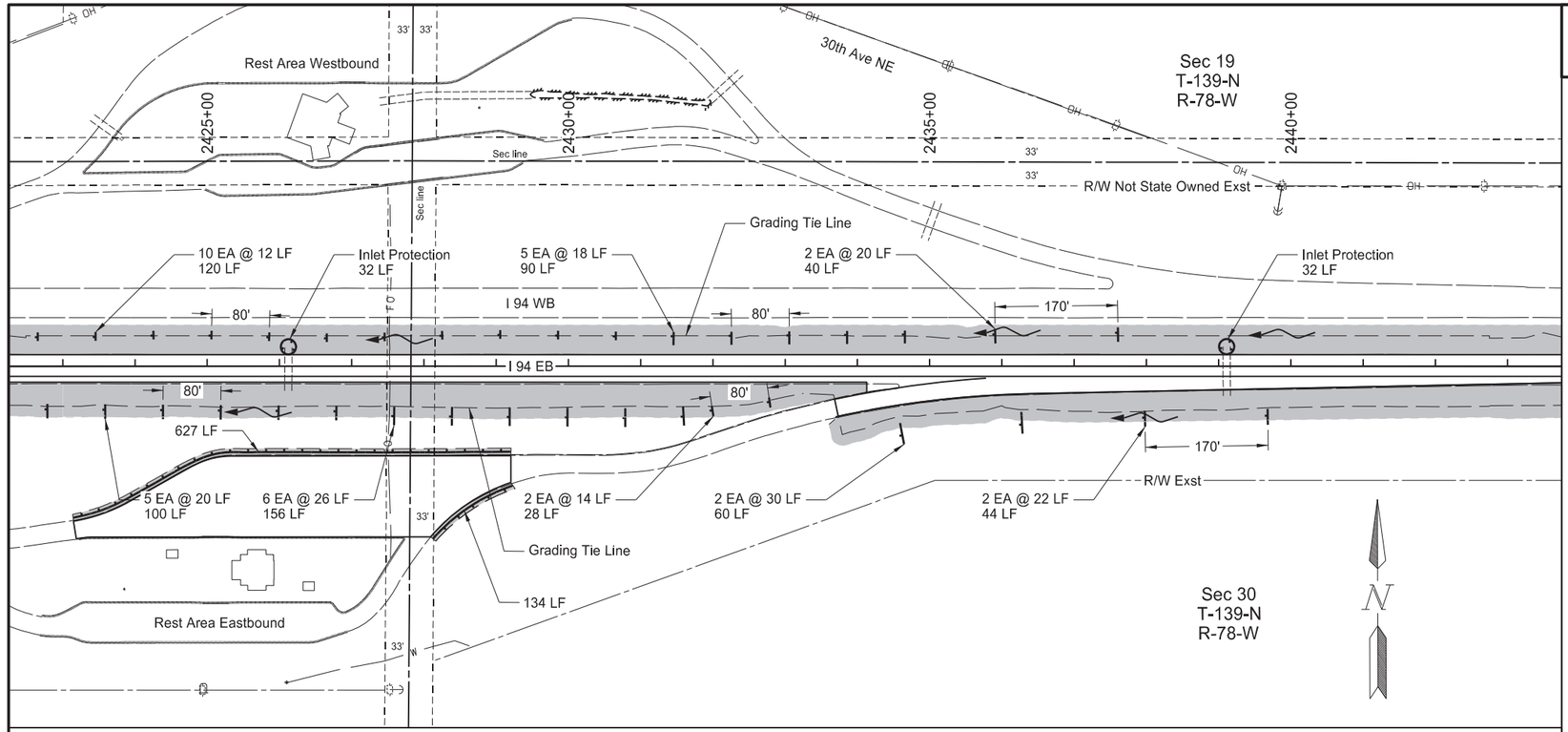
- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

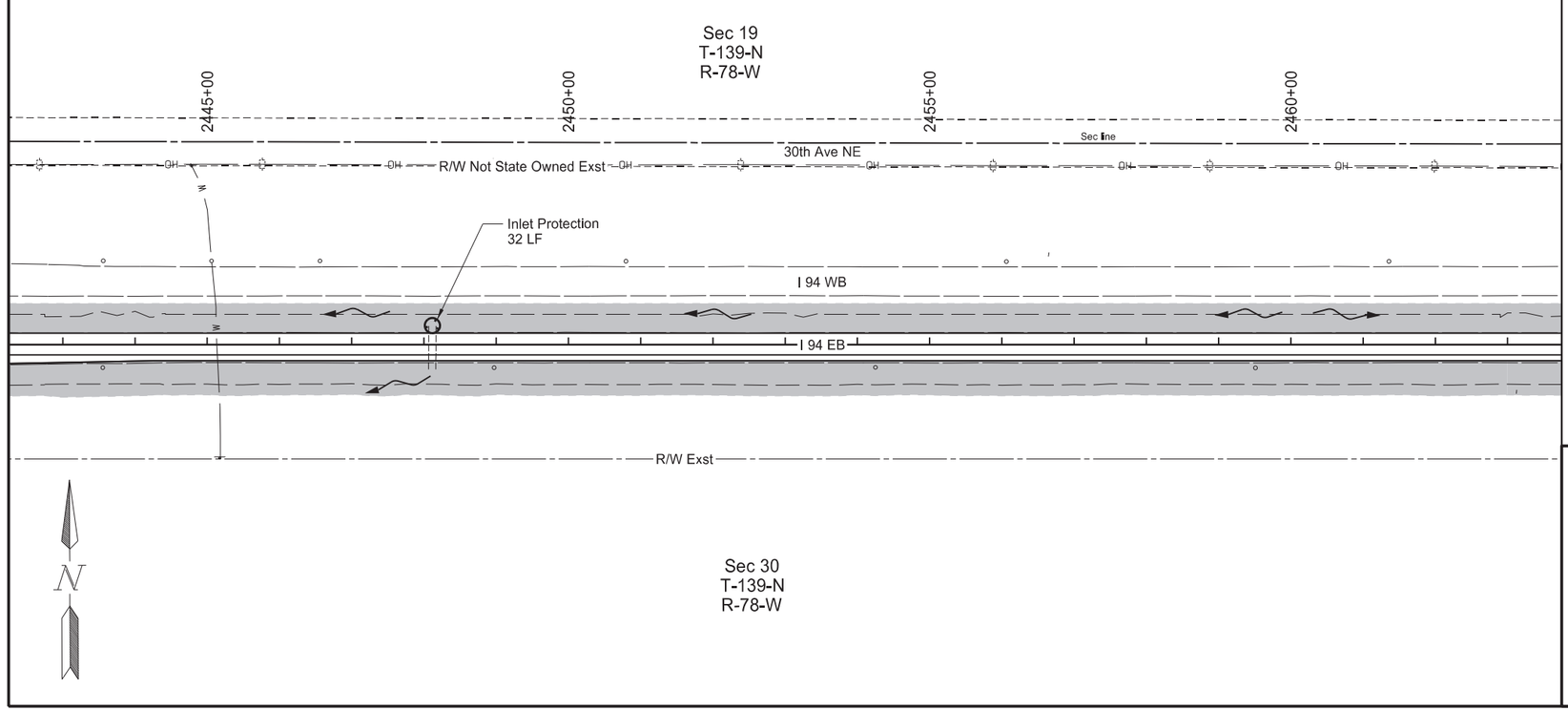
Temporary Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 09:01:54 -05'00'
NORTH DAKOTA





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	76	9

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	8.20	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.20	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 2423+00 to Sta 2443+00 Lt	250	LF
		Sta 2423+00 to Sta 2443+00 Rt	388	LF
		Culvert Inlet Locations (32 LF EA)	96	LF
		Rest Area Parking Lot	761	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 2423+00 to Sta 2443+00 Lt	250	LF
		Sta 2423+00 to Sta 2443+00 Rt	388	LF
		Culvert Inlet Locations (32 LF EA)	96	LF
		Rest Area Parking Lot	761	LF

Legend

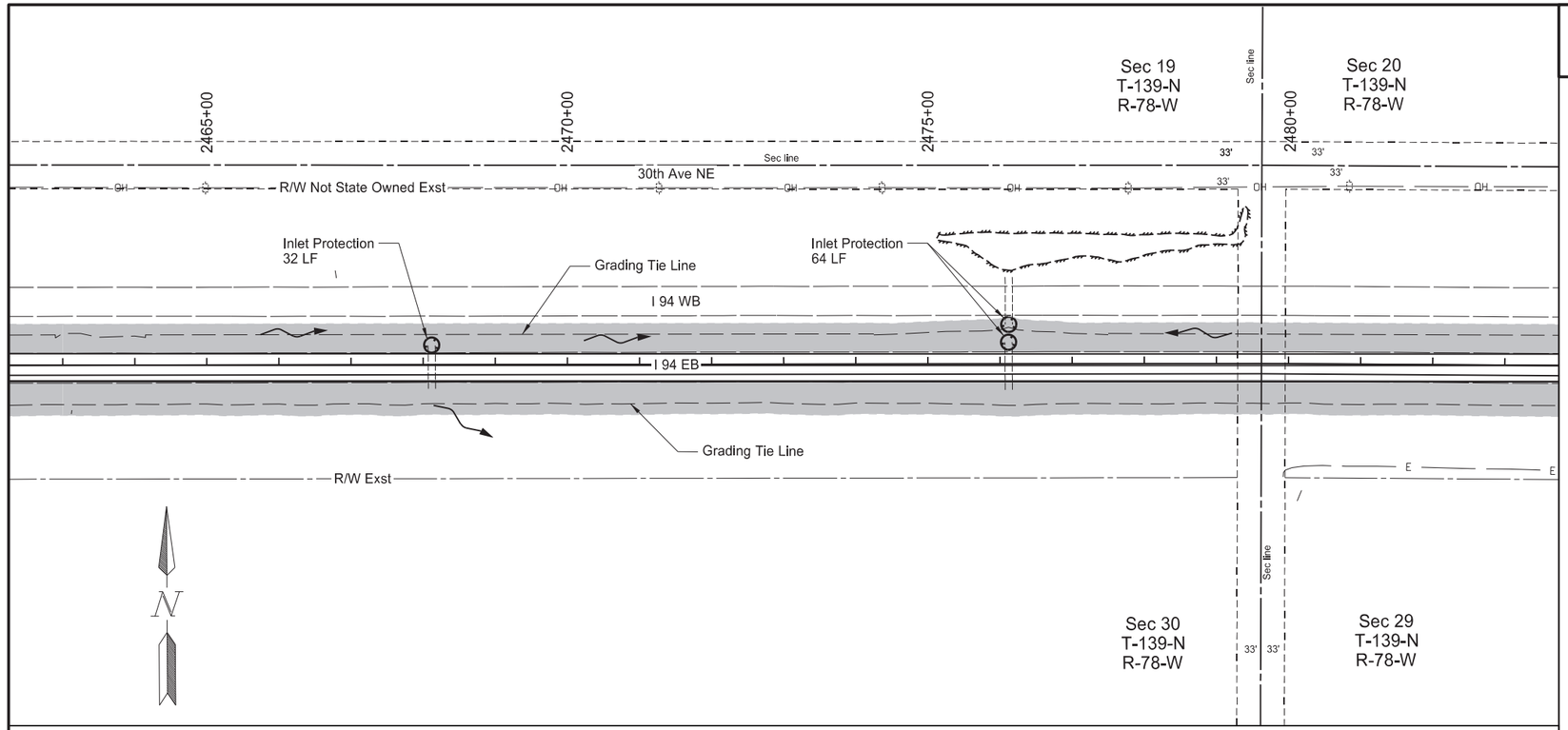
- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

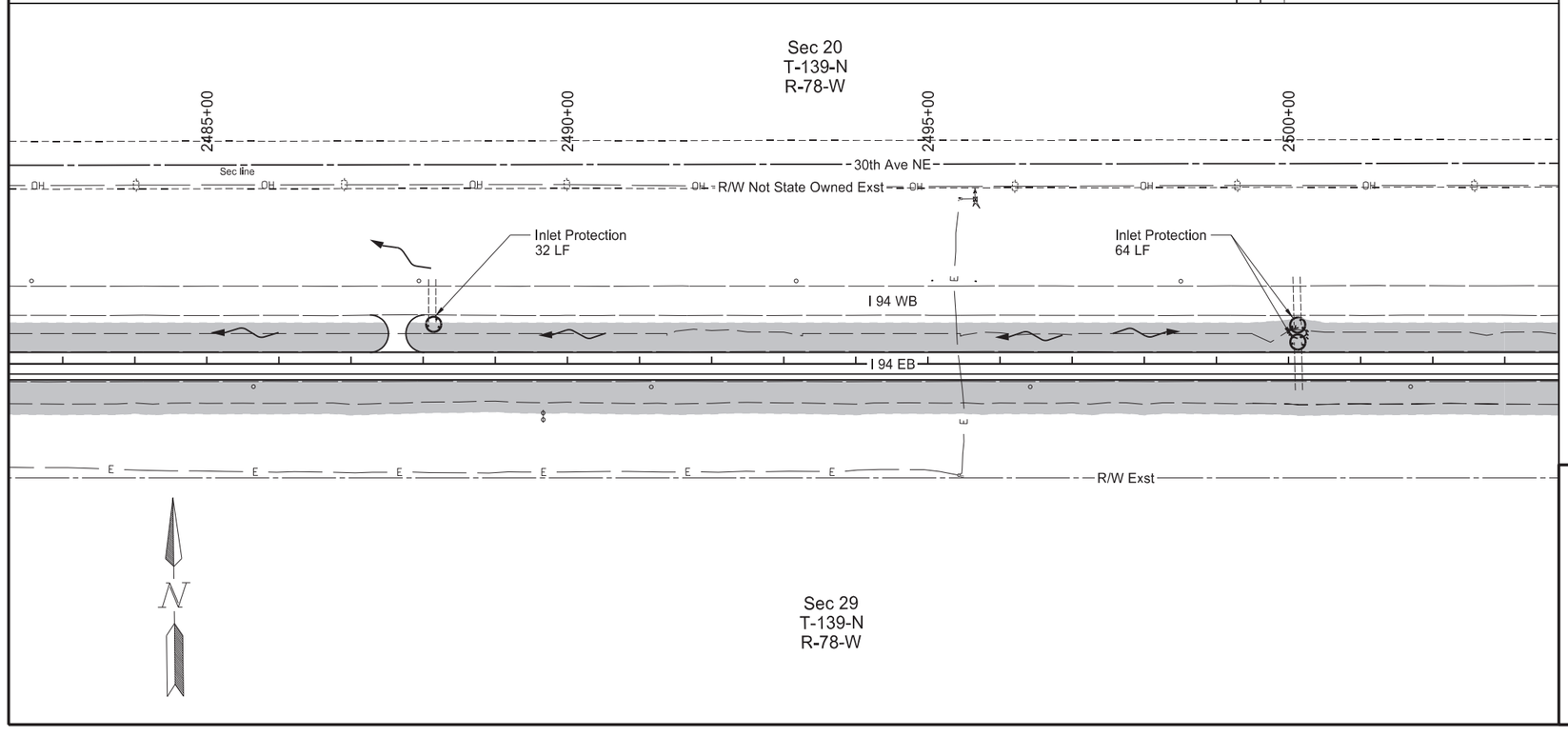
Temporary Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 09:02:29 -05'00'
NORTH DAKOTA





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	76	10

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	8.13	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.13	ACRE
261	0112	FIBER ROLLS 12IN		
		Culvert Inlet Locations (32 LF EA)	192	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Culvert Inlet Locations (32 LF EA)	192	LF

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

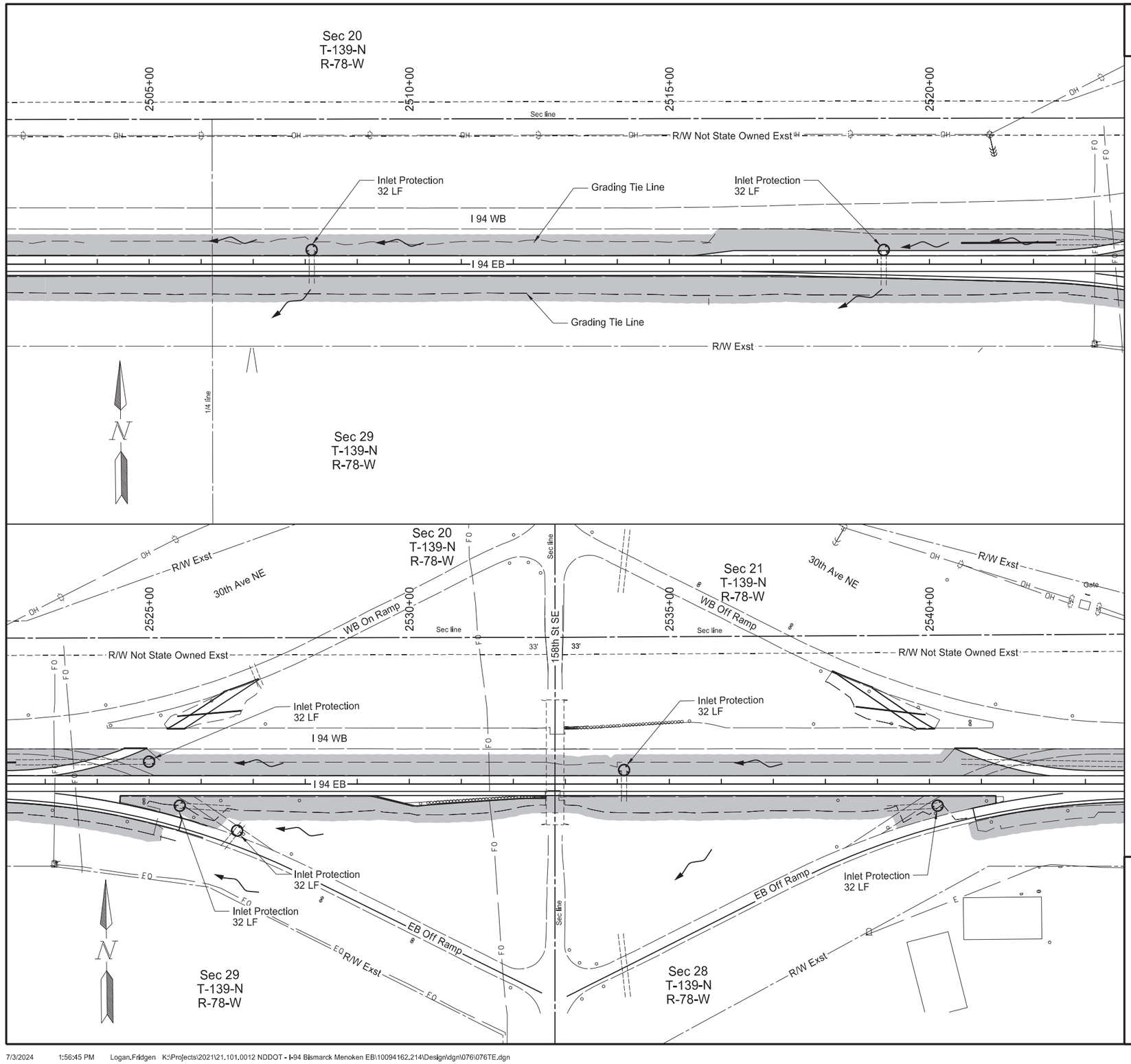
Temporary Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 09:03:06 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	76	11



SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	7.99	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	7.99	ACRE
261	0112	FIBER ROLLS 12IN		
		Culvert Inlet Locations (32 LF EA)	224	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Culvert Inlet Locations (32 LF EA)	224	LF

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

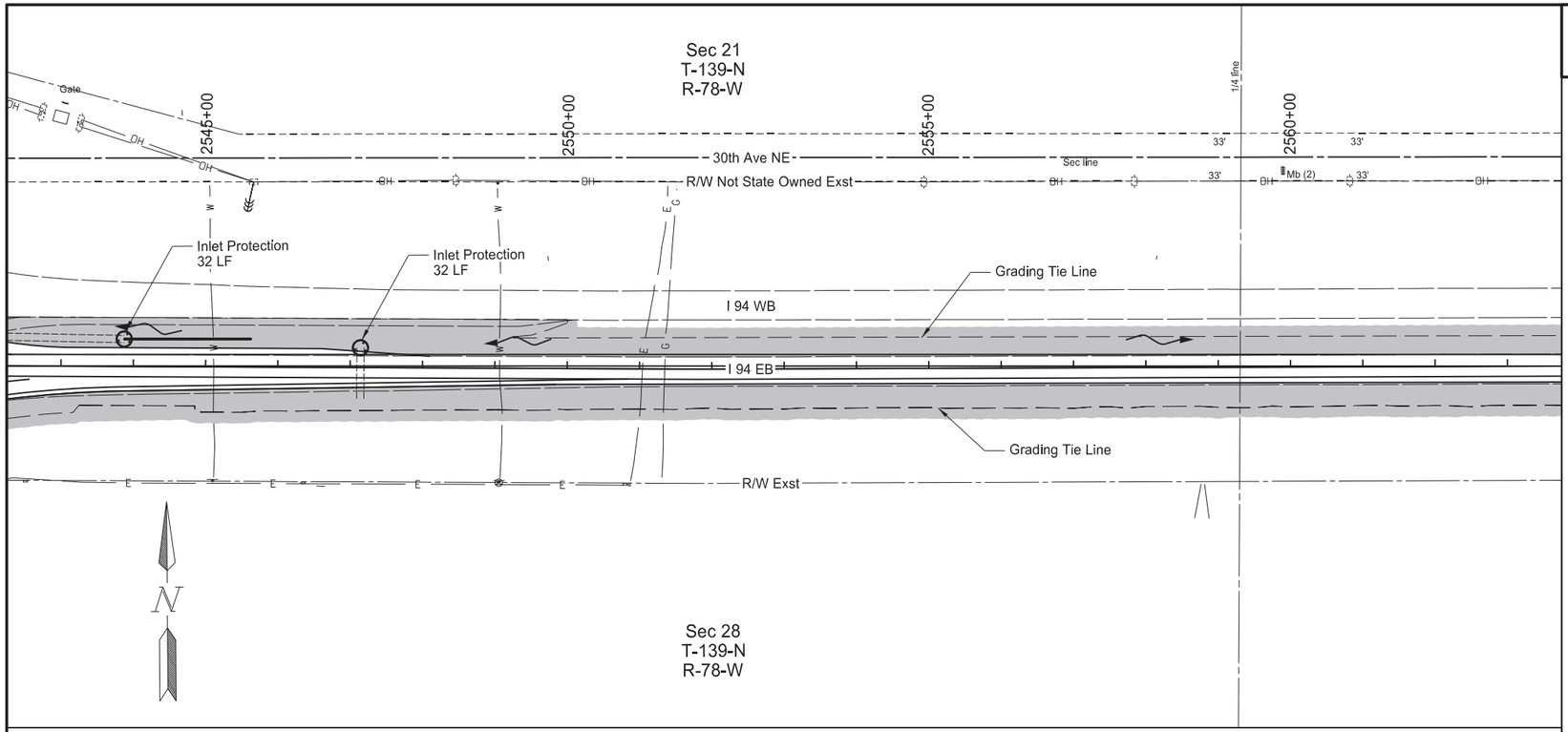
Temporary Sediment and Erosion Control

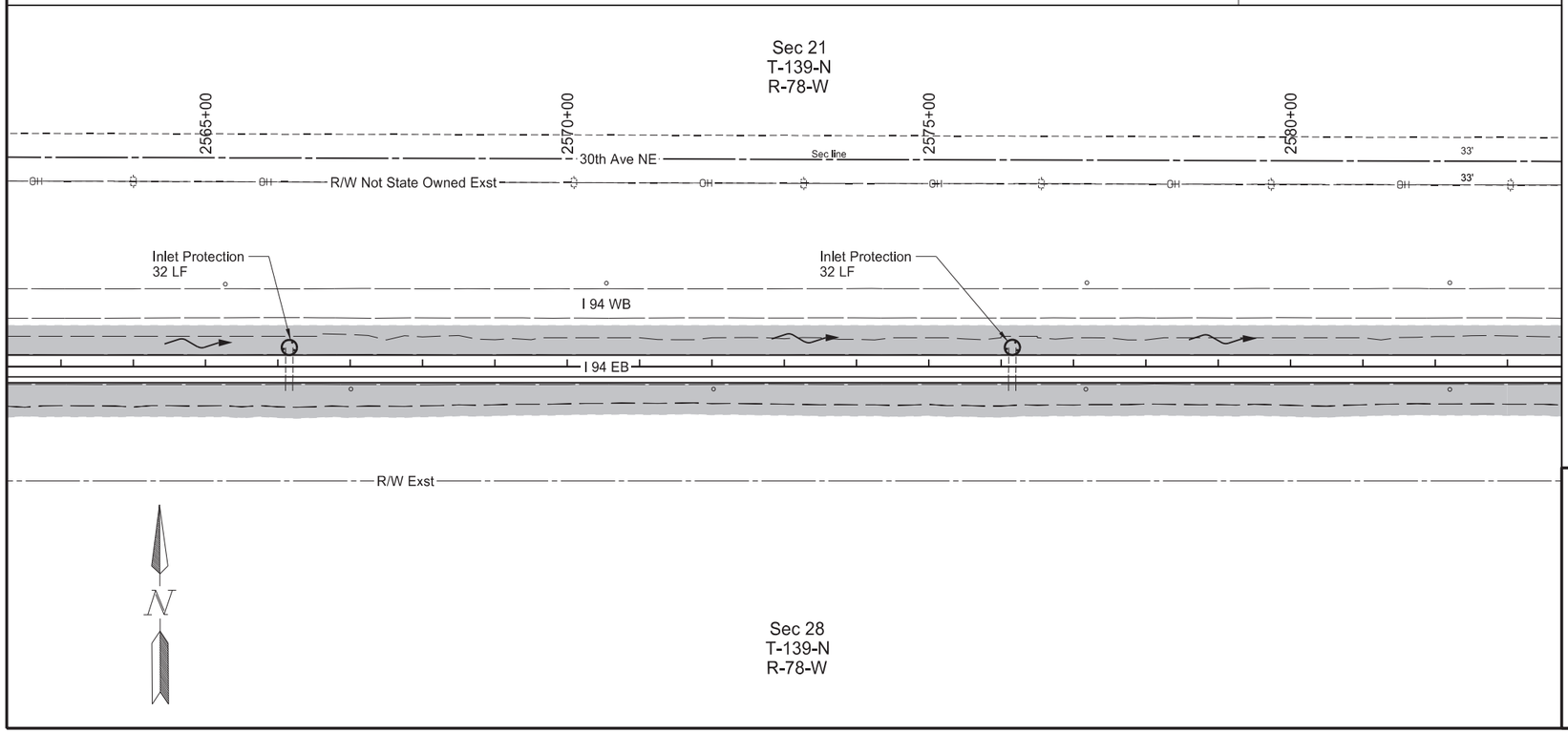
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 09:03:49 -05'00'
NORTH DAKOTA

7/3/2024 1:56:45 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162,214\Design\dgn\076\076TE.dgn





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	76	12

SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	8.12	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.12	ACRE
261	0112	FIBER ROLLS 12IN		
		Culvert Inlet Locations (32 LF EA)	128	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Culvert Inlet Locations (32 LF EA)	128	LF

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

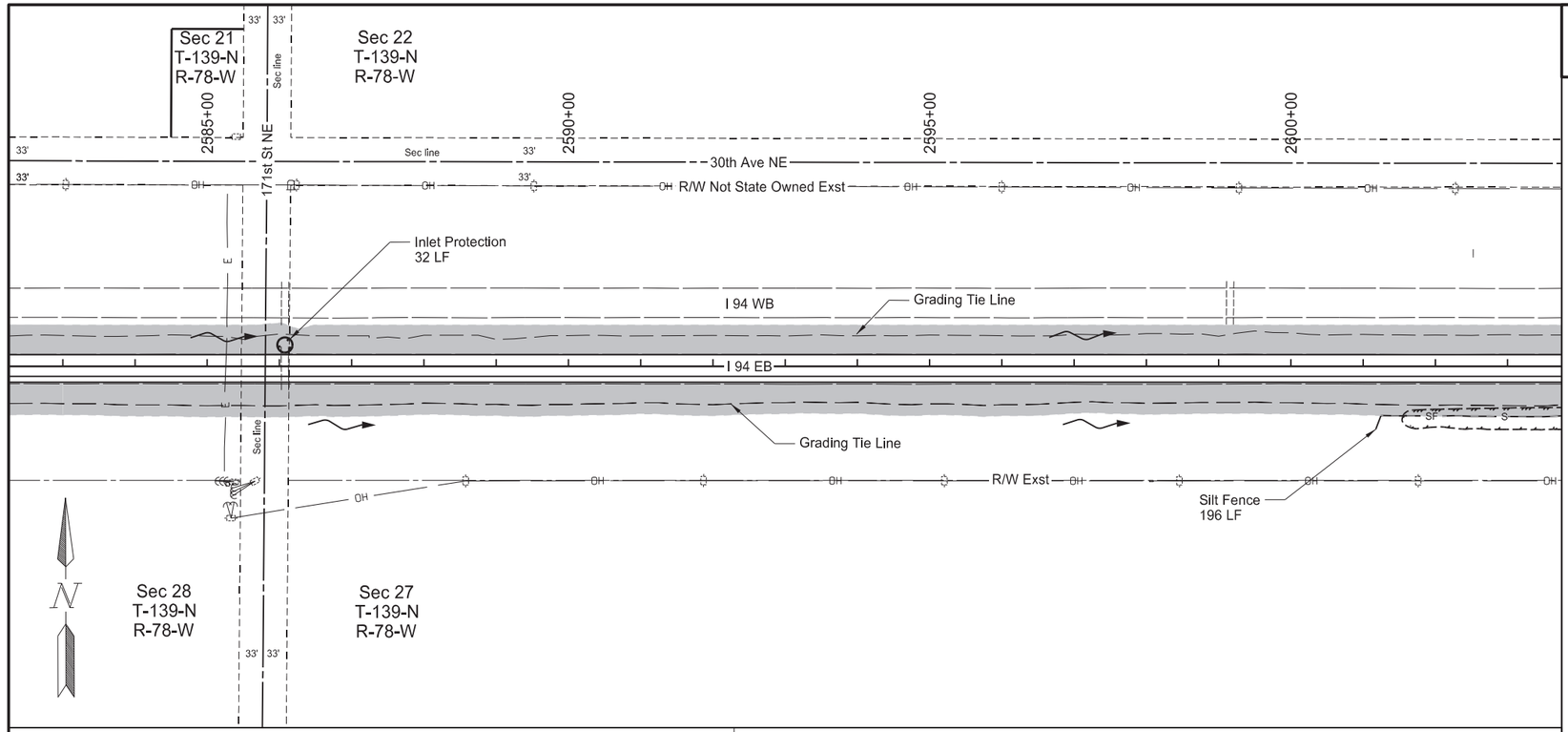
Temporary Sediment and Erosion Control

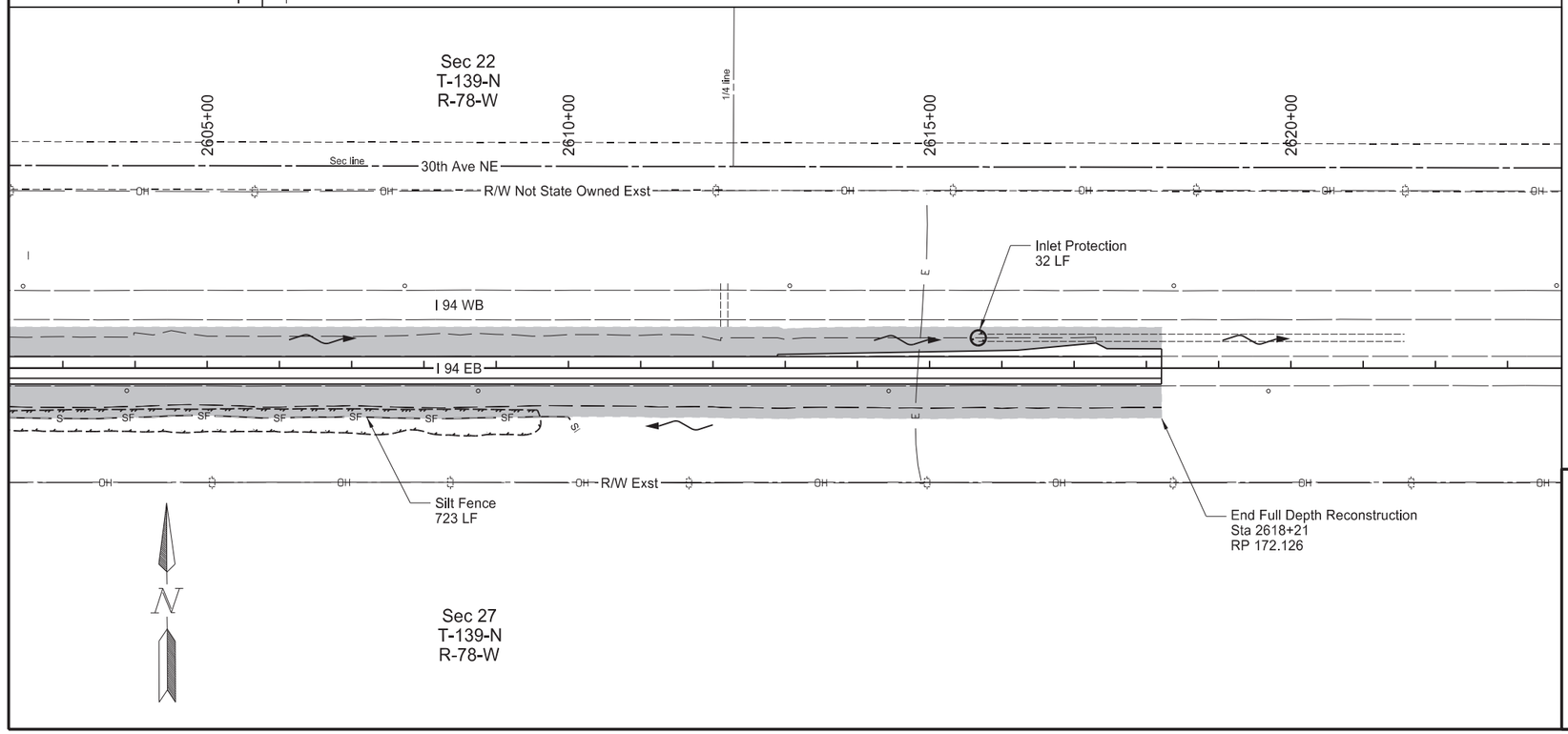
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 09:04:32 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	76	13





SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		Sheet Quantity	6.93	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	6.93	ACRE
260	0100	SILT FENCE UNSUPPORTED		
		Sta 2601+18 - 87' RT to Sta 2603+00 - 55' Rt	196	LF
		Sta 2603+00 - 55' Rt to Sta 2610+13 - 87' Rt	723	LF
260	0101	REMOVE SILT FENCE UNSUPPORTED		
		Sta 2601+18 - 87' RT to Sta 2603+00 - 55' Rt	196	LF
		Sta 2603+00 - 55' Rt to Sta 2610+13 - 87' Rt	723	LF
261	0112	FIBER ROLLS 12IN		
		Culvert Inlet Locations (32 LF EA)	64	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Culvert Inlet Locations (32 LF EA)	64	LF

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Unsupported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Temp Cover Crop / Soil Stabilization

Temporary Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 09:58:49 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	1

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	8.57	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.57	ACRE
255	0103	ECB TYPE 3		
		Sta 2103+00 to Sta 2123+00 Rt	699	SY
261	0112	FIBER ROLLS 12IN		
		Sta 2103+00 to Sta 2123+00 Lt	96	LF
		Sta 2103+00 to Sta 2123+00 Rt	1810	LF
		Sta 2123+00 to Sta 2143+00 Lt	770	LF
		Sta 2123+00 to Sta 2143+00 Rt	438	LF

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

Permanent Sediment and Erosion Control

I-94 Reconstruction

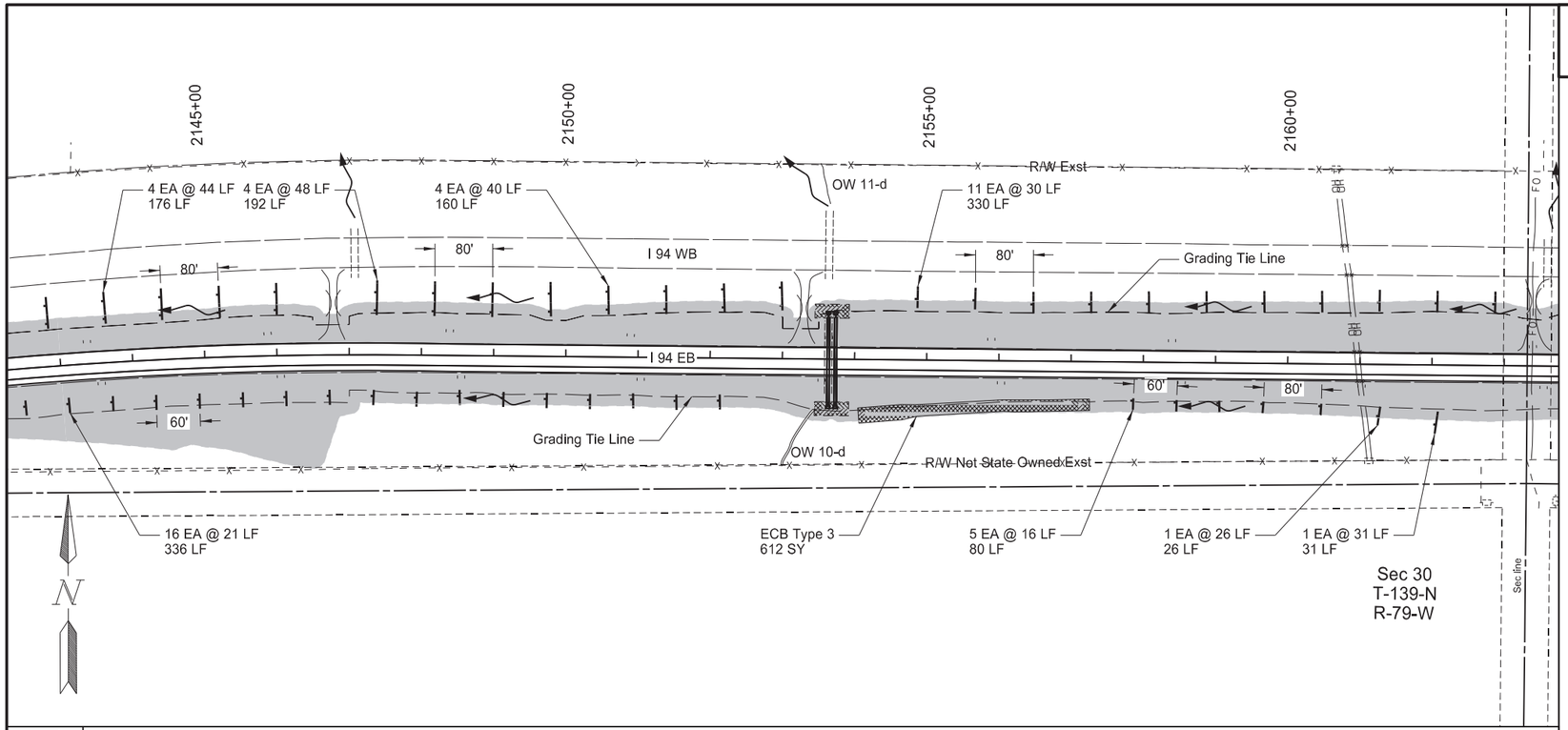
Bismarck to E of Menoken Interchange - EB

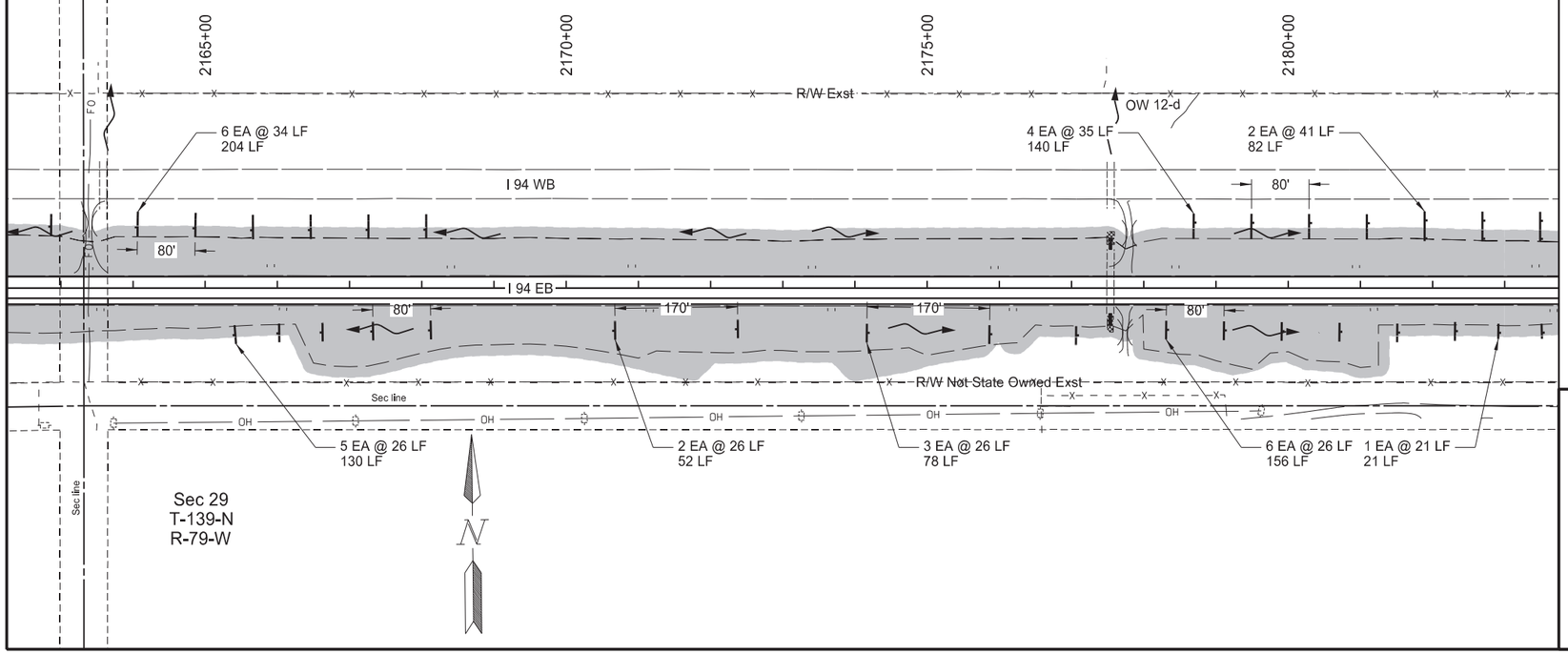
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:23:42 -05'00'
REGISTERED PROFESSIONAL ENGINEER
NORTH DAKOTA

7/3/2024 2:04:50 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\077\077PE.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	2

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	11.90	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	11.90	ACRE
255	0103	ECB TYPE 3		
		Sta 2143+00 to Sta 2163+00 Rt	612	SY
261	0112	FIBER ROLLS 12IN		
		Sta 2143+00 to Sta 2163+00 Lt	858	LF
		Sta 2143+00 to Sta 2163+00 Rt	473	LF
		Sta 2163+00 to Sta 2183+00 Lt	426	LF
		Sta 2163+00 to Sta 2183+00 Rt	437	LF





Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

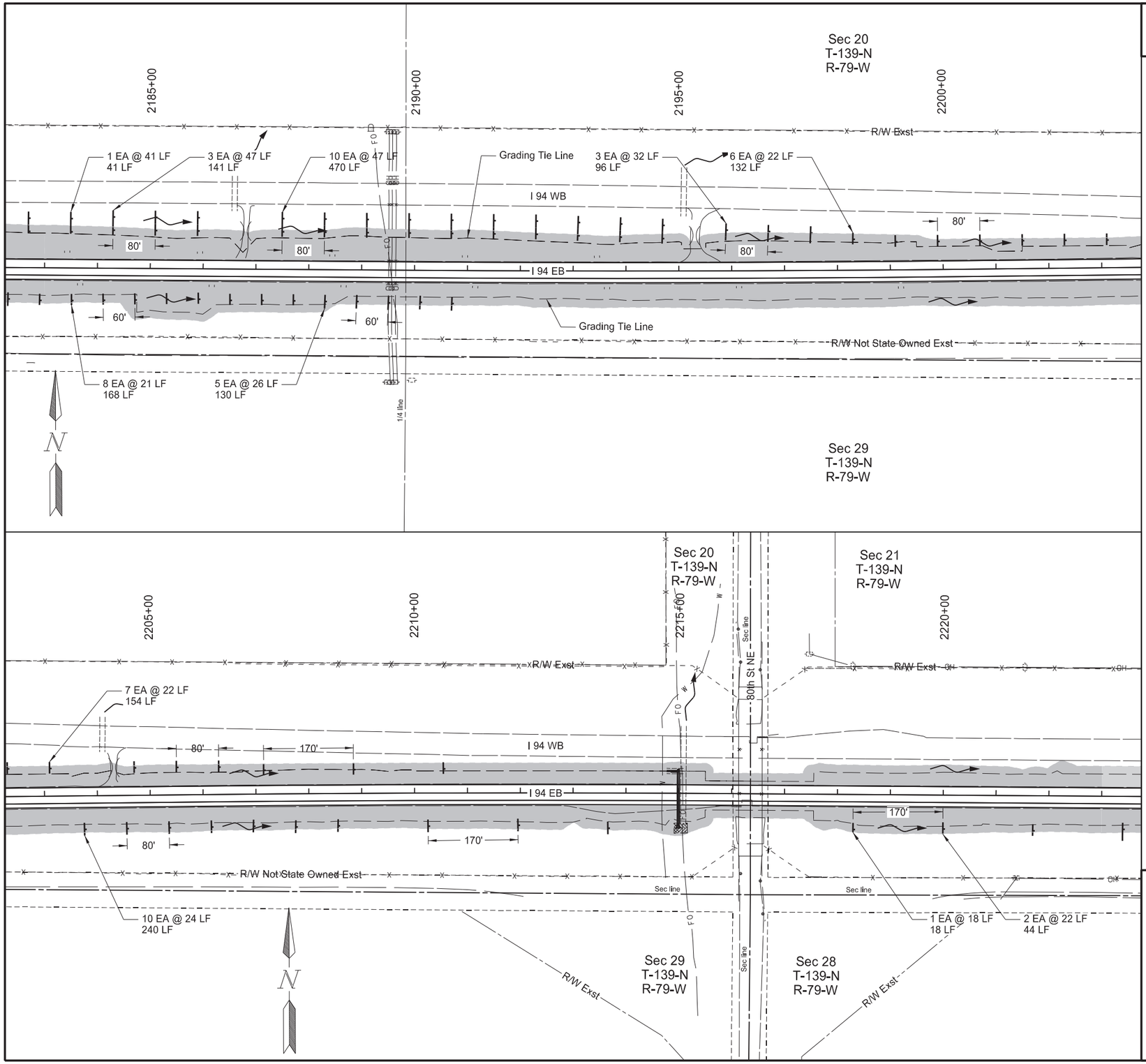
Permanent Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:24:17 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	3



SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	8.68	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.68	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 2183+00 to Sta 2203+00 Lt	880	LF
		Sta 2183+00 to Sta 2203+00 Rt	298	LF
		Sta 2203+00 to Sta 2223+00 Lt	154	LF
		Sta 2203+00 to Sta 2223+00 Rt	302	LF

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

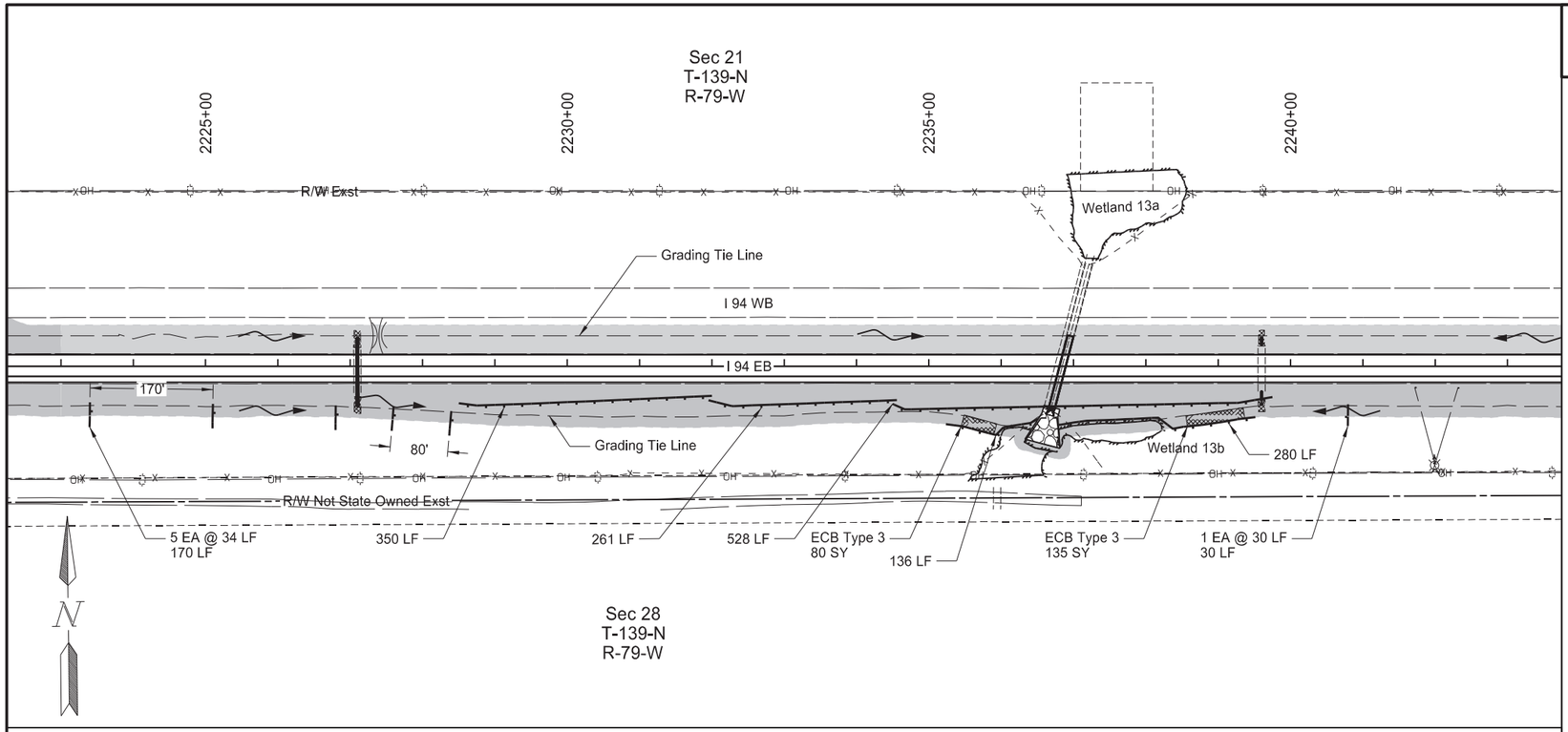
Permanent Sediment and Erosion Control

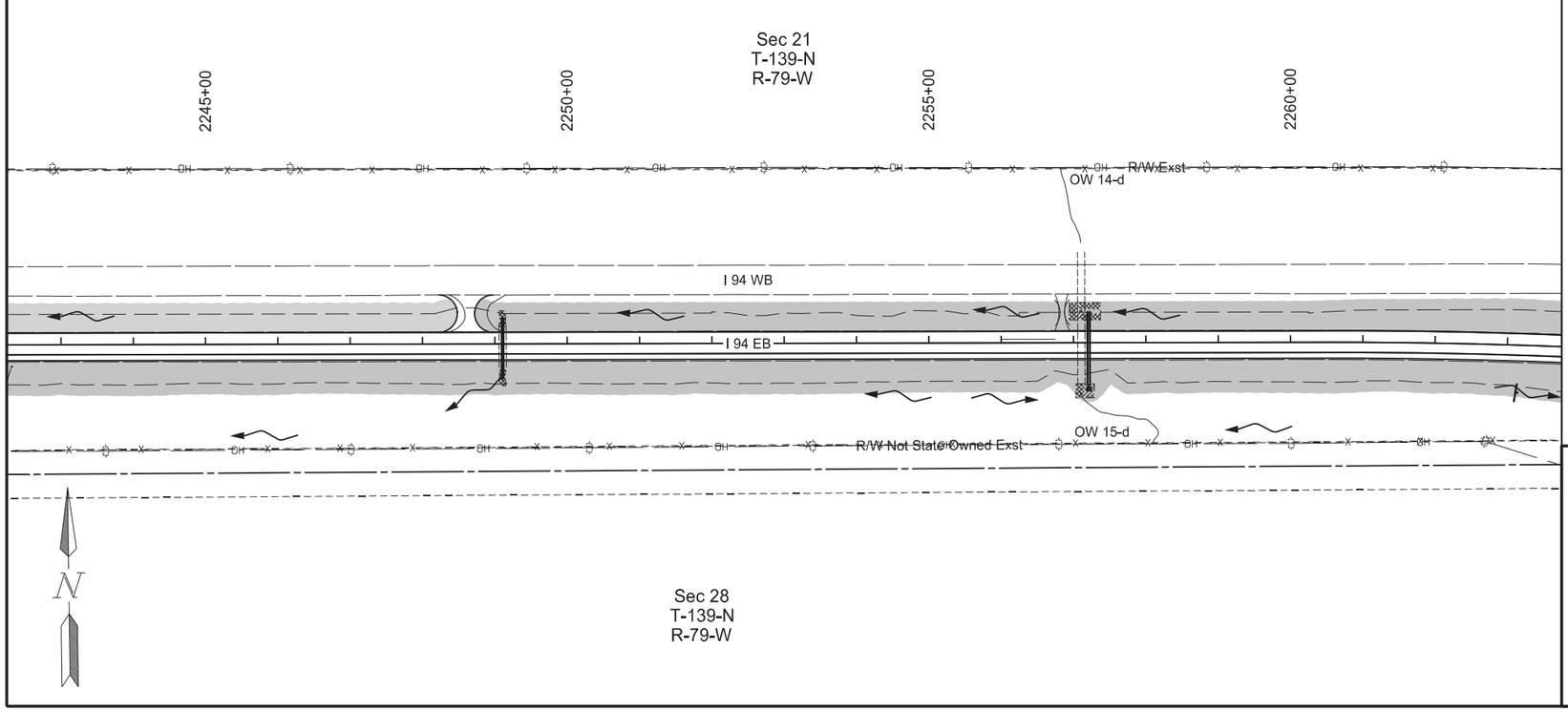
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:25:17 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	4





SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	8.52	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.52	ACRE
255	0103	ECB TYPE 3		
		Sta 2223+00 to Sta 2243+00 Rt	215	SY
261	0112	FIBER ROLLS 12IN		
		Sta 2223+00 to Sta 2243+00 Rt	1755	LF

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

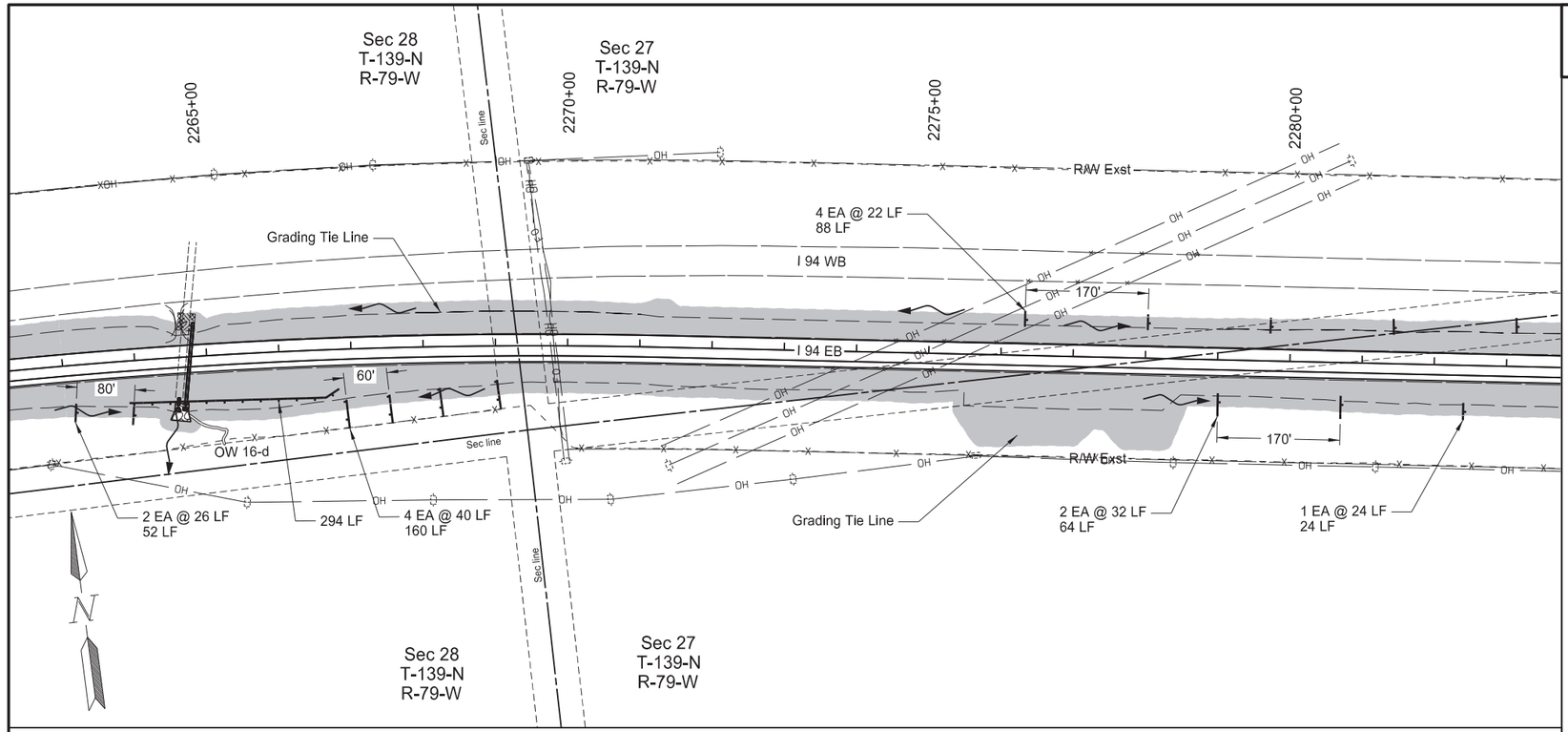
Permanent Sediment and Erosion Control

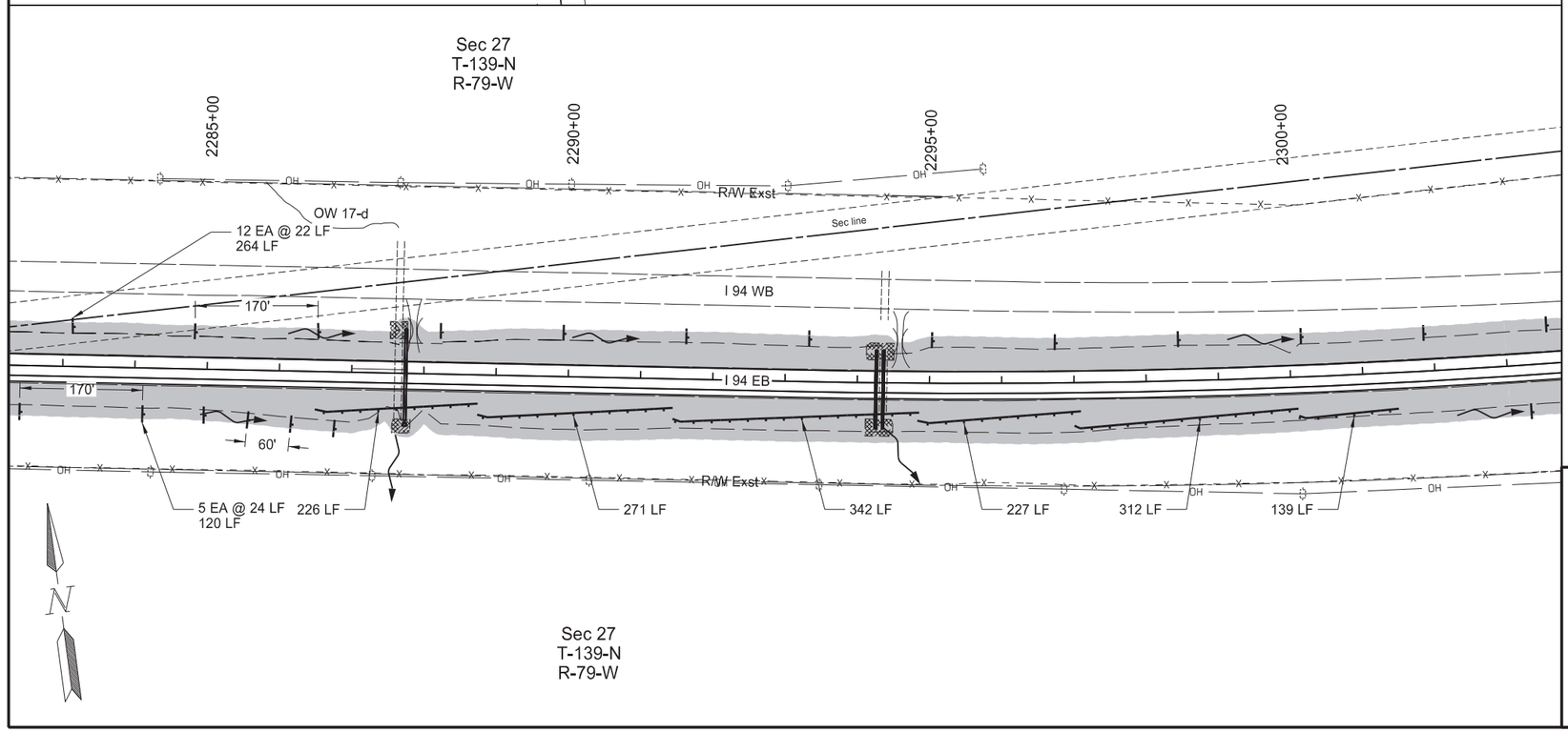
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:25:56 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	77	5





SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	9.35	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	9.35	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 2263+00 to Sta 2283+00 Lt	88	LF
		Sta 2263+00 to Sta 2283+00 Rt	594	LF
		Sta 2283+00 to Sta 2303+00 Lt	264	LF
		Sta 2283+00 to Sta 2303+00 Rt	1637	LF

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

Permanent Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:26:29 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	6

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	8.05	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.05	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 2303+00 to Sta 2323+00 Lt	108	LF
		Sta 2303+00 to Sta 2323+00 Rt	162	LF
		Sta 2323+00 to Sta 2343+00 Lt	130	LF
		Sta 2323+00 to Sta 2343+00 Rt	48	LF

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

Permanent Sediment and Erosion Control

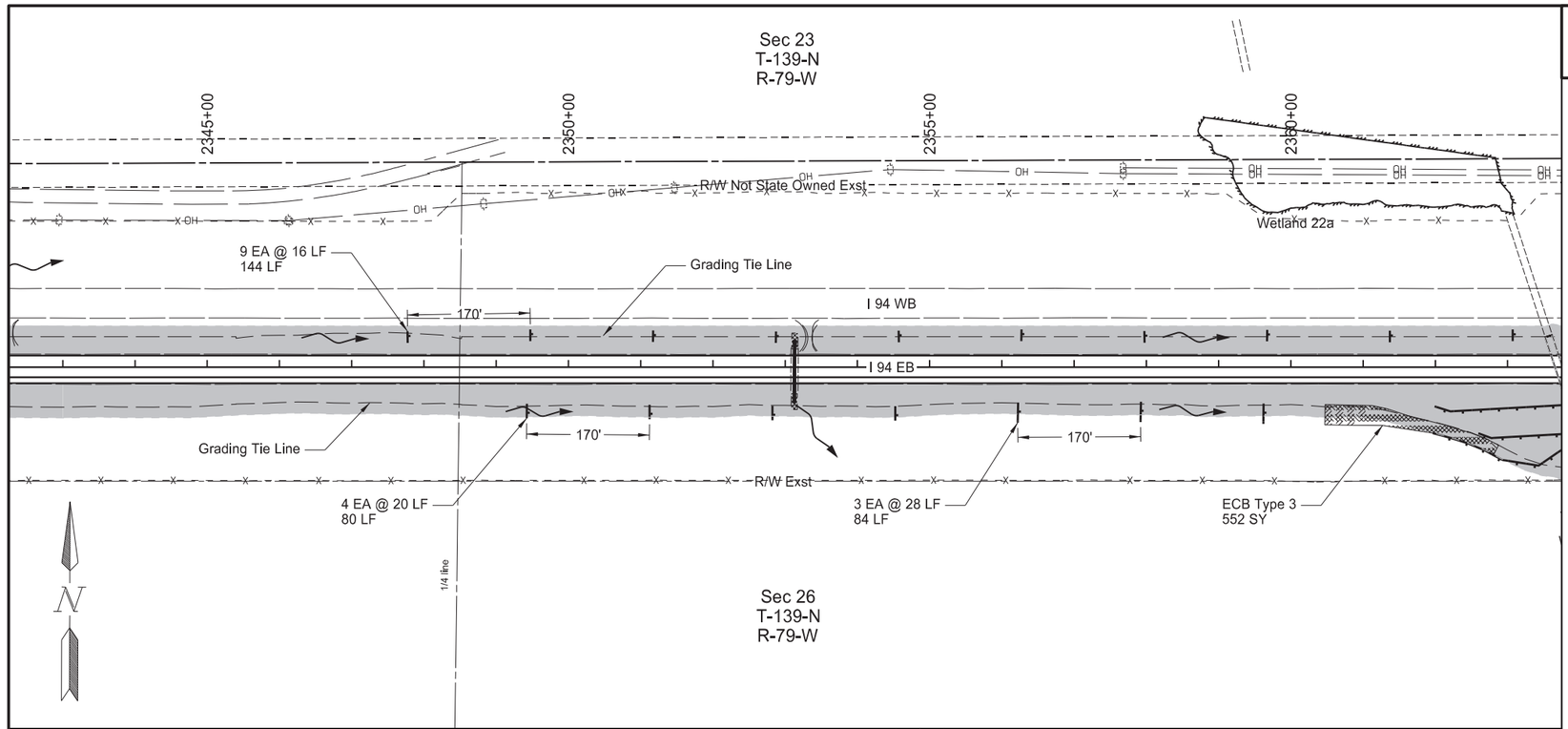
I-94 Reconstruction

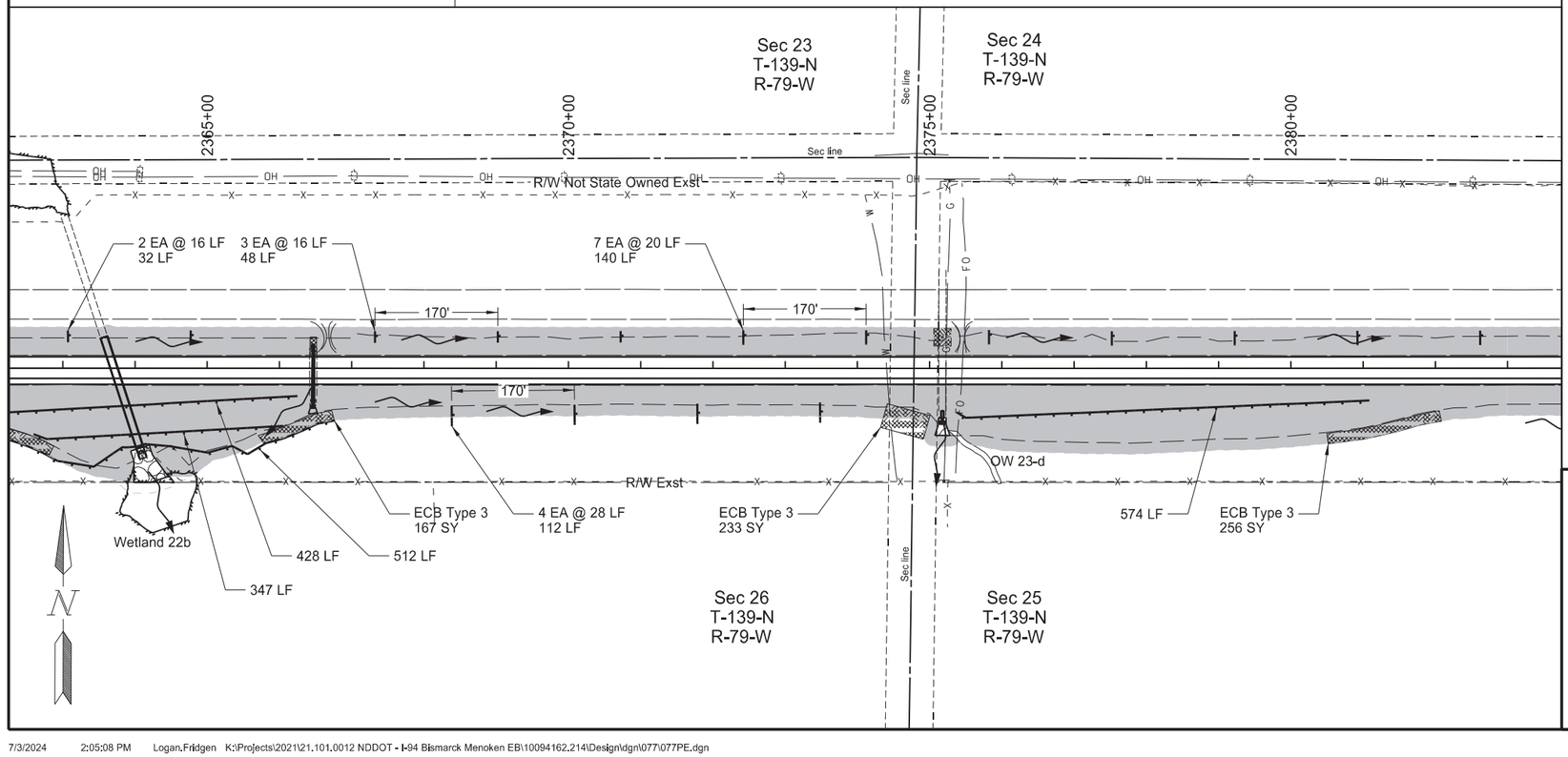
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:27:08 -05'00'
NORTH DAKOTA

7/3/2024 2:05:05 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\077\077PE.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	7





SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	9.22	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	9.22	ACRE
255	0103	ECB TYPE 3		
		Sta 2343+00 to Sta 2363+00 Rt	552	SY
		Sta 2363+00 to Sta 2383+00 Rt	656	SY
261	0112	FIBER ROLLS 12IN		
		Sta 2343+00 to Sta 2363+00 Lt	144	LF
		Sta 2343+00 to Sta 2363+00 Rt	164	LF
		Sta 2363+00 to Sta 2383+00 Lt	220	LF
		Sta 2363+00 to Sta 2383+00 Rt	1973	LF

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

Permanent Sediment and Erosion Control

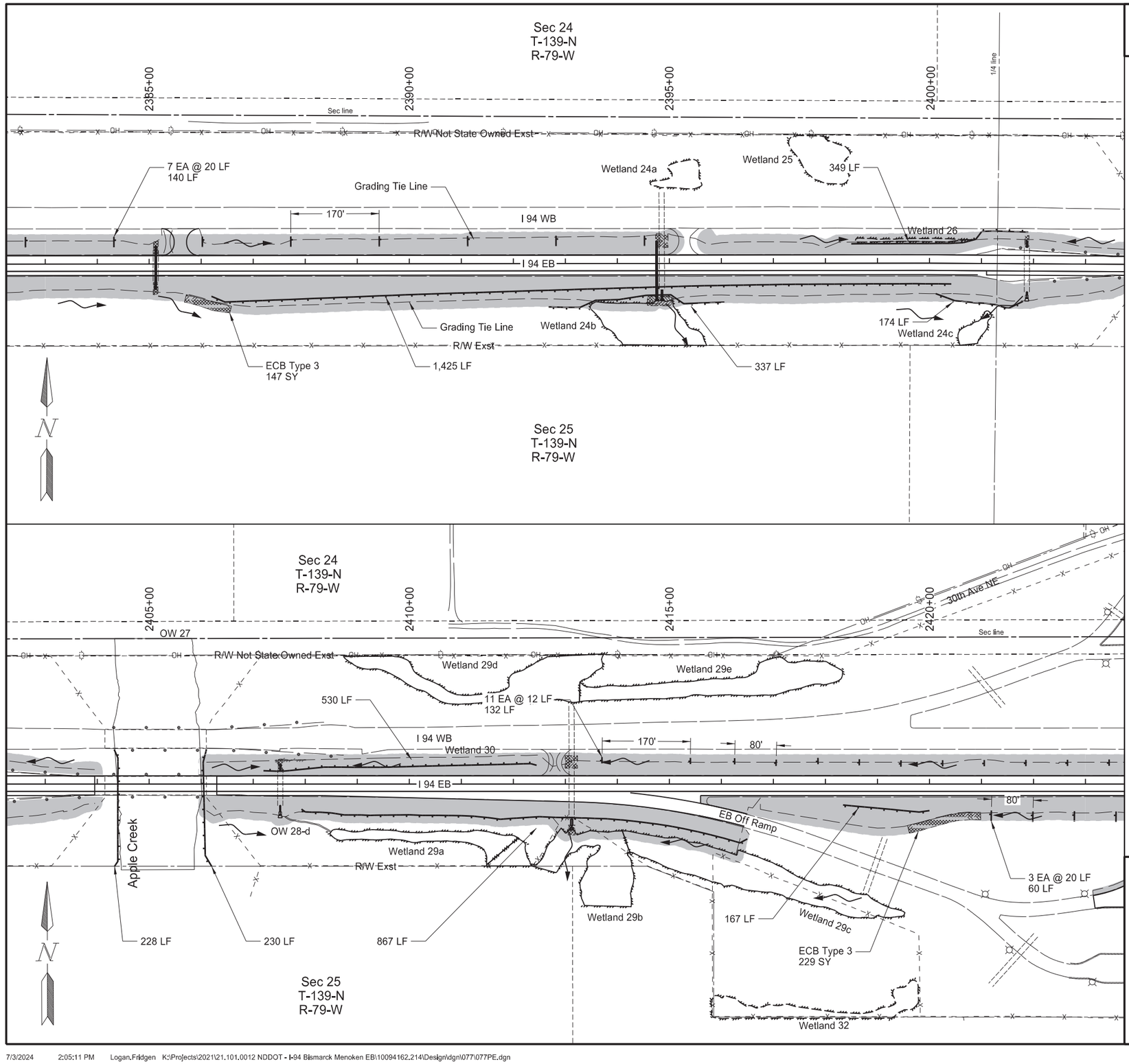
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:27:49 -05'00'
NORTH DAKOTA

7/3/2024 2:05:08 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162,214\Design\dgn\077\077PE.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	8



SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	8.53	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.53	ACRE
255	0103	ECB TYPE 3		
		Sta 2383+00 to Sta 2403+00 Rt	147	SY
		Sta 2403+00 to Sta 2423+00 Rt	229	SY
261	0112	FIBER ROLLS 12IN		
		Sta 2383+00 to Sta 2403+00 Lt	489	LF
		Sta 2383+00 to Sta 2403+00 Rt	1936	LF
		Sta 2403+00 to Sta 2423+00 Lt	662	LF
		Sta 2403+00 to Sta 2423+00 Rt	1552	LF

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

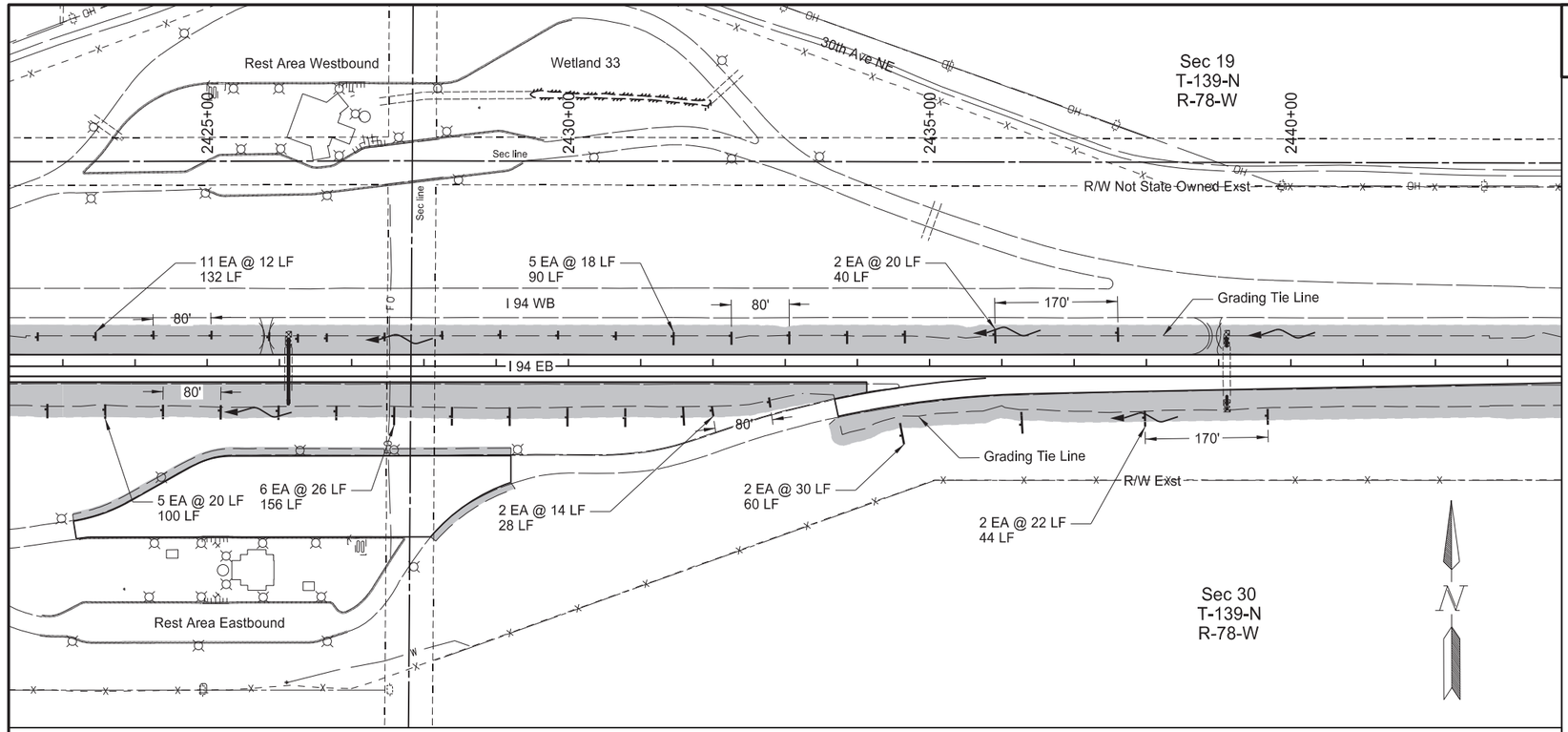
Permanent Sediment and Erosion Control

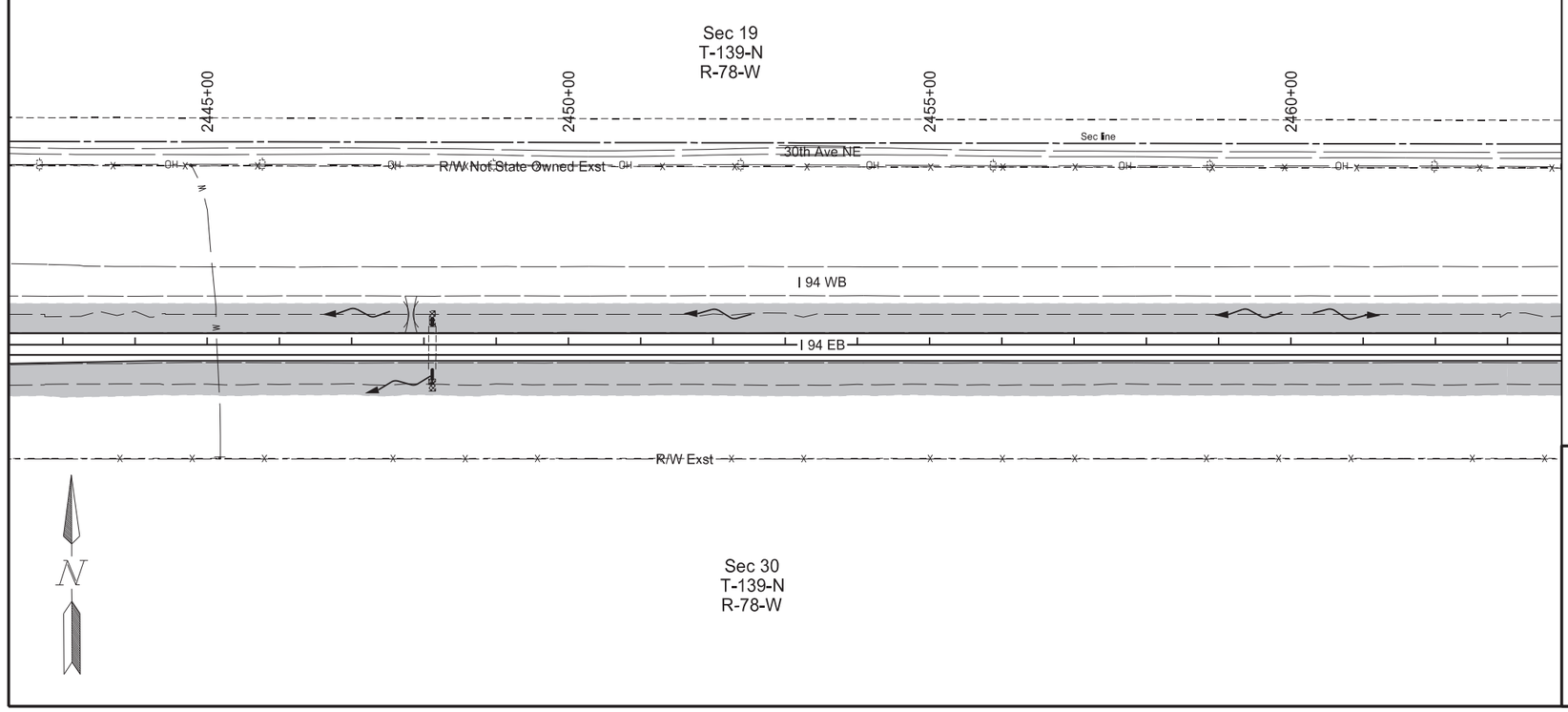
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:30:23 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	9





SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	8.20	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.20	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 2423+00 to Sta 2443+00 Lt	262	LF
		Sta 2423+00 to Sta 2443+00 Rt	388	LF

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

Permanent Sediment and Erosion Control

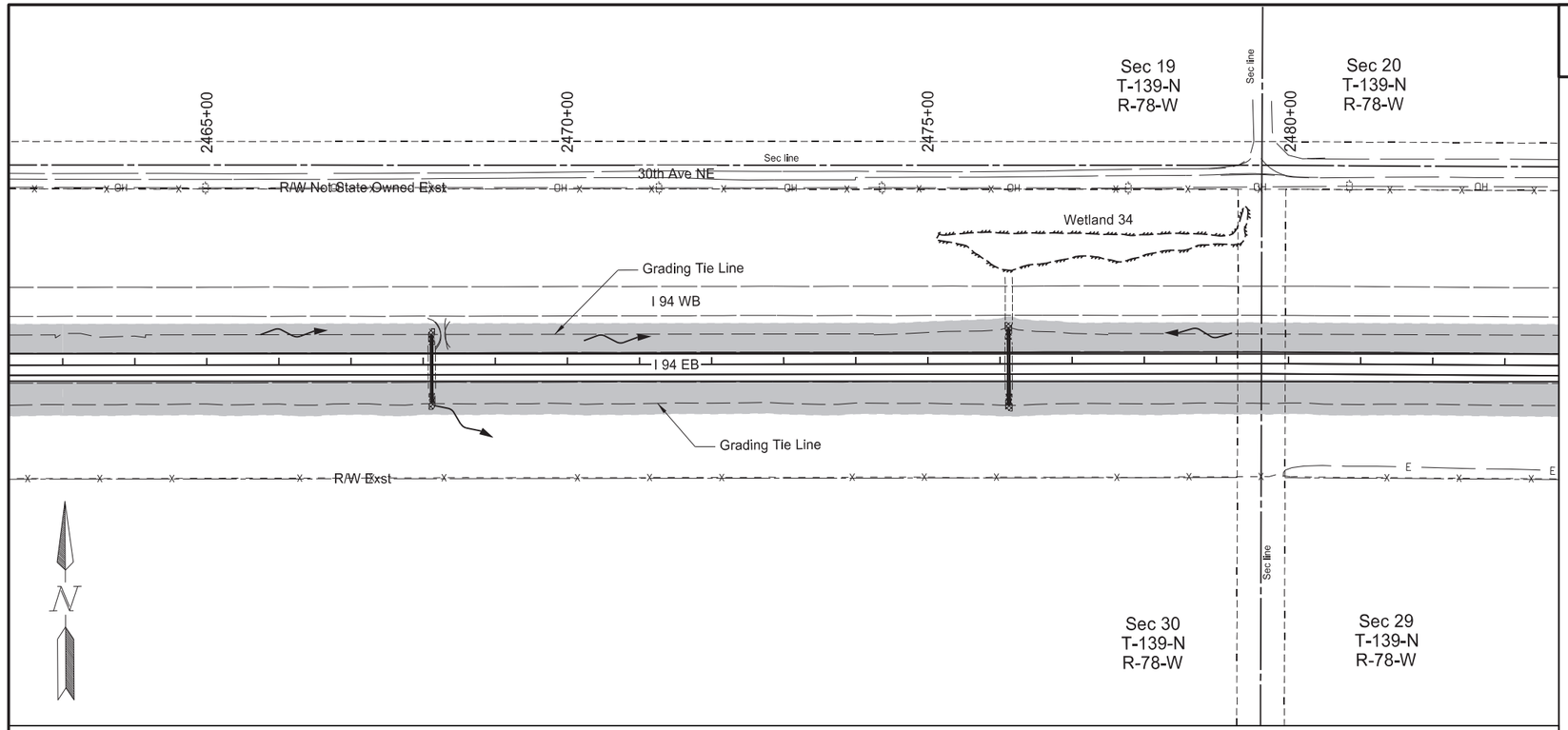
I-94 Reconstruction

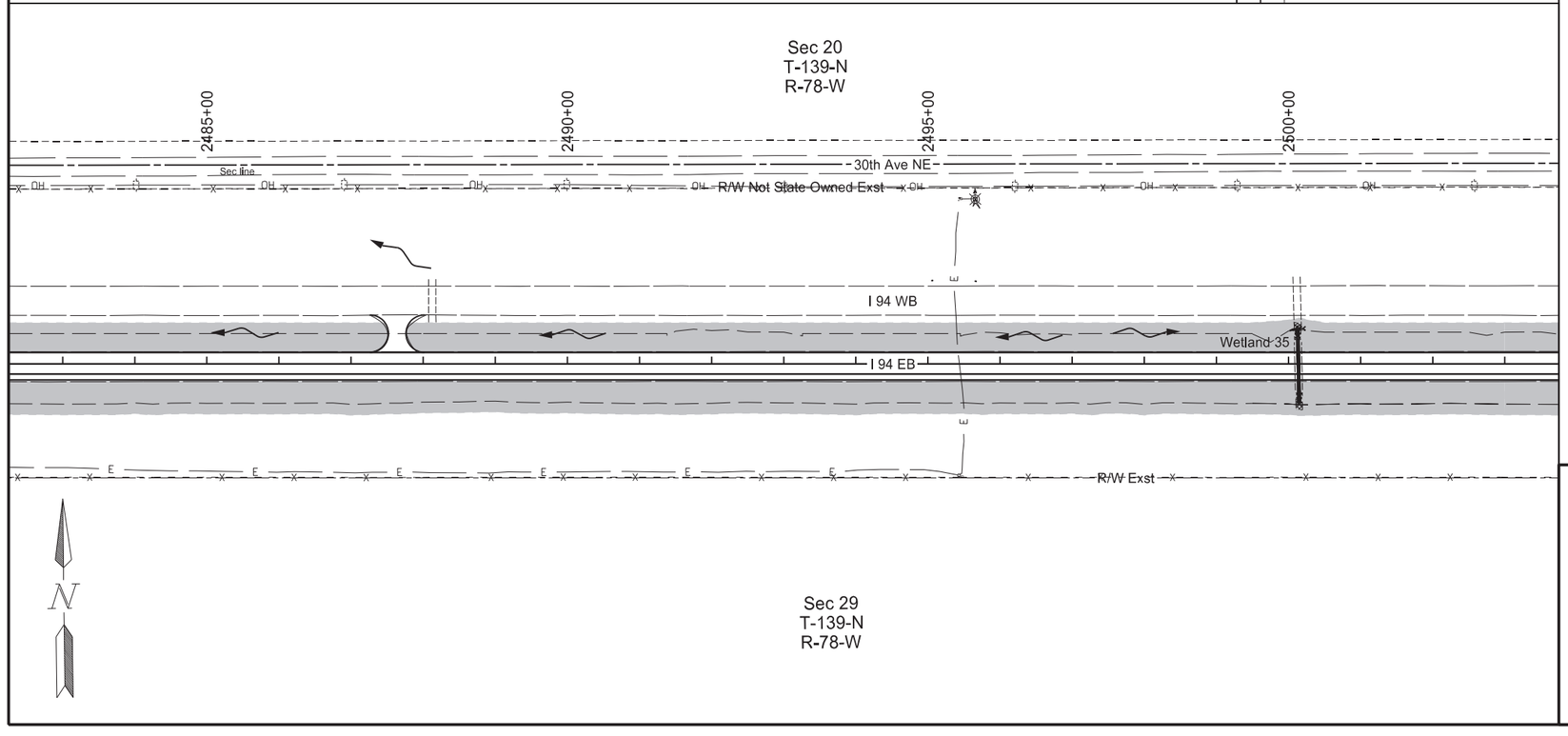
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:30:57 -05'00'
NORTH DAKOTA

7/3/2024 2:05:12 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\077\077PE.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	10





SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	8.13	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.13	ACRE

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

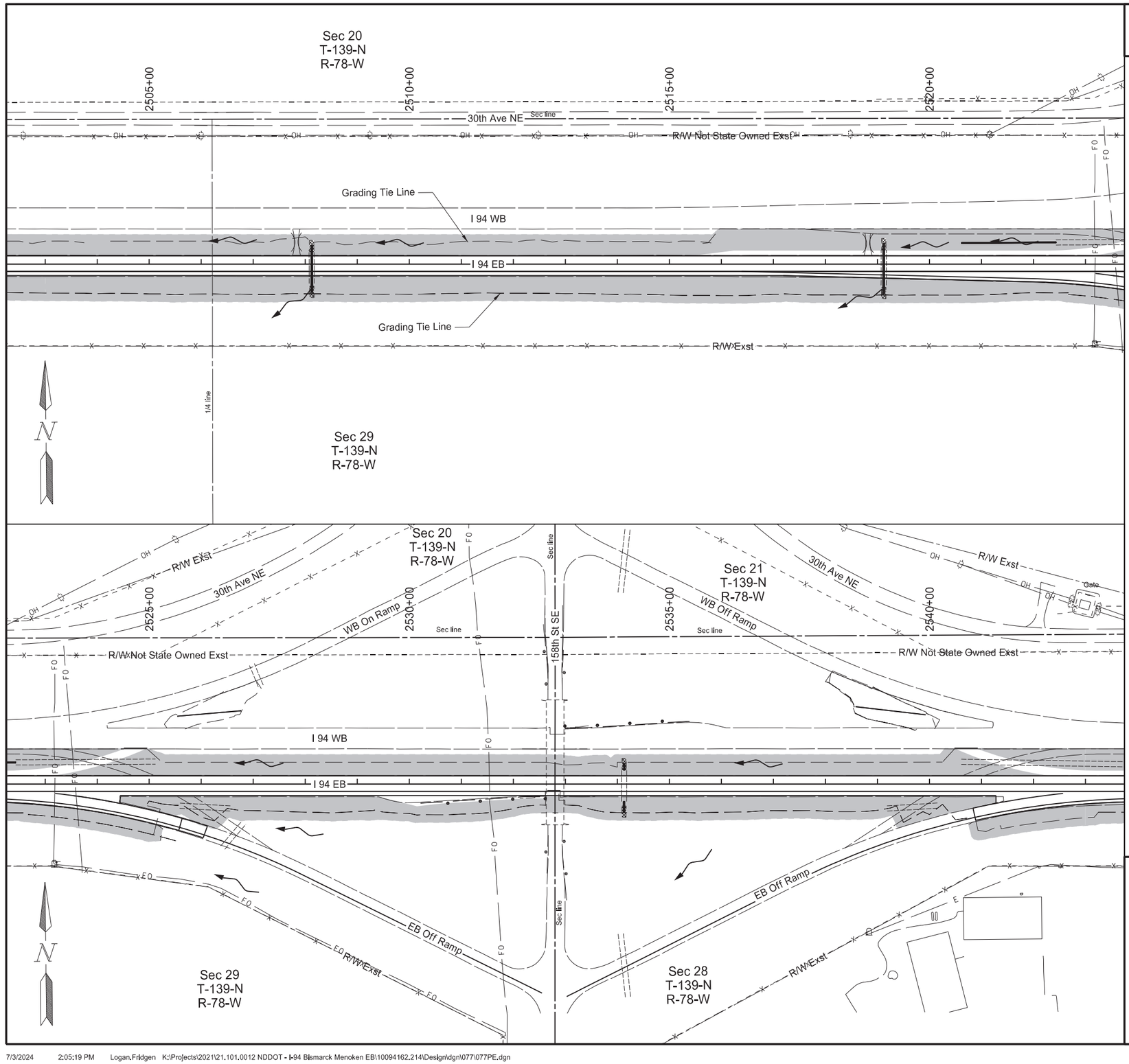
Permanent Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:31:30 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	11



SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	7.97	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	7.97	ACRE

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

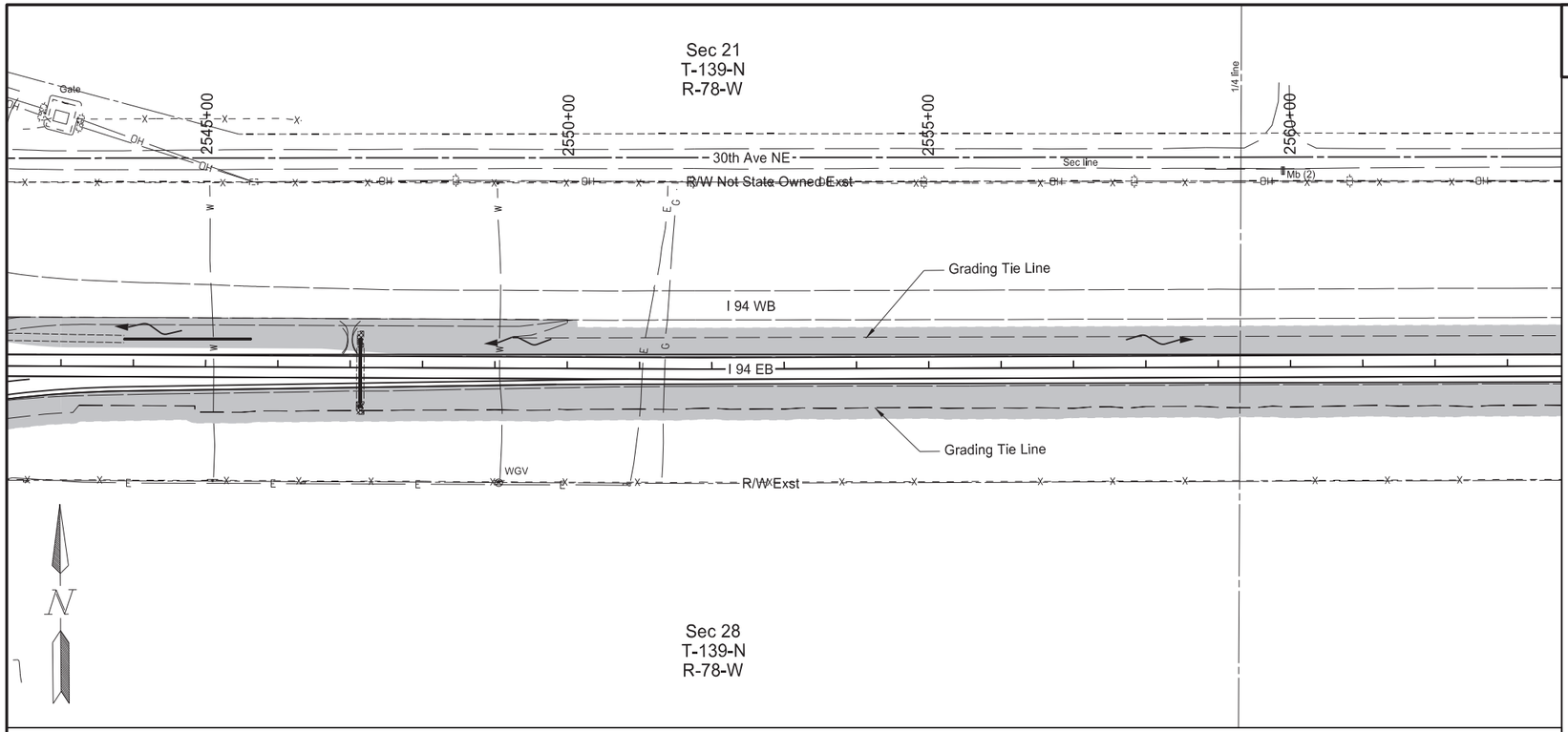
- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

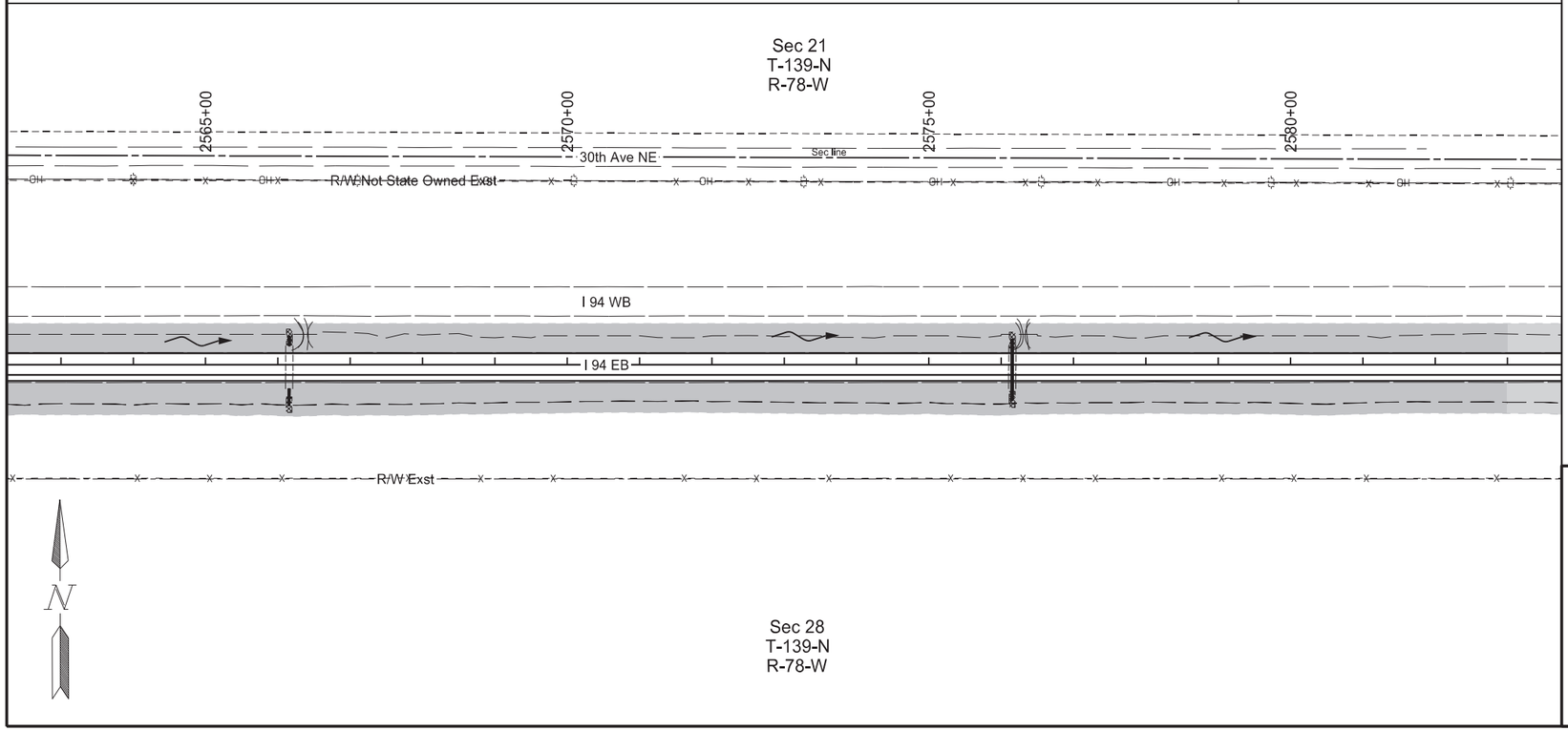
Permanent Sediment and Erosion Control

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:32:03 -05'00'
NORTH DAKOTA





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	77	12

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	8.12	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	8.12	ACRE

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

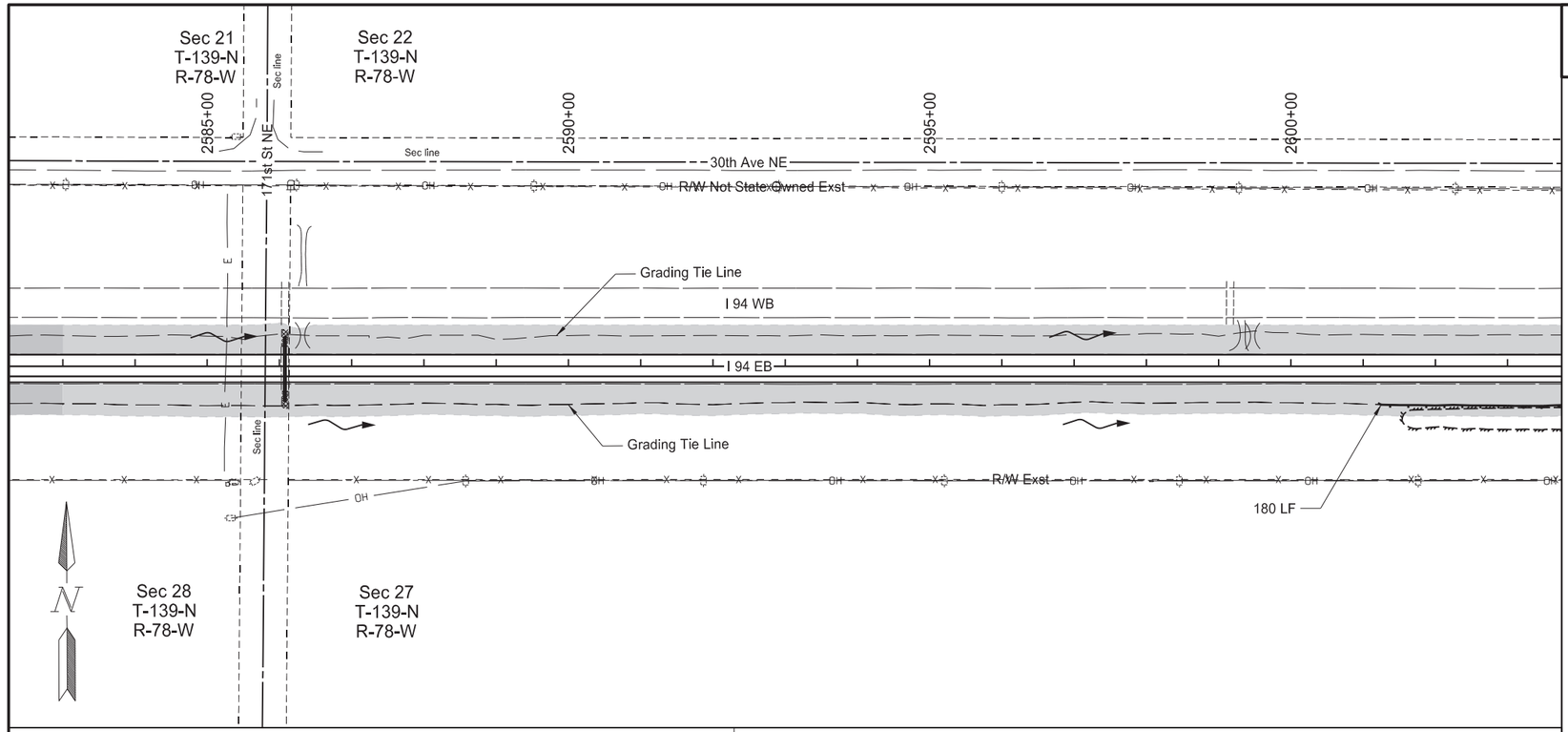
Permanent Sediment and Erosion Control

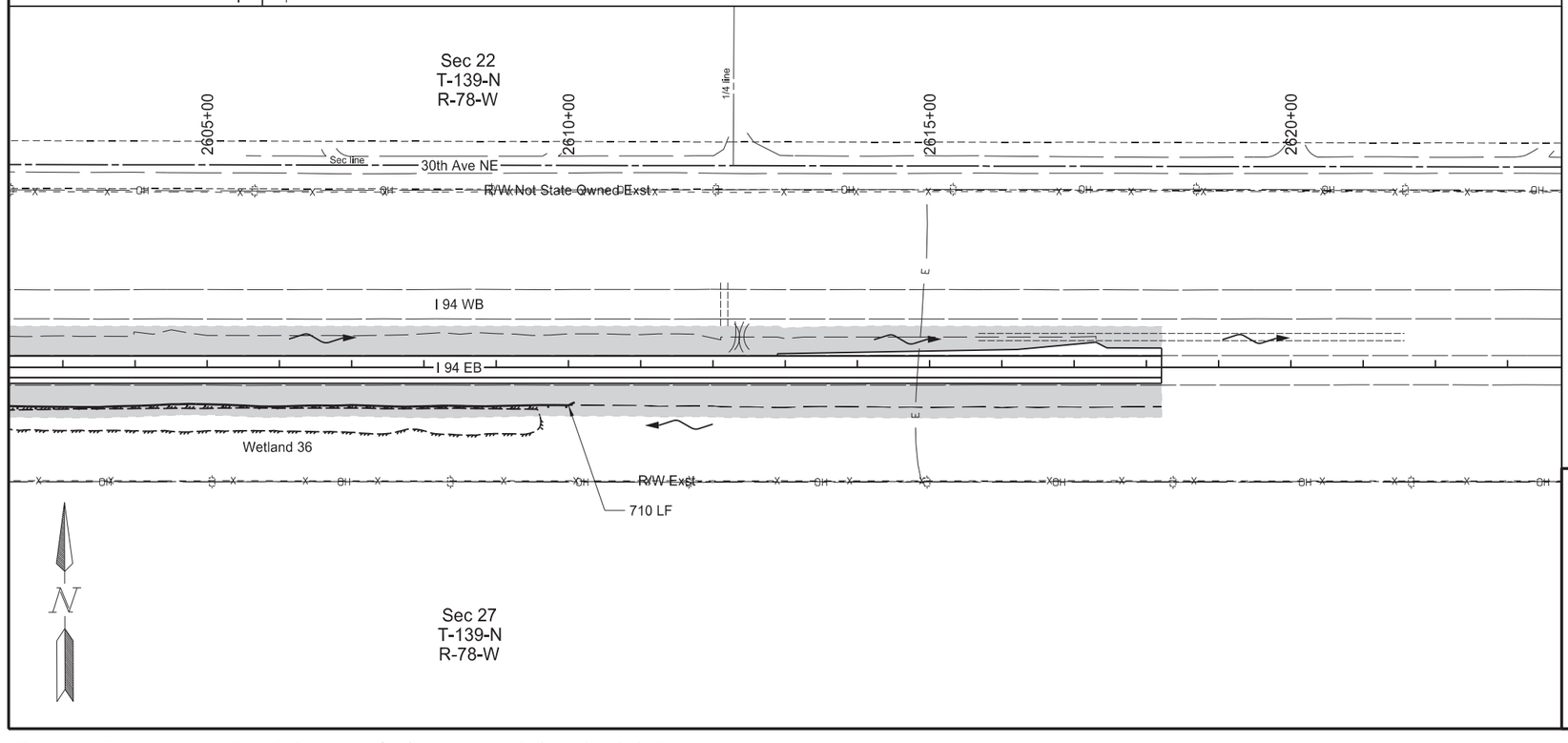
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:32:43 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	77	13





SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sheet Quantity	6.93	ACRE
253	0061	SOIL STABILIZATION		
		Sheet Quantity	6.93	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 2583+00 to Sta 2603+00 Rt	180	LF
		Sta 2603+00 to Sta 2623+00 Rt	710	LF

Notes:
Refer to section 20 for erosion control blankets located at culvert end section

Legend

- Fiber Rolls 12IN
- SF — Silt Fence Supported
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Existing Delineated Wetland
- Flow Direction
- Seeding Class II / Soil Stabilization
- Seeding Class II / ECB Type 3

Permanent Sediment and Erosion Control

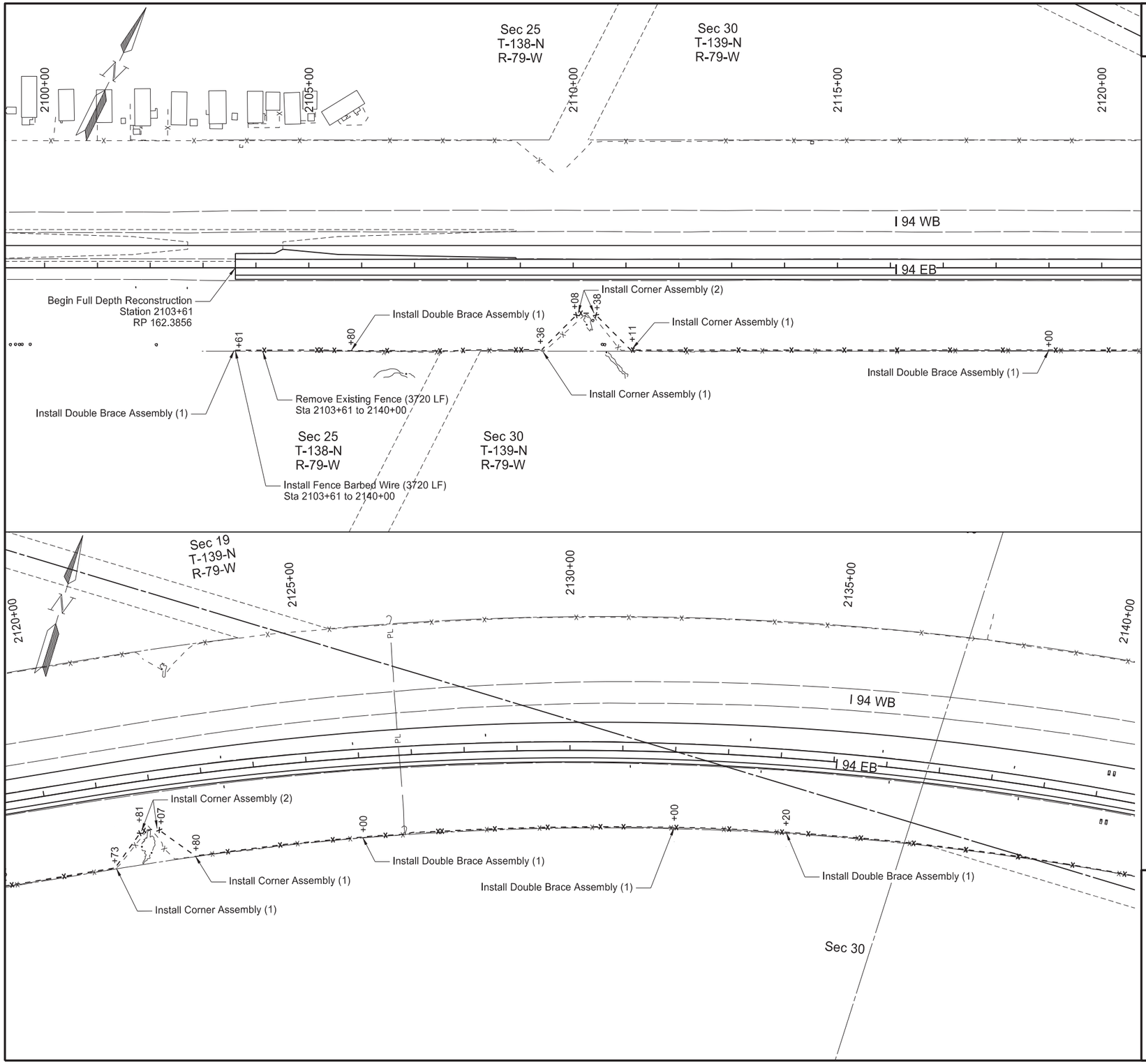
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:33:23 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	80	1

SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2103+61 to 2140+00	3,720	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2103+61 to 2140+00	3,720	LF
752	2995	CORNER ASSEMBLY-WOOD POST		
		Sta 2103+61 to 2140+00	8	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2103+61 to 2140+00	6	EA



Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

Fencing Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:03:55 -05'00'
NORTH DAKOTA

7/16/2024 10:34:31 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\080\080LO.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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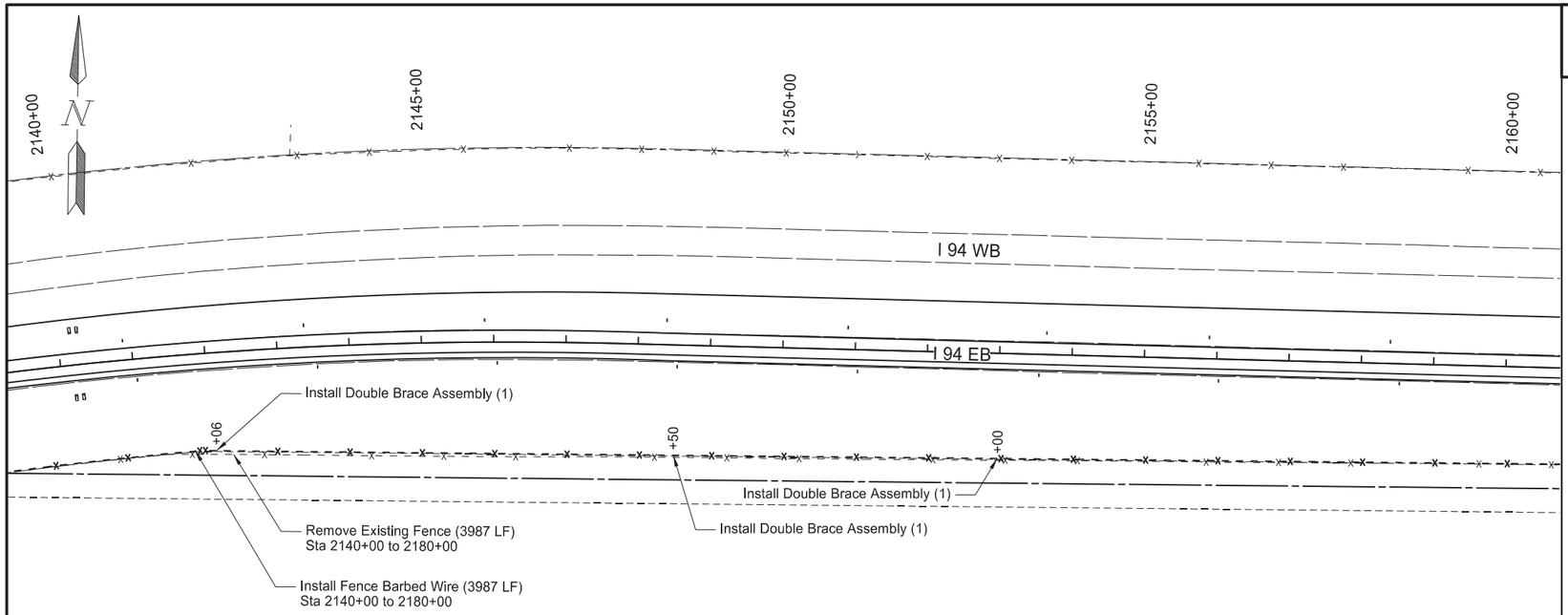
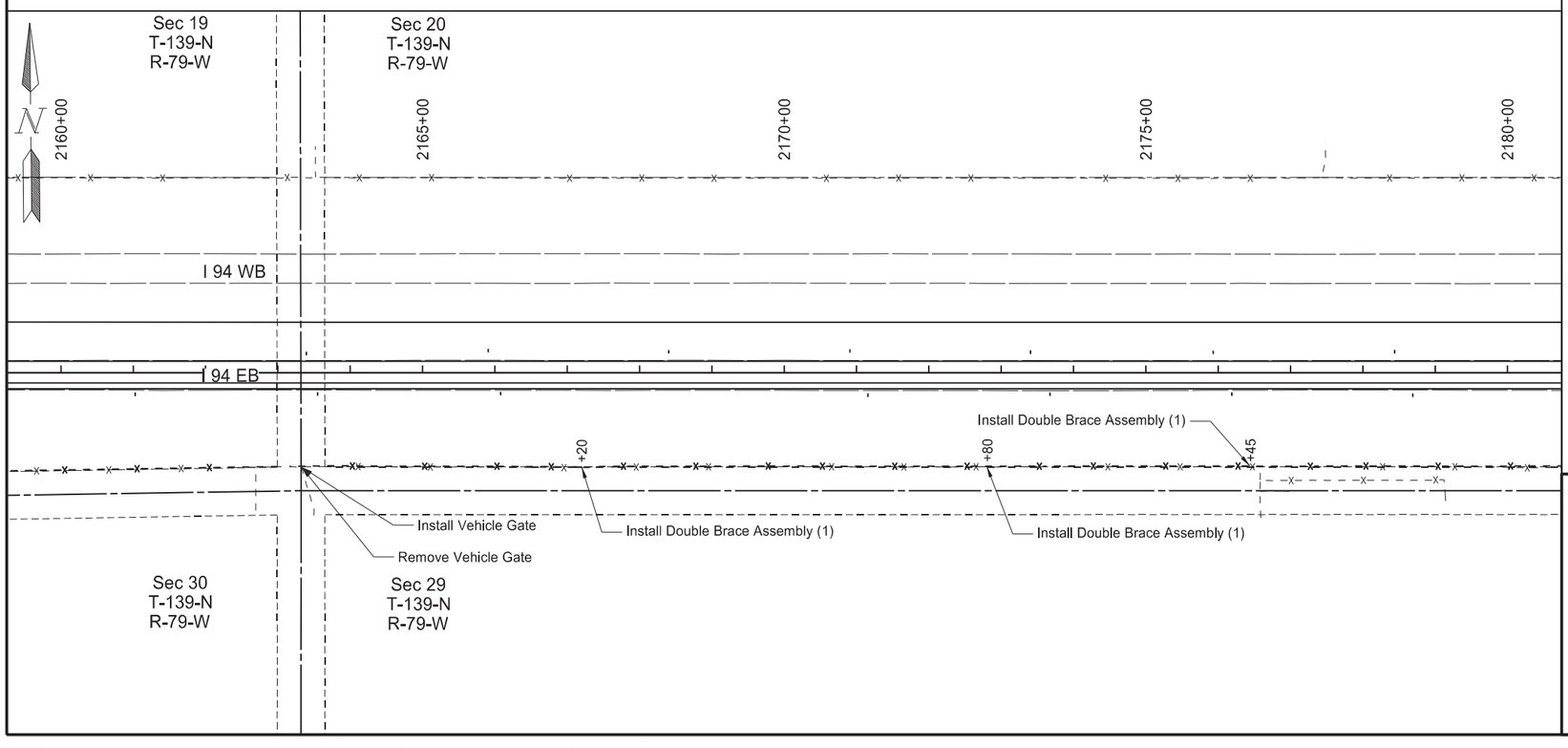




SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2140+00 to 2180+00	3,987	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2140+00 to 2180+00	3,987	LF
752	2100	VEHICLE GATE		
		Sta 2163+32	1	EA
752	2120	REMOVE VEHICLE GATE		
		Sta 2163+32	1	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2140+00 to 2180+00	6	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

Fencing Layout

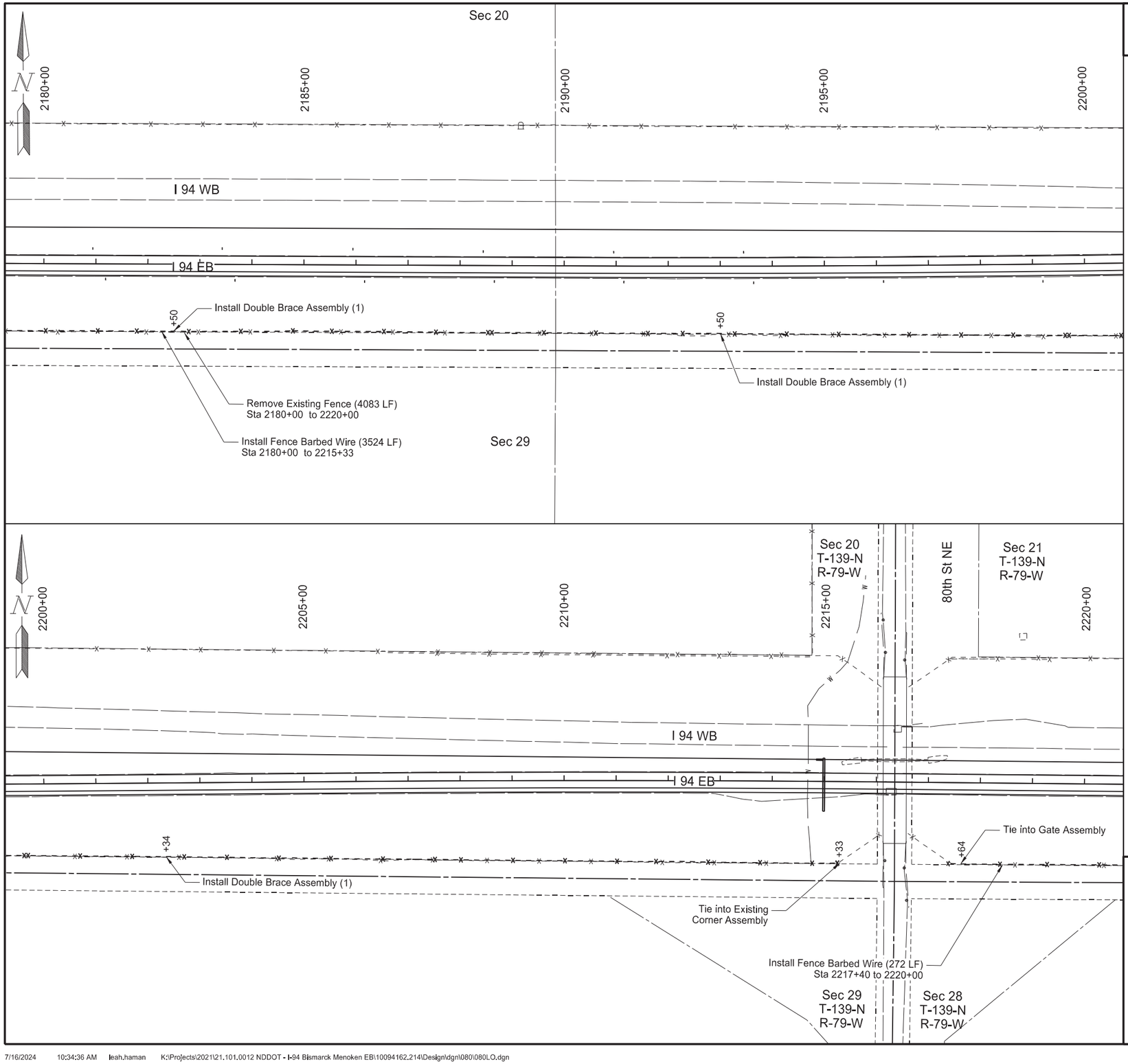
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:04:08 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	80	3

SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2180+00 to 2220+00	4,083	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2180+00 to 2215+33	3,524	LF
		Sta 2217+40 to 2220+00	272	LF
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2180+00 to 2220+00	3	EA



Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

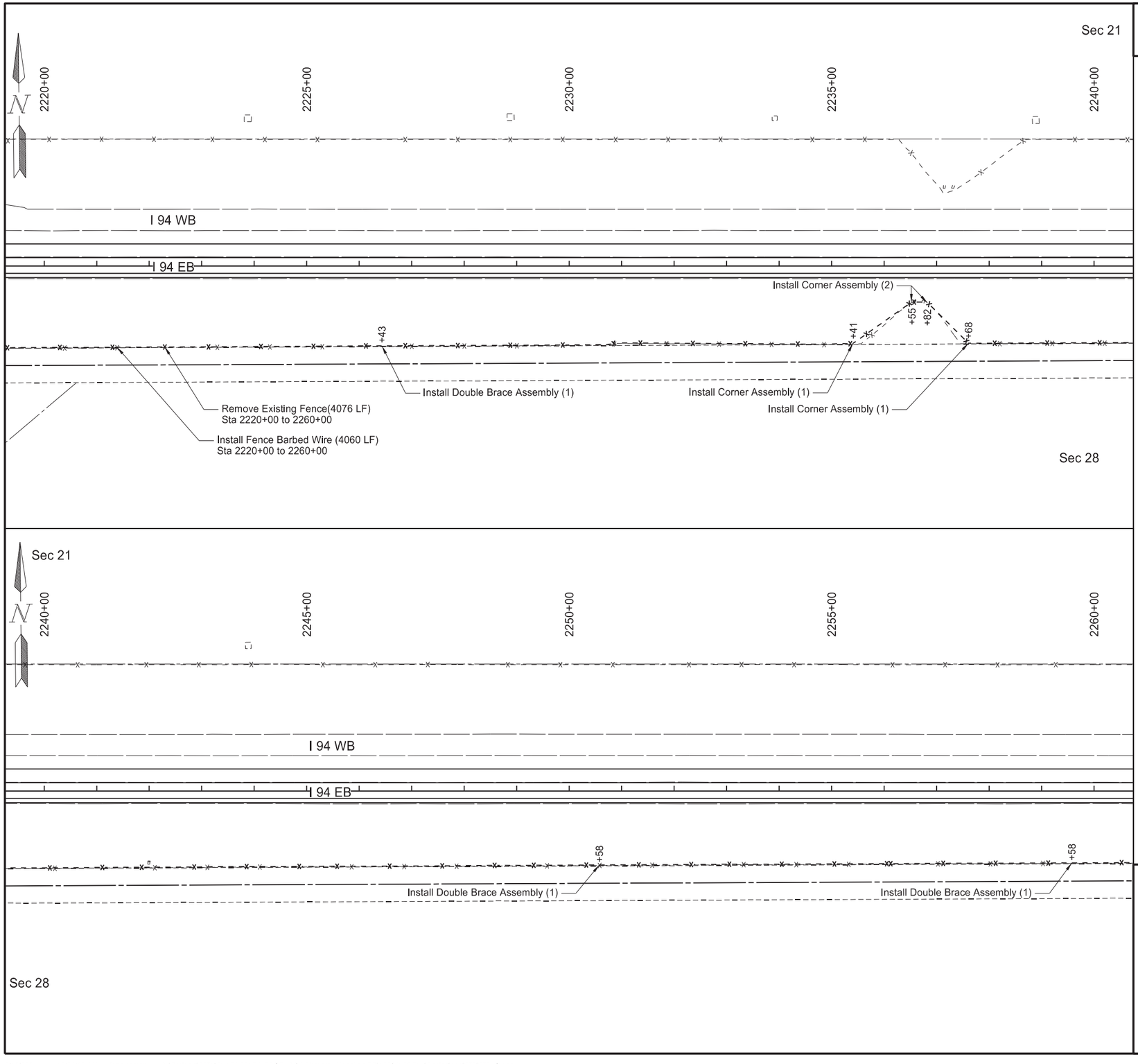
Fencing Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:04:36 -05'00'
NORTH DAKOTA

7/16/2024 10:34:36 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\080\080LO.dgn



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	80	4

SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2220+00 to 2260+00	4,076	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2220+00 to 2260+00	4,076	LF
752	2995	CORNER ASSEMBLY-WOOD POST		
		Sta 2220+00 to 2260+00	4	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2220+00 to 2260+00	3	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

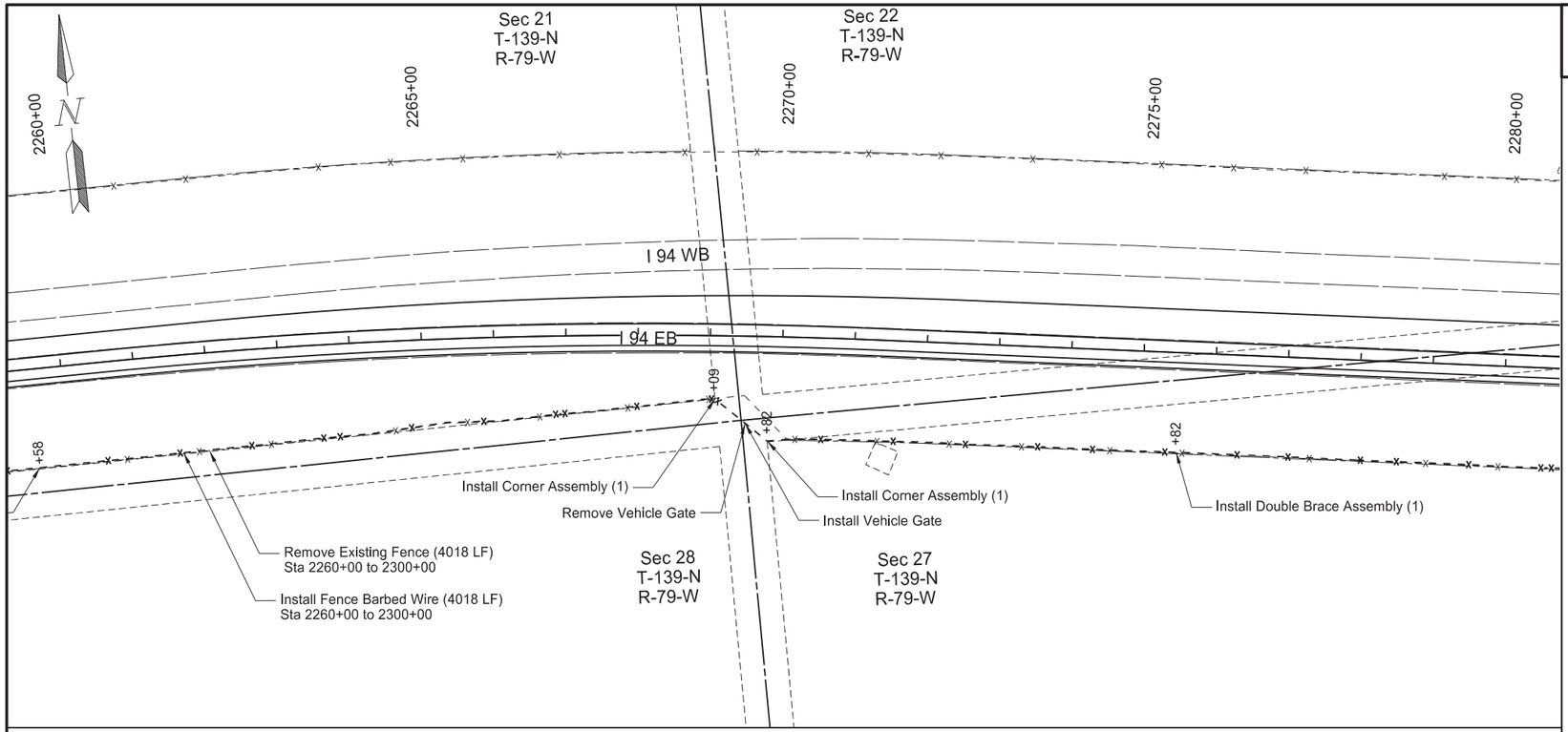
Fencing Layout

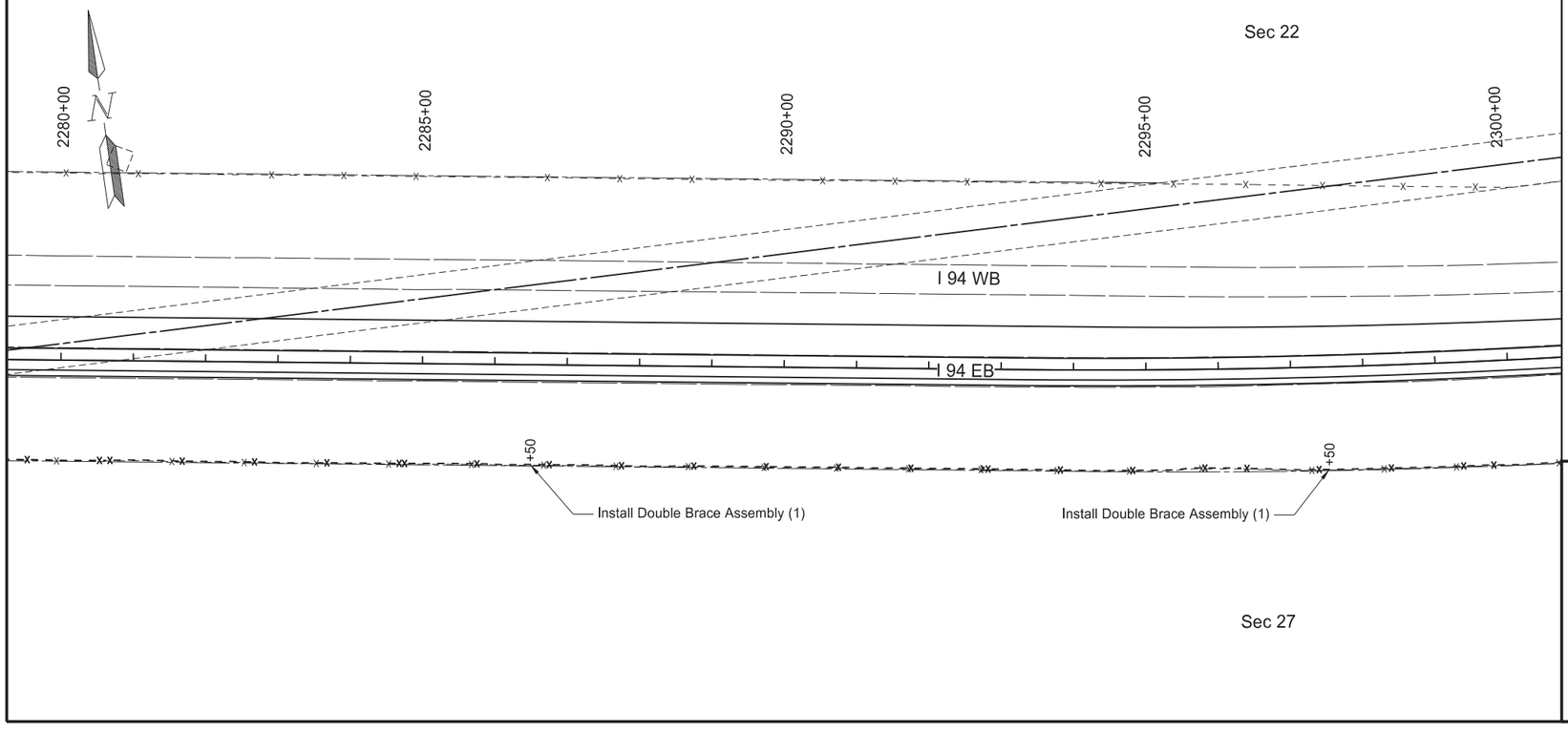
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:04:50 -05'00'
NORTH DAKOTA

7/16/2024 10:34:40 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\080\080LO.dgn





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	80	5

SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2260+00 to 2300+00	4,018	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2260+00 to 2300+00	4,018	LF
752	2100	VEHICLE GATE		
		Sta 2269+50	1	EA
752	2120	REMOVE VEHICLE GATE		
		Sta 2269+50	1	EA
752	2995	CORNER ASSEMBLY-WOOD POST		
		Sta 2260+00 to 2300+00	2	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2260+00 to 2300+00	3	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

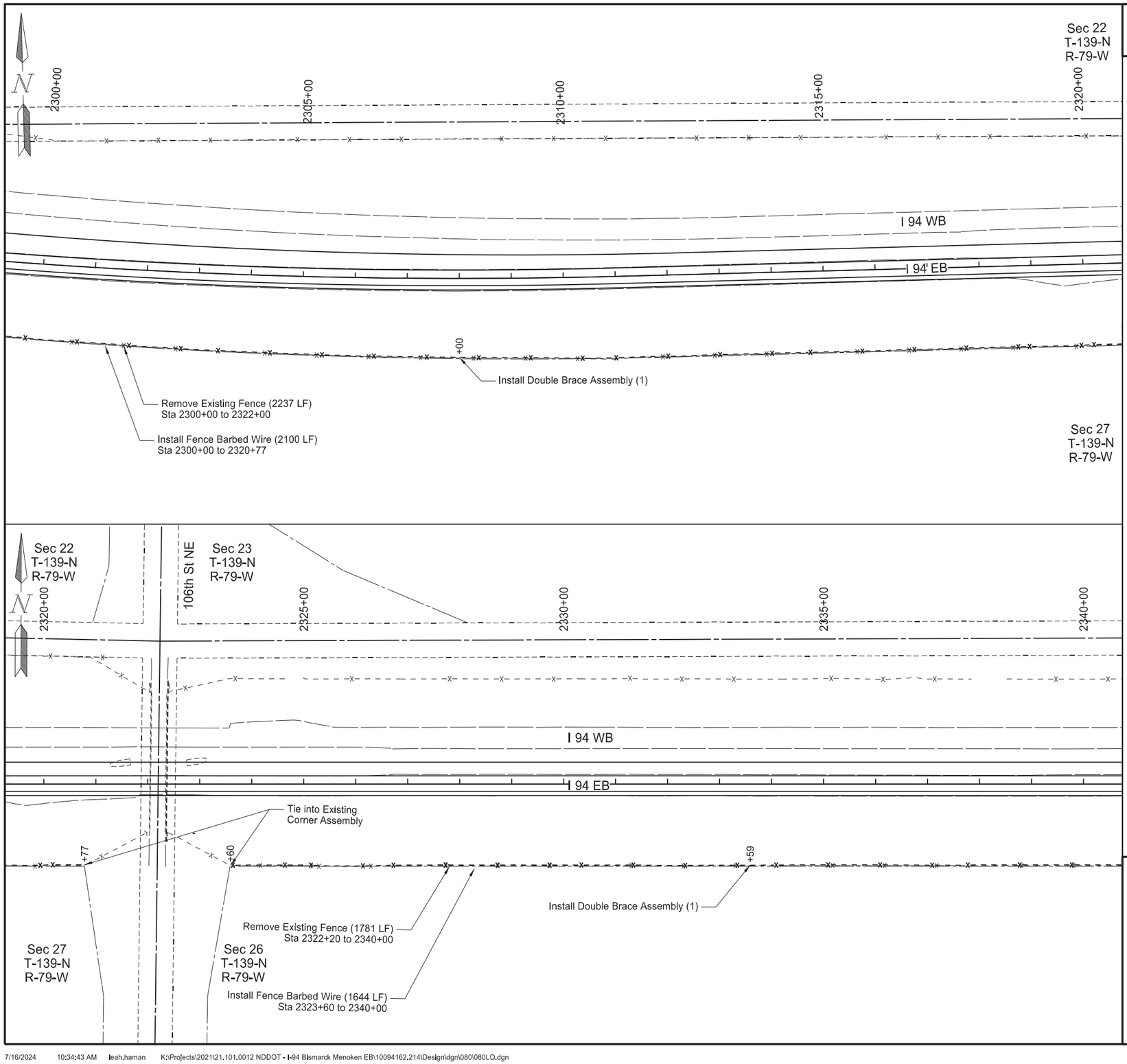
Fencing Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:05:04 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	80	6



SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2300+00 to 2340+00	4,018	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2300+00 to 2340+00	3,744	LF
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2300+00 to 2340+00	2	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

Fencing Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:05:17 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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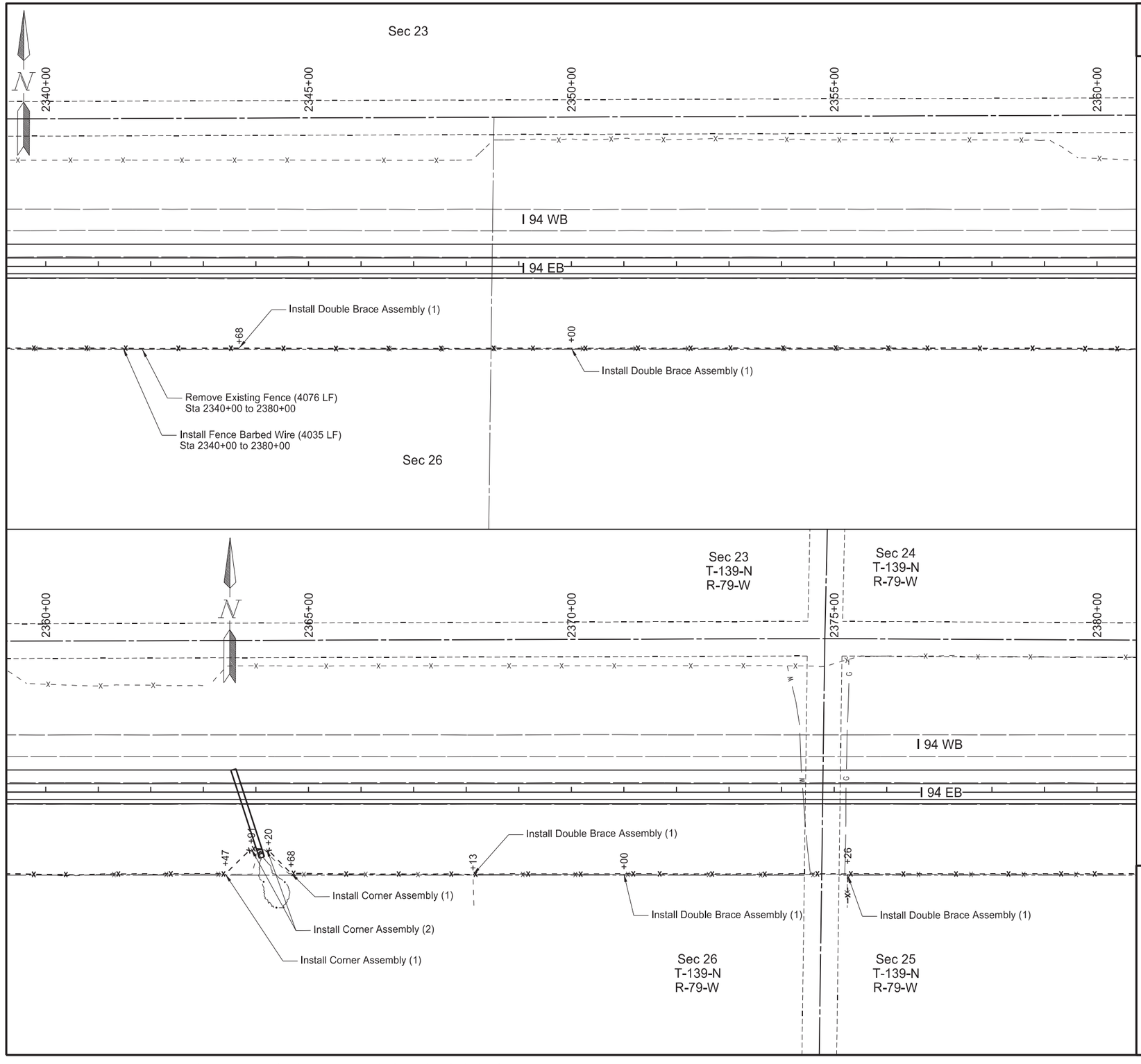

SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2340+00 to 2380+00	4,076	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2340+00 to 2380+00	4,035	LF
752	2995	CORNER ASSEMBLY-WOOD POST		
		Sta 2340+00 to 2380+00	4	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2340+00 to 2380+00	5	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

Fencing Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:05:31 -05'00'
NORTH DAKOTA

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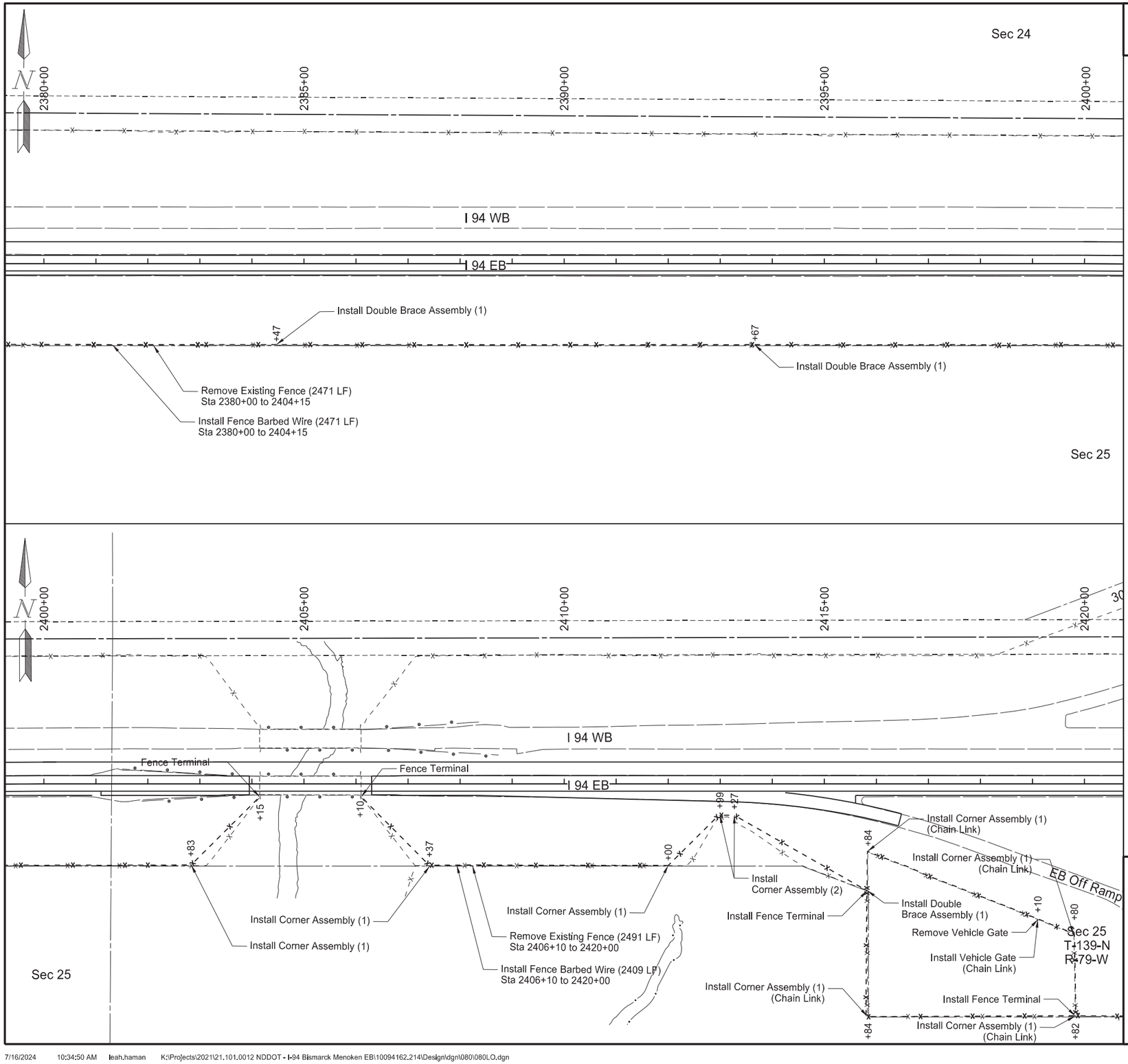


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	80	8

SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2380+00 to 2404+15	2,495	LF
		Sta 2406+10 to 2420+00	2,508	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2380+00 to 2404+15	2,470	LF
		Sta 2406+10 to 2415+84	1,128	LF
752	0600	FENCE CHAIN LINK		
		Sta 2415+84 to 2420+00	1,302	LF
752	0993	FENCE TERMINAL		
		Sta 2380+00 to 2420+00	4	EA
752	2100	VEHICLE GATE		
		Sta 2380+00 to 2420+00	1	EA
752	2120	REMOVE VEHICLE GATE		
		Sta 2380+00 to 2420+00	1	EA
752	2995	CORNER ASSEMBLY-WOOD POST		
		Sta 2380+00 to 2420+00	5	EA
752	3100	CORNER ASSEMBLY CHAIN LINK		
		Sta 2380+00 to 2420+00	4	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2380+00 to 2420+00	3	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

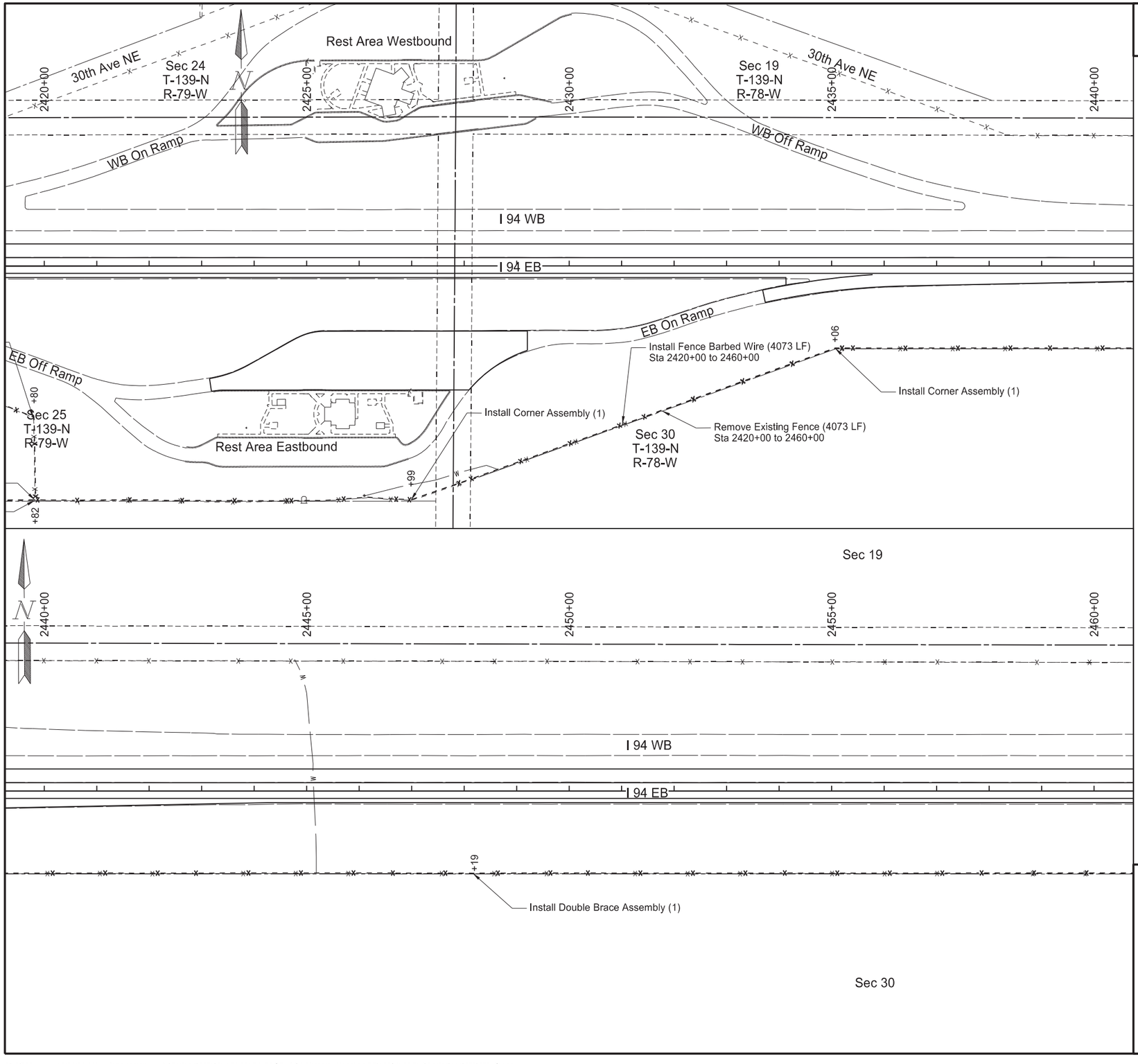
Stationing based on EX94EB alignment

Fencing Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:05:46 -05'00'
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	80	9

SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2420+00 to 2460+00	4,227	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2420+00 to 2460+00	4,227	LF
752	2995	CORNER ASSEMBLY-WOOD POST		
		Sta 2420+00 to 2460+00	2	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2420+00 to 2460+00	1	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

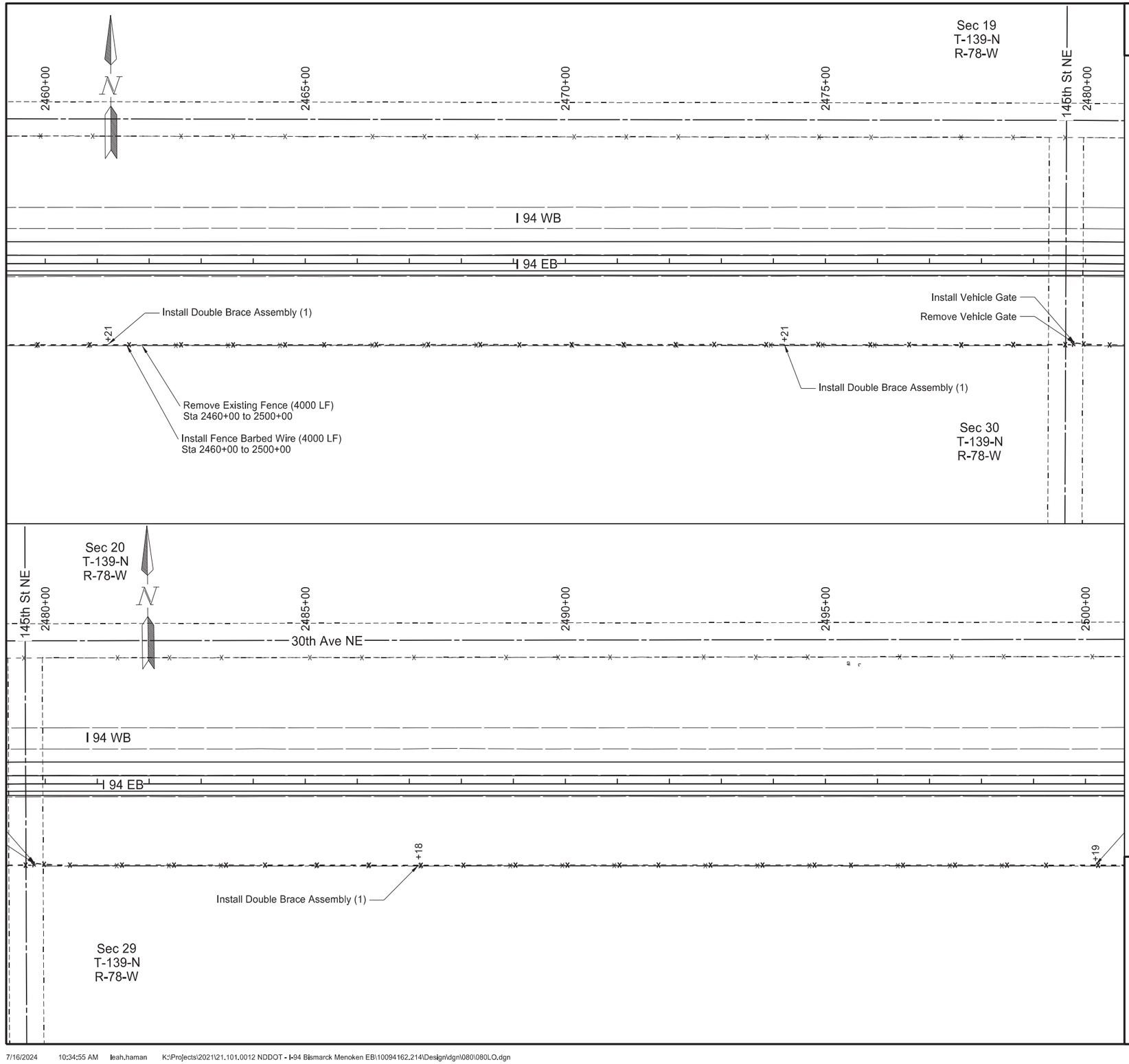
Fencing Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:06:02 -05'00'
NORTH DAKOTA

7/16/2024 10:34:54 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\080\080LO.dgn



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	80	10

SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2460+00 to 2500+00	4,000	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2460+00 to 2500+00	4,000	LF
752	2100	VEHICLE GATE		
		Sta 2479+80	1	EA
752	2120	REMOVE VEHICLE GATE		
		Sta 2479+80	1	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2460+00 to 2500+00	3	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

Fencing Layout

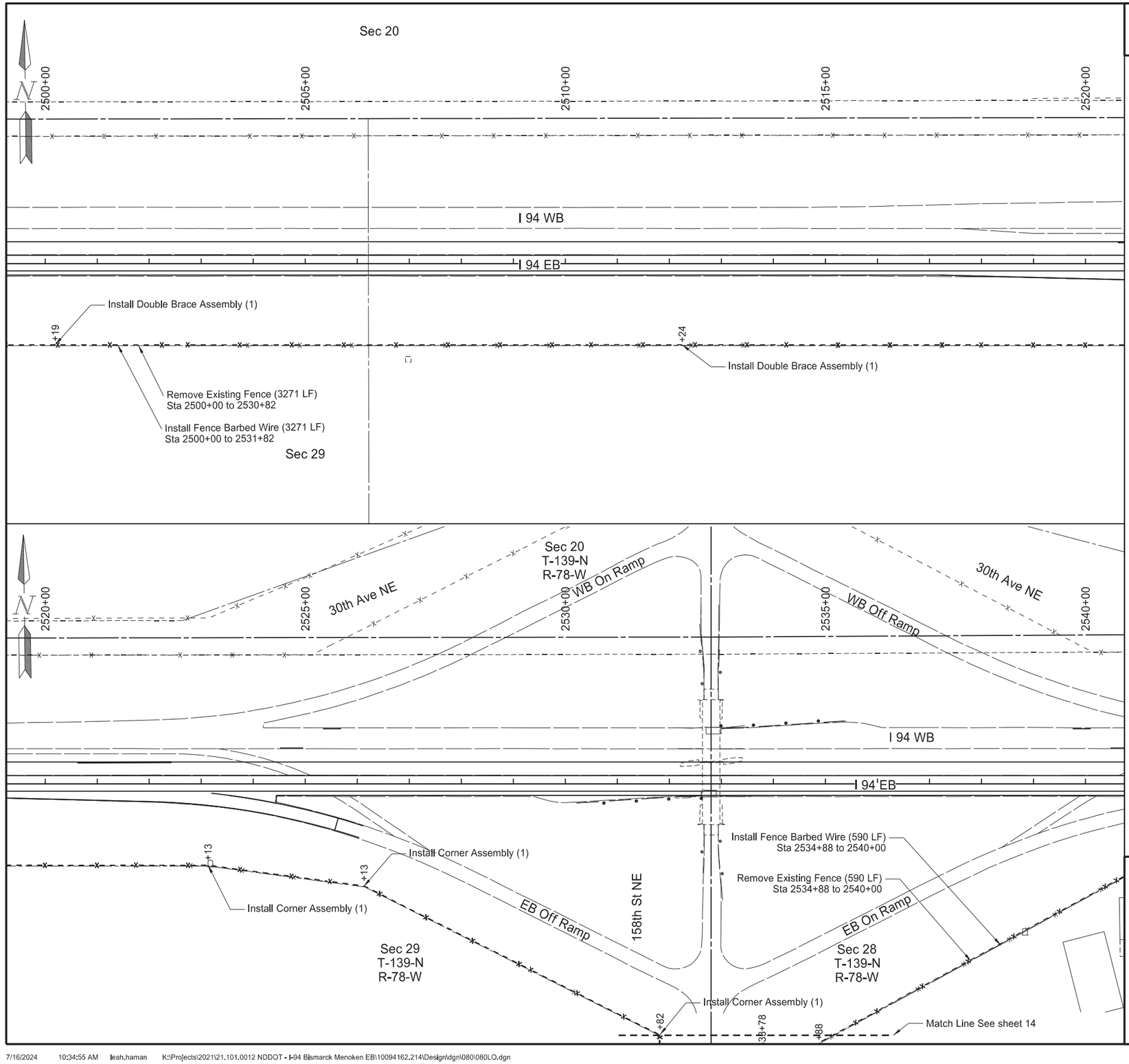
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:06:18 -05'00'
NORTH DAKOTA

7/16/2024 10:34:55 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\080\080LO.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	80	11



SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2500+00 to 2530+98	3,165	LF
		Sta 2535+95 to 2540+00	470	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2500+00 to 2531+82	3,271	LF
		Sta 2534+88 to 2540+00	590	LF
752	2995	CORNER ASSEMBLY-WOOD POST		
		Sta 2500+00 to 2540+00	3	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2500+00 to 2540+00	2	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

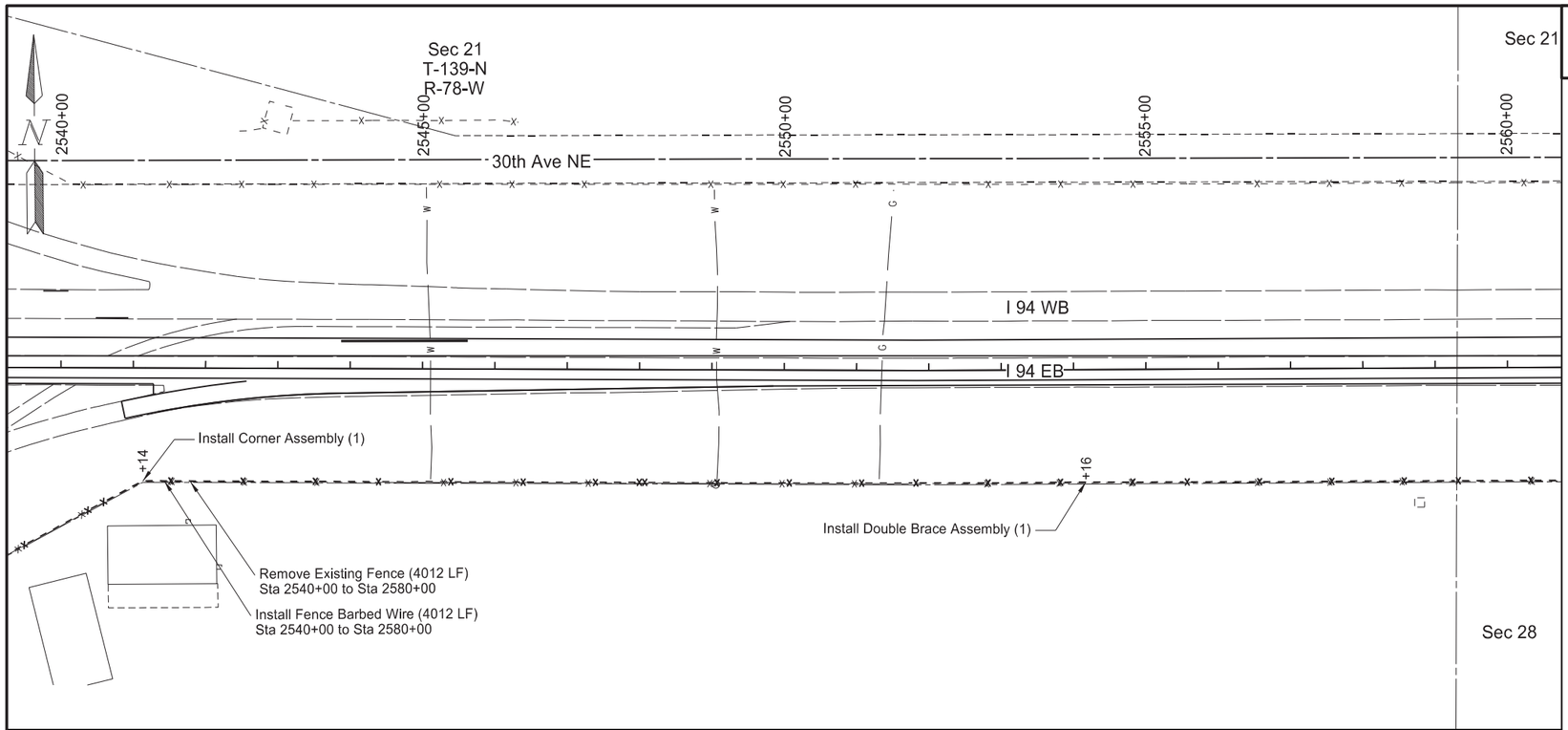
Fencing Layout

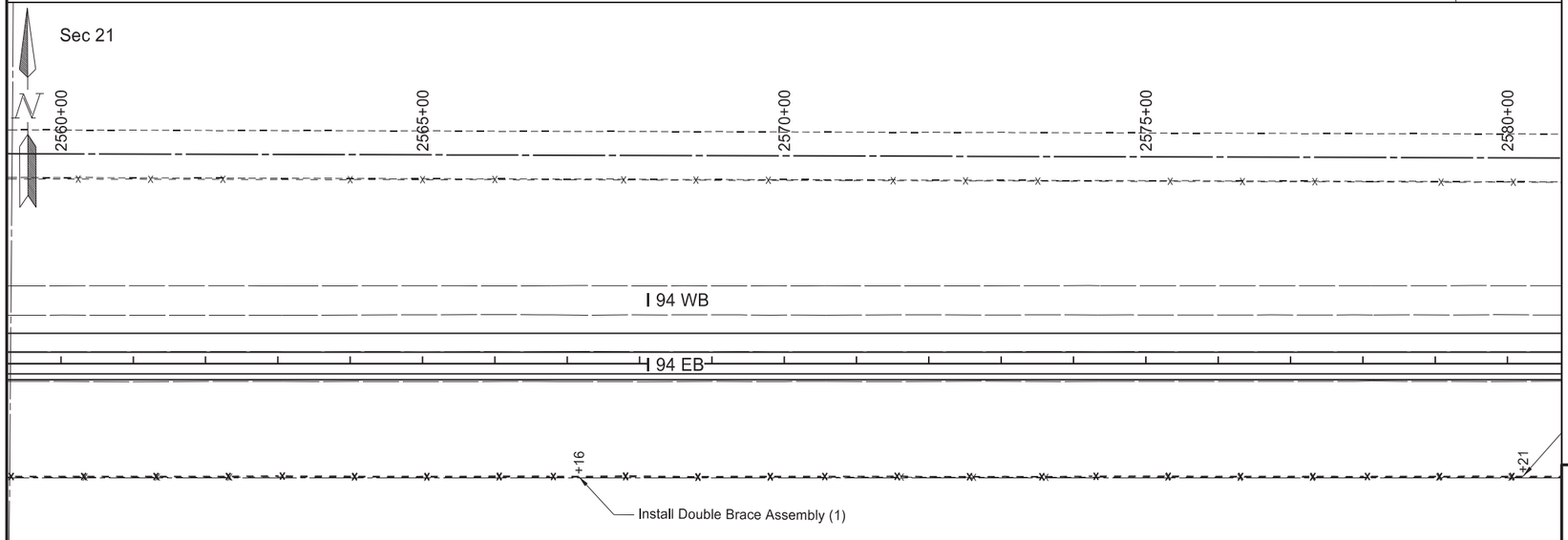
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:06:32 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	80	12





SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2540+00 to 2580+00	4,012	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2540+00 to 2580+00	4,012	LF
752	2995	CORNER ASSEMBLY-WOOD POST		
		Sta 2540+00 to 2580+00	1	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2540+00 to 2580+00	2	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

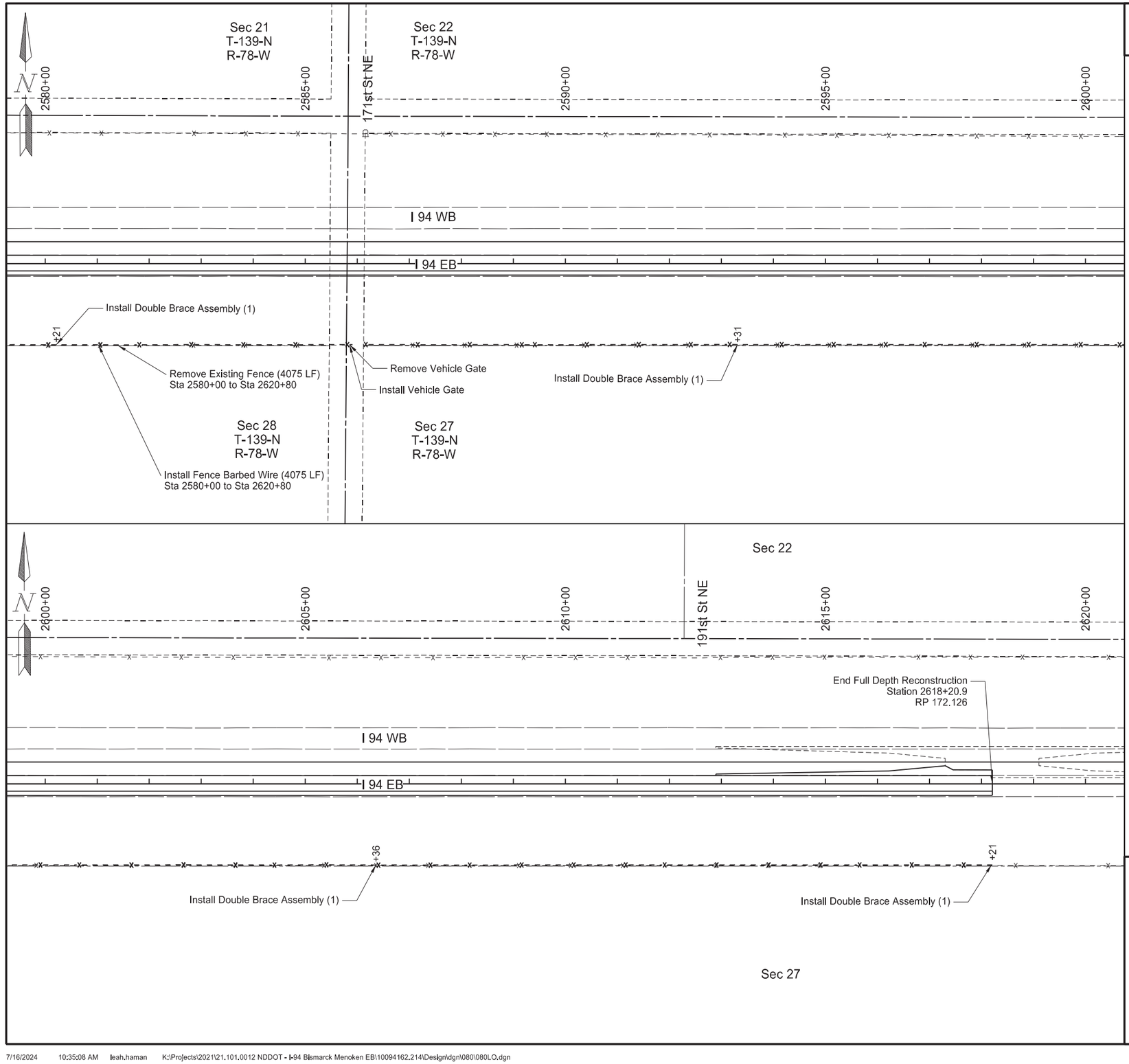
Fencing Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:06:46 -05'00'
NORTH DAKOTA

7/16/2024 10:35:01 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162,214\Design\dgn\080\080LO.dgn



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	80	13

SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		Sta 2580+00 to 2618+21	3,802	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2580+00 to 2618+21	3,802	LF
752	2100	VEHICLE GATE		
		Sta 2585+85	1	EA
752	2120	REMOVE VEHICLE GATE		
		Sta 2585+85	1	EA
752	3995	DOUBLE BRACE ASSEMBLY-WOOD POST		
		Sta 2580+00 to 2618+21	4	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

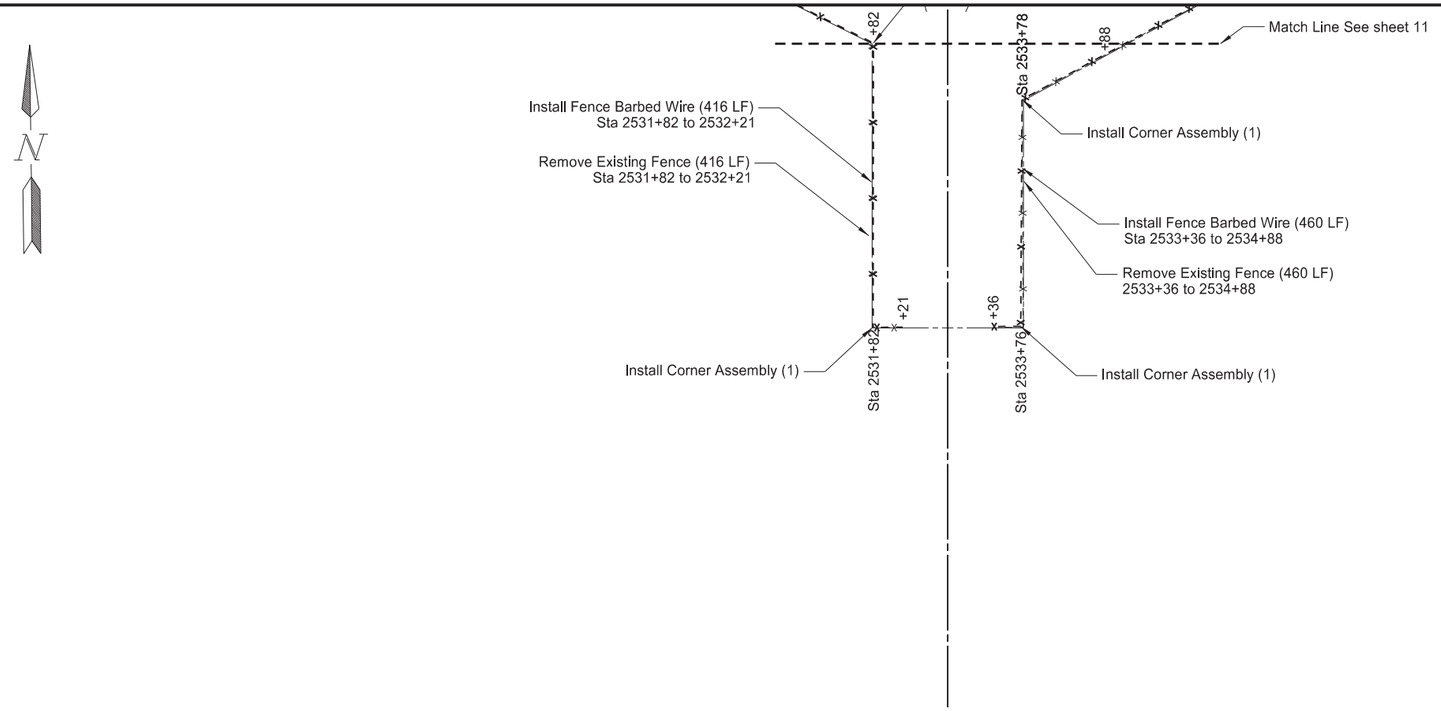
Fencing Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:07:00 -05'00'
NORTH DAKOTA

7/16/2024 10:35:08 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\080\080LO.dgn



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	80	14

202	0312	REMOVE EXISTING FENCE		
		Sta 2531+82 to 2532+21	416	LF
		Sta 2533+36 to 2534+88	460	LF
752	0300	FENCE BARBED WIRE 4 STRAND-WOOD POST		
		Sta 2531+82 to 2532+21	416	LF
		Sta 2533+36 to 2534+88	460	LF
752	2995	CORNER ASSEMBLY-WOOD POST		
		Sta 2520+00 to 2540+00	3	EA

Legend

–x– – – – –x Install New Fence

–x– – – – – Existing Fence

Stationing based on EX94EB alignment

Fencing Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DEREK ANDERSON
PE-7107
DATE 2024.07.16 15:07:14 -05'00'
NORTH DAKOTA

7/16/2024 10:35:00 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\080\080LO.dgn

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - E BIS INTR E TO E OF MENOKEN INTR

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
I-94 (Chain SCL94)			
Begin	8470+54.56	424922.35	1905760.60
PC	8527+49.97	424893.91	1911455.94
PI - C40346	8545+64.36	424884.85	1913270.30
PT	8563+12.73	425692.57	1914894.99
Sec Line Xing	8579+24.56	426410.11	1916338.28
PC	8591+71.58	426965.25	1917454.92
Sec Line Xing	8599+15.93 Bk Tan	427296.62	1918121.45
PI - C528	8605+51.30	427579.46	1918690.38
1/4 Line Xing	Ahd Tan 245.65' from PI	427576.70	1918936.02
PT	8618+79.46	427563.96	1920070.01
Sec Line Xing	8633+93.65	427546.94	1921584.11
1/4 Line Xing	8660+45.14	427517.85	1924235.44
Sec Line Xing	8686+96.99	427488.76	1926887.12
PC	8732+51.10	427438.62	1931440.96
PI - C504	8737+88.37	427432.70	1931978.20
Sec Line Xing	Ahd Tan 204.35' from PI	427401.88	1932180.22
PT	8743+23.89	427351.65	1932509.33
Sec Line Xing	8753+46.45	427197.39	1933520.19
PC	8765+06.03	427022.45	1934666.51
PI - C505	8773+93.86	426888.52	1935544.17
PT	8782+78.14	426891.36	1936431.99
Sec Line Xing	8792+81.73	426894.58	1937435.57
1/4 Line Xing	8819+10.86	426903.01	1940064.69
Sec Line Xing	8845+39.99	426911.45	1942693.80
PI	8870+59.23	426920.49	1945213.03
1/4 Line Xing	8871+91.99	426920.01	1945345.78
Sec Line Xing	8898+43.67	426910.42	1947997.45
Sec Line Xing	8950+24.03	426890.53	1953177.77
1/4 Line Xing	8976+83.00	426859.01	1955836.56
Station equation: SCL194 9003+41.97 I 94 Bk = 9003+19.17 I 94 Ahd		426827.50	1958495.34
PI	9022+21.16	426804.96	1960397.19
1/4 Line Xing	9029+69.22	426802.27	1961145.25
Sec Line Xing	9056+19.28	426792.77	1963795.30
End	9109+10.54	426773.80	1969086.52

CURVE DATA

ARC DEFINITION

Curve C40346
PI = 8545+64.36
Delta = 26° 43' 14" (LT)
Da = 0° 45' 00"
R = 7639.49'
T = 1814.39'
L = 3562.77'

Curve C528
PI = 8605+51.30
Delta = 27° 04' 42" (RT)
Da = 01° 00' 00"
R = 5729.65'
T = 1379.71'
L = 2707.87'

Curve C504
PI = 8737+88.37
Delta = 8° 02' 45" (RT)
Da = 0° 45' 00"
R = 7639.49'
T = 537.28'
L = 1072.79'

Curve C505
PI = 8773+93.86
Delta = 8° 51' 38" (LT)
Da = 0° 30' 00"
R = 11459.19'
T = 887.82'
L = 1772.11'

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
Rest Area Easbound (Chain EXSWR)			
Begin	0+00.00	426864.04	1945890.16
PC	6+40.20	426845.73	1946530.10
PI - C8151	8+74.40	426839.03	1946764.21
PT	11+04.50	426758.14	1946983.99
PC	14+59.30	426635.58	1947316.96
PI - C8152	15+40.28	426607.61	1947392.96
PT	16+19.62	426607.32	1947473.94
PC	20+74.27	426605.67	1947928.59
PI - C8153	21+44.14	426605.42	1947998.45
PT	22+12.57	426629.08	1948064.19
PC	25+66.33	426748.86	1948397.04
PI - C8154	28+04.20	426829.41	1948620.87
PT	30+37.78	426833.31	1948858.71
End	39+96.38	426849.01	1949817.19
Rest Area Westbound (Chain EXNWR)			
Begin	0+00.00	426972.08	1945880.55
PC	10+00.20	426988.46	1946880.62
PI - C8101	12+38.08	426992.36	1947118.47
PT	14+71.66	427072.91	1947342.29
PC	18+25.41	427192.70	1947675.15
PI - C8102	18+95.27	427216.35	1947740.88
PT	19+63.71	427216.10	1947810.74
PC	24+22.86	427214.44	1948269.89
PI - C8103	25+03.85	427214.15	1948350.88
PT	25+83.18	427186.18	1948426.88
PC	29+37.99	427063.62	1948759.84
PI - C8104	31+72.19	426982.72	1948979.63
PT	34+02.28	426976.02	1949213.73
End	40+00.88	426958.90	1949812.09

CURVE DATA

ARC DEFINITION

Curve C8151
PI = 8+74.40
Delta = 18° 34' 05" (RT)
Da = 4° 00' 00"
R = 1432.69'
T = 234.20'
L = 464.30'

Curve C8153
PI = 21+44.14
Delta = 20° 00' 00" (LT)
Da = 14° 30' 00"
R = 396.20'
T = 69.86'
L = 138.30'

Curve C8152
PI = 15+40.28
Delta = 20° 00' 00" (LT)
Da = 12° 30' 00"
R = 459.28'
T = 80.98'
L = 160.32'

Curve C8154
PI = 28+04.20
Delta = 18° 51' 15" (RT)
Da = 4° 00' 00"
R = 1432.69'
T = 237.88'
L = 471.45'

Curve C8101
PI = 12+38.08
Delta = 18° 51' 15" (LT)
Da = 4° 00' 00"
R = 1432.69'
T = 237.88'
L = 471.45'

Curve C8103
PI = 25+03.85
Delta = 20° 00' 00" (RT)
Da = 12° 30' 00"
R = 459.28'
T = 80.98'
L = 160.32'

Curve C8102
PI = 18+95.27
Delta = 20° 00' 00" (RT)
Da = 14° 30' 00"
R = 396.20'
T = 69.86'
L = 138.30'

Curve C8104
PI = 31+72.19
Delta = 18° 34' 05" (LT)
Da = 4° 00' 00"
R = 1432.69'
T = 234.20'
L = 464.30'

NOTES: Sheet 1 of 2

Date Survey Completed 7/01/21

☐ Assumed Coordinates

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

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

INITIALIZING BENCH MARK
GRID NORTH

☒ NAVD-88
☐ _____

☐ GEOID12B ☐ _____
☒ GEOID18

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.16 16:22:10 -05'00'
NORTH DAKOTA

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - E BIS INTR E TO E OF MENOKEN INTR

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	81	2

US PUBLIC LAND SURVEY DATA

CORNER		IRN	NORTHING	EASTING
T-139-N R-79-W				
NW Cor	Sec 31	1-L	422023.70	1916293.77
W 1/4 Cor	Sec 30	1-K	424655.64	1916320.54
NW Cor	Sec 30	1-J	427287.38	1916347.15
W 1/4 Cor	Sec 19	1-H	429937.78	1916378.19
NW Cor	Sec 19	1-G	432586.88	1916406.49
S 1/4 Cor	Sec 30	2-L	422021.67	1918881.71
S 1/4 Cor	Sec 19	2-J	427300.85	1918933.19
N 1/4 Cor	Sec 19	2-G	432573.08	1918987.20
NE Cor	Sec 31	3-L	422019.53	1921521.24
NW Cor	Sec 29	3-J	427313.99	1921582.01
NE Cor	Sec 19	3-G	432558.87	1921629.27
S 1/4 Cor	Sec 29	4-L	421997.60	1924167.08
C Cor	Sec 29	4-K	424641.19	1924200.59
N 1/4 Cor	Sec 29	4-J	427284.96	1924234.22
N 1/4 Cor	Sec 20	4-G	432545.67	1924261.82
SE Cor	Sec 29	5-L	421975.80	1926812.78
E 1/4 Cor	Sec 29	5-K	424615.83	1926849.83
NE Cor	Sec 29	5-J	427255.74	1926886.08
E 1/4 Cor	Sec 20	5-H	429892.68	1926897.88
NE Cor	Sec 20	5-G	432531.27	1926921.08
S 1/4 Cor	Sec 28	6-L	421960.75	1929453.36
N 1/4 Cor	Sec 21	6-G	432513.27	1929578.24
SE Cor	Sec 28	7-L	421945.99	1932093.86
E 1/4 Cor	Sec 28	7-K	424583.60	1932136.02
NW Cor	Sec 27	7-J	427221.30	1932178.20
E 1/4 Cor	Sec 21	7-H	429794.40	1932206.93
NE Cor	Sec 21	7-G	432495.47	1932237.13
E 1/4 Cor	Sec 16	7-F	435135.46	1932258.87
S 1/4 Cor	Sec 27	8-L	421898.09	1934741.31
SE Cor	Sec 27	9-L	421850.20	1937389.14
E 1/4 Cor	Sec 27	9-K	424488.89	1937413.43
NE Cor	Sec 27	9-J	427127.58	1937437.72
NE Cor	Sec 22	9-G	432407.60	1937494.54

NOTES: Sheet 2 of 2

US PUBLIC LAND SURVEY DATA

CORNER		IRN	NORTHING	EASTING
S 1/4 Cor	Sec 26	10-L	421864.14	1940016.24
S 1/4 Cor	Sec 23	10-J	427144.58	1940067.01
SE Cor	Sec 26	11-L	421878.14	1942643.44
NW Cor	Sec 25	11-J	427161.58	1942696.31
W 1/4 Cor	Sec 24	11-H	429804.39	1942746.82
NE Cor	Sec 23	11-G	432447.15	1942797.39
S 1/4 Cor	Sec 25	12-L	421874.97	1945293.77
S 1/4 Cor	Sec 24	12-J	427157.06	1945348.23
SE Cor	Sec 25	13-L	421871.80	1947944.10
NE Cor	Sec 25	13-J	427152.51	1948000.01
E 1/4 Cor	Sec 24	13-H	429794.44	1948022.06
NE Cor	Sec 24	13-G	432437.24	1948050.59
T-139-N R-78-W				
SE Cor	Sec 30	3-L	421830.86	1953138.01
E 1/4 Cor	Sec 30	3-K	424477.25	1953158.88
SE Cor	Sec 19	3-J	427123.62	1953179.60
E 1/4 Cor	Sec 19	3-H	429763.77	1953205.52
WTCor	Sec 19		432254.19	1953229.98
NE Cor	Sec 19	3-G	432404.41	1953231.45
S 1/4 Cor	Sec 29	4-L	421810.55	1955786.19
N 1/4 Cor	Sec 29	4-J	427095.67	1955838.92
SE Cor	Sec 29	5-L	421790.39	1958434.52
SE Cor	Sec 20	5-J	427067.72	1958498.24
E 1/4 Cor	Sec 20	5-H	429712.13	1958528.54
NE Cor	Sec 20	5-G	432356.38	1958558.96
S 1/4 Cor	Sec 28	6-L	421774.77	1961086.79
S 1/4 Cor	Sec 21	6-J	427050.88	1961148.15
C Cor	Sec 21	6-H	429695.34	1961175.64
N 1/4 Cor	Sec 21	6-G	432339.75	1961203.09
SE Cor	Sec 28	7-L	421759.20	1963739.07
E 1/4 Cor	Sec 28	7-K	424396.19	1963767.74
SE Cor	Sec 21	7-J	427034.05	1963798.07
NE Cor	Sec 21	7-G	432323.17	1963847.17
S 1/4 Cor	Sec 22	8-J	427020.53	1966443.68

Date Survey Completed 7/01/21

US PUBLIC LAND SURVEY DATA

CORNER		IRN	NORTHING	EASTING
N 1/4 Cor	Sec 22	8-G	432305.94	1966484.14
SE Cor	Sec 27	9-L	421732.66	1969027.46
SE Cor	Sec 22	9-J	427006.79	1969089.25
NE Cor	Sec 22	9-G	432278.07	1969140.22
NE Cor	Sec 23	11-G	432282.12	1974407.47

SECONDARY CONTROL POINTS

PNT	NORTHING	EASTING	STATION	OFFSET	
HV 104	424852.78	1912283.93	8535+71	82 ' Rt	SCL94
HV 118	427225.55	1918286.65	8600+46	71 ' Rt	SCL94
HV 130	427437.22	1923480.06	8652+91	89 ' Rt	SCL94
HV 141	427412.56	1928252.55	8700+63	61 ' Rt	SCL94
HV 152	427187.66	1933062.21	8748+95	79 ' Rt	SCL94
HV 164	426836.43	1938120.92	8799+67	60 ' Rt	SCL94
HV 172	426848.51	1942077.74	8839+24	61 ' Rt	SCL94
HV 186	426848.67	1948008.29	8898+55	62' Rt	SCL94
HV 219	428390.37	1958524.03	9003+29	1563' Lt	SCL94
HV 236	426728.32	1964477.76	9063+02	62 ' Rt	SCL94
HV 244	426714.85	1968463.27	9102+88	61 ' Rt	SCL94
HV 250	426705.10	1971075.83	Off Chain	Off Chain	Off Chain
RTK6593	427514.98	1924060.85	8658+70	5' Rt	SCL94
RTK6594	427511.23	1924426.65	8662+36	5' Rt	SCL94
RTK6613	427566.91	1921116.48	8629+26	15' Lt	SCL94
RTK6614	427548.86	1921432.88	8632+42	℄	SCL94
RTK6628	426895.08	1937272.43	8791+19	1' Lt	SCL94
RTK6629	426894.01	1937043.70	8788+90	℄	SCL94
RTK6642	427311.95	1932739.95	8745+58	5' Rt	SCL94
RTK6643	427401.83	1932129.82	8739+41	2' Lt	SCL94

☐ Assumed Coordinates

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

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
MONUMENT DESCRIPTION					
GPS 1	427031.66	1926778.30	1799.19	8685+93	458' Rt
# 5 Rebar w/ 1.5" Alum Cap Stamped "I-94 1"					
GPS 3	426496.60	1916073.70	1760.71	8577+26	195' Lt
# 5 Rebar w/ 1.5" Alum Cap Stamped "I-94 3"					
GPS 4	427340.95	1922522.82	1881.21	8643+35	196' Rt
# 5 Rebar w/ 1.5" Alum Cap Stamped "NDDOT"					
GPS 5	426605.99	1947955.05	1709.60	8898+02	305' Rt
# 5 Rebar w/ 1.5" Alum Cap Stamped "NDDOT"					
GPS 6	426081.74	1958582.69	1725.52	9004+15	745 Rt
# 5 Rebar w/ 1.5" Alum Cap Stamped "NDDOT"					

REFERENCE MARKERS

MKR	NORTHING	EASTING	STATION	OFFSET	CHAIN
162	425255.59	1914042.47	8553+61	71' Rt	SCL94
163	427370.54	1918924.31	8607+10	89' Rt	SCL94
164	427419.06	1924166.35	8659+77	100' Rt	SCL94
165	427388.05	1929446.51	8712+57	73' Rt	SCL94
166	426928.76	1934691.68	8765+45	89' Rt	SCL94
167	426830.99	1939958.44	8818+04	72' Rt	SCL94
168	426848.17	1945240.21	8870+87	72' Rt	SCL94
169	426829.75	1950512.13	8923+59	71' Rt	SCL94
170	426786.89	1955810.88	8976+58	72' Rt	SCL94
171	426730.20	1961085.88	9029+10	72' Rt	SCL94
172	426711.37	1966368.03	9081+92	72' Rt	SCL94

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

INITIALIZING BENCH MARK
GRID NORTH

☒ NAVD-88

☐ _____

☐ GEOID12B ☐ _____

☒ GEOID18

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.16 16:23:27 -05'00'
NORTH DAKOTA

7/16/2024 11:29:20 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Survey\081CD_002.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	82	1

I 94 Eastbound Alignment

Alignment Name: EX94EB
Alignment Description:
Alignment Style: Alignment\Horizontal\Large Scale\Alignment

		Station	Northing	Easting
Element: Linear				
START	( )	200000.000 R1	424880.348	1905760.391
PC	( )	205695.410 R1	424851.91	1911455.73
Tangential Direction:		S89.714°E		
Tangential Length:		5695.41		
Element: Circular				
PC	( )	205695.410 R1	424851.91	1911455.73
COMBINATION	( )	207519.772 R1	424842.801	1913280.069
CC	( )		432533.304	1911494.084
PT	( )	209277.762 R1	425654.959	1914913.684
Radius:		7681.49		
Delta:		26.721° Left		
Degree of Curvature (Arc):		0.746°		
Length:		3582.352		
Tangent:		1824.362		
Chord:		3549.976		
Middle Ordinate:		207.889		
External:		213.672		
Back Tangent Direction:		S89.714°E		
Back Radial Direction:		S0.286°W		
Chord Direction:		N76.926°E		
Ahead Radial Direction:		S26.434°E		
Ahead Tangent Direction:		N63.566°E		
Element: Linear				
PT	( )	209277.762 R1	425654.959	1914913.684
PC	( )	212064.065 R1	426895.349	1917408.662
Tangential Direction:		N63.566°E		
Tangential Length:		2786.303		
Element: Circular				
PC	( )	212064.065 R1	426895.349	1917408.662
COMBINATION	( )	213442.965 R1	427509.199	1918643.39
CC	( )		421764.767	1919959.353
PT	( )	214770.400 R1	427494.072	1920022.207
Radius:		5729.65		
Delta:		27.063° Right		
Degree of Curvature (Arc):		1.000°		
Length:		2706.336		
Tangent:		1378.9		
Chord:		2681.248		
Middle Ordinate:		159.047		
External:		163.588		
Back Tangent Direction:		N63.566°E		
Back Radial Direction:		S26.434°E		
Chord Direction:		N77.097°E		
Ahead Radial Direction:		S0.629°W		
Ahead Tangent Direction:		S89.371°E		
Element: Linear				
PT	( )	214770.400 R1	427494.072	1920022.207
PC	( )	219008.596 R1	427447.579	1924260.148
Tangential Direction:		S89.371°E		
Tangential Length:		4238.196		
Element: Circular				
PC	( )	219008.596 R1	427447.579	1924260.148
COMBINATION	( )	219508.747 R1	427442.093	1924760.269
CC	( )		484739.922	1924888.685
PT	( )	220008.873 R1	427445.337	1925260.41
Radius:		57295.79		
Delta:		1.000° Left		
Degree of Curvature (Arc):		0.100°		
Length:		1000.277		
Tangent:		500.151		
Chord:		1000.265		
Middle Ordinate:		2.183		
External:		2.183		
Back Tangent Direction:		S89.371°E		
Back Radial Direction:		S0.629°W		
Chord Direction:		S89.872°E		
Ahead Radial Direction:		S0.372°E		
Ahead Tangent Direction:		N89.628°E		
Element: Linear				
PT	( )	220008.873 R1	427445.337	1925260.41
PC	( )	220612.545 R1	427449.254	1925864.069
Tangential Direction:		N89.628°E		
Tangential Length:		603.672		
Element: Circular				
PC	( )	220612.545 R1	427449.254	1925864.069
COMBINATION	( )	221113.860 R1	427452.506	1926365.373
CC	( )		370154.67	1926235.794
PT	( )	221615.149 R1	427446.987	1926866.658
Radius:		57295.79		
Delta:		1.003° Right		
Degree of Curvature (Arc):		0.100°		
Length:		1002.604		
Tangent:		501.315		
Chord:		1002.591		
Middle Ordinate:		2.193		
External:		2.193		
Back Tangent Direction:		N89.628°E		
Back Radial Direction:		S0.372°E		
Chord Direction:		S89.870°E		
Ahead Radial Direction:		S0.631°W		
Ahead Tangent Direction:		S89.369°E		
Element: Linear				
PT	( )	221615.149 R1	427446.987	1926866.658
PC	( )	226057.707 R1	427398.071	1931308.946
Tangential Direction:		S89.369°E		
Tangential Length:		4442.558		

Survey Data Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.18 08:27:21 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	82	2

I 94 Eastbound Alignment continued

Alignment Name: EX94EB (continued)
Alignment Description:
Alignment Style: Alignment\Horizontal\Large Scale\Alignment

		Station	Northing	Easting
Element: Circular				
PC	( )	226057.707 R1	427398.071	1931308.946
COMBINATION	( )	226594.985 R1	427392.155	1931846.192
CC	( )		419759.044	1931224.831
PT	( )	227130.497 R1	427311.102	1932377.321
Radius:		7639.49		
Delta:		8.046° Right		
Degree of Curvature (Arc):		0.750°		
Length:		1072.79		
Tangent:		537.278		
Chord:		1071.909		
Middle Ordinate:		18.823		
External:		18.87		
Back Tangent Direction:		S89.369°E		
Back Radial Direction:		S0.631°W		
Chord Direction:		S85.346°E		
Ahead Radial Direction:		S8.677°W		
Ahead Tangent Direction:		S81.323°E		
Element: Linear				
PT	( )	227130.497 R1	427311.102	1932377.321
PC	( )	229324.815 R1	426980.068	1934546.526
Tangential Direction:		S81.323°E		
Tangential Length:		2194.318		
Element: Circular				
PC	( )	229324.815 R1	426980.068	1934546.526
COMBINATION	( )	230212.638 R1	426846.131	1935424.188
CC	( )		438308.11	1936275.255
PT	( )	231096.921 R1	426848.979	1936312.006
Radius:		11459.19		
Delta:		8.860° Left		
Degree of Curvature (Arc):		0.500°		
Length:		1772.105		
Tangent:		887.823		
Chord:		1770.34		
Middle Ordinate:		34.239		
External:		34.341		
Back Tangent Direction:		S81.323°E		
Back Radial Direction:		S8.677°W		
Chord Direction:		S85.754°E		
Ahead Radial Direction:		S0.184°E		
Ahead Tangent Direction:		N89.816°E		
Element: Linear				
PT	( )	231096.921 R1	426848.979	1936312.006
COMBINATION	( )	237478.894 R1	426869.446	1942693.947
Tangential Direction:		N89.816°E		
Tangential Length:		6381.974		
Element: Linear				
COMBINATION	( )	237478.894 R1	426869.446	1942693.947
COMBINATION	( )	239997.990 R1	426878.491	1945213.026
Tangential Direction:		N89.794°E		
Tangential Length:		2519.095		
Element: Linear				
COMBINATION	( )	239997.990 R1	426878.491	1945213.026
COMBINATION	( )	242782.271 R1	426868.425	1947997.289
Tangential Direction:		S89.793°E		
Tangential Length:		2784.282		
Element: Linear				
COMBINATION	( )	242782.271 R1	426868.425	1947997.289
COMBINATION	( )	247962.461 R1	426848.53	1953177.441
Tangential Direction:		S89.780°E		
Tangential Length:		5180.19		
Element: Linear				
COMBINATION	( )	247962.461 R1	426848.53	1953177.441
COMBINATION	( )	255182.395 R1	426762.956	1960396.868
Tangential Direction:		S89.321°E		
Tangential Length:		7219.934		
Element: Linear				
COMBINATION	( )	255182.395 R1	426762.956	1960396.868
END	( )	263871.949 R1	426731.799	1969086.366
Tangential Direction:		S89.795°E		
Tangential Length:		8689.554		

Survey Data Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.18 08:27:38 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	82	3

South Rest Area Alignment

Alignment Name: PR_RA

		Station	Northing	Easting
Element: Linear				
START	( )	0+00.000	426864.043	1945890.164
PC	( )	6+40.311	426845.728	1946530.213
Tangential Direction:		S88.361°E		
Tangential Length:		640.311		
Element: Circular				
PC	( )	6+40.311	426845.728	1946530.213
COMBINATION PI	( )	8+74.400	426839.032	1946764.206
CC	( )		425414.314	1946489.253
PT	( )	11+04.384	426758.175	1946983.887
Radius:		1432		
Delta:		18.568° Right		
Degree of Curvature (Arc):		4.001°		
Length:		464.074		
Tangent:		234.089		
Chord:		462.045		
Middle Ordinate:		18.758		
External:		19.007		
Back Tangent Direction:		S88.361°E		
Back Radial Direction:		S1.639°W		
Chord Direction:		S79.077°E		
Ahead Radial Direction:		S20.207°W		
Ahead Tangent Direction:		S69.793°E		
Element: Linear				
PT	( )	11+04.384	426758.175	1946983.887
PC	( )	14+59.302	426635.581	1947316.96
Tangential Direction:		S69.793°E		
Tangential Length:		354.917		
Element: Circular				
PC	( )	14+59.302	426635.581	1947316.96
COMBINATION PI	( )	15+40.285	426607.608	1947392.959
CC	( )		427066.592	1947475.602
PT	( )	16+19.621	426607.315	1947473.942
Radius:		459.28		
Delta:		20.000° Left		
Degree of Curvature (Arc):		12.475°		
Length:		160.319		
Tangent:		80.983		
Chord:		159.506		
Middle Ordinate:		6.977		
External:		7.085		
Back Tangent Direction:		S69.793°E		
Back Radial Direction:		S20.207°W		
Chord Direction:		S79.793°E		
Ahead Radial Direction:		S0.207°W		
Ahead Tangent Direction:		S89.793°E		
Element: Linear				
PT	( )	16+19.621	426607.315	1947473.942
PC	( )	20+74.312	426605.671	1947928.63
Tangential Direction:		S89.793°E		
Tangential Length:		454.691		
Element: Circular				
PC	( )	20+74.312	426605.671	1947928.63
COMBINATION PI	( )	21+44.137	426605.419	1947998.455
CC	( )		427001.669	1947930.061
PT	( )	22+12.542	426629.063	1948064.155
Radius:		396		
Delta:		20.000° Left		
Degree of Curvature (Arc):		14.469°		
Length:		138.23		
Tangent:		69.825		
Chord:		137.529		
Middle Ordinate:		6.016		
External:		6.109		
Back Tangent Direction:		S89.793°E		
Back Radial Direction:		S0.207°W		
Chord Direction:		N80.207°E		
Ahead Radial Direction:		S19.793°E		
Ahead Tangent Direction:		N70.207°E		
Element: Linear				
PT	( )	22+12.542	426629.063	1948064.155
PC	( )	25+66.445	426748.902	1948397.15
Tangential Direction:		N70.207°E		
Tangential Length:		353.903		
Element: Circular				
PC	( )	25+66.445	426748.902	1948397.15
COMBINATION PI	( )	28+04.206	426829.413	1948620.866
CC	( )		425401.5	1948882.055
PT	( )	30+37.669	426833.308	1948858.595
Radius:		1432		
Delta:		18.854° Right		
Degree of Curvature (Arc):		4.001°		
Length:		471.224		
Tangent:		237.762		
Chord:		469.101		
Middle Ordinate:		19.339		
External:		19.604		
Back Tangent Direction:		N70.207°E		
Back Radial Direction:		S19.793°E		
Chord Direction:		N79.634°E		
Ahead Radial Direction:		S0.939°E		
Ahead Tangent Direction:		N89.061°E		
Element: Linear				
PT	( )	30+37.669	426833.308	1948858.595
END	( )	39+96.388	426849.015	1949817.185
Tangential Direction:		N89.061°E		
Tangential Length:		958.718		

Survey Data Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.18 08:27:54 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	82	4

I 94 Southeast Ramp at Menoken Interchange

Alignment Name: OL94SETR
Alignment Description:
Alignment Style: Alignment\Horizontal\Large Scale\Alignment

		Station	Northing	Easting
Element: Linear				
START	( )	0	426698.723	1959278.687
PC	( )	35.881	426706.42	1959313.732
	Tangential Direction:	N77.613°E		
	Tangential Length:	35.881		
Element: Circular				
PC	( )	35.881	426706.42	1959313.732
COMBINATION	( )	59.324	426711.449	1959336.63
CC	( )		426916.415	1959267.613
PT	( )	82.582	426721.294	1959357.905
	Radius:	215		
	Delta:	12.445° Left		
	Degree of Curvature (Arc):	87.432°		
	Length:	46.701		
	Tangent:	23.443		
	Chord:	46.609		
	Middle Ordinate:	1.267		
	External:	1.274		
	Back Tangent Direction:	N77.613°E		
	Back Radial Direction:	S12.387°E		
	Chord Direction:	N71.390°E		
	Ahead Radial Direction:	S24.832°E		
	Ahead Tangent Direction:	N65.168°E		
Element: Linear				
PT	( )	82.582	426724.827	1959365.539
COMBINATION	( )	285.484	426810.038	1959549.681
	Tangential Direction:	N65.168°E		
	Tangential Length:	202.902		

I 94 Southwest Ramp at Menoken Interchange

Alignment Name: OL94SWTR
Alignment Description:
Alignment Style: Alignment\Horizontal\Large Scale\Alignment

		Station	Northing	Easting
Element: Linear				
START	( )	0	426857.835	1957285.932
PC	( )	80.152	426856.885	1957366.078
	Tangential Direction:	S89.321°E		
	Tangential Length:	80.152		
Element: Circular				
PC	( )	79.878	426856.888	1957365.804
COMBINATION	( )	127.058	426856.332	1957412.707
CC	( )		426641.903	1957363.256
PT	( )	172.516	426836.291	1957455.116
	Radius:	215		
	Delta:	24.614° Right		
	Degree of Curvature (Arc):	87.432°		
	Length:	92.365		
	Tangent:	46.906		
	Chord:	91.656		
	Middle Ordinate:	4.941		
	External:	5.057		
	Back Tangent Direction:	S89.321°E		
	Back Radial Direction:	S0.679°W		
	Chord Direction:	S77.014°E		
	Ahead Radial Direction:	S25.294°W		
	Ahead Tangent Direction:	S64.706°E		
Element: Linear				
PT	( )	172.516	426836.291	1957455.115
PC	( )	373.78	426750.301	1957637.084
	Tangential Direction:	S64.706°E		
	Tangential Length:	201.263		

Survey Data Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.18 08:28:09 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	82	5

I-94 SW Existing Temporary Ramp Connection

Alignment Name: MSW

		Station	Northing	Easting
Element: Linear				
START	( )	20+00.000 R1	426875.9821	1956936.122
COMBINATION PI	( )	21+80.400 R1	426861.8495	1957115.968
	Tangential Direction:	S85°30'24.53107"E		
	Tangential Length:	180.4		
Element: Linear				
COMBINATION PI	( )	21+80.400 R1	426861.8495	1957115.968
PC	( )	25+20.400 R1	426857.8197	1957455.944
	Tangential Direction:	S89°19'15.20048"E		
	Tangential Length:	340		
Element: Circular				
PC	( )	25+20.400 R1	426857.8197	1957455.944
COMBINATION PI	( )	27+19.291 R1	426855.4624	1957654.821
CC	( )		426214.8649	1957448.323
PT	( )	29+06.178 R1	426741.2277	1957817.634
	Radius:	643		
	Delta:	34°22'31.917"	Right	
	Degree of Curvature (Arc):	08°54'38.508"		
	Length:	385.778		
	Tangent:	198.891		
	Chord:	380.018		
	Middle Ordinate:	28.715		
	External:	30.058		
	Tangent Direction:	S89°19'15.20048"E		
	Radial Direction:	S00°40'44.79952"W		
	Chord Direction:	S72°07'59.24197"E		
	Radial Direction:	S35°03'16.71655"W		
	Tangent Direction:	S54°56'43.28346"E		
Element: Linear				
PT	( )	29+06.178 R1	426741.2277	1957817.634
END	( )	30+88.437 R1	426636.5459	1957966.832
	Tangential Direction:	S54°56'43.28346"E		
	Tangential Length:	182.259		

I-94 SE Existing Temporary Ramp Connection

Alignment Name: MSE

		Station	Northing	Easting
Element: Linear				
START	( )	40+00.000 R1	426628.8488	1959034.173
PC	( )	41+90.310 R1	426731.4997	1959194.425
	Tangential Direction:	N57°21'28.83752"E		
	Tangential Length:	190.31		
Element: Circular				
PC	( )	41+90.310 R1	426731.4997	1959194.425
COMBINATION PI	( )	43+82.737 R1	426835.2924	1959356.46
CC	( )		426190.0568	1959541.252
PT	( )	45+64.255 R1	426833.0116	1959548.873
	Radius:	643		
	Delta:	33°19'15.962"	Right	
	Degree of Curvature (Arc):	08°54'38.508"		
	Length:	373.945		
	Tangent:	192.427		
	Chord:	368.697		
	Middle Ordinate:	26.993		
	External:	28.176		
	Tangent Direction:	N57°21'28.83752"E		
	Radial Direction:	S32°38'31.16248"E		
	Chord Direction:	N74°01'06.81852"E		
	Radial Direction:	S00°40'44.79952"W		
	Tangent Direction:	S89°19'15.20048"E		
Element: Linear				
PT	( )	45+64.255 R1	426833.0116	1959548.873
COMBINATION PI	( )	51+64.255 R1	426825.9002	1960148.831
	Tangential Direction:	S89°19'15.20048"E		
	Tangential Length:	600		
Element: Linear				
COMBINATION PI	( )	51+64.255 R1	426825.9002	1960148.831
END	( )	52+61.002 R1	426836.7615	1960244.966
	Tangential Direction:	N83°33'14.74067"E		
	Tangential Length:	96.747		

Survey Data Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.18 08:28:26 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	82	6

I-94 NW Temporary Ramp Connection

Alignment Name: MNW

		Station	Northing	Easting
Element: Linear				
START	( )	0.000 R1	426818.269	1956742.819
COMBINATION PI	( )	96.747 R1	426829.131	1956838.955
	Tangential Direction:	N83.554°E		
	Tangential Length:	96.747		
Element: Linear				
COMBINATION PI	( )	96.747 R1	426829.131	1956838.955
PC	( )	696.747 R1	426822.019	1957438.913
	Tangential Direction:	S89.321°E		
	Tangential Length:	600		
Element: Circular				
PC	( )	696.747 R1	426822.019	1957438.913
COMBINATION PI	( )	889.174 R1	426819.738	1957631.326
CC	( )		427464.974	1957446.534
PT	( )	1070.692 R1	426923.531	1957793.36
	Radius:	643		
	Delta:	33.321° Left		
	Degree of Curvature (Arc):	8.911°		
	Length:	373.945		
	Tangent:	192.427		
	Chord:	368.697		
	Middle Ordinate:	26.993		
	External:	28.176		
	Back Tangent Direction:	S89.321°E		
	Back Radial Direction:	S0.679°W		
	Chord Direction:	N74.019°E		
	Ahead Radial Direction:	S32.642°E		
	Ahead Tangent Direction:	N57.358°E		
Element: Linear				
PT	( )	1070.692 R1	426923.531	1957793.36
END	( )	1261.002 R1	427026.182	1957953.613
	Tangential Direction:	N57.358°E		
	Tangential Length:	190.311		

I-94 NE Temporary Ramp Connection

Alignment Name: MNE

		Station	Northing	Easting
Element: Linear				
START	( )	0.000 R1	427018.448	1959024.086
PC	( )	182.256 R1	426913.767	1959173.282
	Tangential Direction:	S54.945°E		
	Tangential Length:	182.256		
Element: Circular				
PC	( )	182.256 R1	426913.767	1959173.282
COMBINATION PI	( )	381.149 R1	426799.531	1959336.096
CC	( )		427440.129	1959542.595
PT	( )	568.036 R1	426797.174	1959534.974
	Radius:	643		
	Delta:	34.376° Left		
	Degree of Curvature (Arc):	8.911°		
	Length:	385.78		
	Tangent:	198.892		
	Chord:	380.02		
	Middle Ordinate:	28.716		
	External:	30.058		
	Back Tangent Direction:	S54.945°E		
	Back Radial Direction:	S35.055°W		
	Chord Direction:	S72.133°E		
	Ahead Radial Direction:	S0.679°W		
	Ahead Tangent Direction:	S89.321°E		
Element: Linear				
PT	( )	568.036 R1	426797.174	1959534.974
COMBINATION PI	( )	908.036 R1	426793.144	1959874.95
	Tangential Direction:	S89.321°E		
	Tangential Length:	340		
Element: Linear				
COMBINATION PI	( )	908.036 R1	426793.144	1959874.95
END	( )	1088.436 R1	426779.011	1960054.795
	Tangential Direction:	S85.507°E		
	Tangential Length:	180.4		

Survey Data Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.18 08:28:43 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	82	7

SW MENOKEN TEMPORARY RAMP DETOUR ALIGNMENT

Alignment Name: OL94SWTR
Alignment Description:
Alignment Style: Alignment\Horizontal\Large Scale\Alignment 7

		Station	Northing	Easting
Element: Linear				
START	( )	0	426871.042	1956973.461
PC	( )	81.599	426870.263	1957055.056
	Tangential Direction:	S89.453°E		
	Tangential Length:	81.599		
Element: Circular				
PC	( )	81.599	426870.263	1957055.056
COMBINATION	( )	116.515	426869.929	1957089.97
CC	( )		426655.273	1957053.003
PT	( )	150.826	426858.564	1957122.984
	Radius:	215		
	Delta:	18.448° Right		
	Degree of Curvature (Arc):	87.432°		
	Length:	69.227		
	Tangent:	34.916		
	Chord:	68.928		
	Middle Ordinate:	2.78		
	External:	2.817		
	Back Tangent Direction:	S89.453°E		
	Back Radial Direction:	S0.547°W		
	Chord Direction:	S80.229°E		
	Ahead Radial Direction:	S18.996°W		
	Ahead Tangent Direction:	S71.004°E		
Element: Linear				
PT	( )	150.826	426858.564	1957122.984
PC	( )	396.203	426778.696	1957354.999
	Tangential Direction:	S71.004°E		
	Tangential Length:	245.377		
Element: Circular				
PC	( )	396.203	426778.696	1957354.999
COMBINATION	( )	420.149	426770.901	1957377.641
CC	( )		426981.988	1957424.981
PT	( )	443.898	426768.28	1957401.443
	Radius:	215		
	Delta:	12.710° Left		
	Degree of Curvature (Arc):	87.432°		
	Length:	47.695		
	Tangent:	23.946		
	Chord:	47.597		
	Middle Ordinate:	1.321		
	External:	1.329		
	Back Tangent Direction:	S71.004°E		
	Back Radial Direction:	S18.996°W		
	Chord Direction:	S77.360°E		
	Ahead Radial Direction:	S6.285°W		
	Ahead Tangent Direction:	S83.715°E		
Element: Linear				
PT	( )	443.898	426768.28	1957401.443
END	( )	598.925	426751.308	1957555.538
	Tangential Direction:	S83.715°E		
	Tangential Length:	155.028		

SE MENOKEN TEMPORARY RAMP DETOUR ALIGNMENT

Alignment Name: OL94SETR
Alignment Description:
Alignment Style: Alignment\Horizontal\Large Scale\Alignment 7

		Station	Northing	Easting
Element: Linear				
START	( )	0	426729.398	1959471.489
PC	( )	151.725	426736.986	1959623.024
	Tangential Direction:	N87.133°E		
	Tangential Length:	151.725		
Element: Circular				
PC	( )	151.725	426736.986	1959623.024
COMBINATION	( )	178.762	426738.339	1959650.027
CC	( )		426951.717	1959612.271
PT	( )	205.517	426746.335	1959675.855
	Radius:	215		
	Delta:	14.335° Left		
	Degree of Curvature (Arc):	87.432°		
	Length:	53.792		
	Tangent:	27.037		
	Chord:	53.652		
	Middle Ordinate:	1.68		
	External:	1.693		
	Back Tangent Direction:	N87.133°E		
	Back Radial Direction:	S2.867°E		
	Chord Direction:	N79.966°E		
	Ahead Radial Direction:	S17.202°E		
	Ahead Tangent Direction:	N72.798°E		
Element: Linear				
PT	( )	205.517	426746.335	1959675.855
PC	( )	442.554	426816.436	1959902.289
	Tangential Direction:	N72.798°E		
	Tangential Length:	237.037		
Element: Circular				
PC	( )	442.554	426816.436	1959902.289
COMBINATION	( )	476.378	426826.439	1959934.6
CC	( )		426611.054	1959965.873
PT	( )	509.652	426826.038	1959968.422
	Radius:	215		
	Delta:	17.881° Right		
	Degree of Curvature (Arc):	87.432°		
	Length:	67.098		
	Tangent:	33.824		
	Chord:	66.826		
	Middle Ordinate:	2.612		
	External:	2.644		
	Back Tangent Direction:	N72.798°E		
	Back Radial Direction:	S17.202°E		
	Chord Direction:	N81.739°E		
	Ahead Radial Direction:	S0.679°W		
	Ahead Tangent Direction:	S89.321°E		
Element: Linear				
PT	( )	509.652	426826.038	1959968.422
END	( )	582.465	426825.175	1960041.23
	Tangential Direction:	S89.321°E		
	Tangential Length:	72.813		

Alignment Descriptions

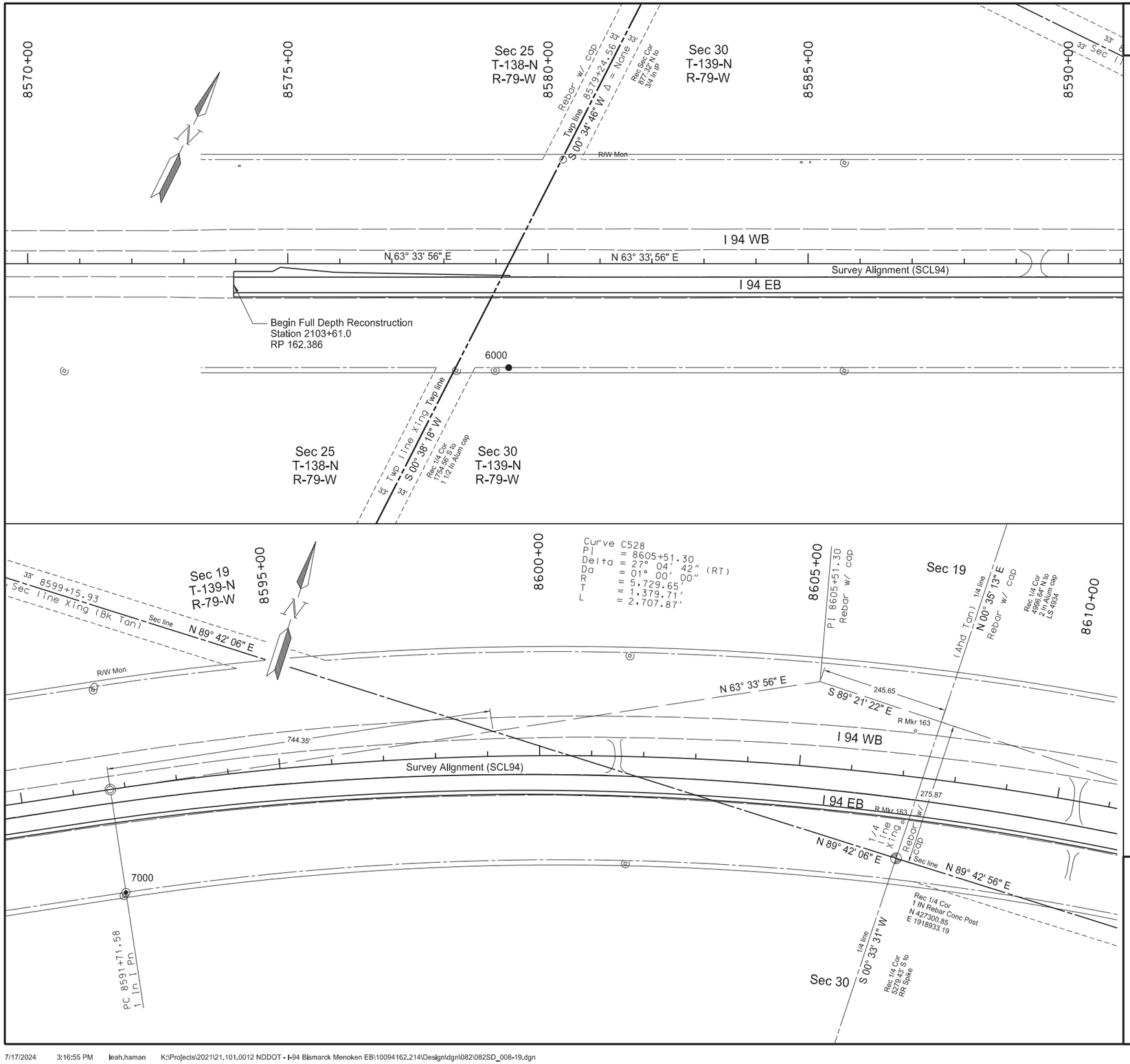
I-94 Reconstruction
Temporary Ramp Connection Detours

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.18 08:29:04 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	8

POINT	NORTHING	EASTING	STATION	OFFSET
6000	426231.02	1916427.32	8579+24.56	200
7000	426786.16	1917543.96	8591+71.58	200



Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

I-94 Reconstruction

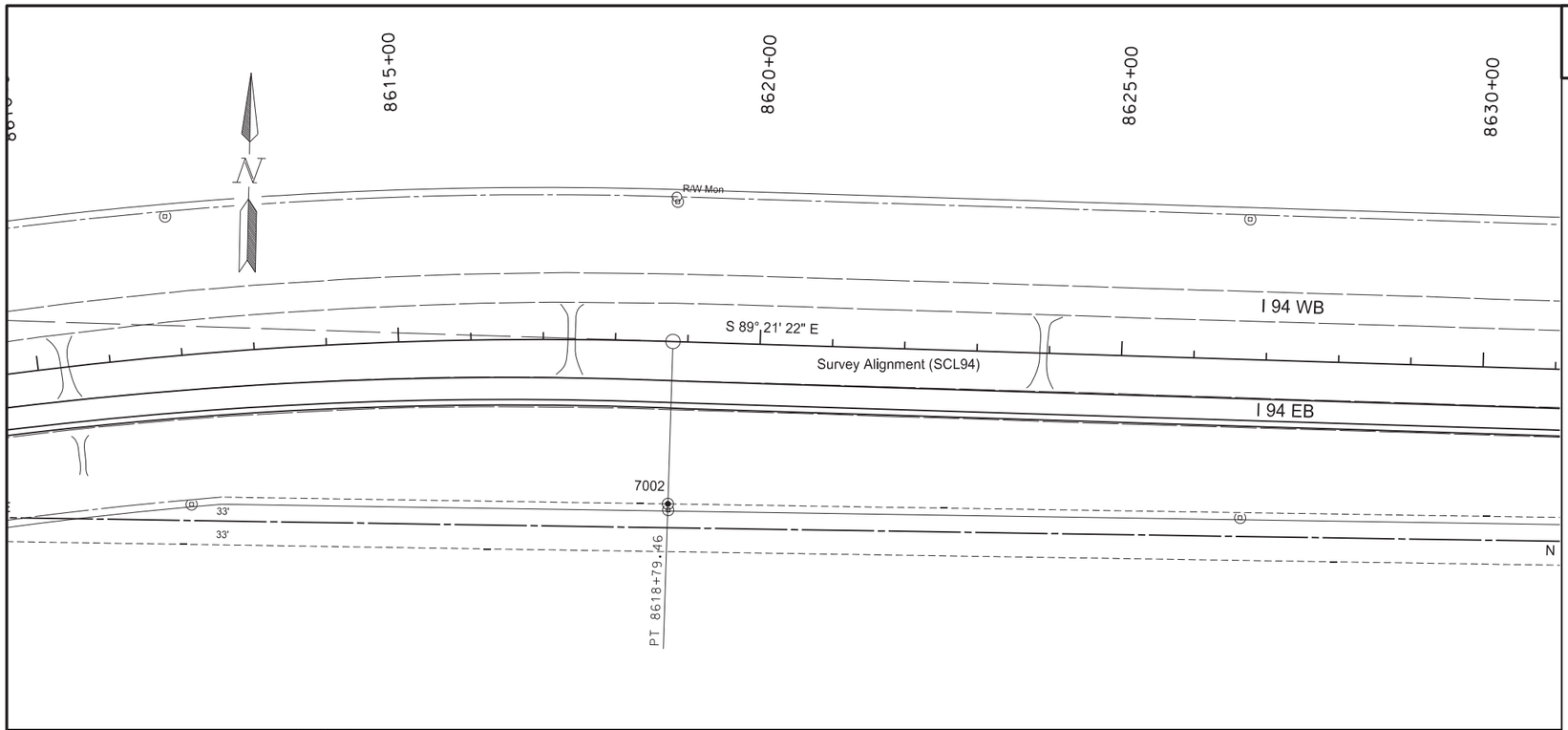
Bismarck to E of Menoken Interchange - EB

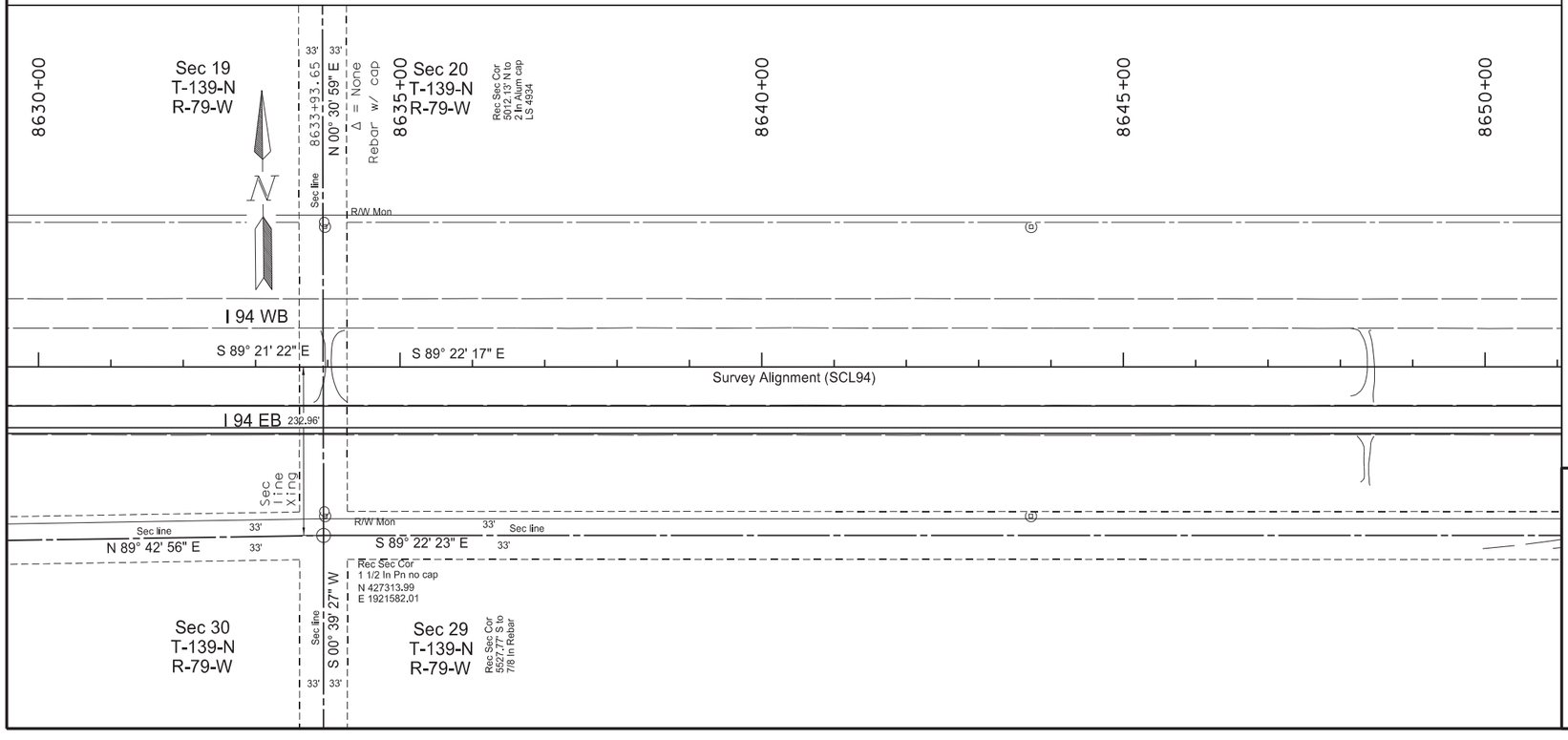
REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18
08:43:15 -05'00'
NORTH DAKOTA

7/17/2024 3:16:55 PM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\082\082SD_008-19.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	9

POINT	NORTHING	EASTING	STATION	OFFSET
7002	427339.46	1920067.49	8618+79.46	224.51





Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

I-94 Reconstruction

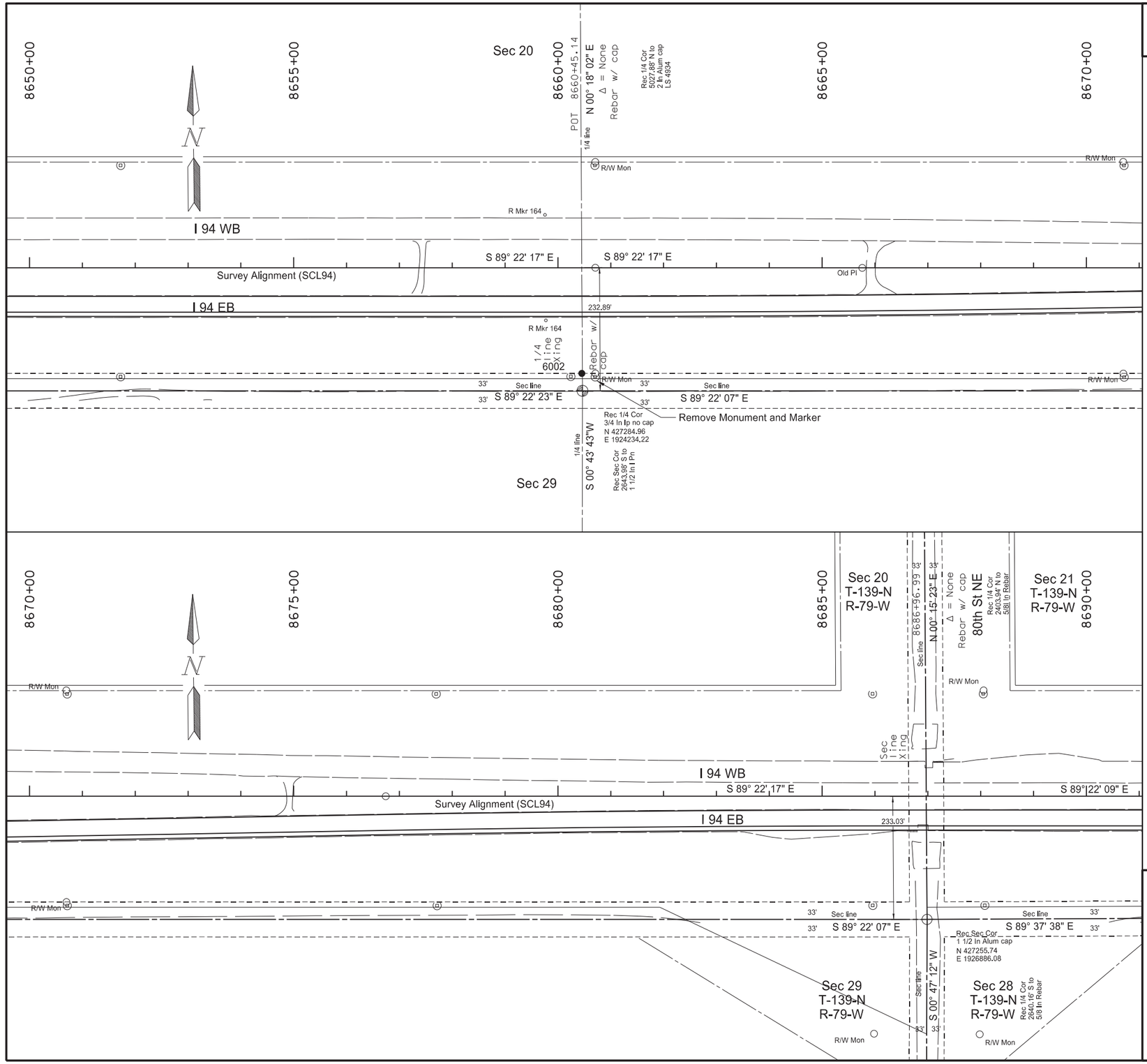
Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18 08:44:39 -05'00'
NORTH DAKOTA

7/17/2024 3:16:56 PM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\082\082SD_008-19.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	10

POINT	NORTHING	EASTING	STATION	OFFSET
6002	427317.94	1924233.25	8660+45.15	199.93



Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

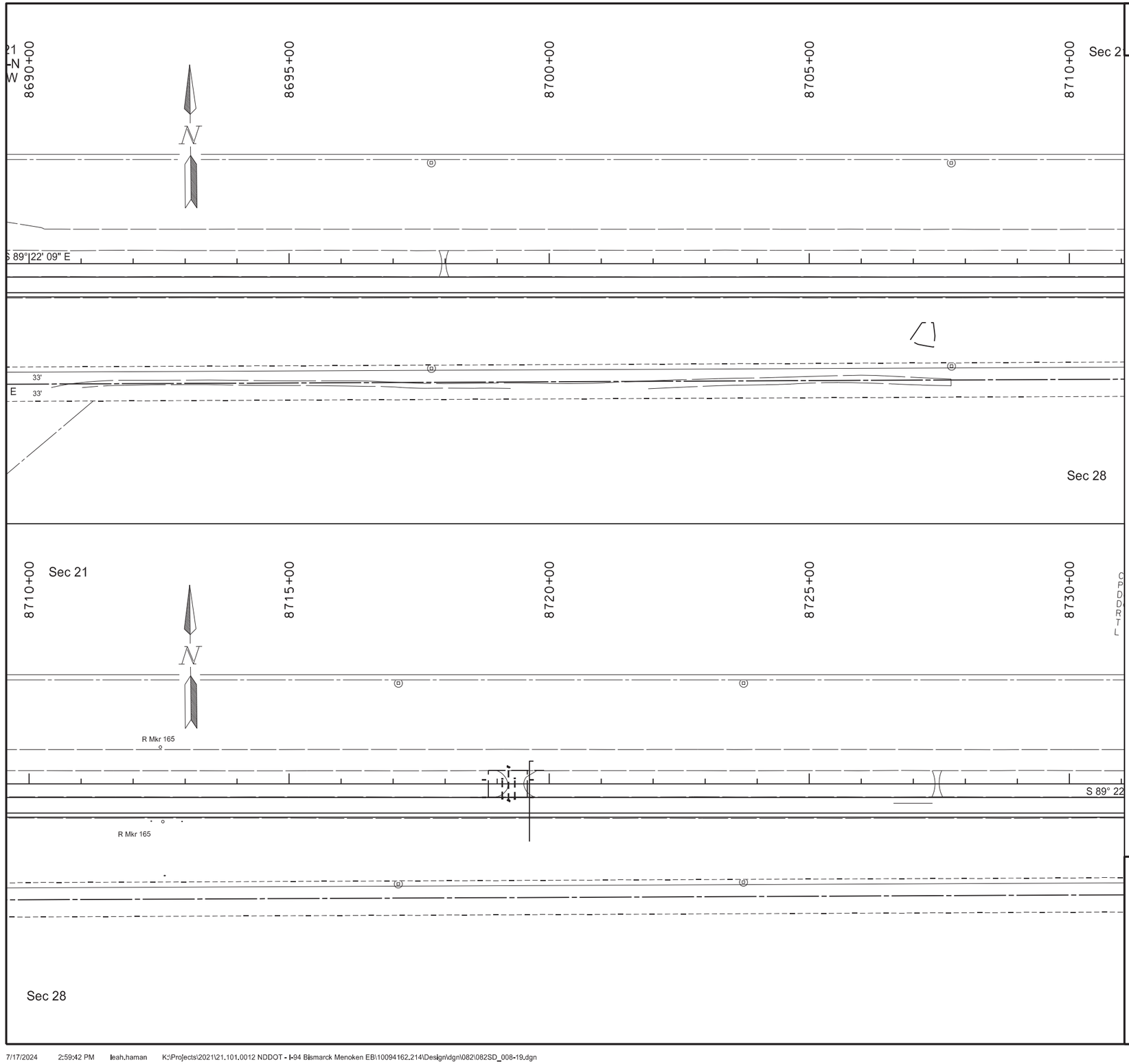
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18 08:45:33 -05'00'
NORTH DAKOTA

7/17/2024 3:16:56 PM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\082\082SD_008-19.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	11



Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

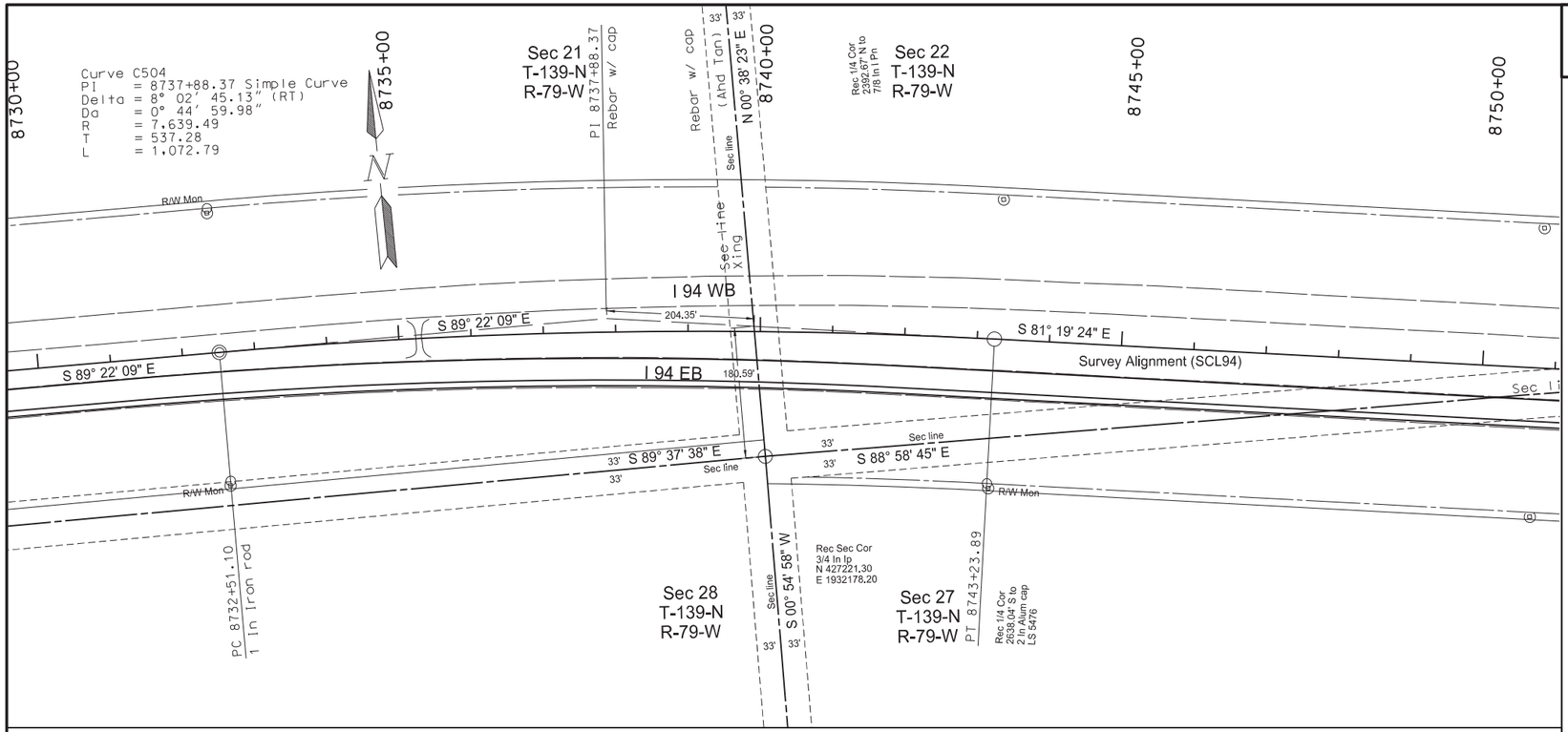
I-94 Reconstruction

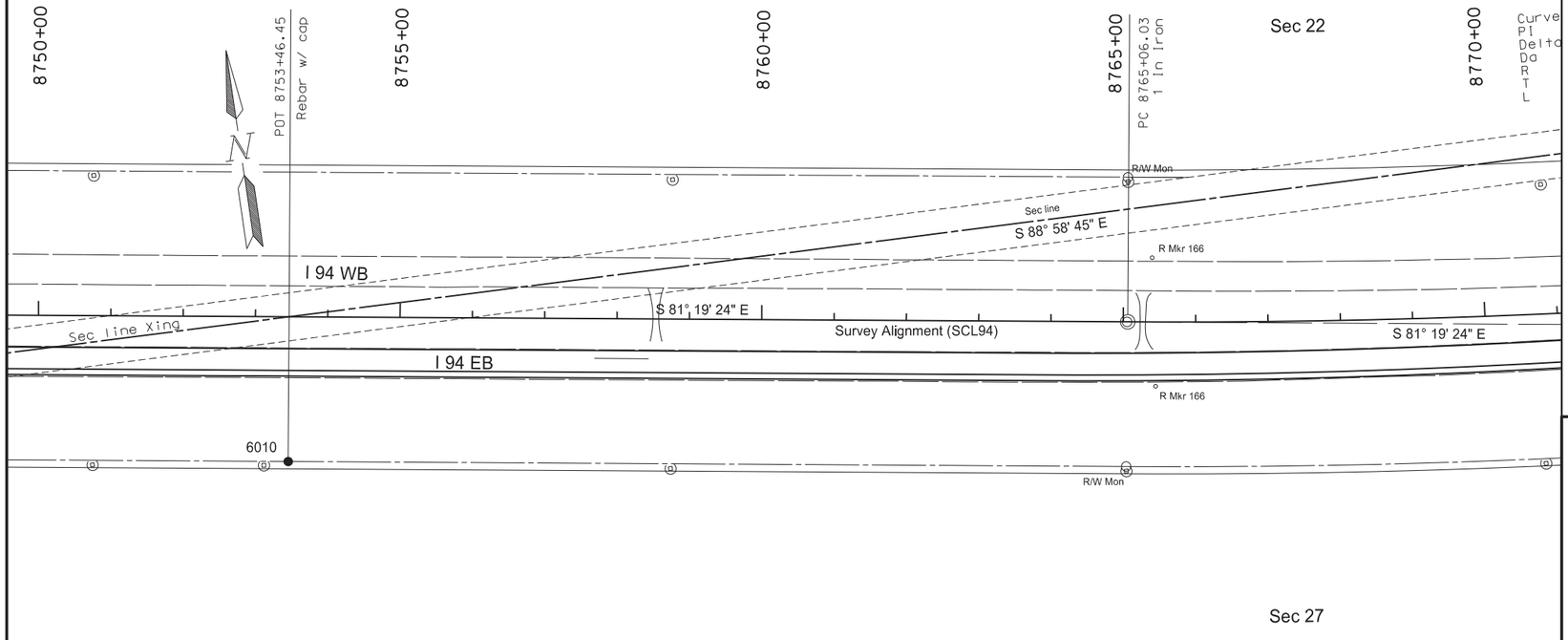
Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18
08:46:32 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	12

POINT	NORTHING	EASTING	STATION	OFFSET
6010	426999.68	1933490.02	8753+46.45	200





Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

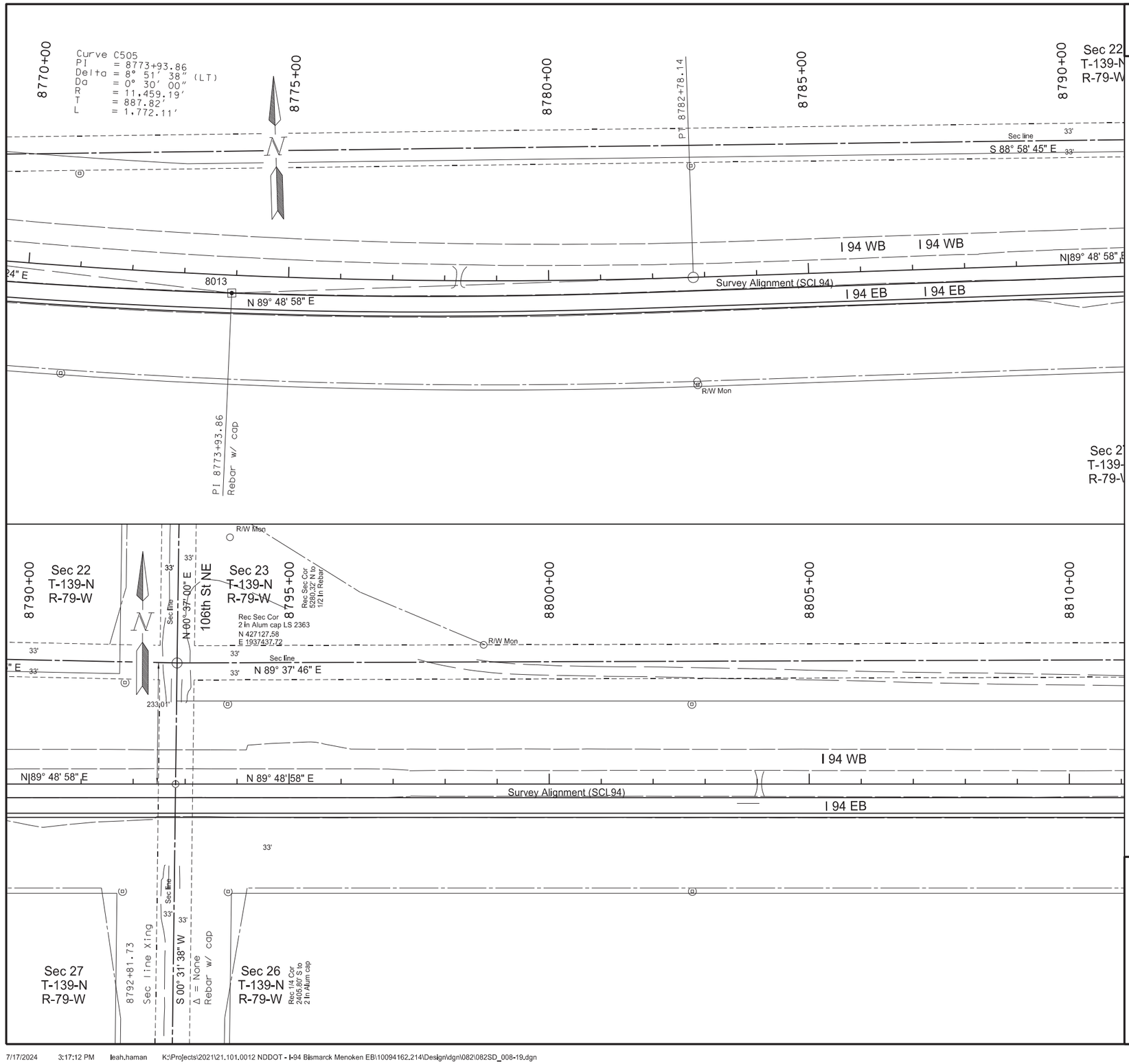
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18 08:47:33 -05'00'
NORTH DAKOTA

7/17/2024 3:17:11 PM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\082\082SD_008-19.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	13



POINT	NORTHING	EASTING	STATION	OFFSET
8013	426888.52	1935544.17	8773+93.86	34.34

Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

I-94 Reconstruction

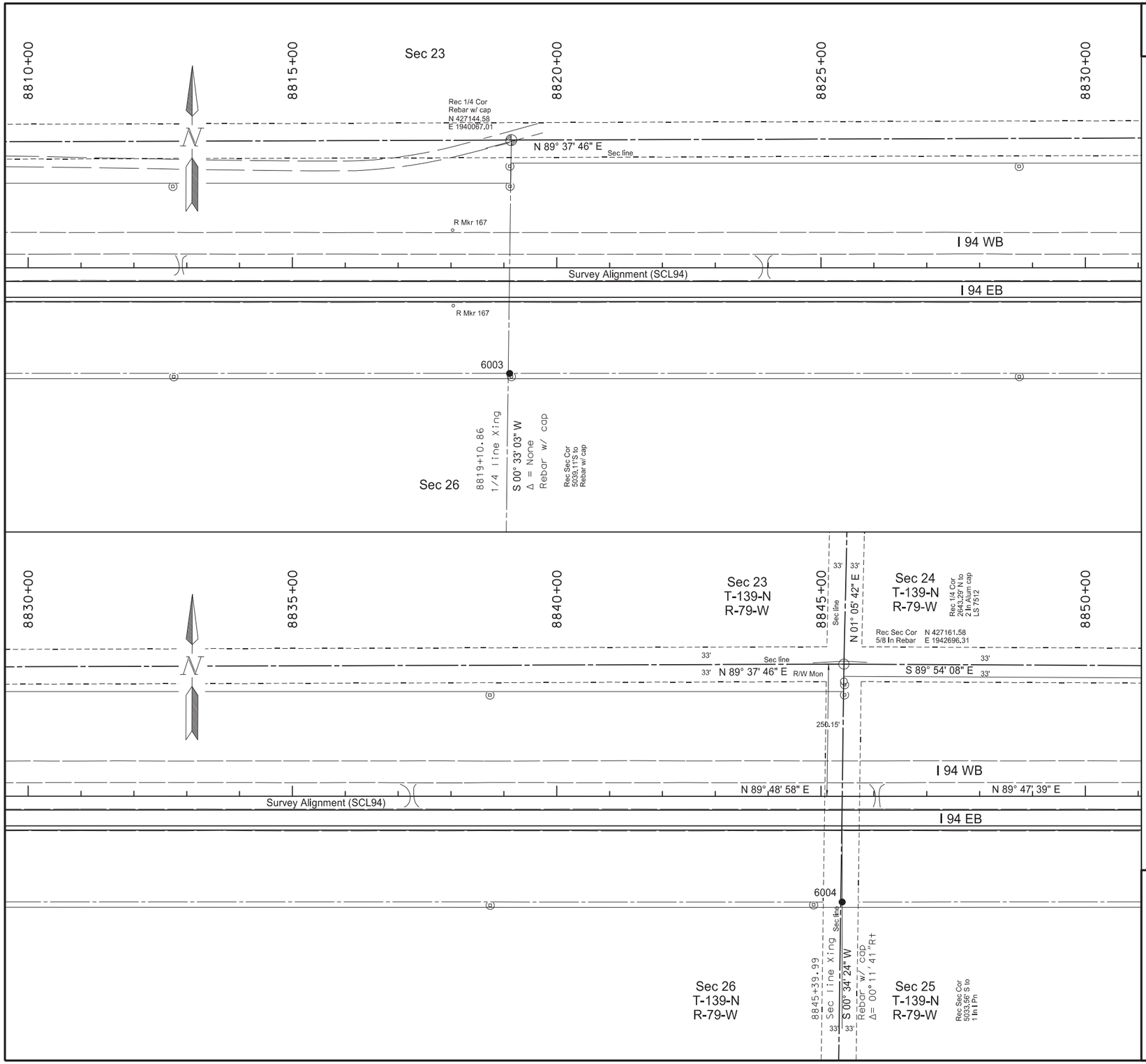
Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18
08:48:36 -05'00'
NORTH DAKOTA

7/17/2024 3:17:12 PM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\082\082SD_008-19.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	14

POINT	NORTHING	EASTING	STATION	OFFSET
6003	426703.02	1940065.33	8819+10.86	200
6004	426711.47	1942694.48	8845+39.99	200



Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

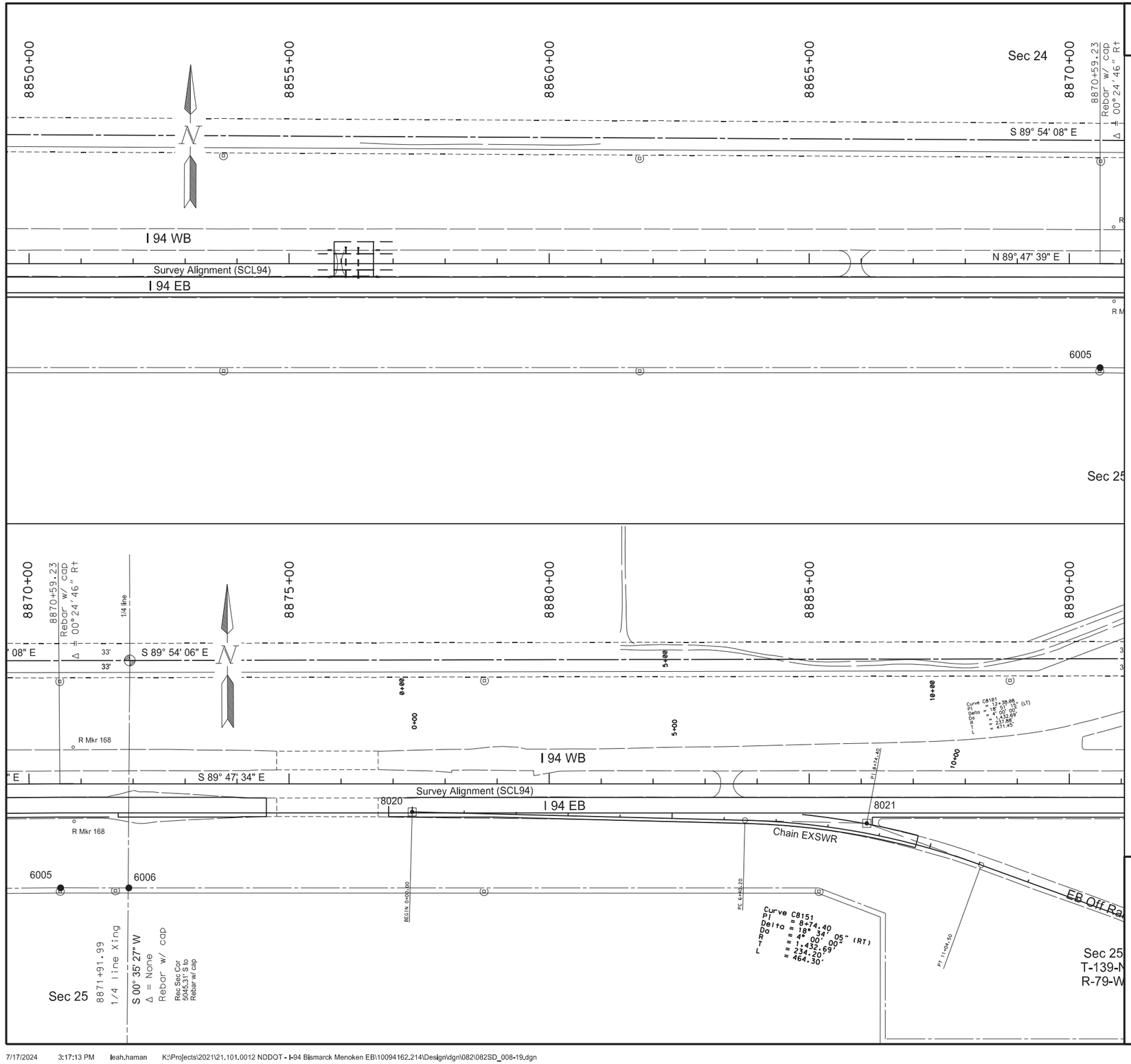
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18
08:49:39 -05'00'
NORTH DAKOTA

7/17/2024 3:17:12 PM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\082\082SD_008-19.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	15



SCL94 Alignment

POINT	NORTHING	EASTING	STATION	OFFSET
6005	426720.49	1945213.75	8870+59.23	200.00
6006	426720.01	1945345.06	8871+91.99	200.00

Rest Area Eastbound (Chain PR_RA)

POINT	NORTHING	EASTING	STATION	OFFSET
8020	426864.04	1945890.16	0+00	0.00
8021	426839.03	1946764.21	8+74.40	-19.01

Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

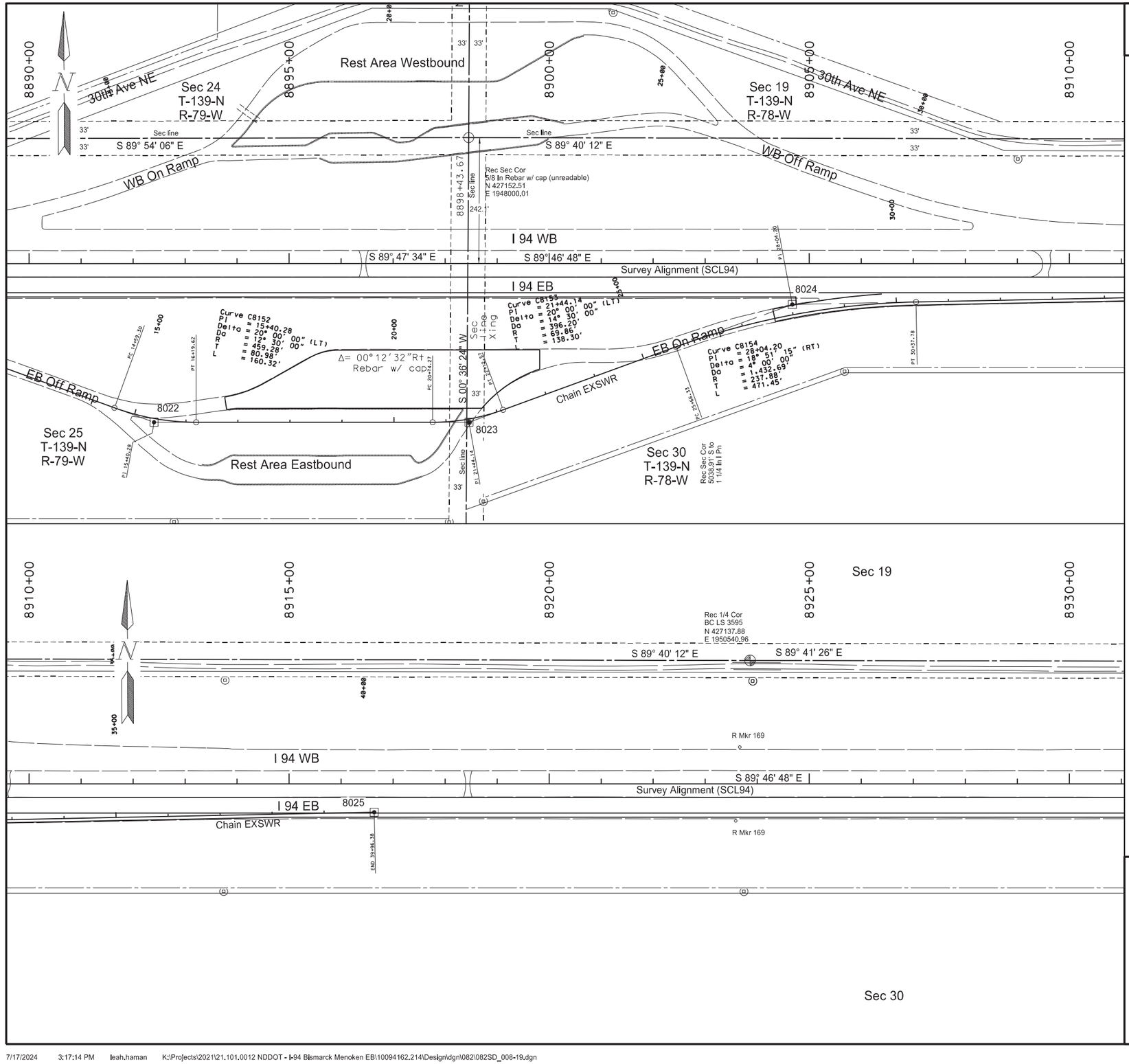
Survey Data Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18
08:50:45 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	16



Rest Area Eastbound (Chain PR_RA)

POINT	NORTHING	EASTING	STATION	OFFSET
8022	426607.61	1947392.96	15+40.28	7.09
8023	426605.42	1947998.45	21+44.14	6.11
8024	426829.41	1948620.87	28+04.20	-19.61
8025	426849.01	1949817.19	39+96.38	0.00

Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

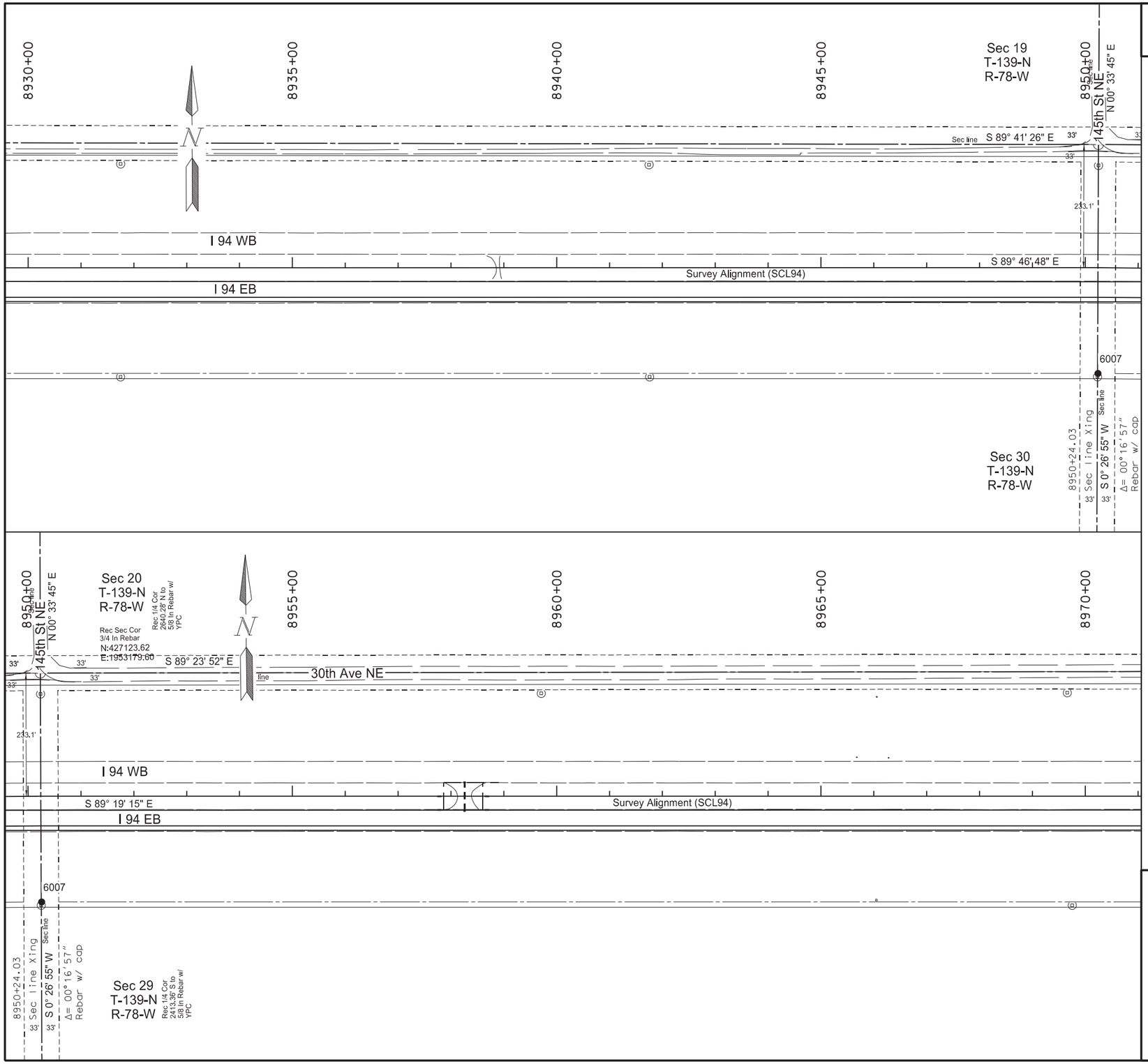
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18 08:51:51 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	17

POINT	NORTHING	EASTING	STATION	OFFSET
6007	426690.54	1953176.21	8950+24.03	200



Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

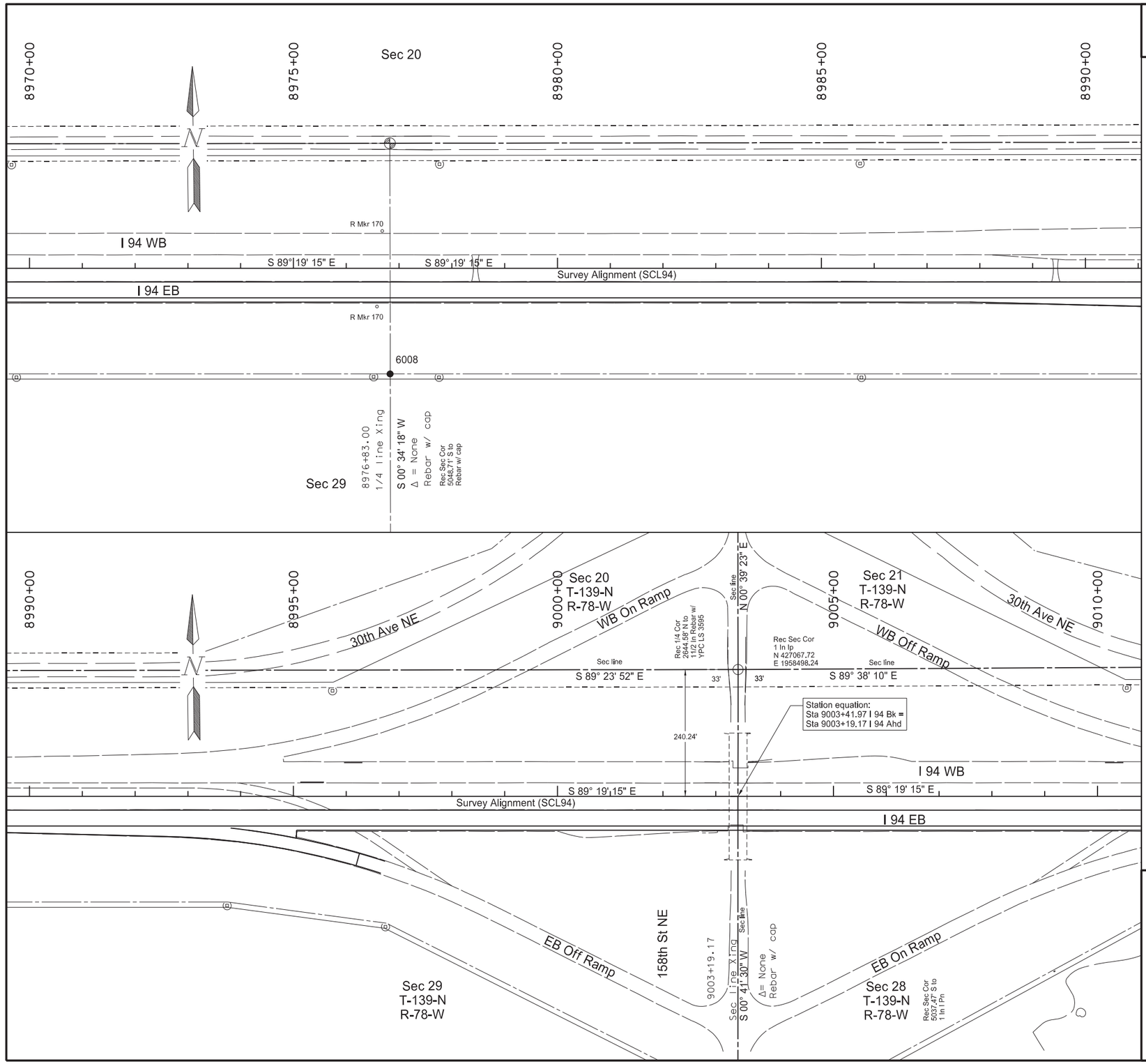
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18 08:53:02 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	18

POINT	NORTHING	EASTING	STATION	OFFSET
6008	426659.03	1955834.19	8976+83.00	200.00



Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

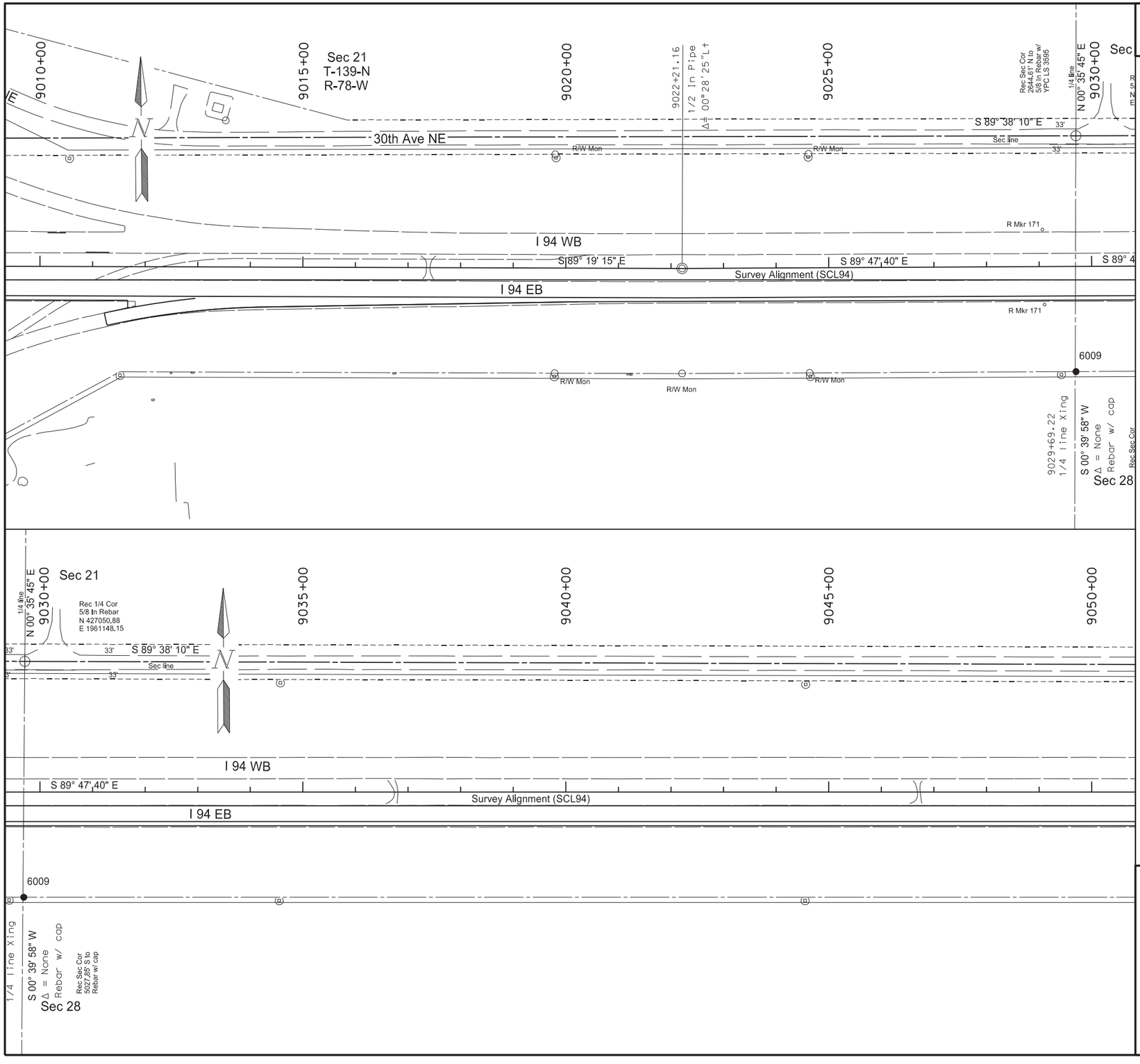
- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18
08:54:15 -05'00'
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	82	19

POINT	NORTHING	EASTING	STATION	OFFSET
6009	426602.27	1961144.54	9029+69.22	200.00

Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

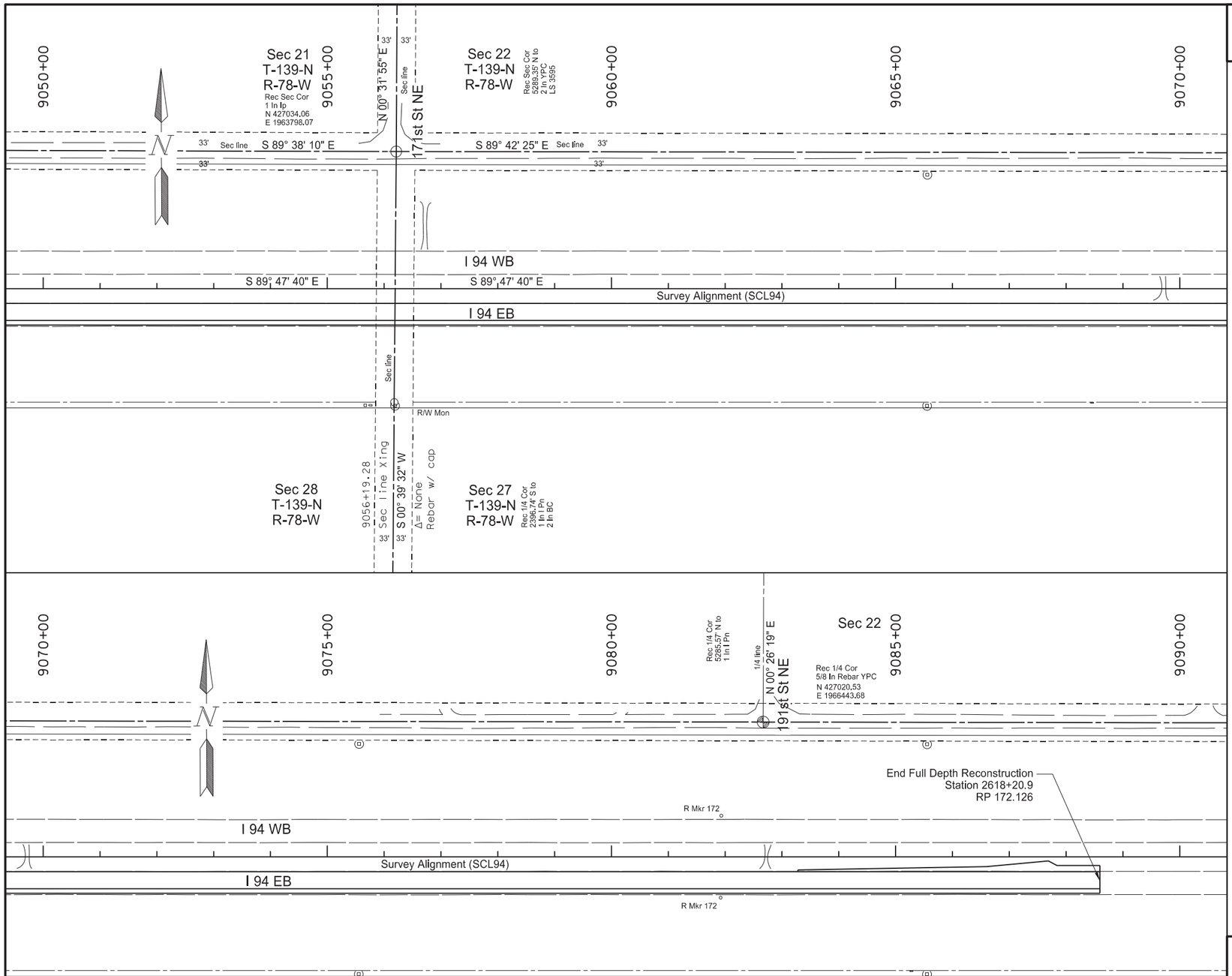
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18
08:55:25 -05'00'
NORTH DAKOTA

7/17/2024 3:17:16 PM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\082\082SD_008-19.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	20



Note:

1. Stationing is based on the alignment "SCL94" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18 08:56:28 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	82	21

SPEC	CODE	BID ITEM	QTY	UNIT
720	0110	RIGHT OF WAY MARKERS		
		I-94	7	EA
720	0125	ALIGNMENT MONUMENTS		
		I-94 & Rest Area Eastbound	7	EA
720	0130	IRON PIN R/W MONUMENTS		
		I-94	2	EA
720	0135	IRON PIN REFERENCE MONUMENTS		
		I-94	10	EA

SCL94 Alignment

Point	North	East	Station	Offset	R/W Marker (Witness Post)	Iron Pin R/W Monument	Iron Pin Reference Monument
6000	426231.02	1916427.32	8579+24.56	200.00	X		X
6002	427317.94	1924233.25	8660+45.15	199.93	X		X
6003	426703.02	1940065.33	8819+10.86	200.00			X
6004	426711.47	1942694.48	8845+39.99	200.00	X		X
6005	426720.49	1945213.75	8870+59.23	200.00			X
6006	426720.01	1945345.06	8871+91.99	200.00	X		X
6007	426690.54	1953176.21	8950+24.03	200.00			X
6008	426659.03	1955834.19	8976+83.00	200.00	X		X
6009	426602.27	1961144.54	9029+69.22	200.00	X		X
6010	426999.68	1933490.02	8753+46.45	200.00	X		X
7000	426786.16	1917543.96	8591+71.58	200.00		X	
7002	427339.46	1920067.49	8618+79.46	224.51		X	
				R/W Marker Total:	7		
				Iron Pin R/W Monument Total:		2	
				Iron Pin Reference Monument:			10

SCL94 Alignment

Point	North	East	Station	Offset	Alignment Monument
8013	426888.52	1935544.17	8773+93.86	34.34	X
			Alignment Monument Total:		1

Rest Area Eastbound (Chain PR_RA)

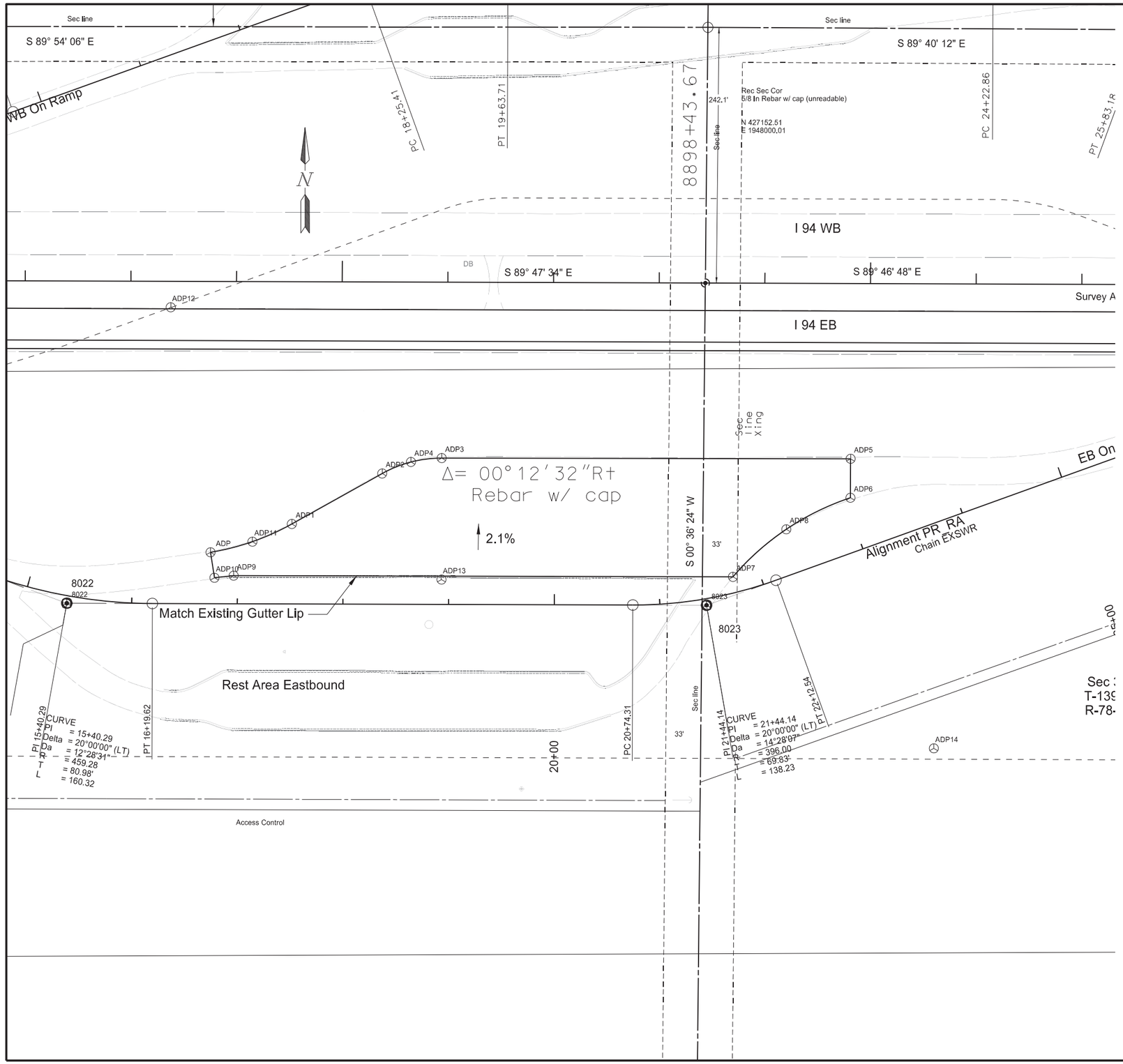
Point	North	East	Station	Offset	Alignment Monument
8020	426864.04	1945890.16	0+00	0.00	X
8021	426839.03	1946764.21	8+74.40	-19.01	X
8022	426607.61	1947392.96	15+40.28	7.09	X
8023	426605.42	1947998.45	21+44.14	6.11	X
8024	426829.41	1948620.87	28+04.20	-19.61	X
8025	426849.01	1949817.19	39+96.38	0.00	X
			Alignment Monument Total:		6

Survey Data Layout - Quantities

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED LAND SURVEYOR
BOYD D. ERBELE
LS-7986
DATE 2024.07.18 08:57:27 -05'00'
NORTH DAKOTA



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	82	22

POINT	NORTHING	EASTING	STATION	OFFSET
ADP	426655.77	1947529.01	16+74.51	-48.65
ADP1	426682.54	1947605.97	17+51.37	-75.70
ADP2	426730.29	1947691.54	18+36.78	-123.76
ADP3	426744.87	1947747.84	18+93.02	-138.54
ADP4	426741.19	1947718.75	18+63.95	-134.76
ADP5	426744.00	1948134.82	23+17.95	-84.22
ADP6	426707.11	1948134.69	23+05.33	-49.55
ADP7	426632.25	1948023.39	21+73.74	-14.97
ADP8	426677.28	1948073.92	22+38.06	-42.06
ADP9	426633.60	1947550.88	16+96.46	-26.56
ADP10	426631.65	1947532.70	16+78.29	-24.54
ADP11	426665.79	1947568.66	17+14.12	-58.82
ADP12	426887.75	1947491.45	16+36.12	-280.49
ADP13	426629.87	1947747.58	18+93.18	-23.54
ADP14	426469.84	1948213.45	22+99.10	200.37

Note:

1. Stationing is based on the alignment "PR_RA" unless otherwise noted.

LEGEND

- Iron Pin Reference Monument
- R/W Marker (witness post)
- Alignment Monument
- Iron Monument Found
- Iron Pin R/W Monument

Survey Data Layout

I-94 Reconstruction

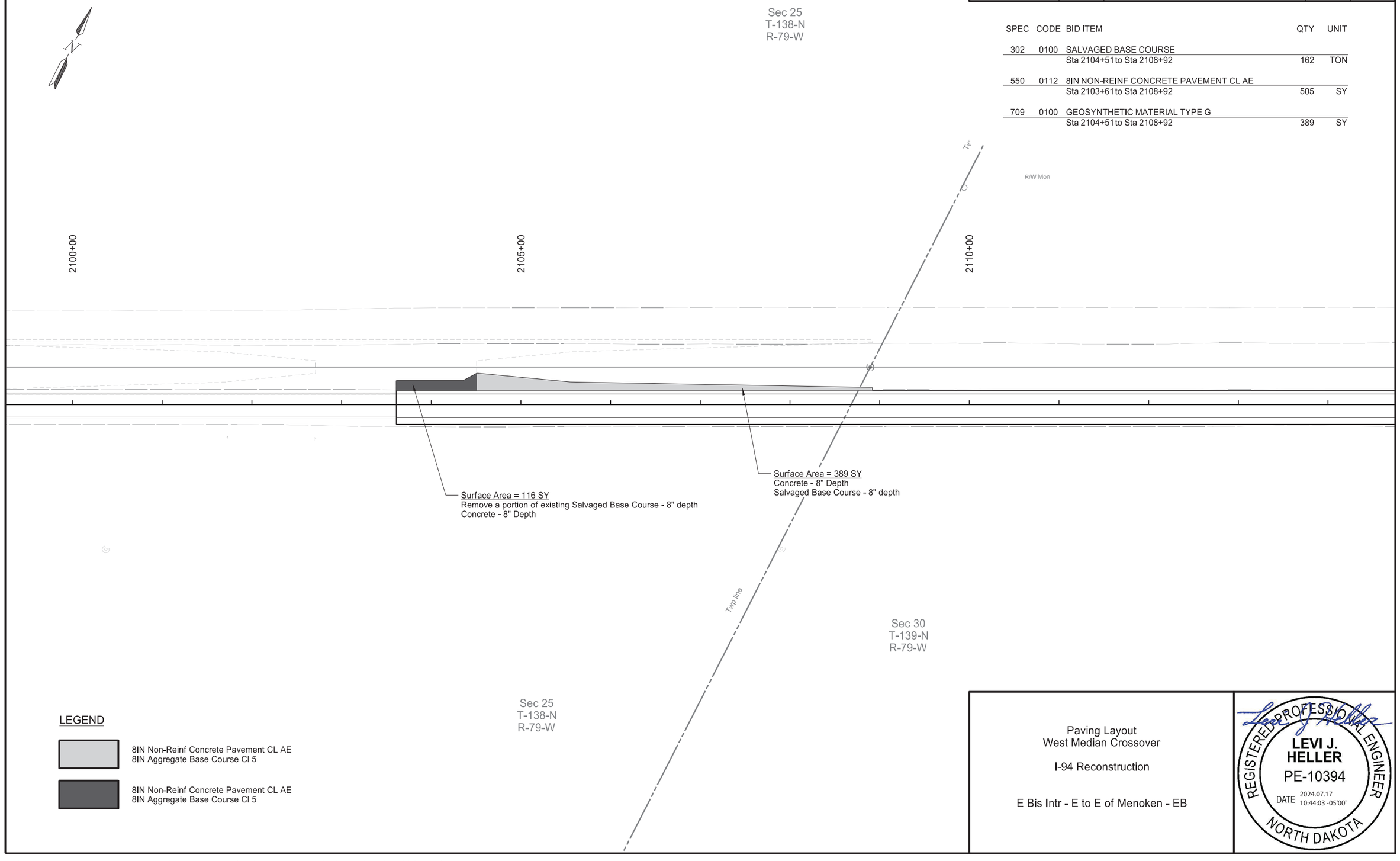
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
DAWN L.S. MICHEL
PE-8029
DATE 2024.07.18 08:29:25 -05'00'
NORTH DAKOTA

7/17/2024 4:53:07 PM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162,214\Design\dgn\082\082SD_Parking Area.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	90	1

SPEC	CODE	BID ITEM	QTY	UNIT
302	0100	SALVAGED BASE COURSE		
		Sta 2104+51 to Sta 2108+92	162	TON
550	0112	8IN NON-REINF CONCRETE PAVEMENT CL AE		
		Sta 2103+61 to Sta 2108+92	505	SY
709	0100	GEOSYNTHETIC MATERIAL TYPE G		
		Sta 2104+51 to Sta 2108+92	389	SY



Paving Layout
West Median Crossover

I-94 Reconstruction

E Bis Intr - E to E of Menoken - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:44:03 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	90	2

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		Sta 2416+44 to Sta 2417+75	20	GAL
411	0114	MILLING PAVEMENT SURFACE - 2 INCH		
		Sta 2416+44 to Sta 2417+75	396	SY
430	0143	RAP - SUPERPAVE FAA 43		
		Sta 2416+44 to Sta 2417+75	44	TON
430	5815	PG 58S-34 ASPHALT CEMENT		
		Sta 2416+44 to Sta 2417+75	2	TON

N

2405+00

2410+00

2415+00

I 94 WB

Tied Longitudinal Joint

℄ EB Lanes

Doweled Joint
15' c to c

± 2' Nose to Match
Mainline Joint

I 94 EB

30'

16'

14'

8'

12'

± 15'

24'

EB Off Ramp

Refer to Inset A

Refer to Inset B

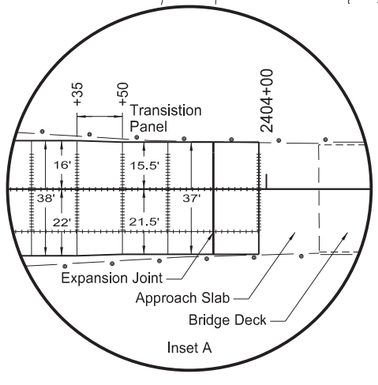
± 2' Nose to Match
Mainline Joint

Tied Longitudinal Joint

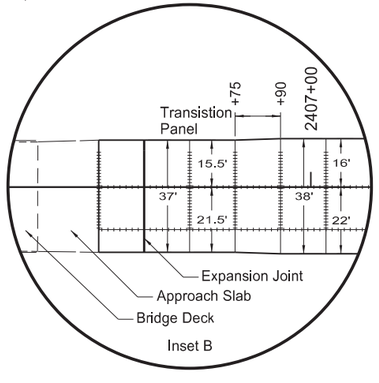
Doweled Joint
15' c to c

Tied Longitudinal Joint

Apple Creek



Inset A



Inset B

LEGEND

2" Mill and Overlay

3" HMA

Doweled Joint at Transverse Joints
Joint Spacing - 15' Typical

Paving Layout

I-94 Reconstruction
Rest Area Ramp

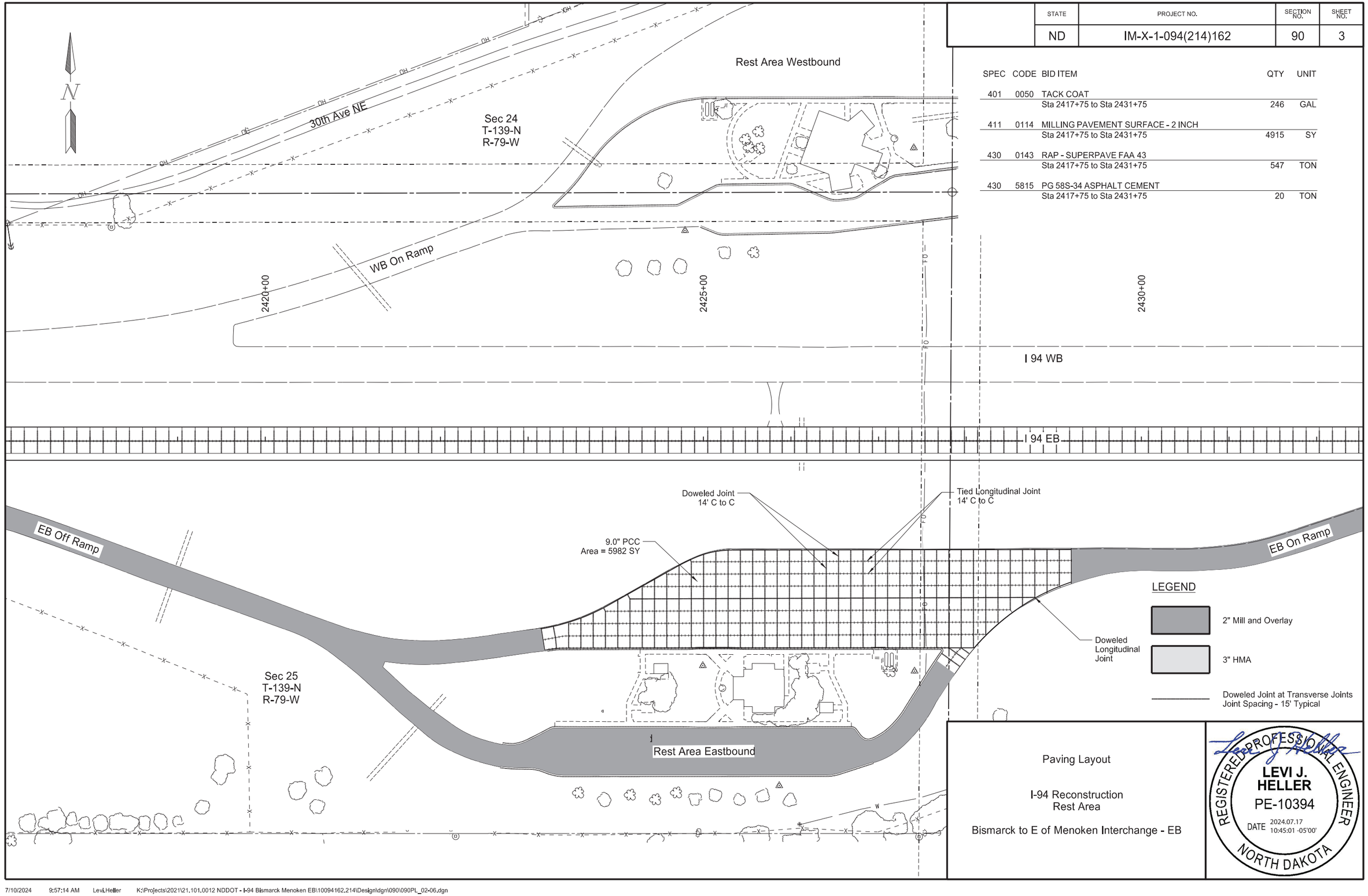
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:44:35 -05'00'
NORTH DAKOTA

7/10/2024 9:57:13 AM LeviHeller K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\090\090PL_02-06.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	90	3

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		Sta 2417+75 to Sta 2431+75	246	GAL
411	0114	MILLING PAVEMENT SURFACE - 2 INCH		
		Sta 2417+75 to Sta 2431+75	4915	SY
430	0143	RAP - SUPERPAVE FAA 43		
		Sta 2417+75 to Sta 2431+75	547	TON
430	5815	PG 58S-34 ASPHALT CEMENT		
		Sta 2417+75 to Sta 2431+75	20	TON



Paving Layout

I-94 Reconstruction
Rest Area

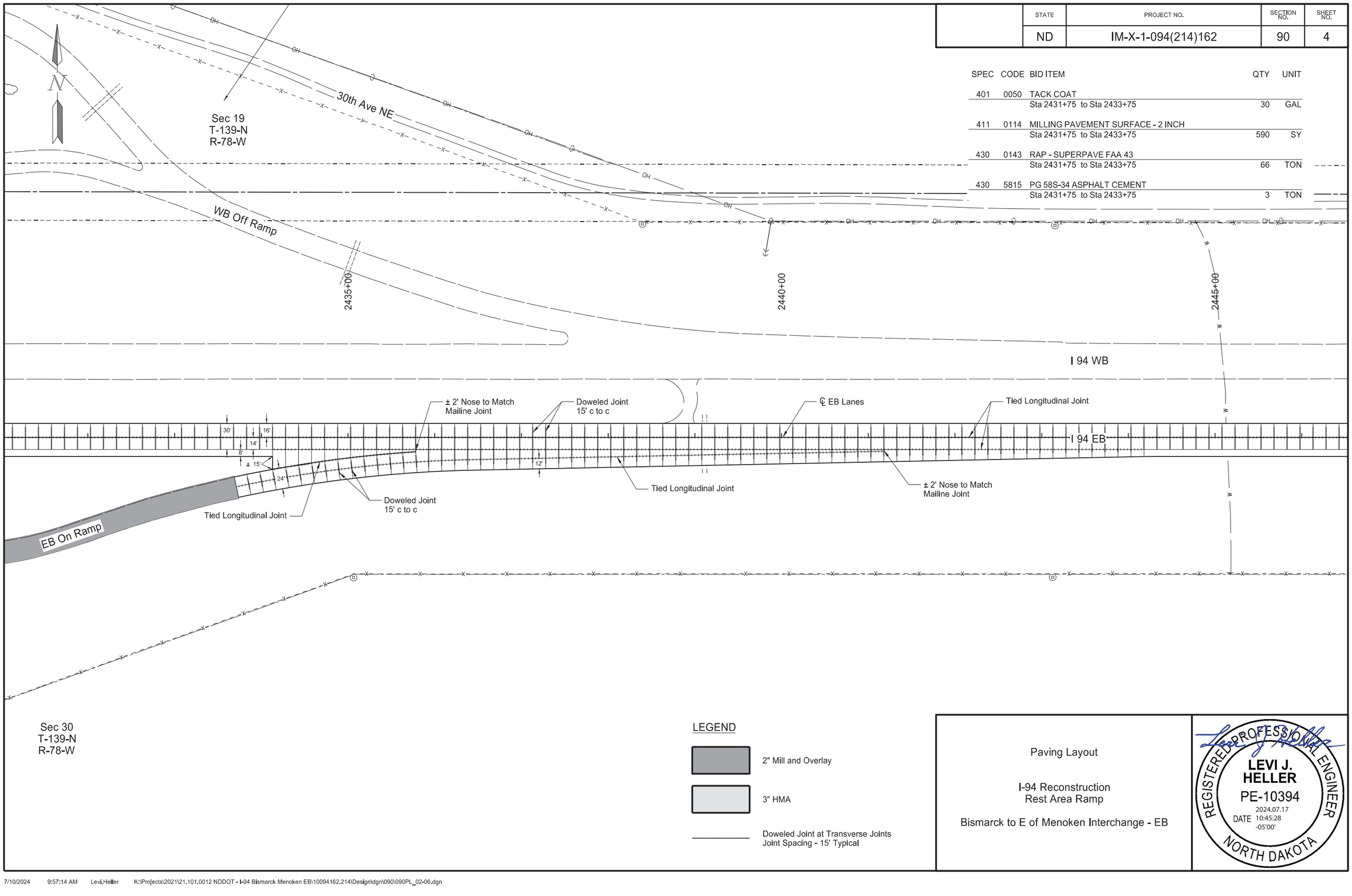
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:45:01 -05'00'
NORTH DAKOTA

7/10/2024 9:57:14 AM Levi.Heller K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\090\090PL_02-06.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	90	4

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		Sta 2431+75 to Sta 2433+75	30	GAL
411	0114	MILLING PAVEMENT SURFACE - 2 INCH		
		Sta 2431+75 to Sta 2433+75	590	SY
430	0143	RAP - SUPERPAVE FAA 43		
		Sta 2431+75 to Sta 2433+75	66	TON
430	5815	PG 58S-34 ASPHALT CEMENT		
		Sta 2431+75 to Sta 2433+75	3	TON



LEGEND

- 2" Mill and Overlay
- 3" HMA
- Doweled Joint at Transverse Joints
  Joint Spacing - 15' Typical

Paving Layout

I-94 Reconstruction
Rest Area Ramp

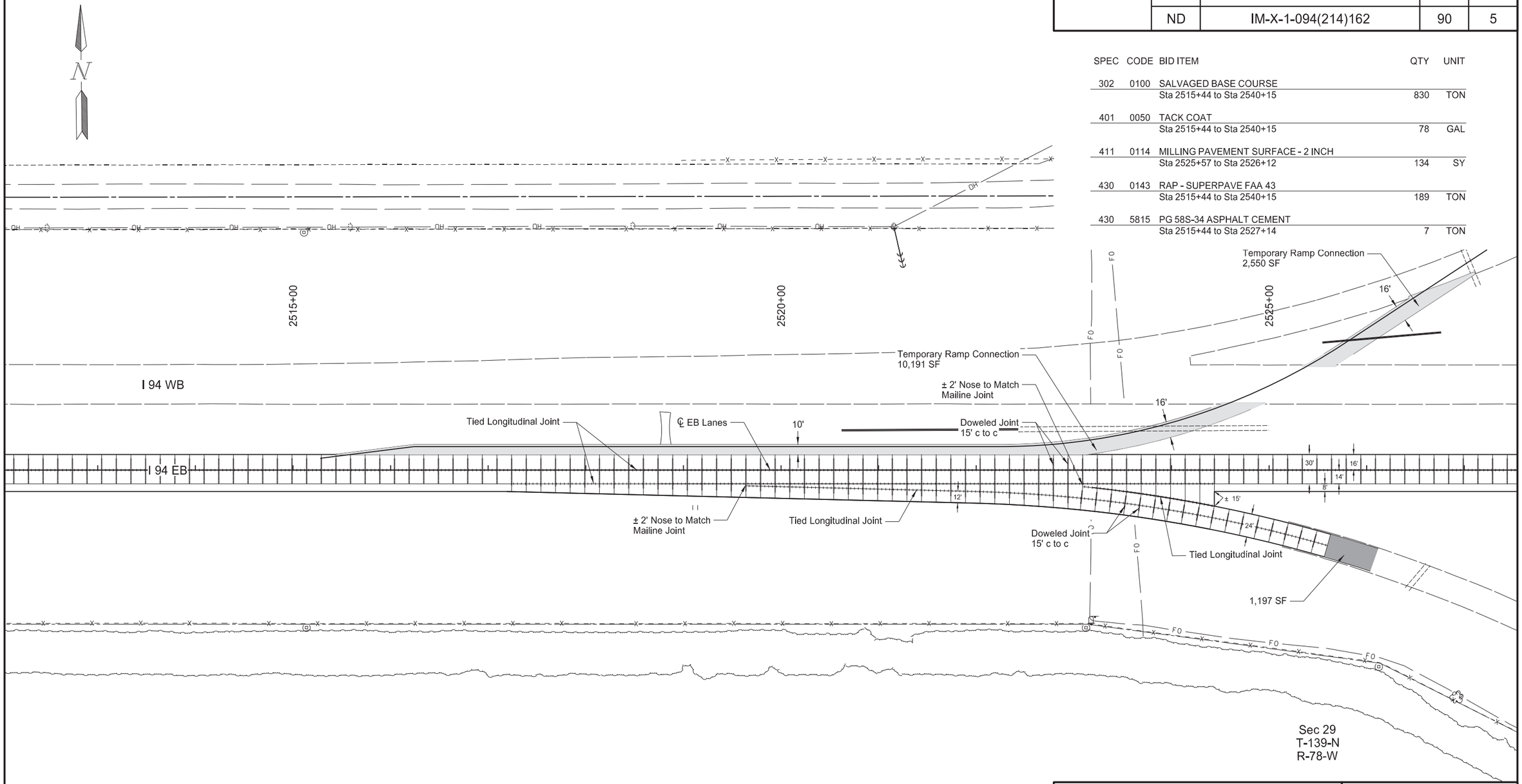
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:45:28 -05'00'
NORTH DAKOTA

7/10/2024 9:57:14 AM LeviHeller K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\090\090PL_02-06.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	90	5

SPEC	CODE	BID ITEM	QTY	UNIT
302	0100	SALVAGED BASE COURSE Sta 2515+44 to Sta 2540+15	830	TON
401	0050	TACK COAT Sta 2515+44 to Sta 2540+15	78	GAL
411	0114	MILLING PAVEMENT SURFACE - 2 INCH Sta 2525+57 to Sta 2526+12	134	SY
430	0143	RAP - SUPERPAVE FAA 43 Sta 2515+44 to Sta 2540+15	189	TON
430	5815	PG 58S-34 ASPHALT CEMENT Sta 2515+44 to Sta 2527+14	7	TON



LEGEND

- 2" Mill and Overlay
- 3" HMA
- Doweled Joint at Transverse Joints
  Joint Spacing - 15' Typical

Paving Layout

I-94 Reconstruction
Menoken Interchange Ramp

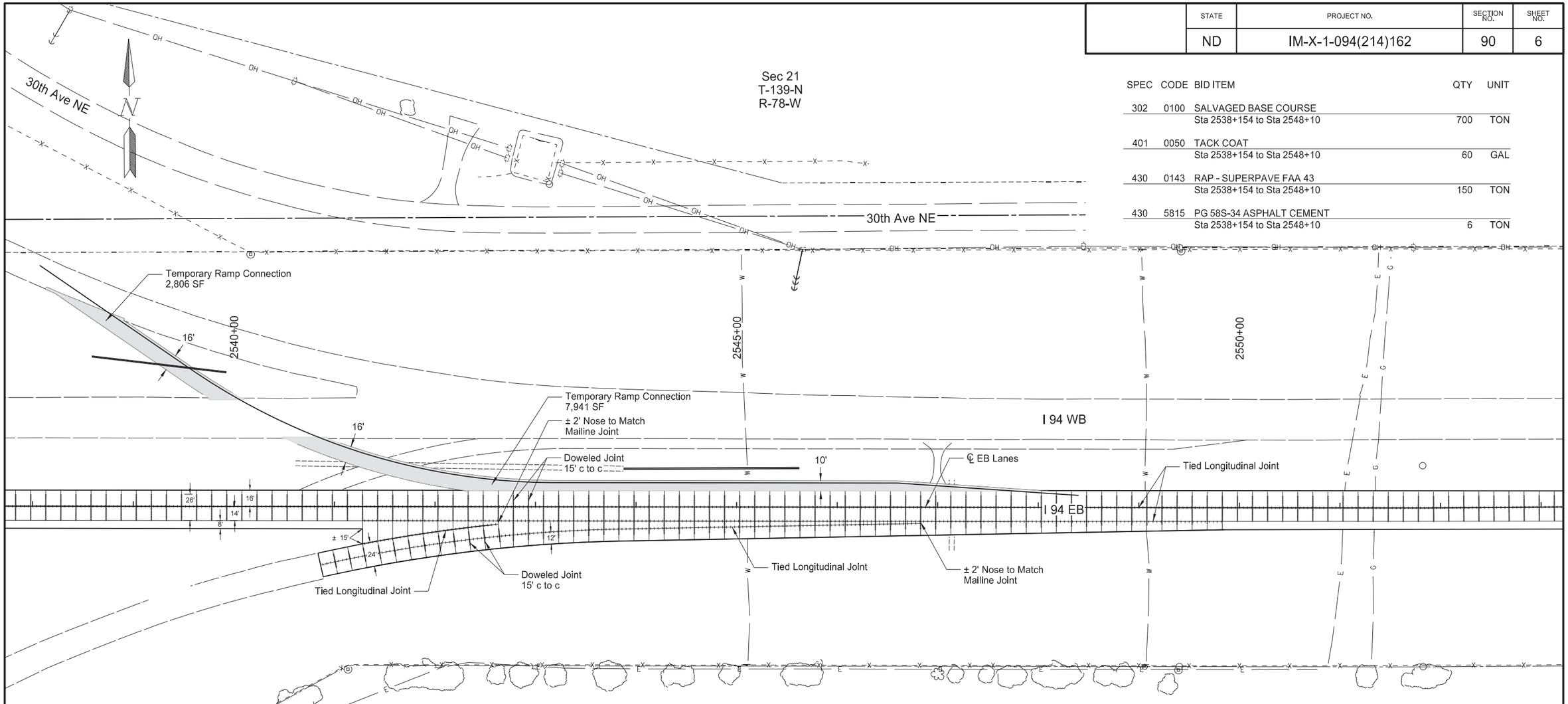
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:46:21 -05'00'
NORTH DAKOTA

7/10/2024 9:57:15 AM LeviHeller K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\090\090PL_02-06.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	90	6

SPEC	CODE	BID ITEM	QTY	UNIT
302	0100	SALVAGED BASE COURSE Sta 2538+154 to Sta 2548+10	700	TON
401	0050	TACK COAT Sta 2538+154 to Sta 2548+10	60	GAL
430	0143	RAP - SUPERPAVE FAA 43 Sta 2538+154 to Sta 2548+10	150	TON
430	5815	PG 58S-34 ASPHALT CEMENT Sta 2538+154 to Sta 2548+10	6	TON



LEGEND

- 2" Mill and Overlay
- 3" HMA
- Doweled Joint at Transverse Joints
  Joint Spacing - 15' Typical

Paving Layout

I-94 Reconstruction
Menoken Interchange Ramp

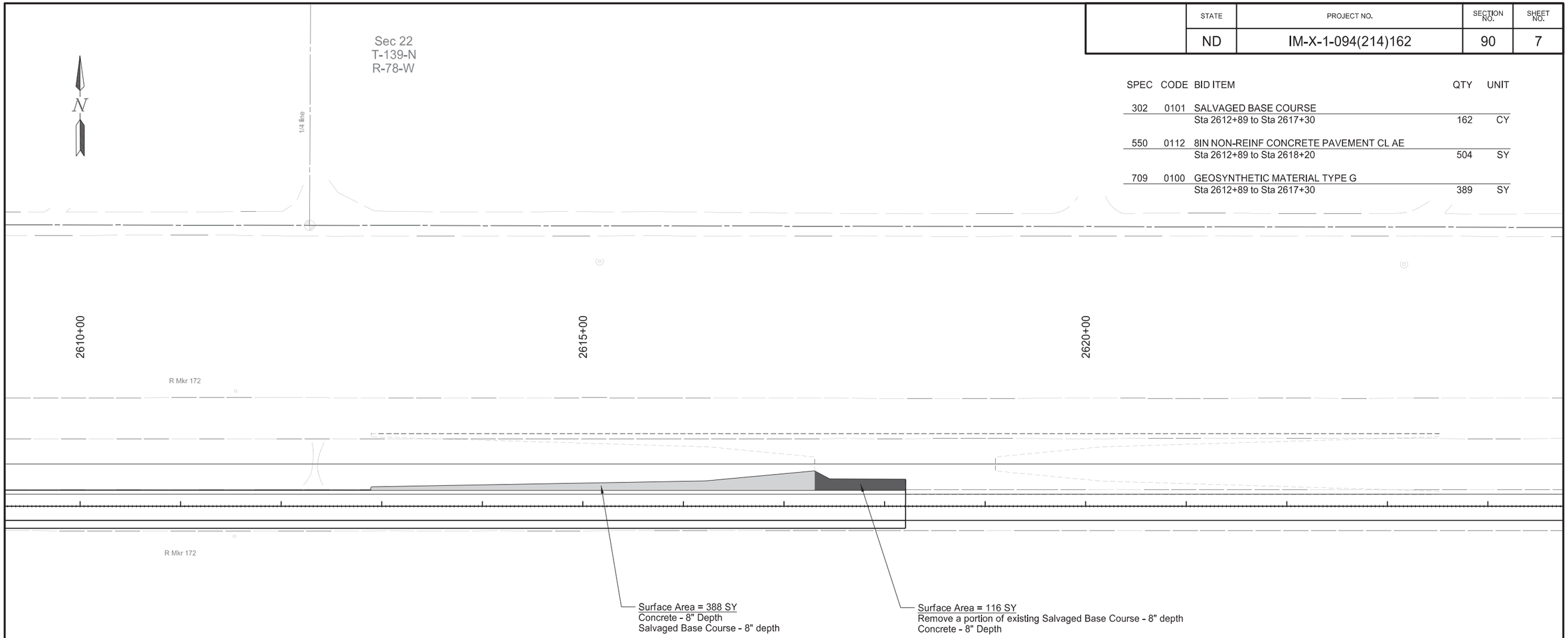
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:46:46 -05'00'
NORTH DAKOTA

7/10/2024 9:57:15 AM LeviHeller K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\090\090PL_02-06.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	90	7

SPEC	CODE	BID ITEM	QTY	UNIT
302	0101	SALVAGED BASE COURSE Sta 2612+89 to Sta 2617+30	162	CY
550	0112	8IN NON-REINF CONCRETE PAVEMENT CL AE Sta 2612+89 to Sta 2618+20	504	SY
709	0100	GEOSYNTHETIC MATERIAL TYPE G Sta 2612+89 to Sta 2617+30	389	SY



LEGEND

8IN Non-Reinf Concrete Pavement CL AE
8IN Aggregate Base Course Cl 5

8IN Non-Reinf Concrete Pavement CL AE
8IN Aggregate Base Course Cl 5

Paving Layout
East Median Crossover

I-94 Reconstruction

E Bis Intr - E to E of Menoken - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:47:13 -05'00'
NORTH DAKOTA

7/10/2024 9:57:04 AM LeviHeller K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Design\dgn\090\090PL_01 & 07_median crossover.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	**48"x48"**	**EXIT GORE**	**2**				**2**	**35**	**70**
G20-1-60	**60"x24"**	**ROAD WORK NEXT __ MILES**			**1**		**1**	**28**	**28**
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)						18	
G20-2-48	**48"x24"**	**END ROAD WORK**	**2**	**2**	**2**		**2**	**26**	**52**
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)						18	
G20-10-108	108"x48"	CONTRACTOR SIGN						70	
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS						43	
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW						36	
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT**		**2**			**2**	**59**	**118**
I2-5-96	96"x48"	YOUR HIGHWAY DOLLARS AT WORK						59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)						10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)						10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)						10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)						7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)						7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)						7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)						7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)						7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT						15	
M4-10-48	**48"x18"**	**DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)**		**6**			**6**	**7**	**42**
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)						7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)						9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)						7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)						9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)						7	
R1-1-48	**48"x48"**	**STOP**		**1**			**1**	**32**	**32**
R1-2-60	**60"x60"**	**YIELD**	**2**	**3**	**2**		**3**	**29**	**87**
R2-1-36	**36"x48"**	**SPEED LIMIT __ (Portable only)**	**12**		**8**		**12**	**30**	**360**
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**16**	**22**	**8**		**22**	**39**	**858**
R2-1aP-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**18**	**8**	**10**		**18**	**10**	**180**
R3-2-48	48"x48"	NO LEFT TURN						35	
R4-1-36	36"x48"	DO NOT PASS (Portable only)						30	
R4-1-48	**48"x60"**	**DO NOT PASS**		**22**			**22**	**39**	**858**
R4-7-48	**48"x60"**	**KEEP RIGHT**		**2**			**2**	**39**	**78**
R5-1-48	48"x48"	DO NOT ENTER						35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)						14	
R7-1-12	12"x18"	NO PARKING ANY TIME						11	
R10-6-24	24"x36"	STOP HERE ON RED						16	
R11-2-48	**48"x30"**	**ROAD CLOSED (Mounted on barricade)**		**15**			**15**	**12**	**180**
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)						12	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)						15	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)						15	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)						15	
W1-3-48	**48"x48"**	**REVERSE TURN RIGHT or LEFT**		**2**			**2**	**35**	**70**
W1-4-48	**48"x48"**	**REVERSE CURVE RIGHT or LEFT**		**2**			**2**	**35**	**70**
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT						35	
W1-6-48	**48"x24"**	**ONE DIRECTION LARGE ARROW**		**2**			**2**	**26**	**52**
W1-6-60	60"x30"	ONE DIRECTION LARGE ARROW						31	
W3-1-48	48"x48"	STOP AHEAD						35	
W3-3-48	48"x48"	SIGNAL AHEAD						35	
W3-4-48	48"x48"	BE PREPARED TO STOP						35	
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**10**	**3**	**6**		**10**	**35**	**350**
W4-1-48	**48"x48"**	**MERGING TRAFFIC**		**3**	**2**		**3**	**35**	**105**
W4-2-48	**48"x48"**	**LANE ENDS RIGHT or LEFT**	**12**	**2**	**4**		**12**	**35**	**420**
W5-1-48	48"x48"	ROAD NARROWS						35	
W5-4-48	**48"x48"**	**RAMP NARROWS**			**3**		**3**	**35**	**105**
W5-8-48	**48"x48"**	**THRU TRAFFIC RIGHT LANE**	**1**				**1**	**35**	**35**
W5-9-48	**48"x48"**	**ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW**	**1**				**1**	**35**	**35**
W6-3-48	**48"x48"**	**TWO WAY TRAFFIC**		**22**			**22**	**35**	**770**
W8-1-48	48"x48"	BUMP						35	
W8-3-48	48"x48"	PAVEMENT ENDS						35	
W8-7-48	48"x48"	LOOSE GRAVEL						35	
W8-11-48	48"x48"	UNEVEN LANES						35	
W8-12-48	48"x48"	NO CENTER LINE						35	
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL						35	
W8-53-48	**48"x48"**	**TRUCKS ENTERING HIGHWAY**		**1**			**1**	**35**	**35**
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT or _ MILE						35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT or _ MILE						35	
W8-56-48	**48"x48"**	**TRUCKS EXITING HIGHWAY**		**1**			**1**	**35**	**35**
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL						35	
W13-1P-30	**30"x30"**	**__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)**		**2**	**3**		**3**	**14**	**42**
W13-4p-36	**36"x36"**	**ON RAMP (Mounted on other sign post)**			**3**		**3**	**17**	**51**
W14-3-64	64"x48"	NO PASSING ZONE						28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)						10	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**10**	**4**	**9**		**10**	**35**	**350**
W20-2-48	48"x48"	DETOUR AHEAD or __FT or _MILE						35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or _ MILE						35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or _ MILE						35	
W20-5-48	**48"x48"**	**RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE**	**16**	**4**	**4**		**16**	**35**	**560**
W20-7-48	**48"x48"**	**FLAGGER**	**3**	**2**	**1**		**3**	**35**	**105**
W20-8-18	**18"x18"**	**STOP - SLOW PADDLE Back to Back**	**3**	**2**	**1**		**3**	**5**	**15**
W20-52P-54	**54"x12"**	**NEXT __ MILES (Mounted on warning sign post)**		**22**			**22**	**12**	**264**

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-1-48	48"x48"	WORKERS						35	
W21-2-48	48"x48"	FRESH OIL						35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or _ MILE						35	
W21-5-48	**48"x48"**	**SHOULDER WORK**			**2**		**2**	**35**	**70**
W21-5a-48	**48"x48"**	**RIGHT or LEFT SHOULDER CLOSED**	**2**	**1**	**2**		**2**	**35**	**70**
W21-5b-48	**48"x48"**	**RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT or _ MILE**	**2**		**2**		**2**	**35**	**70**
W21-6-48	48"x48"	SURVEY CREW						35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT						35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY						35	
W21-52-48	48"x48"	PAVEMENT BREAKS						35	
W21-53-48	48"x48"	RUMBLE STRIPS AHEAD						35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK						35	

SPECIAL SIGNS

Consign 1	**72"x54"**	**MENOKEN EXIT GORE**		**1**			**1**	**47**	**47**
Consign 2	**90"x48"**	**MENOKEN 1 MILE**		**1**			**1**	**51**	**51**
Consign 3	**72"x54"**	**EXIT 170 GORE**		**1**			**1**	**47**	**47**
Consign 4	**84"x30"**	**EXIT 170 PLAQUE**		**1**			**1**	**36**	**36**

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS 6803**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2	3		TOTAL QUANTITY
202-0350	**REMOVAL OF TEMPORARY BYPASS**	EACH		**2**	**2**		**4**
704-0100	**FLAGGING**	MHR	**900**	**2300**	**100**		**3300**
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH					
704-1045	**ATTENUATION DEVICE-TYPE B-75**	EACH	**8**	**4**	**2**		**8**
704-1048	PORTABLE RUMBLE STRIPS	EACH					
704-1050	TYPE I BARRICADES	EACH					
704-1052	**TYPE III BARRICADES**	EACH	**6**	**52**	**1**		**52**
704-1060	**DELINEATOR DRUMS**	EACH	**240**	**191**	**227**		**240**
704-1065	TRAFFIC CONES	EACH					
704-1067	**TUBULAR MARKERS**	EACH	**368**		**174**		**368**
704-1070	**DELINEATOR**	EACH		**195**			**195**
704-1072	**FLEXIBLE DELINEATORS**	EACH		**609**	**72**		**609**
704-1080	STACKABLE VERTICAL PANELS	EACH					
704-1081	**VERTICAL PANELS - BACK TO BACK**	EACH	**6**				**6**
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH					
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH					
704-1087	**SEQUENCING ARROW PANEL - TYPE C**	EACH	**4**		**2**		**4**
704-1088	**SEQUENCING ARROW PANEL - TYPE C - CROSSOVER**	EACH		**2**			**2**
704-1090	**FLASHING BEACON**	EACH		**2**			**2**
704-1500	**OBLITERATION OF PVMT MK**	SF		**5767**			**5767**
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF					
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH					
704-3511	**STATE FURNISHED MEDIAN BARRIERS**	LF	**2760**	**2840**	**360**		**2840**
704-8015	**VEHICLE SPEED FEEDBACK SIGN**	EACH		**2**			**2**
710-0100	**TEMPORARY BYPASS**	EACH		**2**			**2**
762-0200	**RAISED PAVEMENT MARKERS**	EACH		**22799**			**22799**
762-0420	SHORT TERM 4IN LINE - TYPE R	LF					
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF					
762-0432	**SHORT TERM 6IN LINE-TYPE NR**	LF		**7210**			**7210**
764-8080	**MODIFY BARREL ATTENUATION DEVICE**	EACH	**3**				**3**

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

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:00:44 -05'00'
NORTH DAKOTA

Traffic Control Devices List

I-94 Reconstruction

E Bis Intr - E to E of Menoken - EB

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	2

LEGEND

Vertical Panels (Back to Back)

Traffic Direction

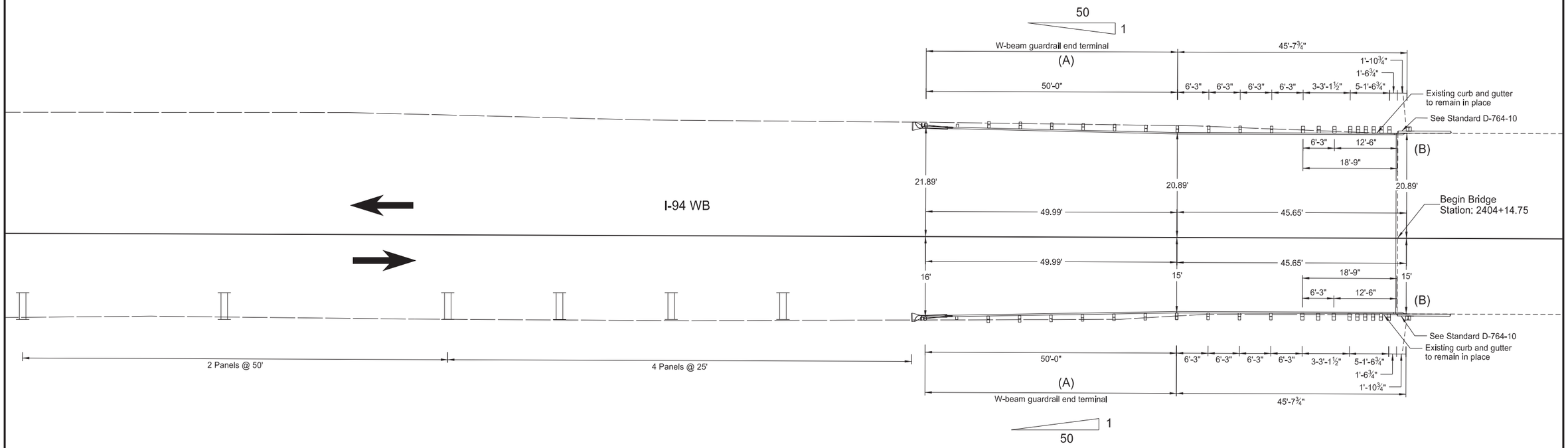
(A) Install a SKT Terminal at this location.
See Standard D-764-5

(B) Terminal connector to be connected to bridge connection plate.

(C) Include all costs to install w-beam guardrail in the price bid for "W-Beam Guardrail End Terminal."

23 USC § 407 Documents
NDDOT Reserves All Objections

SPEC	CODE	BID ITEM	QTY	UNIT
704	1081	VERTICAL PANELS-BACK TO BACK		
		Lt Median	6	EA
764	0145	W-BEAM GUARDRAIL END TERMINAL		
		Sta 2403+20.87 to 2404+16.52 Lt	1	EA
		Sta 2403+20.87 to 2404+16.52 Lt Median	1	EA



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W-Beam Guardrail End Treatment Layout
For Two-Way Traffic
Apple Creek Bridge - 094-168.101 (WB)
I-94 Reconstruction
Phase 1A & 1B

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:01:11 -05'00'
NORTH DAKOTA

7/2/2024 8:42:00 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\100WZ\100WZ_002-003.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	3

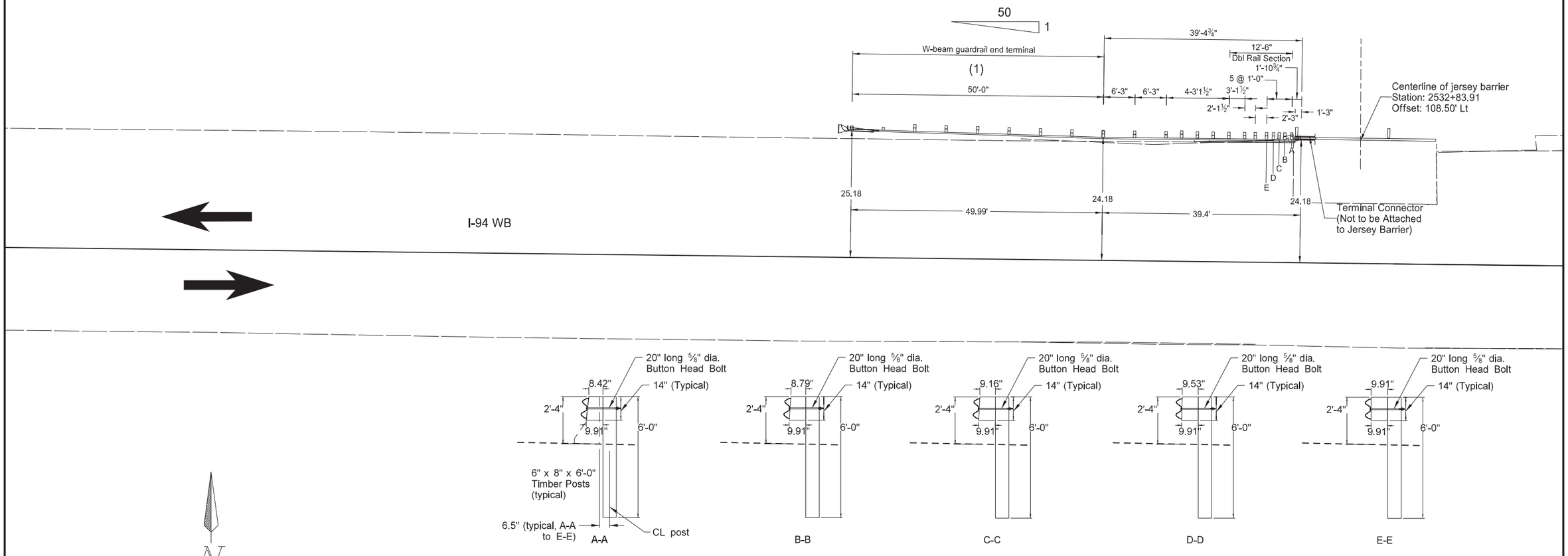
23 USC § 407 Documents
NDDOT Reserves All Objections

LEGEND

Traffic Direction

(1) Install a Sequential Kinking Terminal at this location. Include all costs to install w-beam guardrail in the price bid for "W-Beam Guardrail End Terminal."

SPEC	CODE	BID ITEM	QTY	UNIT
764	0145	W-BEAM GUARDRAIL END TERMINAL Sta 2531+83.07 to 2532+72.60 Lt	1	EA



W-Beam Guardrail End Treatment Layout
For Two-Way Traffic
Menoken Interchange - 094-170.519 (WB)
I-94 Reconstruction
Phase 1A

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:01:35 -05'00'
NORTH DAKOTA

7/2/2024 8:42:01 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\100WZ\100WZ_002-003.dgn

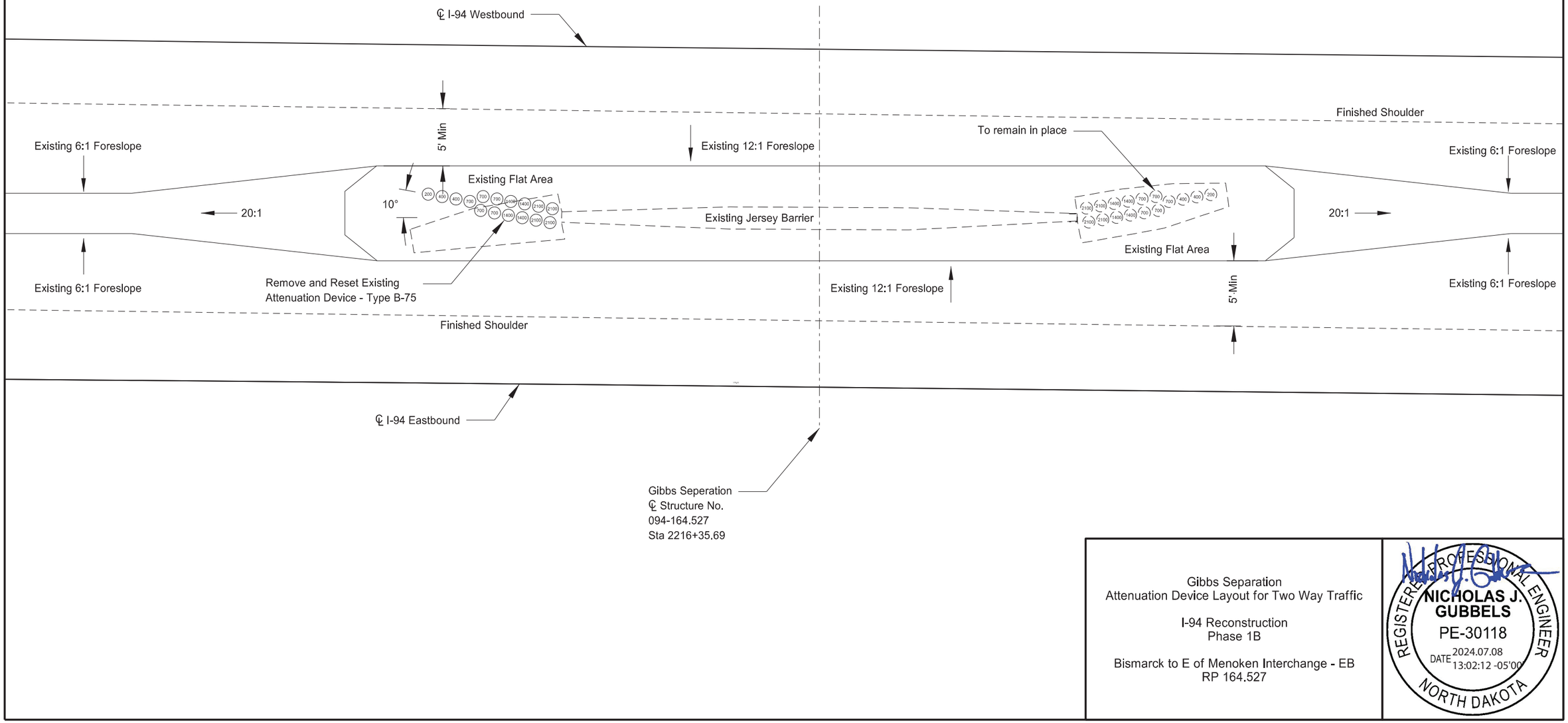
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	4

NOTES:

1. Include all costs to remove & reset attenuation device for temporary traffic control in the bid price for "Modify Barrel Attenuation Device." Install Attenuation Device-Type B-75 per Standard Drawing D-704-1.
2. Complete removal and reset attenuation device work prior to establishment of head to head traffic.

23 USC § 407 Documents
NDDOT Reserves All Objections

SPEC	CODE	BID ITEM	QTY	UNIT
764	8080	MODIFY BARREL ATTENUATION DEVICE Sta 2215+33.44 Lt Median	1	EA



Gibbs Separation
Attenuation Device Layout for Two Way Traffic

I-94 Reconstruction
Phase 1B

Bismarck to E of Menoken Interchange - EB
RP 164.527

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:02:12 -05'00'
NORTH DAKOTA

7/2/2024 8:42:02 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\100WZ\100WZ_004-006.dgn

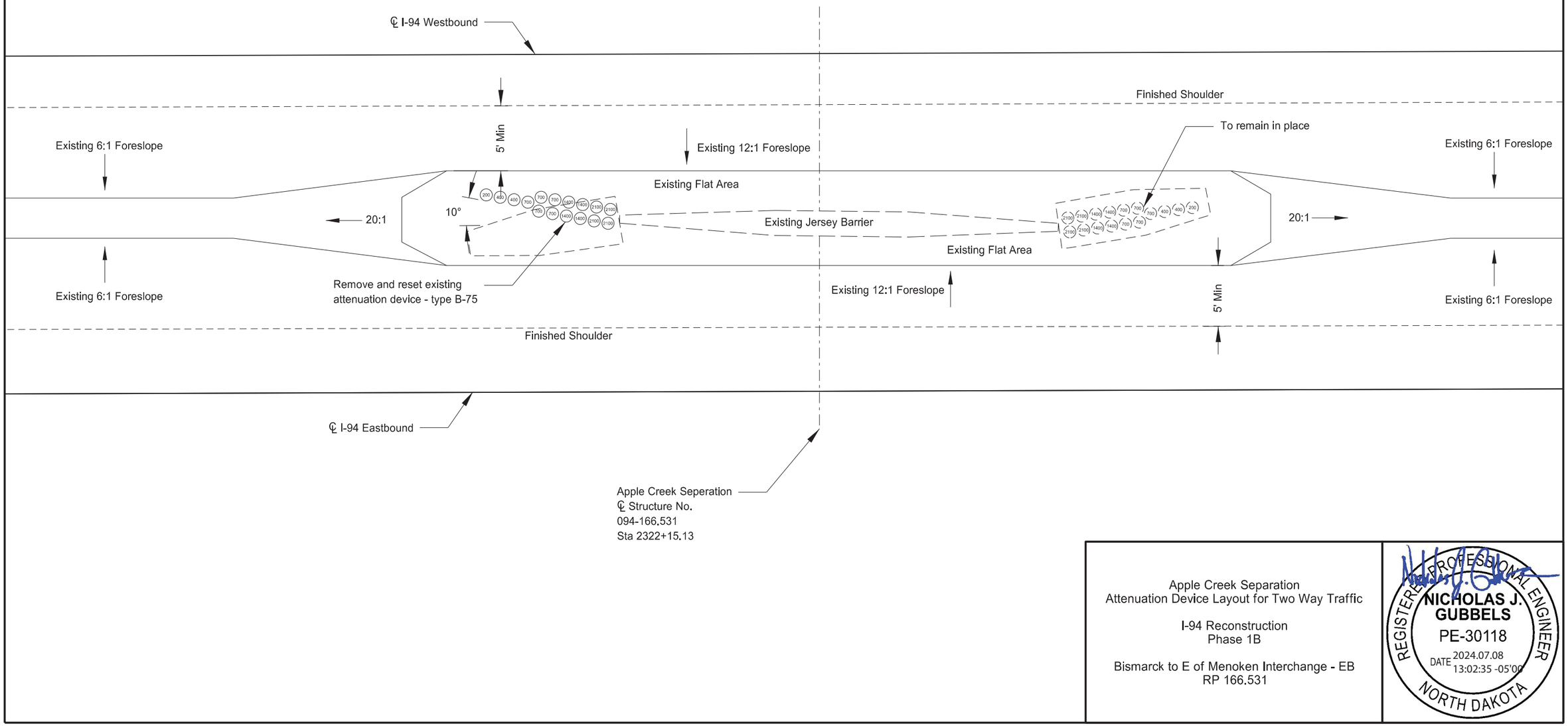
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	5

NOTES:

1. Include all costs to remove & reset attenuation device for temporary traffic control in the bid price for "Modify Barrel Attenuation Device." Install Attenuation Device-Type B-75 per Standard Drawing D-704-1.
2. Complete removal and reset attenuation device work prior to establishment of head to head traffic.

23 USC § 407 Documents
NDDOT Reserves All Objections

SPEC	CODE	BID ITEM	QTY	UNIT
764	8080	MODIFY BARREL ATTENUATION DEVICE		
		Sta 2321+31.60 Lt Median	1	EA



Apple Creek Separation
Attenuation Device Layout for Two Way Traffic

I-94 Reconstruction
Phase 1B

Bismarck to E of Menoken Interchange - EB
RP 166.531

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:02:35 -05'00'
NORTH DAKOTA

7/2/2024 8:42:03 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\100WZ\100WZ_004-006.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	6

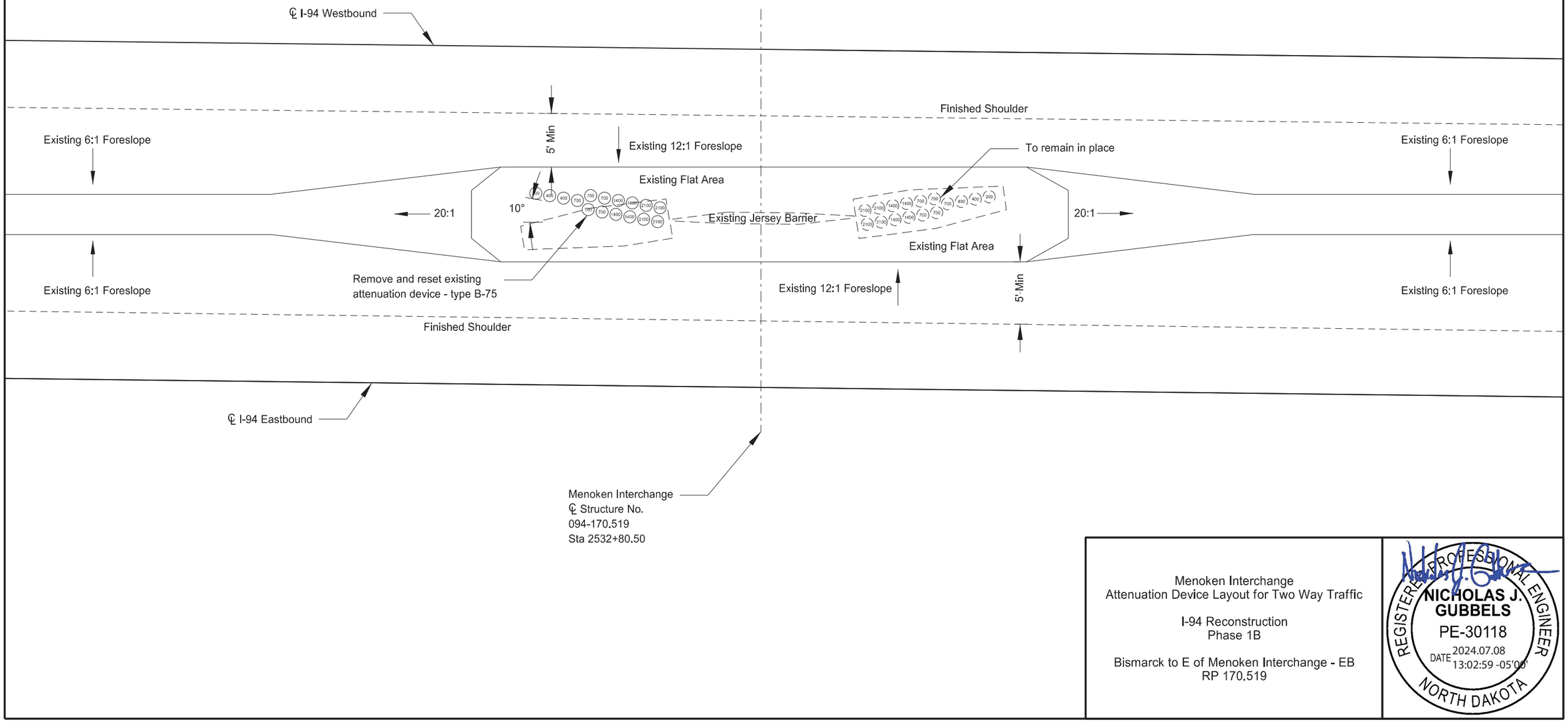
NOTES:

1. Include all costs to remove & reset attenuation device for temporary traffic control in the bid price for "Modify Barrel Attenuation Device." Install Attenuation Device-Type B-75 per Standard Drawing D-704-1.

2. Complete removal and reset attenuation device work prior to establishment of head to head traffic.

23 USC § 407 Documents
NDDOT Reserves All Objections

SPEC	CODE	BID ITEM	QTY	UNIT
764	8080	MODIFY BARREL ATTENUATION DEVICE		
		Sta 2532+22.35 Lt Median	1	EA



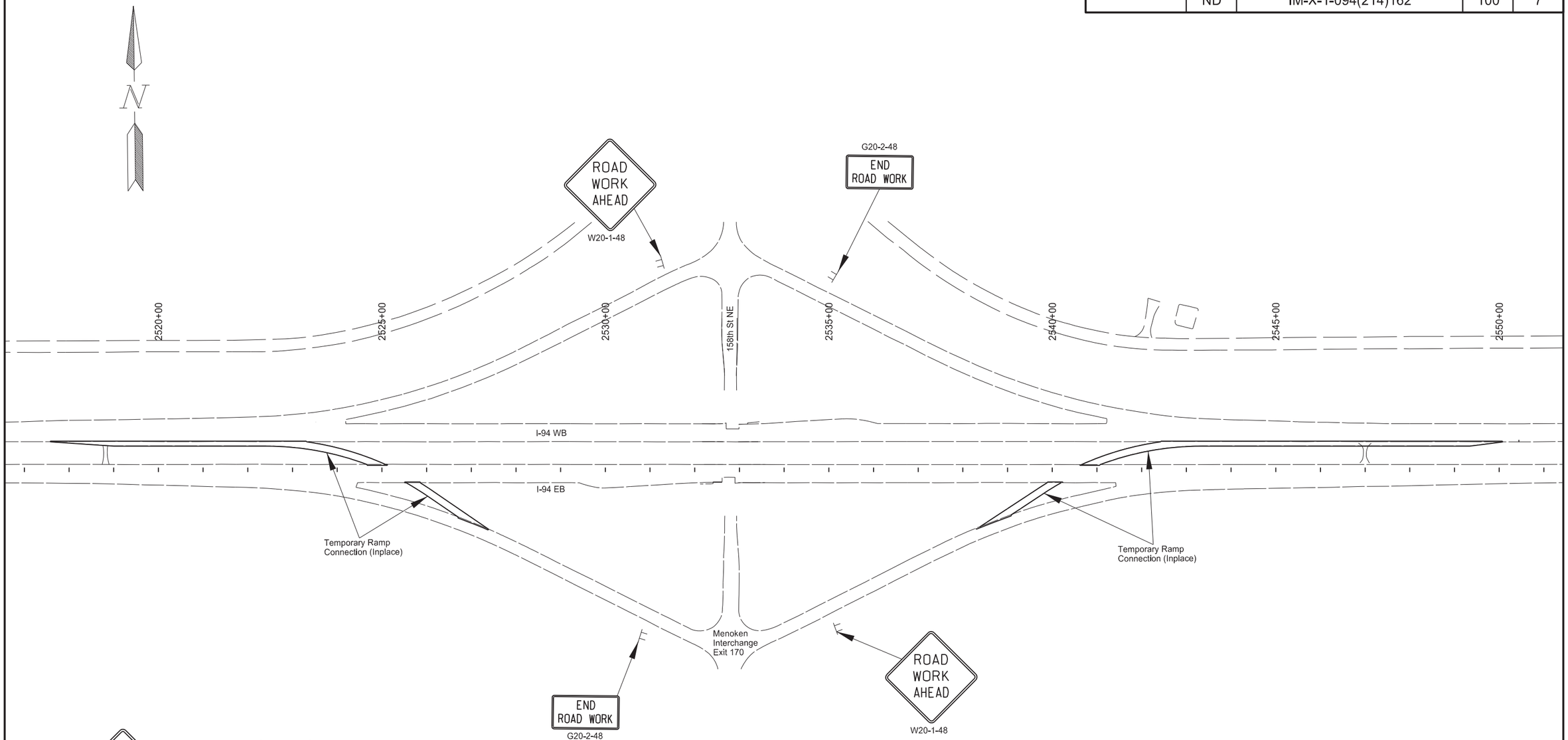
Menoken Interchange
Attenuation Device Layout for Two Way Traffic

I-94 Reconstruction
Phase 1B

Bismarck to E of Menoken Interchange - EB
RP 170.519

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:02:59 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	7



W6-3-48

R4-1-48

W20-52P-54

Note: Install signs R4-1-48, W6-3-48 and W20-52P-54 at one mile increments and after each interchange. A quantity of 12 EA has been provided for each sign on the traffic control devices list.

Traffic Control Layout

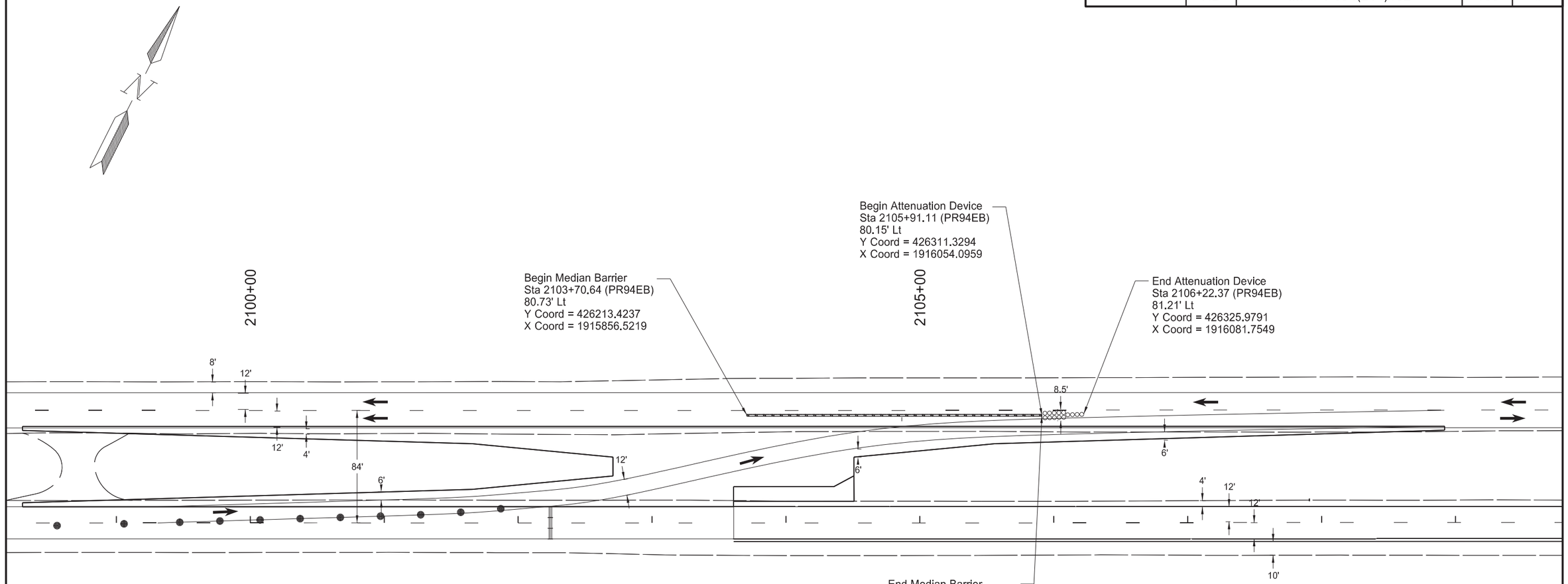
I-94 Reconstruction
Phase 2

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:03:28 -05'00'
NORTH DAKOTA

7/2/2024 8:42:04 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\100WZ\100WZ_007.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	8



Note: See Section 100 Sheet 10 for additional devices and traffic control signs required for the median crossover traffic control.

Location Detail for Attenuation Device
and Median Barriers at West Median Crossover

I-94 Reconstruction
Phase 2

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:03:52 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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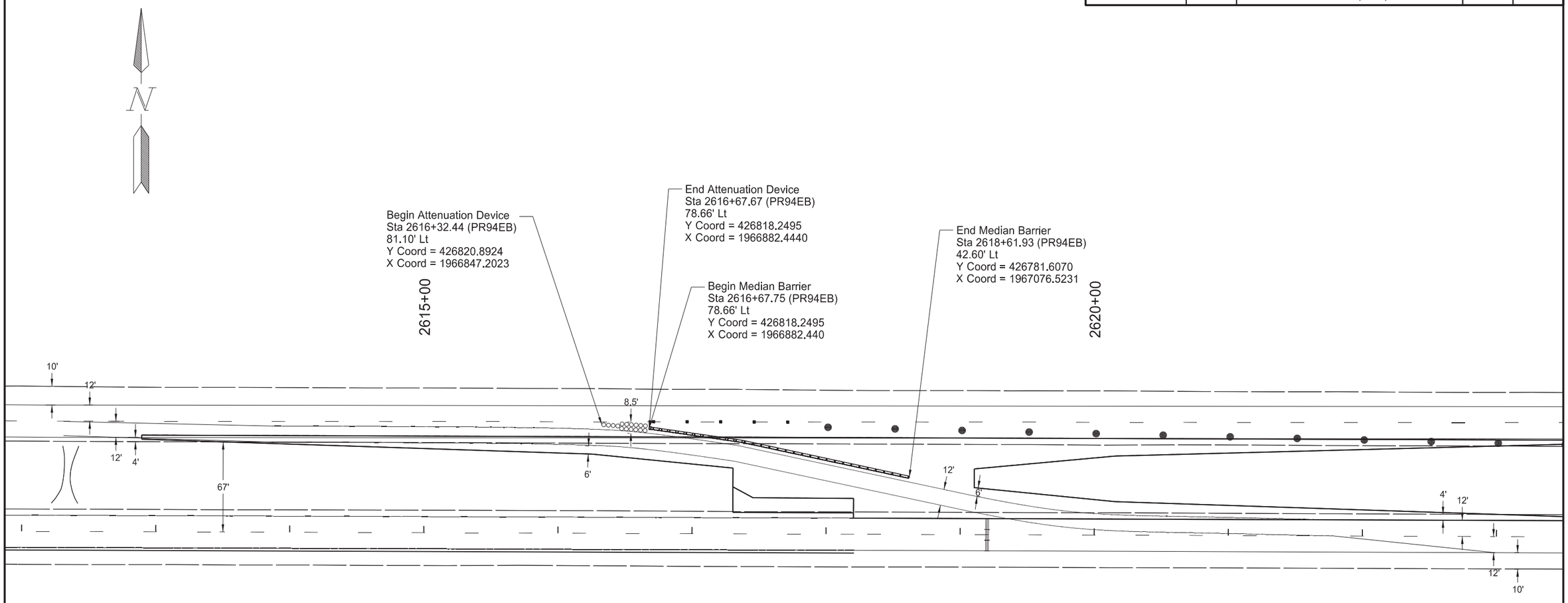

Note: See Section 100 Sheet 11 for additional devices and traffic control signs required for the median crossover traffic control.

Location Detail for Attenuation Device
and Median Barriers at East Median Crossover

I-94 Reconstruction
Phase 2

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
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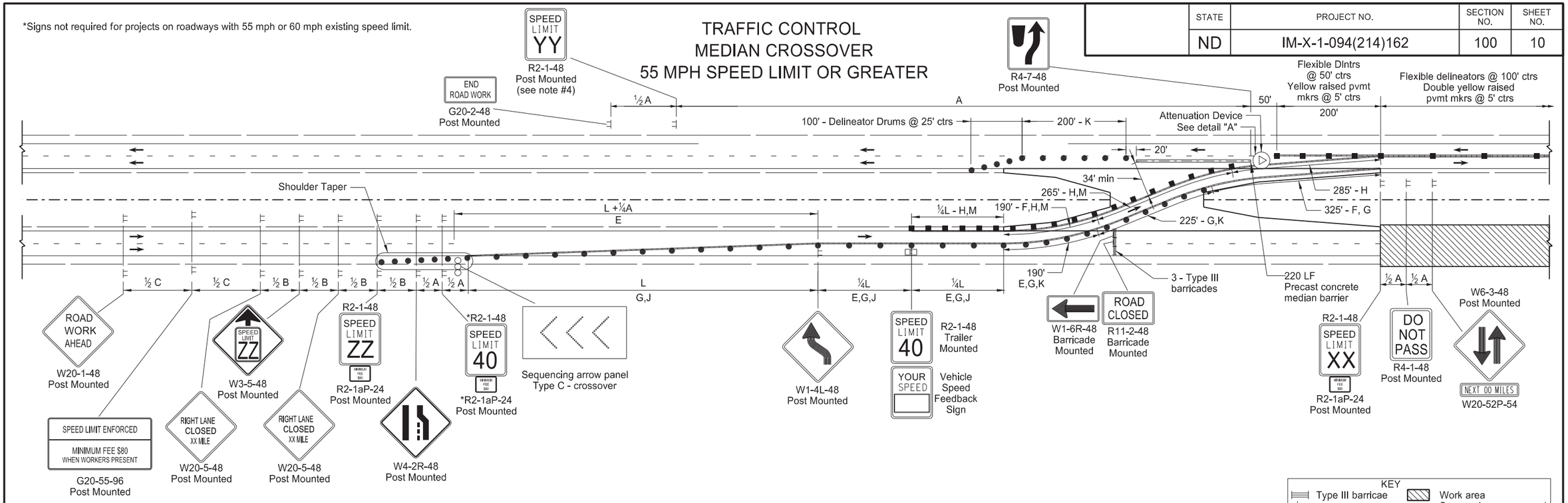
DATE 2024.07.08 13:04:29 -05'00'
NORTH DAKOTA

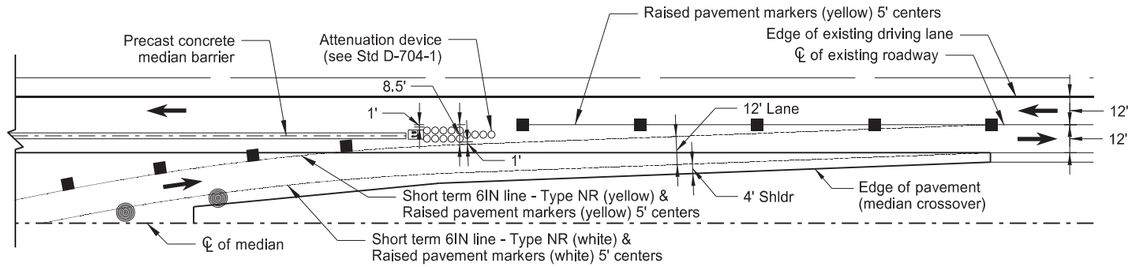
7/2/2024 8:42:05 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162,214\Traffic\100WZ\100WZ_008-009.dgn

*Signs not required for projects on roadways with 55 mph or 60 mph existing speed limit.

TRAFFIC CONTROL
MEDIAN CROSSOVER
55 MPH SPEED LIMIT OR GREATER

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	100	10





ROADWAY EXISTING SPEED LIMIT	SPEED LIMIT TO BE USED		
	XX	YY	ZZ
55	50	55	40
60	50	60	40
65	55	65	55
70	60	70	55
75	65	75	55

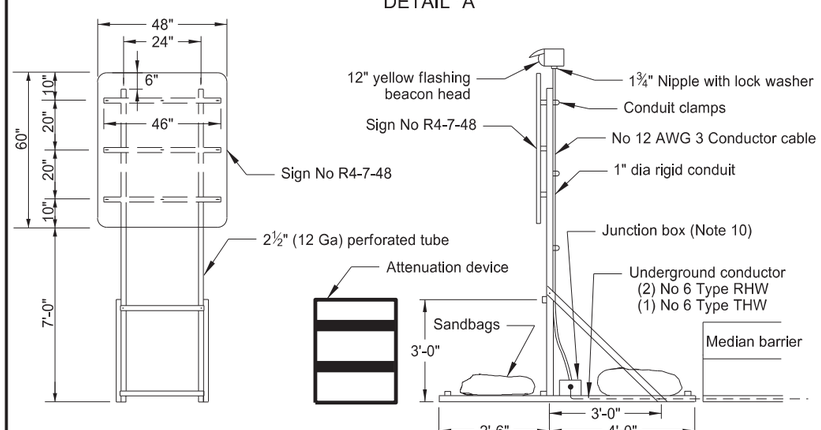
ROAD TYPE	ADVANCE WARNING SIGN SPACING		
	Minimum Distance Between Signs (ft)		
	A	B	C
Urban Expressway and Freeway (55 mph to 65 mph)	850	1,350	2,200
Rural Expressway and Freeway (70 mph to 75 mph)	1,000	1,500	2,640

KEY

Type III barricae	Work area
Sign	Sequencing arrow panel
Flagger	Delineator drum
	Flexible Delineator

LEGEND
- E Obliteration of pavement marking (10' line, 30' skip, ℄)
- F Obliteration of pavement marking (edge lines)
- G Short Term 6IN Line - Type NR (white) & raised pavement markers (white) 5' centers
- H Short Term 6IN Line - Type NR (yellow) & raised pavement markers (yellow) 5' centers
- J Drums spaced @ "S" centers
- K Drums spaced @ 40' centers
- M Flexible Delineators spaced @ 40' centers (O/s 2' from edge of lane line)

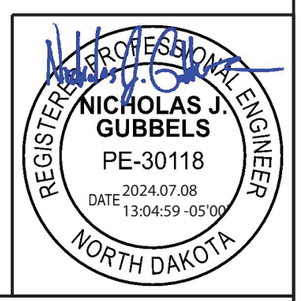
DETAIL "A"



Place conductor behind barricade away from traffic, tie at each barrier connection, and drape above the ground. Place conductors a minimum of 6" underground between the barrier and pole.

DETAIL "B"

Notes:
1. Variables:
   S=Numerical value of posted speed limit, off-peak 85th percentile speed prior to work starting, or anticipated operating speed in MPH.
   W=Width of offset in feet
   L=Taper length in feet. Speeds 45 mph or greater L=WS.
2. Place signs and barricades on the roadway on moveable assemblies. Mount signs on barricades with the sign bottom on the top of the top barricade bar.
3. Install signs R4-1-48, W6-3-48, and W20-52P-54 at one mile increments and after each interchange.
4. Place the speed limit sign only if the crossover is more than 1 mile from an interchange exit ramp.
5. Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on the roadway surface. Use Type C on roadways with high traffic speeds and volumes (over 40 mph or 5000 ADT or greater)
6. Cover existing speed limit signs within a reduced speed zone.
7. Upon approval, the Engineer will measure obliterated or covered pavement marking as Obliteration of Pavement Marking.
8. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
9. Reduce speed when placing traffic control devices. Place "Minimum Fee $80" signs below speed limit signs in reduced speed areas. Place "Work Zone Speed Limit Enforced" sign in advance of the project at the time traffic control devices are installed.
10. Determine proper size, waterproof junction box, and attach to skid or vertical brace assembly.



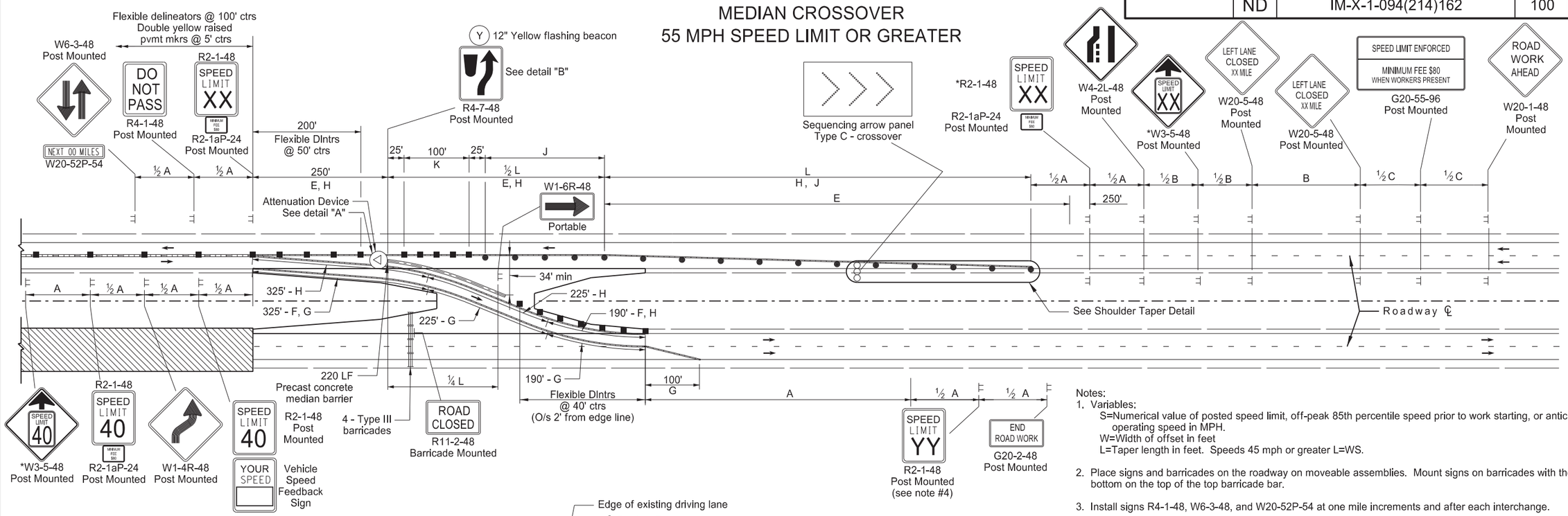
Traffic Control Layout
Temporary Median Crossover Entrance

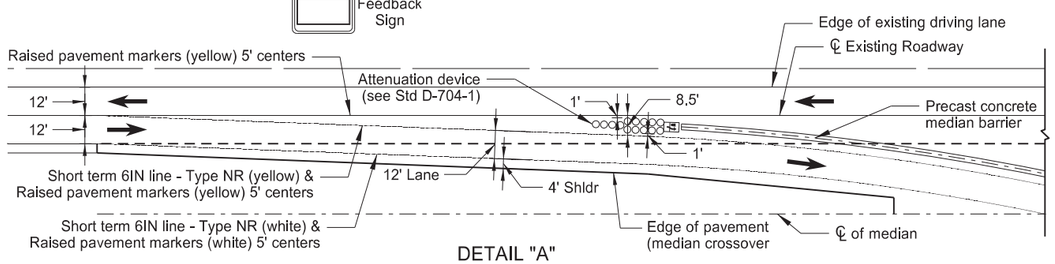
I-94 Reconstruction
Phase 2
Bismarck to E of Menoken Interchange - EB

*Not required for projects on roadways with 55 mph existing speed limit.

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	11

TRAFFIC CONTROL SYSTEM
MEDIAN CROSSOVER
55 MPH SPEED LIMIT OR GREATER





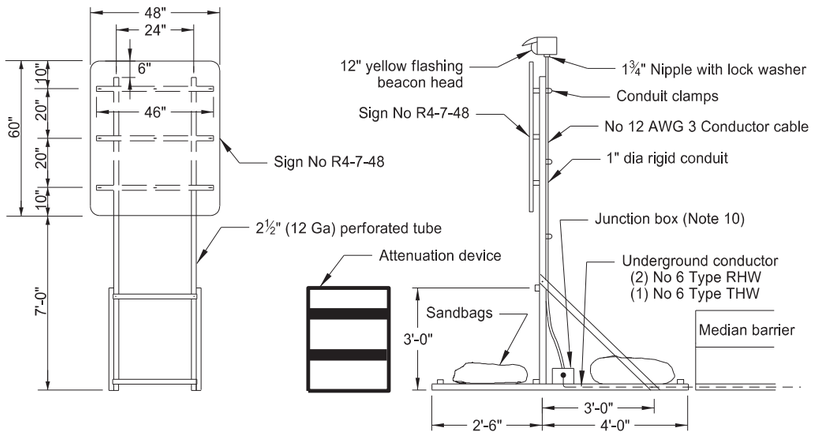
DETAIL "A"

KEY

Type III barricae	Work area
Sign	Sequencing arrow panel
Flagger	Delineator drum
	Flexible Delineator

LEGEND
E Obliteration of pavement marking (10' line, 30' skip, ℄)
F Obliteration of pavement marking (edge lines)
G Short Term 6IN Line - Type NR (white) & raised pavement markers (white) 5' centers
H Short Term 6IN Line - Type NR (yellow) & raised pavement markers (yellow) 5' centers
J Drums spaced @ "S" centers
K Flexible delineators-4 spaces @ 25'

Notes:
1. Variables:
   S=Numerical value of posted speed limit, off-peak 85th percentile speed prior to work starting, or anticipated operating speed in MPH.
   W=Width of offset in feet
   L=Taper length in feet. Speeds 45 mph or greater L=WS.
2. Place signs and barricades on the roadway on moveable assemblies. Mount signs on barricades with the sign bottom on the top of the top barricade bar.
3. Install signs R4-1-48, W6-3-48, and W20-52P-54 at one mile increments and after each interchange.
4. Place the speed limit sign only if the crossover is more than 1 mile from an interchange exit ramp.
5. Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on the roadway surface. Use Type C on roadways with high traffic speeds and volumes (over 40 mph or 5000 ADT or greater)
6. Cover existing speed limit signs within a reduced speed zone.
7. Upon approval, the Engineer will measure obliterated or covered pavement marking as Obliteration of Pavement Marking.
8. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
9. Reduce speed when placing traffic control devices. Place "Minimum Fee $80" signs below speed limit signs in reduced speed areas. Place "Work Zone Speed Limit Enforced" sign in advance of the project at the time traffic control devices are installed.
10. Determine proper size, waterproof junction box, and attach to skid or vertical brace assembly.



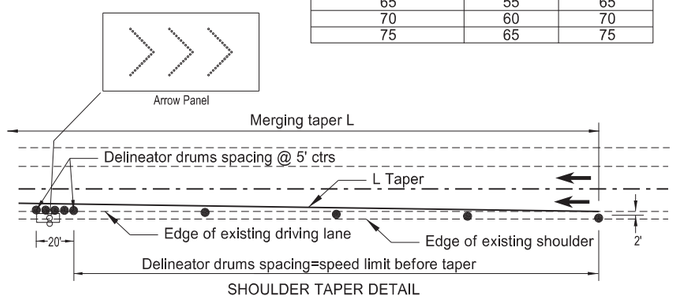
Place conductor behind barricade away from traffic, tie at each barrier connection, and drape above the ground. Place conductors a minimum of 6" underground between the barrier and pole.

DETAIL "B"

ADVANCE WARNING SIGN SPACING

ROAD TYPE	Minimum Distance Between Signs (ft) A	B	C
Urban Expressway and Freeway (55 mph to 65 mph)	850	1,350	2,200
Rural Expressway and Freeway (70 mph to 75 mph)	1,000	1,500	2,640

ROADWAY EXISTING SPEED LIMIT	SPEED LIMIT TO BE USED XX	YY
55	50	55
60	50	60
65	55	65
70	60	70
75	65	75



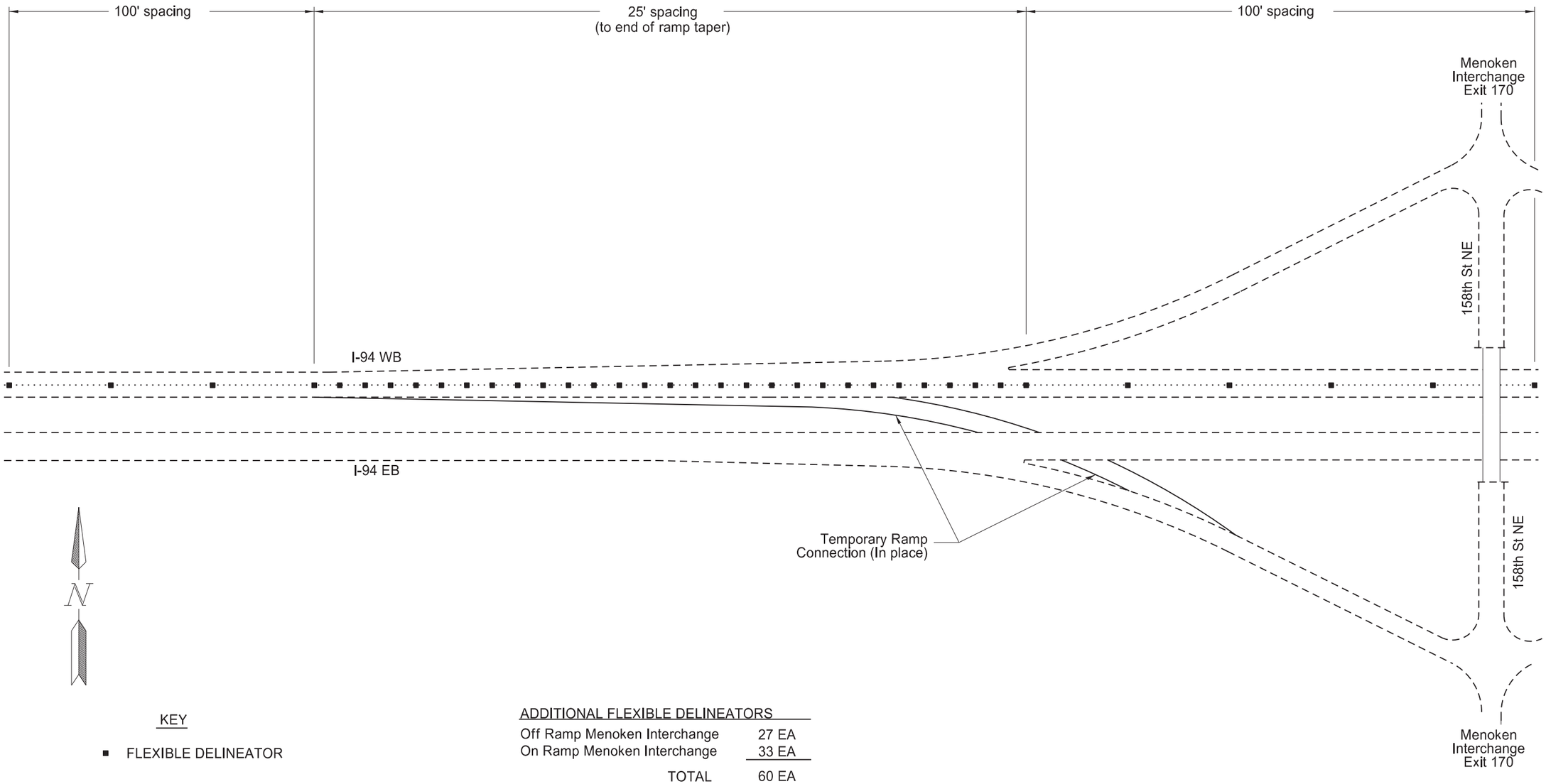
SHOULDER TAPER DETAIL

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:05:38 -05'00'
NORTH DAKOTA

Traffic Control Layout
Temporary Median Crossover Exit

I-94 Reconstruction
Phase 2
Bismarck to E of Menoken Interchange - EB

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	12



N

KEY

■ FLEXIBLE DELINEATOR

ADDITIONAL FLEXIBLE DELINEATORS

Off Ramp Menoken Interchange	27 EA
On Ramp Menoken Interchange	33 EA
TOTAL	60 EA

Mainline Traffic Control at Ramp Connection

I- 94 Reconstruction
Phase 2

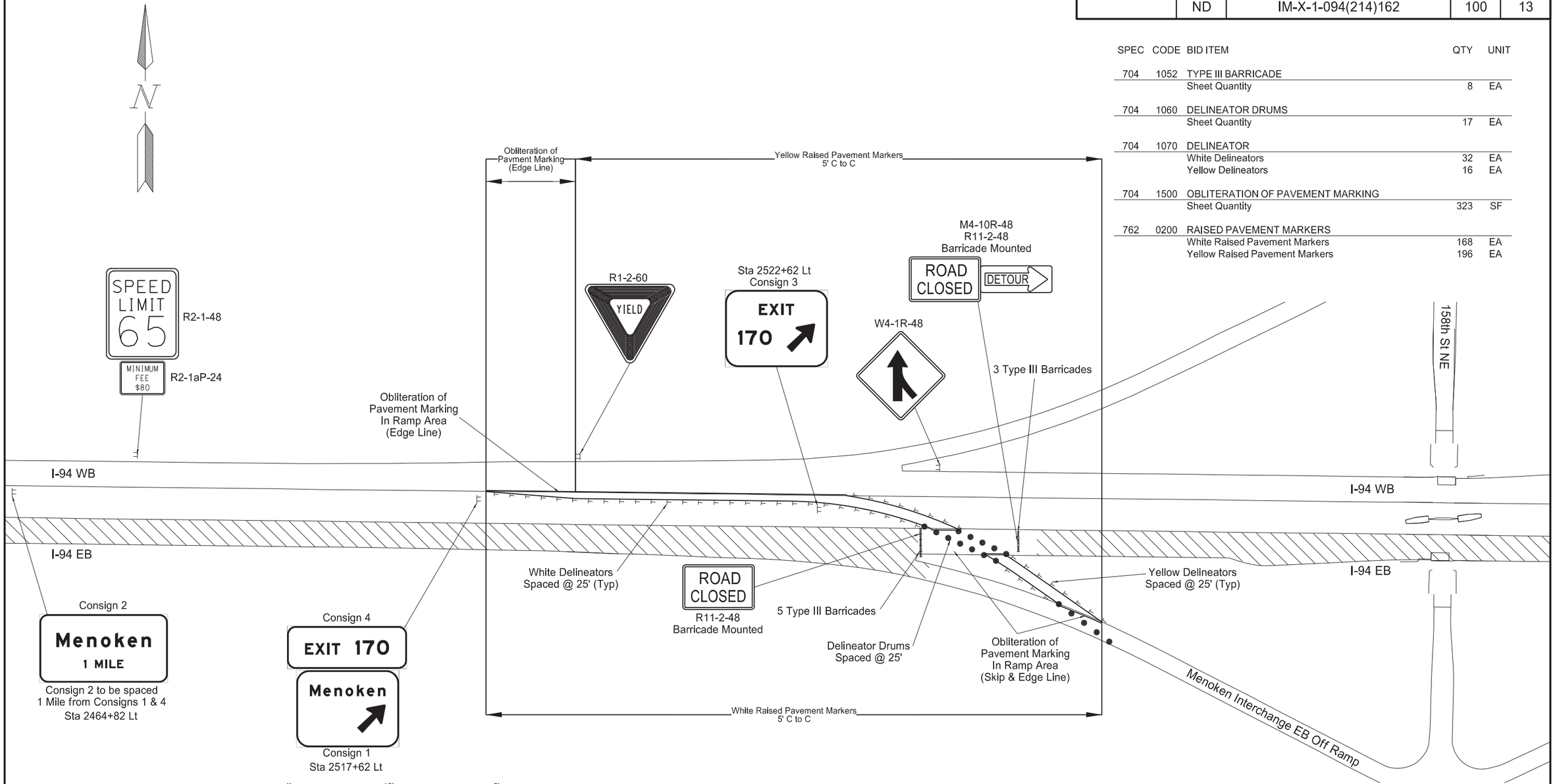
Bismarck to E of Menoken Interchange - EB

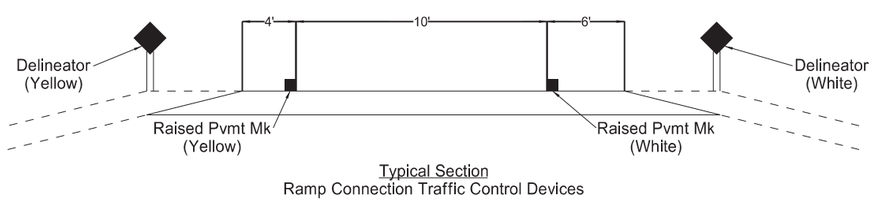
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:06:09 -05'00'
NORTH DAKOTA

7/2/2024 8:42:07 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\100WZ\100WZ_012.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	13

SPEC	CODE	BID ITEM	QTY	UNIT
704	1052	TYPE III BARRICADE		
		Sheet Quantity	8	EA
704	1060	DELINEATOR DRUMS		
		Sheet Quantity	17	EA
704	1070	DELINEATOR		
		White Delineators	32	EA
		Yellow Delineators	16	EA
704	1500	OBLITERATION OF PAVEMENT MARKING		
		Sheet Quantity	323	SF
762	0200	RAISED PAVEMENT MARKERS		
		White Raised Pavement Markers	168	EA
		Yellow Raised Pavement Markers	196	EA





Typical Section
Ramp Connection Traffic Control Devices

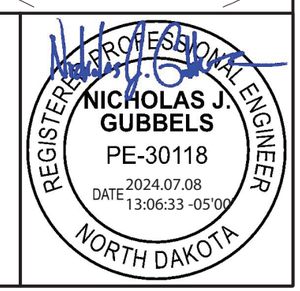
Work Area

Note: See Construction Sign Detail Sheet for detailed images and dimensions of special signs.

EB Off Ramp Connection
Menoken Interchange Traffic Control

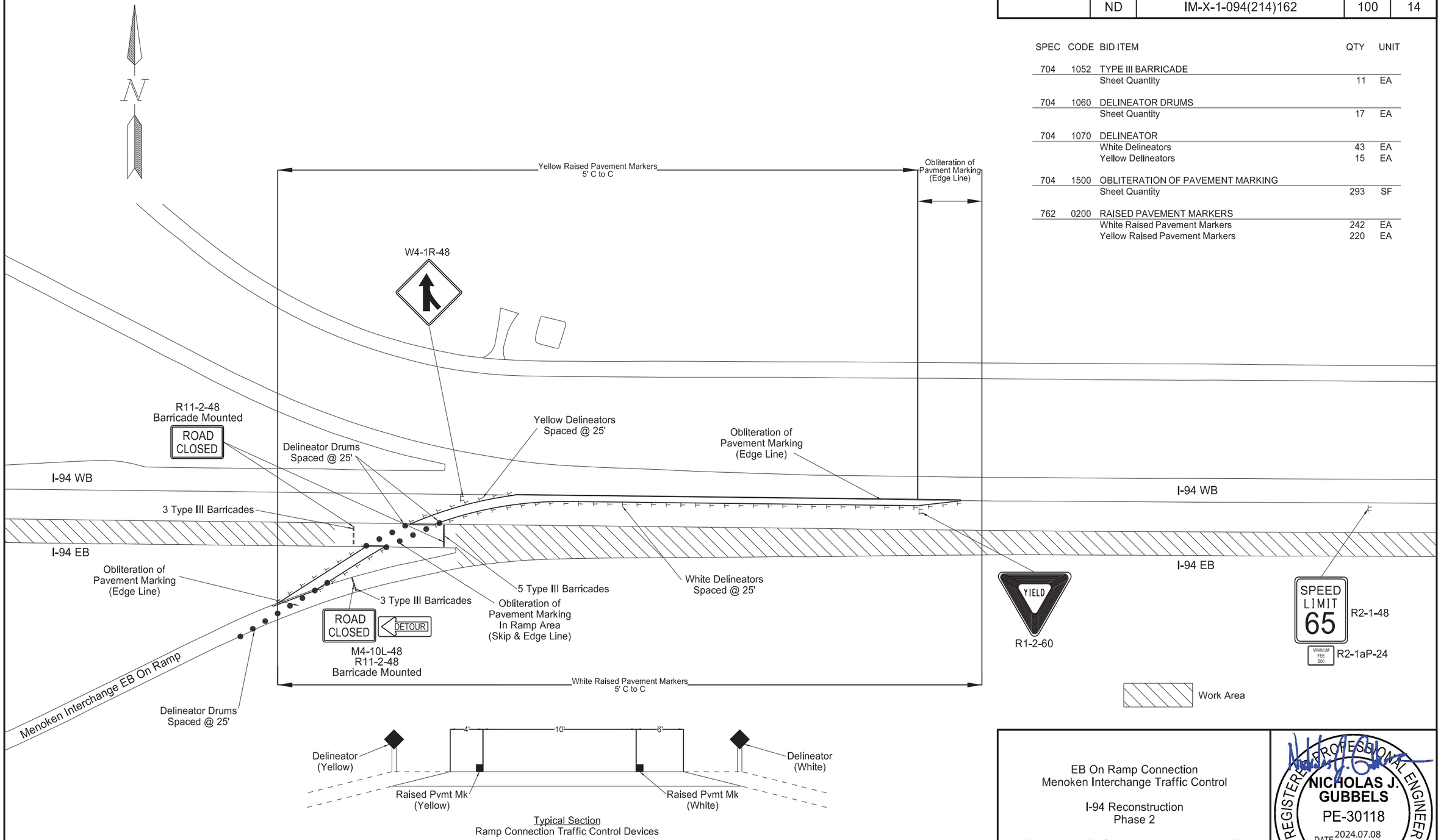
I-94 Reconstruction
Phase 2

Bismarck to E of Menoken Interchange - EB



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	14

SPEC	CODE	BID ITEM	QTY	UNIT
704	1052	TYPE III BARRICADE		
		Sheet Quantity	11	EA
704	1060	DELINEATOR DRUMS		
		Sheet Quantity	17	EA
704	1070	DELINEATOR		
		White Delineators	43	EA
		Yellow Delineators	15	EA
704	1500	OBLITERATION OF PAVEMENT MARKING		
		Sheet Quantity	293	SF
762	0200	RAISED PAVEMENT MARKERS		
		White Raised Pavement Markers	242	EA
		Yellow Raised Pavement Markers	220	EA



Typical Section
Ramp Connection Traffic Control Devices

Note: See Construction Sign Detail Sheet for detailed images and dimensions of special signs.

EB On Ramp Connection
Menoken Interchange Traffic Control

I-94 Reconstruction
Phase 2

Bismarck to E of Menoken Interchange - EB

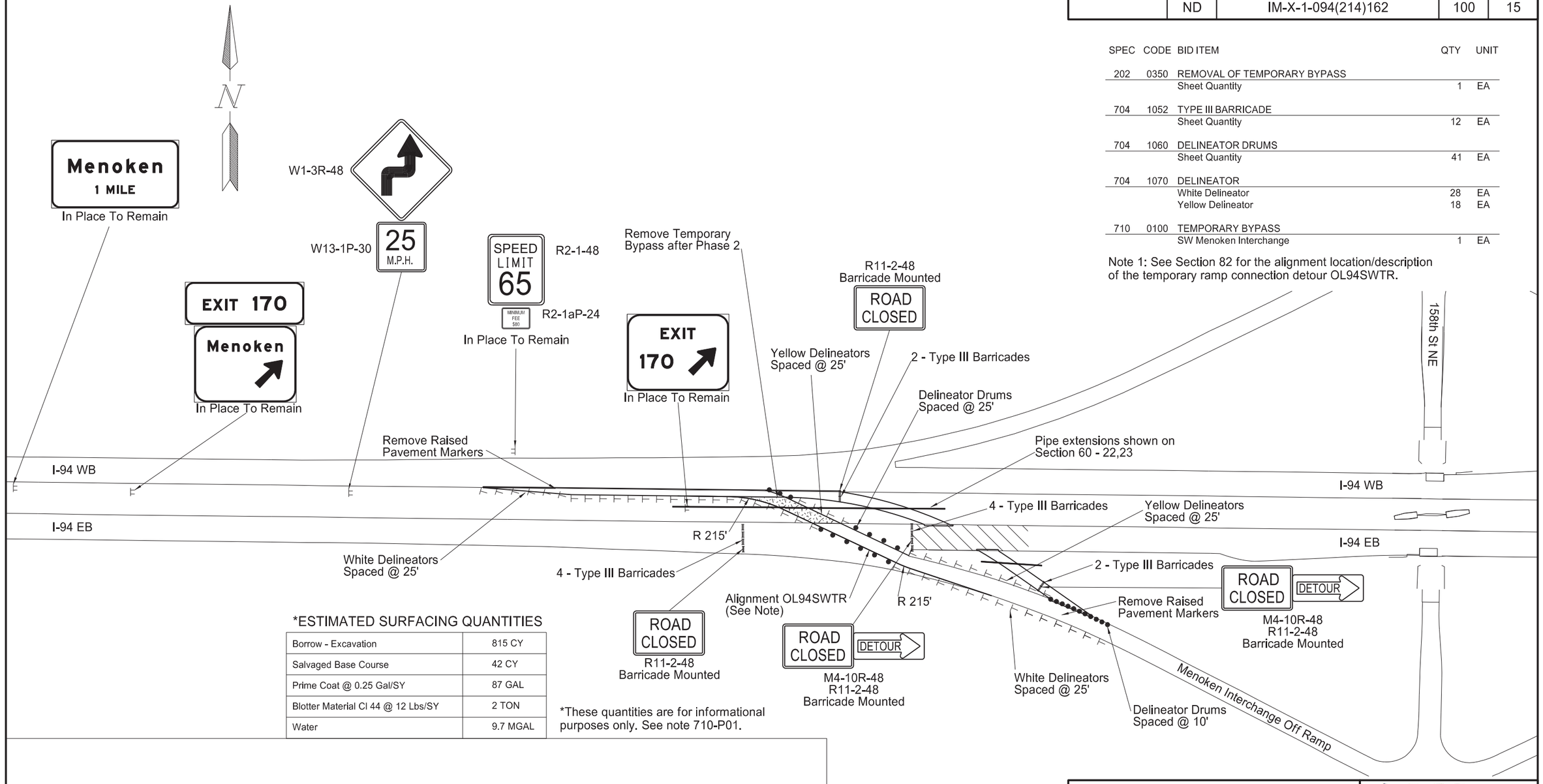
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:07:01 -05'00'
NORTH DAKOTA

7/2/2024 8:42:11 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\100WZ\100WZ_014.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	15

SPEC	CODE	BID ITEM	QTY	UNIT
202	0350	REMOVAL OF TEMPORARY BYPASS		
		Sheet Quantity	1	EA
704	1052	TYPE III BARRICADE		
		Sheet Quantity	12	EA
704	1060	DELINEATOR DRUMS		
		Sheet Quantity	41	EA
704	1070	DELINEATOR		
		White Delineator	28	EA
		Yellow Delineator	18	EA
710	0100	TEMPORARY BYPASS		
		SW Menoken Interchange	1	EA

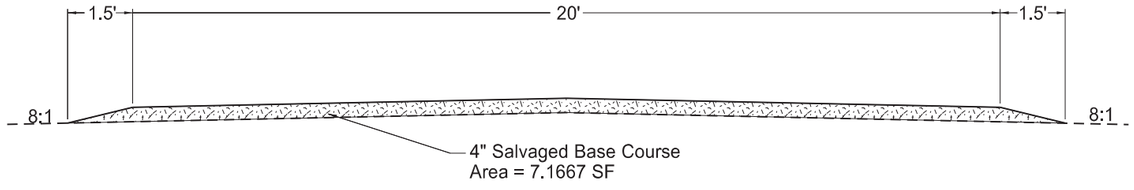
Note 1: See Section 82 for the alignment location/description of the temporary ramp connection detour OL94SWTR.



*ESTIMATED SURFACING QUANTITIES

Borrow - Excavation	815 CY
Salvaged Base Course	42 CY
Prime Coat @ 0.25 Gal/SY	87 GAL
Blotter Material Cl 44 @ 12 Lbs/SY	2 TON
Water	9.7 MGAL

*These quantities are for informational purposes only. See note 710-P01.



Typical Section
Ramp Connection Detour

* Not drawn to scale

Work Area

Temp Ramp

Traffic Control - Southwest Ramp Connection Detour

I-94 Reconstruction
Phase 2

Bismarck to E of Menoken Interchange -EB

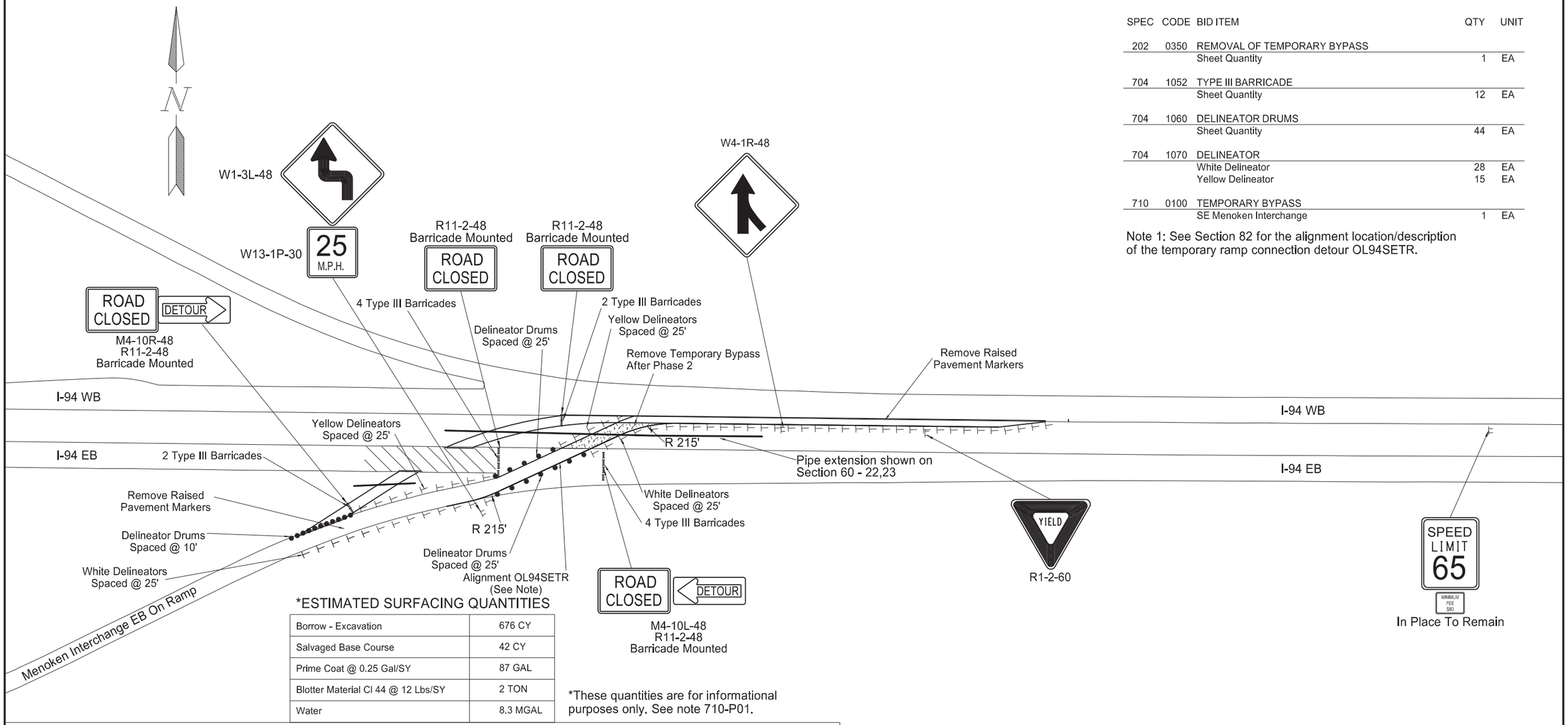
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:07:42 -05'00'
NORTH DAKOTA

7/2/2024 8:42:12 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\100WZ\100WZ_015.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	16

SPEC	CODE	BID ITEM	QTY	UNIT
202	0350	REMOVAL OF TEMPORARY BYPASS		
		Sheet Quantity	1	EA
704	1052	TYPE III BARRICADE		
		Sheet Quantity	12	EA
704	1060	DELINEATOR DRUMS		
		Sheet Quantity	44	EA
704	1070	DELINEATOR		
		White Delineator	28	EA
		Yellow Delineator	15	EA
710	0100	TEMPORARY BYPASS		
		SE Menoken Interchange	1	EA

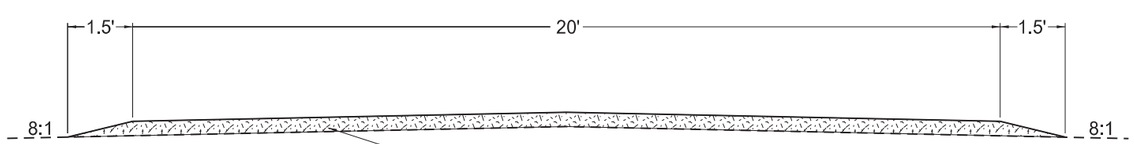
Note 1: See Section 82 for the alignment location/description of the temporary ramp connection detour OL94SETR.



*ESTIMATED SURFACING QUANTITIES

Borrow - Excavation	676 CY
Salvaged Base Course	42 CY
Prime Coat @ 0.25 Gal/SY	87 GAL
Blotter Material Cl 44 @ 12 Lbs/SY	2 TON
Water	8.3 MGAL

*These quantities are for informational purposes only. See note 710-P01.



Typical Section
Ramp Connection Detour

* Not drawn to scale

Work Area

Temp Ramp

Traffic Control - Southeast Ramp Connection Detour

I-94 Reconstruction
Phase 2

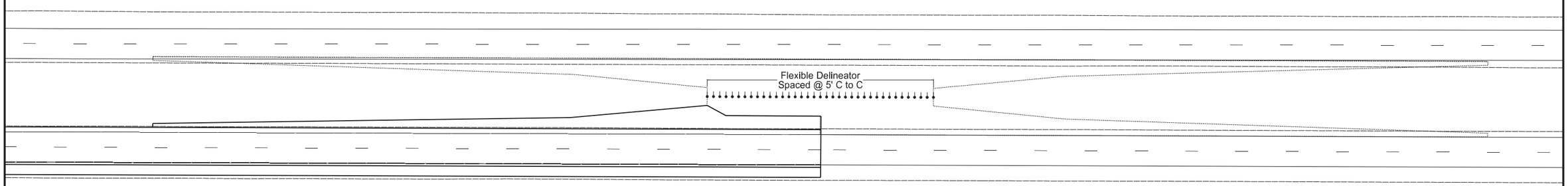
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:08:29 -05'00'
NORTH DAKOTA

7/2/2024 8:42:13 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\100WZ\100WZ_016.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	17

SPEC	CODE	BID ITEM	QTY	UNIT
704	1072	FLEXIBLE DELINEATORS		
		West Median Crossover	36	EA
		East Median Crossover	36	EA



Typical Median Crossover

Notes:
1. Refer to Section 6 for additional information.

Flexible Delineator Detail

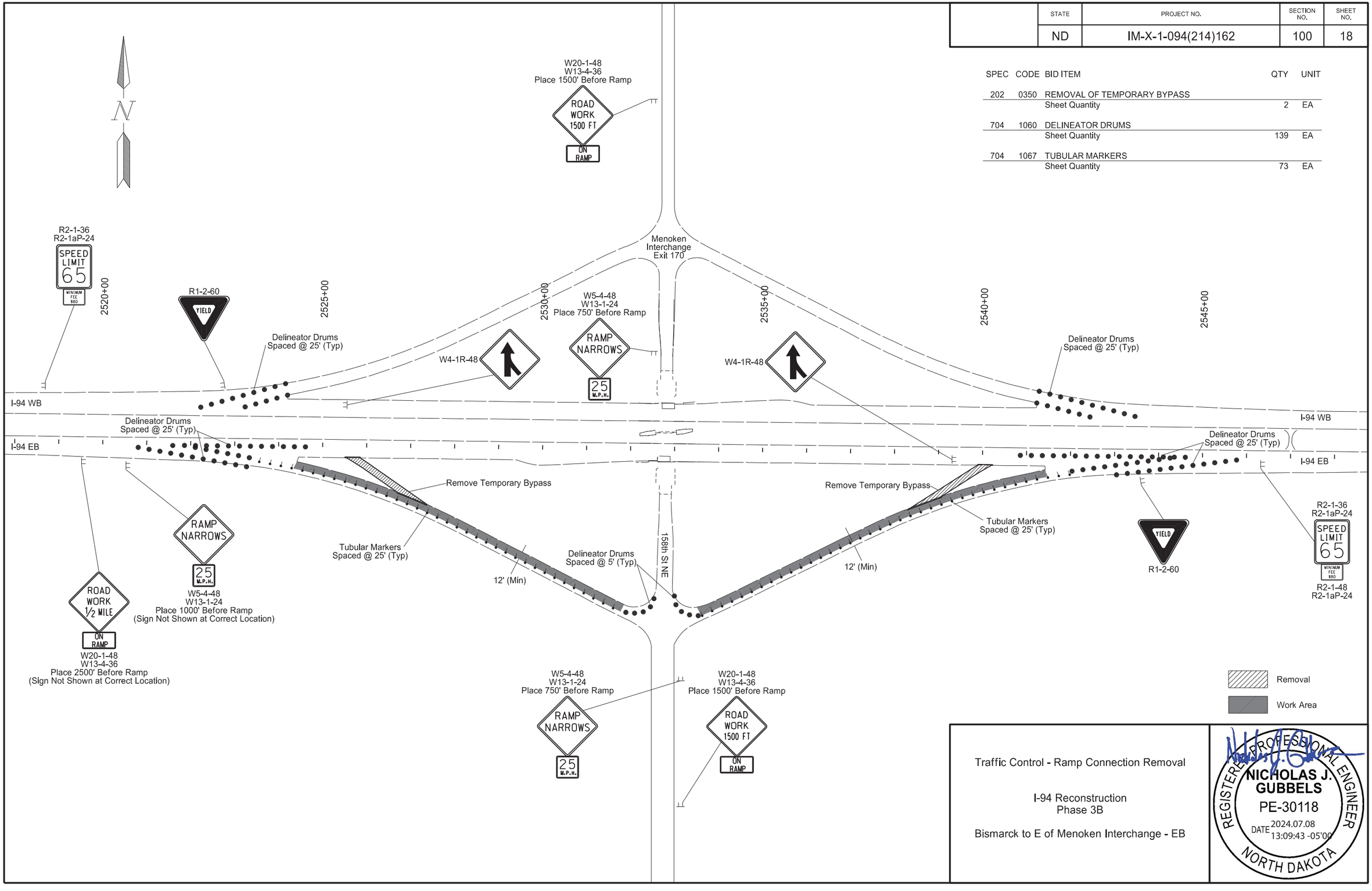
I-94 Reconstruction
Phase 3A

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:09:09 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	18

SPEC	CODE	BID ITEM	QTY	UNIT
202	0350	REMOVAL OF TEMPORARY BYPASS		
		Sheet Quantity	2	EA
704	1060	DELINEATOR DRUMS		
		Sheet Quantity	139	EA
704	1067	TUBULAR MARKERS		
		Sheet Quantity	73	EA



Traffic Control - Ramp Connection Removal

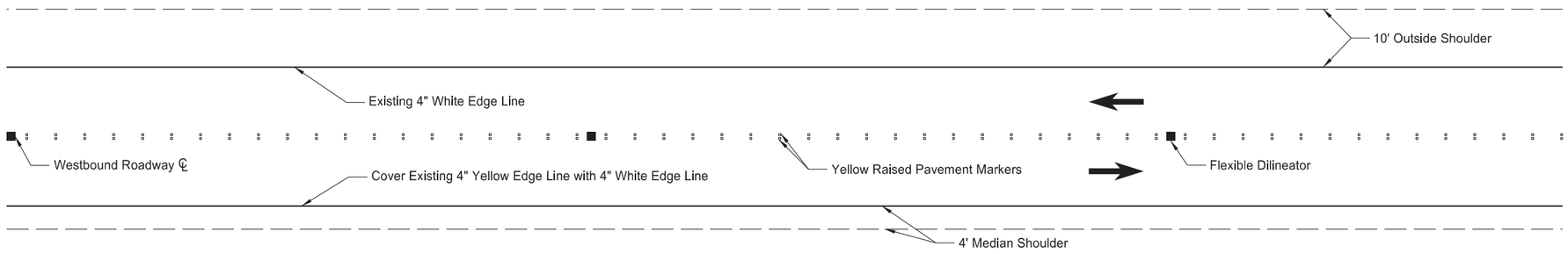
I-94 Reconstruction
Phase 3B

Bismarck to E of Menoken Interchange - EB

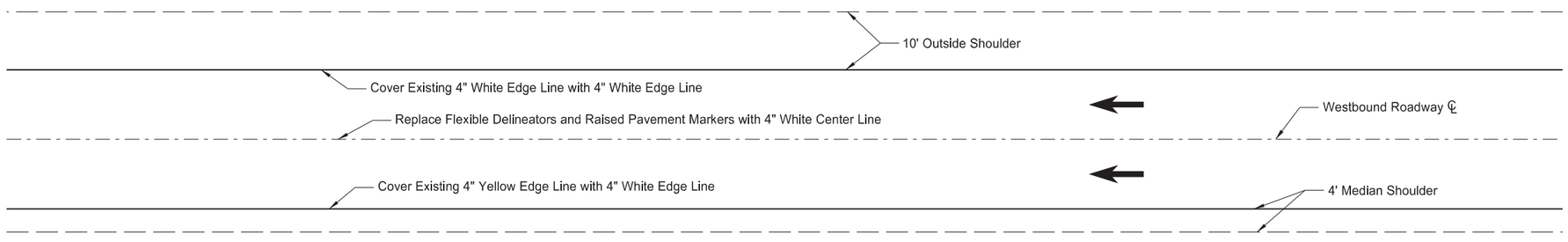
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:09:43 -05'00'
NORTH DAKOTA

7/2/2024 8:42:21 AM Kasey.Ward K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\100WZ\100WZ_018.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	19



TWO-WAY TRAFFIC ON A SINGLE TWO-LANE ROADWAY
Center Line has been obliterated.
Flexible Delineators installed @ 100' ctrs.
Two rows of Yellow Raised Pvmt Mrks installed @ 5' ctrs. - 4" Between.
Median 4" Yellow Edge Line covered by placing 4" White Edge Line on top.



TO RETURN TRAFFIC TO NORMAL FOUR LANE DIVIDED OPERATION:
Remove Flexible Delineators and Raised Pvmt. Mkrs.
Place 4" White Center Line.
Place 4" Yellow Edge Line over Median 4" White Edge Line.
Place 4" White Edge Line over Outside 4" White Edge Line.

SPEC	CODE	BID ITEM	QTY	UNIT
704	1072	FLEXIBLE DELINEATORS		
		Sta 2106+22 to Sta 2616+32 (Minus Temporary Ramp Connection Areas)	510	EA
704	1500	OBLITERATION OF PAVEMENT MARKING		
		Sta 2106+22 to Sta 2616+32 (4" White Centerline Skips - centerline of north roadway for two - way traffic)	4,250	SF
762	0200	RAISED PAVEMENT MARKERS		
		Sta 2106+22 to Sta 2616+32	20,404	EA
762	1104	PVMT MK PAINTED 4IN LINE		
		Sta 2106+22 to Sta 2616+32 (4" White Edge Lines - median side edge line on north roadway for two - way traffic)	51,010	LF

Traffic Conctrol for Two-Way
Interstate Traffic on One Roadway

I-94 Reconstruction

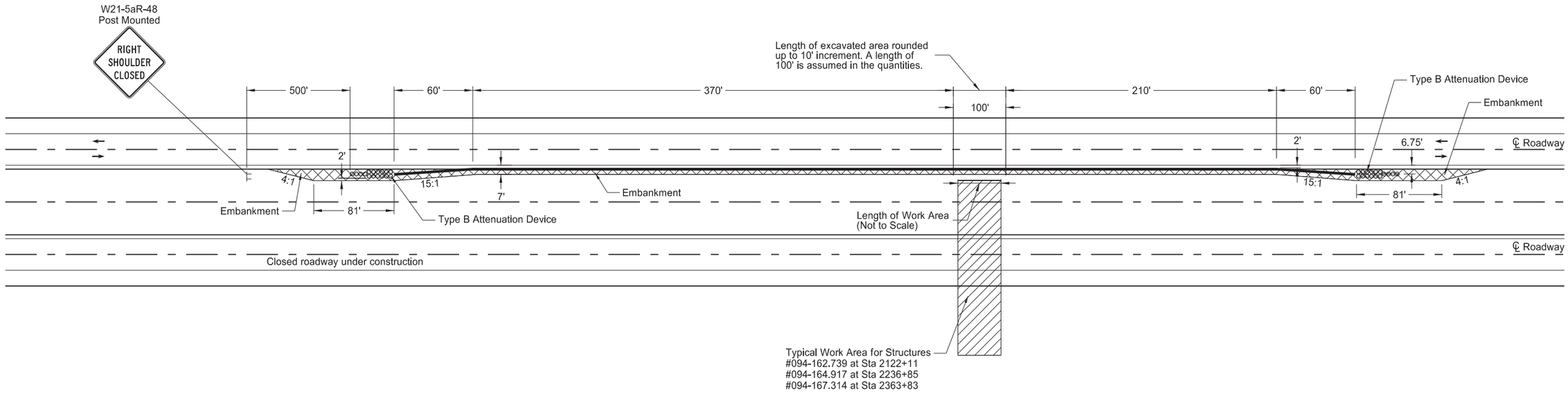
Bismarck to E of Menoken Interchange - EB

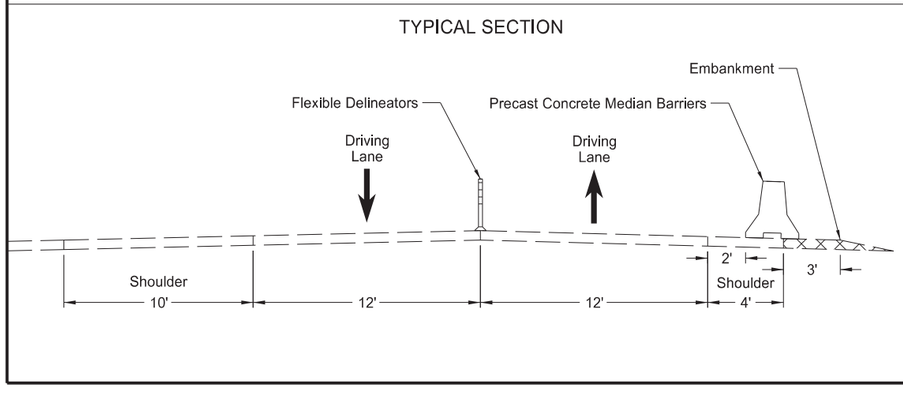
REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:10:19 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	20

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

SPEC	CODE	BID ITEM	QTY	UNIT
704	1045	ATTENUATION DEVICE-TYPE B-75		
		Sta 2122+11 - Str.#094-162.739	2	EA
		Sta 2236+85 - Str.#094-164.917	2	EA
		Sta 2363+83 - Str.#094-167.314	2	EA
704	3511	STATE FURNISHED MEDIAN BARRIER		
		Sta 2122+11 - Str.#094-162.739	800	LF
		Sta 2236+85 - Str.#094-164.917	800	LF
		Sta 2363+83 - Str.#094-167.314	800	LF





Notes:
1. The location is within a project and the necessary traffic control is in place.
2. Install Portable Precast Concrete Median Barriers when excavation is within clear zone and 1 foot or more in depth.
3. Include the cost of embankment in the bid item "State Furnished Median Barrier."

See standard drawing D-704-57 for additional details

Traffic Control - Concrete Barrier Detail

I 94 Reconstruction

Bismarck to E of Menoken - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:11:31 -05'00'
NORTH DAKOTA

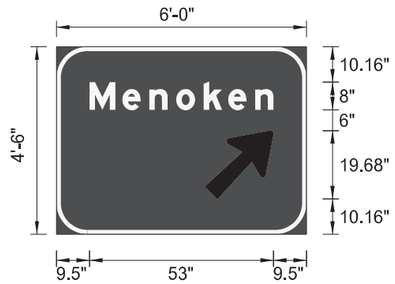
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	100	21

SIGN NUMBER	Consign 1
WIDTH X HEIGHT	6'-0" x 4'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	9"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflectlve
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_8IN_TYPE A	42.81	10.16	15.1	25	315

STATION(S): none

AREA: 27 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Const_Guide.ssi

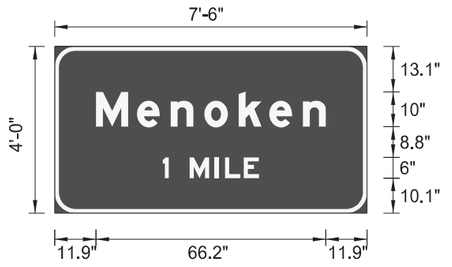
LETTER POSITION (X)																				LENGTH	SIZE	SERIES
M	e	n	o	k	e	n														52.96	8/6	EM 2000
9.52	18.96	26.72	34.48	42.4	49.44	57.2																

SIGN NUMBER	Consign 2
WIDTH X HEIGHT	7'-6" x 4'-0"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	6"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S): none

AREA: 30 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Const_Guide.ssi

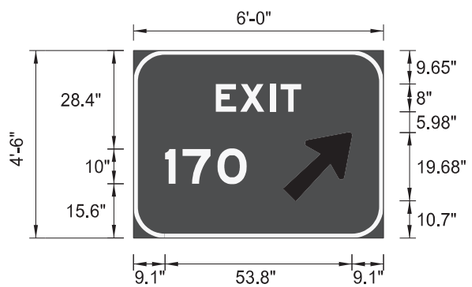
LETTER POSITION (X)																				LENGTH	SIZE	SERIES
M	e	n	o	k	e	n														66.2	10/7.5	EM 2000
11.9	23.7	33.4	43.1	53	61.8	71.5																
1		M	I	L	E															27.78	6	EM 2000
31.11	32.91	38.91	46.17	49.05	54.45																	

SIGN NUMBER	Consign 3
WIDTH X HEIGHT	6'-0" x 4'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	9"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_8IN_TYPE A	43.23	10.7	15.1	25	315

STATION(S): none

AREA: 27.01 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Const_Guide.ssi

LETTER POSITION (X)																				LENGTH	SIZE	SERIES
E	X	I	T																	24.64	8	EM 2000
23.68	30.72	39.36	42.4																			
1	7	0																		23.5	10	EM 2000
9.1	14.1	24.2																				

SIGN NUMBER	Consign 4
WIDTH X HEIGHT	7'-0" x 2'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	6"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S): none

AREA: 17.51 Sq.Ft.

Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Const_Guide.ssi

LETTER POSITION (X)																				LENGTH	SIZE	SERIES
E	X	I	T	1	7	0														58.84	8,10	EM 2000
12.58	19.62	28.26	31.3	47.92	52.92	63.02																

Traffic Control Signs

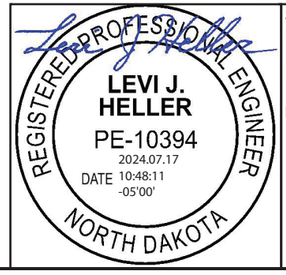
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:12:28 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	IM-X-1-094(214)162	110	1

Station / RP	Sign / Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Panel For Signs IV SF	Panel For Signs XI SF	Overlay Panel IV SF	Overlay Panel XI SF	Vert Clear-ance FT	Galv Steel Sheet Standard Pipe 1st LF	Galv Steel Sheet Standard Pipe 2nd LF	Size	Galv Steel Post W-Shape Posts 1st LF	Galv Steel Post W-Shape Posts 2nd LF	Galv Steel Post W-Shape Posts 3rd LF	Max Post Len LF	Post Space FT	Revise Fuse Joint EA	Std Pipe Fdn Dia FT	Std Pipe Fdn Dep FT	Std Pipe Fdn Vol CY	W-Shape Pile LF	Remove Sign Fdns Conc Fdn EA	Remove Sign Fdns W-Shape Pile EA	Reset Sign Panel EA	Reset Sign Support EA	Stub Post EA	Multi Dir Base EA	Comments
I-94 EB																												
2089+91 Rt	D12-5-66			35.8				7.0	19.0		6.0				21.7			1.8	10.0	0.9			2					
2103+37 Rt	Sign 1			132.0				7.0			W8x24	20.6	20.6		25.3	8.3					28		2					
2210+25 Rt																							2					
2353+90 Rt	Sign 2			55.0				7.0			W5x16	17.1	17.1		23.3	5.5					28		2					
2383+20 Rt	Sign 3			63.0				7.0			W5x16	17.5	17.5		21.3	5.3					28		2					
2396+94 Rt	Sign 4				61.8			7.0			W5x16	18.9	20.1		21.9	4.8					28		2					
2406+82 Rt	Sign 5			69.0				7.0			W5x16	18.5	18.7		19.7	5.8					28		2					
2463+12 Rt	Sign 7/8			105.5				7.0			W6x20	18.6	18.7		26.5	6.0					28		2					
2489+67 Rt	Sign 9			140.0				7.0			W6x20	15.2	15.2		16.9	8.8					28		2					
2515+75 Rt	Sign 7/10			92.5				7.0			W5x16	18.9	20.2		21.0	5.0					28		2					
2559+86 Rt	SA A	27.0						7.0	20.9		6.0				29.1			1.8	8.5	0.8		1						
2569+87 Rt	R2-1-48		20.0					7.0	16.5		5.0				23.7			1.8	7.0	0.6		1						
Sub Total		27.0	20.0	692.8	61.8			**Total**	56.4			**Total**	293.4							2.3	224	2	20	0	0	0	0	
Rest Area																												
2415+81 Rt	D5-2a-78			42.3				7.0	15.3	15.3	4.0				17.1	3.3		1.3	7.0	0.7		2						
Sub Total				42.3				**Total**	30.6			**Total**	0.0							0.7	0	2	0	0	0	0	0	
Exit 170																												
2524+90 Rt	Sign 11			40.0				7.0	14.4	14.4	4.0				17.1	4.0		1.3	7.0	0.7		2						
Sub Total				40.0				**Total**	28.8			**Total**	0.0							0.7	0	2	0	0	0	0	0	
Grand Total		**27.0**	**20.0**	**775.1**	**61.8**			**Total**	**115.8**			**Total**	**293.4**							**3.7**	**224**	**6**	**20**	**0**	**0**	**0**	**0**	



Sign Summary
Round Steel Pipe & W-Shape

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	IM-X-1-094(214)162	110	2

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	2nd LF	3rd LF	4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
I-94 EB																							
2248+52 Lt	R5-11-30	32		5.0	10.0				5.0	2 x 2 12 ga	10.6						1	4	2.25 x 2.25 12 ga				
2248+96 Lt	R5-11-30	32		5.0	10.0				5.0	2 x 2 12 ga	10.6						1	4	2.25 x 2.25 12 ga				
2395+11 Lt	R5-11-30	32		5.0	10.6				5.0	2.25 x 2.25 12 ga	13.9						1	4	2.5 x 2.5 12 ga				
2395+46 Lt	R5-11-30	32		5.0	10.6				5.0	2.25 x 2.25 12 ga	13.9						1	4	2.5 x 2.5 12 ga				
2487+38 Lt	R5-11-30	32		5.0	10.8				5.0	2.25 x 2.25 12 ga	13.9						1	4	2.5 x 2.5 12 ga				
2487+86 Lt	R5-11-30	32		5.0	10.8				5.0	2.25 x 2.25 12 ga	13.9						1	4	2.5 x 2.5 12 ga				
Sub Total			0.0	30.0		**Total**	62.8										**Total**	24.0		0	0	0	
Rest Area																							
2415+72 Rt	W13-2-48	12		20.0	12.3	12.6			5.0	2.25 x 2.25 12 ga	14.6	3.2	3.5			2.5 x 2.5 12 ga	2	4	3 x 3 7 ga			2	
2418+49 Rt	R2-1-24	9		5.0	12.8				7.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
2421+60 Rt	Sign 6		24.8		12.1	12.1			7.0	2.25 x 2.25 12 ga	13.4	3.9	3.9			2.5 x 2.5 12 ga	2	4	3 x 3 7 ga			2	
2423+32 Rt	R5-1-30	15		6.3	11.8				7.0	2.5 x 2.5 12 ga	14.6						1	4	3 x 3 7 ga				
2427+65 Rt	R1-2-36	4		3.9	9.8				7.0	2 x 2 12 ga	13.6						1	4	2.25 x 2.25 12 ga				
2428+16 Rt	R1-2-36	4		3.9	12.4				7.0	2 x 2 12 ga	13.6						1	4	2.25 x 2.25 12 ga				
Sub Total			24.8	39.1		**Total**	95.9										**Total**	32.0		0	0	4	
Grand Total			**24.8**	**69.1**		**Total**	**158.7**										**Total**	**56**	**0**	**0**	**0**	**4**	

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:49:14 -05'00'
NORTH DAKOTA

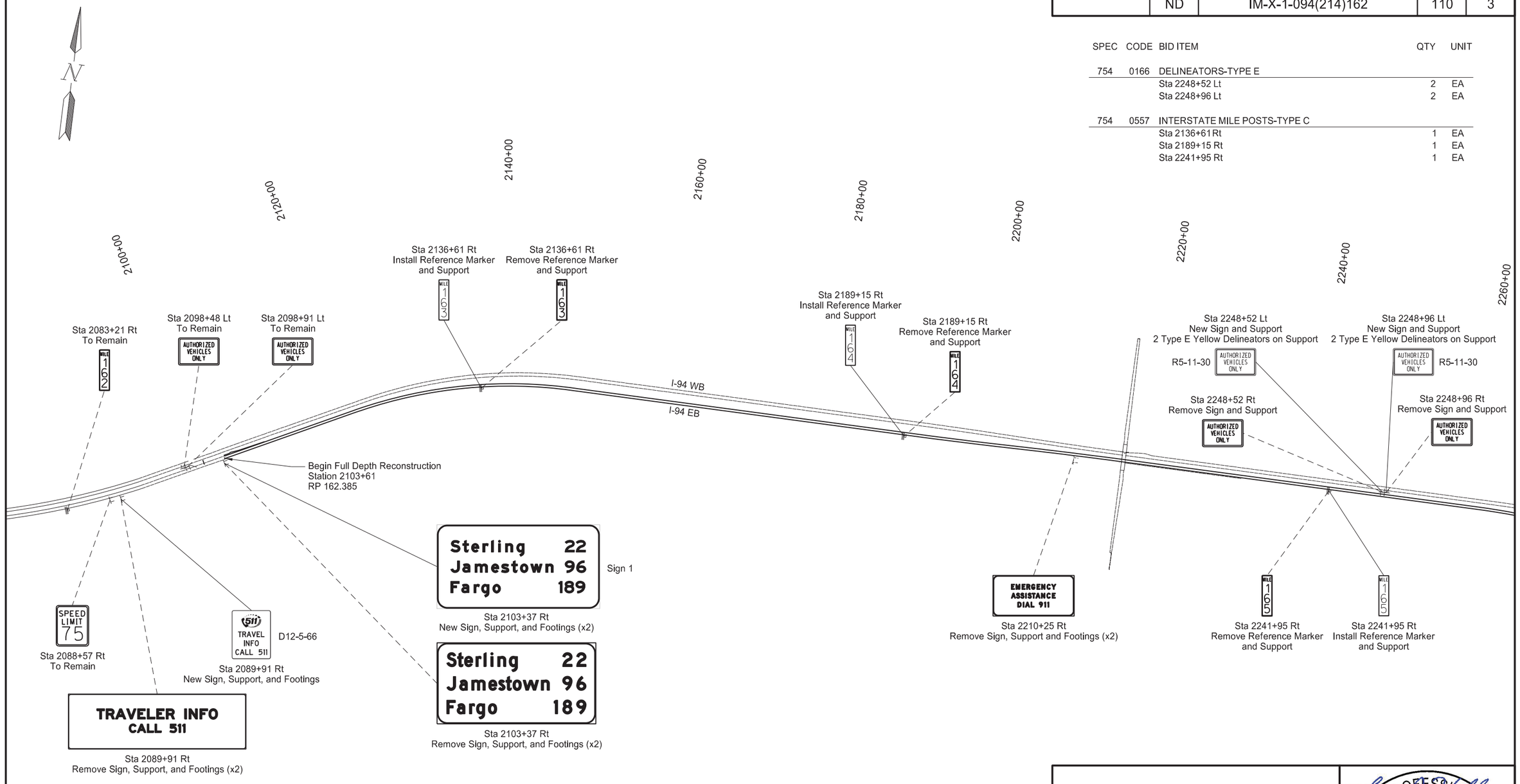
Sign Summary
Perforated Tube

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	110	3

SPEC	CODE	BID ITEM	QTY	UNIT
754	0166	DELINEATORS-TYPE E		
		Sta 2248+52 Lt	2	EA
		Sta 2248+96 Lt	2	EA
754	0557	INTERSTATE MILE POSTS-TYPE C		
		Sta 2136+61Rt	1	EA
		Sta 2189+15 Rt	1	EA
		Sta 2241+95 Rt	1	EA



Permanent Signing

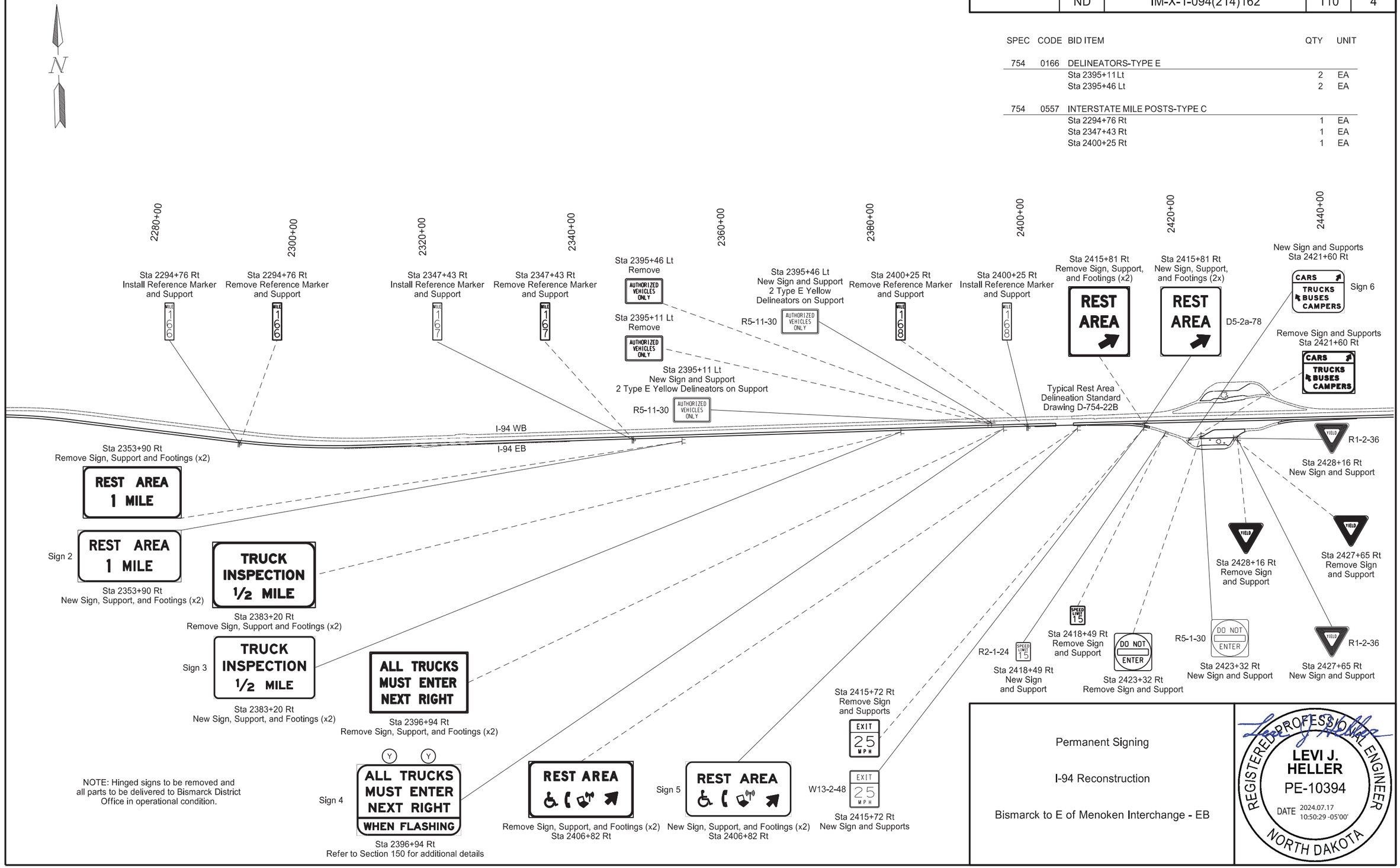
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:49:59 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	110	4

SPEC	CODE	BID ITEM	QTY	UNIT
754	0166	DELINEATORS-TYPE E		
		Sta 2395+11 Lt	2	EA
		Sta 2395+46 Lt	2	EA
754	0557	INTERSTATE MILE POSTS-TYPE C		
		Sta 2294+76 Rt	1	EA
		Sta 2347+43 Rt	1	EA
		Sta 2400+25 Rt	1	EA



NOTE: Hinged signs to be removed and all parts to be delivered to Bismarck District Office in operational condition.

Permanent Signing

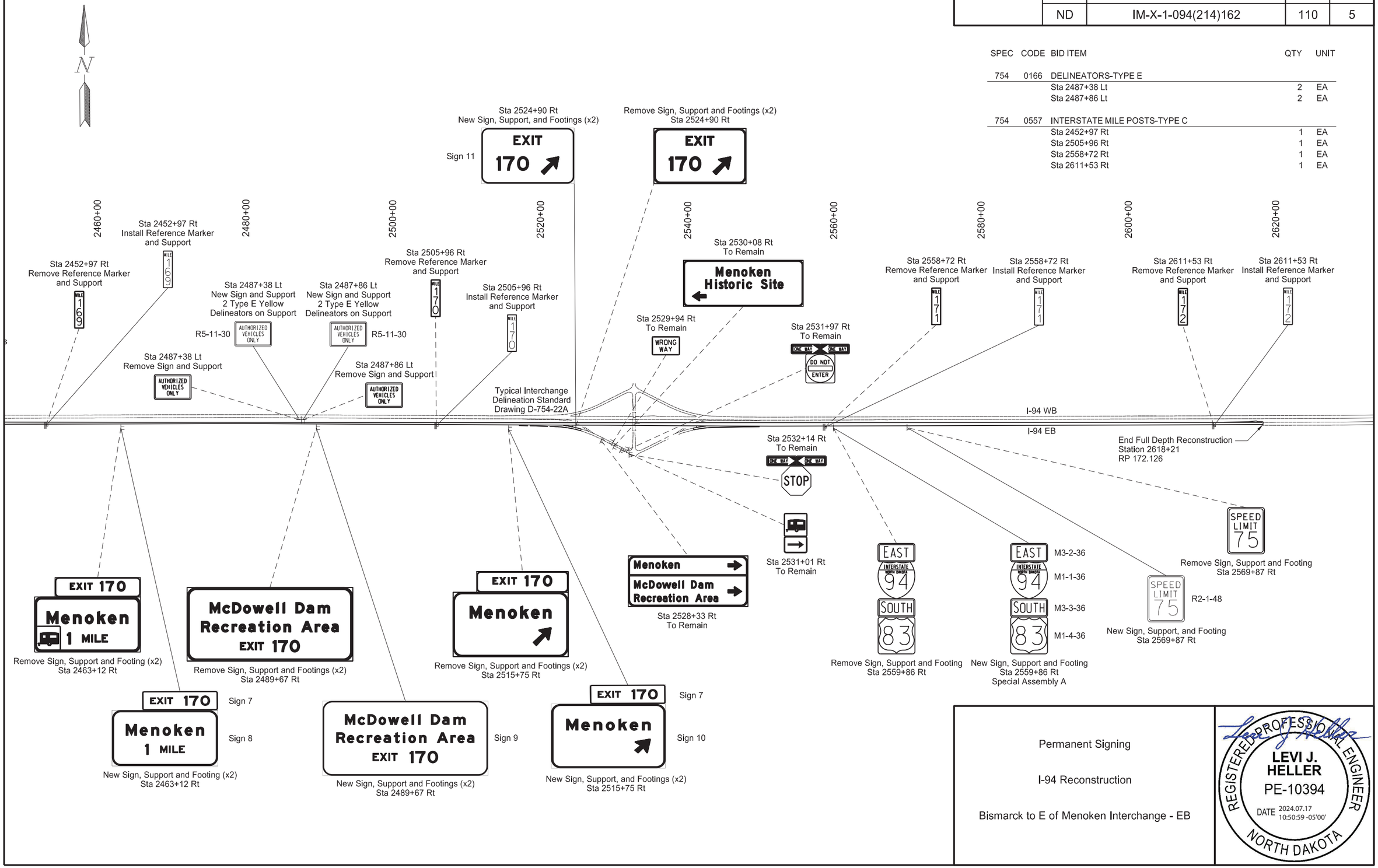
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:50:29 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	110	5

SPEC	CODE	BID ITEM	QTY	UNIT
754	0166	DELINEATORS-TYPE E		
		Sta 2487+38 Lt	2	EA
		Sta 2487+86 Lt	2	EA
754	0557	INTERSTATE MILE POSTS-TYPE C		
		Sta 2452+97 Rt	1	EA
		Sta 2505+96 Rt	1	EA
		Sta 2558+72 Rt	1	EA
		Sta 2611+53 Rt	1	EA



Permanent Signing

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:50:59 -05'00'
NORTH DAKOTA

7/9/2024 12:35:26 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\110SN\110SN.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	110	6

SIGN NUMBER	Sign 1
WIDTH X HEIGHT	15'-6" x 8'-0"
BORDER WIDTH	2" (inset 0")
CORNER RADIUS	12"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
2103+37 Rt

AREA: 124.0 Sq.Ft.

Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Fwy_Distance_Post Intchg.ssl

LETTER POSITION (X)																						LENGTH	SIZE	SERIES
S	t	e	r	l	i	n	g															83.9	13.3/10	EM 2000
15.9	29.4	39.4	52.3	62.1	70.1	78.1	91																	
2	2																					23.4	13.3	E 2000
146.3	159																							
J	a	m	e	s	t	o	w	n														117.2	13.3/10	EM 2000
15.9	29.3	43.4	62.1	73.6	85.2	95.1	106.8	124.3																
9	6																					23.8	13.3	E 2000
146.3	159.4																							
F	a	r	g	o																		56.9	13.3/10	EM 2000
15.9	28.1	42.2	50.8	63.7																				
1	8	9																				30.1	13.3	E 2000
139.2	145.8	158.4																						

SIGN NUMBER	Sign 2
WIDTH X HEIGHT	11'-0" x 5'-0"
BORDER WIDTH	2" (inset 0")
CORNER RADIUS	9"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Blue
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
2353+90 Rt

AREA: 55.0 Sq.Ft.

Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Fwy_Gen Serv_Rest-Roadside Area.ssl

LETTER POSITION (X)																						LENGTH	SIZE	SERIES
R	E	S	T		A	R	E	A														103.8	12	E 2000
14.1	26.2	36.9	47.9	56.9	68.9	83.2	95.3	105.7																
1	M	I	L	E																		52.6	15,10	E 2000
39.7	59.2	71.2	75.6	84.8																				

Sign Details

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:51:33 -05'00'
NORTH DAKOTA

7/9/2024 12:35:17 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\110SN\110GUIDSESIGN.dgn

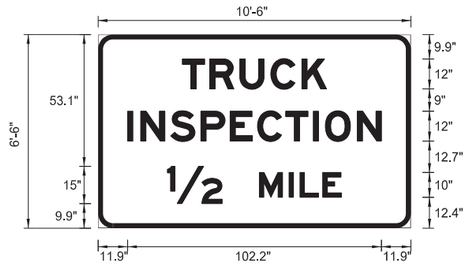
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	110	7

SIGN NUMBER	Sign 3
WIDTH X HEIGHT	10'-6" x 6'-6"
BORDER WIDTH	2" (inset 0")
CORNER RADIUS	6"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
2383+20 Rt

AREA: 68.3 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Fwy_Weigh Station.ssl

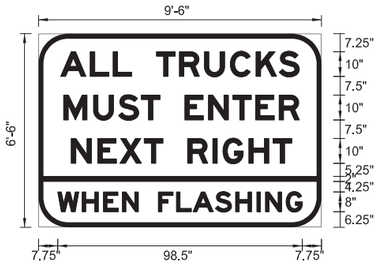
LETTER POSITION (X)																		LENGTH	SIZE	SERIES
T	R	U	C	K														58.1	12	E 2000
34	45	57.1	69.6	82.1																
I	N	S	P	E	C	T	I	O	N									102.2	12	E 2000
11.9	17.2	29.3	41.4	53.2	64.2	75.6	86.6	91.6	104.4											
1/2	M	I	L	E														70.1	15,10	E 2000
28	64.9	76.9	81.3	90.5																

SIGN NUMBER	Sign 4
WIDTH X HEIGHT	9'-6" x 6'-6"
BORDER WIDTH	2" (inset 0")
CORNER RADIUS	12"
MOUNTING	Ground
BACKGROUND	TYPE: IX Reflective
	COLOR: White / White
LEGEND/BORDER	TYPE: IX Non-Reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
2396+94 Rt

AREA: 61.8 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_60_Large.ssl

LETTER POSITION (X)																		LENGTH	SIZE	SERIES
A	L	L		T	R	U	C	K	S									96.1	10	E 2000
9	20.9	30.1	37.6	47.6	56.8	66.9	77.3	87.7	97											
M	U	S	T		E	N	T	E	R									94.9	10	E 2000
10.2	22.2	32.3	41.5	49	59	68.5	78.3	87.5	97											
N	E	X	T		R	I	G	H	T									88.8	10	E 2000
13.2	23.9	32.8	42.6	50.1	60.1	70.2	74.3	84.7	94.5											
W	H	E	N		F	L	A	S	H	I	N	G						98.5	8	E 2000
7.8	17.6	26.2	33.8	40.2	48.2	55.6	62.2	71.3	79.4	87.9	91.4	99.8								

SIGN NUMBER	Sign 5
WIDTH X HEIGHT	11'-6" x 6'-0"
BORDER WIDTH	2" (inset 0")
CORNER RADIUS	9"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Blue
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
Handicapped	16.2	12.7	19.3	22	0
Telephone	47.5	12.7	7	22	0
Wireless Internet	66.5	12.7	23.5	22	0
ND_12IN_TYPE B	105.6	12.7	18.2	20	315

STATION(S):
2406+82 Rt

AREA: 69.0 Sq.Ft.

Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

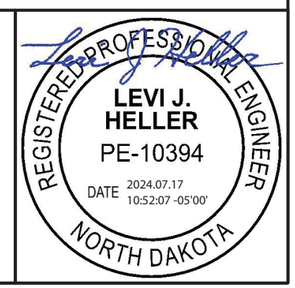
PANEL STYLE: ND_Fwy_Rest-Scenic Area.ssl

LETTER POSITION (X)																		LENGTH	SIZE	SERIES
R	E	S	T		A	R	E	A										103.8	12	E 2000
16.2	28.3	39	50	59	71	85.3	97.4	107.8												

Sign Details

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

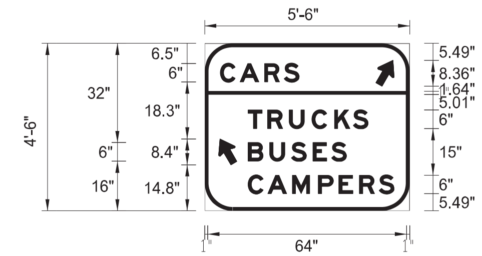


SIGN NUMBER	Sign 6
WIDTH X HEIGHT	5'-6" x 4'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	9"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_6IN_TYPE D	55.1	40.2	6	9	330
ND_6IN_TYPE D	4.5	14.8	6	9	30

STATION(S):
2421+60 Rt

AREA: 24.8 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

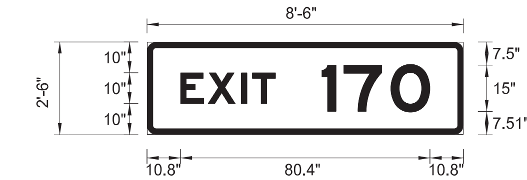
PANEL STYLE: ND_Conv_Destination_Divided.ssi

LETTER POSITION (X)							LENGTH	SIZE	SERIES
C	A	R	S				25.4	6	E 2000
5	11.3	19.2	25.6						
T	R	U	C	K	S		38.7	6	E 2000
14	20.2	27.2	34.5	41.8	47.8				
B	U	S	E	S			31.7	6	E 2000
14	20.9	27.9	34.8	40.8					
C	A	M	P	E	R	S	47	6	E 2000
14	20.3	28.2	36.6	43.2	49.8	56.1			

SIGN NUMBER	Sign 7
WIDTH X HEIGHT	8'-6" x 2'-6"
BORDER WIDTH	2" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

STATION(S):
2463+12 Rt
2515+75 Rt

AREA: 21.3 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

ND_Fwy_Exit Panel.bsi

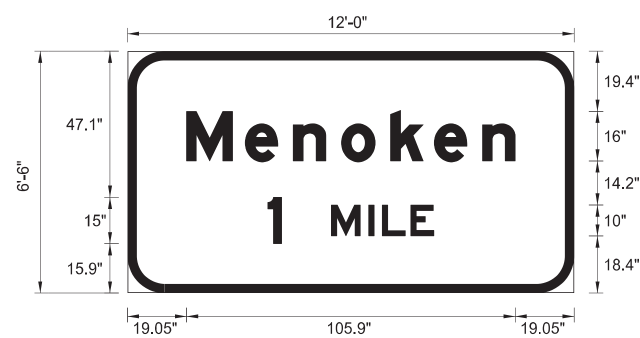
							LENGTH	SIZE	SERIES
E	X	I	T	1	7	0	80.4	10,15	E 2000
10.8	19.7	30.4	33.9	56.4	63.5	78.6			

SIGN NUMBER	Sign 8
WIDTH X HEIGHT	12'-0" x 6'-6"
BORDER WIDTH	3" (inset 0")
CORNER RADIUS	12"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
2463+12 Rt

AREA: 78.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

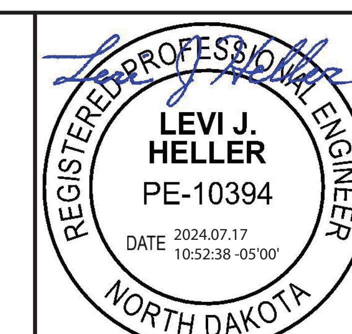
PANEL STYLE: ND_Fwy_Advance_Int.ssi

LETTER POSITION (X)							LENGTH	SIZE	SERIES
M	e	n	o	k	e	n	105.9	16/12	EM 2000
19	37.9	53.4	69	84.8	98.9	114.4			
1	M	I	L	E			53.6	15,10	E 2000
45.2	65.7	77.7	82.1	91.3					

Sign Details

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB



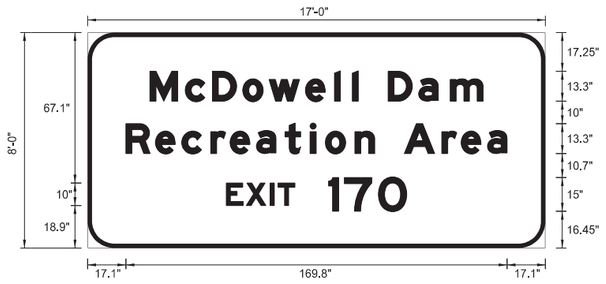
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	110	9

SIGN NUMBER	Sign 9
WIDTH X HEIGHT	17'-0" x 8'-0"
BORDER WIDTH	2" (inset 0")
CORNER RADIUS	12"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Brown
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
2489+67 Rt

AREA: 136.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Fwy_Recreation_Cultural_Supplemental.ssl

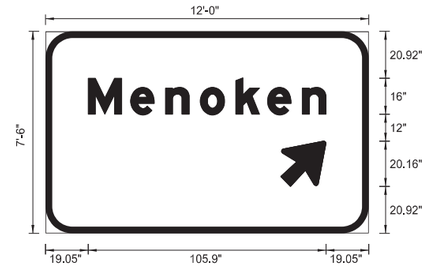
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
M	c	D	o	w	e	l	l		D	a	m								148.4	13.3/10	EM 2000
27.8	43.5	55.6	69.1	80.9	97.1	110	118	120.6	133.9	147.5	161.6										
R	e	c	r	e	a	t	i	o	n		A	r	e	a					169.8	13.3/10	EM 2000
17.1	30.2	42	54.9	63.5	75.2	88	99.1	105.9	119.1	127.9	141.2	157.8	166.4	178.1							
E	X	I	T	1	7	0													80.4	10,15	E 2000
61.8	70.7	81.4	84.9	107.4	114.4	129.6															

SIGN NUMBER	Sign 10
WIDTH X HEIGHT	12'-0" x 7'-6"
BORDER WIDTH	3" (inset 0")
CORNER RADIUS	12"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_16IN_TYPE B	104.8	20.9	22.2	25	315

STATION(S):
2515+75 Rt

AREA: 90.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Fwy_Advance_Int.ssl

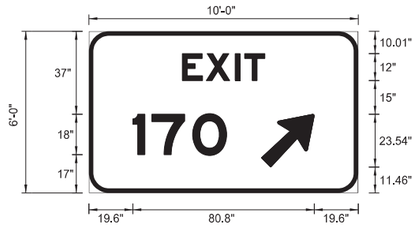
LETTER POSITION (X)							LENGTH	SIZE	SERIES
M	e	n	o	k	e	n	105.9	16/12	EM 2000
19	37.9	53.4	69	84.8	98.9	114.4			

SIGN NUMBER	Sign 11
WIDTH X HEIGHT	10'-0" x 6'-0"
BORDER WIDTH	2" (inset 0")
CORNER RADIUS	9"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_12IN_TYPE A	76.9	11.5	18.2	30	315

STATION(S):
2524+90 Rt

AREA: 60.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Fwy_Gore.ssl

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
E	X	I	T																36.7	12	E 2000
41.6	52.3	65.2	69.4																		
1	7	0																	41.8	18	E 2000
19.6	28.1	46.2																			

Sign Details

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

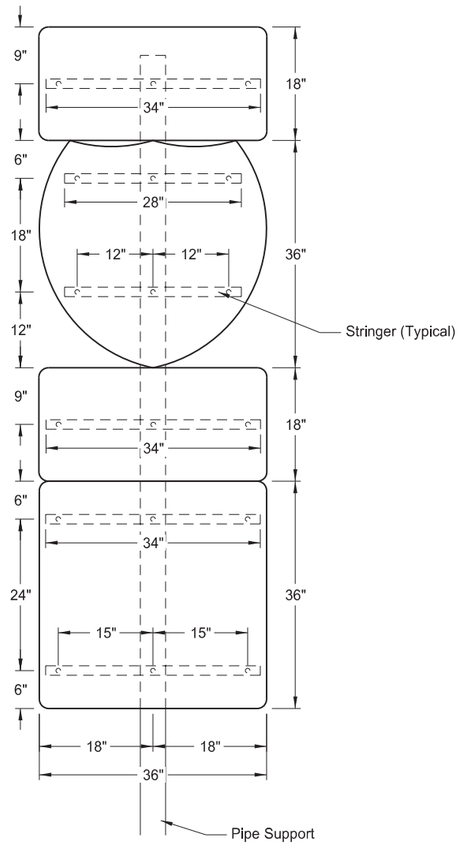
REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:53:11 -05'00'
NORTH DAKOTA

7/9/2024 12:35:18 PM Logan.Fridgen K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\110SN\110GUIDSESIGN.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	110	10

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1 ½" x 1 ½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



Special Assembly A
(Round Steel Pipe)

Sta 2559+86 Rt

Area: 27.0 SF

Sign Assemblies

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:53:37 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	120	1

TYPE	DESCRIPTION	RATE	QUANTITY	UNIT
Interstate 94 Eastbound Roadway (Sta 2094+81 to Sta 2623+00)				
PVMT MK PAINTED 6IN LINE	Centerline Skips (White)	1,320 LF/Mile	13,205	LF
	Outside Edge (White)	5,280 LF/Mile	52,819	LF
	Inside Edge (Yellow)	5,280 LF/Mile	52,819	LF

TYPE	DESCRIPTION	RATE	QUANTITY	UNIT
Apple Creek Rest Area Entrance (Area not Covered by Mainline Pavement Marking)				
EPOXY PVMT MK 6IN LINE-GROOVED	Dotted Line (White)	660 LF/Mile	138	LF
EPOXY PVMT MK 12IN LINE-GROOVED	Channel Line (White)	5,280 LF/Mile	556	LF

TYPE	DESCRIPTION	RATE	QUANTITY	UNIT
Apple Creek Rest Area Exit (Area not Covered by Mainline Pavement Marking)				
EPOXY PVMT MK 6IN LINE-GROOVED	Dotted Line (White)	660 LF/Mile	171	LF
EPOXY PVMT MK 12IN LINE-GROOVED	Channel Line (White)	5,280 LF/Mile	724	LF

TYPE	DESCRIPTION	RATE	QUANTITY	UNIT
Menoken EB Area Exit (Area not Covered by Mainline Pavement Marking)				
EPOXY PVMT MK 6IN LINE-GROOVED	Dotted Line (White)	660 LF/Mile	120	LF
EPOXY PVMT MK 12IN LINE-GROOVED	Channel Line (White)	5,280 LF/Mile	585	LF
EPOXY PVMT MK 6IN LINE-GROOVED	Outside Edge (White)	5,280 LF/Mile	891	LF
	Inside Edge (Yellow)	5,280 LF/Mile	894	LF
PVMT MK PAINTED 24IN LINE	Stop Line (White)	5,280 LF/Mile	80	LF

TYPE	DESCRIPTION	RATE	QUANTITY	UNIT
Menoken EB Area Entrance (Area not Covered by Mainline Pavement Marking)				
EPOXY PVMT MK 6IN LINE-GROOVED	Dotted Line (White)	660 LF/Mile	178	LF
EPOXY PVMT MK 12IN LINE-GROOVED	Channel Line (White)	5,280 LF/Mile	323	LF
EPOXY PVMT MK 6IN LINE-GROOVED	Outside Edge (White)	5,280 LF/Mile	899	LF
	Inside Edge (Yellow)	5,280 LF/Mile	895	LF

TYPE	DESCRIPTION	RATE	QUANTITY	UNIT
Interstate 94 Westbound Roadway (Sta 2107+35 to Sta 2613+86))				
PVMT MK PAINTED 6IN LINE	Centerline Skips (White)	1,320 LF/Mile	12,663	LF
	Outside Edge (White)	5,280 LF/Mile	50,651	LF
	Inside Edge (Yellow)	5,280 LF/Mile	50,651	LF

Pavement Marking Layout

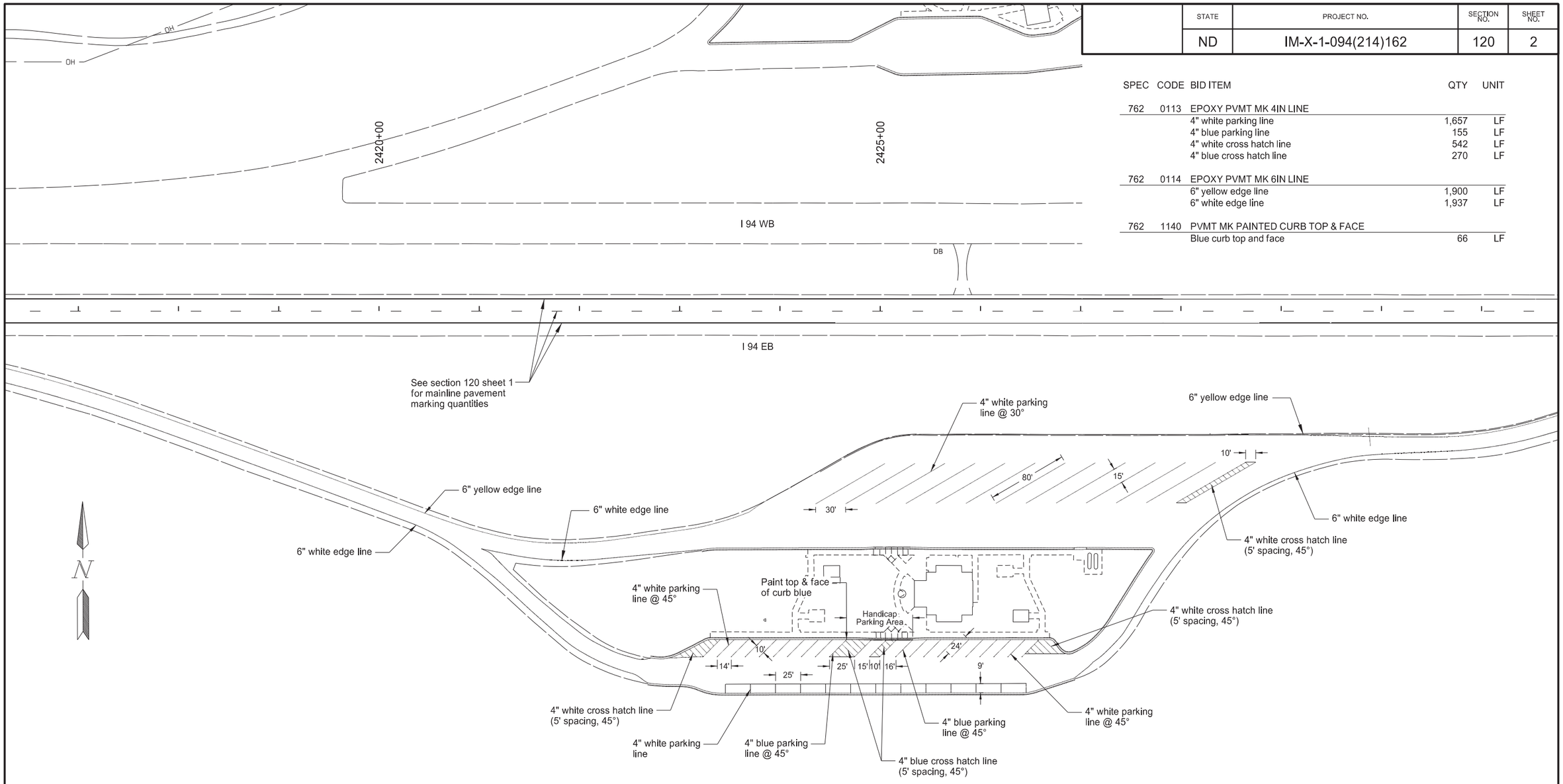
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:56:44 -05'00'
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	120	2

SPEC	CODE	BID ITEM	QTY	UNIT
762	0113	EPOXY PVMT MK 4IN LINE		
		4" white parking line	1,657	LF
		4" blue parking line	155	LF
		4" white cross hatch line	542	LF
		4" blue cross hatch line	270	LF
762	0114	EPOXY PVMT MK 6IN LINE		
		6" yellow edge line	1,900	LF
		6" white edge line	1,937	LF
762	1140	PVMT MK PAINTED CURB TOP & FACE		
		Blue curb top and face	66	LF



Pavement Marking Layout

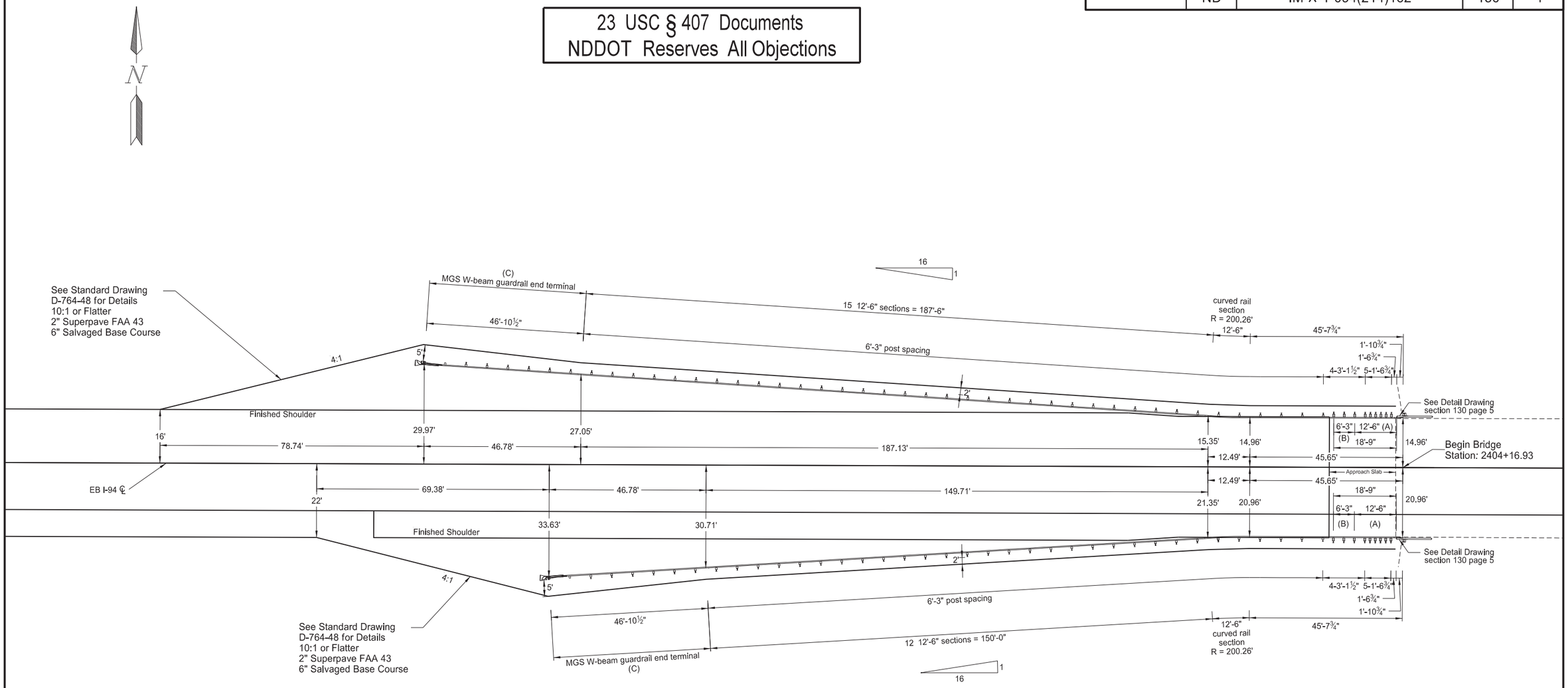
I-94 Reconstruction
Apple Creek Rest Area

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
LEVI J. HELLER
PE-10394
DATE 2024.07.17 10:58:02 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	130	1

23 USC § 407 Documents
NDDOT Reserves All Objections



(A) Thrie beam rail section (double thickness)

(B) Symmetrical W-beam to thrie beam transition

(C) Install an MGS FLEAT end terminal at this location. See Standard D-764-38. Instead of the CRT wood posts at posts 3 through 8 shown on D-764-38 install:

Posts 3 through 6:
Steel posts, per the manufacture's recommendation, with 8" routed timber blocks.

Posts 7 and 8:
Standard steel line posts with 8" routed wood blocks. See plan details.

Thrie/MGS W-Beam Guardrail Layout
Apple Creek Bridge
Str No. 094-168.101 R
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:13:43 -05'00'
NORTH DAKOTA

7/2/2024 8:50:24 AM Kasey.Ward K:\ProJects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\130GR\130GR_001-004.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	130	2

23 USC § 407 Documents
NDDOT Reserves All Objections

LOCATION	(A) 5/8" [6] x 10" LONG GUARD-RAIL BOLT	(A) W6 x 9 x 6'-0" POST	(A) 6" x 8" x 14" ROUTED TIMBER BLOCK	(A) 5/8" [6] x 11/4" LONG GUARD-RAIL BOLT	(A) 12' - 6" STRAIGHT W-BEAM RAIL SECTION	(A) 12' - 6" CURVED W-BEAM RAIL SECTION	(A) REFL-ECTOR-IZED PLATES	(A) W6 x 9 x 6'-6" POST	(A) HSS12 x 6 x 1/4 x 1'-9 1/8" STEEL BLOCK	(A) HSS12 x 6 x 1/4 x 1'-2" STEEL BLOCK	(A) 5/8" [6] x 14" LONG GUARD-RAIL BOLT	(A) 6' - 3" W-THRIE BEAM TRANS-ITION SECTION	(A) 12' - 6" DOUBLE THRIE BEAM SECTION	(A) 2' - 6" THRIE BEAM TERM-INAL CON-NECTOR	(A) 7/8" [6] x 3/4" LONG BOLT	(A) 5/8" [6] x 2" LONG POST BOLT
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
Sta 2401+24.63 to Sta 2404+16.93 Rt Mdn	36	38	36	176	17	1	7	7	7	2	16	1	1	1	5	2
Sta 2401+62.05 to Sta 2404+16.93 Rt	30	32	30	152	14	1	7	7	7	2	16	1	1	1	5	2
TOTAL	66	70	66	328	31	2	14	14	14	4	32	2	2	2	10	4

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

SPEC	CODE	BID ITEM	QTY	UNIT
764	0131	W-BEAM GUARDRAIL		
		Sta 2401+71.41 to 2404+16.93 Lt Mdn	245.7	LF
		Sta 2402+08.84 to 2404+16.93 Rt	208.2	LF
764	0145	W-BEAM GUARDRAIL END TERMINAL		
		Sta 2401+24.63 to 2401+71.41 Lt Mdn	1	EA
		Sta 2401+62.05 to 2402+08.84 Rt	1	EA
764	0151	REMOVE W-BEAM GUARDRAIL & POSTS		
		Sta 2402+00.49 to 2404+16.93 Lt Mdn	214.4	LF
		Sta 2402+38.14 to 2404+16.93 Rt	176.9	LF
764	2081	REMOVE END TREATMENT & TRANSITION		
		Sta 2401+50.49 to 2402+00.49 Lt Mdn	1	EA
		Sta 2401+88.14 to 2402+38.14 Rt	1	EA

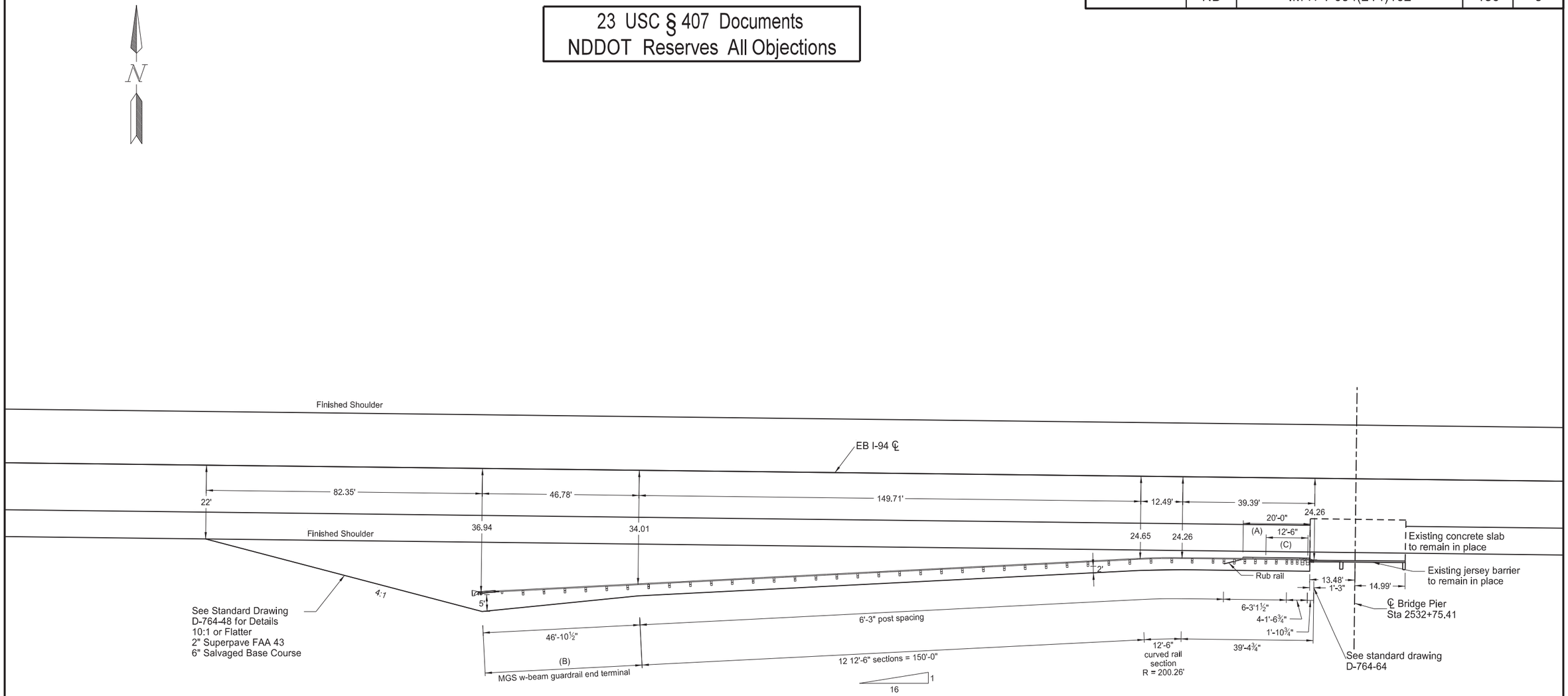
Thrie/W-Beam Guardrail Quantities
Apple Creek Bridge
Str No. 094-168.101 R
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:14:09 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	130	3

23 USC § 407 Documents
NDDOT Reserves All Objections



(A) Curb & Gutter - Type 1 Special. Install in accordance with Standard Drawing D-748-1, except for transitions on each end as shown on Standard Drawing D-764-64.

(B) Install either a MGS FLEAT or MGS Slotted Rail Terminal (SRT) at this location. See Standard Drawing D-764-38 for MGS FLEAT and D-764-39 for MGS SRT. If MGS SRT is installed, install with the offset shown on Standard Drawing D-764-39. Additional guardrail embankment required is at the contractor's expense.

(C) Double 12-Gauge W-Beam rail section.

MGS W-Beam Guardrail Layout
Menoken Interchange
Str No. 094-170.519
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:14:27 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	130	4

23 USC § 407 Documents
NDDOT Reserves All Objections

LOCATION	(A) TERMINAL CONNEC-TOR EACH	(A) 7/8" [6] x 9" LONG HEAVY HEX EACH	(A) 10" x 10" x 8' - 0" TIMBER EACH	(A) 10" x 8" x 21" WOOD TAPERED BLOCK EACH	(A) 6" x 8" x 7'- 0" TIMBER POST EACH	(A) 6" x 8" x 21" WOOD OFFSET BLOCK EACH	(A) 6" x 8" x 6'- 0" TIMBER POST EACH	(A) 6" x 9 3/4" x 14" WOOD OFFSET BLOCK EACH	(A) 6" x 8" x 14" WOOD OFFSET BLOCK EACH	(A) 5/8" [6] x 20" LONG GUARD-RAIL BOLT EACH	(A) 5/8" [6] x 18" LONG GUARD-RAIL BOLT EACH	(A) 5/8" [6] x 22" LONG RUB RAIL BOLT EACH	(A) 5/8" [6] x 20" LONG RUB RAIL BOLT EACH	(A) 12' - 6 " W-BEAM DOUBLE RAIL SECTION EACH	(A) C6 x 8.2 RUB RAIL SECTION EACH	(A) RUB RAIL SPLICE EACH	(A) 12' - 6" STRAIGHT RAIL SECTION EACH	(A) 12' - 6" CURVED RAIL SECTION EACH	(A) 5/8" [6] x 2" BUTTON HEAD SPLICE BOLTS EACH	(A) 5/8" [6] x 1 3/4" BUTTON HEAD SPLICE BOLTS EACH	(A) 5/8" [6] x 1 1/4" LONG GUARD-RAIL BOLT EACH	(A) REFLEC TOR-IZED PLATES EACH
Sta 2530+14.45 to Sta 2532+62.83 Rt	1	4	2	2	3	7	34	1	29	6	36	4	7	1	1	1	14	1	36	8	152	7
TOTAL	1	4	2	2	3	7	34	1	29	6	36	4	7	1	1	1	14	1	36	8	152	7

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

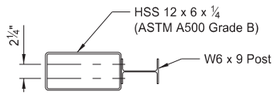
SPEC	CODE	BID ITEM	QTY	UNIT
748	0141	CURB & GUTTER-TYPE 1 SPECIAL		
		Sta 2532+42.83 to 2532+62.83 Rt	20.0	LF
764	0131	W-BEAM GUARDRAIL		
		Sta 2530+61.23 to 2532+62.83 Rt	201.9	LF
764	0145	W-BEAM GUARDRAIL END TERMINAL		
		Sta 2530+14.45 to 2530+61.23 Rt	1	EA
764	0151	REMOVE W-BEAM GUARDRAIL & POSTS		
		Sta 2530+70.54 to 2532+62.83 Rt	189.4	LF
764	2081	REMOVE END TREATMENT & TRANSITION		
		Sta 2530+21.54 to 2530+70.54 Rt	1	EA

MGS W-Beam Guardrail Quantities
Menoken Interchange
Str No. 094-170.519
I-94 Reconstruction

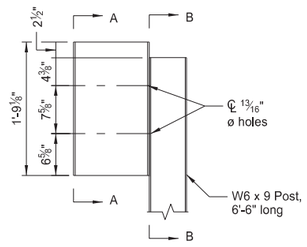
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS J. GUBBELS
PE-30118
DATE 2024.07.08 13:14:46 -05'00'
NORTH DAKOTA

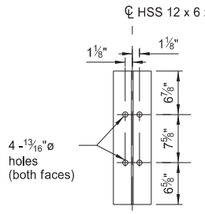
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	130	5



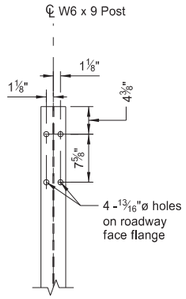
TOP VIEW



ELEVATION VIEW

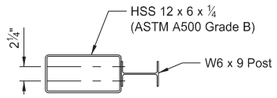


SECTION A-A

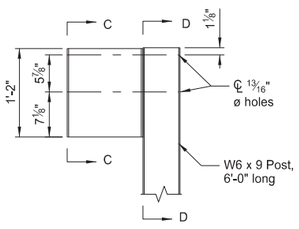


SECTION B-B

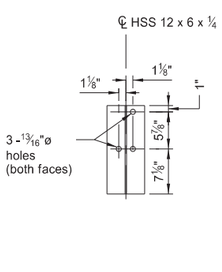
THRIE BEAM STEEL BLOCKOUT (POSTS 1-7)



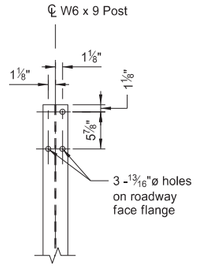
TOP VIEW



ELEVATION VIEW

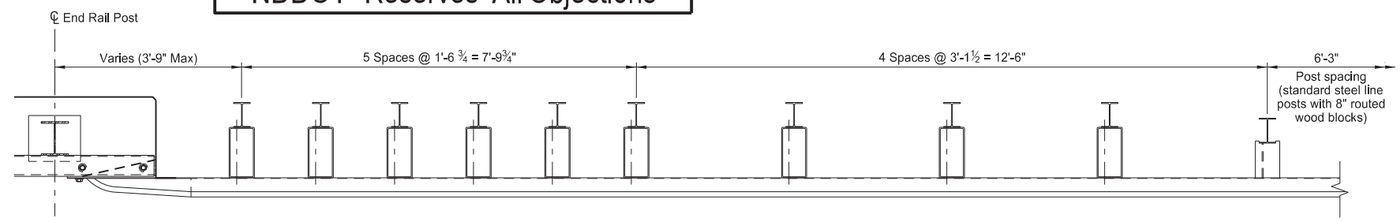


SECTION C-C

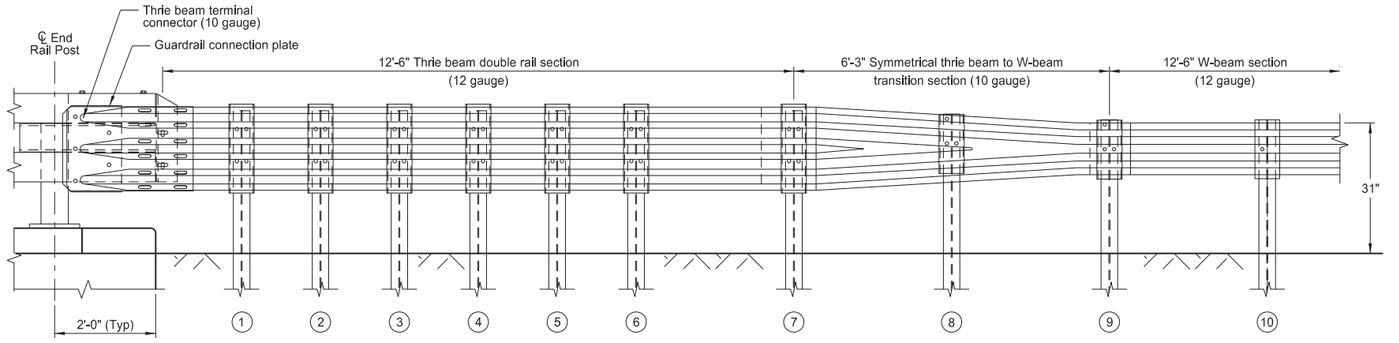


SECTION D-D

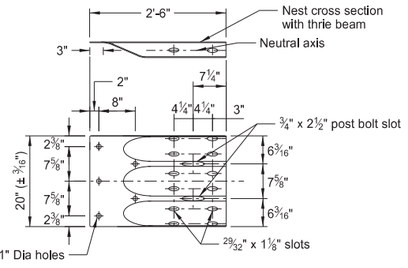
THRIE BEAM STEEL BLOCKOUT (POSTS 8-9)



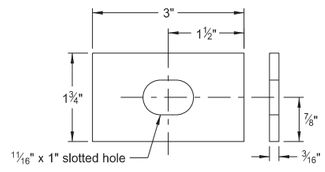
PLAN VIEW



ELEVATION VIEW

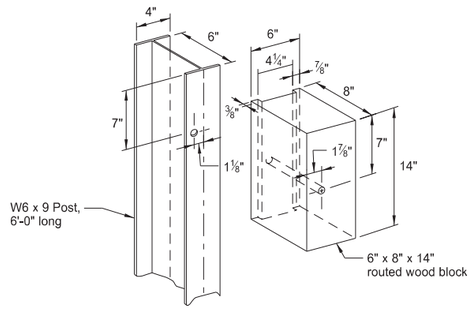


THRIE BEAM TERMINAL CONNECTOR

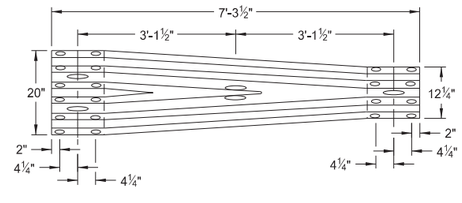


RECTANGULAR PLATE WASHER

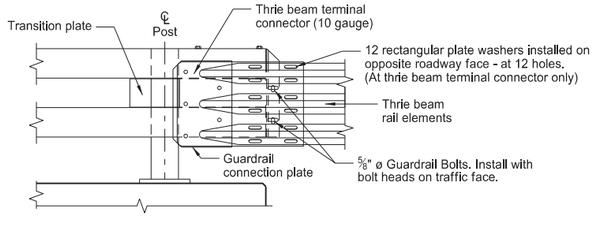
TRANSITION POST AND BLOCKOUT SIZING		
POST NO.	POST SIZE	BLOCKOUT SIZE
1-7	W6 x 9 x 6'-6" long	HSS 12 x 6 x ¼ x 1'-9⅛" long
8-9	W6 x 9 x 6'-0" long	HSS 12 x 6 x ¼ x 1'-2" long
10	W6 x 9 x 6'-0" long	6" x 8" x 14" routed wood



STANDARD STEEL LINE POST WITH 8" ROUTED WOOD BLOCKS (POST 10)



SYMMETRICAL THRIE TO W-BEAM TRANSITION SECTION (10 GUAGE)

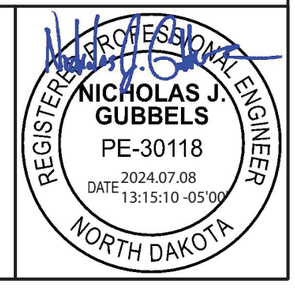


TRANSITION CONNECTION - ELEVATION

MGS Thrie Beam Transition to
Double Box Beam Retrofit Detail

Apple Creek Bridge
Str No. 094-168.101 R

Bismarck to E of Menoken Interchange - EB



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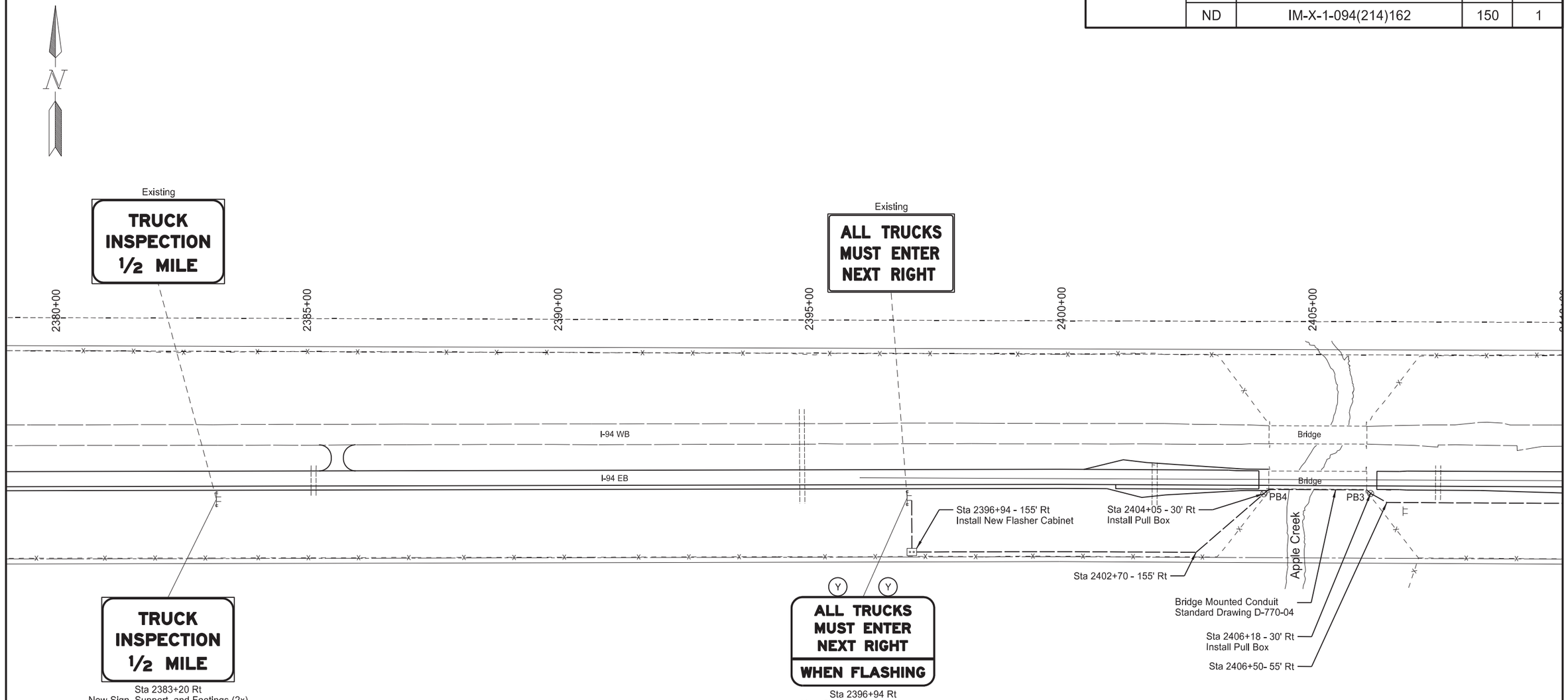
	ND	IM-X-1-094(214)162	150	1



NOTE: Removed sign and hinge system to be delivered to Bismarck District Office in operational condition

Flashing Beacon Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
WESLEY GULLICKS
PE-6068
DATE 2024.07.17 08:09:09 -05'00'
NORTH DAKOTA

7/16/2024 11:53:59 AM leah.haman K:\Projects\2021\21.101.0012 NDDOT - I-94 Bismarck Menoken EB\10094162.214\Traffic\150SL\150SL_001-002_DLFLSH.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	150	2

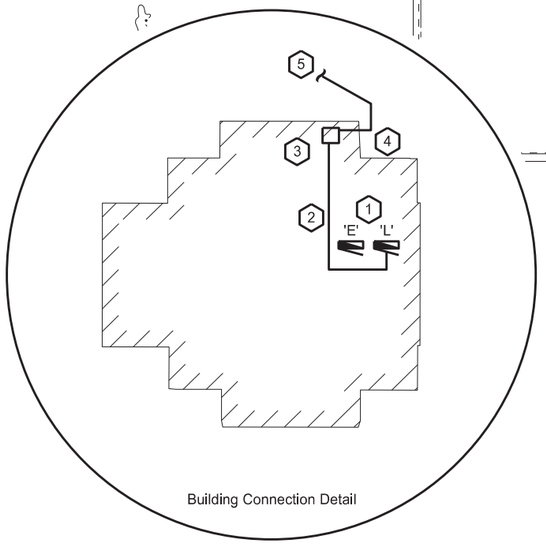
N

2410+00
2415+00
2420+00
2425+00
2430+00
2435+00

Access Control
Access Control
Access Control

I-94 WB
I-94 EB

PB2
PB1
Sta 2411+50 - 55' Rt
Install Pull Box
Sta 2416+18 - 55' Rt
Sta 2418+16 - 100' Rt
Install Pull Box
Sta 2424+16 - 160' Rt
Flashing Beacon Control Switch
Refer to installation detail
Sta 2425+78 - 254' Rt
Refer to enlaged detail for scope
of work at rest area building



Building Connection Detail

Construction Notes:
All required materials and work within the rest area building (Items 1 thru 4) are to be inlcuded in the Pay Item "Feed Point - Flashing Beacon".

1. Existing Eaton/Cutler Hammer PRL1A Series planelboads. Connect new flashing beacon circuitry to existing spare circuit breaker located in Panel 'L' space 23 or 25. Verify circuit breaker is spare. If currently being utilized, connect to spare breaker in panel 'E'. Update panel circuit directories.
2. Route 1" EMT conduit with 2-#4 conductors +#6 EGC along block wall in mechanical room. Route conduit as high as possible.
3. Provide minimum 6" x 6" x 4" junction box mounted at 18" above finished floor. Route 2" conduit out back of box thru block wall to the exterior. Duct seal conduit openings.
4. Core drill block wall to route 2" conduit thru wall and down to below grade. All above grade conduit and conduit bodies are to be rigid galvanized steel. Exterior conduit is to be installed on east wall of building to minimize visibility from parking lot.
5. Directional bore circuitry under existing sidewalk and truck parking area to new flashing beacon switch.

Flashing Beacon Layout

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
WESLEY GULLICKS
PE-6068
DATE 2024.07.17 08:09:41 -05'00'
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	150	3

CONDUIT / CONDUCTOR RUN TABULATION											
SEGMENT				CONDUIT RUNS		BRIDGE MTD CONDUIT		CABLE RUNS			
STATION		STATION		LF	SIZE	LF	SIZE	LF	CONDUCTOR SIZE, TYPE & QUANITITY	LF	CONDUCTOR SIZE, TYPE & QUANITITY
2425+78 254' RT	BUILDING	2424+16 160' RT	SWITCH	200	2"		–	440	(2) #4 RHW	220	(1) #6 THW
2424+16 160' RT	SWITCH	2418+16 100' RT	PB1	635	2"		–	1302	(2) #4 RHW	651	(1) #6 THW
2418+16 100' RT	PB1	2416+18 55' RT	–	198	2"		–	408	(2) #4 RHW	204	(1) #6 THW
2416+18 55' RT	–	2411+50 55' RT	PB2	468	2"		–	948	(2) #4 RHW	474	(1) #6 THW
2411+50 55' RT	PB2	2406+50 55' RT	–	500	2"		–	1012	(2) #4 RHW	506	(1) #6 THW
2406+50 55' RT	–	2406+18 30' RT	PB3	42	2"		–	96	(2) #4 RHW	48	(1) #6 THW
2406+18 30' RT	PB3	2404+05 30' RT	PB4	–	–	233	2"	490	(2) #4 RHW	245	(1) #6 THW
2404+05 30' RT	PB4	2402+70 155' RT	–	184	2"		–	380	(2) #4 RHW	190	(1) #6 THW
2402+70 155' RT	–	2396+94 155' RT	FBFP	576	2"		–	1172	(2) #4 RHW	586	(1) #6 THW
2396+94 155' RT	FBFP	2396+94 RT	SIGN	118	2"		–	138	NO. 12 AWG 5 CONDUCTOR CABLE		

FLASHING BEACON QUANTITIES								
DESCRIPTION	PULL BOX	2" DIAMETER RIGID CONDUIT	2" DIAMETER RIGID CONDUIT - BRIDGE MOUNTED	UNDERGROUND CONDUCTOR NO 4 - TYPE RHW	UNDERGROUND CONDUCTOR NO 6 - TYPE THW	NO. 12 AWG 5 CONDUCTOR CABLE	FEED POINT - FLASHING BEACON	FLASHING BEACON- POST MOUNTED
UNIT	EA	LF	LF	LF	LF	LF	EA	EA
QUANTITY	4	2921	233	6248	3124	138	1	1

Flashing Beacon

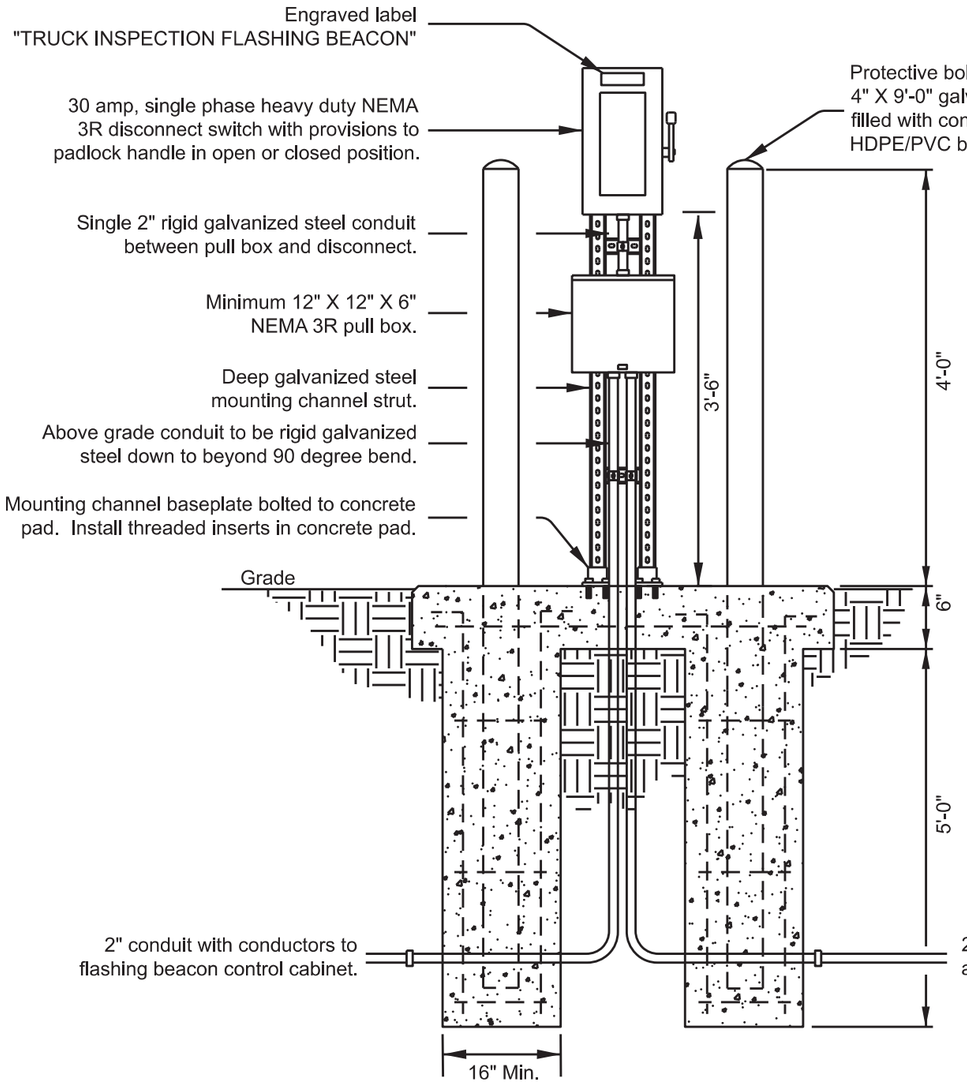
Quantities

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

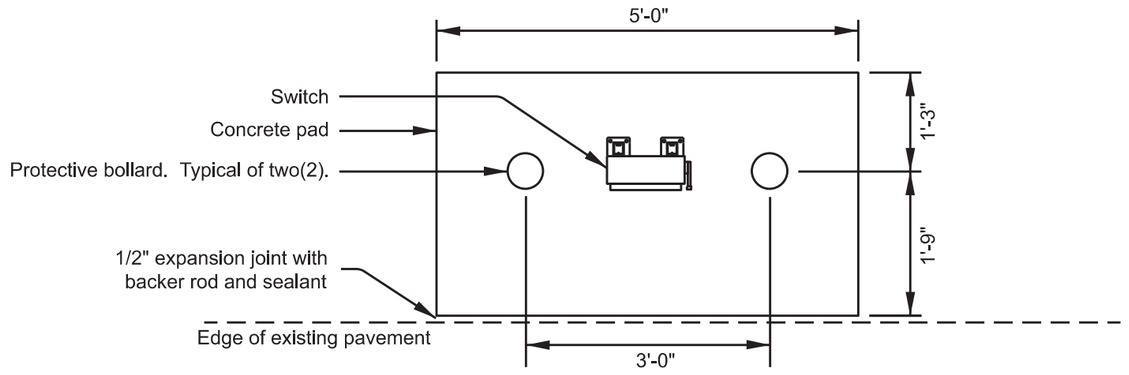
REGISTERED PROFESSIONAL ENGINEER
WESLEY GULLICKS
PE-6068
DATE 2024.07.17 08:10:07 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	150	4



FRONT ELEVATION

Note:
All costs to install Control Switch including all equipment, bollards, hardware and concrete foundation is to be included in Pay Item "Feed Point - Flashing Beacon".



PLAN VIEW

Flashing Beacon

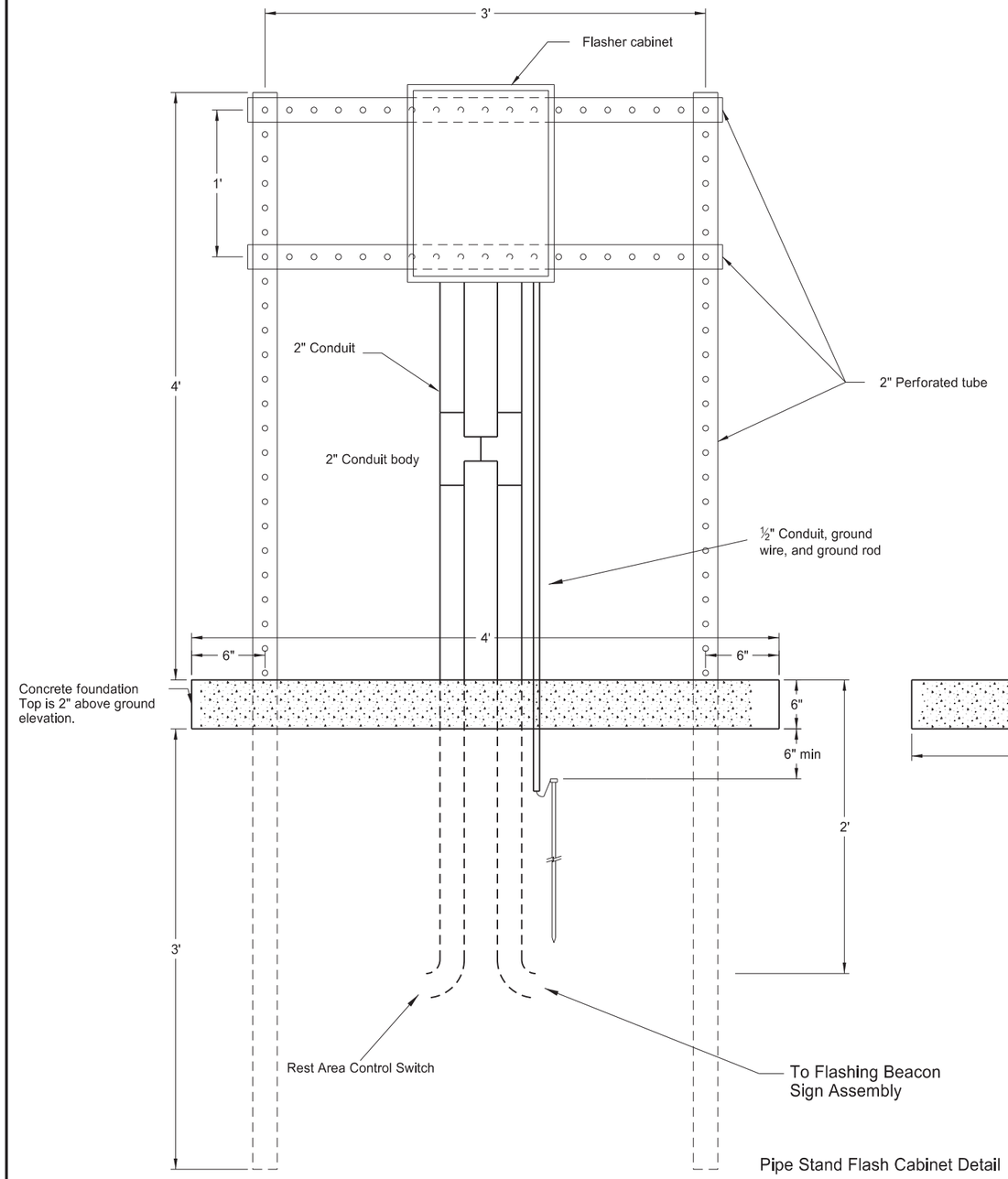
Control Switch Details

I-94 Reconstruction

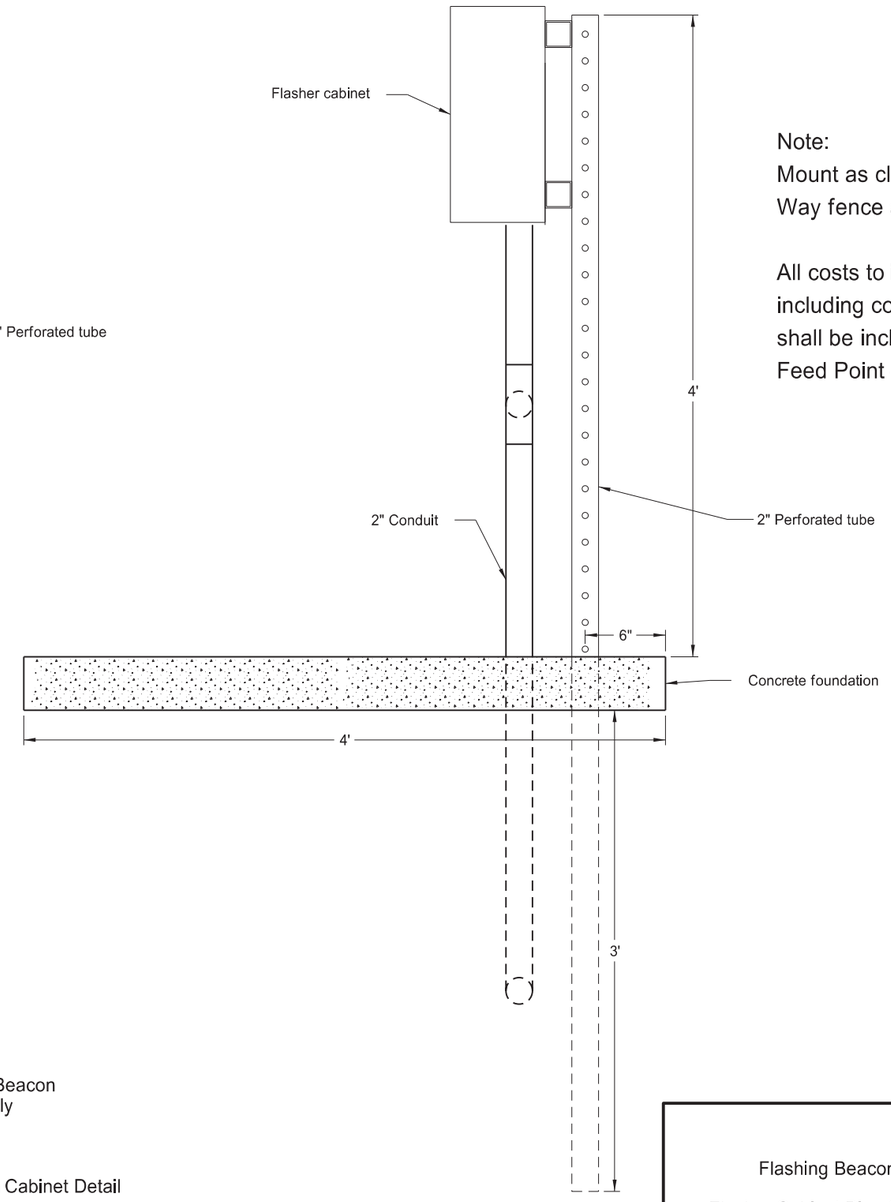
Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
WESLEY GULLICKS
PE-6068
DATE 2024.07.17 08:10:29 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-X-1-094(214)162	150	5



Front View



Side View

Pipe Stand Flash Cabinet Detail

Note:
Mount as close to the Right of Way fence as possible.

All costs to install Flasher Cabinet including concrete foundation shall be included in the Pay Item Feed Point - Flashing Beacon

Flashing Beacon Post Mounted

Flasher Cabinet Pipe Stand Mounted Detail

I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
WESLEY GULLICKS
PE-6068
DATE 2024.07.17 08:10:51 -05'00'
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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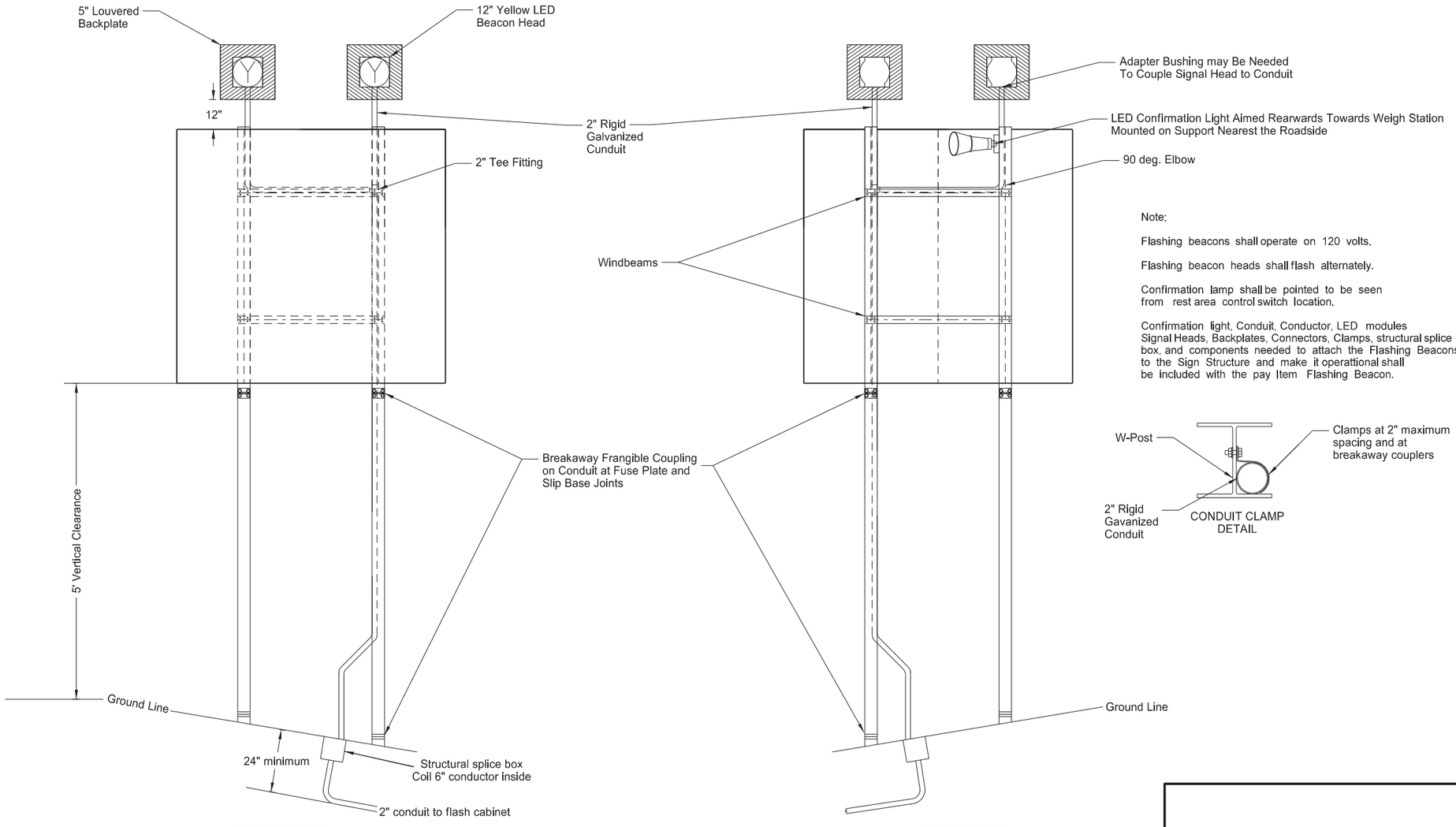


Note:

Flashing beacons shall operate on 120 volts.

Flashing beacon heads shall flash alternately.

Confirmation lamp shall be pointed to be seen from rest area control switch location.

Confirmation light, Conduit, Conductor, LED modules Signal Heads, Backplates, Connectors, Clamps, structural splice box, and components needed to attach the Flashing Beacons to the Sign Structure and make it operattional shall be included with the pay Item Flashing Beacon.

Flashing Beacon

Assembly Dertails

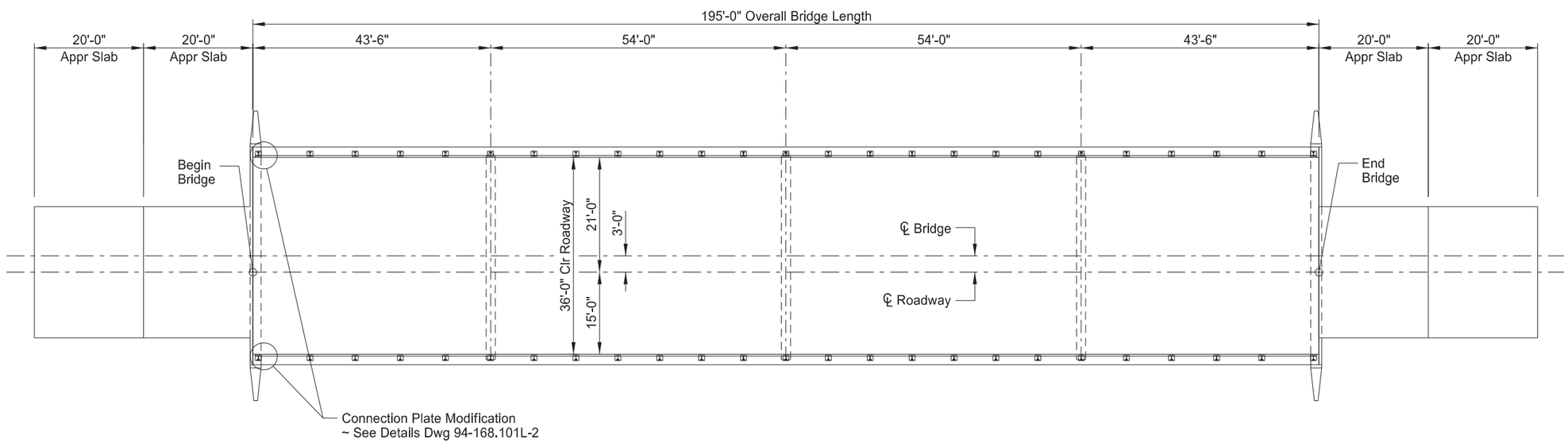
I-94 Reconstruction

Bismarck to E of Menoken Interchange - EB

REGISTERED PROFESSIONAL ENGINEER
WESLEY GULLICKS
PE-6068
DATE 2024.07.17 08:11:15 -05'00'
NORTH DAKOTA

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

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	170	1



PLAN

NOTES:

100 SCOPE OF WORK: Work at this site consists of constructing guardrail connections at the west end of the bridge.

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
624	3005	CONNECTION PLATE MODIFICATION	EA	2

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 06/04/24
NORTH DAKOTA

APPLE CREEK
9 EAST OF US 83 NORTH

BRIDGE LAYOUT

ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

Jason Thorenson
06/04/24

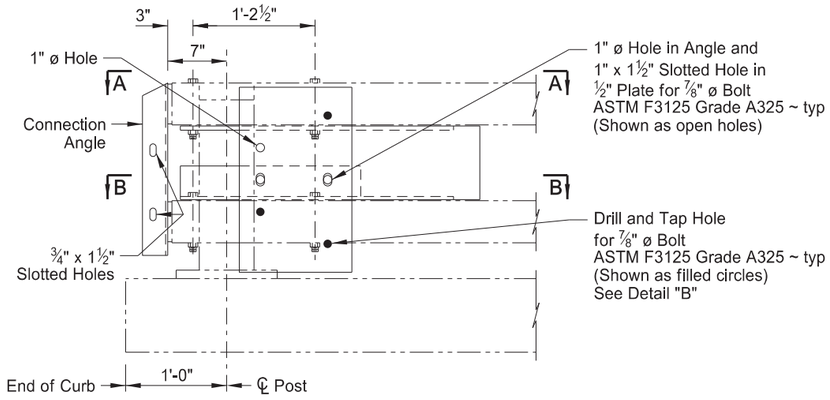
6/4/2024 2:06:11 PM rrykowsky c:\srf-pw\d0152390\170BR_001_BRLO.dgn

RAR RAR

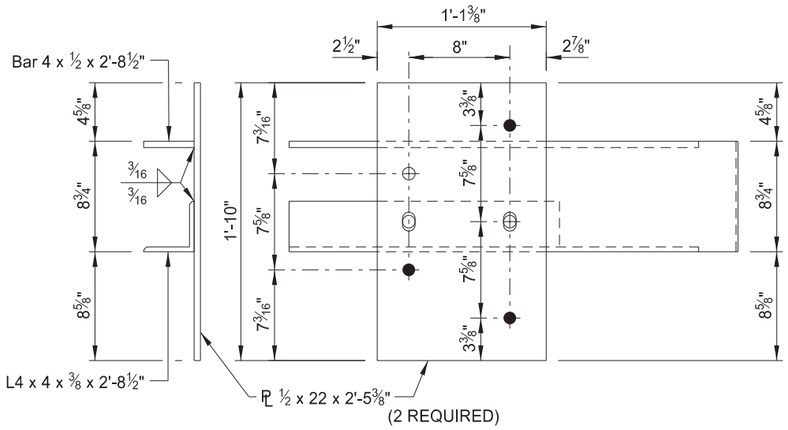
94-168.101L-1

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

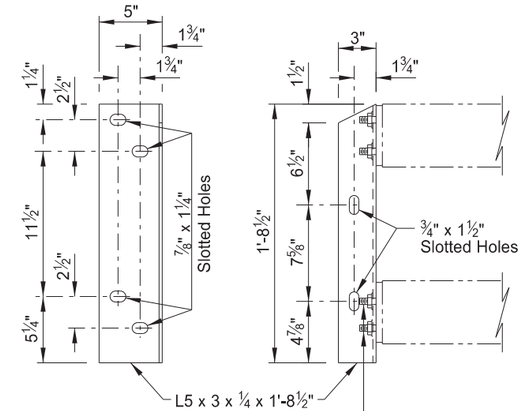
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	170	2



CONNECTION DETAILS

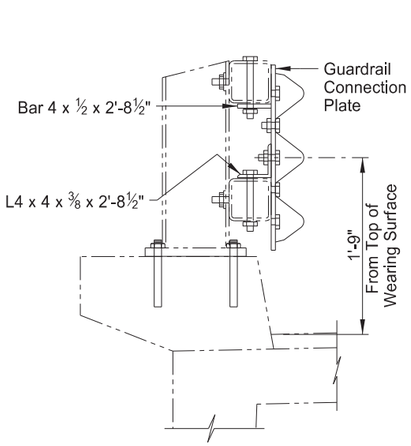


GUARDRAIL CONNECTION PLATE DETAILS

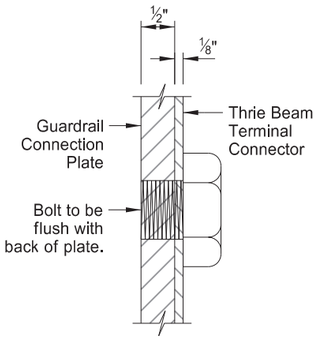


(2 REQUIRED)

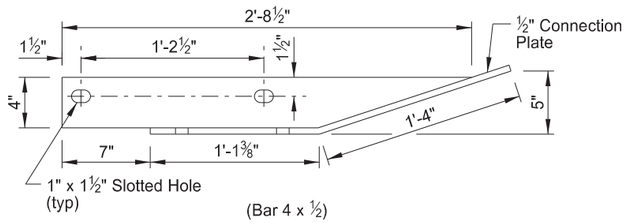
CONNECTION ANGLE DETAILS



CONNECTION DETAILS



DETAIL "B"



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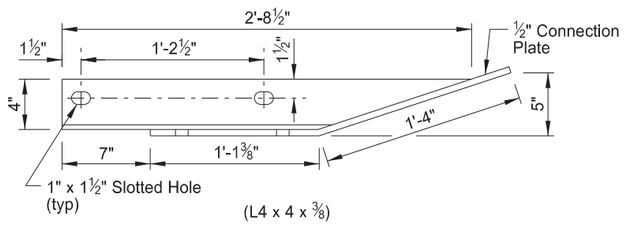


B-B

NOTES:

Provide steel plates and angles that conform to ASTM Specification A 36, unless noted otherwise.

Provide high tensile strength bolts, nuts, and washers according to Section 834.03, unless noted otherwise.

Galvanize all steel components after fabrication according to Section 854.

Field verify all dimensions and incorporate them into the shop drawings. Submit shop drawings for review to the Engineer prior to fabrication.

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 06/04/24
NORTH DAKOTA

QUANTITIES

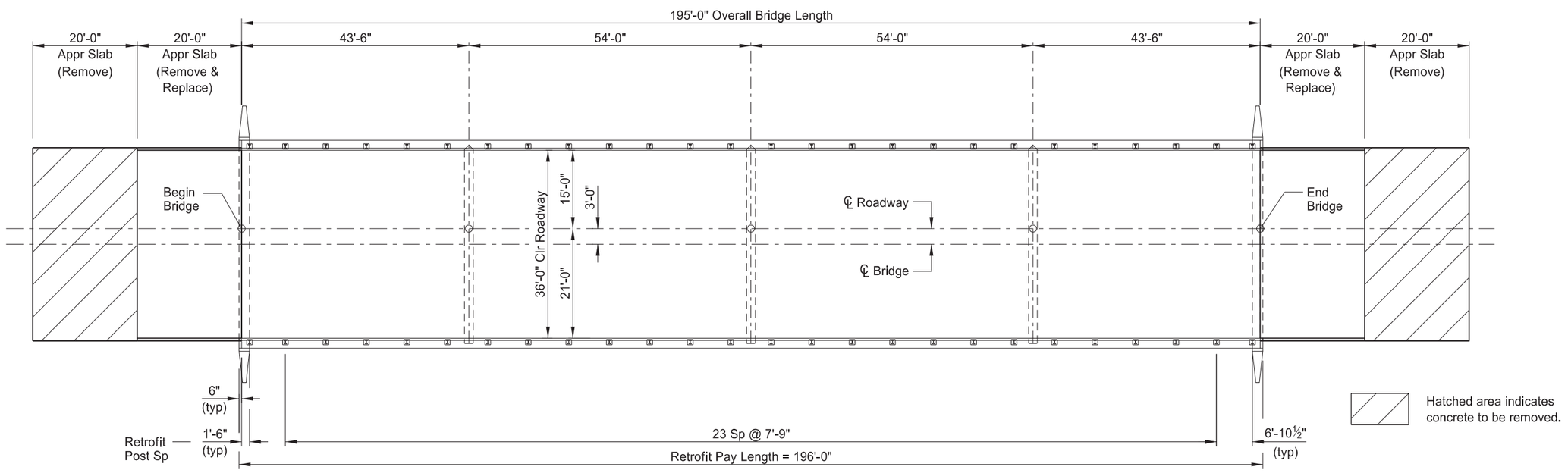
CONNECTION PLATE MODIFICATION	2 EA

APPLE CREEK
9 EAST OF US 83 NORTH

GUARDRAIL CONNECTION DETAILS

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

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	170	3



PLAN

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0111	REMOVAL OF CONCRETE	L SUM	1
602	1135	BRIDGE APPROACH SLAB-REMOVE & REPLACE	SY	164.4
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	940.0
602	2105	CURB REPAIR	SF	50
602	7000	SPECIAL SURFACE FINISH	SF	1045
624	3001	DOUBLE BOX BEAM RAIL RETROFIT-FREE STANDING	LF	392.0
930	9223	CRACK SEALING	LF	1,600

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 06/04/24
NORTH DAKOTA

APPLE CREEK
9 EAST OF US 83 NORTH

BRIDGE LAYOUT

ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

Jason Thorenson
06/04/24

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

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-094(214)162	170	4

NOTES

100 SCOPE OF WORK: Work at this site consists of installing a rail retrofit, removing and replacing approach slabs, repairing spalls on the curbs, crack sealing, applying special surface finish, and applying penetrating water repellent treatment.

202 REMOVAL OF CONCRETE: Remove the outside 20'-0" concrete approach slab at both ends of the bridge. Include all costs associated with removing the concrete approach slabs in the price bid for "Removal of Concrete."

602 BRIDGE APPROACH SLAB-REMOVE & REPLACE: Remove and replace the inside 20'-0" approach slabs at each end of the bridge. Include all costs to remove and replace the approach slabs in the price bid for "Bridge Approach Slab-Remove and Replace."

602 WATER WASHING EQUIPMENT: In addition to the water-washing equipment listed in Section 602.02 D, a cold water pressure washer that provides a minimum nozzle pressure of 3,000 psi may be used.

602 CURB REPAIR: The concrete bridge curbs have spalling at several isolated locations. The actual limits of the repair are to be determined by the Engineer in the field.

After the existing railing is removed, remove all unsound concrete at the identified locations and replace it with new material to the original constructed section. Use a 15 pound maximum size chipping hammer on any unsound concrete. Remove concrete around the periphery of any exposed reinforcing steel to provide a minimum clearance behind the bar of ¼" plus the dimension of the maximum size aggregate of the repair material. Provide sharp, neat lines at least 1 inch deep at the edges of repair areas. Produce these sharp, neat lines by saw cutting or other means approved by the Engineer.

Sandblast clean the existing concrete and exposed reinforcing steel. Clean the existing concrete surface by high pressure water blasting. After the surface has dried and just before the patching material is placed, coat the surface with an epoxy bonding agent. Replace removed concrete with a two component, polymer-modified, cementitious repair mortar material that is specifically intended for patching concrete and contains a corrosion inhibitor. This patching material may be SikaTop 123 Plus (Sika Corporation), Duratop Gel (Euclid Chemical Company), MasterEmaco N 400 (BASF Corporation), or an approved equal repair mortar. Cure the material as recommended by the manufacturer. Include all labor, equipment and materials needed for these repairs in the bid item "Curb Repair."

602 PENETRATING WATER REPELLENT TREATMENT: Apply penetrating water repellent solution to the top of the bridge deck and approach slabs. Do not apply crack sealant, pavement marking, or allow traffic until the solution has completely penetrated and the entire driving surface is dry.

602 SPECIAL SURFACE FINISH: After the curb spall repair is complete, and before installation of the rail retrofit, clean the top and inside surfaces of the curbs, using sandblasting, shot blasting, or water-washing equipment to remove all dirt, grease, oil, efflorescence, laitance, and loose or flaking coatings. Fill cracks larger than 0.02" with Tex-Cote Skim Cote or an approved crack sealer compatible with Tex-Cote XL Bridge Cote.

Apply Tex-Cote XL 70 Bridge Cote with Silane to the top and inside surfaces of the curb. Use gray surface finish color 36424 meeting AMS-STD-595 with a medium textured finish.

930 CRACK SEALING: After the penetrating water repellent has been applied and is dry, the Engineer will perform a visual inspection of the bridge deck and approach slabs to determine the need for crack sealing. Mark and repair all visible cracks appearing on the top surface 0.02" or greater in width at its widest segment or as directed by the Engineer.

Immediately before applying the sealer, clean the cracks by removing all dust and debris with compressed air. Seal the cracks with a two-part epoxy in accordance with the manufacturer's recommendations. Chase crack with the sealant application to limits of crack, including those portions that are narrower than 0.02" wide. Use Paulco TE-2501 (Viking Paints, Inc.), Dural 50 LM (Euclid Chemical Co.), TK-9000 or TK-2110 (TK Products), or an approved equal epoxy sealer.

The "Crack Sealing" bid item will be used to pay for all labor, equipment, and materials associated with the bridge deck crack sealing. Include all costs to seal the approach slabs in the price bid for "Bridge Approach Slab-Remove & Replace."

REGISTERED PROFESSIONAL ENGINEER
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DATE: 06/04/24
NORTH DAKOTA

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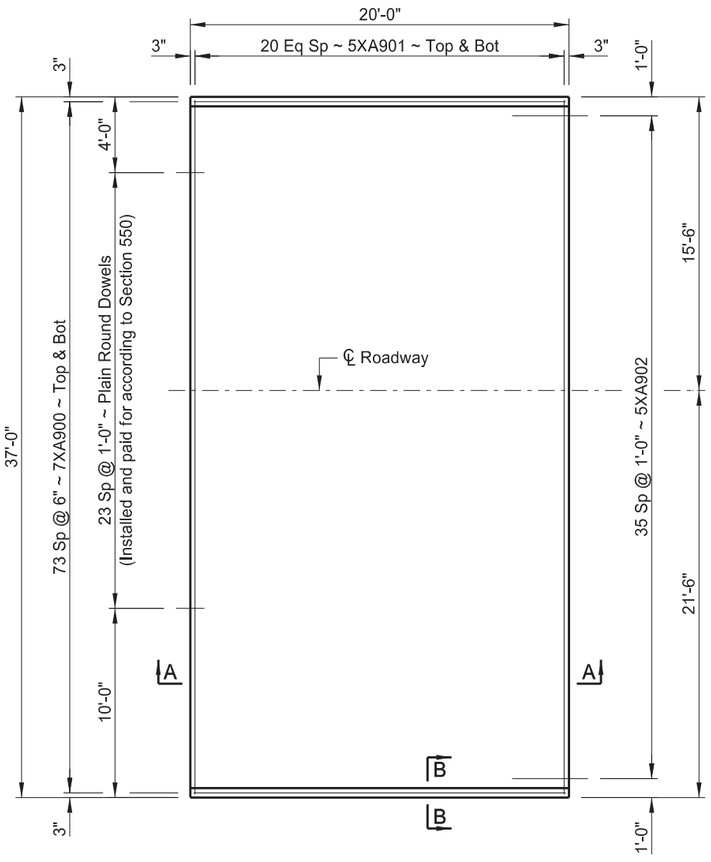
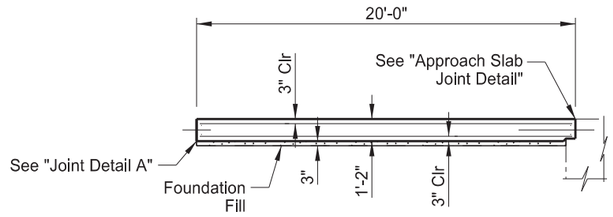
ND	IM-X-1-094(214)162	170	5



PLAN



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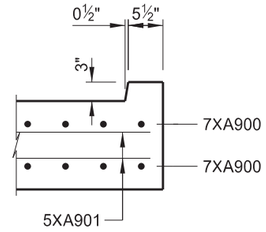
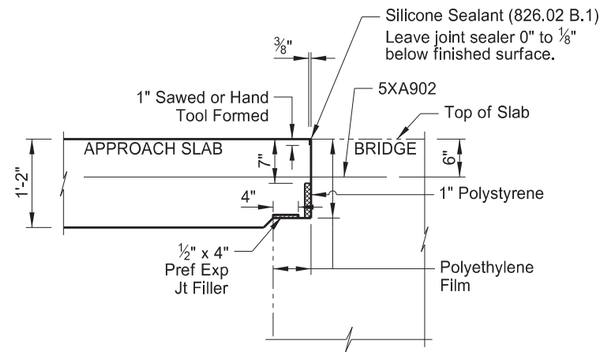


B-B



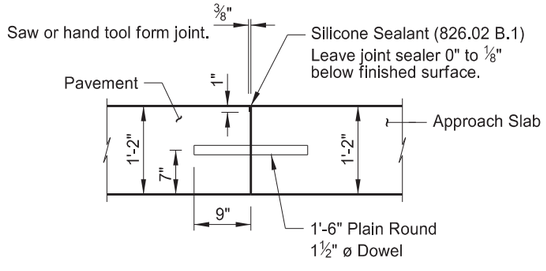
APPROACH SLAB JOINT DETAIL

SKEW ANGLE = 0°			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
7	XA900	148	19'-8"
5	XA901	42	36'-8"
5	* XA902	36	4'-0"

ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL (LBS)	CONCRETE (CY)
7,706	32.2

* Install bars according to manufacturer's recommendations with a high strength adhesive specifically intended for concrete anchorage (16k min. ultimate pullout), and that meets the requirements of Section 806.02. Length shown is based on 1 foot minimum anchorage length. Length may vary depending on manufacturer's recommendations for anchorage.

ELEVATION



JOINT DETAIL A

NOTES:

The estimated material quantities shown are for information purposes only. Include the concrete, reinforcing bars, polyethylene film, preformed joint filler, polystyrene, silicone sealant, foundation fill, and labor required to build the approach slabs and curbs in the pay item "Bridge Approach Slab-Remove and Replace." Use Class AAE-3 concrete and Grade 60 reinforcing steel. Provide reinforcing steel that meets the requirements of Section 612. Use polyethylene film that meets the requirements of ASTM C171.

The bar marks beginning with an "X" indicate an epoxy coated bar.

REGISTERED PROFESSIONAL ENGINEER
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DATE: 06/04/24
NORTH DAKOTA

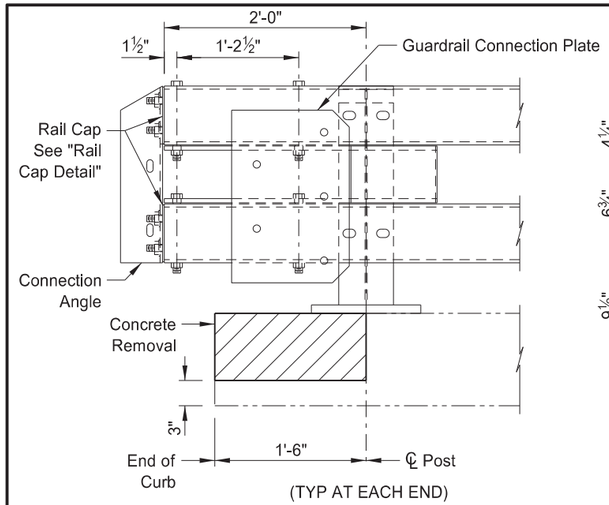
QUANTITIES	(ONE SLAB)
BRIDGE APPR SLAB-REMOVE & REPLACE	82.2 SY

APPLE CREEK
9 EAST OF US 83 NORTH

APPROACH SLAB DETAILS

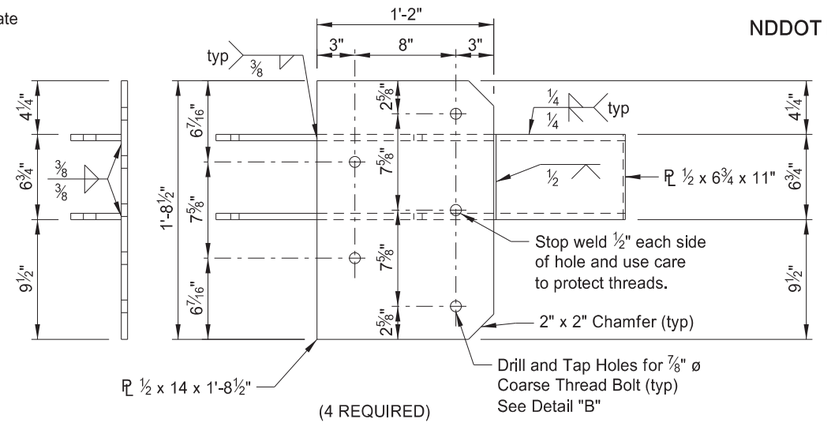
23 U.S.C. 407
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-X-1-094(214)162	170	6



(TYP AT EACH END)

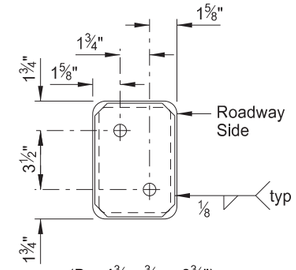
END POST CONNECTION DETAIL



(4 REQUIRED)

ELEVATION

GUARDRAIL CONNECTION PLATE DETAIL



(Bar 4¾ x 3/16 x 6¾")
Cope corners 1" to provide zinc drains.

RAIL CAP END VIEW

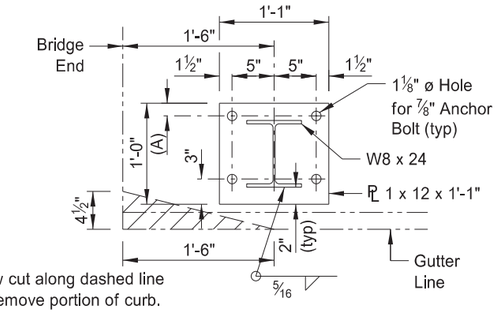
NOTES:

Provide steel posts and base plates in accordance with ASTM A709 Grade 50. Provide bars, bar washers, and guardrail connection plates and angles in accordance with ASTM A709 Grade 36.

Provide reduced base studs in accordance with ASTM A108 Grade 1010. Provide ⅞" ø anchor bolts in accordance with ASTM F1554 Grade 105.

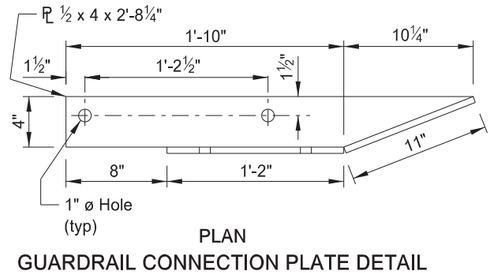
Remove existing double box beam retrofit railing and posts. Cut existing anchor bolts flush with top of curb. Grind out cut anchor bolts ½" below top of curb and fill holes with light gray epoxy or an approved sealer.

Include all labor, equipment, and materials needed to furnish and install the guardrail connection plates, saw and remove portions of the curb, and remove the existing double box beam rail retrofit in the bid item "Double Box Beam Rail Retrofit-Free Standing."



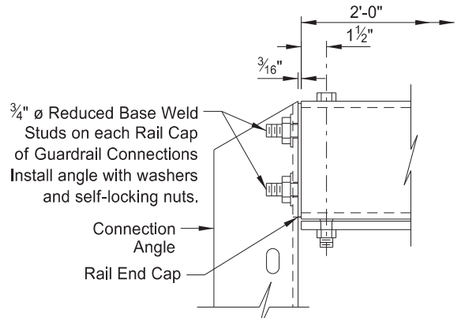
(A) Variable 1½" to 3"

BASE PLATE DETAIL

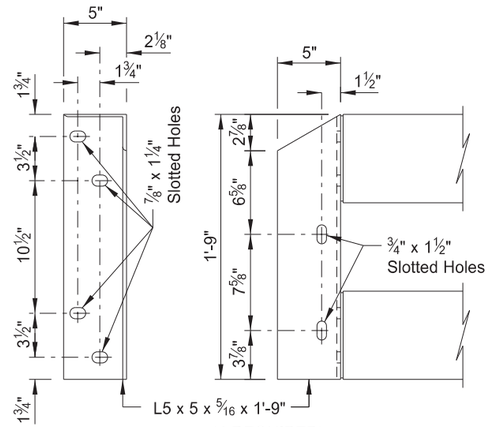


PLAN

GUARDRAIL CONNECTION PLATE DETAIL

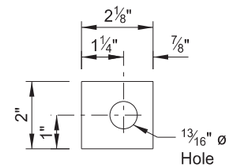


RAIL CAP DETAIL



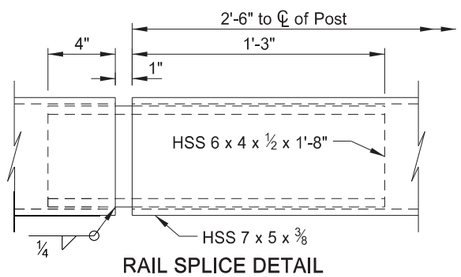
(4 REQUIRED)

CONNECTION ANGLE DETAILS

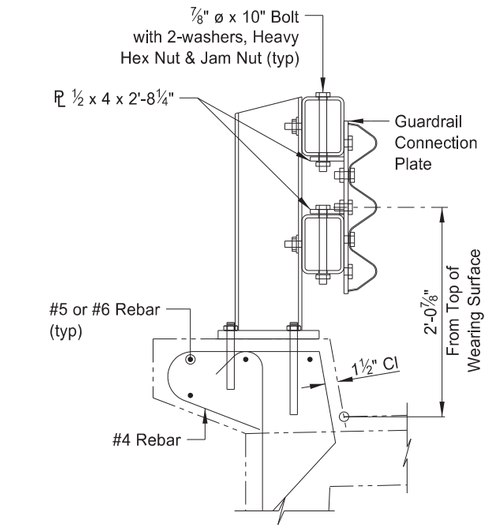


Position washers to completely cover slotted holes.

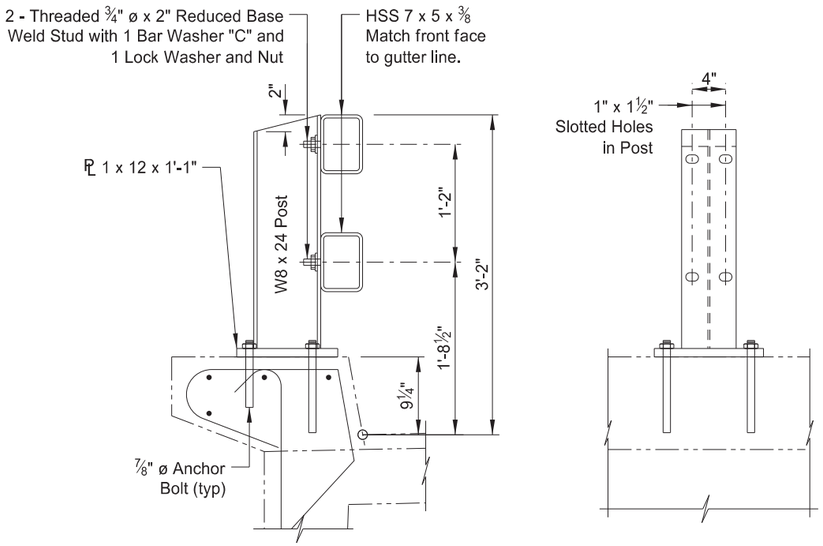
¼" BAR WASHER "C"



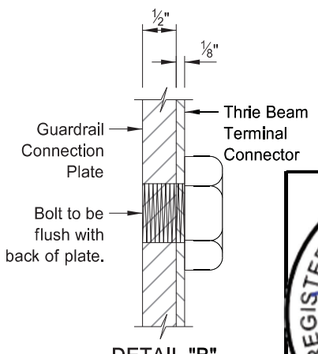
RAIL SPLICE DETAIL



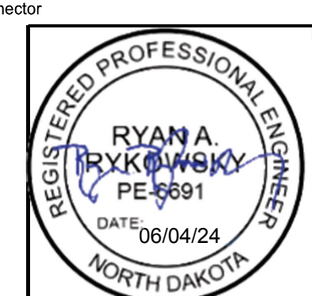
CONNECTION DETAILS



CURB MOUNT POST DETAILS



DETAIL "B"



QUANTITIES (ONE SIDE)	
RAIL RETROFIT - FREE STANDING	196.0 LF

APPLE CREEK
9 EAST OF US 83 NORTH

DOUBLE BOX BEAM RAIL RETROFIT
DETAILS - (FREE STANDING)