DESIGN DATA				
Traffic	Average Daily			
Current 2013	Pass: 715	Trucks: 110	Total: 825	
Forecast 2033	Pass: 875	Trucks: 150	Total: 1025	
Clear Zone Distance: Existing		Design Speed: 65 mph		
Minimum Sight Dist. for Stopping: 645'		Bridges: HL-93		
Sight Dist. for No Passing Zone: 1100'				
Pavement Design Life 20 (years)				
Design Accumulated One-way Flexible ESALs: 268,008				

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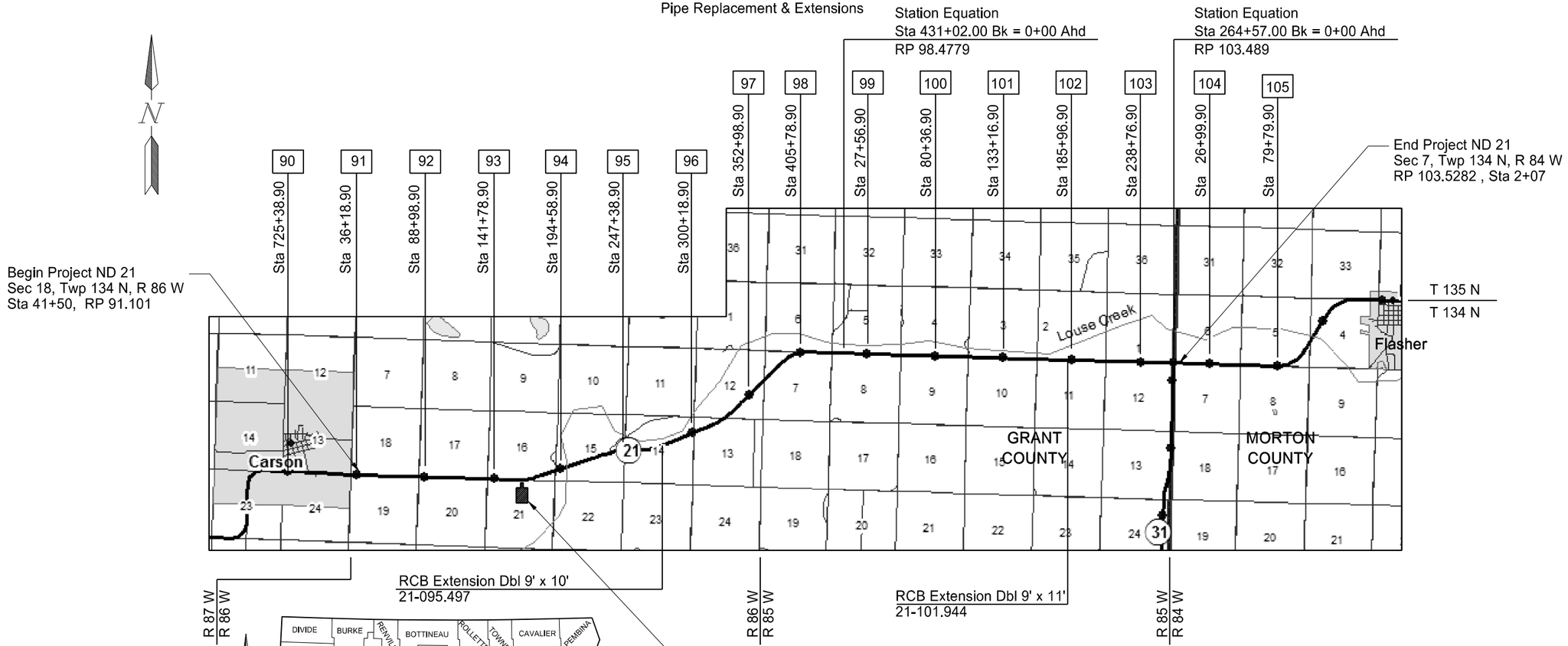
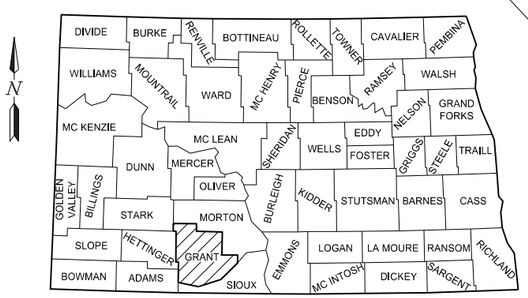
JOB # 2
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

NH-1-021(018)090
FHWA Full Involvement
Grant County
Carson East to Junction ND 31
3" Overlay with Sliver Widening
Reinforced Concrete Box Culvert Extensions
Pipe Replacement & Extensions

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

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
NH-1-012(018)090	12.4272	12.4272





STATE COUNTY MAP

DESIGNERS

Conni Schafer

Douglas A. Schumaker

APPROVED DATE 8/28/2013

Roger Weigel /s/
OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

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

APPROVED DATE 8/28/2013

James Douglas Rath /s/
NDDOT DESIGN DIVISION

This document was originally issued and sealed by James Douglas Rath Registration Number PE- 4288 , on 8/28/2013 and the original document is stored at the North Dakota Department of Transportation

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LIST OF SPECIAL PROVISIONS (SP)

SP #	Description
SP 559(08)	Permanent Pavement Marking Monitoring System
SP 1101(08)	Split Sampling and Testing Requirements for Aggregate Base
SP 1257(08)	Permits and Environmental Considerations
SP 1010(08)	Temporary Erosion and Sediment Best Management Practices
SP 1275(08)	Weather Limitations for Hot Bituminous Mix

LIST OF STANDARD DRAWINGS

Standard No.	Description
D-20-1 to D-20-32	Abbreviations, Linestyles, & Symbols
D-704-2	Traffic Control for Coring of Hot Bituminous Pavement
D-704-5	Contractor Sign Detail
D-704-7	Breakaway Systems for Construction Zone Signs Perforated Tube
D-704-8	Breakaway Systems for Construction Zone Signs
D-704-9,10,11	Construction Sign Details
D-704-13	Barricade Details and Channelizing Devices
D-704-14	Construction Sign and Barricade Assembly Details
D-704-15	Construction Sign and Barricade Location Details
D-704-19,20,22,24,26	Construction Sign and Barricade Location Details
D-704-27	Traffic Control Plan for Moving Operations on Conventional Highways (Pavement Marking)
D-704-50	Portable Sign Support Assembly
D-704-56	Mobile Operation (Grinding shoulder Rumble Strips)
D-706-1	Type C Field Laboratory
D-708-2	Erosion and Siltation Controls
D-708-5	Erosion and Siltation Control Blanket Installation
D-708-6	Erosion Control Median or Ditch Inlet Protection
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D-714-1	Reinforced Concrete Pipe Culvert and End Section
D-714-4	Corrugated Steel Pipe Culverts and End Sections (Round Pipe)
D-714-8	4’ x 6’ Standard Sectional Concrete Cattle Pass (with Steel Fabric Reinforcement)
D-714-11	Traversable End Sections for Corrugated Steel Pipe Culverts
D-714-22	Concrete Pipe Ties
D-714-28	Transverse Centerline Pipe Fill for New Pipe Laid on Existing Ground in Embankment Areas
D-754-9	Letter and Arrow Details for Variable Length Signs
D-754-19	(Conventional Use) Reference Markers
D-754-23	Assembly Details
D-754-24,25	Mounting Details Perforated Tube
D-754-26,27,29,32	Sign Punching, Stringer and Support Location Details Regulatory, Warning and Guide Signs
D-754-47,48	Sign Punching, Stringer and Support Location Details for Variable Length Signs
D-754-51,57,60	Sign Punching, Stringer and Support Location Details – Route Marker Signs
D-754-83	Object Markers - Culverts
D-754-87	Sign Punching, Stringer and Support Location Details for Street Name Signs and 911 Signing
D-760-4	Rumble Strips Undivided Highways (Shoulders Less Than 4')
D-762-1	Pavement Marking Message Details
D-762-3	Pavement Marking Standard 90 Degree Flared Intersections
D-762-4	Pavement Marking
D-762-6	Short Term Pavement Marking
D-766-1	Mailbox Location Details

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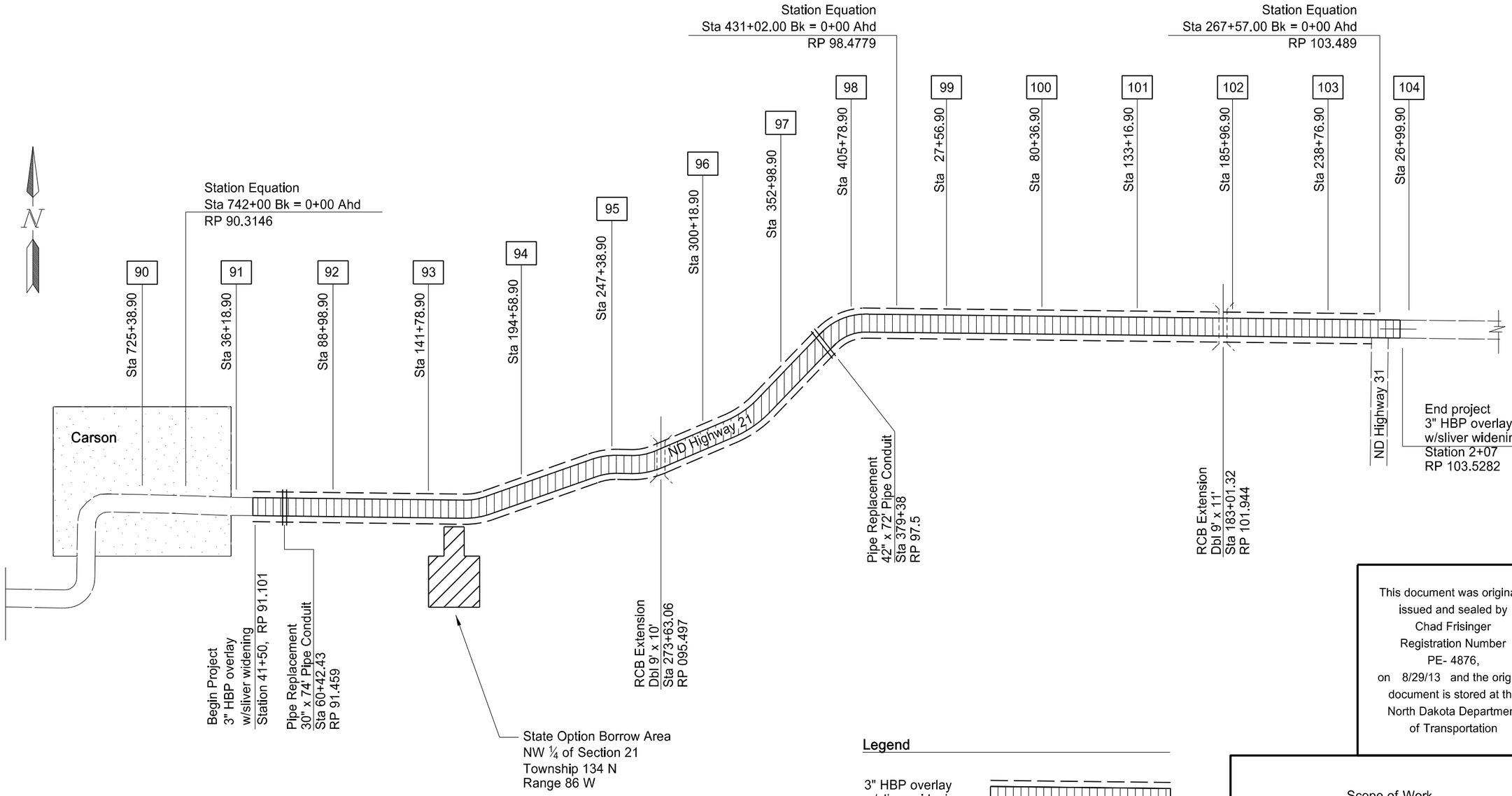

This document was originally issued and sealed by Chad Frisinger Registration Number PE- 4876, on 8/29/13 and the original document is stored at the North Dakota Department of Transportation

Scope of Work

ND Hwy 21
Carson East to Junction ND 31

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100-160 UTILITY POLES: Equipment shall work around utility poles within the construction area that are not to be disturbed.

100-P01 WORK SCHEDULE: In the areas designated for the pipe replacement, the roadbed shall have the existing pavement surface removed, the required earthwork performed, and brought back to grade with suitable backfill and temporary gravel.

The contractor shall be responsible for maintaining these gravel sections to a condition satisfactory for all-weather use or as accepted by the engineer in the field.

107-P01 HAUL ROAD RESTRICTIONS: The contractor shall contact the appropriate State, County, Township, City or Political Subdivision official(s) to determine if the proposed haul road has local load restrictions or is designated as a “No Haul Route” prior to preparing a bid for this project. Paved roads off the state system will not be designated as haul roads by the NDDOT. If the contractor chooses to use a paved road off the state system for this project, the contractor shall be responsible for all costs of the inspection, maintenance, restoration, and release of the haul road. The entire haul cycle, loaded and empty, will be considered for haul routes.

200-010 SHRINKAGE: 30 percent additional volume is included for shrinkage in earth embankment.

203-P01 EARTHWORK: The earthwork quantities were developed from field measured cross sections at ¼ mile increments and at pipe locations. Supplemental design data consisting of electronic survey files or models used for GPS controlled equipment are not available and will not be created for this project due to the significant spacing between cross sections.

203-P02 COMPACTION AND DENSITY CONTROL: The sliver grading shall be constructed as Type C Embankment, Section 203.02 I. Benching will be required.

203-P03 HAUL: No average haul has been computed for this project.

203-P04 TOPSOIL: The existing topsoil (not being classified as topsoil wetland) within the areas of sliver widening shall be salvaged. Removal of topsoil is based upon a 4" depth. The topsoil shall be removed to its full depth and stockpiled. Upon completion of the grading operation, the topsoil shall be spread evenly over the areas to be seeded. Topsoil measurement shall be according to Section 203.03G of the Standard Specifications, Contract Quantity Payment.

203-P05 TOPSOIL: In lieu of providing fiber rolls for temporary erosion control the contractor shall windrow the topsoil from the inslope into the shape of a berm (at the ditch bottom) to act as temporary erosion control. All costs for this described work shall be included in the price bid for “Topsoil.”

203-P06 TOPSOIL – WETLAND: Topsoil shall be stripped to a depth of 6-10” from all wetland areas which will be permanently impacted by the project. Areas of temporary impact shall not be stripped.

The wetland topsoil shall be stockpiled separately from other topsoil. All wetland topsoil that is stripped shall be spread in the mitigated wetland areas so that it is evenly distributed to a minimum depth of 6”. The final elevation of the created wetlands shall match or be lower than the existing elevation of the adjacent wetland.

Wetland topsoil should not be stockpiled for more than four weeks, with a maximum height of the stockpile of 3 feet. If the topsoil is stockpiled longer than four weeks, the following wetland seed mix shall be used for the mitigated wetland areas.

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

** American, fowl, or both may be used. If only one is used the seeding rate of other species does not need to be increased.*
*** Seed may not be available and can be removed without increasing the seeding rate of other species*

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

The costs to remove, stockpile, place, and seed the wetland topsoil shall be included in the price bid for “Topsoil – Wetland”. Payment for the bid item “Topsoil – Wetland” will be paid at plan quantity.

203-P07 COMMON EXCAVATION - WASTE: There are numerous wetlands which will be impacted by the proposed sliver grading on Highway 21. These impacted wetlands will be mitigated on-site within NDDOT Right of Way. At the proposed mitigation location (as shown in Section 75), the contractor is required to strip the existing topsoil and excavate for the newly created mitigated wetland. This excavation shall be constructed to a depth that would accommodate the placement of the wetland topsoil, and the top of the finished wetland topsoil is to be equal or lower than the adjoining wetland. In addition the created wetland shall be constructed to an elevation that is below the invert elevation of the adjacent pipe.

The common excavation quantity is based on a 1 foot depth for these locations – except Wetland 32-D which requires 10’ of excavation (as shown in Sec 20 – Sheet 12). All excess

NOTES

topsoil and excavation from the mitigated wetlands may be placed on the inslopes that require sliver grading. All costs for labor, materials, and equipment, to remove the existing topsoil and earth for the wetland mitigation sites are included in the price bid for “Common Excavation – Waste”. Payment for the bid item “Common Excavation - Waste” will be paid at plan quantity.

410-P01 SUPERPAVE FAA 43: The 5" hot bituminous pavement for the pipe replacements shall be paver laid in three lifts. The 3" hot bituminous pavement for the overlay shall be paver laid in two lifts. Approximately ¼” of the 1.5” first lift will be used for tight blading before the overlay is applied. The tight blading shall be performed in a single motor grader pass. This pass will tight blade mix across the driving lane. The material shall then be compacted with a pneumatic roller prior to the overlay. The quantity used for the tight blading will be deducted from the mainline of Superpave FAA 43. Payment for the tight blading work will be paid at Contract Unit Prices for “SS1H or CSS1H of MS1 Emulsified Asphalt”, “Superpave FAA 43”, and “PG 58-28 Asphalt Cement”.

410-P02 SUPERPAVE PROPERTIES: The aggregate blend and properties shall meet the requirements outlined in Section 410 Superpave Volumetric Design Mix. The following aggregate and mix design properties are required:

Test	Criteria	Reference
Coarse Aggregate Angularity	75% min	NDDOT Field Sampling/Testing Manual
Fine Aggregate Angularity	43% min	AASHTO T 304
Gyratory Effort, # Gyrations	Nini = 7, Ndes = 75, Nmax = 115	AASHTO R 35
Voids Filled with Asphalt	65 -78%	AASHTO M 323, T 166
%Gmm @ Nini	89% max	AASHTO M 323, T 166

411-P01 MILLING SECTIONS: At the beginning and end of the project, the existing bituminous material shall be removed to form a straight vertical edge to allow placement of the HBP overlay surfacing.

At pipe replacement locations, the existing bituminous pavement material shall be removed by milling. A transverse sawcut is not required. The existing bituminous material shall be removed to form a straight vertical edge to allow placement of the bottom lift of HBP surfacing. If the contractor elects to remove the bituminous material by using other methods, it shall also be paid for as “Milling Pavement Surface”.

All bituminous material removed from these described operations shall become the property of the contractor.

411-P02 TEMPORARY ASPHALT WEDGES: The contractor shall place temporary asphalt wedges to allow smooth passage of vehicles at milled locations. Asphalt wedges shall be placed at these milled areas prior to the traffic being allowed back on the milled roadway section. Milled bituminous material shall not be used as wedges. All costs associated with labor, materials and equipment for the installation and removal of the asphalt wedges shall be included in the price bid for “Milling Pavement Surface”.

704-252 TRAFFIC CONTROL FOR UNEVEN PAVEMENT: The contractor has the option of making the paving lanes even at the end of each day's paving operation, or signing for the uneven pavement and providing the following devices: Install "Uneven Lanes" signs (Sign No. W8-11-48) and a supplemental plate (Sign No. W20-52-54), identifying the distance, on the right shoulder (both directions) in advance of the beginning of the uneven pavement and at major intersections. A major intersection shall be defined as a CMC, state, U.S. highway, or Interstate ramp. Install "Do Not Pass" signs (Sign No. R4-1-48) on the right shoulder (both directions) between the uneven lanes sign and the beginning of the uneven pavement and at major intersections. Install tubular markers spaced at two times the posted speed limit on the centerline where uneven pavement exists.

These traffic control devices shall be left in place until the lanes are even. These signs and tubular markers are included in the "Traffic Control Devices List" and will be measured and paid for at the contract unit price for each device. No extra compensation will be allowed for relocation due to work progression.

704-P01 TRAFFIC CONTROL: Traffic control for the HBP overlay, sliver grading, pipe extensions and box culvert extensions shall consist of a lane closure, flagging, pilot car, and shoulder closures. Traffic Control Devices shall comply with the following Standard Drawings:

1. D-704-2, Coring bituminous pavement.
2. D-704-5, Contractor sign is applicable.
3. D-704-7, 8, 9, 10, 11, 13, and 14 are applicable.
4. D-704-15, Layout A: For sliver grading and placement of aggregate base when a one lane closure is needed to carry out these operations. In addition, it will also be used for temporary roadway closure during the lane paving operations.
5. D-704-15, Layout B and 704-19, Layout F: Traffic Control for pipe replacement
6. D-704-20, Layout G: For construction signing during paving operations.
7. D-704-22, Type K and L: For construction trucks entering from an aggregate source or a contractor jobsite.
8. D-704-24, Type R and S: For the construction of the pipe extensions and box culvert extensions. Delineator drums shall be used in-place of the cones as shown on the Standard Drawing. Two shoulder closures have been provided. A quantity of 30 delineator drums have been provided for each 1/2 mile work area – total of 60 drums.
9. D-704-26, Type CC, EE, and GG for paving operations, and Type BB for shoulder work.
10. D-704-27: For pavement marking operations.
11. D-704-50: Portable sign support assembly
12. D-704-56: For installation of rumble strips.

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Traffic control quantities for uneven pavement have been developed based on a 6 mile limitation for the paving operations. The required traffic control signs and devices are included in the "Traffic Control Devices List" and will be measured and paid at the Contract Unit Price for each device. Additional devices required to accommodate the Contractor's operation shall be the Contractor's responsibility. The contractor shall relocate the flaggers and portable signs with the movement of the paving operation to minimize the delay time for the traveling public.

704-P02 TRAFFIC CONTROL: When the aggregate base is extended for sliver widening, there will be a drop off area adjacent to the lane, as indicated in the proposed typical section. This area shall not have a drop off greater than 2 inches. If a drop off exceeds 2 inches, the contractor will be required to provide a safe and traversable inslope. A safe and traversable slope is defined as having a cross slope of 4:1 or flatter. The reshaping of the aggregate or embankment required for this operation shall not be paid for separately but shall be included in the price bid for aggregate or embankment items.

704-P03 TRAFFIC CONTROL FOR PIPE REPLACEMENT: Traffic control for the installation of the centerline pipe conduit shall be in accordance with the Traffic Control Layout for Pipe Removal & Replacement Locations in conjunction with Standard Drawing D-704-19, Layout Type F. The Contractor will need to install pipe, backfill trench up to grade, and return traffic to normal by end of day's work. If the Contractor is unable to complete the centerline pipe replacement work in one working day, the area shall be made traversable for two lanes of traffic or flagged 24 hours per day. To maintain traffic a fifteen foot wide driving surface shall be provided with the use of flaggers or a thirty foot wide driving surface with the use of traffic control devices (D-704-15 Type B).

704-P04 TRAFFIC CONTROL FOR CENTERLINE RUMBLE STRIP INSTALLATION: For cutting in centerline rumble strips, the Contractor shall provide traffic control as described below: Two sets of signs for D-704-15, layout Type A is a minimum. The work zone shall be limited to 2 ½ miles in length. However, the signs for the next 2 ½ -mile work zone shall be set ahead of the current work zone in the direction the operation is moving. Once the Contractor gets to that point, the original set of signs is removed and reset ahead in the next 2 ½ miles. This traffic control requires a minimum of 2 flaggers working at all times. Signs cannot be moved by the flaggers. The cost of moving the signs shall not be paid for separately but included in the price bid for traffic control signs. Additional signing shall be at the Contractor's expense, unless specifically requested by the Engineer.

714-P01 SILTED PIPES: If the Contractor encounters silted-in pipes at locations where pipe are to be extended, the silted-in material shall be removed from the pipes before extending them. The silt shall also be removed 50 feet beyond the end of the pipe, unless otherwise directed by the Engineer. The cost of removing the silt shall be included in the price bid for centerline pipe.

714-P02 CATTLE PASS: CL 3 or CL 5 backfill material required for the installation of the cattle pass and relaying of the cattle pass end sections shall not be bid separately but included in the price bid for "Cattle Pass Conc Intermed Section" and "Remove and Relay Conc Cattle Pass End Section."

The existing fence attached to the cattle pass shall be reattached once the cattle pass has been extended. All costs to remove and reattach the fence shall be included in the price bid for "Cattle Pass Conc Intermed Section" and "Remove and Relay Conc Cattle Pass End Section."

All dewatering costs associated with extending the cattle pass shall be included in the price bid for "Cattle Pass Conc Intermed Section" and "Remove and Relay Conc Cattle Pass End Section."

752-P01 FENCE REMOVE & RESET: In order to remove the trees and brush, extend the 84" pipe and place riprap at RP 99.191, the existing fence shall be removed, stockpiled and reset. The fence consists of 14 heavy gauge livestock panels 4' x 16' (224LF) as shown in the Section 20 Detail plan sheet. The existing panel fence is attached wooden fence posts – that may need to be replaced. All costs to remove, stockpile and reset the existing fence and provide new fence posts shall be included in the price bid for "Fence Remove & Reset".

754-P01 SCHOOL SIGNS: The school signs shall have a fluorescent yellow green background with black letters and border. The signs shall be furnished with sheeting consisting of prismatic lenses formed in a transparent synthetic resin, sealed, and backed with an aggressive pressure sensitive adhesive protected by a removable liner. The sheeting shall have a smooth surface with a distinctive interlocking diamond seal pattern and orientation marks visible on their face. The cost for furnishing the fluorescent yellow green background shall be included in the price bid for the item "Flat Sheet Signs-Type XI Refl Sheeting".

762-P01 PAVEMENT MARKING: Pavement markings will not be measured for payment unless changes are made in the field. Payment for pavement markings will be at plan quantity.

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

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ENVIRONMENTAL COMMITMENTS

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

COMMITMENT NO. 1: Unavoidable impacts to wetlands will be mitigated onsite, adjacent to the project, or at a NDDOT approved mitigation site or bank. Approximately 0.51 *natural/jurisdictional*, 0.36 *natural/non-jurisdictional*, 0.05 *artificial/jurisdictional*, and 0.02 *artificial/non-jurisdictional* acres of wetlands will be impacted permanently, and 1.29 acres will be impacted temporarily.
ACTION TAKEN/REQUIRED: 1.04 acres of permanent impacts to wetlands will require mitigation. The NDDOT proposes to mitigate 0.92 acres onsite within the project limits, and 0.12 acres 0at Vollrath 16/17.

Wetland Number	Location	Cowardin Classification	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands*	Wetland Impacts Temp.	Wetland Impacts Perm.	Mitigation Required 11990	Mitigation Required USACE	Mitigation Required Location	Mitigation Required Onsite Mitigation
20	Sec.19, T134N, R86W	PEMA	Artificial	0.13	Ditch	N/A	0.05	0.02	N	N		
21-A	Sec. 19, T134N, R86W	PEMC	Natural	1.17	Basin	N/A	0.25	0.18	Y	N	Onsite	0.18
21-B	Sec. 18, T134N, R86W	PEMC	Natural	1.27	Basin	N/A	0.29	0.18	Y	N	Onsite	0.18
22	Sec. 15, T134N, R86W	PABFh	Natural	0.11	Drainage	X	0.00	0.00				
23-A	Sec. 15, T134N, R86W	PEMA	Natural	0.12	Drainage	X	0.02	0.01	Y	N	Onsite	0.01
23-B	Sec. 14, T134N, R86W	PEMA	Natural	0.03	Drainage	X	0.01	0.01	Y	N	Onsite	0.01
24-A	Sec. 14, T134N, R86W	PEMC	Natural	0.03	Meander Cutoff	X	0.01	0.02	Y	Y	Onsite @ Wetland 32D @ a 1:1 Ratio	
24-B	Sec. 14, T134N, R86W	PEMC	Natural	0.03	Meander Cutoff	X	0.01	0.02	Y	Y	Onsite @ Wetland 32D @ a 1:1 Ratio	
25-A	Sec. 14, T134N, R86W	PABFh	Natural	0.15	Basin	X	0.12	0.03	Y	Y	Onsite @ Wetland 32D @ a 1:1 Ratio	
25-B	Sec. 14, T134N, R86W	PEMC	Natural	0.08	Drainage	X	0.07	0.02	Y	Y	Onsite @ Wetland 32D @ a 1:1 Ratio	
25-C	Sec. 14, T134N, R86W	PEMC	Natural	0.05	Drainage	X	0.04	0.01	Y	Y	Onsite @ Wetland 32D @ a 1:1 Ratio	
26	Sec. 14, T134N, R86W	PEMC	Natural	0.01	Drainage	X	0.01	0.01	Y	N	Vollrath 16/17	0.01
27-A	Sec. 13, T134N, R86W	PEMC	Natural	0.1	Drainage	X	0.02	0.04	Y	N	Onsite	0.04
27-B	Sec. 13, T134N, R86W	PEMC	Natural	0.09	Drainage	X	0.02	0.03	Y	N	Onsite	0.03
28-A	Sec. 12, T134N, R86W	PEMC	Natural	0.04	Drainage	X	0.04	0.01	Y	N	Vollrath 16/17	0.01
28-B	Sec. 12, T134N, R86W	PEMA	Natural	0.06	Drainage	X	0.06	0.01	Y	N	Vollrath 16/17	0.01
28-C	Sec. 12, T134N, R86W	PEMC	Natural	0.16	Drainage	X	0.00	0.00				
28-D	Sec. 12, T134N, R86W	PEMC	Natural	0.11	Basin	X	0.02	0.01	Y	N	Vollrath 16/17	0.01

Wetland Impacts Summary

Total Permanent Impact Summary		Additional Impact Info for 404 Permit	
Wetland Type	**Total (Acres)**	**Wetland Type**	**Total (Acres/Lf)**
Natural/Non-JD	0.36	Permanent JD ≥ 0.10	**0.47**
Artificial /Non-JD	0.02	Temporary JD	**1.29**
Natural /JD	0.51	POW	**0**
Artificial /JD	0.05		
Totals	**0.87**		

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ENVIRONMENTAL COMMITMENTS

Wetland Number	Location	Cowardin Classification	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands*	Wetland Impacts Temp.	Wetland Impacts Perm.	Mitigation Required 11990	Mitigation Required USACE	Mitigation Required Location	Mitigation Required Onsite Mitigation
38-A	Sec. 12, T134N, R86W	PEMC	Artificial	0.09	Basin	X	0.00	0.00				
38-B	Sec. 12, T134N, R86W	PEMC	Natural	0.34	Basin	X	0.00	0.00				
38-C	Sec. 12, T134N, R86W	PEMC	Artificial	0.12	Basin	X	0.00	0.00				
38-D	Sec. 12, T134N, R86W	PEMC	Artificial	0.42	Basin	X	0.11	0.05	N	N		
39	Sec. 12, T134N, R86W	PEMC	Natural	0.03	Drainage	X	0.00	0.00				
40-A	Sec. 12, T134N, R85W	PEMC	Natural	0.03	Drainage	X	0.00	0.03	Y	N	Vollrath 16/17	0.03
40-B	Sec. 12, T134N, R85W	PEMC	Natural	0.02	Drainage	X	0.00	0.02	Y	N	Vollrath 16/17	0.02
29-A	Sec. 9, T134N, R85W	PEMC	Natural	0.43	Drainage	X	0.00	0.00				
29-B	Sec. 4, T134N, R85W	PEMC	Natural	0.09	Drainage	X	0.00	0.00				
30-A	Sec. 10, T134N, R85W	PEMC	Natural	0.06	Drainage	X	0.05	0.01	Y	N	Vollrath 16/17	0.01
30-B	Sec. 3, T134N, R85W	PEMC	Natural	0.04	Drainage	X	0.02	0.01	Y	N	Vollrath 16/18	0.01
31-A	Sec. 11, T134N, R85W	PEMC	Natural	0.12	Drainage	X	0.00	0.12	Y	Y	Onsite @ Wetland 32D @ a 2:1 Ratio	
31-B	Sec. 2, T134N, R85W	PEMC	Natural	0.05	Drainage	X	0.00	0.05	Y	Y	Onsite @ Wetland 32D @ a 2:1 Ratio	
32-A	Sec. 14, T134N, R86W	PEMC	Natural	0.04	Drainage	X	0.01	0.01	Y	N	Vollrath 16/17	0.01
32-B	Sec. 14, T134N, R86W	PEMC	Natural	0.06	Drainage	X	0.03	0.03	Y	N	Onsite @ Wetland 32D @ a 1:1 Ratio	
32-C	Sec. 14, T134N, R86W	PEMC	Natural	0.04	Drainage	X	0.04	0.00				
32-D	Sec. 14, T134N, R86W	PEMC	Natural	0.08	Drainage	X	0.00	0.00				0.47
34	Sec. 15, T134N, R86W	PABFh	Natural	0.08	Drainage	X	0.00	0.00				
TOTALS				**5.88**			**1.29**	**0.94**		**0.00**		**1.04**
A wetland Jurisdictional Determination was issued by the USACE on 02/03/2011; NWO-2011-00136-BIS												
Field verification and modifications 6/6/2013 & 6/19/2013												

PERMITS REQUIRED:

- Section 404 Permit (US Army Corps of Engineers)

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
201	0330	CLEARING & GRUBBING	L SUM	1	1
202	0101	REMOVAL OF CONCRETE	EA	1	1
202	0111	REMOVAL OF CONCRETE	L SUM	1	1
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES	EA	27	27
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES	LF	140	140
203	0108	TOPSOIL-BORROW AREA	CY	6,450	6,450
203	0109	TOPSOIL	CY	40,440	40,440
203	0113	COMMON EXCAVATION-WASTE	CY	8,335	8,335
203	0121	TOPSOIL-WETLAND	CY	790	790
203	0140	BORROW-EXCAVATION	CY	97,176	97,176
210	0109	CLASS 2 EXCAVATION-BOX CULVERT	EA	2	2
210	0201	FOUNDATION PREPARATION	EA	2	2
210	0210	FOUNDATION FILL	CY	135	135
216	0100	WATER	M GAL	3,764	3,764
302	0100	SALVAGED BASE COURSE	TON	44,057	44,057
401	0150	SS1H OR CSS1H OR MS1 EMULSIFIED ASPHALT	GAL	24,194	24,194
410	0213	SUPERPAVE FAA 43	TON	42,534	42,534
410	0445	PG 58-28 ASPHALT CEMENT	TON	2,765	2,765
410	0910	CORED SAMPLE	EA	276	276
411	0105	MILLING PAVEMENT SURFACE	SY	1,115	1,115
602	1131	CLASS AE-3 CONCRETE-BOX CULVERT	CY	246.1	246.1
612	0114	REINFORCING STEEL-GRADE 60-BOX CULVERT	LBS	33,845	33,845
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	2,500	2,500
704	1000	TRAFFIC CONTROL SIGNS	UNIT	2,708	2,708
704	1052	TYPE III BARRICADE	EA	2	2
704	1060	DELINEATOR DRUMS	EA	74	74
704	1067	TUBULAR MARKERS	EA	245	245
704	1081	VERTICAL PANELS-BACK TO BACK	EA	16	16
704	1185	PILOT CAR	HR	1,000	1,000
706	0200	FIELD LABORATORY-TYPE B	EA	1	1
706	0300	FIELD LABORATORY-TYPE C	EA	2	2

ESTIMATE NUMBER: 15163 RUN DATE: 08/29/2013 TIME: 15:29:34

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	8	2

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
708	1020	RIPRAP-LOOSE ROCK	CY	1,340	1,340
708	1325	SILT FENCE SUPPORTED	LF	6,639	6,639
708	1335	REMOVAL SILT FENCE SUPPORTED	LF	6,639	6,639
708	1430	FIBER ROLLS 12IN	LF	4,125	4,125
708	2240	SEEDING-TYPE B-CL II	ACRE	120	120
708	2260	SEEDING-TYPE B-CL IV	ACRE	120	120
708	5500	MULCHING	ACRE	240	240
708	5651	ECB TYPE 2	SY	1,776	1,776
708	8500	STABILIZED CONSTRUCTION ACCESS	EA	1	1
709	0600	GEOTEXTILE FABRIC-TYPE RR	SY	1,533	1,533
709	0701	GEOTEXTILE FABRIC-TYPE R1	SY	691	691
714	0615	PIPE CONC REINF 24IN CL III	LF	130	130
714	0820	PIPE CONC REINF 30IN CL III	LF	136	136
714	1005	PIPE CONC REINF 42IN CL III	LF	12	12
714	1105	PIPE CONC REINF 48IN CL III	LF	34	34
714	1310	PIPE CONC REINF 60IN CL III	LF	4	4
714	1510	PIPE CONC REINF 72IN CL III	LF	20	20
714	1710	PIPE CONC REINF 84IN CL III	LF	34	34
714	3023	END SECT-TRAVERSABLE REINF. CONC.24IN	EA	17	17
714	3033	END SECT-TRAVERSABLE REINF. CONC.30IN	EA	12	12
714	3075	END SECT-CONC REINF 84IN	EA	2	2
714	4110	PIPE CONDUIT 30IN	LF	74	74
714	4120	PIPE CONDUIT 42IN	LF	72	72
714	9200	CATTLE PASS CONC INTERMED SECTION	LF	42	42
714	9611	REMOVE & RELAY CONC CATTLE PASS END SECTION	EA	8	8
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES	EA	31	31
752	0922	FENCE REMOVE & RESET	LF	224	224
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	167	167
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	78	78
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	593	593
754	0562	REFERENCE MARKER-TYPE B	EA	8	8
754	0563	REFERENCE MARKER-TYPE C	EA	4	4
754	0592	RESET SIGN PANEL	EA	10	10

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	8	3

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
754	0805	OBJECT MARKERS - CULVERTS	EA	64	64
760	0005	RUMBLE STRIPS - ASPHALT SHOULDER	MILE	24.8	24.8
760	0007	RUMBLE STRIPS - ASPHALT CENTERLINE	MILE	12.4	12.4
762	0430	SHORT TERM 4IN LINE-TYPE NR	LF	284,663	284,663
762	1104	PVMT MK PAINTED 4IN LINE	LF	202,397	202,397
766	0100	MAILBOX-ALL TYPES	EA	1	1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	10	1

BASIS OF ESTIMATE

Stations		Stations	
Sta 41+50 to 431+02 Bk = 0+00 Ahd	389.52	Sta 0+00 to 2+07	2.07
Sta 0+00 to 264+57 Bk = 0+00 Ahd	264.57		
Total Stations	654.09	Total Stations	2.07
Tangent		Tangent	

Material	Unit	Application Rate	Width (ft)	Area	Quantity per Station	Total	Width (ft)	Area	Quantity per Station	Total	Grand Total
Salvaged Base Course	Ton	1.875 Ton/CY	-	9.42	65.42	42,788	0				42,788
SS1H or CSS1H or MS1 Emulsified Asphalt (1st Lift)	Gal	0.05 Gal/SY	34		18.89	12,355	34		18.89	39	12,394
SS1H or CSS1H or MS1 Emulsified Asphalt (2nd Lift)	Gal	0.05 Gal/SY	32		17.78	11,628	32		17.78	37	11,665
Hot Bituminous Pavement Superpave FAA 43	Ton	2 Ton/CY		8.60	63.70	41,668		8.60	63.70	132	41,800
PG 58-28 Asphalt Cement (1st and 2nd Lift)	Ton	6.5% HBP			4.14	2,708			4.14	9	2717

Temporary Marking

Short Term 4IN Line - Type NR					
Location	LF/Mile (feet)	Distance (Miles)	Applications	Quantity	Unit
Centerline - Skips	1,320	12.4272	4	65,615.62	LF
Centerline -Barrier EB	5,280	5.0781	4	107,249.47	LF
Centerline -Barrier WB	5,280	5.2935	4	111,798.72	LF
			Total	284,663.81	LF

Permanent Pavement Marking

Painted Pavement Marking 4IN Line - Type NR					
Location	LF/Mile (feet)	Distance (Miles)	Applications	Quantity	Unit
Centerline - Skips	1,320	12.4272	1	16,403.90	LF
Centerline -Barrier EB	5,280	5.0781	1	26,812.37	LF
Centerline -Barrier WB	5,280	5.2935	1	27,949.68	LF
Edge Lines	10,560	12.4272	1	131,231.23	LF
			Total	202,397.18	LF

Object Markers - Culverts

Spec	Code	Location	Quantity
754	0805	Various	**64**

Cored Samples

Application Rate	Lanes	Lifts	Distance	Lot Distance/200 FT	Quantity	UNIT
2 EA/Lane/Lift/Lot	2	2	12.4272	33	264	EA
1 EA/Mile			12.4272		12	EA
				Total	276	EA

Water

- Water for Dust Palliative
  2000 MGal
- 20 Gal/Ton for Aggregates
  42,788 ton *20 Gal = 855,760 Gal = **856 MGal**
- 10 Gal/CY for Embankment
  90,820 CY*10/1000 = **908 MGal**

Rumble Strips

- Asphalt Shoulder Rumble Strips
  12.4272 Miles x 2 Shoulders = **24.8544 Miles**
- Asphalt Centerline Rumble Strips
  12.4272 Miles

Mailboxes

Number Type	Location	Work
1 Single	RP 99.125	Replace

Borrow Site

Borrow Site 1: NW 1/4 of Sec 21, T134N, R86W			
Spec	**Code**	**Location**	**Quantity**
203	108	Topsoil - Borrow Area	6450 CY
708	1325	Silt Fence Supported	1500 LF
708	1335	Removal of Silt Fence Supported	1500 LF

Note: Removal of topsoil is based upon a 4" depth and an estimated area of 12 acres (75% of the maximum 15.5 acre area)

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	11	1

Earthwork Summary

Station	Fill End Area (SF)	Adjusted Fill Volume (CY)
41+50.00	28	-
49+38.91	26.9	1,043.000
75+78.91	15.6	2,701.00
88+98.91	28.0	1,386.00
102+18.91	75.6	3,292.00
115+38.91	24.5	3,181.00
141+78.91	39.9	4,093.00
181+38.91	34.1	7,055.00
194+58.91	29.3	2,015.00
207+78.91	30.8	1,910.00
220+98.91	12.5	1,376.00
234+18.91	23.8	1,154.00
286+98.91	23.3	5,987.00
313+38.91	35.0	3,705.00
352+98.91	31.5	6,340.00
409+48.51	32.2	8,664.00
53+96.69	22.0	9,852.00
93+56.69	20.5	4,052.00
133+16.69	26.0	4,433.00
146+36.69	22.2	1,532.00
159+56.69	16.4	1,227.00
212+36.69	26.5	5,453.00
238+76.69	19.5	2,924.00
266+96.21	28	3,801.00
Subtotal		87,176.00
Pipe & Box Culverts		10,000.00
Total		97,176.00

Location	Embankment (CY)	Borrow Excavation (CY) Pay Item
Start to End Sta 41+50.00 R/4 to Sta 266+96.21 R/5	97,176	97,176

Note: The quantity shown for embankment has been increased by 30% to adjust by shrinkage

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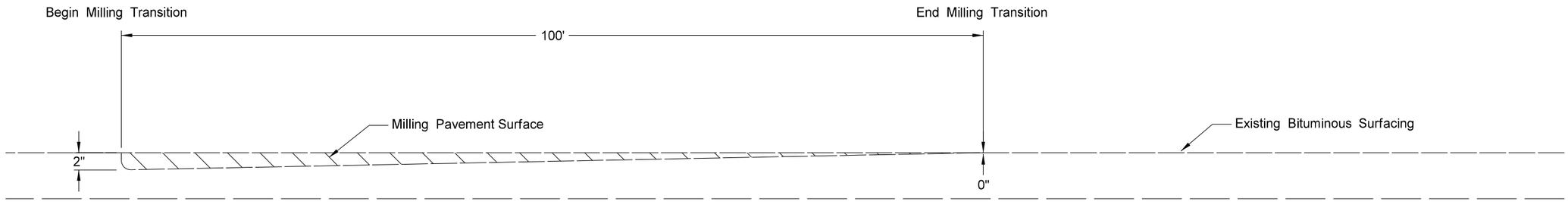
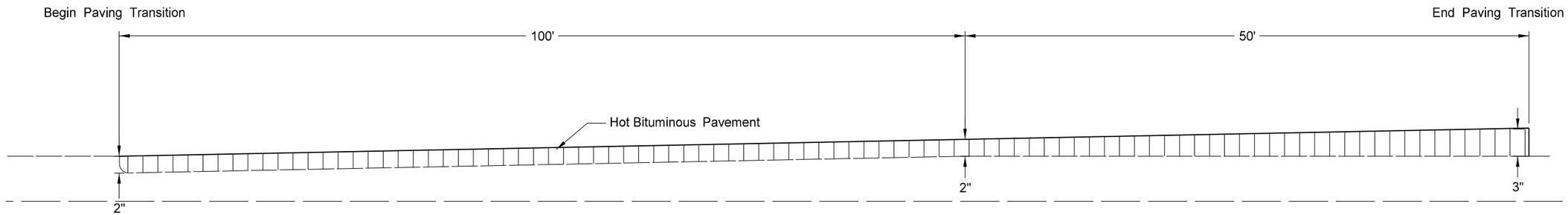
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	1

Hot Bituminous Pavement - Surfacing Transitions



Milling Transition



Paving Transition

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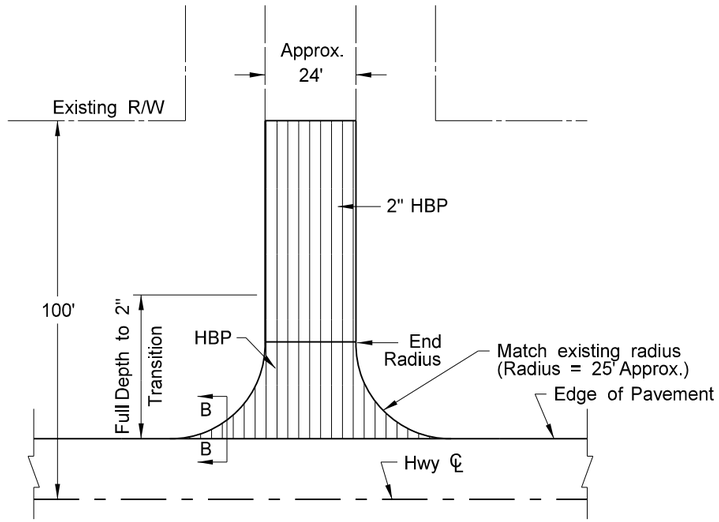
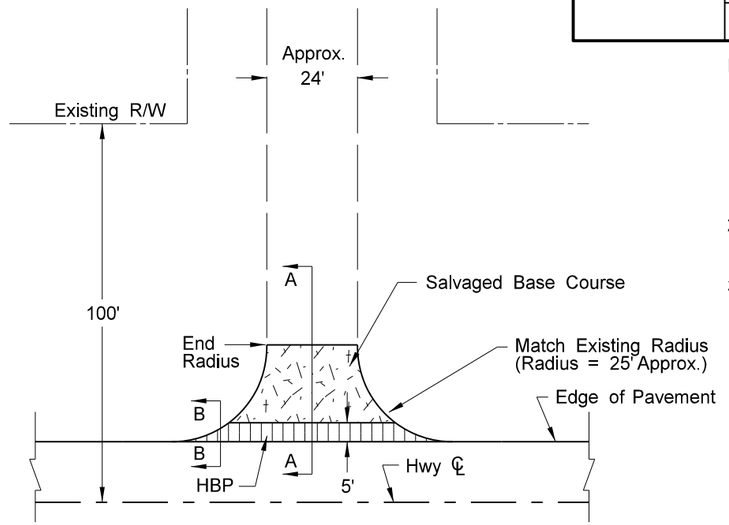
Milling/Paving Transitions
Beginning of Project

ND Hwy 21
Carson East to Junction ND 31

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	20	2



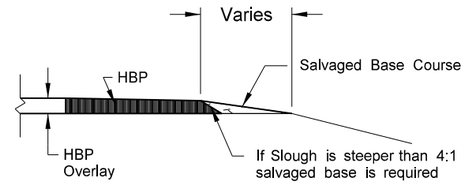
(1) Paved Section Line, County Road, or Street Approach



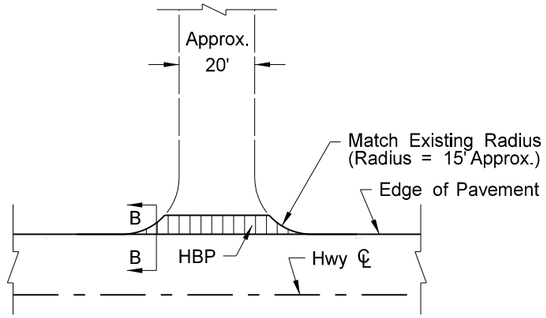
(2) Gravel Section Line, County Road, or Street Approach

Notes:

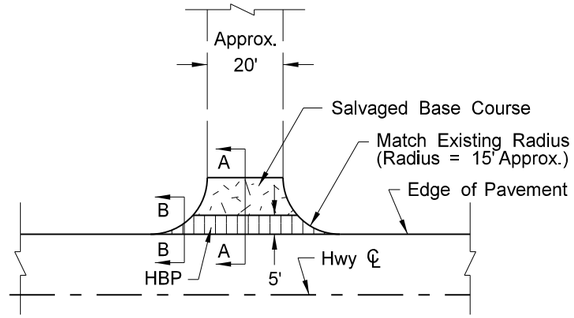
1. A longer HBP wedge may be needed if an existing elevation difference between the mainline and the approach exists. Actual HBP paving and salvaged base locations may vary in the field for situations, as approved by the Engineer.
2. Quantity totals have been included in the bid items of the "Estimate of Quantities" of the plans.
3. Approximately 200 tons of salvaged base have been provided to fill in around the radii. This material will be required when sloughs are steeper than 4:1, see Section B-B.



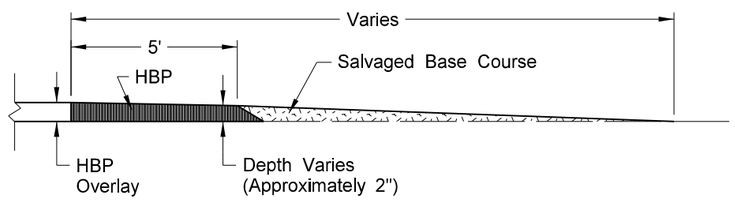
Section B-B



(3) Paved Private Drive Approach



(4) Gravel Private Drive or Field Drive Approach



Section A-A

BASIS OF ESTIMATE		(1)	(2)	(3)	(4)	
ITEM	UNIT	Paved Section Line	Gravel Section Line	Paved Private Drive	Gravel Field/ Private Drive	TOTALS
Number of Locations	#	3	10	4	64	
Salvaged Base	TON	N/A	8	N/A	4	336
Tack Coat	GAL	15.2	2.1	1.0	1.0	135
HBP	TON	39	6	4	4	449

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Approach Details

ND Hwy 21
Carson East to Junction ND 31

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	3

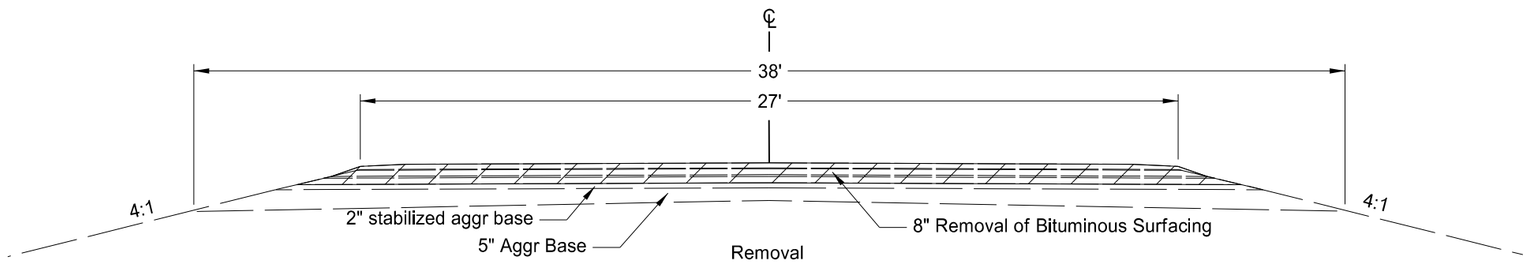
Reference Points	Location	Type	Notes
91.4053	Lt	Field Drive	
91.4053	Rt	Gravel Private Drive	
91.6855	Lt & Rt	Field Drive	
91.9007	Lt & Rt	Gravel Section Line	
91.9908	Rt	Field Drive	
92.2356	Lt	Gravel Private Drive	
92.401	Rt	Field Drive	
92.6567	Lt & Rt	Field Drive	
92.9023	Lt & Rt	Field Drive	
92.9624	Lt & Rt	Field Drive	
93.1204	Lt & Rt	Field Drive	
93.3009	Lt & Rt	Field Drive	
93.3912	Rt	Field Drive	
93.7173	Lt & Rt	Field Drive	
93.9028	Lt & Rt	Gravel Section Line	51st Ave
94.6453	Rt	Field Drive	
94.7449	Lt	Gravel Section Line	50th Ave
94.8635	Rt	Field Drive	
94.9442	Rt	Field Drive	
95.1158	Rt	Field Drive	
95.2789	Lt & Rt	Field Drive	
95.3015	Lt & Rt	Field Drive	
95.6314	Lt & Rt	Field Drive	
96.015	Lt & Rt	Gravel Section Line	49th Ave
96.1151	Lt & Rt	Field Drive	
96.5105	Lt	Gravel Private Drive	
96.5505	Rt	Gravel Private Drive	
96.7808	Lt & Rt	Field Drive	
97.0632	Lt & Rt	Field Drive	
97.2625	Rt	Gravel Section Line	48th Ave
97.3014	Lt	Gravel Section Line	48th Ave

Reference Points	Location	Type	Notes
97.5299	Lt & Rt	Field Drive	
97.9091	Lt & Rt	Field Drive	
98.0154	Lt		Sheet
98.1698	Lt	Field Drive	
98.211	Rt	Field Drive	
98.3448	Lt	Gravel Private Drive	
98.4426	Lt & Rt	Gravel Section Line	47th Ave
98.8235	Lt & Rt	Field Drive	
98.9573	Rt	Field Drive	
99.1254	Lt	Paved Private Drive	
99.1254	Rt	Field Drive	
99.2408	Rt	Field Drive	
99.4816	Lt	Paved Section Line	
99.4816	Lt	Gravel Section Line	
99.8327	Lt & Rt	Field Drive	
99.9431	Lt	Paved Private Drive	
99.9632	Rt	Field Drive	
100.09	Lt	Gravel Private Drive	
100.2001	Rt	Field Drive	
100.4751	Lt & Rt	Gravel Section Line	
100.6702	Rt	Field Drive	
100.8252	Rt	Field Drive	
100.8853	Lt	Field Drive	
101.4012	Lt	Gravel Private Drive	
101.4012	Rt	Paved Private Drive	
101.4864	Lt	Paved Private Drive	
101.4864	Rt	Gravel Section Line	44th Ave
101.5566	Rt	Field Drive	
101.8725	Lt	Field Drive	
102.1296	Rt	Field Drive	
102.4187	Lt	Field Drive	
102.4736	Lt & Rt	Paved Section Line	
103.3858	Rt	Field Drive	

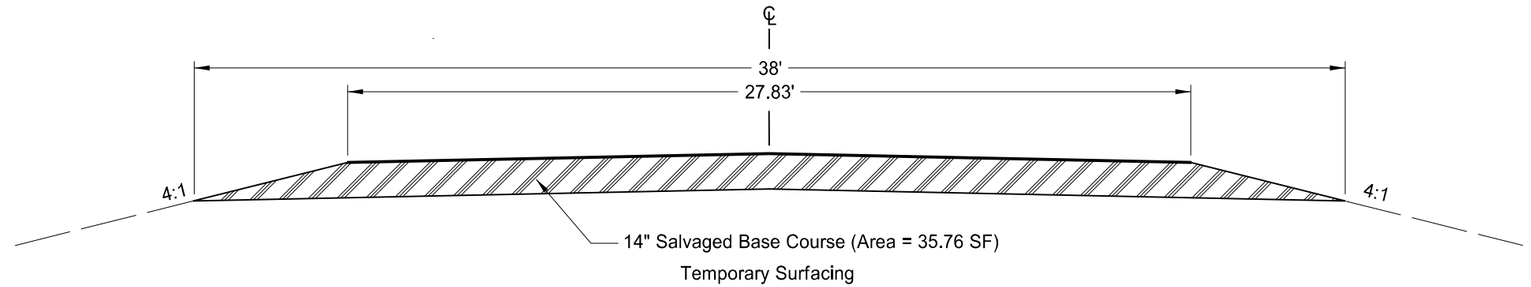
Approach Paving Locations

ND Hwy 21
Carson East to Junction ND 31

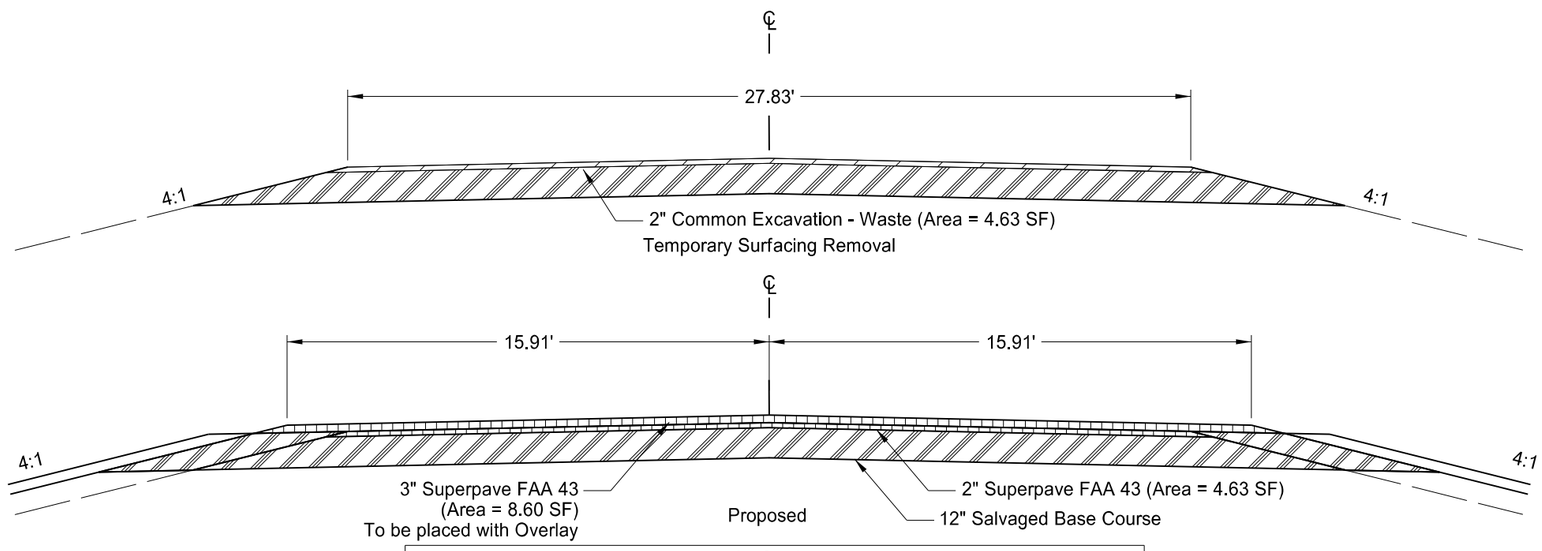
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	4



Removal



Temporary Surfacing



Temporary Surfacing Removal

Proposed

Pipe Replacement Locations
RP 91.459
RP 97.5

Basis of Estimate

Removal

Spec	Code	Description	Unit	Qty Per Location	Total
411	0105	MILLING PAVEMENT SURFACE	SY	225	450

Temporary Surfacing

Spec	Code	Description	Unit	Qty Per Location	Total
302	100	SALVAGED BASE COURSE	TON	198	397

Temporary Surfacing Removal

Spec	Code	Description	Unit	Qty Per Location	Total
203	113	COMMON EXCAVATION - WASTE	CY	12.86	26

Proposed

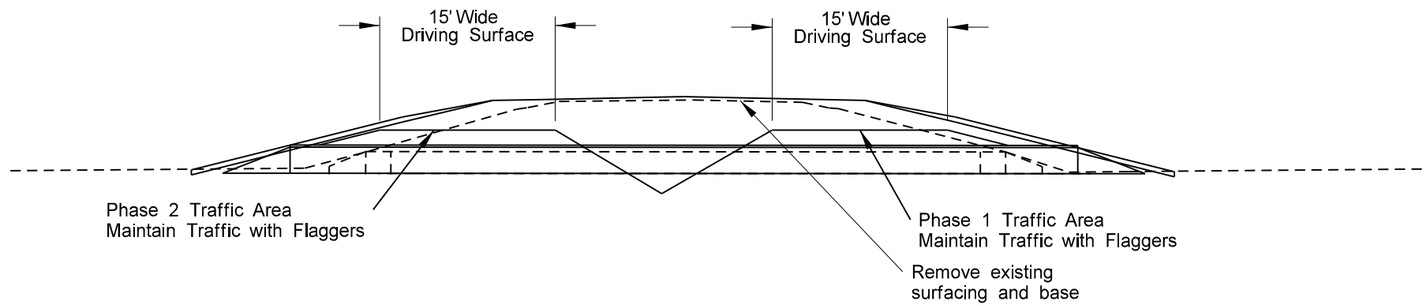
Spec	Code	Description	Unit	Qty Per Location	Total
410	213	SUPERPAVE FAA 43	TON	26	52

Note: Quantities were calculated using an average length of 75'.

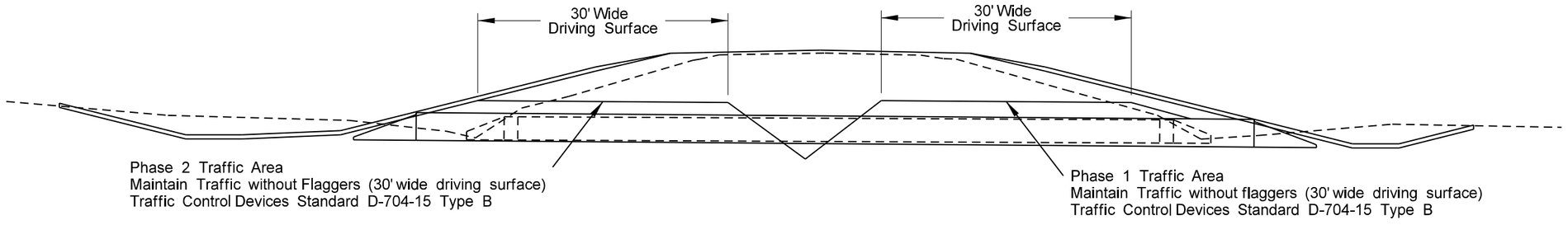
Pipe Replacement Locations
Removal and Paving Detail

ND Hwy 21
Carson East to Junction ND 31

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	5



Phasing for a single lane of traffic with flaggers



Phasing for two lanes of traffic without flaggers

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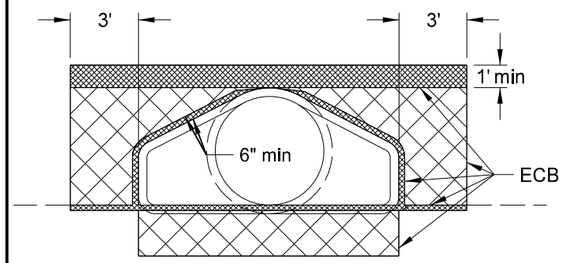
Phasing Detial
Pipe Replacement

ND Hwy 21
Carson East to Junction ND 31

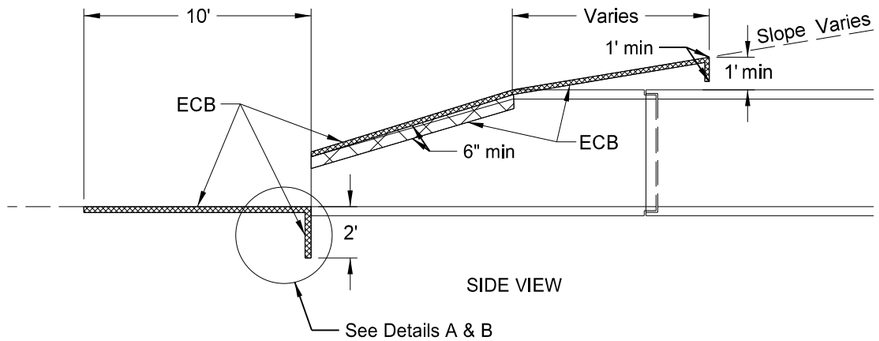
8/29/2013 10:18:18 AM cfrising R:\project\10021090.018\design\Sheets\020GD_005_pipe phasing details.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	6

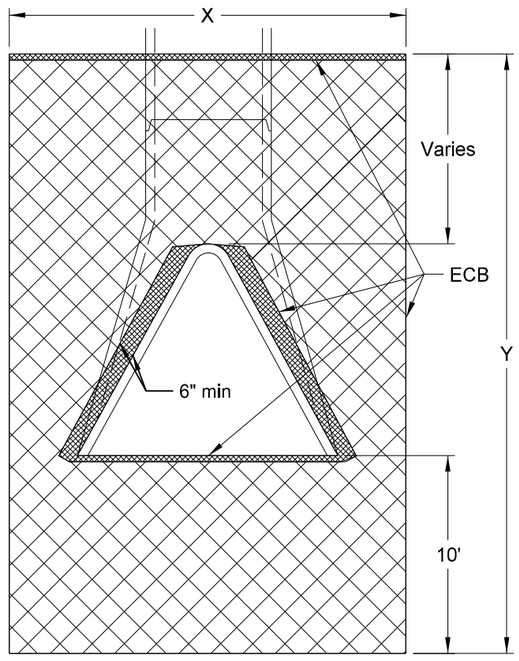
SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	5651	ECB TYPE 2		
		Locations listed on following sheet	SY	1776



FRONT VIEW

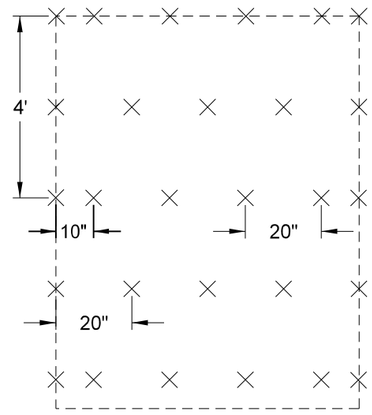


SIDE VIEW



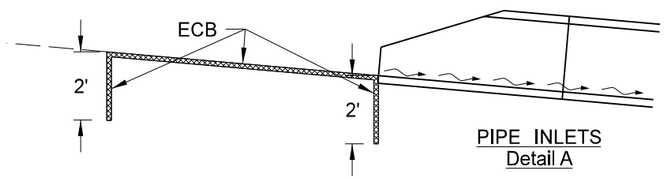
TOP VIEW

NOTE: The ECB shall be tucked a minimum of 1' into the embankment above the flared end section, a minimum of 6" into the embankment (against the flared end section) around the opening of the flared end section, and 2' into the ground at the end of the flared end section.

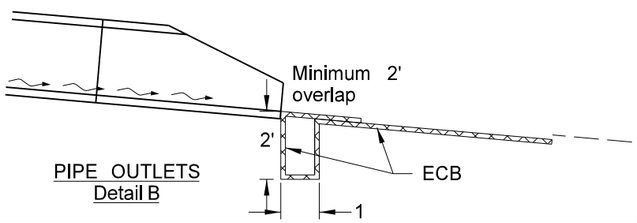


STAPLE PATTERN: 3.8 staples per square yard using 8-inch 11 gauge wire "u" staples

DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
15	9.0	20.0	176.0	20
18	9.5	20.7	190.7	22
21	9.5	21.0	190.9	22
24	10.5	21.6	214.1	24
30	11.6	22.5	241.5	27
36	12.7	23.3	268.8	30
42	13.3	23.3	279.7	31
48	13.8	24.0	293.2	33
54	14.5	23.4	300.6	34
60	15.0	23.0	307.5	35
66	15.6	24.0	325.6	37
72	16.2	24.5	340.6	38
84	17.3	25.7	390.6	43



PIPE INLETS
Detail A



PIPE OUTLETS
Detail B

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Culvert End Protection Details

ND Hwy 21
Carson East to Junction ND 31

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	7

Ref Point	Station / Location	Offset	Pipe Diameter	ECB Quantity
			Inch	SY
91.459	60+42.43 R4	37.0' Lt	30	27
	60+42.43 R4	37.0' Rt	30	27
91.837	80+38.27 R 4	30.0' Lt	24	24
	80+38.27 R 4	32.0" Rt	24	24
92.133	96+01.15 R4	39.5' Lt	30	27
	96+01.15 R4	22' Rt	30	27
92.644	122+99.23 R4	30.5' Lt	24	24
	122+99.23 R4	29.5' Rt	24	24
92.758	129+01.05 R4	46.5' Lt	24	24
	129+01.05 R4	25.5' Rt	24	24
93.137	149+022.27 R4	33.0' Lt	42	31
	149+022.27 R4	24' Rt	42	31
93.307	157+99.84 R4	38.0' Lt	24	24
	157+99.84 R4	26.5' Rt	24	24
93.467	166+44.67 R4	29.0' Lt	30	27
	166+44.67 R4	30.0' Rt	30	27
94.43	217+29.31 R4	73.5'Lt	30	27
	217+29.31 R4	59.5' Rt	30	27
94.54	223+00.00 R4	73.5' Lt	30	27
	223+00.00 R4	60.5' Rt	30	27
94.87				
	240+52.51 R4	38.5' Rt	60	35
95.25				
	260+58.91 R4	63.5' Rt	30	27
96.038	302+19.55 R4	27.5' Lt	24	24
	302+19.55 R4	24.5' Rt	24	24
96.08	304+41.31 R4	42.5 Lt	72	38
	304+41.31 R4	40.0' Rt	72	38
96.419				
	322+31.23 R4	36.0' Rt	30	27
96.702	337+24.75 R4	36.0' Lt	48	33
	337+24.75 R4	36.0' Rt	48	33
96.704	337+36.24 R4	36.0' Lt	48	33
	337+36.24 R4	36.0' Rt	48	33
97.112	358+90.27 R4	27.5' Lt	24	24
	358+90.27 R4	25.50' Rt	24	24
97.322	369+99.07 R4	31.5' Lt	24	24
	369+99.07 R4	28.5' Rt	24	24
97.5	379+38.91 R4	39.0' Lt	42	31
98.261	419+56.99 R4	33.5' Lt	30	27
	419+56.99 R4	26.5' Rt	30	27
98.468				
	430+49.95 R4	28.5' Rt	24	24
98.594	6+13.01 R5	32.5' Lt	30	27
	6+13.01 R5	32.5' Rt	30	27
98.715	12+51.89 R5	55.5' Lt	30	27

Ref Point	Station / Location	Offset	Pipe Diameter	ECB Quantity
			Inch	SY
99.191	37+65.17 R5	42.0' Lt	84	43
	37+65.17 R5	27.5' Rt	84	43
99.797	69+64.85 R5	35.5' Lt	30	27
	69+64.85 R5	27.5'Rt	30	27
100.471	105+23.57 R5	41.5'Lt	24	24
	105+23.57 R5	24.5' Rt	24	24
100.512	107+40.05 R5	52.5' Lt	30	27
	107+40.05 R5	51.5' Rt	30	27
100.77	121+02.29 R5	60.5' Lt	30	27
	121+02.29 R5	48.5' Rt	30	27
100.864	125+98.61 R5	60.5' Lt	48	33
	125+98.61 R5	55.5' Rt	48	33
101.353	151+80.53 R5	75.5' Lt	30	27
	151+80.53 R5	29.5' Rt	30	27
101.716	170+97.17 R5	36.5' Lt	24	24
	170+97.17 R5	32.5' Rt	24	24
102.152	193+99.25 R5	74.5' Lt	30	27
102.653	220+44.53 R5	50.5' Lt	30	27
	220+44.53 R5	50.5' Rt	30	27
103.314	255+34.61 R5	47.0' Rt	72	38
	255+34.61 R5	40.0' Lt	72	38
TOTAL	TOTAL			1776

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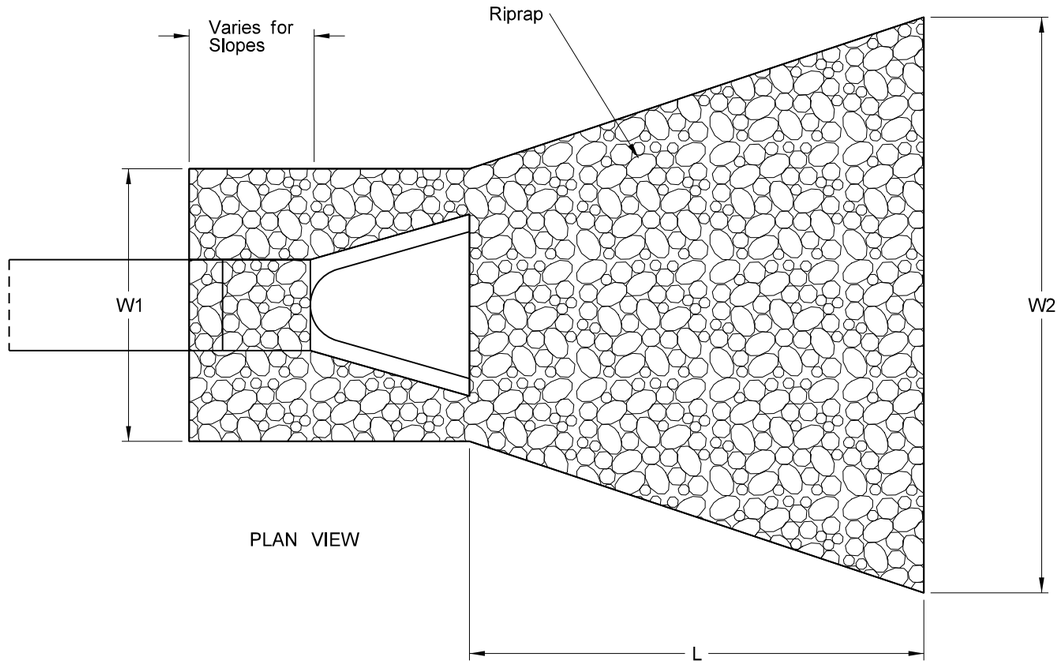
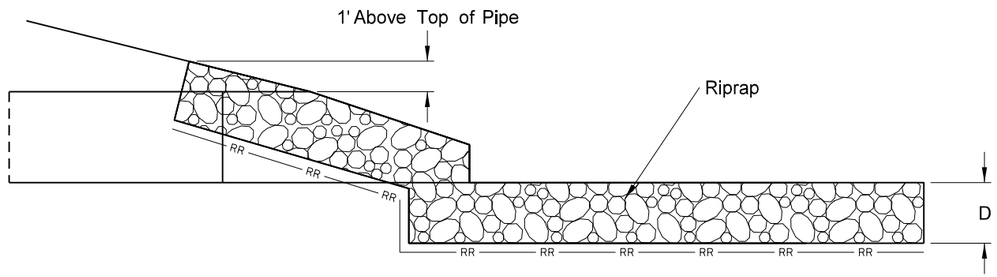
Culvert End Protection

Erosion Control Blanket Locations
ND Hwy 21
Carson East to Junction ND 31

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	8



PLAN VIEW



PROFILE VIEW

Stations Needing Riprap - Outlet Ends						
24" Pipe	30" Pipe	42" Pipe	48" Pipe	60" Pipe	72" Pipe	84" Pipe
129+00	96+00	149+00	126+19	247+45	255+35	37+65
158+00	217+30	379+40				
105+22	223+00					
	322+30					
	419+55					
	6+10					
	12+50					
	69+65					
	121+05					
	151+80					
	194+00					

See Section 75 plan view locations.

Riprap Dimensions				
Culvert Diameter (inches)	L (feet)	W_1 (feet)	W_2 (feet)	Riprap Depth, D (inches)
24	8.5	6	12	31
30	15.5	7.5	18	44
42	22	10.5	25	44
48	23.5	12	28	44
60	24	15	31	40
72	36	18	42	44
84	40	21	48	44

Culvert Diameter (inches)	RR Fabric (SY)	Riprap (CY)
24	14	11
30	31	34
36	--	--
42	56	63
48	67	76
54	--	--
60	79	82
72	144	167
84	183	213

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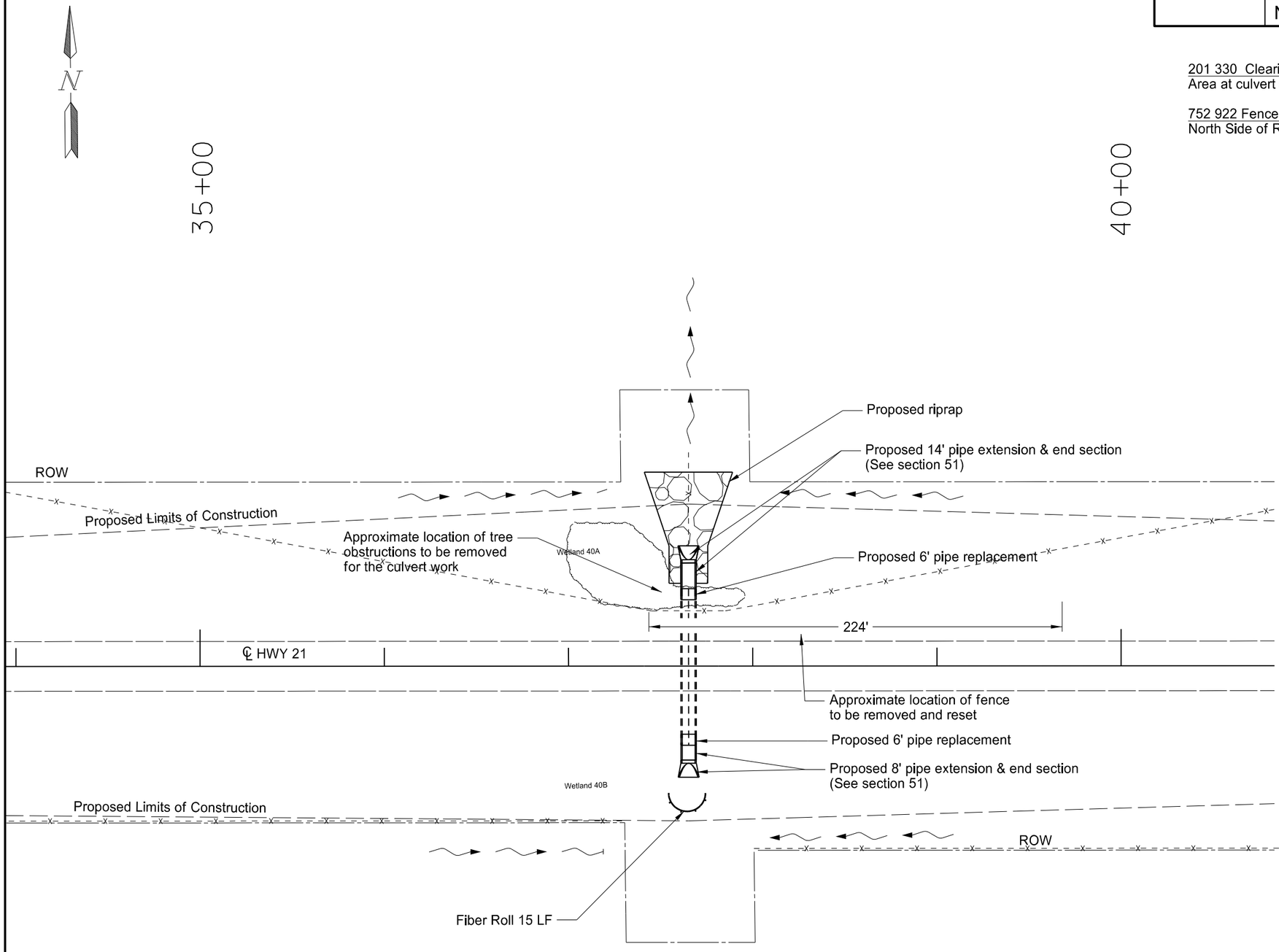
Riprap at Pipe Outlets

ND Hwy 21
Carson East to Junction ND 31

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	9

201 330 Clearing & Grubbing
Area at culvert end, north side of road — 1 L SUM

752 922 Fence Remove & Reset
North Side of Road — 224 LF



Existing 84 X 84 RCP
Sta 37+65.17/R5
RP 99.191
Lengthen left 14'
Lengthen right 8'

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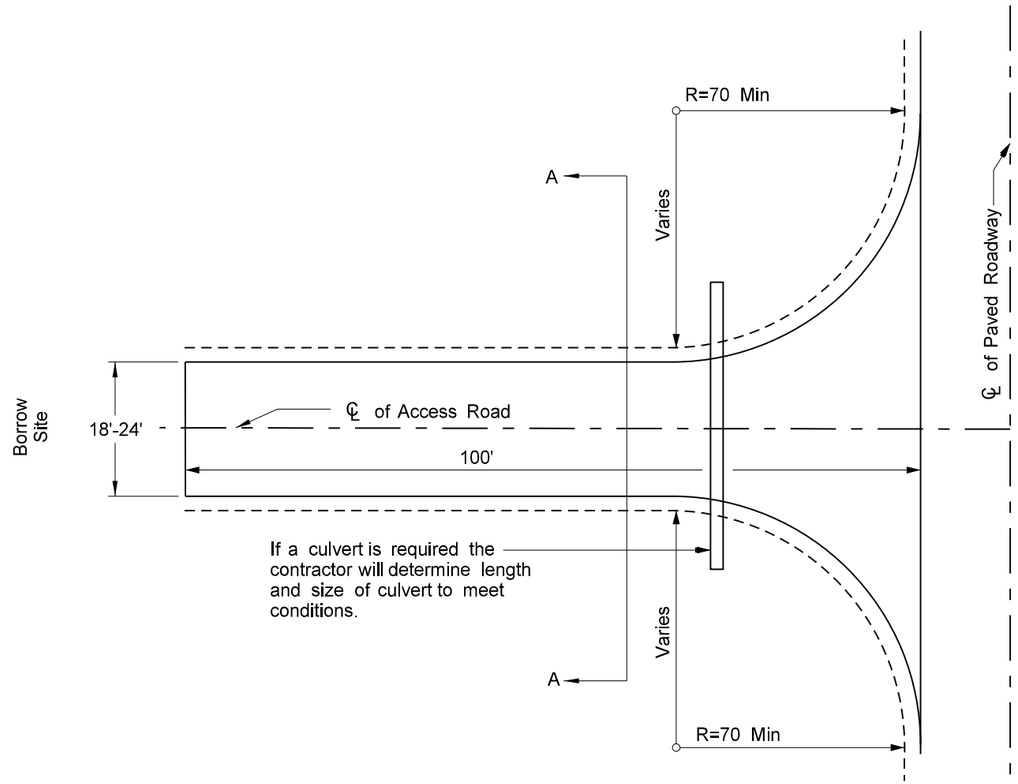
Tree & Brush Obstruction
for Culvert Work at RP 99.191

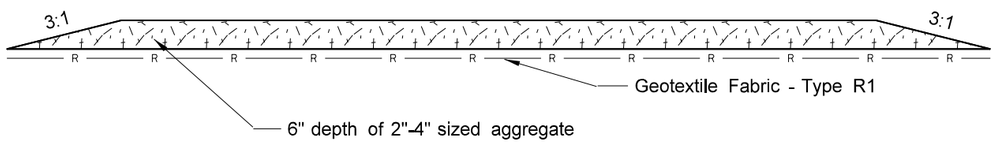
ND Hwy 21
Carson East to Junction ND 21

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	10

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	8500	STABILIZED CONSTRUCTION ACCESS		
		Borrow Site	EA	1



PLAN VIEW



A - A Cross Section

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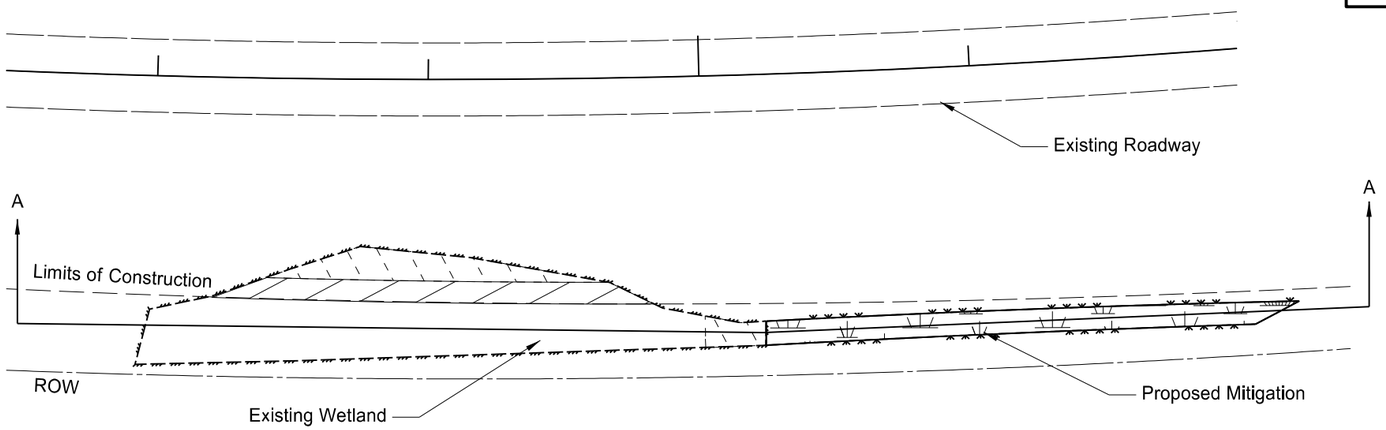
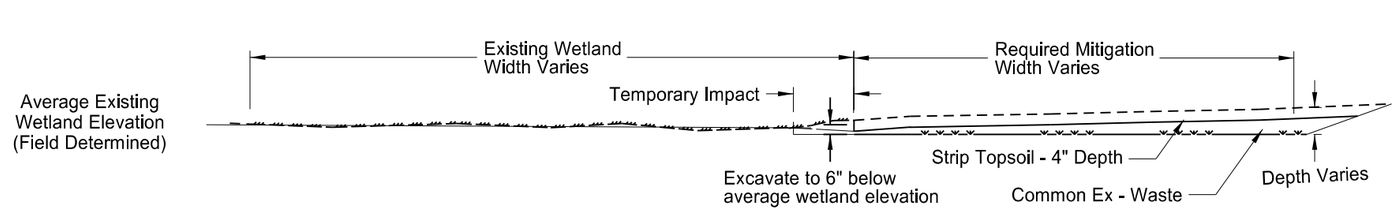
Stabilized Construction Access

ND Hwy 21
Carson East to Junction ND 31

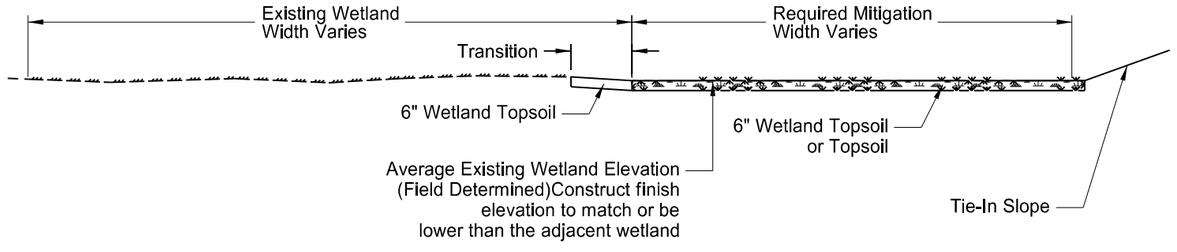
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	11



Plan



Typical Section A-A



Proposed Typical Section A-A

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Wetland Mitigation Detail

ND Hwy 21
Carson East to Junction ND 31

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	20	12

14
4-N
6 W

250+00

255+00

260+0

N

Construct 0.47 Acres of Wetlands

A

5' Flat Wetland Area

10:1 Slope for 15'

Flat Wetland Area

4:1 Inslope

371'

159'

180'

103'

104'

410'

A

ROW

Limits of Construction

Wetland 32-D

Wetland 24-A

Wetland 24-B

Limits of Const

Limits of Construction

ROW

Proposed Sliver Grading

Existing Roadway Inslope

Seed with Wetland Seed Mixture
See Topsoil - Wetland Plan Note - Section 6

Varies - Approx. 40'

15'

Varies

15'

5'

Wetland

Wetland

Existing Channel Backslope

4:1 Slope or Flatter

Topsoil

Approx. 10' Excavation

18" Depth

10:1 Slope

Flat

10:1 Slope

Flat

3'

Common Excavation - Waste
May be wasted on Sliver Grading Areas

Wetland Mitigation
(to be constructed)

Existing Wetland

Section A-A

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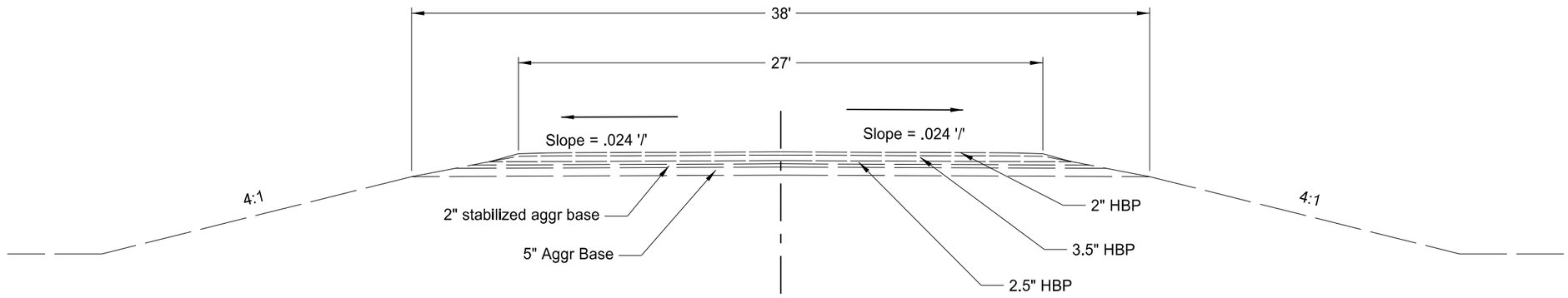
Wetland Mitigation Detail

ND Hwy 21
West Jct 49 East to Carson

8/29/2013 10:18:50 AM cfrising R:\project\10021090.018\design\Sheets\020TP_012_Wetland_Impacts_Mitigation_Area.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	30	1



Existing Typical Section

Carson East to Junction ND 31

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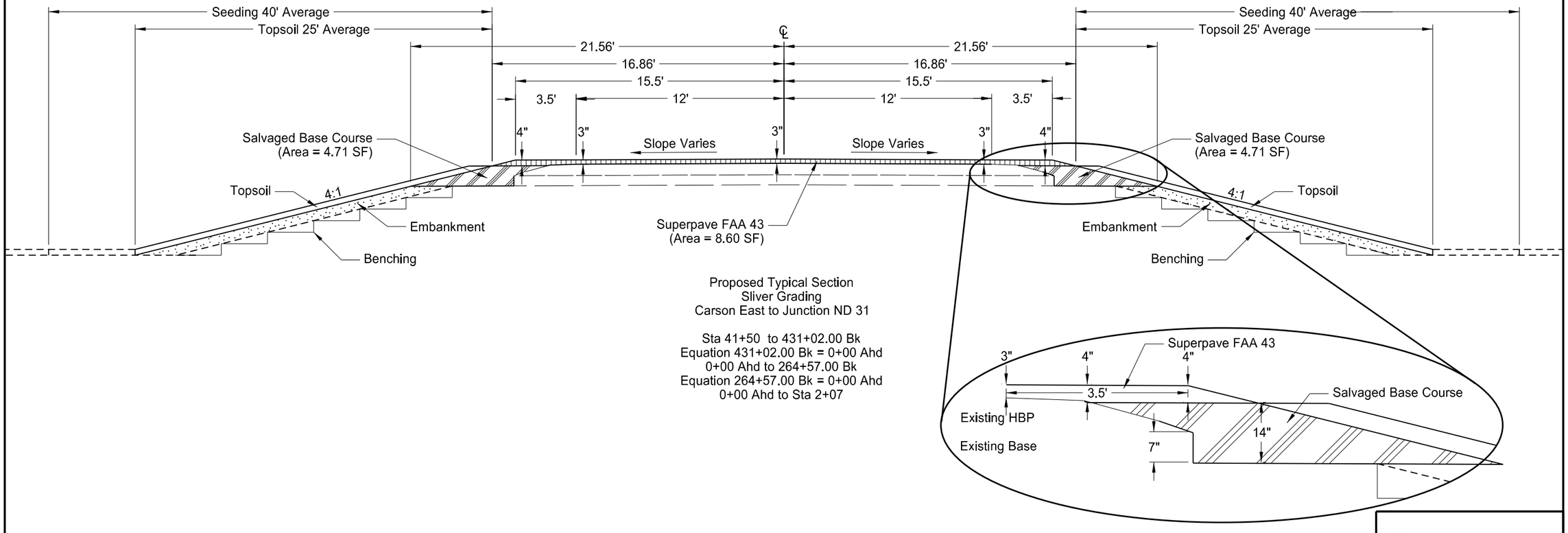
*The existing plans were based on Project SS-1-021(011)069 dated 1996 and grading plans

Existing Typical Sections

ND Hwy 21
Carson East to Junction ND 31

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	30	2



Proposed Typical Section
Sliver Grading
Carson East to Junction ND 31

Sta 41+50 to 431+02.00 Bk
Equation 431+02.00 Bk = 0+00 Ahd
0+00 Ahd to 264+57.00 Bk
Equation 264+57.00 Bk = 0+00 Ahd
0+00 Ahd to Sta 2+07

Item	Description	Left Width (FT)	Right Width (FT)	Length (Miles)	Total	Unit
203-0109	Topsoil - 4" Removal Depth	25	25	12.42	40,440	CY
708-2240	Seeding Type B Class II	40	40	12.42	120	ACRE
708-2260	Seeding Type B Class IV	40	40	12.42	120	ACRE
708-5500	Mulching (Temporary)	40	40	12.42	120	ACRE
708-5500	Mulching (Permanent)	40	40	12.42	120	ACRE

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Proposed Typical Sections

ND Hwy 21
Carson East to Junction ND 31

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	50	1

HYDRAULIC DATA FOR NH-1-021(018)090 (A)

STATION	EXISTING PIPE	PROPOSED PIPE SIZE	DRAINAGE AREA (ACRES)	25-YEAR DATA				100-YEAR DATA	
				DESIGN DISCHARGE (CFS)	DESIGN HEADWATER (FT)	DESIGN VELOCITY (FPS)	DESIGN STAGE (NAVD 88)	100-YEAR DISCHARGE (CFS)	100-YEAR STAGE (NAVD 88)
60+40	24"x62' RCP	30"	49.8	27.3	2.93	7.30	2292.43	45.2	2294.22
80+40	24"x62' RCP	24"	26.0	15.0	2.09	8.34	2295.57	25.1	2296.71
96+00	30"x82' RCP	30"	55.9	30.9	2.93	13.11	2290.41	51.0	2292.25
123+00	24"x58' RCP	24"	9.4	11.5	1.97	5.75	2251.77	18.5	2252.62
129+00	24"x70' RCP	24"	19.3	19.3	2.49	14.08	2244.79	31.0	2246.38
149+00	42"x56' RCP	42"	168.7	80.7	4.53	13.08	2197.53	130.4	2200.52
158+00	24"x64' RCP	24"	20.1	21.8	2.79	12.36	2193.29	34.8	2195.24
166+45	30"x62' RCP	30"	69.9	43.2	4.18	9.54	2190.89	69.9	2194.44
217+30	30"x130' RCP	30"	8.3	11.2	1.55	10.23	2194.55	18.0	2195.05
223+00	30"x94' RCP	30"	6.0	8.6	1.28	12.22	2192.78	13.9	2193.23
247+45	60"x86' RCP	60"	315.1	116.7	4.46	14.21	2195.97	189.6	2197.76
263+05	30"x122' RCP	30"	24.4	22.3	2.44	6.73	2142.43	35.9	2143.60
283+03	4'x6'x48' Cattle Pass	4'x6' C.P.	153.1	74.5	3.52	5.85	2144.32	120.4	2145.66
302+20	24"x52' RCP	24"	7.5	12.1	1.89	5.87	2153.21	19.1	2153.89
304+43	72"x78' RCP	72"	634.6	162.2	5.21	9.62	2145.40	267.4	2147.37
322+30	30"x108' RCP	30"	16.9	24.3	2.43	16.91	2143.13	37.8	2144.14
337+30	Dbl 48"x72' RCP	Dbl 48"	1736.4	313.7	5.02	9.75	2120.72	518.6	2123.35
344+00	4'x6'x48' Cattle Pass	4'x6' C.P.			4.32	9.83			
358+90	24"x52' RCP	24"	15.1	18.8	2.47	7.96	2167.17	29.8	2168.76
370+00	24"x60' RCP	24"	12.9	18.4	2.43	8.64	2172.93	28.8	2174.28
379+40	36"x56' RCP	42"	197.1	90.3	5.01	13.80	2157.71	145.7	2161.38
395+00	4'x6'x72' Cattle Pass	4'x6' C.P.	465.4	157.9	5.65	13.58	2133.35	255.6	2136.09
419+55	30"x58' RCP	30"	41.0	38.6	3.54	13.36	2122.54	60.9	2124.94
430+50	24"x50' RCP	24"	18.5	23.2	3.10	8.18	2117.10	36.6	2119.46
6+10	30"x72' RCP	30"	62.2	53.1	5.00	14.11	2100.50	83.5	2105.20
12+50	30"x94' RCP	30"	21.3	21.0	2.24	13.24	2100.24	33.7	2101.12
25+00	30"x154' RCP	30"	26.1	25.5	2.72	7.09	2097.72	40.6	2099.48
37+65	84"x84' RCP	84"	1183.2	272.6	6.30	14.80	2068.90	445.3	2071.48
69+65	30"x62' RCP	30"	81.6	50.2	4.68	13.32	2093.68	80.8	2097.68
87+00	24"x100' RCP	24"	8.6	12.0	1.82	5.96	2058.12	19.1	2058.87
105+22	24"x66' RCP	24"	10.0	11.9	1.79	10.16	2081.59	19.2	2082.30
107+40	30"x96' RCP	30"	72.8	45.9	4.95	9.91	2081.25	74.0	2085.72
121+05	30"x104' RCP	30"	17.9	22.3	2.33	13.33	2056.73	35.2	2057.65
126+19	48"x142' RCP	48"	179.8	91.9	4.40	15.19	2050.70	147.2	2053.01
151+80	30"x124' RCP	30"	78.2	53.2	4.98	18.65	2082.98	85.0	2087.96
171+00	24"x70' RCP	24"	34.4	25.4	3.40	8.68	2075.90	41.3	2079.51
194+00	30"x138' RCP	30"	58.2	33.5	3.13	11.82	2028.73	54.8	2030.81
220+45	30"x98' RCP	30"	59.0	30.3	3.15	7.72	2066.65	50.2	2069.02
255+35	72"x84' RCP	72"	672.9	200.5	5.68	12.71	2000.78	325.0	2003.20

(A) Hydraulic data provided is for smooth-walled (Manning's n=0.012) type conduits.

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Culvert Hydraulic Data

ND 21
Carson East to Jct ND 31

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	51	1

Ref Point	Begin Station / Location	Begin Offset	End Station / Location	End Offset	Length	Pipe Conduit Pay Size	Allowable Material	Required Diameter	Minimum Thickness	R1 Fabric (Pay Item)	Cattle Passes		(A) End Sections		End Sections						Removal of Pipe _ All Types & Sizes	Applicable Backfill Detail
											Remove & Relay Conc. Cattle Pass End Section	Conc Intermed. Section	Begin	End	Remove End Section	Remove & Relay	Install New Traversable End 24"	Install New Traversable End 30"	Install New Traversable End 36"	Install New RCP 84"		
					LF	In		In	In	SY	EA	LF	EA	EA	EA	EA	EA	EA	EA	EA	LF	
91.459	60+42.43 R4	37.0' Lt	60+42.43 R4	37.0 Rt	74	30	Reinforced Concrete Pipe - Class III **(barrel length = 72 LF)**	30		342			1		-			2			72	D-714-26
							Polymeric Coated Steel (over zinc or aluminum coated steel)	30	0.064					1								
91.837	80+38.27 R 4	30.0' Lt	80+38.27 R 4	36.0' Lt	6	24	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	24							1		1					D-714-28
	80+38.27 R 4	32.0" Rt	80+38.27 R 4	38.0' Rt	6	24	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	24							1		1					D-714-28
92.133	96+01.15 R4	39.5' Lt	96+01.15 R4	43.5' Lt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30							1			1				D-714-28
	96+01.15 R4	22' Rt	96+01.15 R4	30.0' Rt	6	30	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	30								1						D-714-28
92.644	122+99.23 R4	30.5' Lt	122+99.23 R4	36.5' Rt	6	24	Reinforced Concrete Pipe - Class III **(barrel length =6 LF)**	24							1		1					D-714-28
	122+99.23 R4	29.5' Rt	122+99.23 R4	35.5' Rt	8	24	Reinforced Concrete Pipe - Class III **(barrel length =8 LF)**	24							1		1					D-714-28
92.758	129+01.15 R4	46.5' Lt	129+01.15 R4	50.5' Lt	4	24	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	24								1						D-714-28
	129+01.15 R4	25.5' Rt	129+01.15 R4	35.5' Rt	10	24	Reinforced Concrete Pipe - Class III **(barrel length = 10 LF)**	24							1		1					D-714-28
93.137	149+02.27 R4	33.0' Lt	149+02.27 R4	37.0' Lt	4	42	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	42								1						D-714-28
	149+02.27 R4	24' Rt	149+02.27 R4	32.0' Rt	8	42	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	42								1						D-714-28
93.307	157+99.84 R4	38.0' Lt	157+99.84 R4	44.0 Rt	4	24	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	24							1		1					D-714-28
	157+99.84 R4	26.5' Rt	157+99.84 R4	34.5' Rt	8	24	Reinforced Concrete Pipe - Class III **(barrel length =8 LF)**	24							1		1					D-714-28
93.467	166+44.67 R4	29.0' Lt	166+44.67 R4	33.0' Lt	4	30	Reinforced Concrete Pipe - Class III **(barrel length =4 LF)**	30							1			1				D-714-28
	166+44.67 R4	30.0' Rt	166+44.67 R4	36.0' Rt	6	30	Reinforced Concrete Pipe - Class III **(barrel length =6 LF)**	30							1			1				D-714-28
94.43	217+29.31 R4	73.5'Lt	217+29.31 R4	79.5 Lt	6	30	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	30								1						D-714-28
	217+29.31 R4	59.5' Rt	217+29.31 R4	63.5' Rt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
94.54	223+00.00 R4	73.5' Lt	223+00.00 R3	77.5' Lt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
	223+00.00 R4	60.5' Rt	223+00.00 R4	64.5' Rt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
94.87			240+52.51 R4	Lt.			No extension required															D-714-28
	240+52.51 R4	38.5' Rt	240+52.51 R4	42.5 Rt	4	60	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	60								1						D-714-28
95.25				Lt.			No extension required															D-714-28
	260+58.91 R4	63.5' Rt	260+58.91 R4	67.5' Rt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
95.625	280+38.91 R2	27.0' Lt	280+38.91 R2	31.0' Lt	4		4' x 6' Conc Cattle Pass Extension (Lt) **(Barrel length = 4 LF)**				1	4										
	280+38.91 R2	21.0' Rt	280+38.91 R2	29.0' Rt	8		4' x 6' Conc Cattle Pass Extension(Rt) **(Barrel length = 8 LF)**				1	8										
96.038	302+19.55 R4	27.5' Lt	302+19.55 R4	33.5' Rt	6	24	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	24							1		1					D-714-28
	302+19.55 R4	24.5' Rt	302+19.55 R4	34.5' Rt	10	24	Reinforced Concrete Pipe - Class III **(barrel length = 10 LF)**	24								1						D-714-28
96.08	304+41.31 R4	42.5 Lt	304+41.31 R4	46.5' Rt	4	72	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	72								1						D-714-28
	304+41.31 R4	40.0' Rt	304+41.31 R4	46.0' Rt	6	72	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	72								1						D-714-28
96.419				Lt.			No extension required															D-714-28
	322+31.23 R4	36.0' Rt	322+31.23 R4	40.0' Rt	10	30	Reinforced Concrete Pipe - Class III **(barrel length = 10 LF)**	30								1						D-714-28
96.702	337+24.75 R4	36.0' Lt	337+24.75 R4	40.0' Lt	4	48	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	48								1						D-714-28
	337+24.75 R4	36.0' Rt	337+24.75 R4	42.0' Rt	6	48	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	48								1						D-714-28
96.704	337+36.24 R4	36.0' Lt	337+36.24 R4	40.0' Lt	4	48	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	48								1						D-714-28
	337+36.24 R4	36.0' Rt	337+36.24 R4	42.0' Rt	6	48	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	48								1						D-714-28
96.8	342+42.91 R4	26.0' Lt	342+42.91 R4	30.0' Lt	4		4' x 6' Conc Cattle Pass Extension (Lt) **(Barrel length = 4 LF)**				1	4										
	342+42.91 R4	22.0' Rt	342+42.91 R4	28.0' Rt	6		4' x 6' Conc Cattle Pass Extension (Lt) **(Barrel length = 6 LF)**				1	6										
97.112	358+90.27 R4	27.5' Lt	358+90.27 R4	33.5' Lt	6	24	Reinforced Concrete Pipe - Class III **(barrel length =6 LF)**	24							1		1					D-714-28
	358+90.27 R4	25.50' Rt	358+90.27 R4	31.5' Rt	6	24	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	24							1		1					D-714-28
97.322	369+99.07 R4	31.5' Lt	369+99.07 R4	39.5' Lt	8	24	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	24							1		1					D-714-28
	369+99.07 R4	28.5' Rt	369+99.07 R4	36.5' Rt	8	24	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	24							1		1					D-714-28
97.5	379+38.91 R4	39.0' Lt	379+38.91 R4	36.0'Rt	72	42	Reinforced Concrete Pipe - Class III **(barrel length = 66 LF)**	42		349			1	1							56	D-714-26
							Polymeric Coated Steel (over zinc or aluminum coated steel)	48	0.064													D-714-26

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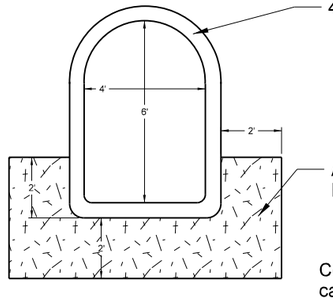
Pipe List

ND Hwy 21
Carson East to Junction ND 31

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	51	2

Ref Point	Begin Station / Location	Begin Offset	End Station / Location	End Offset	Length	Pipe Conduit Pay Size	Allowable Material	Required Diameter	Minimum Thickness	R1 Fabric (Pay Item)	Cattle Passes		(A) End Sections		End Sections						Removal of Pipe _ All Types & Sizes	Applicable Backfill Detail
											Remove & Relay Conc. Cattle Pass End Section	Conc Intermed. Section	Begin	End	Remove End Section	Remove & Relay	Install New Traversable End 24"	Install New Traversable End 30"	Install New Traversable End 36"	Install New RCP 84"		
					LF	In		In	In	SY	EA	LF	EA	EA	EA	EA	EA	EA	EA	EA	LF	
97.75	392+58.91 R4	33.0' Lt	392+58.91 R4	39.0' Lt	6		4' x 6' Conc Cattle Pass Extension (Lt) **(Barrel length = 6 LF)**				1	6			-							D-714-28
	392+58.91 R4	41.0' Rt	392+58.91 R4	47.0' Rt	6		4' x 6' Conc Cattle Pass Extension (Lt) **(Barrel length = 6 LF)**				1	6			-							D-714-28
98.261	419+56.99 R4	33.5' Lt	419+56.99 R4	41.5' Lt	8	30	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	30							1			1				D-714-28
	419+56.99 R4	26.5' Rt	419+56.99 R4	32.5' Rt	6	30	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	30							1			1				D-714-28
98.468				Lt.			No extension required															D-714-28
	430+49.95 R4	28.5' Rt	430+49.95 R4	32.5' Rt	4	24	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	24							1		1					D-714-28
98.594	6+13.01 R5	32.5' Lt	6+13.01 R5	40.5' Rt	8	30	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	30							1			1				D-714-28
	6+13.01 R5	32.5' Rt	6+13.01 R5	40.5' Rt	8	30	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	30							1			1				D-714-28
98.715	12+51.89 R5	55.5' Lt	12+51.89 R5	59.5' Lt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	30							1			1				D-714-28
				Rt.			No extension required															D-714-28
98.951	24+97.97 R5			Lt.			No extension required															D-714-28
	24+97.97 R5			Rt.			No extension required															D-714-28
99.191	37+65.17 R5	42.0' Lt	37+65.17 R5	56.0' Lt	20	84	Reinforced Concrete Pipe - Class III **(barrel length = 20 LF)**	84	See Detail 20-9 for additional quantity's											1	6	D-714-28
	37+65.17 R5	27.5' Rt	37+65.17 R5	35.5' Rt	14	84	Reinforced Concrete Pipe - Class III **(barrel length = 14 LF)**	84												1	6	D-714-28
99.797	69+64.85 R5	35.5' Lt	69+64.85 R5	41.5' Lt	6	30	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	30							1	-		1				D-714-28
	69+64.85 R5	27.5'Rt	69+64.85 R5	35.5' Rt	8	30	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	30							1	-		1				D-714-28
100.471	105+23.57 R5	41.5'Lt	105+23.57 R5	45.5'Lt	4	24	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	24							1	-	1					D-714-28
	105+23.57 R5	24.5' Rt	105+23.57 R5	34.5' Rt	10	24	Reinforced Concrete Pipe - Class III **(barrel length = 10 LF)**	24							1		1					D-714-28
100.512	107+40.05 R5	52.5' Lt	107+40.05 R5	56.5' Rt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
	107+40.05 R5	51.5' Rt	107+40.05 R5	55.5' RT	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
100.77	121+02.29 R5	60.5' Lt	121+02.29 R5	64.5' Lt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
	121+02.29 R5	48.5' Rt	121+02.29 R5	52.5' Rt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
100.864	125+98.61 R5	60.5' Lt	125+98.61 R5	64.5' Lt	8	48	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	48								1						D-714-28
	125+98.61 R5	55.5' Rt	125+98.61 R5	52.5' Rt	6	48	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	48								1						D-714-28
101.33	150+59.09 R5						4' x 6' Conc Cattle Pass No extension required															
101.353	151+80.53 R5	75.5' Lt	151+80.53 R5	79.5' Lt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
	151+80.53 R5	29.5' Rt	151+80.53 R5	33.5'Rt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
101.716	170+97.17 R5	36.5' Lt	170+97.17 R5	44.5' Lt	8	24	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	24							1	-	1					D-714-28
	170+97.17 R5	32.5' Rt	170+97.17 R5	40.5' Rt	8	24	Reinforced Concrete Pipe - Class III **(barrel length = 8 LF)**	24							1	-	1					D-714-28
102.152	193+99.25 R5	74.5' Lt	193+99.25 R5	78.5' Lt	4	30	Reinforced Concrete Pipe - Class III (barrel length = 4 LF)	30								1						D-714-26
				Rt.			No extension required															
102.23	198+11.09 R5	24'.0' Lt	198+11.09 R5	28.0' Lt	4		4' x 6' Conc Cattle Pass Extension (Lt) **(Barrel length = 4 LF)**				1	4				-						
	198+11.09 R5	24.0' Rt	198+11.09 R5	28.0' Rt	4		4' x 6' Conc Cattle Pass Extension(Rt) **(Barrel length = 4 LF)**				1	4				-						
102.653	220+44.53 R5	50.5' Lt	220+44.53 R5	54.5' Lt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
	220+44.53 R5	50.5' Rt	220+44.53 R5	54.5' Rt	4	30	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	30								1						D-714-28
103.314	255+34.61 R5	47.0' Rt	255+34.61 R5	51.0' Rt	4	72	Reinforced Concrete Pipe - Class III **(barrel length = 4 LF)**	72								1						D-714-28
	255+34.61 R5	40.0' Lt	255+34.61 R5	46.0' Rt	6	72	Reinforced Concrete Pipe - Class III **(barrel length = 6 LF)**	72								1						D-714-28
TOTAL	**TOTAL**									691	8	42	2	2	27	31	17	12	0	2	140	

(A) Not paid for separately, to be included in the price bid for Pipe Conduit.



4' x 6' Standard Section Concrete Cattle Pass

Aggregate Base Course Cl 3 or Cl 5
Backfill Area = 26.09 SF

Compaction requirements for all materials associated with the cattle pass trench installation shall meet 90% of AASHTO T-180. Maximum thickness of any one lift shall not exceed 6 inches.

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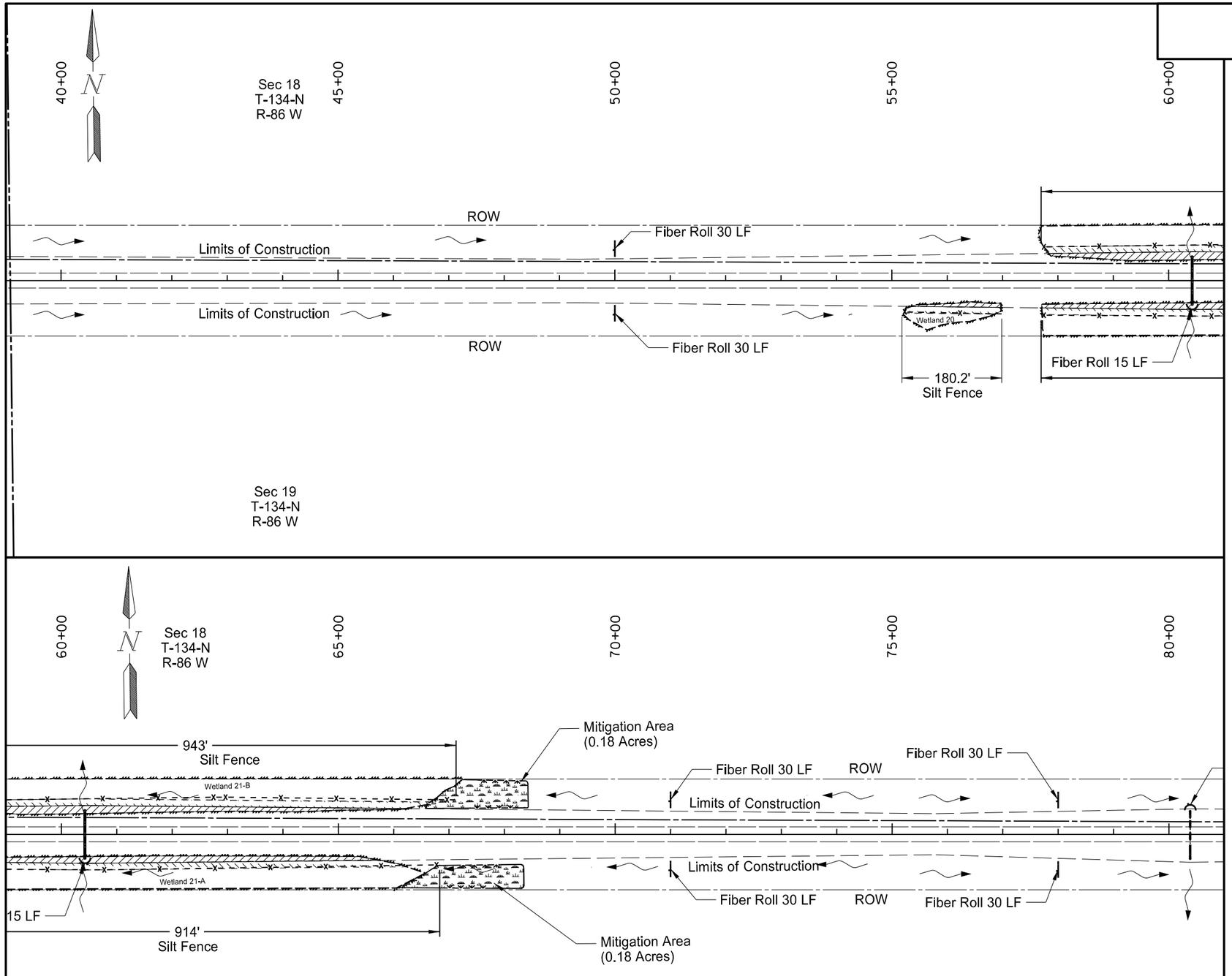
Pipe List

ND Hwy 21
Carson East to Junction ND 31

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	1



Temporary Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1325	SILT FENCE SUPPORTED		
		40+00 to 80+00	LF	2037
708	1335	REMOVAL SILT FENCE SUPPORTED		
		40+00 to 80+00	LF	2037

Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1430	FIBER ROLLS 12 IN		
		60+42 Rt	LF	15
		40+00 to 80+00	LF	180
203	113	COMMON EXCAVATION - WASTE		
		Wetland 21-A	CY	290
		Wetland 21-B	CY	290
203	121	TOPSOIL-WETLAND		
		Wetland 21-A	CY	145
		Wetland 21-B	CY	145

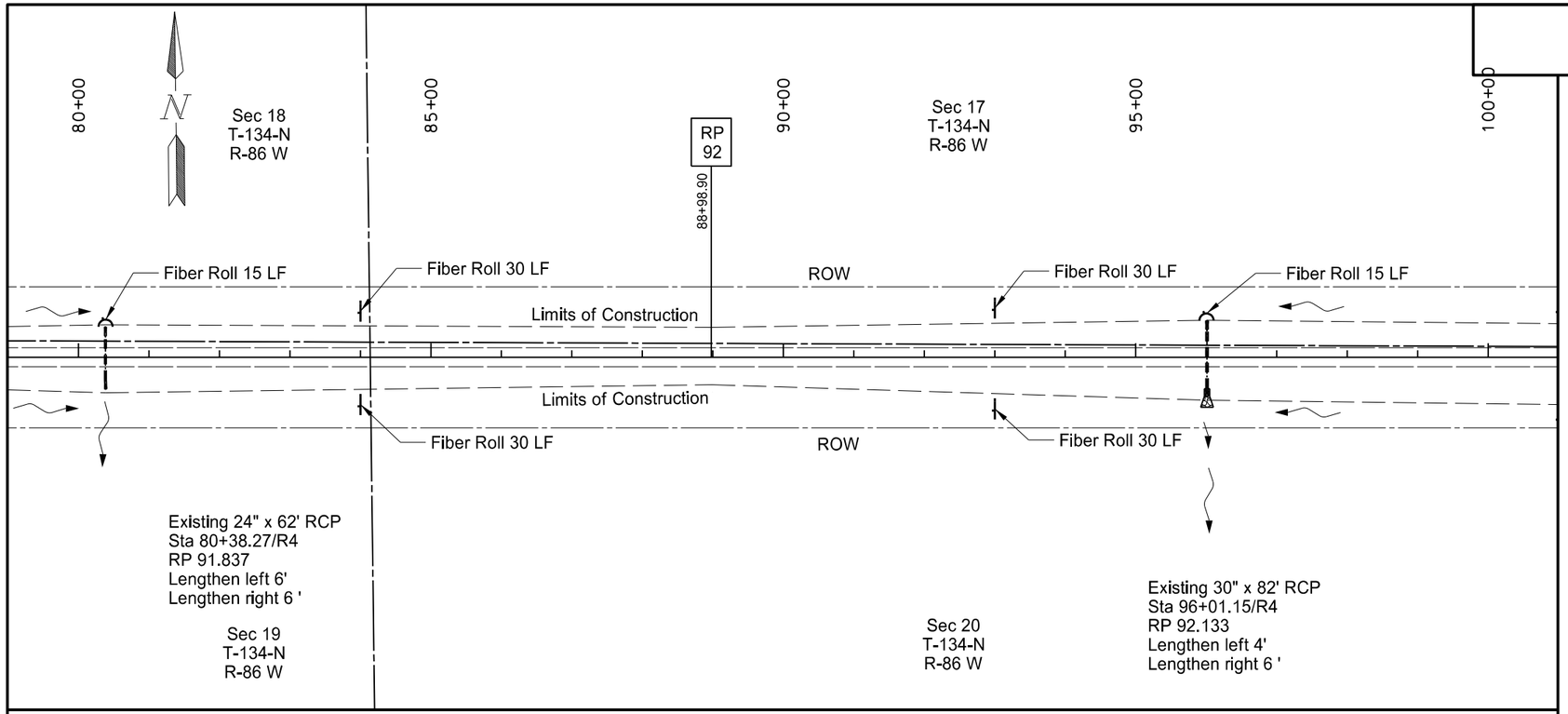
Legend

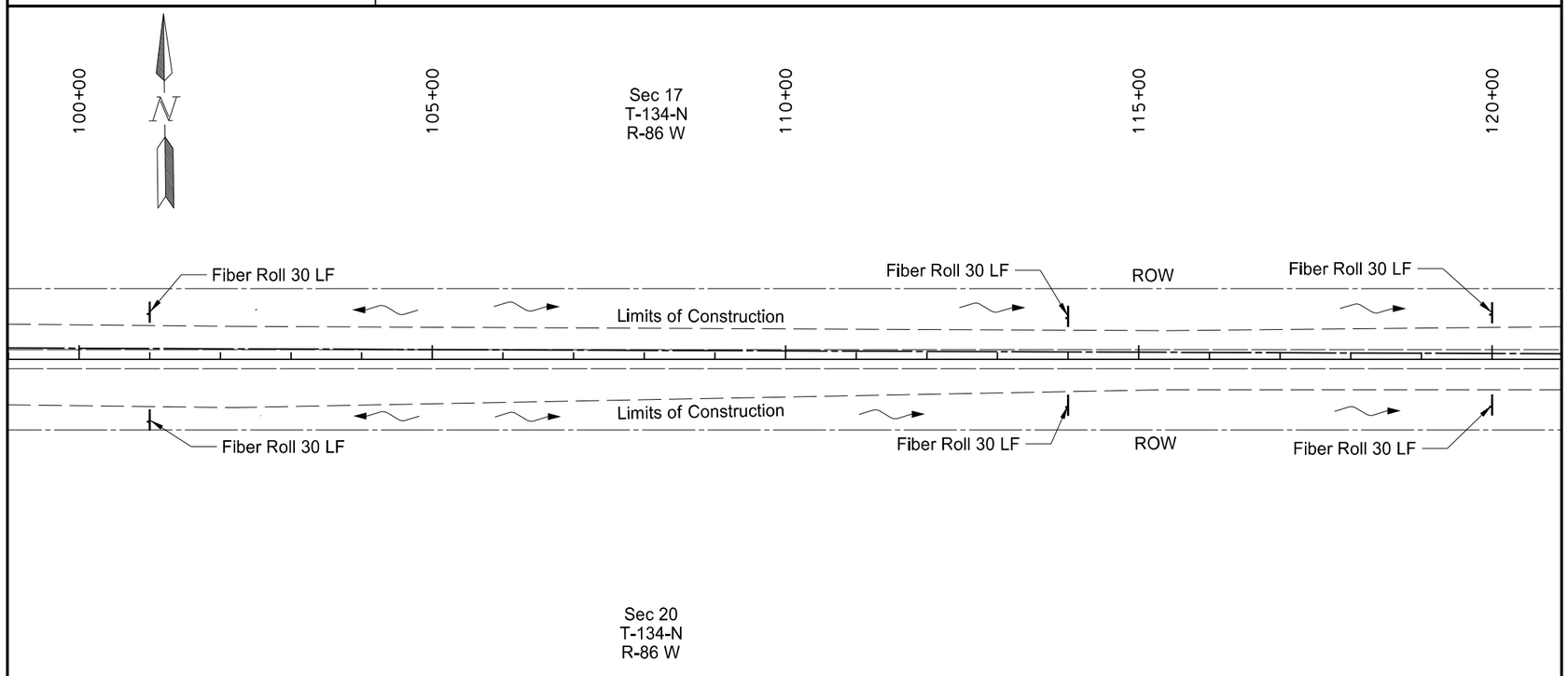
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	2





Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	**1020**	**RIPRAP - LOOSE ROCK**		
		96+01 Rt - 30" Pipe	CY	41
708	**1430**	**FIBER ROLLS 12 IN**		
		96+01 Lt	LF	15
		80+00 to 120+00	LF	300
709	**600**	**GEOTEXTILE FABRIC - TYPE RR**		
		96+01 Rt - 30" Pipe	SY	31

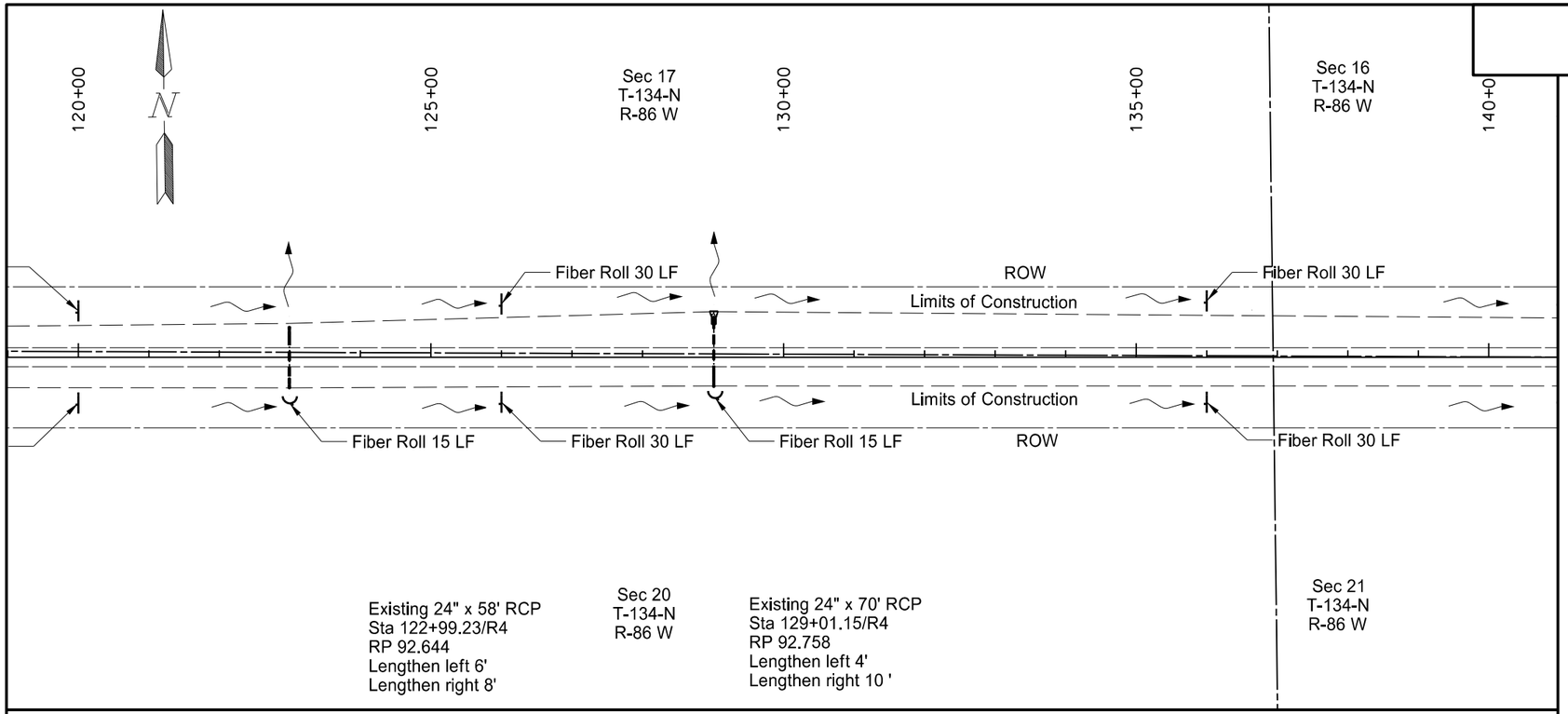
Legend

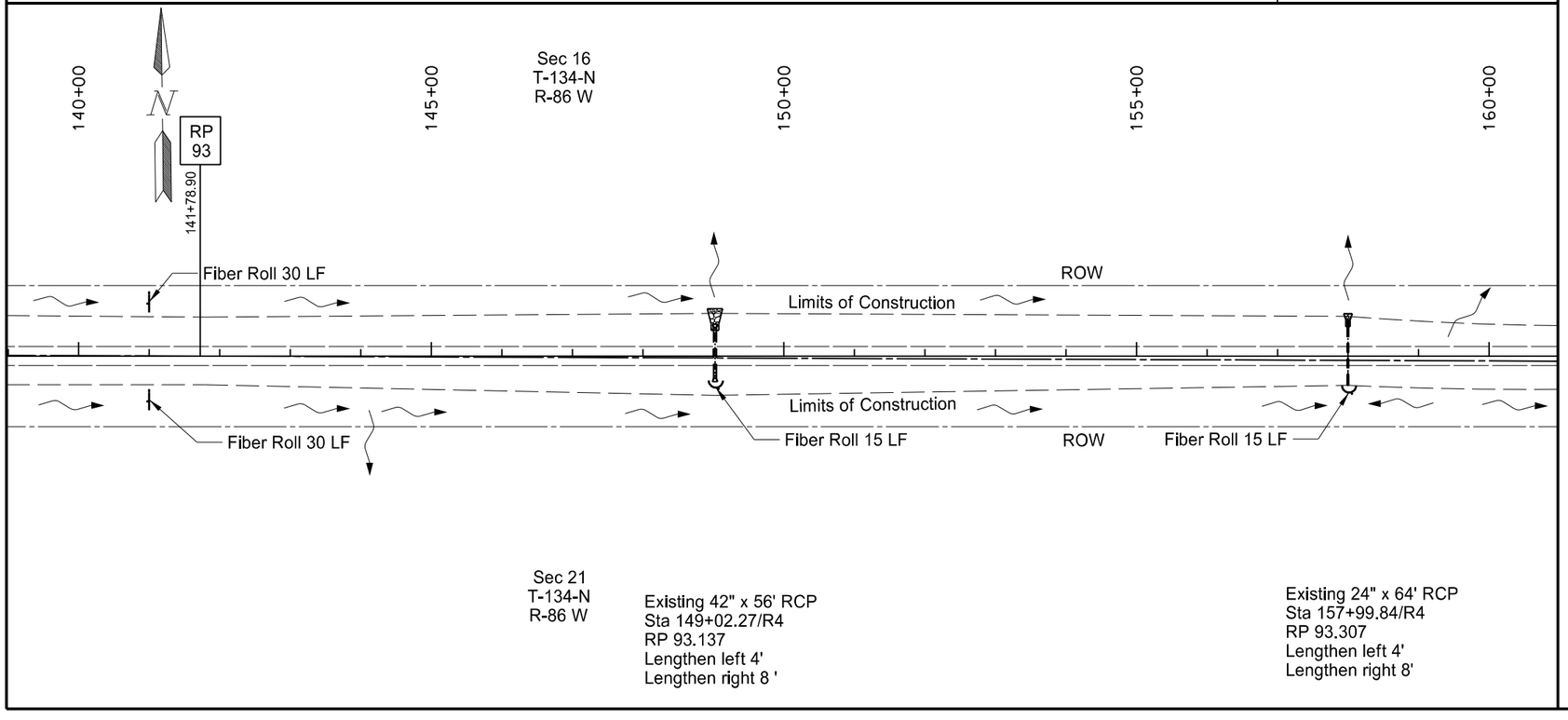
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	3





Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	**1020**	**RIPRAP - LOOSE ROCK**		
		129+01.15 Lt - 24" Pipe	CY	41
		149+02.27 Lt - 42" Pipe	CY	51
		157+99.84 Rt - 24" Pipe	CY	41
708	**1430**	**FIBER ROLLS 12 IN**		
		122+99.23 Rt	LF	15
		129+01.15 Rt	LF	15
		149+02.27 Rt	LF	15
		157+99.84 Rt	LF	15
		120+00 to 160+00	LF	180
709	**600**	**GEOTEXTILE FABRIC - TYPE RR**		
		129+01.15 Lt - 24" Pipe	SY	41
		149+02.27 Lt - 42" Pipe	SY	51
		157+99.84 Rt - 24" Pipe	SY	41

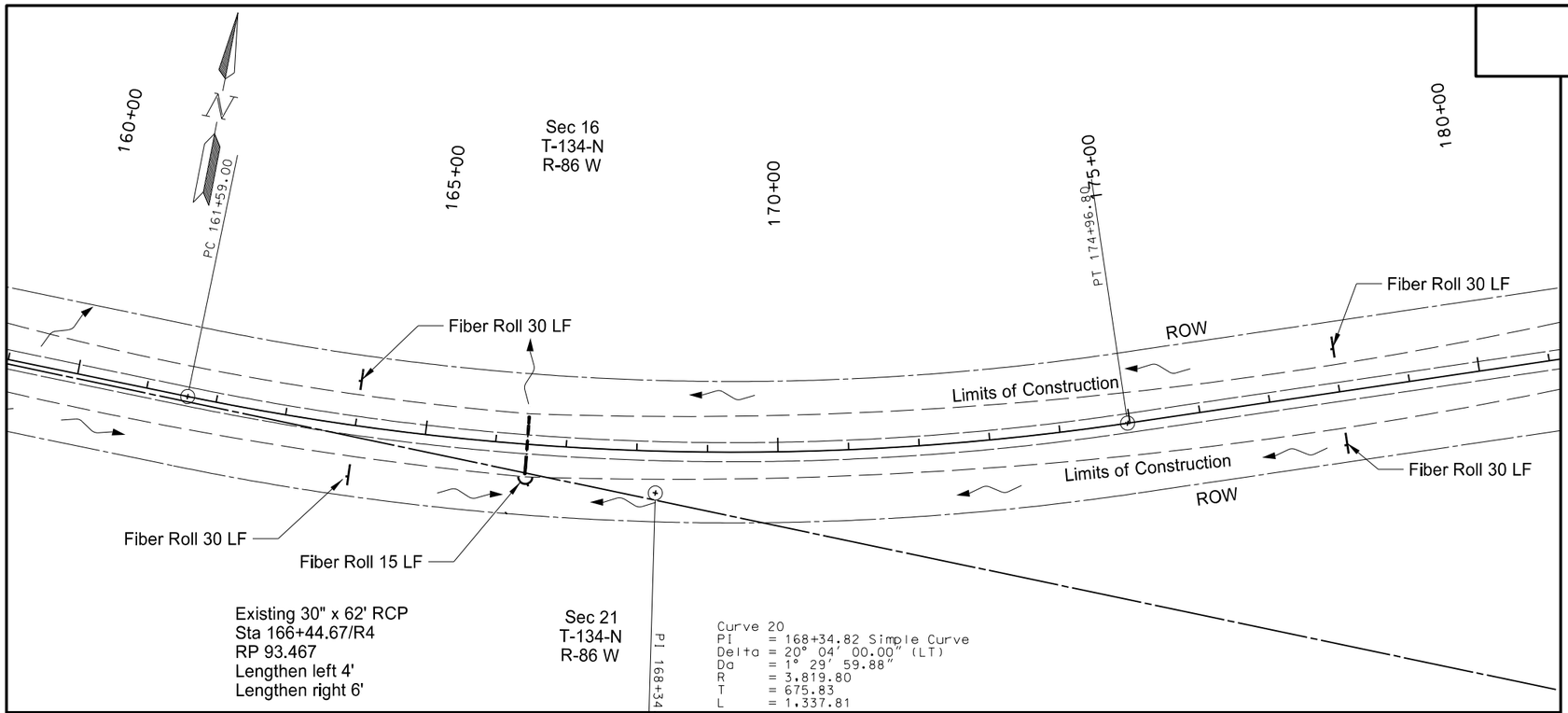
Legend

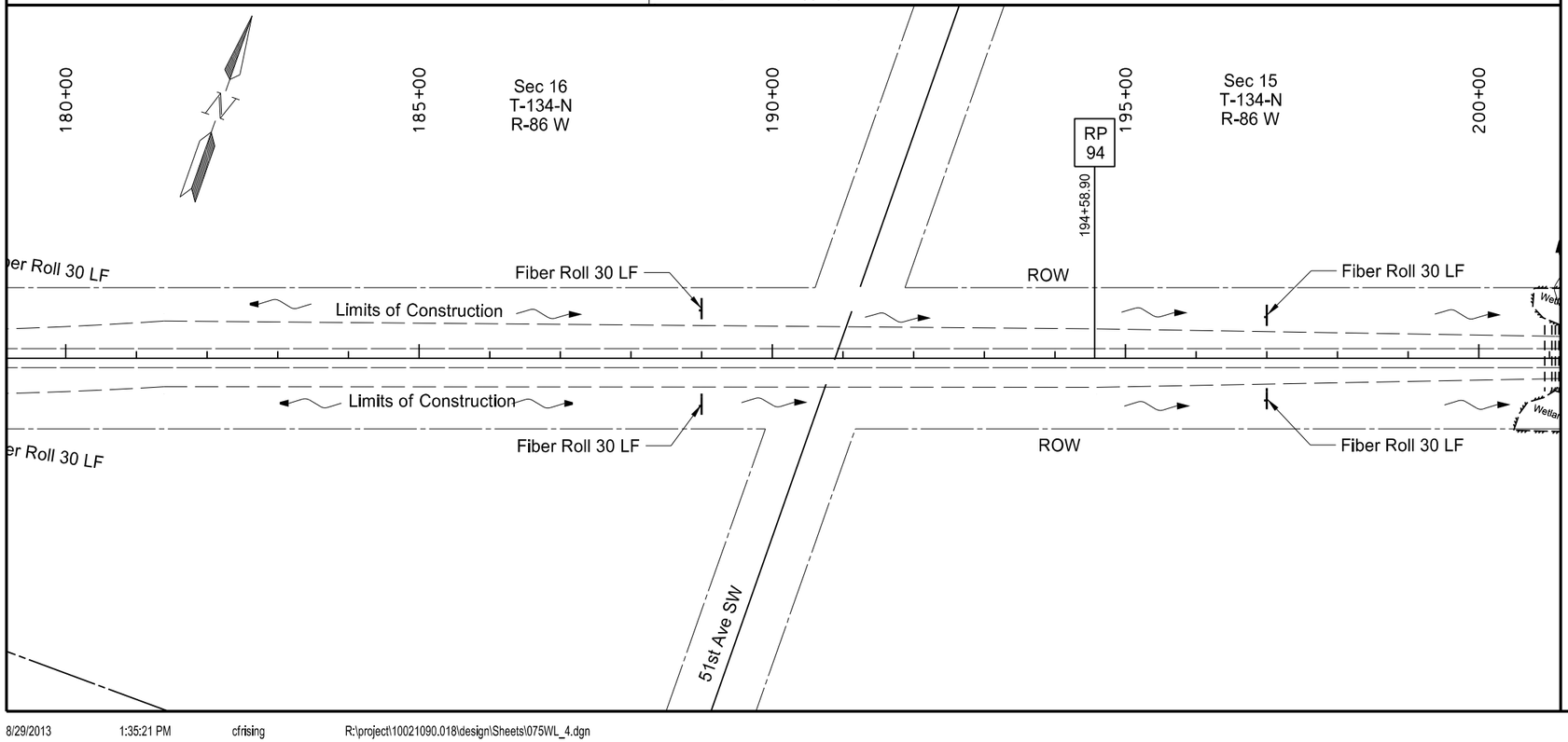
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	4





Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1430	FIBER ROLLS 12 IN		
		166+44.67 Rt	LF	15
		160+00 to 200+00	LF	240

Legend

- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

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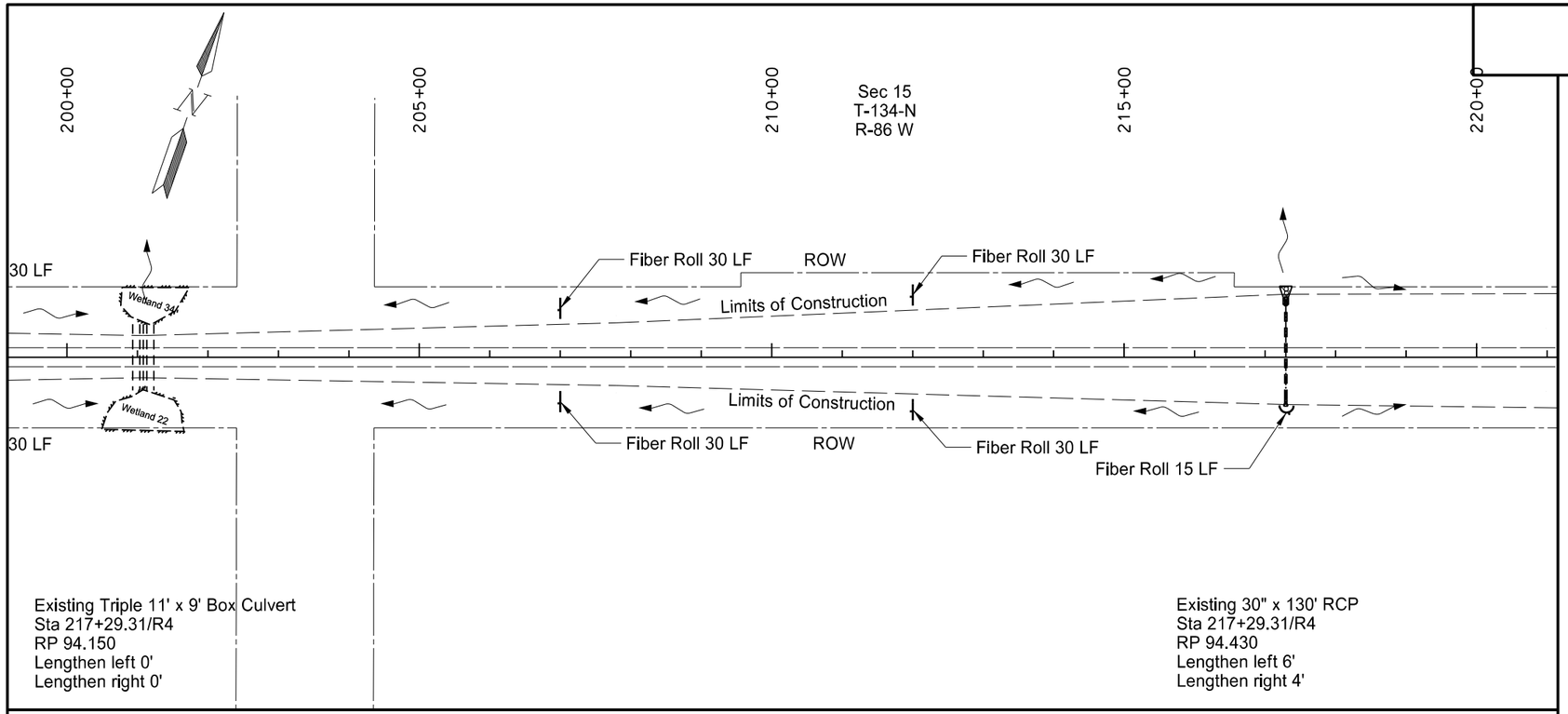
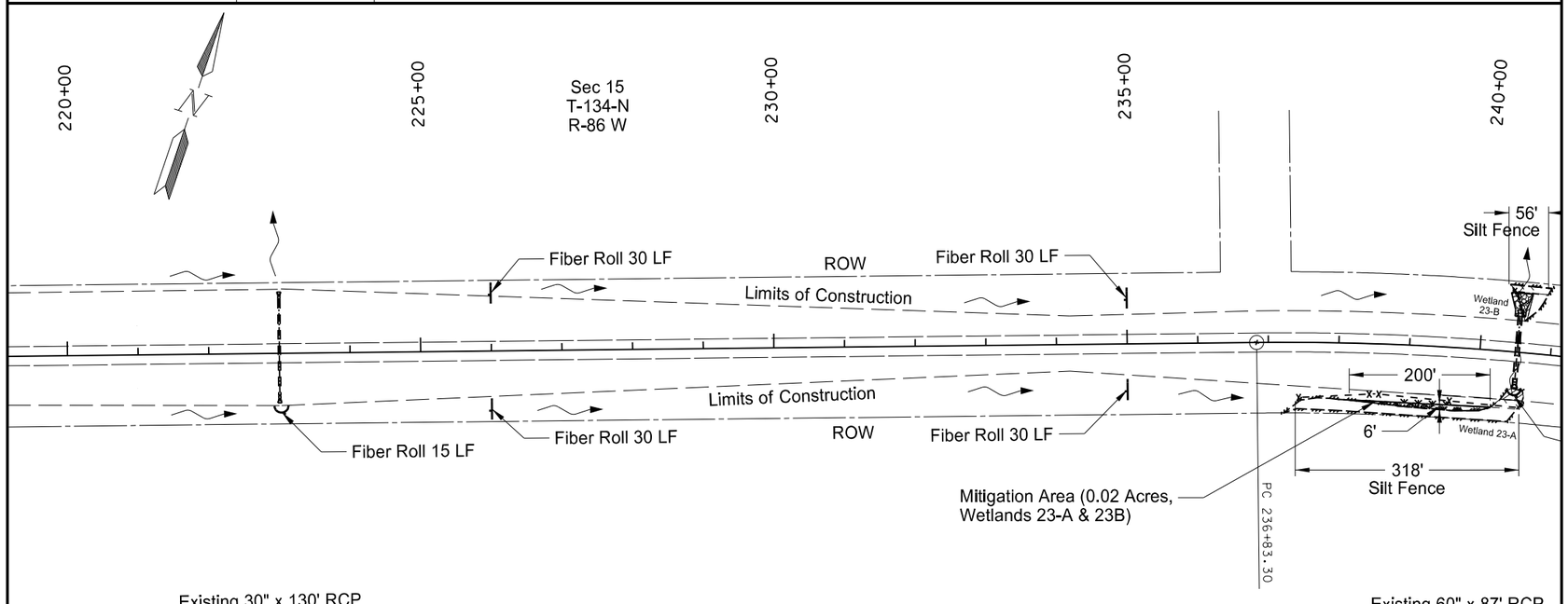
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	5





Temporary Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1325	SILT FENCE SUPPORTED		
		237+38 to 246+56 Rt	LF	318
708	1335	REMOVAL SILT FENCE SUPPORTED		
		237+38 to 246+56 Rt	LF	318

Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
203	113	COMMON EXCAVATION - WASTE		
		Wetland 23-A	CY	32
203	121	TOPSOIL-WETLAND		
		Wetland 23-A	CY	16
708	1020	RIPRAP - LOOSE ROCK		
		217+29.31 Lt - 30" Pipe	CY	31
708	1430	FIBER ROLLS 12 IN		
		217+29.31 Rt	LF	15
		223+00.00 Rt	LF	15
		200+00 to 240+00	LF	240
709	600	GEOTEXTILE FABRIC - TYPE RR		
		217+29.31 Lt - 30" Pipe	SY	31

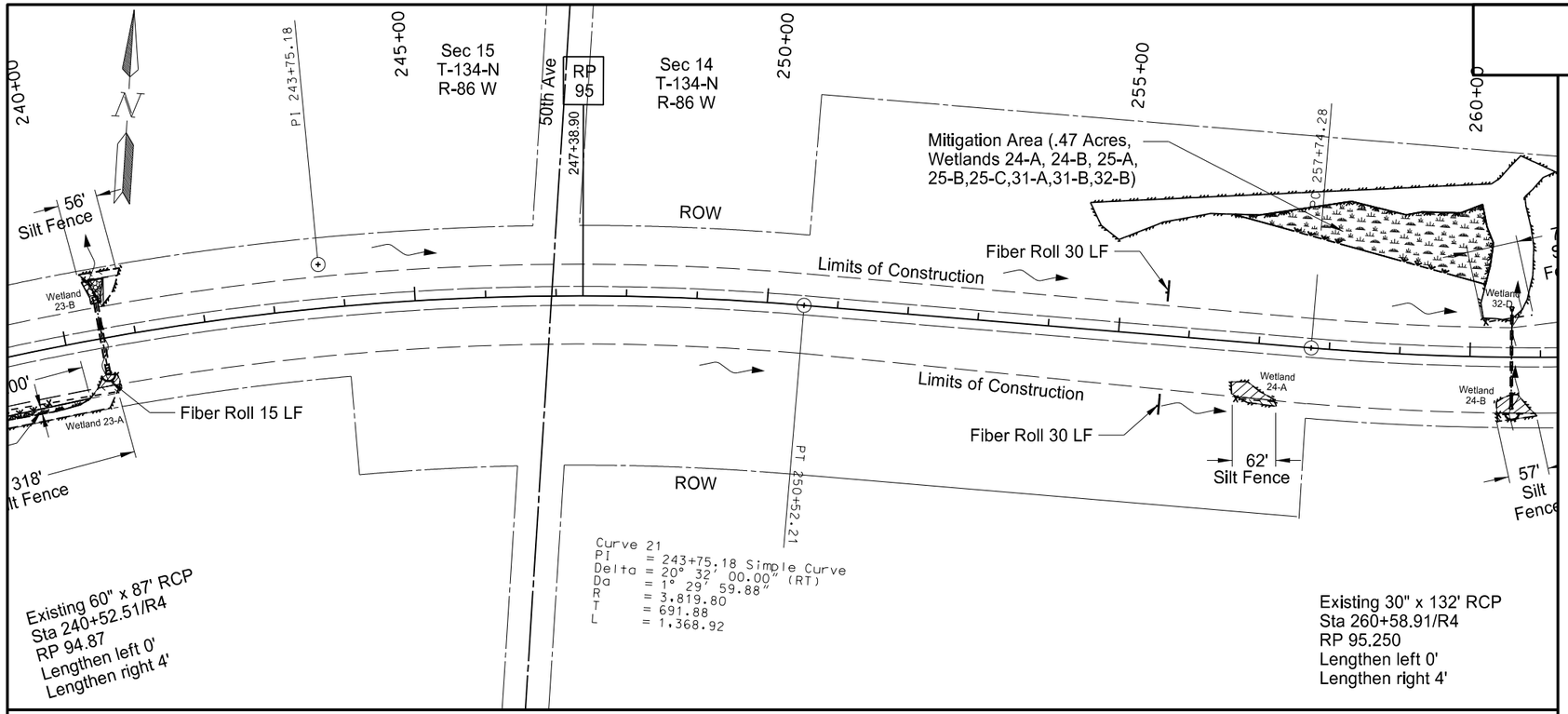
Legend

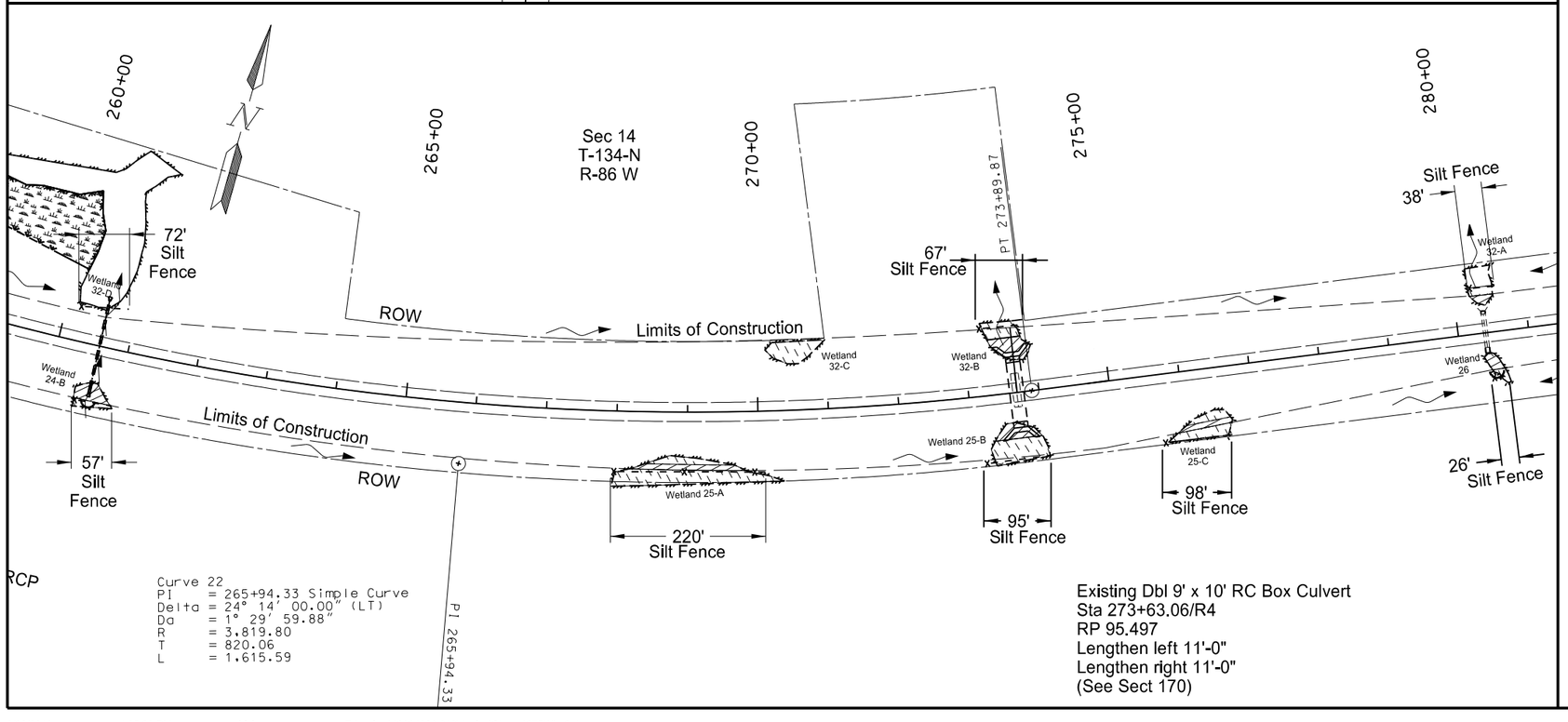
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	6





Temporary Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1325	SILT FENCE SUPPORTED		
		240+36 to 240+92 Lt	LF	56
		256+63 to 257+25 Rt	LF	62
		260+11 to 260+83 Lt	LF	72
		260+36 to 260+93 Rt	LF	57
		267+93 to 270+13 Rt	LF	220
		274+32 to 275+27 Rt	LF	95
		274+39 to 275+06 Lt	LF	67
		275+64 to 276+62 Rt	LF	98
708	1335	REMOVAL SILT FENCE SUPPORTED		
		240+36 to 240+92 Lt	LF	56
		256+63 to 257+25 Rt	LF	62
		260+11 to 260+83 Lt	LF	72
		260+36 to 260+93 Rt	LF	57
		267+93 to 270+13 Rt	LF	220
		274+32 to 275+27 Rt	LF	95
		274+39 to 275+06 Lt	LF	67
		275+64 to 276+62 Rt	LF	98

Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
203	113	COMMON EXCAVATION - WASTE		
		Wetland 32-D	CY	7583
203	121	TOPSOIL-WETLAND		
		Wetland 23-B	CY	379
708	1020	RIPRAP - LOOSE ROCK		
		240+52 Lt - 60" Pipe	CY	87
708	1430	FIBER ROLLS 12 IN		
		240+52.51 Rt	LF	15
		260+58.91 Rt	LF	15
		240+00 to 280+00	LF	60
709	600	GEOTEXTILE FABRIC - TYPE RR		
		240+52 Lt - 60" Pipe	SY	87

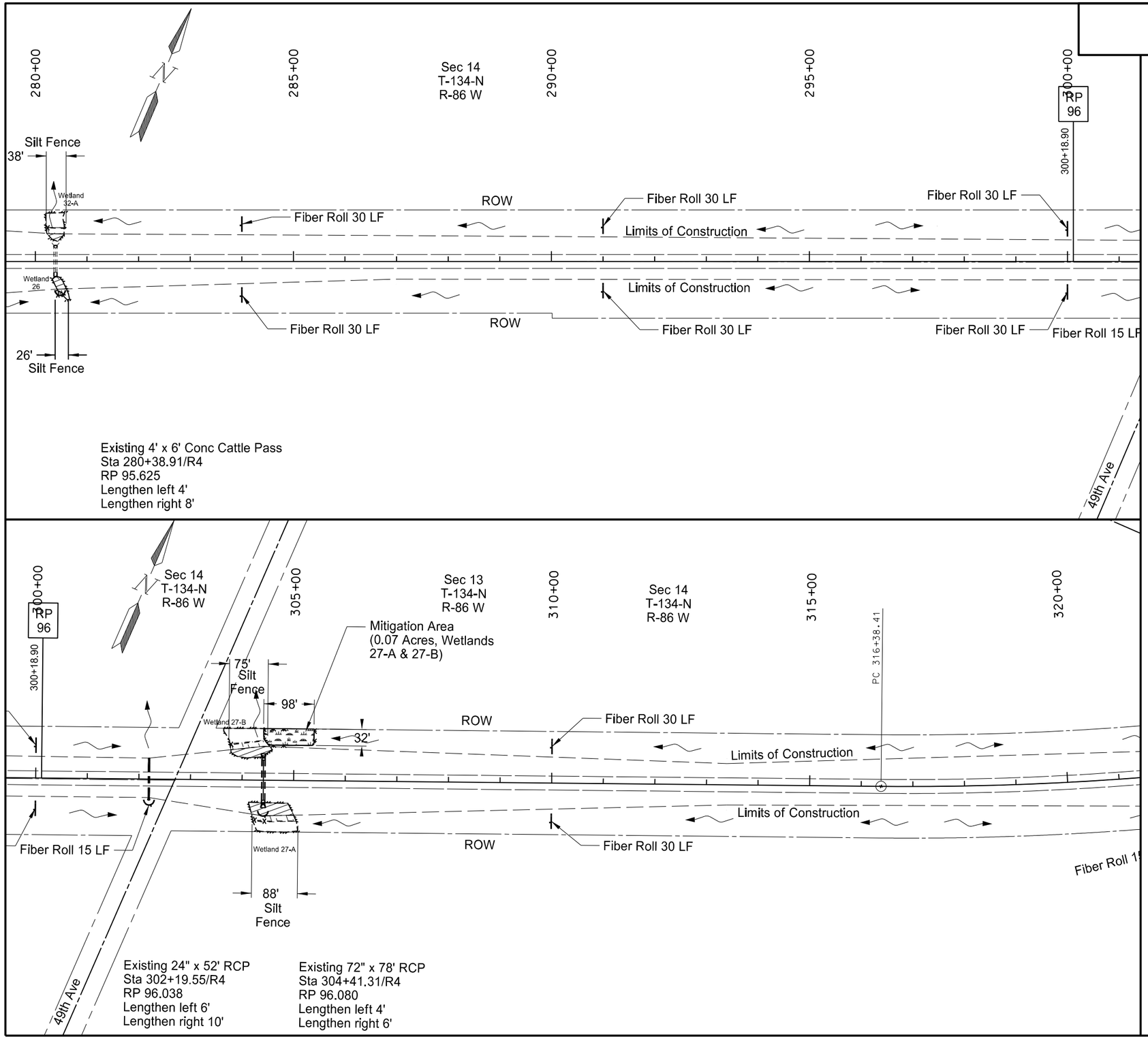
Legend

- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	7



Temporary Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	**1325**	**SILT FENCE SUPPORTED**		
		280+38 to 280+63 Rt	LF	26
		280+19 to 280+57 Lt	LF	38
		303+73 to 304+48 Lt	LF	75
		304+20 to 305+08 Rt	LF	88
708	**1335**	**REMOVAL SILT FENCE SUPPORTED**		
		280+38 to 280+63 Rt	LF	26
		280+19 to 280+57 Lt	LF	38
		303+73 to 304+48 Lt	LF	75
		304+20 to 305+08 Rt	LF	88

Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
203	**113**	**COMMON EXCAVATION - WASTE**		
		Wetland 27-B	CY	113
203	**121**	**TOPSOIL-WETLAND**		
		Wetland 27-B	CY	32
708	**1430**	**FIBER ROLLS 12 IN**		
		280+38.91 Rt	LF	15
		302+19.55 Rt	LF	15
		280+00 to 320+00	LF	240

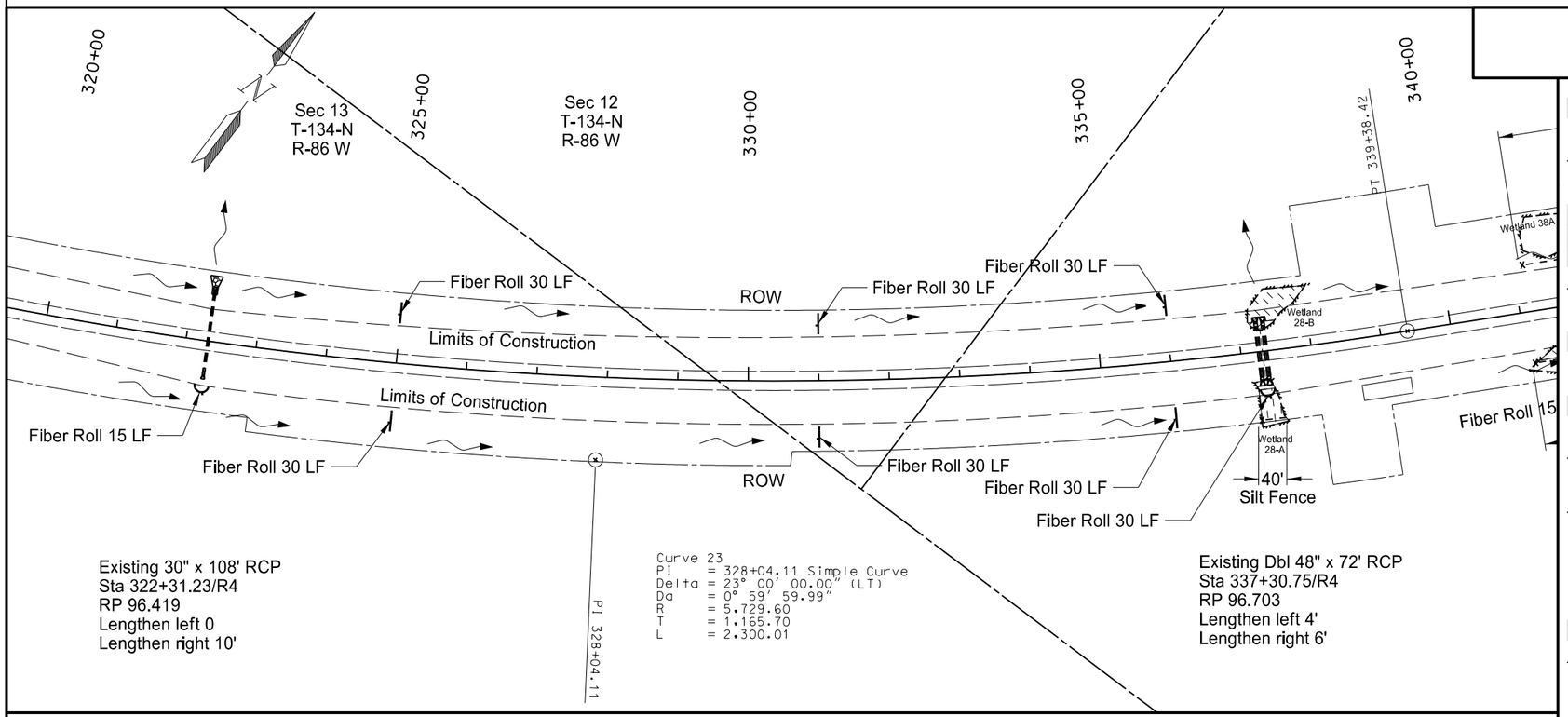
Legend

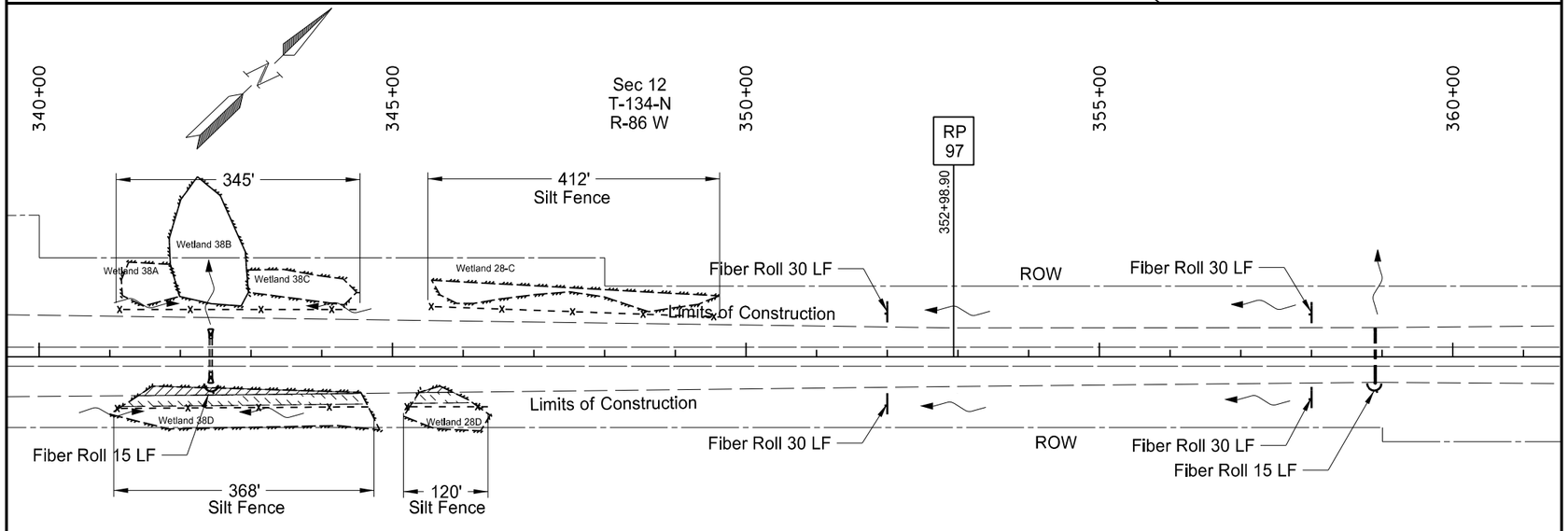
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	8





Temporary Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1325	SILT FENCE SUPPORTED		
		337+14 to 337+54 Rt	LF	40
		343+02 to 347+14 Lt	LF	412
		341+05 to 344+73 Rt	LF	368
		341+09 to 344+54 Lt	LF	345
		345+15 to 346+45 Rt	LF	120
708	1335	REMOVAL SILT FENCE SUPPORTED		
		337+14 to 337+54 Rt	LF	40
		343+02 to 347+14 Lt	LF	412
		341+05 to 344+73 Rt	LF	368
		341+09 to 344+54 Lt	LF	345
		345+15 to 346+45 Rt	LF	120

Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1020	RIPRAP - LOOSE ROCK		
		322+31 Lt - 30" Pipe	CY	31
708	1430	FIBER ROLLS 12 IN		
		322+31 Rt	LF	15
		337+25 Rt	LF	15
		337+35 Rt	LF	15
		342+42 Rt	LF	15
		358+90 Rt	LF	15
		320+00 to 360+00	LF	300
709	600	GEOTEXTILE FABRIC - TYPE RR		
		332+31 Lt - 30" Pipe	SY	31

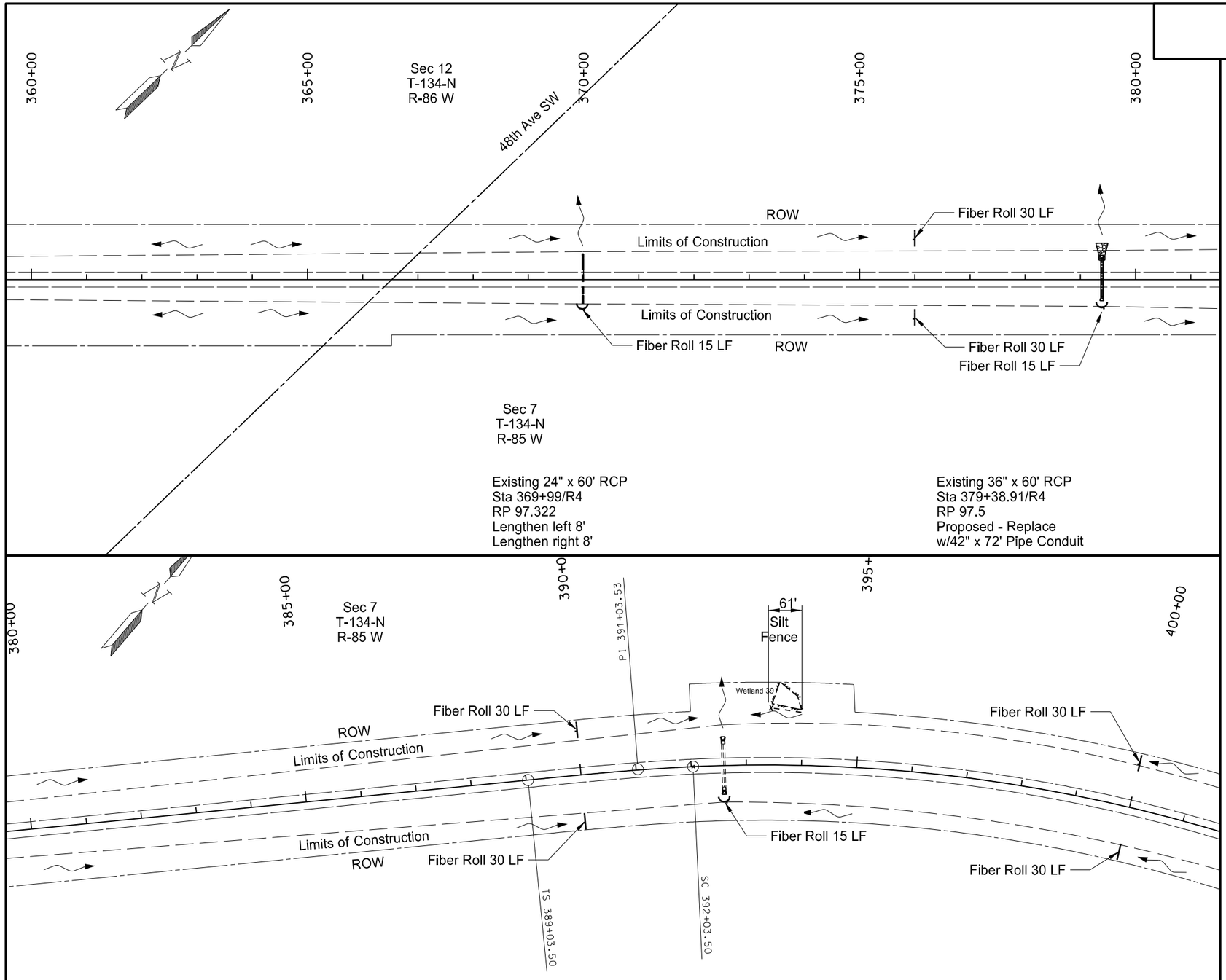
Legend

- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	9



Temporary Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1325	SILT FENCE SUPPORTED		
		393+39 to 394+00	LF	61
708	1335	REMOVAL SILT FENCE SUPPORTED		
		393+39 to 394+00	LF	61

Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1020	RIPRAP - LOOSE ROCK		
		379+38 Lt - 60" Pipe	CY	87
708	1430	FIBER ROLLS 12 IN		
		369+99 Rt	LF	15
		379+38 Rt	LF	15
		392+58 Rt	LF	15
		360+00 to 400+00	LF	180
709	600	GEOTEXTILE FABRIC - TYPE RR		
		379+38 Lt - 60" Pipe	SY	87

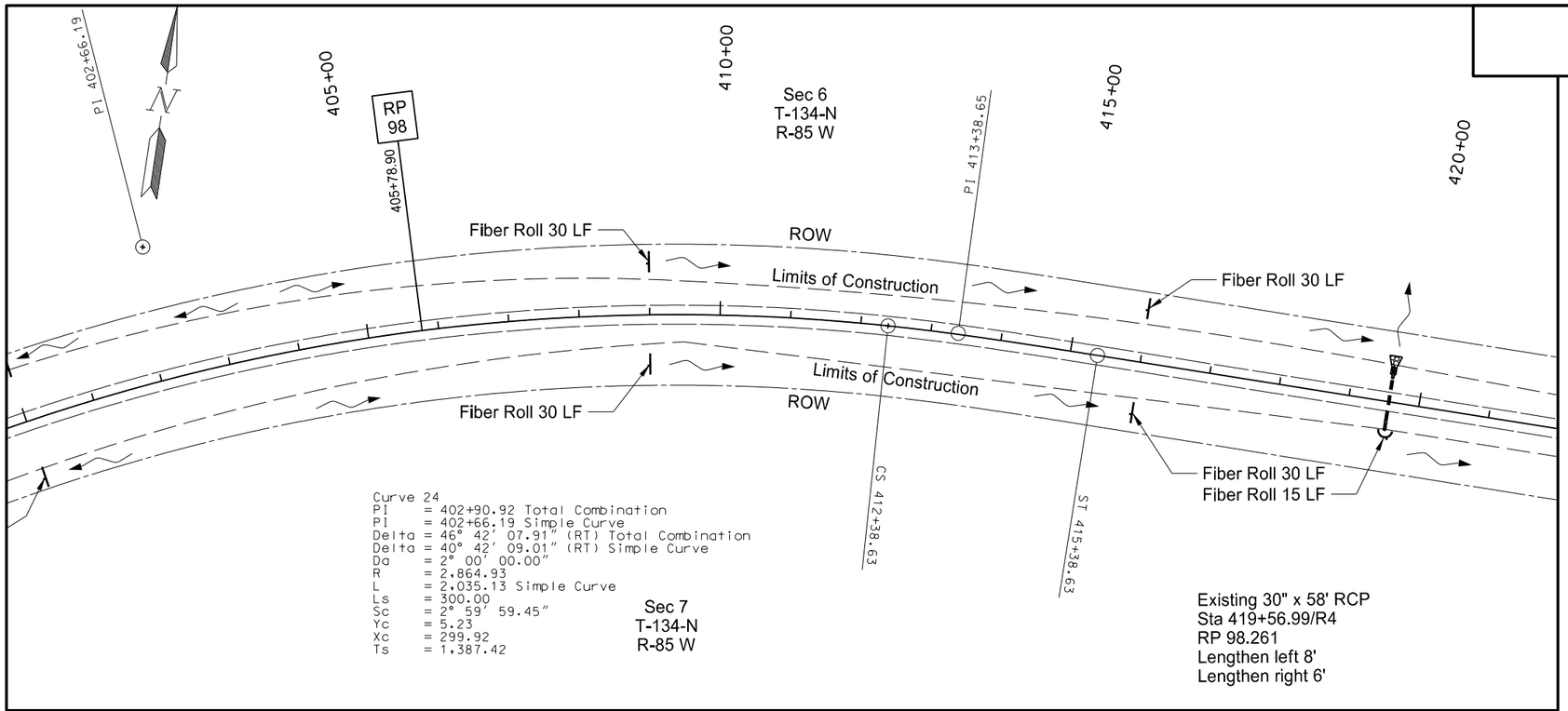
Legend

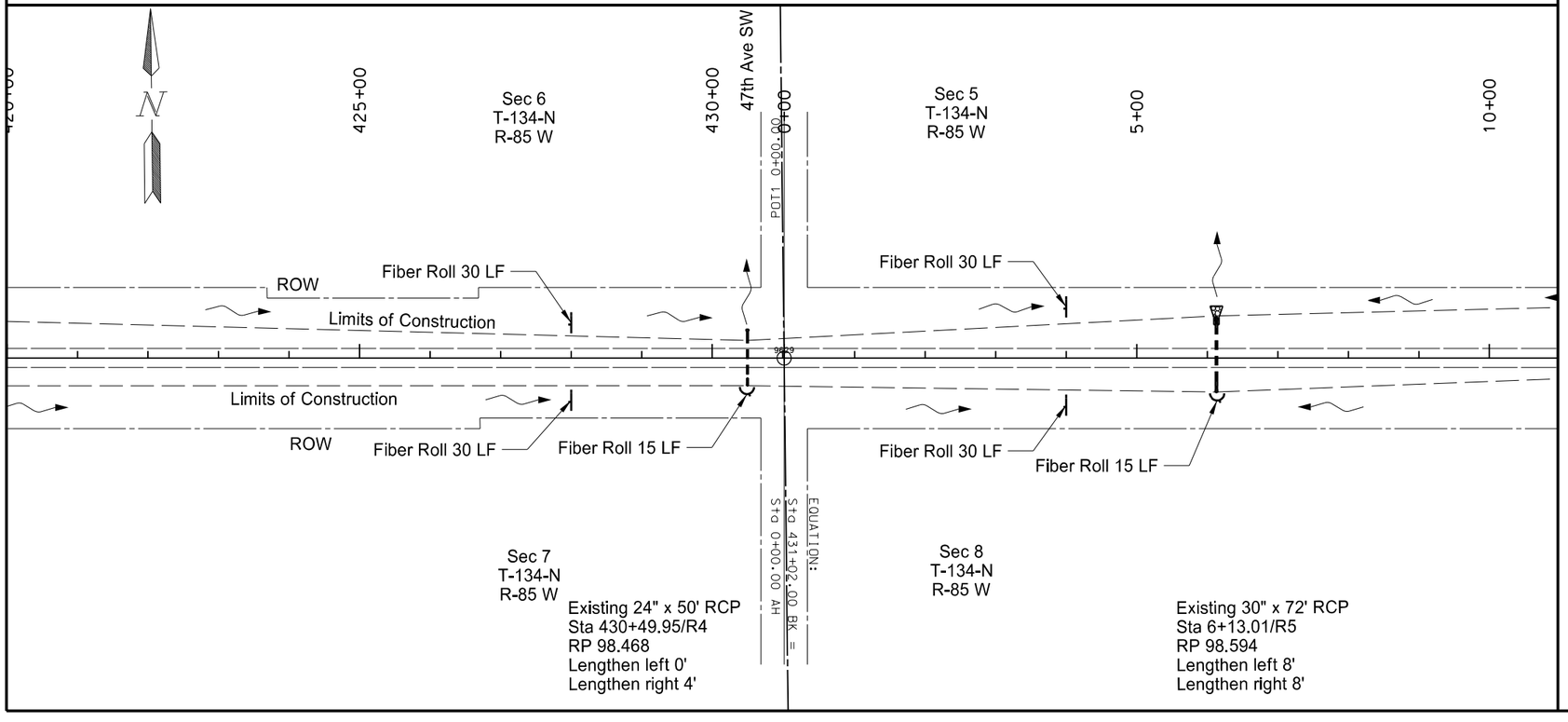
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	10





Permanent Erosion Control

708	**1020**	**RIPRAP - LOOSE ROCK**		
		419+56 - 30" Pipe	CY	31
		6+13 - 72" Pipe	CY	159
708	**1430**	**FIBER ROLLS 12 IN**		
		419+56 Rt	LF	15
		430+49 Rt	LF	15
		6+13 Rt	LF	15
		400+00 to 10+00	LF	240
709	**600**	**GEOTEXTILE FABRIC - TYPE RR**		
		419+56 - 30" Pipe	SY	31

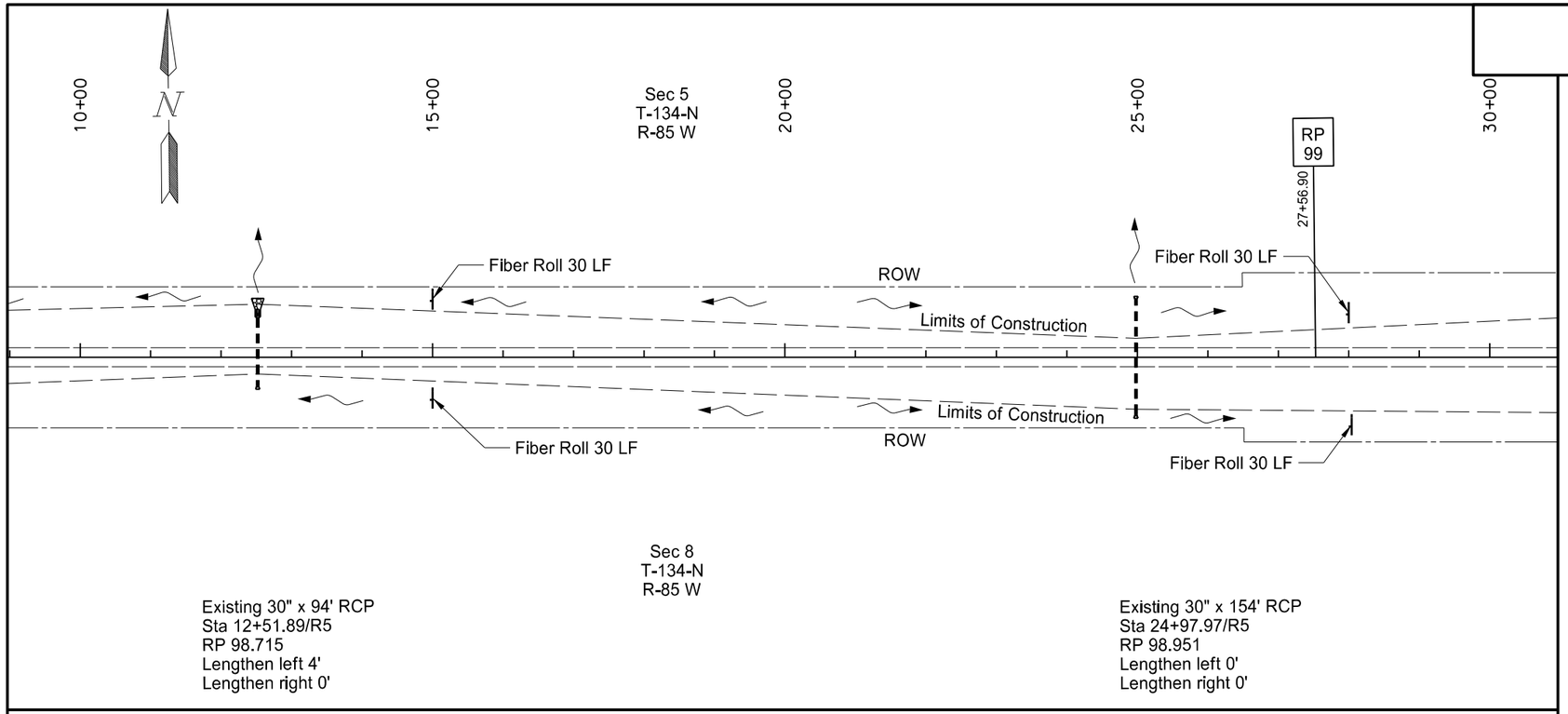
Legend

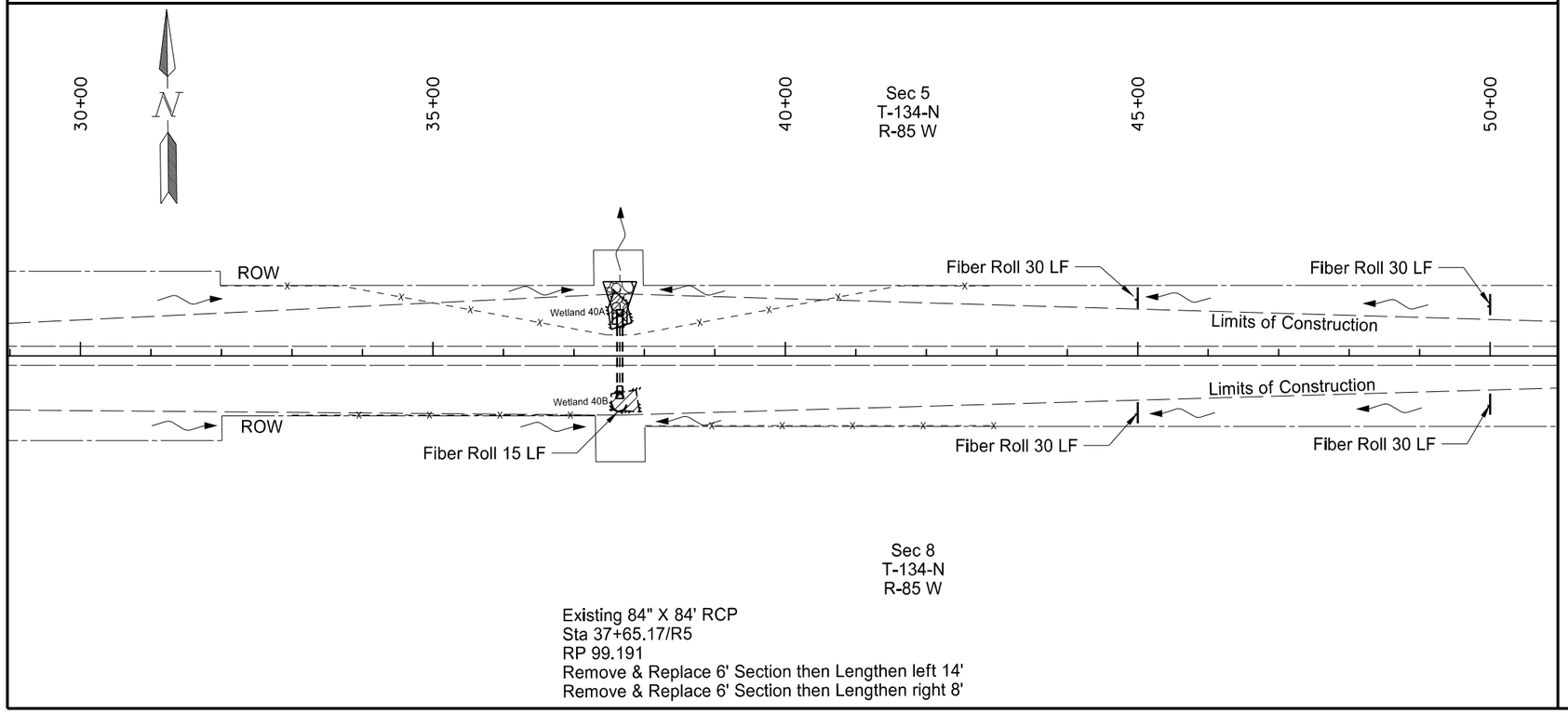
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	11





Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	**1020**	**RIPRAP - LOOSE ROCK**		
		12+51 - 30" Pipe	CY	31
		37+65 - 84" Pipe	CY	159
708	**1430**	**FIBER ROLLS 12 IN**		
		37+65 Rt	LF	15
		10+00 to 50+00	LF	240
709	**600**	**GEOTEXTILE FABRIC - TYPE RR**		
		12+51 - 30" Pipe	SY	31
		37+65 - 84" Pipe	SY	245

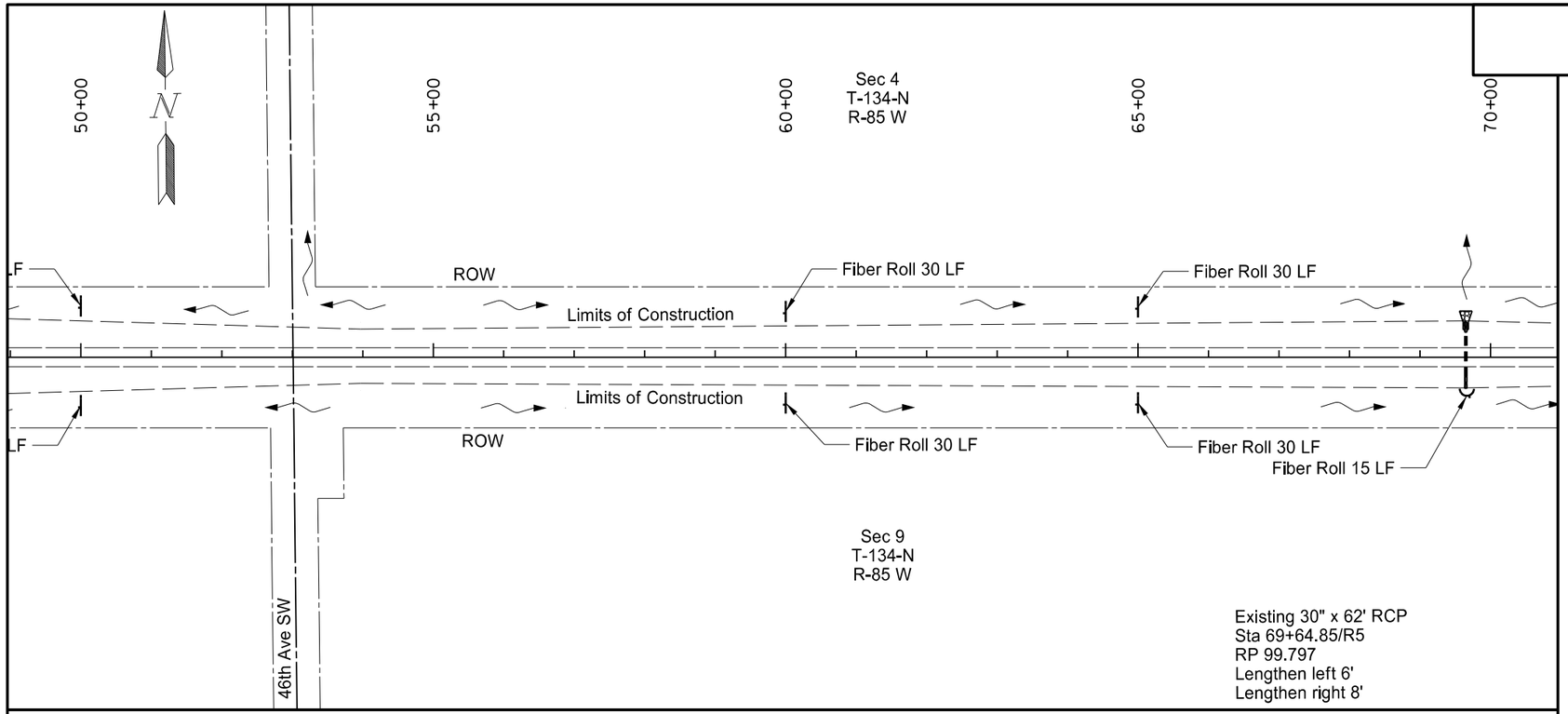
Legend

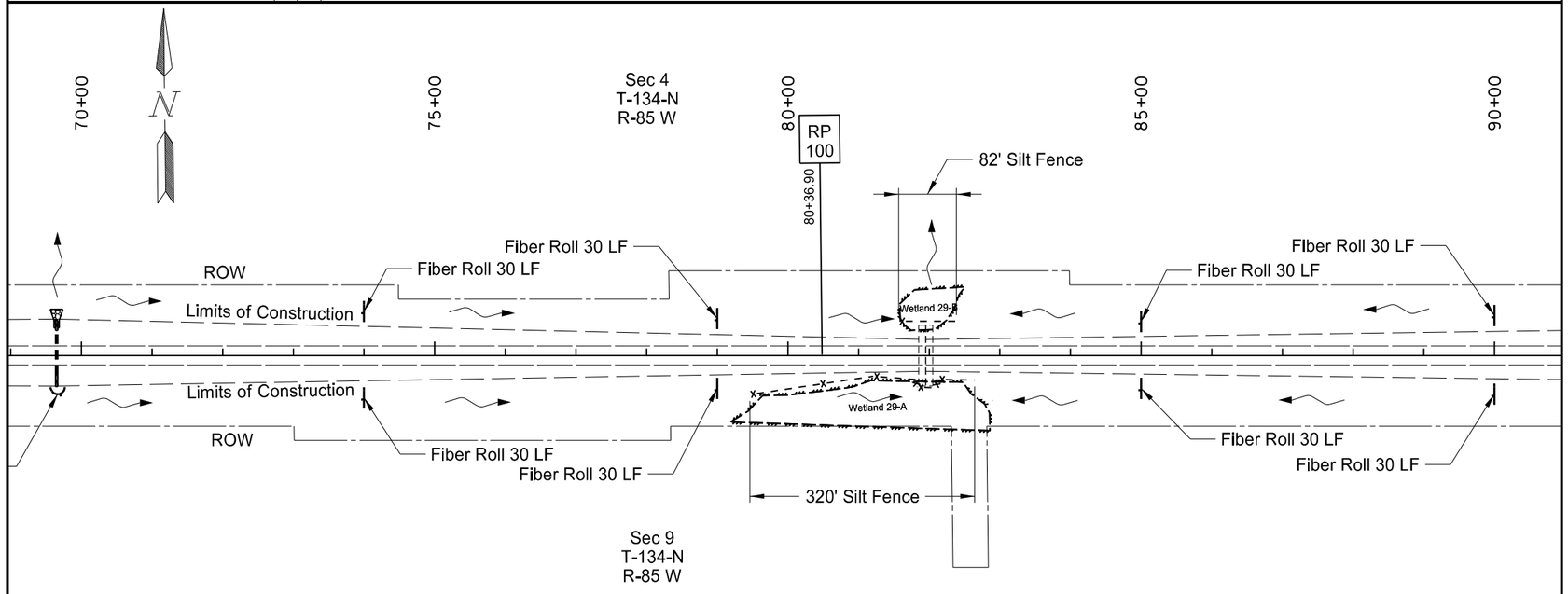
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	12





Temporary Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1325	SILT FENCE SUPPORTED		
		79+46 to 82+66 Rt	LF	320
		81+56 to 82+38 Lt	LF	82
708	1335	REMOVAL SILT FENCE SUPPORTED		
		79+46 to 82+66 Rt	LF	320
		81+56 to 82+38 Lt	LF	82

Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1020	RIPRAP - LOOSE ROCK		
		69+64 - 30" Pipe	CY	44
708	1430	FIBER ROLLS 12 IN		
		69+64 Rt	LF	15
		50+00 to 90+00	LF	360
709	600	GEOTEXTILE FABRIC - TYPE RR		
		69+64 - 30" Pipe	SY	31

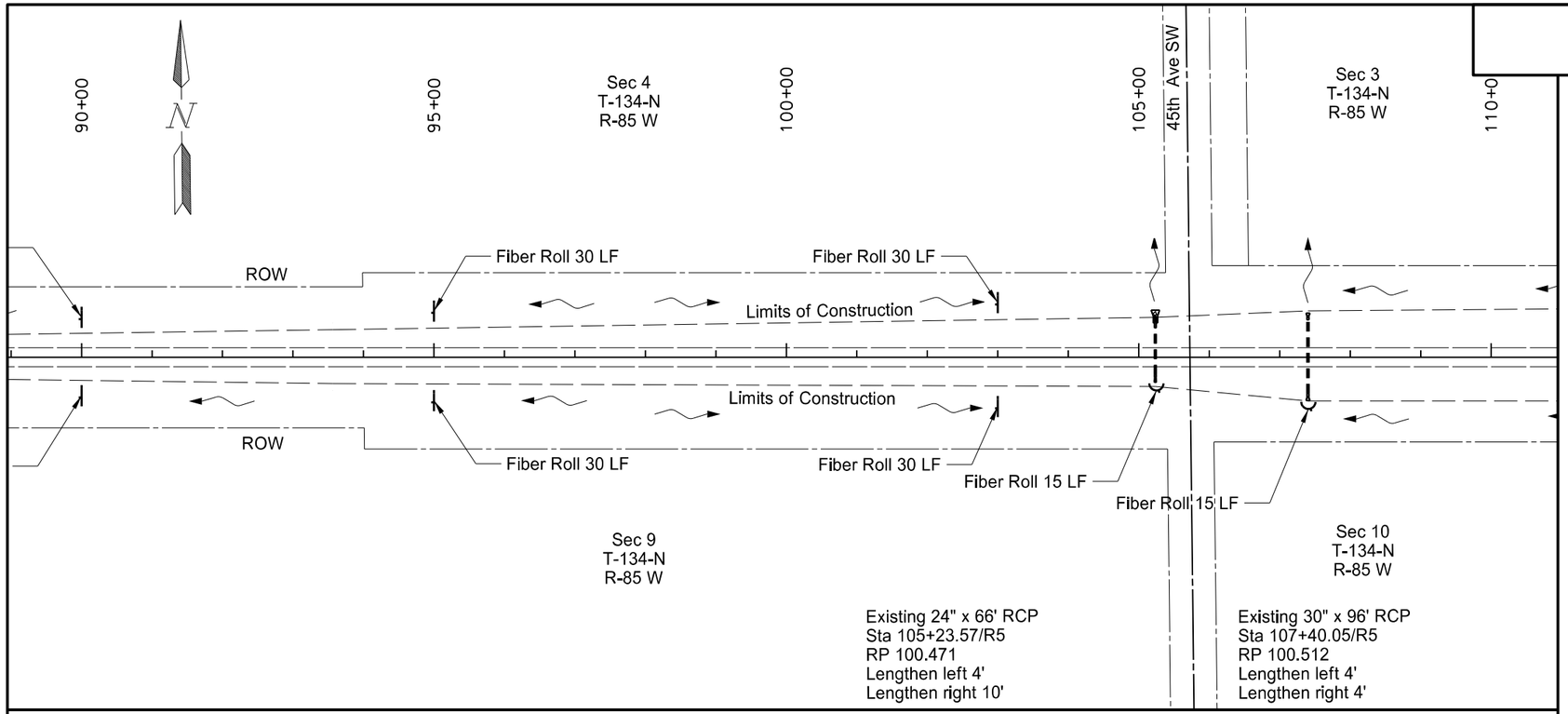
Legend

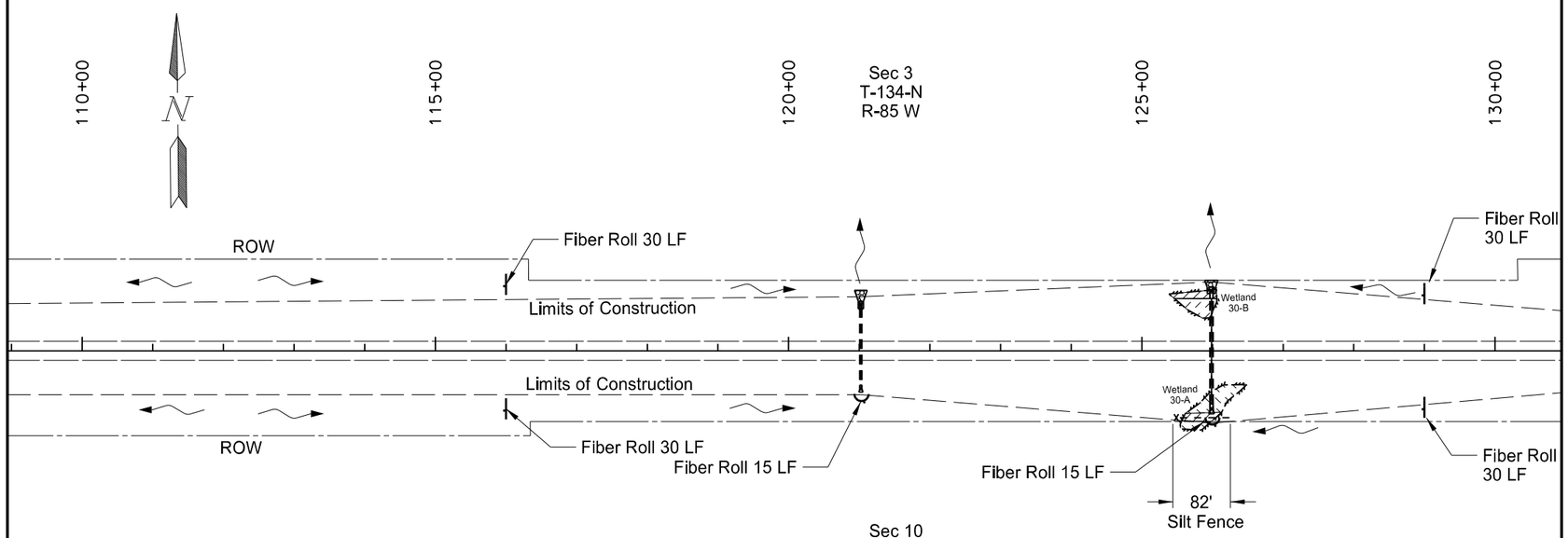
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	13





SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1325	SILT FENCE SUPPORTED		
		125+43 to 126+25 Rt	LF	82
708	1335	REMOVAL SILT FENCE SUPPORTED		
		79+46 to 82+66 Rt	LF	82

Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1020	RIPRAP - LOOSE ROCK		
		105+23 - 24" Pipe	CY	10
		121+02 - 30" Pipe	CY	31
		125+98 - 48" Pipe	CY	79
708	1430	FIBER ROLLS 12 IN		
		105+23 Rt	LF	15
		107+40 Rt	LF	15
		121+02 Rt	LF	15
		125+98 Rt	LF	15
		90+00 to 130+00	LF	240
709	600	GEOTEXTILE FABRIC - TYPE RR		
		105+23 - 24" Pipe	SY	16
		121+02 - 30" Pipe	SY	31
		125+98 - 48" Pipe	SY	79

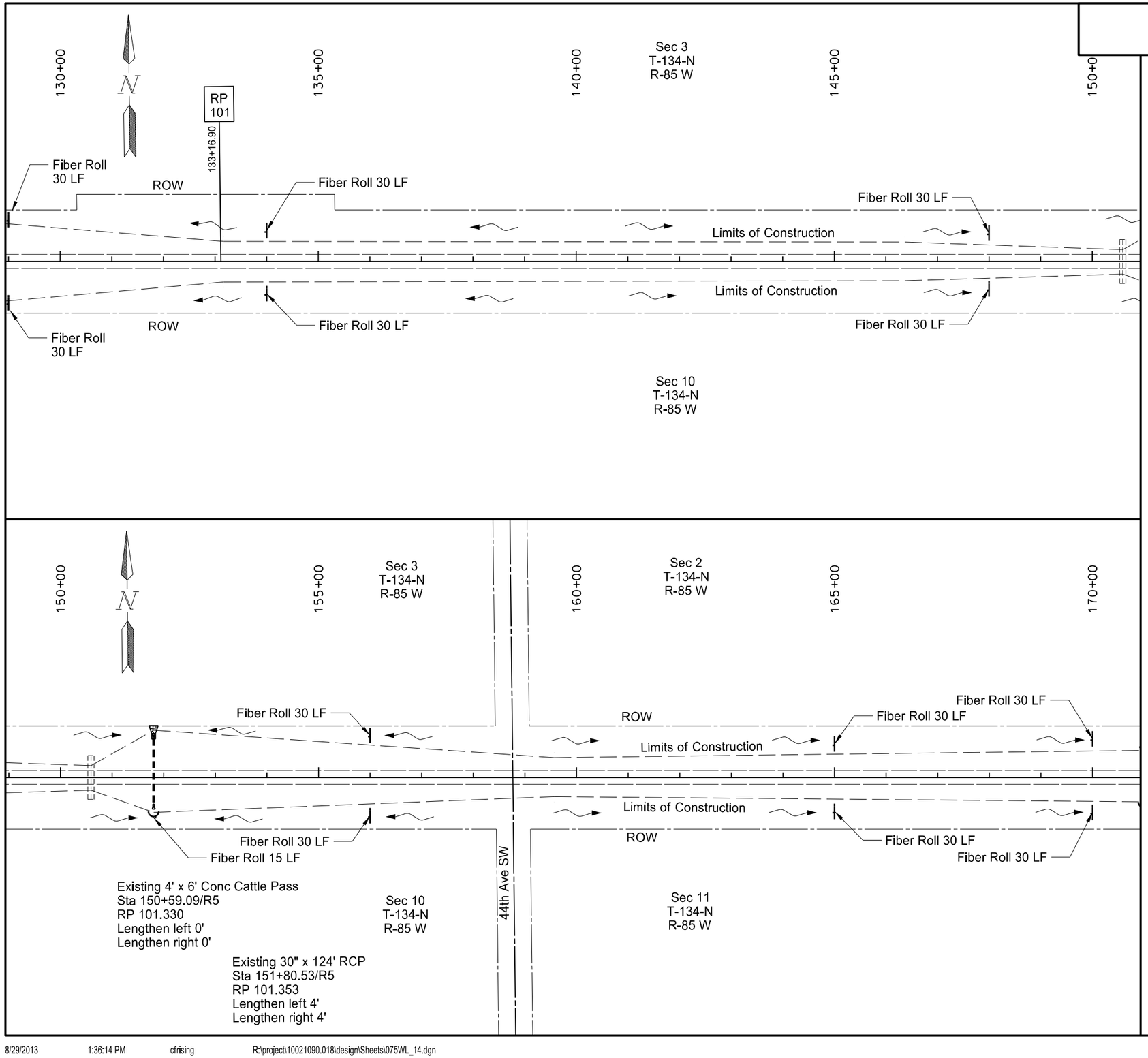
Legend

- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	14



Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	**1020**	**RIPRAP - LOOSE ROCK**		
		151+80 - 30" Pipe	CY	31
708	**1430**	**FIBER ROLLS 12 IN**		
		151+80 Rt	LF	15
		130+00 to 170+00	LF	300
709	**600**	**GEOTEXTILE FABRIC - TYPE RR**		
		151+80 - 30" Pipe	SY	31

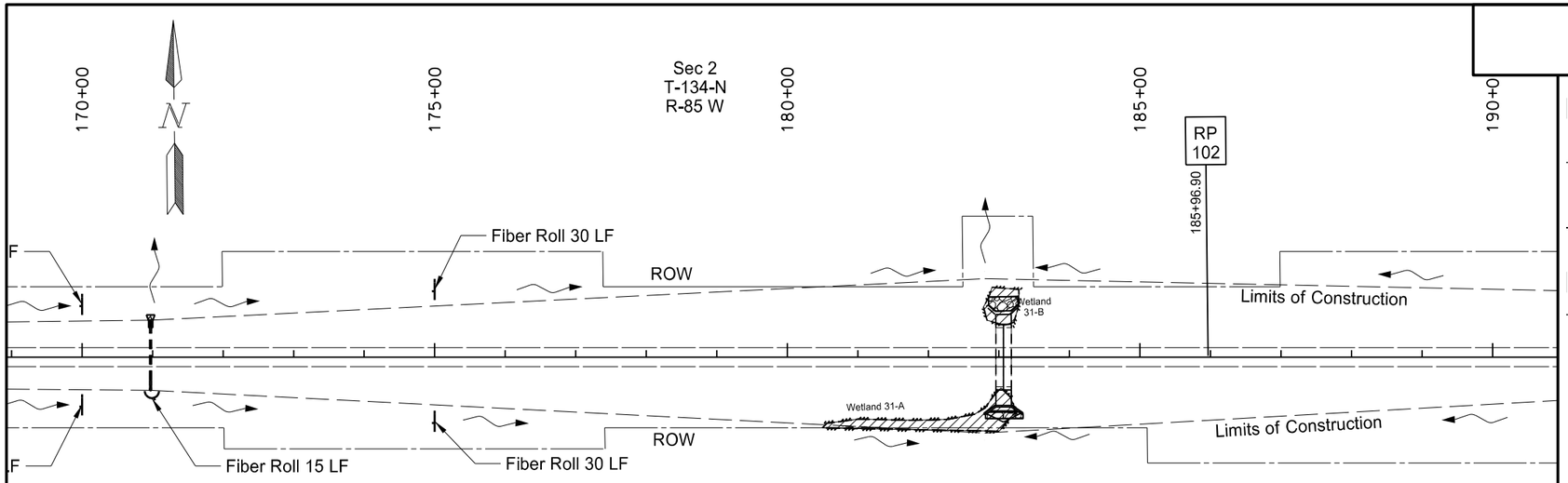
Legend

- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

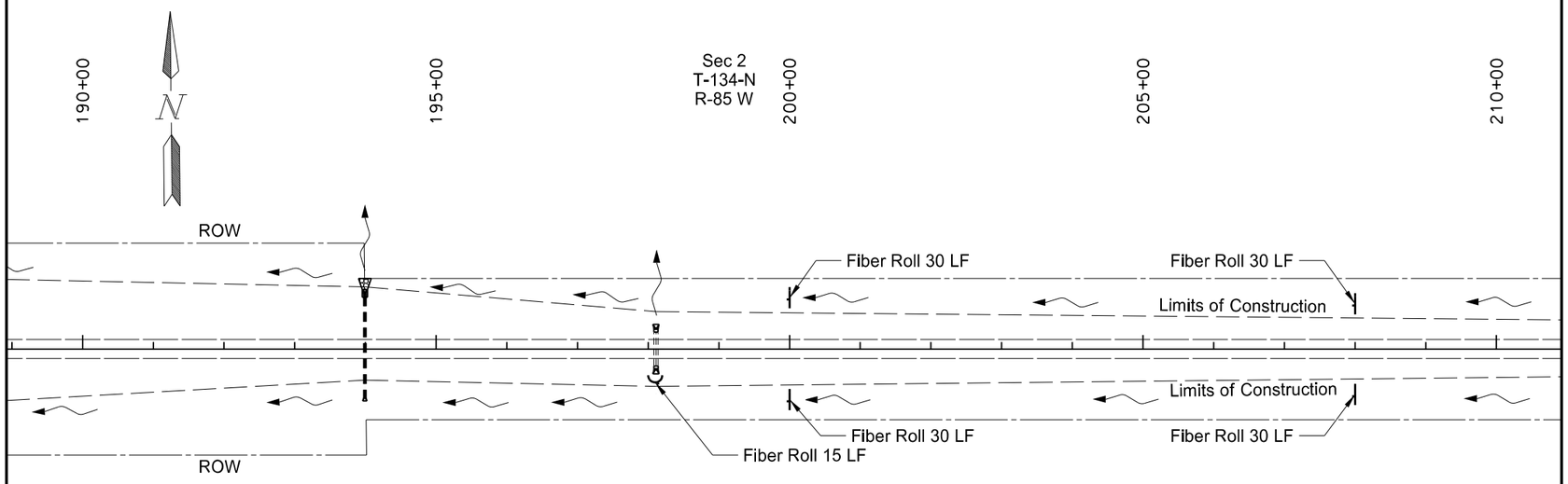
ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	15



Existing 24" x 70' RCP
Sta 170+97.15/R5
RP 101.716
Lengthen left 8'
Lengthen right 8'

Existing Dbl 9' x 11' Box Culvert
Sta 183+01.32/R5
RP 101.940
Lengthen left 14'
Lengthen right 22'
(See Sect 170)



Existing 30" x 138' RCP
Sta 193+99.25/R5
RP 102.152
Lengthen left 4'
Lengthen right 0'

Existing 4' x 6' Cattle Pass
Sta 198+11.09/R5
RP 102.23
Lengthen left 4'
Lengthen right 4'

Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1020	RIPRAP - LOOSE ROCK		
		170+97 - 24" Pipe	CY	10
		193+99 - 30" Pipe	CY	31
708	1430	FIBER ROLLS 12 IN		
		170+97 Rt	LF	15
		198+11	LF	15
		170+00 to 210+00	LF	180
709	600	GEOTEXTILE FABRIC - TYPE RR		
		170+97 - 24" Pipe	SY	16
		193+99 - 30" Pipe	SY	31

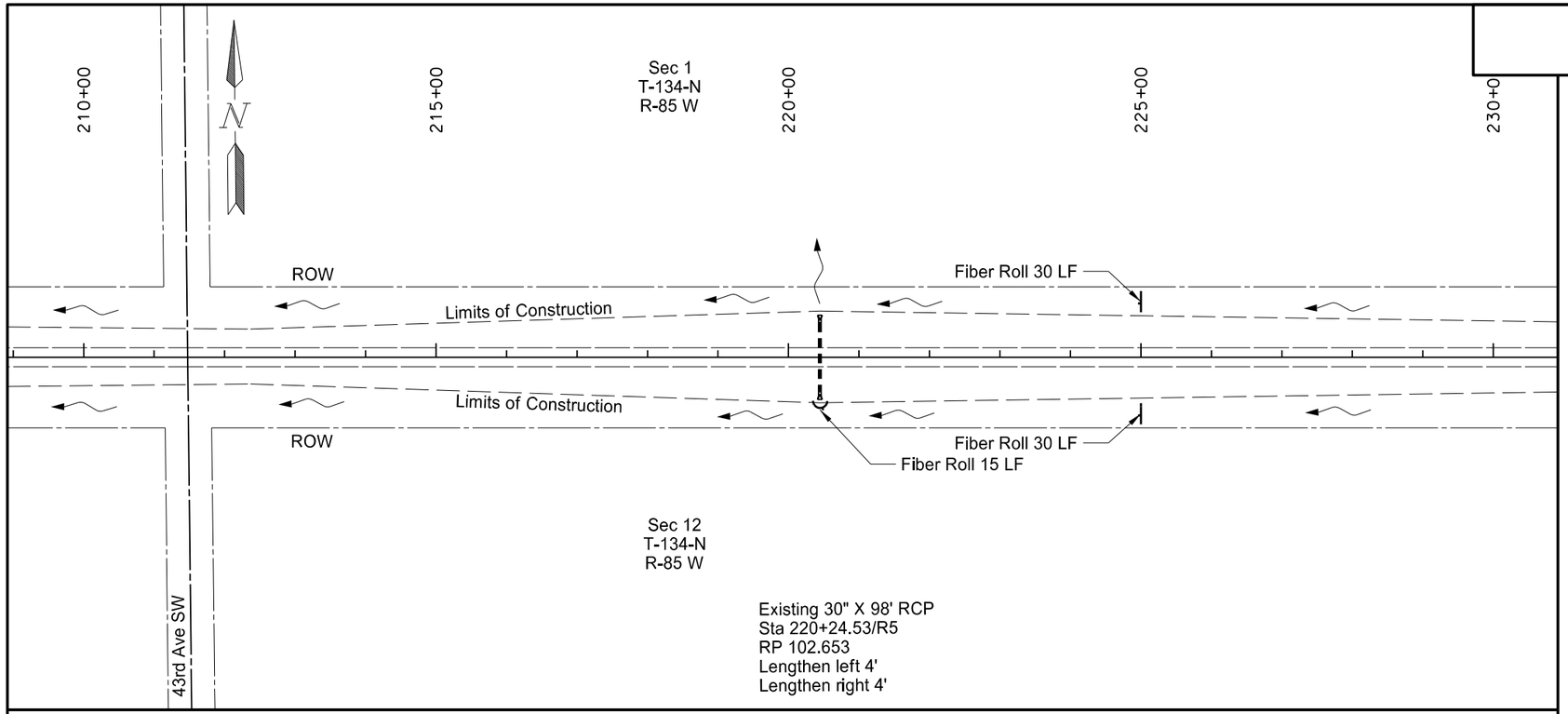
Legend

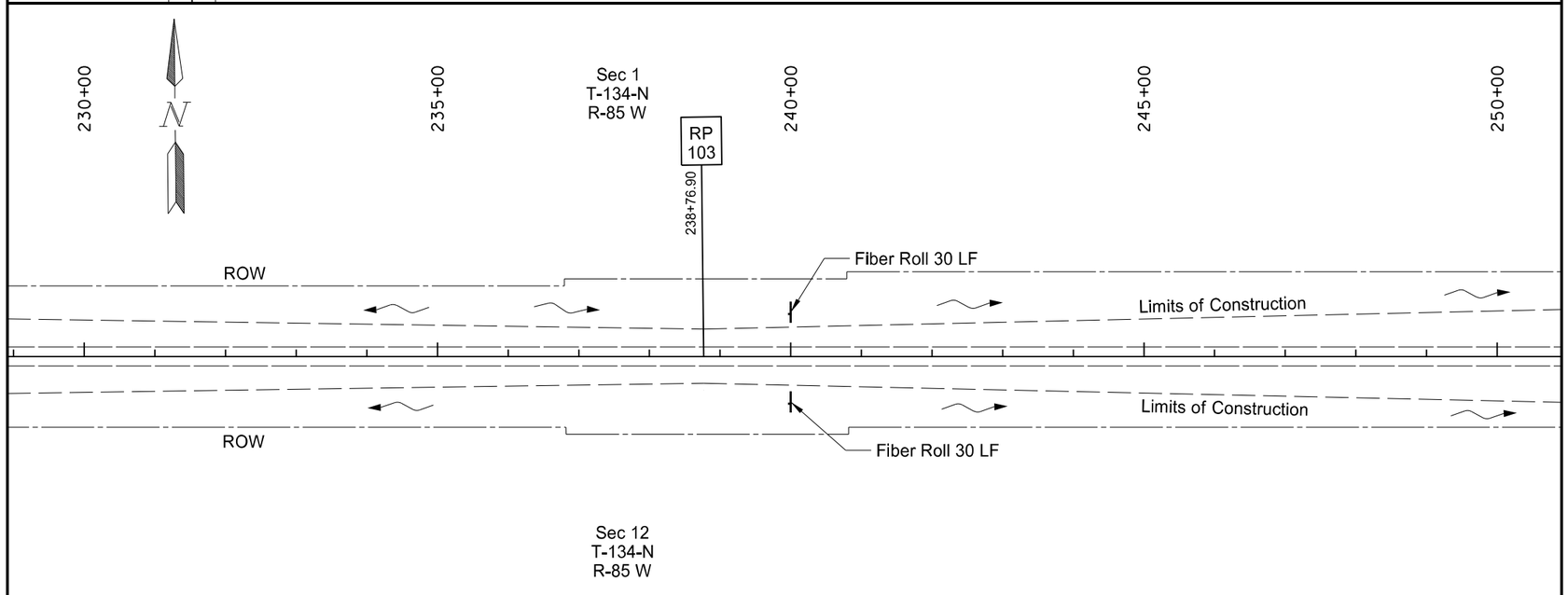
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	16





Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	1430	FIBER ROLLS 12 IN		
		220+24	LF	15
		210+00 to 250+00	LF	120

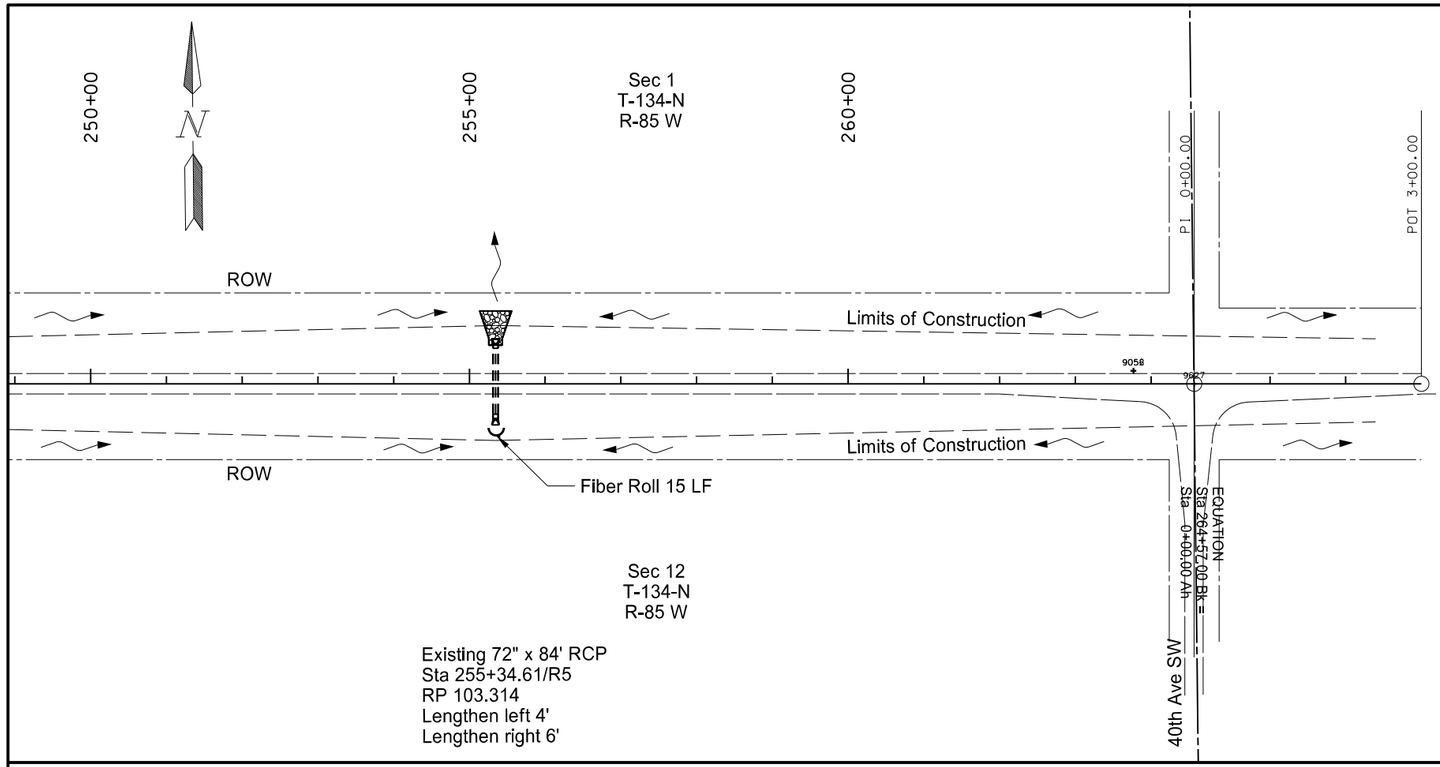
Legend

- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	75	17



Permanent Erosion Control

SPEC	CODE	BID ITEM	UNIT	QUANTITY
708	**1020**	**RIPRAP - LOOSE ROCK**		
		255+34 - 72" Pipe	CY	159
708	**1430**	**FIBER ROLLS 12 IN**		
		255+34 Rt	LF	15
709	**600**	**GEOTEXTILE FABRIC - TYPE RR**		
		255+34 - 72" Pipe	SY	130

Legend

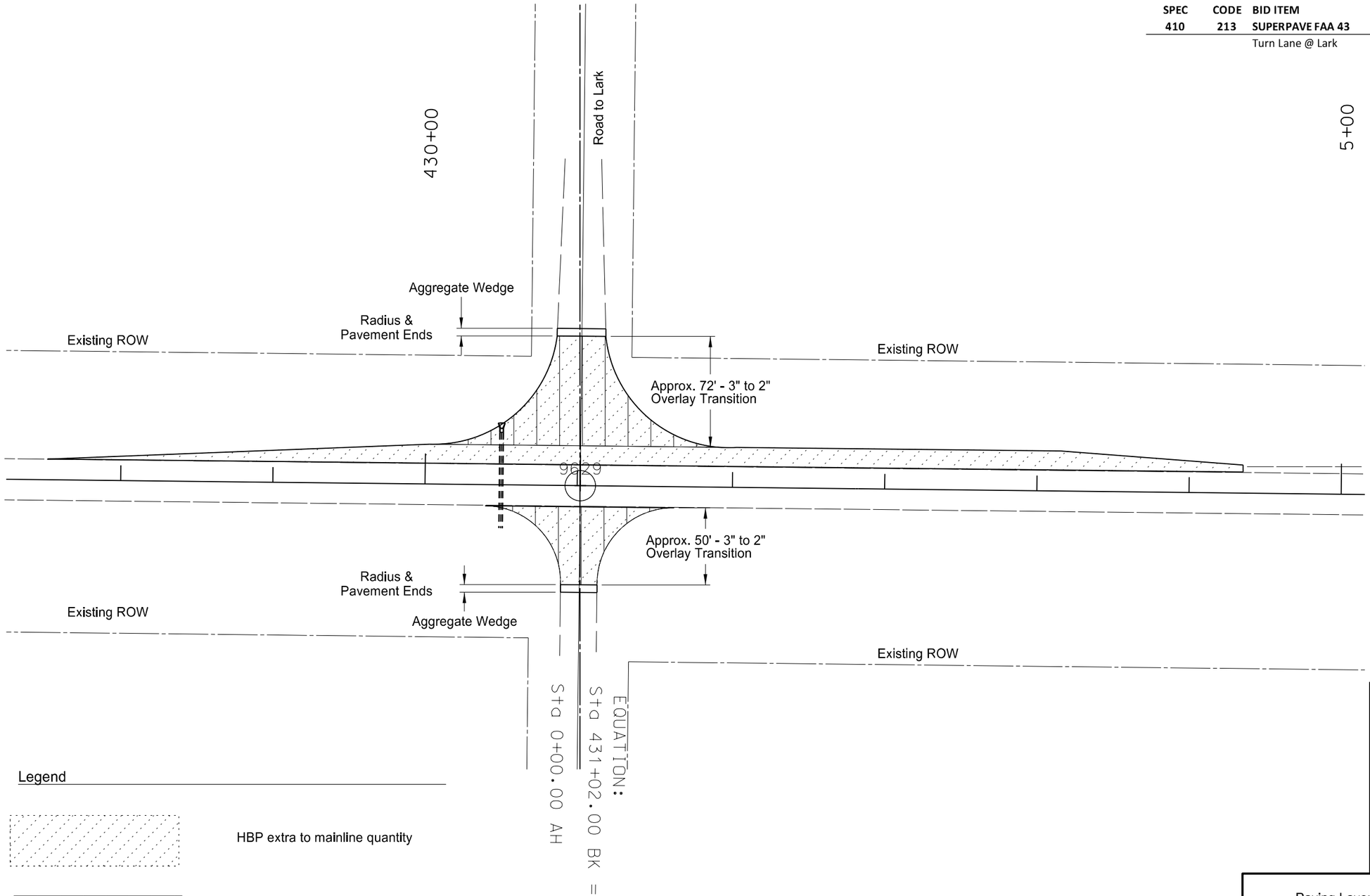
- Silt Fence Supported
- Fiber Rolls
- Permanent Wetland Impact
- Temporary Wetland Impact
- Wetland Mitigation
- Riprap - Loose Rock

Wetlands & Erosion Control

ND Hwy 21
West Jct 49 East to Carson

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	90	1

SPEC	CODE	BID ITEM	UNIT	QUANTITY
410	213	SUPERPAVE FAA 43		
		Turn Lane @ Lark	TON	233



Legend

HBP extra to mainline quantity

Transition HBP

This document was originally issued and sealed by Chad Frisinger Registration Number PE- 4876, on 8/29/13 and the original document is stored at the North Dakota Department of Transportation

Paving Layout for Flared Intersection
@ Station 431+02.00 R/4 Bk
= 0+00.00 R/5 AH

ND Hwy 21
West Jct 49 East to Carson

8/29/2013 10:19:18 AM cfrising R:\project\10021090.018\design\Sheets\090PL_001_Flared_Pav.dgn

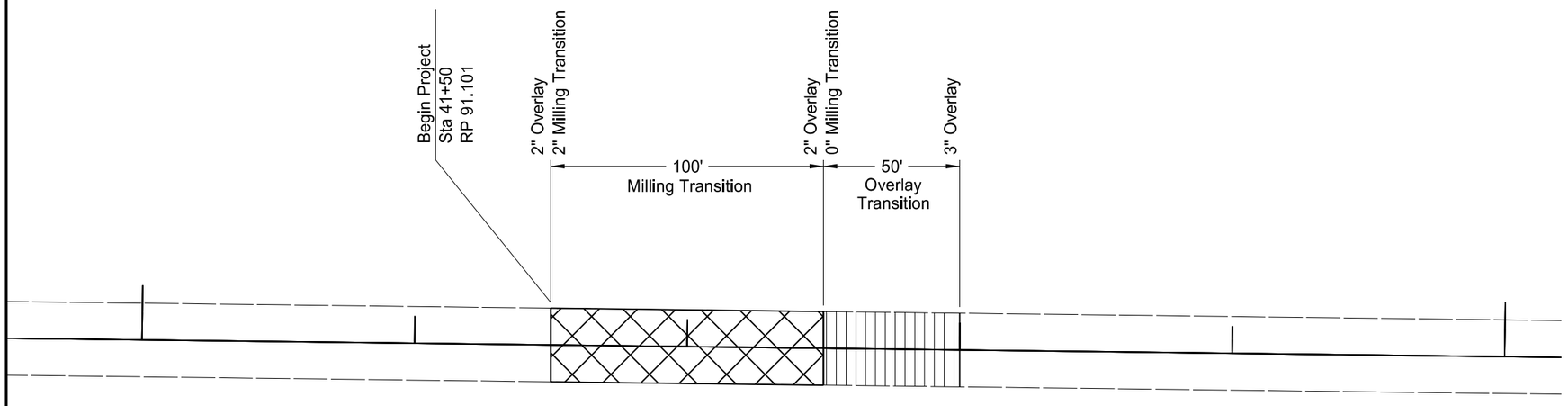
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	90	2

SPEC	CODE	BID ITEM	UNIT	QUANTITY
411	105	MILLING PAVEMENT SURFACE		
		Beginning of Project	TON	300

40+00

N

45+00



Legend

Milling w/HBP

Transition HBP

HBP extra to mainline quantity

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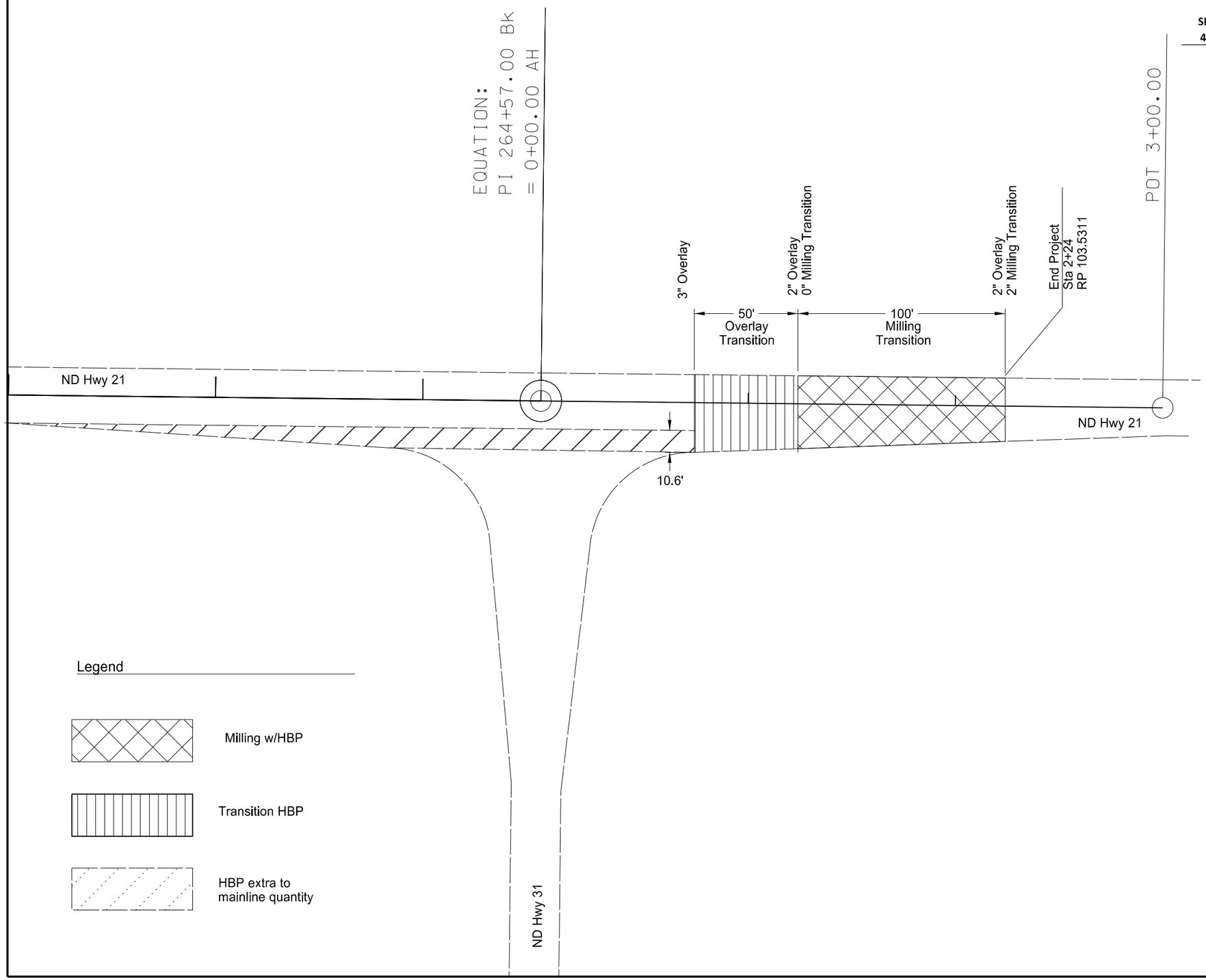
Milling/Transition Details
Beginning of Project

ND Hwy 21
Carson East to Junction ND 21

8/29/2013 10:19:21 AM cfrising R:\project\10021090.018\design\Sheets\090PL_002_Milling&Paving_Transition.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	90	3

SPEC	CODE	BID ITEM	UNIT	QUANTITY
411	105	MILLING PAVEMENT SURFACE		
		End of Project	TON	365



Legend

Milling w/HBP

Transition HBP

HBP extra to mainline quantity

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Milling/Transition Details
End of Project, Junction of ND 31

ND Hwy 21
Carson East to Junction ND 31

8/29/2013 10:19:25 AM cfrising R:\project\10021090.018\design\Sheets\090PL_003_Milling&Paving_Transition.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
D3-36	36"x6"	STREET NAME SIGN (Sign and installation only)		6	
G20-1-60	**60"x24"**	**ROAD WORK NEXT __ MILES**	**2**	**34**	**68**
G20-1b-60	60"x24"	WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)		26	
G20-2-48	**48"x24"**	**END ROAD WORK**	**2**	**19**	**38**
G20-4-36	**36"x18"**	**PILOT CAR FOLLOW ME (Mounted to back of pilot car)**	**1**	**18**	**18**
G20-10-108	**108"x48"**	**CONTRACTOR SIGN**	**2**	**64**	**128**
G20-50a-72	**72"x36"**	**ROAD WORK NEXT __ MILES RT & LT ARROWS**	**2**	**37**	**74**
G20-52a-72	**72"x24"**	**ROAD WORK NEXT __ MILES RT or LT ARROW**	**3**	**30**	**90**
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT**	**2**	**59**	**118**
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT		23	
M5-1-21	21"x15"	ARROW AHD AND RT or LT(Mounted on route marker post)		7	
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)		7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)		7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)		7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)		7	
R1-1-48	**48"x48"**	**STOP**	**4**	**32**	**128**
R1-1a-18	**18"x18"**	**STOP and SLOW PADDLE Back to Back**	**6**	**5**	**30**
R1-2-60	60"x60"	YIELD		29	
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**8**	**39**	**312**
R2-1a-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**2**	**10**	**20**
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT		35	
R4-1-48	**48"x60"**	**DO NOT PASS**	**2**	**39**	**78**
R4-7-48	48"x60"	KEEP RIGHT SYMBOL		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT		13	
R7-1-12	12"x18"	NO PARKING		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED		28	
R11-2a-48	48"x30"	STREET CLOSED		28	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC		31	
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-4-48	48"x48"	RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-6-48	48"x24"	LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD SYMBOL		35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL		35	
W3-4-48	**48"x48"**	**BE PREPARED TO STOP**	**4**	**35**	**140**
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**4**	**35**	**140**
W4-2-48	48"x48"	RIGHT or LEFT LANE TRANSITION SYMBOL		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC SYMBOL		35	
W8-1-48	**48"x48"**	**BUMP**	**4**	**35**	**140**
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF		35	
W8-11-48	**48"x48"**	**UNEVEN LANES**	**2**	**35**	**70**
W8-12-48	48"x48"	NO CENTER STRIPE		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	**48"x48"**	**TRUCKS ENTERING AHEAD or __ FT.**	**2**	**35**	**70**
W8-55-48	**48"x48"**	**TRUCKS CROSSING AHEAD or __ FT.**	**2**	**35**	**70**
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL		35	
W13-1-24	**24"x24"**	**__ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)**	**4**	**11**	**44**
W13-4-48	48"x60"	RAMP ARROW		39	
W14-3-48	48"x36"	NO PASSING ZONE		23	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**8**	**35**	**280**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT.		35	
W20-4-48	**48"x48"**	**ONE LANE ROAD AHEAD or __ FT.**	**2**	**35**	**70**
W20-5-48	48"x48"	RIGHT or LEFT LANE CLOSED AHEAD or __ FT.		35	
W20-7a-48	**48"x48"**	**FLAGGING SYMBOL**	**6**	**35**	**210**
W20-7k-24	**24"x18"**	**__ FEET (Mounted on warning sign post)**	**2**	**10**	**20**
W20-8-48	48"x48"	STREET CLOSED		35	
W20-51-48	48"x48"	EQUIPMENT WORKING		35	
W20-52-54	**54"x12"**	**NEXT __ MILES (Mounted on warning sign post)**	**6**	**12**	**72**
W21-1a-48	48"x48"	WORKERS SYMBOL		35	
W21-2-48	**48"x48"**	**FRESH OIL**	**2**	**35**	**70**
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT		35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-5-48	**48"x48"**	**SHOULDER WORK**	**2**	**35**	**70**
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED		35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT.		35	
W21-6a-48	48"x48"	SURVEY CREW AHEAD		35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT.		35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY		35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK		35	
	24"x24"	TAKE TURNS (6" D letters) (Mounted on stop sign post)		11	

SPECIAL SIGNS

Consign 1	**48"x48"**	**PAVEMENT BREAKS**	**4**	**35**	**140**

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**2708**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	**FLAGGING**	**MHR**	**2500**
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH	
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH	
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1051	TYPE II BARRICADES	EACH	
704-1052	**TYPE III BARRICADES**	**EACH**	**2**
704-1060	**DELINEATOR DRUMS**	**EACH**	**74**
704-1065	TRAFFIC CONES	EACH	
704-1067	**TUBULAR MARKERS**	**EACH**	**245**
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1081	**VERTICAL PANELS - BACK TO BACK**	**EACH**	**16**
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH	
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH	
704-1095	TYPE B FLASHERS	EACH	
704-1185	**PILOT CAR**	**HR**	**1000**
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	
762-1500	OBLITERATION OF PVMT MK	SF	
772-2110	FLASHING BEACON - POST MOUNTED	EACH	

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

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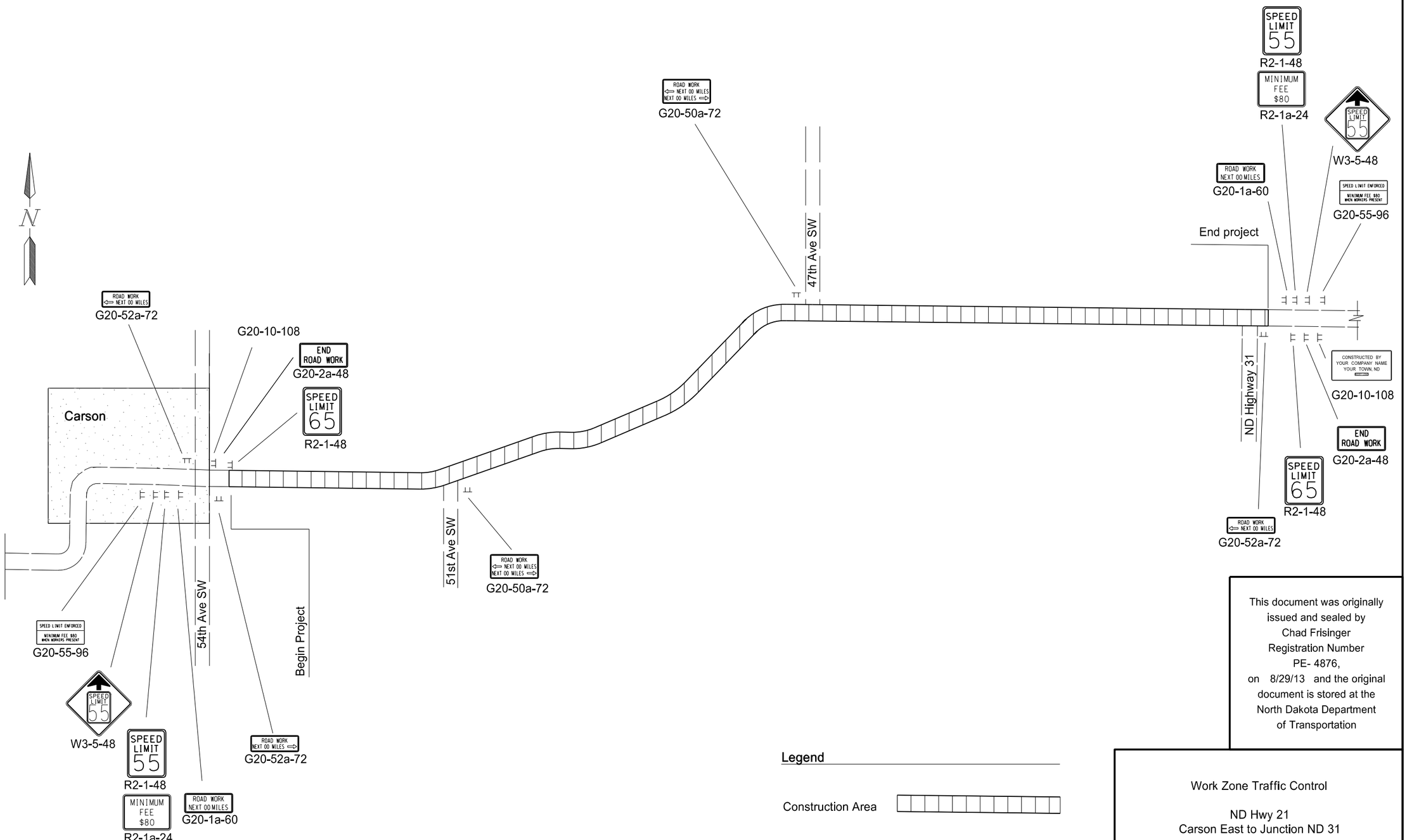
Traffic Control Devices List

ND Hwy 21

West Jct 49 East to Carson

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	100	2



Legend

Construction Area

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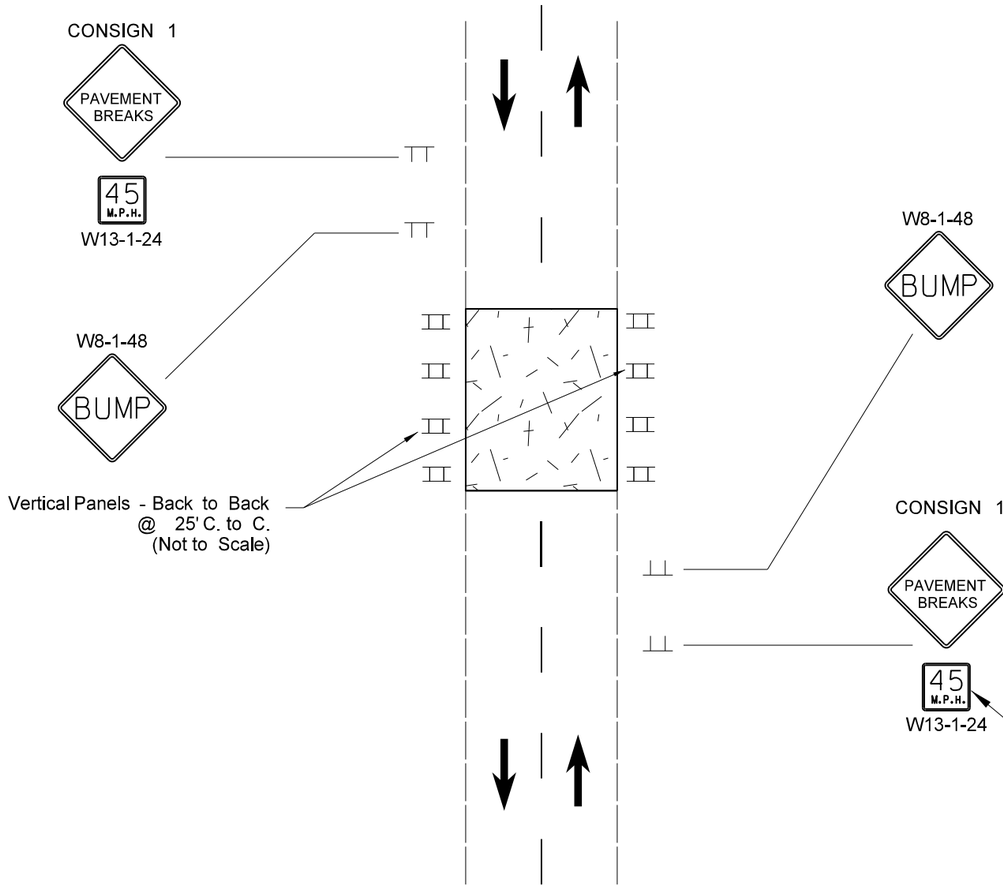
Work Zone Traffic Control

ND Hwy 21
Carson East to Junction ND 31

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	100	3

Vertical Panels - Back to Back
Pipe Replacement Locations (75 LF Avg/ 25' O.C. x 2)
RP 91.46 8 EA
RP 97.50 8 EA
Total: 16 EA

Pipe Replacement Locations (2 locations)
(No Work Present)



*See Standard D-704-15 Type A TEMPORARY ROAD CLOSURE for when work is present.

*See Standard D-704-26 for spacings

The advisory speed will be determined by the engineer in the field.

Pipe Location Area

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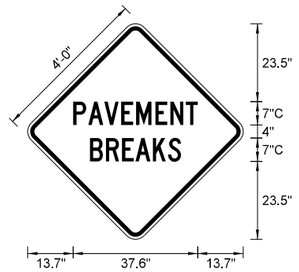
Work Zone Traffic Control
Non Working Hours
Pipe Locations
ND Hwy 21
ND 21
West Junction 49 East to Carson

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	100	4

SIGN NUMBER	Consign 1
WIDTH x HEIGHT	5'-5" x 5'-5"
BORDER WIDTH	1.25" (inset 0.75")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	**TYPE:** Diamond Grade
	COLOR: Fluorescent Orange
LEGEND/BORDER	**TYPE:** Non Reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S): **AREA: 16.0 Sq.Ft.**



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

LETTER POSITION (X)																		LENGTH	SIZE	SERIES
P	A	V	E	M	E	N	T											37.6	7	C 2000
13.7	18.3	23.1	28.2	32.7	38.5	43	47.7													
B	R	E	A	K	S													27.5	7	C 2000
18.8	23.6	28.5	32.5	37.8	42.3															

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Work Zone Traffic Control

ND Hwy 21
Carson East to Junction ND 31

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	NH-1-021(018)090	110	1

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	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
ND 21 RP 91.10 to 98.48																						
155+75 Rt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
178+68 Rt		20		9.0	13.0				2.25 x 2.25 12 ga	14.1	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
179+52 Lt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
182+88 Rt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
191+00 Rt				5.2	14.5				2.25 x 2.25 12 ga	15.5	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
229+90 Rt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
236+58 Lt				5.2	14.5				2.25 x 2.25 12 ga	15.5	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
249+44 Rt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
251+98 Lt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
278+30 Lt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
303+00 Rt				5.2	14.5				2.25 x 2.25 12 ga	15.5	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
310+80 Rt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
345+91 Lt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
359+12 Rt		20		9.0	13.0				2.25 x 2.25 12 ga	14.1	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
366+35 Lt				5.2	14.5				2.25 x 2.25 12 ga	15.5	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
376+22 Lt		20		9.0	13.0				2.25 x 2.25 12 ga	14.1	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
382+03 Rt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
405+79 Lt				5.2	14.5				2.25 x 2.25 12 ga	15.5	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
419+40 Lt		19		6.3	12.7				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
426+70 Rt	SN 1		6.0		10.7				2.25 x 2.25 12 ga	10.9						1	4	2.5 x 2.5 12 ga				
430+70 Lt				5.2	14.5				2.25 x 2.25 12 ga	15.5	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
Sub Total			6.0	127.5		**Total**	276.1									**Total**	84		6	0	9	

Basis of Estimate
Sign Support Lengths

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

Rural Roadway - 60"

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Sign Summary
Perforated Tube

Carson E to Jct ND 31
ND Hwy 21

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	NH-1-021(018)090	110	2

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	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
ND 21 RP 98.48 to 103.49																						
0+15 Rt		1		5.2	12.0				2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
4+15 Lt	SN 2		6.0		10.7				2.25 x 2.25 12 ga	10.9						1	4	2.5 x 2.5 12 ga				
53+33 Rt				5.2	14.5				2.25 x 2.25 12 ga	15.5	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
105+43 Lt				5.2	14.5				2.25 x 2.25 12 ga	15.5	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
159+04 Rt				5.2	14.5				2.25 x 2.25 12 ga	15.5	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
211+68 Rt				5.2	14.5				2.25 x 2.25 12 ga	15.5	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
252+24 Rt		391	6.2		12.7				2.5 x 2.5 12 ga	15.9						1	4	3 x 3 7 ga				
258+24 Lt		9		5.0	12.0				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
260+24 Lt	SN 3		13.5		11.8				2.5 x 2.5 10 ga	14.1	3.3				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1	
260+24. Rt	SN 4		28.0		12.3	13.3			2.5 x 2.5 10 ga	14.0	3.8	4.8			2.19 x 2.19 10 ga	2	4	3 x 3 7 ga			2	
262+24 Lt		371	6.0		12.5				2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga				
262+24. Rt		405	12.4		12.5				2.5 x 2.5 12 ga	13.5	4.1				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
264+50 Lt		34		8.0	9.3				2.5 x 2.5 12 ga	11.3						1	4	3 x 3 7 ga				
Sub Total			72.1	39.0		**Total**	177.2									**Total**	56		4	0	8	
Grand Total			78.1	166.5		**Total**	453.3									**Total**	140		10	0	17	

Basis of Estimate
Sign Support Lengths

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

Rural Roadway - 60"

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Sign Summary
Perforated Tube

Carson E to Jct ND 31
ND Hwy 21

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	110	3

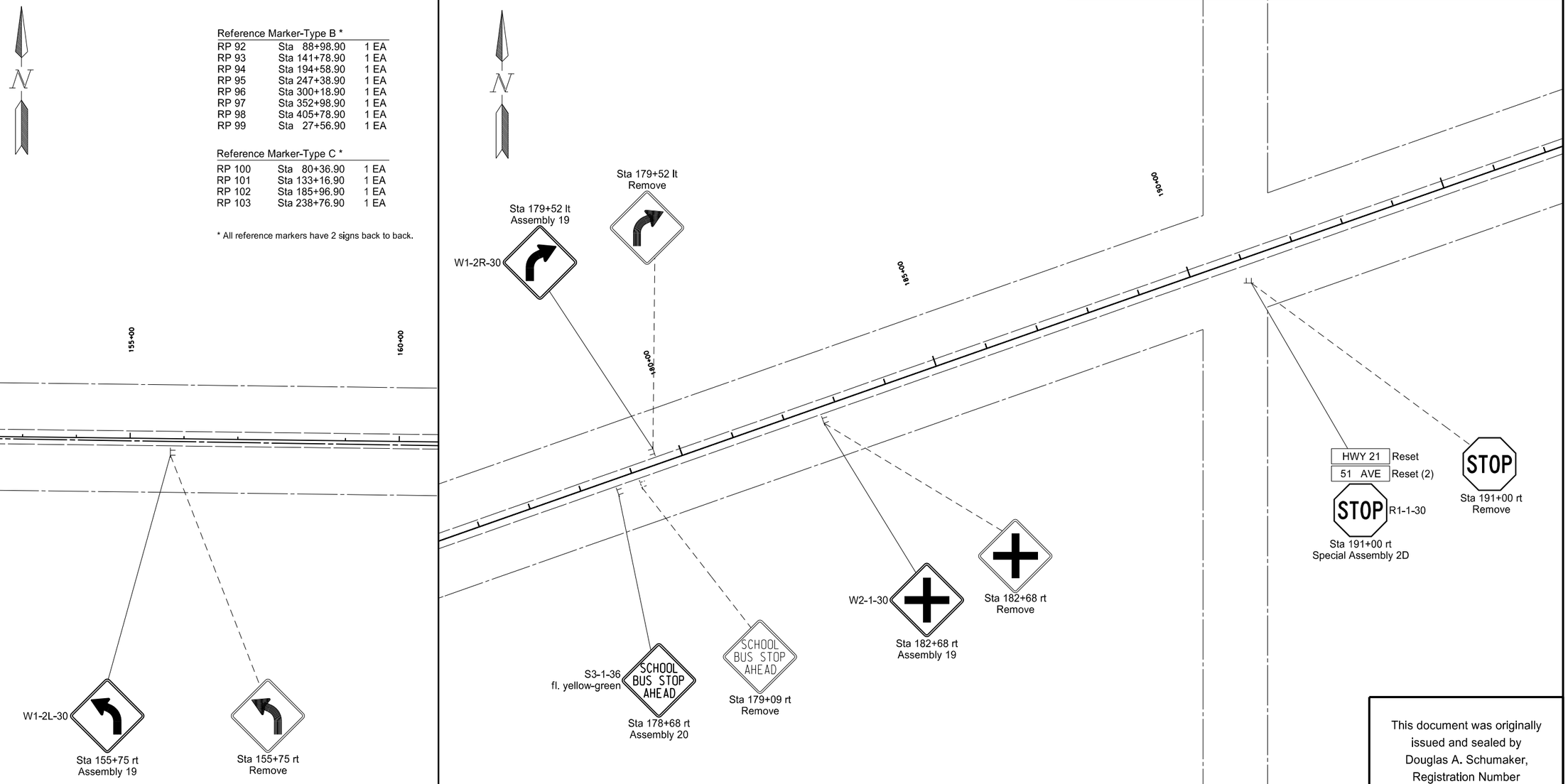
Reference Marker-Type B *

RP 92	Sta 88+98.90	1 EA
RP 93	Sta 141+78.90	1 EA
RP 94	Sta 194+58.90	1 EA
RP 95	Sta 247+38.90	1 EA
RP 96	Sta 300+18.90	1 EA
RP 97	Sta 352+98.90	1 EA
RP 98	Sta 405+78.90	1 EA
RP 99	Sta 27+56.90	1 EA

Reference Marker-Type C *

RP 100	Sta 80+36.90	1 EA
RP 101	Sta 133+16.90	1 EA
RP 102	Sta 185+96.90	1 EA
RP 103	Sta 238+76.90	1 EA

* All reference markers have 2 signs back to back.



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Sign Layout

Carson E to Jct ND 31
ND Hwy 21

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	4

N

Sta 236+58 lt
Special Assembly 2D

HWY 21	Reset
50 AVE	Reset (2)

Sta 236+58 lt
Remove

STOP

STOP R1-1-30

Sta 251+98 lt
Assembly 19

W1-2L-30

Sta 251+98 lt
Remove

245+00

240+00

235+00

230+00

250+00

255+00

W1-2R-30

Sta 229+90 rt
Assembly 19

Sta 229+90 rt
Remove

W1-2L-30

Sta 249+44 rt
Assembly 19

Sta 249+44 rt
Remove

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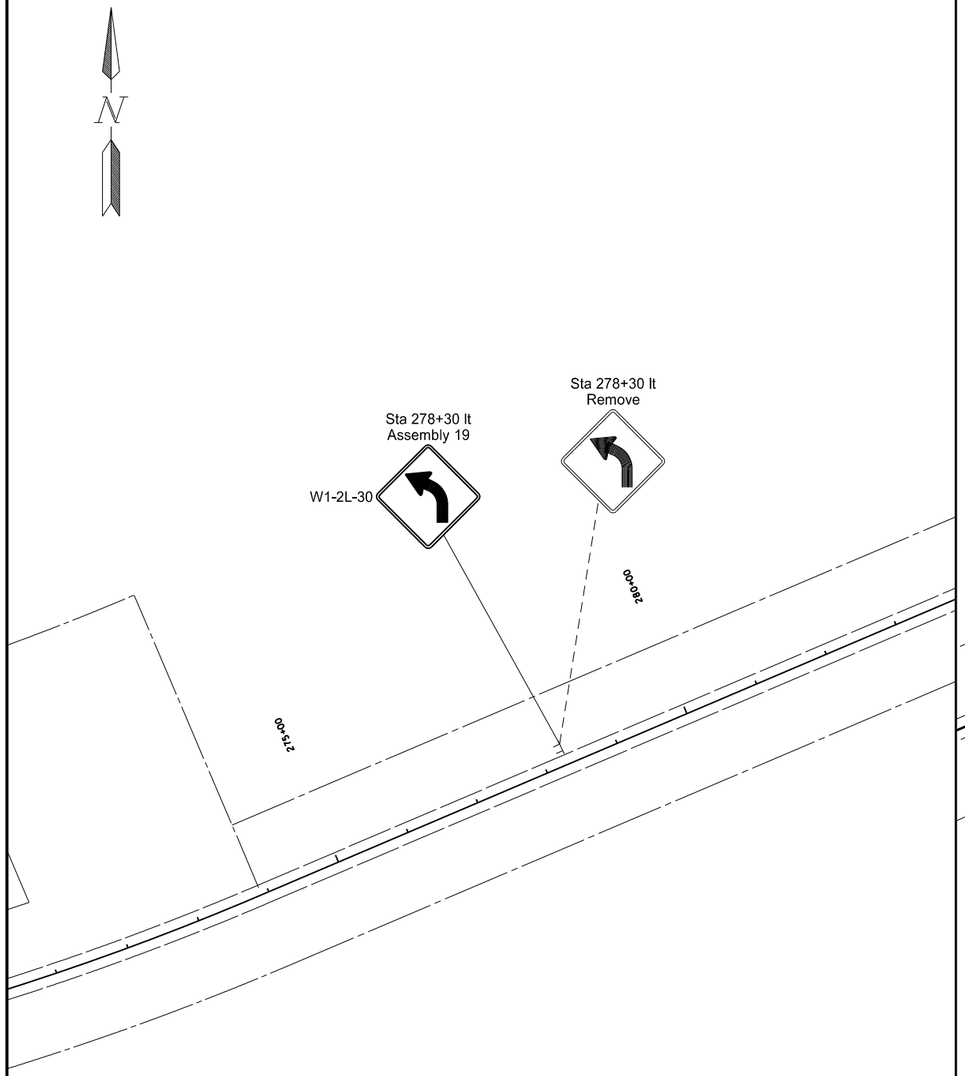
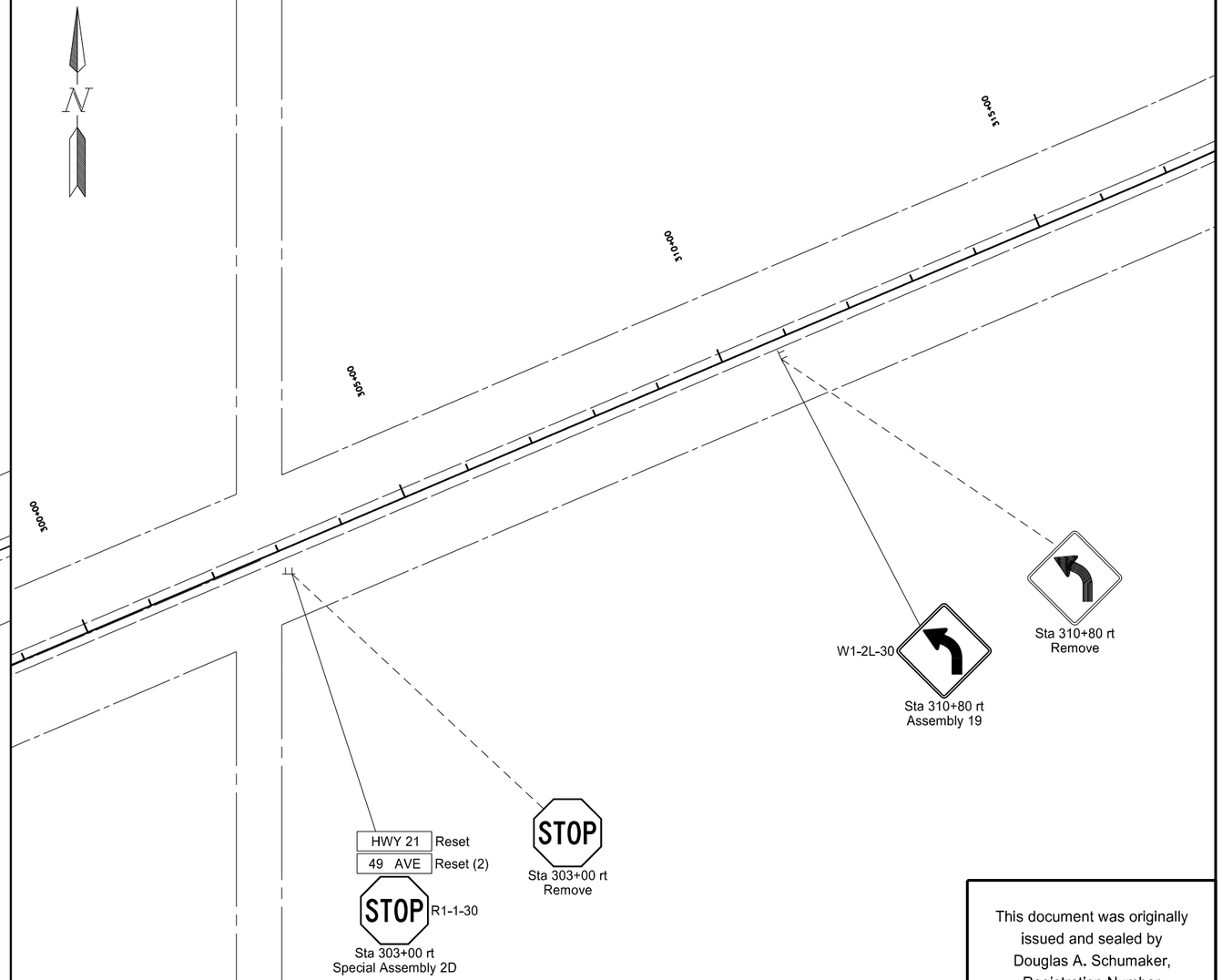
Sign Layout

Carson E to Jct ND 31
ND Hwy 21

8/29/2013 11:18:52 AM sulvestad R:\project\10021090.018\traffic\110SN_004_lsign.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	5





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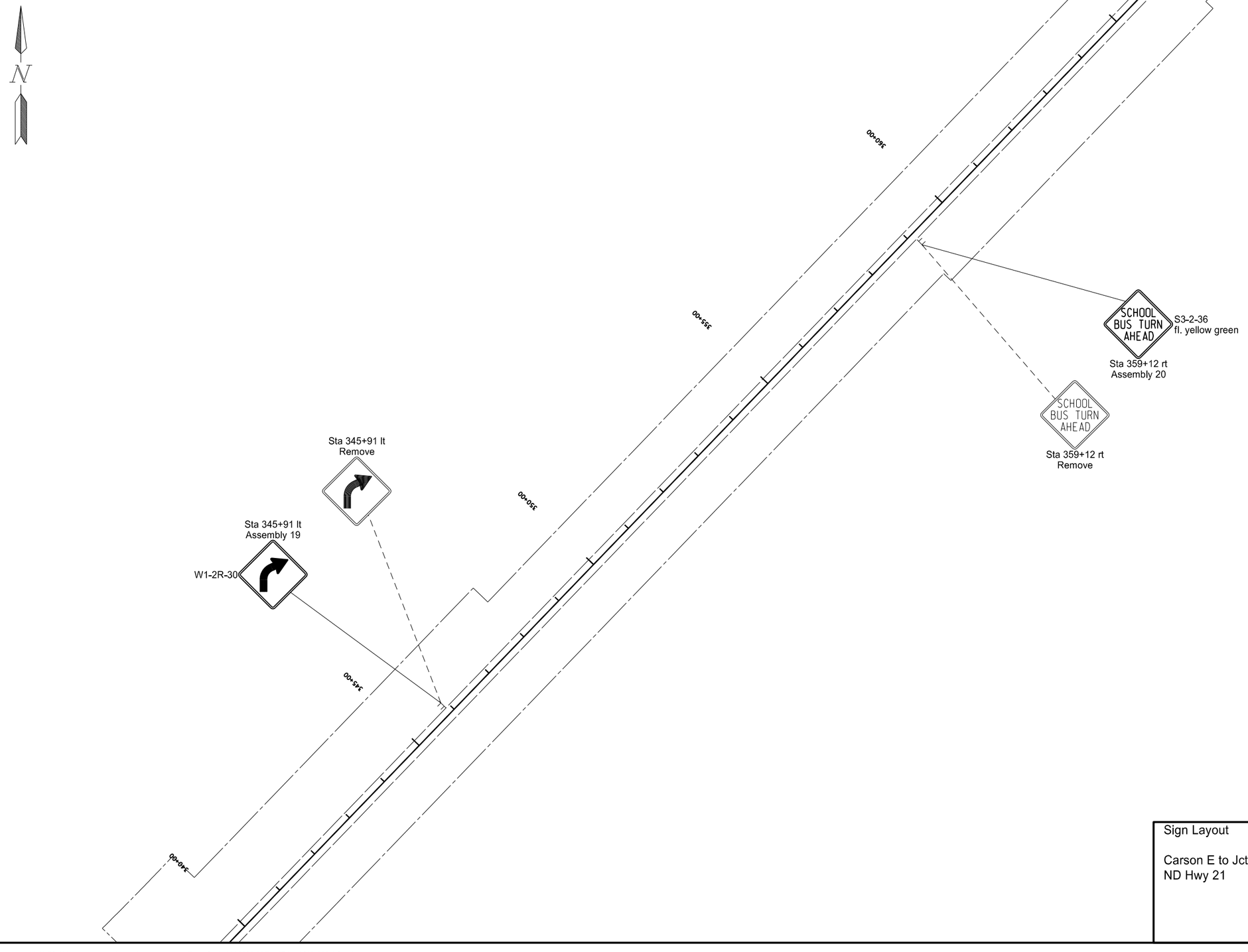
Sign Layout

Carson E to Jct ND 31
ND Hwy 21

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	6



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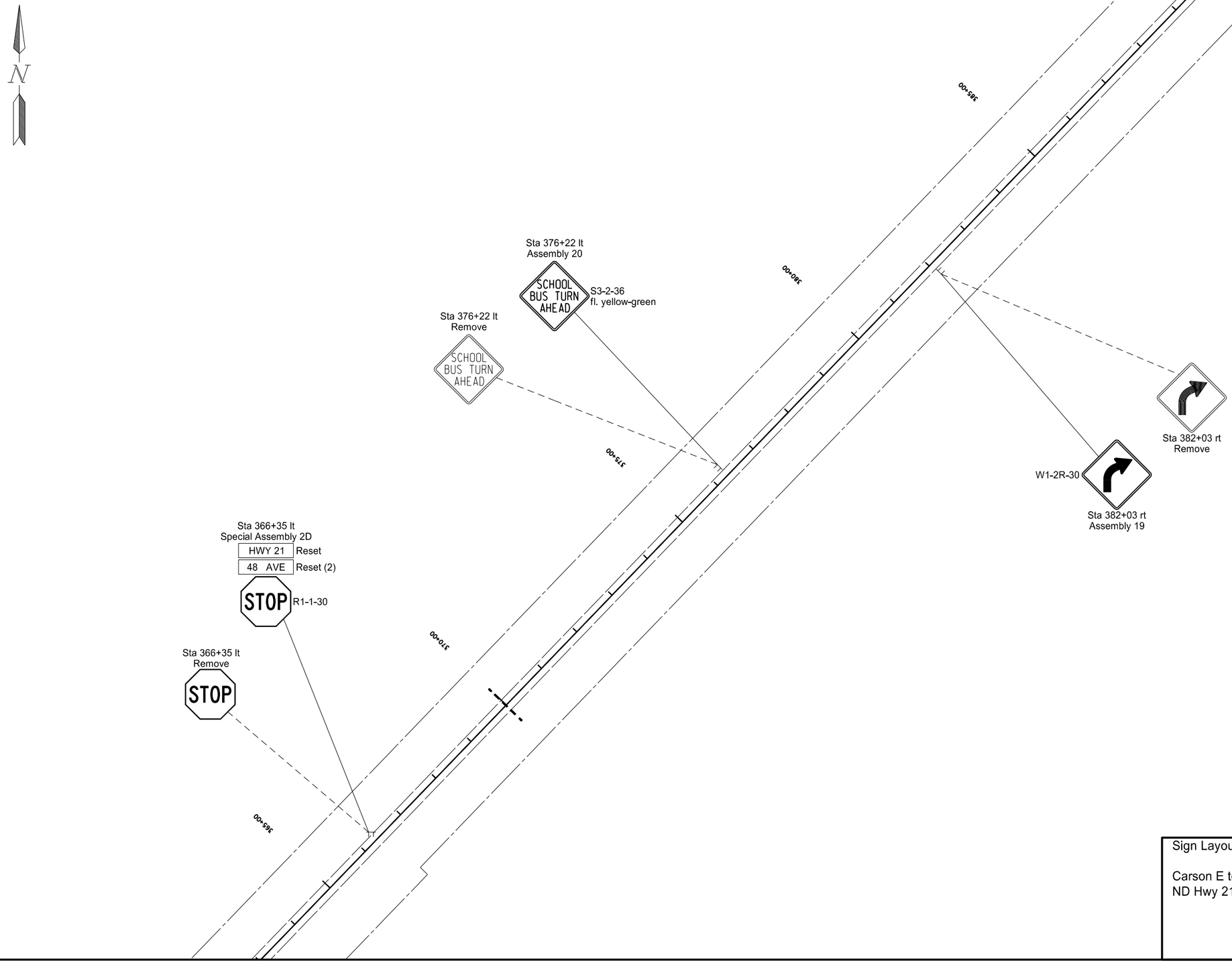
Sign Layout

Carson E to Jct ND 31
ND Hwy 21

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	7



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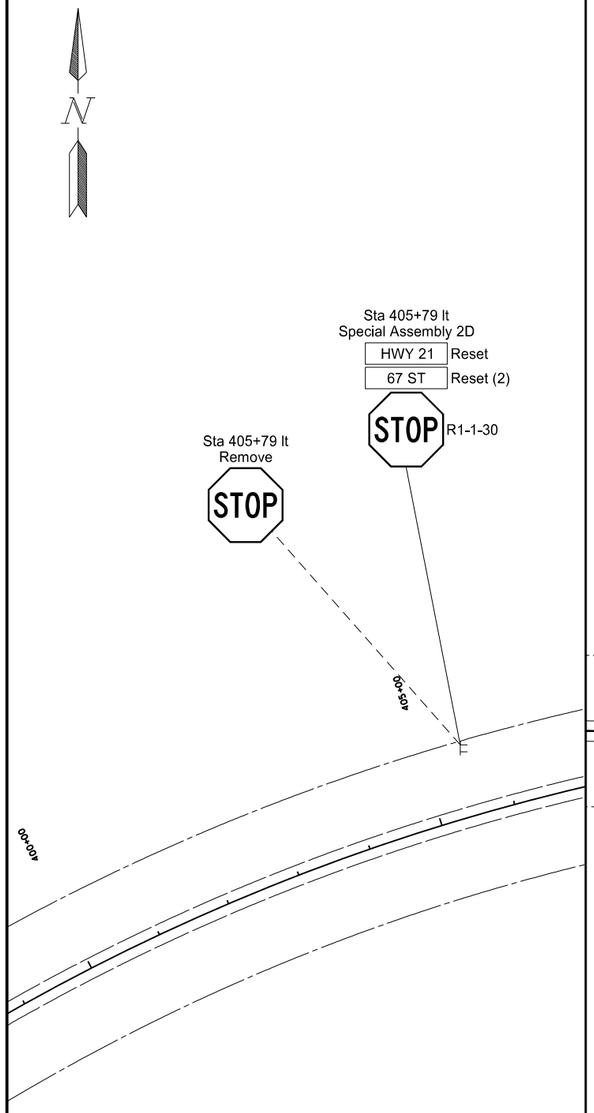
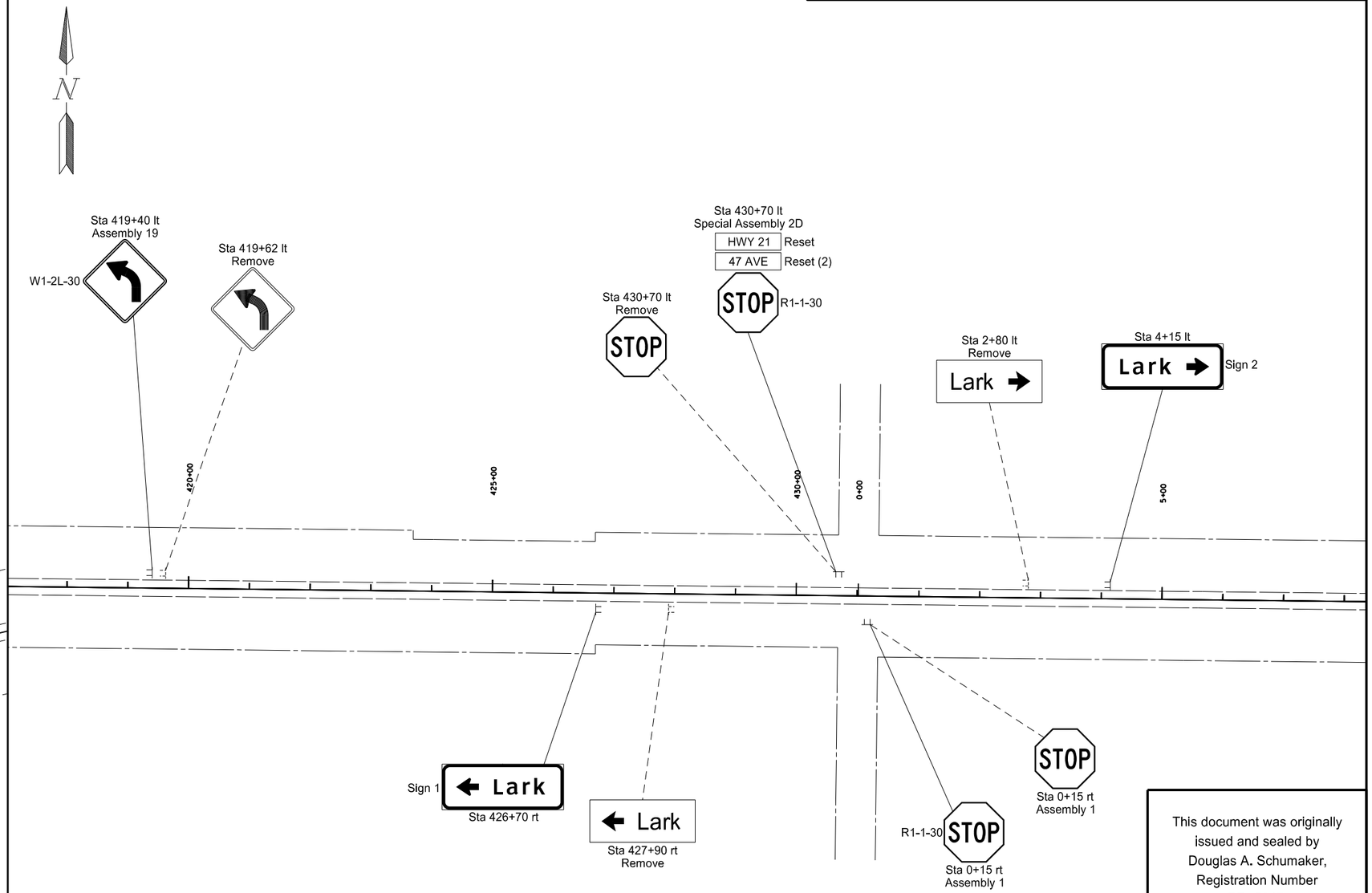
Sign Layout

Carson E to Jct ND 31
ND Hwy 21

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	8





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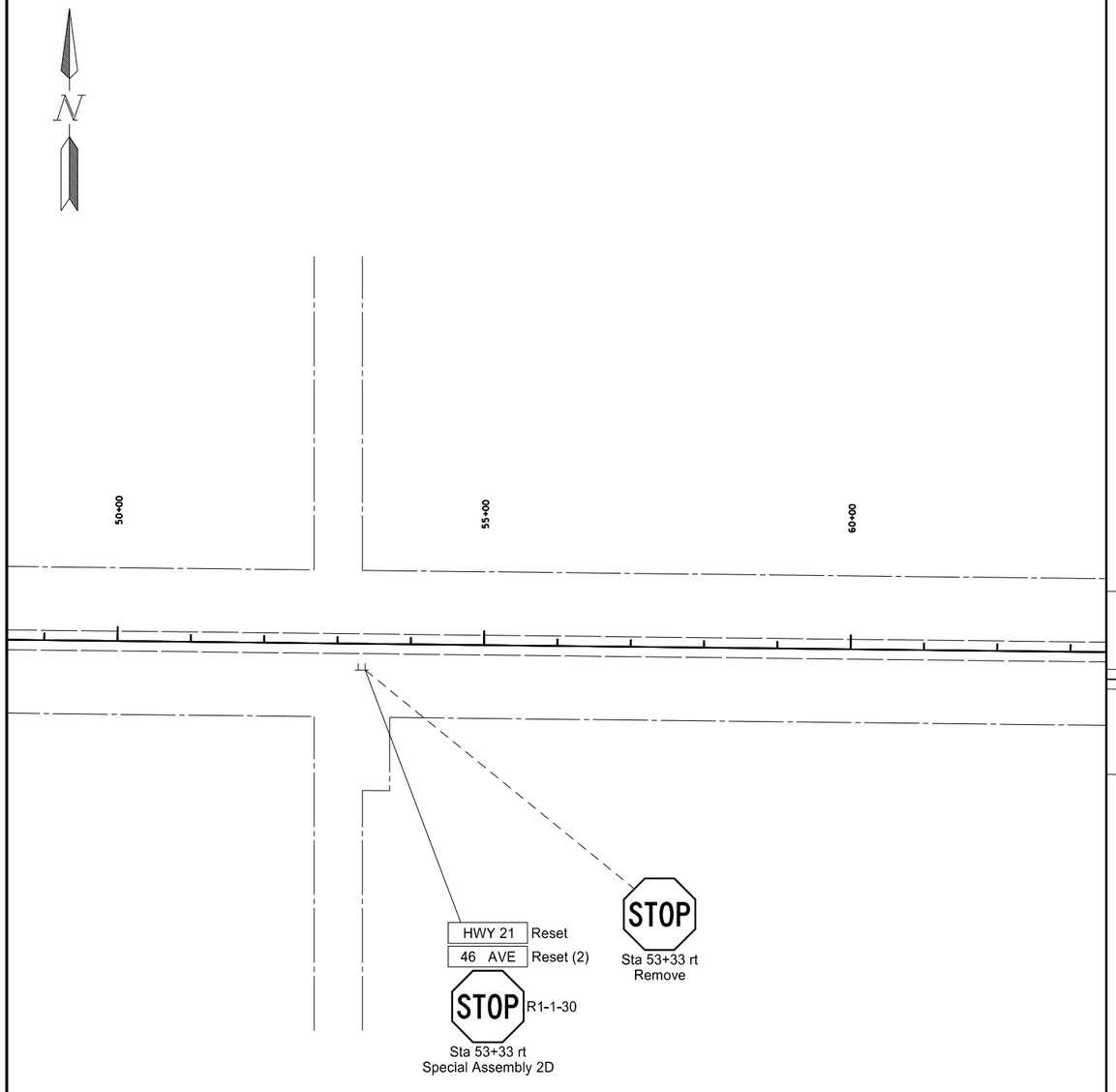
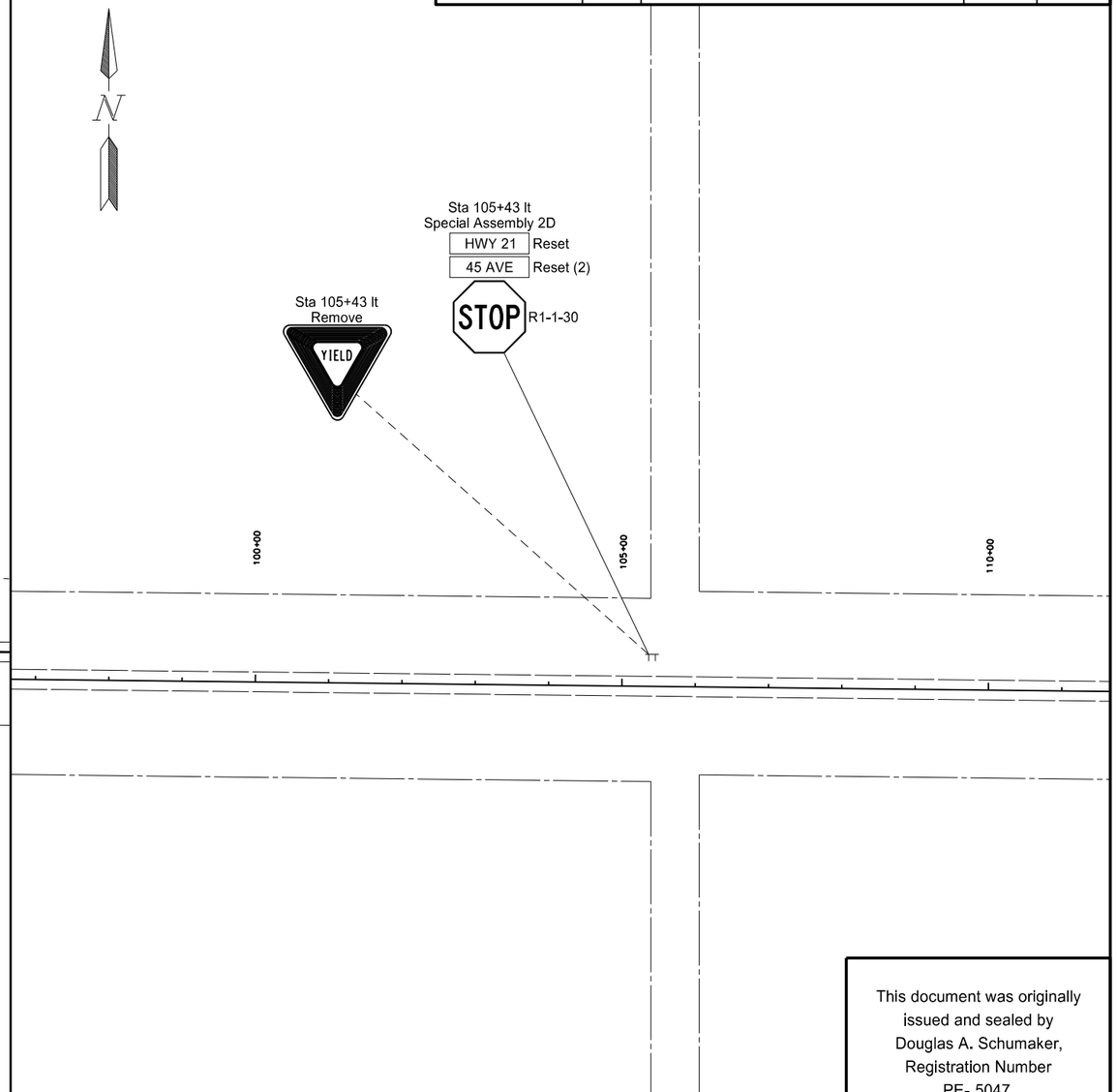
Sign Layout

Carson E to Jct ND 31
ND Hwy 21

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	9





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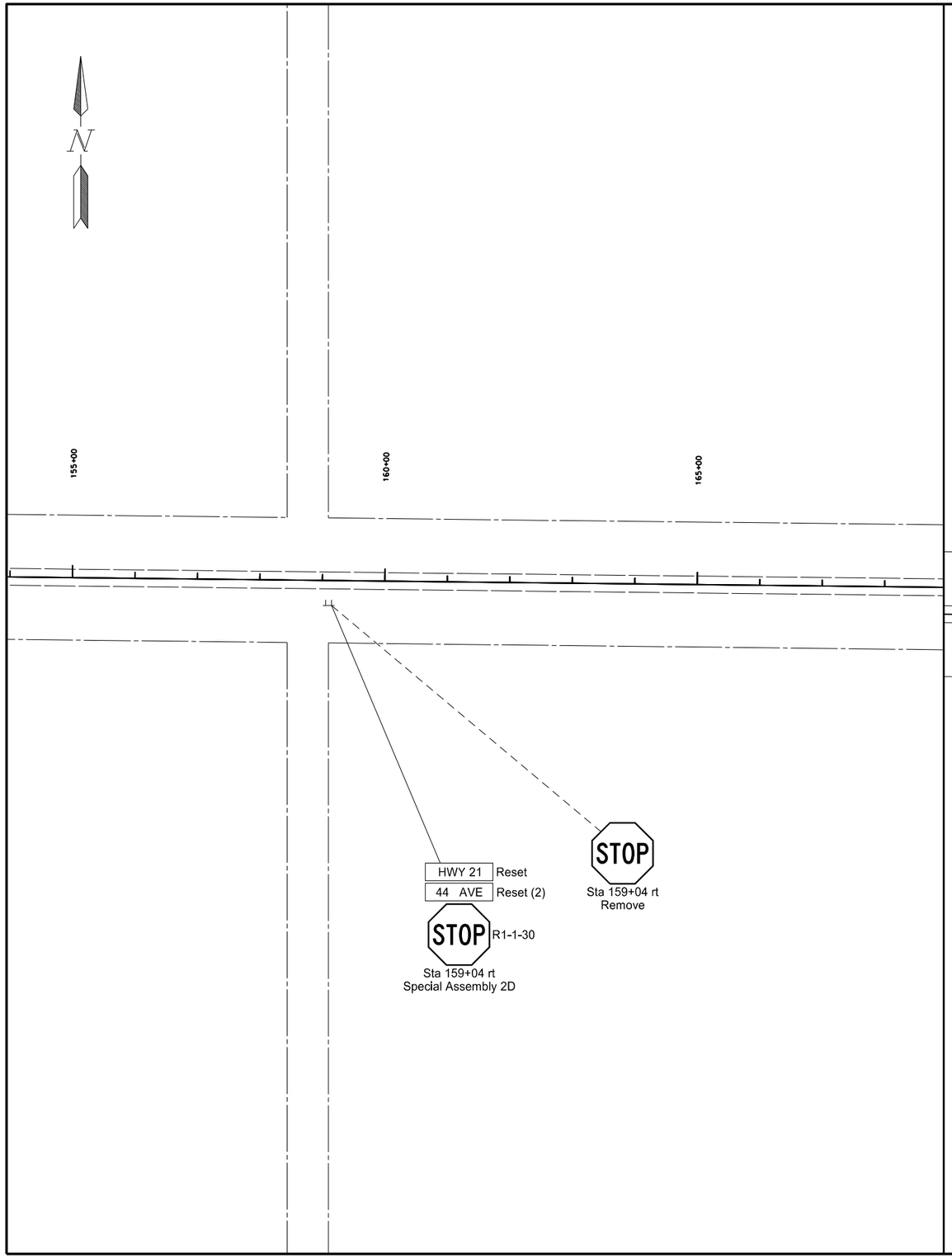
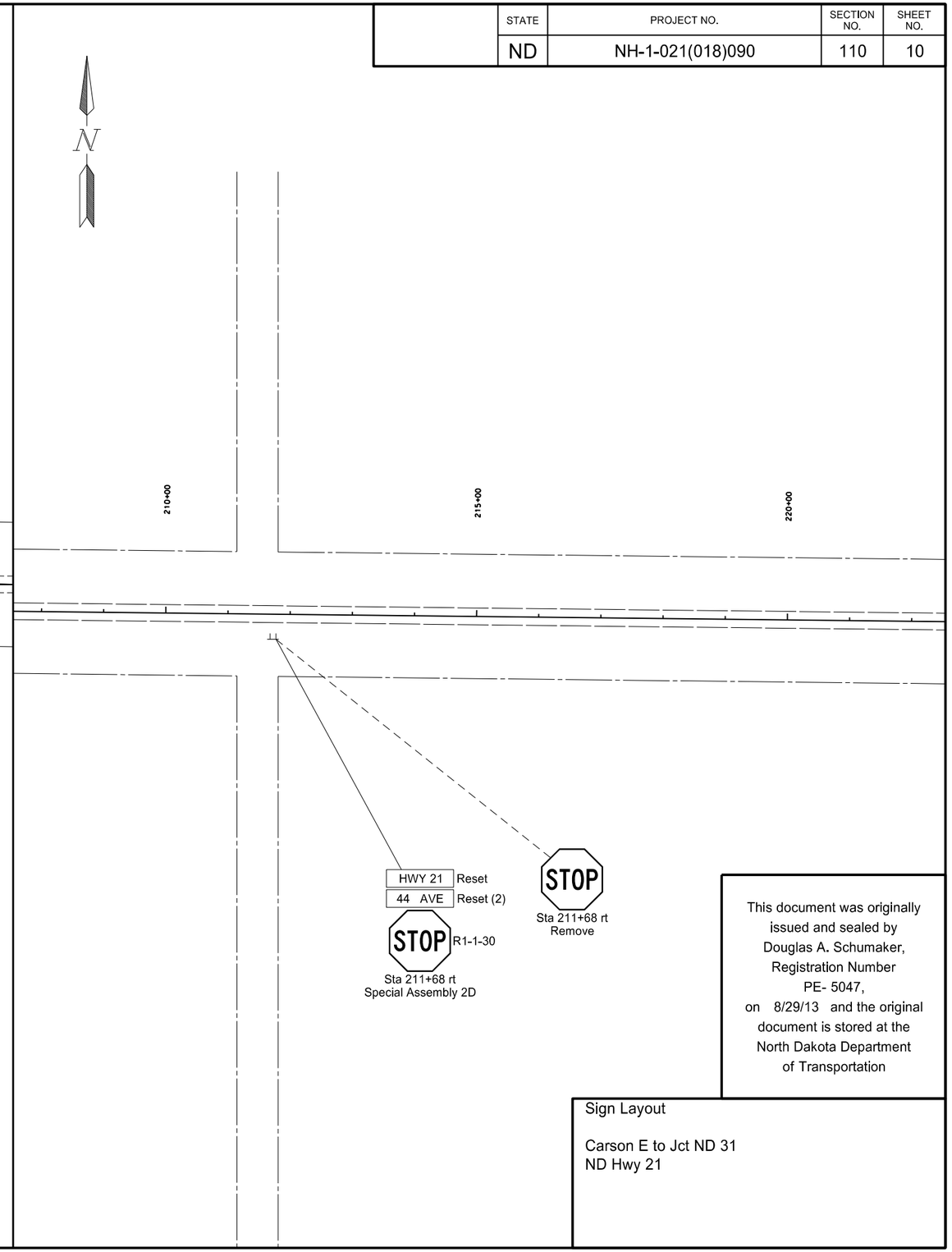
Sign Layout

Carson E to Jct ND 31
ND Hwy 21

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	10





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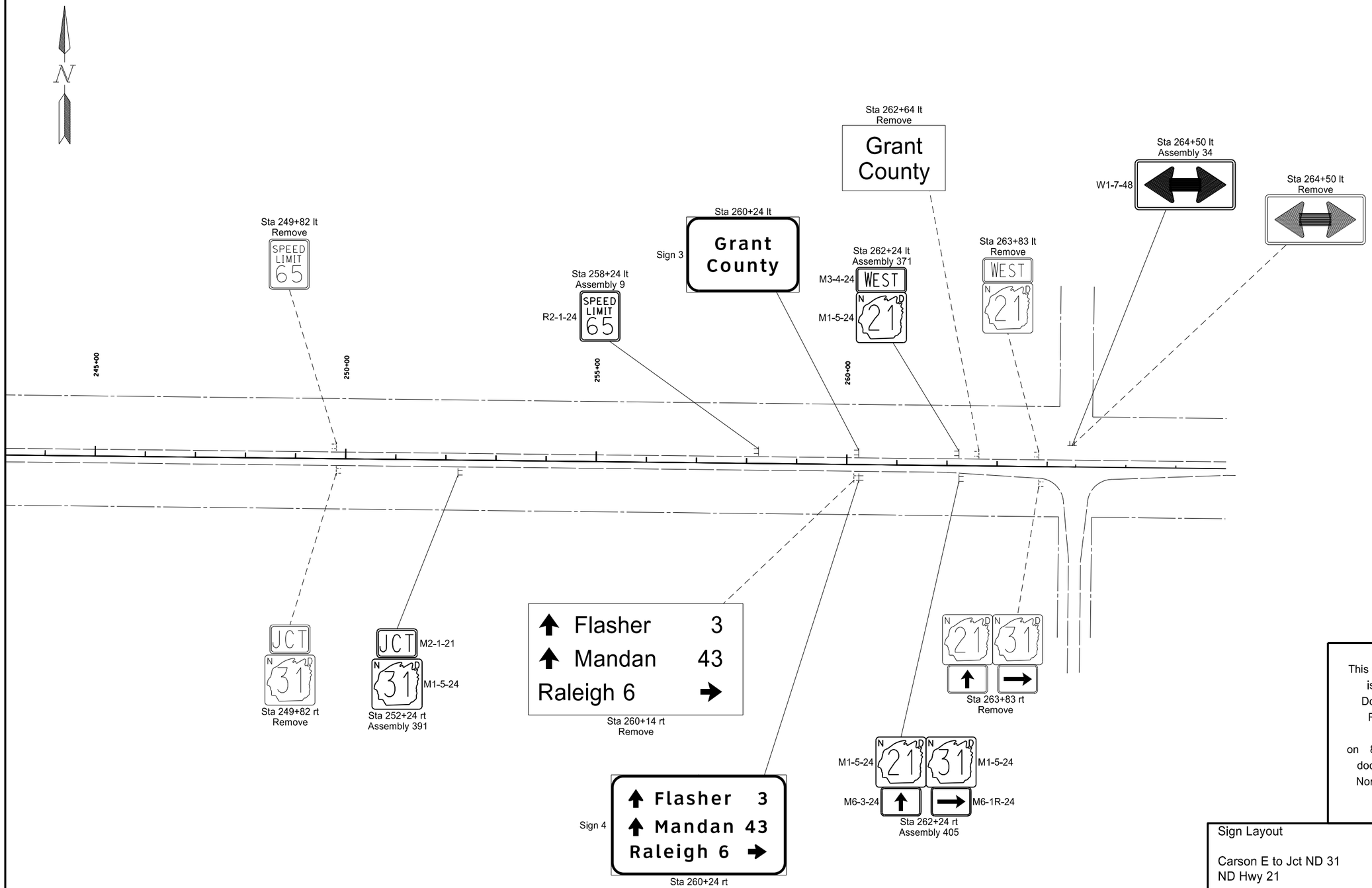
Sign Layout

Carson E to Jct ND 31
ND Hwy 21

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	11



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Sign Layout

Carson E to Jct ND 31
ND Hwy 21

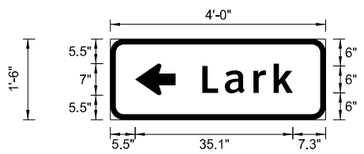
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	12

SIGN NUMBER	Sign 1
WIDTH x HEIGHT	4'-0" x 1'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ARDD	5.5	5.5	7	9	180

STATION(S):
426+70 rt

AREA: 6.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Destination.ssi

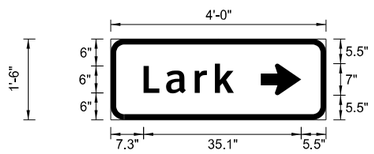
LETTER POSITION (X)																		LENGTH	SIZE	SERIES
L	a	r	k															20.1	6/4.9	ClearviewHwy-5-W
20.5	25.6	31.9	36.4																	

SIGN NUMBER	Sign 2
WIDTH x HEIGHT	4'-0" x 1'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ARDD	33.5	5.5	7	9	0

STATION(S):
4+15 lt

AREA: 6.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Destination.ssi

LETTER POSITION (X)																		LENGTH	SIZE	SERIES
L	a	r	k															20.1	6/4.9	ClearviewHwy-5-W
7.3	12.4	18.7	23.2																	

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Sign Details

Carson E to Jct ND 31
ND Hwy 21

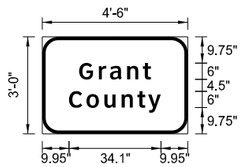
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	13

SIGN NUMBER	Sign 3
WIDTH x HEIGHT	4'-6" x 3'-0"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	6"
MOUNTING	Overhead
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S): 260+24 lt

AREA: 13.5 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Destination.ssi

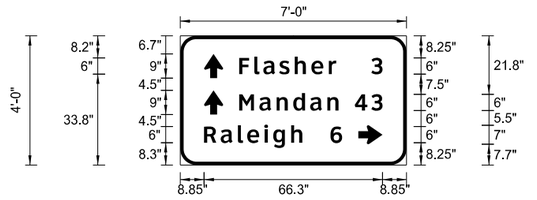
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
G	r	a	n	t															26.6	6/4.9	ClearviewHwy-5-W
13.7	21	25.1	31.5	37.4																	
C	o	u	n	t	y														34.1	6/4.9	ClearviewHwy-5-W
10	16.4	23.1	29.5	35.3	39.3																

SIGN NUMBER	Sign 4
WIDTH x HEIGHT	7'-0" 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
ARDD	8.9	32.3	7	9	90
ARDD	8.9	18.7	7	9	90
ARDD	66.1	7.7	7	9	0

STATION(S): 260+24 rt

AREA: 28.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Distance.ssi

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
F	l	a	s	h	e	r	3												53.2	6/4.9	ClearviewHwy-5-W
21.9	27.5	30.8	36.7	42.5	48.7	55.2	70.9														
M	a	n	d	a	n	4	3												53.2	6/4.9	ClearviewHwy-5-W
21.9	29.4	35.8	42	48.2	54.6	64.8	70.9														
R	a	l	e	i	g	h													36.5	6/4.9	ClearviewHwy-5-W
8.9	15	21.4	24.9	31.2	34.5	41.2															
6																			4.4	6	ClearviewHwy-5-W
55.8																					

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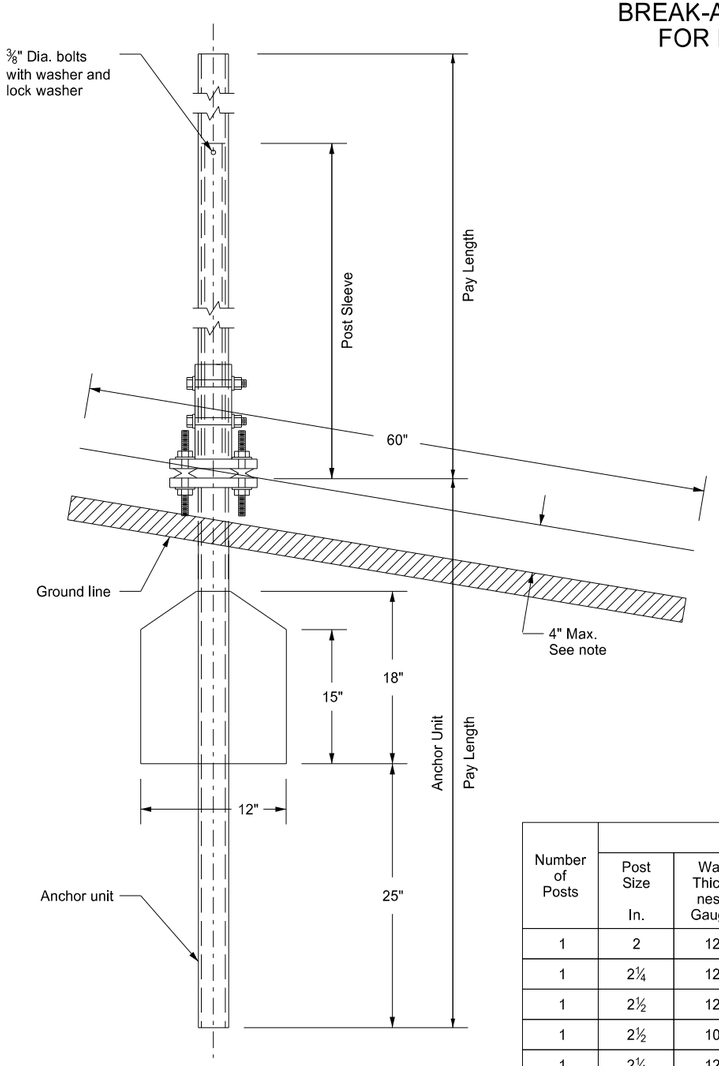
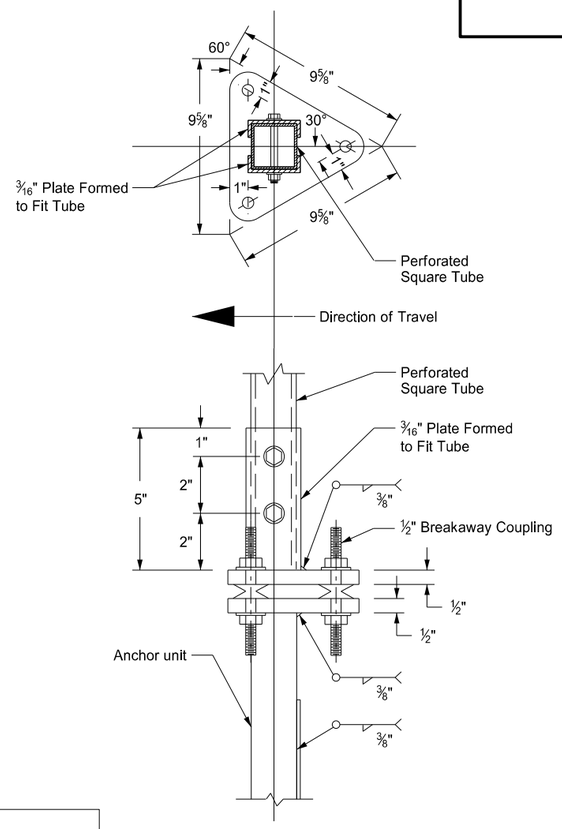
Sign Details

Carson E to Jct ND 31
ND Hwy 21

BREAK-AWAY COUPLER SYSTEM FOR PERFORATED TUBES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	110	14





BASE PLATE WITH BREAKAWAY COUPLER

NOTES:

1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
2. Anchor unit shall be the same size as the post and shall have the same specification as the post.
3. When used in concrete sidewalk, anchor shall be the same except the anchor plate shall be omitted.
4. Four post signs shall have over 8' between the first and fourth post.
5. In lieu of the breakaway base system on standard D-754-24 the breakaway coupling system may be used. The breakaway coupler system shall be manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements as specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350.
6. Base plates and formed plates shall be fabricated from steel meeting the requirements of AASHTO M-183 and M232.

Number of Posts	Telescoping Perforated Tube					
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size In.
1	2	12			No	2¼
1	2¼	12			No	2½
1	2½	12			B	2½
1	2½	10			Yes	2½
1	2¼	12	2	12	Yes	2¼ & 2 Sleeve
1	2½	12	2¼	12	Yes	2½ & 2¼ Sleeve
2	2	12			No	2¼
2	2¼	12			No	2½
2	2½	12			Yes	2½
2	2½	10			Yes	2½
2	2¼	12	2	12	Yes	2¼ & 2 Sleeve
2	2½	12	2¼	12	Yes	2½ & 2¼ Sleeve
3 & 4	2½	12			Yes	2½
3 & 4	2½	10			Yes	2½
3 & 4	2½	12	2¼	12	Yes	2½ & 2¼ Sleeve
3 & 4	2¼	12	2	12	Yes	2¼ & 2 Sleeve
3 & 4	2½	10	2⅜16	10	Yes	2½ & 2⅜16 Sleeve

B - The 2½" 12 gauge posts do not need breakaway bases when placed in standard soils. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In.4	Cross Sect. area In.2	Section Modules In.3
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2⅜16 x 2⅜16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.785

The 2⅜16" size 10 gauge is shown as 2.19" size on the plans. The 2½" size 10 gauge is shown as 2.51" size on the plans.

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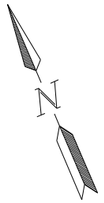
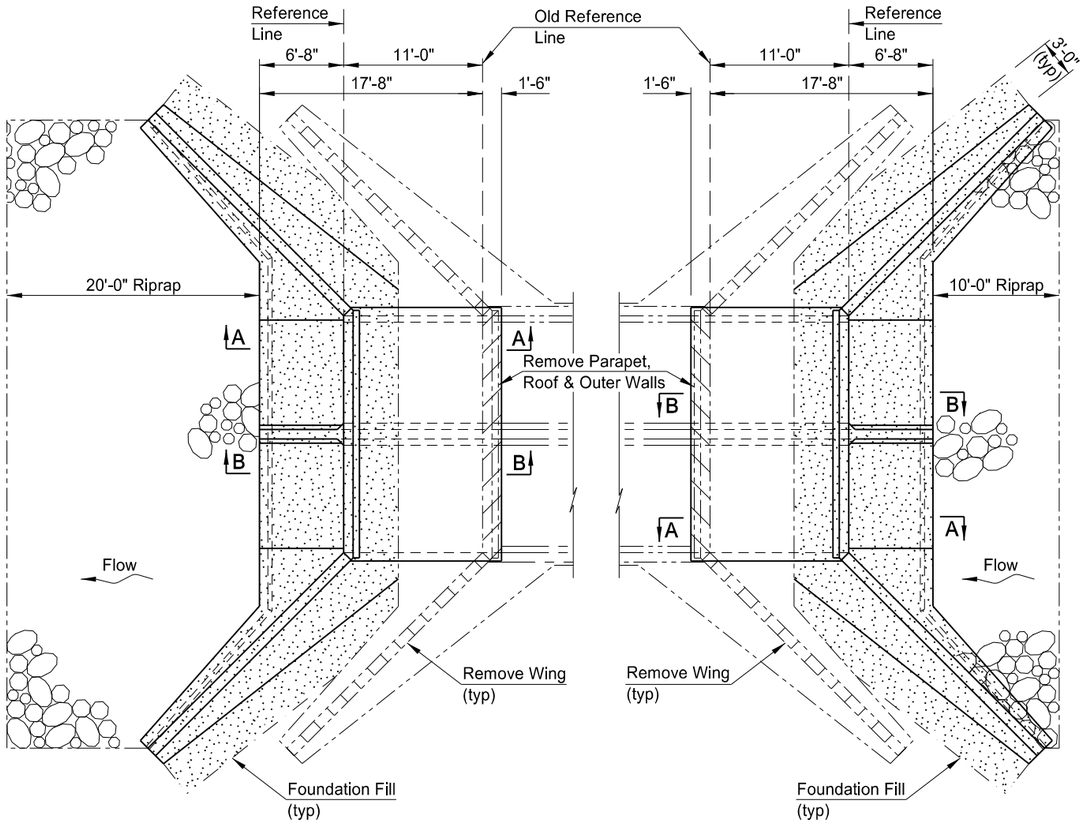
Perforated Tube Details
Break-Away Coupler System

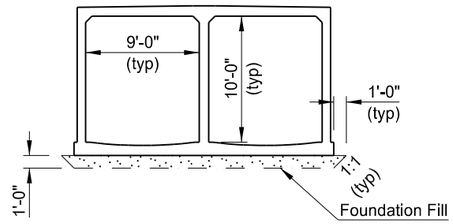
Carson E to Jct ND 31
ND Hwy 21

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	1

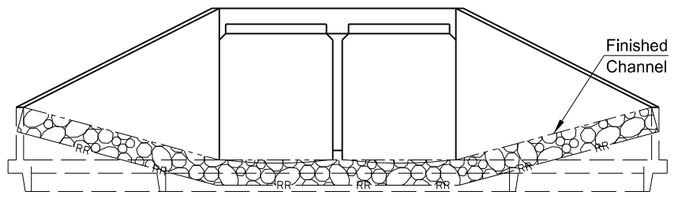




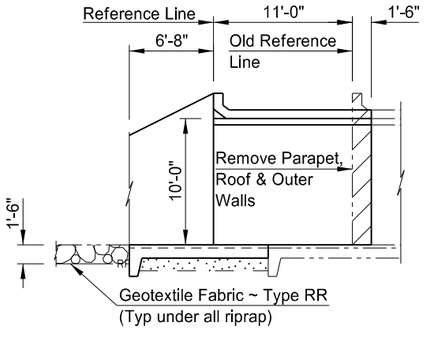
PLAN



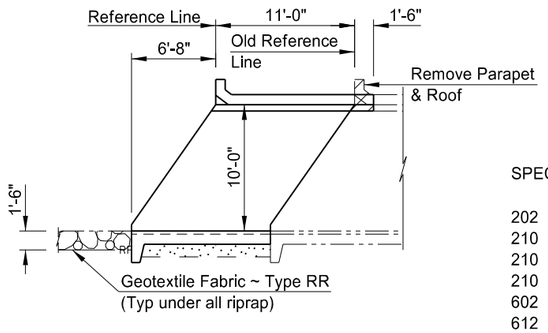
(SHOWING FILL UNER BOX)
SECTION



(SHOWING FINISHED SECTION)
END VIEW



A-A



B-B

DESIGN STRENGTHS:

f'c = 3,000 psi ~ Class AE-3 Concrete
fy = 60,000 psi ~ Reinforcing Steel

Load & Resistance Factor Design

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0101	REMOVAL OF CONCRETE	EA	1
210	0109	CLASS 2 EXCAVATION-BOX CULVERT	EA	1
210	0201	FOUNDATION PREPARATION	EA	1
210	0210	FOUNDATION FILL	CY	60
602	1131	CLASS AE-3 CONCRETE-BOX CULVERT	CY	91.4
612	0114	REINFORCING STEEL-GRADE 60-BOX CULVERT	LBS	14,701
708	1020	RIPRAP-LOOSE ROCK	CY	75
709	0600	GEOTEXTILE FABRIC-TYPE RR	SY	145

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HL-93 DESIGN LOADING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
CREEK
5 MILES EAST OF CARSON

REINFORCED CONCRETE DOUBLE BOX CULVERT EXTENSION LAYOUT

CLEAR SPAN 2 x 9' CLEAR HEIGHT 10'
MAXIMUM FILL 11'

PROJECT: NH-1-021(018)090
STATION: 273+63.06
GRANT COUNTY

08/21/13 — DATE
Terrence R. Udland — BRIDGE ENGINEER

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	170	2

NOTES

100 SCOPE OF WORK: Work at this site consists of extending a double 9' x 10' reinforced concrete box culvert 11'-0" on the north end and 11'-0" on the south end.

202 REMOVAL OF CONCRETE: Remove portions of existing culvert end where extension is to be attached. Remove 1'-6" of existing concrete to expose the existing reinforcing steel at the parapet, and the outside walls at the vertical junction with the wing. Remove existing wing walls in entirety. Leave existing floor and cutoff walls in place.

In accordance with the Federal Migratory Bird Act, measures to prevent birds from building new nests or using old nests for active nesting must be incorporated into the project. The Contractor shall remove all nesting sites within the removal area. The Contractor shall remove any new bird nests on a weekly basis within the removal area. These measures shall be maintained until all concrete has been removed. All costs associated with the removal of bird nests shall be included in the bid for "Removal of Concrete."

If the existing wall and roof thicknesses are different than the new thicknesses, the inner surfaces shall be flush and the exterior surfaces tapered in the first 1'-6" of the barrel.

210 EXCAVATION: All excavation required to build the box culvert shall be included in the bid for "Class 2 Excavation-Box Culvert."

210 FOUNDATION PREPARATION: The Contractor shall be aware of the possible inundated conditions at this site before the bid letting. The cost of any cofferdams, dewatering the excavation and all measures required to maintain flow shall be included in the bid for "Foundation Preparation."

210 FOUNDATION FILL: Moisture and density controls shall be in accordance with Section 203.02 G of the Standard Specifications.

602 CONCRETE: All concrete shall be Class AE-3 and shall be compacted by vibration.

The following elements of each section shall be cast in one continuous run:

1. Floor slab and wing footings
2. Each intermediate wall up to the bottom of fillets
3. Each sidewall up to the bottom of fillets with its adjacent wings complete to the top
4. Roof slab and parapets

All exposed edges of concrete shall be beveled with ¾" triangular molding. The concrete in the walls shall be allowed to set at least two hours before the roof slab is poured.

612 REINFORCING STEEL: The transverse and vertical bars shall be placed nearest the surface. The longitudinal, temperature or tie bars shall be placed immediately inside the vertical and transverse bars and the intersections tied.

The clear distance from the nearest bar to the surface of the concrete shall be as follows:

Bottom of wing footing =	3" clear
Bottom of floor slab =	2½" clear
Top of floor slab =	2" clear
Top of wing footing =	2" clear
All walls =	2" clear
Top of roof slab =	2" clear
Bottom of roof slab =	1" clear

Dimensions of bent bars are given out to out. All bends conform to A.C.I. Standards unless indicated otherwise.

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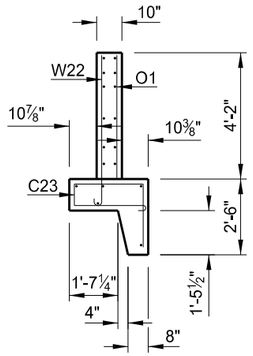
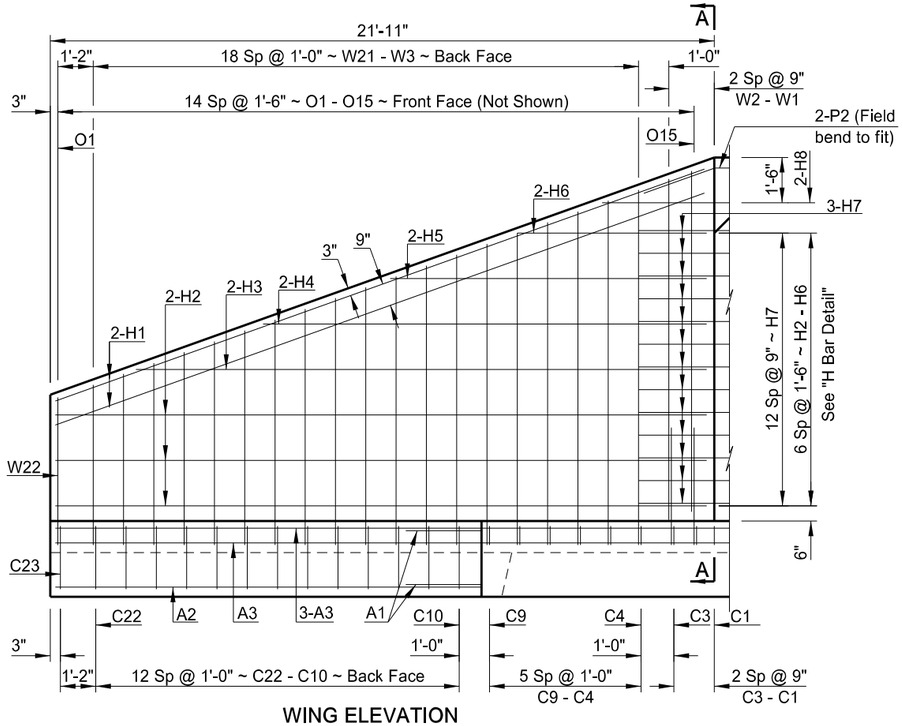
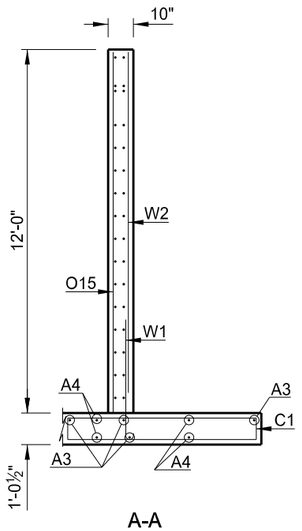
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	3



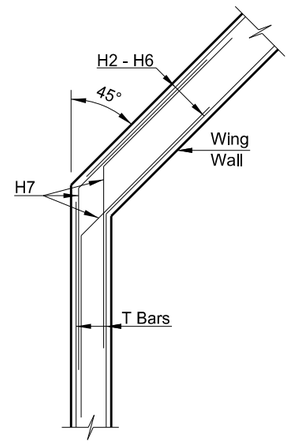
END VIEW



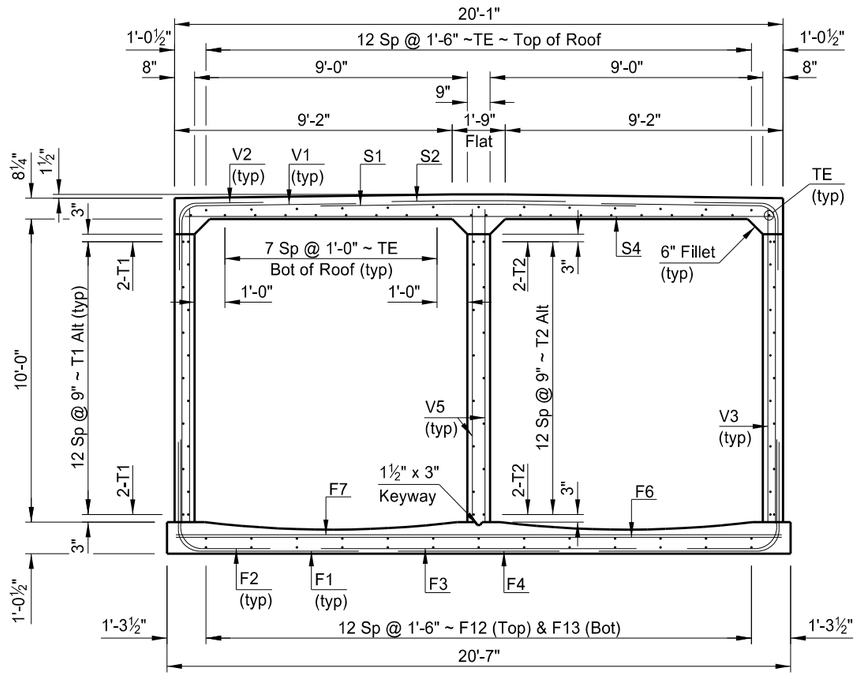
WING ELEVATION



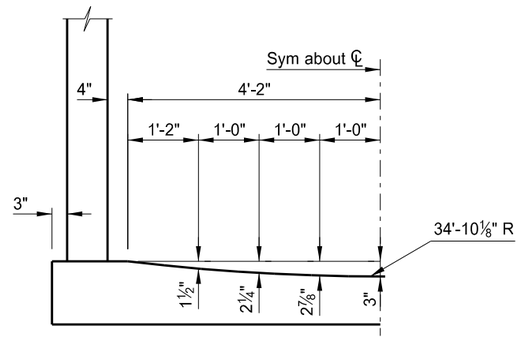
A-A



H BAR DETAIL



SECTION OF BARREL

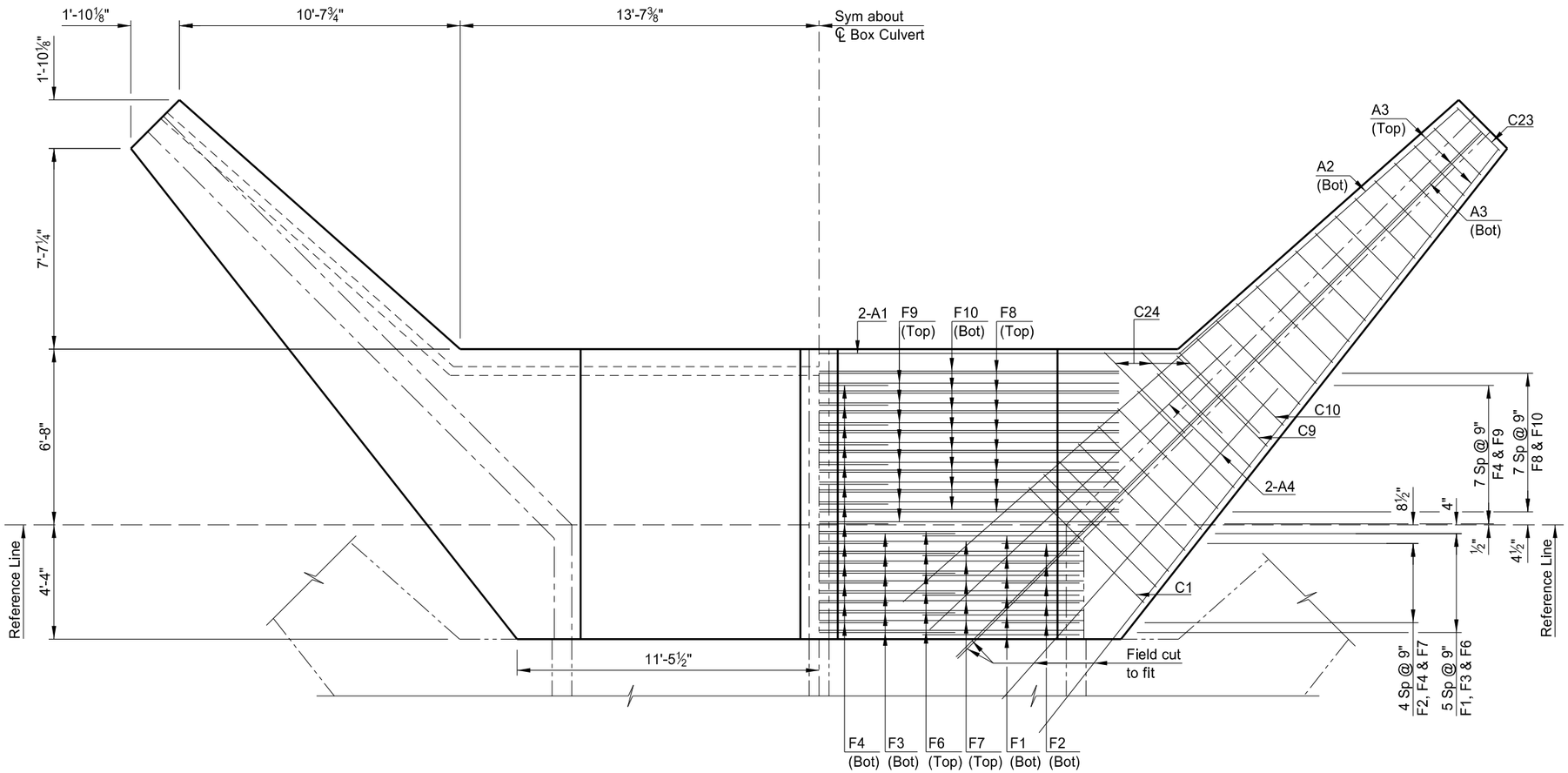


CURVED FLOOR OFF-SETS

CREEK
5 MILES EAST OF CARSON

BARREL SECTION & WING DETAILS

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	4



(SHOWING DIMENSIONS) (SHOWING REINFORCING)

FLOOR PLAN

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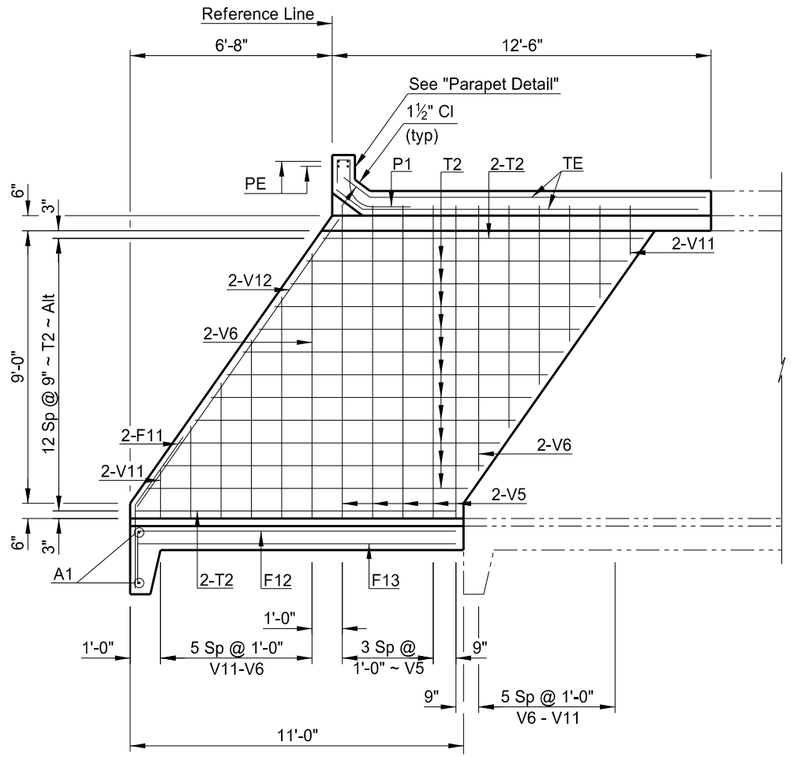
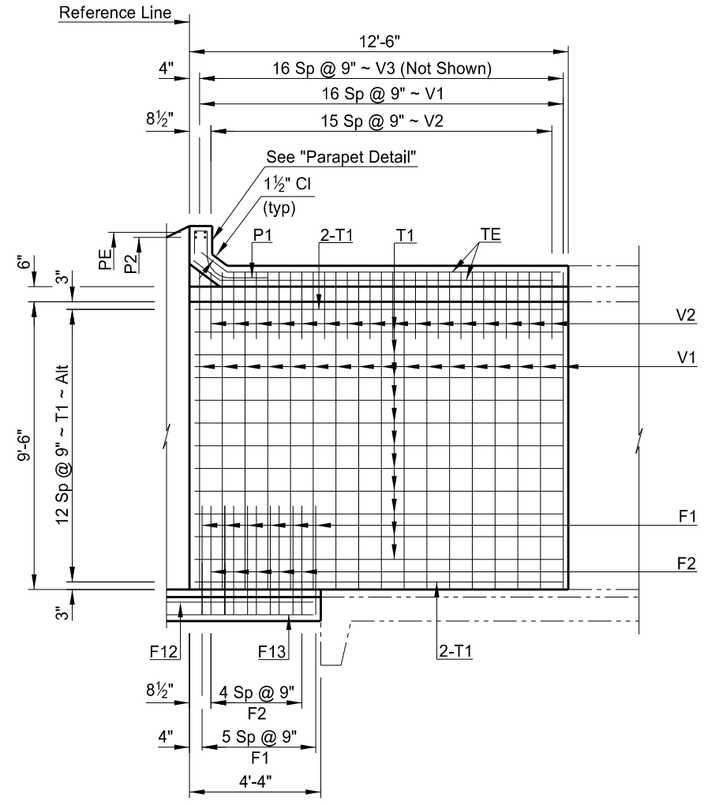
CREEK
5 MILES EAST OF CARSON

FLOOR DETAILS

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	5

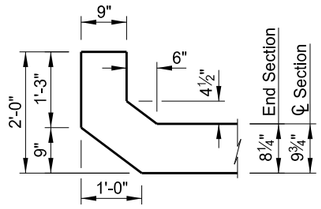


INNER WALL



OUTER WALL

LONGITUDINAL SECTIONS



PARAPET DETAIL

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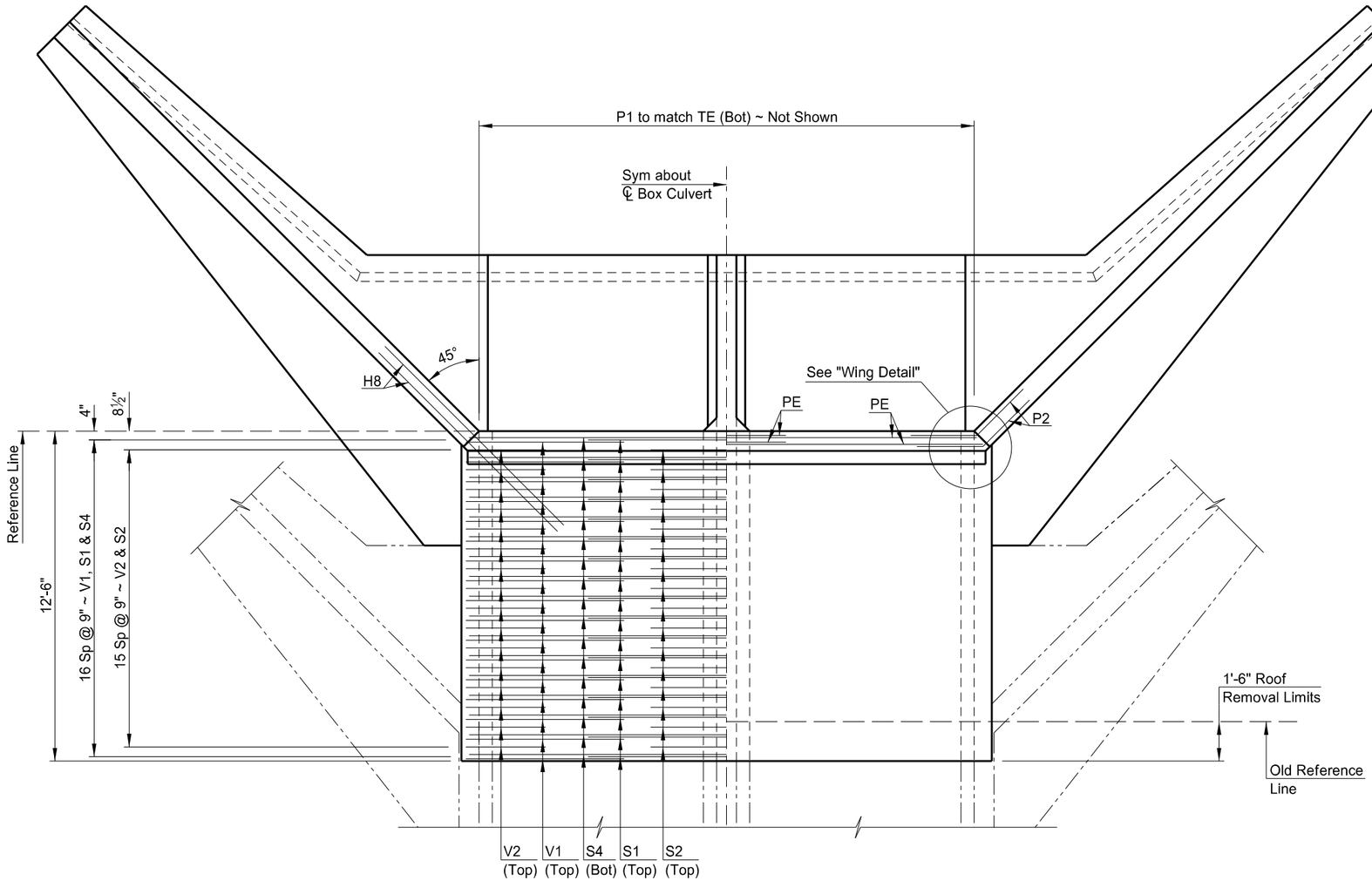
CREEK
5 MILES EAST OF CARSON

WALL DETAILS &
PARAPET DETAIL

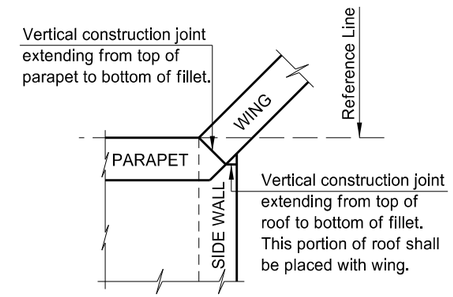
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	6



(SHOWING ROOF REINFORCING)

(SHOWING PARAPET REINFORCING)

ROOF PLAN



WING DETAIL

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CREEK
5 MILES EAST OF CARSON

ROOF DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	170	7

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
W1	7	8	4'-8"	BENT
W2	6	8	11'-3"	STR.
W3	7	4	12'-6"	BENT
W4	7	4	12'-2"	BENT
W5	7	4	11'-10"	BENT
W6	7	4	11'-5"	BENT
W7	7	4	11'-1"	BENT
W8	7	4	10'-9"	BENT
W9	6	4	10'-3"	BENT
W10	6	4	9'-10"	BENT
W11	6	4	9'-6"	BENT
W12	5	4	9'-1"	BENT
W13	5	4	8'-8"	BENT
W14	5	4	8'-4"	BENT
W15	4	4	7'-11"	BENT
W16	4	4	7'-6"	BENT
W17	4	4	7'-2"	BENT
W18	4	4	6'-10"	BENT
W19	4	4	6'-6"	BENT
W20	4	4	6'-1"	BENT
W21	4	4	5'-9"	BENT
W22	4	4	5'-5"	BENT
C1	6	4	14'-2"	BENT
C2	6	4	13'-10"	BENT
C3	6	4	13'-8"	BENT
C4	6	4	13'-4"	BENT
C5	5	4	12'-10"	BENT
C6	5	4	12'-6"	BENT
C7	5	4	12'-2"	BENT
C8	5	4	11'-10"	BENT
C9	5	4	11'-6"	BENT
C10	5	4	12'-7"	BENT
C11	5	4	12'-3"	BENT
C12	5	4	11'-9"	BENT
C13	4	4	11'-4"	BENT
C14	4	4	11'-0"	BENT
C15	4	4	10'-8"	BENT
C16	4	4	10'-4"	BENT
C17	4	4	10'-0"	BENT
C18	4	4	9'-8"	BENT
C19	4	4	9'-2"	BENT
C20	4	4	8'-10"	BENT
C21	4	4	8'-6"	BENT
C22	4	4	8'-2"	BENT
C23	4	4	7'-8"	BENT
C24	4	12	6'-5"	BENT
H 1	7	16	22'-9"	STR.
H 2	4	24	21'-6"	STR.
H 3	4	8	18'-10"	STR.
H 4	4	8	14'-7"	STR.
H 5	4	8	10'-5"	STR.
H 6	4	8	6'-3"	STR.
H 7	4	156	6'-0"	BENT
H 8	6	8	9'-7"	STR.
O 1-O15	4	4 SETS	117'-6"	STR.
A 1	6	8	17'-1"	BENT
A 2	6	4	14'-2"	STR.
A 3	6	16	28'-2"	STR.
A 4	6	16	15'-9"	STR.
P 1	4	40	4'-7"	BENT
P 2	6	8	5'-0"	BENT
PE	6	40	12'-8"	STR.

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
V 6	4	8	8'-9"	STR.
V 7	4	8	7'-4"	STR.
V 8	4	8	5'-11"	STR.
V 9	4	8	4'-5"	STR.
V10	4	8	3'-0"	STR.
V11	4	8	1'-7"	STR.
V12	6	4	11'-7"	STR.
F 8	4	16	22'-9"	STR.
F 9	4	16	22'-9"	STR.
F10	5	16	22'-9"	STR.
F11	6	4	5'-6"	BENT
F12	4	26	12'-3"	BENT
F13	4	26	10'-6"	STR.

BAR LIST (VARIABLE)

MARK	SIZE	NO.	LENGTH	SHAPE
V 1	4	68	16'-0"	BENT
V 2	4	64	4'-9"	BENT
V 3	4	68	10'-4"	STR.
V 5	4	20	10'-4"	STR.
F 1	4	24	9'-3"	BENT
F 2	5	20	6'-3"	BENT
F 3	5	12	10'-6"	STR.
F 4	5	26	5'-3"	STR.
F 6	4	24	20'-0"	STR.
F 7	4	20	20'-0"	STR.
S 1	4	68	10'-6"	STR.
S 2	6	64	5'-9"	STR.
S 4	5	68	19'-6"	STR.
T1	4	60	12'-2"	STR.
T2	4	30	10'-7"	STR.
TE	4	66	12'-2"	BENT

CONCRETE QUANTITIES (ONE END)	
ENTIRE FLOOR	18.0 CY
TWO OUTSIDE WALLS & 2 WINGS	16.6 CY
INSIDE WALL	2.9 CY
ENTIRE ROOF	8.2 CY
TOTAL	45.7 CY

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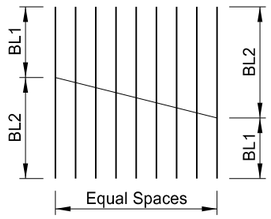
QUANTITIES	
CLASS AE-3 CONCRETE	91.4 CY
REINFORCING STEEL	14,701 LBS

CREEK
5 MILES EAST OF CARSON

REINFORCING BAR LIST

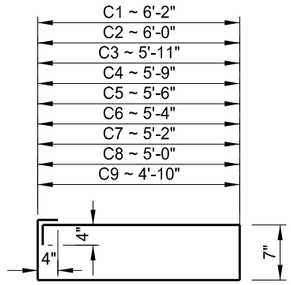
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	8



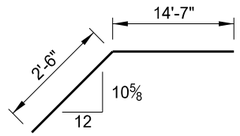
2 SETS SHOWN

MARK	LENGTH 1 SET	BL1	BL2	SPACES
O1-O15	117'-6"	4'-1"	11'-7"	14

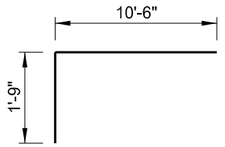
BAR CUTTING DETAILS



C1 - C9



A1



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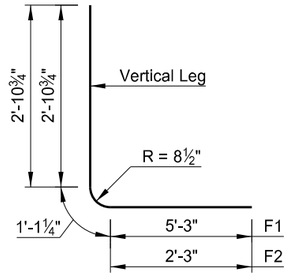
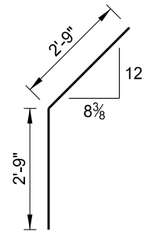


F1 & F2



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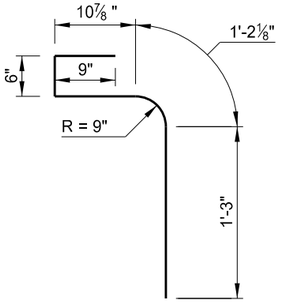

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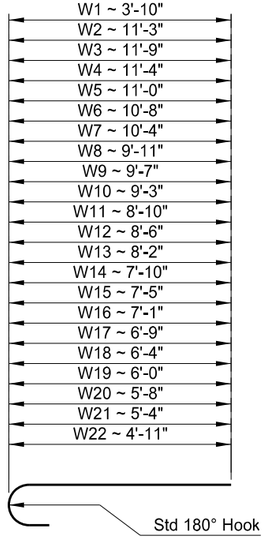
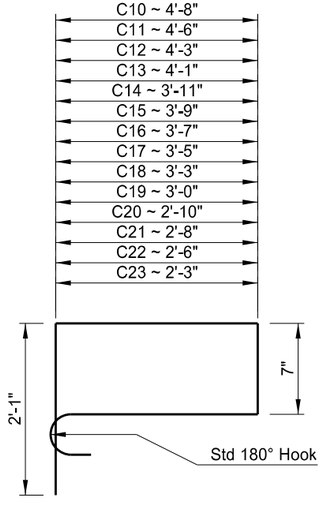
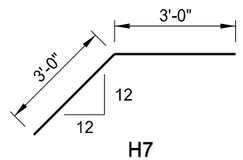


W1 - W22



C10 - C23



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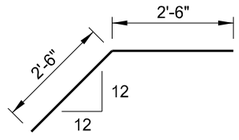

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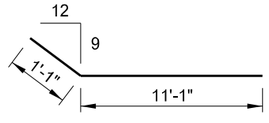
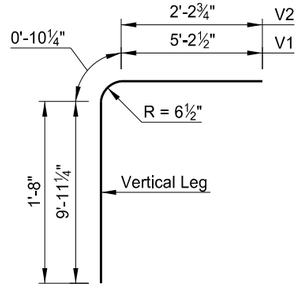
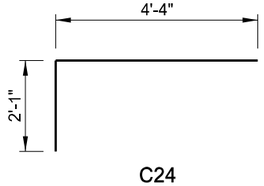


TE



V1 & V2

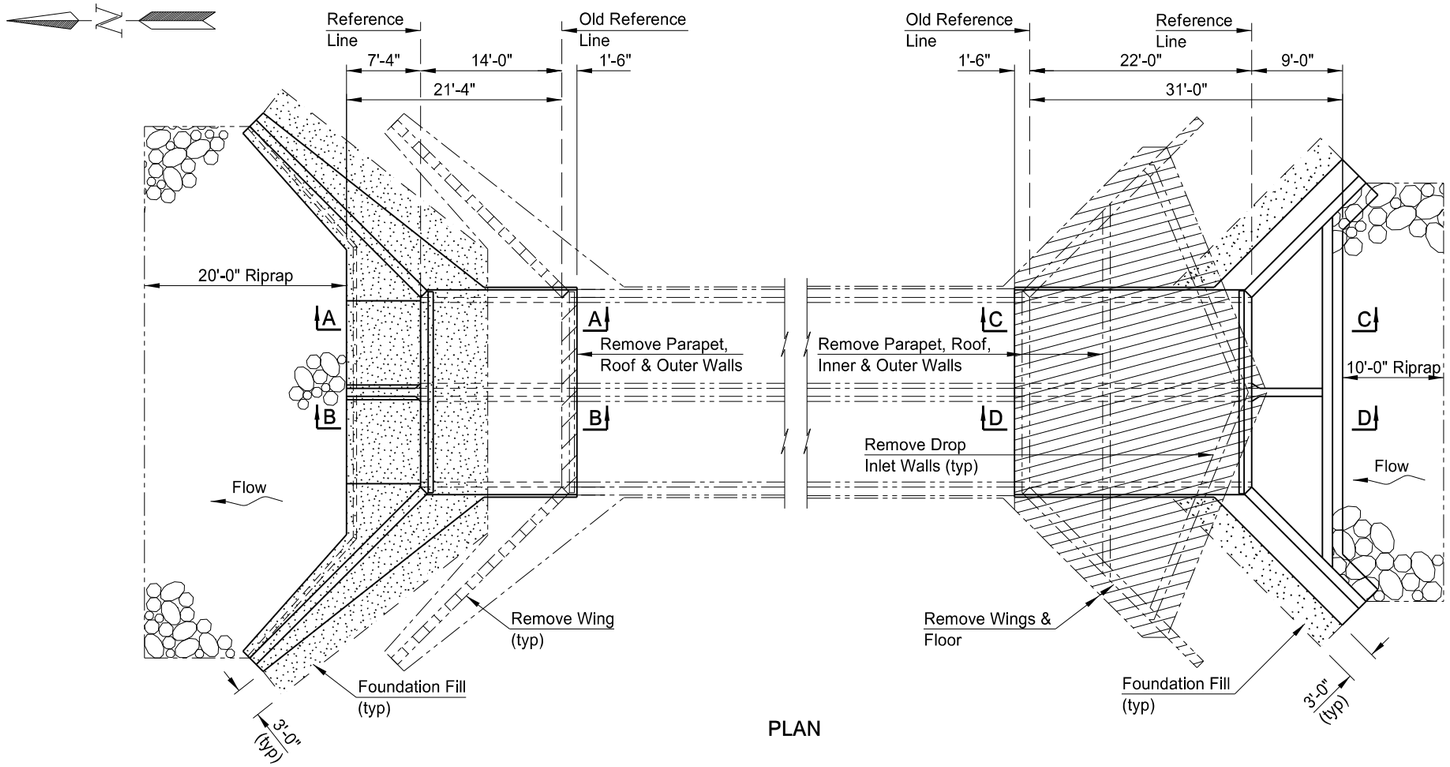


C24

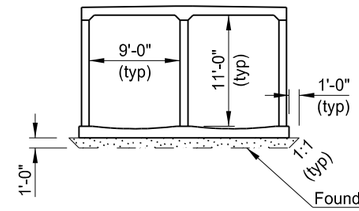
CREEK
5 MILES EAST OF CARSON

BAR DETAILS

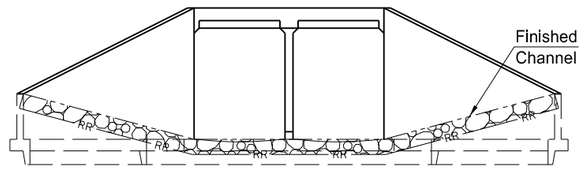
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	9



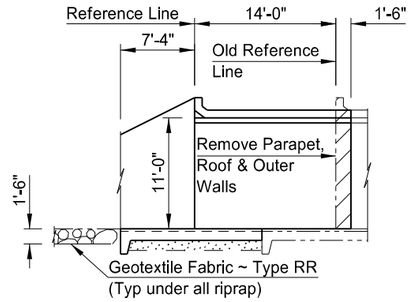
PLAN



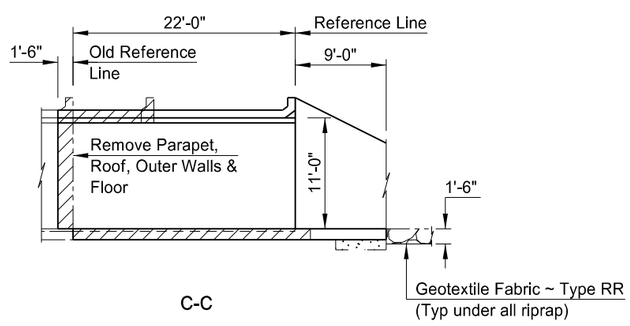
(SHOWING FILL UNDER BOX)
SECTION



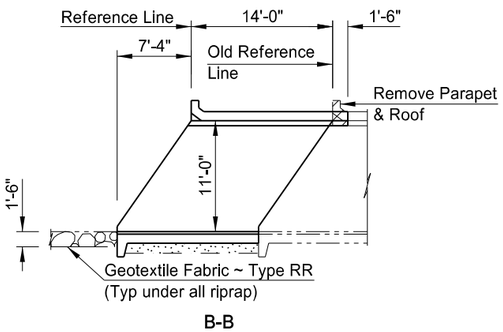
(SHOWING FINISHED SECTION)
END VIEW



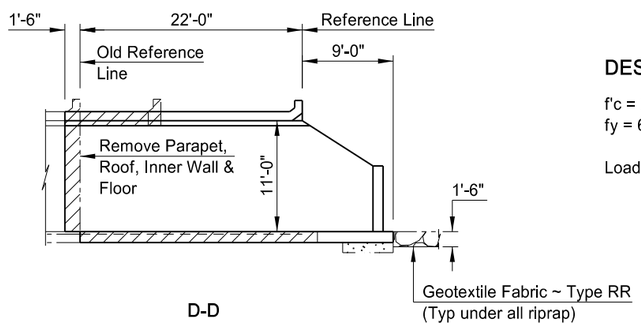
A-A



C-C



B-B



D-D

DESIGN STRENGTHS:

f'c = 3,000 psi ~ Class AE-3 Concrete
fy = 60,000 psi ~ Reinforcing Steel

Load & Resistance Factor Design

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0111	REMOVAL OF CONCRETE	L SUM	1
210	0109	CLASS 2 EXCAVATION-BOX CULVERT	EA	1
210	0201	FOUNDATION PREPARATION	EA	1
210	0210	FOUNDATION FILL	CY	75
602	1131	CLASS AE-3 CONCRETE-BOX CULVERT	CY	154.7
612	0114	REINFORCING STEEL-GRADE 60-BOX CULVERT	LBS	19,144
708	1020	RIPRAP-LOOSE ROCK	CY	80
709	0600	GEOTEXTILE FABRIC-TYPE RR	SY	155

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HL-93 DESIGN LOADING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
CREEK
11 MILES EAST OF CARSON

REINFORCED CONCRETE DOUBLE BOX CULVERT EXTENSION LAYOUT

CLEAR SPAN 2 x 9' CLEAR HEIGHT 11'
MAXIMUM FILL 14'

PROJECT: NH-1-021(018)090
STATION: 183+01.32
GRANT COUNTY

08/21/13 — DATE
Terrence R. Udland — BRIDGE ENGINEER

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	170	10

NOTES

100 SCOPE OF WORK: Work at this site consists of extending a double 9' x 11' reinforced concrete box culvert 14'-0" on the north end and 22'-0" on the south end. The south end consists of removing and replacing a drop inlet.

202 REMOVAL OF CONCRETE: Remove portions of existing culvert end where extension is to be attached. On the north end remove 1'-6" of existing concrete to expose the existing reinforcing steel at the parapet and the outside walls at the vertical junction with the wing. Remove existing wing walls entirely on north end.

On the south end remove 1'-6" of existing concrete to expose the existing reinforcing steel at the parapet, outside walls at the vertical junction with the wing, inside wall, and roof. Remove floor to old reference line and drop inlet walls in entirety on south end.

In accordance with the Federal Migratory Bird Act, measures to prevent birds from building new nests or using old nests for active nesting must be incorporated into the project. The Contractor shall remove all nesting sites within the removal area. The Contractor shall remove any new bird nests on a weekly basis within the removal area. These measures shall be maintained until all concrete has been removed. All costs associated with the removal of bird nests shall be included in the bid for "Removal of Concrete."

If the existing wall and roof thicknesses are different than the new thicknesses, the inner surfaces shall be flush and the exterior surfaces tapered in the first 1'-6" of the barrel.

210 EXCAVATION: All excavation required to build the box culvert shall be included in the bid for "Class 2 Excavation-Box Culvert."

210 FOUNDATION PREPARATION: The Contractor shall be aware of the possible inundated conditions at this site before the bid letting. The cost of any cofferdams, dewatering the excavation and all measures required to maintain flow shall be included in the bid for "Foundation Preparation."

210 FOUNDATION FILL: Moisture and density controls shall be in accordance with Section 203.02 G of the Standard Specifications.

602 CONCRETE: All concrete shall be Class AE-3 and shall be compacted by vibration.

The following elements of each section shall be cast in one continuous run:

1. Floor slab and wing footings
2. Each intermediate wall up to the bottom of fillets
3. Each sidewall up to the bottom of fillets with its adjacent wings complete to the top
4. Roof slab and parapets

All exposed edges of concrete shall be beveled with ¾" triangular molding. The concrete in the walls shall be allowed to set at least two hours before the roof slab is poured.

612 REINFORCING STEEL: The transverse and vertical bars shall be placed nearest the surface. The longitudinal, temperature or tie bars shall be placed immediately inside the vertical and transverse bars and the intersections tied.
The clear distance from the nearest bar to the surface of the concrete shall be as follows:

Bottom of wing footing =	3" clear
Bottom of floor slab =	2½" clear
Top of floor slab =	2" clear
Top of wing footing =	2" clear
All walls =	2" clear
Top of roof slab =	2" clear
Bottom of roof slab =	1" clear

Dimensions of bent bars are given out to out. All bends conform to A.C.I. Standards unless indicated otherwise.

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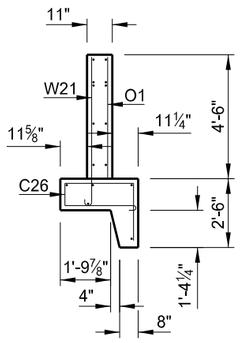
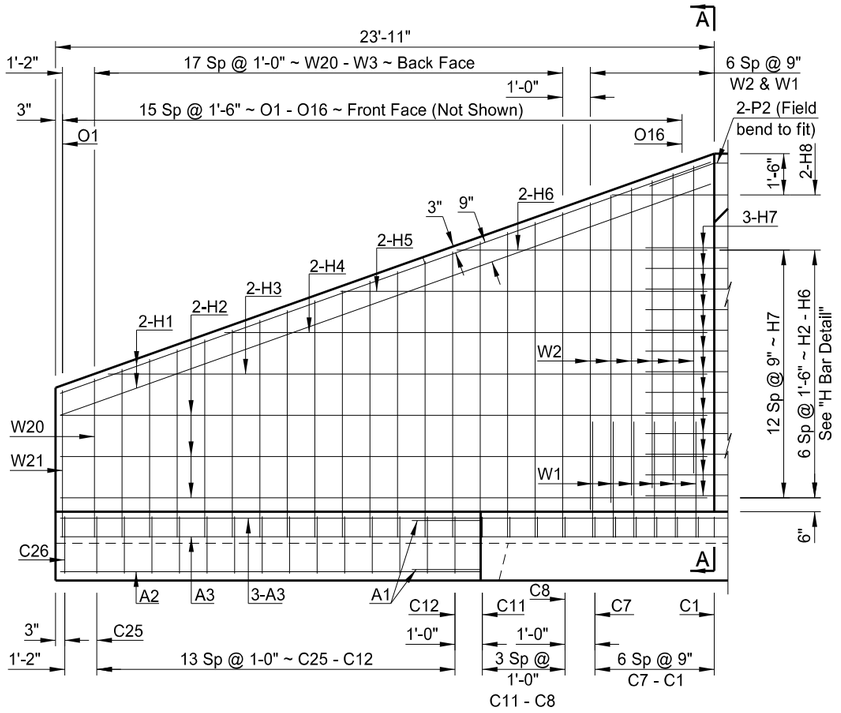
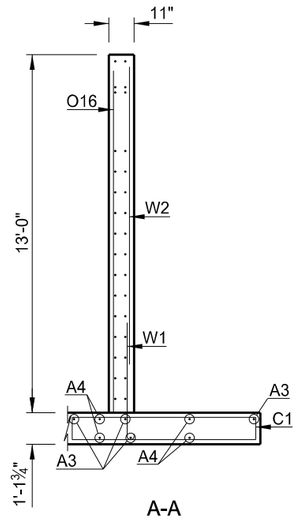
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	11



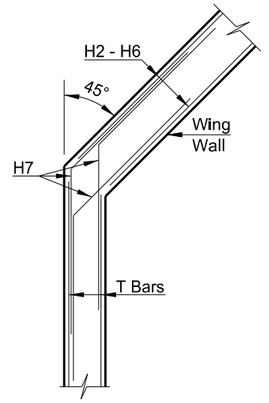
END VIEW



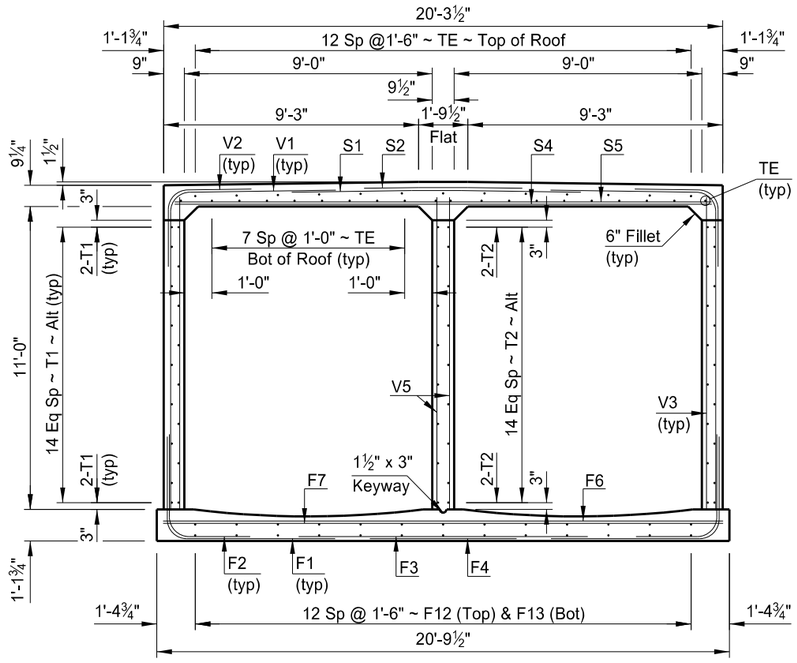
WING ELEVATION



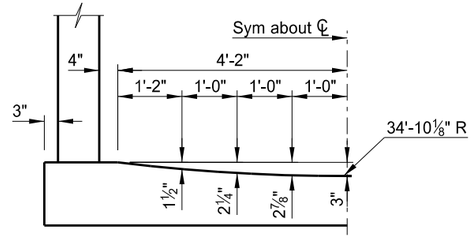
A-A



H BAR DETAIL



SECTION OF BARREL



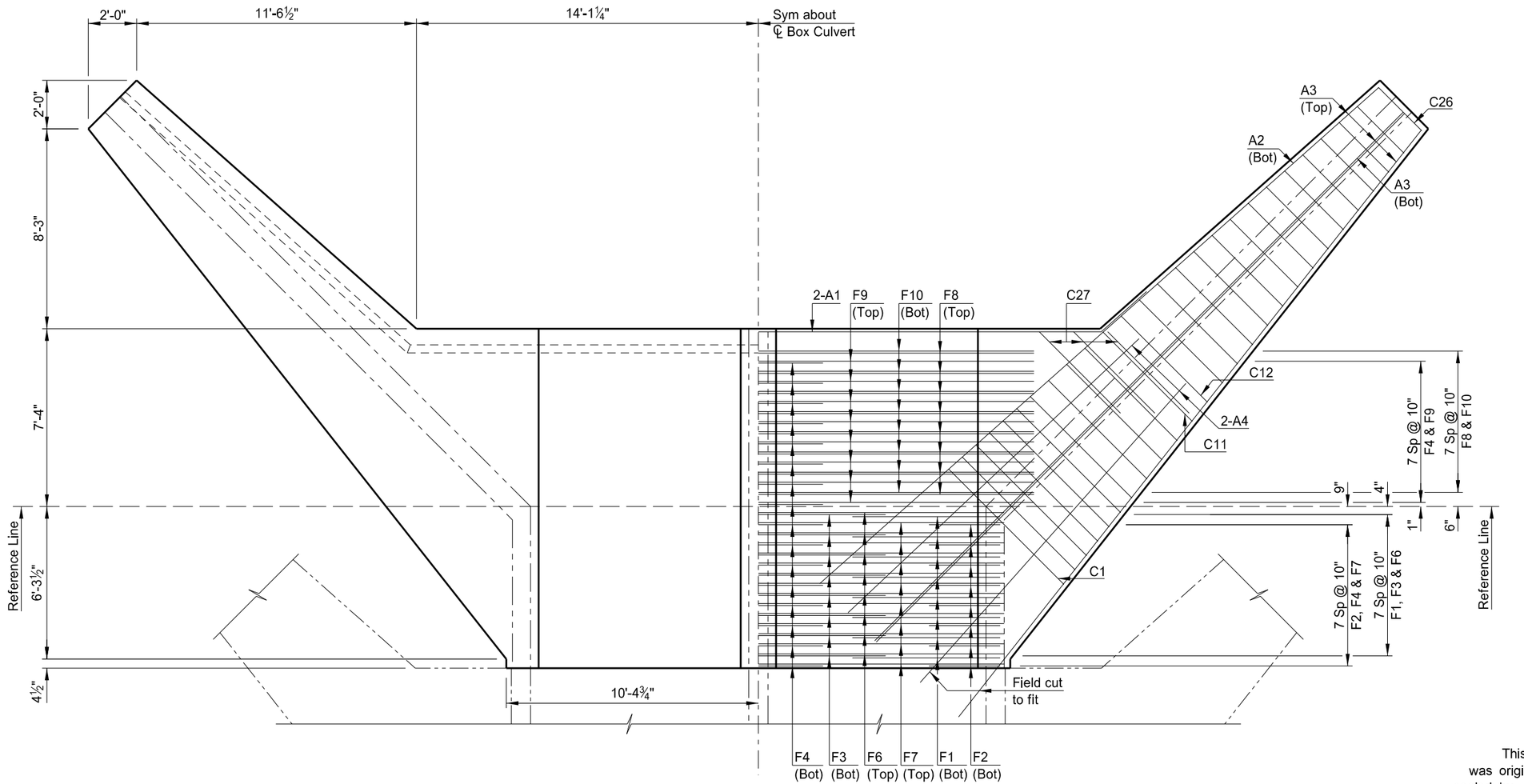
CURVED FLOOR OFF-SETS

CREEK
11 MILES EAST OF CARSON

(NORTH EXTENSION)

BARREL SECTION & WING DETAILS

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	12



(SHOWING DIMENSIONS) (SHOWING REINFORCING)

FLOOR PLAN

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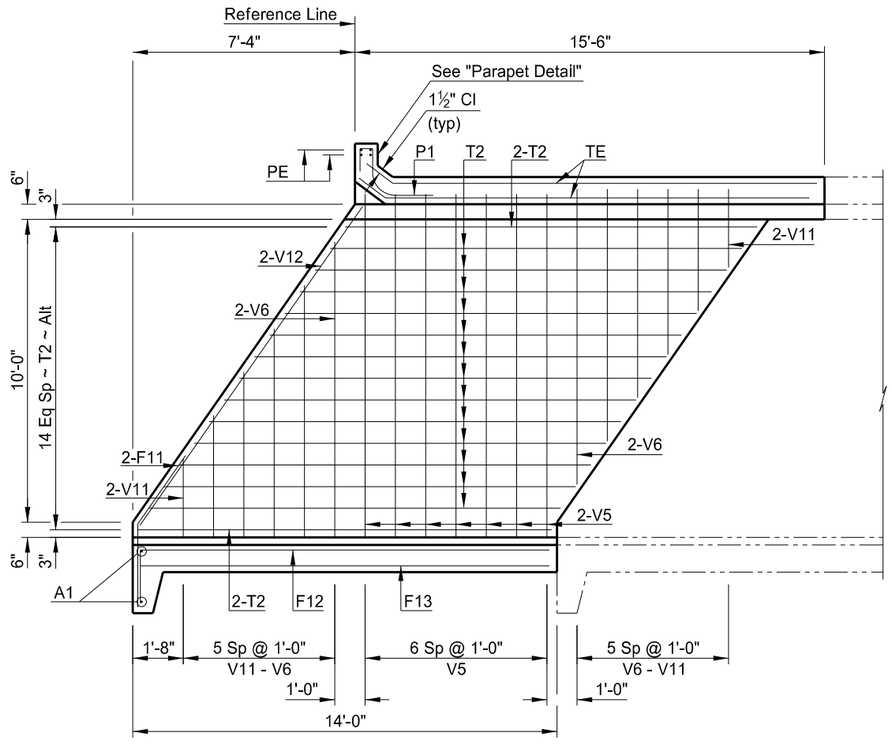
CREEK
11 MILES EAST OF CARSON

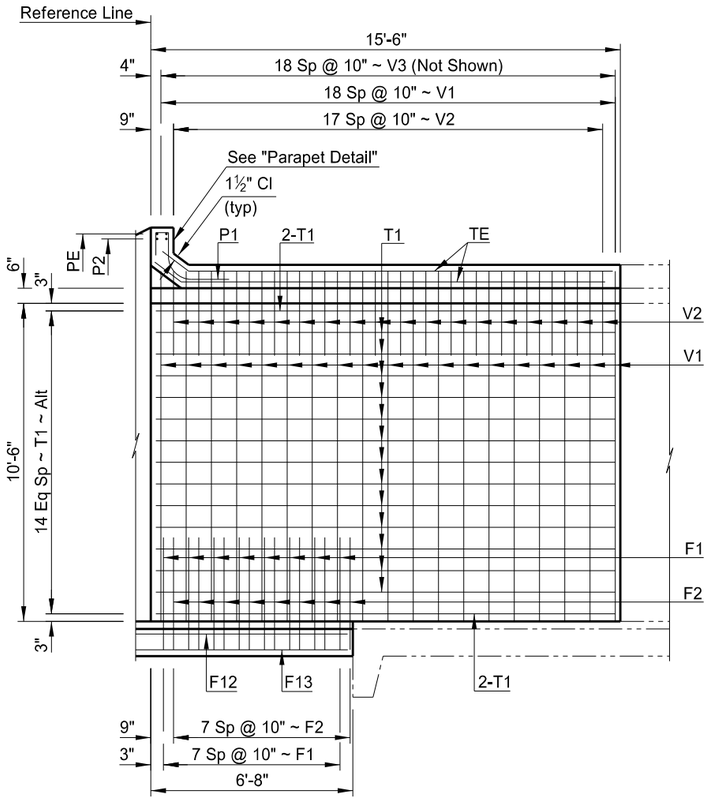
(NORTH EXTENSION)

FLOOR DETAIL

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	13

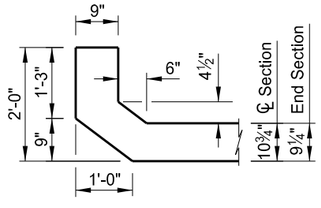


INNER WALL



OUTER WALL

LONGITUDINAL SECTIONS



PARAPET DETAIL

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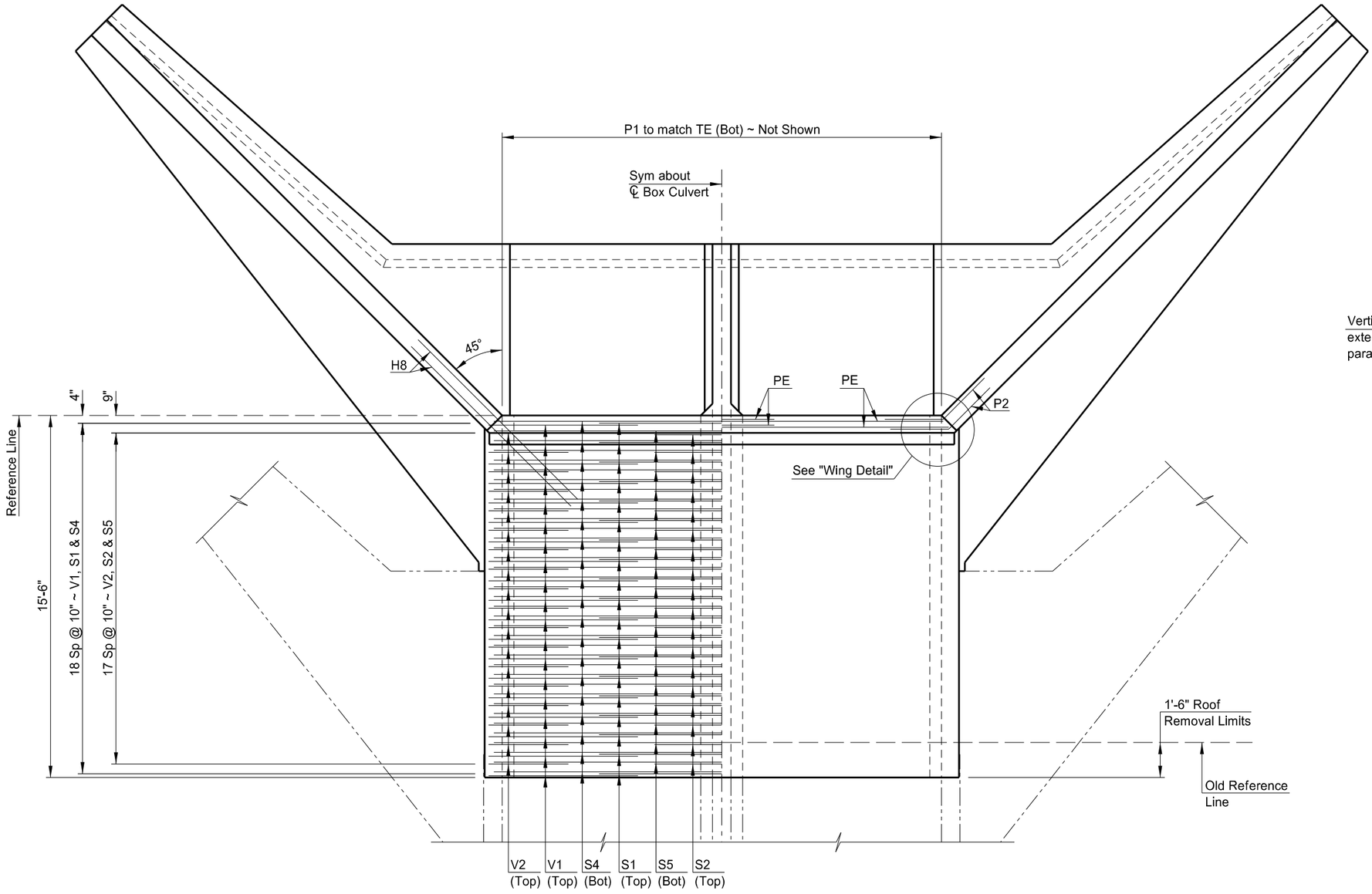
CREEK
11 MILES EAST OF CARSON

(NORTH EXTENSION)

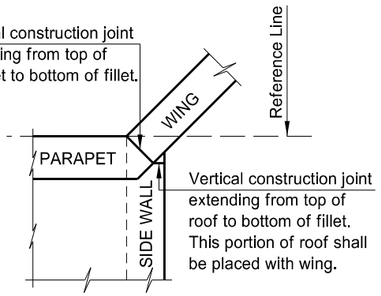
WALL DETAILS &
PARAPET DETAIL

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	14



(SHOWING ROOF REINFORCING) (SHOWING PARAPET REINFORCING)

ROOF PLAN



WING DETAIL

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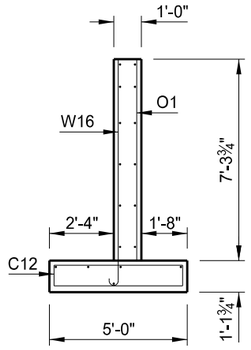
CREEK
11 MILES EAST OF CARSON

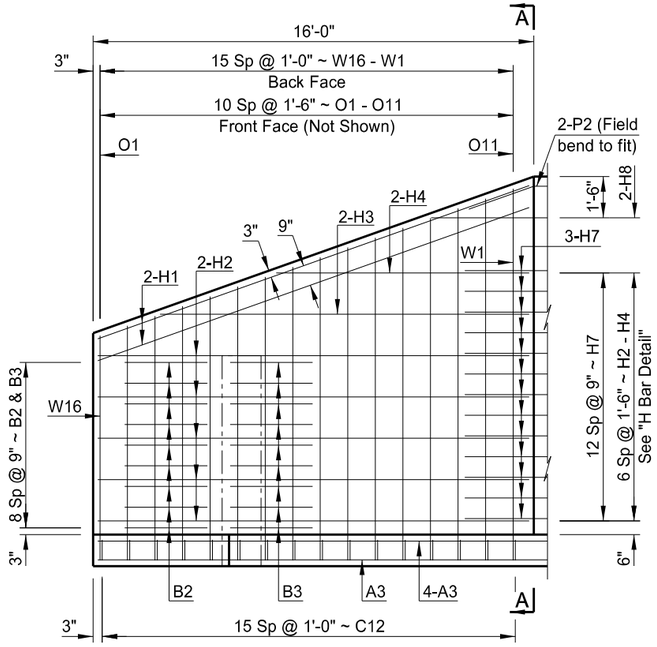
(NORTH EXTENSION)

ROOF DETAIL &
WING DETAIL

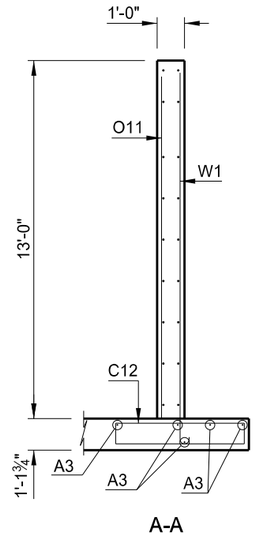
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	15



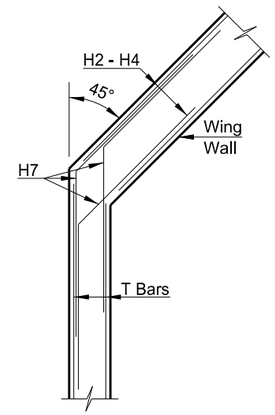
END VIEW



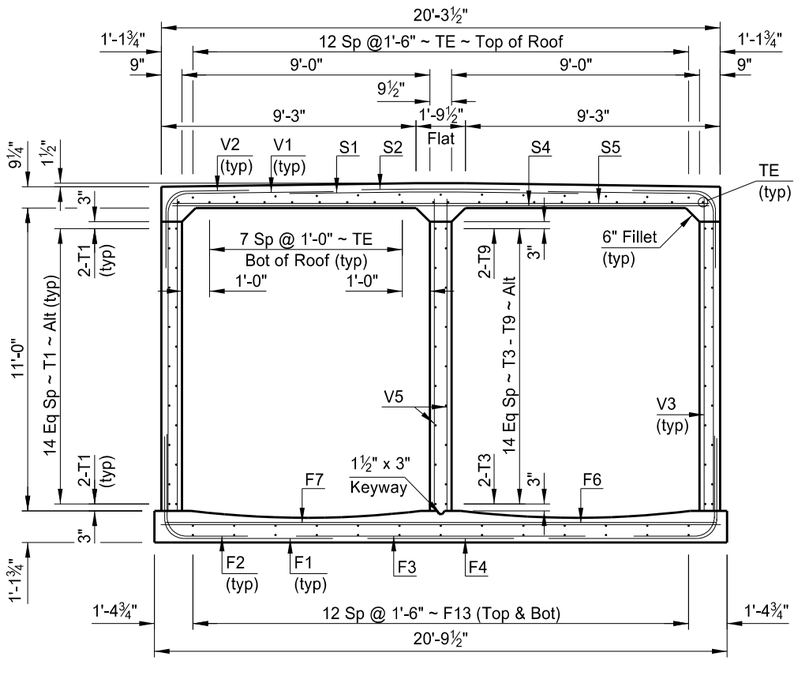
WING ELEVATION



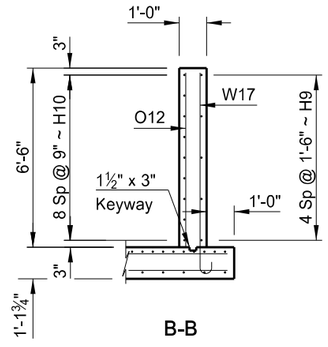
A-A



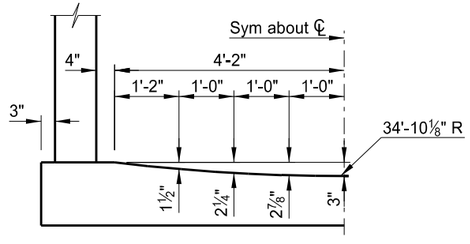
H BAR DETAIL



SECTION OF BARREL



B-B



CURVED FLOOR OFF-SETS

NOTE:

See Dwg 21-101.944-10 for location of Section B-B.

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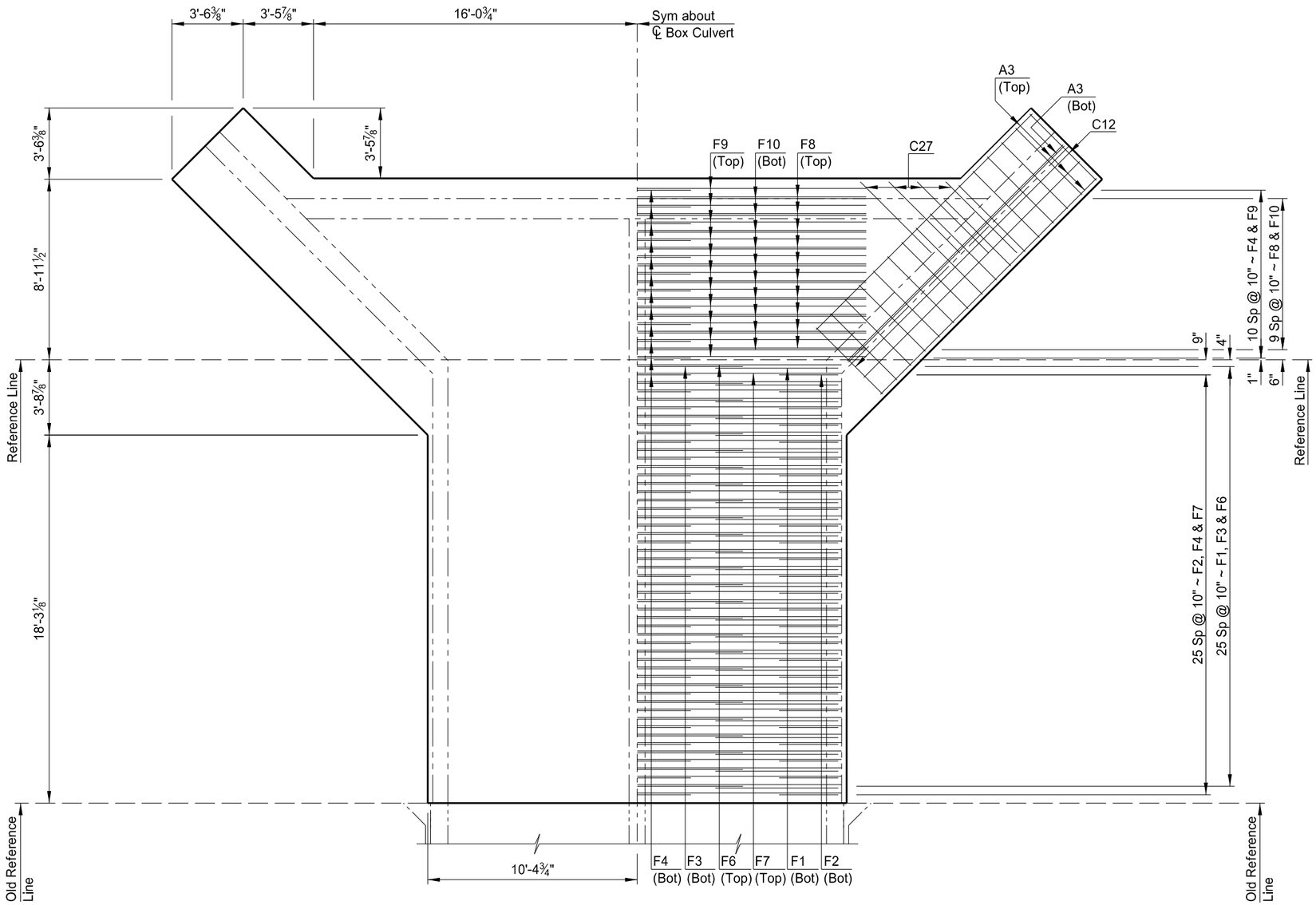
CREEK
11 MILES EAST OF CARSON

(SOUTH EXTENSION)

BARREL SECTION, WING & DROP INLET WALL DETAILS

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	16



(SHOWING DIMENSIONS) (SHOWING REINFORCING)

FLOOR PLAN

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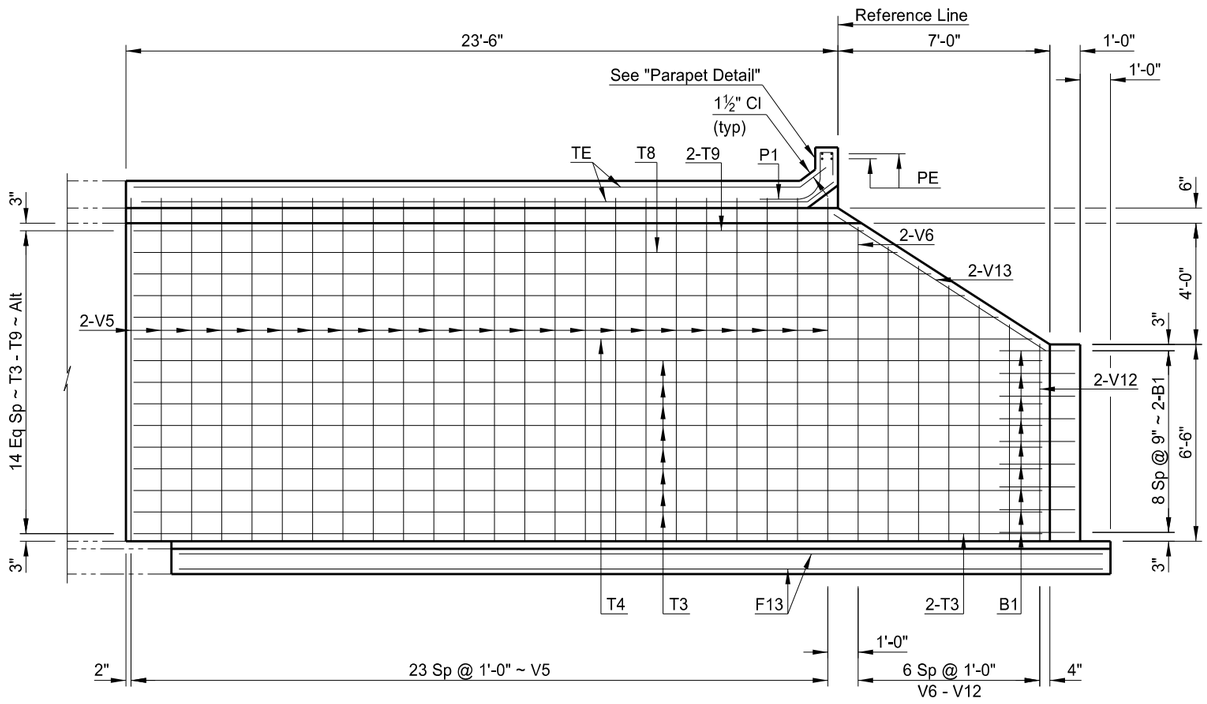
CREEK
11 MILES EAST OF CARSON

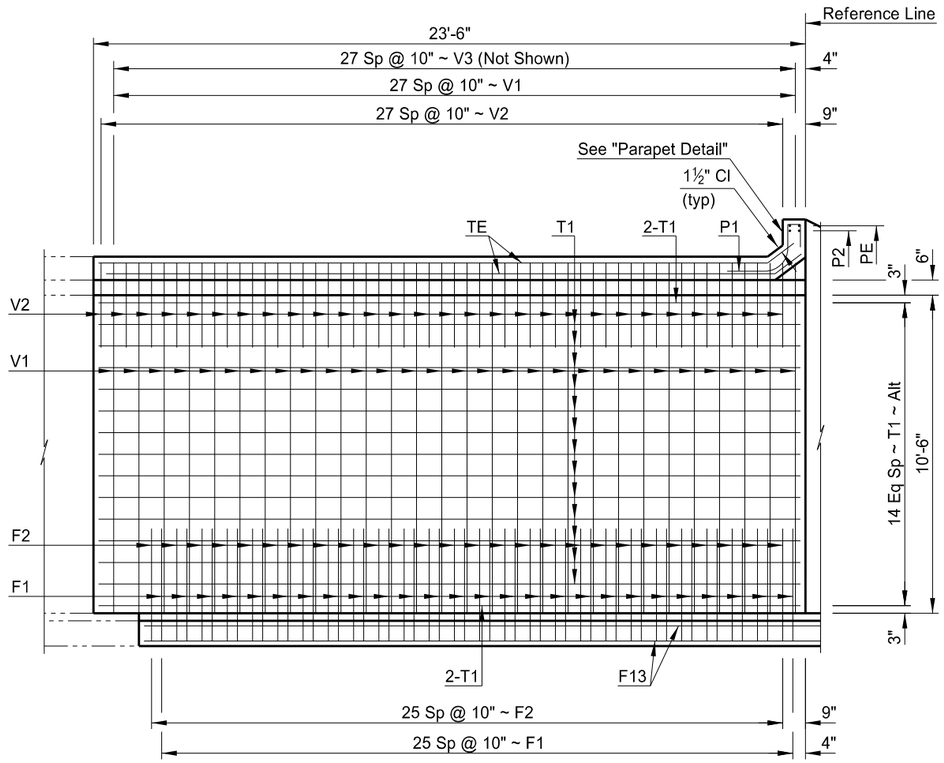
(SOUTH EXTENSION)

FLOOR DETAIL

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	17

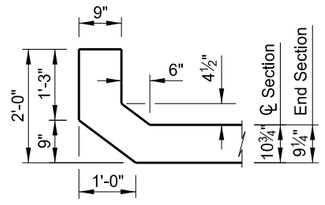


INNER WALL



OUTER WALL

LONGITUDINAL SECTIONS



PARAPET DETAIL

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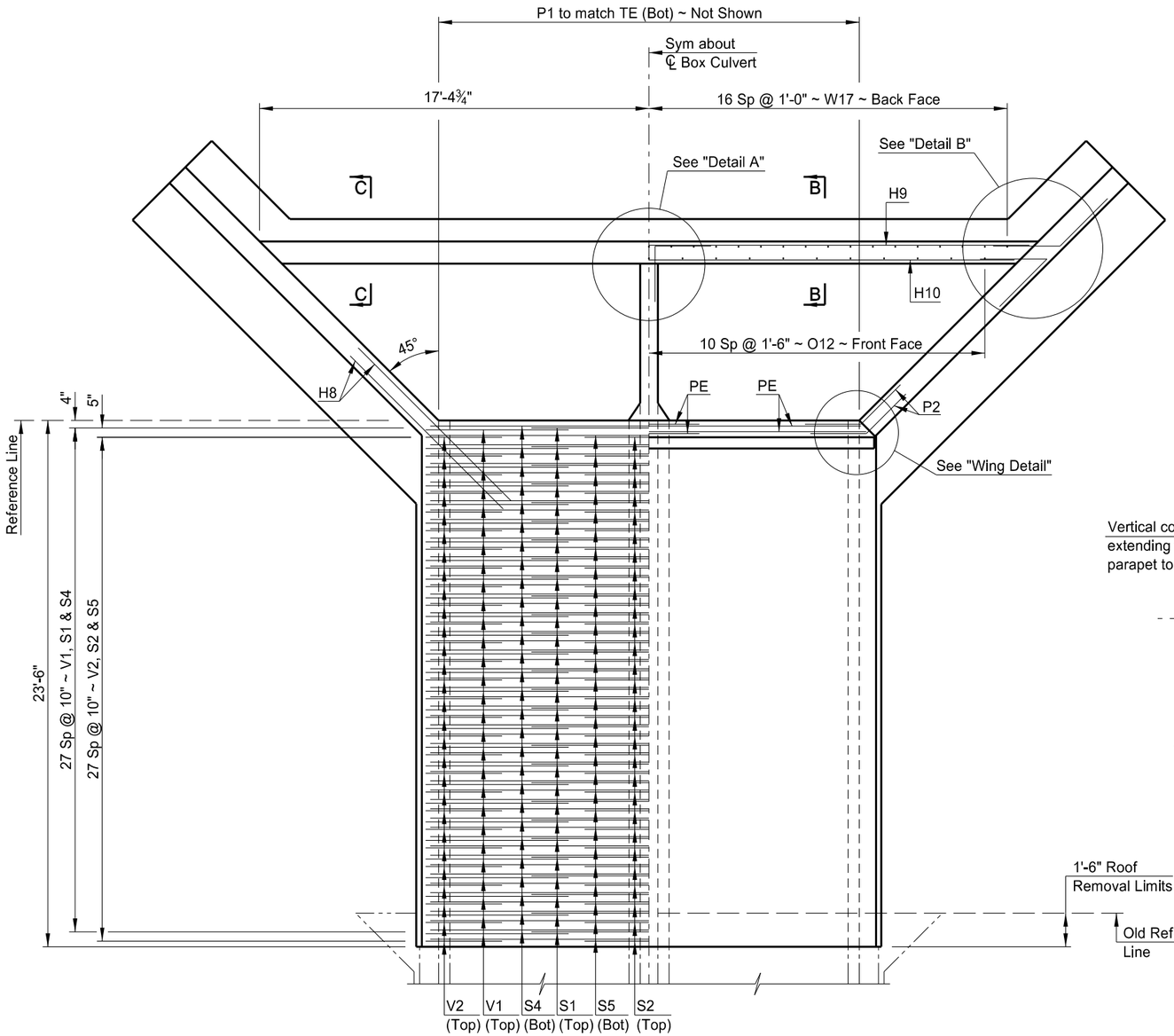
CREEK
11 MILES EAST OF CARSON

(SOUTH EXTENSION)

WALL DETAILS &
PARAPET DETAIL

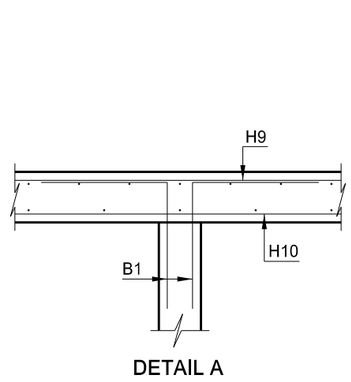
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	18



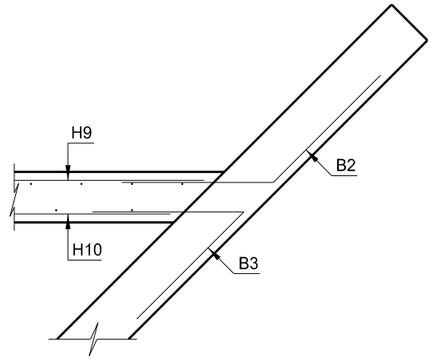
(SHOWING ROOF REINFORCING)

(SHOWING PARAPET & INLET WALL REINFORCING)

ROOF PLAN



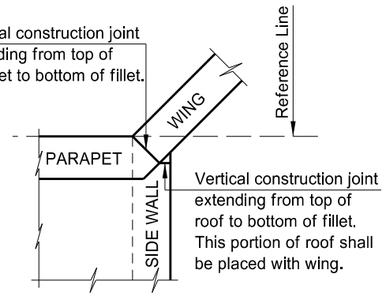
DETAIL A



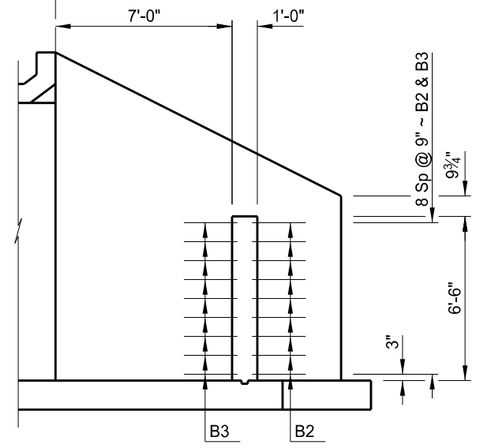
DETAIL B

NOTE:

See Dwg 21-101.944-7 for Section B-B.



WING DETAIL



C-C

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CREEK
11 MILES EAST OF CARSON

(SOUTH EXTENSION)

ROOF DETAIL, WING & DROP INLET WALL DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	170	19

* NORTH EXTENSION

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
W1	7	12	5'-0"	BENT
W2	6	12	11'-2"	STR.
W3	7	2	12'-7"	BENT
W4	7	2	12'-3"	BENT
W5	7	2	11'-11"	BENT
W6	7	2	11'-6"	BENT
W7	7	2	11'-2"	BENT
W8	7	2	10'-10"	BENT
W9	6	2	10'-4"	BENT
W10	6	2	9'-11"	BENT
W11	6	2	9'-7"	BENT
W12	5	2	9'-2"	BENT
W13	5	2	8'-10"	BENT
W14	4	2	8'-4"	BENT
W15	4	2	8'-0"	BENT
W16	4	2	7'-8"	BENT
W17	4	2	7'-4"	BENT
W18	4	2	6'-11"	BENT
W19	4	2	6'-7"	BENT
W20	4	2	6'-3"	BENT
W21	4	2	5'-10"	BENT
C1	6	2	15'-8"	BENT
C2	6	2	15'-4"	BENT
C3	6	2	15'-0"	BENT
C4	6	2	14'-10"	BENT
C5	6	2	14'-6"	BENT
C6	6	2	14'-4"	BENT
C7	6	2	14'-0"	BENT
C8	5	2	13'-8"	BENT
C9	5	2	13'-4"	BENT
C10	5	2	13'-0"	BENT
C11	5	2	12'-6"	BENT
C12	5	2	13'-5"	BENT
C13	5	2	13'-1"	BENT
C14	5	2	12'-9"	BENT
C15	5	2	12'-5"	BENT
C16	5	2	12'-1"	BENT
C17	4	2	11'-8"	BENT
C18	4	2	11'-2"	BENT
C19	4	2	10'-10"	BENT
C20	4	2	10'-6"	BENT
C21	4	2	10'-2"	BENT
C22	4	2	9'-10"	BENT
C23	4	2	9'-6"	BENT
C24	4	2	9'-2"	BENT
C25	4	2	8'-10"	BENT
C26	4	2	8'-4"	BENT
C27	4	6	6'-10"	BENT
H1	7	8	25'-0"	STR.
H2	4	12	23'-6"	STR.
H3	4	4	21'-9"	STR.
H4	4	4	17'-6"	STR.
H5	4	4	13'-3"	STR.
H6	4	4	9'-1"	STR.
H7	4	78	6'-0"	BENT
H8	6	4	9'-8"	STR.
O1-O16	4	2 SETS	134'-8"	STR.

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
A1	6	4	17'-7"	BENT
A2	6	2	15'-5"	STR.
A3	6	8	30'-10"	STR.
A4	6	8	16'-6"	STR.
P1	4	20	4'-7"	BENT
P2	6	4	5'-0"	BENT
PE	6	4	12'-8"	STR.
V6	4	4	9'-9"	STR.
V7	4	4	8'-3"	STR.
V8	4	4	6'-10"	STR.
V9	4	4	5'-5"	STR.
V10	4	4	4'-0"	STR.
V11	4	4	2'-7"	STR.
V12	6	2	12'-10"	STR.
F8	5	8	22'-9"	STR.
F9	4	8	22'-9"	STR.
F10	5	8	22'-9"	STR.
F11	6	2	5'-6"	BENT
F12	4	13	15'-3"	BENT
F13	4	13	13'-6"	STR.

BAR LIST (VARIABLE)

MARK	SIZE	NO.	LENGTH	SHAPE
V1	4	38	17'-3"	BENT
V2	5	36	5'-6"	BENT
V3	4	38	11'-4"	STR.
V5	4	14	11'-4"	STR.
F1	5	16	9'-6"	BENT
F2	5	16	6'-4"	BENT
F3	5	8	10'-6"	STR.
F4	5	16	5'-4"	STR.
F6	5	8	20'-4"	STR.
F7	4	8	20'-4"	STR.
S1	5	19	10'-6"	STR.
S2	6	18	5'-9"	STR.
S4	4	19	19'-6"	STR.
S5	4	18	19'-6"	STR.
T1	4	34	15'-0"	STR.
T2	4	17	13'-6"	STR.
TE	4	33	15'-0"	BENT

* SOUTH EXTENSION

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
W1	4	2	14'-0"	BENT
W2	4	2	13'-7"	BENT
W3	4	2	13'-3"	BENT
W4	4	2	12'-11"	BENT
W5	4	2	12'-6"	BENT
W6	4	2	12'-2"	BENT
W7	4	2	11'-10"	BENT
W8	4	2	11'-6"	BENT
W9	4	2	11'-1"	BENT
W10	4	2	10'-9"	BENT
W11	4	2	10'-5"	BENT
W12	4	2	10'-1"	BENT
W13	4	2	9'-8"	BENT
W14	4	2	9'-4"	BENT
W15	4	2	9'-0"	BENT
W16	4	2	8'-8"	BENT
W17	4	33	7'-9"	BENT
C12	5	32	11'-6"	BENT
C27	4	8	5'-9"	BENT
H1	7	8	16'-7"	STR.
H2	4	20	15'-8"	STR.
H3	4	4	13'-4"	STR.
H4	4	4	9'-2"	STR.
H7	4	78	6'-0"	BENT
H8	6	4	9'-8"	STR.
H9	5	5	33'-11"	STR.
H10	5	9	32'-7"	STR.
O1-O11	4	2 SETS	108'-2"	STR.
O12	4	21	6'-4"	STR.
A3	6	10	15'-2"	STR.
B1	5	18	5'-0"	BENT
B2	5	18	6'-0"	BENT
B3	5	18	6'-0"	BENT
P1	4	20	4'-7"	BENT
P2	6	4	5'-0"	BENT
PE	6	4	12'-8"	STR.
V6	4	2	10'-4"	STR.
V7	4	2	9'-8"	STR.
V8	4	2	9'-1"	STR.
V9	4	2	8'-5"	STR.
V10	4	2	7'-9"	STR.
V11	4	2	7'-2"	STR.
V12	4	2	6'-6"	STR.
V13	6	2	8'-3"	STR.
F8	5	10	22'-9"	STR.
F9	4	11	22'-9"	STR.
F10	5	10	22'-9"	STR.
F13	4	26	30'-6"	STR.

BAR LIST (VARIABLE)

MARK	SIZE	NO.	LENGTH	SHAPE
V1	4	56	17'-3"	BENT
V2	5	56	5'-6"	BENT
V3	4	56	11'-4"	STR.
V5	4	48	11'-4"	STR.
F1	5	52	9'-6"	BENT
F2	5	52	6'-4"	BENT
F3	5	26	10'-6"	STR.
F4	5	37	5'-4"	STR.
F6	5	26	20'-4"	STR.
F7	4	26	20'-4"	STR.
S1	5	28	10'-6"	STR.
S2	6	28	5'-9"	STR.
S4	4	28	19'-6"	STR.
S5	4	28	19'-6"	STR.
T1	4	34	23'-0"	STR.
T3	4	10	30'-0"	STR.
T4	4	1	29'-8"	STR.
T5	4	1	28'-6"	STR.
T6	4	1	27'-5"	STR.
T7	4	1	26'-4"	STR.
T8	4	1	25'-2"	STR.
T9	4	2	24'-1"	STR.
TE	4	33	23'-0"	BENT

NORTH EXTENSION CONCRETE QUANTITIES	
ENTIRE FLOOR	23.7 CY
TWO OUTSIDE WALLS & 2 WINGS	23.0 CY
INSIDE WALL	4.3 CY
ENTIRE ROOF	11.2 CY
TOTAL	62.2 CY

SOUTH EXTENSION CONCRETE QUANTITIES	
ENTIRE FLOOR	33.0 CY
TWO OUTSIDE WALLS & 2 WINGS	25.7 CY
INSIDE WALL	9.0 CY
ENTIRE ROOF	16.7 CY
INLET WALL	8.1 CY
TOTAL	92.5 CY

* A designation shall be added to the bar mark to differentiate between the north and south extensions.

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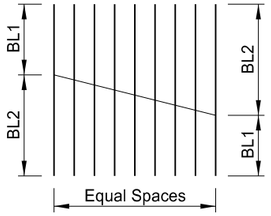
QUANTITIES	
CLASS AE-3 CONCRETE	154.7 CY
REINFORCING STEEL	19,144 LBS

CREEK
11 MILES EAST OF CARSON

REINFORCING BAR LIST

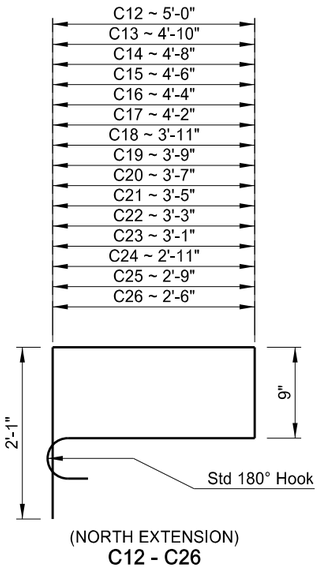
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	170	20



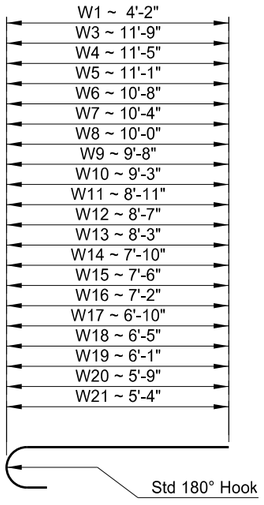
2 SETS SHOWN

	MARK	LENGTH 1 SET	BL1	BL2	SPACES
NORTH EXTENSION	O1-O16	134'-8"	4'-5"	12'-5"	15
SOUTH EXTENSION	O1-O11	108'-2"	7'-2"	12'-6"	10

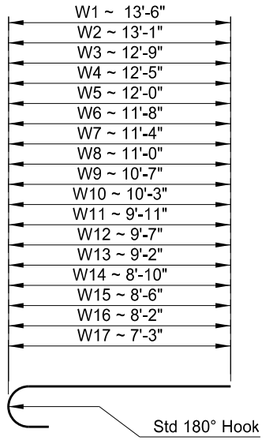
BAR CUTTING DETAILS



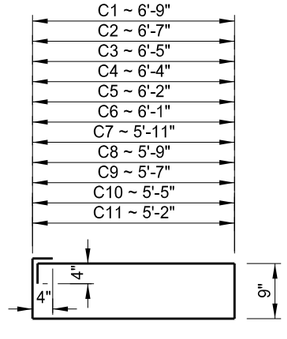
(NORTH EXTENSION)
C12 - C26



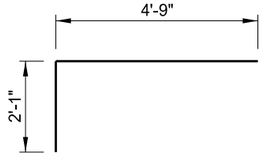
(NORTH EXTENSION)
W1, W3 - 21



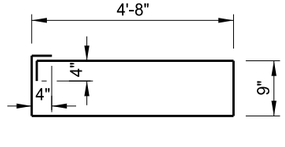
(SOUTH EXTENSION)
W1 - W17



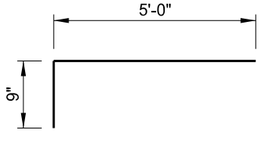
(NORTH EXTENSION)
C1 - C11



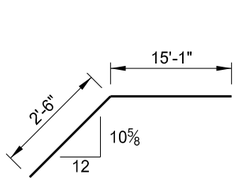
(NORTH EXTENSION)
C27



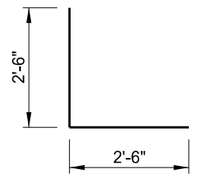
(SOUTH EXTENSION)
C12



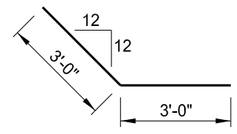
(SOUTH EXTENSION)
C27



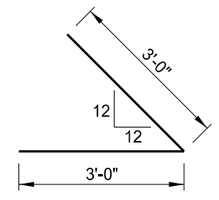
A1



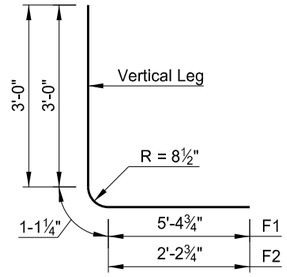
B1



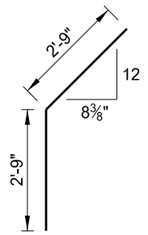
B2



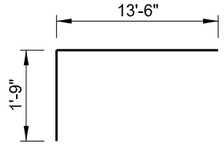
B3



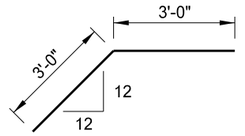
F1 & 2



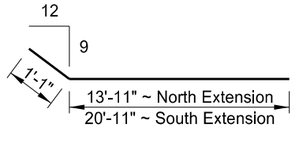
F11



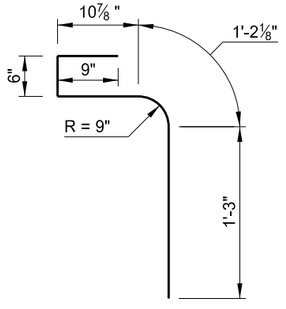
F12



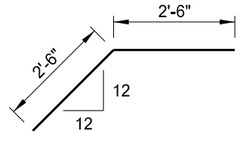
H7



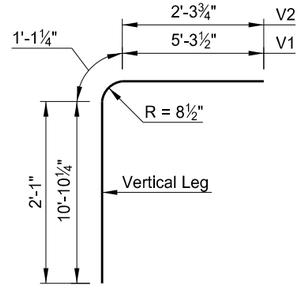
TE



P1



P2



V1 & V2

CREEK
11 MILES EAST OF CARSON

BAR DETAILS

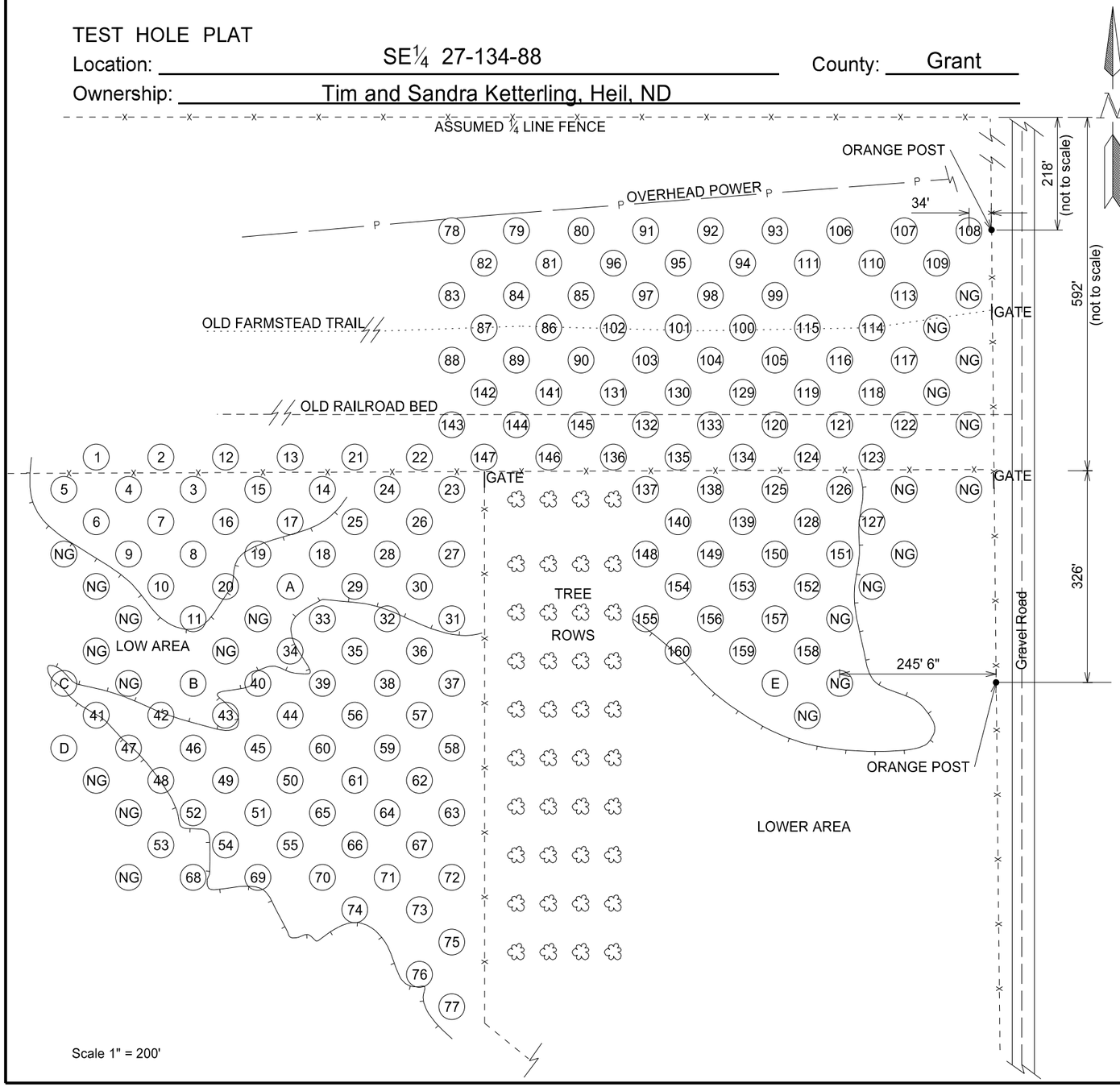
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	180	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

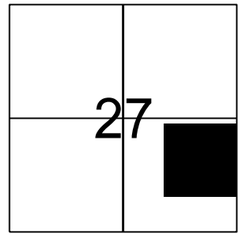
TEST HOLE PLAT

Location: SE¼ 27-134-88 County: Grant

Ownership: Tim and Sandra Ketterling, Heil, ND



LOCATION OF PIT IN SECTION



Area "A" consists of Test Holes 1 - 11
Area "B" consists of Test Holes 12 - 20
Area "C" consists of Test Holes 21 - 30
Area "D" consists of Test Holes 31 - 40
Area "E" consists of Test Holes 41 - 55
Area "F" consists of Test Holes 56 - 67
Area "G" consists of Test Holes 68 - 77
Area "H" consists of Test Holes 78 - 90
Area "I" consists of Test Holes 91 - 105
Area "J" consists of Test Holes 106 - 117
Area "K" consists of Test Holes 118 - 128
Area "L" consists of Test Holes 129 - 140
Area "M" consists of Test Holes 141 - 147
Area "N" consists of Test Holes 148 - 160

Legend:
gr = gravel
sd = sand
FS = fine sand
Fgr = fine gravel
CS = coarse sand
sh = shale
SiCl = silt clay
rk = rock
FeO = Iron oxide
CoS = Coal Slack
WL = water line
NG = no gravel

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	180	2

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
1	1.0	1.0 FgrSiCl	0	5	16	30	+WL 7.0
		2.0 gr SiCl					
		2.0 sd					
		1.0 FS SiCl					
2	1.5	0.5 FgrSiCl	0	4	16	31	FS SiCl
		1.0 gr SiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 gr SiCl					
		1.0 sd SiCl					
		1.0 gr SiCl					
		1.0 FgrSiCl					
3	2.0	3.0 gr SiCl	0	3	10	16	FS SiCl
		6.0 sd					
		1.5 FgrSiCl					
4	6.0	2.0 FgrSiCl	0	3	9	15	SiCl
		2.0 sd SiCl					
5	5.0	2.0 gr SiCl	0	4	15	25	FS SiCl
		1.0 Fgr					
		1.0 sd SiCl					
		2.0 sd					
		1.0 sd SiCl					
		2.0 sd					
		1.0 sd SiCl					
6	1.0	2.0 gr SiCl	0	4	12	21	SiCl
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
		2.0 sd SiCl					
7	2.0	2.0 FgrSiCl	0	5	14	25	FS
		1.0 gr					
		1.0 Fgr					
		3.0 sd					
		1.0 FgrSiCl					
8	2.0	3.0 gr SiCl	0	3	12	24	FS
		1.0 sd SiCl					
		3.0 FgrSiCl					
		1.0 FS					
		1.0 sd					
		1.0 sd SiCl					
		1.0 FgrSiCl					
9	1.0	1.5 FgrSiCl	0	5	13	27	SiCl
		0.5 gr SiCl					
		1.0 sd SiCl					
		2.0 FgrSiCl					
		1.0 gr SiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
10	1.5	0.5 gr SiCl	0	2	9	18	FS
		2.0 sd SiCl					
		1.0 sd					
		1.0 FgrSiCl					
11	1.5	1.5 FgrSiCl	0	5	12	22	FS
		1.0 Fgr					
		1.0 sd					
		1.0 FgrSiCl					
12	1.5	1.5 gr SiCl	0	0	6	15	FS
		5.0 sd					
13	1.5	1.5 FgrSiCl	0	0	8	22	FS
		2.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd					
		2.0 FgrSiCl					
14	1.5	2.5 gr SiCl	0	4	13	26	FS
		3.0 FgrSiCl					
		1.0 sd SiCl					
		2.0 sd					
		1.0 sd SiCl					
		2.0 sd					
		3.0 FgrSiCl					
15	3.0	1.0 FgrSiCl	0	4	14	24	FS
		1.0 sd					
		1.0 FgrSiCl					
		0.5 sd					
		0.5 FgrSiCl					
		1.0 Fgr					
		1.5 FgrSiCl					
		0.5 gr					
		1.0 FgrSiCl					
16	2.0	3.0 gr SiCl	1	5	15	27	FS
		2.0 FgrSiCl					
		2.0 sd					
		1.0 FgrSiCl					
		2.0 sd					
17	2.0	1.5 gr SiCl	0	6	14	25	FS
		0.5 FgrSiCl					
		1.0 sd SiCl					
		1.0 sd					
		1.0 Fgr					
		1.0 sd					
		0.5 Fgr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
18	3.0	2.0 sd SiCl	0	5	12	19	FS
		1.0 gr SiCl					
19	2.0	2.0 FgrSiCl	0	3	13	24	FS
		2.5 Fgr					
		0.5 sd SiCl					
20	1.0	2.0 gr SiCl	0	8	19	35	FS SiCl
		2.0 FgrSiCl					
		1.0 sd SiCl					
21	1.0	1.0 FS	0	0	4	13	SiCl
		6.0 FgrSiCl					
		2.0 sd					
		1.0 FS					
		1.0 sd					
		1.0 FgrSiCl					
22	1.0	0.5 gr SiCl	0	1	6	13	SiCl
		0.5 FgrSiCl					
		1.0 gr SiCl					
		1.0 FgrSiCl					
		1.5 SiCl					
		7.5 sd SiCl					
		2.0 FgrSiCl					
		2.0 sd SiCl					
		2.0 FgrSiCl					
		0.5 SiCl					
		0.5 sd SiCl					
23	3.0	2.0 gr SiCl	0	1	5	12	FS
		2.0 sd SiCl					
		4.0 sd					
		2.0 FgrSiCl					
		1.0 FS SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 sd					
		2.0 gr SiCl					
24	3.0	1.0 sd SiCl	0	3	14	26	sd CoS
		1.0 FS SiCl					
		1.0 sd SiCl					
		2.0 FgrSiCl					
		1.0 Fgr					
		1.0 gr SiCl					
		3.0 sd					
		1.0 Fgr					
25	2.5	0.5 sd	0	2	5	16	FS
		3.0 Fgr					
		1.0 sd SiCl					
		1.0 FS					
		1.0 sd CoS					
		1.0 sd					
		1.0 sd CoS					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	
26	2.0	1.5 FgrSiCl	0	2	11	20	FS
		0.5 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		2.0 sd					
		1.0 FS SiCl					
		0.5 sd					
		0.5 Fgr					
		3.0 sd					
		1.0 sd SiCl					
		1.0 Fgr					
		1.0 sd SiCl					
27	4.0	2.0 FS SiCl	0	0	3	7	FS SiCl
		1.0 sd SiCl					
		0.5 Fgr					
		1.5 FS SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		2.0 sd					
		1.0 FS SiCl					
		1.0 sd					
28	2.0	3.0 sd SiCl	0	0	3	7	FS
		1.0 FgrSiCl					
		3.0 sd SiCl					
		1.0 sd					
29	2.0	2.0 FgrSiCl	0	2	7	15	SiCl
		1.0 gr SiCl					
		0.5 FgrSiCl					
		1.5 sd SiCl					
30	4.5	2.5 FgrSiCl	0	1	6	15	FS
		1.0 FS					
		1.0 sd					
31	4.0	2.0 gr SiCl	0	8	18	34	SiCl
		2.0 FgrSiCl					
		1.0 gr SiCl					
		1.0 sd SiCl					

RANGE 88 **TWP** 134 **SEC** SE 1/4 27

COUNTY Grant Jun-11

PROSPECTED BY Volk/Nelson

INSPECTED & APPROVED B. Hoesel Dec-11

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	180	3

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
32	1.0	7.5 FgrSiCl	0	2	12	22	FS
		1.0 sd					
		0.5 FgrSiCl					
		2.0 sd					
		3.0 FgrSiCl					
33	1.0	2.0 FgrSiCl	0	5	10	17	SiCl
		1.0 FS SiCl					
		1.5 sd SiCl					
		0.5 FgrSiCl					
		0.5 sd					
		0.5 FgrSiCl					
		1.5 sd					
		0.5 Fgr					
		2.0 sd SiCl					
34	0.5	1.5 gr SiCl	0	3	13	23	FS SiCl
		1.5 FgrSiCl					
		1.5 sd					
		1.0 FgrSiCl					
35	1.0	2.0 gr SiCl	0	3	11	26	SiCl
		0.5 FgrSiCl					
		0.5 sd SiCl					
		2.0 FgrSiCl					
		1.0 gr SiCl					
		1.0 Fgr					
		1.0 sd SiCl					
		1.0 FS SiCl					
		1.0 sd SiCl					
36	1.0	6.0 FgrSiCl	0	4	10	20	FS SiCl
		1.0 sd SiCl					
		2.0 sd					
		2.0 FgrSiCl					
37	1.0	1.0 gr SiCl	0	3	10	21	FS SiCl
		1.0 sd SiCl					
		1.0 sd					
		1.0 gr SiCl					
		0.5 FgrSiCl					
		0.5 sd SiCl					
		1.0 gr SiCl					
38	2.0	8.0 FgrSiCl	0	5	15	26	FS
		1.0 sd					
		1.0 Fgr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
39	2.5	0.5 FgrSiCl	0	2	9	20	FS
		1.0 gr SiCl					
		1.0 sd SiCl					
		1.0 gr SiCl					
		1.0 FgrSiCl					
		4.5 sd SiCl					
		0.5 sd CoS					
		1.0 sd					
		1.0 FgrSiCl					
40	0.5	1.0 FgrSiCl	0	6	14	24	FS SiCl
		0.5 gr SiCl					
		1.0 SiCl					
		1.0 sd SiCl					
		1.5 FgrSiCl					
		0.5 gr SiCl					
		1.5 FgrSiCl					
41	2.5	2.5 FgrSiCl	0	0	7	14	SiCl
		1.0 sd SiCl					
		1.0 FgrSiCl					
42	1.0	2.0 sd SiCl	0	6	19	33	FS SiCl
		3.5 gr SiCl					
		2.5 FgrSiCl					
		2.0 sd SiCl					
43	2.0	2.0 FgrSiCl	0	2	9	18	FS SiCl
		1.0 sd SiCl					
		2.0 sd					
		1.0 sd SiCl					
44	2.0	1.0 FgrSiCl	0	3	13	25	FS SiCl
		1.0 gr SiCl					
		1.0 sd SiCl					
		0.5 FgrSiCl					
		0.5 sd SiCl					
		2.0 FgrSiCl					
		2.0 sd					
		1.0 FgrSiCl					
45	2.5	0.5 gr SiCl	0	3	10	18	FS
		3.0 FS SiCl					
		1.0 sd SiCl					
		2.5 FgrSiCl					
		3.5 FS					
		1.0 sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
46	1.0	1.0 FgrSiCl	0	5	10	17	FS SiCl
		1.0 gr SiCl					
		1.0 SiCl					
		1.0 sd SiCl					
		4.0 SiCl					
		1.0 gr SiCl					
		1.0 Fgr					
		1.0 sd SiCl					
		1.0 FS					
		2.5 sd					
		0.5 sd SiCl					
		1.0 sd CoS					
47	3.0	3.0 FgrSiCl	0	2	10	19	SiCl
		2.0 sd SiCl					
		1.0 FgrSiCl					
		2.0 sd					
		2.0 FgrSiCl					
		4.5 sd SiCl					
		2.0 FgrSiCl					
		2.0 sd					
49	3.0	2.0 FgrSiCl	0	4	11	20	FS CoS
		3.0 sd SiCl					
		0.5 sd					
		1.5 sd SiCl					
		1.0 gr SiCl					
		1.0 sd CoS					
		1.0 Fgr					
		1.0 gr SiCl					
		1.0 sd SiCl					
50	1.5	2.5 FgrSiCl	0	1	5	13	FS SiCl
		1.0 FS SiCl					
		2.0 sd					
		3.0 FgrSiCl					
		2.0 sd					
		1.0 FS SiCl					
		1.0 sd SiCl					
		4.0 sd CoS					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
51	2.0	0.5 sd SiCl	0	6	17	29	FS SiCl
		0.5 FgrSiCl					
		2.5 gr SiCl					
		0.5 FgrSiCl					
		1.5 gr SiCl					
		0.5 FgrSiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 gr SiCl					
		2.0 gr					
		1.0 sd					
		2.0 gr SiCl					
		1.0 sd SiCl					
52	1.0	3.0 gr SiCl	0	1	8	17	FS
		1.0 FS SiCl					
		1.0 FS					
		1.0 FgrSiCl					
		1.0 sd					
		1.0 FgrSiCl					
		3.0 sd					
		4.0 FgrSiCl					
53	1.0	2.0 gr SiCl	0	3	15	34	FS
		0.5 Fgr					
		0.5 FgrSiCl					
54	2.5	3.5 FgrSiCl	0	4	12	24	FS
		2.0 sd					
		1.0 Fgr					
		1.0 FgrSiCl					
		2.0 sd					
		1.0 Fgr					
55	4.0	2.0 FgrSiCl	0	3	10	21	sd SiCl
		1.5 FS SiCl					
		0.5 sd SiCl					
		1.0 FS SiCl					
		1.0 sd SiCl					
		1.0 FS					
		0.5 FgrSiCl					
		1.5 gr					
		1.0 gr SiCl					
		1.0 sd					

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	180	4

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
56	4.0	1.0 FgrSiCl	0	2	6	15	SiCl
		1.0 sd SiCl					
		1.0 sd					
		1.0 FgrSiCl					
		2.0 sd					
		1.0 FgrSiCl					
57	3.0	1.0 sd SiCl	0	3	14	27	sd SiCl
		3.0 FgrSiCl					
		1.0 Fgr					
		1.0 FgrSiCl					
58	3.0	1.0 gr SiCl	0	6	15	27	FS
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 gr SiCl					
		1.0 FgrSiCl					
		1.0 gr SiCl					
		1.0 sd SiCl					
		3.0 sd CoS					
		0.5 Fgr CoS					
61	3.0	3.0 FgrSiCl	0	0	7	21	FS SiCl
		1.0 gr SiCl					
		0.5 FgrSiCl					
		0.5 sd					
		1.0 Fgr					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
62	2.0	1.0 sd SiCl	0	0	6	15	FS SiCl
		1.0 FgrSiCl					
		1.0 sd					
		2.0 FgrSiCl					
		1.0 FS SiCl					
		2.0 sd					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
63	3.0	6.0 FgrSiCl	0	0	8	16	FS
		2.0 FS SiCl					
		2.0 sd SiCl					
		2.0 sd CoS					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
64	6.0	1.0 FgrSiCl	0	1	7	16	FS SiCl
		1.0 sd SiCl					
		2.0 sd					
		1.0 gr SiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
65	1.5	1.5 gr SiCl	0	0	7	16	FS
		3.0 FS SiCl					
		2.0 sd SiCl					
		3.0 FgrSiCl					
		1.0 sd					
		2.0 Fgr					
		1.0 sd					
		2.0 FS SiCl					
		1.0 FgrSiCl					
66	2.5	1.0 FgrSiCl	0	3	10	19	FS SiCl
		1.5 sd SiCl					
		3.0 FS SiCl					
		2.0 FgrSiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		2.0 FS SiCl					
		1.0 gr SiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
67	5.5	0.5 FgrSiCl	0	0	5	8	FS
		1.0 gr SiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
		2.0 SiCl					
		1.0 FS SiCl					
		1.0 sd CoS					
		2.0 sd SiCl					
68	1.0	1.0 CS	0	1	8	23	FS
		1.0 Fgr					
		1.0 sd					
		1.0 FgrSiCl					
		1.0 Fgr					
69	3.0	2.0 gr SiCl	0	0	8	19	FS SiCl
		1.0 FgrSiCl					
		2.0 sd SiCl					
70	4.0	1.0 FgrSiCl	0	0	2	6	SiCl
		1.0 SiCl					
		2.0 FS SiCl					
		1.0 sd SiCl					
		1.0 FS					
		1.0 sd					
		2.0 Fgr					
		1.0 FS					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
71	1.5	1.5 FgrSiCl	0	1	10	19	SiCl
		1.0 sd SiCl					
		1.0 FgrSiCl					
		2.0 FS SiCl					
		4.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
72	3.0	2.0 gr SiCl	0	2	9	21	FS
		1.0 sd SiCl					
		1.0 FS SiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
		3.5 FgrSiCl					
73	3.0	1.0 gr SiCl	0	2	16	23	SiCl
		0.5 FgrSiCl					
		0.5 sd SiCl					
74	2.5	2.5 gr SiCl	0	4	13	22	FS
75	1.0	2.0 gr SiCl	0	5	14	22	FS
76	2.0	1.0 FgrSiCl	0	3	16	26	SiCl
		1.0 sd SiCl					
		1.5 FgrSiCl					
77	2.0	1.0 gr SiCl	0	4	14	24	FS SiCl
		1.0 sd SiCl					
		2.0 gr SiCl					
		1.0 sd SiCl					
78	2.0	1.0 gr SiCl	0	3	7	16	FS SiCl
		2.0 FgrSiCl					
		1.0 gr SiCl					
		5.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 FS SiCl					
		1.0 FgrSiCl					
		1.0 sd					
		1.0 sd CoS					
		1.0 FgrSiCl					
		1.0 sd SiCl					
79	2.0	2.0 gr SiCl	0	4	14	26	FS SiCl
		1.0 FgrSiCl					
		4.0 gr SiCl					
		2.0 FS SiCl					
		2.0 sd					
		1.0 sd SiCl					
		2.0 sd					
		1.0 sd					
80	3.0	4.0 gr SiCl	0	2	13	26	sd CoS
		4.0 sd SiCl					
		3.0 FgrSiCl					
		2.0 sd SiCl					
		2.0 FgrSiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
81	5.0	3.0 sd SiCl	0	1	8	17	FS
		1.0 gr SiCl					
		1.0 gr					
		1.5 sd SiCl					
		0.5 FgrSiCl					
		2.5 sd SiCl					
		1.5 Fgr					
		2.0 sd					
82	4.0	6.0 FgrSiCl	0	5	13	24	+
		3.0 FS					
		1.0 FgrSiCl					
		1.0 sd					
		1.5 FgrSiCl					
		1.5 sd					
		2.0 FgrSiCl					
83	4.0	1.0 gr SiCl	0	3	8	16	+
		2.0 FgrSiCl					
		1.0 Fgr					
		1.0 gr SiCl					
		1.0 sd SiCl					
		2.0 FS SiCl					
		1.0 FS					
		3.0 FS SiCl					
		1.0 FS					
		2.0 sd SiCl					
84	4.0	4.0 sd SiCl	0	0	5	13	+
		2.5 FgrSiCl					
		2.5 FS					
		2.0 sd SiCl					
		1.0 FgrSiCl					
		3.0 sd SiCl					
		1.0 Fgr					

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PROSPECTED BY Volk/Nelson

INSPECTED & APPROVED B. Hoesel Dec-11

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ND	NH-1-021(018)090	180	5

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
85	7.0	1.0 sd SiCl	0	0	5	11	FS
		1.5 FgrSiCl					
		0.5 sd SiCl					
		1.0 SiCl					
		1.0 FS SiCl					
		1.0 sd SiCl					
		1.0 FS					
		1.5 FS SiCl					
		3.5 sd SiCl					
86	5.0	1.0 sd	0	0	6	11	+
		1.0 FgrSiCl					
		3.0 sd SiCl					
		4.0 sd					
		1.0 SiCl					
		1.0 sd					
		2.0 Fgr					
		2.0 FgrSiCl					
87	3.0	2.0 sd SiCl	0	4	14	26	+
		2.0 FgrSiCl					
		2.0 gr SiCl					
		2.0 gr					
		1.0 FgrSiCl					
		1.0 SiCl					
		3.0 sd SiCl					
		2.0 FS SiCl					
		1.0 FgrSiCl					
		1.0 sd					
88	2.0	2.0 gr	0	2	11	23	+
		2.0 gr SiCl					
		5.0 FgrSiCl					
		3.0 sd SiCl					
		1.0 FgrSiCl					
		5.0 sd					
89	3.0	2.0 sd SiCl	0	0	5	12	+
		2.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 SiCl					
		2.0 FS SiCl					
		3.0 sd					
		2.0 FgrSiCl					
		3.0 sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
90	2.0	2.0 gr SiCl	0	0	5	14	+
		2.0 FgrSiCl					
		1.0 sd					
		1.0 FgrSiCl					
		1.0 sd					
		2.0 SiCl					
		1.0 FS SiCl					
		2.0 sd SiCl					
		1.0 FgrSiCl					
91	4.0	1.5 sd SiCl	0	0	4	11	+
		0.5 Fgr					
		3.0 sd SiCl					
		1.0 FS SiCl					
		1.5 sd					
		0.5 Fgr					
		1.5 FgrSiCl					
		0.5 sd CoS					
		2.0 FS					
		3.0 sd					
		1.0 Fgr					
92	2.0	4.5 FgrSiCl	0	0	10	20	FS
93	1.0	2.0 sd SiCl	0	1	6	12	FS SiCl
		2.0 FS SiCl					
		2.0 sd SiCl					
		1.0 sd					
		1.0 FgrSiCl					
		1.0 sd					
94	1.5	6.5 sd SiCl	0	0	5	11	FS
		1.0 sd					
		1.0 FgrSiCl					
		1.0 sd					
		5.0 FgrSiCl					
95	2.0	1.0 FgrSiCl	0	2	8	17	FS SiCl
		1.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
96	5.5	1.5 sd SiCl	0	0	4	9	+
		2.0 FgrSiCl					
		1.0 FS					
		2.0 FS SiCl					
		1.0 sd					
		2.0 sd SiCl					
		1.0 FgrSiCl					
		4.0 sd					
97	2.5	1.5 FgrSiCl	0	0	3	9	+
		2.0 sd SiCl					
		1.0 FS SiCl					
		2.0 sd SiCl					
		2.0 FS SiCl					
		4.0 sd SiCl					
		2.0 sd					
		1.0 sd CoS					
		1.0 sd SiCl					
98	2.0	1.0 FS SiCl	0	1	6	13	FS SiCl
		5.0 sd SiCl					
		2.0 FgrSiCl					
		1.0 sd SiCl					
		2.0 FgrSiCl					
		1.0 FgrSiCl					
		1.0 sd					
99	2.5	0.5 gr SiCl	0	5	16	30	FS
		1.0 FgrSiCl					
		1.5 sd SiCl					
		0.5 FgrSiCl					
		1.0 sd					
		1.5 gr					
		0.5 FgrSiCl					
		1.0 gr SiCl					
		1.0 FS SiCl					
		3.0 sd SiCl					
		2.0 FgrSiCl					
		2.0 gr SiCl					
100	2.0	1.0 gr SiCl	0	0	5	11	+
		3.0 sd SiCl					
		2.0 sd					
		1.5 FgrSiCl					
		2.5 sd					
		1.0 sd SiCl					
		5.0 sd					
		1.0 FgrSiCl					
		1.0 sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
101	9.0	1.0 gr SiCl	0	6	12	22	+
		3.0 sd SiCl					
		1.0 FS SiCl					
		2.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 gr SiCl					
		2.0 FgrSiCl					
102	5.0	3.0 FgrSiCl	0	0	3	9	+
		2.0 sd CoS					
		2.0 sd					
		1.0 sd SiCl					
		4.0 sd					
		1.0 FgrSiCl					
		2.0 sd					
103	2.0	4.0 FgrSiCl	0	0	6	18	+
		4.0 sd SiCl					
		3.0 FS SiCl					
		1.0 sd					
		1.0 sd SiCl					
		1.0 sd					
		3.0 FgrSiCl					
		1.0 sd					
104	0.5	2.5 sd SiCl	0	1	5	14	+
		2.0 FgrSiCl					
		2.0 FS SiCl					
		2.0 sd					
		2.0 sd SiCl					
		1.0 sd					
		2.0 FgrSiCl					
		4.0 sd					
		2.0 FgrSiCl					

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INSPECTED & APPROVED B. Hoesel Dec-11

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ND	NH-1-021(018)090	180	6

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
105	0.5	1.5 FgrSiCl	0	0	5	16	FS
		1.0 sd SiCl					
		1.0 FS					
		4.0 sd SiCl					
		2.0 FS					
		1.0 FgrSiCl					
		2.0 sd					
		2.0 FgrSiCl					
106	2.0	1.0 FgrSiCl	0	0	4	9	FS
		2.0 FS					
107	3.0	2.0 sd SiCl	0	0	6	16	FS
		5.0 FgrSiCl					
108	3.0	1.0 gr SiCl	0	8	17	27	FS
		0.5 FgrSiCl					
		0.5 sd					
		1.0 gr					
109	4.0	1.0 sd SiCl	0	5	15	27	FS
		3.0 FgrSiCl					
110	1.0	2.0 FgrSiCl	0	4	14	29	FS
		1.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 Fgr					
		2.0 FgrSiCl					
111	0.5	2.0 FgrSiCl	0	1	8	18	FS
		0.5 sd					
		2.0 FgrSiCl					
112	2.0	1.0 FgrSiCl	0	4	14	29	FS
		1.0 Fgr					
		1.0 FgrSiCl					
		1.0 gr SiCl					
113	3.0	6.0 FgrSiCl	0	3	11	22	FS
		1.0 sd SiCl					
114	3.0	7.0 FgrSiCl	0	6	20	38	FS
115	2.0	2.0 gr SiCl	0	2	6	12	FS
		1.0 SiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 sd					
		1.0 sd SiCl					
116	0.5	0.5 FgrSiCl	0	4	16	31	FS SiCl
		2.0 gr SiCl					
		1.0 FgrSiCl					
		1.0 gr SiCl					
		1.0 sd SiCl					
		1.5 FgrSiCl					
		0.5 sd SiCl					
117	2.0	2.0 sd	0	1	7	15	FS SiCl
		1.0 FgrSiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
118	1.0	1.5 gr SiCl	0	2	11	23	FS
		1.5 sd SiCl					
		1.0 FgrSiCl					
119	0.5	0.5 FgrSiCl	0	1	8	21	FS
		1.0 gr SiCl					
		2.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 sd					
120	0.5	0.5 FgrSiCl	0	2	11	23	FS
		1.0 gr SiCl					
		4.0 FgrSiCl					
		1.0 sd					
		1.0 Fgr					
		1.0 sd SiCl					
121	0.5	1.5 sd	0	0	7	14	FS
		3.0 sd SiCl					
		1.0 gr SiCl					
122	1.0	1.0 sd SiCl	0	1	6	15	FS
		2.0 gr SiCl					
123	1.0	2.0 sd SiCl	0	1	10	24	FS
		1.5 FgrSiCl					
		0.5 gr SiCl					
124	0.5	0.5 FgrSiCl	0	1	10	25	FS
		1.0 sd SiCl					
		1.0 SiCl					
		1.0 sd SiCl					
		3.0 FgrSiCl					
125	5.0	4.0 sd SiCl	0	1	7	15	+
		1.0 FgrSiCl					
		1.0 sd					
		1.0 FS SiCl					
		2.0 FS					
126	4.0	3.0 sd SiCl	0	0	8	20	FS SiCl
		0.5 FgrSiCl					
		0.5 sd SiCl					
127	3.0	1.0 sd	0	0	2	11	FS
		1.0 Fgr					
		2.0 sd SiCl					
		1.0 FgrSiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
128	5.0	1.0 gr SiCl	0	2	10	22	FS
		1.0 sd SiCl					
		0.5 gr					
		0.5 Fgr					
		1.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 FgrSiCl					
129	1.0	2.0 FgrSiCl	0	0	4	11	SiCl
		2.0 sd SiCl					
		1.0 FgrSiCl					
		4.0 sd SiCl					
		2.0 sd					
		2.0 CS					
		2.0 sd					
		1.0 Fgr					
		1.0 sd					
		1.0 FgrSiCl					
130	3.0	1.0 FgrSiCl	0	0	4	14	+
		1.0 sd SiCl					
		1.0 FgrSiCl					
		2.0 sd SiCl					
		2.0 FS					
		1.0 sd SiCl					
		1.0 gr SiCl					
		1.0 FgrSiCl					
		1.0 gr					
		1.0 sd SiCl					
		1.0 FS SiCl					
		2.0 FgrSiCl					
		2.0 sd					
131	2.0	3.0 gr SiCl	0	3	10	18	+
		1.0 SiCl					
		1.0 gr SiCl					
		2.0 sd SiCl					
		6.0 FS SiCl					
		3.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd					
132	1.0	2.0 gr SiCl	0	0	4	14	+
		2.0 sd SiCl					
		2.0 sd					
		1.0 FS SiCl					
		1.0 sd SiCl					
		3.0 FgrSiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
133	0.5	2.5 FgrSiCl	0	4	11	20	+
		1.0 Fgr					
		3.0 FgrSiCl					
		2.0 FS SiCl					
		1.0 sd					
		2.0 FS					
		2.0 FgrSiCl					
		1.0 sd					
		1.0 FS SiCl					
		2.0 sd SiCl					
		1.0 sd					
134	3.0	1.0 FgrSiCl	0	1	8	20	+
		1.0 sd SiCl					
		0.5 FgrSiCl					
		1.5 sd SiCl					
		1.0 sd					
		2.0 sd SiCl					
		2.0 FS SiCl					
		1.5 FgrSiCl					
		0.5 gr SiCl					
		2.0 sd SiCl					
135	3.0	1.0 sd SiCl	0	1	6	10	+
		2.0 FgrSiCl					
		1.0 FS					
		1.0 sd SiCl					
		2.0 FS SiCl					
		2.0 sd					
		1.0 Fgr					
		3.0 sd SiCl					
		2.0 FgrSiCl					
		2.0 gr SiCl					
		2.0 sd SiCl					
		2.0 FgrSiCl					
		2.0 sd SiCl					

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PROSPECTED BY Volk/Nelson

INSPECTED & APPROVED B. Hoesel Dec-11

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ND	**NH-1-021(018)090**	**180**	**7**

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
136	4.0	1.0 sd SiCl	0	0	4	9	+
		1.0 FgrSiCl					
		1.0 sd SiCl					
		4.0 FS SiCl					
		1.0 SiCl					
		2.0 sd SiCl					
		1.0 FS					
		5.0 sd SiCl					
137	5.0	3.0 FgrSiCl	0	1	8	18	+
		1.0 sd					
		4.0 sd SiCl					
		2.0 FS SiCl					
		1.0 gr SiCl					
		1.0 FS CoS					
		1.0 sd SiCl					
		1.0 CoS					
		1.0 sd SiCl					
138	4.0	2.5 FgrSiCl	0	2	11	22	+
		0.5 sd SiCl					
		1.0 FgrSiCl					
		2.0 sd SiCl					
		2.0 FgrSiCl					
		3.0 sd SiCl					
		1.0 FS					
		1.0 FgrSiCl					
		2.0 gr SiCl					
		1.0 sd SiCl					
139	5.0	1.0 sd SiCl	0	2	8	15	+
		2.0 sd					
		1.0 sd SiCl					
		1.0 Fgr					
		2.0 sd SiCl					
		2.0 FS SiCl					
		1.0 sd					
		3.0 Fgr					
		2.0 FgrSiCl					
140	5.0	2.0 FgrSiCl	0	1	6	17	+
		2.0 gr SiCl					
		1.0 sd SiCl					
		1.0 SiCl					
		1.0 FS SiCl					
		1.0 sd SiCl					
		1.0 FS SiCl					
		1.0 sd SiCl					
		1.0 sd					
		1.0 sd CoS					
		1.0 FgrSiCl					
		2.0 gr SiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
141	3.0	5.0 sd SiCl	0	0	1	5	+
		6.0 FS SiCl					
		4.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
142	3.0	2.0 gr SiCl	0	1	6	12	+
		3.0 FgrSiCl					
		3.0 FS SiCl					
		4.0 sd SiCl					
		5.0 sd					
143	2.0	4.0 gr	0	2	8	15	+
		4.0 FS SiCl					
		2.0 FS					
		2.0 sd					
		1.0 FS SiCl					
		1.0 Fgr					
		1.0 FS					
		1.0 Fgr					
		2.0 FS					
144	4.0	1.0 FS	0	0	4	8	+
		2.0 FgrSiCl					
		1.0 FS					
		2.0 sd					
		1.0 FS SiCl					
		1.0 FS					
		1.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd CoS					
		4.0 sd SiCl					
145	2.0	4.0 FgrSiCl	0	0	4	11	+
		1.0 FS					
		1.0 sd SiCl					
		5.0 FS					
		3.0 sd					
		1.0 FS SiCl					
		2.0 FgrSiCl					
		1.0 sd SiCl					
146	4.0	2.0 gr SiCl	0	0	3	8	+
		3.0 FS					
		2.0 sd SiCl					
		6.0 FS					
		1.0 Fgr					
		1.0 FgrSiCl					
		1.0 sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
147	2.0	1.0 FgrSiCl	0	1	7	14	+
		2.0 gr SiCl					
		0.5 FgrSiCl					
		0.5 sd SiCl					
		6.0 FS SiCl					
		1.0 sd SiCl					
		1.0 sd					
		2.0 FgrSiCl					
		1.0 sd SiCl					
		2.0 sd					
148	4.0	2.0 gr SiCl	0	0	8	17	+
		1.0 sd SiCl					
		4.0 FgrSiCl					
		2.0 FS SiCl					
		1.0 sd SiCl					
		1.0 FS					
		1.0 Fgr					
		1.0 sd					
149	6.0	2.0 sd SiCl	0	2	11	23	+
		1.5 FgrSiCl					
		0.5 gr SiCl					
		1.0 sd SiCl					
		3.0 FS SiCl					
		2.0 sd SiCl					
		1.0 FS SiCl					
		1.0 FgrSiCl					
		1.0 sd CoS					
150	6.0	4.0 sd SiCl	0	0	4	9	SiCl
		1.0 FgrSiCl					
		1.0 sd SiCl					
		3.0 FS SiCl					
		1.0 sd					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 Fgr					
151	6.0	1.0 FS	0	0	5	15	FS
		1.0 sd SiCl					
		1.0 Fgr					
152	6.0	1.0 FS SiCl	0	5	12	18	FS
		1.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 gr SiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
153	4.0	1.0 gr SiCl	0	2	8	15	+
		1.0 sd SiCl					
		2.0 sd					
		3.0 FgrSiCl					
		4.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					
		1.0 sd					
		2.0 FgrSiCl					
154	6.0	1.5 sd SiCl	0	2	9	17	+
		0.5 FgrSiCl					
		3.0 sd SiCl					
		1.0 sd CoS					
		2.0 sd SiCl					
		1.0 sd CoS					
		1.0 sd					
		2.0 FgrSiCl					
		2.0 gr SiCl					
155	2.0	1.0 gr SiCl	0	1	5	10	+
		1.0 FS SiCl					
		2.0 sd					
		1.0 FgrSiCl					
		2.0 sd					
		4.0 FS SiCl					
		1.0 sd CoS					
		1.0 Fgr					
		2.0 FS SiCl					
		1.0 sd					
		1.0 FgrSiCl					
		1.0 sd SiCl					
156	5.0	6.0 sd SiCl	0	1	5	11	+
		3.0 FS SiCl					
		3.0 sd SiCl					
		2.0 FgrSiCl					
		1.0 sd SiCl					
157	4.0	3.0 sd SiCl	0	0	8	14	FS
		2.0 sd					
		3.0 FgrSiCl					

RANGE 88 **TWP** 134 **SEC** SE 1/4 27

COUNTY Grant

PROSPECTED BY Volk/Nelson

INSPECTED & APPROVED B. Hoesel Dec-11

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	180	8

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
158	4.0	6.0 FS	0	0	1	2	FS
		1.0 Fgr					
159	2.0	2.0 gr SiCl	0	0	5	12	FS
		2.0 sd SiCl					
		2.0 sd					
		3.0 Fgr					
		1.0 FS					
		1.0 FS SiCl					
		2.0 FS					
		2.0 FgrSiCl					
160	2.0	4.0 sd SiCl	0	0	6	16	+
		0.5 FgrSiCl					
		0.5 gr SiCl					
		4.0 sd SiCl					
		1.0 FS SiCl					
		4.0 sd SiCl					
		1.0 FgrSiCl					
		1.0 gr SiCl					
		1.0 FgrSiCl					
		1.0 sd SiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
A	3.0	1.0 FgrSiCl	0	2	8	13	FS
B	4.0	2.0 FgrSiCl	0	3	7	15	FS
C	1.0	2.0 FgrSiCl	0	2	8	15	SiCl
D	3.0	2.0 FgrSiCl	0	4	12	23	SiCl
E	5.0	3.0 sd SiCl	0	0	1	9	FS
		1.0 FgrSiCl					
		1.0 sd SiCl					
F	3.0	2.0 gr SiCl	0	2	6	16	SiCl
		2.0 sd SiCl					
		1.0 gr SiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole

RANGE 88 **TWP** 134 **SEC** SE 1/4 27

COUNTY Grant Jun-11

PROSPECTED BY Volk/Nelson

INSPECTED & APPROVED B. Hoesel Dec-11

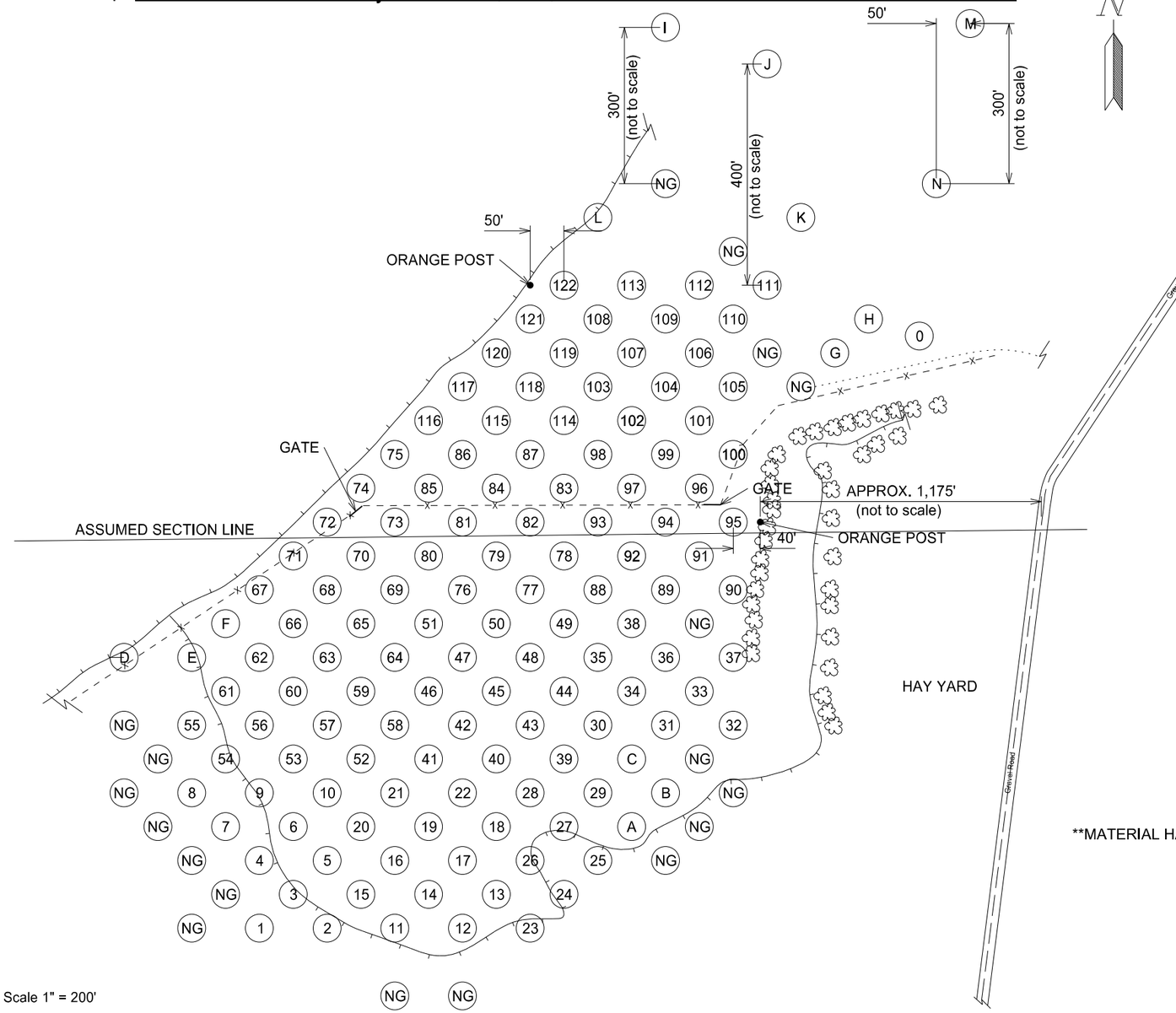
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-1-021(018)090	180	9

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

TEST HOLE PLAT

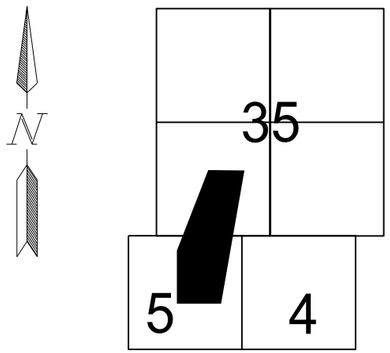
Location: SW¼ 35-133-88 & SE¼ 5-132-88 County: Grant

Ownership: Clayton Zacher, Heil, ND



Scale 1" = 200'

LOCATION OF PIT IN SECTION



Area "A" consists of Test Holes 1 - 10
Area "B" consists of Test Holes 11 - 22
Area "C" consists of Test Holes 23 - 29
Area "D" consists of Test Holes 30 - 38
Area "E" consists of Test Holes 39 - 51
Area "F" consists of Test Holes 52 - 66
Area "G" consists of Test Holes 67 - 75
Area "H" consists of Test Holes 76 - 87
Area "I" consists of Test Holes 88 - 100
Area "J" consists of Test Holes 101 - 113
Area "K" consists of Test Holes 114 - 122

Legend:
gr = gravel
sd = sand
FS = fine sand
Fgr = fine gravel
CS = coarse sand
sh = shale
SiCl = silt clay
rk = rock
FeO = Iron oxide
CoS = Coal Slack
WL = water line
NG = no gravel

**MATERIAL HAS BEEN REMOVED SINCE BORING WERE PERFORMED.

8/28/2013 11:49:52 AM cfrising R:\project\10021090.018\design\Sheets\180PT_009_PITPLAT.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	180	10

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
1	2.0	1.0 gr SiCl	0	5	11	29	SiCl
		2.0 gr					
		1.0 FgrSiCl					
2	3.0	1.0 gr SiCl	0	12	25	43	SiCl
		4.0 gr					
		1.0 gr SiCl					
		0.5 gr					
		0.5 Fgr					
3	4.0	1.0 Fgr	0	7	18	36	sd SiCl
		3.0 gr					
		1.0 Fgr					
4	3.0	2.0 gr	0	13	23	35	sd CoS
		1.0 Fgr					
		2.0 gr					
5	3.0	1.0 Fgr	1	9	19	37	SiCl
		5.0 gr					
		1.0 Fgr					
6	3.5	0.5 FgrSiCl	0	8	17	32	SiCl
		1.0 sd CoS					
		1.0 gr					
		1.0 Fgr					
		1.0 gr					
		1.5 FgrSiCl					
		1.5 Fgr					
7	2.0	3.0 gr	0	8	18	33	SiCl
		2.0 Fgr					
8	2.0	1.5 Fgr	0	2	12	29	SiCl
		0.5 gr					
		1.0 FgrSiCl					
9	4.0	1.0 gr	0	8	20	38	SiCl
		1.0 Fgr					
		1.0 gr					
		1.0 Fgr					
		1.0 sd SiCl					
		1.0 gr					
		1.0 Fgr					
		1.0 sd SiCl					
		2.0 Fgr					
		2.0 gr SiCl					
10	5.0	1.5 Fgr	0	8	16	30	SiCl
		0.5 gr					
		1.0 sd SiCl					
		2.0 Fgr					
		2.0 gr SiCl					
11	4.5	0.5 sd SiCl	0	6	17	34	SiCl
		1.0 Fgr					
		4.0 gr					
		1.0 FgrSiCl					
12	2.0	1.0 Fgr	0	11	24	39	gr SiCl
		5.0 gr					
		1.0 FgrSiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
13	3.5	6.5 Fgr	0	4	12	24	SiCl
		1.0 sd					
14	4.0	1.5 Fgr	0	6	17	33	SiCl
		1.5 sd					
		2.0 Fgr					
		3.0 gr					
15	4.0	4.0 gr	0	7	18	35	SiCl
		2.0 Fgr					
		2.0 gr					
		1.0 Fgr					
16	3.0	0.5 Fgr	0	5	14	28	SiCl
		0.5 gr					
		1.0 Fgr					
		0.5 gr					
		0.5 sd					
		2.0 gr					
		1.0 sd					
		1.0 CoS					
		1.0 gr					
		1.0 FgrSiCl					
17	2.0	1.0 sd	0	10	21	33	SiCl
		0.5 FS					
		3.5 gr					
		1.0 Fgr					
		0.5 sd					
		1.5 Fgr					
		1.0 gr SiCl					
18	5.0	1.0 Fgr	0	2	9	25	SiCl
		2.0 sd CoS					
		1.0 Fgr CoS					
		1.0 gr					
		3.0 Fgr					
19	3.5	1.5 sd	1	9	16	30	SiCl
		2.0 Fgr					
		1.0 gr CoS					
		1.0 gr					
		2.0 gr CoS					
		1.0 Fgr					
		1.0 gr					
20	3.0	2.0 gr	1	8	18	30	SiCl
		1.0 gr CoS					
		1.0 Fgr CoS					
		1.0 sd					
		2.0 Fgr					
		1.0 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
21	6.0	2.0 Fgr	0	2	11	24	SiCl
		1.0 gr SiCl					
		0.5 FS SiCl					
		0.5 sd					
		1.0 Fgr					
		1.0 sd					
		1.0 Fgr SiCl					
22	5.0	3.0 Fgr	0	2	8	21	SiCl
		1.0 gr					
		1.0 sd SiCl					
		1.0 FgrSiCl					
23	3.0	1.0 FgrSiCl	0	2	8	17	SiCl
		1.0 sd					
		1.0 FgrSiCl					
24	0.5	2.0 gr SiCl	0	4	20	37	SiCl
		0.5 sd					
		1.0 Fgr					
		1.0 gr SiCl					
25	2.0	1.0 sd	0	0	3	13	SiCl
		2.0 Fgr					
		1.0 sd					
26	1.5	1.5 Fgr	0	6	14	25	SiCl
		1.0 sd					
		2.0 sd					
		1.0 Fgr					
		1.0 gr					
27	4.0	1.0 sd	0	2	6	13	SiCl
		2.0 Fgr					
28	5.0	1.0 Fgr	0	3	10	25	SiCl
		4.0 FgrSiCl					
29	5.0	1.0 Fgr	0	4	11	25	SiCl
		1.0 FgrSiCl					
		1.5 gr					
		1.5 Fgr					
30	3.0	1.0 sd	0	2	11	25	SiCl
		2.0 Fgr					
		3.0 gr					
		2.0 FgrSiCl					
31	4.0	1.0 Fgr	0	3	11	24	SiCl
		2.0 gr					
		2.0 Fgr					
32	4.0	1.0 sd	0	0	4	12	SiCl
		1.0 Fgr					
		1.0 sd					
		1.5 Fgr					
33	4.0	1.0 FgrSiCl	0	6	12	30	SiCl
		4.0 gr					
34	5.0	1.5 Fgr CoS	0	3	12	32	SiCl
		2.5 Fgr					
		1.0 gr CoS					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	
35	2.5	1.5 sd SiCl	0	3	9	18	SiCl
		3.0 sd					
		2.0 Fgr					
		1.0 sd					
		1.0 FgrSiCl					
36	5.0	3.5 Fgr	0	4	9	19	SiCl
		1.5 FgrSiCl					
37	5.0	3.0 sd	0	0	3	7	SiCl
		1.0 Fgr					
38	6.0	1.0 sd	0	1	8	21	SiCl
		2.5 Fgr					
		1.5 gr					
		1.0 gr SiCl					
39	6.0	1.0 Fgr	0	5	14	30	SiCl
		1.0 sd					
		1.0 gr SiCl					
		2.0 gr					
40	5.0	1.0 FgrSiCl	0	10	16	29	SiCl
		2.0 Fgr					
		1.0 FgrSiCl					
		1.0 gr					
41	4.0	1.0 Fgr	0	4	12	29	SiCl
		0.5 gr					
		2.5 Fgr					
		1.0 gr					
		1.0 gr SiCl					
		1.0 FgrSiCl					
42	5.5	1.5 FgrSiCl	0	4	12	26	SiCl
		1.0 Fgr					
		1.5 gr					
		0.5 FgrSiCl					
43	5.0	3.0 Fgr	2	10	19	36	SiCl
		3.5 gr					
		0.5 gr SiCl					
		1.0 gr					
		1.0 gr SiCl					

RANGE 88 **TWP** 133 **SEC** SW 1/4 35

COUNTY Grant Jun-11

PROSPECTED BY Volk/Nelson

INSPECTED & APPROVED B. Hoesel Oct-11

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	180	11

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
44	4.0	2.0 Fgr	0	2	10	32	SiCl
		2.0 gr					
		2.0 Fgr					
		1.0 gr					
45	4.0	2.0 gr	0	7	15	36	SiCl
		1.0 FgrSiCl					
		1.0 Fgr CoS					
		2.0 gr					
		1.0 Fgr					
46	4.0	1.0 Fgr	2	6	18	35	SiCl
		1.0 Fgr CoS					
		2.0 gr					
		1.0 Fgr					
		3.0 gr					
47	2.0	1.0 gr	0	6	14	29	SiCl
		2.0 Fgr CoS					
		4.0 Fgr					
		1.0 sd					
		1.0 gr					
		0.5 sd					
48	2.5	0.5 sd SiCl	0	5	12	28	SiCl
		1.0 sd					
		3.0 Fgr					
		1.0 gr SiCl					
		1.0 Fgr					
		2.0 sd					
49	4.0	1.0 FgrSiCl	0	4	12	32	SiCl
		1.0 gr					
		1.0 Fgr					
		1.5 gr					
		1.5 Fgr					
		1.0 sd CoS					
		1.0 Fgr					
		1.0 gr CoS					
50	4.0	3.0 gr	0	3	9	22	SiCl
		2.0 Fgr					
		2.0 sd SiCl					
		1.0 Fgr					
		1.0 sd					
51	3.0	1.5 gr	0	3	10	24	FS SiCl
		0.5 sd					
		1.0 gr					
		3.0 Fgr					
		2.0 FS CoS					
		1.0 Fgr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
52	4.5	1.5 Fgr	0	8	19	34	SiCl
		1.0 gr					
		1.0 FgrSiCl					
		1.0 gr					
		0.5 Fgr					
		0.5 SiCl					
		0.5 FgrSiCl					
		0.5 gr SiCl					
53	5.0	1.0 FgrSiCl	0	7	16	31	SiCl
		1.0 Fgr					
		1.0 gr					
		1.0 FgrSiCl					
		1.0 gr					
54	4.0	1.0 Fgr	0	10	23	40	SiCl
		2.0 gr SiCl					
		0.5 FgrSiCl					
		1.5 Fgr					
		1.0 gr					
		0.5 FgrSiCl					
55	2.5	2.0 gr SiCl	0	9	19	33	SiCl
		1.0 sd CoS					
		2.5 gr					
56	4.0	4.0 Fgr	0	6	15	29	SiCl
		1.0 sd					
57	4.0	2.0 FgrSiCl	0	7	15	27	SiCl
		1.5 Fgr					
		0.5 FgrSiCl					
58	4.0	2.0 Fgr	0	6	16	30	SiCl
		1.0 gr					
		1.0 sd					
		2.0 gr					
		1.0 FgrSiCl					
59	6.0	1.5 gr	0	5	18	40	SiCl
		0.5 Fgr					
		1.0 gr SiCl					
		1.0 gr CoS					
60	5.0	1.0 gr	1	7	16	31	SiCl
		1.0 sd					
		1.0 Fgr					
		1.0 gr					
		1.0 Fgr					
		1.0 gr SiCl					
61	5.0	2.0 gr	0	3	13	30	SiCl
62	4.0	1.0 FgrSiCl	0	5	14	27	SiCl
		1.0 sd					
		1.0 Fgr					
		1.0 gr					
		1.0 Fgr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
63	4.0	1.0 gr SiCl	0	5	14	29	SiCl
		2.0 gr					
		2.0 Fgr					
		1.0 sd CoS					
		1.0 Fgr					
		1.0 sd					
64	4.0	1.0 gr	0	5	12	27	SiCl
		1.0 sd					
		1.5 gr					
		0.5 sd					
		1.0 Fgr					
		0.5 sd					
		1.0 gr					
		2.0 gr					
		1.0 FgrSiCl					
65	4.0	3.0 gr SiCl	0	4	13	28	FS SiCl
		2.0 gr					
		3.0 sd					
66	3.5	1.5 gr SiCl	0	5	13	28	FS SiCl
		1.0 gr CoS					
		2.0 Fgr					
		2.0 sd					
		1.0 gr					
		2.5 sd CoS					
		0.5 Fgr					
		0.5 FgrSiCl					
68	5.5	0.5 FgrSiCl	0	6	16	32	
		0.5 gr					
		0.5 Fgr					
		1.0 gr					
		1.0 Fgr					
		4.0 gr					
69	4.0	2.0 gr	1	5	15	31	FS SiCl
		3.0 Fgr					
		0.5 sd					
		0.5 CoS					
		2.0 Fgr					
70	5.0	2.0 gr	0	4	11	25	SiCl
		2.0 Fgr					
		1.5 sd					
		0.5 Fgr					
		1.0 gr					
72	5.0	1.5 gr	0	8	18	33	FS SiCl
		1.5 Fgr CoS					
		3.0 Fgr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
73	4.0	1.0 gr SiCl	0	5	15	30	SiCl
		1.0 gr					
		1.0 Fgr					
		1.0 gr					
		0.5 Fgr					
		0.5 sd					
		1.5 Fgr					
		0.5 gr					
		1.0 Fgr CoS					
		2.0 Fgr					
74	3.0	1.0 Fgr SiCl	0	9	18	30	SiCl
		4.0 Fgr					
		1.0 gr					
		2.0 sd					
		1.0 Fgr SiCl					
75	4.0	1.0 Fgr SiCl	0	5	9	29	SiCl
		8.0 Fgr					
76	4.0	3.5 gr	0	3	10	25	SiCl
		0.5 sd SiCl					
		1.0 Fgr					
		1.0 sd					
		1.5 gr					
		0.5 sd					
		1.0 Fgr SiCl					
77	3.5	0.5 gr SiCl	0	2	6	16	SiCl
		1.5 Fgr CoS					
		0.5 Fgr SiCl					
		2.0 sd SiCl					
		1.0 sd					
		2.0 Fgr					
78	4.0	1.0 Fgr SiCl	0	8	23	48	SiCl
		2.0 gr					
		2.0 gr SiCl					
		1.0 gr					
		1.0 Fgr					

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PROSPECTED BY Volk/Nelson

INSPECTED & APPROVED B. Hoesel Oct-11

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	180	12

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
79	5.0	0.5 gr SiCl	0	7	17	33	SiCl
		1.5 gr					
		1.0 gr SiCl					
		1.0 Fgr					
		1.0 gr					
		2.0 Fgr					
80	5.0	1.0 Fgr	0	2	9	23	SiCl
		1.0 SiCl					
		1.0 Fgr					
		1.5 Fgr CoS					
		0.5 gr					
		1.0 gr SiCl					
		2.0 Fgr					
81	4.0	1.0 Fgr SiCl	0	5	15	33	SiCl
		1.0 gr					
		1.0 Fgr SiCl					
		6.0 gr					
82	4.0	5.0 gr	0	2	12	29	SiCl
		1.0 Fgr					
		1.0 sd CoS					
		1.5 Fgr					
83	3.0	6.0 Fgr	0	4	9	20	FS SiCl
		1.0 FS CoS					
		1.5 sd CoS					
84	3.0	3.0 FgrSiCl	0	5	13	30	SiCl
		1.0 Fgr					
		1.0 gr					
		1.0 sd					
		1.0 gr SiCl					
		2.0 sd SiCl					
85	3.5	3.0 gr SiCl	0	5	15	30	FS SiCl
		2.5 gr					
		1.0 sd					
		1.0 sd CoS					
		1.0 Fgr					
86	3.0	3.0 gr	0	6	16	32	SiCl
		1.0 Fgr					
		2.0 sd CoS					
		1.0 Fgr					
87	3.0	4.5 Fgr	0	5	17	33	SiCl
		0.5 sd					
		2.0 Fgr					
		2.0 gr					
		2.0 Fgr					
88	5.0	2.0 Fgr SiCl	0	1	9	22	SiCl
		1.0 gr					
		2.0 Fgr					
		1.0 sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
89	6.0	2.0 FgrSiCl	0	2	12	31	FS SiCl
90	3.0	1.0 gr	0	2	8	22	SiCl
		1.0 FgrSiCl					
		1.0 sd					
		2.0 FgrSiCl					
		2.5 gr					
91	4.0	1.5 Fgr	0	2	9	26	SiCl
		2.0 gr					
		0.5 Fgr					
92	4.0	2.5 FgrSiCl	0	3	13	34	SiCl
		0.5 gr					
		1.0 gr CoS					
		3.0 gr					
93	3.0	2.0 FgrSiCl	0	2	9	28	SiCl
		2.0 gr					
		0.5 Fgr					
		0.5 sd					
		1.0 Fgr					
		2.0 Fgr					
94	4.5	2.5 FgrSiCl	0	2	8	25	SiCl
		2.0 Fgr					
		1.0 sd					
		1.0 gr					
		1.0 FgrSiCl					
		2.0 Fgr					
95	4.0	2.0 Fgr	0	1	6	17	SiCl
		1.0 FS					
		1.5 sd					
		0.5 sd CoS					
		1.0 gr					
96	3.0	1.0 gr	0	0	4	10	SiCl
		1.0 FS SiCl					
		1.0 sd					
		1.0 FS CoS					
		1.0 FS SiCl					
		1.5 FS CoS					
		1.5 sd					
		1.0 Fgr CoS					
97	3.0	4.0 FgrSiCl	0	0	6	15	FS SiCl
		1.0 Fgr					
		2.0 sd					
		2.0 Fgr					
98	3.0	1.0 FgrSiCl	0	5	13	26	SiCl
		3.0 Fgr					
		1.0 gr					
		4.0 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
99	3.0	1.0 gr	0	2	11	24	SiCl
		1.0 FS CoS					
		2.0 Fgr					
		1.0 sd					
		3.0 Fgr					
100	2.0	2.0 Fgr SiCl	0	1	4	11	SiCl
		2.0 sd SiCl					
		1.0 Fgr SiCl					
		1.0 Fgr					
101	4.0	1.0 sd CoS	0	2	6	8	FS SiCl
		1.0 Fgr					
		2.0 sd					
102	3.0	2.0 FgrSiCl	0	4	12	27	SiCl
		4.0 Fgr					
103	4.0	0.5 FgrSiCl	0	3	13	30	SiCl
		1.5 Fgr					
		1.0 sd					
		1.0 Fgr					
		0.5 gr					
		1.5 Fgr					
		1.0 Fgr CoS					
		0.5 FgrSiCl					
104	4.0	1.0 gr SiCl	0	0	4	14	SiCl
		1.0 gr					
		1.0 sd					
		1.0 Fgr					
		2.0 sd					
105	4.5	2.5 Fgr	0	3	10	21	SiCl
		1.0 sd					
		1.0 Fgr					
		1.0 FS CoS					
		1.0 FgrSiCl					
106	5.0	1.0 Fgr CoS	0	6	16	31	FS SiCl
		2.0 Fgr					
		1.0 gr					
107	4.0	3.5 Fgr	0	1	6	17	FS SiCl
		0.5 CoS					
		2.0 FS					
108	5.0	1.0 Fgr	0	3	9	23	SiCl
		1.0 gr					
		1.0 sd					
		1.0 Fgr					
		0.5 gr					
		0.5 Fgr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
109	5.5	0.5 FgrSiCl	0	4	12	25	SiCl
		1.0 gr					
		1.0 Fgr CoS					
		1.5 Fgr					
		0.5 sd CoS					
		1.5 CoS					
		1.5 Fgr CoS					
		1.0 gr SiCl					
110	4.0	1.0 sd	0	0	0	0	SiCl
		1.0 sd SiCl					
111	3.0	2.0 gr	0	4	16	29	FS SiCl
112	3.0	1.0 gr SiCl	0	4	12	15	SiCl
		1.0 sd					
113	5.0	2.5 gr CoS	0	6	11	21	FS SiCl
		0.5 sd					
		1.0 FS					
114	3.0	1.0 gr	0	8	15	26	SiCl
		7.0 Fgr					
115	3.0	2.0 FgrSiCl	0	6	19	37	SiCl
		5.5 Fgr					
		0.5 sd					
		1.0 Fgr					
		1.0 gr					
118	4.0	1.0 Fgr	0	7	17	34	SiCl
		5.0 gr					
119	4.0	1.0 FgrSiCl	0	0	7	19	SiCl
		4.0 Fgr					
		1.5 sd					
		1.5 Fgr					
120	6.0	1.0 gr					
		3.0 Fgr					
		2.0 gr					

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INSPECTED & APPROVED B. Hoesel Oct-11

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-1-021(018)090	180	13

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
121	5.0	1.0 sd	0	2	10	25	SiCl
		1.0 Fgr CoS					
		1.0 gr					
		1.5 Fgr					
		0.5 sd CoS					
		0.5 CoS					
		0.5 sd					
		0.5 Fgr					
		0.5 gr					
		1.0 sd					
		0.5 Fgr CoS					
		0.5 Fgr					
		1.0 FgrSiCl					
122	7.0	2.0 FgrSiCl	0	2	8	20	SiCl
		1.0 Fgr					
		1.5 sd					
		1.5 Fgr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
A	6.0	1.0 gr	0	0	0	0	SiCl
B	5.0	1.0 CS	0	2	6	17	SiCl
		1.0 Fgr CoS					
C	8.0	1.0 Fgr	0	7	18	39	SiCl
		1.0 gr					
D	3.0	2.0 CGr	0	6	13	22	FS SiCl
E	4.0	1.0 gr	1	12	20	32	FS SiCl
		1.0 Fgr					
F	4.0	2.0 FgrSiCl	0	11	20	33	SiCl
		1.0 gr					
G	1.0	2.0 FgrSiCl	0	5	12	19	SiCl
		1.5 Fgr					
H	4.0	2.0 gr	0	0	0	0	SiCl
I	4.5	0.5 FgrSiCl	0	4	14	29	SiCl
		1.5 gr SiCl					
		1.5 FgrSiCl					
		1.0 sd SiCl					
J	3.0	1.0 FgrSiCl	0	8	19	33	SiCl
		5.0 Fgr					
		1.0 sd					
K	4.0	2.0 gr	0	0	0	0	SiCl
L	6.0	1.0 FgrSiCl	0	7	14	26	SiCl
		1.0 gr					
		0.5 Fgr Cos					
		0.5 sd CoS					
		1.0 Fgr					
M	5.0	1.0 Fgr	0	6	16	31	FS
		2.0 gr					
		1.0 Fgr					
N	8.0	2.0 sd	0	2	6	17	SiCl
		1.0 Fgr					
O	4.0	1.0 FS	0	4	13	29	FS
		1.0 Fgr					
		1.0 Fgr SiCl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole

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