DESIGN DATA - US Hwy 281 from RP 148.796 to RP 149.106				
Traffic	Average Daily			
Current 2016	Pass: 1,264	Trucks: 316	Total: 1,580	
Forecast 2036	Pass: 1,600	Trucks: 400	Total: 2,000	
Clear Zone Distance: 20'		Design Speed: 65 MPH		
Minimum Sight Dist. for Stopping: 645		Bridges: N/A		
Sight Dist. for No Passing Zone: 1,100'				
Pavement Design Life: 20 (years)				
Design Accumulated One-way Flexible ESALs: 1,238,902				

DESIGN DATA - US Hwy 281 from RP 149.106 to RP 155.036				
Traffic	Average Daily			
Current 2016	Pass: 294	Trucks: 151	Total: 445	
Forecast 2036	Pass: 792	Trucks: 408	Total: 1,200	
Clear Zone Distance: 20'		Design Speed: 65 MPH		
Minimum Sight Dist. for Stopping: 645'		Bridges: N/A		
Sight Dist. for No Passing Zone: 1,100'				
Pavement Design Life: 20 (years)				
Design Accumulated One-way Flexible ESALs: 1,021,551				

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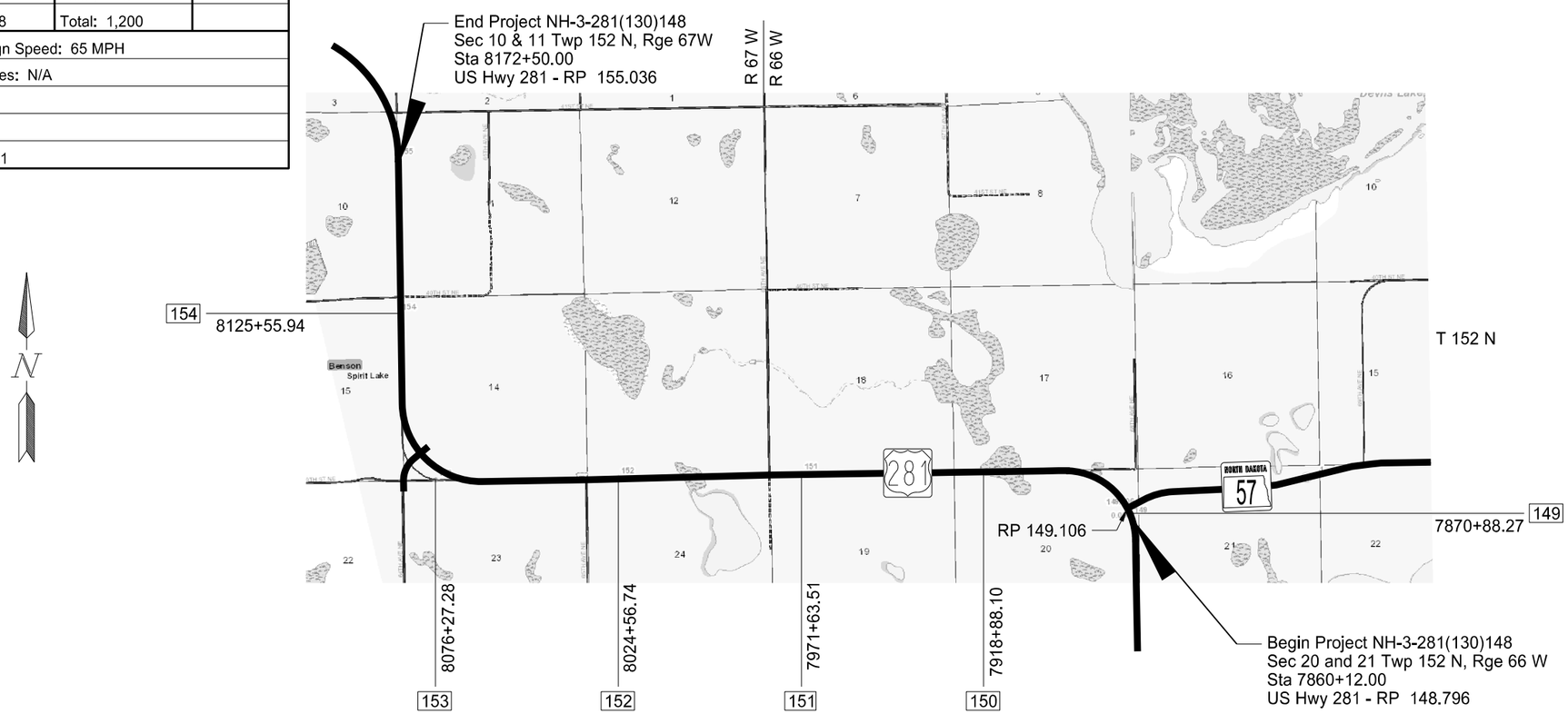
	ND	NH-3-281(130)148	21506	1	1

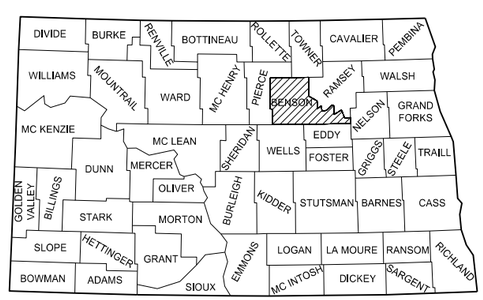
JOB # 25
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

NH-3-281(130)148
Benson County
Near Junction 57 to New 281
Grading, Full Depth Reclamation, Milling, Hot Mix Asphalt
Roadway Realignment

GOVERNING SPECIFICATIONS:
2014 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
NH-3-281(130)148	5.916	5.916





STATE COUNTY MAP

DESIGNERS

Matthew Huettl, PE

Whitney Schroeder

Dan Bergerson

Melissa Langer

Ronald Ceroll

APPROVED DATE 8/30/17

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 8/28/17

Craig Mizera /s/
HDR Engineering

This document was originally issued and sealed by Craig Mizera, Registration Number PE- 7475, on 8/28/17 and the original document is stored at the North Dakota Department of Transportation

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LIST OF STANDARD DRAWINGS

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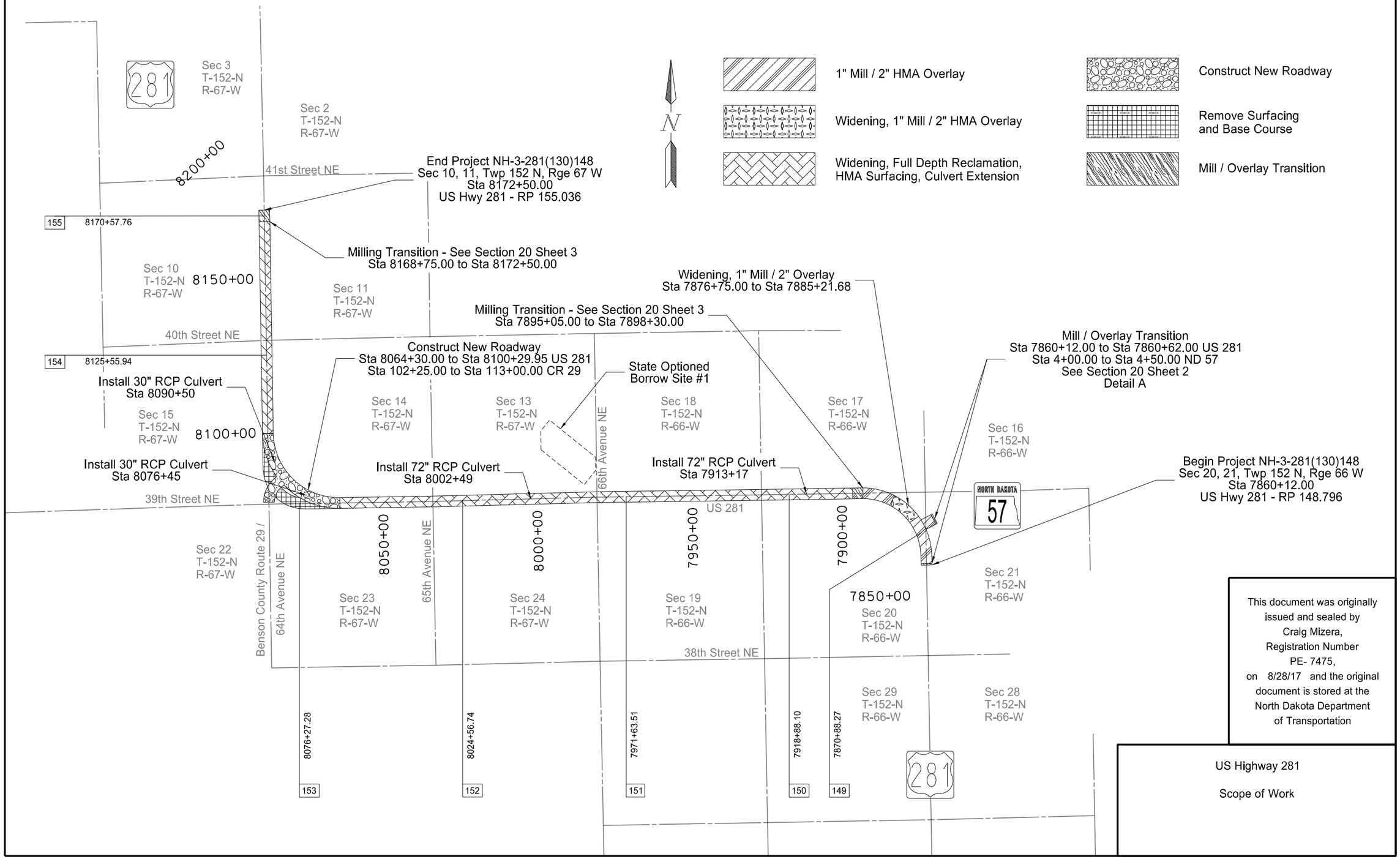

This document was originally issued and sealed by Craig Mizera, Registration Number PE- 7475, on 8/28/17 and the original document is stored at the North Dakota Department of Transportation

US Highway 281

Scope of Work

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NOTES

105-200 UTILITY COORDINATION: A utility coordination meeting is required.

105-P01 UTILITY CONFLICTS: Utility conflict meetings were held with each utility company during the design process. Please see contact information and summary of utility conflicts below. Contact the utility company 2 weeks prior to working near the conflicts to schedule adjustment and relocation of impacted utilities.

Central Plains Water District
Contact: Terry Morrow - 701.547.3751 – cpwd@gondtc.com

Water Line Crossing Conflict - Sta. 8129+72 to Sta. 8131+24
Water line will be adjusted by Central Plains prior to construction.

North Dakota Telephone Company
Contact: Terry Thompson – 701.662.1100 – terryt@ndtel.com

Buried Telephone Line Crossing – Sta. 8033+35 to Sta. 8033+37
Telephone line will be adjusted by ND Telecom during construction.

Buried Telephone Line – Sta. 8050+05 to Sta. 8055+19, LT
Telephone line will be adjusted by ND Telecom during construction.

Buried Telephone Line – Sta. 8056+84 to Sta. 8058+08, LT
Telephone line will be adjusted by ND Telecom during construction.

Buried Fiber Optic Line Crossing – Sta. 8092+67 to Sta. 8096+44
Telephone line will be adjusted by ND Telecom during construction.

Buried Fiber Optic Line – Sta. 8117+90 to Sta. 8121+06, RT
Telephone line will be adjusted by ND Telecom during construction.

Buried Fiber Optic Line – Sta. 8129+00 to Sta. 8133+00, LT
Telephone line will be adjusted by ND Telecom during construction.

Buried Fiber Optic Line – Sta. 8146+00 to Sta. 8159+00, LT
Telephone line will be adjusted by ND Telecom during construction.

Northern Plains Electric Cooperative Inc.
Contact: Seth Syverson – 701.652.1842 – seths@nplains.com

Overhead Electric – Sta. 8067+10 to Sta. 8073+90, RT
OH line is an under build on Otter Tail infrastructure. OH line and poles will be relocated by Otter Tail prior to construction.

Buried Electric – Sta. 8077+78 to Sta. 8082+56, LT
Electric line will be relocated during construction.

Buried Electric – Sta. 8082+56 to Sta. 8088+20, LT
Electric line will be relocated during construction.

Buried Electric – Sta. 8090+36 to Sta. 8091+04, LT
Electric line will be relocated during construction.

Buried Electric Crossing – Sta. 8091+10 to Sta. 8094+81
Electric line will be relocated during construction.

Otter Tail Power Company
Contact: Dennis Huffman – 218.739.8764 – dhuffman@otpco.com

Overhead Electric – Sta. 8067+10 to Sta. 8073+90, RT
OH line and poles will be adjusted by Otter Tail prior to construction.

Overhead Electric – Sta. 8083+60 to Sta. 8085+07, LT
OH line and poles will be adjusted by Otter Tail prior to construction.

Overhead Electric Crossing – Sta. 8091+42 to Sta. 8097+20
OH line and poles will be adjusted by Otter Tail prior to construction.

107-100 LAWS TO BE OBSERVED: All or a portion of this project lies within the exterior boundaries of an Indian Reservation. Review laws and ordinances pertaining to the work contained within the boundaries of the reservation.

107-P01 MAINTAINING TRAFFIC –DROP-OFFS: If, at the end of the work-day, drop-offs greater than 2 inches and less than 18 inches or slopes steeper than 4:1 exist between the edge of a traffic lane and the outside edge of the proposed roadway, perform one of the following actions:

- Construct a traversable wedge in the area of the drop-off or steep slope; or
- Close the lane adjacent to the drop-off or steep slope and provide 24-hour flagging or pilot car operations.

When constructing a wedge, construct a wedge composed of aggregate or earthen materials with a 4:1 or flatter slope along the entire length of the area. Compact materials using Type C compaction, as specified in 203.04 E.4, “Compaction Control Type C”.

Install stackable vertical panels that meet the requirements of Section 704.03 H, “Stackable Vertical Panels”, along the edge of the driving lane closest to the wedge.

The Engineer will measure stackable vertical panels as specified in Section 704.05, “Method of Measurement” and will pay for panels as specified in Section 704.06, “Basis of Payment”.

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NOTES

The Engineer will not measure material used to construct the wedge. Include the cost of materials, equipment, labor, and incidentals required for this operation in the price bid for “Traffic Service Aggregate”.

If a 4:1 or flatter wedge is not installed, provide 24 hour flagging or pilot car operations and associated traffic control at no additional cost to the Department.

The requirements of Section 704.04 O, “Traffic Control for Uneven Pavement” apply to drop-offs created by milling or the placement of hot mix asphalt.

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

108-500 TERO COORDINATION: Invite the Tribal TERO Office to the Preconstruction Conference.

203-010 SHRINKAGE: 20 percent additional volume is included for shrinkage in earth embankment.

203-380 AVERAGE HAUL: The average haul shown on the plans does not include the dead haul from the borrow areas to the point of entry into the mass.

302-P02 TRAFFIC SERVICE AGGREGATE: Use material meeting the requirements for salvaged base course for surfacing during Temporary Traffic Control Operations.

9,700 Tons of Traffic Service Aggregate provided to maintain traffic as required during Phases 1, 2, and 3. Make every effort to reuse this material throughout the life of the project. After returning traffic to normal flow, remove Traffic Service Aggregate and place topsoil where shown in plans.

Include all costs for time and labor associated with stockpiling, placing and reusing the material in the unit bid price for “Traffic Service Aggregate”.

306-P01 FULL DEPTH RECLAMATION: Existing pavement section varies with maintenance activities occurring over the life of the pavement. Full depth reclamation is intended to:

1) Reclaim entire HBP section, blended base to include all existing HBP.
2) Blended base to include a minimum of 50% aggregate.
3) Leave a minimum of 1” of existing aggregate in place, do not contaminate blended base with subgrade material.

To achieve items (1) & (3) some areas of the full depth reclamation will require a maximum and/or minimum amount of aggregate added before blending operation occur. The additional aggregate needed to achieve blue top grade shall be added in lifts and conventional methods. To achieve item (2) some areas of pavement may require milling. See Section 11 for tables of approximate aggregate and milling depths to accommodate full depth reclamation operation.

401-P01 FOG SEAL: Apply fog seal after the final roller and with a minimum surface temperature of 125 degrees Fahrenheit. CSS-1h emulsified asphalt is required.

430-100 HMA LONGITUDINAL JOINTS: Construct the joints within the final lift of pavement as detailed within this note.

Place a longitudinal joint at the centerline of the roadway.

Construct each lane and the adjoining shoulder using a single pass or a hot seam.

A hot seam is defined as follows:

- Constructed using two pavers simultaneously;
- No more than 300 feet between pavers; and
- Roll the seam between paver passes in a manner such that the seam is not visible.

626-P01 COFFERDAM: Cofferdams will be required to install mainline 72” pipe conduit at Sta. 7913+17 and Sta. 8002+49. Both ends of the pipe will require cofferdams. A site is defined as one end of a pipe and cofferdams will be paid per site. Include all costs associated with installing and removing the cofferdams and dewatering the work area in the price bid for “Cofferdam”.

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

704-255 TRAFFIC CONTROL FOR SHOULDER DROP-OFF: If the shoulder and adjacent driving lane are not even at the end of the day, the following criteria will apply:

Place the following sign assembly at the locations listed below.

Sign Assembly: Sign No. W8-9a-48 "Shoulder Drop Off" and supplemental plate Sign No. W20-52-54 to identify the distance.

Locations:

- In advance of the drop off;
- Spaced at each mile from the advance sign; and
- At major intersections (CMC routes, state and US highways, and Interstate Ramps).

NOTES

If the difference in elevation between the shoulder and the driving lane is 2" or greater, construct a slough on the driving lane that is 4:1 or flatter.

If the difference in elevation between the shoulder and driving lane is less than 2", no slough is required.

Sign assemblies will be measured and paid for according to Section 704 "Temporary Traffic Control".

704-P01 TRAFFIC CONTROL DEVICES: Provide traffic control consisting of a temporary road closure, flagging, and a pilot car. The traffic control devices list has been developed using the layouts shown in the plans and the following layouts shown on the Standard Drawings.

D-704-15 Layout Type A to be used any time conditions exist. (Quantities are based on two one lane closures happening simultaneously.)

D-704-19 Layout Type F for Lane Closure on Two Lane Road Using Flaggers to be used during daylight hours of operation.

D-704-20 Layout Type G as the basis of the Construction Signing Sheet.

D-704-21 Layout Type J for Road Closure with a Diversion Sign Layout to maintain traffic in both directions.

D-704-22, Layout Type K and Type L for Construction Truck Hauling Material.

D-704-26 Layouts Type BB, CC, EE, FF, GG, and KK as needed.

D-704-30 Layout Windrow Marking.

D-704-37 Construction Sign Layout

Make the embankment through the area in which traffic will be maintained on at all times traversable with 4:1 slopes or flatter the same day it is placed/removed, or the Contractor needs to provide 24 hour flagging at the Contractor's expense.

When installing layout G from Standard D-704-20, move sign W3-5-48 and the sign assembly containing signs R2-1-48 and R2-1aP-24 with the work area as it progresses through the construction zone. Place the R2-1-48 assembly a minimum of 500 feet in advance of flagging signs.

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.

704-P02 TRAFFIC CONTROL PHASING: The project includes 4 Phases.

Phase 1

Phase 1 construction is to occur between Stations 7860+12 to 7898+30 and 8064+30 to 8100+30.

Station 7860+12 – 7898+30: Mill roadway surface, construct proposed sliver grading, construct aggregate base, erosion control and topsoil placement, as shown in the plans.

Station 8064+30 – 8100+30: Construct proposed grading, install roadway pipes, construct aggregate base, erosion control and topsoil placement, as shown in the plans. Maintain 2 lanes of traffic on existing US 281 alignment while constructing proposed roadway embankment.

Phase 2

Phase 2 construction is to occur between Stations 7898+30 to 8064+30

Station 7898+30 – 8064+30: Mill roadway surface, construct proposed grading, install roadway pipes, perform full depth reclamation, construct aggregate base, erosion control and topsoil placement, as shown in the plans.

Phase 3

Phase 3 construction is to occur between Stations 8100+30 to 8172+50

Station 8100+30 – 8172+50: Mill roadway surface, construct proposed grading, install roadway pipes, perform full depth reclamation, construct aggregate base, erosion control and topsoil placement, as shown in the plans.

Phase 4

Phase 4 construction is to occur between Stations 7860+12 to 8172+50

Station 7860+12 – 8172+50: Pave roadway surfacing, install permanent traffic control, erosion control.

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NOTES

706-P01 FIELD OFFICE: Provide a field office which meets the following requirements:

1. Minimum total area of 440 square feet
2. Indoor bathroom facilities and supplies with weekly cleaning services
3. Hookups for heat, electricity, sewer, and potable water.
4. Minimum cabinet space of 32 cubic feet
5. Minimum counter space of 40 square feet
6. Air conditioner with a minimum of 20,000 BTUs
7. Lighting with a minimum of 110 foot-candles
8. DSL broadband internet and a router that broadcasts Wi-Fi and will allow for hard wiring of a computer.
9. Photocopy/Printer with scanning capabilities capable of 11x17 photocopies and toner to last the duration of the project. Other features to include digital copying and scanning. Copier/printer machine with operating software compatible with that used by the NDDOT.

   Supply a photocopier with enough toner to last the length of the project and with the following capabilities:
   a. Printing;
   b. Scanning; and
   c. Producing 11 x 17 photocopies and prints.

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

Make the field office available for occupancy one week before the start of the project. The Engineer will approve the location and the condition of the office. Do not remove the field office until the Engineer releases the field office.

The Engineer is responsible for the following items:
- Furnishing office equipment; and
- Supplying paper.

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

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

770-P01 DESTINATION LIGHT LUMINAIRE: Provide the following destination light luminaire: American Electric Autobahn ATBS LED Luminaire with drop refractor. Catalog Number: ATBS H MVOLT D3 3K. Provide photo control at the feed point. Include all cost associated with the destination light LED luminaire in the bid price for “Destination Lighting”.

770-P02 ALUMINUM FEED POINT CABINET: Provide an aluminum feed point cabinet for the destination lighting at Sta. 7866+51.

990-P01 PIPE CLEANOUT: Remove silt from each mainline pipe and beyond the end of the pipe. The cost of removing the silt is included in the price bid for “Pipe Cleanout”. Assume all extended pipes require silt cleanout.

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ENVIRONMENTAL NOTES

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

EN-1 THREATENED OR ENDANGERED SPECIES: The contractor will notify the Project engineer immediately in the event any threatened or endangered species is identified within one mile of the proposed action. The Project engineer will cease all construction activities, establish at least a 0.5 mile avoidance area, and immediately coordinate with the USFWS, FHWA, and NDDOT Environmental and Transportation Services. The contractor will not resume work within the avoidance area until the Project engineer has confirmed with the agencies that work may proceed (either species have left the area or approved minimization measures have been implemented).

For above ground utility conflicts, contact the NDDOT Utility Engineer to coordinate with the utility company. Line markers (bird diverters) will be placed along the segment(s) of overhead utilities to be raised, lowered, and/or moved within 1 mile of whooping crane stopover habitat to reduce the risk of flight collisions.

EN-2 TEMPORARY WETLAND IMPACT: Temporary impact areas within wetlands and or other waters are incorporated into the plans for this project. Remove temporary fill placed and sedimentation in wetlands or other waters. Restore these wetlands to preconstruction contours.

EN-3 WETLAND MITIGATION: Wetland mitigation is required for unavoidable permanent wetland impacts. The wetland mitigation plan is incorporated into the plans for this project. After completion of the mitigation area, the Engineer will complete the Onsite Mitigation Certification Form SFN 61042. Any sedimentation occurring within the mitigation area will be removed.

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ESTIMATE OF QUANTITIES

Spec - Code	Item Description	Units	Qty
103 - 0100	CONTRACT BOND	LSUM	1
201 - 0330	CLEARING & GRUBBING	LSUM	1
202 - 0021	REMOVE AGGREGATE BASE & SURFACING	TON	11,658
202 - 0169	REMOVAL OF END SECTION - ALL TYPES & SIZES	EA	26
202 - 0174	REMOVAL OF PIPE ALL TYPES AND SIZES	LF	1,410
202 - 0350	REMOVAL OF TEMPORARY BYPASS	EA	2
203 - 0101	COMMON EXCAVATION-TYPE A	CY	103,798
203 - 0109	TOPSOIL	CY	62,552
203 - 0122	TOPSOIL - DEPT OPTION BORROW SITE	CY	17,020
203 - 0140	BORROW EXCAVATION	CY	154,897
216 - 0100	WATER	M GAL	4,016
251 - 0200	SEEDING CLASS II	ACRE	92.0
251 - 1000	WETLAND SEED	ACRE	2.8
251 - 2000	TEMPORARY COVER CROP	ACRE	92.0
253 - 0101	STRAW MULCH	ACRE	184.0
255 - 0103	ECB TYPE 3	SY	11,590
256 - 0201	RIPRAP GRADE II	TON	15,388
260 - 0100	SILT FENCE UNSUPPORTED	LF	5,071
260 - 0101	REMOVE SILT FENCE UNSUPPORTED	LF	5,071
261 - 0112	FIBER ROLLS 12IN	LF	19,574
261 - 0113	REMOVE FIBER ROLLS 12IN	LF	9,787
261 - 0120	FIBER ROLLS 20IN	LF	44,078
261 - 0121	REMOVE FIBER ROLLS 20IN	LF	22,039
262 - 0100	FLOTATION SILT CURTAIN	LF	933
262 - 0101	REMOVE FLOTATION SILT CURTAIN	LF	933
265 - 0100	STABILIZED CONSTRUCTION ACCESS	EA	1
265 - 0101	REMOVE STABILIZED CONSTRUCTION ACCESS	EA	1
302 - 0050	TRAFFIC SERVICE AGGREGATE	TON	9,700
302 - 0120	AGGREGATE BASE COURSE CL 5	TON	51,467
306 - 0510	FULL DEPTH RECLAMATION	SY	93,793
401 - 0050	TACK COAT	GAL	20,154
401 - 0060	PRIME COAT	GAL	37,091
401 - 0070	FOG SEAL	GAL	6,856
401 - 0160	BLOTTER MATERIAL CL 44	TON	1,112
411 - 0105	MILLING PAVEMENT SURFACE	SY	60,834
430 - 0044	SUPERPAVE FAA 44	TON	37,193
430 - 1000	CORED SAMPLE	EA	190
430 - 5803	PG 58S-28 ASPHALT CEMENT	TON	1,278
430 - 5806	PG 58H-28 ASPHALT CEMENT	TON	155
430 - 5818	PG 58H-34 ASPHALT CEMENT	TON	800
626 - 0100	COFFERDAM	EA	4
702 - 0100	MOBILIZATION	LSUM	1
704 - 0100	FLAGGING	MHR	5,000

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ESTIMATE OF QUANTITIES

Spec - Code	Item Description	Units	Qty
704 - 1000	TRAFFIC CONTROL SIGNS	UNIT	6,653
704 - 1052	TYPE III BARRICADE	EA	6
704 - 1060	DELINEATOR DRUMS	EA	392
704 - 1067	TUBULAR MARKERS	EA	200
704 - 1080	STACKABLE VERTICAL PANELS	EA	200
704 - 1081	VERTICAL PANELS - BACK TO BACK	EA	91
704 - 1185	PILOT CAR	HR	2,500
706 - 0400	FIELD OFFICE	EA	1
706 - 0500	AGGREGATE LABORATORY	EA	1
706 - 0550	BITUMINOUS LABORATORY	EA	1
706 - 0600	CONTRACTOR'S LABORATORY	EA	1
709 - 0100	GEOSYNTHETIC MATERIAL TYPE G	SY	4,884
709 - 0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	13,577
714 - 0615	PIPE CONC REINF 24IN CL III	LF	340
714 - 0905	PIPE CONC REINF 36IN CL III	LF	20
714 - 3020	END SECT-CONC REINF 24IN	EA	24
714 - 3035	END SECT-CONC REINF 36IN	EA	2
714 - 4099	PIPE CONDUIT 18IN-APPROACH	LF	180
714 - 4106	PIPE CONDUIT 24IN - APPROACH	LF	740
714 - 4110	PIPE CONDUIT 30IN	LF	368
714 - 4113	PIPE CONDUIT 30IN - APPROACH	LF	204
714 - 4145	PIPE CONDUIT 72IN	LF	174
720 - 0110	RIGHT OF WAY MARKERS	EA	76
720 - 0125	ALIGNMENT MONUMENTS	EA	24
720 - 0130	IRON PIN R/W MONUMENTS	EA	46
720 - 0135	IRON PIN REFERENCE MONUMENTS	EA	30
754 - 0110	FLAT SHEET FOR SIGNS - TYPE XI REFL SHEETING	SF	262
754 - 0168	DELINEATORS - TYPE D	EA	30
754 - 0206	STEEL GALV POSTS - TELESCOPING PERFORATED TUBE	LF	753
754 - 0563	REFERENCE MARKER - TYPE C	EA	7
754 - 0592	RESET SIGN PANEL	EA	8
754 - 0805	OBJECT MARKERS - CULVERTS	EA	72
760 - 0005	RUMBLE STRIPS - ASPHALT SHOULDER	MILE	11.8
760 - 0007	RUMBLE STRIPS - ASPHALT CENTERLINE	MILE	5.9
760 - 0010	RUMBLE STRIPS - INTERSECTION	SET	1
762 - 0103	PVMT MK PAINTED - MESSAGE	SF	192
762 - 0430	SHORT TERM 4IN LINE - TYPE NR	LF	281,142
762 - 1104	PVMT MK PAINTED 4IN LINE	LF	88,019
762 - 1108	PVMT MK PAINTED 8IN LINE	LF	3,710
762 - 1124	PVMT MK PAINTED 24IN LINE	LF	41
766 - 0100	MAILBOX-ALL TYPES	EA	5
770 - 0007	DESTINATION LIGHTING	EA	1
990 - 0400	PIPE CLEANOUT	EA	13

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BASIS OF ESTIMATE

		US HIGHWAY 281																	
		7898+30.00 to 8064+30.00 8100+29.95 to 8168+00.00 Length (Sta.) 233.70			8168+00.00 to 8168+75.00 Length (Sta.) 0.75			8064+30.00 to 8072+22.34 8092+65.95 to 8100+29.95 Length (Sta.) 15.56			8076+12.34 to 8085+00.00 Length (Sta.) 8.88			8085+00.00 to 8085+79.41 Length (Sta.) 0.79			8089+69.41 to 8090+85.95 Length (Sta.) 1.17		
		2 Lane Full Depth Reclamation			2 Lane - Varied Shoulder Full Depth Reclamation			2 Lane Reconstruction			2 Lane w/ Left Turn Lane Reconstruction			2 Lane w/ Right Turn Lane & 12' Median Reconstruction			2 Lane w/ Right Turn Lane Reconstruction		
Material	Unit	Width (ft)	Area (sf)	Quantity	Width (ft)	Area (sf)	Quantity	Width (ft)	Area (sf)	Quantity	Width (ft)	Area (sf)	Quantity	Width (ft)	Area (sf)	Quantity	Width (ft)	Area (sf)	Quantity
Aggregate Base Course CL 5 @ 1.875 Ton/CY	Ton		11.38	18468.83		13.26	69.04		55.99	6051.35		70.98	4375.42		83.47	460.30		68.47	554.13
Full Depth Reclamation	SY	36.00		93480.20	37.50		312.50			–			–			–			–
Prime Coat @ 0.25 Gal/SY	Gal	39.64		25733.02	41.14		85.71	39.58		1711.11	51.59		1272.07	61.61		135.90	49.59		160.53
Blotter Material Cl 44 @ 15 lbs/SY	Ton	39.64		771.99	41.14		2.57	39.58		51.33	51.59		38.16	61.61		4.08	49.59		4.82
Tack Coat @ 0.05 Gal/SY (1st Lift)	Gal	39.64		5146.60	41.14		17.14	39.58		342.22	51.59		254.41	61.61		27.18	49.59		32.11
Tack Coat @ 0.05 Gal/SY (2nd Lift)	Gal	38.56		5006.38	40.06		16.69	38.53		333.14	50.54		249.24	60.55		26.71	48.53		31.42
Tack Coat @ 0.05 Gal/SY (Wearing Course)	Gal	37.46		4863.57	38.96		16.23	37.47		323.98	49.48		244.01	59.50		26.25	47.48		30.74
HBP Superpave FAA 44 @ 2 Ton/CY (1st & 2nd Lifts)	Ton		9.64	16687.95		10.08	56.00		9.58	1104.42		12.58	827.17		15.11	88.88		12.11	104.54
HBP Superpave FAA 44 @ 2 Ton/CY (Wearing Course)	Ton		6.12	10594.42		6.37	35.39		6.12	705.54		8.12	533.91		9.78	57.53		7.78	67.16
PG 58S-28 Asphalt Cement @ 6.0% (1st & 2nd Lifts)	Ton			1001.28			3.36			66.27			49.63			5.33			6.27
PG 58H-34 Asphalt Cement @ 6.0% (Wearing Course)	Ton			635.67			2.12			42.33			32.03			3.45			4.03
PG 58H-28 Asphalt Cement @ 6.0% (Overlay)	Ton																		
CSS-1h Emulsified Asphalt - Fog Seal @ 0.05 Gal/SY	Gal	36.00		4674.01	37.50		15.63	36.00		311.27	48.00		236.71	58.00		25.59	46.00		29.78

		US HIGHWAY 281																	
		8072+22.34 to 8076+12.34 Length (Sta.) 3.90			8085+79.41 to 8089+69.41 Length (Sta.) 3.90			8090+85.95 to 8092+65.95 Length (Sta.) 1.80			7876+75.00 to 7885+21.68 Length (Sta.) 8.47			7860+12.00 to 7876+75.00 7885+21.68 to 7895+05.00					
		Transition - 2 Lane to 2 Lane w/ Left Turn Lane Reconstruction			Transition - 2 Lane w/ Right Turn Lane & 12' Median to 2 Lane w/ Right Turn Lane Reconstruction			Transition - 2 Lane w/ Right Turn Lane to 2 Lane Reconstruction			Overlay w/ Sliver Widening			Mill & Overlay (Includes ND HWY 57) (Transitions Quantified Section 20 Sheet 3)					
Material	Unit	Width (ft)	Area (sf)	Quantity	Width (ft)	Area (sf)	Quantity	Width (ft)	Area (sf)	Quantity	Width (ft)	Area (sf)	Quantity	Depth (in)	Area (sf)	Quantity			
Aggregate Base Course CL 5 @ 1.875 Ton/CY	Ton		63.49	1719.52		75.97	2057.52		62.23	777.88		21.04	1237.09			–			
Full Depth Reclamation	SY			–			–			–			–			–			
Prime Coat @ 0.25 Gal/SY	Gal	45.59		493.89	55.60		602.33	44.59		222.95	55.64		1308.59	2.00	165121.00	4586.69			
Blotter Material Cl 44 @ 15 lbs/SY	Ton	45.59		14.82	55.60		18.07	44.59		6.69	55.64		39.26	2.00	165121.00	137.60			
Tack Coat @ 0.05 Gal/SY (1st Lift)	Gal	45.59		98.78	55.60		120.47	44.59		44.59	11.56		54.38			–			
Tack Coat @ 0.05 Gal/SY (2nd Lift)	Gal	44.54		96.50	54.54		118.17	43.53		43.53			–			–			
Tack Coat @ 0.05 Gal/SY (Wearing Course)	Gal	43.48		94.21	53.49		115.90	42.48		42.48	53.50		251.65	2.00	165121.00	917.34			
HBP Superpave FAA 44 @ 2 Ton/CY (1st & 2nd Lifts)	Ton		11.08	320.09		13.61	393.18		10.85	144.67		2.64	165.57			–			
HBP Superpave FAA 44 @ 2 Ton/CY (Wearing Course)	Ton		7.12	205.69		8.78	253.64		6.95	92.67		8.79	551.28	2.00	165121.00	2038.53			
PG 58S-28 Asphalt Cement @ 6.0% (1st & 2nd Lifts)	Ton			19.21			23.59			8.68			9.93						
PG 58H-34 Asphalt Cement @ 6.0% (Wearing Course)	Ton			12.34			15.22			5.56									
PG 58H-28 Asphalt Cement @ 6.0% (Overlay)	Ton												33.08			122.31			
CSS-1h Emulsified Asphalt - Fog Seal @ 0.05 Gal/SY	Gal	42.00		91.00	52.00		112.67	41.00		41.00	52.00		244.60		165121.00	917.34			

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US Highway 281

Basis of Estimate

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	10	2

		Benson County Route 29								
		102+25.00 to 109+00.00			109+00.00 to 111+00.00			111+00.00 to 111+26.96		
		Length (Sta.) 6.75			Length (Sta.) 2.00			Length (Sta.) 0.27		
		2 Lane 24' Gravel Roadway			Transition - 2 Lane 24' Gravel Roadway to 2 Lane 32' Gravel Roadway			2 Lane 32' Gravel Roadway		
Material	Unit	Width (ft)	Area (sf)	Quantity	Width (ft)	Area (sf)	Quantity	Width (ft)	Area (sf)	Quantity
Aggregate Base Course CL 5 @ 1.875 Ton/CY	Ton		13.09	613.59		30.18	419.17		17.09	32.00
Full Depth Reclamation	SY	SEE SECTION 20 SHEET 5 FOR QUANTITIES OF PAVED FLARED INTERSECTION								
Prime Coat @ 0.25 Gal/SY	Gal									
Blotter Material Cl 44 @ 15 lbs/SY	Ton									
Tack Coat @ 0.05 Gal/SY (1st Lift)	Gal									
Tack Coat @ 0.05 Gal/SY (2nd Lift)	Gal									
Tack Coat @ 0.05 Gal/SY (Wearing Course)	Gal									
HBP Superpave FAA 44 @ 2 Ton/CY (1st Lift)	Ton									
HBP Superpave FAA 44 @ 2 Ton/CY (Wearing Course)	Ton									
PG 58S-28 Asphalt Cement @ 6.0% (1st & 2nd Lifts)	Ton									
PG 58H-34 Asphalt Cement @ 6.0% (Wearing Course)	Ton									
PG 58H-28 Asphalt Cement @ 6.0% (Overlay)	Ton									
CSS-1h Emulsified Asphalt - Fog Seal @ 0.05 Gal/SY	Gal									

430-1000 HBP Cored Samples							
	A	B	C	D			
Specification Section	Distance (Ft) / 2000	Lanes	Lifts	Sublots (A x B x C)	Quantity (D x 2)	Quantity (1 per mile)	Unit
430.04 I.2.b(1), "General"							
US 281 Mainline (Sta 7898+30 - 8072+22) (Sta 8092+66 - 8172+50)	13	2	3	78	156	-	EA
US 281 Mainline @ CR 29 (Sta 8072+22 - 8092+66)	1	3	3	9	18	-	EA
US 281 Mainline @ ND 57 (Sta 7863+20 - 7885+22)	1	3	1	3	6	-	EA
US 281 Mainline & ND 57 Overlay (Sta 7860+12 - 7863+20) (Sta 7885+22 - 7898+30)	1	2	1	2	4	-	EA
430.04 I.2.b(2), "Pavement Thickness Determination Cores"					-	6	EA
				Total	184	6	EA

Water
25 Mgal / Mile for Dust Palliative
20 Gal / Ton for Aggregate Base
10 Gal / CY for Embankment
20 Gal / Ton for Traffic Service Aggregate

Removals
Milling Pavement Surface @ 1.875 TON/CY
Asphalt Surfacing @ 1.875 TON/CY
Aggregate Surfacing @ 1.875 TON/CY
Aggregate Base Course @ 1.875 TON/CY

Materials
Traffic Service Aggregate @ 1.875 TON/CY
Riprap @ 1.700 TON/CY

Mailboxes

Station	Type	Work
7894+45.38 RT	Single	Replace
7940+81.14 RT	Single	Replace
8023+23.58 RT	Single	Replace
8034+32.56 LT	Single	Replace
8058+27.04 LT	Single	Replace

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US Highway 281

Basis of Estimate

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	1

SURFACING QUANTITY SUMMARY

LOCATION	Aggregate Base Course CL 5	Full Depth Reclamation	Prime Coat	Tack Coat	Blotter Material CI 44	Fog Seal	Superpave FAA 44	PG 58S-28 Asphalt Cement	PG 58H-34 Asphalt Cement	PG 58H-28 Asphalt Cement	Traffic Service Aggregate
	302 - 0120	306 - 0510	401 - 0060	401 - 0050	401 - 0160	401 - 0070	430 - 0044	430 - 5803	430 - 5818	430 - 5806	302 - 0050
	(TON)	(SY)	(GAL)	(GAL)	(TON)	(GAL)	(TON)	(TON)	(TON)	(TON)	(TON)
US Highway 281	35,771	93,793	36,313	18,986	1,089	6,700	35,028	1,194	753	155	–
Full Depth Reclamation	10,239	–	–	–	–	–	--	–	–	--	–
Milling Transistions	–	–	778	467	23	156	867	31	21	--	–
Approaches	3,886	–	–	593	–	–	1,098	45	22	--	–
Benson County Route 29	1,571	–	–	108	–	–	200	8	4	--	–
Temporary Traffic Control	–	–	–	–	–	–	--	–	–	--	9,700
Project Total =	51,467	93,793	37,091	20,154	1,112	6,856	37,193	1,278	800	155	9,700

SUMMARY

LOCATION	REMOVE AGGREGATE BASE & SURFACING	HBP MILLINGS
	202 - 0021	
	(TON)	(TON)
Old US Highway 281	9,746	–
Benson County Route 29	1,912	–
US Highway 281	–	3,275
Project Total =	11,658	3,275

EARTHWORK SUMMARY

LOCATION	Common Excavation-Type A	*Embankment	Borrow Exavation	Topsoil Stripping	Topsoil Proposed
	203 - 0101	–	203 - 0140	203 - 0109	–
	(CY)	(CY)	(CY)	(CY)	(CY)
US Highway 281	45707	245567	199860	53506	51568
Benson County Route 29	106	13031	12925	1317	1374
**Mitigation Site #1	30764	7	–	2949	3805
**Mitigation Site #2	3806	90	–	980	1025
**Excavation Site #1	18667	–	–	3174	3174
**Excavation Site #2	2242	–	–	391	546
**Excavation Site #3	2506	–	–	235	530
**Temporary Bypasses	–	4680	–	–	–
Project Total =	103798	263375	154897	62552	62022

*Volumes shown have been adjusted to account for 20% shrinkage.
**Material to be used during final construction of proposed roadway.
See Section 70 Sheet 1 for Department Option Borrow Site #1.
See Section 70 Sheet 2 for Excavation Site Layouts. Sites located at curve reconstruction area.

CORE DATA

Reference Point	HMA Core Depth (inch)
148.875	5.500
149.000	5.750
149.250	4.250
149.375	5.000
149.500	4.750
149.625	8.500
149.750	6.500
149.875	6.250
150.000	6.250
150.250	7.000
150.375	7.250
150.500	7.000
150.625	8.000
150.750	7.750
150.875	7.500
151.000	8.500
151.250	8.000
151.375	6.750
151.500	8.500
151.625	7.750
151.750	8.500

Reference Point	HMA Core Depth (inch)
151.875	6.750
152.000	7.750
152.250	8.000
152.375	9.000
152.500	7.500
152.625	8.000
152.750	8.750
152.875	8.000
153.000	7.500
153.250	9.000
153.375	6.250
153.500	8.250
153.625	7.500
153.750	7.500
153.875	7.250
154.000	7.750
154.250	7.500
154.375	7.750
154.500	7.250
154.625	6.750
154.750	5.750

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US Highway 281

Earthwork Summary
Core Data

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	2

	End Area		Volume		Added Volumes		
	Excavation	Embankment	Excavation	Embankment	Excavation	Embankment	
Station	(SF)	(SF)	(CY)	(CY)	(CY)	(CY)	Mass Ordinate
7876+61	--	--	–	–	--	--	–
7876+75	58.204	94.223	14.723	28.602	--	--	-13.879
7877+00	53.761	94.351	51.836	104.763	--	--	-66.806
7877+50	15.858	80.892	64.462	194.714	--	--	-197.058
7878+00	12.102	75.099	25.889	173.323	--	--	-344.492
7878+50	11.768	74.215	22.102	165.904	--	--	-488.294
7879+00	11.411	61.453	21.462	150.742	--	--	-617.574
7879+50	10.241	39.304	20.048	111.952	--	--	-709.478
7880+00	12.869	37.139	21.398	84.937	--	--	-773.017
7880+50	8.382	46.846	19.677	93.317	--	--	-846.657
7881+00	9.852	66.313	16.883	125.732	--	--	-955.506
7881+50	7.48	67.779	16.048	148.991	--	--	-1088.449
7882+00	10.016	63.754	16.2	146.148	--	--	-1218.397
7882+50	21.543	41.789	29.221	117.27	--	--	-1306.446
7883+00	22.928	33.615	41.177	83.782	--	--	-1349.051
7883+50	76.75	29.19	92.294	69.783	--	--	-1326.540
7884+00	74.791	39.27	140.316	76.067	--	--	-1262.291
7884+50	73.754	39.965	137.542	88.039	--	--	-1212.788
7885+00	90.041	36.621	151.662	85.096	--	--	-1146.222
7885+21	96.17	33.199	72.415	32.583	--	--	-1106.390
7899+00	56.023	82.053	–	–	--	--	-1106.390
7900+00	150.619	142.112	382.67	498.144	--	--	-1221.864
7900+85	143.527	157.841	463.008	566.578	--	--	-1325.434
7901+00	80.045	144.68	62.103	100.84	--	--	-1364.171
7901+14	73.3	312.475	39.756	142.226	--	--	-1466.641
7901+38	110.755	152.464	81.802	247.967	--	--	-1632.806
7901+51	118.764	176.434	55.255	95.015	--	--	-1672.566
7902+00	41.741	172.883	145.643	380.367	--	--	-1907.290
7903+00	31.618	169.981	135.85	761.92	--	--	-2533.360
7904+00	19.449	202.965	94.569	828.769	--	--	-3267.560
7905+00	2.008	199.36	39.735	894.056	--	--	-4121.881
7905+25	0.037	157.929	0.947	198.494	--	--	-4319.428
7905+48	0.103	386.046	0.06	278.032	--	--	-4597.400
7905+82	0.35	159.043	0.285	411.845	--	--	-5008.960
7906+00	1.311	188.906	0.554	139.18	--	--	-5147.586
7907+00	2.91	180.385	7.817	820.647	--	--	-5960.416
7907+84	0.034	199.13	4.58	708.428	--	--	-6664.264
7908+00	--	238.873	0.01	155.734	--	--	-6819.988
7908+11	0.02	215.773	0.004	111.136	--	--	-6931.120
7908+51	0.189	172.978	0.155	345.556	--	--	-7276.521
7909+00	0.028	249.455	0.197	459.983	--	--	-7736.307
7910+00	0.856	226.84	1.637	1058.433	--	--	-8793.103
7911+00	0.021	207.516	1.624	965.236	--	--	-9756.715
7912+00	--	206.245	0.039	919.469	--	--	-10676.145
7913+00	--	156.901	–	806.991	--	--	-11483.136
7913+17	0.003	153.233	0.001	117.162	--	--	-11600.297
7914+00	0.001	169.777	0.006	595.774	--	--	-12196.065
7915+00	0.038	192.953	0.072	806.067	--	--	-13002.060
7916+00	0.004	196.78	0.078	866.073	--	--	-13868.055
7917+00	0.001	194.724	0.009	870.009	--	--	-14738.055
7918+00	0.003	190.322	0.007	855.658	--	--	-15593.706
7919+00	--	185.539	0.006	835.247	--	--	-16428.947
7920+00	0.016	180.826	0.03	814.144	--	--	-17243.061
7921+00	0.04	179.829	0.104	801.456	--	--	-18044.413
7922+00	0.02	166.424	0.111	769.451	--	--	-18813.753
7923+00	0.058	168.013	0.144	743.193	--	--	-19556.802

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US Highway 281

Earthwork Tables

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	3

	End Area		Volume		Added Volumes		
	Excavation	Embankment	Excavation	Embankment	Excavation	Embankment	
Station	(SF)	(SF)	(CY)	(CY)	(CY)	(CY)	Mass Ordinate
7924+00	--	96.797	0.107	588.467	--	--	-20145.162
7925+00	--	164.939	--	581.636	--	--	-20726.798
7926+00	0.003	156.054	0.006	713.318	--	--	-21440.110
7926+33	6.164	166.658	3.769	236.655	--	--	-21672.996
7926+70	0.193	338.419	4.356	415.286	--	--	-22083.926
7926+95	49.998	153.456	23.237	273.264	--	--	-22333.953
7927+00	33.846	156.912	7.763	34.485	--	--	-22360.675
7927+45	54.68	127.365	73.772	284.277	--	--	-22571.180
7927+90	10.465	240.02	54.288	367.385	--	--	-22884.277
7928+00	12.69	128.515	4.288	81.897	--	--	-22961.886
7928+20	105.02	109.625	43.596	105.84	--	--	-23024.130
7929+00	35.603	185.935	208.33	525.44	--	--	-23341.240
7930+00	52.967	170.322	164.019	791.682	--	--	-23968.903
7931+00	50.377	177.991	191.378	774.029	--	--	-24551.554
7932+00	66.367	168.162	216.193	769.229	--	--	-25104.590
7933+00	55.425	166.823	225.541	744.411	--	--	-25623.460
7934+00	41.848	152.799	180.135	710.271	--	--	-26153.596
7935+00	61.38	143.224	191.163	657.829	--	--	-26620.262
7936+00	28.528	120.85	166.496	586.831	--	--	-27040.597
7937+00	35.564	137.593	118.689	574.318	--	--	-27496.226
7938+00	19.558	121.772	102.078	576.367	--	--	-27970.515
7939+00	20.33	131.145	73.867	562.038	--	--	-28458.686
7939+49	67.91	169.423	79.432	324.68	--	--	-28703.934
7940+00	6.294	150.593	70.617	365.458	--	--	-28998.775
7940+77	12.505	70.206	26.806	377.812	--	--	-29349.781
7941+00	29.501	195.314	17.891	135.71	--	--	-29467.600
7941+03	31.127	190.166	3.368	25.699	--	--	-29489.931
7941+42	53.669	107.789	61.242	258.228	--	--	-29686.917
7942+00	44.399	127.386	105.332	303.114	--	--	-29884.699
7943+00	30.215	133.74	138.174	580.28	--	--	-30326.805
7944+00	24.852	129.696	101.976	585.413	--	--	-30810.242
7945+00	27.617	127.31	97.165	571.124	--	--	-31284.201
7946+00	19.754	139.698	87.724	593.351	--	--	-31789.828
7947+00	14.014	111.082	62.533	557.289	--	--	-32284.584
7948+00	52.375	100.548	122.943	470.289	--	--	-32631.930
7948+17	49.409	125.49	31.798	84.739	--	--	-32684.871
7949+00	30.2	218.54	122.554	635.538	--	--	-33197.855
7950+00	83.509	191.23	210.572	910.6	--	--	-33897.883
7951+00	15.637	172.104	183.604	807.409	--	--	-34521.688
7952+00	12.201	208.585	51.552	845.976	--	--	-35316.112
7952+47	34.082	270.274	40.446	502.163	--	--	-35777.829
7953+00	40.332	274.691	72.774	639.547	--	--	-36344.602
7954+00	19.103	283.756	110.065	1240.993	--	--	-37475.530
7955+00	24.4	190.68	80.561	1054.302	--	--	-38449.271
7956+00	5.204	159.732	54.822	778.693	--	--	-39173.142
7957+00	3.103	164.008	15.383	719.422	--	--	-39877.181
7958+00	3.064	159.745	11.42	719.451	--	--	-40585.212
7958+37	3.096	141.678	4.221	247.837	--	--	-40828.828
7958+70	3.483	498.315	4.021	469.328	--	--	-41294.135
7959+00	3.773	89.211	4.031	391.684	--	--	-41681.788
7960+00	3.217	208.669	12.944	661.956	--	--	-42330.800
7960+84	41.277	273.817	69.617	905.894	--	--	-43167.077
7961+00	19.418	218.44	17.433	169.665	--	--	-43319.309
7962+00	3.18	202.229	41.848	934.82	--	--	-44212.281
7963+00	3.022	170.951	11.485	829.289	--	--	-45030.085
7964+00	3.041	155.875	11.228	726.28	--	--	-45745.137

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US Highway 281

Earthwork Tables

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	4

	End Area		Volume		Added Volumes		
	Excavation	Embankment	Excavation	Embankment	Excavation	Embankment	
Station	(SF)	(SF)	(CY)	(CY)	(CY)	(CY)	Mass Ordinate
7965+00	2.999	199.903	11.185	790.618	--	--	-46524.570
7966+00	62.669	163.422	121.607	807.389	--	--	-47210.352
7967+00	21.974	166.743	156.746	733.7	--	--	-47787.306
7968+00	51.654	175.578	136.348	760.713	--	--	-48411.671
7969+00	87.687	157.182	258.039	739.467	--	--	-48893.099
7970+00	88.816	147.901	326.857	677.962	--	--	-49244.204
7971+00	89.806	138.58	330.781	636.624	--	--	-49550.047
7972+00	65.484	131.804	287.574	600.853	--	--	-49863.326
7973+00	21.216	136.793	160.556	596.882	--	--	-50299.652
7974+00	26.776	158.176	88.874	655.487	--	--	-50866.265
7975+00	37.698	134.995	119.396	651.491	--	--	-51398.360
7976+00	44.449	105.328	152.124	534.051	--	--	-51780.287
7976+15	42.139	134.378	24.036	79.849	--	--	-51836.100
7977+00	43.925	115.856	135.487	472.72	--	--	-52173.333
7978+00	98.318	130.413	263.413	547.264	--	--	-52457.184
7978+17	96.586	136.129	61.359	100.694	--	--	-52496.519
7978+20	84.692	152.527	10.071	19.244	--	--	-52505.692
7978+48	3.433	443.226	45.694	370.691	--	--	-52830.689
7978+79	66.735	102.12	40.282	375.683	--	--	-53166.090
7979+00	40.084	136.546	41.541	111.377	--	--	-53235.926
7980+00	38.654	178.328	145.811	699.72	--	--	-53789.835
7980+54	59.861	134.07	98.515	374.878	--	--	-54066.198
7981+00	21.547	191.111	69.348	332.407	--	--	-54329.257
7981+08	34.954	258.282	8.371	79.892	--	--	-54400.778
7981+11	41.005	243.993	4.22	33.485	154897	--	100467.096
7981+58	77.311	151.71	102.979	413.29	--	--	100156.785
7981+67	93.028	154.094	28.39	61.161	--	--	100124.014
7982+00	84.64	139.188	108.575	215.073	--	--	100017.516
7983+00	24.223	139.518	201.598	619.347	--	--	99599.767
7984+00	7.592	145.357	58.917	633.056	--	--	99025.628
7985+00	14.754	75.539	41.381	490.88	--	--	98576.129
7985+44	16.601	100.581	25.752	173.576	--	--	98428.305
7986+00	8.085	96.019	25.44	243.129	--	--	98210.616
7987+00	0.068	153.416	15.098	554.3	--	--	97671.414
7988+00	6.245	160.96	11.691	698.613	--	--	96984.492
7989+00	23.369	145.948	54.841	682.018	--	--	96357.315
7990+00	22.126	140.722	84.25	637.044	--	--	95804.521
7991+00	33.968	146.217	103.878	637.642	--	--	95270.757
7992+00	21.54	156.156	102.793	671.94	--	--	94701.610
7993+00	3.481	187.844	46.335	764.444	--	--	93983.501
7994+00	2.92	146.207	11.854	742.336	--	--	93253.019
7994+06	3.053	140.777	0.664	38.265	--	--	93215.418
7994+08	3.286	137.497	0.235	12.368	--	--	93203.285
7994+37	3.294	475.481	3.534	395.03	--	--	92811.789
7994+67	3.095	160.13	3.549	423.741	--	--	92391.597
7995+00	3.076	148.965	3.771	226.67	--	--	92168.698
7996+00	3.165	162.274	11.557	691.642	--	--	91488.613
7997+00	2.998	171.851	11.413	742.5	--	--	90757.526
7998+00	4.452	177.427	13.796	776.173	--	--	89995.149
7999+00	9.49	183.318	25.819	801.656	--	--	89219.312
8000+00	3.507	87.958	24.069	602.836	--	--	88640.545
8001+00	3.397	113.103	12.785	446.802	--	--	88206.528
8002+00	4.837	75.087	15.248	418.2	--	--	87803.576
8002+49	4.884	93.171	8.821	183.214	--	--	87629.183
8003+00	4.367	89.746	8.737	207.306	--	--	87430.614
8004+00	4.8	76.512	16.976	369.462	--	--	87078.128

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US Highway 281

Earthwork Tables

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	5

	End Area		Volume		Added Volumes		
	Excavation	Embankment	Excavation	Embankment	Excavation	Embankment	
Station	(SF)	(SF)	(CY)	(CY)	(CY)	(CY)	Mass Ordinate
8005+00	4.27	98.07	16.796	387.96	--	--	86706.964
8006+00	3.626	128.942	14.622	504.471	--	--	86217.115
8007+00	3.017	214.988	12.302	764.289	--	--	85465.128
8008+00	7.583	166.593	19.63	847.958	--	--	84636.800
8009+00	7.656	174.495	28.22	757.973	--	--	83907.047
8010+00	47.011	157.157	101.235	737.004	--	--	83271.278
8011+00	71.423	144.132	219.322	669.531	--	--	82821.069
8012+00	97.81	151.639	313.394	657.269	--	--	82477.194
8013+00	78.017	145.788	325.606	660.949	--	--	82141.851
8014+00	43.514	151.636	225.057	660.942	--	--	81705.966
8015+00	52.38	153.216	177.581	677.449	--	--	81206.098
8016+00	42.354	137.765	175.433	646.624	--	--	80734.907
8017+00	55.951	120.726	182.046	574.424	--	--	80342.529
8018+00	62.581	115.338	219.504	524.587	--	--	80037.446
8019+00	51.312	141.267	210.913	570.233	--	--	79678.126
8020+00	46.218	115.128	180.611	569.767	--	--	79288.970
8020+84	67.246	125.986	177.445	452.491	--	--	79013.924
8021+00	49.79	114.989	33.702	83.27	--	--	78964.356
8022+00	57.11	190.168	197.963	678.127	--	--	78484.192
8023+00	67.394	133.23	230.563	718.662	--	--	77996.093
8023+08	73.716	157.644	20.905	51.711	--	--	77965.287
8023+32	1.536	213.226	33.445	197.797	--	--	77800.935
8023+40	3.179	315.375	0.699	93.974	--	--	77707.660
8023+69	213.384	17.027	116.302	214.215	--	--	77609.747
8023+75	209.972	25.205	47.04	5.631	--	--	77651.156
8024+00	157.531	160.34	170.14	103.081	--	--	77718.215
8025+00	235.464	212.833	727.769	829.273	--	--	77616.711
8026+00	206.74	196.18	818.896	908.918	--	--	77526.689
8027+00	204.266	195.66	761.122	870.756	--	--	77417.055
8028+00	169.941	182.569	692.976	840.509	--	--	77269.522
8029+00	162.779	175.048	616.148	794.704	--	--	77090.966
8030+00	137.25	164.694	555.609	754.982	--	--	76891.593
8031+00	84.795	171.557	411.194	747.224	--	--	76555.563
8032+00	53.695	166.919	256.463	752.169	--	--	76059.857
8033+00	94.714	166.859	274.831	741.729	--	--	75592.959
8033+57	172.844	124.868	282.422	369.521	--	--	75505.860
8033+63	167.209	116.351	37.784	32.163	--	--	75511.481
8033+70	119.238	113.908	37.132	35.818	--	--	75512.795
8034+00	22.757	225.108	78.886	226.011	--	--	75365.670
8034+14	56.495	375.032	20.547	186.71	--	--	75199.507
8034+20	60.052	192.821	12.95	75.714	--	--	75136.743
8034+63	17.728	161.566	61.936	338.636	--	--	74860.043
8034+70	20.098	140.64	4.903	47.01	--	--	74817.936
8035+00	26.88	141.482	26.099	188.081	--	--	74655.954
8036+00	32.058	141.101	109.144	627.962	--	--	74137.136
8037+00	20.537	137.237	97.398	618.529	--	--	73616.005
8038+00	120.164	126.919	260.557	587.013	--	--	73289.549
8039+00	122.367	133.392	449.131	578.469	--	--	73160.211
8040+00	112.079	137.709	434.159	602.447	--	--	72991.923
8041+00	54.533	143.36	308.541	624.598	--	--	72675.866
8042+00	81.389	143.889	251.707	638.331	--	--	72289.242
8043+00	65.857	158.43	272.678	671.82	--	--	71890.100
8044+00	31.657	166.9	180.581	722.956	--	--	71347.725
8045+00	36.736	129.477	126.654	658.616	--	--	70815.763
8045+36	33.078	94.229	46.879	180.257	--	--	70682.385
8046+00	66.847	107.691	117.949	286.008	--	--	70514.326

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US Highway 281

Earthwork Tables

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	6

	End Area		Volume		Added Volumes		
	Excavation	Embankment	Excavation	Embankment	Excavation	Embankment	
Station	(SF)	(SF)	(CY)	(CY)	(CY)	(CY)	Mass Ordinate
8047+00	57.948	149.604	231.102	571.767	--	--	70173.661
8048+00	12.297	160.18	130.083	688.409	--	--	69615.335
8049+00	42.107	136.554	100.748	659.409	--	--	69056.674
8050+00	52.746	129.624	175.654	591.507	--	--	68640.821
8051+00	98.105	132.641	279.354	582.811	--	--	68337.364
8052+00	173.268	123.962	502.543	570.229	--	--	68269.678
8053+00	144.682	99.062	588.796	495.609	--	--	68362.865
8053+46	81.818	86.551	193.07	189.861	--	--	68366.074
8054+00	28.857	111.132	110.614	237.088	--	--	68239.600
8054+66	35.171	151.002	78.256	384.463	--	--	67933.393
8055+00	11.921	293.687	29.651	335.987	--	--	67627.057
8055+33	11.781	171.902	14.485	341.432	--	--	67300.110
8056+00	18.129	177.41	37.111	520.087	--	--	66817.134
8057+00	19.209	167.478	69.144	766.418	--	--	66119.860
8058+00	19.151	150.279	71.037	706.127	--	--	65484.770
8058+04	25.199	144.647	3.285	26.216	--	--	65461.839
8058+40	17.34	183.722	28.359	262.695	--	--	65227.503
8058+75	42.181	149.973	38.578	259.541	--	--	65006.540
8059+00	43.377	141.197	39.61	161.761	--	--	64884.389
8060+00	9.917	145.2	98.693	636.438	--	--	64346.644
8060+16	16.371	139.599	7.789	101.262	--	--	64253.171
8060+53	14.692	273.661	21.284	339.792	--	--	63934.663
8060+87	42.502	77.081	36.011	265.005	--	--	63705.669
8060+88	38.885	70.41	1.643	3.573	--	--	63703.739
8061+00	23.519	63.406	13.764	35.417	--	--	63682.086
8061+35	13.622	118.39	24.073	141.397	--	--	63564.762
8062+00	10.856	150.57	29.464	388.498	--	--	63205.728
8062+41	10.277	156.181	16.045	279.484	--	--	62942.289
8063+00	9.947	155.509	22.097	408.66	--	--	62555.726
8063+48	8.461	179.075	16.363	356.89	--	--	62215.199
8064+00	8.755	184.773	16.578	420.447	--	--	61811.330
8064+30	8.601	199.923	9.642	256.464	--	--	61564.508
8065+00	15.069	241.716	30.683	686.994	--	--	60908.197
8065+24	10.665	254.644	11.437	264.725	--	--	60654.909
8066+00	0.009	295.124	15.023	928.497	--	--	59741.435
8067+00	60.717	360.073	112.456	1455.993	--	--	58397.898
8068+00	105.418	386.283	307.657	1658.569	--	--	57046.986
8069+00	165.379	435.898	501.476	1827.069	--	--	55721.393
8070+00	211.011	461.904	697.019	1995.116	--	--	54423.296
8071+00	107.106	428.84	589.106	1979.431	--	--	53032.971
8072+00	66.233	403.816	320.998	1850.347	--	--	51503.622
8073+00	47.203	387.754	210.067	1759.044	--	--	49954.645
8074+00	18.297	408.185	121.296	1768.753	--	--	48307.188
8075+00	8.507	457.267	49.637	1923.227	32080	7	78506.598
8076+00	7.295	544.908	29.263	2227.056	--	--	76308.805
8076+45	7.085	541.862	11.983	1086.77	--	--	75234.018
8077+00	7.81	521.414	15.171	1299.56	--	--	73949.629
8078+00	65.691	374.266	136.113	1990.4	--	--	72095.342
8079+00	48.464	429.993	211.398	1787.242	--	--	70519.498
8080+00	37.242	434.128	158.715	1920.269	--	--	68757.944
8081+00	16.871	461.376	100.209	1990.009	--	--	66868.144
8082+00	1.17	497.638	33.409	2131.142	--	--	64770.411
8083+00	3.125	497.332	7.954	2211.044	--	--	62567.321
8084+00	13.713	383.462	31.181	1957.32	--	--	60641.182
8085+00	6.047	435.958	36.593	1820.933	21963	13031	67788.842
8086+00	--	784.26	11.198	2711.596	--	--	65088.444

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US Highway 281

Earthwork Tables

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	7

	End Area		Volume		Added Volumes		
	Excavation	Embankment	Excavation	Embankment	Excavation	Embankment	
Station	(SF)	(SF)	(CY)	(CY)	(CY)	(CY)	Mass Ordinate
8087+00	--	908.79	–	3762.333	4048	90	65284.111
8087+22	--	876.431	–	872.775	--	--	64411.336
8088+00	--	975.234	–	3209.553	--	--	61201.783
8089+00	--	735.473	–	3801.571	--	--	57400.212
8090+00	0.964	816.746	1.785	3449.376	--	--	53952.621
8090+50	--	646.965	0.893	1626.346	--	--	52327.168
8091+00	--	690.279	–	1485.827	--	--	50841.341
8091+92	--	551.33	–	2538.401	--	--	48302.940
8092+00	93.215	625.575	13.81	209.228	--	--	48107.522
8092+11	45.325	874.835	28.221	366.767	--	--	47768.976
8092+39	--	2245.582	23.502	1941.593	--	--	45850.885
8092+68	127.21	967.325	68.316	2070.54	--	--	43848.661
8092+82	0.031	838.455	32.988	561.798	--	--	43319.851
8093+00	39.132	826.554	13.054	666.004	--	--	42666.901
8094+00	241.1	769.432	518.948	3546.636	--	--	39639.213
8095+00	204.288	560.011	824.793	2954.318	--	--	37509.688
8096+00	126.241	368.927	612.091	2064.307	--	--	36057.472
8097+00	12.225	277.571	256.419	1436.662	--	--	34877.229
8098+00	8.792	291.298	38.92	1264.153	--	--	33651.996
8099+00	27.68	232.126	67.541	1163.164	--	--	32556.373
8099+36	29.479	213.211	38.106	356.27	--	--	32238.209
8100+00	37.509	193.583	79.393	578.551	--	--	31739.051
8100+30	23.083	179.111	33.662	248.463	--	--	31524.250
8101+00	9.684	193.285	42.476	579.283	--	--	30987.443
8101+12	7.282	194.498	3.77	103.409	--	--	30887.804
8102+00	2.239	190.453	15.516	752.793	--	--	30150.527
8102+19	1.816	191.39	1.427	161.223	--	--	29990.731
8103+00	13.095	167.677	22.367	646.321	--	--	29366.777
8103+25	18.089	152.781	14.437	178.032	--	--	29203.182
8103+52	17.722	154.124	17.906	184.143	--	--	29036.945
8103+86	7.631	337.169	15.963	371.199	--	--	28681.709
8104+00	7.177	156.2	3.839	153.493	--	--	28532.055
8104+16	19.695	128.739	7.962	101.312	--	--	28438.705
8105+00	52.439	151.91	112.208	523.878	--	--	28027.035
8106+00	51.723	154.637	192.893	681.216	--	--	27538.712
8107+00	83.532	164.528	250.472	709.256	--	--	27079.928
8108+00	62.793	171.353	270.972	746.402	--	--	26604.498
8109+00	53.318	157.318	215.02	730.38	--	--	26089.138
8110+00	73.378	125.127	234.622	627.656	--	--	25696.104
8110+26	43.299	155.12	56.178	161.92	--	--	25590.362
8110+62	13.468	104.095	37.845	207.372	--	--	25420.835
8110+84	62.011	73.137	31.03	87.434	--	--	25364.431
8110+96	51.894	67.24	24.89	36.81	--	--	25352.511
8111+00	49.907	68.32	7.541	12.05	--	--	25348.002
8112+00	18.553	111.309	126.778	399.176	--	--	25075.604
8113+00	7.582	145.131	48.398	569.867	--	--	24554.135
8114+00	8.988	129.429	30.685	610.133	--	--	23974.687
8115+00	4.541	155.407	25.054	632.969	--	--	23366.772
8116+00	3.442	157.305	14.783	694.916	--	--	22686.639
8117+00	44.33	164.829	88.467	715.853	--	--	22059.253
8118+00	103.17	150.607	273.148	700.969	--	--	21631.432
8119+00	107.316	146.232	389.789	659.642	--	--	21361.579
8120+00	79.76	165.144	346.437	691.947	--	--	21016.069
8121+00	76.085	168.327	288.602	741.047	--	--	20563.624
8122+00	55.951	159.157	244.511	727.742	--	--	20080.393
8123+00	6.424	188.456	115.509	772.473	--	--	19423.429

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US Highway 281

Earthwork Tables

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	8

	End Area		Volume		Added Volumes		
	Excavation	Embankment	Excavation	Embankment	Excavation	Embankment	
Station	(SF)	(SF)	(CY)	(CY)	(CY)	(CY)	Mass Ordinate
8124+00	3.905	209.531	19.128	884.416	--	--	18558.141
8125+00	16.544	167.546	37.869	837.949	--	--	17758.061
8126+00	22.249	258.38	71.839	946.502	--	--	16883.398
8127+00	29.944	133.375	96.654	870.567	--	--	16109.485
8128+00	19.321	151.545	91.231	633.156	--	--	15567.560
8129+00	63.003	137.1	152.452	641.433	--	--	15078.579
8129+82	137.9	100.533	305.075	433.02	--	--	14950.634
8129+89	113.415	146.54	32.578	38.434	--	--	14944.778
8130+00	66.252	108.546	36.599	62.354	--	--	14919.023
8130+39	34.457	193.592	72.734	261.853	--	--	14729.904
8130+94	198.336	81.846	237.104	336.646	--	--	14630.362
8131+00	219.909	88.285	46.472	22.684	--	--	14654.150
8131+01	219.543	88.948	8.138	3.939	--	--	14658.349
8132+00	150.411	112.809	678.249	443.865	--	--	14892.733
8133+00	134.92	107.254	528.391	489.029	--	--	14932.095
8134+00	66.473	126.787	372.95	520.091	--	--	14784.954
8135+00	43.478	132.749	203.613	576.747	--	--	14411.820
8136+00	84.32	122.651	236.663	567.556	--	--	14080.927
8137+00	147.855	115.329	429.954	528.844	--	--	13982.037
8138+00	117.507	126.33	491.411	537.02	--	--	13936.428
8139+00	70.784	128.576	348.687	566.458	--	--	13718.657
8140+00	37.077	130.095	199.743	574.824	--	--	13343.576
8141+00	78.206	125.022	213.487	566.927	--	--	12990.136
8142+00	21.627	141.207	184.876	591.62	--	--	12583.392
8143+00	3.568	184.823	46.657	724.511	--	--	11905.538
8144+00	6.026	190.649	17.767	834.382	--	--	11088.923
8145+00	12.952	244.039	35.144	965.973	--	--	10158.094
8145+69	39.645	228.165	67.461	726.774	--	--	9498.781
8146+00	34.608	247.351	42.269	324.83	--	--	9216.220
8147+00	212.748	133.237	458.067	845.751	--	--	8828.536
8148+00	287.553	113.846	926.483	549.073	--	--	9205.946
8148+06	267.154	104.965	61.634	29.175	--	--	9238.405
8148+14	214.642	92.711	71.377	35.142	--	--	9274.640
8148+46	27.802	348.889	143.671	314.027	--	--	9104.284
8148+81	45.597	121.256	47.573	365.668	--	--	8786.189
8148+88	49.837	97.771	12.371	34.071	--	--	8764.489
8149+00	57.727	101.18	23.903	53.054	--	--	8735.338
8150+00	201.648	113.466	480.324	476.991	--	--	8738.671
8151+00	163.514	123.761	676.226	527.171	--	--	8887.726
8152+00	16.116	132.816	332.648	570.171	--	--	8650.203
8153+00	31.763	200.265	88.665	740.18	--	--	7998.688
8154+00	34.434	203.968	122.587	898.296	--	--	7222.979
8155+00	44.527	95.117	146.224	664.633	--	--	6704.570
8156+00	73.198	138.558	218.009	519.278	--	--	6403.301
8157+00	47.125	146.137	222.82	632.656	--	--	5993.465
8158+00	21.153	127.434	126.441	607.936	--	--	5511.970
8158+43	39.626	171.02	48.094	283.399	--	--	5276.665
8159+00	39.74	115.416	84.172	364.538	--	--	4996.299
8160+00	10.57	151.669	93.167	593.522	--	--	4495.944
8161+00	5.266	156.305	29.326	684.387	--	--	3840.883
8162+00	4.983	147.209	18.98	674.476	--	--	3185.387
8163+00	5.699	119.326	19.781	592.3	--	--	2612.868
8164+00	9.719	119.135	28.552	529.913	--	--	2111.507
8165+00	8.488	124.169	33.717	540.676	--	--	1604.548
8166+00	8.149	120.121	30.809	542.867	--	--	1092.490
8167+00	7.653	120.118	29.263	533.864	--	--	587.889
8168+00	9.045	83.773	30.922	453.091	--	--	165.720
8168+75	16.479	36.929	35.45	201.17	--	--	0.000

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US Highway 281

Earthwork Tables

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	9

Benson County Route 29							
	End Area		Volume		Added Volumes		
	Excavation	Embankment	Excavation	Embankment	Excavation	Embankment	
Station	(SF)	(SF)	(CY)	(CY)	(CY)	(CY)	Mass Ordinate
102+25	0.859	0.989	–	–	--	--	–
102+53	64.606	--	33.945	0.615	--	--	33.330
103+00	5.768	10.998	61.251	11.487	--	--	83.094
103+16	6.957	19.552	3.77	10.862	--	--	76.002
103+50	0.173	43.622	4.489	47.731	--	--	32.760
103+63	--	--	0.043	12.941	--	--	19.862
103+78	0.012	66.919	0.003	21.786	--	--	-1.921
103+86	--	75.56	0.002	25.33	--	--	-27.249
104+00	--	90.62	–	51.7	--	--	-78.949
104+50	--	121.599	–	235.799	--	--	-314.748
105+00	--	150.616	–	302.461	--	--	-617.209
105+50	--	182.097	–	369.681	--	--	-986.890
106+00	--	202.331	–	427.142	--	--	-1414.032
106+50	--	222.974	–	472.561	--	--	-1886.593
107+00	--	252.715	–	528.543	--	--	-2415.136
107+50	--	210.642	–	514.841	--	--	-2929.977
108+00	--	61.293	–	302.15	--	--	-3232.127
108+50	1.396	59.227	1.293	133.911	--	--	-3364.745
109+00	--	689.665	1.293	832.102	--	--	-4195.554
109+50	--	788.285	–	1642.167	--	--	-5837.721
109+92	--	724.759	–	1412.174	--	--	-7249.895
110+00	--	702.15	–	253.673	--	--	-7503.568
110+62	--	563.186	–	1743.352	--	--	-9246.920
111+00	--	526.072	–	919.818	--	--	-10166.738
111+27	--	543.305	–	641.626	--	--	-10808.364
112+00	--	761.412	–	2116.541	--	--	-12924.905

Values added to US Highway 281 tables at station 8084+00.

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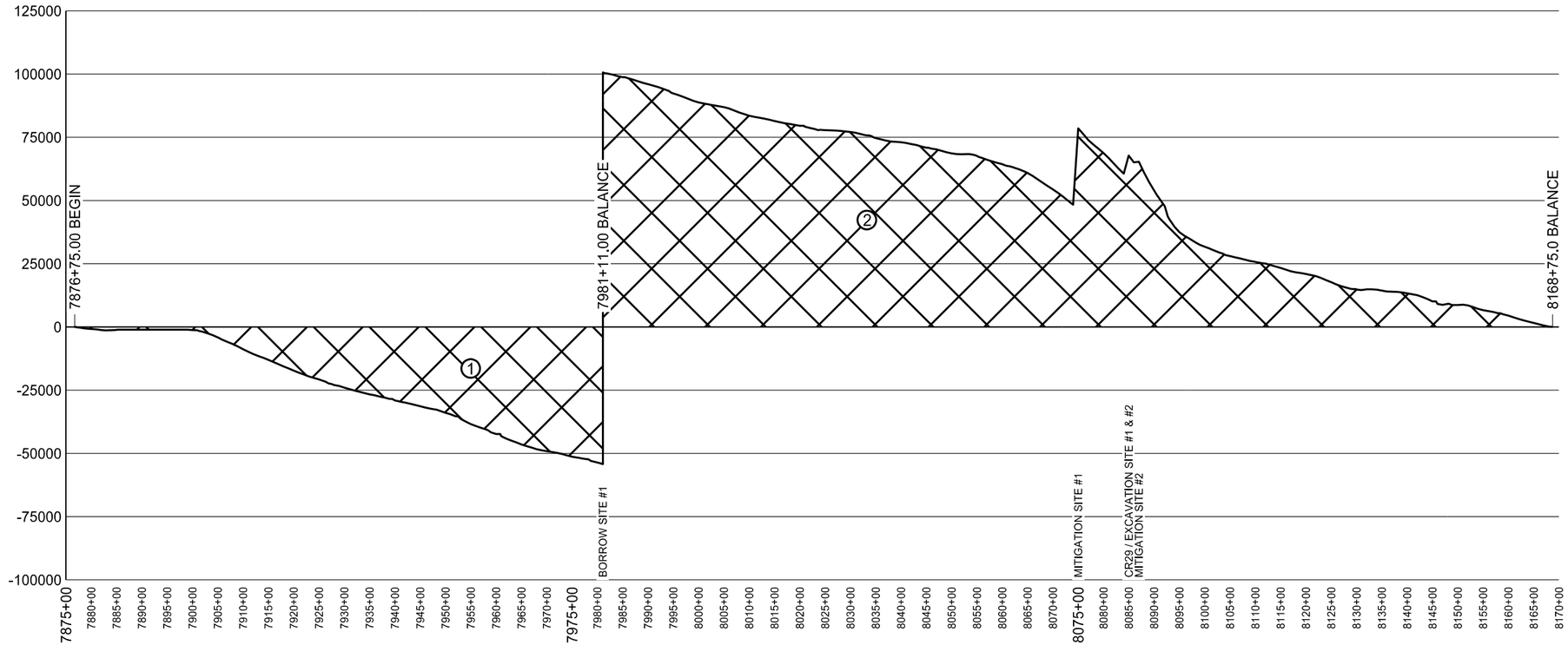
Benson County Route 29

Earthwork Tables

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	10



1

Excavation =	9,779	CY
Borrow Excavation =	54,401	CY
Embankment =	64,180	CY
CY Stationing =	2,400,912	CY-STA
AVG Haul =	54,643	CY
	44	STA

2

Excavation =	94,019	CY
Borrow Excavation =	100,496	CY
Embankment =	194,515	CY
CY Stationing =	9,678,309	CY-STA
AVG Haul =	139,122	CY
	70	STA

PROJECT TOTALS

Excavation =	103,798	CY
Borrow Excavation =	154,897	CY
Embankment =	258,695	CY
CY Stationing =	12,079,220	CY-STA
AVG Haul =	193,765	CY
	62	STA

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US Highway 281

Mass / Haul Diagram

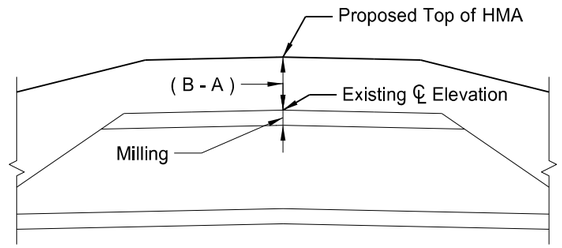
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	11

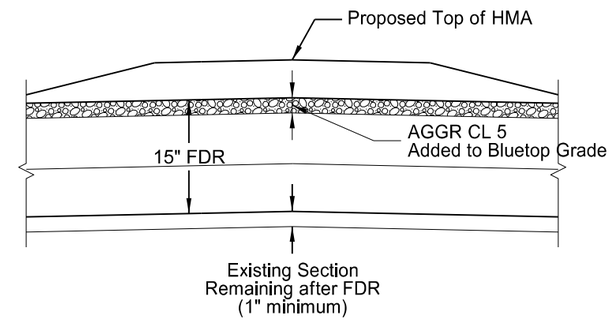
		(A)	(B)	(C)	(D)	(E)		Aggregate Base Course CL 5		
	Station	Existing Centerline Elevation (feet)	Proposed Centerline Elevation (feet)	(B - A) (inches)	Existing Asphalt & Aggr Base Total Section (inches)	((D + C) - 20") Existing Section Remaining after FDR (inches)	Milling (inches)	Added to Bluetop Grade	Maximum for FDR (inches)	Minimum for FDR (inches)
	*Ranges require a maximum AGGR lift for FDR, then base course to be brought to grade in lifts.									
	7899+00.00	1485.556	1486.306	9.004	16.500	5.504	1.000	5.004	–	–
	7900+00.00	1483.771	1484.380	7.299	16.500	3.799	1.000	3.299	–	–
	7901+00.00	1481.311	1482.170	10.301	16.500	6.801	1.000	6.301	–	–
	7902+00.00	1478.903	1479.818	10.978	15.500	6.478	–	5.978	–	–
	7903+00.00	1476.554	1477.467	10.959	15.500	6.459	–	5.959	–	–
	7904+00.00	1474.101	1475.115	12.173	15.500	7.673	–	7.173	–	–
	7905+00.00	1471.923	1472.764	10.085	15.500	5.585	–	5.085	–	–
	7906+00.00	1469.727	1470.412	8.219	15.500	3.719	–	3.219	–	–
	7907+00.00	1467.374	1468.155	9.380	14.500	3.880	–	4.380	–	–
*	7908+00.00	1465.690	1466.864	14.098	14.375	8.473	–	9.098	7.625	1.625
	7909+00.00	1465.738	1466.658	11.041	14.375	5.416	–	6.041	–	–
	7910+00.00	1465.751	1466.664	10.952	14.375	5.327	–	5.952	–	–
	7911+00.00	1465.768	1466.670	10.820	14.375	5.195	–	5.820	–	–
	7912+00.00	1465.831	1466.676	10.141	14.375	4.516	–	5.141	–	–
	7913+00.00	1465.768	1466.682	10.960	14.250	5.210	–	5.960	–	–
	7914+00.00	1466.060	1466.687	7.529	14.250	1.779	–	2.529	–	–
	7915+00.00	1465.984	1466.693	8.515	14.250	2.765	–	3.515	–	–
	7916+00.00	1465.951	1466.699	8.977	14.250	3.227	–	3.977	–	–
	7917+00.00	1465.991	1466.705	8.566	14.250	2.816	–	3.566	–	–
	7918+00.00	1465.981	1466.711	8.755	14.250	3.005	–	3.755	–	–
	7919+00.00	1465.836	1466.717	10.562	14.250	4.812	–	5.562	–	–
	7920+00.00	1465.786	1466.723	11.240	14.625	5.865	–	6.240	–	–
	7921+00.00	1465.827	1466.728	10.816	14.625	5.441	–	5.816	–	–
	7922+00.00	1465.957	1466.734	9.328	14.625	3.953	–	4.328	–	–
	7923+00.00	1465.794	1466.740	11.351	14.625	5.976	–	6.351	–	–
	7924+00.00	1465.881	1466.828	11.369	14.625	5.994	–	6.369	–	–
	7925+00.00	1467.393	1468.296	10.840	14.625	5.465	–	5.840	–	–
	7926+00.00	1470.526	1471.509	11.801	14.625	6.426	–	6.801	–	–
*	7927+00.00	1473.882	1475.003	13.443	14.625	8.068	–	8.443	7.375	1.375
	7928+00.00	1476.933	1477.985	12.629	14.625	7.254	–	7.629	–	–
	7929+00.00	1479.560	1480.446	10.638	14.625	5.263	–	5.638	–	–
	7930+00.00	1481.795	1482.385	7.089	14.625	1.714	–	2.089	–	–
	7931+00.00	1483.043	1483.803	9.116	14.625	3.741	–	4.116	–	–
	7932+00.00	1483.952	1484.699	8.965	15.000	3.965	–	3.965	–	–
	7933+00.00	1484.215	1485.073	10.303	15.125	5.428	–	5.303	–	–
	7934+00.00	1484.002	1484.926	11.088	15.125	6.213	–	6.088	–	–
	7935+00.00	1483.530	1484.351	9.848	15.125	4.973	–	4.848	–	–
	7936+00.00	1483.019	1483.734	8.574	15.125	3.699	–	3.574	–	–
	7937+00.00	1482.566	1483.266	8.403	15.125	3.528	–	3.403	–	–
	7938+00.00	1482.278	1483.096	9.810	15.125	4.935	–	4.810	–	–
	7939+00.00	1482.298	1483.224	11.108	15.250	6.358	–	6.108	–	–
	7940+00.00	1482.885	1483.650	9.175	15.125	4.300	–	4.175	–	–
	7941+00.00	1483.571	1484.225	7.850	15.125	2.975	–	2.850	–	–
	7942+00.00	1484.170	1484.800	7.562	15.125	2.687	–	2.562	–	–
	7943+00.00	1484.765	1485.375	7.315	15.125	2.440	–	2.315	–	–
	7944+00.00	1485.081	1485.950	10.432	15.125	5.557	–	5.432	–	–
	7945+00.00	1485.903	1486.525	7.463	15.000	2.463	–	2.463	–	–
	7946+00.00	1486.432	1487.100	8.015	15.500	3.515	–	3.015	–	–
	7947+00.00	1487.052	1487.860	9.702	15.500	5.202	–	4.702	–	–
	7948+00.00	1488.032	1488.991	11.498	15.500	6.998	–	6.498	–	–
*	7949+00.00	1489.331	1490.491	13.922	15.500	9.422	–	8.922	6.500	0.500
	7950+00.00	1491.542	1492.363	9.847	15.500	5.347	–	4.847	–	–
	7951+00.00	1493.650	1494.419	9.229	15.500	4.729	–	4.229	–	–
	7952+00.00	1495.512	1496.475	11.555	16.000	7.555	1.000	7.555	–	–
*	7953+00.00	1497.399	1498.502	13.237	15.875	9.112	1.000	9.237	7.125	1.125
	7954+00.00	1499.473	1500.328	10.265	15.875	6.140	1.000	6.265	–	–
	7955+00.00	1501.198	1501.923	8.704	15.875	4.579	1.000	4.704	–	–
	7956+00.00	1502.710	1503.288	6.931	15.875	2.806	1.000	2.931	–	–
	7957+00.00	1503.759	1504.422	7.953	15.875	3.828	1.000	3.953	–	–

NOTES:

Column (D): Values calculated from core data, may vary due to field conditions.

Column (E): 20" derived from complete proposed section depth. (5" HBP / 15" FDR)





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US Highway 281

FDR Profile Strip Grades

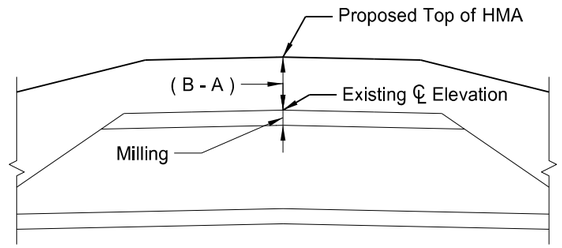
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	12

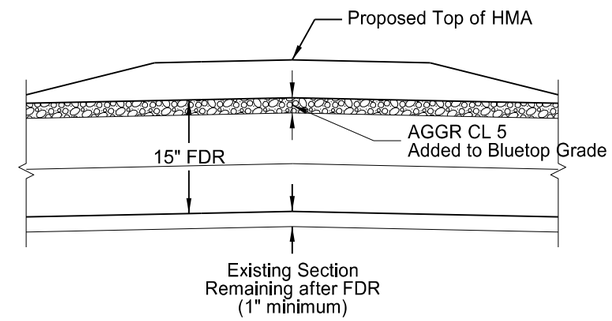
	(A)	(B)	(C)	(D)	(E)		Aggregate Base Course CL 5		
Station	Existing Centerline Elevation (feet)	Proposed Centerline Elevation (feet)	(B - A) (inches)	Existing Asphalt & Aggr Base Total Section (inches)	((D + C) - 20") Existing Section Remaining after FDR (inches)	Milling (inches)	Added to Bluetop Grade	Maximum for FDR (inches)	Minimum for FDR (inches)
*Ranges require a maximum AGGR lift for FDR, then base course to be brought to grade in lifts.									
7958+00.00	1504.641	1505.325	8.213	15.750	3.963	1.000	4.213	–	–
7959+00.00	1505.473	1505.998	6.309	15.625	1.934	1.000	2.309	–	–
7960+00.00	1506.039	1506.578	6.477	15.625	2.102	1.000	2.477	–	–
7961+00.00	1507.121	1508.014	10.714	15.625	6.339	1.000	6.714	–	–
7962+00.00	1509.818	1510.486	8.020	15.625	3.645	1.000	4.020	–	–
7963+00.00	1512.914	1513.887	11.684	15.625	7.309	1.000	7.684	–	–
7964+00.00	1516.682	1517.441	9.105	15.625	4.730	1.000	5.105	–	–
7965+00.00	1519.922	1520.859	11.248	15.500	6.748	1.000	7.248	–	–
7966+00.00	1522.747	1523.690	11.319	16.000	7.319	1.000	7.319	–	–
7967+00.00	1525.270	1525.898	7.528	16.000	3.528	1.000	3.528	–	–
7968+00.00	1526.751	1527.482	8.770	16.000	4.770	1.000	4.770	–	–
7969+00.00	1527.578	1528.442	10.376	16.000	6.376	1.000	6.376	–	–
7970+00.00	1528.241	1528.800	6.714	16.000	2.714	1.000	2.714	–	–
7971+00.00	1528.527	1528.986	5.508	16.000	1.508	1.000	1.508	–	–
7972+00.00	1528.795	1529.172	4.528	16.500	1.028	1.000	0.528	–	–
7973+00.00	1528.913	1529.358	5.335	16.250	1.585	1.000	1.335	–	–
7974+00.00	1528.797	1529.544	8.963	16.250	5.213	1.000	4.963	–	–
7975+00.00	1529.081	1529.730	7.787	16.250	4.037	1.000	3.787	–	–
7976+00.00	1529.144	1529.916	9.262	16.250	5.512	1.000	5.262	–	–
7977+00.00	1529.194	1530.102	10.892	16.250	7.142	1.000	6.892	–	–
7978+00.00	1529.373	1530.288	10.975	16.250	7.225	1.000	6.975	–	–
7979+00.00	1529.831	1530.474	7.718	16.250	3.968	1.000	3.718	–	–
7980+00.00	1529.926	1530.660	8.807	16.250	5.057	1.000	4.807	–	–
7981+00.00	1530.035	1530.846	9.728	16.250	5.978	1.000	5.728	–	–
7982+00.00	1530.317	1531.032	8.582	16.250	4.832	1.000	4.582	–	–
7983+00.00	1530.538	1531.218	8.151	16.250	4.401	1.000	4.151	–	–
7984+00.00	1530.611	1531.404	9.516	16.250	5.766	1.000	5.516	–	–
7985+00.00	1530.733	1531.590	10.278	16.000	6.278	1.000	6.278	–	–
7986+00.00	1530.940	1531.784	10.124	15.375	5.499	–	5.124	–	–
7987+00.00	1531.176	1532.000	9.894	15.375	5.269	–	4.894	–	–
7988+00.00	1531.492	1532.238	8.950	15.375	4.325	–	3.950	–	–
7989+00.00	1531.869	1532.480	7.335	15.375	2.710	–	2.335	–	–
7990+00.00	1532.134	1532.723	7.071	15.375	2.446	–	2.071	–	–
7991+00.00	1532.138	1532.965	9.928	14.750	4.678	–	4.928	–	–
7992+00.00	1532.409	1533.208	9.586	15.625	5.211	1.000	5.586	–	–
7993+00.00	1532.323	1533.279	11.468	15.625	7.093	1.000	7.468	–	–
7994+00.00	1532.085	1532.942	10.294	15.625	5.919	1.000	6.294	–	–
7995+00.00	1531.510	1532.197	8.241	15.625	3.866	1.000	4.241	–	–
7996+00.00	1530.393	1531.042	7.790	15.625	3.415	1.000	3.790	–	–
* 7997+00.00	1528.409	1529.478	12.824	15.625	8.449	1.000	8.824	7.375	1.375
7998+00.00	1526.752	1527.505	9.032	16.500	5.532	1.000	5.032	–	–
7999+00.00	1524.854	1525.323	5.629	16.125	1.754	1.000	1.629	–	–
8000+00.00	1522.855	1523.534	8.144	16.125	4.269	1.000	4.144	–	–
8001+00.00	1521.291	1522.245	11.448	16.125	7.573	1.000	7.448	–	–
8002+00.00	1520.713	1521.457	8.932	16.125	5.057	1.000	4.932	–	–
8003+00.00	1520.295	1521.170	10.495	16.125	6.620	1.000	6.495	–	–
8004+00.00	1520.561	1521.384	9.869	16.125	5.994	1.000	5.869	–	–
8005+00.00	1521.424	1522.098	8.089	15.750	3.839	1.000	4.089	–	–
8006+00.00	1522.587	1523.314	8.723	16.125	4.848	1.000	4.723	–	–
* 8007+00.00	1523.872	1525.000	13.539	16.125	9.664	1.000	9.539	6.875	0.875
8008+00.00	1525.889	1526.794	10.858	16.125	6.983	1.000	6.858	–	–
8009+00.00	1527.793	1528.588	9.540	16.125	5.665	1.000	5.540	–	–
8010+00.00	1529.589	1530.382	9.511	16.125	5.636	1.000	5.511	–	–
8011+00.00	1531.541	1532.176	7.625	16.500	4.125	1.000	3.625	–	–
8012+00.00	1533.347	1533.970	7.479	15.625	3.104	1.000	3.479	–	–
8013+00.00	1535.181	1535.764	6.998	15.625	2.623	1.000	2.998	–	–
8014+00.00	1537.039	1537.558	6.225	15.625	1.850	1.000	2.225	–	–
8015+00.00	1538.472	1539.351	10.551	15.625	6.176	1.000	6.551	–	–
8016+00.00	1540.059	1540.970	10.935	15.625	6.560	1.000	6.935	–	–

NOTES:

Column (D): Values calculated from core data, may vary due to field conditions.

Column (E): 20" derived from complete proposed section depth. (5" HBP / 15" FDR)





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US Highway 281

FDR Profile Strip Grades

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	13

	(A)	(B)	(C)	(D)	(E)		Aggregate Base Course CL 5		
Station	Existing Centerline Elevation (feet)	Proposed Centerline Elevation (feet)	(B - A) (inches)	Existing Asphalt & Aggr Base Total Section (inches)	((D + C) - 20") Existing Section Remaining after FDR (inches)	Milling (inches)	Added to Bluetop Grade	Maximum for FDR (inches)	Minimum for FDR (inches)
*Ranges require a maximum AGGR lift for FDR, then base course to be brought to grade in lifts.									
8017+00.00	1541.722	1542.270	6.576	15.625	2.201	1.000	2.576	–	–
8018+00.00	1542.537	1543.252	8.574	14.750	3.324	–	3.574	–	–
8019+00.00	1543.109	1543.915	9.671	15.250	4.921	–	4.671	–	–
8020+00.00	1543.702	1544.434	8.793	15.250	4.043	–	3.793	–	–
8021+00.00	1544.150	1544.954	9.640	15.250	4.890	–	4.640	–	–
8022+00.00	1544.708	1545.473	9.178	15.250	4.428	–	4.178	–	–
8023+00.00	1545.121	1545.993	10.457	15.250	5.707	–	5.457	–	–
8024+00.00	1545.616	1546.447	9.971	15.250	5.221	–	4.971	–	–
8025+00.00	1546.097	1546.771	8.083	15.750	3.833	1.000	4.083	–	–
8026+00.00	1546.413	1546.964	6.613	15.875	2.488	1.000	2.613	–	–
8027+00.00	1546.504	1547.027	6.268	15.875	2.143	1.000	2.268	–	–
8028+00.00	1546.425	1547.024	7.197	15.875	3.072	1.000	3.197	–	–
8029+00.00	1546.428	1547.022	7.127	15.875	3.002	1.000	3.127	–	–
8030+00.00	1546.576	1547.020	5.321	15.875	1.196	1.000	1.321	–	–
8031+00.00	1546.422	1547.017	7.139	15.875	3.014	1.000	3.139	–	–
8032+00.00	1546.290	1547.015	8.700	15.875	4.575	1.000	4.700	–	–
8033+00.00	1546.353	1547.012	7.914	15.875	3.789	1.000	3.914	–	–
8034+00.00	1546.359	1547.010	7.812	15.875	3.687	1.000	3.812	–	–
8035+00.00	1546.493	1547.008	6.173	15.875	2.048	1.000	2.173	–	–
8036+00.00	1546.358	1547.005	7.772	15.875	3.647	1.000	3.772	–	–
8037+00.00	1546.447	1547.081	7.616	15.875	3.491	1.000	3.616	–	–
8038+00.00	1546.667	1547.387	8.636	16.000	4.636	1.000	4.636	–	–
8039+00.00	1547.176	1547.924	8.980	16.500	5.480	1.000	4.980	–	–
8040+00.00	1547.886	1548.695	9.715	16.500	6.215	1.000	5.715	–	–
8041+00.00	1548.715	1549.620	10.857	16.500	7.357	1.000	6.857	–	–
8042+00.00	1549.930	1550.549	7.421	16.500	3.921	1.000	3.421	–	–
8043+00.00	1550.800	1551.477	8.122	16.500	4.622	1.000	4.122	–	–
8044+00.00	1551.610	1552.406	9.544	17.000	6.544	2.000	6.544	–	–
8045+00.00	1552.473	1553.334	10.341	16.250	6.591	1.000	6.341	–	–
8046+00.00	1553.544	1554.263	8.623	16.250	4.873	1.000	4.623	–	–
8047+00.00	1554.362	1555.191	9.952	16.250	6.202	1.000	5.952	–	–
8048+00.00	1555.314	1556.120	9.677	16.250	5.927	1.000	5.677	–	–
8049+00.00	1556.400	1557.049	7.786	16.250	4.036	1.000	3.786	–	–
8050+00.00	1557.345	1557.977	7.589	16.250	3.839	1.000	3.589	–	–
8051+00.00	1558.228	1558.874	7.751	15.500	3.251	1.000	3.751	–	–
8052+00.00	1558.994	1559.680	8.227	15.750	3.977	1.000	4.227	–	–
8053+00.00	1559.845	1560.392	6.569	15.750	2.319	1.000	2.569	–	–
8054+00.00	1560.393	1561.012	7.427	15.750	3.177	1.000	3.427	–	–
8055+00.00	1560.912	1561.570	7.895	15.750	3.645	1.000	3.895	–	–
8056+00.00	1561.507	1562.126	7.431	15.750	3.181	1.000	3.431	–	–
8057+00.00	1561.954	1562.682	8.731	15.750	4.481	1.000	4.731	–	–
8058+00.00	1562.638	1563.238	7.203	16.000	3.203	1.000	3.203	–	–
8059+00.00	1562.969	1563.795	9.911	16.375	6.286	2.000	6.911	–	–
8060+00.00	1563.519	1564.351	9.980	16.375	6.355	2.000	6.980	–	–
8061+00.00	1564.296	1564.907	7.329	16.375	3.704	2.000	4.329	–	–
8062+00.00	1564.847	1565.463	7.402	16.375	3.777	2.000	4.402	–	–
8063+00.00	1565.328	1566.020	8.301	16.375	4.676	2.000	5.301	–	–
8064+00.00	1565.859	1566.576	8.597	16.750	5.347	2.000	5.597	–	–
GAP FOR CURVE RECONSTRUCTION									
8101+00.00	1573.724	1574.511	9.444	15.500	4.944	–	4.444	–	–
8102+00.00	1574.744	1575.540	9.552	15.500	5.052	–	4.552	–	–
8103+00.00	1575.814	1576.570	9.067	15.500	4.567	–	4.067	–	–
8104+00.00	1576.756	1577.600	10.124	15.500	5.624	–	5.124	–	–
8105+00.00	1577.797	1578.629	9.990	15.500	5.490	–	4.990	–	–
8106+00.00	1578.910	1579.659	8.983	15.500	4.483	–	3.983	–	–
8107+00.00	1579.827	1580.689	10.340	15.500	5.840	–	5.340	–	–
8108+00.00	1580.925	1581.655	8.756	15.500	4.256	–	3.756	–	–
8109+00.00	1581.307	1582.167	10.327	15.500	5.827	–	5.327	–	–
8110+00.00	1581.785	1582.566	9.377	15.500	4.877	–	4.377	–	–

NOTES:

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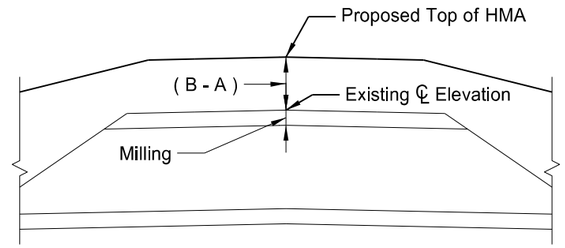
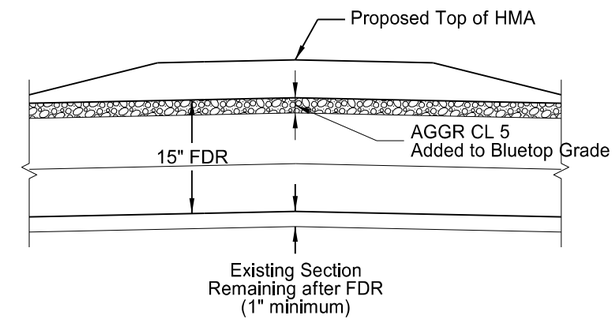
Column (E): 20" derived from complete proposed section depth. (5" HBP / 15" FDR)





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US Highway 281

FDR Profile Strip Grades

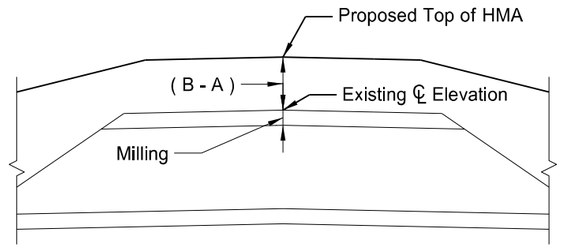
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	11	14

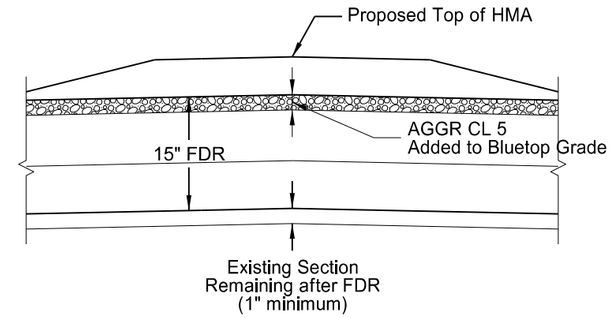
	(A)	(B)	(C)	(D)	(E)		Aggregate Base Course CL 5		
Station	Existing Centerline Elevation (feet)	Proposed Centerline Elevation (feet)	(B - A) (inches)	Existing Asphalt & Aggr Base Total Section (inches)	((D + C) - 20") Existing Section Remaining after FDR (inches)	Milling (inches)	Added to Bluetop Grade	Maximum for FDR (inches)	Minimum for FDR (inches)
*Ranges require a maximum AGGR lift for FDR, then base course to be brought to grade in lifts.									
8111+00.00	1582.220	1582.965	8.934	15.500	4.434	–	3.934	–	–
8112+00.00	1582.776	1583.364	7.054	15.500	2.554	–	2.054	–	–
8113+00.00	1583.208	1583.848	7.676	15.375	3.051	–	2.676	–	–
8114+00.00	1584.034	1584.707	8.078	15.375	3.453	–	3.078	–	–
8115+00.00	1585.047	1585.879	9.985	15.375	5.360	–	4.985	–	–
8116+00.00	1586.119	1587.001	10.589	15.375	5.964	–	5.589	–	–
8117+00.00	1587.141	1587.899	9.088	15.375	4.463	–	4.088	–	–
8118+00.00	1587.954	1588.568	7.361	15.375	2.736	–	2.361	–	–
8119+00.00	1588.473	1589.008	6.416	15.250	1.666	–	1.416	–	–
8120+00.00	1588.488	1589.218	8.764	15.500	4.264	–	3.764	–	–
8121+00.00	1588.365	1589.200	10.024	15.500	5.524	–	5.024	–	–
8122+00.00	1588.125	1588.953	9.936	15.500	5.436	–	4.936	–	–
8123+00.00	1587.503	1588.477	11.692	15.500	7.192	–	6.692	–	–
8124+00.00	1587.130	1587.845	8.584	15.500	4.084	–	3.584	–	–
8125+00.00	1586.471	1587.209	8.857	15.500	4.357	–	3.857	–	–
8126+00.00	1585.778	1586.573	9.535	15.750	5.285	1.000	5.535	–	–
8127+00.00	1585.218	1585.936	8.622	15.625	4.247	1.000	4.622	–	–
8128+00.00	1584.512	1585.300	9.451	15.625	5.076	1.000	5.451	–	–
8129+00.00	1583.798	1584.583	9.419	15.625	5.044	1.000	5.419	–	–
8130+00.00	1583.023	1583.620	7.159	15.625	2.784	1.000	3.159	–	–
8131+00.00	1581.690	1582.405	8.571	15.625	4.196	1.000	4.571	–	–
8132+00.00	1580.210	1580.938	8.730	15.625	4.355	1.000	4.730	–	–
8133+00.00	1578.598	1579.300	8.429	15.625	4.054	1.000	4.429	–	–
8134+00.00	1576.890	1577.657	9.208	15.625	4.833	1.000	5.208	–	–
8135+00.00	1575.132	1576.014	10.590	15.625	6.215	1.000	6.590	–	–
8136+00.00	1573.557	1574.289	8.787	15.625	4.412	1.000	4.787	–	–
8137+00.00	1571.680	1572.311	7.576	15.500	3.076	1.000	3.576	–	–
8138+00.00	1569.368	1570.076	8.496	15.625	4.121	1.000	4.496	–	–
8139+00.00	1566.581	1567.583	12.023	15.625	7.648	1.000	8.023	–	–
8140+00.00	1563.801	1564.915	13.373	15.625	8.998	1.000	9.373	7.375	1.375
8141+00.00	1561.427	1562.357	11.167	15.625	6.792	1.000	7.167	–	–
8142+00.00	1559.765	1560.388	7.478	15.750	3.228	1.000	3.478	–	–
8143+00.00	1558.106	1559.058	11.420	15.500	6.920	–	6.420	–	–
8144+00.00	1557.368	1558.367	11.989	15.500	7.489	–	6.989	–	–
8145+00.00	1557.407	1558.201	9.527	15.500	5.027	–	4.527	–	–
8146+00.00	1557.194	1558.086	10.716	15.500	6.216	–	5.716	–	–
8147+00.00	1556.947	1557.964	12.206	15.500	7.706	–	7.206	–	–
8148+00.00	1556.557	1557.574	12.198	15.250	7.448	–	7.198	–	–
8149+00.00	1555.700	1556.791	13.097	15.000	8.097	–	8.097	7.000	1.000
8150+00.00	1554.964	1555.615	7.823	15.000	2.823	–	2.823	–	–
8151+00.00	1553.306	1554.047	8.893	15.000	3.893	–	3.893	–	–
8152+00.00	1551.155	1552.085	11.161	15.000	6.161	–	6.161	–	–
8153+00.00	1548.849	1549.739	10.678	15.000	5.678	–	5.678	–	–
8154+00.00	1546.597	1547.381	9.409	14.750	4.159	–	4.409	–	–
8155+00.00	1544.808	1545.374	6.797	14.250	1.047	–	1.797	–	–
8156+00.00	1542.852	1543.725	10.475	14.250	4.725	–	5.475	–	–
8157+00.00	1541.449	1542.434	11.815	14.250	6.065	–	6.815	–	–
8158+00.00	1540.173	1541.386	14.553	14.250	8.803	–	9.553	7.750	1.750
8159+00.00	1539.358	1540.346	11.850	13.750	5.600	–	6.850	–	–
8160+00.00	1538.323	1539.300	11.723	13.750	5.473	–	6.723	–	–
8161+00.00	1537.037	1537.978	11.290	13.750	5.040	–	6.290	–	–
8162+00.00	1535.225	1536.224	11.986	13.750	5.736	–	6.986	–	–
8163+00.00	1533.340	1534.041	8.413	13.750	2.163	–	3.413	–	–
8164+00.00	1530.902	1531.703	9.610	13.750	3.360	–	4.610	–	–
8165+00.00	1528.531	1529.364	9.999	13.750	3.749	–	4.999	–	–
8166+00.00	1526.370	1527.026	7.872	13.750	1.622	–	2.872	–	–
8167+00.00	1524.065	1524.687	7.460	13.750	1.210	–	2.460	–	–
8168+00.00	1521.723	1522.348	7.507	13.750	1.257	–	2.507	–	–
8169+00.00	1519.464	1520.594	13.571	13.750	7.321	–	8.571	–	–

NOTES:

Column (D): Values calculated from core data, may vary due to field conditions.

Column (E): 20" derived from complete proposed section depth. (5" HBP / 15" FDR)





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US Highway 281

FDR Profile Strip Grades

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	20	1

T.S. Station	7861+70.88
S.C. Station	7864+70.88
P.C. Station	7864+70.88
P.I. Station	7882+38.07
Delta =	81° 31' 32.14" (LT)
Degree =	2° 47' 41.70"
Tangent =	2198.84
Length =	2916.92
Radius =	2050.00
External =	656.56
P.T. Station	7893+87.81
C.S. Station	7893+87.81
S.T. Station	7896+87.81

Station	Left Slope	Right Slope
TS - 109'	-2.1	-2.1
TS	-2.1	0.0
TS+109'	-2.1	2.1
SC	-5.8	5.8
CS	-5.8	5.8
TS + 109'	-2.1	2.1
ST	-2.1	0.0
ST + 109'	-2.1	-2.1

Note: Calculations based on AASHTO method five. A design speed of 65 mph and maximum superelevation of 6% were used.

P.C. Station	8064+30.06
P.I. Station	8087+21.69
Delta =	89° 59' 26.60" (RT)
Degree =	2° 29' 59.34"
Tangent =	2,291.63
Length =	3,599.89
Radius =	2,292.00
External =	949.12
P.T. Station	8100+29.95

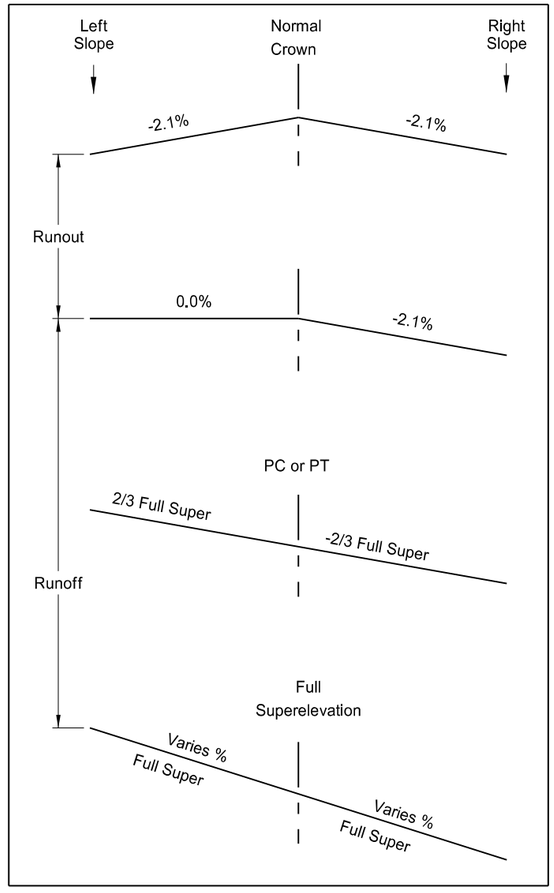
Station	Left Slope	Right Slope
PC - 295'	-2.1	-2.1
PC - 189'	0.0	-2.1
PC - 82'	2.1	-2.1
PC + 94'	5.6	-5.6
PT - 94'	5.6	-5.6
PT + 82'	2.1	-2.1
PT + 189'	0.0	-2.1
PT + 295'	-2.1	-2.1

Note: Calculations based on AASHTO method five. A design speed of 65 mph and maximum superelevation of 6% were used.

P.C. Station	103+15.76
P.I. Station	106+97.11
Delta =	50° 58' 25.96" (RT)
Degree =	7° 09' 43.10"
Tangent =	381.36
Length =	711.73
Radius =	800.00
External =	86.25
P.T. Station	110+27.49

Station	Left Slope	Right Slope
PC - 63'	3.0	-3.0
PC	0.0	-3.0
PC + 63'	-3.0	-3.0
PC + 70'	-3.4	-3.4
PT - 36'	-3.4	-3.4
PT - 28'	-3.0	-3.0
PT + 34'	0.0	-3.0
PT + 100'	2.1	-2.1

Note: Calculations based on AASHTO method five. A design speed of 25 mph and maximum superelevation of 6% were used.



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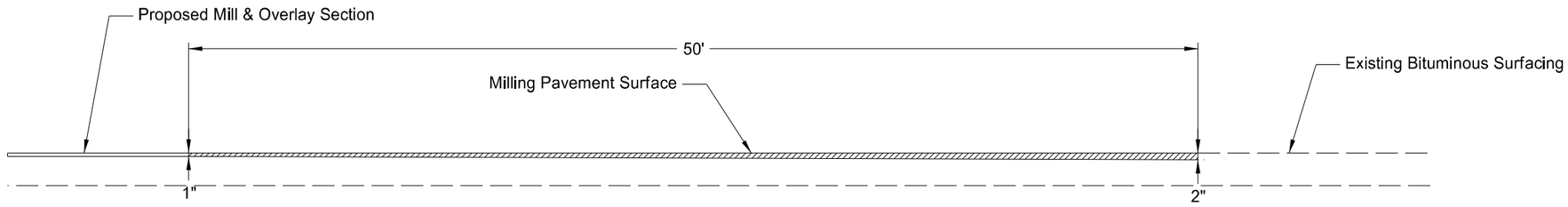
US Highway 281

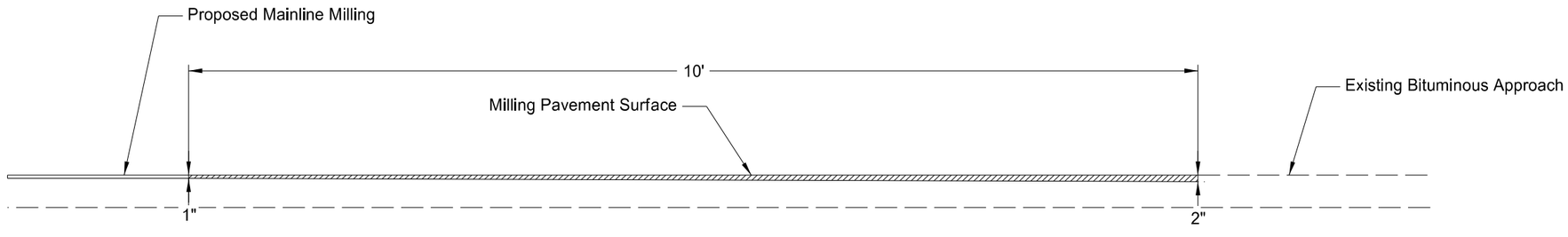
Superelevation Table

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	2



Milling Transition Detail A

	Location
US HWY 281	7860+12 - 7860+62
ND HWY 57	4+00 - 4+50



Approach Milling Transition

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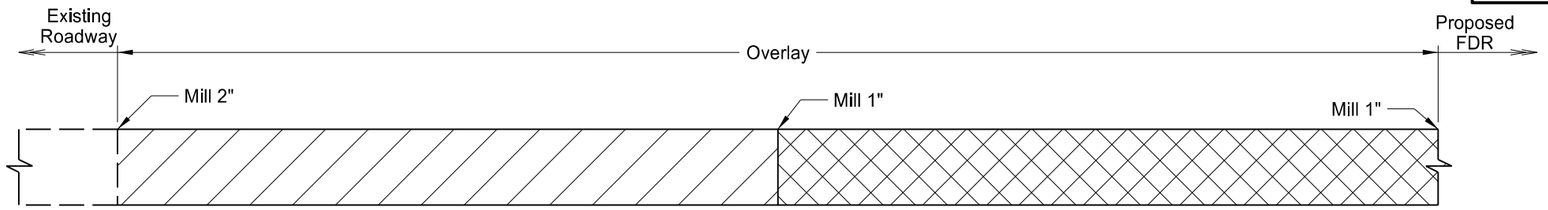
US Highway 281

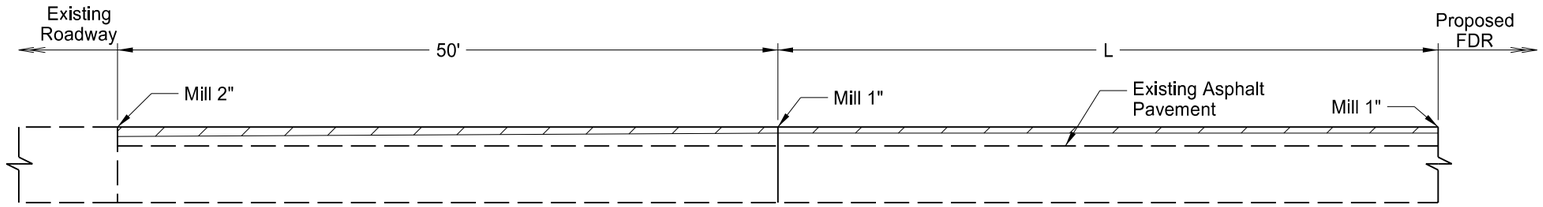
Milling and Paving Transitions

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	20	3



Plan View

Location	L (ft)	X (in)
7895+05 - 7898+30	275	7.50
8168+75 - 8172+50	325	8.50



Milling Transition Detail

Overlay Transition Detail

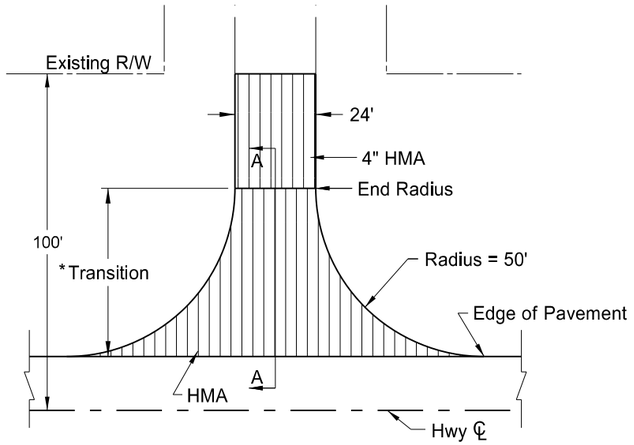
BASIS OF ESTIMATE

		7895+05 - 7898+30	8168+75 - 8172+50
Material	Unit	Quantity	Quantity
Prime Coat @ 0.25 Gal/SY	Gal	361.11	416.67
Blotter Material Cl 44 @ 15 lbs/SY	Ton	10.83	12.50
Tack Coat @ 0.05 Gal/SY (2 Lifts)	Gal	144.44	166.66
Tack Coat @ 0.05 Gal/SY (Wearing Course)	Gal	72.22	83.33
HBP Superpave FAA 44 @ 2 Ton/CY (2 Lifts)	Ton	220.68	300.93
HBP Superpave FAA 44 @ 2 Ton/CY (Wearing Course)	Ton	160.47	185.19
PG 58S-28 Asphalt Cement @ 6.0%	Ton	13.24	18.06
PG 58H-34 Asphalt Cement @ 6.0%	Ton	9.63	11.11
CSS-1h Emulsified Asphalt - Fog Seal @ 0.05 Gal/SY	Gal	72.22	83.33

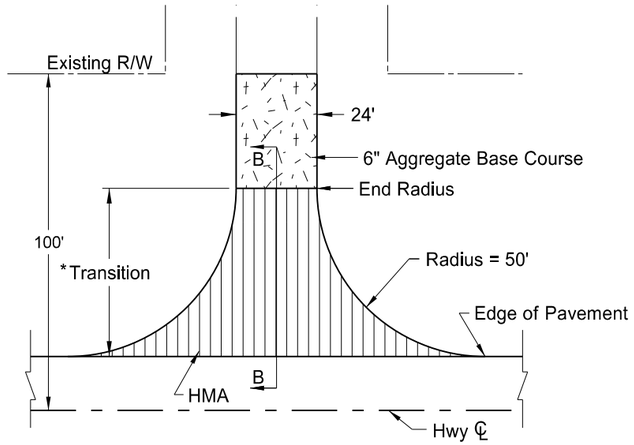
US Highway 281

Milling and Paving Transitions

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	4



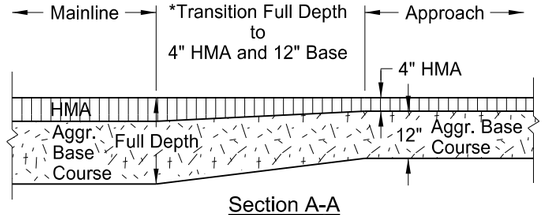
(1) Paved Section Line, County Road, or Street Approach



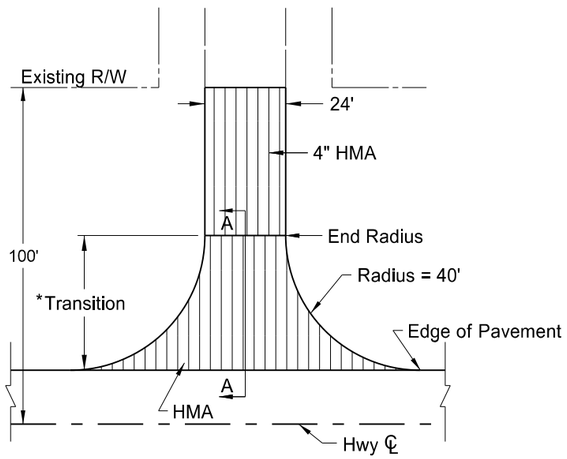
(2) Gravel Section Line, County Road, or Street Approach

Notes:

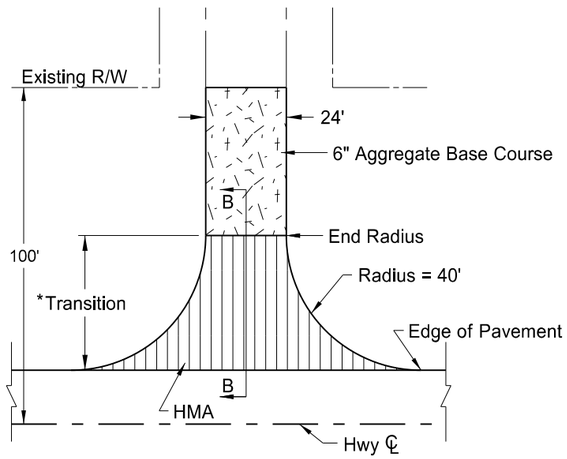
1. Actual HMA paving and aggregate base course locations may vary in the field, as approved by the Engineer.
2. Quantity totals have been included in the bid items of the "Estimate of Quantities" of the plans.



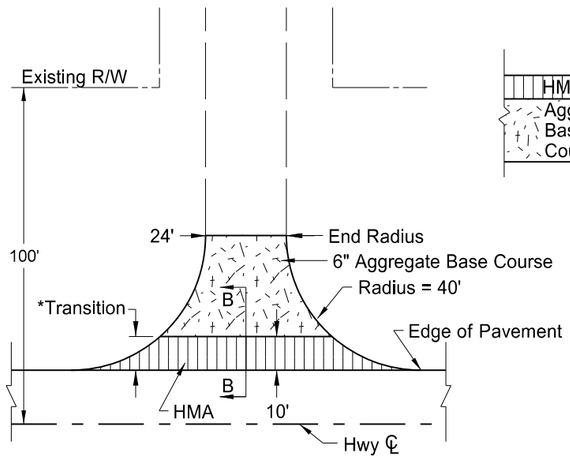
Section A-A
(not to scale)



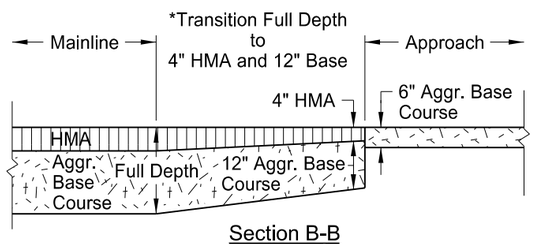
(3) Paved Private Drive Approach



(4) Gravel Private Drive Approach



(5) Field Drive Approach



Section B-B
(not to scale)

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US Highway 281

Approach Paving Details for New or Regrading Rural Approaches

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	5

APPROACH LOCATION	TYPE	SPEC CODE	302 0120	401 0050	430 0044	430 5803	430 5806
		PAY ITEM	AGGREGATE BASE COURSE CL 5 (TON)	TACK COAT (GAL)	SUPERPAVE FAA 44 (TON)	PG 58S-28 ASPHALT CEMENT (TON)	PG 58H-28 ASPHALT CEMENT (TON)
7888+00 (APPROACH RIGHT)	Section Line		51.81	11.05	20.47	0.83	0.42
7893+42 (APPROACH RIGHT)	Field Drive		34.50	7.36	13.63	0.55	0.28
7894+37 (APPROACH LEFT)	Private Drive		41.99	8.96	16.59	0.67	0.34
7901+14 (APPROACH LEFT)	Field Drive		86.56	11.29	20.90	0.85	0.43
7905+48 (APPROACH LEFT)	Field Drive		86.56	11.29	20.90	0.85	0.42
7908+11 (APPROACH RIGHT)	Field Drive		90.72	12.22	22.63	0.92	0.46
7926+70 (APPROACH RIGHT)	Field Drive		86.58	11.29	20.91	0.85	0.43
7927+90 (APPROACH LEFT)	Field Drive		86.46	11.28	20.89	0.85	0.42
7941+03 (APPROACH RIGHT)	Section Line		156.15	27.45	50.82	2.07	1.03
7958+70 (APPROACH RIGHT)	Field Drive		86.58	11.29	20.91	0.85	0.43
7958+70 (APPROACH LEFT)	Field Drive		86.58	11.29	20.91	0.85	0.43
7978+48 (APPROACH RIGHT)	Field Drive		86.58	11.29	20.91	0.85	0.43
7978+48 (APPROACH LEFT)	Field Drive		86.58	11.29	20.91	0.85	0.43
7981+08 (APPROACH LEFT)	Section Line		209.29	38.15	70.64	2.87	1.44
7981+11 (APPROACH RIGHT)	Section Line		202.52	37.49	69.42	2.82	1.41
7994+37 (APPROACH RIGHT)	Field Drive		86.58	11.29	20.91	0.85	0.43
7994+37 (APPROACH LEFT)	Field Drive		86.58	11.29	20.91	0.85	0.43
8023+32 (APPROACH RIGHT)	Section Line		157.21	27.45	50.82	2.07	1.03
8023+40 (APPROACH LEFT)	Field Drive		86.58	11.29	20.91	0.85	0.43
8034+14 (APPROACH RIGHT)	Field Drive		87.22	11.35	21.02	0.85	0.43
8034+20 (APPROACH LEFT)	Section Line		231.40	37.55	69.54	2.83	1.41
8055+00 (APPROACH LEFT)	Private Drive		154.18	27.45	50.82	2.07	1.03
8058+40 (APPROACH LEFT)	Private Drive		182.28	38.89	72.01	2.93	1.46
8060+53 (APPROACH RIGHT)	Field Drive		86.58	11.29	20.91	0.85	0.43
8084+74 (APPROACH RIGHT)	Field Drive		88.65	11.52	21.33	0.87	0.43
8084+74 (APPROACH LEFT)	Section Line		506.07	107.96	199.93	8.13	4.07
8090+13 (APPROACH RIGHT)	Field Drive		89.08	11.58	21.44	0.87	0.44
8092+39 (APPROACH LEFT)	Private Drive		288.30	28.29	52.40	2.13	1.07
8103+86 (APPROACH RIGHT)	Field Drive		86.57	11.29	20.91	0.85	0.43
8110+50 (APPROACH LEFT)	Field Drive		86.47	11.27	20.86	0.85	0.42
8130+38 (APPROACH RIGHT)	Section Line		231.68	37.88	70.15	2.85	1.43
8130+38 (APPROACH LEFT)	Section Line		204.27	37.89	70.16	2.85	1.43
8148+46 (APPROACH RIGHT)	Field Drive		86.58	11.29	20.91	0.85	0.43
8148+46 (APPROACH LEFT)	Field Drive		86.58	11.29	20.91	0.85	0.43
		*TOTALS =	3886	593	1098	45	22

*Does not include Benson County Route 29 quantities at Sta 8084+74 Lt.

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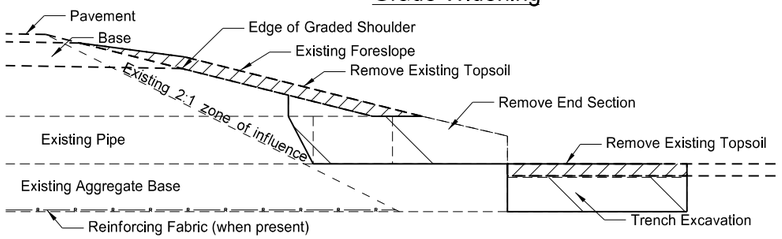
US Highway 281

Approach Quanitites

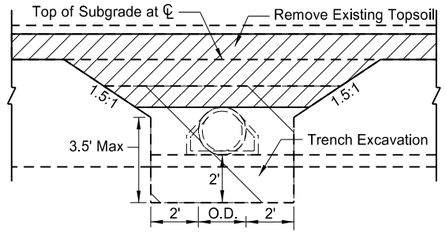
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	6

Grade Widening



Removal Section

Cross Section View

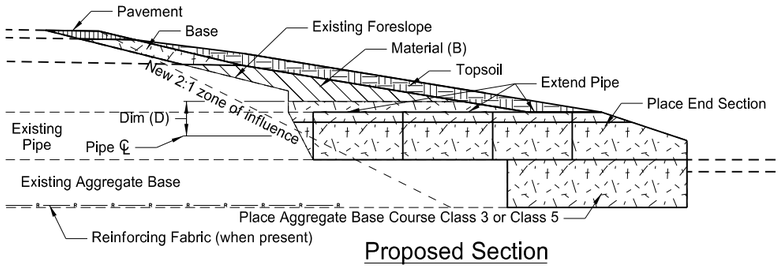


Removal Detail

Side View

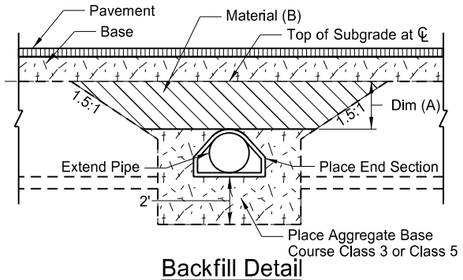
Pay Items
1) Pipe*
2) Remove & Relay Pipe - All Types & Sizes (when required)
3) Remove & Reset End Section or new End Section
4) Borrow Excavation (Compaction Control Type A) or Common Excavation-Type A
5) Topsoil
6) Seeding
7) Mulching

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



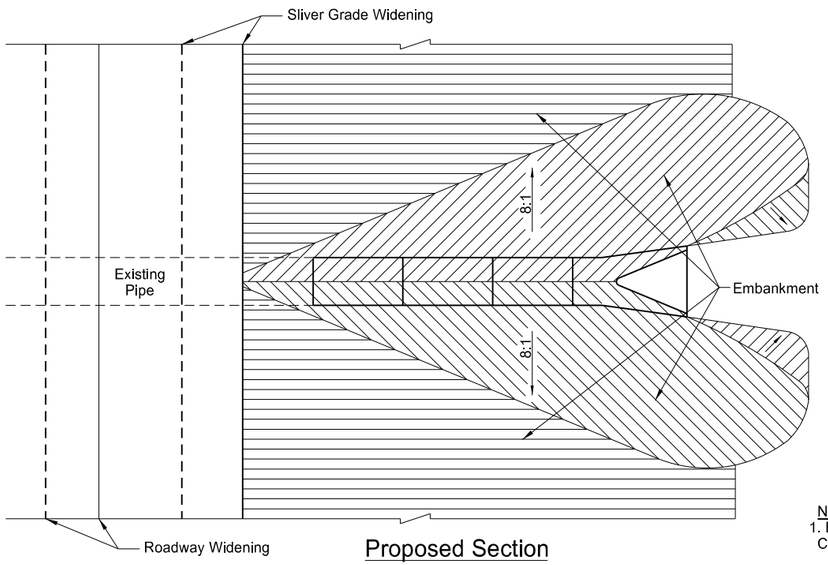
Proposed Section

Cross Section View



Backfill Detail

Side View (Topsoil not shown)



Proposed Section

Plan View

Pipe Materials	Dim (A)<=4 Feet Material (B)	Backfill Dimension Dim (D)
Concrete	Embank or Aggr	0.5 O.D.
Metal and Plastic	Embank or Aggr	0.5 O.D.

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

NOTES:
1. Embankment may be either Borrow Excavation (Compaction Control - Type A) or Common Excavation - Type A.

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

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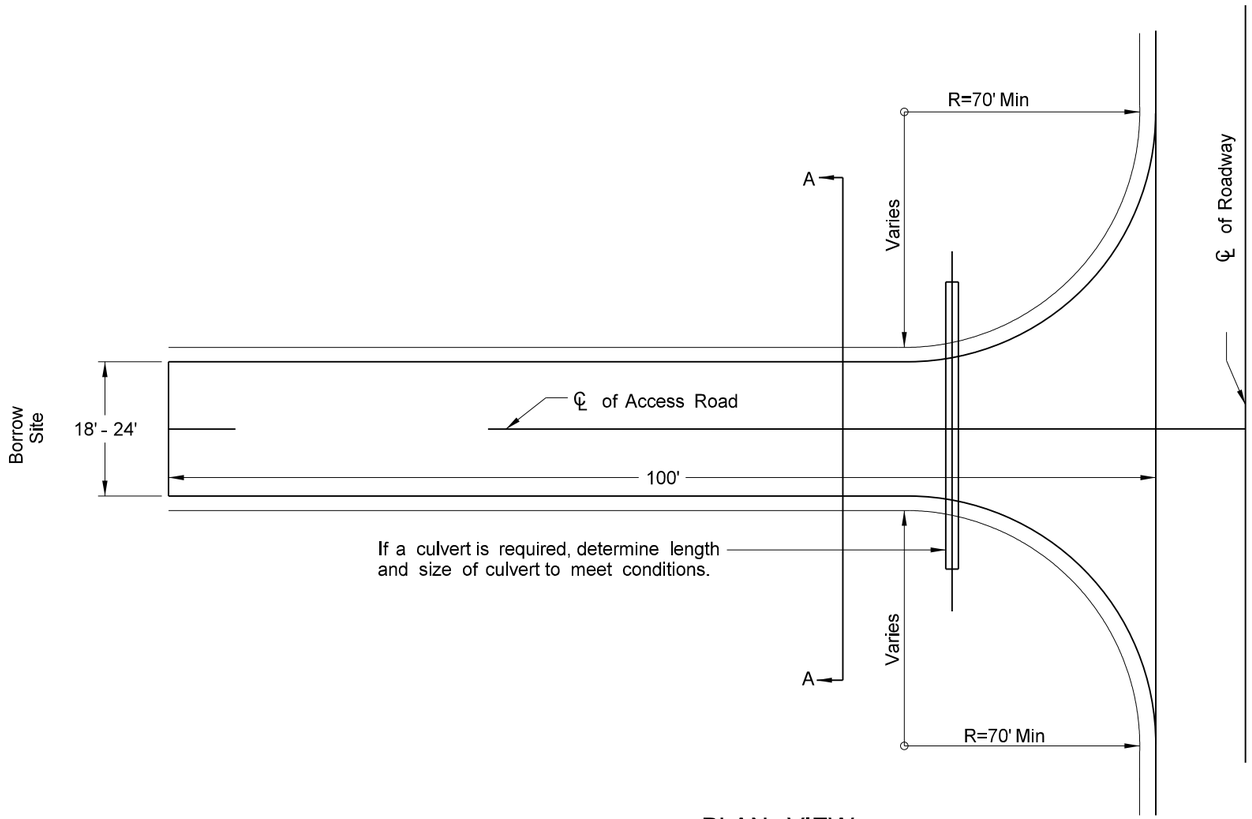
US Highway 281

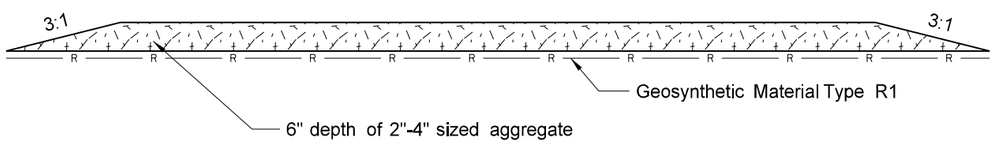
Mainline ℄ Pipe Extension Detail

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	7

SPEC	CODE	BID ITEM	QTY	UNIT
265	0100	STABILIZED CONSTRUCTION ACCESS		
		BORROW SITE NO. 1	1	EA
265	0101	REMOVE STABILIZED CONSTRUCTION ACCESS		
		BORROW SITE NO. 1	1	EA



PLAN VIEW



A - A Cross Section

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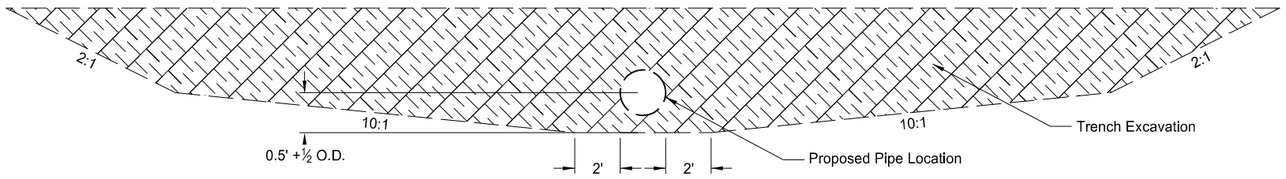
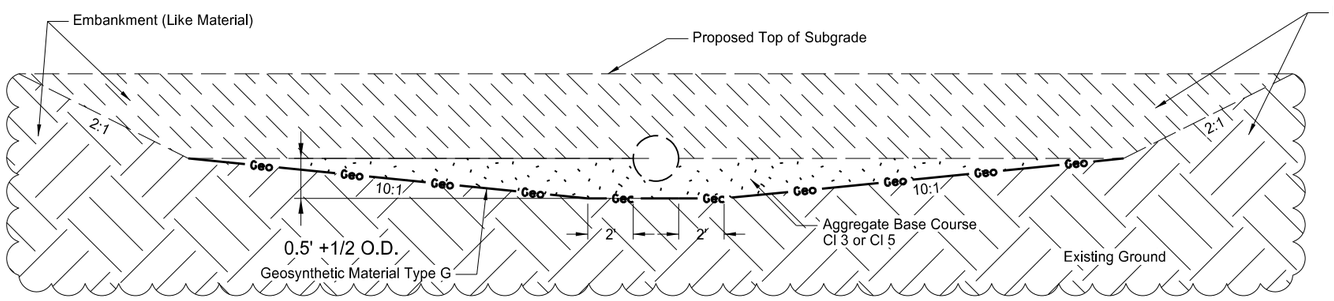
US Highway 281

Stabilized Construction Access

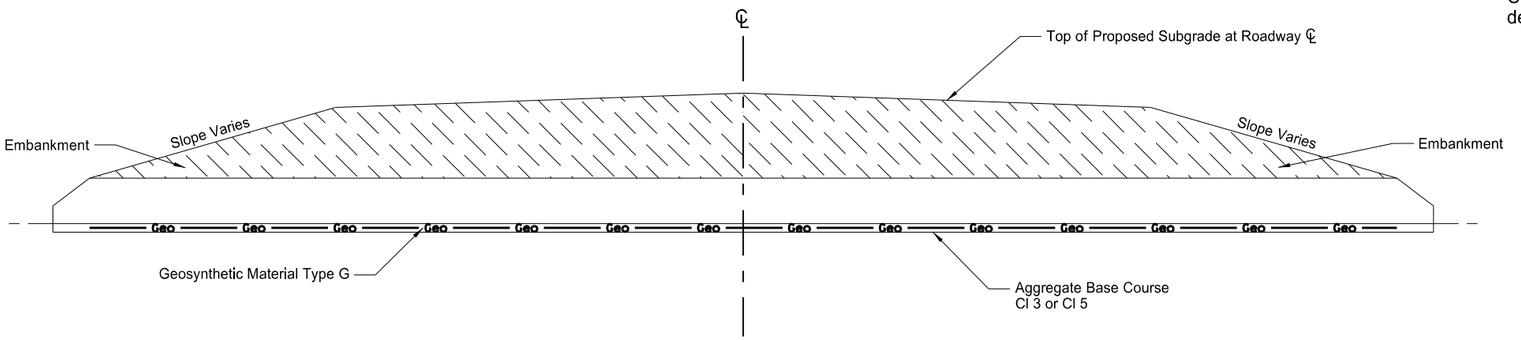
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	8



EXCAVATION DETAIL



INSTALLATION DETAIL



CROSS SECTION

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

* Included In Pipe Pay item
1) Pipe
2) Trench Excavation
3) Aggregate Base Course Cl 3 or Cl 5
4) Embankment
5) Rock Bedding & Geogrid (See note 3)

NOTES:

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

2) Embankment may be either Borrow Excavation or Common Excavation - Type A. Borrow Excavation is required to have a Group and Subgroup Classification the same as the excavated material as defined by AASHTO M 145. Common Excavation - Type A is required to be the material excavated during trench excavation.

3) If ground water is encountered, a rock bedding, meeting CL 7 aggregate specifications, may be used to help with dewatering. Install Geogrid under rock bedding if utilized.

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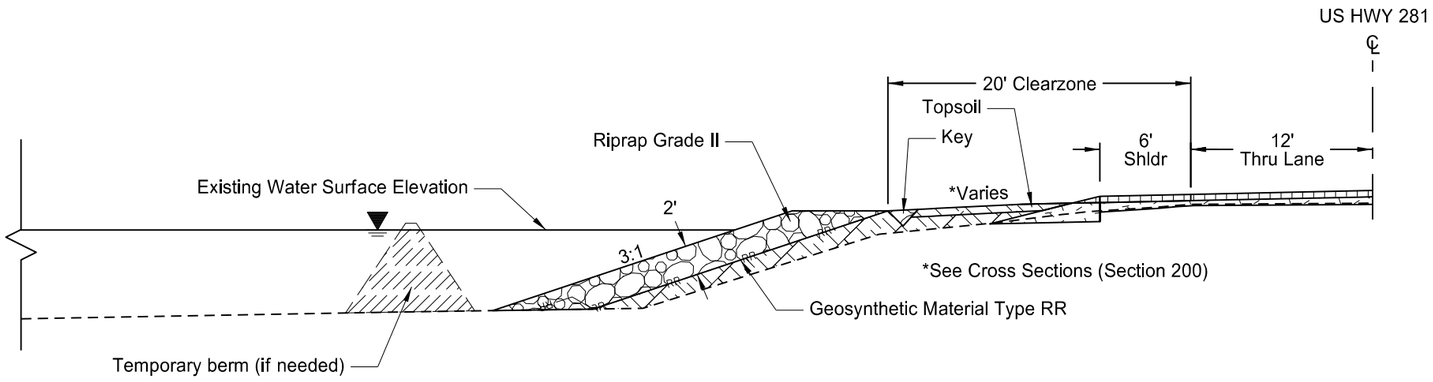
US Highway 281

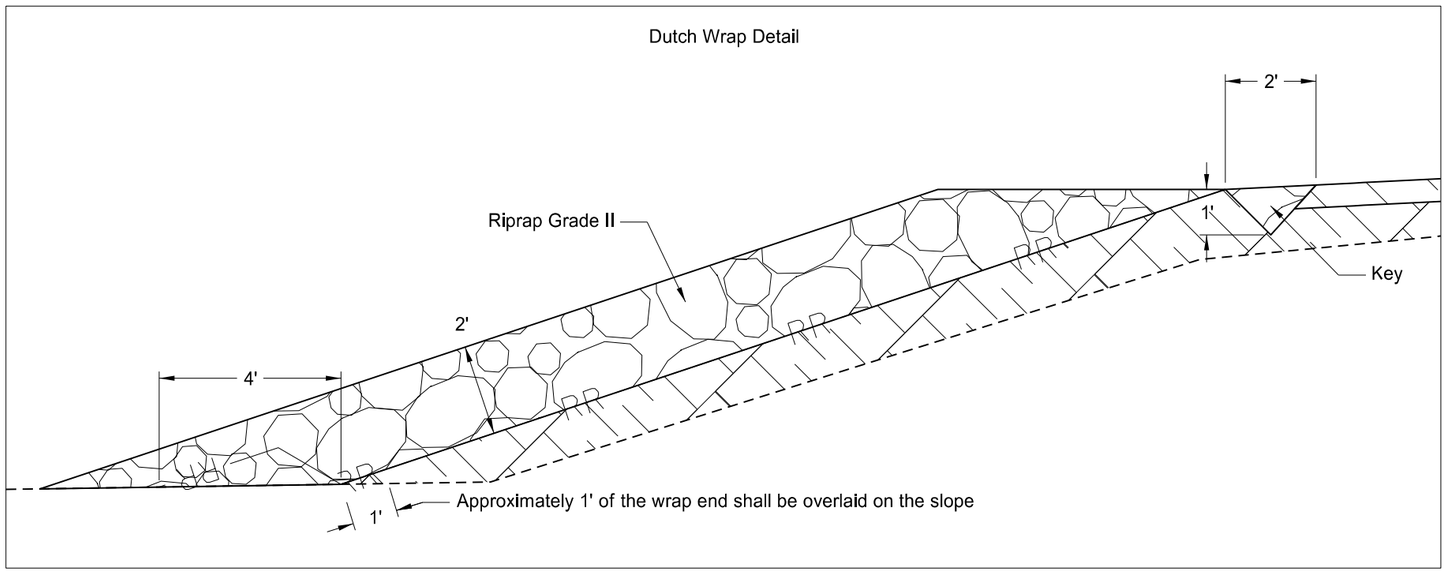
Alternate Pipe Backfill Detail

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	9

NOTE: If temporary berm is needed all materials and work associated with hauling, placing, maintaining and reclaiming berm shall be incidental to the unit price bid for "RIPRAP GRADE II".

If temporary berm is used it must be completely removed.





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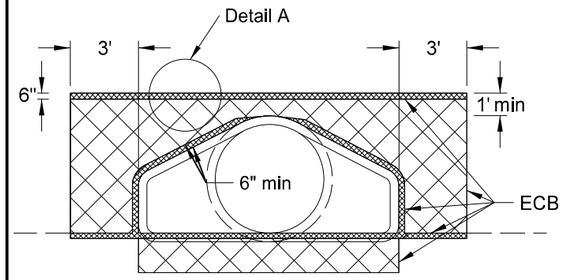
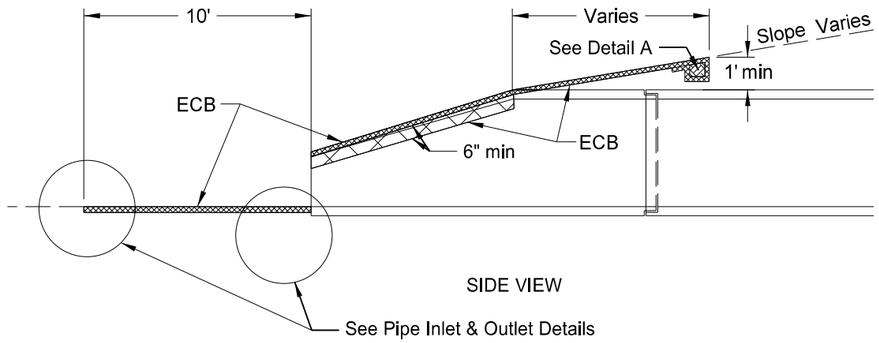
US Highway 281

Riprap Slope Detail

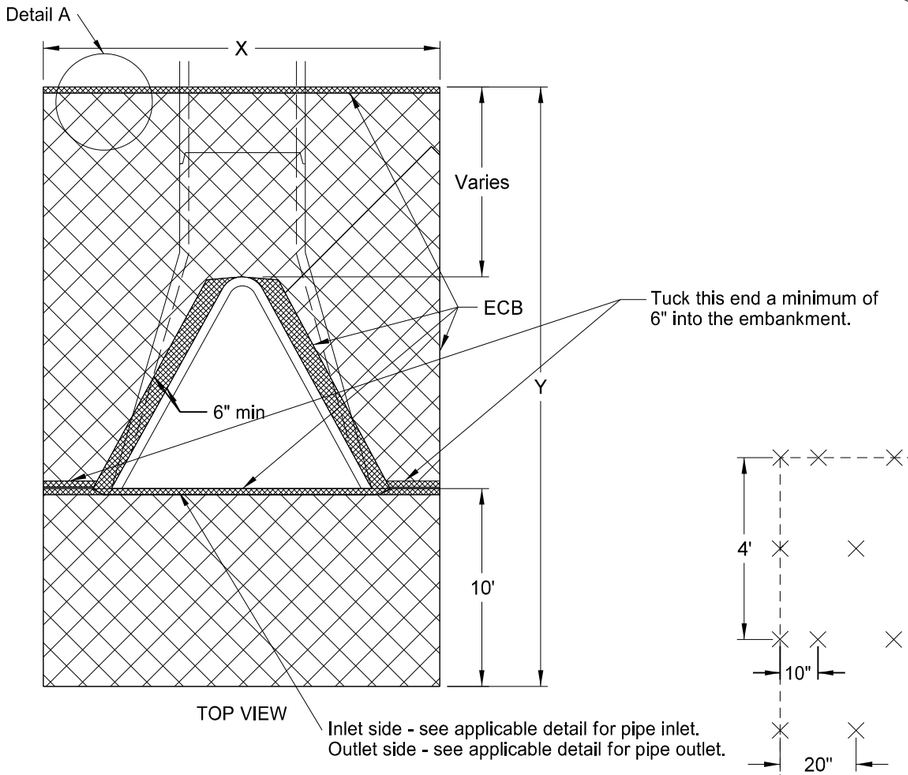
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	10



FRONT VIEW

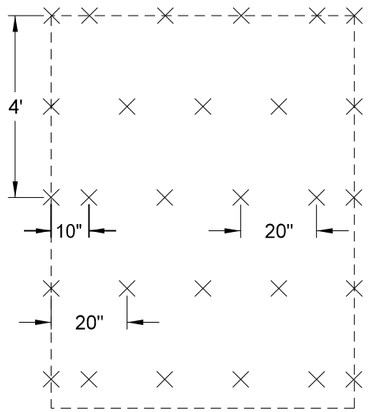


SIDE VIEW



TOP VIEW

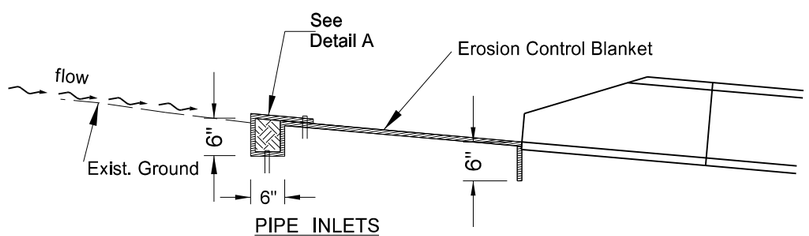
NOTE: Tuck the ECB a minimum of 6" into the embankment (against the flared end section) around the opening of the flared end section.



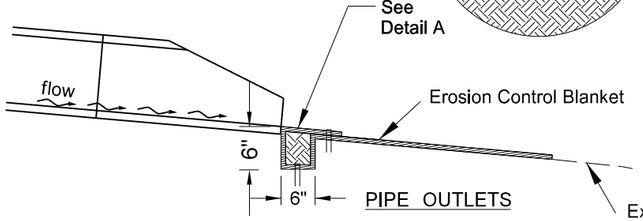
STAPLE PATTERN

CENTERLINE CULVERTS									
DIA	X	Y	Surface area to be protected	ECB	DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY	In	Ft	Ft	SF	SY
24	10.5	19.6	193.1	22	24	10.5	27.6	172.1	20
27	11.0	20.0	204.3	23	27	11.0	18.0	182.3	21
30	11.6	20.5	218.3	25	30	11.6	18.5	195.1	22
36	12.7	21.2	242.1	27	36	12.7	19.2	216.7	24
42	13.3	21.2	251.8	28	42	13.3	19.2	225.2	25
48	13.8	22.0	265.6	30	48	13.8	20.0	238.0	27
54	14.5	21.5	273.7	31	54	14.5	19.5	244.7	28
60	15.0	21.0	278.3	31	60	15.0	19.0	248.3	28
66	15.6	22.0	295.7	33	66	15.6	20.0	264.5	30
72	16.2	22.5	309.2	35	72	16.2	20.5	276.8	31
Note: Quantities based on 6:1 slope.					Note: Quantities based on 4:1 slope.				

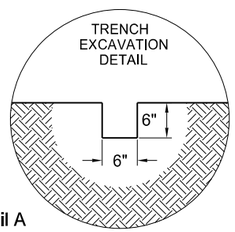
APPROACH CULVERTS				
DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
15	9.0	20.0	176.0	20
18	9.5	20.7	190.7	22
21	9.5	21.0	190.9	22
24	10.5	21.6	214.1	24
27	11.0	22.0	226.3	25
30	11.6	22.5	241.5	27
36	12.7	23.3	268.8	30
42	13.3	23.3	279.7	31
48	13.8	24.0	293.2	33
54	14.5	23.4	300.6	34
60	15.0	23.0	307.5	35
66	15.6	24.0	325.6	37
72	16.2	24.5	340.6	38
Note: Quantities based on 8:1 slope.				

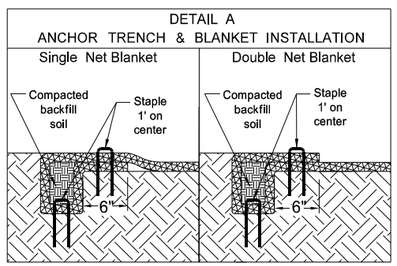


PIPE INLETS



PIPE OUTLETS





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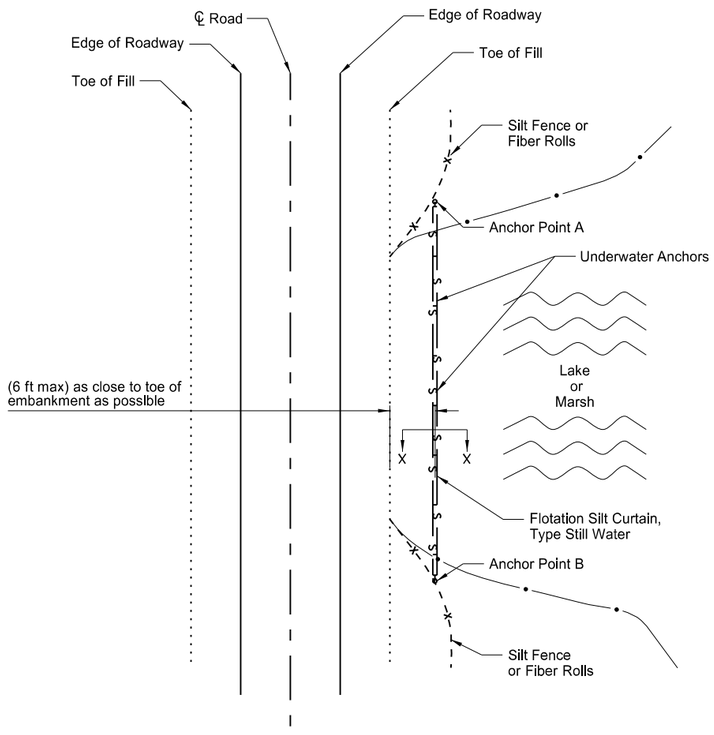
US Highway 281

Erosion Control at Culvert Flared End Sections

TYPICAL INSTALLATIONS
May vary with conditions

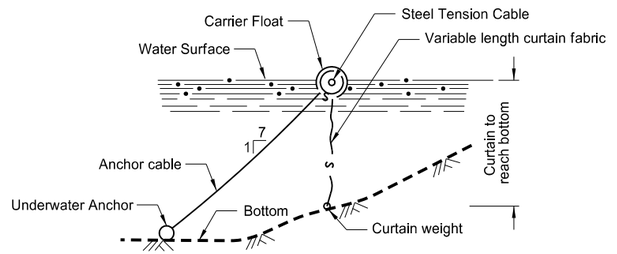
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	11



PLAN VIEW

FLOTATION SILT CURTAIN - TYPE STILL WATER

Extend silt curtain onto shore and anchor there also.



SECTION X-X
FLOTATION SILT CURTAINS

Note:
Maximum water velocity for moving water = 5 ft/sec

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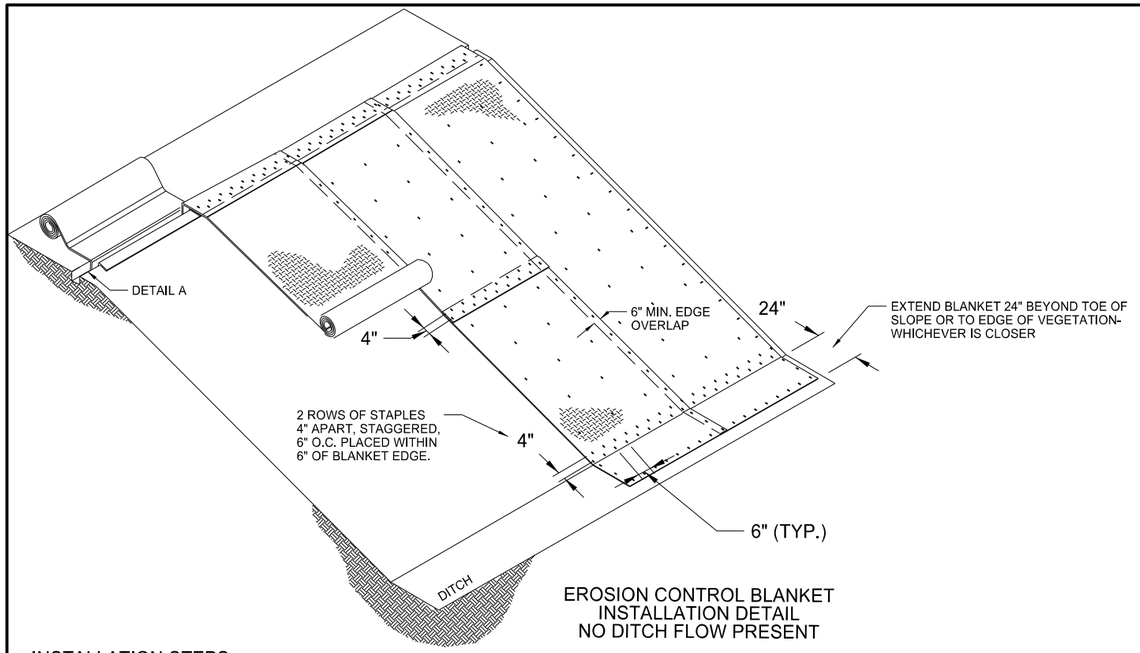
US Highway 281

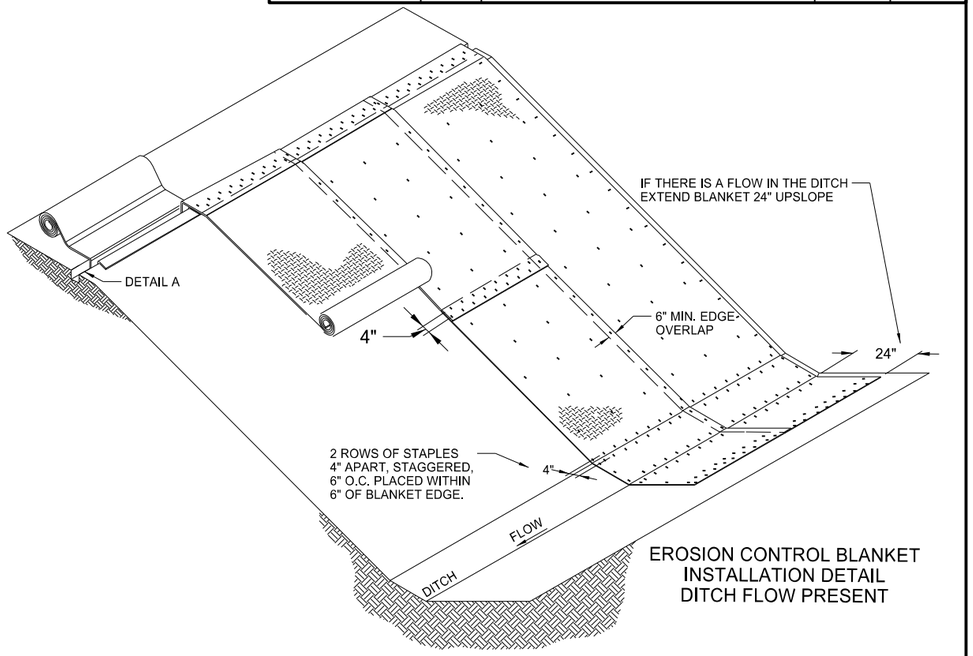
Temporary Erosion Control - Flotation Silt Curtain

8/28/2017 15:04:52 mhuettl c:\pwworking\central01\dms26485\020GD_011_DFLOTATION_SILT_CURTAIN.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	12



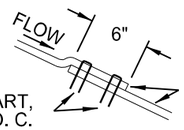
EROSION CONTROL BLANKET
INSTALLATION DETAIL
NO DITCH FLOW PRESENT



EROSION CONTROL BLANKET
INSTALLATION DETAIL
DITCH FLOW PRESENT

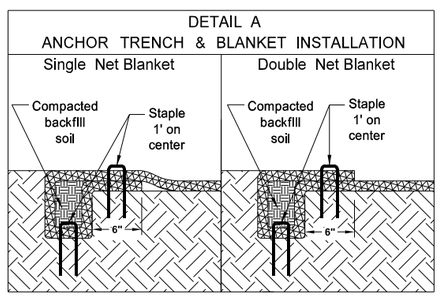
INSTALLATION STEPS:

1. Prepare smooth slope per spec. section 255
2. Amend soil and seed, as specified.
3. Dig anchor trench. Set aside native soil removed from trench.
4. Secure blanket in anchor trench, staking or stapling blanket as shown.
5. Replace native soil previously removed from trench.
6. Staple blanket as shown so there are no gaps between the blanket and the soil. Staple while unrolling blanket to minimize walking on blanket.
7. Install splices a minimum 24 inches prior to toe of slope.

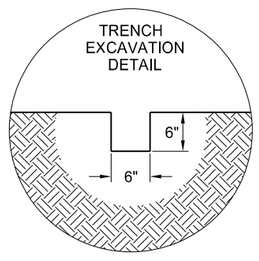


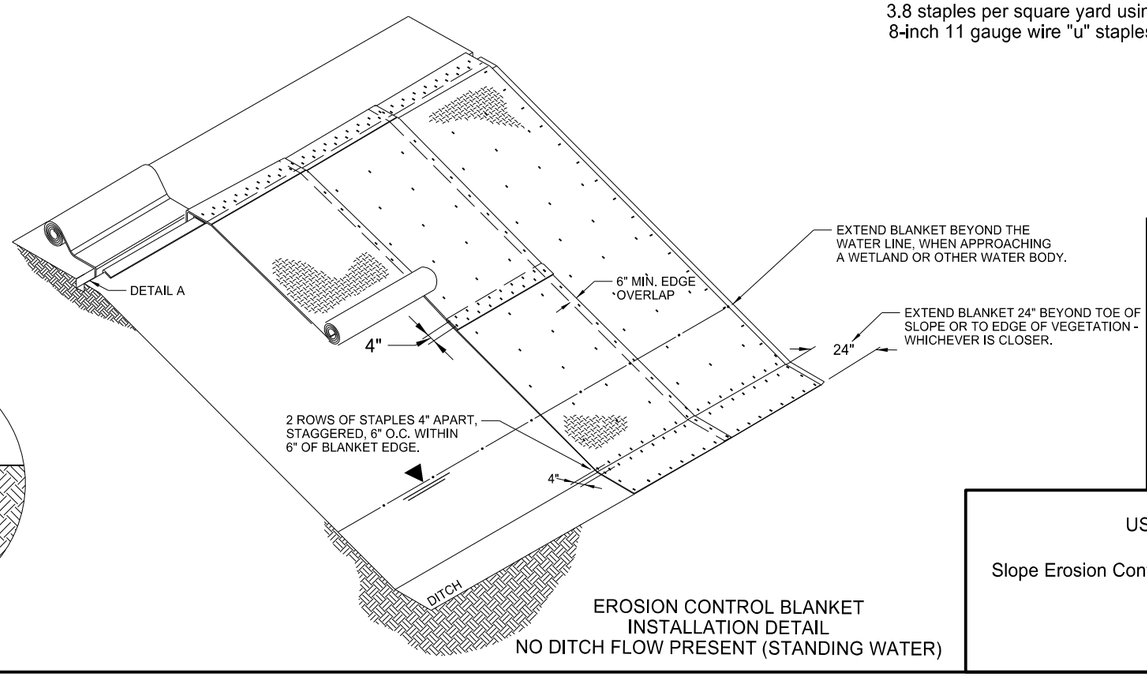
STAPLES ~ 4" APART, STAGGERED, 6" O. C.

EROSION CONTROL BLANKETS

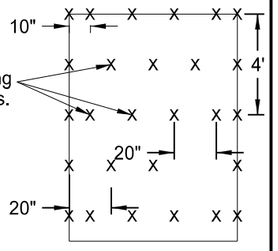


NOTE:
Install Single Net Blanket with netting on top of installed blanket.





EROSION CONTROL BLANKET
INSTALLATION DETAIL
NO DITCH FLOW PRESENT (STANDING WATER)



3.8 staples per square yard using 8-inch 11 gauge wire "u" staples.

STAPLE PATTERN

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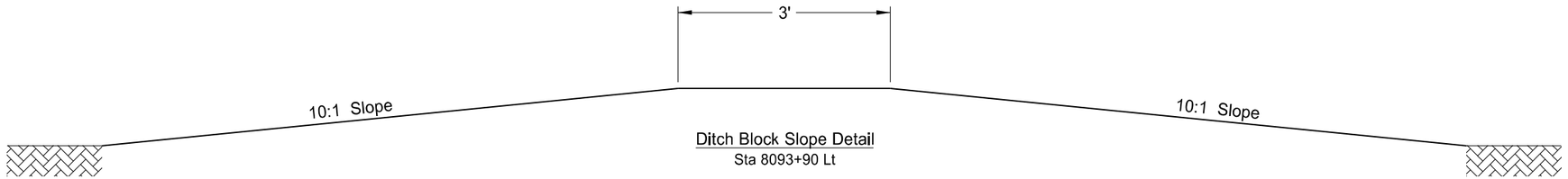
US Highway 281

Slope Erosion Control Blanket Installation Details

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	20	13



Ditch Block Slope Detail
Sta 8093+90 Lt

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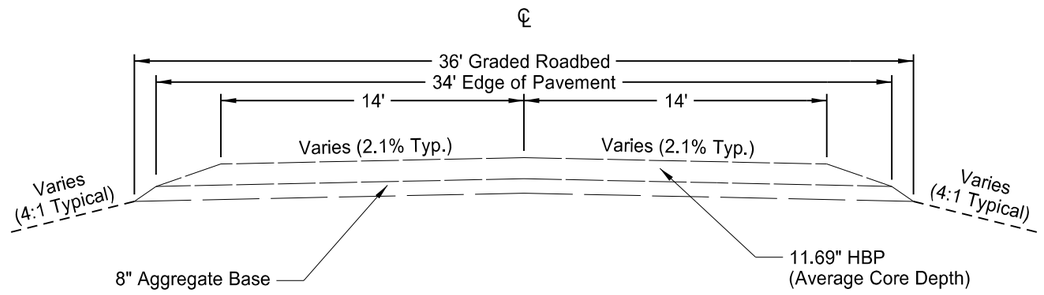
US Highway 281

Ditch Block Detail

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	30	1

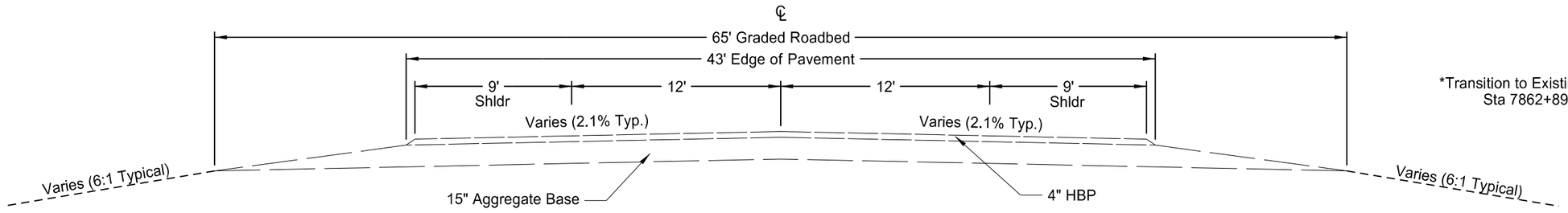
Note: Typical sections represent tangent sections. See cross sections (Section 200) and curve data tables (Section 20) for curves and curve transitions within these station ranges.

All HBP Slough 4:1 or Flatter



Existing Typical Section 1

Sta 7860+12.00 to 7860+52.00



*Transition to Existing Typical Section 3
Sta 7862+89.91 to 7865+23.18

Existing Typical Section 2

Sta 7860+52.00 to 7862+89.91
Sta 7879+51.68 to 7898+88.49

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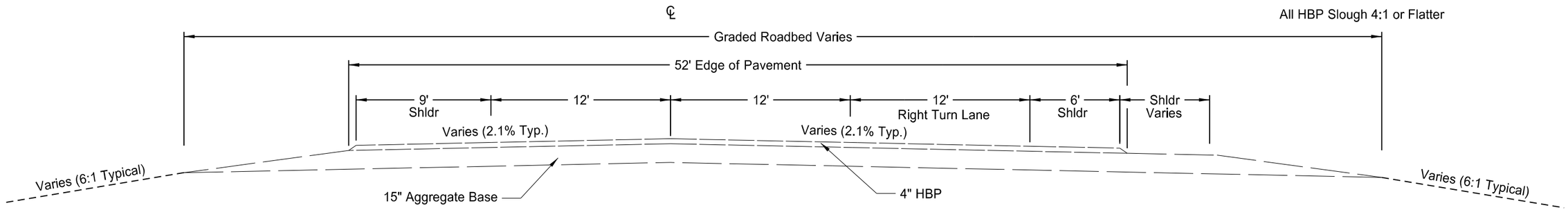
Existing Typical Sections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	30	2

Note: Typical sections represent tangent sections. See cross sections (Section 200) and curve data tables (Section 20) for curves and curve transitions within these station ranges.

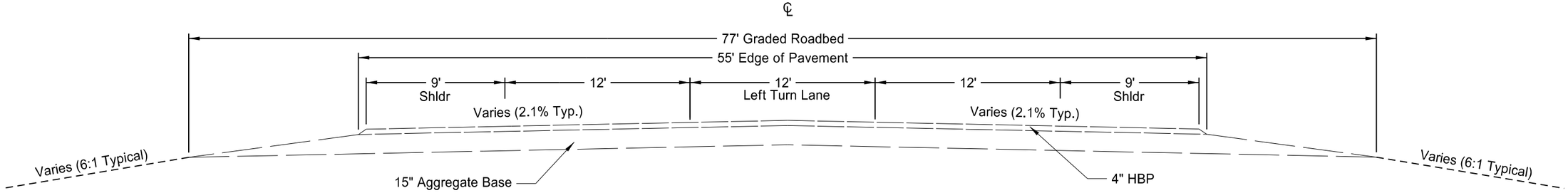
All HBP Slough 4:1 or Flatter



Existing Typical Section 3

Sta 7865+23.18 to 7868+00.00

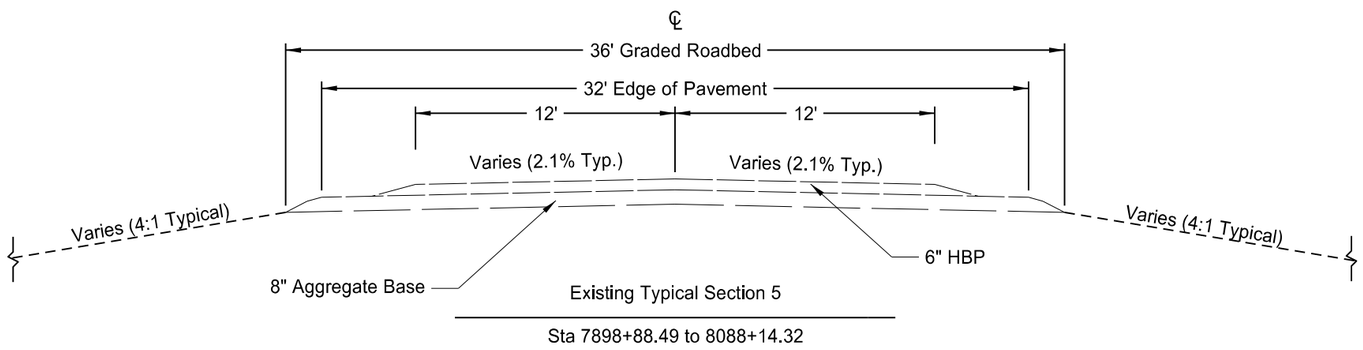
*Transition to Existing Typical Section 4
Sta 7868+00.00 to 7873+21.68



Existing Typical Section 4

Sta 7873+21.68 to 7875+71.68

*Transition to Existing Typical Section 2
Sta 7875+71.68 to 7879+51.68



Existing Typical Section 5

Sta 7898+88.49 to 8088+14.32

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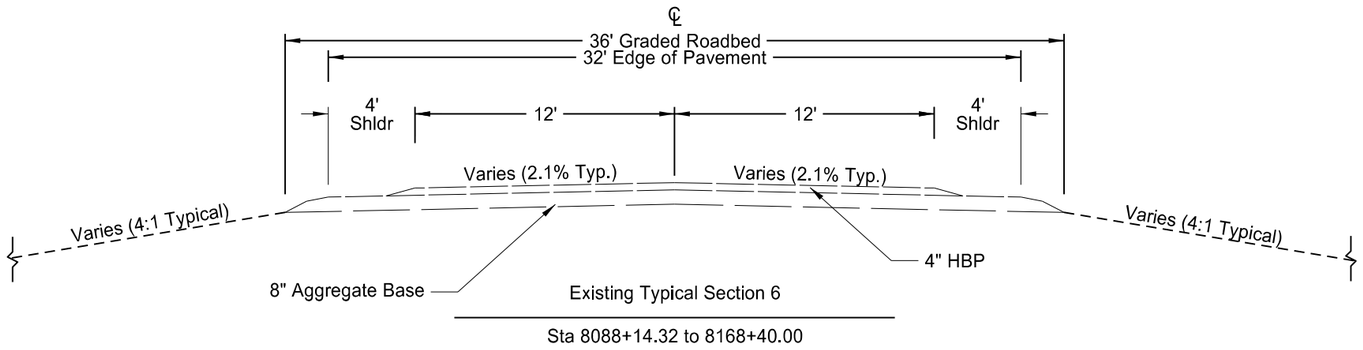
US Highway 281

Existing Typical Sections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	30	3

Note: Typical sections represent tangent sections. See cross sections (Section 200) and curve data tables (Section 20) for curves and curve transitions within these station ranges.

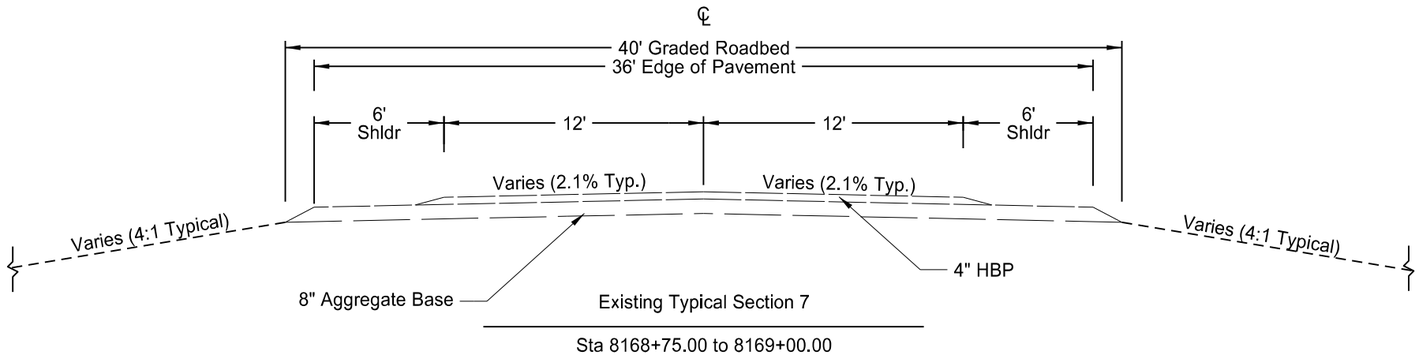
All HBP Slough 4:1 or Flatter



Existing Typical Section 6

Sta 8088+14.32 to 8168+40.00

*Transition to Existing Typical Section 7
Sta 8168+40.00 to 8168+75.00



Existing Typical Section 7

Sta 8168+75.00 to 8169+00.00

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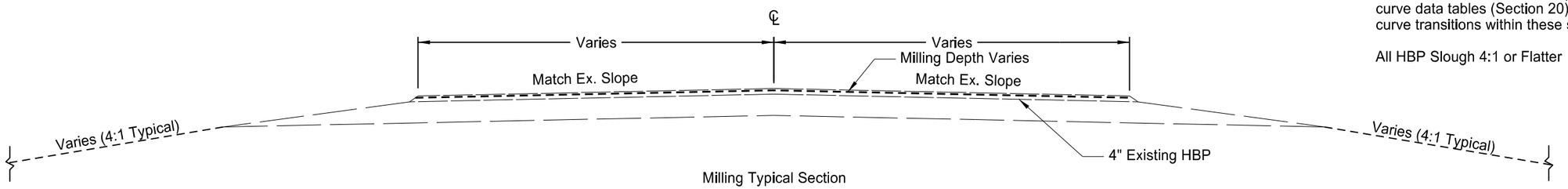
US Highway 281

Proposed Typical Sections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	30	4

Note: Typical sections represent tangent sections. See cross sections (Section 200) and curve data tables (Section 20) for curves and curve transitions within these station ranges.

All HBP Slough 4:1 or Flatter



Milling Typical Section

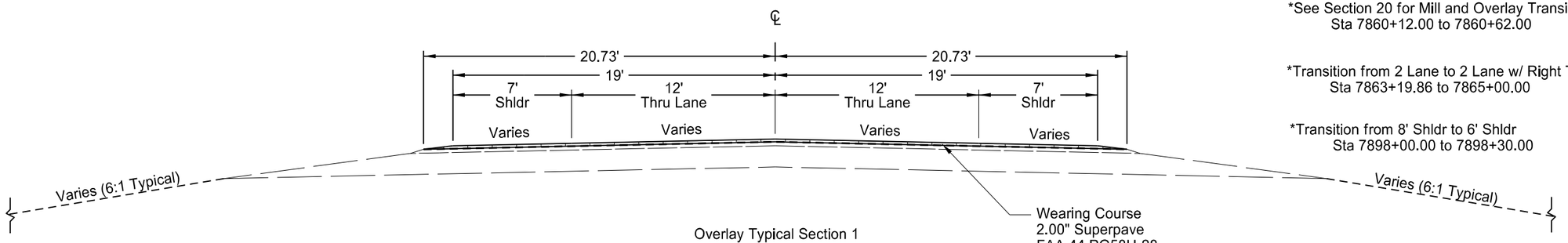
See Section 40 for Milling Locations

*See Section 20 for Mill & Overlay Transition

*See Section 20 for Mill and Overlay Transition
Sta 7860+12.00 to 7860+62.00

*Transition from 2 Lane to 2 Lane w/ Right Turn Lane
Sta 7863+19.86 to 7865+00.00

*Transition from 8' Shldr to 6' Shldr
Sta 7898+00.00 to 7898+30.00



Overlay Typical Section 1
2 Lane

Sta 7860+87.00 to 7863+19.86
Sta 7885+21.82 to 7898+00.00

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US Highway 281

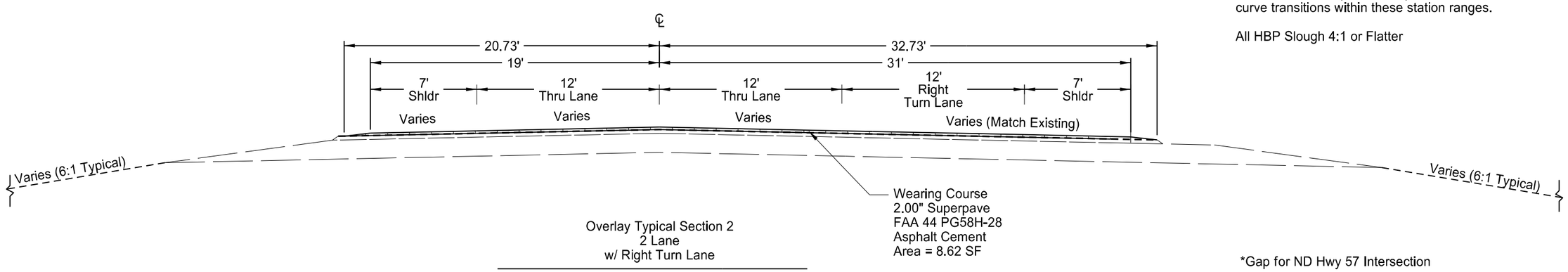
Milling Typical Section
Proposed Typical Sections

8/28/2017 15:05:11 mhuettl c:\pwworking\central01\dms26485\030TP_004_PCN21506.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	30	5

Note: Typical sections represent tangent sections. See cross sections (Section 200) and curve data tables (Section 20) for curves and curve transitions within these station ranges.

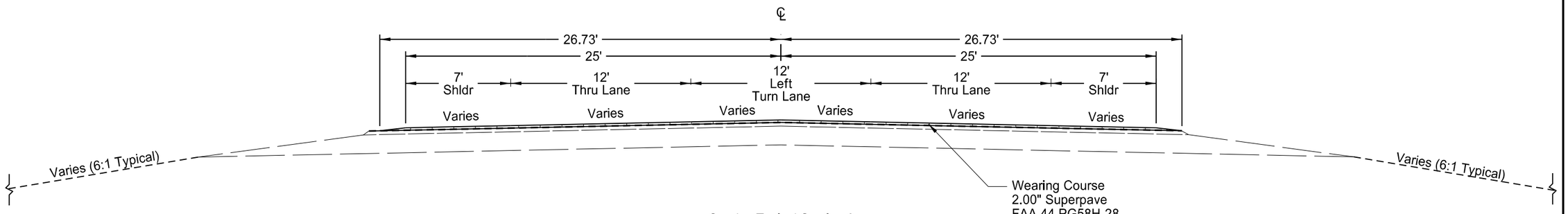
All HBP Slough 4:1 or Flatter



Overlay Typical Section 2
2 Lane
w/ Right Turn Lane

Sta 7865+00.00 to 7868+04.72

*Gap for ND Hwy 57 Intersection



Overlay Typical Section 3
2 Lane
w/ Left Turn Lane

Sta 7873+21.68 to 7876+75.00

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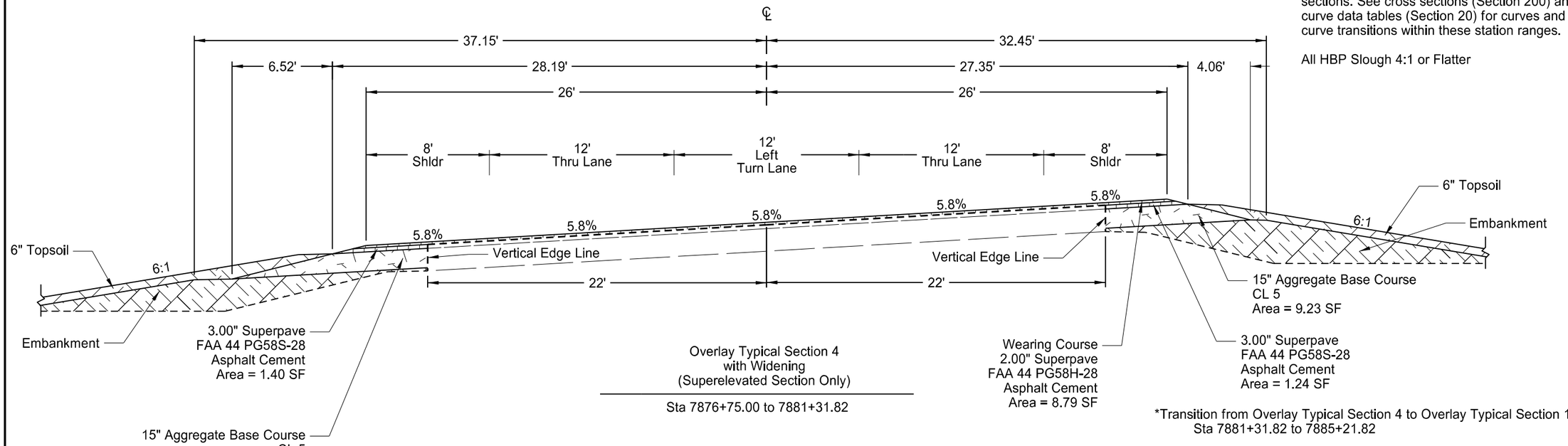
US Highway 281

Proposed Typical Sections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	30	6

Note: Typical sections represent tangent sections. See cross sections (Section 200) and curve data tables (Section 20) for curves and curve transitions within these station ranges.

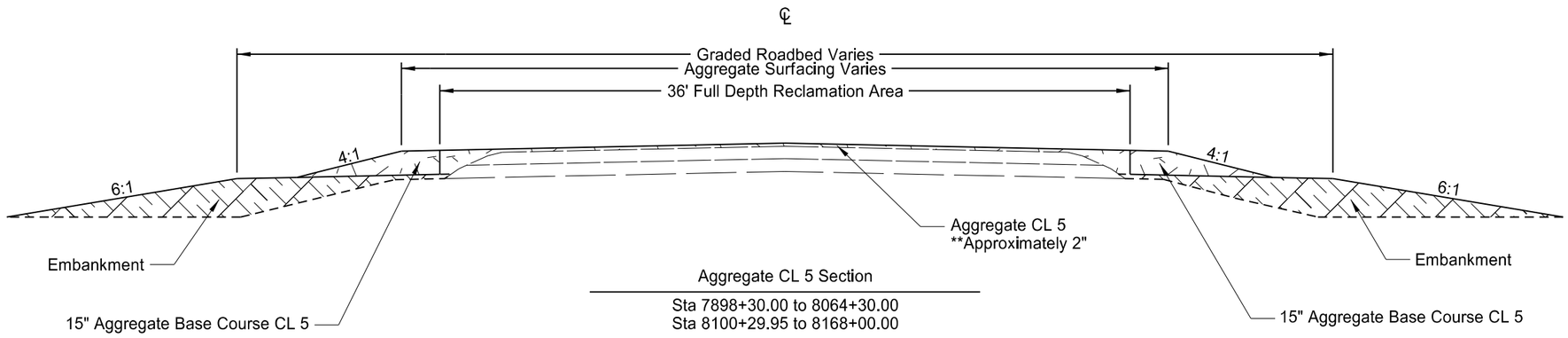
All HBP Slough 4:1 or Flatter



Overlay Typical Section 4
with Widening
(Superelevated Section Only)

Sta 7876+75.00 to 7881+31.82

*Transition from Overlay Typical Section 4 to Overlay Typical Section 1
Sta 7881+31.82 to 7885+21.82



Aggregate CL 5 Section

Sta 7898+30.00 to 8064+30.00
Sta 8100+29.95 to 8168+00.00

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US Highway 281

Proposed Typical Sections

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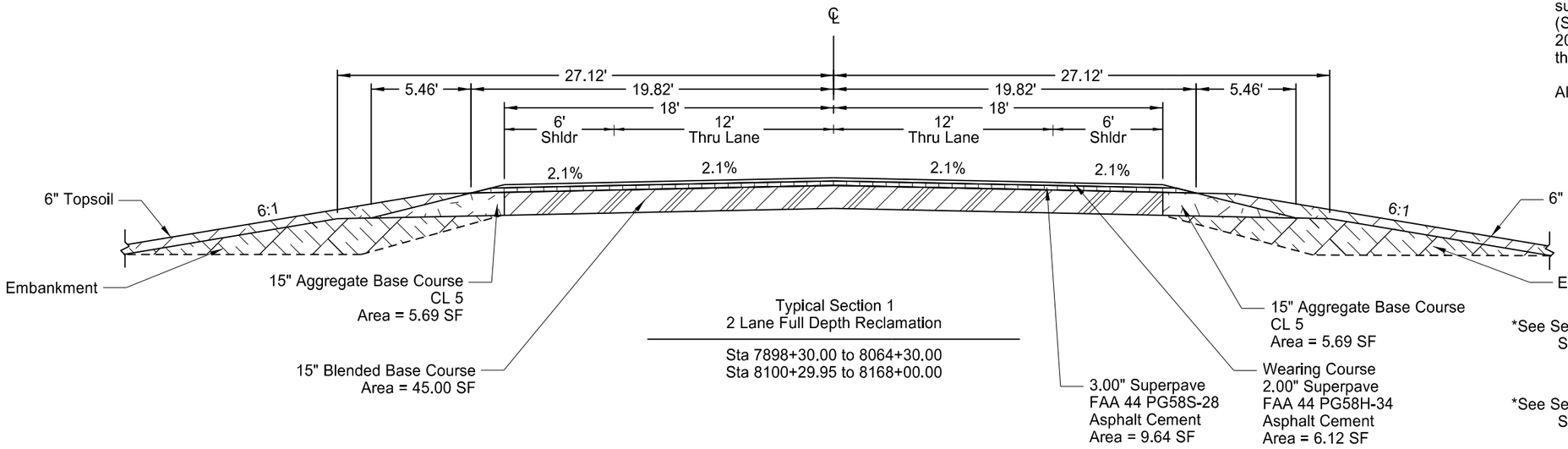
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	30	7

Note: Typical sections represent fully superelevated sections. See cross sections (Section 200) and curve data tables (Section 20) for curves and curve transitions within these station ranges.

All HBP Slough 4:1 or Flatter

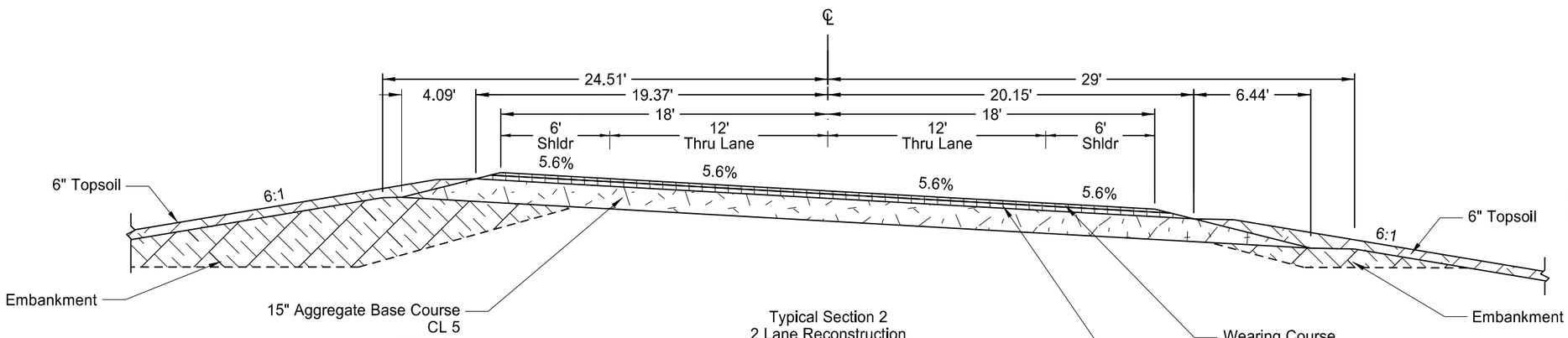


Typical Section 1
2 Lane Full Depth Reclamation

Sta 7898+30.00 to 8064+30.00
Sta 8100+29.95 to 8168+00.00

*See Section 20 for Mill and Overlay Transition
Sta 8168+75.00 to 8169+00.00

*See Section 20 for Shoulder Transition
Sta 8168+00.00 to 8169+00.00



Typical Section 2
2 Lane Reconstruction

Sta 8064+30.00 to 8072+22.34
Sta 8092+65.95 to 8100+29.95

*Transition from 2 Lane Reconstruction to 2 Lane Reconstruction w/ Left Turn Lane
Sta 8072+22.34 to 8076+12.34

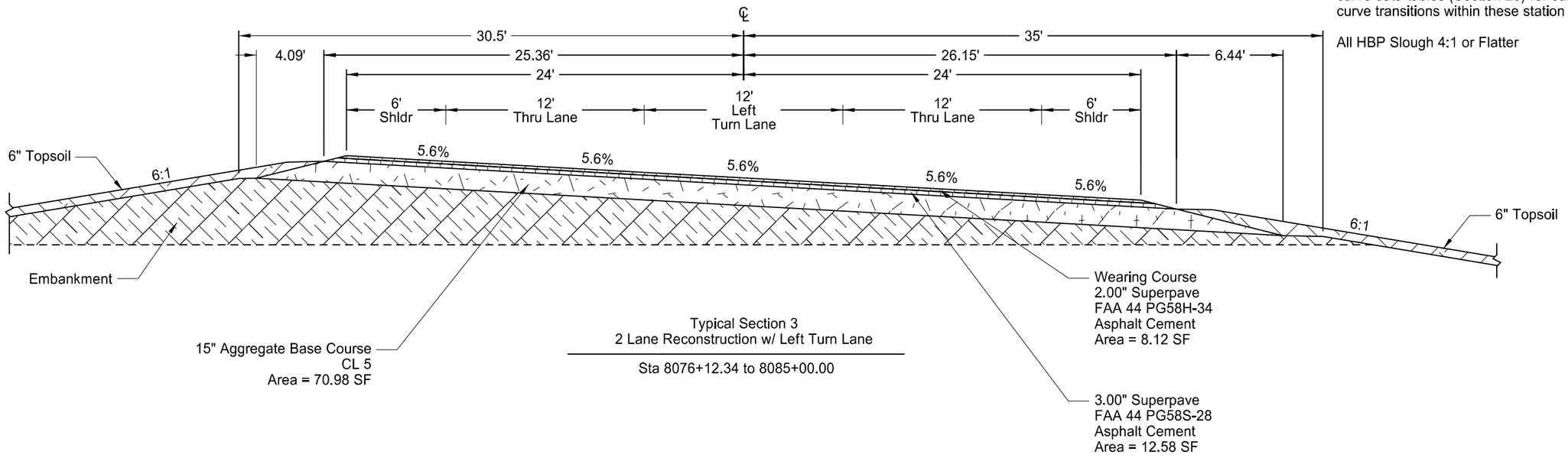
US Highway 281

Proposed Typical Sections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	30	8

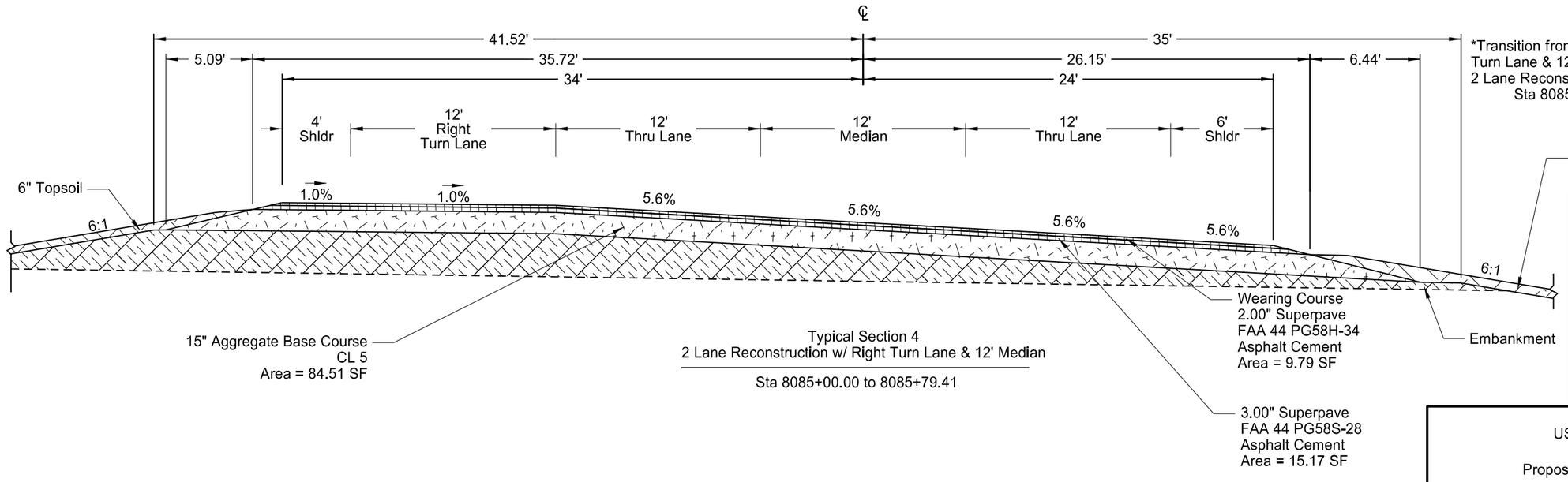
Note: Typical sections represent tangent sections. See cross sections (Section 200) and curve data tables (Section 20) for curves and curve transitions within these station ranges.

All HBP Slough 4:1 or Flatter



Typical Section 3
2 Lane Reconstruction w/ Left Turn Lane

Sta 8076+12.34 to 8085+00.00



Typical Section 4
2 Lane Reconstruction w/ Right Turn Lane & 12' Median

Sta 8085+00.00 to 8085+79.41

*Transition from 2 Lane Reconstruction w/ Right Turn Lane & 12' Median to 2 Lane Reconstruction w/ Right Turn Lane
Sta 8085+79.41 to 8089+69.41

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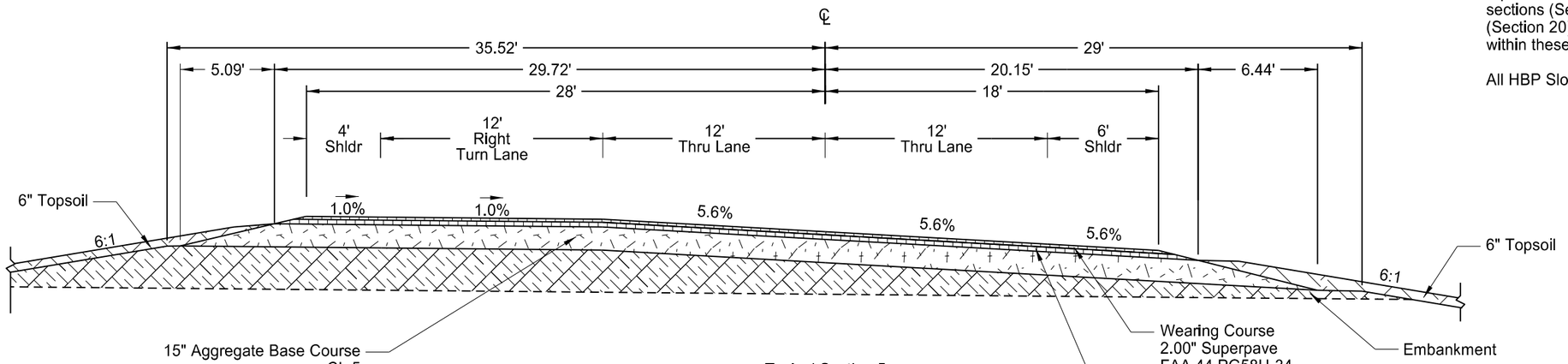
US Highway 281

Proposed typical Sections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	30	9

Note: Typical section 5 represents fully superelevated sections; typical section 6 represents tangent sections. See cross sections (Section 200) and curve data tables (Section 20) for curves and curve transitions within these station ranges.

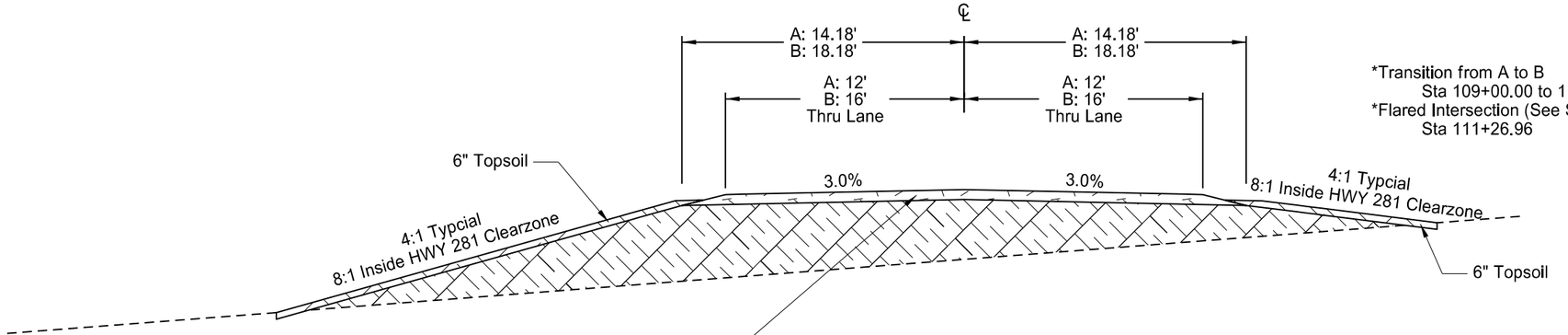
All HBP Slough 4:1 or Flatter



Typical Section 5
2 Lane Reconstruction w/ Right Turn Lane

Sta 8089+69.41 to 8090+85.95

*Transition form 2 Lane Reconstruction w/ Right Turn Lane to 2 Lane Reconstruction
Sta 8090+85.95 to 8092+65.95



Typical Section 6
Country Route 29

A: Sta 102+25.00 to 109+00.00
B: Sta 111+00.00 to 111+26.96

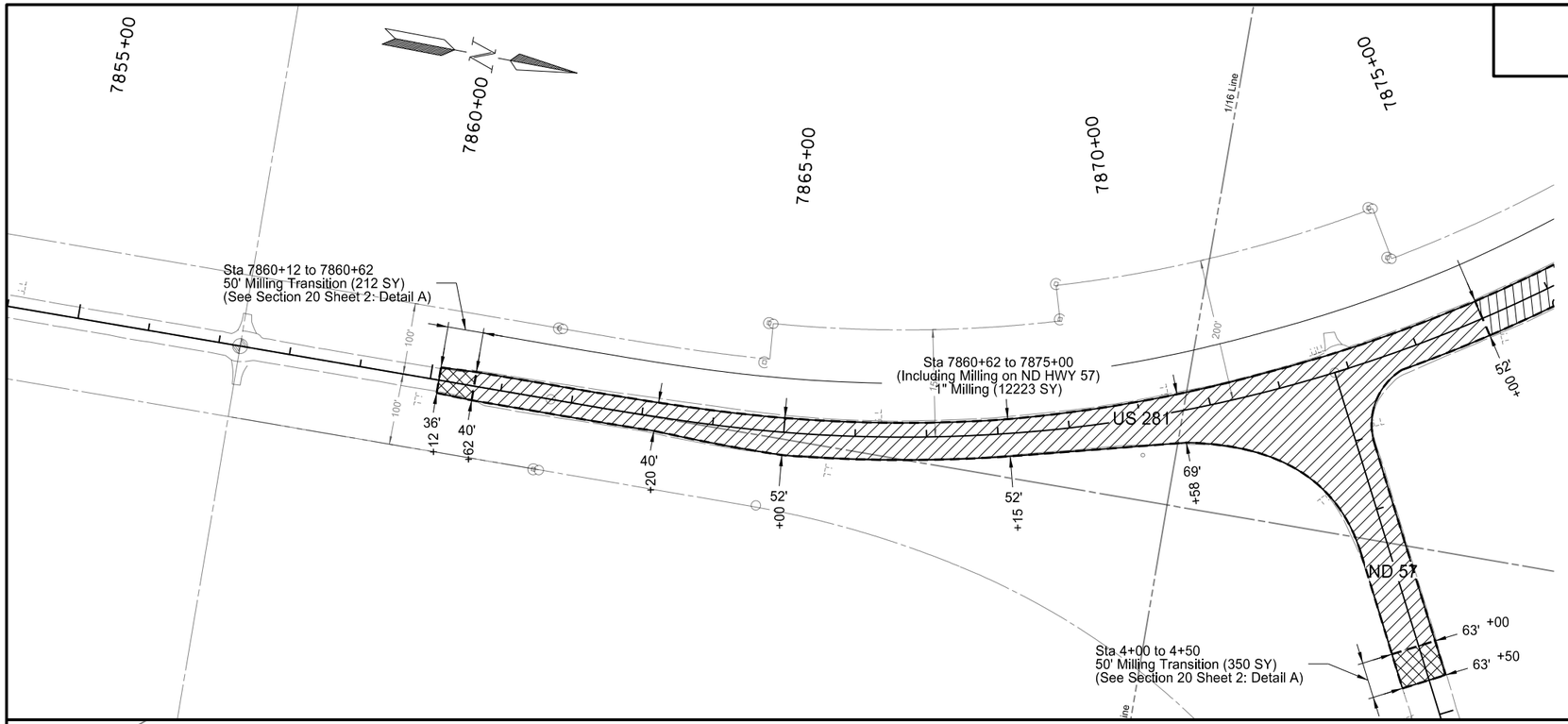
*Transition from A to B
Sta 109+00.00 to 111+00.00
*Flared Intersection (See Standard Drawing D-203-6)
Sta 111+26.96

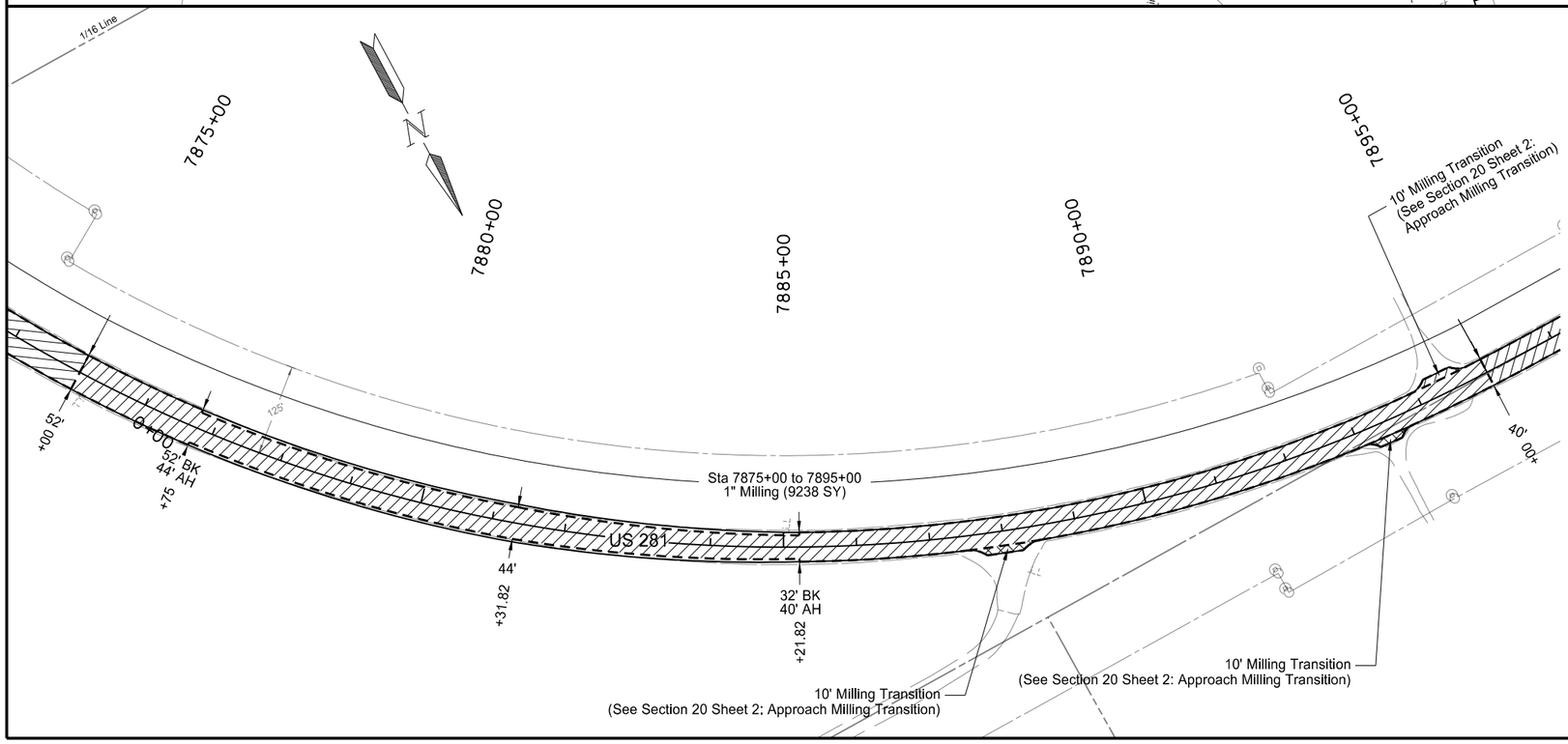
US Highway 281

Proposed Typical Sections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	40	1

SPEC	CODE	BID ITEM	QTY	UNIT
411	0105	MILLING PAVEMENT SURFACE		
		Sta 7860+12 to 7860+62	212	SY
		Sta 7860+62 to 7875+00	12,223	SY
		Sta 7875+00 to 7895+00	9,238	SY
		Sta 4+00 to 4+50	350	SY





LEGEND

REMOVE — Remove Aggregate Base & Surfacing

Mill Asphalt Pavement

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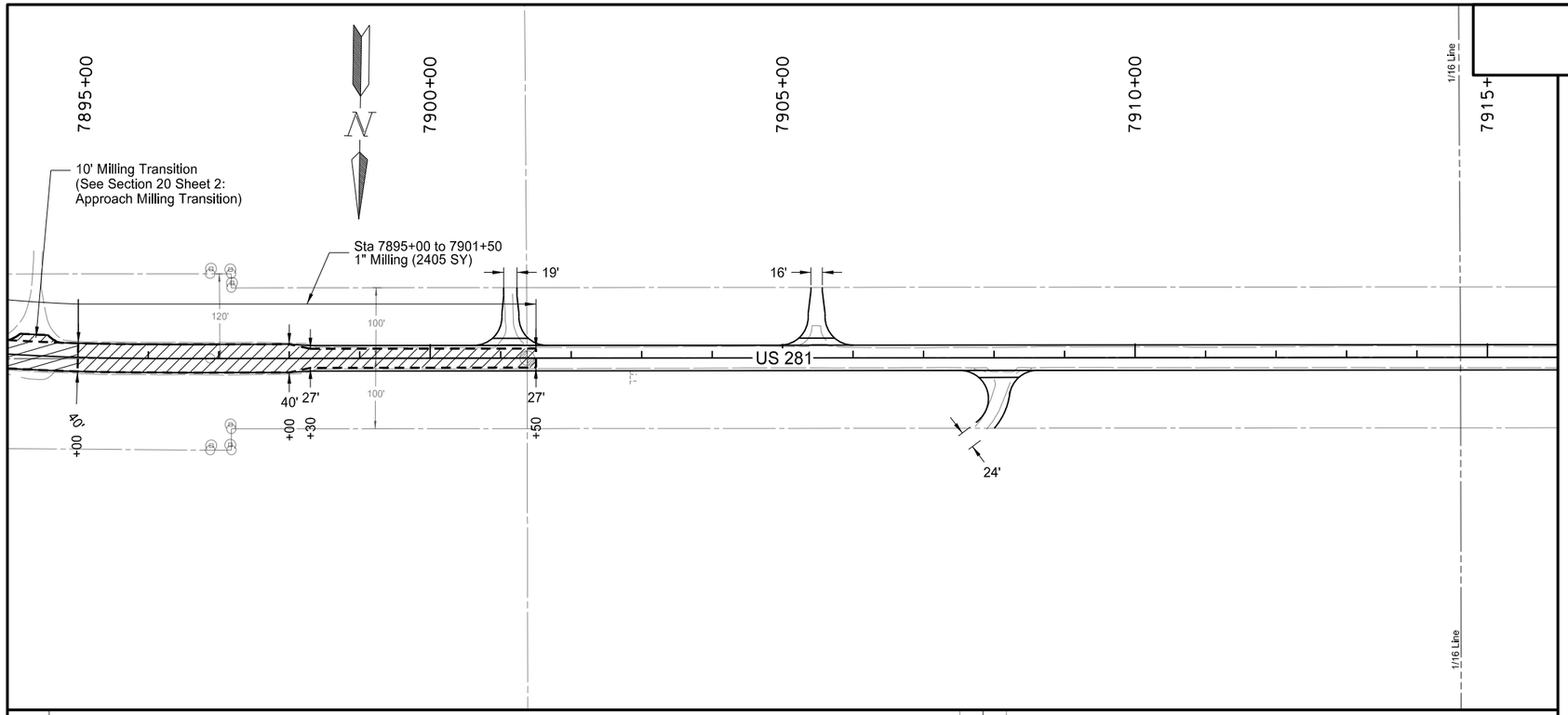
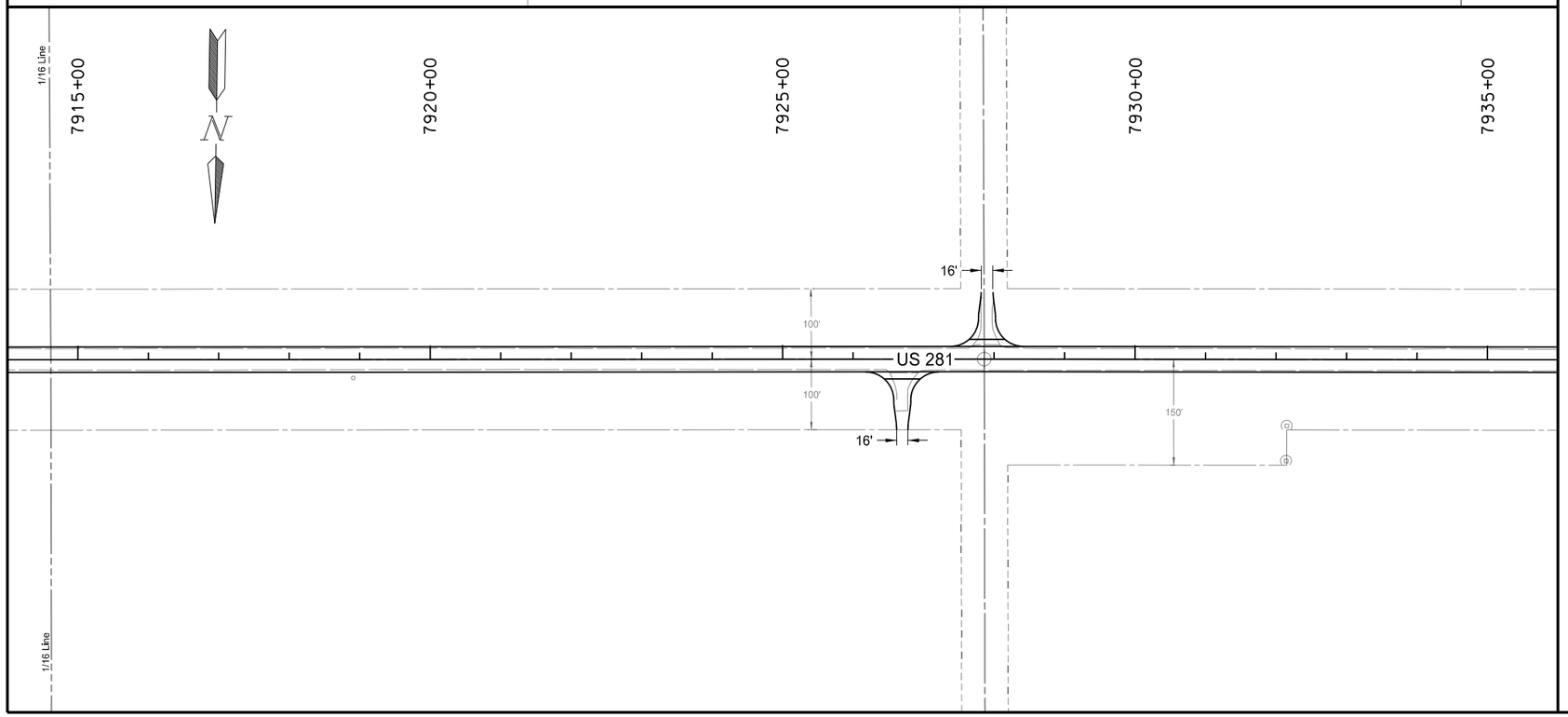
US Highway 281

Removal & Milling Detail

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	40	2





SPEC	CODE	BID ITEM	QTY	UNIT
411	0105	MILLING PAVEMENT SURFACE		
		Sta 7895+00 to 7901+50	2,405	SY

LEGEND

Remove Aggregate Base & Surfacing

Mill Asphalt Pavement

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US Highway 281

Removal & Milling Detail

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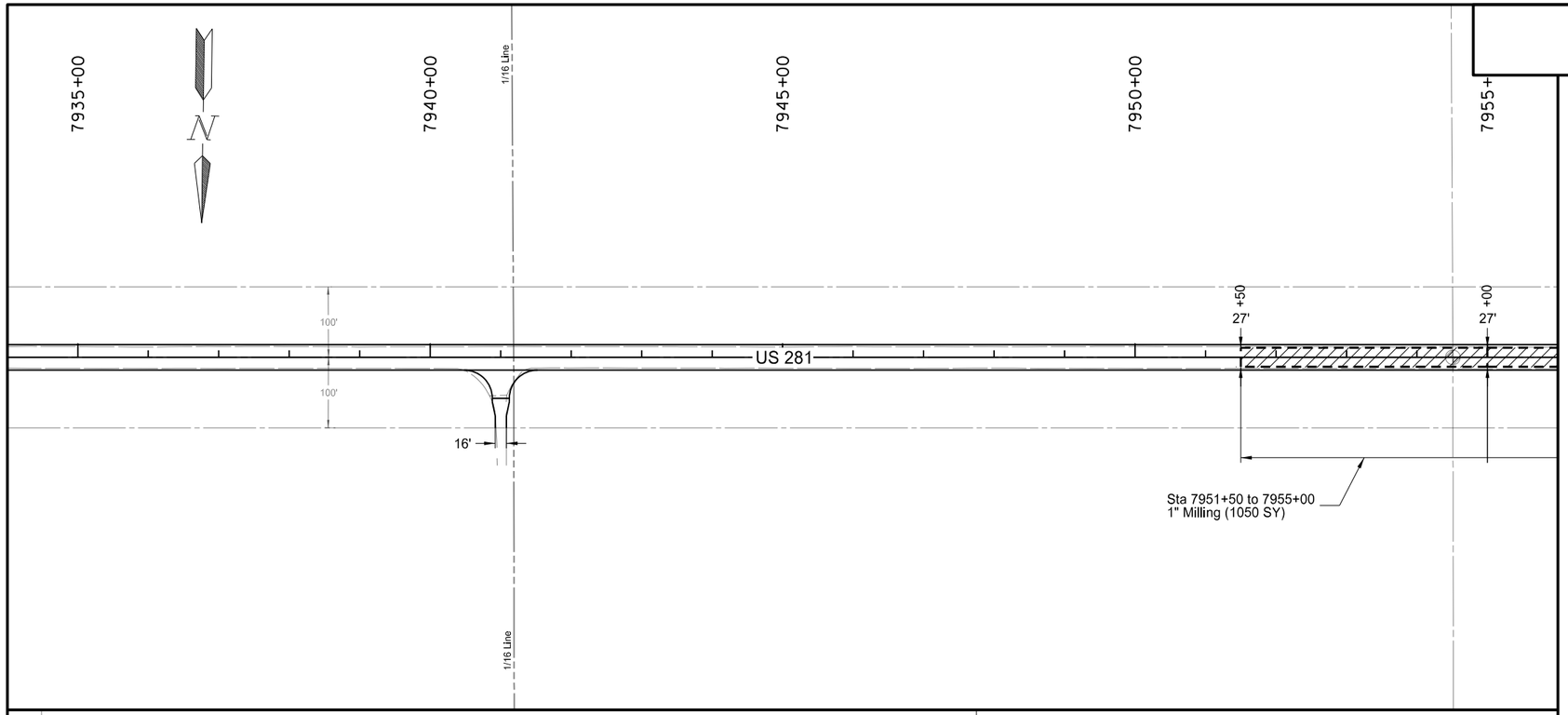
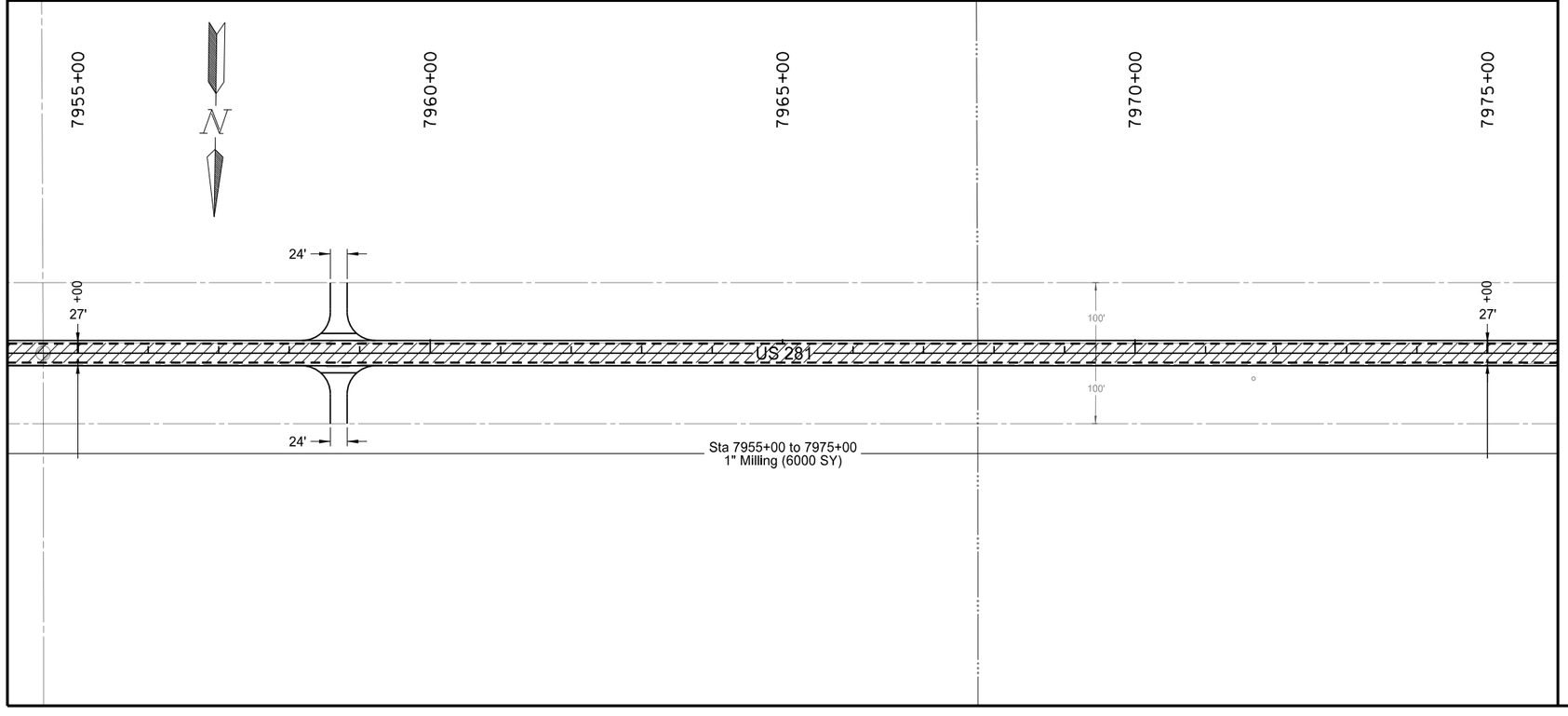
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	40	3





SPEC	CODE	BID ITEM	QTY	UNIT
411	0105	MILLING PAVEMENT SURFACE		
		Sta 7951+50 to 7955+00	1,050	SY
		Sta 7955+00 to 7975+00	6,000	SY

LEGEND

REMOVE — Remove Aggregate Base & Surfacing

Mill Asphalt Pavement

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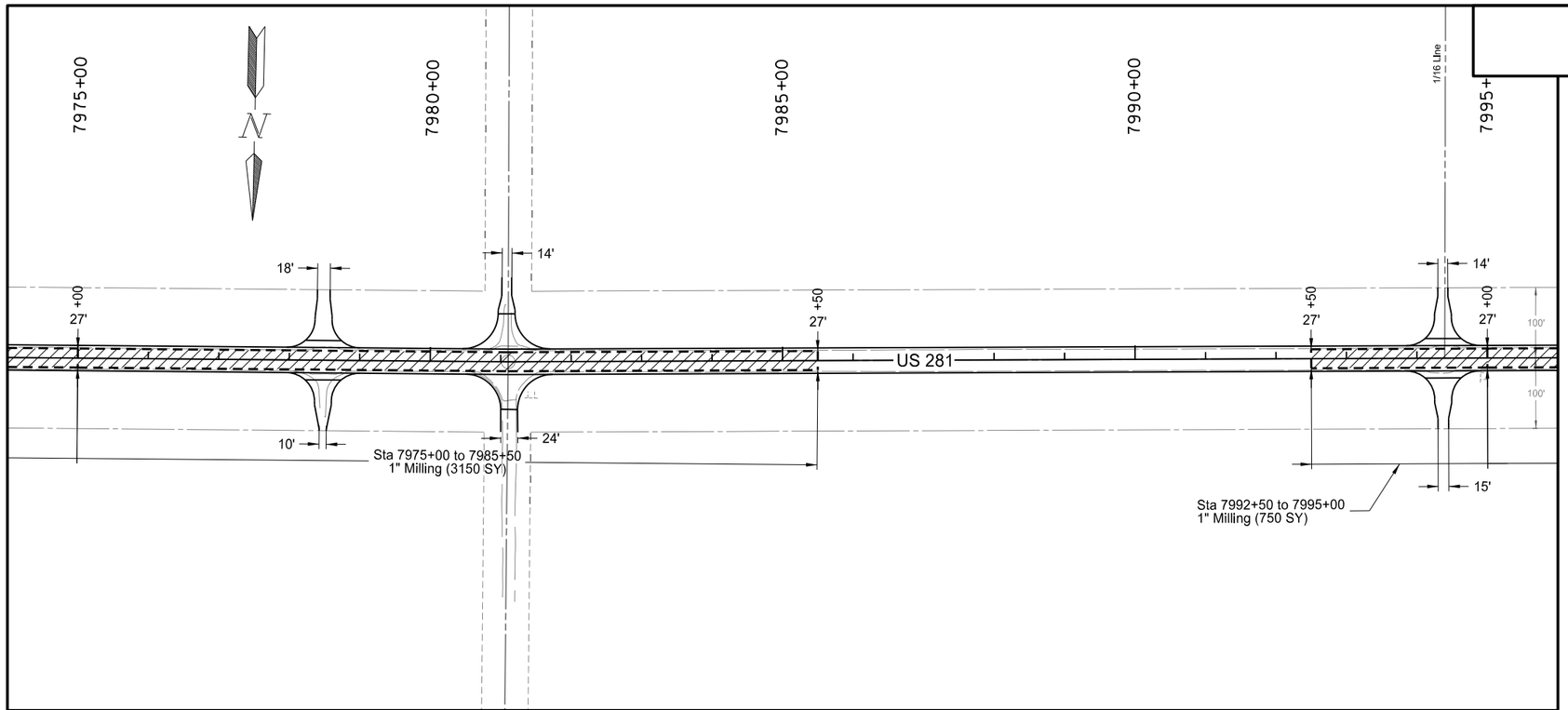
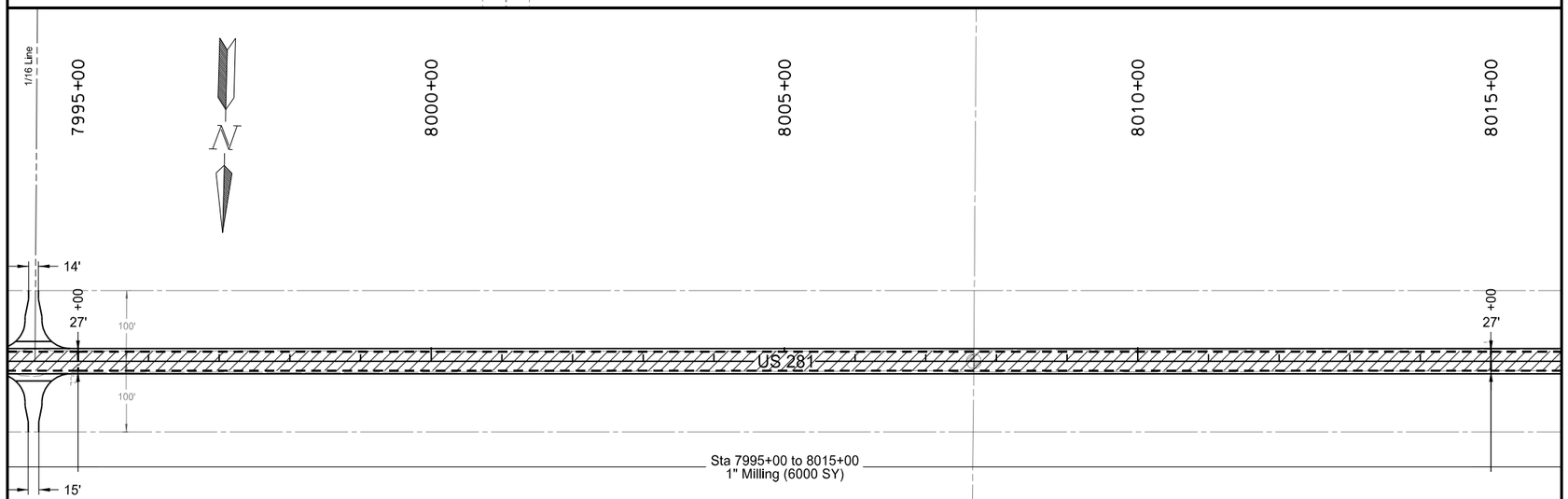
US Highway 281

Removal & Milling Detail

8/14/2017 5:24:13 PM dbergers c:\pwworking\central01\dms26485\040RM_003_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	40	4





SPEC	CODE	BID ITEM	QTY	UNIT
411	0105	MILLING PAVEMENT SURFACE		
		Sta 7975+00 to 7985+50	3,150	SY
		Sta 7992+50 to 7995+00	750	SY
		Sta 7995+00 to 8015+00	6,000	SY

LEGEND

REMOVE / REMOVE — Remove Aggregate Base & Surfacing

Mill Asphalt Pavement

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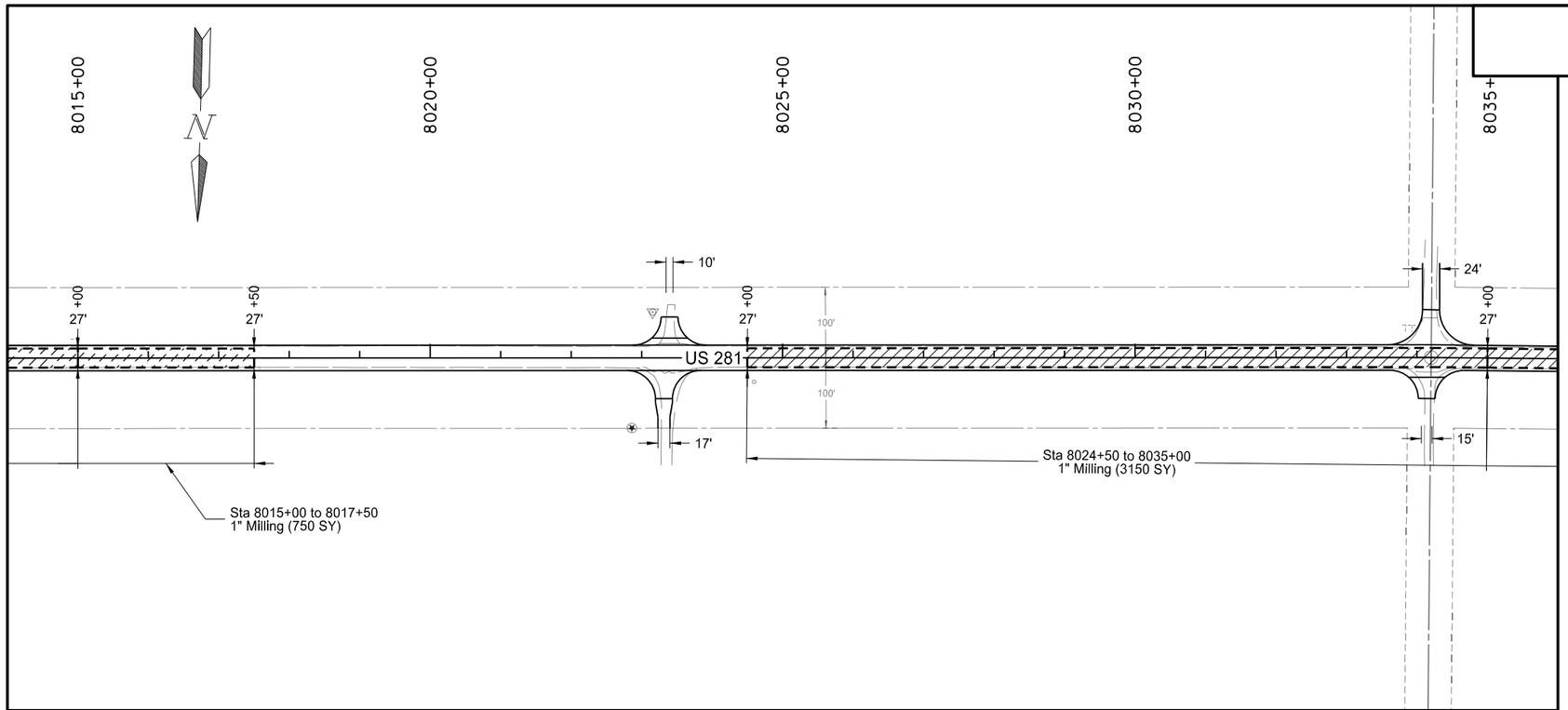
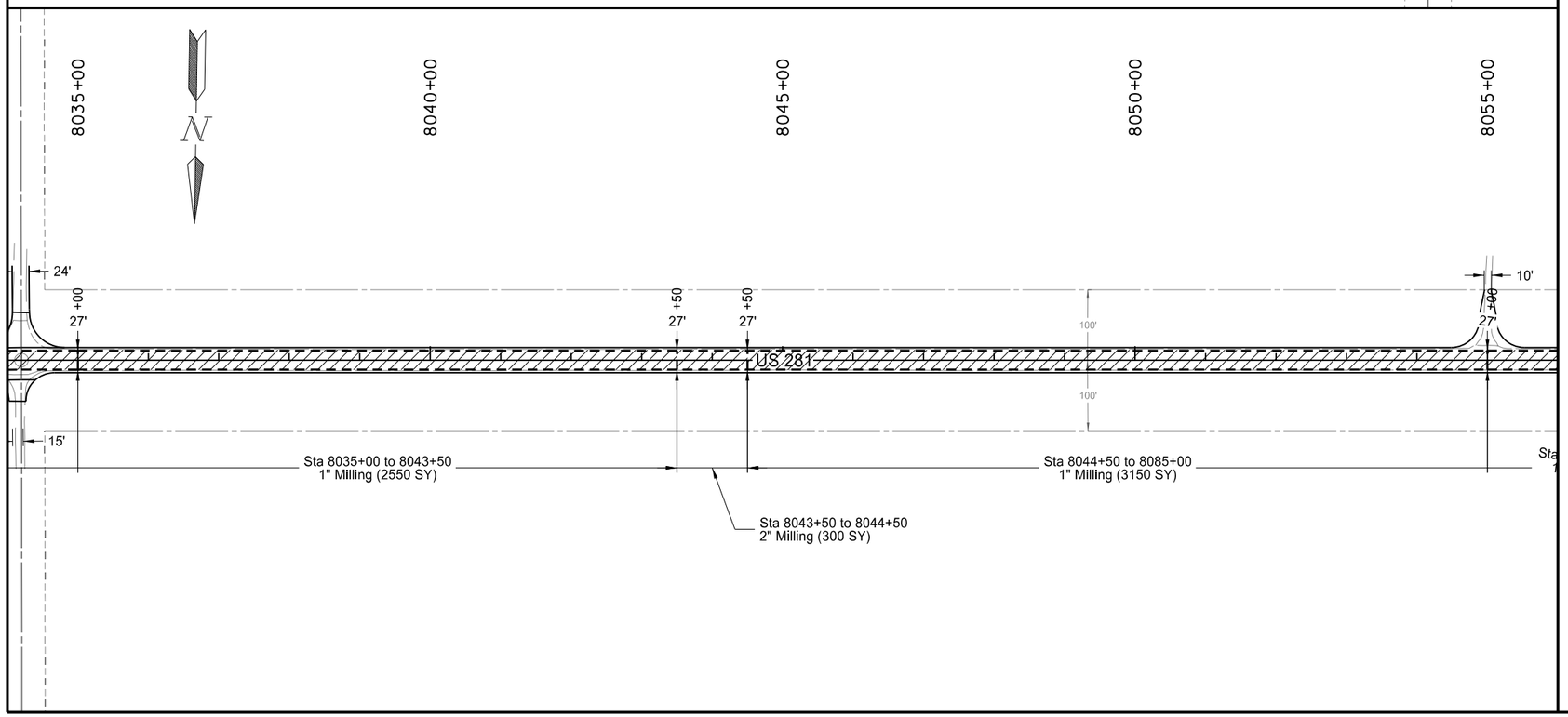
US Highway 281

Removal & Milling Detail

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	40	5





SPEC	CODE	BID ITEM	QTY	UNIT
411	0105	MILLING PAVEMENT SURFACE		
		Sta 8015+00 to 8017+50	750	SY
		Sta 8024+50 to 8035+00	3,150	SY
		Sta 8035+00 to 8043+50	2,550	SY
		Sta 8043+50 to 8044+50	300	SY
		Sta 8044+50 to 8085+00	3,150	SY

LEGEND

REMOVE / REMOVE — Remove Aggregate Base & Surfacing

Mill Asphalt Pavement

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US Highway 281

Removal & Milling Detail

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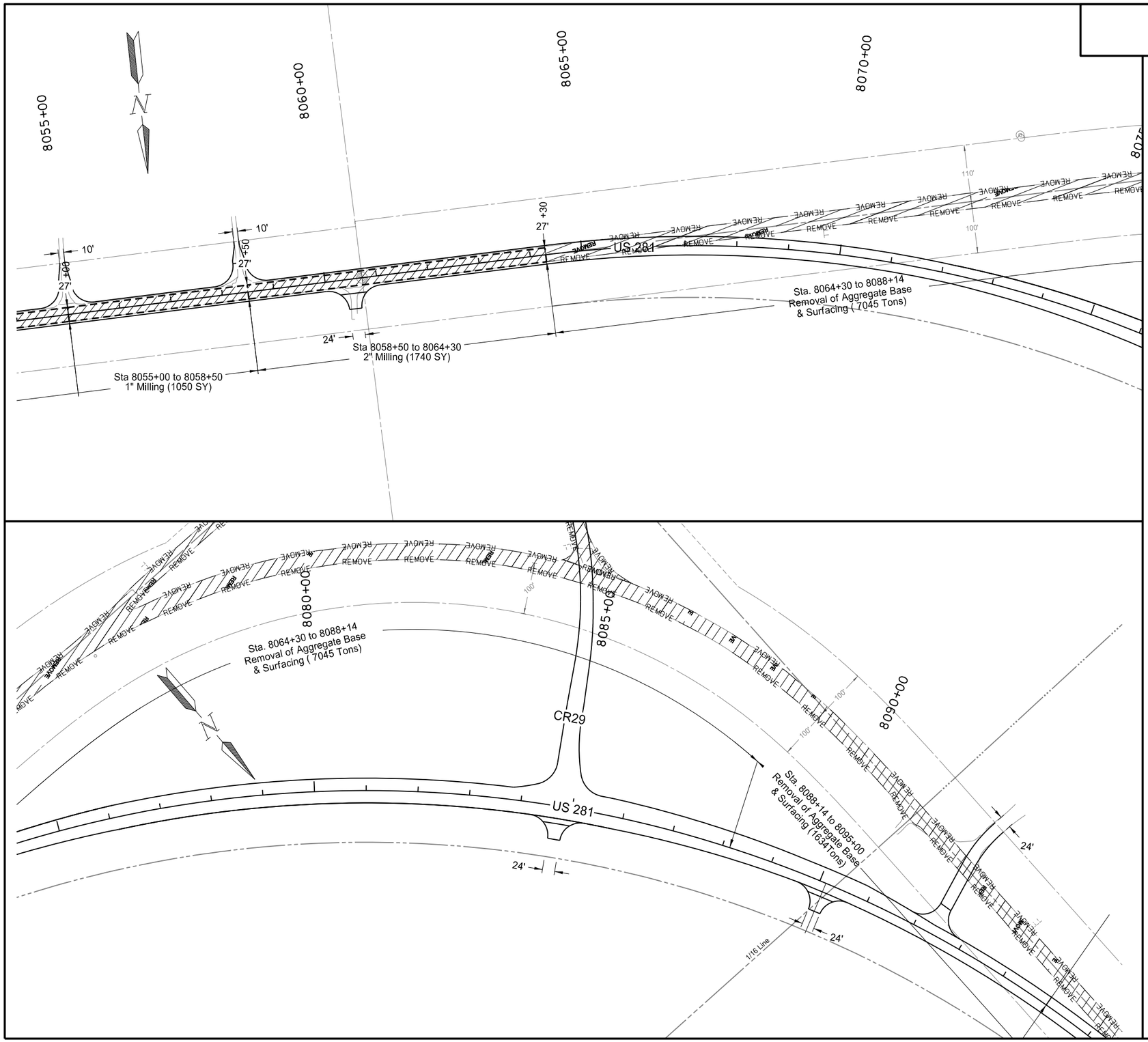
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	40	6

SPEC	CODE	BID ITEM	QTY	UNIT
411	0105	MILLING PAVEMENT SURFACE		
		Sta 8055+00 to 8058+50	1,050	SY
		Sta 8058+50 to 8064+30	1,740	SY
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		US Highway 281 Sta 8064+30 to 8088+14	7,045	TON
		US Highway 281 Sta 8088+14 to 8095+00	1,634	TON



LEGEND

REMOVE — Remove Aggregate Base & Surfacing

Mill Asphalt Pavement

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US Highway 281

Removal & Milling Detail

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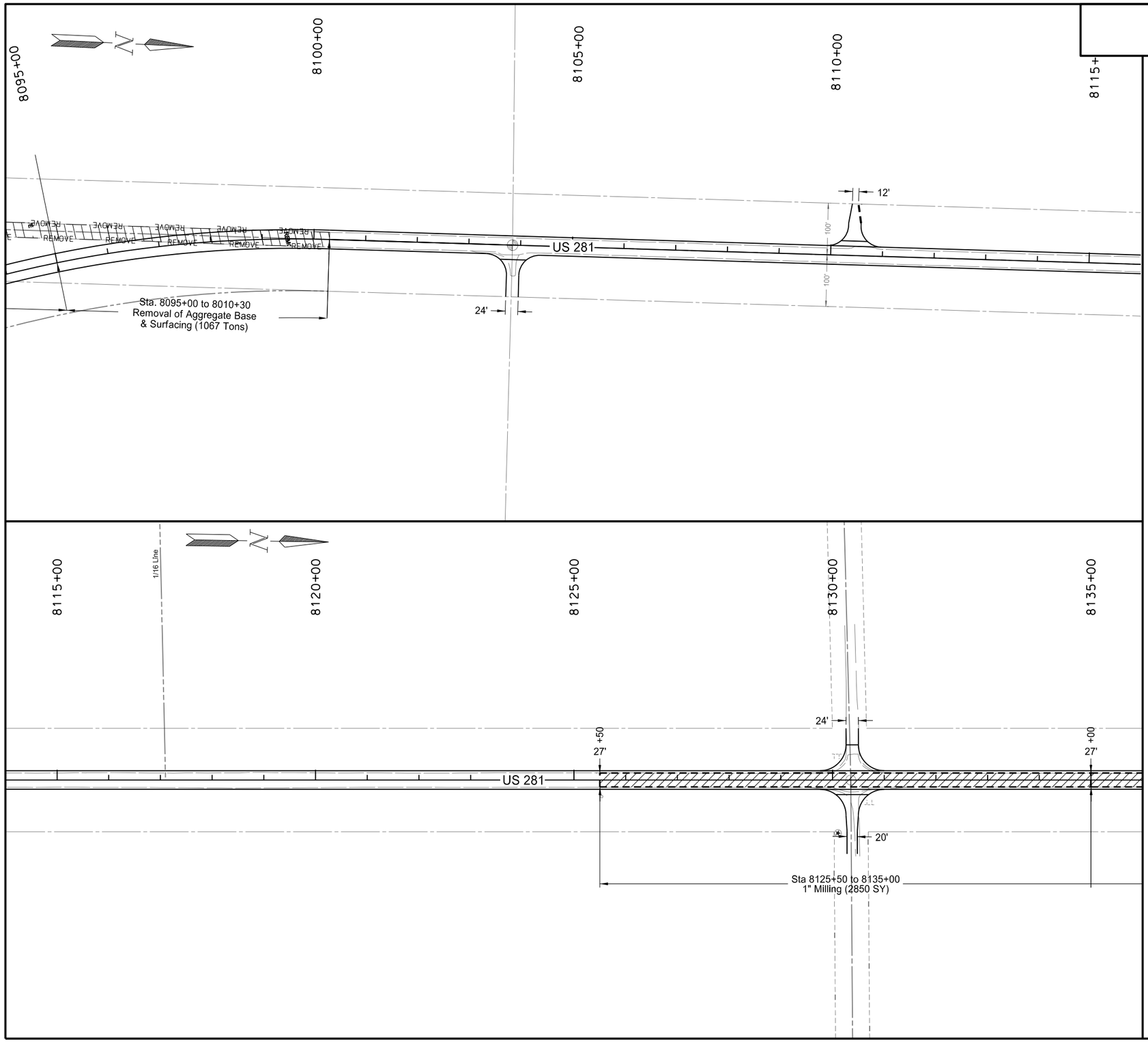
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	40	7



SPEC	CODE	BID ITEM	QTY	UNIT
411	0105	MILLING PAVEMENT SURFACE		
		Sta 8125+50 to 8135+00	2,850	SY
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		US Highway 281 Sta 8095+00 to 8110+30	1,067	TON

LEGEND

REMOVE — Remove Aggregate Base & Surfacing

Mill Asphalt Pavement

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US Highway 281

Removal & Milling Detail

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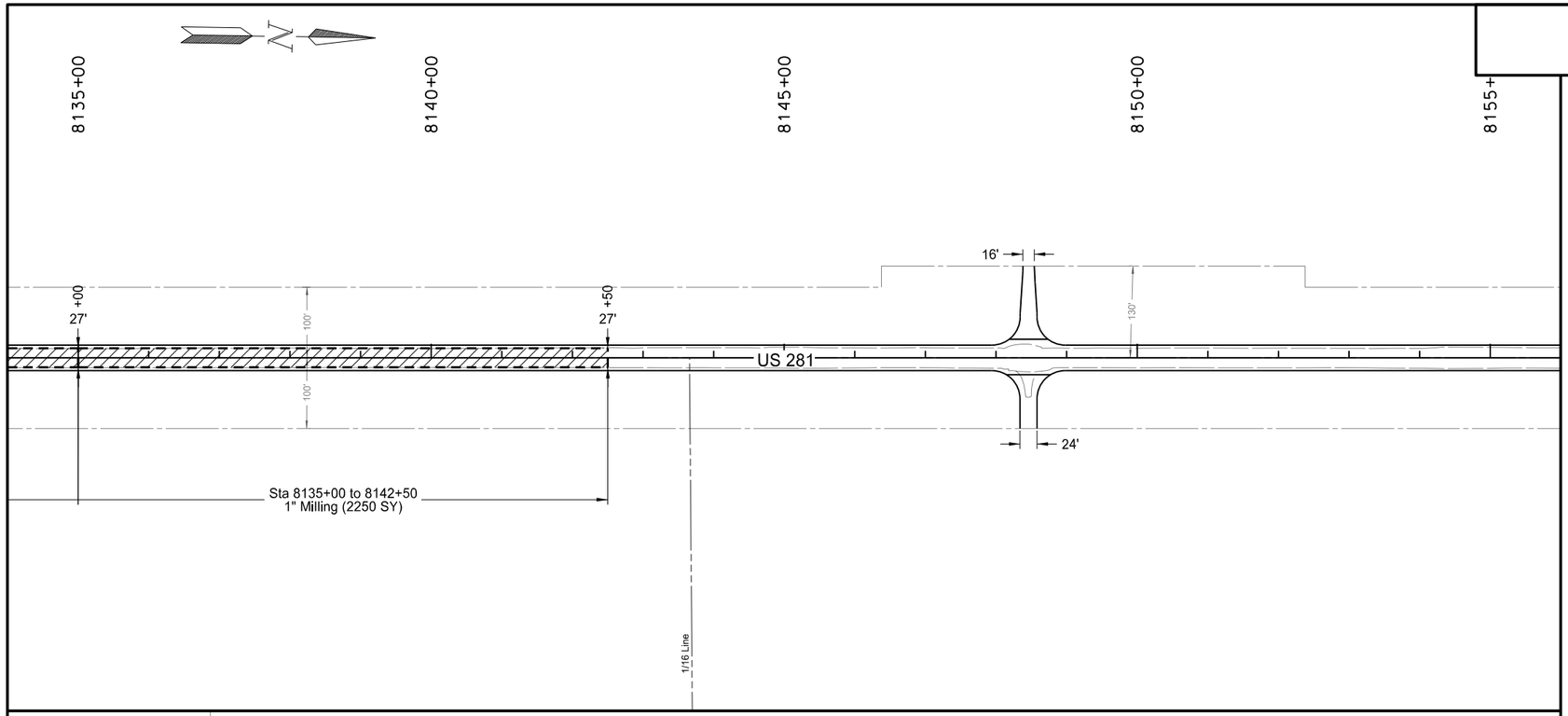
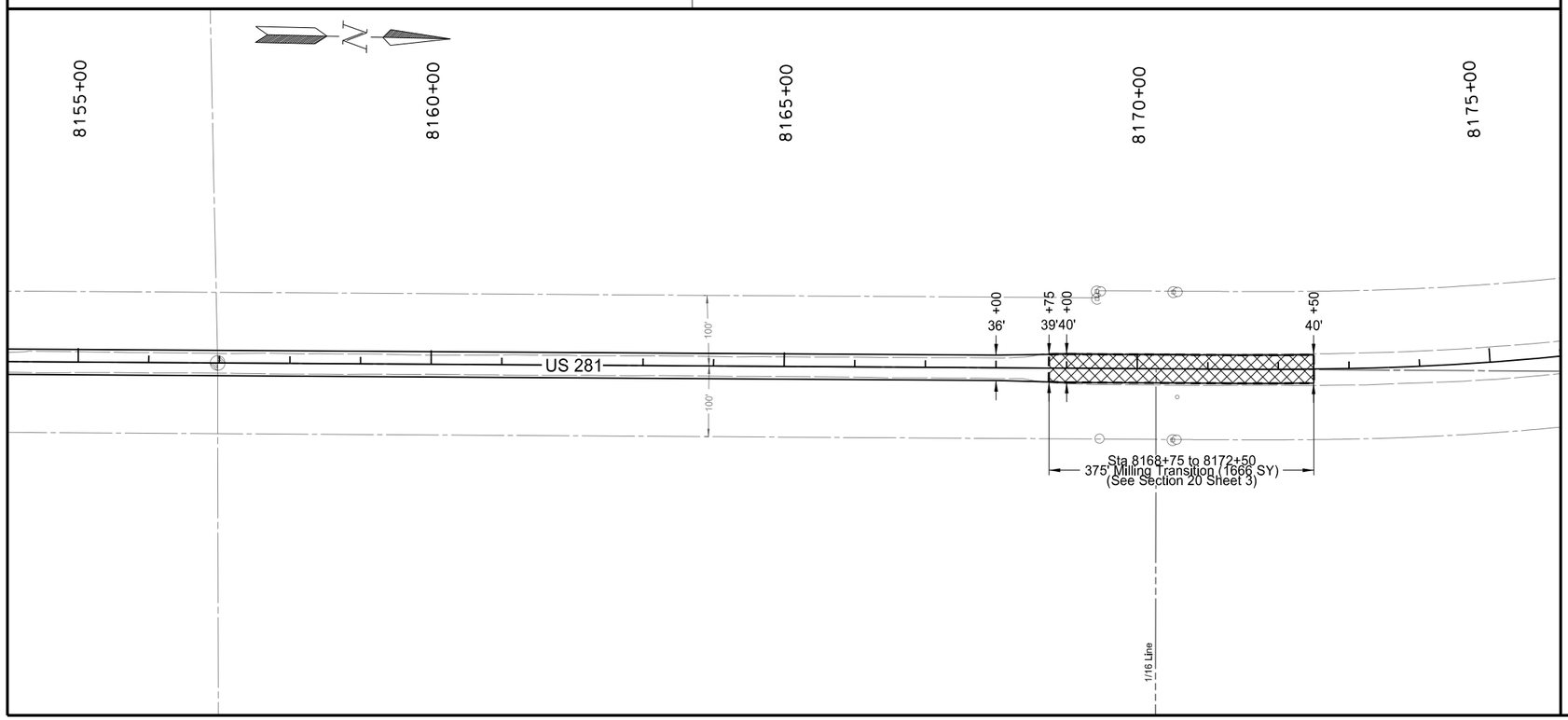
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	40	8





SPEC	CODE	BID ITEM	QTY	UNIT
411	0105	MILLING PAVEMENT SURFACE		
		Sta 8135+00 to 8142+50	2,250	SY
		Sta 8168+75 to 8172+50	1,666	SY

LEGEND

REMOVE / REMOVE — Remove Aggregate Base & Surfacing

Mill Asphalt Pavement

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US Highway 281

Removal & Milling Detail

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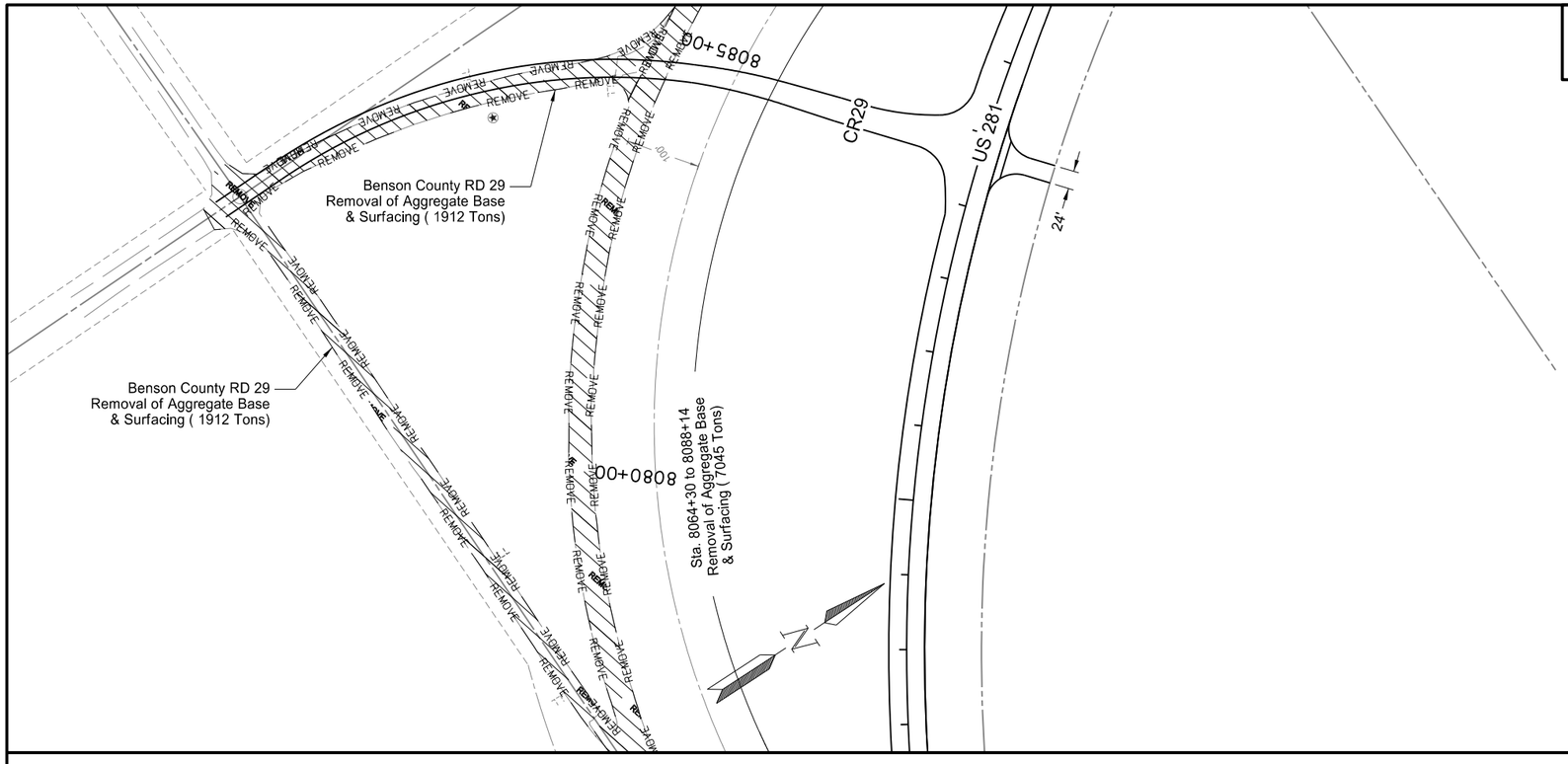
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	40	9



SPEC	CODE	BID ITEM	QTY	UNIT
202	0021	REMOVE AGGREGATE BASE & SURFACING		
		Benson County RD 29	1,912	TON

LEGEND

REMOVE — Remove Aggregate Base & Surfacing

Mill Asphalt Pavement

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Benson County RD 29

Removal & Milling Detail

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	50	1

HYDRAULIC DATA FOR PROJECT NH-3-281(130)148 (A)									
STATION	EXISTING PIPE SIZE / TYPE	PROPOSED PIPE SIZE	DRAINAGE AREA (ACRES)	25-YEAR DATA				100-YEAR DATA	
				DESIGN DISCHARGE (CFS)	DESIGN HEADWATER (FT)	DESIGN VELOCITY (FPS)	DESIGN STAGE (NAVD88)	100-YEAR DISCHARGE (CFS)	100-YEAR STAGE (NAVD 88)
7913+17	30" RCP	72"	627	113	8.235	3.997	1464.18	183	1464.86
8002+49	24" RCP	72"	710	104	7.670	3.678	1520.07	164	1520.61
8076+45	24" RCP	30"	12	12	1.686	6.532	1562.00	19	1562.55
8086+50	None	30"	3	7	1.340	4.590	1562.31	10	1562.6
8093+10	24" RCP	30"	10	23	2.710	6.792	1565.48	34	1566.59

(A) Hydraulic data provided is for smooth-walled type conduits.

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US Highway 281

Hydraulic Data

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	R1 Fabric (Pay Item)	(*) End Sections		Applicable Backfill
				In.	Bid Item	LF		In.	Type		In.	SY	Begin EA	End EA	
7900+93	69.2' Lt	7901+39	69.2' Lt	18	Pipe Conduit - Approach	46	Reinforced Concrete Pipe - Class III (barrel length = 38 LF)	18					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
7907+85	70.9' Rt	7908+24	79.5' Rt	24	Pipe Conduit - Approach	40	Reinforced Concrete Pipe - Class III (barrel length = 34 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
7913+17	44.4' Lt	7913+17	45.2' Rt	72	Pipe Conduit	90	Reinforced Concrete Pipe - Class III (barrel length = 86 LF)	72					FES	FES	Section 20 Sheet 8
							Corrugated Steel Pipe	72	A	2, 3, 5	0.164				
							Corrugated Steel Pipe	72	P	2	0.138				
							Corrugated Steel Pipe	72	P	3, 5	0.064				
							Spiral Rib Steel Pipe	72	P	3/4, 1	0.109				
7926+47	64.1' Rt	7926+87	64.1' Rt	18	Pipe Conduit - Approach	40	Reinforced Concrete Pipe - Class III (barrel length = 32 LF)	18					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
7927+60	64.1' Lt	7928+14	64.1' Lt	18	Pipe Conduit - Approach	54	Reinforced Concrete Pipe - Class III (barrel length = 46 LF)	18					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
7939+48	45.0' Lt	7939+48	39.0' Lt	36	Pipe Conc. Reinf. CL III (Extension)	6	Reinforced Concrete Pipe - Class III (barrel length = 6 LF)	36					FES		Section 20 Sheet 6
7939+49	42.0' Rt	7939+50	56.0' Rt	36	Pipe Conc. Reinf. CL III (Extension)	14	Reinforced Concrete Pipe - Class III (barrel length = 14 LF)	36						FES	Section 20 Sheet 6
7940+62	64.5' Rt	7941+36	62.6' Rt	24	Pipe Conduit - Approach	74	Reinforced Concrete Pipe - Class III (barrel length = 68 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
7948+16	48.6' Lt	7948+16	40.6' Lt	24	Pipe Conc. Reinf. CL III (Extension)	8	Reinforced Concrete Pipe - Class III (barrel length = 8 LF)	24					FES		Section 20 Sheet 6
7948+17	42.1' Rt	7948+18	54.1' Rt	24	Pipe Conc. Reinf. CL III (Extension)	12	Reinforced Concrete Pipe - Class III (barrel length = 12 LF)	24						FES	Section 20 Sheet 6
7952+47	63.3' Lt	7952+47	39.3' Lt	24	Pipe Conc. Reinf. CL III (Extension)	24	Reinforced Concrete Pipe - Class III (barrel length = 24 LF)	24					FES		Section 20 Sheet 6
7952+47	41.6' Rt	7952+47	63.6' Rt	24	Pipe Conc. Reinf. CL III (Extension)	22	Reinforced Concrete Pipe - Class III (barrel length = 22 LF)	24						FES	Section 20 Sheet 6

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

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

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

(*) The price bid for "Pipe Conduit" bid items includes end sections. Pipe Extensions shall pay for end sections separately.
(**) All pipe sections to be replaced are assumed to be 8 LF.
FES = Flared End Section
TES = Traversable End Section

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US Highway 281

Allowable Pipe List

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	51	2

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	R1 Fabric (Pay Item)	(*) End Sections		Applicable Backfill
				In.	Bid Item	LF		In.	Type		In.	SY	Begin EA	End EA	
7960+85	63.1' Lt	7960+85	39.1' Lt	24	Pipe Conc. Reinf. CL III (Extension)	24	Reinforced Concrete Pipe - Class III (barrel length = 24 LF)	24					FES		Section 20 Sheet 6
7960+85	39.1' Lt	7960+85	- Lt	24	Pipe Conc. Reinf. CL III **(Replacement)	16	Reinforced Concrete Pipe - Class III (barrel length = 16 LF)	24							Section 20 Sheet 6
7960+84	44.5' Rt	7960+84	66.5' Rt	24	Pipe Conc. Reinf. CL III (Extension)	22	Reinforced Concrete Pipe - Class III (barrel length = 22 LF)	24						FES	Section 20 Sheet 6
7976+16	50.6' Lt	7976+16	36.6' Lt	24	Pipe Conc. Reinf. CL III (Extension)	14	Reinforced Concrete Pipe - Class III (barrel length = 14 LF)	24					FES		Section 20 Sheet 6
7976+14	42.3' Rt	7976+14	50.3' Rt	24	Pipe Conc. Reinf. CL III (Extension)	8	Reinforced Concrete Pipe - Class III (barrel length = 8 LF)	24						FES	Section 20 Sheet 6
7978+26	75.4' Lt	7978+70	75.1' Lt	24	Pipe Conduit - Approach	44	Reinforced Concrete Pipe - Class III (barrel length = 38 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
7978+30	68.7' Rt	7978+66	68.6' Rt	24	Pipe Conduit - Approach	36	Reinforced Concrete Pipe - Class III (barrel length = 30 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
7980+70	74.0' Lt	7981+45	73.3' Lt	24	Pipe Conduit - Approach	74	Reinforced Concrete Pipe - Class III (barrel length = 68 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
7980+70	67.9' Rt	7981+53	67.7' Rt	24	Pipe Conduit - Approach	84	Reinforced Concrete Pipe - Class III (barrel length = 78 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
7985+43	45.5' Lt	7985+44	37.5' Lt	24	Pipe Conc. Reinf. CL III (Extension)	8	Reinforced Concrete Pipe - Class III (barrel length = 8 LF)	24					FES		Section 20 Sheet 6
7985+45	- Rt	7985+45	41.1' Rt	24	Pipe Conc. Reinf. CL III **(Replacement)	24	Reinforced Concrete Pipe - Class III (barrel length = 24 LF)	24							Section 20 Sheet 6
7985+45	41.1' Rt	7985+45	45.1' Rt	24	Pipe Conc. Reinf. CL III (Extension)	4	Reinforced Concrete Pipe - Class III (barrel length = 4 LF)	24						FES	Section 20 Sheet 6
8002+49	41.8' Lt	8002+49	41.7' Rt	72	Pipe Conduit	84	Reinforced Concrete Pipe - Class III (barrel length = 80 LF)	72					FES	FES	Section 20 Sheet 8
							Corrugated Steel Pipe	2 - 54	A	2, 3, 5	0.168				
							Corrugated Steel Pipe	2 - 54	P	2	0.079				
							Corrugated Steel Pipe	2 - 54	P	3, 5	0.064				
							Spiral Rib Steel Pipe	72	P	3/4, 1	0.109				
8020+84	52.2' Lt	8020+84	42.2' Lt	24	Pipe Conc. Reinf. CL III (Extension)	10	Reinforced Concrete Pipe - Class III (barrel length = 10 LF)	24					FES		Section 20 Sheet 6
8020+84	38.5' Rt	8020+84	52.5' Rt	24	Pipe Conc. Reinf. CL III (Extension)	14	Reinforced Concrete Pipe - Class III (barrel length = 14 LF)	24						FES	Section 20 Sheet 6

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

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

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

(*) The price bid for "Pipe Conduit" bid items includes end sections. Pipe Extensions shall pay for end sections separately.
(**) All pipe sections to be replaced are assumed to be 8 LF.
FES = Flared End Section
TES = Traversable End Section

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US Highway 281

Allowable Pipe List

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	51	3

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item) In.	Bid Item	LF	Allowable Material	Required Diameter In.	Steel Pipe Coatings Type	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness In.	R1 Fabric (Pay Item) SY	(*) End Sections Begin EA	(*) End Sections End EA	Applicable Backfill
8023+04	75.6' Rt	8023+58	76.0' Rt	24	Pipe Conduit - Approach	54	Reinforced Concrete Pipe - Class III (barrel length = 48 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
8023+21	78.7' Lt	8023+57	78.8' Lt	24	Pipe Conduit - Approach	36	Reinforced Concrete Pipe - Class III (barrel length = 30 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
8033+84	68.7' Rt	8034+43	68.0' Rt	30	Pipe Conduit - Approach	58	Reinforced Concrete Pipe - Class III (barrel length = 54 LF)	30					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe	36	Z, A, P	2	0.064				
							Spiral Rib Steel Pipe	30	Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene	30							
							Polypropylene Pipe (AASHTO M330, Type S)	30							
8033+86	67.9' Lt	8034+53	67.0' Lt	30	Pipe Conduit - Approach	68	Reinforced Concrete Pipe - Class III (barrel length = 64 LF)	30					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe	36	Z, A, P	2	0.064				
							Spiral Rib Steel Pipe	30	Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene	30							
							Polypropylene Pipe (AASHTO M330, Type S)	30							
8045+37	45.3' Lt	8045+37	41.3' Lt	24	Pipe Conc. Reinf. CL III (Extension)	4	Reinforced Concrete Pipe - Class III (barrel length = 4 LF)	24					FES		Section 20 Sheet 6
8045+36	37.6' Rt	8045+36	49.6' Rt	24	Pipe Conc. Reinf. CL III (Extension)	12	Reinforced Concrete Pipe - Class III (barrel length = 12 LF)	24						FES	Section 20 Sheet 6
8053+47	45.3' Lt	8053+47	41.3' Lt	24	Pipe Conc. Reinf. CL III (Extension)	4	Reinforced Concrete Pipe - Class III (barrel length = 4 LF)	24					FES		Section 20 Sheet 6
8053+45	38.0' Rt	8053+45	44.0' Rt	24	Pipe Conc. Reinf. CL III (Extension)	6	Reinforced Concrete Pipe - Class III (barrel length = 6 LF)	24						FES	Section 20 Sheet 6
8054+84	78.1' Lt	8055+16	77.8' Lt	24	Pipe Conduit - Approach	32	Reinforced Concrete Pipe - Class III (barrel length = 26 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
8058+20	64.1' Lt	8058+58	64.1' Lt	24	Pipe Conduit - Approach	38	Reinforced Concrete Pipe - Class III (barrel length = 32 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								

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

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

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

(*) The price bid for "Pipe Conduit" bid items includes end sections. Pipe Extensions shall pay for end sections separately.
(**) All pipe sections to be replaced are assumed to be 8 LF.
FES = Flared End Section
TES = Traversable End Section

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US Highway 281

Allowable Pipe List

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	51	4

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	R1 Fabric (Pay Item)	(*) End Sections		Applicable Backfill
				In.	Bid Item	LF		In.	Type		In.	SY	Begin EA	End EA	
8060+88	44.5' Lt	8060+88	40.5' Lt	24	Pipe Conc. Reinf. CL III (Extension)	4	Reinforced Concrete Pipe - Class III (barrel length = 4 LF)	24					FES		Section 20 Sheet 6
8060+88	38.0' Rt	8060+88	44.0' Rt	24	Pipe Conc. Reinf. CL III (Extension)	6	Reinforced Concrete Pipe - Class III (barrel length = 6 LF)	24						FES	Section 20 Sheet 6
8076+45	66.0' Lt	8076+45	43.3' Rt	30	Pipe Conduit	110	Reinforced Concrete Pipe - Class III (barrel length = 106 LF)	30					FES	FES	Section 20 Sheet 8
							Corrugated Steel Pipe	36	P	2	0.064				
							Spiral Rib Steel Pipe	30	P	3/4, 1	0.064				
8084+36	298.8' Lt	8085+13	302.0' Lt	24	Pipe Conduit - Approach	88	Reinforced Concrete Pipe - Class III (barrel length = 82 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
8086+50	82.7' Lt	8086+50	54.6' Rt	30	Pipe Conduit	138	Reinforced Concrete Pipe - Class III (barrel length = 134 LF)	30					FES	FES	Section 20 Sheet 8
							Corrugated Steel Pipe	36	P	2	0.064				
							Spiral Rib Steel Pipe	30	P	3/4, 1	0.064				
8092+00	94.7' Lt	8092+75	94.4' Lt	30	Pipe Conduit - Approach	78	Reinforced Concrete Pipe - Class III (barrel length = 74 LF)	30					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe	36	Z, A, P	2	0.064				
							Spiral Rib Steel Pipe	30	Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene	30							
							Polypropylene Pipe (AASHTO M330, Type S)	30							
8093+10	67.6' Lt	8093+10	51.7' Rt	30	Pipe Conduit	120	Reinforced Concrete Pipe - Class III (barrel length = 116 LF)	30					FES	FES	Section 20 Sheet 8
							Corrugated Steel Pipe	36	P	2	0.064				
							Spiral Rib Steel Pipe	30	P	3/4, 1	0.064				
8103+65	64.1' Rt	8104+05	64.1' Rt	18	Pipe Conduit - Approach	40	Reinforced Concrete Pipe - Class III (barrel length = 32 LF)	18					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
8110+85	42.7' Lt	8110+85	38.7' Lt	24	Pipe Conc. Reinf. CL III (Extension)	4	Reinforced Concrete Pipe - Class III (barrel length = 4 LF)	24					FES		Section 20 Sheet 6
8110+83	- Rt	8110+83	39.9' Rt	24	Pipe Conc. Reinf. CL III **(Replacement)	8	Reinforced Concrete Pipe - Class III (barrel length = 8 LF)	24							Section 20 Sheet 6
8110+83	39.9' Rt	8110+83	43.9' Rt	24	Pipe Conc. Reinf. CL III (Extension)	4	Reinforced Concrete Pipe - Class III (barrel length = 4 LF)	24						FES	Section 20 Sheet 6
8130+02	70.7' Lt	8130+76	68.9' Lt	24	Pipe Conduit - Approach	74	Reinforced Concrete Pipe - Class III (barrel length = 68 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
8130+08	70.3' Rt	8130+74	69.9' Rt	24	Pipe Conduit - Approach	66	Reinforced Concrete Pipe - Class III (barrel length = 60 LF)	24					FES	FES	Specification 714.04 A
							Corrugated Steel Pipe		Z, A, P	2	0.064				
							Spiral Rib Steel Pipe		Z, A, P	3/4, 1	0.064				
							High-Density Polyethylene								
							Polypropylene Pipe (AASHTO M330, Type S)								
8145+68	49.2' Lt	8145+69	41.2' Lt	24	Pipe Conc. Reinf. CL III (Extension)	8	Reinforced Concrete Pipe - Class III (barrel length = 8 LF)	24					FES		Section 20 Sheet 6
8145+68	41.2' Lt	8145+68	- Lt	24	Pipe Conc. Reinf. CL III **(Replacement)	8	Reinforced Concrete Pipe - Class III (barrel length = 8 LF)	24							Section 20 Sheet 6
8145+70	40.2' Rt	8145+71	72.2' Rt	24	Pipe Conc. Reinf. CL III (Extension)	32	Reinforced Concrete Pipe - Class III (barrel length = 32 LF)	24						FES	Section 20 Sheet 6
8158+41	56.8' Lt	8158+42	40.8' Lt	24	Pipe Conc. Reinf. CL III (Extension)	16	Reinforced Concrete Pipe - Class III (barrel length = 16 LF)	24					FES		Section 20 Sheet 6
8158+42	40.8' Lt	8158+42	- Lt	24	Pipe Conc. Reinf. CL III **(Replacement)	16	Reinforced Concrete Pipe - Class III (barrel length = 16 LF)	24							Section 20 Sheet 6
8158+44	41.8' Rt	8158+44	49.8' Rt	24	Pipe Conc. Reinf. CL III (Extension)	8	Reinforced Concrete Pipe - Class III (barrel length = 8 LF)	24						FES	Section 20 Sheet 6

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

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

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

(*) The price bid for "Pipe Conduit" bid items includes end sections. Pipe Extensions shall pay for end sections separately.
(**) All pipe sections to be replaced are assumed to be 8 LF.
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TES = Traversable End Section

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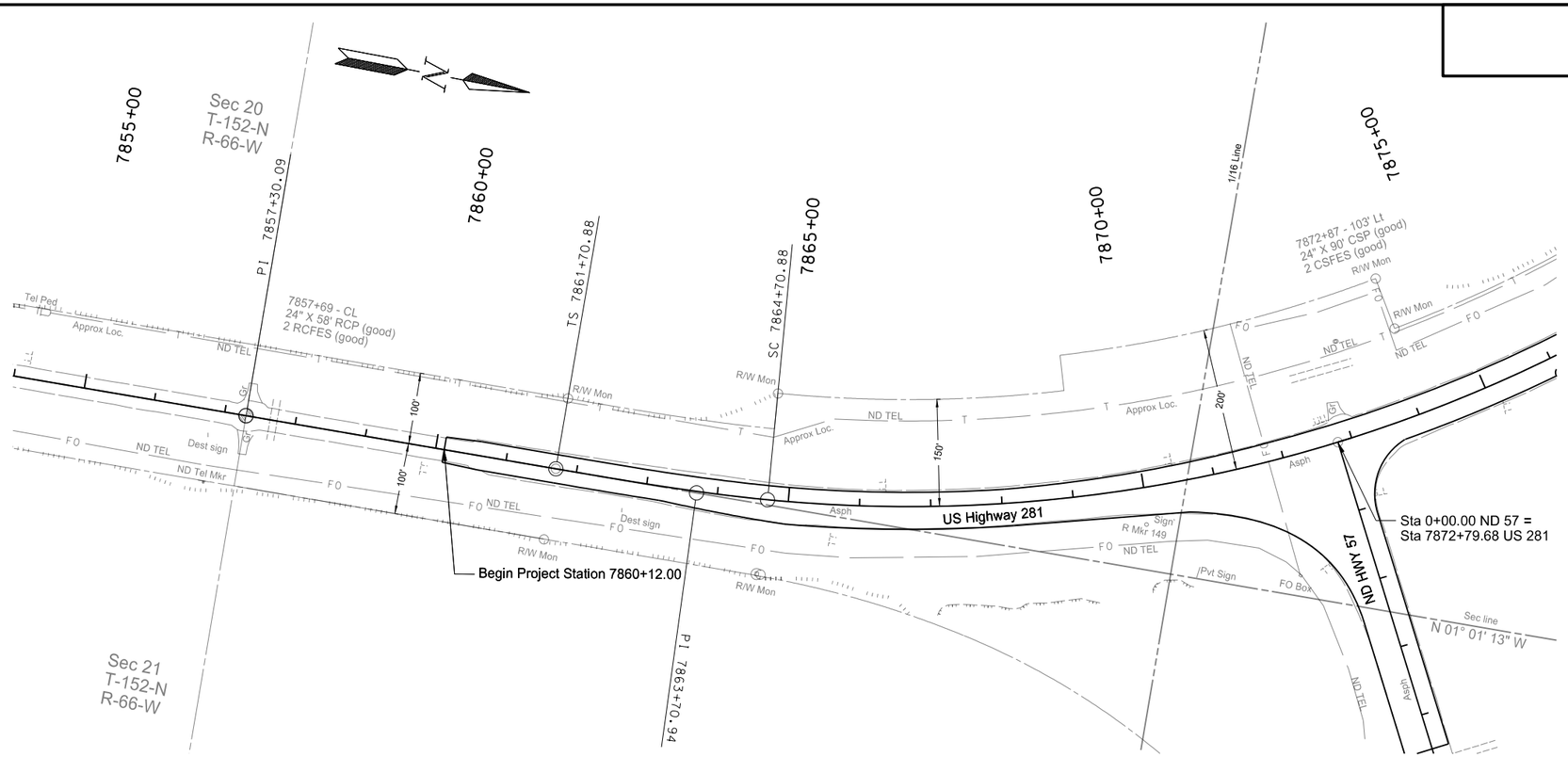
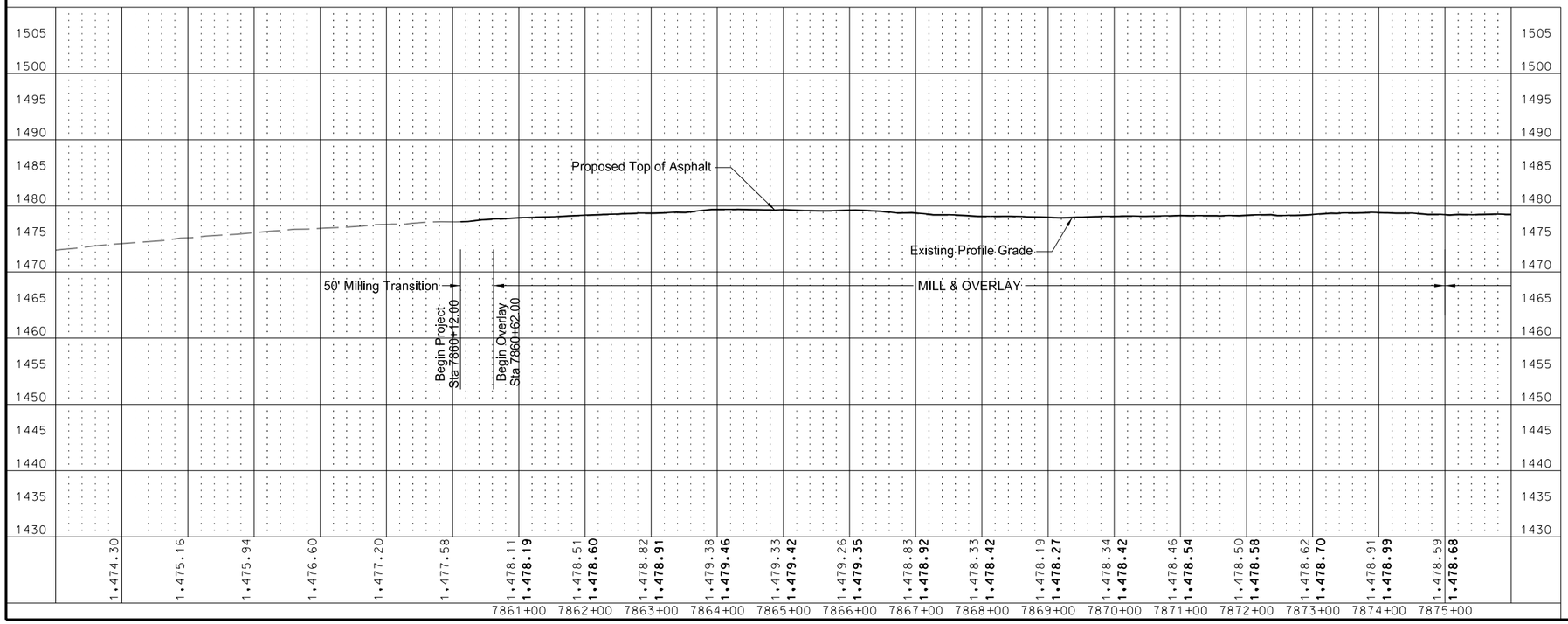
US Highway 281

Allowable Pipe List

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	1





Ditch elevations and grades noted are at the lowest point in the ditch, at the start of the backslope.

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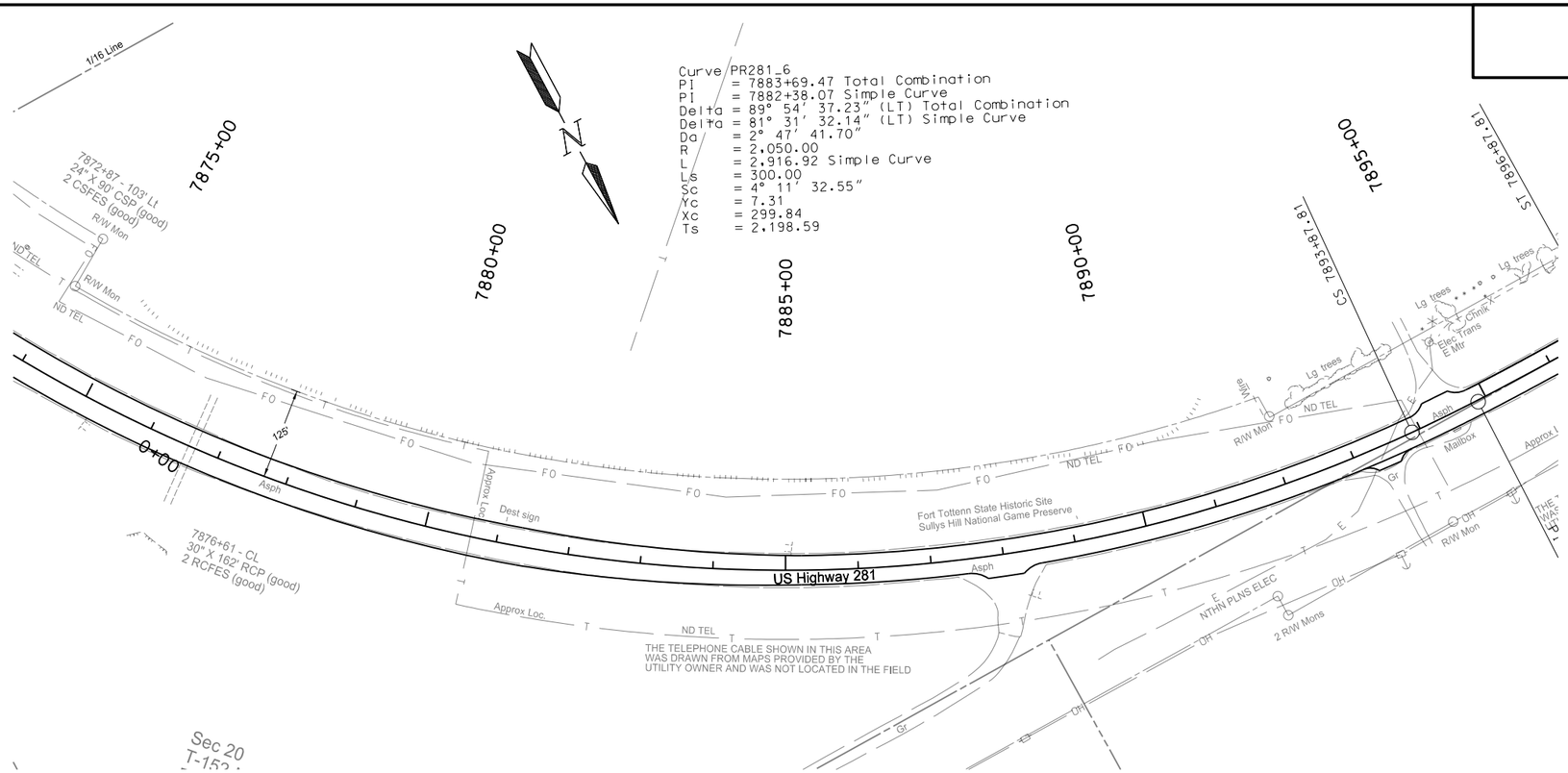
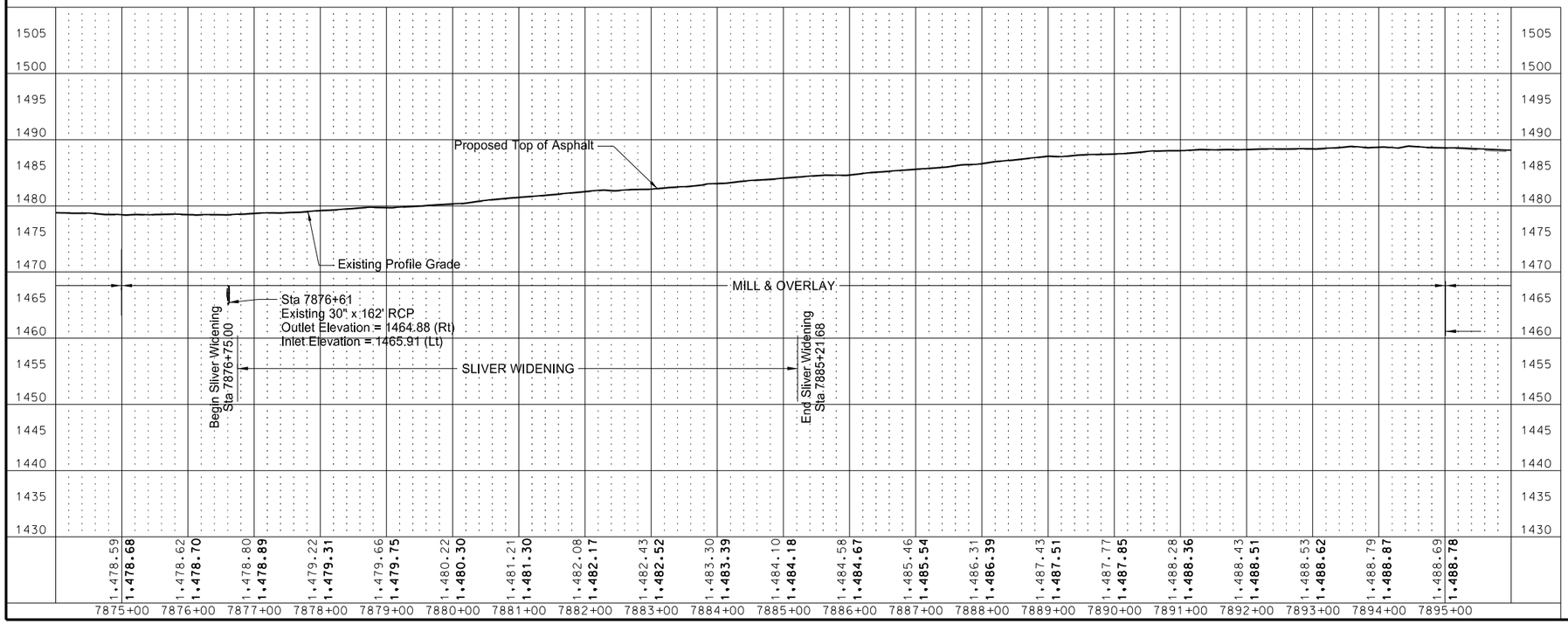
US Highway 281

Plan & Profile Sheets

7855+00 to 7875+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	60	2





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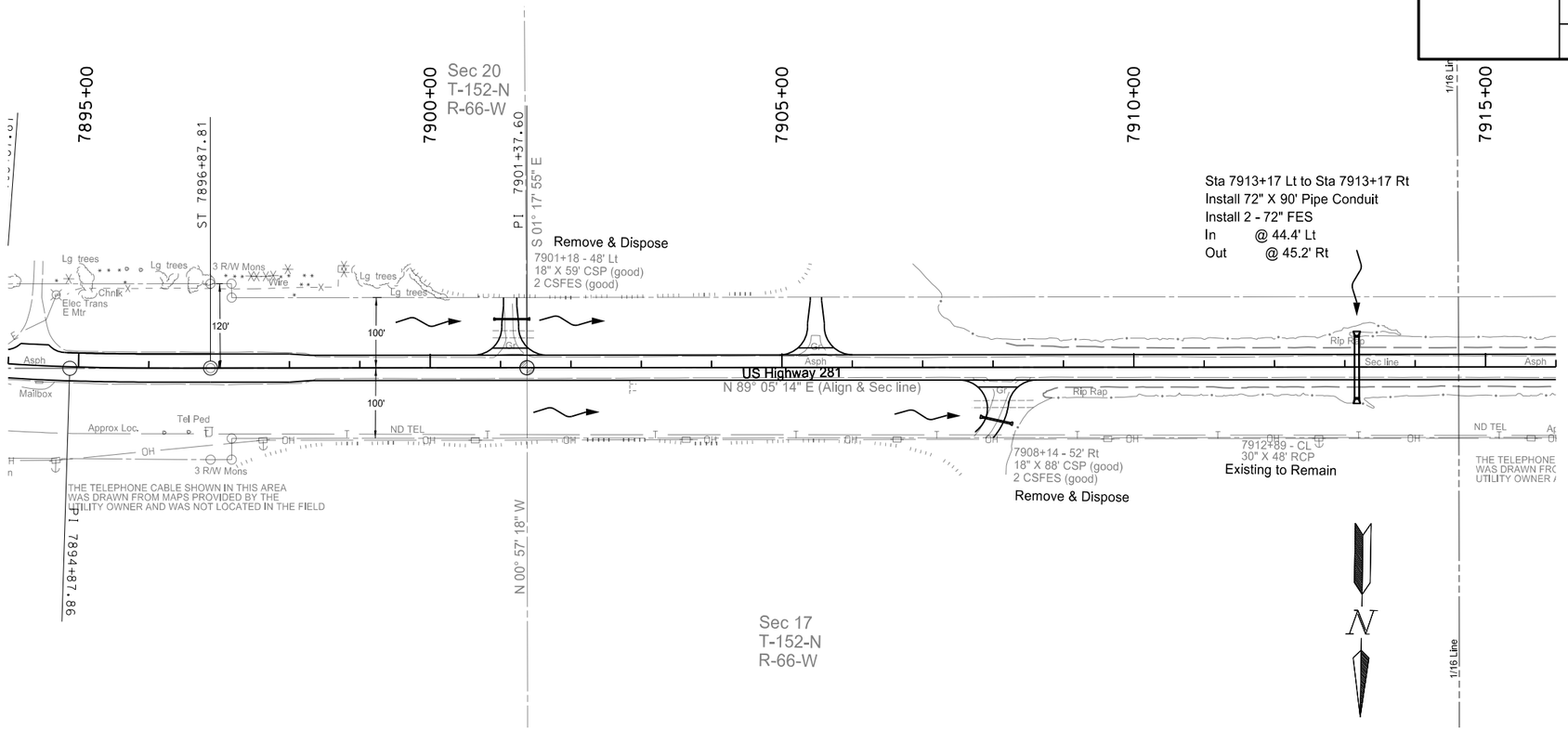
US Highway 281

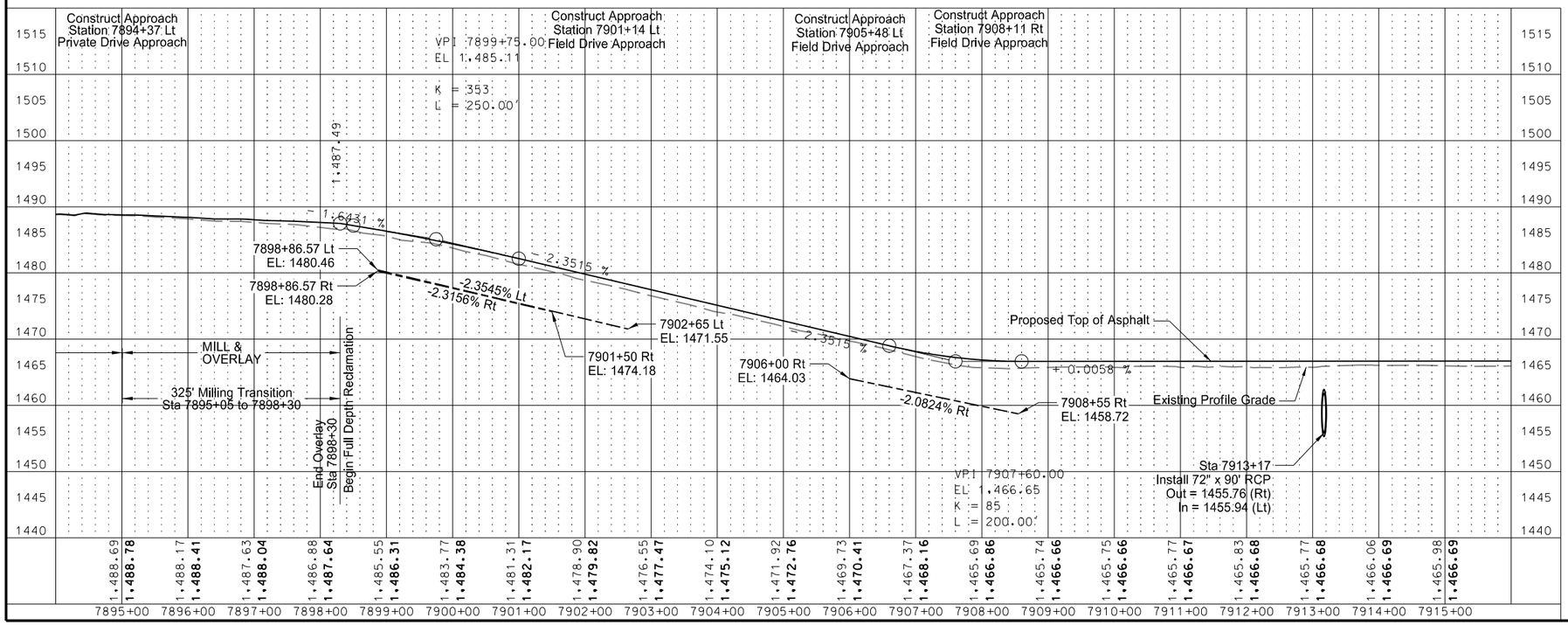
Plan & Profile Sheets

7875+00 to 7895+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	3



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 7901+18 - 48' Lt	LF	59
		Sta 7908+14 - 52' Rt	LF	88
714	4099	PIPE CONDUIT 18IN - APPROACH		
		Sta 7901+16 - 69' Lt	LF	46
714	4106	PIPE CONDUIT 24IN - APPROACH		
		Sta 7908+05 - 75' Rt	LF	40
714	4145	PIPE CONDUIT 72IN		
		Sta 7913+17 - CL	LF	90



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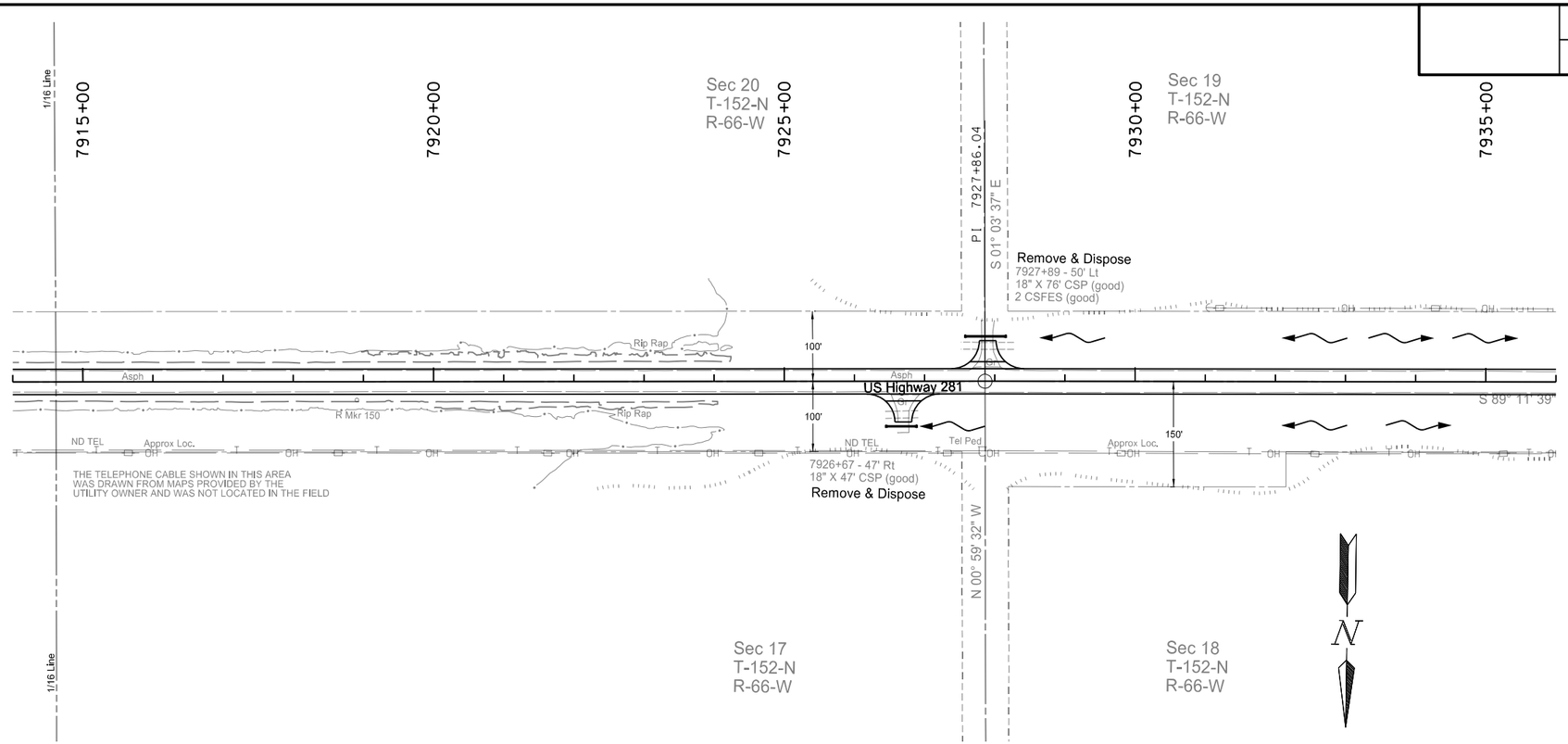
US Highway 281

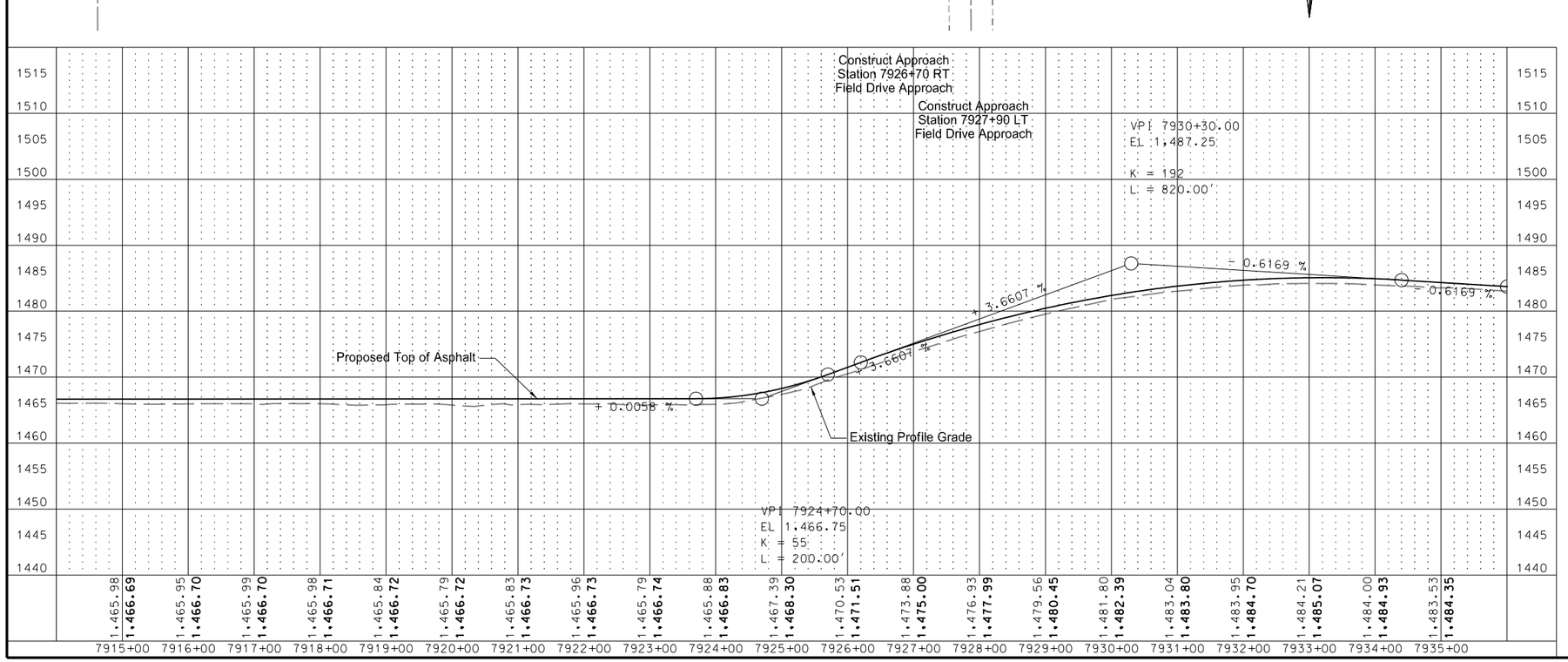
Plan & Profile Sheets

7895+00 to 7915+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	4



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 7926+67 - 47' Rt	LF	47
		Sta 7927+89 - 50' Lt	LF	76
714	4099	PIPE CONDUIT 18IN - APPROACH		
		Sta 7926+67 - 64' Rt	LF	40
		Sta 7927+87 - 64' Lt	LF	54



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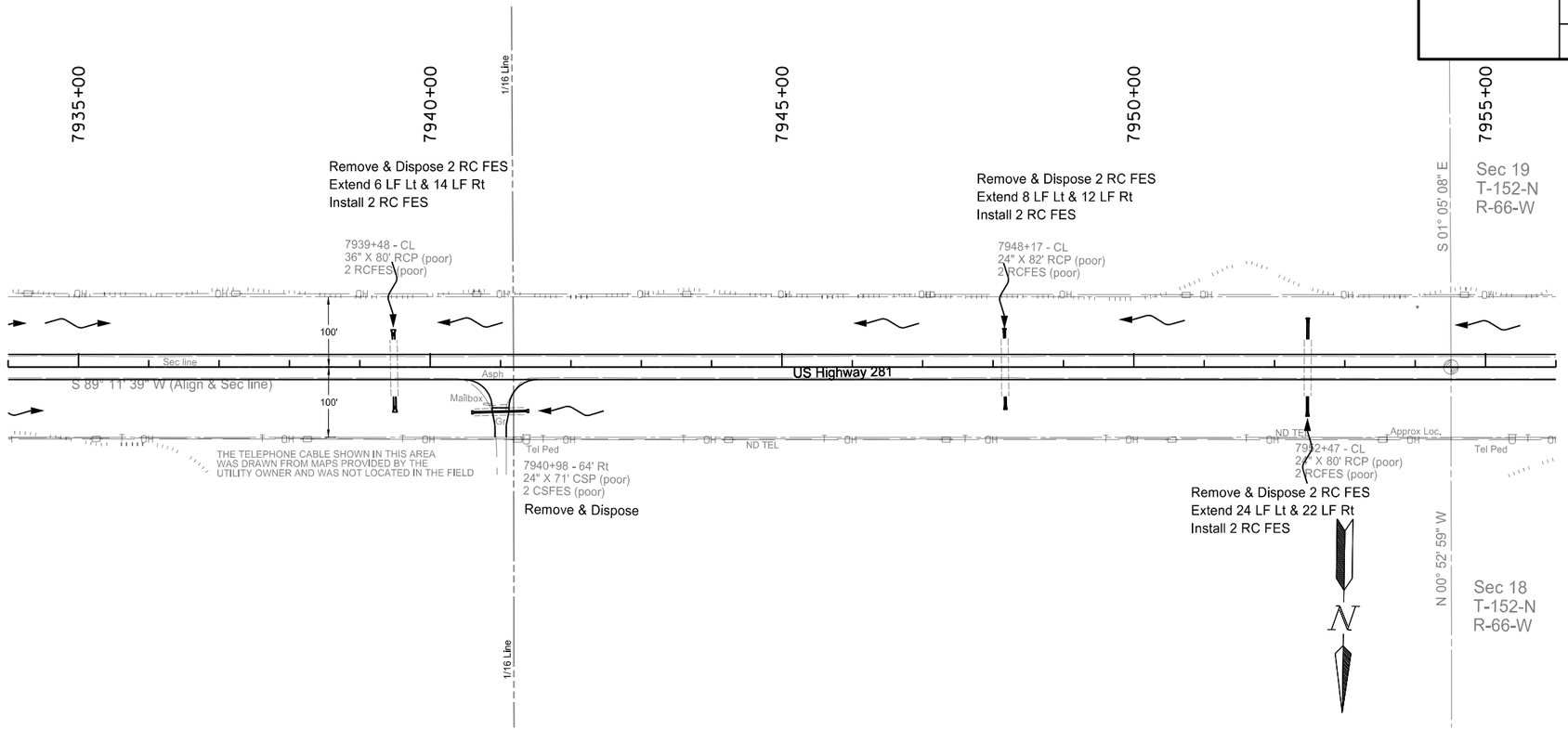
US Highway 281

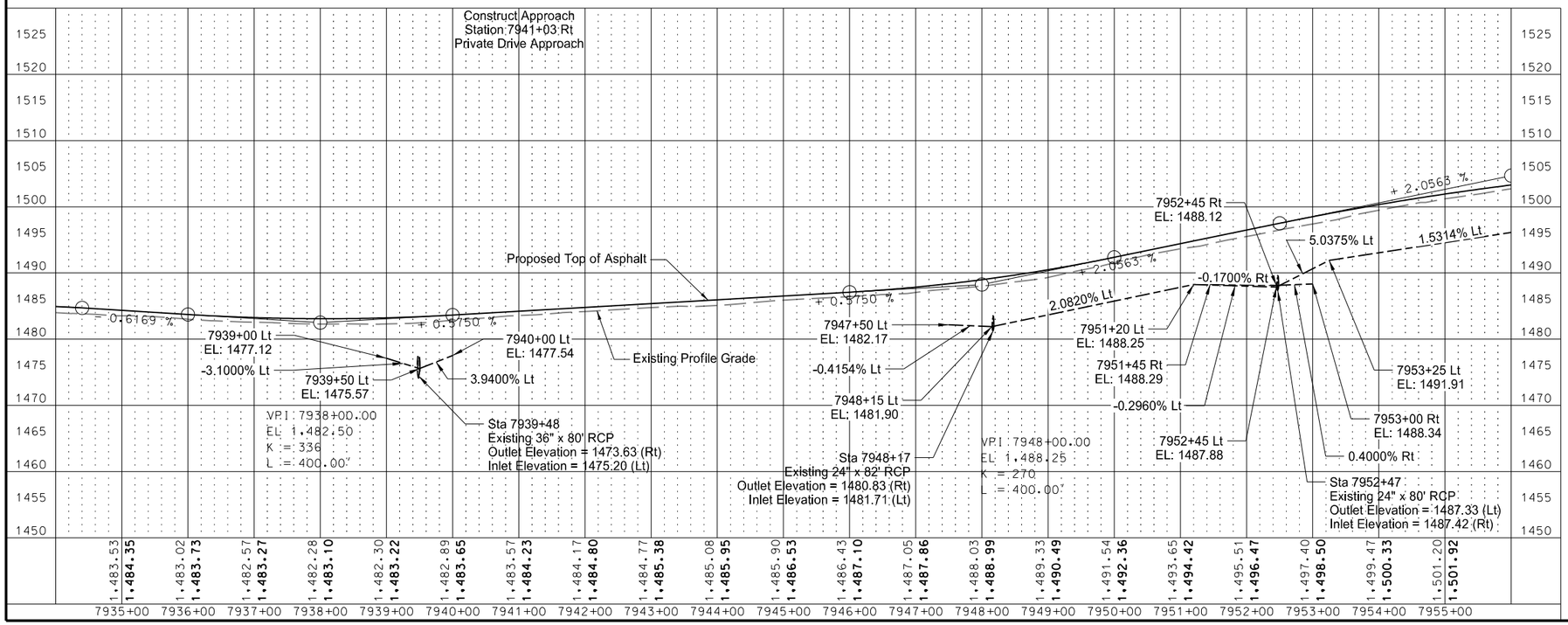
Plan & Profile Sheets

7915+00 to 7935+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	5



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0169	REMOVAL OF END SECTION - ALL TYPES & SIZES		
		Sta 7939+48 - CL (Lt & Rt)	EA	2
		Sta 7948+17 - CL (Lt & Rt)	EA	2
		Sta 7952+47 - CL (Lt & Rt)	EA	2
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 7940+98 - 64' Rt	LF	71
714	0615	PIPE CONC REINF 24IN CL III		
		Sta 7948+17 - CL (Lt)	LF	8
		Sta 7948+17 - CL (Rt)	LF	12
		Sta 7952+47 - CL (Lt)	LF	24
		Sta 7952+47 - CL (Rt)	LF	22
714	0905	PIPE CONC REINF 36IN CL III		
		Sta 7939+48 - CL (Lt)	LF	6
		Sta 7939+48 - CL (Rt)	LF	14
714	3020	END SECT-CONC REINF 24IN		
		Sta 7948+17 - CL (Lt & Rt)	EA	2
		Sta 7952+47 - CL (Lt & Rt)	EA	2
714	3035	END SECT-CONC REINF 36IN		
		Sta 7939+48 - CL (Lt & Rt)	EA	2
714	4106	PIPE CONDUIT 24IN - APPROACH		
		Sta 7940+99 - 64' Rt	LF	74



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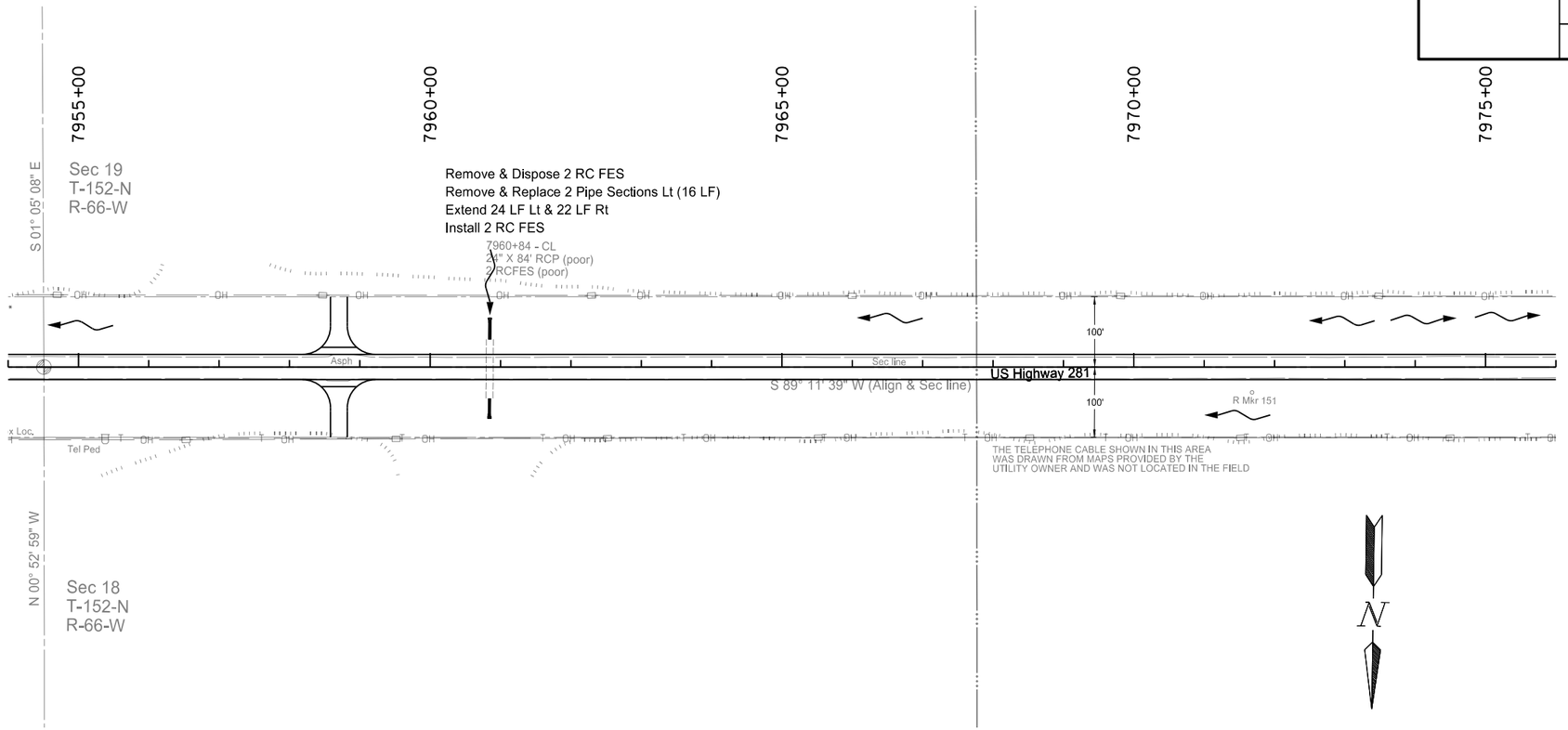
US Highway 281

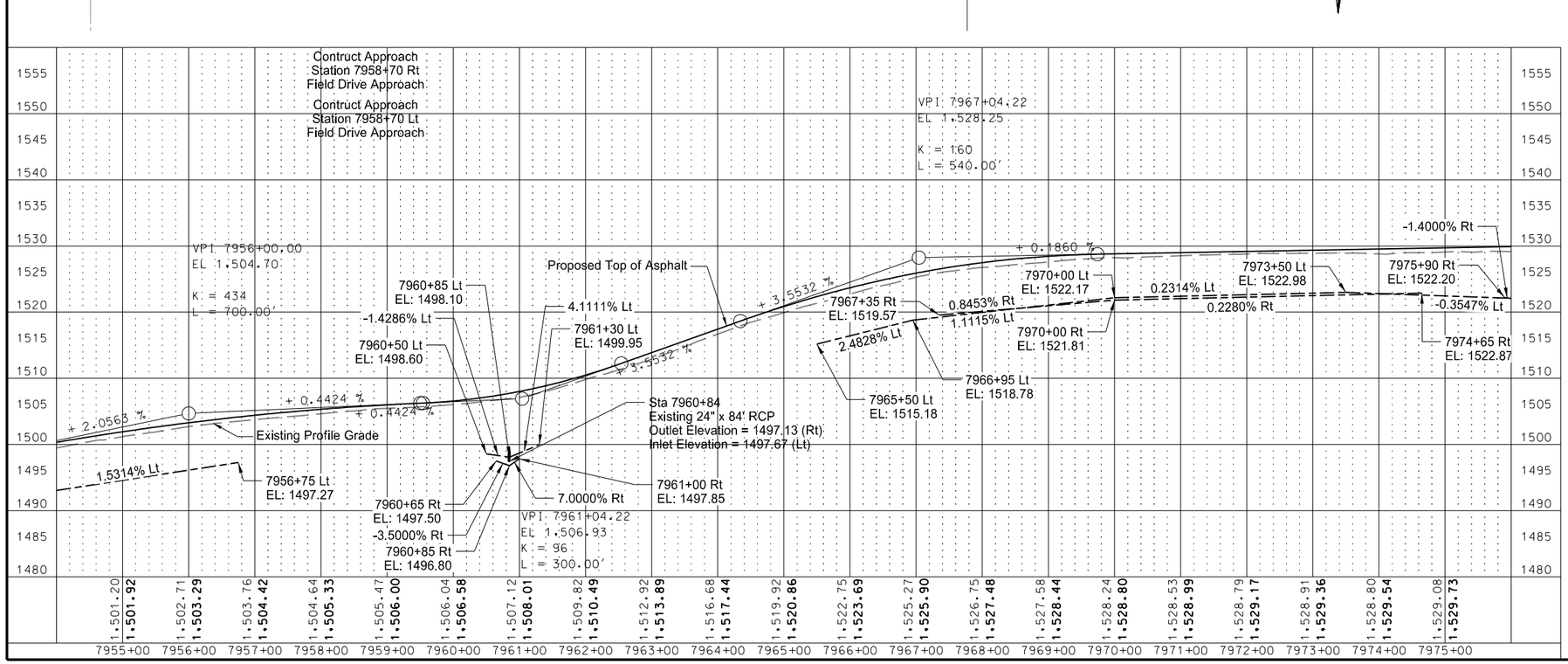
Plan & Profile Sheets

7935+00 to 7955+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	6



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0169	REMOVAL OF END SECTION - ALL TYPES & SIZES		
		Sta 7960+84 - CL (Lt & Rt)	EA	2
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 7960+84 - CL (Lt)	LF	16
714	0615	PIPE CONC REINF 24IN CL III		
		Sta 7960+84 - CL (Lt)	LF	24
		Sta 7960+84 - CL (Lt)	LF	16
		Sta 7960+84 - CL (Rt)	LF	22
714	3020	END SECT-CONC REINF 24IN		
		Sta 7960+84 - CL (Lt & Rt)	EA	2



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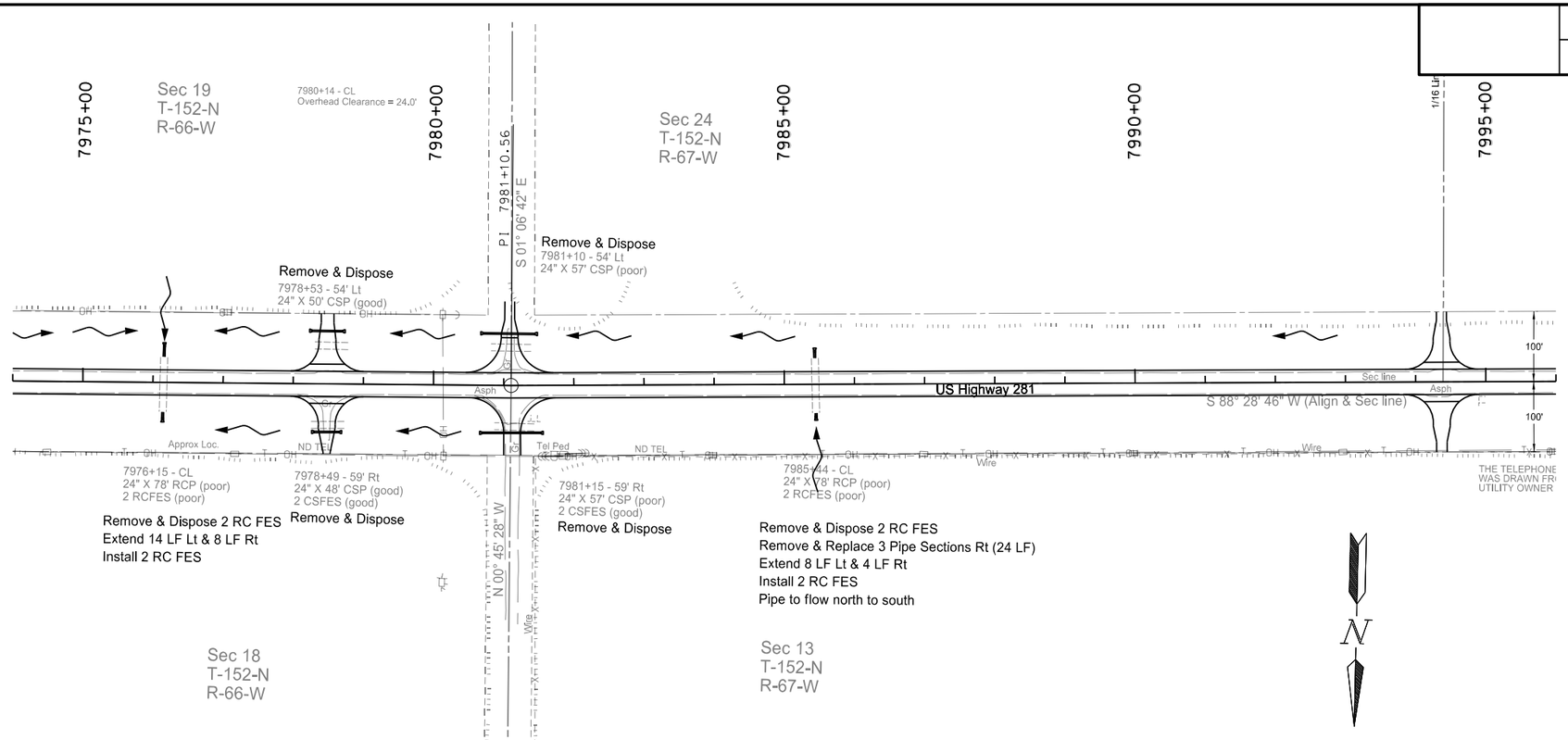
US Highway 281

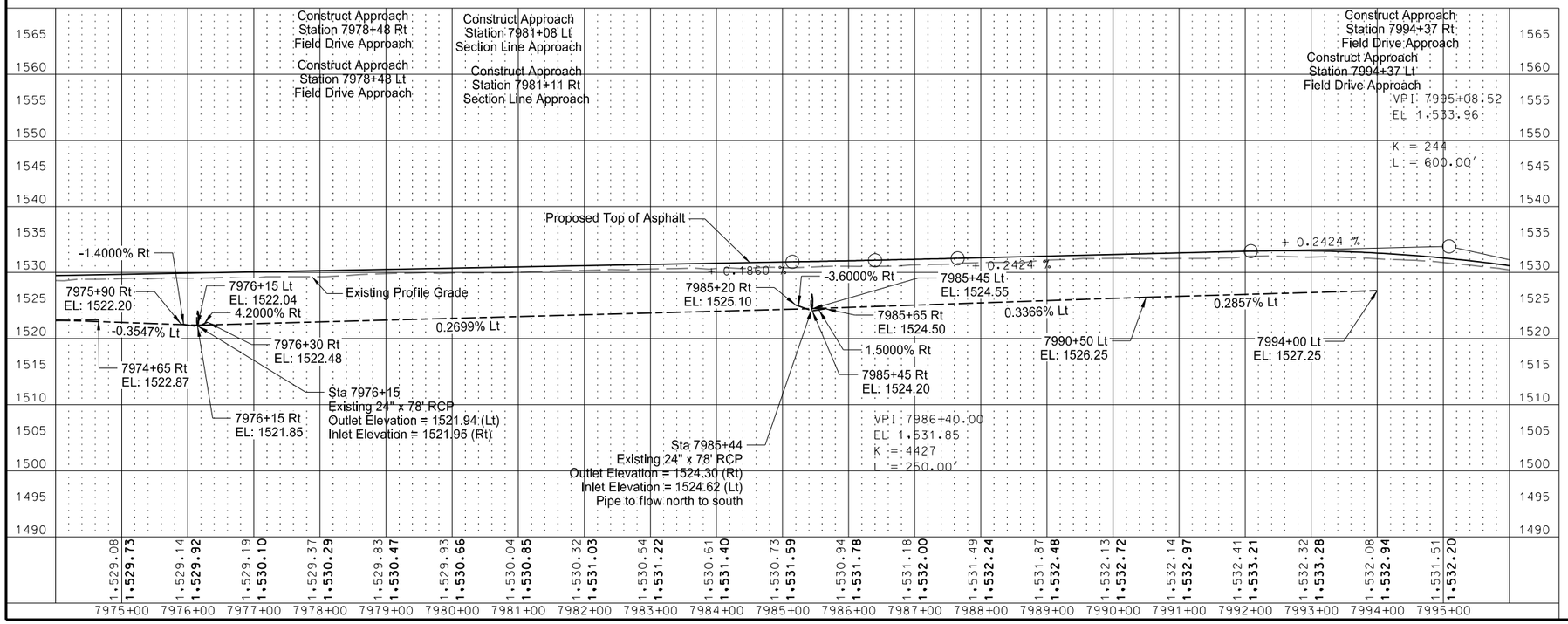
Plan & Profile Sheets

7955+00 to 7975+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	7



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0169	REMOVAL OF END SECTION - ALL TYPES & SIZES		
		Sta 7976+15 - CL (Lt & Rt)	EA	2
		Sta 7985+44 - CL (Lt & Rt)	EA	2
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 7978+49 - 59' Rt	LF	48
		Sta 7978+53 - 54' Lt	LF	50
		Sta 7981+10 - 54' Lt	LF	57
		Sta 7981+15 - 59' Rt	LF	57
		Sta 7985+44 - CL (Rt)	LF	24
714	0615	PIPE CONC REINF 24IN CL III		
		Sta 7976+15 - CL (Lt)	LF	14
		Sta 7976+15 - CL (Rt)	LF	8
		Sta 7985+44 - CL (Lt)	LF	8
		Sta 7985+44 - CL (Rt)	LF	24
		Sta 7985+44 - CL (Rt)	LF	6
714	3020	END SECT-CONC REINF 24IN		
		Sta 7976+15 - CL (Lt & Rt)	EA	2
		Sta 7985+44 - CL (Lt & Rt)	EA	2
714	4106	PIPE CONDUIT 24IN - APPROACH		
		Sta 7978+48 - 75' Lt	LF	44
		Sta 7978+48 - 69' Rt	LF	36
		Sta 7981+07 - 74' Lt	LF	74
		Sta 7981+11 - 68' Rt	LF	84



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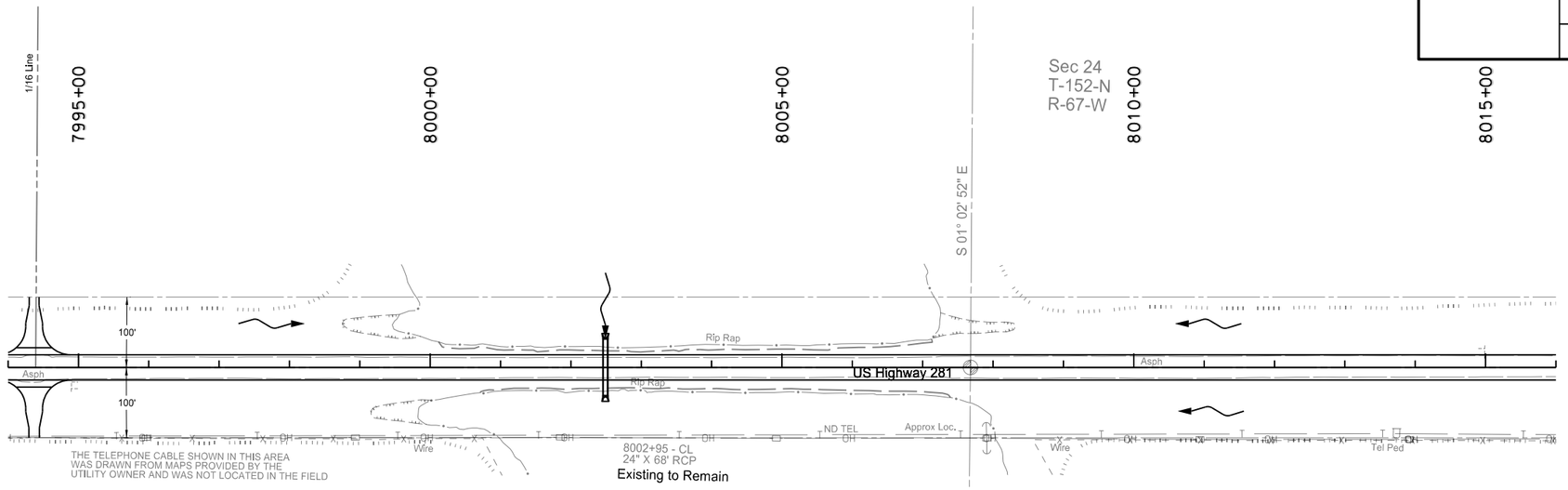
US Highway 281

Plan & Profile Sheets

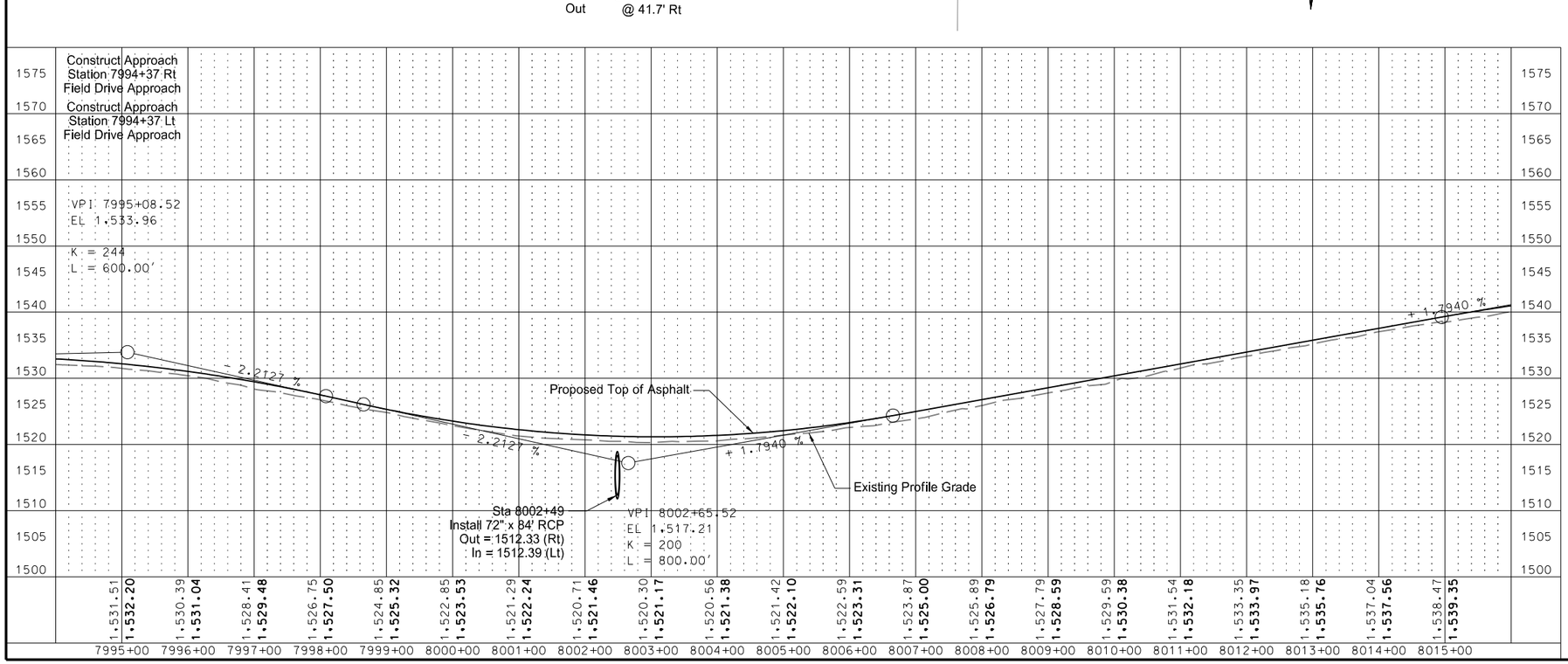
7975+00 to 7995+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	8

SPEC	CODE	BID ITEM	UNIT	QUANTITY
714	4145	PIPE CONDUIT 72IN Sta 8002+49 - CL	LF	84



Sta 8002+49 Lt to Sta 8002+49 Rt
Install 72" X 84' Pipe Conduit
Install 2 - 72" FES
In @ 41.8' Lt
Out @ 41.7' Rt



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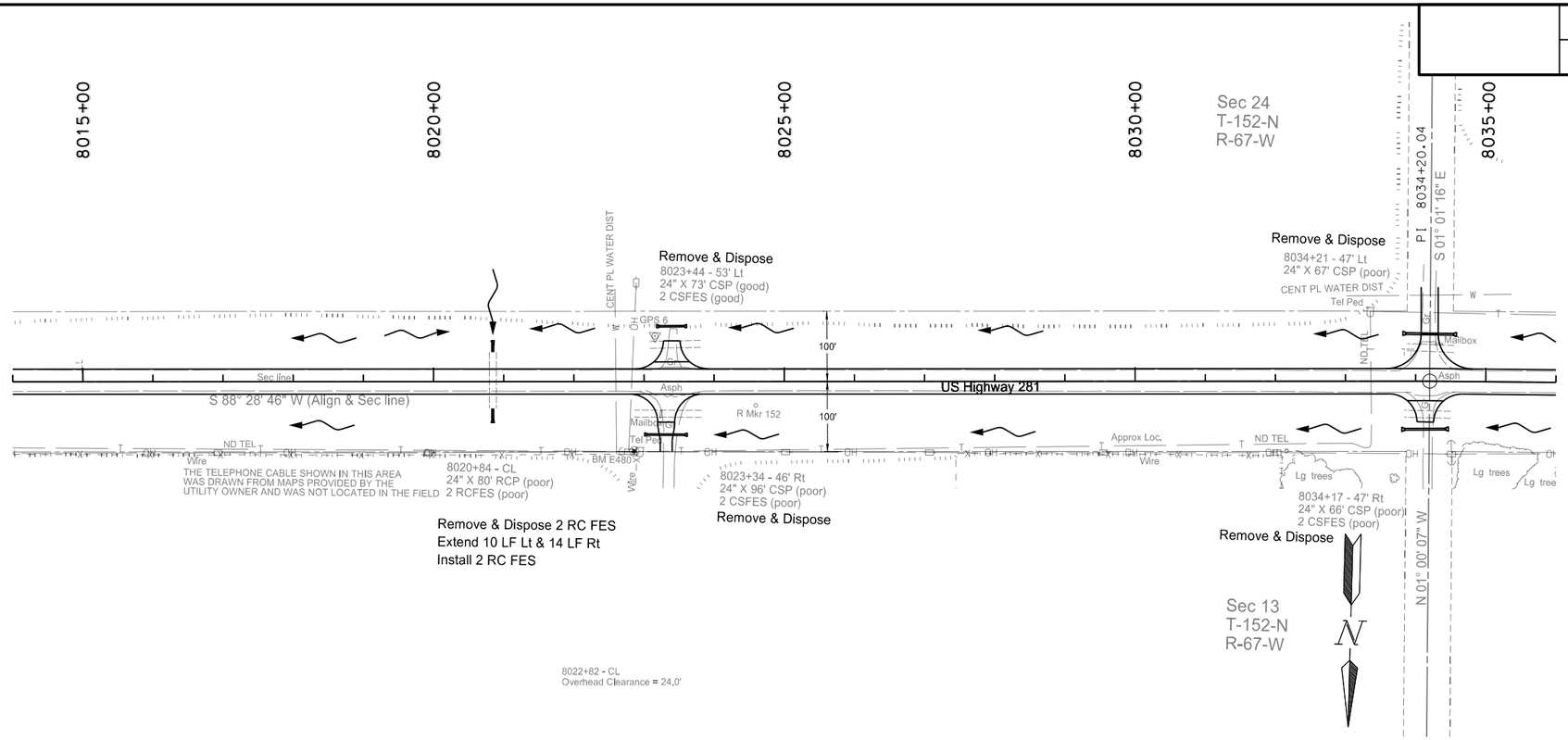
US Highway 281

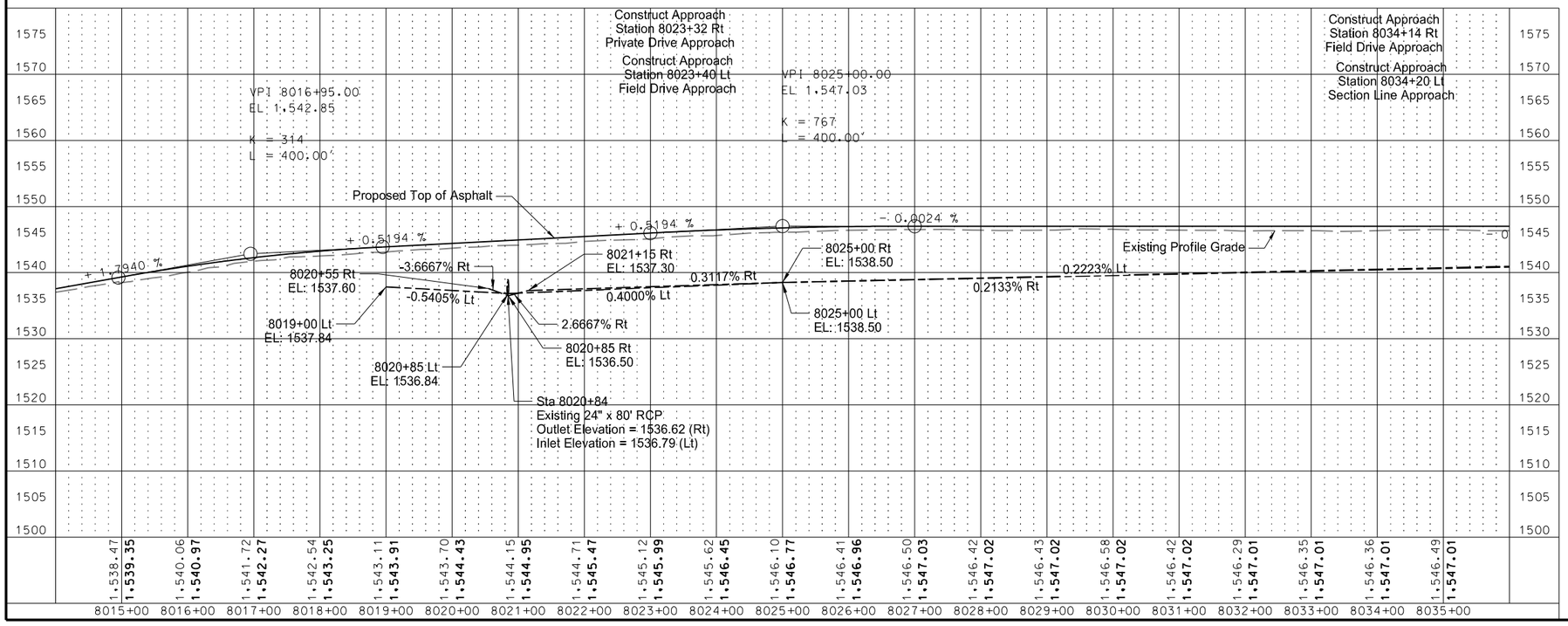
Plan & Profile Sheets

7995+00 to 8015+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	9



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0169	REMOVAL OF END SECTION - ALL TYPES & SIZES		
		Sta 8020+84 - CL (Lt & Rt)	EA	2
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 8023+34 - 46' Rt	LF	96
		Sta 8023+44 - 53' Lt	LF	73
		Sta 8034+17 - 47' Rt	LF	66
		Sta 8034+21 - 47' Lt	LF	67
714	0615	PIPE CONC REINF 24IN CL III		
		Sta 8020+84 - CL (Lt)	LF	10
		Sta 8020+84 - CL (Rt)	LF	14
714	3020	END SECT-CONC REINF 24IN		
		Sta 8020+84 - CL (Lt & Rt)	EA	2
714	4106	PIPE CONDUIT 24IN - APPROACH		
		Sta 8023+31 - 76' Rt	LF	54
		Sta 8023+39 - 79' Lt	LF	36
714	4113	PIPE CONDUIT 30IN - APPROACH		
		Sta 8034+13 - 68' Rt	LF	58
		Sta 8034+20 - 67' Lt	LF	68



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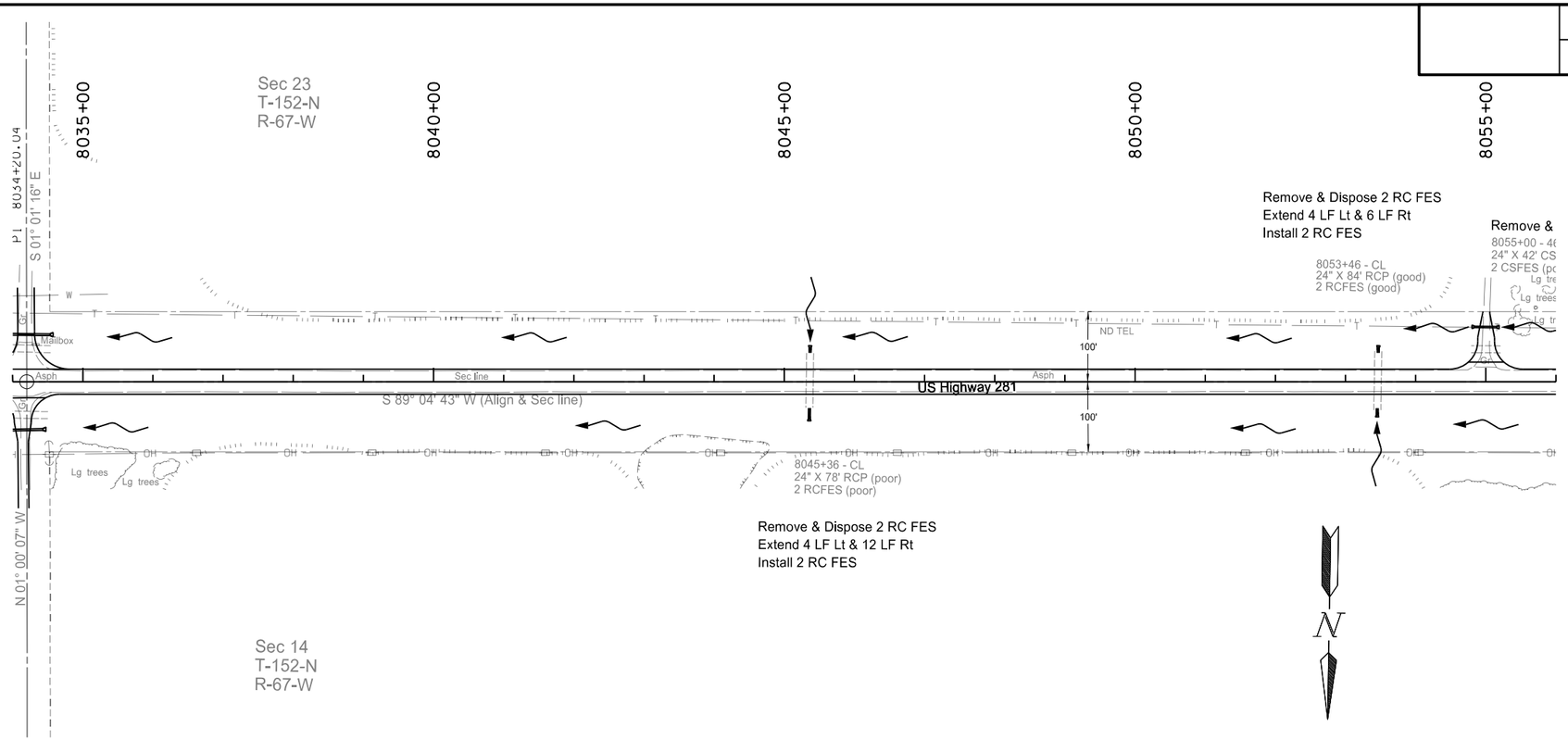
US Highway 281

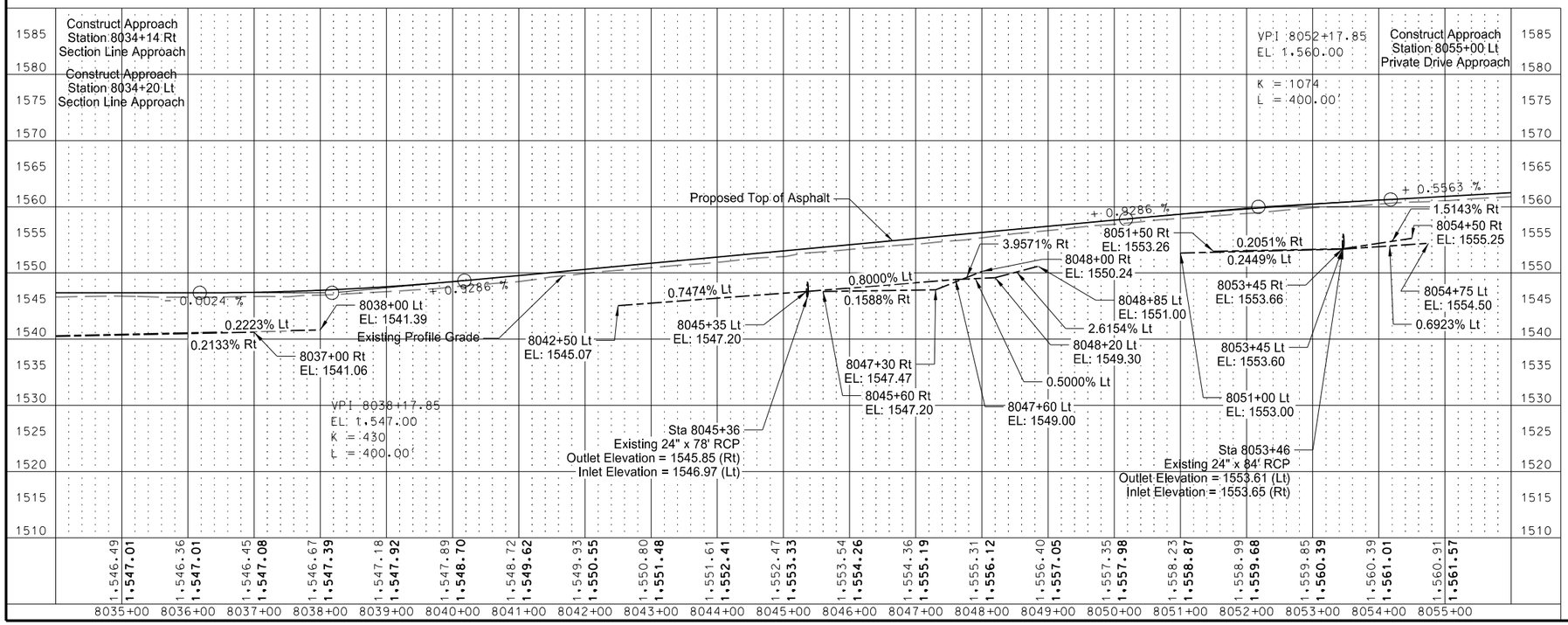
Plan & Profile Sheets

8015+00 to 8035+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	10



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0169	REMOVAL OF END SECTION - ALL TYPES & SIZES		
		Sta 8045+36 - CL (Lt & Rt)	EA	2
		Sta 8053+46 - CL (Lt & Rt)	EA	2
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 8055+00 - 46' Lt	LF	42
714	0615	PIPE CONC REINF 24IN CL III		
		Sta 8045+36 - CL (Lt)	LF	4
		Sta 8045+36 - CL (Rt)	LF	12
		Sta 8053+46 - CL (Lt)	LF	4
		Sta 8053+46 - CL (Rt)	LF	6
714	3020	END SECT-CONC REINF 24IN		
		Sta 8045+36 - CL (Lt & Rt)	EA	2
		Sta 8053+46 - CL (Lt & Rt)	EA	2
714	4106	PIPE CONDUIT 24IN - APPROACH		
		Sta 8055+00 - 78' Lt	LF	32



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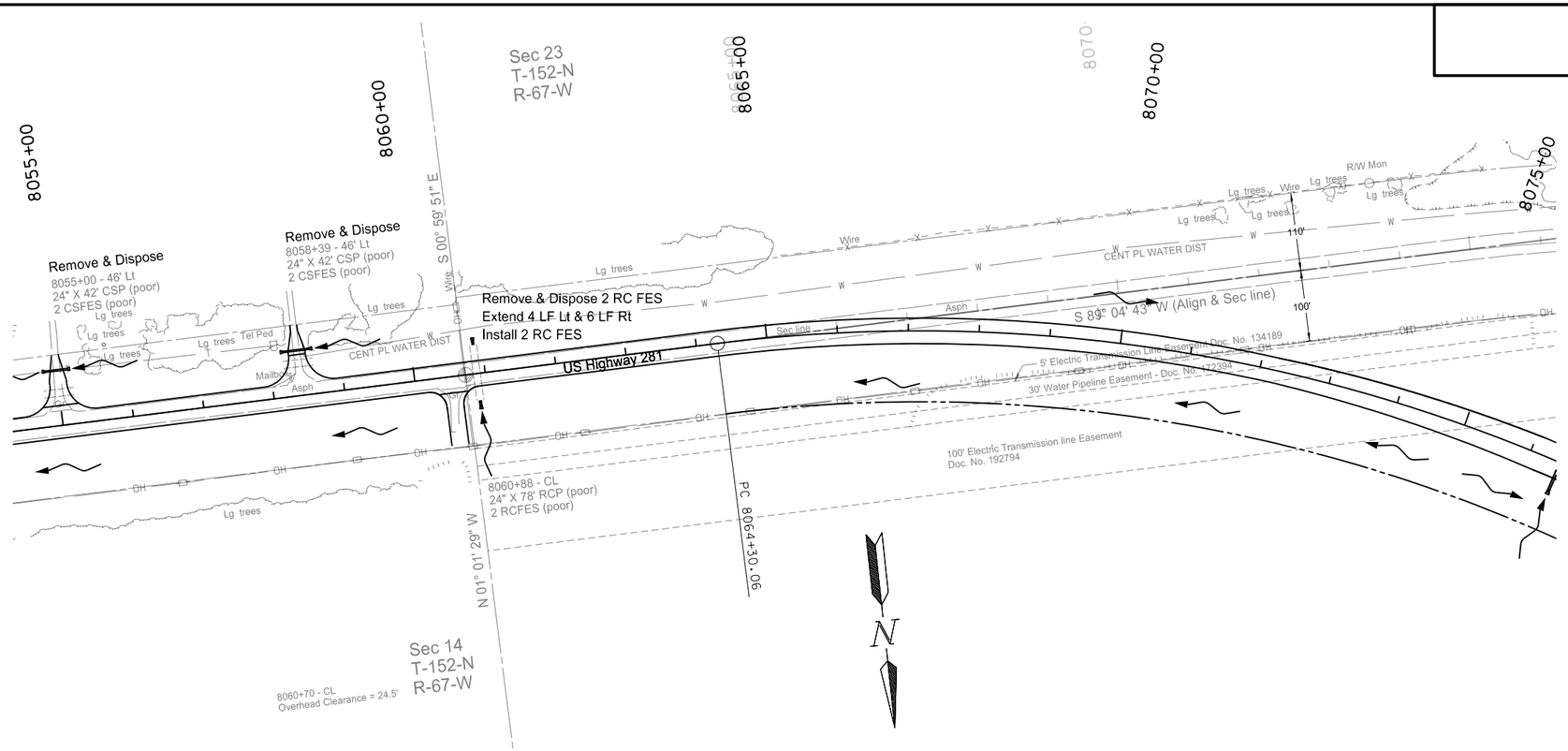
US Highway 281

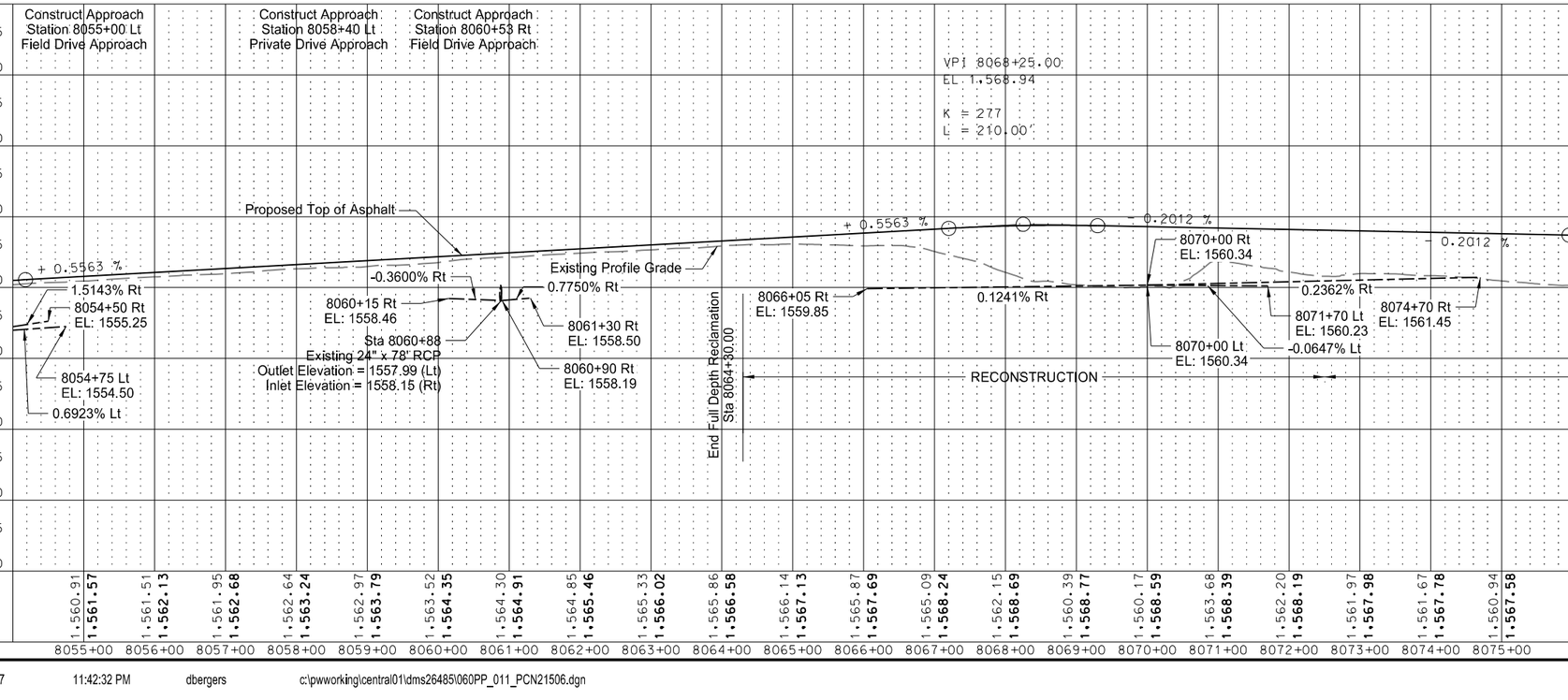
Plan & Profile Sheets

8035+00 to 8055+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	11



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0169	REMOVAL OF END SECTION - ALL TYPES & SIZES		
		Sta 8060+88 - CL (Lt & Rt)	EA	2
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 8058+39 - 46' Lt	LF	42
714	0615	PIPE CONC REINF 24IN CL III		
		Sta 8060+88 - CL (Lt)	LF	4
		Sta 8060+88 - CL (Rt)	LF	6
714	3020	END SECT-CONC REINF 24IN		
		Sta 8060+88 - CL (Lt & Rt)	EA	2
714	4106	PIPE CONDUIT 24IN - APPROACH		
		Sta 8058+39 - 64' Lt	LF	38



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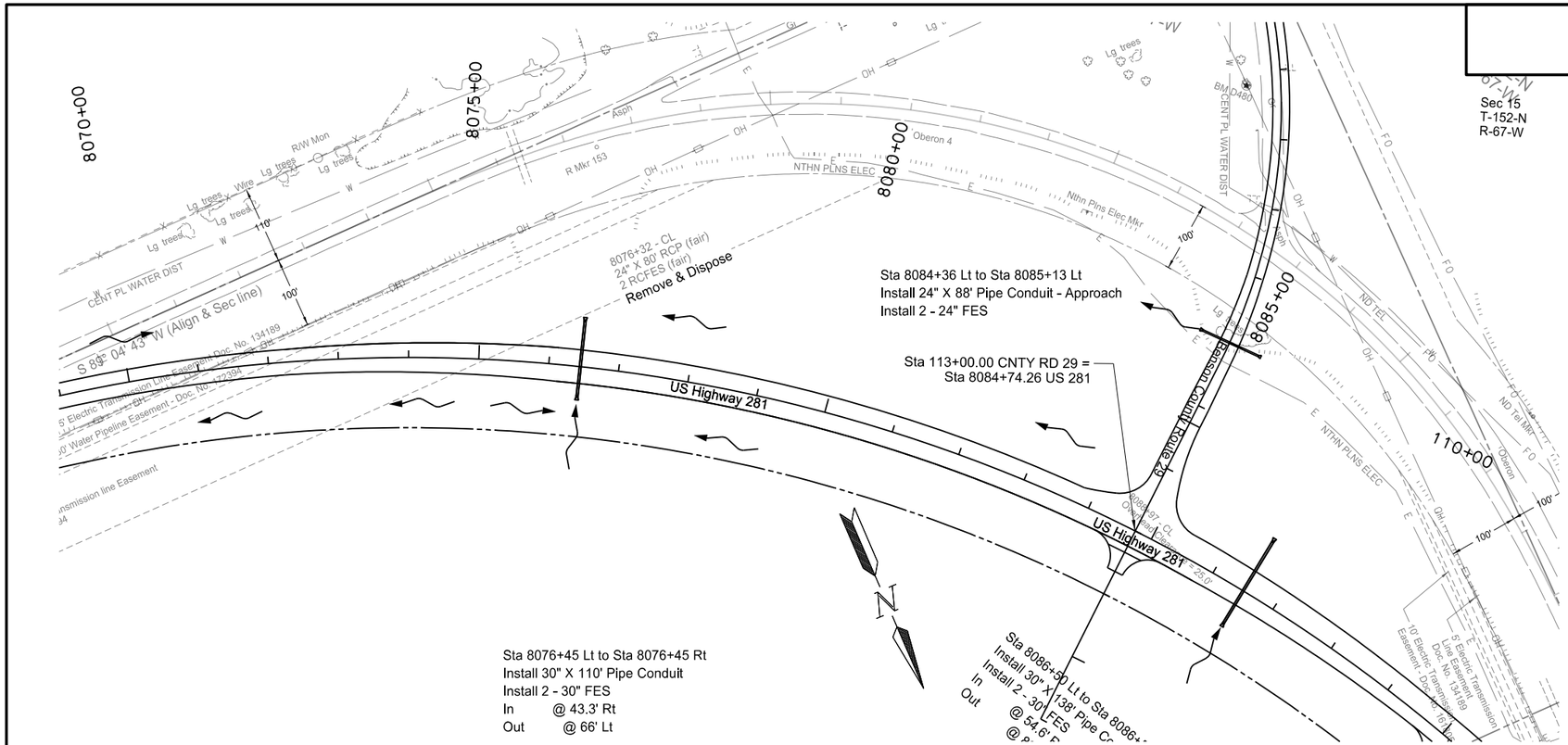
US Highway 281

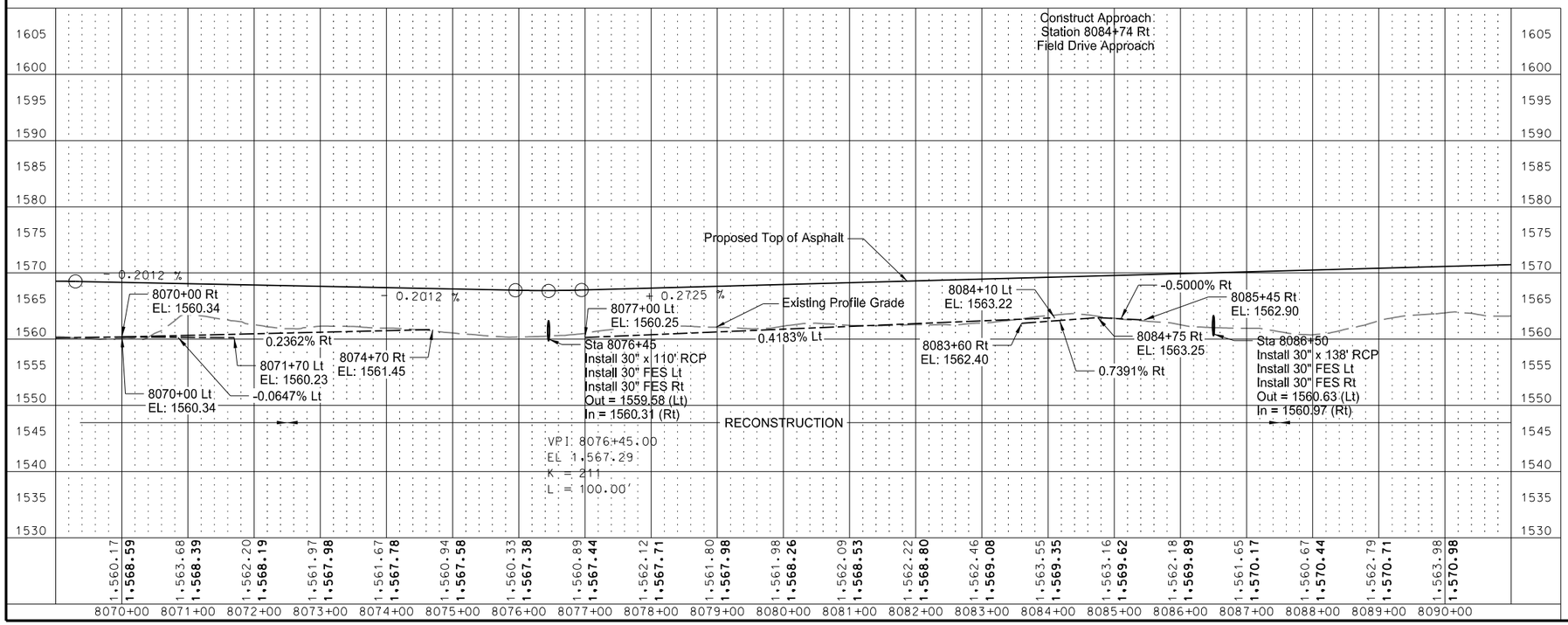
Plan & Profile Sheets

8055+00 to 8070+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	12



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 8075+40 - 261' Lt	LF	80
714	4106	PIPE CONDUIT 24IN - APPROACH		
		Sta 8084+73 - 300' Lt	LF	88
714	4110	PIPE CONDUIT 30IN		
		Sta 8076+45 - CL (Lt & Rt)	LF	110



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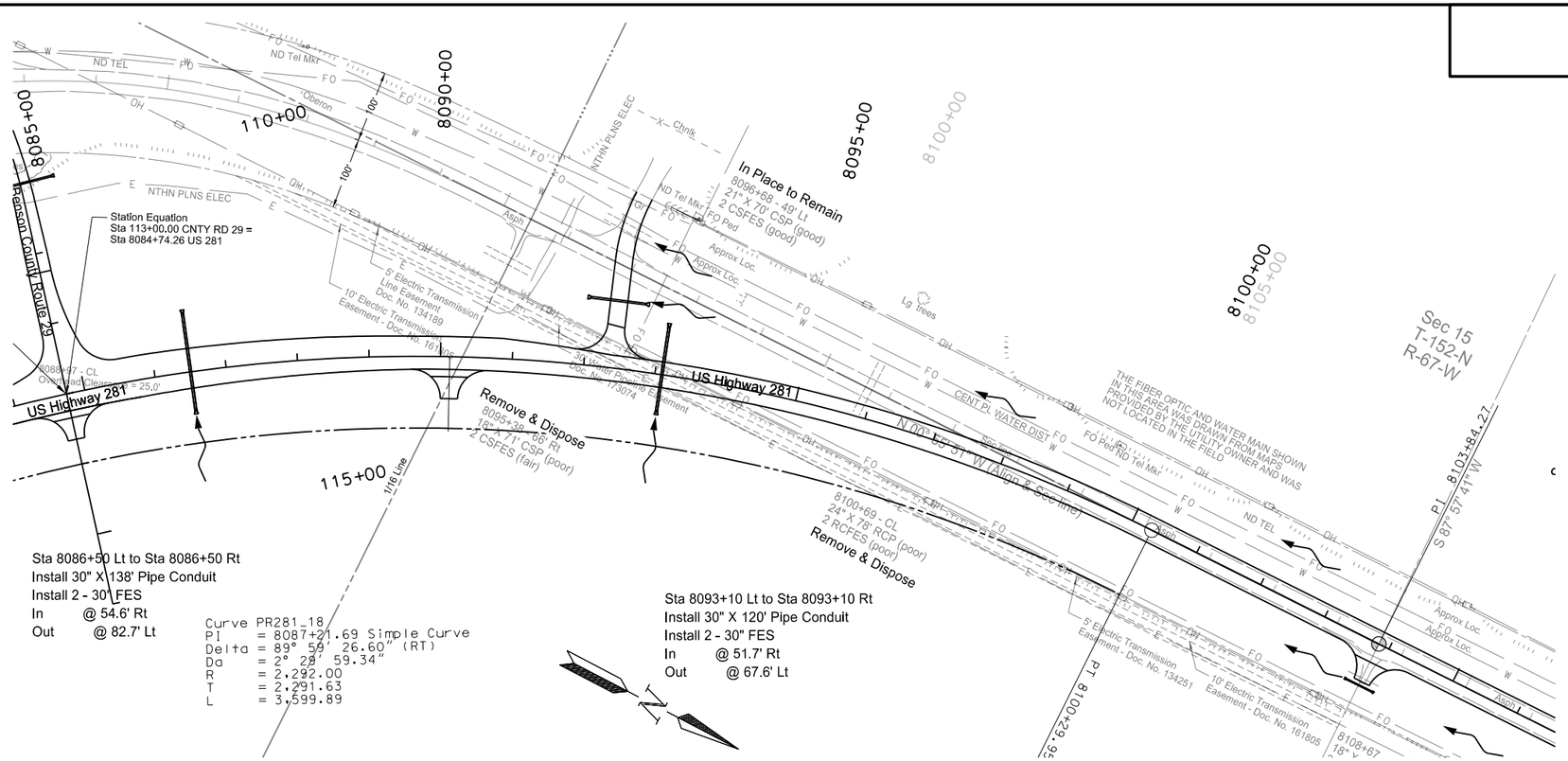
US Highway 281

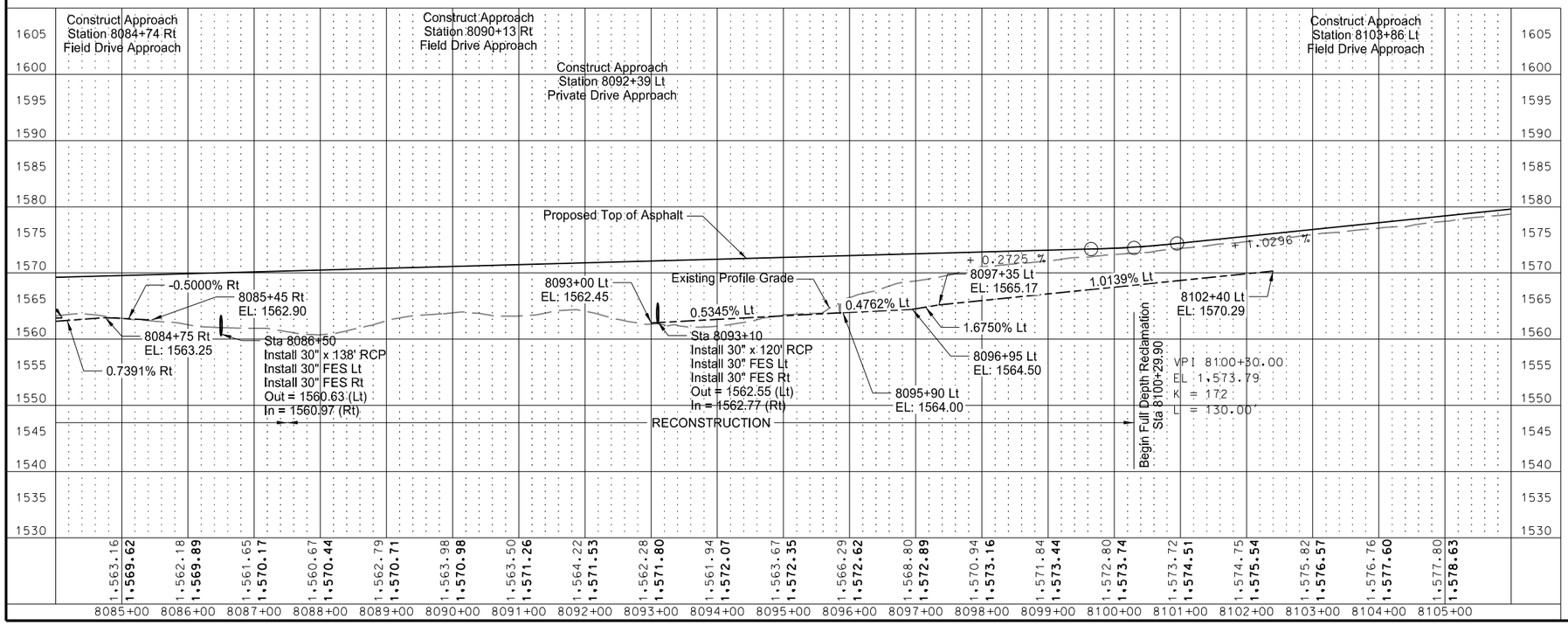
Plan & Profile Sheets

8070+00 to 8085+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	13

SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 8090+86 - 137' Lt	LF	71
		Sta 8095+94 - 42' Lt	LF	78
714	4110	PIPE CONDUIT 30IN		
		Sta 8086+50 - CL (Lt & Rt)	LF	138
		Sta 8093+10 - CL (Lt & Rt)	LF	120
714	4113	PIPE CONDUIT 30IN - APPROACH		
		Sta 8092+38 - 94' Lt	LF	78





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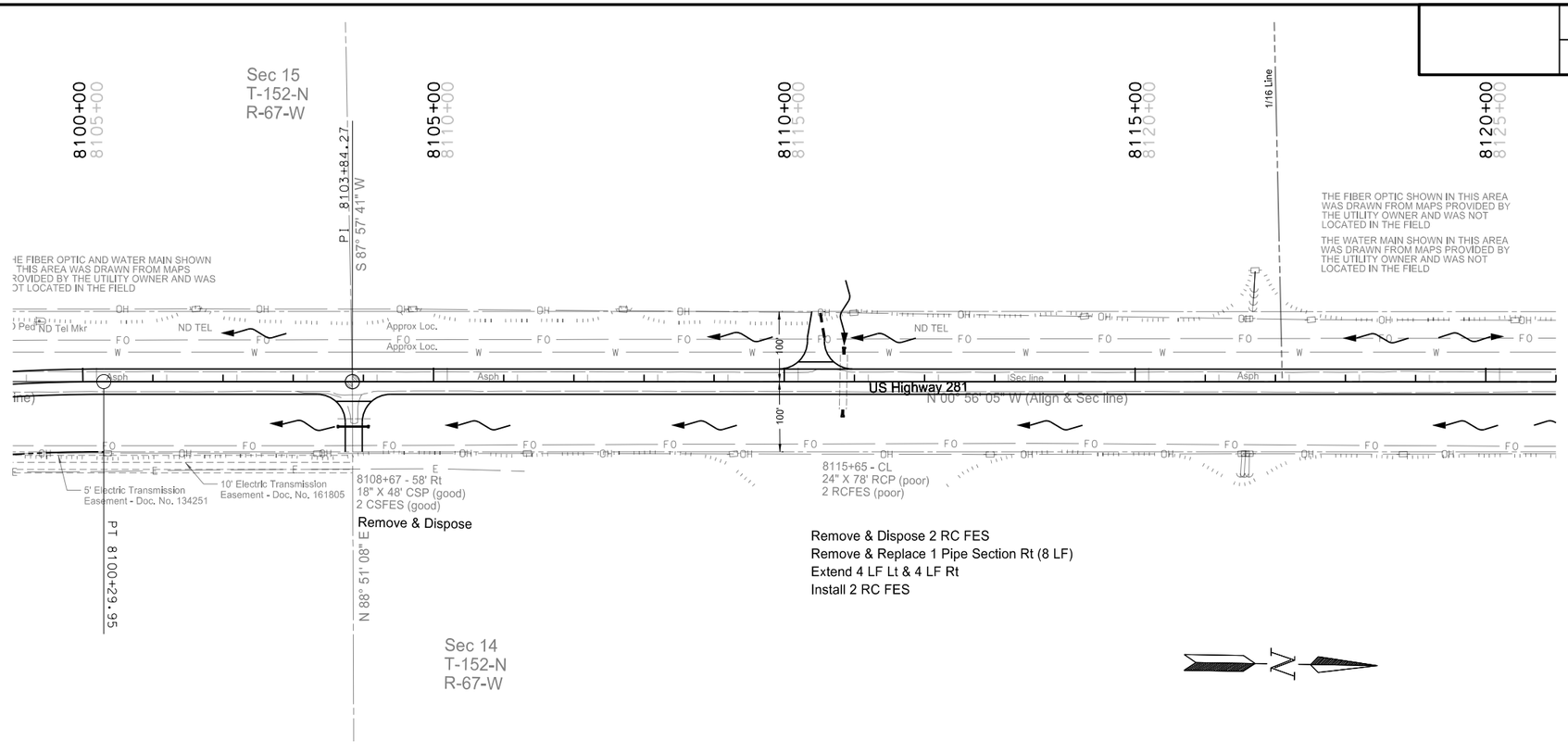
US Highway 281

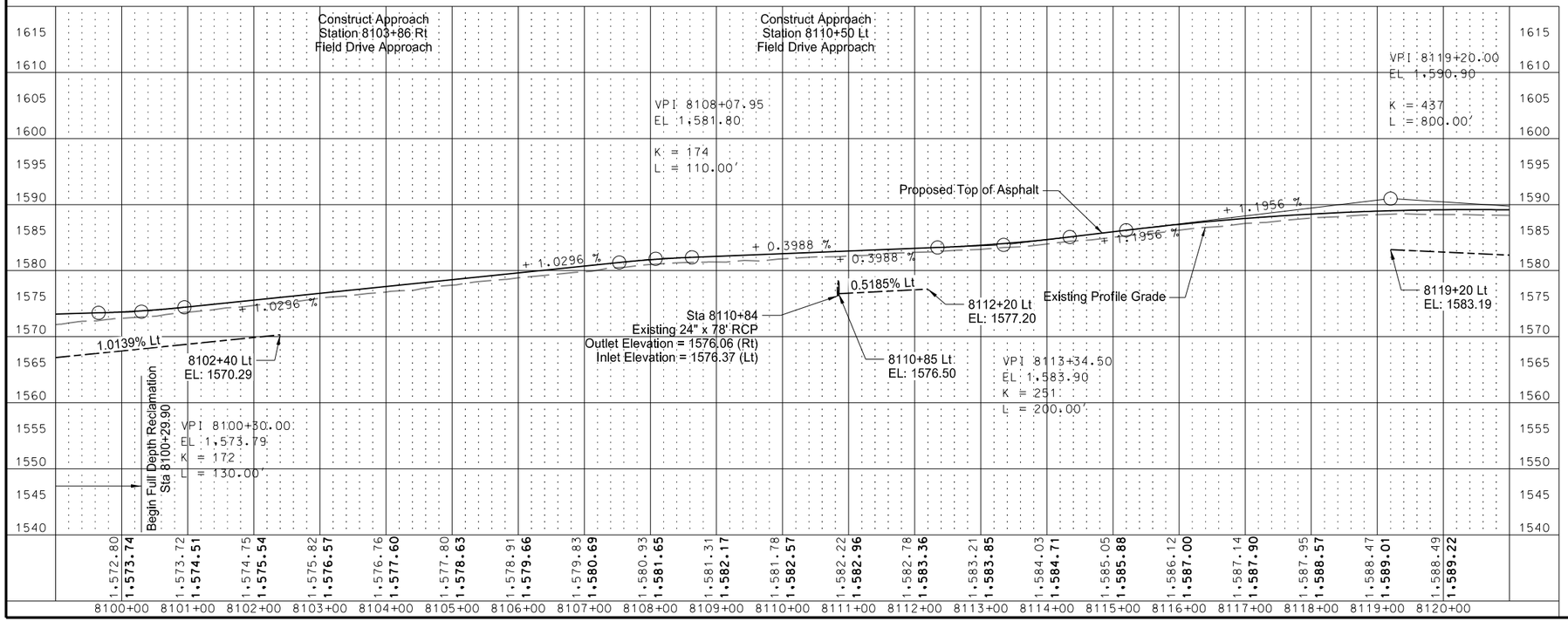
Plan & Profile Sheets

8085+00 to 8100+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	14



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0169	REMOVAL OF END SECTION - ALL TYPES & SIZES		
		Sta 8110+84 - CL (Lt & Rt)	EA	2
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 8103+86 - 58' Rt (Bk & Ahd)	LF	48
		Sta 8110+84 - CL (Rt)	LF	8
714	0615	PIPE CONC REINF 24IN CL III		
		Sta 8110+84 - CL (Lt)	LF	4
		Sta 8110+84 - CL (Rt)	LF	8
		Sta 8110+84 - CL (Rt)	LF	4
714	3020	END SECT-CONC REINF 24IN		
		Sta 8110+84 - CL (Lt & Rt)	EA	2
714	4099	PIPE CONDUIT 18IN - APPROACH		
		Sta 8103+85 - 64' Rt	LF	40



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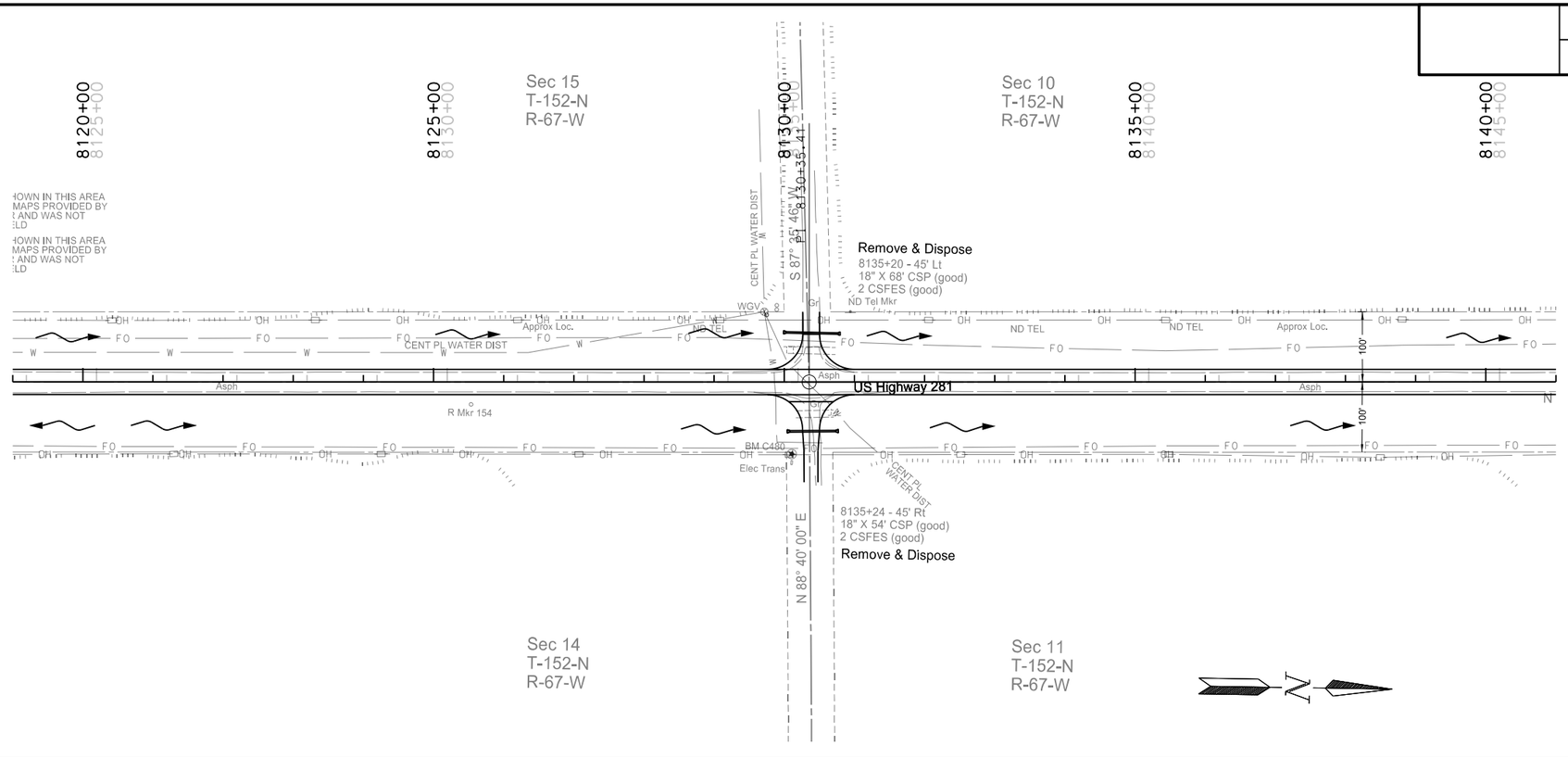
US Highway 281

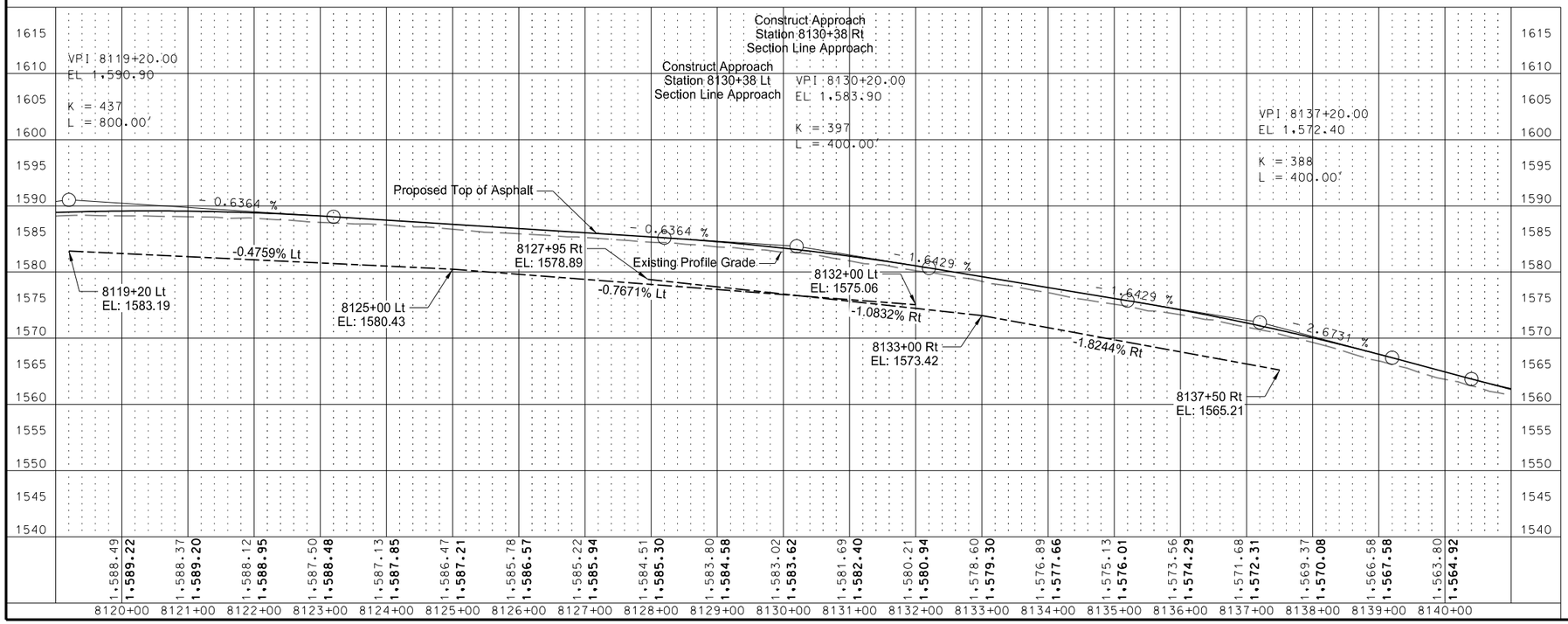
Plan & Profile Sheets

8100+00 to 8120+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	15

SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 8130+39 - 45' Lt	LF	68
		Sta 8130+43 - 45' Rt	LF	54
714	4106	PIPE CONDUIT 24IN - APPROACH		
		Sta 8130+41 - 70' Lt	LF	74
		Sta 8130+41 - 70' Rt	LF	66





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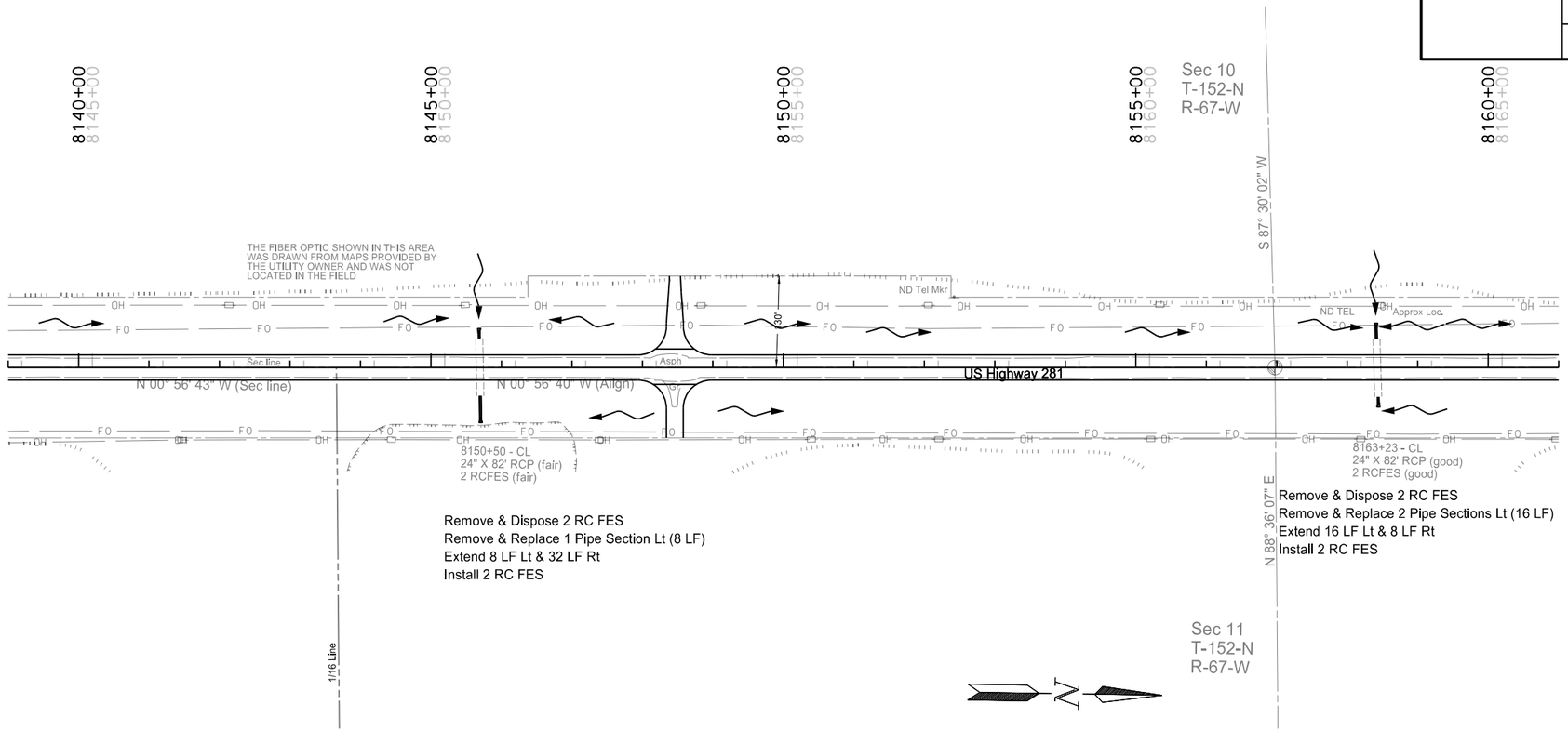
US Highway 281

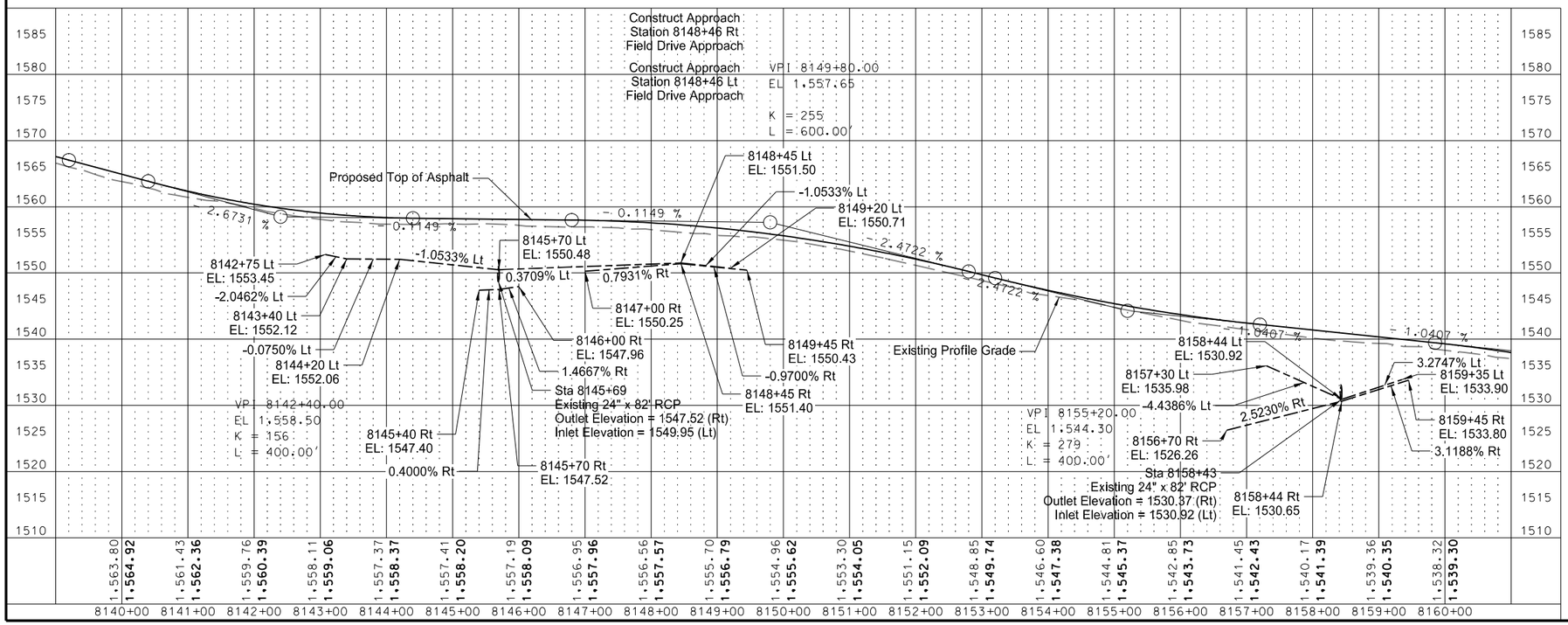
Plan & Profile Sheets

8120+00 to 8140+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	60	16



SPEC	CODE	BID ITEM	UNIT	QUANTITY
202	0169	REMOVAL OF END SECTION - ALL TYPES & SIZES		
		Sta 8145+69 - CL (Lt & Rt)	EA	2
		Sta 8158+43 - CL (Lt & Rt)	EA	2
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES		
		Sta 8145+69 - CL (Lt)	LF	8
		Sta 8158+43 - CL (Lt)	LF	16
714	0615	PIPE CONC REINF 24IN CL III		
		Sta 8145+69 - CL (Lt)	LF	8
		Sta 8145+69 - CL (Lt)	LF	8
		Sta 8145+69 - CL (Rt)	LF	32
		Sta 8158+43 - CL (Lt)	LF	16
		Sta 8158+43 - CL (Lt)	LF	16
		Sta 8158+43 - CL (Rt)	LF	8
714	3020	END SECT-CONC REINF 24IN		
		Sta 8145+69 - CL (Lt & Rt)	EA	2
		Sta 8158+43 - CL (Lt & Rt)	EA	2



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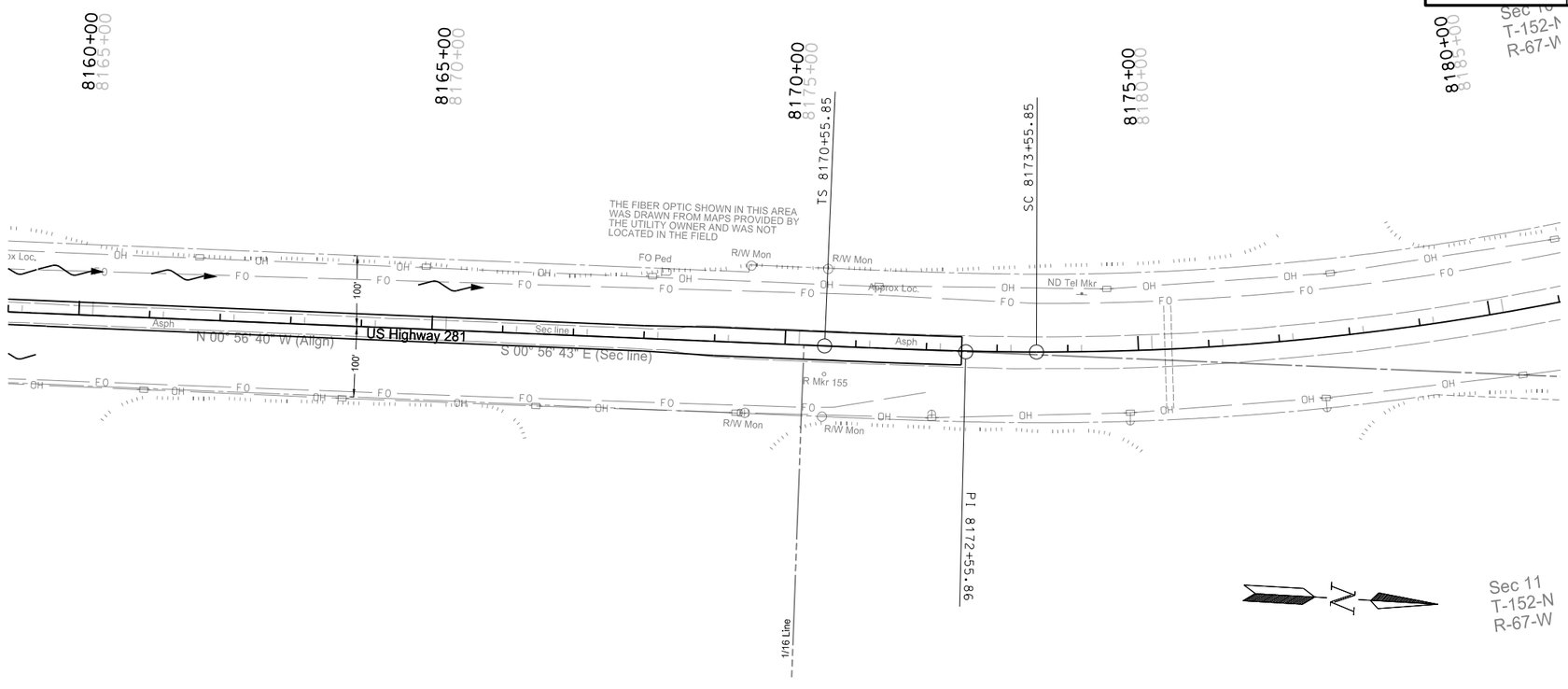
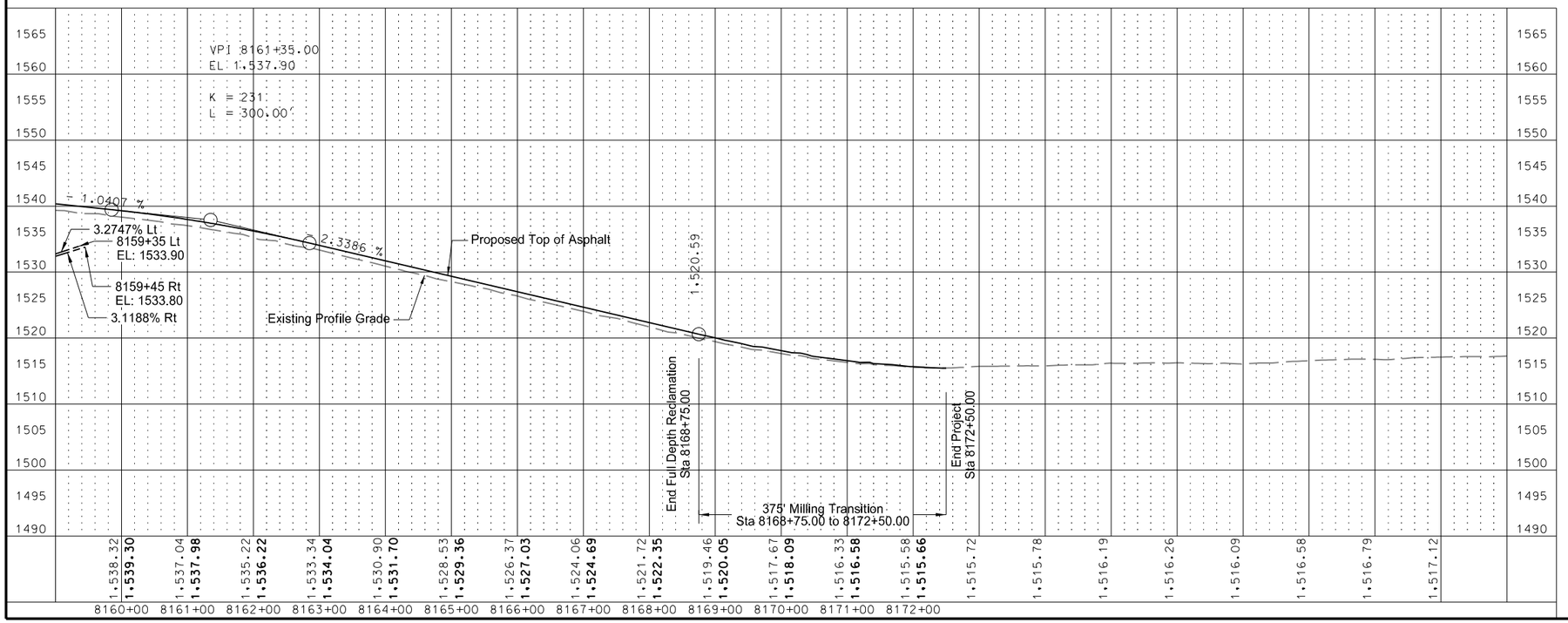
US Highway 281

Plan & Profile Sheets

8140+00 to 8160+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	60	17





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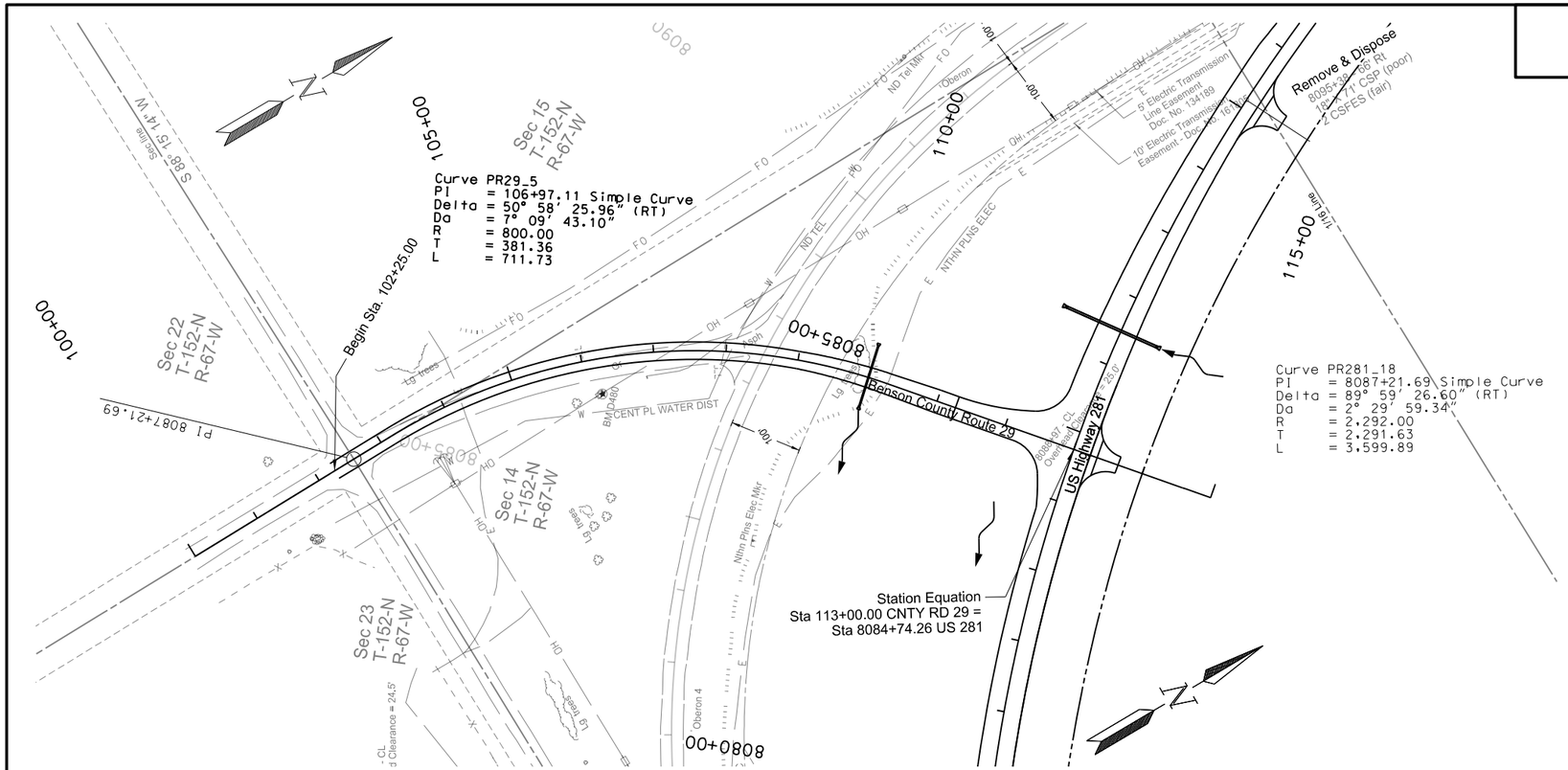
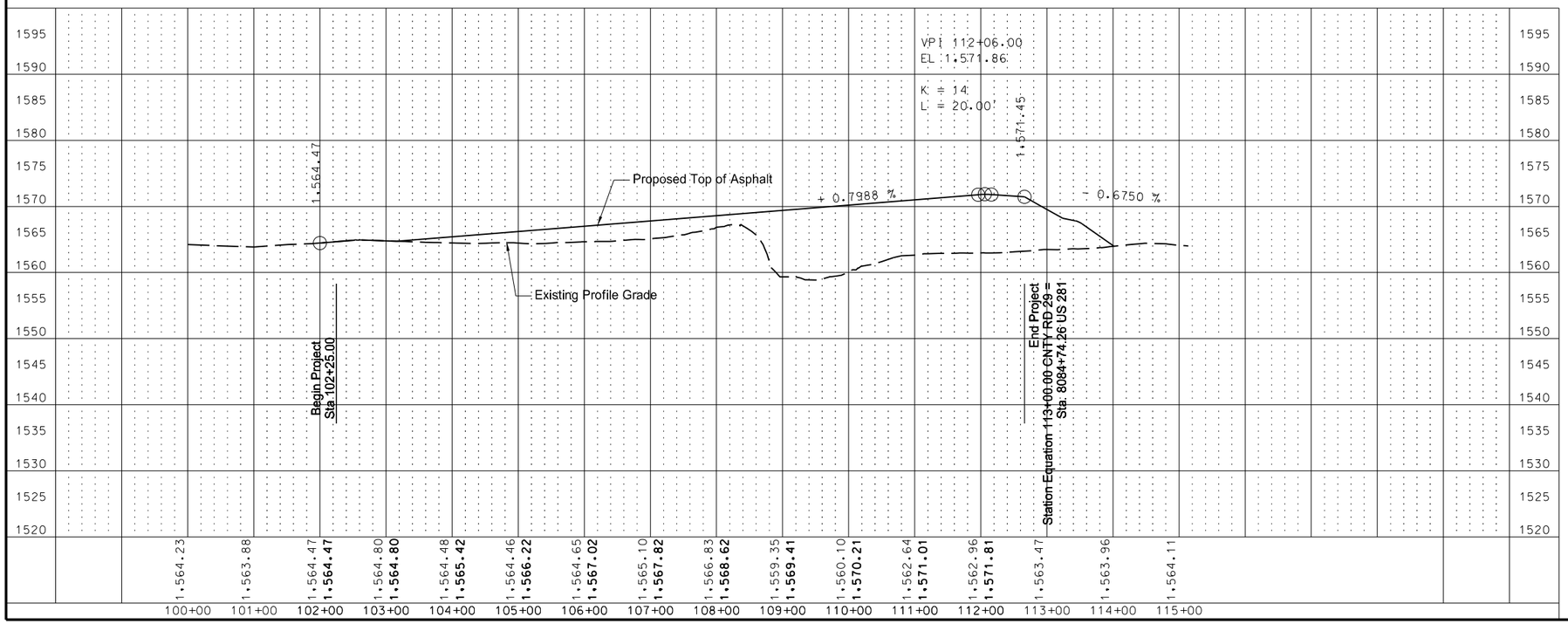
US Highway 281

Plan & Profile Sheets

8160+00 to 8180+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	60	18





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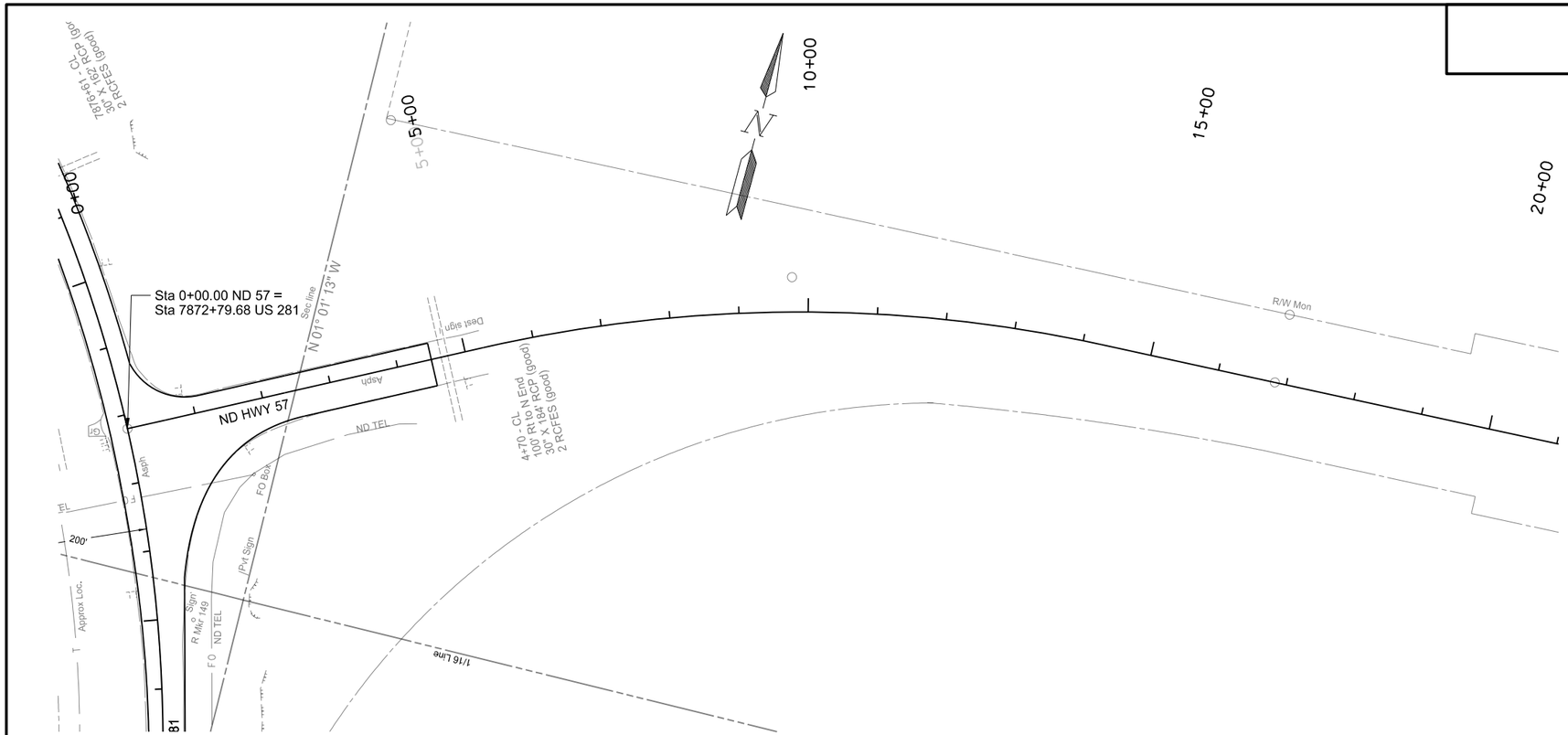
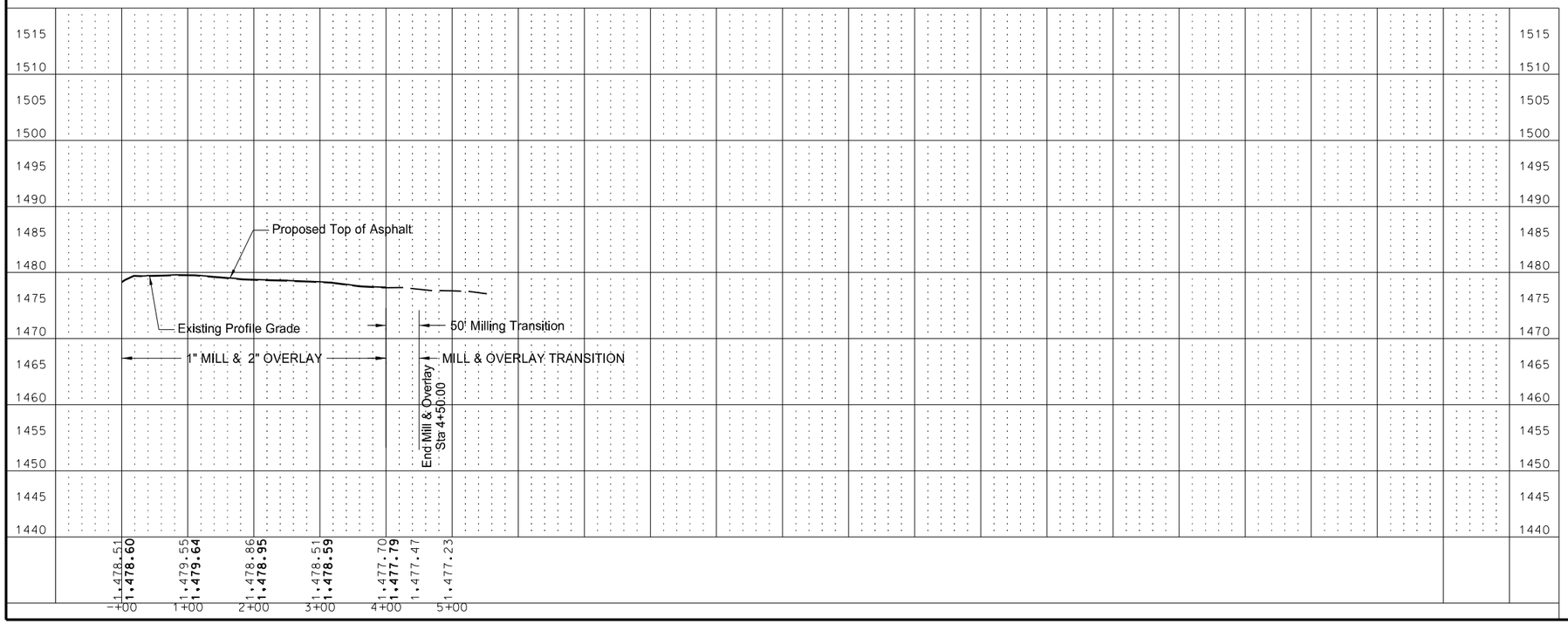
Benson Co. 29

Plan & Profile Sheets

100+00 to 113+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	60	19





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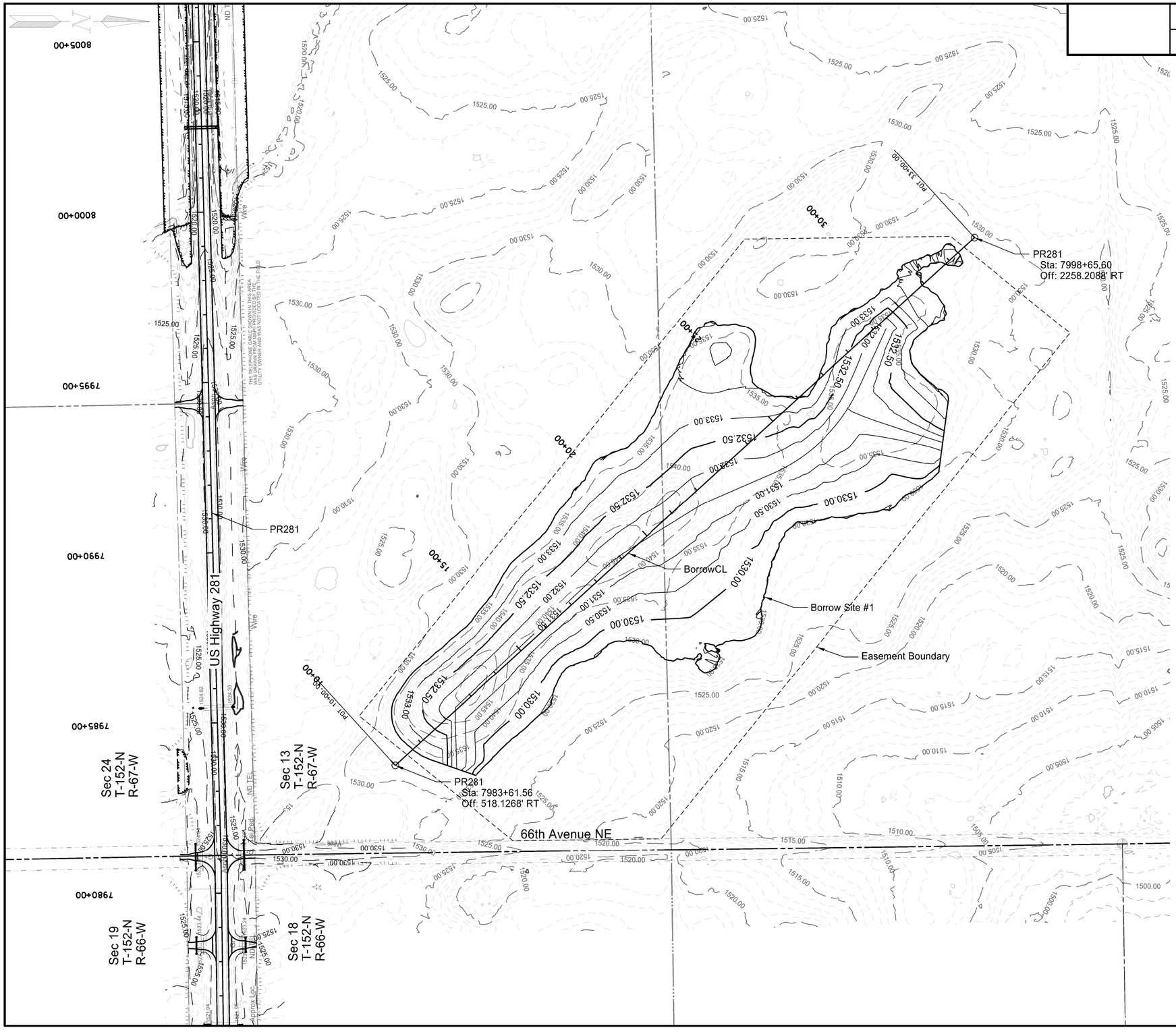
ND 57

Plan & Profile Sheets

0+00 to 20+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	70	1

SPEC	CODE	BID ITEM	UNIT	QTY
203	0122	TOPSOIL - DEPT OPTION BORROW AREA		
		Borrow Site #1	CY	17,020
203	0140	BORROW - EXCAVATION		
		Borrow Site #1	CY	154,897



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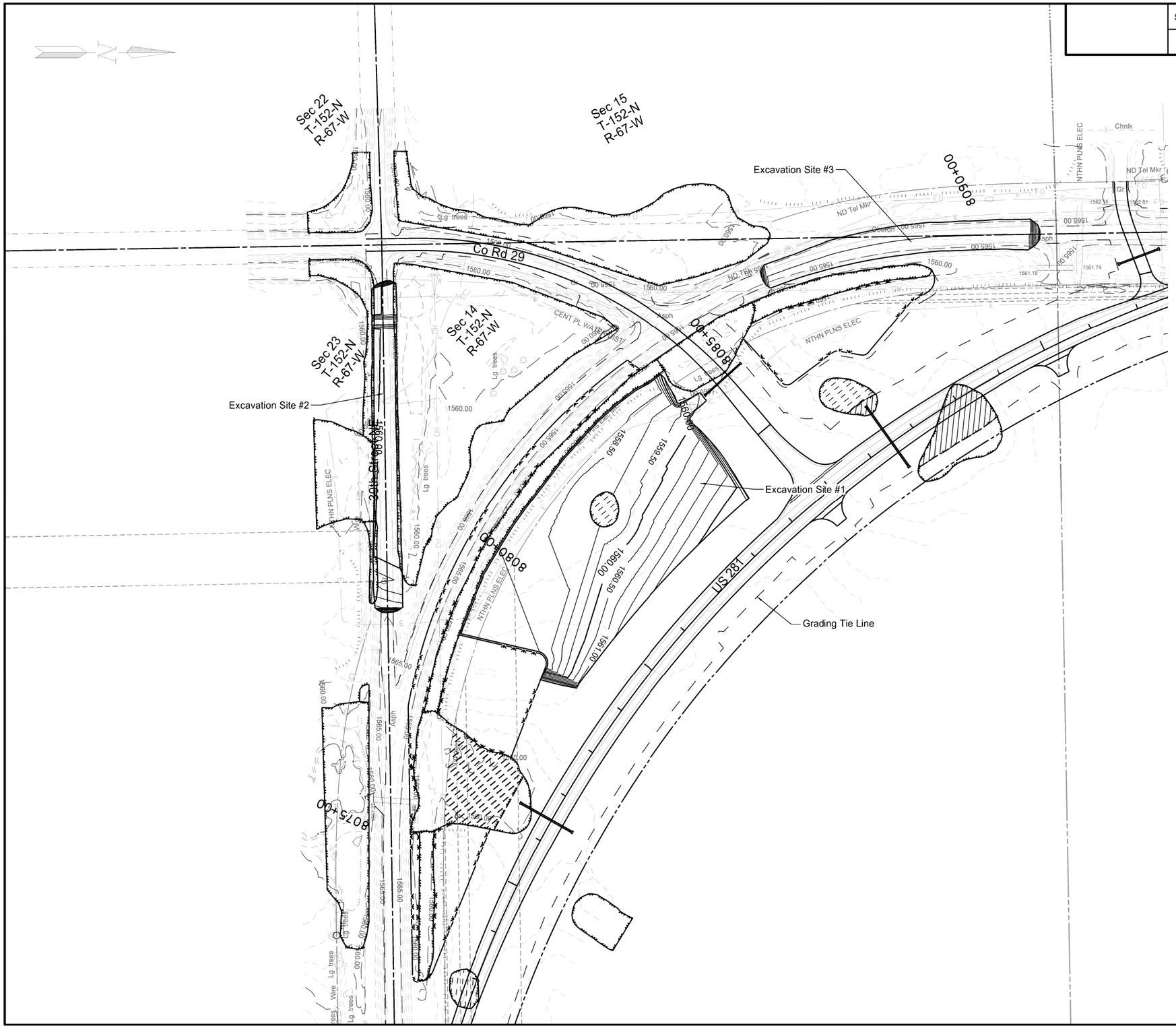
US Highway 281

Borrow Site 1 Contour Layout

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	70	2

SPEC	CODE	BID ITEM	UNIT	QTY
203	0101	COMMON EXCAVATION - TYPE A		
		Excavation Site #1	CY	18,667
		Excavation Site #2	CY	2,000
		Excavation Site #3	CY	2,507



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US Highway 281

Excavation Site 1 & 2 Contour Layout

9/5/2017 18:27:05 mhuettl c:\pwworking\central01\dms26485\070CT_002_ExcavationSite_1.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	75	1

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands1	Wetland Impacts Acre(s)		USFWS Easement Impacts Acre(s)		Wetland Mitigation													County	RSA
									Mitigation Required			USACE/11990 Bank		11990 Bank		USFWS Bank		Onsite					
					Temp.	Perm.	Temp.	Perm.	EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)	Mitigation Location; Ratio	Acre(s)	Constructed Site #	Constructed Size Acre(s)		
40b	Sec 21 T 152N R 66W	Basin	Artificial	No	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
41	Sec 20 T 152N R 66W	Basin	Artificial	No	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
42	Sec 17 T 152N R 66W	Basin	Natural	No	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
43a	Sec 20 T 152N R 66W	Basin	Natural	Yes	0.74	0.53	0.00	0.00	Y	N	N							Creation at WL 57d; 2:1	1.06	1	1.06	Benson	Devils Lake Basin
43b	Sec 17 T 152N R 66W	Basin	Natural	Yes	0.13	0.02	0.00	0.00	Y	N	N							Restoration at WL 57d Roadbed; 1:1	0.02	1	0.02	Benson	Devils Lake Basin
43c	Sec 17 T 152N R 66W	Ditch	Artificial	Yes	0.00	0.05	0.00	0.00	N	N	N											Benson	Devils Lake Basin
44	Sec 18 T 152N R 66W	Basin	Natural	Yes	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
45a	Sec 19 T 152N R 66W	Basin	Natural	Yes	0.08	0.07	0.00	0.00	Y	Y	N							Restoration at WL 57d Roadbed; 1:1	0.07	1	0.07	Benson	Devils Lake Basin
45b	Sec 18 T 152N R 66W	Slope	Natural	Yes	0.05	0.08	0.00	0.00	Y	Y	N							Creation at WL 57d; 2:1	0.08	1	0.16	Benson	Devils Lake Basin
46a	Sec 19 T 152N R 66W	Basin	Natural	Yes	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
46b	Sec 19 T 152N R 66W	Ditch	Artificial	Yes	0.03	0.08	0.00	0.00	N	N	N											Benson	Devils Lake Basin
47a	Sec 19 T 152N R 66W	Basin	Natural	Yes	0.08	0.05	0.00	0.00	Y	Y	N							Creation at WL 57d; 2:1	0.05	1	0.10	Benson	Devils Lake Basin
47b	Sec 18 T 152N R 66W	Basin	Natural	Yes	0.06	0.09	0.00	0.00	N	Y	N							Creation at WL 57d; 2:1	0.09	1	0.18	Benson	Devils Lake Basin
48	Sec 24 T 152N R 67W	Basin	Natural	No	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	75	2

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands1	Wetland Impacts Acre(s)		USFWS Easement Impacts Acre(s)		Wetland Mitigation												County	RSA
									Mitigation Required			USACE/11990 Bank		11990 Bank		USFWS Bank		Onsite				
					Temp.	Perm.	Temp.	Perm.	EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)	Mitigation Location; Ratio	Acre(s)	Constructed Site #	Constructed Size Acre(s)	
49a	Sec 24 T 152N R 67W	Ditch	Artificial	Yes	0.03	0.18	0.00	0.00	N	Y	N										Benson	Devils Lake Basin
49b	Sec 24 T 152N R 67W	Basin	Natural	Yes	0.35	0.4	0.00	0.00	Y	Y	N	Herda	0.31						0.4	1 (0.08 acres) & 2 (0.11 acres)	0.80	Benson	Devils Lake Basin
49c	Sec 24 T 152N R 67W	Ditch	Artificial	Yes	0.01	0.11	0.00	0.00	N	N	N											Benson	Devils Lake Basin
49d	Sec 13 T 152N R 67W	Basin	Natural	Yes	0.37	0.15	0.00	0.00	Y	Y	N							Creation at WL 57d; 2:1	0.15	1	0.30	Benson	Devils Lake Basin
49e	Sec 13 T 152N R 67W	Ditch	Artificial	Yes	0.04	0.05	0.00	0.00	N	N	N											Benson	Devils Lake Basin
50	Sec 23 T 152N R 67W	Ditch	Artificial	Yes	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
51a	Sec 23 T 152N R 67W	Ditch	Artificial	Yes	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
51b	Sec 23 T 152N R 67W	Basin	Natural	Yes	0.04	0.04	0.00	0.00	Y	N	N			Vollrath 16/17	0.04							Benson	Devils Lake Basin
52	Sec 14 T 152N R 67W	Ditch	Artificial	Yes	0.00	0.04	0.00	0.00	N	N	N											Benson	Devils Lake Basin
53	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
54	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.08	0.05	0.00	0.00	Y	N	N			Vollrath 16/17	0.05							Benson	Devils Lake Basin
55	Sec 14 T 152N R 67W	Basin	Natural	No	0.01	0.04	0.00	0.00	Y	N	N			Vollrath 16/17	0.04							Benson	Devils Lake Basin
56a	Sec 23 T 152N R 67W	Basin	Natural	Yes	0.04	0.03	0.00	0.00	Y	N	N			Vollrath 16/17	0.03							Benson	Devils Lake Basin
56b	Sec 14 T 152N R 67W	Ditch	Artificial	Yes	0.01	0.02	0.00	0.00	N	N	N											Benson	Devils Lake Basin

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	75	3

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands1	Wetland Impacts Acre(s)		USFWS Easement Impacts Acre(s)		Wetland Mitigation												County	RSA
									Mitigation Required			USACE/11990 Bank		11990 Bank		USFWS Bank		Onsite				
					Temp.	Perm.	Temp.	Perm.	EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)	Mitigation Location; Ratio	Acre(s)	Constructed Site #	Constructed Size Acre(s)	
57a	Sec 23 T 152N R 67W	Ditch	Artificial	Yes	0.00	0	0.00	0.00	N	N	N										Benson	Devils Lake Basin
57b	Sec 23 T 152N R 67W	Basin	Natural	Yes	0.01	0	0.00	0.00	N	N	N										Benson	Devils Lake Basin
57c	Sec 14 T 152N R 67W	Ditch	Artificial	Yes	0.18	0	0.00	0.00	N	N	N										Benson	Devils Lake Basin
57d	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.33	0	0.49	0.08	N	N	Y					Vollrath 15/21 USFWS Easement Bank	0.08		*Total Mitigation Site 1: 0.07 ac of 1:1; 1.9 acres of 2:1.*	*1*		Benson	Devils Lake Basin
57e	Sec 14 T 152N R 67W	Ditch	Artificial	Yes	0.45	0.02	0.00	0.00	N	N	N										Benson	Devils Lake Basin
57f	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.08	0.27	0.00	0	Y	Y	N							Creation Adjacent at WL 57f; 1:1	0.27	2	0.27	Benson	Devils Lake Basin
57g	Sec 14 T 152N R 67W	Ditch	Artificial	Yes	0.26	0	0.00	0.00	N	N	N								*Total Mitigation Site 2: 0.27 acres of 1:1; 0.059 acres of 2:1*	*2*		Benson	Devils Lake Basin
58	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.00	0	0.00	0.00	N	N	N										Benson	Devils Lake Basin
59a	Sec 22 T 152N R 67W	Ditch	Artificial	Yes	0.00	0	0.00	0.00	N	N	N										Benson	Devils Lake Basin
59b	Sec 23 T 152N R 67W	Ditch	Artificial	Yes	0.04	0	0.00	0.00	N	N	N										Benson	Devils Lake Basin
59c	Sec 23 T 152N R 67W	Basin	Natural	Yes	0.01	0	0.00	0.00	N	N	N										Benson	Devils Lake Basin
59d	Sec 23 T 152N R 67W	Ditch	Artificial	Yes	0.03	0	0.00	0.00	N	N	N										Benson	Devils Lake Basin
59e	Sec 15 T 152N R 67W	Basin	Natural	Yes	0.17	0.1	0.00	0.00	Y	N	N							Creation at WL 57f; 2:1	0.1	1	0.20	Benson	Devils Lake Basin
59f	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.05	0.01	0.00	0.00	Y	Y	N							Creation at WL 57f; 2:1	0.01	2	0.02	Benson	Devils Lake Basin

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	75	4

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands1	Wetland Impacts Acre(s)		USFWS Easement Impacts Acre(s)		Wetland Mitigation												County	RSA
									Mitigation Required			USACE/11990 Bank		11990 Bank		USFWS Bank		Onsite				
					Temp.	Perm.	Temp.	Perm.	EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)	Mitigation Location; Ratio	Acre(s)	Constructed Site #	Constructed Size Acre(s)	
60	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.00	0	0.04	0.00	N	N	N					Vollrath 15/21 USFWS Easement Bank	0.00					Benson	Devils Lake Basin
61	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.00	0	0.12	0.03	N	N	Y					Vollrath 15/21 USFWS Easement Bank	0.03					Benson	Devils Lake Basin
62	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.00	0	0.12	0.25	Y	N	Y					Vollrath 15/21 USFWS Easement Bank	0.25					Benson	Devils Lake Basin
63	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.01	0.01	0.00	0.00	Y	N	N			Vollrath 16/17	0.01							Benson	Devils Lake Basin
64	Sec 15 T 152N R 67W	Basin	Natural	Yes	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
65	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
66	Sec 15 T 152N R 67W	Basin	Natural	Yes	0.04	0.03	0.00	0.00	Y	N	N			Vollrath 16/17	0.03							Benson	Devils Lake Basin
67	Sec 15 T 152N R 67W	Basin	Natural	Yes	0.06	0.05	0.00	0.00	Y	N	N			Vollrath 16/17	0.05							Benson	Devils Lake Basin
68	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.04	0.06	0.00	0.00	Y	N	N			Vollrath 16/17	0.06							Benson	Devils Lake Basin
69	Sec 14 T 152N R 67W	Basin	Natural	Yes	0.05	0.01	0.00	0.00	Y	N	N			Vollrath 16/17	0.01							Benson	Devils Lake Basin
70	Sec 11 T 152N R 67W	Basin	Natural	Yes	0.07	0.13	0.00	0.00	Y	Y	N							Creation at WL 57f; 2:1	0.13	1	0.26	Benson	Devils Lake Basin
71	Sec 11 T 152N R 67W	Slope	Natural	Yes	0.01	0.01	0.00	0.00	Y	N	N			Vollrath 16/17	0.01							Benson	Devils Lake Basin
72	Sec 11 T 152N R 67W	Slope	Natural	Yes	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
73	Sec 3 T 152N R 67W	Basin	Artificial	Yes	0.00	0	0.00	0.00	N	N	N											Benson	Devils Lake Basin
74*	Sec 14 T 152N R 67W	Basin	Natural*	Yes	0.00	0.00	0.00	0.08	N	N	Y					Vollrath 15/21 USFWS Easement Bank	0.08					Benson	Devils Lake Basin
				Totals	3.95	2.78	0.77	0.44					0.61		0.33		0.36		2.43		3.44		

*This wetland was added during the permitting phase as an office delineated wetland, per coordination with USFWS.

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	75	5

Other Waters Impact Table

Other Waters												Other Water Mitigation				
			Size					Impacts to Other Waters				Mitigation Required				
								Acre(s)		Linear Feet						
Number	Location	Type	Acre(s)	Linear Feet	Feature	USACE Jurisdictional1		Temp	Perm	Temp	Perm	EO 11990	USACE	USFWS	Mitigation Location; ratio	Method
1g	Sec 4 T 150N R 66W	Perennial River	0.59	250	Natural	Yes				0.00	0.00					
		Totals	0.59	250.00				0.00	0.00	0.00	0.00					

1 A wetland Jurisdictional Determination was issued by the USACE on 2/21/17 NWO-2016-02213-BIS.

Impact Summary Table

Permanent Impact Summary		*Temporary Impacts and additional information*	
Wetland Type	*Total (Acres)*	*Wetland Type*	*Total (Acres/Lf)*
Natural/JD	2.23	*Temporary JD*	3.94
Natural/Non-JD	0.00	*Non-JD Temporary*	0.01
Artificial/JD	0.55	*Permanent JD > 0.10*	1.77
Artificial /Non-JD	0.00	*Permanent OW*	0.00
Total	2.78	*Temporary OW*	0.00

Mitigation Summary Table

	Location	*Onsite Acre(s)*	*11990 Bank Acre(s)*	*USACE/11990 Bank Acre(s)*	*USFWS Bank Acre(s)*
USACE Only	Onsite	2.78			
EO 11990 Only	Vollrath 16/17		0.33		
USACE/ 11990					
USFWS	Vollrath 15/21 USFWS Easement Bank				0.36
	Total	2.78	0.33	0	0.36

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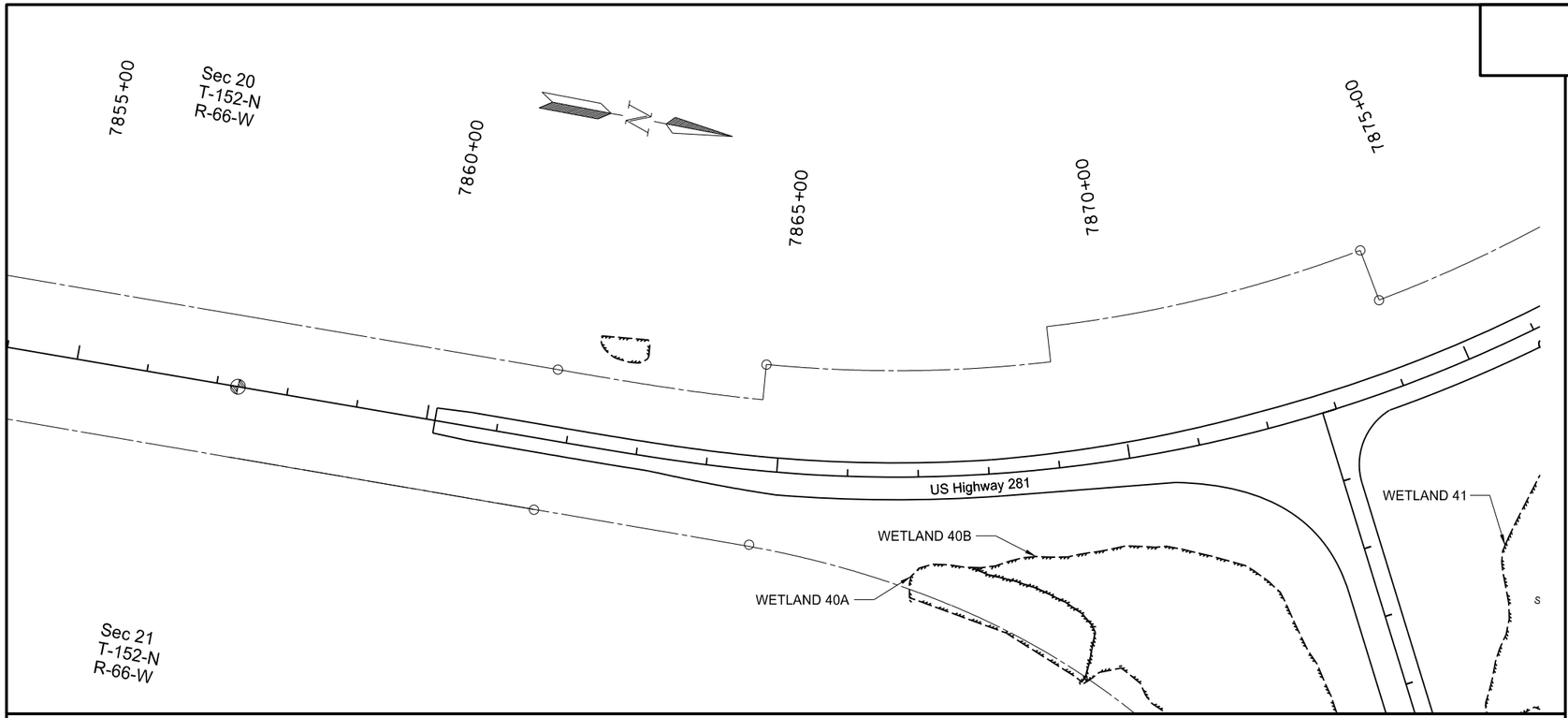
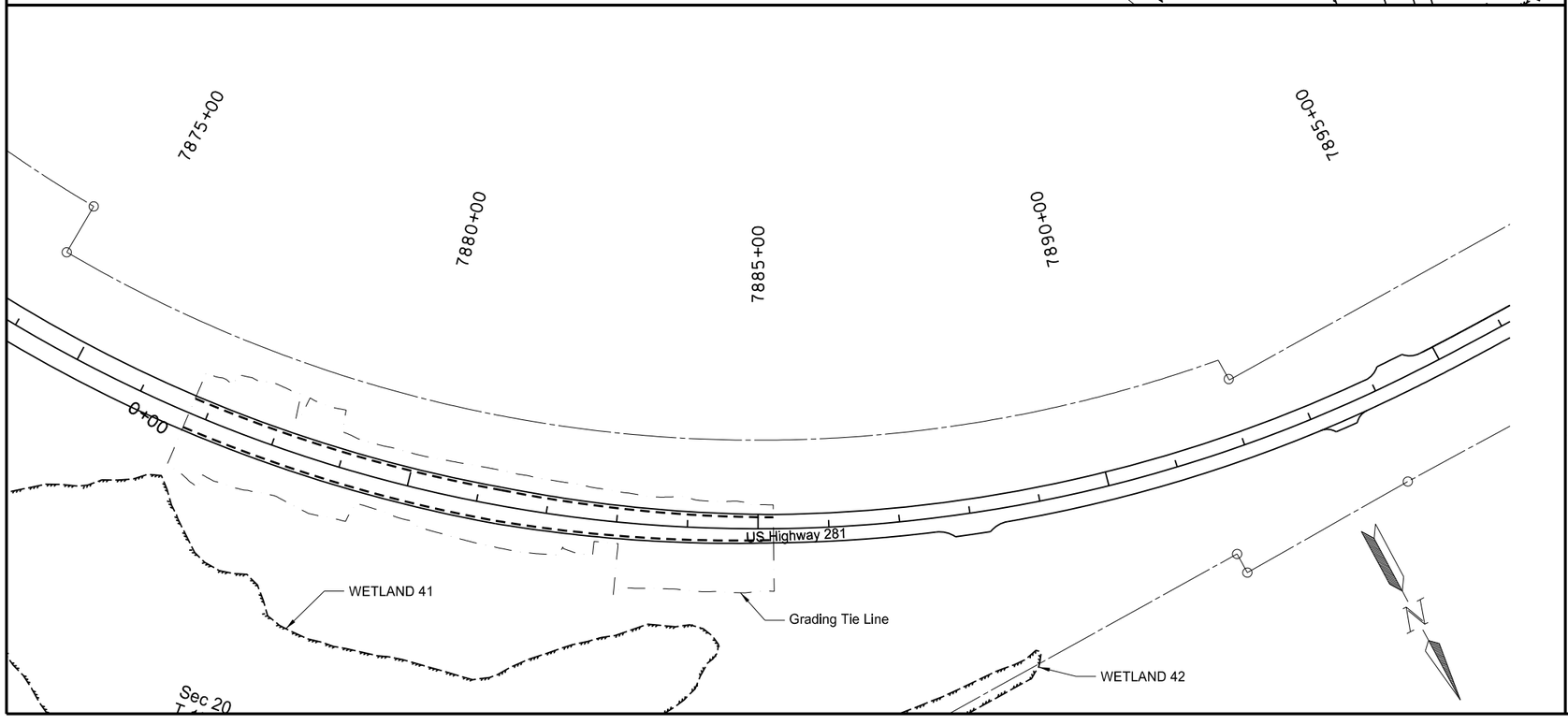
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	75	6





LEGEND

- Delineated Wetland
- Permanent Wetland Impact
- Temporary Wetland Impact
- US Fish & Wildlife (USFWS) Easement Wetlands
- Riprap
- Flow Arrow
- R/W Line
- Temporary Easement Line
- Section Line

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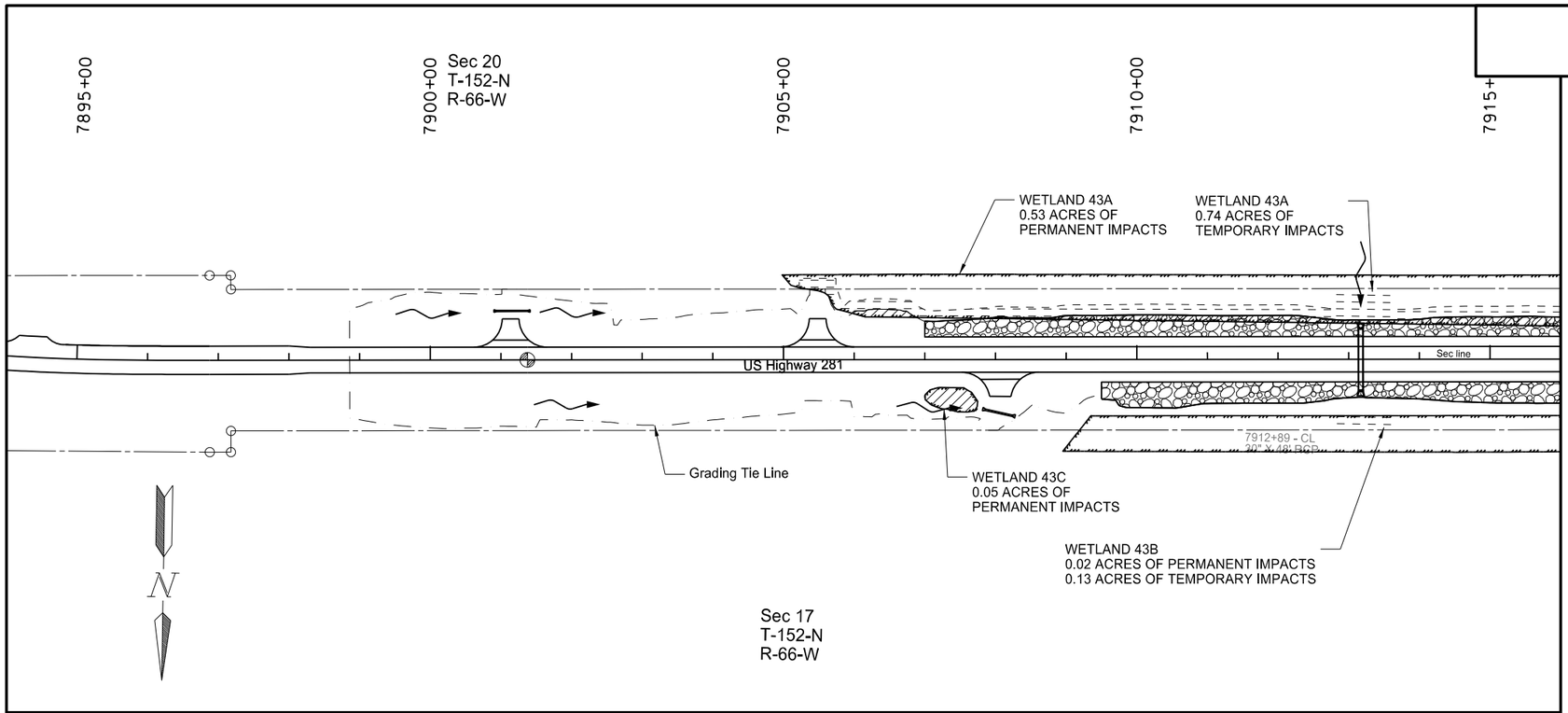
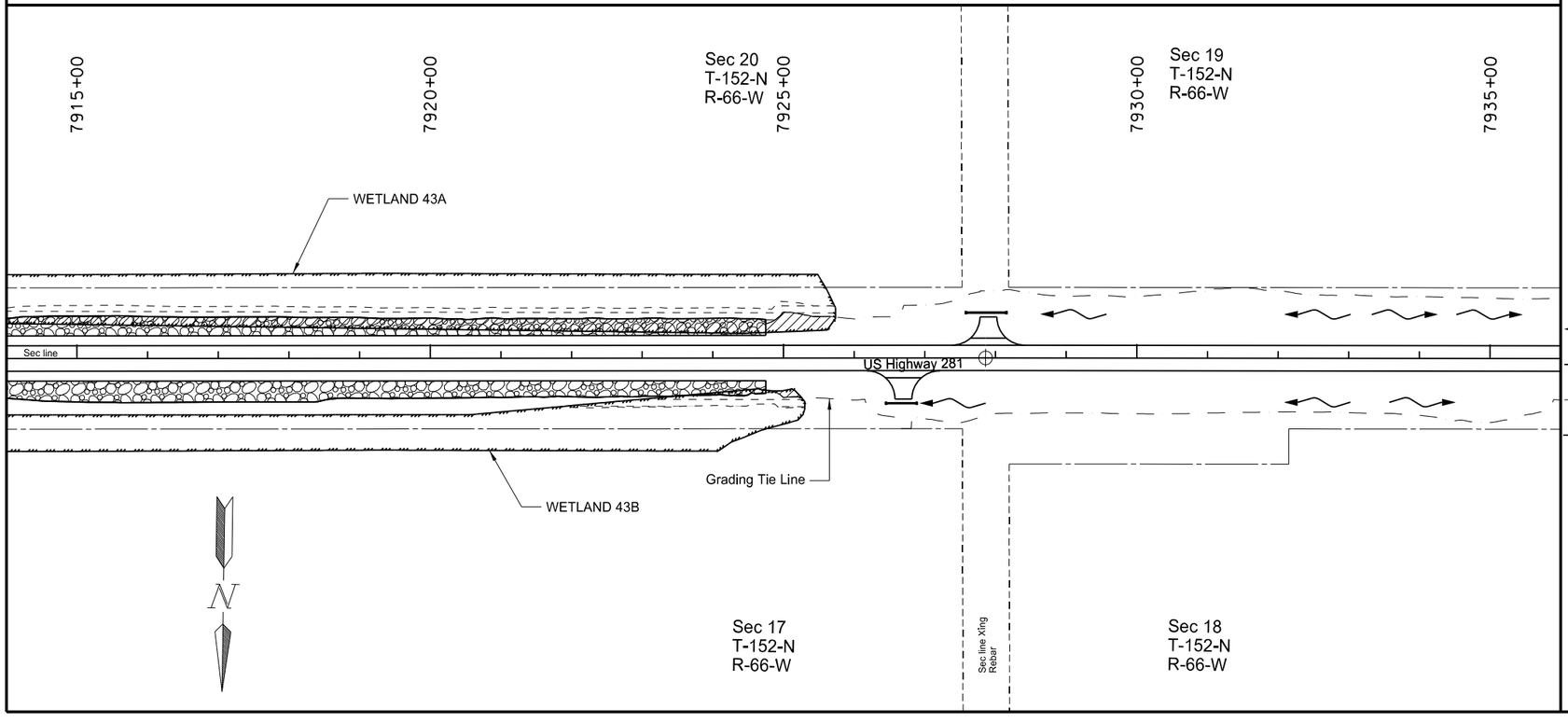
US Highway 281

Wetlands
Sta 7855+00 to 7895+00

8/28/2017 15:08:32 mhuettl c:\pwworking\central01\dms26485\075WL_006_PCN21506.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	75	7





LEGEND

- Delineated Wetland
- Permanent Wetland Impact
- Temporary Wetland Impact
- US Fish & Wildlife (USFWS) Easement Wetlands
- Riprap
- Flow Arrow
- R/W Line
- Temporary Easement Line
- Section Line

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US Highway 281

Wetlands
Sta 7895+00 to 7935+00

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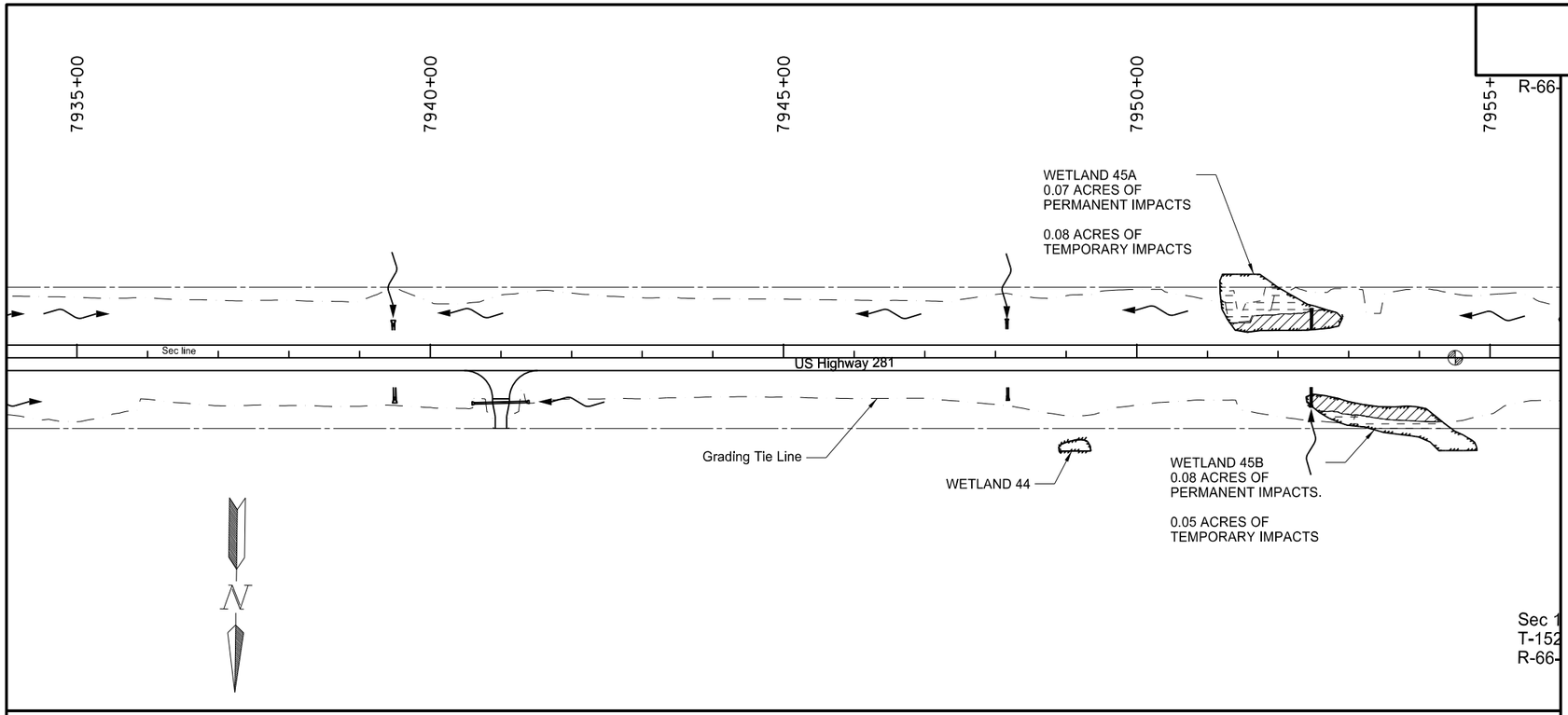
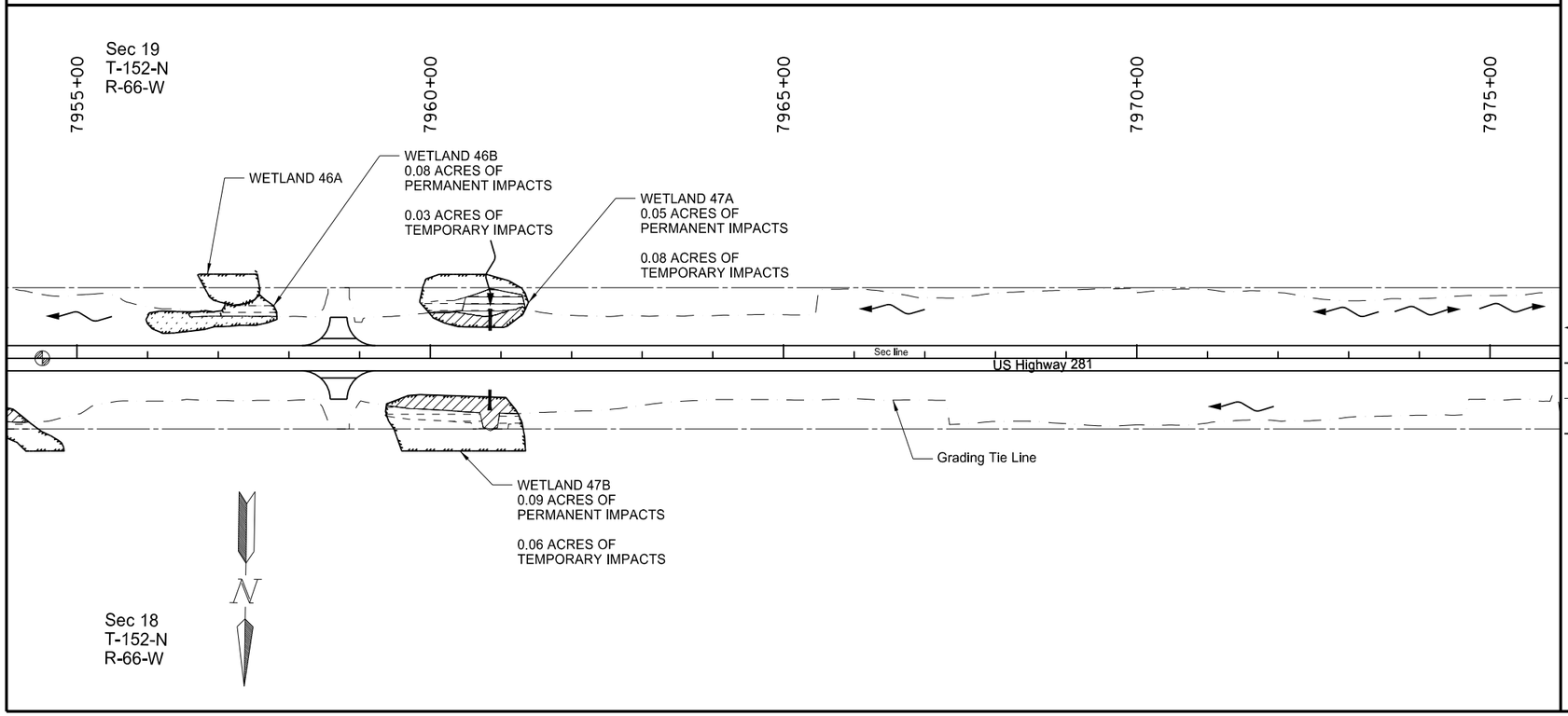
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	75	8





LEGEND

- Delineated Wetland
- Permanent Wetland Impact
- Temporary Wetland Impact
- US Fish & Wildlife (USFWS) Easement Wetlands
- Riprap
- Flow Arrow
- R/W Line
- Temporary Easement Line
- Section Line

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US Highway 281

Wetlands
Sta 7935+00 to 7975+00

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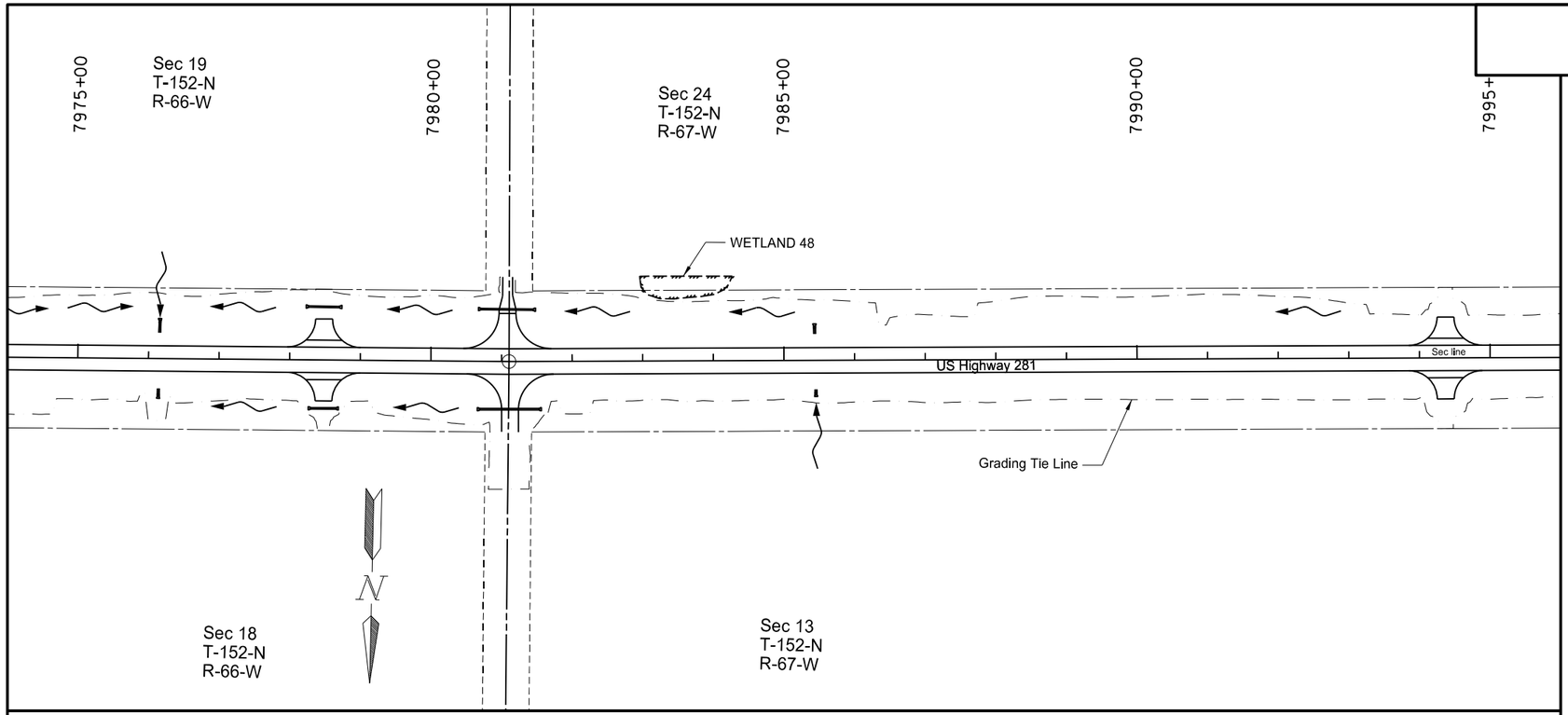
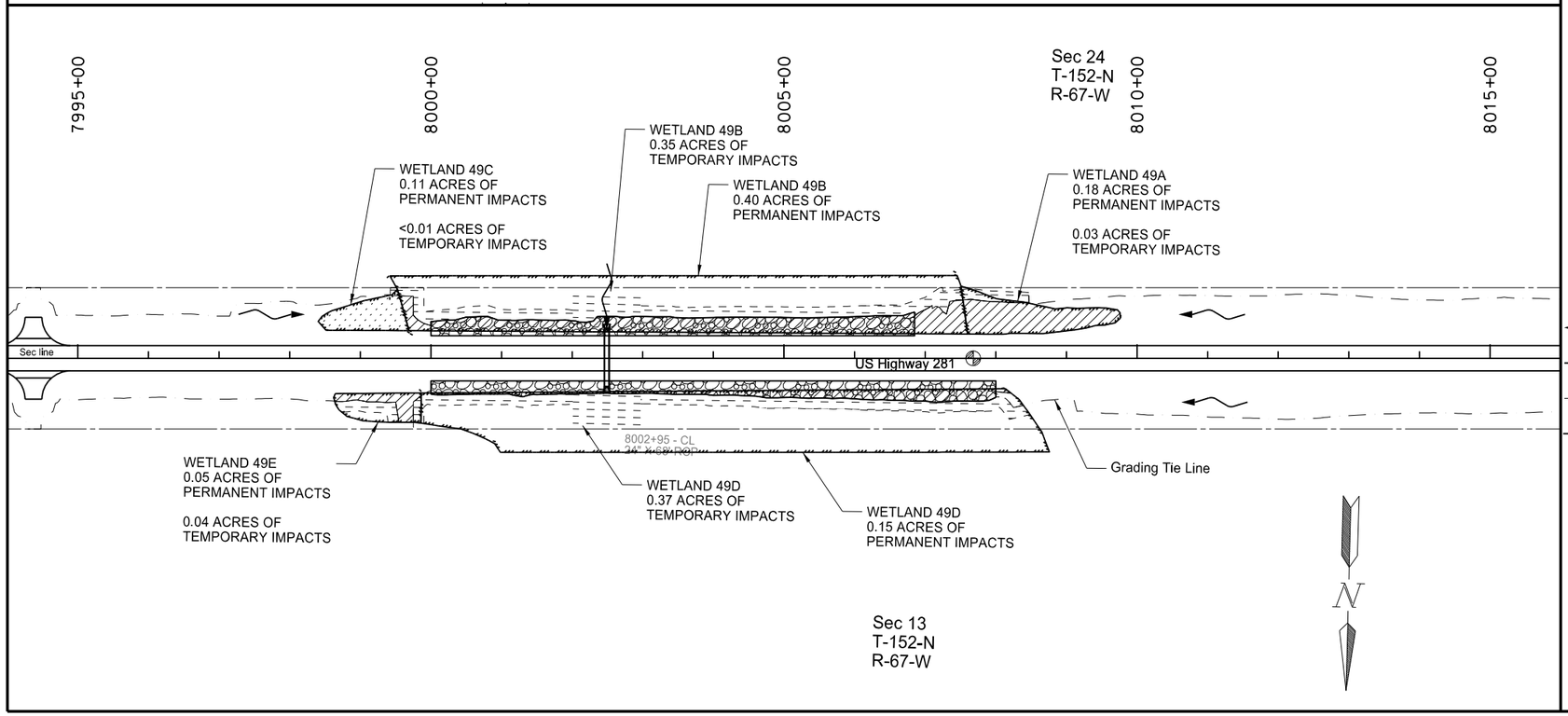
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	75	9





LEGEND

- Delineated Wetland
- Permanent Wetland Impact
- Temporary Wetland Impact
- US Fish & Wildlife (USFWS) Easement Wetlands
- Riprap
- Flow Arrow
- R/W Line
- Temporary Easement Line
- Section Line

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US Highway 281

Wetlands
Sta 7975+00 to 8015+00

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	75	10

8015+00 8020+00 8025+00 8030+00 8035+

Sec 24
T-152-N
R-67-W

WETLAND 50

Sec line

US Highway 281

Grading Tie Line

N

Sec 13
T-152-N
R-67-W

8035+00 8040+00 8045+00 8050+00 8055+00

Sec 23
T-152-N
R-67-W

WETLAND 51A

WETLAND 51B
0.04 ACRES OF PERMANENT IMPACTS
0.04 ACRES OF TEMPORARY IMPACTS

Sec line

US Highway 281

WETLAND 52
0.04 ACRES OF
PERMANENT IMPACTS

WETLAND 53

Grading Tie Line

WETLAND 54
0.05 ACRES OF
PERMANENT IMPACTS

0.08 ACRES OF
TEMPORARY IMPACTS

WETLAND 55
0.04 ACRES OF
PERMANENT IMPACTS

0.01 ACRES OF
TEMPORARY IMPACTS

N

Sec 14
T-152-N
R-67-W

LEGEND

- Delineated Wetland
- Permanent Wetland Impact
- Temporary Wetland Impact
- US Fish & Wildlife (USFWS) Easement Wetlands
- Riprap
- Flow Arrow
- R/W Line
- Temporary Easement Line
- Section Line

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US Highway 281

Wetlands
Sta 8015+00 to 8055+00

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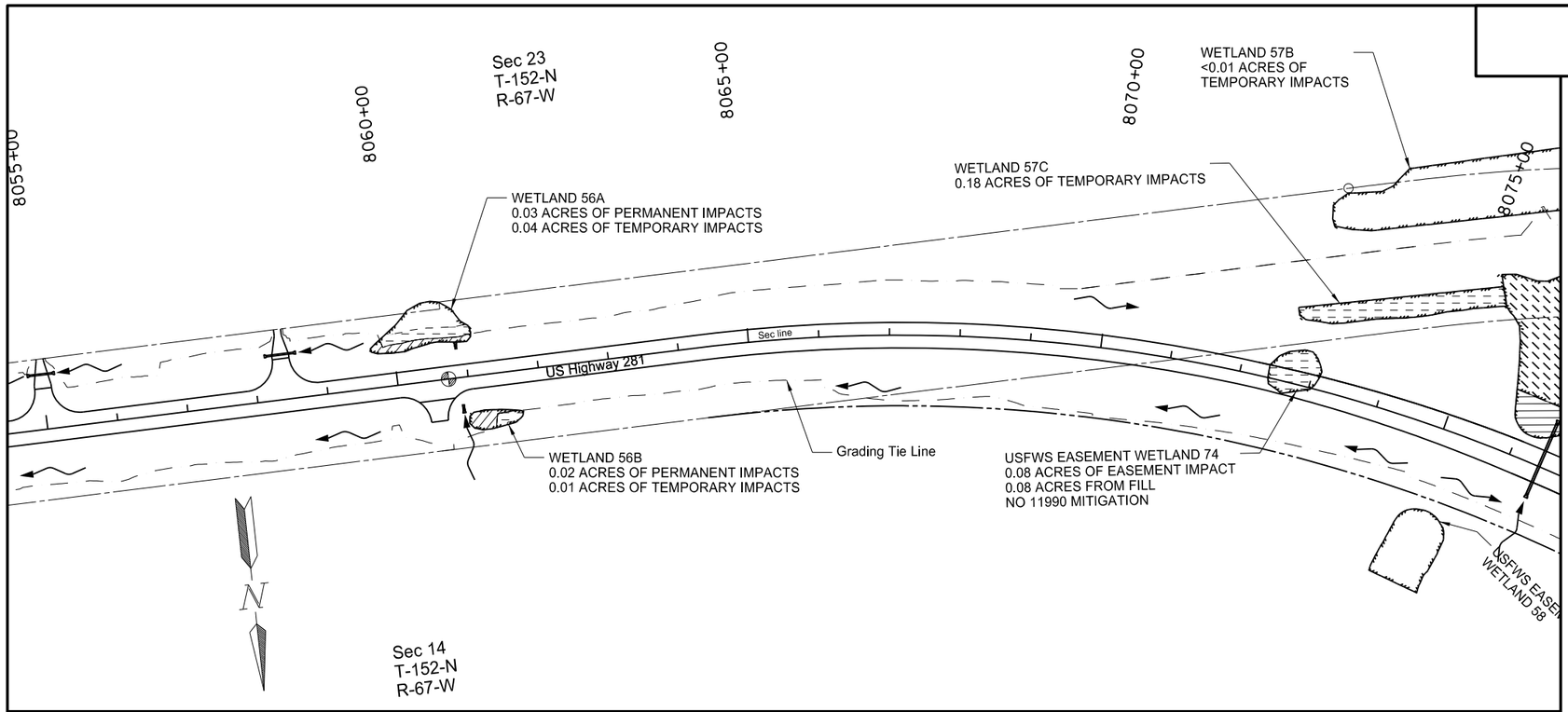
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	75	11



LEGEND

- Delineated Wetland
- Permanent Wetland Impact
- Temporary Wetland Impact
- US Fish & Wildlife (USFWS) Easement Wetlands
- Riprap
- Flow Arrow
- R/W Line
- Temporary Easement Line
- Section Line

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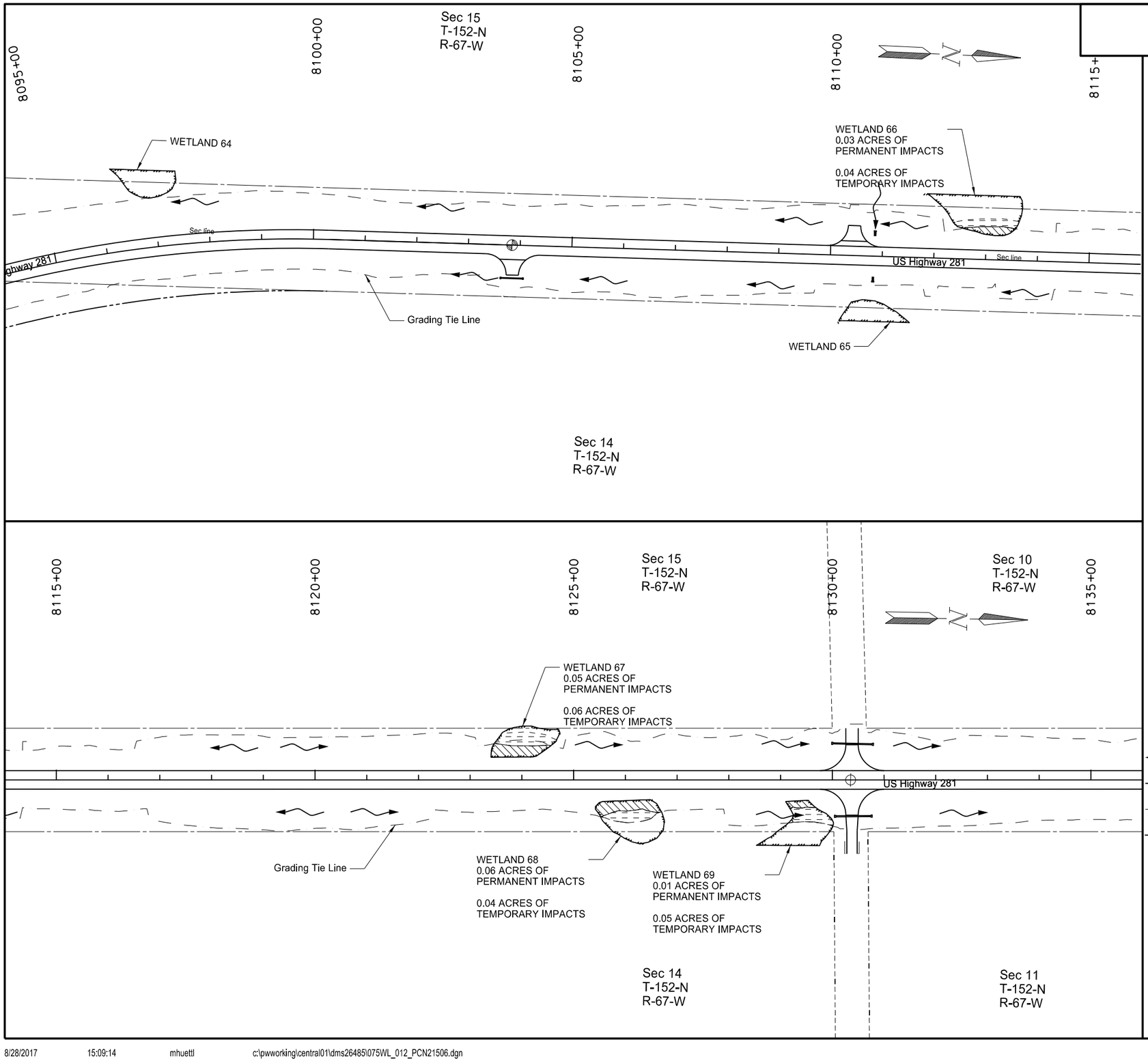
US Highway 281

Wetlands
Sta 8055+00 to 8095+00

9/5/2017 18:27:18 mhuettl c:\pwworking\central01\dms26485\075WL_011_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	75	12



LEGEND

- Delineated Wetland
- Permanent Wetland Impact
- Temporary Wetland Impact
- US Fish & Wildlife (USFWS) Easement Wetlands
- Riprap
- Flow Arrow
- R/W Line
- Temporary Easement Line
- Section Line

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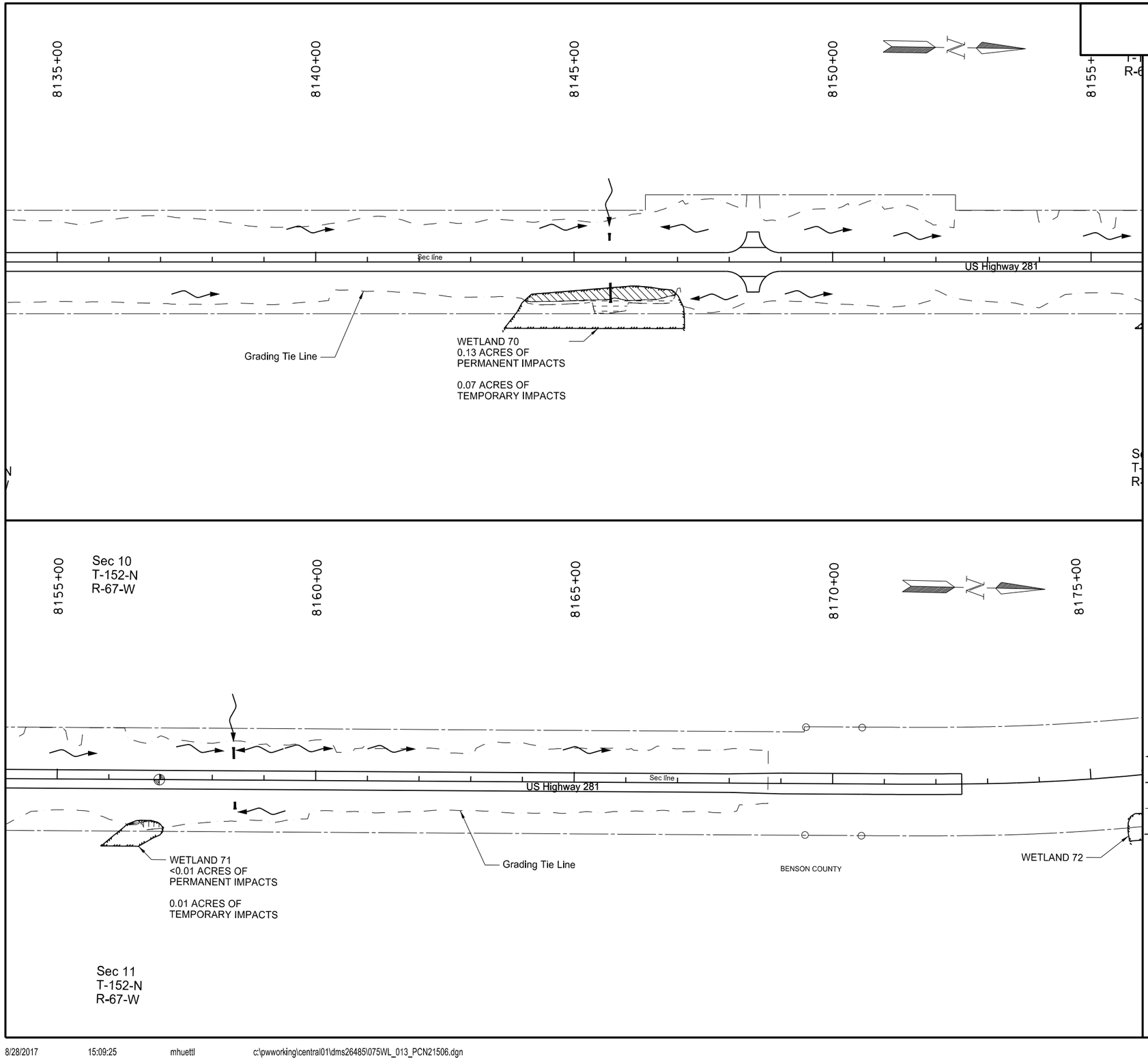
US Highway 281

Wetlands
Sta 8095+00 to 8135+00

8/28/2017 15:09:14 mhuettl c:\pwworking\central01\dms26485\075WL_012_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	75	13



LEGEND

- Delineated Wetland
- Permanent Wetland Impact
- Temporary Wetland Impact
- US Fish & Wildlife (USFWS) Easement Wetlands
- Riprap
- Flow Arrow
- R/W Line
- Temporary Easement Line
- Section Line

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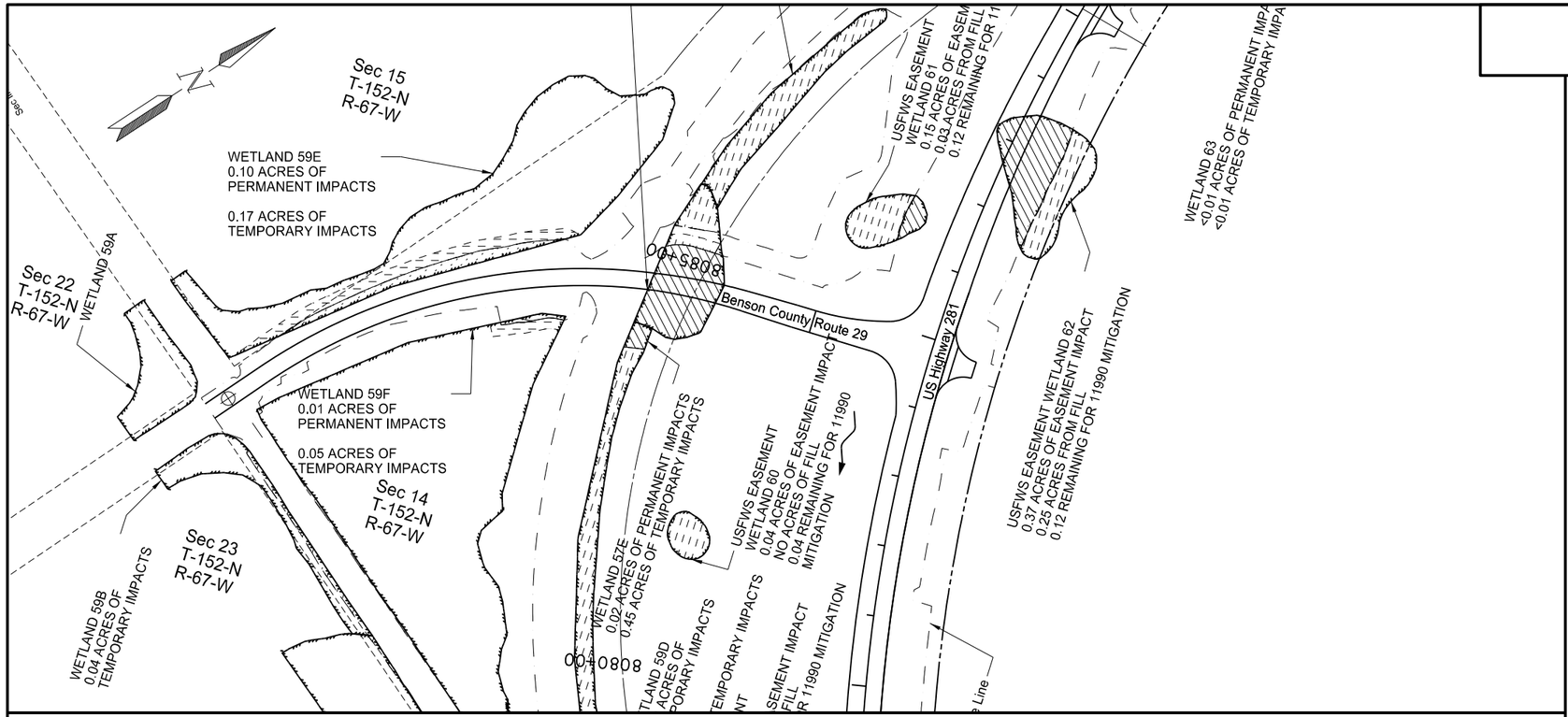
US Highway 281

Wetlands
Sta 8135+00 to 8175+00

8/28/2017 15:09:25 mhuettl c:\pwworking\central01\dms26485\075WL_013_PCN21506.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	75	14



LEGEND

- Delineated Wetland
- Permanent Wetland Impact
- Temporary Wetland Impact
- US Fish & Wildlife (USFWS) Easement Wetlands
- Riprap
- Flow Arrow
- R/W Line
- Temporary Easement Line
- Section Line

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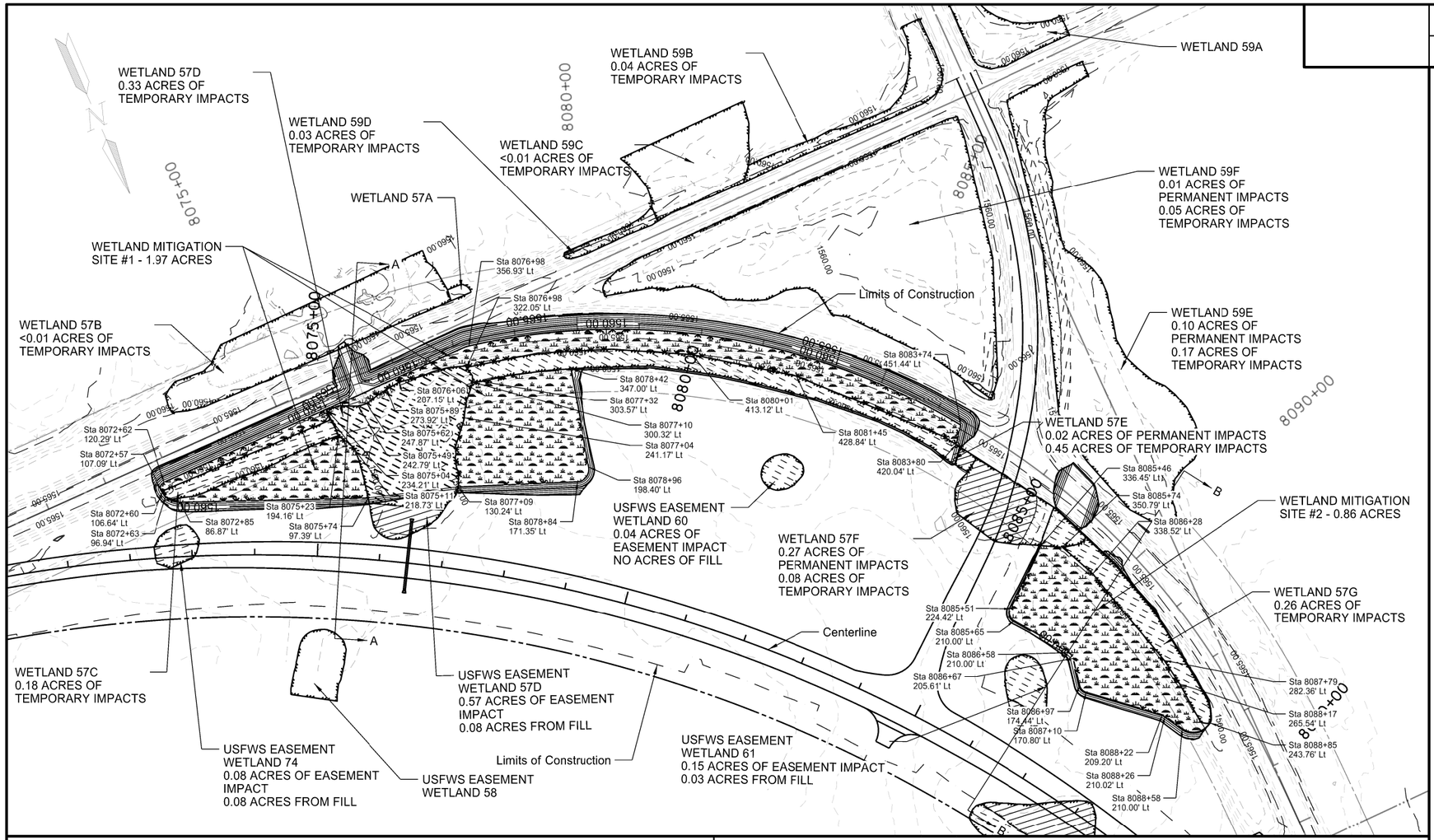
US Highway 281

Wetland
Benson County Route 29

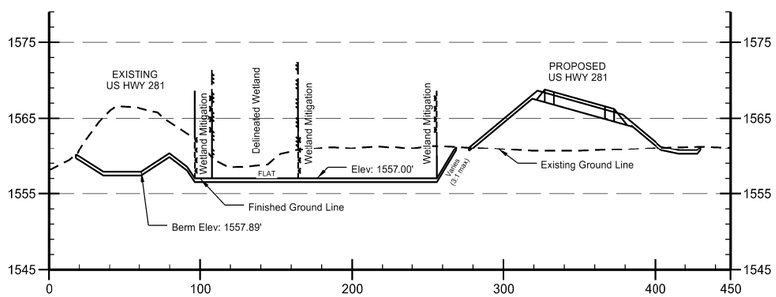
8/28/2017 15:09:43 mhuettl c:\pwworking\central01\dms26485\075WL_014_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	75	15

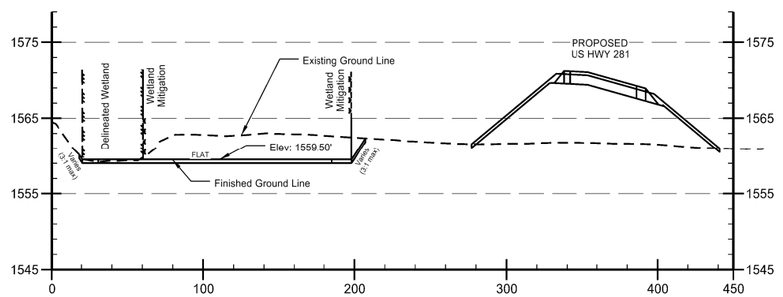


LEGEND

- Delineated Wetland
- Wetland Mitigation
- Permanent Wetland Impact
- Temporary Wetland Impact
- US Fish & Wildlife (USFWS) Easement Wetlands
- Riprap
- Flow Arrow
- R/W Line
- Temporary Easement Line
- Section Line



MITIGATION SITE # 1 - SECTION A-A



MITIGATION SITE #2 - SECTION B-B

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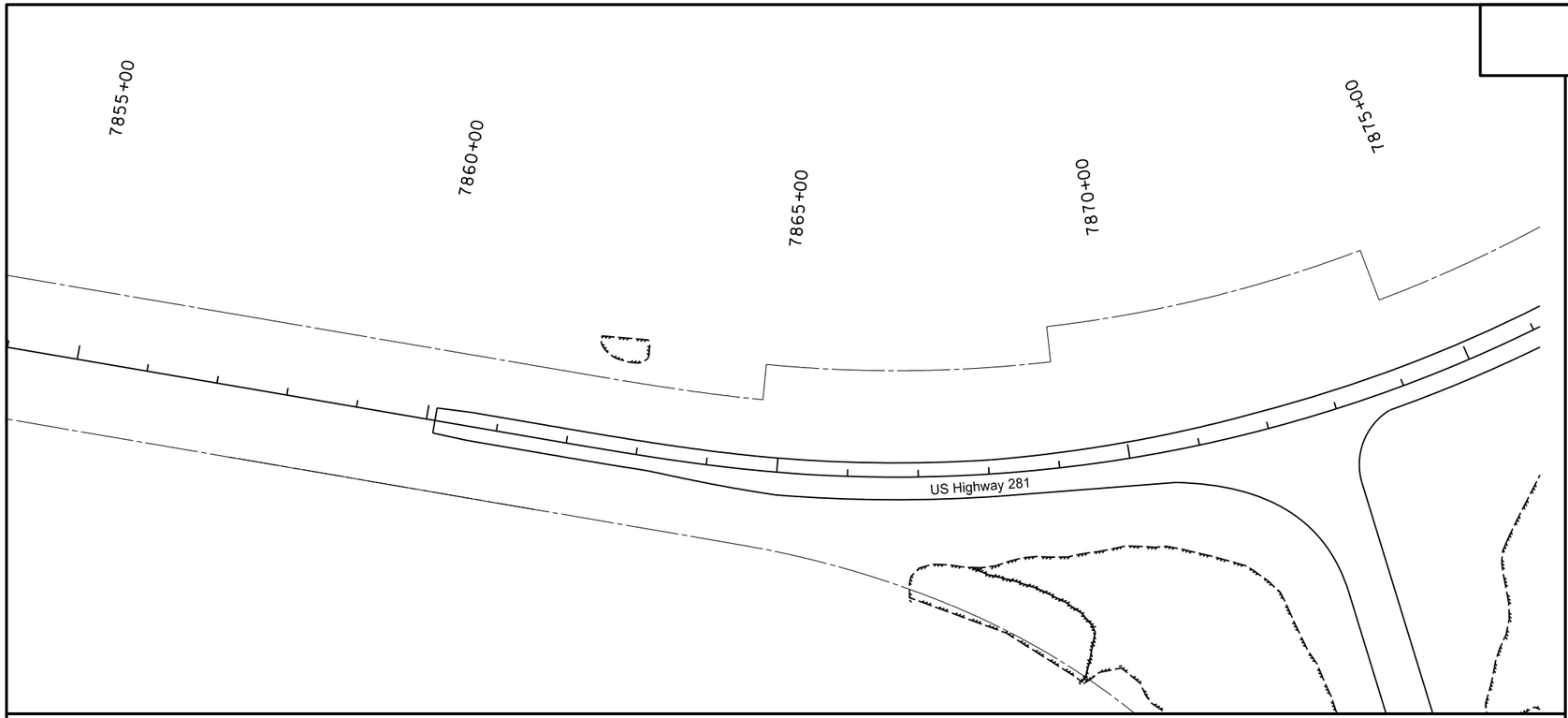
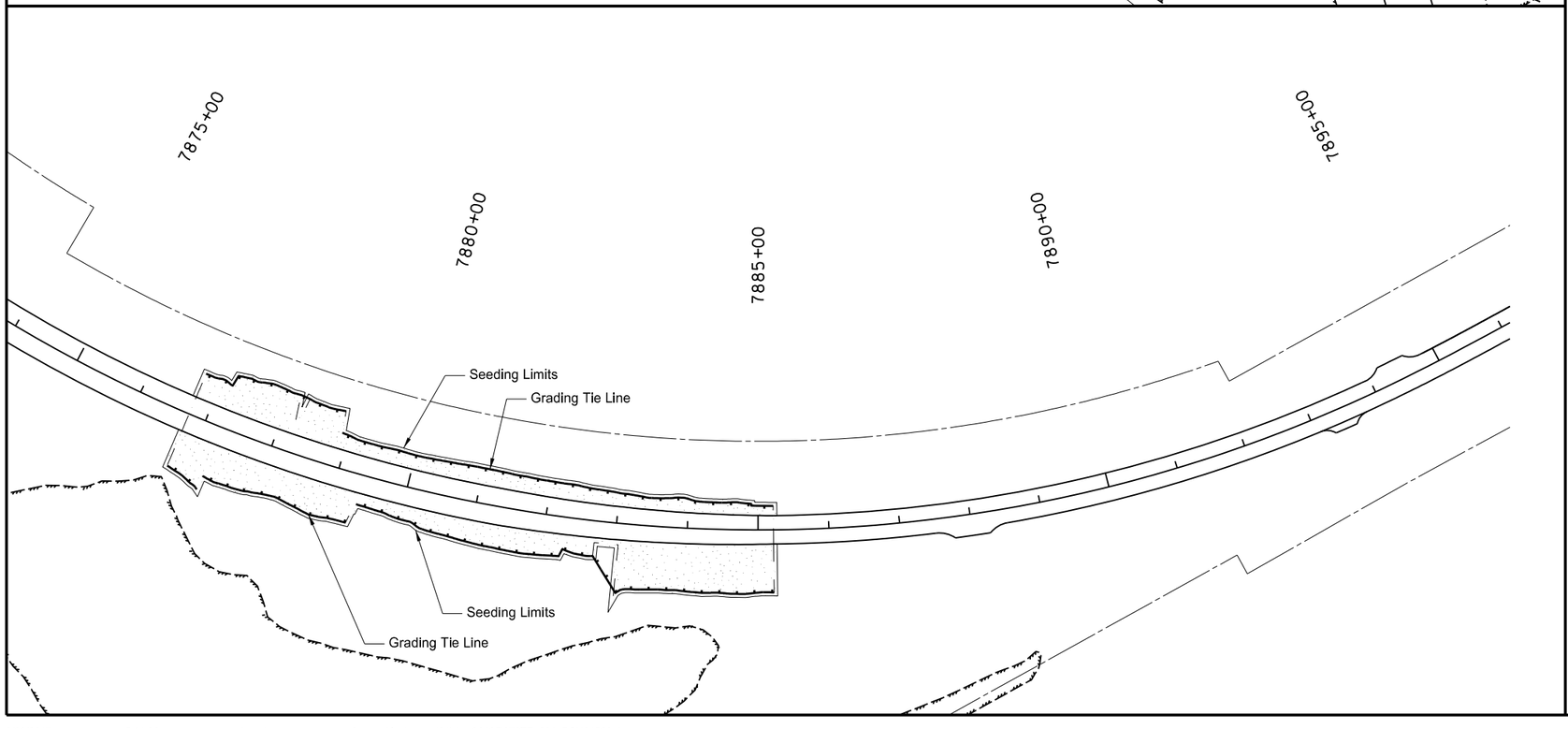
US Highway 281

Mitigation Site Plan
Sites #1 and #2

8/28/2017 15:10:55 mhuettl c:\pwworking\central01\dms26485\075WL_015_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	76	1





251-2000 TEMPORARY COVER CROP

Sta 7860+12 to 7895+00	1.7 AC
Total = 1.7 AC	

253-0101 STRAW MULCH

Sta 7860+12 to 7895+00	1.7 AC
Total = 1.7 AC	

LEGEND

- Delineated Wetland
- Temporary Cover Crop
- Flow Arrow
- Fiber Rolls
- Unsupported Silt Fence
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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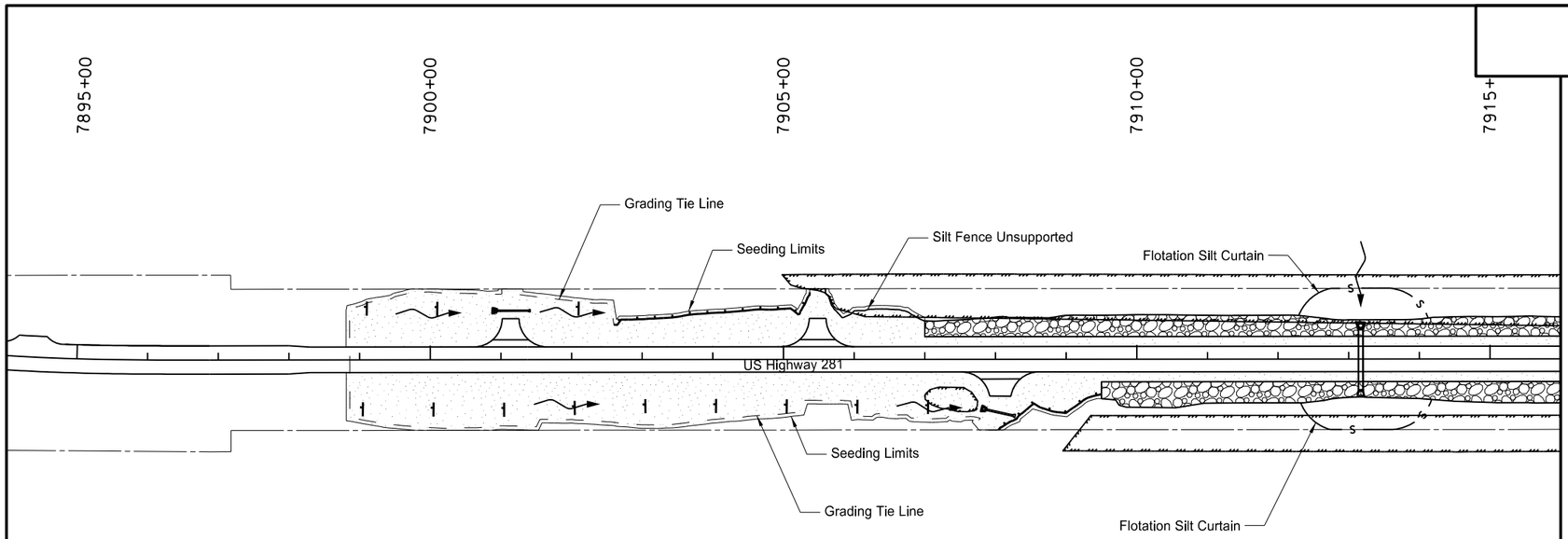
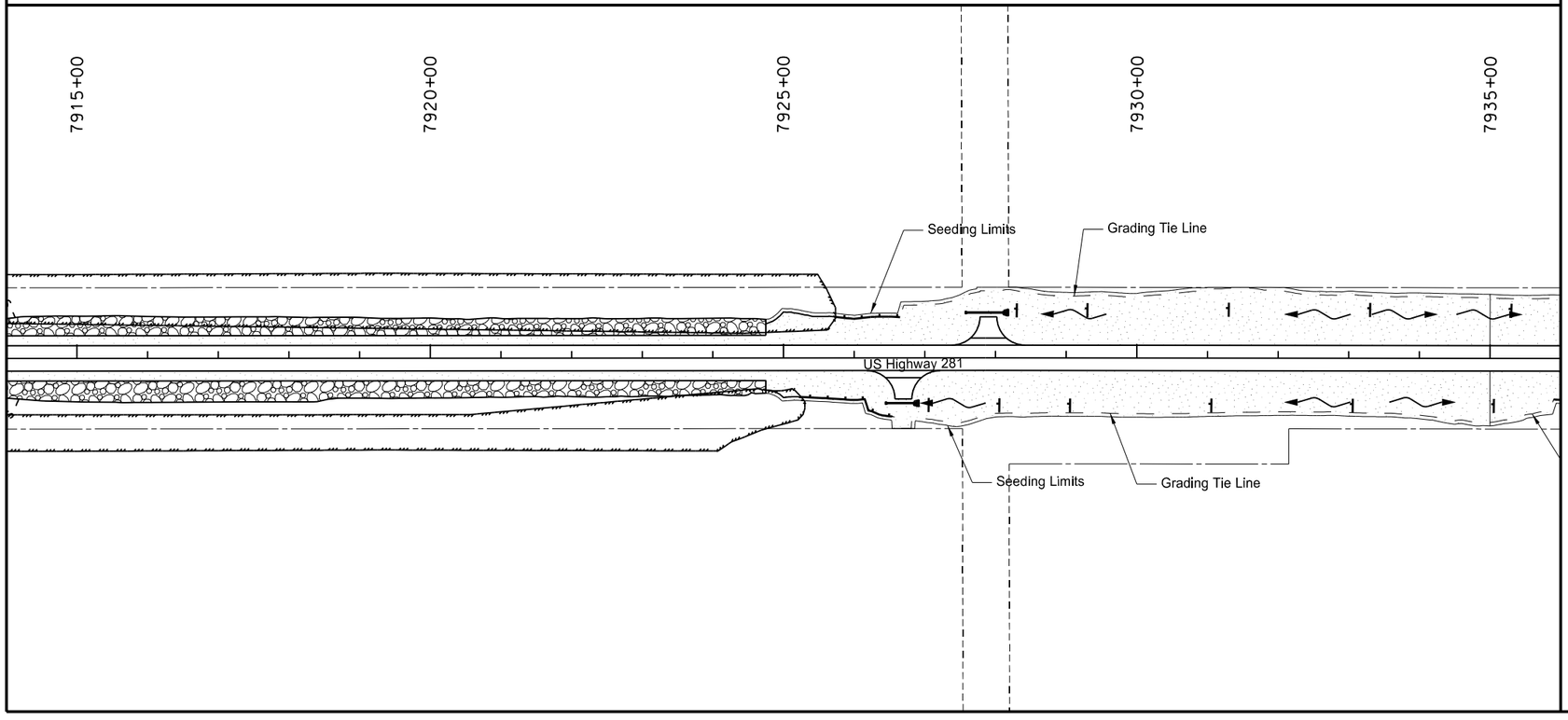
US Highway 281

Temporary Erosion Control
Sta 7855+00 to 7895+00

8/28/2017 15:11:06 mhuettl c:\pwworking\central01\dms26485\076TE_001_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	76	2





251-2000	TEMPORARY COVER CROP	
	Sta. 7895+00 to 7935+00	7.1 AC
	Total =	7.1 AC
253-0101	STRAW MULCH	
	Sta. 7895+00 to 7935+00	7.1 AC
	Total =	7.1 AC
260-0100	SILT FENCE UNSUPPORTED	
	Sta. 7905+56 - 100.0' Lt to 7907+00 - 53.9' Lt	176.0 LF
	Sta. 7924+75 - 48.1' Lt to 7925+73.6 - 57.9' Lt	105.1 LF
	Sta. 7924+75 - 45.6' Rt to 7925+25 - 55.3' Rt	52.9 LF
	Total =	334.0 LF
260-0101	REMOVE SILT FENCE UNSUPPORTED	
	Sta. 7905+56 - 100.0' Lt to 7907+00 - 53.9' Lt	176.0 LF
	Sta. 7924+75 - 48.1' Lt to 7925+73.6 - 57.9' Lt	105.1 LF
	Sta. 7924+75 - 45.6' Rt to 7925+25 - 55.3' Rt	52.9 LF
	Total =	334.0 LF
262-0100	FLOTATION SILT CURTAIN	
	Sta. 7912+32 - 62.1' Rt to 7914+17 - 57.5' Rt	220.5 LF
	Sta. 7912+29 - 61.7' Lt to 7914+12 - 57.8' Lt	218.0 LF
	Total =	438.5 LF
262-0101	REMOVE FLOTATION SILT CURTAIN	
	Sta. 7912+32 - 62.1' Rt to 7914+17 - 57.5' Rt	220.5 LF
	Sta. 7912+29 - 61.7' Lt to 7914+12 - 57.8' Lt	218.0 LF
	Total =	438.5 LF

LEGEND

- Delineated Wetland
- Temporary Cover Crop
- Flow Arrow
- Fiber Rolls
- Unsupported Silt Fence
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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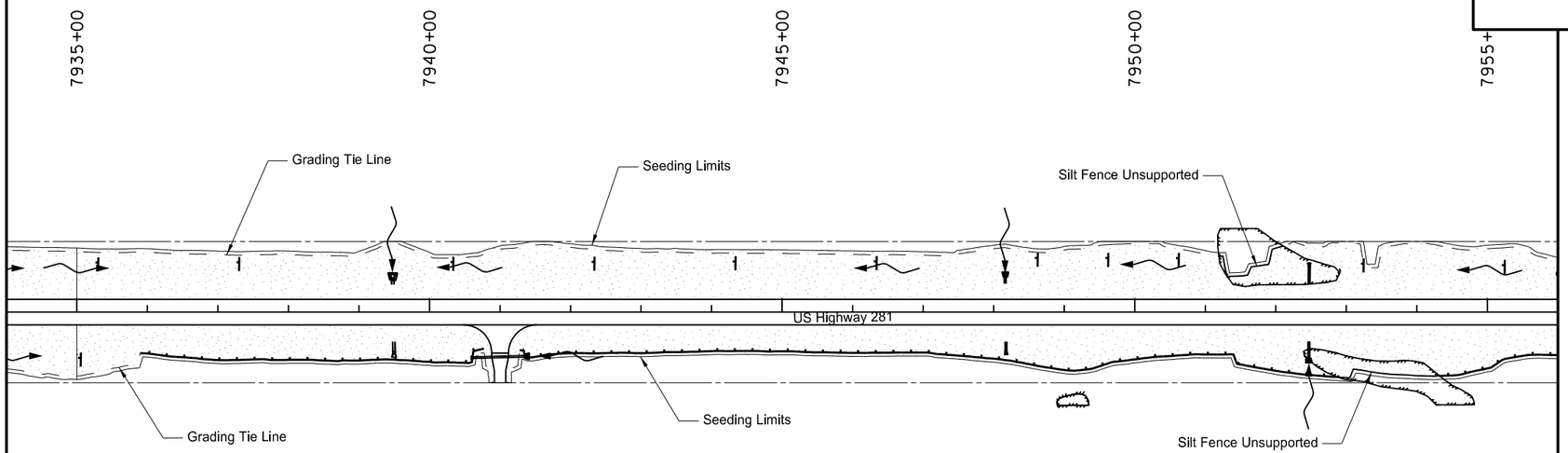
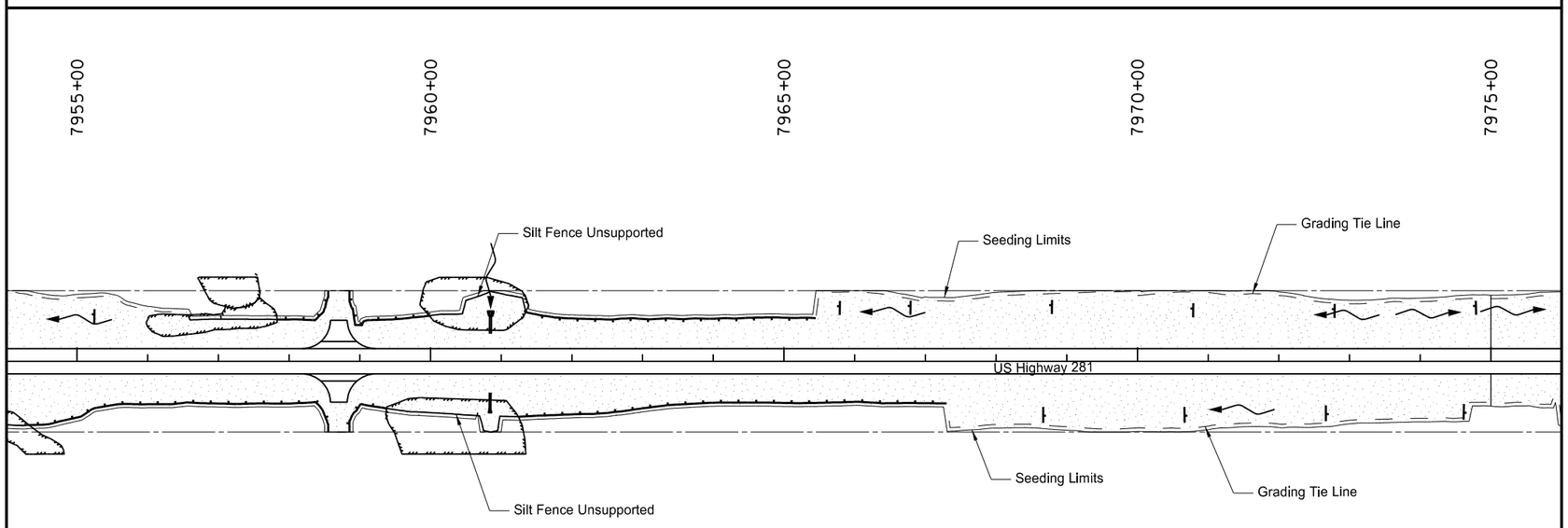
US Highway 281

Temporary Erosion Control
Sta 7895+00 to 7935+00

8/28/2017 15:11:14 mhuettl c:\pwworking\central01\dms26485\076TE_002_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	76	3





251-2000	TEMPORARY COVER CROP		
	Sta. 7935+00 to 7975+00	11.8	AC
		Total = 11.8	AC
253-0101	STRAW MULCH		
	Sta. 7935+00 to 7975+00	11.8	AC
		Total = 11.8	AC
260-0100	SILT FENCE UNSUPPORTED		
	Sta. 7951+19 - 78.8' Lt to 7952+11 - 93.5' Lt	140.1	LF
	Sta. 7952+87 - 92.0' Rt to 7954+32 - 90.3' Rt	154.0	LF
	Sta. 7956+57 - 65.8' Lt to 7957+83 - 59' Lt	130.9	LF
	Sta. 7959+38 - 66.7' Rt to 7961+24 - 78.4' Rt	222.4	LF
	Sta. 7959+98 - 64.4' Lt to 7961+35 - 70.2' Lt	170.4	LF
		Total = 817.8	LF
260-0101	REMOVE SILT FENCE UNSUPPORTED		
	Sta. 7951+19 - 78.8' Lt to 7952+11 - 93.5' Lt	140.1	LF
	Sta. 7952+87 - 92.0' Rt to 7954+32 - 90.3' Rt	154.0	LF
	Sta. 7956+57 - 65.8' Lt to 7957+83 - 59' Lt	130.9	LF
	Sta. 7959+38 - 66.7' Rt to 7961+24 - 78.4' Rt	222.4	LF
	Sta. 7959+98 - 64.4' Lt to 7961+35 - 70.2' Lt	170.4	LF
		Total = 817.8	LF

LEGEND

- Delineated Wetland
- Temporary Cover Crop
- Flow Arrow
- Fiber Rolls
- Unsupported Silt Fence
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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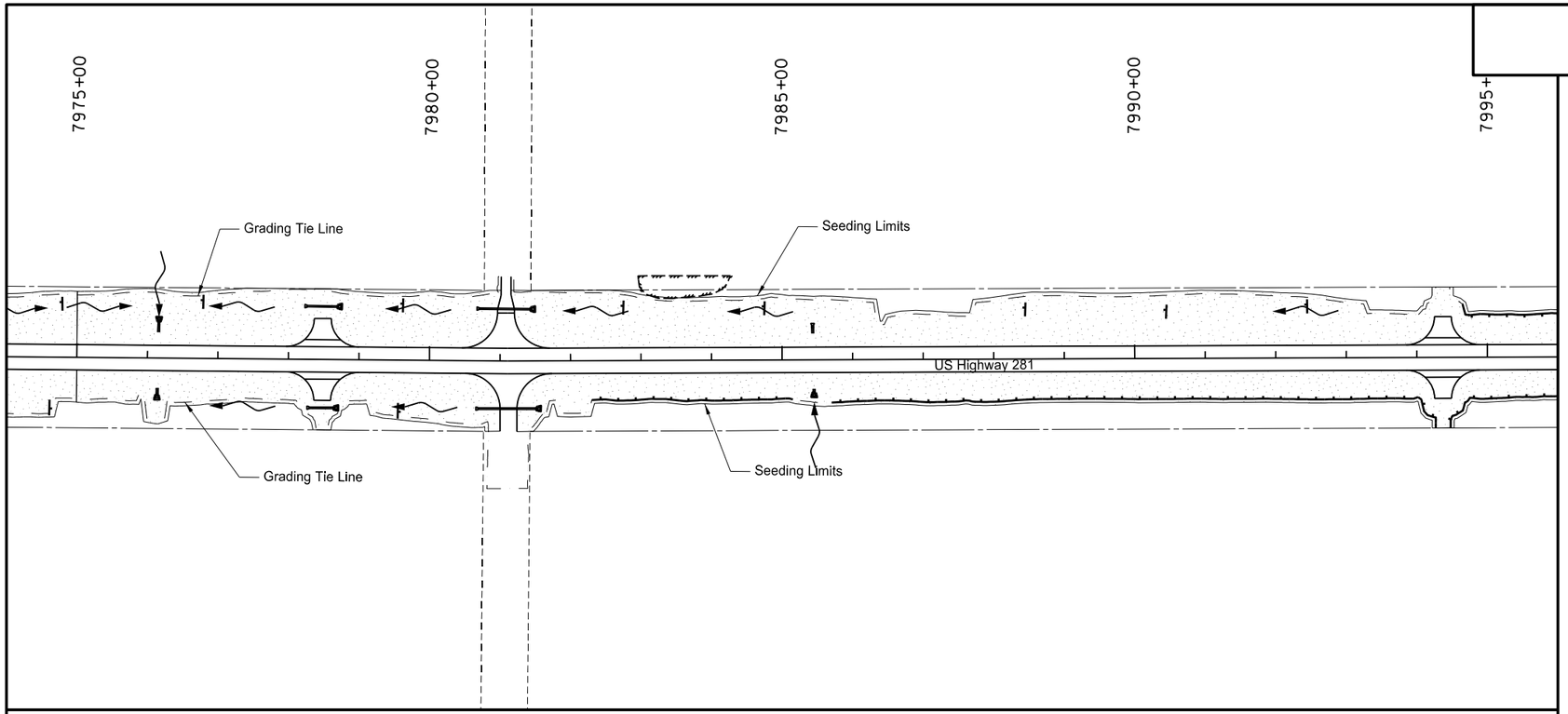
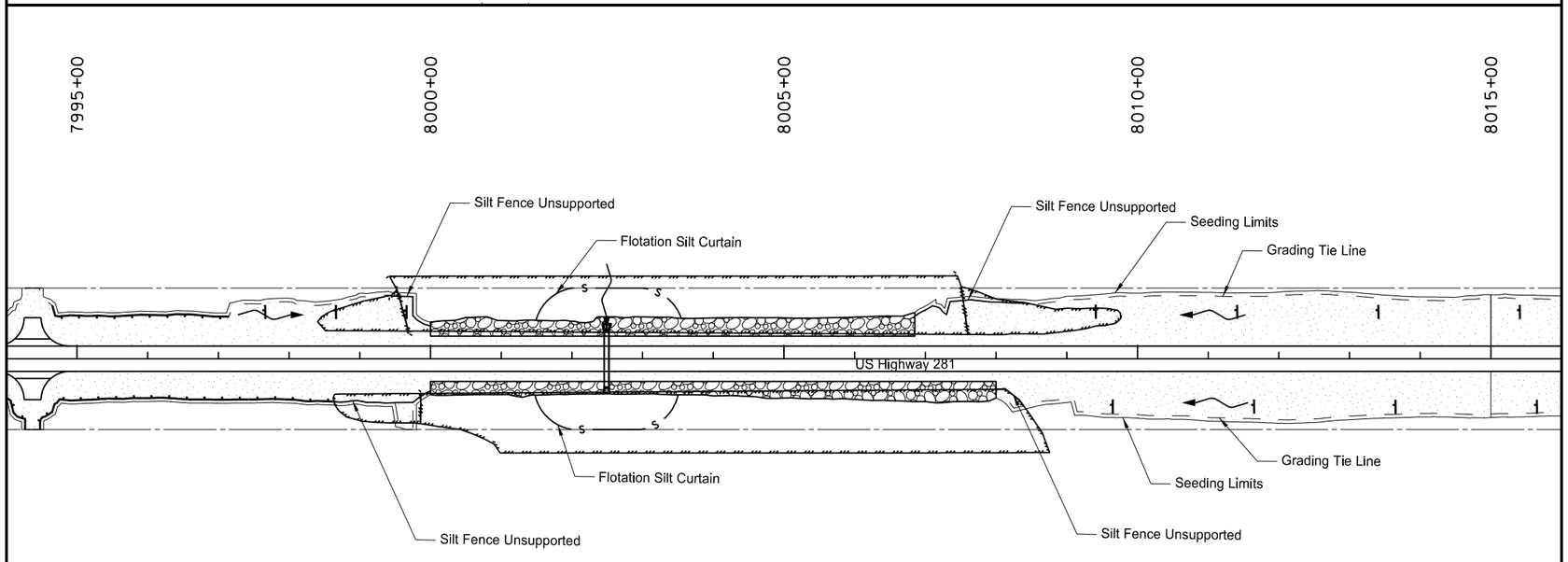
US Highway 281

Temporary Erosion Control
Sta 7935+00 to 7975+00

8/28/2017 15:11:21 mhuettl c:\pwworking\central01\dms26485\076TE_003_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	76	4





251-2000	TEMPORARY COVER CROP		
	Sta. 7975+00 to 8015+00	9.7	AC
		Total = 9.7	AC
253-0101	STRAW MULCH		
	Sta. 7975+00 to 8015+00	9.7	AC
		Total = 9.7	AC
260-0100	SILT FENCE UNSUPPORTED		
	Sta. 7998+64 - 60.7' Rt to 8000+00 - 45.7' Rt	141.8	LF
	Sta. 7999+42 - 89.4' Lt to 8000+00 - 46.4' Lt	89.2	LF
	Sta. 8006+85 - 59.9' Lt to 8008+48 - 77.7' Lt	186.1	LF
	Sta. 8008+00 - 43.2' - Rt to 8008+39 - 66.6' Rt	48.4	LF
		Total = 465.5	LF
260-0101	REMOVE SILT FENCE UNSUPPORTED		
	Sta. 7998+64 - 60.7' Rt to 8000+00 - 45.7' Rt	141.8	LF
	Sta. 7999+42 - 89.4' Lt to 8000+00 - 46.4' Lt	89.2	LF
	Sta. 8006+85 - 59.9' Lt to 8008+48 - 77.7' Lt	186.1	LF
	Sta. 8008+00 - 43.2' - Rt to 8008+39 - 66.6' Rt	48.4	LF
		Total = 465.5	LF
262-0100	FLOTATION SILT CURTAIN		
	Sta. 8001+49 - 54.5' Lt to 8003+55 - 57.4' Lt	245.1	LF
	Sta. 8001+48 - 51.3' Rt to 8003+50 - 51.1' Rt	249.7	LF
		Total = 494.8	LF
262-0101	REMOVE FLOTATION SILT CURTAIN		
	Sta. 8001+49 - 54.5' Lt to 8003+55 - 57.4' Lt	245.1	LF
	Sta. 8001+48 - 51.3' Rt to 8003+50 - 51.1' Rt	249.7	LF
		Total = 494.8	LF

LEGEND

- Delineated Wetland
- Temporary Cover Crop
- Flow Arrow
- Fiber Rolls
- Unsupported Silt Fence
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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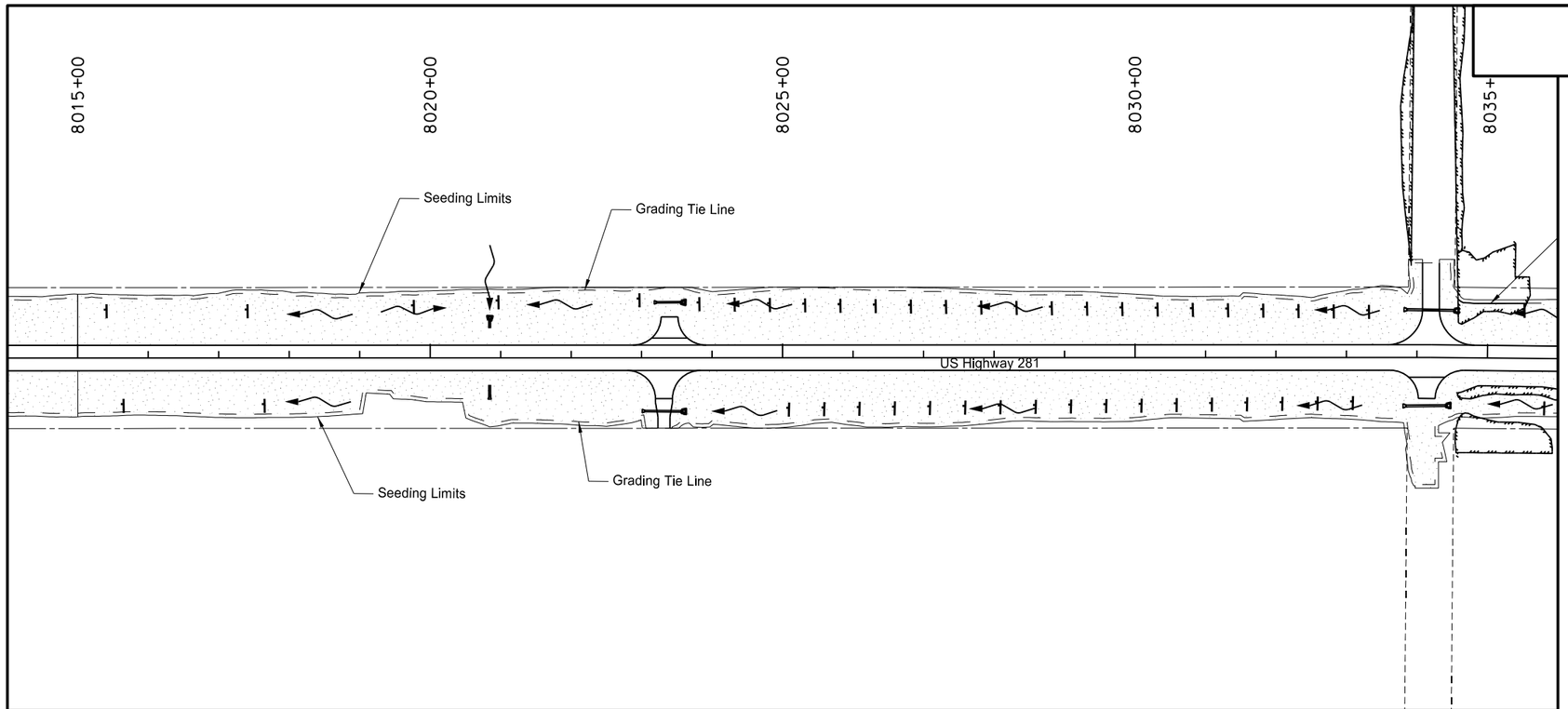
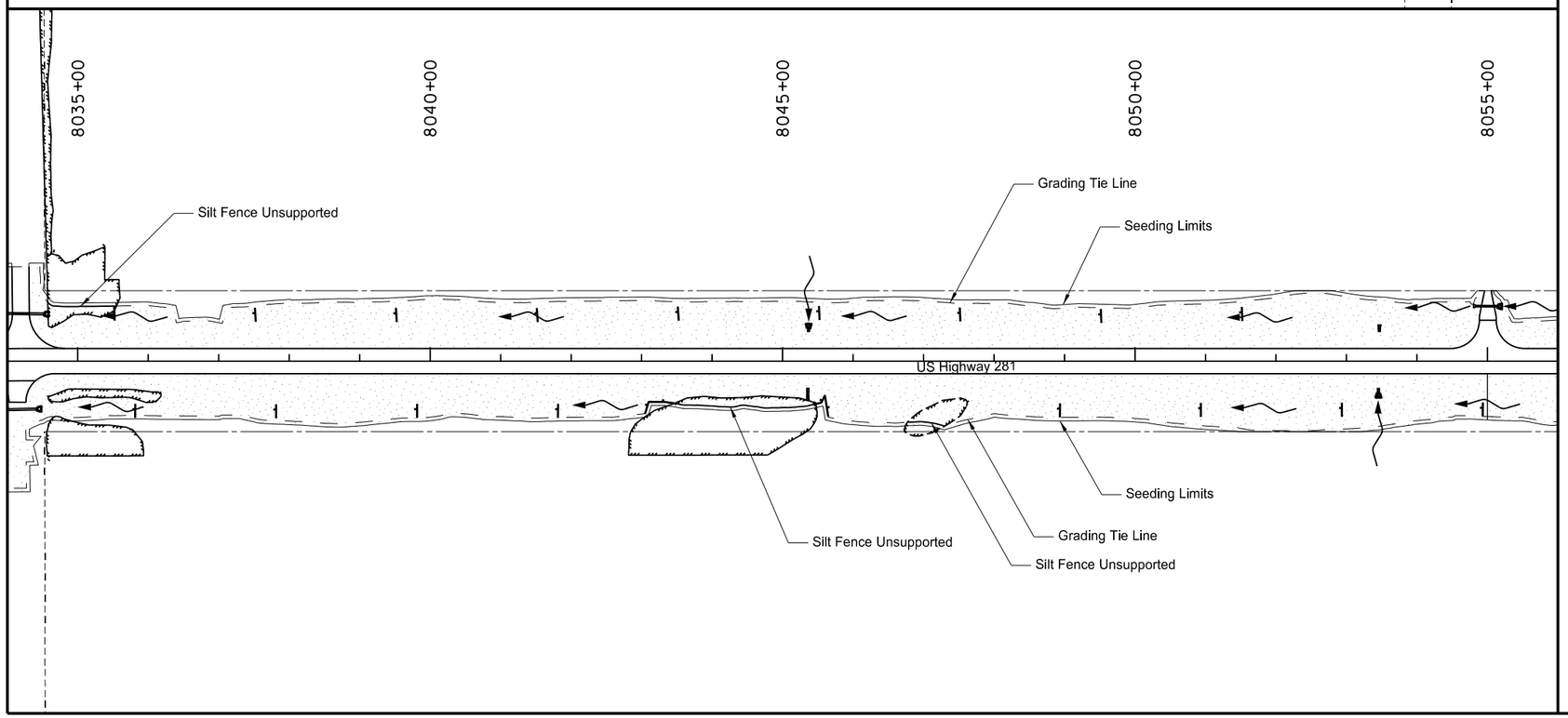
US Highway 281

Temporary Erosion Control
Sta 7975+00 to 8015+00

8/28/2017 15:11:31 mhuettl c:\pwworking\central01\dms26485\076TE_004_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	76	5





251-2000	TEMPORARY COVER CROP		
	Sta. 8015+00 to 8055+00	13.2	AC
		Total = 13.2	AC
253-0101	STRAW MULCH		
	Sta. 8015+00 to 8055+00	13.2	AC
		Total = 13.2	AC
260-0100	SILT FENCE UNSUPPORTED		
	Sta. 8034+57 - 83.3' Lt to 8035+55 - 78.2' Lt	99.1	LF
	Sta. 8043+46 - 59.8' Rt to 8045+46 - 61.1' Rt	200.7	LF
	Sta. 8046+78 - 86.4' Rt to 8047+30 - 92.3' Rt	53.1	LF
		Total = 352.9	LF
260-0101	REMOVE SILT FENCE UNSUPPORTED		
	Sta. 8034+57 - 83.3' Lt to 8035+55 - 78.2' Lt	99.1	LF
	Sta. 8043+46 - 59.8' Rt to 8045+46 - 61.1' Rt	200.7	LF
	Sta. 8046+78 - 86.4' Rt to 8047+30 - 92.3' Rt	53.1	LF
		Total = 352.9	LF

LEGEND

- Delineated Wetland
- Temporary Cover Crop
- Flow Arrow
- Fiber Rolls
- Unsupported Silt Fence
- R/W Line
- Temporary Easement Line
- Section Line

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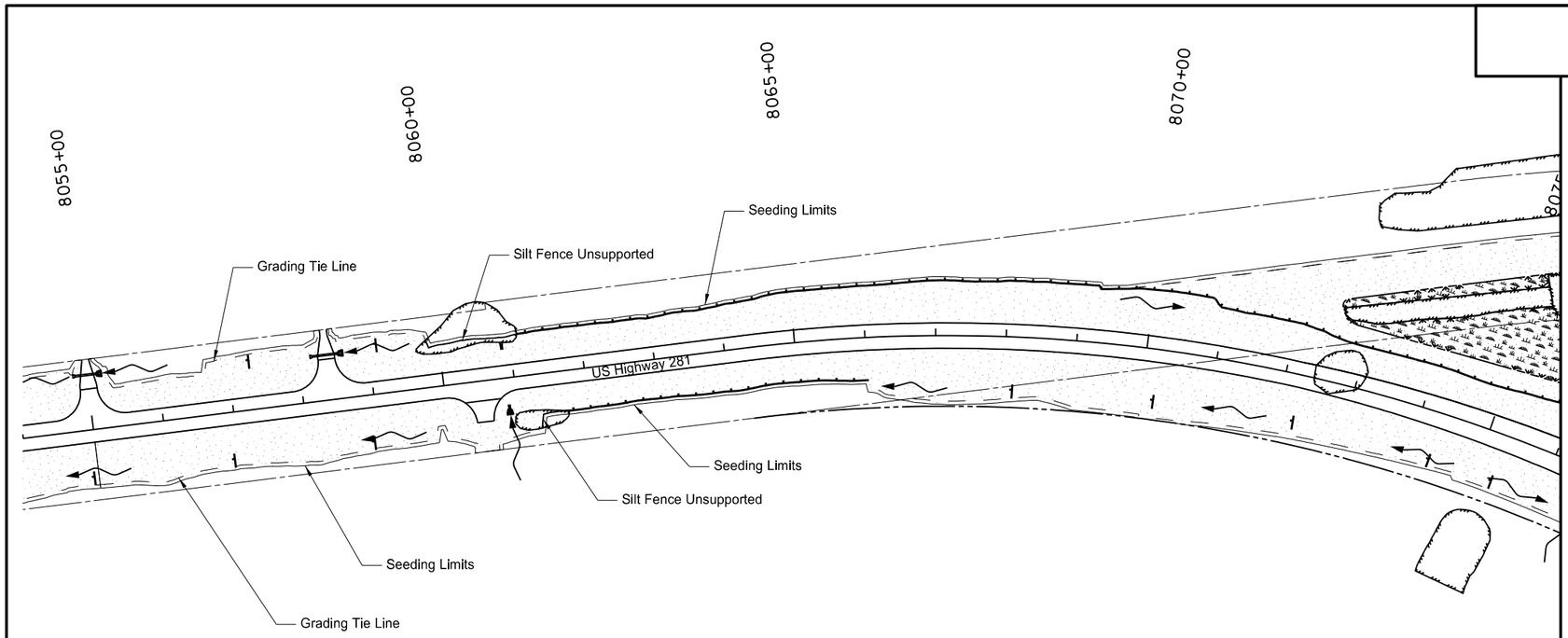
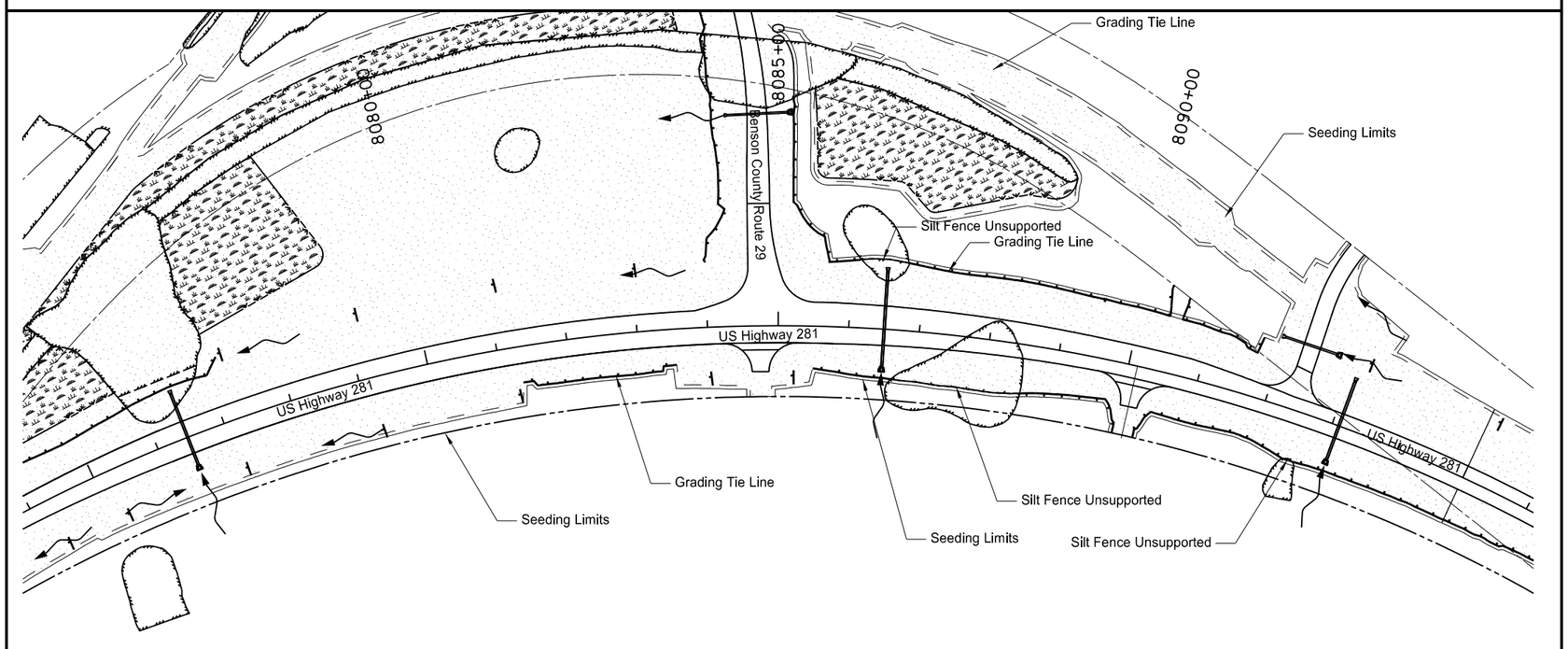
US Highway 281

Temporary Erosion Control
Sta 8015+00 to 8055+00

8/28/2017 15:11:40 mhuettl c:\pwworking\central01\dms26485\076TE_005_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	76	6





251-2000	TEMPORARY COVER CROP		
	Sta. 8055+00 to 8095+00	26.5	AC
		Total = 26.5	AC
253-0101	STRAW MULCH		
	Sta. 8055+00 to 8095+00	26.5	AC
		Total = 26.5	AC
260-0100	SILT FENCE UNSUPPORTED		
	Sta. 8059+82 - 67.3' Lt to 8061+11 - 59.9' Lt	138.3	LF
	Sta. 8061+31 - 76.6' Rt to 8061+65 - 56.2' Rt	50.0	LF
	Sta. 8075+17 - 332' Lt to 8075+30 - 339.2' Lt	16.0	LF
	Sta. 8078+09 - 519.06' Lt to 8081+80 - 903.9' Lt	620.5	LF
	Sta. 8078+72 - 506.4' Lt to 8082+05 - 877.4' Lt	559.3	LF
	Sta. 8083+03 - 893.4' Lt to 8084+81 - 542.1' Lt	427.0	LF
	Sta. 8083+71 - 597.2' Lt to 8083+96 - 510.3' Lt	99.2	LF
	Sta. 8085+09 - 402.8' Lt to 8085+20 - 329.4' Lt	82.7	LF
	Sta. 8086+13 - 96.4' Lt to 8086+78 - 95.8' Lt	67.3	LF
	Sta. 8086+65 - 69.9' Rt to 8088+54 - 69.1' Rt	183.6	LF
	Sta. 8092+49 - 70.1' Rt to 8082+64 - 69.9' Rt	14.8	LF
		Total = 2258.7	LF
260-0101	REMOVE SILT FENCE UNSUPPORTED		
	Sta. 8059+82 - 67.3' Lt to 8061+11 - 59.9' Lt	138.3	LF
	Sta. 8061+31 - 76.6' Rt to 8061+65 - 56.2' Rt	50.0	LF
	Sta. 8075+17 - 332' Lt to 8075+30 - 339.2' Lt	16.0	LF
	Sta. 8078+09 - 519.06' Lt to 8081+80 - 903.9' Lt	620.5	LF
	Sta. 8078+72 - 506.4' Lt to 8082+05 - 877.4' Lt	559.3	LF
	Sta. 8083+03 - 893.4' Lt to 8084+81 - 542.1' Lt	427.0	LF
	Sta. 8083+71 - 597.2' Lt to 8083+96 - 510.3' Lt	99.2	LF
	Sta. 8085+09 - 402.8' Lt to 8085+20 - 329.4' Lt	82.7	LF
	Sta. 8086+13 - 96.4' Lt to 8086+78 - 95.8' Lt	67.3	LF
	Sta. 8086+65 - 69.9' Rt to 8088+54 - 69.1' Rt	183.6	LF
	Sta. 8092+49 - 70.1' Rt to 8082+64 - 69.9' Rt	14.8	LF
		Total = 2258.7	LF

LEGEND

- Delineated Wetland
- Temporary Cover Crop
- Flow Arrow
- Fiber Rolls
- Unsupported Silt Fence
- R/W Line
- Temporary Easement Line
- Section Line

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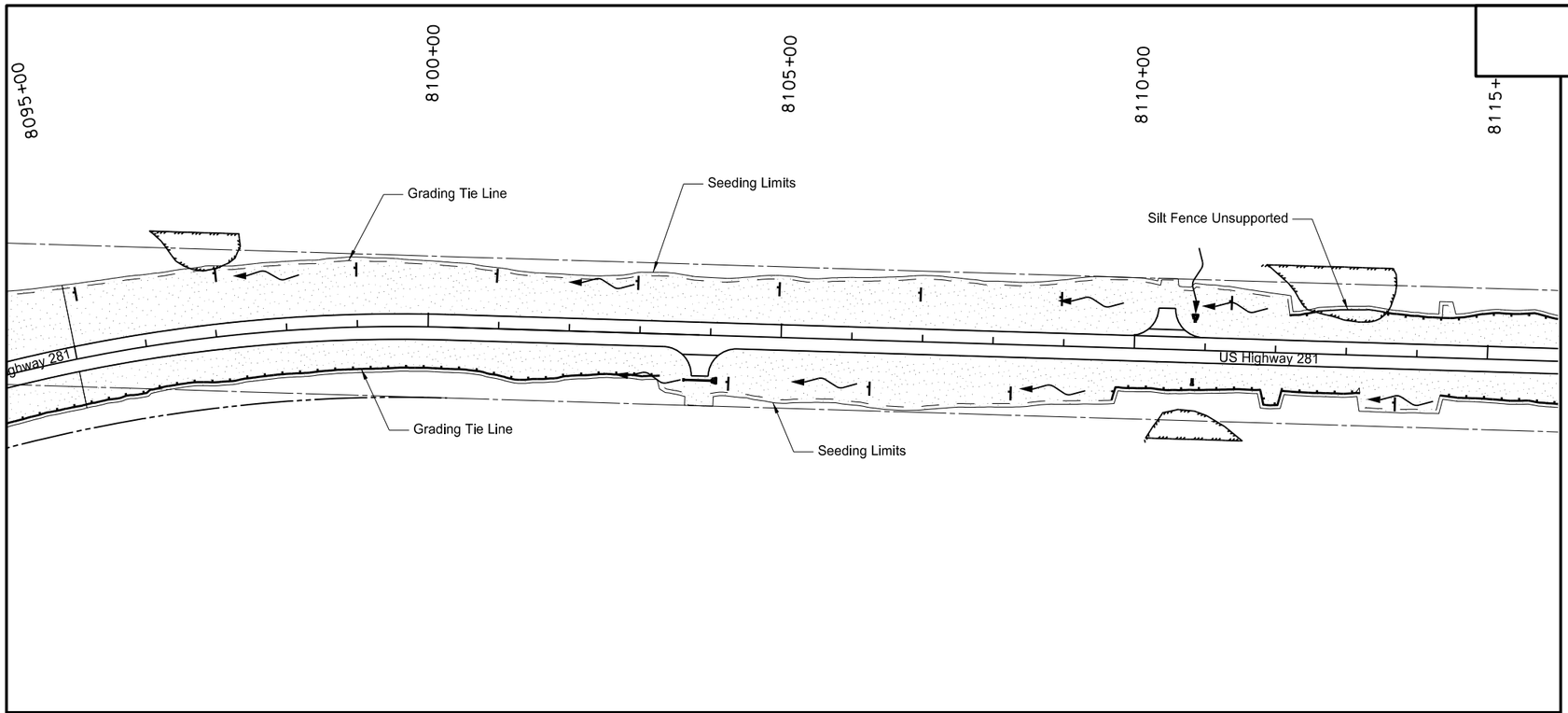
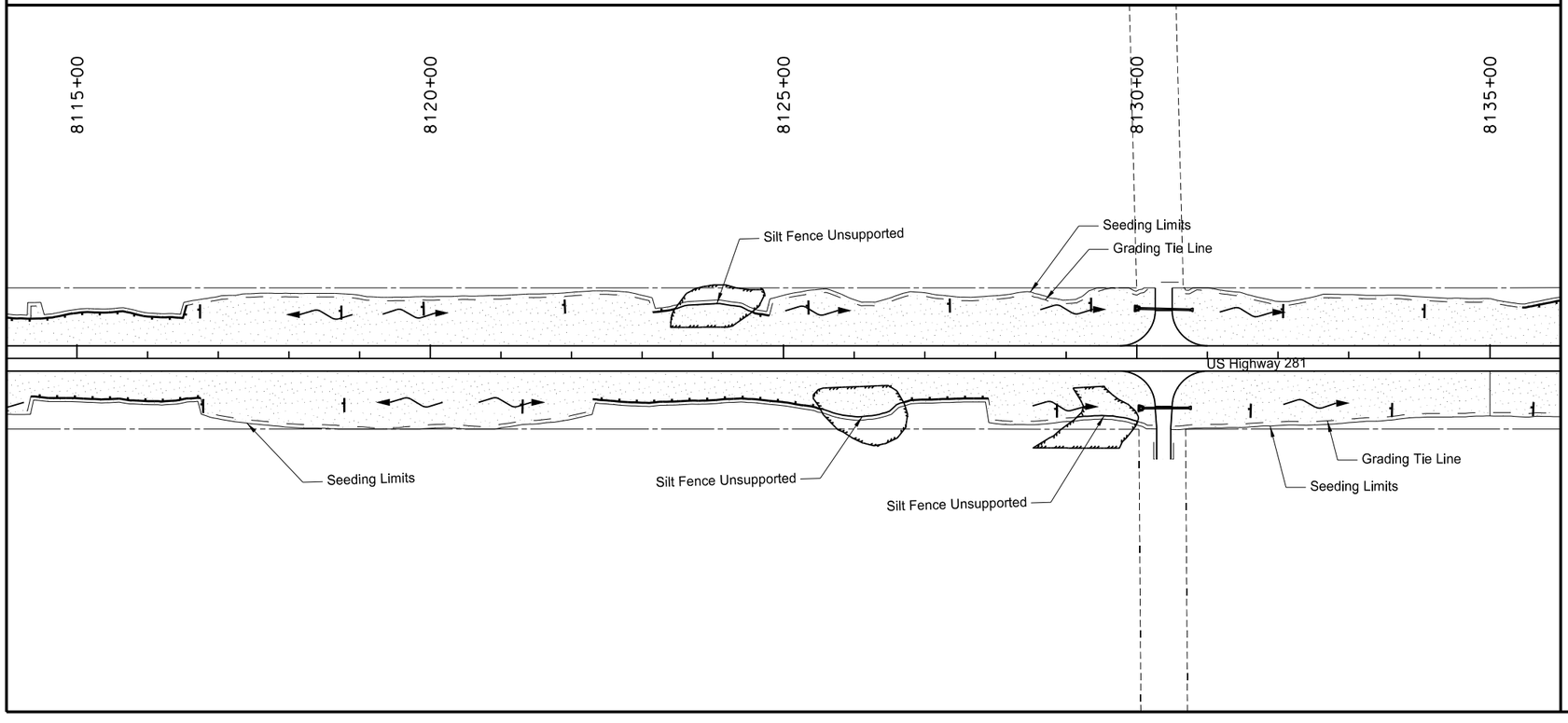
US Highway 281

Temporary Erosion Control
Sta 8055+00 to 8095+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	76	7





251-2000	TEMPORARY COVER CROP		
	Sta. 8095+00 to 8135+00	12.1	AC
		Total = 12.1	AC
253-0101	STRAW MULCH		
	Sta. 8095+00 to 8135+00	12.1	AC
		Total = 12.1	AC
260-0100	SILT FENCE UNSUPPORTED		
	Sta. 8112+55 - 59.2' Lt to 8113+57 - 61.2' Lt	102.5	LF
	Sta. 8123+46 - 70.2' Lt to 8124+56 - 66.0' Lt	112.1	LF
	Sta. 8125+52 - 71.3' Rt to 8126+70 - 62.2' Rt	124.6	LF
	Sta. 8129+15 - 83.3' Rt to 8130+01 - 88.9' Rt	87.1	LF
		Total = 426.3	LF
260-0101	REMOVE SILT FENCE UNSUPPORTED		
	Sta. 8112+55 - 59.2' Lt to 8113+57 - 61.2' Lt	102.5	LF
	Sta. 8123+46 - 70.2' Lt to 8124+56 - 66.0' Lt	112.1	LF
	Sta. 8125+52 - 71.3' Rt to 8126+70 - 62.2' Rt	124.6	LF
	Sta. 8129+15 - 83.3' Rt to 8130+01 - 88.9' Rt	87.1	LF
		Total = 426.3	LF

LEGEND

- Delineated Wetland
- Temporary Cover Crop
- Flow Arrow
- Fiber Rolls
- Unsupported Silt Fence
- R/W Line
- Temporary Easement Line
- Section Line

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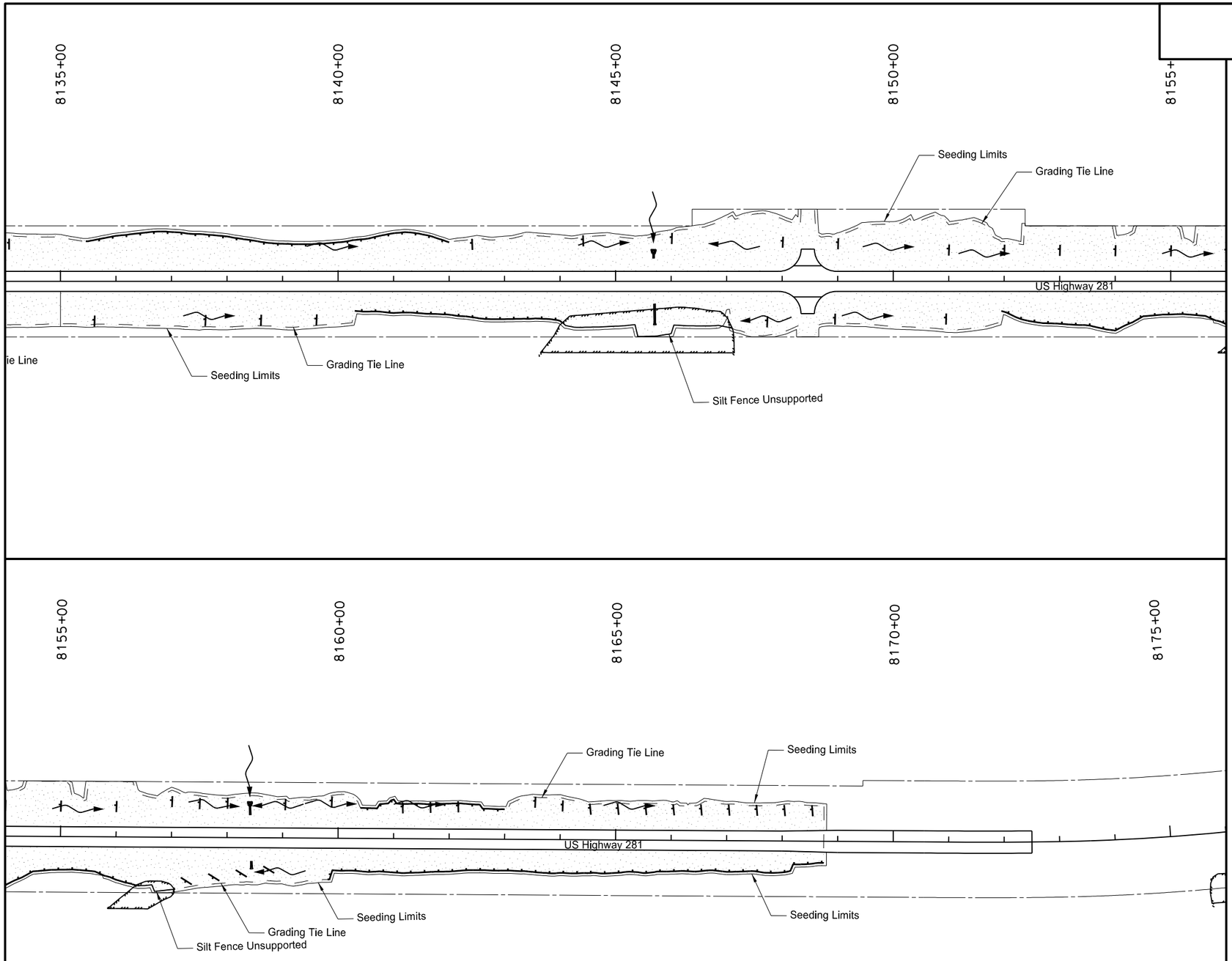
US Highway 281

Temporary Erosion Control
Sta 8095+00 to 8135+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	76	8



251-2000	TEMPORARY COVER CROP		
	Sta. 8135+00 to 8172+50	9.9	AC
		Total = 9.9	AC
253-0101	STRAW MULCH		
	Sta. 8135+00 to 8172+50	9.9	AC
		Total = 9.9	AC
260-0100	SILT FENCE UNSUPPORTED		
	Sta. 8144+04 - 74.5' Rt to 8147+10 - 85.3' Rt	338.5	LF
	Sta. 8156+36 - 86.8' Rt to 8157+05 - 93.5' Rt	77.2	LF
		Total = 415.7	LF
260-0101	REMOVE SILT FENCE UNSUPPORTED		
	Sta. 8144+04 - 74.5' Rt to 8147+10 - 85.3' Rt	338.5	LF
	Sta. 8156+36 - 86.8' Rt to 8157+05 - 93.5' Rt	77.2	LF
		Total = 415.7	LF

LEGEND

- Delineated Wetland
- Temporary Cover Crop
- Flow Arrow
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- Unsupported Silt Fence
- R/W Line
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US Highway 281

Temporary Erosion Control
Sta 8135+00 to 8175+00

8/28/2017 15:12:06 mhuettl c:\pwworking\central01\dms26485\076TE_008_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	76	9

261-0112 FIBER ROLLS 12IN - Ditch Checks

Station	Offset	Quantity	Unit	Station	Offset	Quantity	Unit	Station	Offset	Quantity	Unit	Station	Offset	Quantity	Unit
7899+04.30	Rt	20	LF	8022+96.75	Lt	20	LF	8054+93.43	Rt	20	LF	8154+00.14	Lt	20	LF
7900+04.32	Rt	20	LF	8020+96.77	Lt	20	LF	8056+93.43	Rt	20	LF	8155+00.14	Lt	20	LF
7901+04.32	Rt	20	LF	8009+65.00	Rt	20	LF	8058+93.43	Rt	20	LF	8156+00.14	Lt	20	LF
7902+04.24	Rt	20	LF	8011+65.00	Rt	20	LF	8068+11.09	Rt	20	LF	8159+04.38	Lt	20	LF
7903+04.21	Rt	20	LF	8013+65.00	Rt	20	LF	8070+17.92	Rt	20	LF	8159+88.03	Lt	20	LF
7904+04.26	Rt	20	LF	8015+65.00	Rt	20	LF	8072+23.80	Rt	20	LF	8158+65.48	Rt	24	LF
7905+04.26	Rt	20	LF	8017+65.00	Rt	20	LF	8074+29.72	Rt	20	LF	8158+15.99	Rt	24	LF
7906+04.26	Rt	20	LF	8023+81.94	Lt	20	LF	8075+26.36	Rt	20	LF	8157+66.50	Rt	24	LF
7907+04.26	Rt	20	LF	8024+31.85	Lt	20	LF	8077+11.57	Rt	20	LF	8157+17.01	Rt	24	LF
7899+09.96	Lt	20	LF	8024+81.85	Lt	20	LF	8079+17.53	Rt	20	LF	8161+65.92	Lt	20	LF
7900+09.96	Lt	20	LF	8025+31.84	Lt	20	LF	8081+23.20	Rt	20	LF	8162+15.90	Lt	20	LF
7902+09.86	Lt	20	LF	8025+81.84	Lt	20	LF	8077+27.33	Lt	20	LF	8084+02.51	Rt	20	LF
7927+05.28	Rt	20	LF	8026+31.84	Lt	20	LF	8079+19.38	Lt	20	LF	8085+22.32	Rt	20	LF
7928+05.42	Rt	20	LF	8026+81.83	Lt	20	LF	8081+11.25	Lt	20	LF	8059+11.59	Lt	20	LF
7929+05.42	Rt	20	LF	8027+31.83	Lt	20	LF	8083+03.99	Lt	20	LF	8057+29.68	Lt	20	LF
7931+05.42	Rt	20	LF	8027+81.83	Lt	20	LF	8093+23.96	Lt	20	LF	8163+54.58	Lt	20	LF
7933+05.42	Rt	20	LF	8028+31.82	Lt	20	LF	8116+74.07	Lt	20	LF	8164+04.17	Lt	20	LF
7935+05.42	Rt	20	LF	8028+81.82	Lt	20	LF	8116+78.51	Rt	20	LF	8164+53.27	Lt	20	LF
7928+30.07	Lt	20	LF	8029+31.81	Lt	20	LF	8129+35.35	Lt	20	LF	8165+03.27	Lt	20	LF
7929+30.07	Lt	20	LF	8029+81.81	Lt	20	LF	8128+86.93	Rt	20	LF	8165+53.27	Lt	20	LF
7931+30.07	Lt	20	LF	8030+31.81	Lt	20	LF	8132+07.19	Lt	20	LF	8166+03.27	Lt	20	LF
7933+29.97	Lt	20	LF	8030+81.80	Lt	20	LF	8131+60.93	Rt	20	LF	8166+53.27	Lt	20	LF
7935+29.97	Lt	20	LF	8031+31.80	Lt	20	LF	8142+41.31	Lt	20	LF	8167+03.27	Lt	20	LF
7937+30.08	Lt	20	LF	8031+81.80	Lt	20	LF	8149+00.50	Lt	20	LF	8167+53.27	Lt	20	LF
7940+33.77	Lt	20	LF	8032+31.79	Lt	20	LF	8147+72.81	Rt	20	LF	8168+03.27	Lt	20	LF
7942+33.77	Lt	20	LF	8032+81.79	Lt	20	LF	8148+95.02	Rt	20	LF	8168+53.27	Lt	20	LF
7944+33.76	Lt	20	LF	8033+31.79	Lt	20	LF	8161+15.93	Lt	20	LF	8157+00.44	Lt	20	LF
7946+33.76	Lt	20	LF	8025+08.89	Rt	20	LF	8095+15.79	Lt	20	LF	8157+50.32	Lt	20	LF
7948+62.25	Lt	20	LF	8025+58.88	Rt	20	LF	8097+07.86	Lt	20	LF	8158+00.37	Lt	20	LF
7949+62.25	Lt	20	LF	8026+08.88	Rt	20	LF	8099+00.19	Lt	20	LF	8165+53.27	Lt	20	LF
7950+62.25	Lt	20	LF	8026+58.88	Rt	20	LF	8100+95.51	Lt	20	LF	8166+03.27	Lt	20	LF
7953+24.46	Lt	20	LF	8027+08.88	Rt	20	LF	8102+95.71	Lt	20	LF	8166+53.27	Lt	20	LF
7955+24.45	Lt	20	LF	8027+58.87	Rt	20	LF	8104+95.71	Lt	20	LF	8167+03.27	Lt	20	LF
7965+78.91	Lt	20	LF	8028+08.87	Rt	20	LF	8106+95.70	Lt	20	LF	8167+53.27	Lt	20	LF
7966+78.91	Lt	20	LF	8028+58.87	Rt	20	LF	8108+95.70	Lt	20	LF	8168+03.27	Lt	20	LF
7968+78.95	Lt	20	LF	8029+08.86	Rt	20	LF	8104+27.01	Rt	20	LF	8168+53.27	Lt	20	LF
7970+78.72	Lt	20	LF	8029+58.86	Rt	20	LF	8106+27.01	Rt	20	LF			**Total**	4,347	LF
7972+78.72	Lt	20	LF	8030+08.86	Rt	20	LF	8108+27.01	Rt	20	LF					
7974+78.62	Lt	20	LF	8030+58.85	Rt	20	LF	8111+36.23	Lt	20	LF					
7976+78.53	Lt	20	LF	8031+08.85	Rt	20	LF	8113+70.97	Rt	20	LF					
7974+61.46	Rt	23	LF	8031+58.85	Rt	20	LF	8118+78.50	Rt	20	LF					
7972+66.58	Rt	23	LF	8032+08.84	Rt	20	LF	8121+30.53	Rt	20	LF					
7970+66.60	Rt	23	LF	8032+58.84	Rt	20	LF	8118+74.07	Lt	20	LF					
7968+66.57	Rt	23	LF	8033+08.84	Rt	20	LF	8119+90.26	Lt	20	LF					
7979+61.59	Lt	20	LF	8035+51.66	Lt	20	LF	8121+90.26	Lt	20	LF					
7979+55.62	Rt	23	LF	8037+51.40	Lt	20	LF	8127+35.35	Lt	20	LF					
7982+74.87	Lt	20	LF	8039+51.40	Lt	20	LF	8125+35.25	Lt	20	LF					
7984+74.86	Lt	20	LF	8041+51.26	Lt	20	LF	8134+07.27	Lt	20	LF					
7988+44.68	Lt	20	LF	8043+51.25	Lt	20	LF	8133+60.93	Rt	20	LF					
7990+44.48	Lt	20	LF	8045+51.49	Lt	20	LF	8135+60.92	Rt	20	LF					
7992+44.80	Lt	20	LF	8047+51.48	Lt	20	LF	8137+60.92	Rt	20	LF					
7999+66.07	Lt	20	LF	8049+51.47	Lt	20	LF	8138+60.92	Rt	20	LF					
7998+66.07	Lt	20	LF	8051+51.47	Lt	20	LF	8139+60.92	Rt	20	LF					
7997+66.07	Lt	20	LF	8035+81.19	Rt	20	LF	8144+41.21	Lt	20	LF					
8009+40.88	Lt	20	LF	8037+81.34	Rt	20	LF	8148+00.92	Lt	20	LF					
8011+40.86	Lt	20	LF	8039+81.34	Rt	20	LF	8146+01.03	Lt	20	LF					
8013+40.86	Lt	20	LF	8041+81.16	Rt	20	LF	8150+95.02	Rt	20	LF					
8015+40.86	Lt	20	LF	8048+93.45	Rt	20	LF	8151+00.15	Lt	20	LF					
8017+40.86	Lt	20	LF	8050+93.45	Rt	20	LF	8152+00.14	Lt	20	LF					
8019+76.73	Lt	20	LF	8052+93.43	Rt	20	LF	8153+00.14	Lt	20	LF					

261-0120 FIBER ROLLS 20IN - Site Runoff Protection

Station	to Station	Offset	Quantity	Unit	Station	to Station	Offset	Quantity	Unit
7876+75.00	7878+85.84	Lt	218	LF	8061+65.33	8066+02.39	Rt	433	LF
7876+75.00	7877+24.39	Rt	54	LF	8081+30.00	8083+53.11	Rt	227	LF
7877+25.00	7879+30.00	Rt	214	LF	8082+31.98	8083+87.51	Lt	414	LF
7878+90.00	7885+21.68	Lt	622	LF	8082+64.56	8083+03.44	Lt	74	LF
7879+36.91	7885+21.68	Rt	640	LF	8083+92.22	8084+29.10	Lt	437	LF
7902+60.00	7905+37.34	Lt	306	LF	8085+19.28	8086+12.76	Lt	297	LF
7907+94.85	7909+50.08	Rt	183	LF	8085+50.00	8086+64.71	Rt	112	LF
7925+25.00	7926+53.87	Rt	143	LF	8086+77.05	8090+41.52	Lt	430	LF
7925+73.62	7926+65.00	Lt	92	LF	8088+53.72	8089+97.08	Rt	172	LF
7935+90.00	7940+77.22	Rt	502	LF	8090+28.27	8092+47.95	Rt	245	LF
7941+27.74	7952+87.38	Rt	1182	LF	8090+59.02	8091+73.28	Lt	174	LF
7954+32.02	7958+55.25	Rt	459	LF	8092+64.13	8103+30.00	Rt	1049	LF
7957+82.81	7958+55.25	Lt	102	LF	8109+70.00	8113+21.39	Rt	399	LF
7958+85.24	7959+37.84	Rt	82	LF	8112+19.05	8112+54.65	Lt	37	LF
7958+85.25	7959+98.10	Lt	160	LF	8113+56.55	8116+55.00	Lt	314	LF
7961+24.05	7967+30.00	Rt	607	LF	8114+34.50	8116+75.00	Rt	241	LF
7961+35.00	7965+45.00	Lt	411	LF	8122+30.00	8125+52.01	Rt	324	LF
7982+30.00	7985+15.00	Rt	286	LF	8123+15.00	8123+46.44	Lt	32	LF
7985+70.00	7994+01.43	Rt	833	LF	8124+55.75	8124+80.00	Lt	25	LF
7994+01.74	7994+26.59	Rt	57	LF	8126+70.05	8127+90.00	Rt	121	LF
7994+47.59	7994+48.79	Rt	15	LF	8135+45.53	8142+00.00	Lt	662	LF
7994+48.79	7994+70.84	Rt	35	LF	8140+30.00	8144+04.12	Rt	377	LF
7994+64.85	7997+15.00	Lt	262	LF	8151+95.00	8156+36.00	Rt	457	LF
7994+70.84	7998+63.59	Rt	396	LF	8159+81.59	8168+75.00	Rt	916	LF
8043+05.00	8043+46.40	Rt	54	LF	8160+40.00	8162+99.90	Lt	275	LF
8045+45.77	8045+64.89	Rt	51	LF	**Total**			17,879	LF
8061+10.96	8077+20.00	Lt	1669	LF					

US 281 Mainline Pipe Inlet Protection

Station	Offset	Diameter (IN)	Fiber Roll	
			12IN (LF)	20IN (LF)
7913+17	CL	72		40
7938+48	CL	36	40	
7948+17	CL	24	40	
7952+47	CL	24	40	
7960+84	CL	24	40	
7976+15	CL	24	40	
7985+44	CL	24	40	
8002+49	CL	72		40
8020+84	CL	24	40	
8045+36	CL	24	40	
8053+46	CL	24	40	
8060+88	CL	24	40	
8076+45	CL	30	40	
8086+50	CL	30	40	
8093+10	CL	30	40	
8110+85	CL	24	40	
8145+69	CL	24	40	
8158+43	CL	24	40	
		Total	640	80
CR 29 Mainlaine Pipe Inlet Protection				
110+00	CL	24	40	
		Total	40	160

Approach Pipe Inlet Protection

Station	Offset	Diameter (IN)	Fiber Roll
			12IN (LF)
7900+93	Lt	18	40
7907+85	Rt	24	40
7926+47	Rt	18	40
7927+60	Lt	18	40
7940+62	Rt	24	40
7978+26	Lt	24	40
7978+30	Rt	24	40
7980+70	Lt	24	40
7980+70	Rt	24	40
8023+04	Rt	24	40
8023+21	Lt	24	40
8033+84	Rt	30	40
8033+86	Lt	30	40
8054+84	Lt	24	40
8058+20	Lt	24	40
8092+00	Lt	30	40
8103+65	Rt	18	40
8130+02	Lt	24	40
8130+08	Rt	24	40
	Total		760

Temporary Erosion Controls Totals

251-2000	**TEMPORARY COVER CROP**	92	ACRE
253-0101	**STRAW MULCH**	92	ACRE
260-0100	**SILT FENCE UNSUPPORTED**	5,071	LF
260-0101	**REMOVE SILT FENCE UNSUPPORTED**	5,071	LF
261-0112	**FIBER ROLLS 12IN**		
	Ditch Checks	4,347	LF
	Inlet Protection	1,440	LF
	Additional	4,000	LF
261-0113	**REMOVE FIBER ROLLS 12IN**	9,787	LF
261-0120	**FIBER ROLLS 20IN**		
	Runoff Protection	17,879	LF
	Inlet Protection	160	LF
	Additional	4,000	LF
261-0121	**REMOVE FIBER ROLLS 20IN**	22,039	LF
262-0100	**FLOTATION SILT CURTAIN**	933	LF
262-0101	**REMOVE FLOTATION SILT CURTAIN**	933	LF

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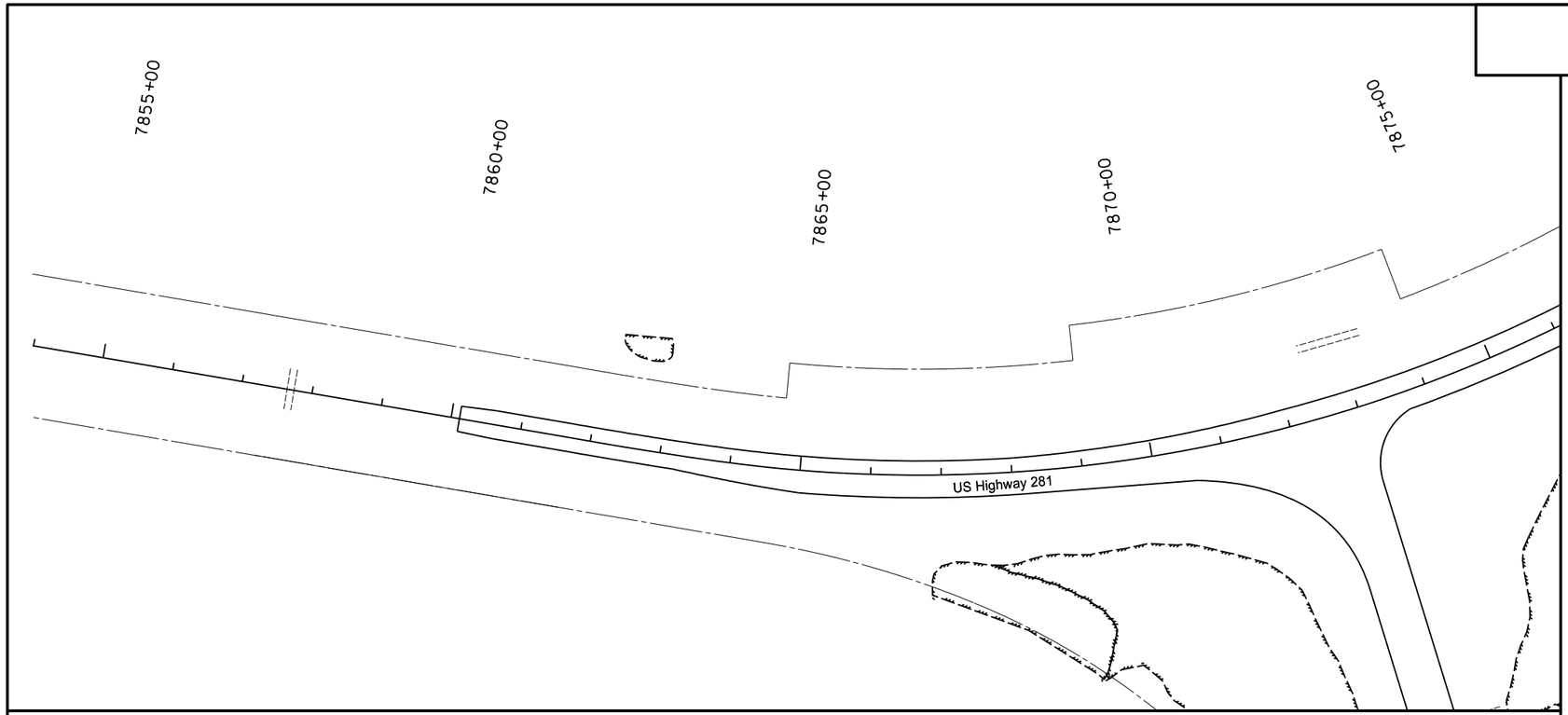
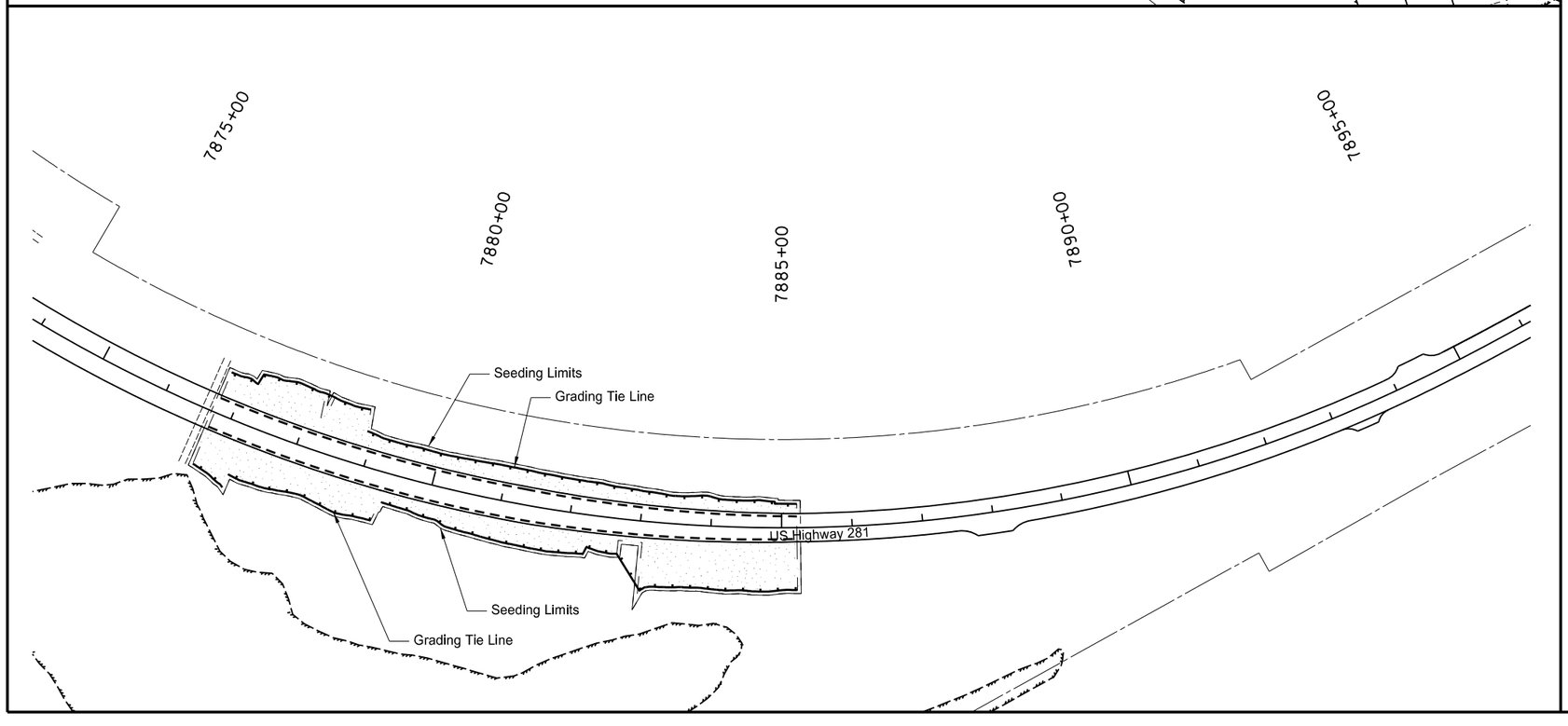
US Highway 281

Temporary Erosion Control
Ditch Checks

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	77	1





251-0200	SEEDING CLASS II		
	Sta 7860+12 to 7895+00	1.7	AC
	Total =	1.7	AC
253-0101	STRAW MULCH		
	Sta 7860+12 to 7895+00	1.7	AC
	Total =	1.7	AC

LEGEND

- Delineated Wetland
- Seeding Class II
- Wetland Seeding
- ECB Type 3
- Riprap
- Flow Arrow
- Fiber Rolls
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: ECB Type 3 is used for erosion control on backslopes and inslopes steeper than 4:1.

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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US Highway 281

Permanent Erosion Control
Sta 7855+00 to 7895+00

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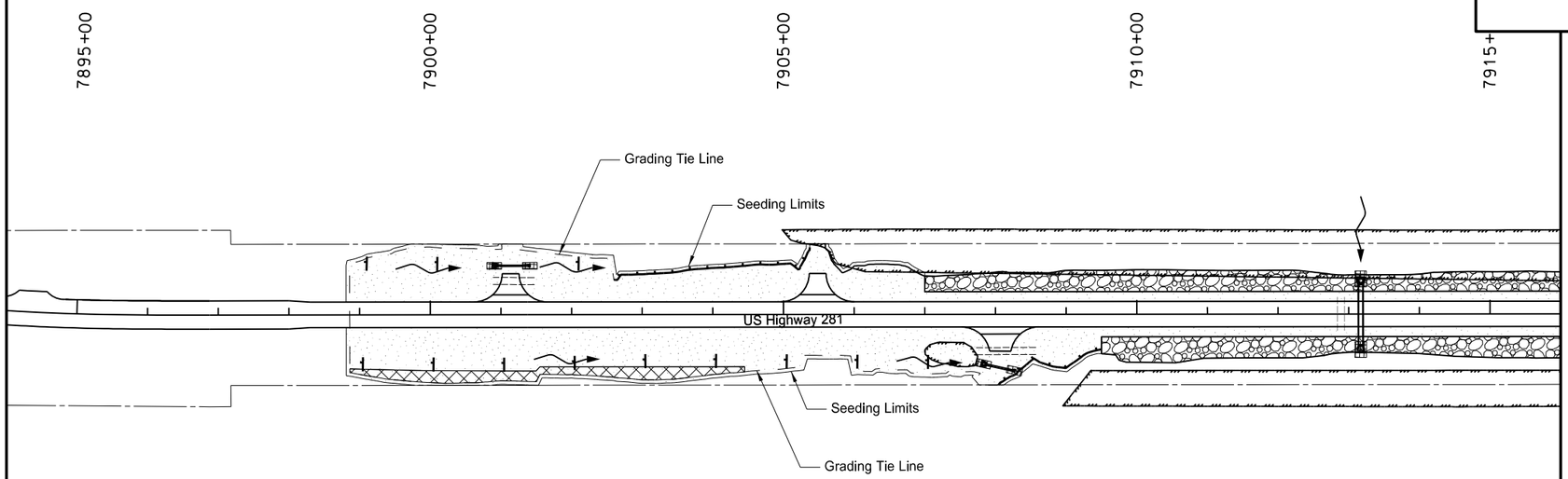
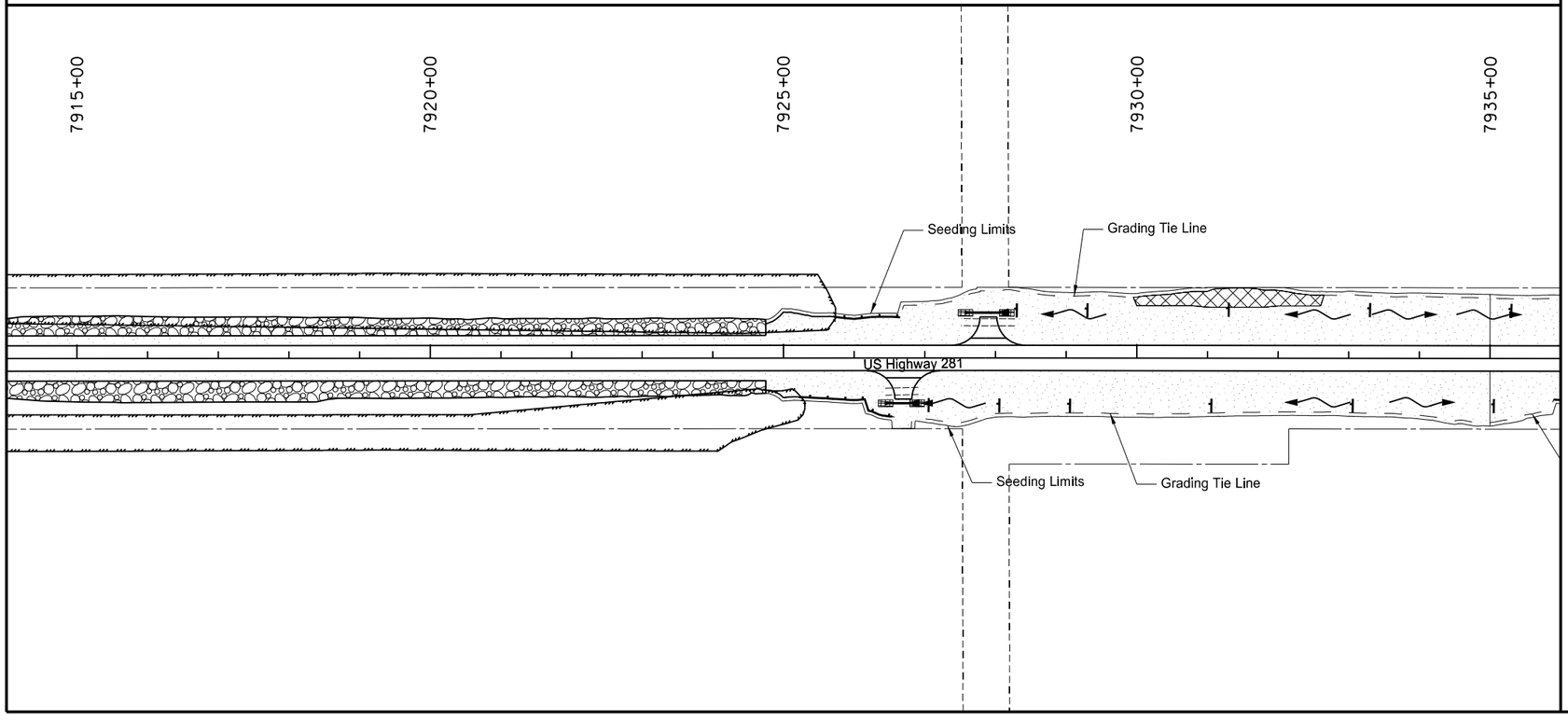
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	77	2





251-0200	SEEDING CLASS II		
	Sta. 7895+00 to 7935+00	7.1	AC
	Total =	7.1	AC
253-0101	STRAW MULCH		
	Sta. 7895+00 to 7935+00	7.1	AC
	Total =	7.1	AC
256-0201	RIPRAP GRADE II		
	Sta. 7895+00 to 7935+00	10980	TN
	Total =	10980	TN
709-0155	GEOSYNTHETIC MATERIAL TYPE RR		
	Sta. 7895+00 to 7935+00	9688	SY
	Total =	9688	SY

LEGEND

- Delineated Wetland
- Seeding Class II
- Wetland Seeding
- ECB Type 3
- Riprap
- Flow Arrow
- Fiber Rolls
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: ECB Type 3 is used for erosion control on backslopes and inslopes steeper than 4:1.

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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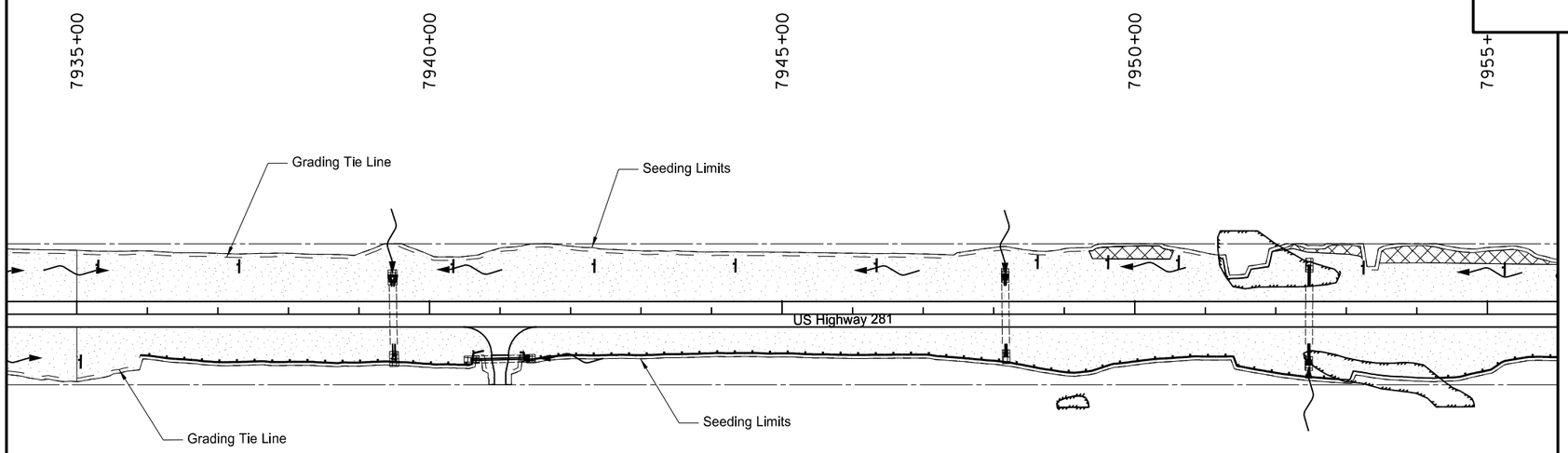
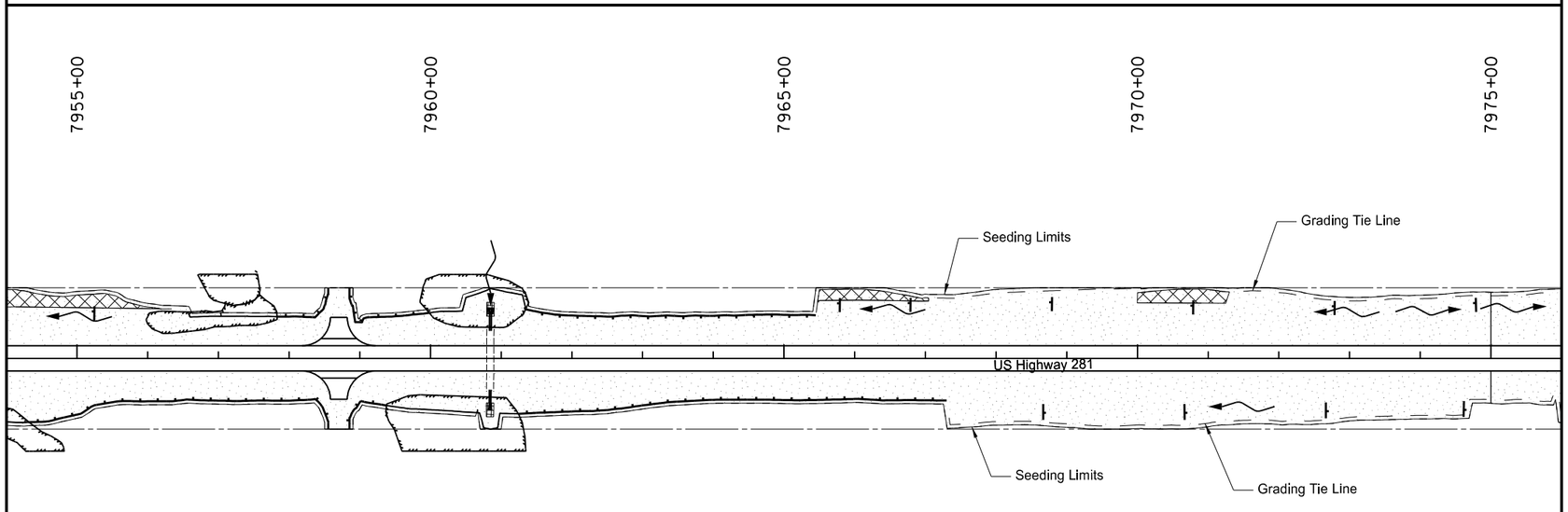
US Highway 281

Permanent Erosion Control
Sta 7895+00 to 7935+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	77	3





251-0200	SEEDING CLASS II		
	Sta. 7935+00 to 7975+00	11.8	AC
	Total =	11.8	AC
253-0101	STRAW MULCH		
	Sta. 7935+00 to 7975+00	11.8	AC
	Total =	11.8	AC

LEGEND

- Delineated Wetland
- Seeding Class II
- Wetland Seeding
- ECB Type 3
- Riprap
- Flow Arrow
- Fiber Rolls
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: ECB Type 3 is used for erosion control on backslopes and inslopes steeper than 4:1.

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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US Highway 281

Permanent Erosion Control
Sta 7935+00 to 7975+00

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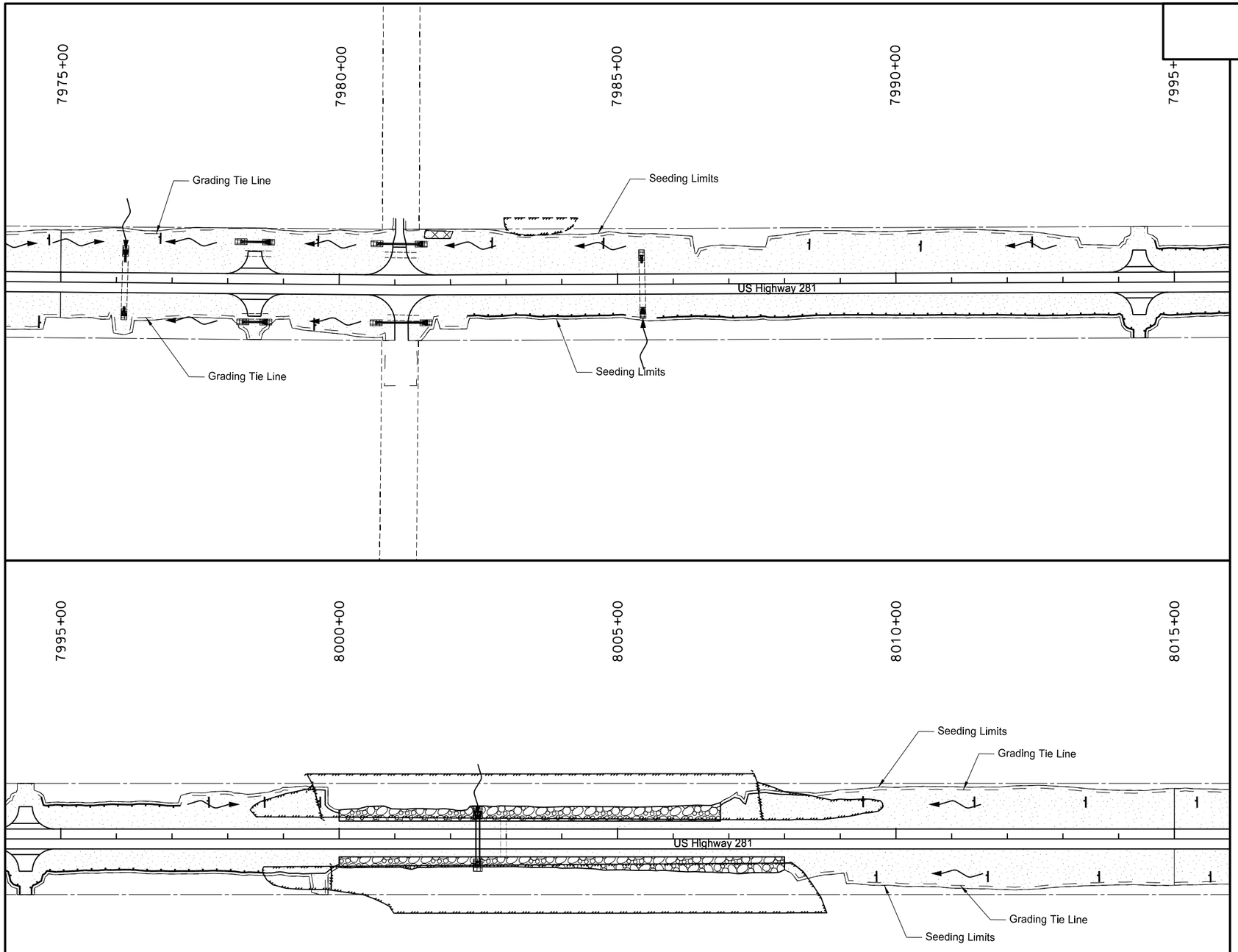
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	77	4



251-0200	SEEDING CLASS II		
	Sta. 7975+00 to 8015+00	9.7	AC
	Total =	9.7	AC
253-0101	STRAW MULCH		
	Sta. 7975+00 to 8015+00	9.7	AC
	Total =	9.7	AC
256-0201	RIPRAP GRADE II		
	Sta. 7975+00 to 8015+00	4408	TN
	Total =	4408	TN
709-0155	GEOSYNTHETIC MATERIAL TYPE RR		
	Sta. 7975+00 to 8015+00	3889	SY
	Total =	3889	SY

LEGEND

- Delineated Wetland
- Seeding Class II
- Wetland Seeding
- ECB Type 3
- Riprap
- Flow Arrow
- Fiber Rolls
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: ECB Type 3 is used for erosion control on backslopes and inslopes steeper than 4:1.

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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US Highway 281

Permanent Erosion Control
Sta 7975+00 to 8015+00

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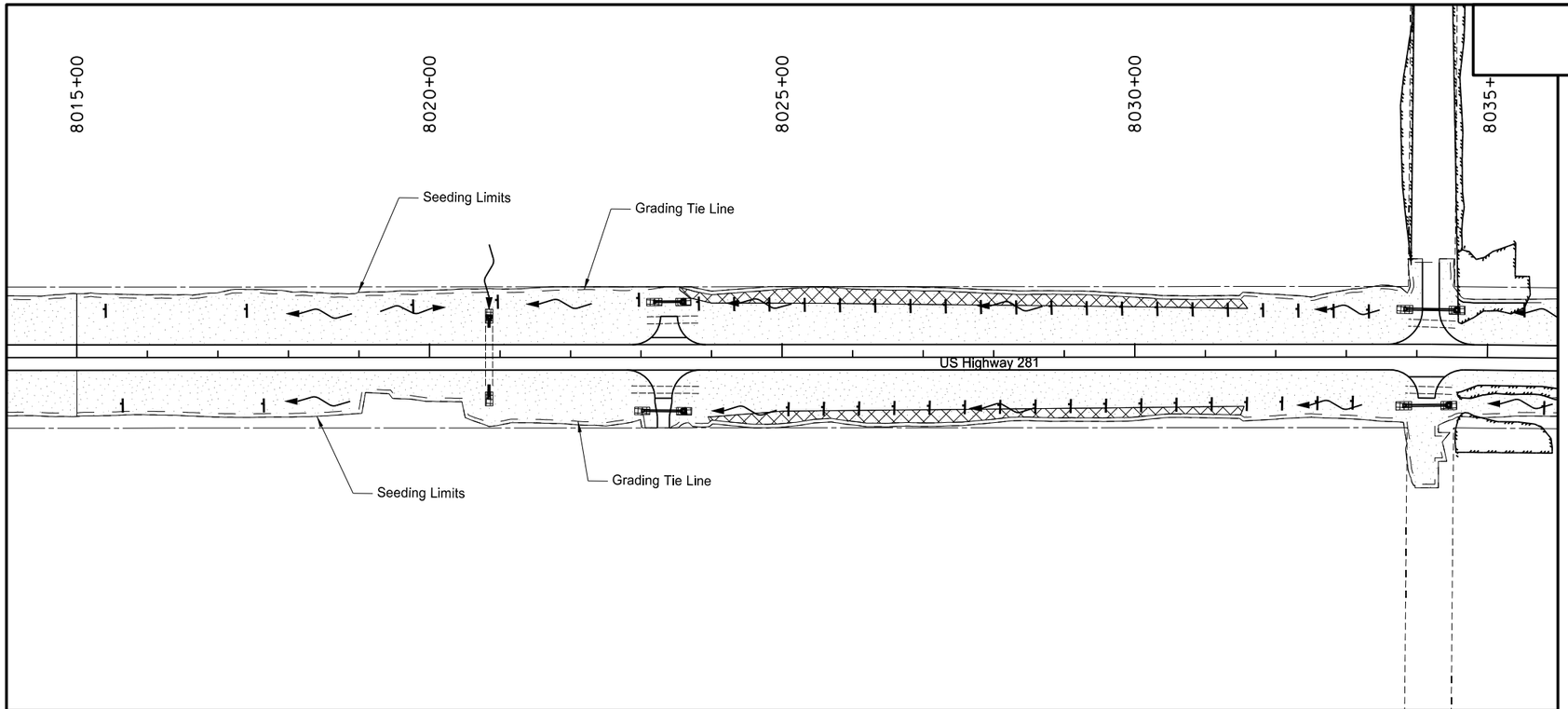
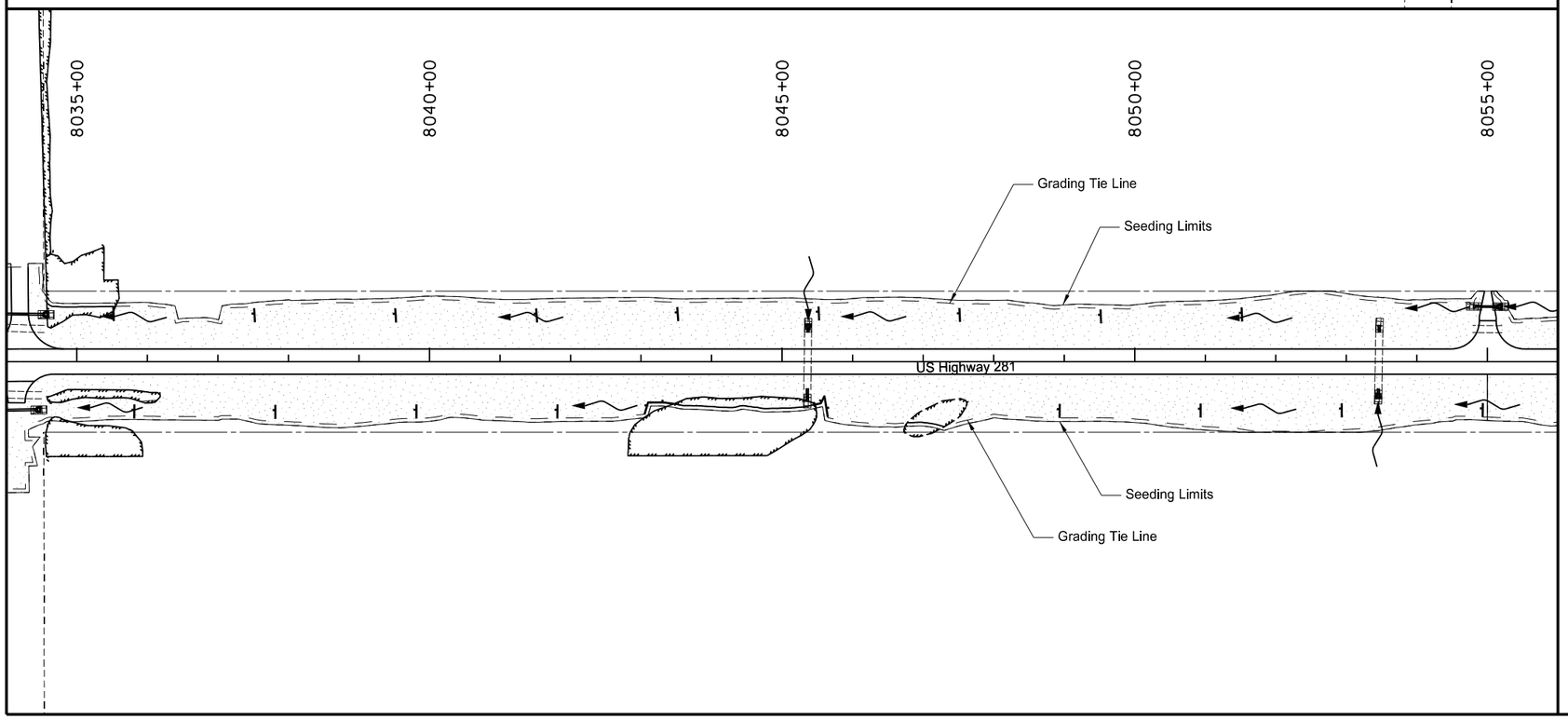
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	77	5





251-0200 SEEDING CLASS II

Sta. 8015+00 to 8055+00	13.2	AC
Total =	13.2	AC

253-0101 STRAW MULCH

Sta. 8015+00 to 8055+00	13.2	AC
Total =	13.2	AC

LEGEND

- Delineated Wetland
- Seeding Class II
- Wetland Seeding
- ECB Type 3
- Riprap
- Flow Arrow
- Fiber Rolls
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: ECB Type 3 is used for erosion control on backslopes and inslopes steeper than 4:1.

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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US Highway 281

Permanent Erosion Control
Sta 8015+00 to 8055+00

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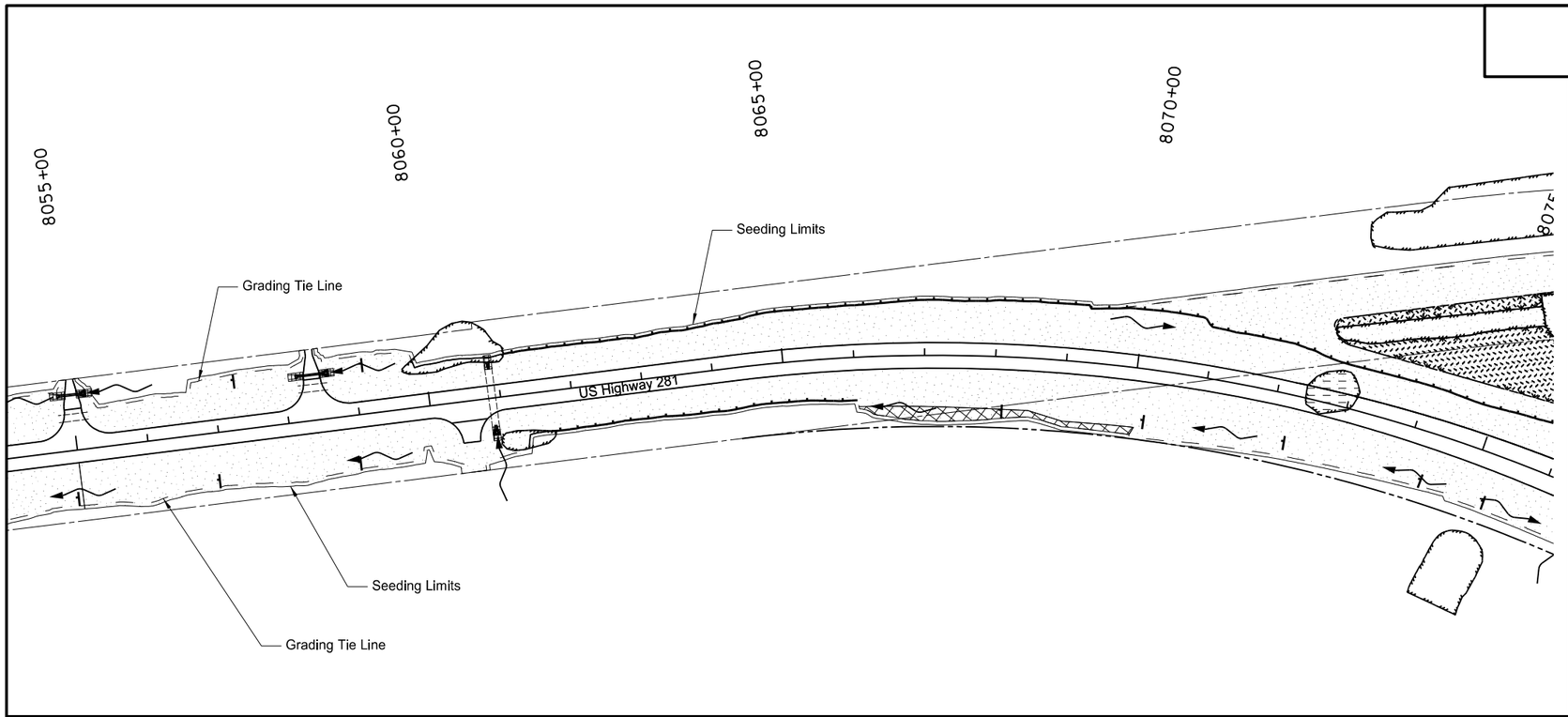
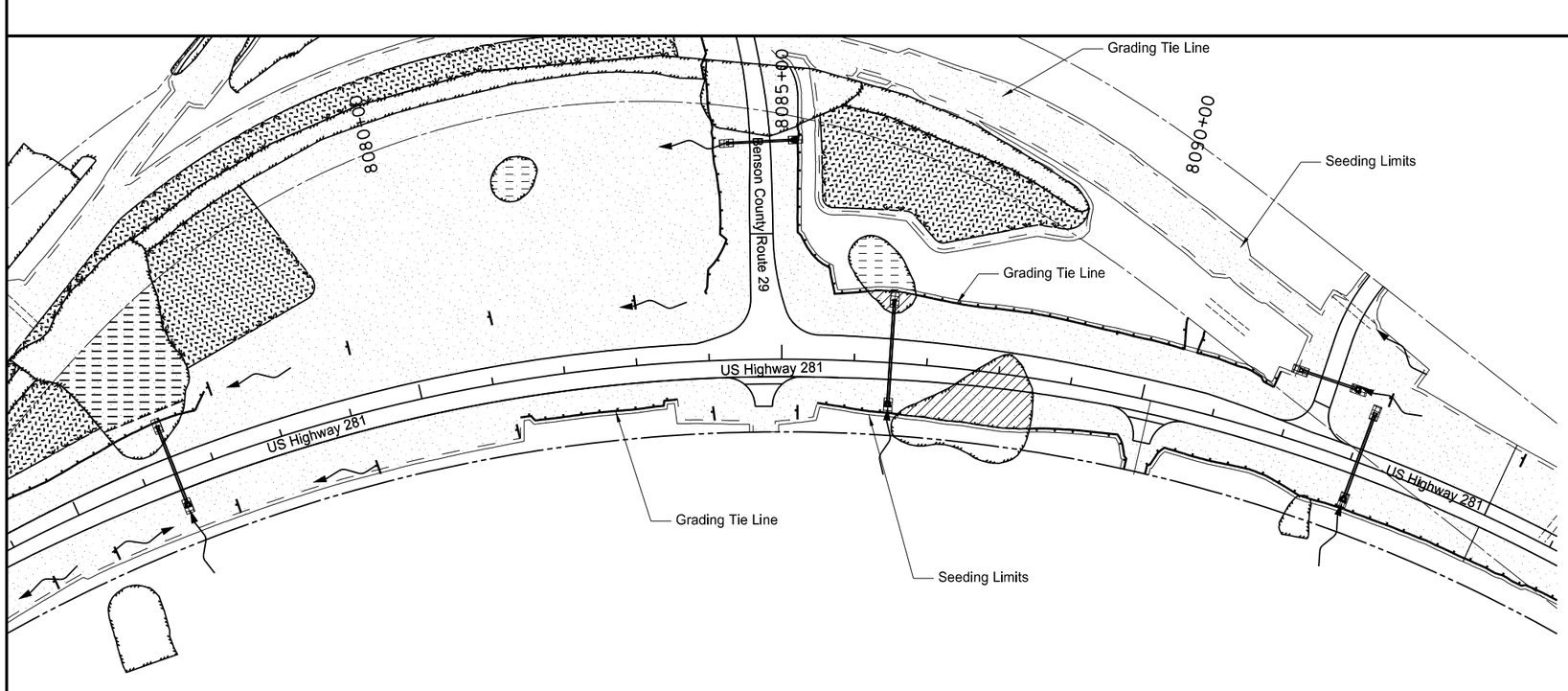
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	77	6





251-0200	SEEDING CLASS II		
	Sta. 8055+00 to 8095+00	26.5	AC
	Total =	26.5	AC
251-1000	WETLAND SEED		
	Sta. 8055+00 to 8095+00	2.8	AC
	Total =	2.8	AC
253-0101	STRAW MULCH		
	Sta. 8055+00 to 8095+00	26.5	AC
	Total =	26.5	AC

LEGEND

- Delineated Wetland
- Seeding Class II
- Wetland Seeding
- ECB Type 3
- Riprap
- Flow Arrow
- Fiber Rolls
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: ECB Type 3 is used for erosion control on backslopes and inslopes steeper than 4:1.

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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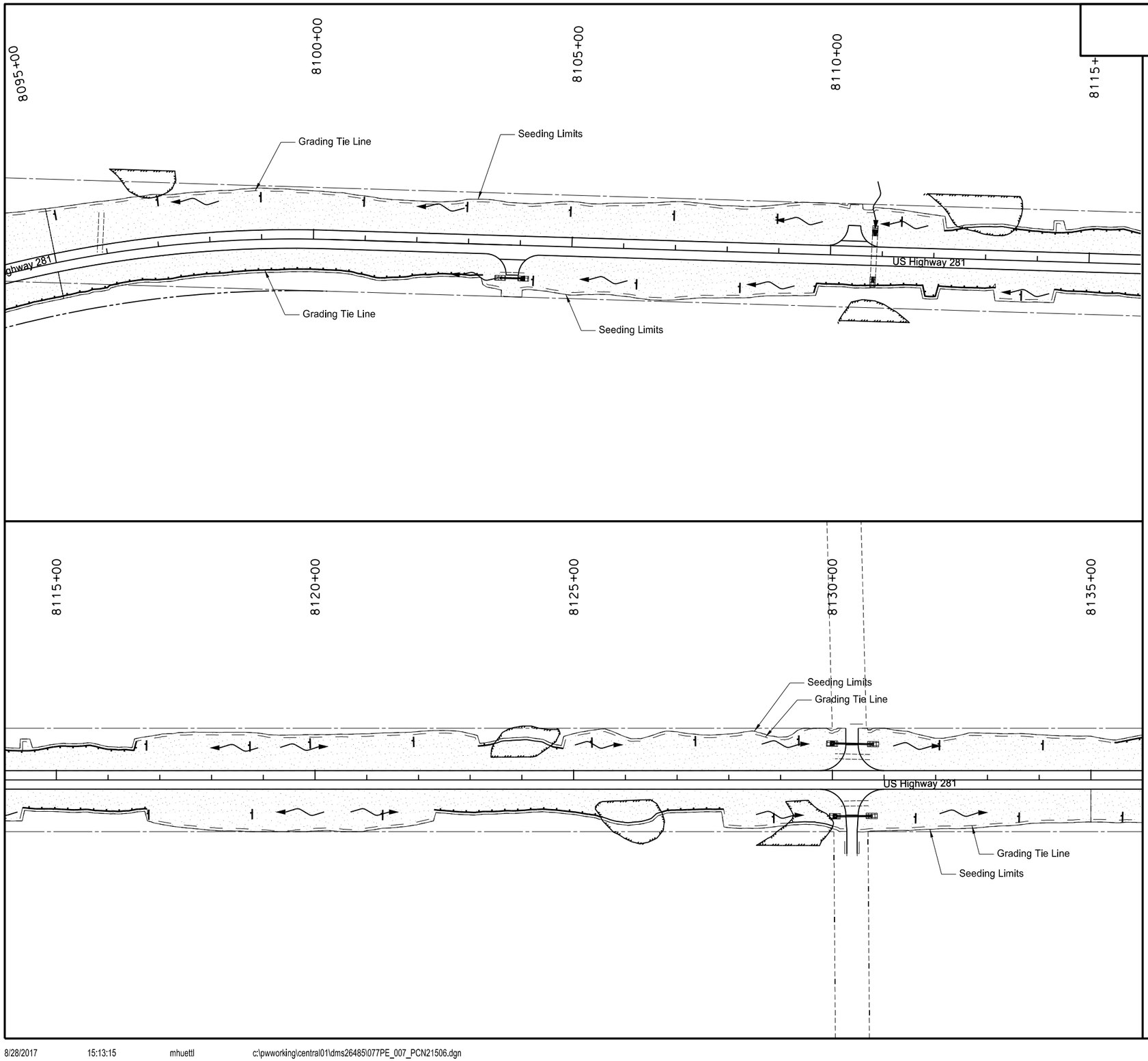
US Highway 281

Permanent Erosion Control
Sta 8055+00 to 8095+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	77	7



251-0200	SEEDING CLASS II		
	Sta. 8095+00 to 8135+00	12.1	AC
	Total =	12.1	AC
253-0101	STRAW MULCH		
	Sta. 8095+00 to 8135+00	12.1	AC
	Total =	12.1	AC

LEGEND

- Delineated Wetland
- Seeding Class II
- Wetland Seeding
- ECB Type 3
- Riprap
- Flow Arrow
- Fiber Rolls
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: ECB Type 3 is used for erosion control on backslopes and inslopes steeper than 4:1.

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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US Highway 281

Permanent Erosion Control
Sta 8095+00 to 8135+00

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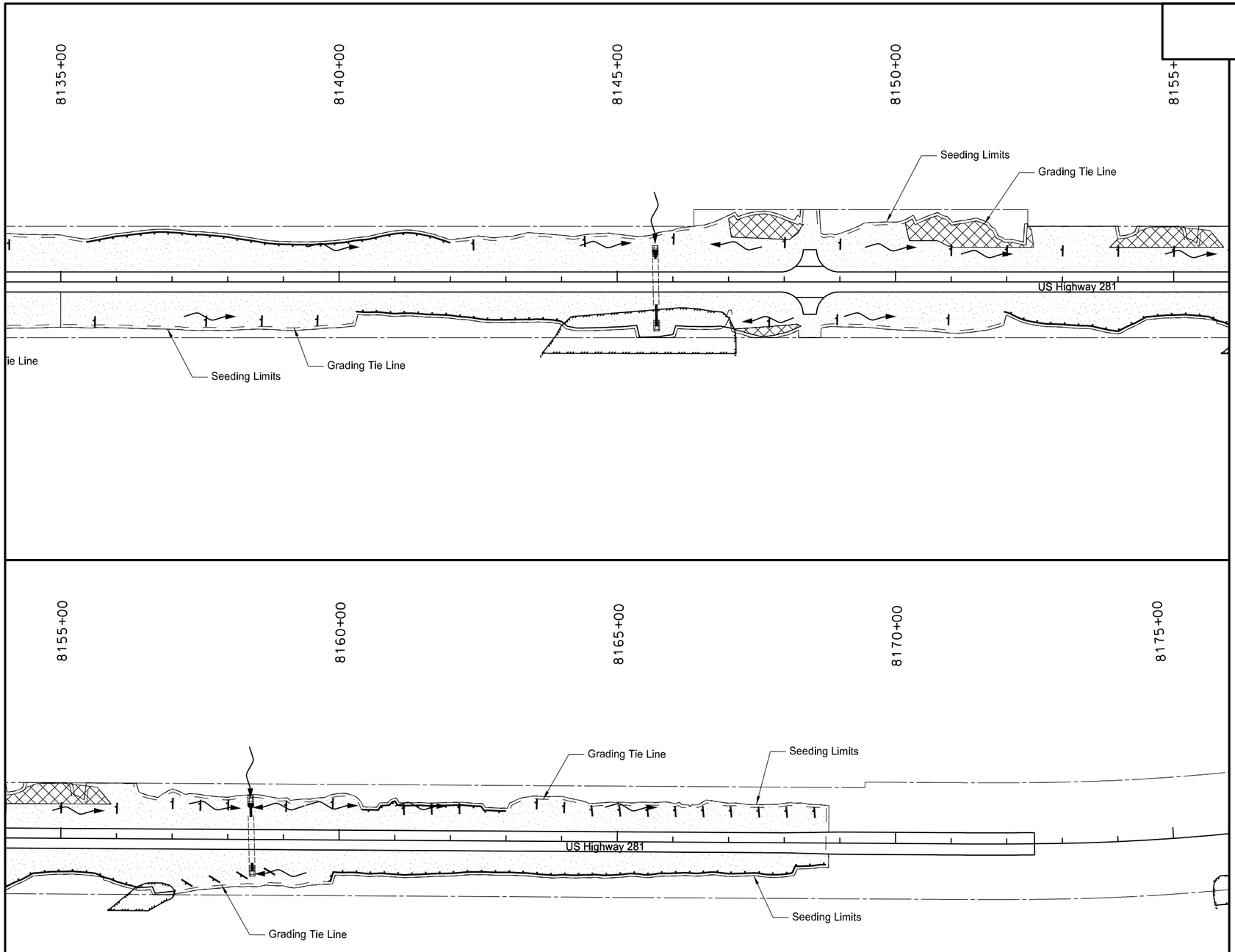
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	77	8



251-0200	SEEDING CLASS II		
	Sta. 8135+00 to 8172+50	9.9	AC
	Total =	9.9	AC
253-0101	STRAW MULCH		
	Sta. 8135+00 to 8172+50	9.9	AC
	Total =	9.9	AC

LEGEND

- Delineated Wetland
- Seeding Class II
- Wetland Seeding
- ECB Type 3
- Riprap
- Flow Arrow
- Fiber Rolls
- R/W Line
- Temporary Easement Line
- Section Line

NOTE: ECB Type 3 is used for erosion control on backslopes and inslopes steeper than 4:1.

NOTE: Natural Vegetative Buffers are used as a runoff erosion control device in fill areas with at least 25 feet of separation from R/W Line

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US Highway 281

Permanent Erosion Control
Sta 8135+00 to 8175+00

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	77	9

261-0112 FIBER ROLLS 12IN - Ditch Checks

Station	Offset	Quantity	Unit	Station	Offset	Quantity	Unit	Station	Offset	Quantity	Unit	Station	Offset	Quantity	Unit
7899+04.30	Rt	20	LF	8022+96.75	Lt	20	LF	8054+93.43	Rt	20	LF	8154+00.14	Lt	20	LF
7900+04.32	Rt	20	LF	8020+96.77	Lt	20	LF	8056+93.43	Rt	20	LF	8155+00.14	Lt	20	LF
7901+04.32	Rt	20	LF	8009+65.00	Rt	20	LF	8058+93.43	Rt	20	LF	8156+00.14	Lt	20	LF
7902+04.24	Rt	20	LF	8011+65.00	Rt	20	LF	8068+11.09	Rt	20	LF	8159+04.38	Lt	20	LF
7903+04.21	Rt	20	LF	8013+65.00	Rt	20	LF	8070+17.92	Rt	20	LF	8159+88.03	Lt	20	LF
7904+04.26	Rt	20	LF	8015+65.00	Rt	20	LF	8072+23.80	Rt	20	LF	8158+65.48	Rt	24	LF
7905+04.26	Rt	20	LF	8017+65.00	Rt	20	LF	8074+29.72	Rt	20	LF	8158+15.99	Rt	24	LF
7906+04.26	Rt	20	LF	8023+81.94	Lt	20	LF	8075+26.36	Rt	20	LF	8157+66.50	Rt	24	LF
7907+04.26	Rt	20	LF	8024+31.85	Lt	20	LF	8077+11.57	Rt	20	LF	8157+17.01	Rt	24	LF
7899+09.96	Lt	20	LF	8024+81.85	Lt	20	LF	8079+17.53	Rt	20	LF	8161+65.92	Lt	20	LF
7900+09.96	Lt	20	LF	8025+31.84	Lt	20	LF	8081+23.20	Rt	20	LF	8162+15.90	Lt	20	LF
7902+09.86	Lt	20	LF	8025+81.84	Lt	20	LF	8077+27.33	Lt	20	LF	8084+02.51	Rt	20	LF
7927+05.28	Rt	20	LF	8026+31.84	Lt	20	LF	8079+19.38	Lt	20	LF	8085+22.32	Rt	20	LF
7928+05.42	Rt	20	LF	8026+81.83	Lt	20	LF	8081+11.25	Lt	20	LF	8059+11.59	Lt	20	LF
7929+05.42	Rt	20	LF	8027+31.83	Lt	20	LF	8083+03.99	Lt	20	LF	8057+29.68	Lt	20	LF
7931+05.42	Rt	20	LF	8027+81.83	Lt	20	LF	8093+23.96	Lt	20	LF	8163+54.58	Lt	20	LF
7933+05.42	Rt	20	LF	8028+31.82	Lt	20	LF	8116+74.07	Lt	20	LF	8164+04.17	Lt	20	LF
7935+05.42	Rt	20	LF	8028+81.82	Lt	20	LF	8116+78.51	Rt	20	LF	8164+53.27	Lt	20	LF
7928+30.07	Lt	20	LF	8029+31.81	Lt	20	LF	8129+35.35	Lt	20	LF	8165+03.27	Lt	20	LF
7929+30.07	Lt	20	LF	8029+81.81	Lt	20	LF	8128+86.93	Rt	20	LF	8165+53.27	Lt	20	LF
7931+30.07	Lt	20	LF	8030+31.81	Lt	20	LF	8132+07.19	Lt	20	LF	8166+03.27	Lt	20	LF
7933+29.97	Lt	20	LF	8030+81.80	Lt	20	LF	8131+60.93	Rt	20	LF	8166+53.27	Lt	20	LF
7935+29.97	Lt	20	LF	8031+31.80	Lt	20	LF	8142+41.31	Lt	20	LF	8167+03.27	Lt	20	LF
7937+30.08	Lt	20	LF	8031+81.80	Lt	20	LF	8149+00.50	Lt	20	LF	8167+53.27	Lt	20	LF
7940+33.77	Lt	20	LF	8032+31.79	Lt	20	LF	8147+72.81	Rt	20	LF	8168+03.27	Lt	20	LF
7942+33.77	Lt	20	LF	8032+81.79	Lt	20	LF	8148+95.02	Rt	20	LF	8168+53.27	Lt	20	LF
7944+33.76	Lt	20	LF	8033+31.79	Lt	20	LF	8161+15.93	Lt	20	LF	8157+00.44	Lt	20	LF
7946+33.76	Lt	20	LF	8025+08.89	Rt	20	LF	8095+15.79	Lt	20	LF	8157+50.32	Lt	20	LF
7948+62.25	Lt	20	LF	8025+58.88	Rt	20	LF	8097+07.86	Lt	20	LF	8158+00.37	Lt	20	LF
7949+62.25	Lt	20	LF	8026+08.88	Rt	20	LF	8099+00.19	Lt	20	LF	8165+53.27	Lt	20	LF
7950+62.25	Lt	20	LF	8026+58.88	Rt	20	LF	8100+95.51	Lt	20	LF	8166+03.27	Lt	20	LF
7953+24.46	Lt	20	LF	8027+08.88	Rt	20	LF	8102+95.71	Lt	20	LF	8166+53.27	Lt	20	LF
7955+24.45	Lt	20	LF	8027+58.87	Rt	20	LF	8104+95.71	Lt	20	LF	8167+03.27	Lt	20	LF
7965+78.91	Lt	20	LF	8028+08.87	Rt	20	LF	8106+95.70	Lt	20	LF	8167+53.27	Lt	20	LF
7966+78.91	Lt	20	LF	8028+58.87	Rt	20	LF	8108+95.70	Lt	20	LF	8168+03.27	Lt	20	LF
7968+78.95	Lt	20	LF	8029+08.86	Rt	20	LF	8104+27.01	Rt	20	LF	8168+53.27	Lt	20	LF
7970+78.72	Lt	20	LF	8029+58.86	Rt	20	LF	8106+27.01	Rt	20	LF		**Total**	4,347	LF
7972+78.72	Lt	20	LF	8030+08.86	Rt	20	LF	8108+27.01	Rt	20	LF				
7974+78.62	Lt	20	LF	8030+58.85	Rt	20	LF	8111+36.23	Lt	20	LF				
7976+78.53	Lt	20	LF	8031+08.85	Rt	20	LF	8113+70.97	Rt	20	LF				
7974+61.46	Rt	23	LF	8031+58.85	Rt	20	LF	8118+78.50	Rt	20	LF				
7972+66.58	Rt	23	LF	8032+08.84	Rt	20	LF	8121+30.53	Rt	20	LF				
7970+66.60	Rt	23	LF	8032+58.84	Rt	20	LF	8118+74.07	Lt	20	LF				
7968+66.57	Rt	23	LF	8033+08.84	Rt	20	LF	8119+90.26	Lt	20	LF				
7979+61.59	Lt	20	LF	8035+51.66	Lt	20	LF	8121+90.26	Lt	20	LF				
7979+55.62	Rt	23	LF	8037+51.40	Lt	20	LF	8127+35.35	Lt	20	LF				
7982+74.87	Lt	20	LF	8039+51.40	Lt	20	LF	8125+35.25	Lt	20	LF				
7984+74.86	Lt	20	LF	8041+51.26	Lt	20	LF	8134+07.27	Lt	20	LF				
7988+44.68	Lt	20	LF	8043+51.25	Lt	20	LF	8133+60.93	Rt	20	LF				
7990+44.48	Lt	20	LF	8045+51.49	Lt	20	LF	8135+60.92	Rt	20	LF				
7992+44.80	Lt	20	LF	8047+51.48	Lt	20	LF	8137+60.92	Rt	20	LF				
7999+66.07	Lt	20	LF	8049+51.47	Lt	20	LF	8138+60.92	Rt	20	LF				
7998+66.07	Lt	20	LF	8051+51.47	Lt	20	LF	8139+60.92	Rt	20	LF				
7997+66.07	Lt	20	LF	8035+81.19	Rt	20	LF	8144+41.21	Lt	20	LF				
8009+40.88	Lt	20	LF	8037+81.34	Rt	20	LF	8148+00.92	Lt	20	LF				
8011+40.86	Lt	20	LF	8039+81.34	Rt	20	LF	8146+01.03	Lt	20	LF				
8013+40.86	Lt	20	LF	8041+81.16	Rt	20	LF	8150+95.02	Rt	20	LF				
8015+40.86	Lt	20	LF	8048+93.45	Rt	20	LF	8151+00.15	Lt	20	LF				
8017+40.86	Lt	20	LF	8050+93.45	Rt	20	LF	8152+00.14	Lt	20	LF				
8019+76.73	Lt	20	LF	8052+93.43	Rt	20	LF	8153+00.14	Lt	20	LF				

261-0120 FIBER ROLLS 20IN - Site Runoff Protection

Station	to Station	Offset	Quantity	Unit	Station	to Station	Offset	Quantity	Unit
7876+75.00	7878+85.84	Lt	218	LF	8061+65.33	8066+02.39	Rt	433	LF
7876+75.00	7877+24.39	Rt	54	LF	8081+30.00	8083+53.11	Rt	227	LF
7877+25.00	7879+30.00	Rt	214	LF	8082+31.98	8083+87.51	Lt	414	LF
7878+90.00	7885+21.68	Lt	622	LF	8082+64.56	8083+03.44	Lt	74	LF
7879+36.91	7885+21.68	Rt	640	LF	8083+92.22	8084+29.10	Lt	437	LF
7902+60.00	7905+37.34	Lt	306	LF	8085+19.28	8086+12.76	Lt	297	LF
7907+94.85	7909+50.08	Rt	183	LF	8085+50.00	8086+64.71	Rt	112	LF
7925+25.00	7926+53.87	Rt	143	LF	8086+77.05	8090+41.52	Lt	430	LF
7925+73.62	7926+65.00	Lt	92	LF	8088+53.72	8089+97.08	Rt	172	LF
7935+90.00	7940+77.22	Rt	502	LF	8090+28.27	8092+47.95	Rt	245	LF
7941+27.74	7952+87.38	Rt	1182	LF	8090+59.02	8091+73.28	Lt	174	LF
7954+32.02	7958+55.25	Rt	459	LF	8092+64.13	8103+30.00	Rt	1049	LF
7957+82.81	7958+55.25	Lt	102	LF	8109+70.00	8113+21.39	Rt	399	LF
7958+85.24	7959+37.84	Rt	82	LF	8112+19.05	8112+54.65	Lt	37	LF
7958+85.25	7959+98.10	Lt	160	LF	8113+56.55	8116+55.00	Lt	314	LF
7961+24.05	7967+30.00	Rt	607	LF	8114+34.50	8116+75.00	Rt	241	LF
7961+35.00	7965+45.00	Lt	411	LF	8122+30.00	8125+52.01	Rt	324	LF
7982+30.00	7985+15.00	Rt	286	LF	8123+15.00	8123+46.44	Lt	32	LF
7985+70.00	7994+01.43	Rt	833	LF	8124+55.75	8124+80.00	Lt	25	LF
7994+01.74	7994+26.59	Rt	57	LF	8126+70.05	8127+90.00	Rt	121	LF
7994+47.59	7994+48.79	Rt	15	LF	8135+45.53	8142+00.00	Lt	662	LF
7994+48.79	7994+70.84	Rt	35	LF	8140+30.00	8144+04.12	Rt	377	LF
7994+64.85	7997+15.00	Lt	262	LF	8151+95.00	8156+36.00	Rt	457	LF
7994+70.84	7998+63.59	Rt	396	LF	8159+81.59	8168+75.00	Rt	916	LF
8043+05.00	8043+46.40	Rt	54	LF	8160+40.00	8162+99.90	Lt	275	LF
8045+45.77	8045+64.89	Rt	51	LF	**Total**			17,879	LF
8061+10.96	8077+20.00	Lt	1669	LF					

This document was originally issued and sealed by Craig Mizera, Registration Number PE- 7475, on 8/28/17 and the original document is stored at the North Dakota Department of Transportation

US Highway 281

Permanent Erosion Control
Ditch Checks

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	77	10

Mainline Pipe Inlet Protection						
Station	Offset	Diameter (IN)	Fiber Roll		ECB Type 3 (SY) Lt	ECB Type 3 (SY) Rt
			12IN (LF)	20IN (LF)		
7913+17	CL	72		40	35	35
7938+48	CL	36	40		27	27
7948+17	CL	24	40		22	22
7952+47	CL	24	40		22	22
7960+84	CL	24	40		22	22
7976+15	CL	24	40		22	22
7985+44	CL	24	40		22	22
8002+49	CL	72		40	35	35
8020+84	CL	24	40		22	22
8045+36	CL	24	40		22	22
8053+46	CL	24	40		22	22
8060+88	CL	24	40		22	22
8076+45	CL	30	40		25	25
8086+50	CL	30	40		25	25
8093+10	CL	30	40		25	25
8110+85	CL	24	40		25	25
8145+69	CL	24	40		25	25
8158+43	CL	24	40		25	25
110+00	CL	24	40		22	22
		Total	680	80	934	

Approach Pipe Inlet Protection				
Station	Offset	Diameter (IN)	Fiber Roll 12IN (LF)	ECB Type 3 (SY) x 2
7900+93	Lt	18	40	44
7907+85	Rt	24	40	48
7926+47	Rt	18	40	44
7927+60	Lt	18	40	44
7940+62	Rt	24	40	48
7978+26	Lt	24	40	48
7978+30	Rt	24	40	48
7980+70	Lt	24	40	48
7980+70	Rt	24	40	48
8023+04	Rt	24	40	48
8023+21	Lt	24	40	48
8033+84	Rt	30	40	54
8033+86	Lt	30	40	54
8054+84	Lt	24	40	48
8058+20	Lt	24	40	48
8092+00	Lt	30	40	54
8103+65	Rt	18	40	44
8130+02	Lt	24	40	48
8130+08	Rt	24	40	48
		Total	760	914

255-0103 ECB TYPE 3 - Slope Protection					
Station	Offset	Station	Offset	Quantity	Unit
7898+86.00	Rt	7904+45.00	Rt	870	SY
7929+95.00	Lt	7932+65.00	Lt	603	SY
7929+95.00	Lt	7932+65.00	Lt	603	SY
7929+95.00	Lt	7932+65.00	Lt	603	SY
7949+35.00	Lt	7950+55.00	Lt	215	SY
7949+35.00	Lt	7950+55.00	Lt	215	SY
7951+94.99	Lt	7953+22.55	Lt	106	SY
7953+46.79	Lt	7956+19.19	Lt	501	SY
7965+47.59	Lt	7967+04.59	Lt	211	SY
7969+99.78	Lt	7971+30.00	Lt	255	SY
7981+53.31	Lt	7982+05.00	Lt	73	SY
7981+53.31	Lt	7982+05.00	Lt	73	SY
8023+54.63	Lt	8031+60.04	Lt	1448	SY
8023+94.91	Rt	8031+55.00	Rt	1171	SY
8066+04.13	Rt	8070+05.03	Rt	547	SY
8146+99.98	Lt	8148+34.83	Lt	513	SY
8147+09.94	Rt	8148+30.15	Rt	151	SY
8147+09.94	Rt	8148+30.15	Rt	151	SY
8150+17.44	Lt	8152+48.12	Lt	808	SY

Permanent Erosion Control Totals			
251-0200	SEEDING CLASS II	92	ACRE
251-1000	WETLAND SEED	2.8	ACRE
253-0101	STRAW MULCH	92	ACRE
261-0112	FIBER ROLLS 12IN		
	Ditch Checks	4,347	LF
	Inlet Protection	1,440	LF
	Additional	4,000	LF
261-0120	FIBER ROLLS 20IN		
	Runoff Protection	17,879	LF
	Inlet Protection	80	LF
	Additional	4,000	LF
255-0103	ECB TYPE 3		
	Slope Protection	9,742	SY
	Pipe Inlet/Outlet Protection	1,848	SY
256-0201	RIPRAP GRADE II	15,388	TN
709-0155	GEOSYNTHETIC MATERIAL TYPE RR	13,577	SY

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US Highway 281

Permanent Erosion Control
Pipe Inlet Protection

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - US 281, ND 57 to New US 281

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
Existing US 281 (SCL281)			
Sec Cor	7830+84.12	354524.08	2305577.78
Qtr Sec	7857+30.09	357169.61	2305529.31
TS	7861+70.83	357610.27	2305521.41
SC	7864+70.83	357909.94	2305508.76
PI SP3	7883+69.47	359808.58	2305482.32
CS	7893+87.81	359770.42	2303583.88
ST	7896+87.81	359772.87	2303283.96
Qtr Cor	7901+37.54	359765.56	2302834.28
Sec Cor	7927+85.98	359723.37	2300186.18
Sec Cor	7981+10.50	359648.48	2294862.18
Sec Cor	8034+19.98	359507.59	2289554.58
TS	8073+70.29	359444.05	2285604.78
SC	8077+70.29	359460.86	2285205.67
PI SP24	8087+21.63	359422.32	2284253.61
CS	8091+70.11	360375.12	2284261.36
ST	8095+70.11	360773.48	2284231.66
Qtr Cor	8108+64.72	362067.92	2284210.63
Sec Cor	8135+15.85	364718.70	2284167.38
TS	8175+36.30	368738.60	2284101.11
SC	8178+36.30	369038.45	2284092.24
PI SP5	8199+51.70	371153.68	2284061.29
CS	8216+24.97	372134.38	2282186.90
ST	8219+24.97	372277.41	2281923.21
PI	8255+80.26	373977.95	2278687.59

CURVE DATA

ARC DEFINITION

Existing US 281

Curve SP3

PI = 7883+69.47

Delta = 89° 54' 43" (LT)

Da = 2° 47' 42"

R = 2,050.00

L = 2,916.98

Ls = 300.00

Sc = 4° 11' 33"

Ts = 2,198.65

Curve SP24

PI = 8087+21.63

Delta = 89° 59' 27" (RT)

Da = 5° 00' 00.00"

R = 1,145.92

L = 1,399.81

Ls = 400.00

Sc = 10° 00' 00"

Ts = 1,351.34

Curve SP5

PI = 8199+51.70

Delta = 61° 19' 48" (LT)

Da = 1° 30' 00"

R = 3,819.72

L = 3,788.67

Ls = 300.00

Sc = 2° 15' 00"

Ts = 2,415.41

US PUBLIC LAND SURVEY DATA

DESC.	SEC-TWP-RGE	NORTHING	EASTING
E 1/4 Cor Sec 17	T-152-N R-66-W	362448.20	2305436.61
N 1/4 Cor Sec 17	T-152-N R-66-W	365039.43	2302746.37
NE Cor Sec 18	T-152-N R-66- W	365031.89	2300094.23
NW Cor Sec 18	T-152-N R-66- W	364941.68	2294777.50
W 1/4 Cor Sec 18	T-152-N R-66- W	362294.47	2294827.19
N1/4 Cor Sec 18	T-152-N R-66-W	364986.83	2297439.84
N 1/4 Cor Sec 19	T-152-N R-66-W	359685.90	2297521.54
NW Cor Sec 19	T-152-N R-66-W	359648.48	2294862.18
S 1/4 Cor Sec 19	T-152-N R-66-W	354381.07	2297622.07
SW Cor Sec 19	T-152-N R-66-W	354339.52	2294965.22
E 1/4 Cor Sec 20	T-152-N R-66-W	357169.61	2305529.31
N 1/4 Cor Sec 20	T-152-N R-66-W	359765.56	2302834.28
NW Cor Sec 20	T-152-N R-66-W	359723.37	2300186.18
S 1/4 Cor Sec 20	T-152-N R-66-W	354473.87	2302954.24
SW Cor Sec 20	T-152-N R-66-W	354422.66	2300284.34
W 1/4 Cor Sec 20	T-152-N R-66-W	357072.56	2300235.24
E 1/4 Cor Sec 21	T-152-N R-66-W	357280.70	2310821.37
N 1/4 Cor Sec 21	T-152-N R-66- W	359848.99	2308135.56
NE Cor Sec 21	T-152-N R-66- W	359933.47	2310773.26
NW Cor Sec 21	T-152-N R-66-W	359808.58	2305482.32
S 1/4 Cor Sec 21	T-152-N R-66-W	354574.56	2308223.84
E 1/4 Cor Sec 28	T-152-N R-66-W	351999.82	2310915.59
NW Cor Sec 28	T-152-N R-66-W	354524.08	2305577.78
E 1/4 Cor Sec 29	T-152-N R-66- W	351873.44	2305626.74
W 1/4 Cor Sec 29	T-152-N R-66-W	351773.38	2300332.93
NE Cor Sec 3	T-152-N R-67-W	375546.36	2283957.33
S 1/4 Cor Sec 3	T-152-N R-67-W	369920.26	2281441.65
NW Cor Sec 3	T-152-N R-67-W	375038.79	2278677.47
W 1/4 Cor Sec 3	T-152-N R-67-W	372450.32	2278726.35
NW Cor Sec 10	T-152-N R-67-W	369801.99	2278776.54
E 1/4 Cor Sec 10	T-152-N R-67-W	367380.53	2284123.46
SW Cor Sec 10	T-152-N R-67-W	364497.06	2278884.24

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	CONTROL POINT DESCRIPTION
GPS 4	345274.99	2305835.91	1525.66	7738+32	85' Rt	Aluminum Cap Stamped 281-4
GPS 5	359770.61	2305505.58	1476.06	7878+99	839' Rt	Aluminum Cap Stamped 281-5
GPS 6	359472.03	2290660.23	1540.95	8023+16	65' Lt	Aluminum Cap Stamped 281-6
GPS 7	371648.87	2282735.39	1522.73	8208+88	77' Lt	Aluminum Cap Stamped 281-7

REFERENCE MARKERS

R MKR	NORTHING	EASTING	STATION	OFFSET
148	353254.87	2305635.82	7818+14	35' Rt SCL281
149	358438.48	2305443.78	7869+96	52' Rt SCL281
150	359763.77	2301081.00	7918+91	26' Rt SCL281
151	359697.78	2295804.000	7971+68	36' Rt SCL281
152	359567.13	2290513.92	8024+59	34' Rt SCL281
153	359477.11	2285235.78	8077+43	20' Rt SCL281
154	364237.33	2284207.22	8130+34	32' Rt SCL281
155	368740.28	2284140.90	8175+37	40' Rt SCL281

NOTES: Sheet 1 of 2
Primary control derived from NDDOT.

Date Survey Completed 11/23/2016

☐ Assumed Coordinates

☒ All coordinates on this sheet are Benson County ground coordinates.
They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9998610

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

INITIALIZING BENCH MARK
NDGPS Station (OPUS)

☒ NAVD-88
☐ NGVD-29

☐ GEOID 09 ☐ GEOID 12B
☒ GEOID 12A

This document was originally issued and sealed by Brian J. Jensen, Registration Number LS- 6615 , on 8/14/17 and the original document is stored at the North Dakota Department of Transportation

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - US 281, Sheyenne to ND 57 Jct to New US 281

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	81	2

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
Existing ND 57 (SCL57)			
POB	0+00.00	358680.42	2305280.36
PC	5+27.04	358926.49	2305746.43
PI C20	9+84.20	359139.94	2306150.70
PT	14+26.65	359161.40	2306607.37
PI	16+83.20	359173.44	2306863.63
POT	36+06.81	359265.21	2308785.05

CURVE DATA

ARC DEFINITION	
Existing ND 57	
Curve C20	
PI = 9+84.20	
Delta = 25° 08' 36" (RT)	
Da = 2° 47' 42"	
R = 2,050.00	
T = 457.17	
L = 899.61	

US PUBLIC LAND SURVEY DATA

DESC.	SEC-TWP-RGE	NORTHING	EASTING
W 1/4 Cor Sec 10	T-152-N R-67-W	367149.51	2278830.41
E 1/4 Cor Sec 11	T-152-N R-67-W	367509.82	2289422.82
NE Cor Sec 11	T-152-N R-67-W	370134.20	2289378.51
NW Cor Sec 11	T-152-N R-67-W	370038.31	2284079.61
N 1/4 Cor Sec 13	T-152-N R-67-W	364891.70	2292115.11
W 1/4 Cor Sec 13	T-152-N R-67-W	362174.06	2289507.95
N 1/4 Cor Sec 14	T-152-N R-67-W	364780.16	2286807.71
NW Cor Sec 14	T-152-N R-67-W	364718.70	2284167.38
E 1/4 Cor Sec 15	T-152-N R-67- W	362067.92	2284210.63
W 1/4 Cor Sec 15	T-152-N R-67-W	361880.20	2278936.60
NW Cor Sec 21	T-152-N R-67- W	359073.52	2273708.35
N 1/4 Cor Sec 22	T-152-N R-67- W	359342.08	2281621.29
N 1/4 Cor Sec 23	T-152-N R-67-W	359464.93	2286902.79
NW Cor Sec 23	T-152-N R-67-W	359422.32	2284253.61
S 1/4 Cor Sec 23	T-152-N R-67-W	354168.89	2286994.99
SW Cor Sec 23	T-152-N R-67-W	354124.47	2284337.47
N 1/4 Cor Sec 24	T-152-N R-67-W	359578.00	2292205.75
NW Cor Sec 24	T-152-N R-67-W	359507.59	2289554.58
S 1/4 Cor Sec 24	T-152-N R-67-W	354276.43	2292308.87
SW Cor Sec 24	T-152-N R-67-W	354213.25	2289652.50
W 1/4 Cor Sec 24	T-152-N R-67-W	356860.47	2289601.76

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	CONTROL POINT DESCRIPTION

NOTES: Sheet 2 of 2

Date Survey Completed 11/23/2016

☐ Assumed Coordinates

☒ All coordinates on this sheet are Benson County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9998610

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

INITIALIZING BENCH MARK
NDGPS Station (OPUS)

☒ NAVD-88
☐ NGVD-29

☐ GEOID 09 ☐ GEOID 12B
☒ GEOID 12A

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	82	1

US HIGHWAY 281 (PR281) - OFFICE LOCATION ALIGNMENT

Chain PR281 contains:
PR2811 PR2813 SPI PR281_5 CUR PR281_6 SPI PR281_7 PR28110 PR28112 PR28114 PR28-116 CUR PR281_18 PR28121 PR28123 SPI PR281_25 CUR PR281_26 SPI PR281_27 SPI PR2-81_30 CUR PR281_31 SPI PR281_32 SPI PR281_35 CUR PR281_36 SPI PR281_37 SPI PR28-1_40 CUR PR281_41 SPI PR281_42 PR28144

Beginning chain PR281 description
Feature: Alignment 2 L

Point PR2811 N 354,524.0830 E 2,305,577.7770 Sta 7830+84.12

Course from PR2811 to PR2813 N 1° 02' 58.11" W Dist 2,645.9715

Point PR2813 N 357,169.6106 E 2,305,529.3140 Sta 7857+30.09

Course from PR2813 to TS PR281_5 N 1° 01' 12.80" W Dist 440.7899

Spiral PR281_5 Type 1 Spiral Element

Angle	4° 11' 32.55" (LT)	P	1.8289	BK N	1° 01' 12.80" W
LS	300.0000	K	149.9732	AH N	5° 12' 45.35" W
R	2,050.0000	LT	200.0561	CB N	2° 25' 03.42" W
YS	7.3143	ST	100.0510	Defl	1° 23' 50.62"
XS	299.8394	LC	299.9286	Deg	2° 47' 41.70"

Spiral Coordinates

Point	North	East	Station
TS	357,610.3306	2,305,521.4656	7861+70.88
PI	357,810.3550	2,305,517.9035	7863+70.94
SC	357,909.9923	2,305,508.8138	7864+70.88
CC	357,723.7467	2,303,467.2916	

Curve Data

Curve PR281_6
P.I. Station 7882+38.07 N 359,669.8749 E 2,305,348.2618
Delta = 81° 31' 32.14" (LT)
Degree = 2° 47' 41.70"
Tangent = 1,767.1910
Length = 2,916.9246
Radius = 2,050.0000
External = 656.5594
Long Chord = 2,677.0086
Mid. Ord. = 497.2907
P.C. Station 7864+70.88 N 357,909.9923 E 2,305,508.8138
P.T. Station 7893+87.81 N 359,770.4256 E 2,303,583.9337
C.C. N 357,723.7467 E 2,303,467.2916
Back = N 5° 12' 45.35" W
Ahead = N 86° 44' 17.48" W
Chord Bear = N 45° 58' 31.41" W

Spiral PR281_7 Type 2 Spiral Element

Angle	4° 11' 32.55" (LT)	P	1.8289	BK N	86° 44' 17.48" W
LS	300.0000	K	149.9732	AH S	89° 04' 09.97" W
R	2,050.0000	LT	200.0561	CB N	89° 31' 59.41" W
YS	7.3143	ST	100.0510	Defl	1° 23' 50.62"
XS	299.8394	LC	299.9286	Deg	2° 47' 41.70"

Spiral Coordinates

Point	North	East	Station
CS	359,770.4256	2,303,583.9337	7893+87.81
PI	359,776.1184	2,303,484.0448	7894+87.86
ST	359,772.8693	2,303,284.0151	7896+87.81
CC	357,723.7467	2,303,467.2916	

Course from ST PR281_7 to PR28110 S 89° 04' 09.97" W Dist 449.7914

Point PR28110 N 359,765.5644 E 2,302,834.2830 Sta 7901+37.60

Course from PR28110 to PR28112 S 89° 05' 13.85" W Dist 2,648.4411

Point PR28112 N 359,723.3720 E 2,300,186.1780 Sta 7927+86.04

Course from PR28112 to PR28114 S 89° 11' 38.77" W Dist 5,324.5227

Point PR28114 N 359,648.4820 E 2,294,862.1820 Sta 7981+10.56

Course from PR28114 to PR28116 S 88° 28' 45.73" W Dist 5,309.4748

Point PR28116 N 359,507.5850 E 2,289,554.5770 Sta 8034+20.04

Course from PR28116 to PC PR281_18 S 89° 04' 42.52" W Dist 3,010.0208

Curve Data

Curve PR281_18
P.I. Station 8087+21.69 N 359,422.3190 E 2,284,253.6130
Delta = 89° 59' 26.60" (RT)
Degree = 2° 29' 59.34"
Tangent = 2,291.6289
Length = 3,599.8941
Radius = 2,292.0000
External = 949.1151
Long Chord = 3,241.1151
Mid. Ord. = 671.1801
P.C. Station 8064+30.06 N 359,459.1751 E 2,286,544.9455
P.T. Station 8100+29.95 N 361,713.6455 E 2,284,216.3859
C.C. N 361,750.8786 E 2,286,508.0835
Back = S 89° 04' 42.52" W
Ahead = N 0° 55' 50.88" W
Chord Bear = N 45° 55' 34.18" W

Course from PT PR281_18 to PR28121 N 0° 55' 50.88" W Dist 354.3237

Point PR28121 N 362,067.9225 E 2,284,210.6300 Sta 8103+84.27

Course from PR28121 to PR28123 N 0° 56' 04.87" W Dist 2,651.1333

Point PR28123 N 364,718.7030 E 2,284,167.3830 Sta 8130+35.41

Course from PR28123 to TS PR281_25 N 0° 56' 40.24" W Dist 4,020.4415

Spiral PR281_25 Type 1 Spiral Element

Angle	2° 15' 00.00" (LT)	P	0.9817	BK N	0° 56' 40.24" W
LS	300.0000	K	149.9923	AH N	3° 11' 40.24" W
R	3,819.7200	LT	200.0162	CB N	1° 41' 40.20" W
YS	3.9266	ST	100.0147	Defl	0° 44' 59.96"
XS	299.9537	LC	299.9794	Deg	1° 30' 00.00"

Spiral Coordinates

Point	North	East	Station
TS	368,738.5982	2,284,101.1097	8170+55.85
PI	368,938.5872	2,284,097.8127	8172+55.86
SC	369,038.4465	2,284,092.2393	8173+55.85
CC	368,825.5894	2,280,278.4547	

Curve Data

Curve PR281_26
P.I. Station 8194+22.46 N 371,101.8452 E 2,283,977.0757
Delta = 56° 49' 48.22" (LT)
Degree = 1° 30' 00.00"
Tangent = 2,066.6100
Length = 3,788.6720
Radius = 3,819.7200
External = 523.2212
Long Chord = 3,635.2653
Mid. Ord. = 460.1855
P.C. Station 8173+55.85 N 369,038.4465 E 2,284,092.2393
P.T. Station 8211+44.52 N 372,134.3826 E 2,282,186.8959
C.C. N 368,825.5894 E 2,280,278.4547
Back = N 3° 11' 40.24" W
Ahead = N 60° 01' 28.45" W
Chord Bear = N 31° 36' 34.34" W

Spiral PR281_27 Type 2 Spiral Element

Angle	2° 15' 00.00" (LT)	P	0.9817	BK N	60° 01' 28.45" W
LS	300.0000	K	149.9923	AH N	62° 16' 28.45" W
R	3,819.7200	LT	200.0162	CB N	61° 31' 28.49" W
YS	3.9266	ST	100.0147	Defl	0° 44' 59.96"
XS	299.9537	LC	299.9794	Deg	1° 30' 00.00"

Spiral Coordinates

Point	North	East	Station
CS	372,134.3826	2,282,186.8959	8211+44.52
PI	372,184.3528	2,282,100.2592	8212+44.54
ST	372,277.4073	2,281,923.2075	8214+44.52
CC	368,825.5894	2,280,278.4547	

Course from ST PR281_27 to TS PR281_30 N 62° 16' 28.45" W Dist 3,213.9719

Spiral PR281_30 Type 1 Spiral Element

Angle	2° 15' 00.00" (RT)	P	0.9817	BK N	62° 16' 28.45" W
LS	300.0000	K	149.9923	AH N	60° 01' 28.45" W
R	3,819.7200	LT	200.0162	CB N	61° 31' 28.49" W
YS	3.9266	ST	100.0147	Defl	0° 44' 59.96"
XS	299.9537	LC	299.9794	Deg	1° 30' 00.00"

Spiral Coordinates

Point	North	East	Station
TS	373,772.6595	2,279,078.2407	8246+58.49
PI	373,865.7140	2,278,901.1889	8248+58.51
SC	373,915.6842	2,278,814.5522	8249+58.49
CC	377,224.4774	2,280,722.9935	

Curve Data

Curve PR281_31
P.I. Station 8250+99.25 N 373,986.0111 E 2,278,692.6217
Delta = 4° 13' 15.02" (RT)
Degree = 1° 30' 00.00"
Tangent = 140.7584
Length = 281.3894
Radius = 3,819.7200
External = 2.5926
Long Chord = 281.3258
Mid. Ord. = 2.5909
P.C. Station 8249+58.49 N 373,915.6842 E 2,278,814.5522
P.T. Station 8252+39.88 N 374,065.1214 E 2,278,576.1981
C.C. N 377,224.4774 E 2,280,722.9935
Back = N 60° 01' 28.45" W
Ahead = N 55° 48' 13.43" W
Chord Bear = N 57° 54' 50.94" W

Spiral PR281_32 Type 2 Spiral Element

Angle	2° 15' 00.00" (RT)	P	0.9817	BK N	55° 48' 13.43" W
LS	300.0000	K	149.9923	AH N	53° 33' 13.43" W
R	3,819.7200	LT	200.0162	CB N	54° 18' 13.40" W
YS	3.9266	ST	100.0147	Defl	0° 44' 59.96"
XS	299.9537	LC	299.9794	Deg	1° 30' 00.00"

Spiral Coordinates

Point	North	East	Station
CS	374,065.1214	2,278,576.1981	8252+39.88
PI	374,121.3326	2,278,493.4742	8253+39.90
ST	374,240.1560	2,278,332.5784	8255+39.88
CC	377,224.4774	2,280,722.9935	

Course from ST PR281_32 to TS PR281_35 N 53° 33' 13.43" W Dist 410.0716

Spiral PR281_35 Type 1 Spiral Element

Angle	1° 52' 30.00" (RT)	P	0.8181	BK N	53° 33' 13.43" W
LS	300.0000	K	149.9946	AH N	51° 40' 43.43" W
R	4,583.6600	LT	200.0112	CB N	52° 55' 43.45" W
YS	3.2722	ST	100.0102	Defl	0° 37' 29.98"
XS	299.9679	LC	299.9857	Deg	1° 15' 00.00"

Spiral Coordinates

Point	North	East	Station
TS	374,483.7667	2,278,002.7109	8259+49.95
PI	374,602.5871	2,277,841.8190	8261+49.96
SC	374,664.6004	2,277,763.3564	8262+49.95
CC	378,260.6937	2,280,605.5478	

US Highway 281

Alignment Descriptions
PR281

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	82	2

US HIGHWAY 281 (PR281) - OFFICE LOCATION ALIGNMENT (cont.)

Curve Data

Curve PR281_36
P.I. Station 8263+17.32 N 374,706.3715 E 2,277,710.5054
Delta = 1° 41' 02.42" (RT)
Degree = 1° 15' 00.00"
Tangent = 67.3650
Length = 134.7203
Radius = 4,583.6600
External = 0.4950
Long Chord = 134.7155
Mid. Ord. = 0.4949
P.C. Station 8262+49.95 N 374,664.6004 E 2,277,763.3564
P.T. Station 8263+84.67 N 374,749.6776 E 2,277,658.9048
C.C. N 378,260.6937 E 2,280,605.5478
Back = N 51° 40' 43.43" W
Ahead = N 49° 59' 41.01" W
Chord Bear = N 50° 50' 12.22" W

Spiral PR281_37 Type 2 Spiral Element

Angle 1° 52' 30.00" (RT) P 0.8181 BK N 49° 59' 41.01" W
LS 300.0000 K 149.9946 AH N 48° 07' 11.01" W
R 4,583.6600 LT 200.0112 CB N 48° 44' 40.99" W
YS 3.2722 ST 100.0102 Defl 0° 37' 29.98"
XS 299.9679 LC 299.9857 Deg 1° 15' 00.00"

Spiral Coordinates

Point	North	East	Station
CS	374,749.6776	2,277,658.9048	8263+84.67
PI	374,813.9700	2,277,582.2984	8264+84.68
ST	374,947.4927	2,277,433.3818	8266+84.67
CC	378,260.6937	2,280,605.5478	

Course from ST PR281_37 to TS PR281_40 N 48° 07' 11.01" W Dist 132.6865

Spiral PR281_40 Type 1 Spiral Element

Angle 2° 42' 30.00" (RT) P 0.9847 BK N 48° 07' 11.01" W
LS 250.0000 K 124.9907 AH N 45° 24' 41.01" W
R 2,644.4200 LT 166.6862 CB N 47° 13' 01.07" W
YS 3.9385 ST 83.3511 Defl 0° 54' 09.94"
XS 249.9441 LC 249.9752 Deg 2° 10' 00.00"

Spiral Coordinates

Point	North	East	Station
TS	375,036.0711	2,277,334.5912	8268+17.36
PI	375,147.3469	2,277,210.4864	8269+84.05
SC	375,205.8603	2,277,151.1267	8270+67.36
CC	377,089.1253	2,279,007.5399	

Curve Data

Curve PR281_41
P.I. Station 8280+79.54 N 375,916.4224 E 2,276,430.2867
Delta = 41° 53' 23.17" (RT)
Degree = 2° 10' 00.00"
Tangent = 1,012.1802
Length = 1,933.3735
Radius = 2,644.4200
External = 187.0930
Long Chord = 1,890.6002
Mid. Ord. = 174.7308
P.C. Station 8270+67.36 N 375,205.8603 E 2,277,151.1267
P.T. Station 8290+00.73 N 376,926.6912 E 2,276,368.1134
C.C. N 377,089.1253 E 2,279,007.5399
Back = N 45° 24' 41.01" W
Ahead = N 3° 31' 17.84" W
Chord Bear = N 24° 27' 59.42" W

Spiral PR281_42 Type 2 Spiral Element

Angle 2° 42' 30.00" (RT) P 0.9847 BK N 3° 31' 17.84" W
LS 250.0000 K 124.9907 AH N 0° 48' 47.84" W
R 2,644.4200 LT 166.6862 CB N 1° 42' 57.78" W
YS 3.9385 ST 83.3511 Defl 0° 54' 09.94"
XS 249.9441 LC 249.9752 Deg 2° 10' 00.00"

Spiral Coordinates

Point	North	East	Station
CS	376,926.6912	2,276,368.1134	8290+00.73
PI	377,009.8849	2,276,362.9935	8290+84.09
ST	377,176.5543	2,276,360.6275	8292+50.73
CC	377,089.1253	2,279,007.5399	

Course from ST PR281_42 to PR28144 N 0° 48' 47.84" W Dist 4,848.2545

Point PR28144 N 382,024.3204 E 2,276,291.8110 Sta 8340+98.99

==========
Ending chain PR281 description

BENSON COUNTY ROUTE 29 (PR29) - OFFICE LOCATION ALIGNMENT

Chain PR29 contains:
PR291 PR293 CUR PR29_5 PR298 PR299

Beginning chain PR29 description
Feature: Alignment 3 L
==========

Point PR291 N 359,166.2211 E 2,284,257.6665 Sta 100+00.00

Course from PR291 to PR293 N 0° 54' 24.51" W Dist 256.1300

Point PR293 N 359,422.3190 E 2,284,253.6130 Sta 102+56.13

Course from PR293 to PC PR29_5 N 0° 55' 50.88" W Dist 59.6256

Curve Data

Curve PR29_5
P.I. Station 106+97.11 N 359,863.2430 E 2,284,246.4493
Delta = 50° 58' 25.96" (RT)
Degree = 7° 09' 43.10"
Tangent = 381.3566
Length = 711.7296
Radius = 800.0000
External = 86.2465
Long Chord = 688.4885
Mid. Ord. = 77.8533
P.C. Station 103+15.76 N 359,481.9367 E 2,284,252.6444
P.T. Station 110+27.49 N 360,108.1546 E 2,284,538.7697
C.C. N 359,494.9326 E 2,285,052.5388
Back = N 0° 55' 50.88" W
Ahead = N 50° 02' 35.08" E
Chord Bear = N 24° 33' 22.10" E

Course from PT PR29_5 to PR298 N 50° 02' 35.08" E Dist 272.5161

Point PR298 N 360,283.1676 E 2,284,747.6608 Sta 113+00.00

Course from PR298 to PR299 N 50° 02' 35.08" E Dist 300.0000

Point PR299 N 360,475.8310 E 2,284,977.6190 Sta 116+00.00

==========
Ending chain PR29 description

Borrow Site #1 Reference Centerline (BORROWCL) - OFFICE LOCATION ALIGNMENT

Chain BORROWCL contains:
BORROWCL1 BORROWCL2

Beginning chain BORROWCL description
Feature: Alignment 8 L
==========

Point BORROWCL1 N 360,159.7655 E 2,294,597.5185 Sta 10+00.00

Course from BORROWCL1 to BORROWCL2 N 42° 21' 32.38" W Dist 2,300.0000

Point BORROWCL2 N 361,859.3223 E 2,293,047.8390 Sta 33+00.00

==========
Ending chain BORROWCL description

This document was originally issued and sealed by Craig Mizera, Registration Number PE- 7475, on 8/14/17 and the original document is stored at the North Dakota Department of Transportation

US Highway 281

Alignment Descriptions
PR281 & PR29

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	82	3

Station	Offset		Northing	Easting	720-0125 ALIGNMENT MONUMENTS	720-0130 IRON PIN R/W MONUMENTS	720-0135 IRON PIN REFERENCE MONUMENTS	720-0110 RIGHT OF WAY MARKERS
000+00	0.0'	CL	358680.422	2305280.364	1	-	-	-
004+65	354.0'	LT	359210.352	2305525.978	-	1	-	1
005+28	271.5'	RT	358686.691	2305873.732	-	1	-	1
005+28	324.4'	LT	359213.658	2305595.503	-	1	-	1
005+28	0.0'	CL	358926.780	2305746.969	1	-	-	-
7857+30	100.0'	CL	357169.611	2305529.314	1	-	-	-
7861+71	110.0'	LT	357610.237	2305521.409	1	-	-	-
7863+71	100.0'	RT	357810.355	2305517.904	1	-	-	-
7864+63	100.0'	RT	357911.408	2305616.069	-	1	-	1
7864+71	100.0'	CL	357909.992	2305508.814	1	-	-	-
7864+71	100.0'	LT	357900.951	2305409.169	-	1	-	1
7867+40	130.0'	RT	358215.566	2305644.533	-	1	-	1
7869+04	130.0'	LT	358289.686	2305280.993	-	1	-	1
7869+05	100.0'	LT	358275.103	2305233.166	-	1	-	1
7879+29	100.0'	RT	359669.875	2305348.262	1	-	-	-
7882+82	100.0'	RT	359832.089	2304897.997	-	1	-	1
7885+73	100.0'	RT	359893.070	2304526.918	-	1	-	1
7892+05	100.0'	LT	359628.286	2303747.143	-	1	-	1
7893+88	488.9'	LT	359657.619	2303577.505	-	1	-	1
7893+88	436.3'	CL	359770.426	2303583.934	1	-	-	-
7894+88	278.2'	RT	359776.118	2303484.045	1	-	-	-
7896+88	506.1'	CL	359772.869	2303284.015	1	-	-	-
7901+38	445.7'	CL	359765.564	2302834.283	1	-	-	-
7901+38	100.0'	LT	359665.575	2302835.907	-	-	1	1
7901+38	110.0'	RT	359865.548	2302832.659	-	-	1	1
7926+86	100.0'	RT	359824.952	2300284.572	-	-	1	1
7926+86	100.0'	LT	359624.978	2300287.759	-	-	1	1
7927+53	100.0'	LT	359623.915	2300221.024	-	1	-	1
7927+53	100.0'	RT	359823.883	2300217.442	-	1	-	1
7927+86	100.0'	CL	359723.372	2300186.178	1	-	-	-
7928+19	100.0'	LT	359622.924	2300155.031	-	1	-	1
7928+20	100.0'	RT	359872.886	2300150.584	-	1	-	1
7928+86	100.0'	LT	359621.981	2300087.967	-	-	1	1
7929+37	100.0'	RT	359871.240	2300033.522	-	-	1	1
7932+15	150.0'	RT	359817.324	2299755.514	-	1	-	1
7932+15	150.0'	RT	359867.319	2299754.811	-	1	-	1
7954+51	100.0'	CL	359685.890	2297521.540	1	-	-	-
7954+51	100.0'	LT	359585.900	2297522.947	-	-	1	1
7954+51	100.0'	RT	359785.880	2297520.134	-	-	1	1
7980+11	125.0'	LT	359549.898	2294963.579	-	-	1	1
7980+11	364.3'	RT	359749.879	2294960.766	-	-	1	1
7980+77	498.0'	LT	359548.964	2294897.119	-	1	-	1
7980+77	200.1'	RT	359748.937	2294893.856	-	1	-	1
7981+11	150.1'	CL	359648.482	2294862.182	1	-	-	-
7981+42	100.1'	RT	359747.606	2294827.868	-	1	-	1
7981+44	113.0'	LT	359547.623	2294831.133	-	1	-	1
7982+08	107.0'	RT	359745.859	2294762.027	-	-	1	1
7982+13	182.1'	LT	359545.797	2294762.345	-	-	1	1
8007+68	0.0'	CL	359577.964	2292205.746	1	-	-	-
8007+68	0.0'	LT	359477.999	2292208.400	-	-	1	1
8007+68	949.1'	RT	359677.928	2292203.092	-	-	1	1
8033+20	0.0'	RT	359610.204	2289651.888	-	-	1	1
8033+20	2.2'	LT	359410.274	2289657.196	-	-	1	1
8033+86	0.0'	RT	359608.450	2289585.818	-	1	-	1
8033+88	656.6'	LT	359408.473	2289589.347	-	1	-	1
8034+20	0.0'	CL	359507.585	2289554.577	1	-	-	-
8034+53	2.2'	LT	359407.070	2289523.361	-	1	-	1
8034+53	0.0'	RT	359607.039	2289519.833	-	1	-	1
8035+18	0.0'	LT	359406.023	2289458.268	-	-	1	1
8035+22	0.0'	RT	359605.930	2289450.869	-	-	1	1

US Highway 281

Monuments

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	82	4

Station	Offset		Northing	Easting	720-0125 ALIGNMENT MONUMENTS	720-0130 IRON PIN R/W MONUMENTS	720-0135 IRON PIN REFERENCE MONUMENTS	720-0110 RIGHT OF WAY MARKERS
8060+72	0.0'	LT	359354.949	2286904.760	-	1	-	1
8060+72	0.0'	LT	359364.947	2286904.581	-	1	-	1
8060+72	0.0'	CL	359464.931	2286902.787	1	-	-	-
8060+72	0.0'	LT	359354.945	2286904.556	-	-	1	1
8060+72	0.0'	RT	359564.918	2286901.179	-	-	1	1
8064+30	0.0'	RT	359559.162	2286543.337	-	1	-	1
8064+30	0.0'	LT	359349.189	2286546.715	-	1	-	1
8064+30	0.0'	CL	359459.175	2286544.946	1	-	-	-
8076+20	0.0'	LT	359352.194	2285188.569	-	1	-	1
8077+82	0.1'	LT	359401.140	2284988.761	-	1	-	1
8082+30	100.0'	LT	359422.319	2284253.613	1	-	-	-
8086+99	100.0'	LT	360187.570	2284208.176	-	1	-	1
8088+38	100.0'	LT	360356.393	2284163.126	-	1	-	1
8091+72	150.0'	LT	360771.854	2284131.674	-	1	-	1
8100+30	100.0'	LT	361712.021	2284116.399	-	1	-	1
8100+30	100.0'	RT	361715.270	2284316.373	-	1	-	1
8100+30	100.0'	CL	361713.646	2284216.386	1	-	-	-
8102+84	100.0'	LT	361966.311	2284112.268	-	-	1	1
8102+84	100.0'	RT	361969.560	2284312.241	-	-	1	1
8103+84	100.0'	CL	362067.923	2284210.630	1	-	-	-
8104+84	100.0'	RT	362169.527	2284308.986	-	-	1	1
8104+84	100.0'	LT	362166.292	2284109.012	-	-	1	1
8129+35	100.0'	RT	364620.348	2284269.001	-	-	1	1
8129+35	100.0'	LT	364617.085	2284069.028	-	-	1	1
8130+00	100.0'	LT	364681.501	2284067.977	-	1	-	1
8130+03	100.0'	RT	364688.033	2284267.897	-	1	-	1
8130+35	100.0'	CL	364718.703	2284167.383	1	-	-	-
8130+66	100.0'	LT	364747.513	2284066.894	-	1	-	1
8130+69	110.0'	RT	364754.026	2284266.814	-	1	-	1
8131+35	100.0'	RT	364820.304	2284265.722	-	-	1	1
8131+35	100.0'	LT	364817.075	2284065.748	-	-	1	1
8146+38	100.0'	LT	366318.582	2284010.989	-	1	-	1
8146+38	100.0'	LT	366319.076	2284040.985	-	1	-	1
8152+38	100.0'	LT	366918.995	2284031.095	-	1	-	1
8152+38	100.0'	LT	366918.500	2284001.099	-	1	-	1
8156+98	100.0'	CL	367380.527	2284123.499	1	-	-	-
8156+98	100.0'	LT	367378.878	2284023.513	-	-	1	1
8156+98	100.0'	RT	367382.175	2284223.486	-	-	1	1
8169+45	100.0'	LT	368625.963	2284002.953	-	1	-	1
8170+56	100.0'	CL	368738.598	2284101.110	1	-	-	-
TOTALS					24	46	30	76

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US Highway 281

Monuments

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4		TOTAL 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**	**2**	**2**	**2**		**2**	**34**	**68**
G20-1b-60	**60"x24"**	**WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)**	**1**	**1**	**1**	**1**		**1**	**26**	**26**
G20-2-48	**48"x24"**	**END ROAD WORK**	**9**	**9**	**9**	**7**		**9**	**19**	**171**
G20-4-36	**36"x18"**	**PILOT CAR FOLLOW ME (Mounted to back of pilot car)**	**1**	**1**	**1**			**1**	**18**	**18**
G20-4b-36	**30"x36"**	**WAIT FOR PILOT CAR**	**2**	**4**	**1**	**7**		**7**	**18**	**126**
G20-10-108	**108"x48"**	**CONTRACTOR SIGN**	**2**	**2**	**2**	**2**		**2**	**64**	**128**
G20-50a-72	**72"x36"**	**ROAD WORK NEXT __ MILES RT & LT ARROWS**	**12**	**12**	**12**	**4**		**12**	**37**	**444**
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW							30	
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT**	**6**	**6**	**6**	**2**		**6**	**59**	**354**
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)**	**6**	**6**	**6**			**6**	**10**	**60**
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)							10	
M3-1-24	**24"x12"**	**NORTH (Mounted on route marker post)**	**3**	**3**	**3**			**3**	**7**	**21**
M3-2-24	24"x12"	EAST (Mounted on route marker post)							7	
M3-3-24	**24"x12"**	**SOUTH (Mounted on route marker post)**	**3**	**3**	**3**			**3**	**7**	**21**
M3-4-24	24"x12"	WEST (Mounted on route marker post)							7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)							7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT							15	
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT							23	
M5-1-21	21"x15"	ARROW AHD AND RT or LT(Mounted on route marker post)							7	
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)							7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)							7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)							7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)							7	
R1-1-48	**48"x48"**	**STOP**	**2**	**2**	**2**			**2**	**32**	**64**
R1-1a-18	**18"x18"**	**STOP and SLOW PADDLE Back to Back**	**2**	**2**	**2**			**2**	**5**	**10**
R1-2-60	60"x60"	YIELD							29	
R2-1-48	**48"x60"**	**SPEED LIMIT**	**16**	**16**	**16**	**16**		**16**	**39**	**624**
R2-1a-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**8**	**8**	**8**	**14**		**14**	**10**	**140**
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT							35	
R4-1-48	**48"x60"**	**DO NOT PASS**	**6**	**6**	**6**	**14**		**14**	**39**	**546**
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**	**4**	**4**	**4**			**4**	**35**	**140**
W1-6-48	**48"x24"**	**LARGE ARROW**	**2**	**2**	**2**			**2**	**26**	**52**
W3-1-48	48"x48"	STOP AHEAD SYMBOL							35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL							35	
W3-4-48	48"x48"	BE PREPARED TO STOP							35	
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**6**	**6**	**6**	**2**		**6**	**35**	**210**
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**	**2**	**2**	**2**			**2**	**35**	**70**
W8-1-48	**48"x48"**	**BUMP**	**4**	**4**	**4**	**4**		**4**	**35**	**140**
W8-3-48	**48"x48"**	**PAVEMENT ENDS**	**4**	**4**	**4**	**2**		**4**	**35**	**140**
W8-7-48	**48"x48"**	**LOOSE GRAVEL**	**6**	**6**	**6**			**6**	**35**	**210**
W8-9a-48	**48"x48"**	**SHOULDER DROP-OFF**	**2**	**2**	**2**			**2**	**35**	**70**
W8-11-48	**48"x48"**	**UNEVEN LANES**	**2**	**2**	**2**	**2**		**2**	**35**	**70**
W8-12-48	**48"x48"**	**NO CENTER STRIPE**	**2**	**2**	**2**	**14**		**14**	**35**	**490**
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY							35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT.							35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT.							35	
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)							11	
W13-4-48	48"x60"	RAMP ARROW							39	
W14-3-48	48"x36"	NO PASSING ZONE							23	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**34**	**34**	**34**	**18**		**34**	**35**	**1190**
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**	**2**	**2**			**2**	**35**	**70**
W20-5-48	48"x48"	RIGHT or LEFT LANE CLOSED AHEAD or __ FT.							35	
W20-7a-48	**48"x48"**	**FLAGGING SYMBOL**	**2**	**2**	**2**			**2**	**35**	**70**
W20-7k-24	**24"x18"**	**__ FEET (Mounted on warning sign post)**	**2**	**2**	**2**			**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**	**6**	**6**	**14**		**14**	**12**	**168**
W21-1a-48	48"x48"	WORKERS SYMBOL							35	
W21-2-48	**48"x48"**	**FRESH OIL**	**2**	**2**	**2**	**2**		**2**	**35**	**70**

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __FT							35	
W21-5-48	**48"x48"**	**SHOULDER WORK**	**2**	**2**	**2**			**2**	**35**	**70**
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED							35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT.							35	
W21-6a-48	48"x48"	SURVEY CREW AHEAD							35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT.							35	
W21-51-48	**48"x48"**	**MATERIAL ON ROADWAY**	**2**	**2**	**2**			**2**	**35**	**70**
W22-8-48	**48"x48"**	**FRESH OIL LOOSE ROCK**				**14**		**14**	**35**	**490**
	24"x24"	**TAKE TURNS (6" D letters) (Mounted on stop sign post)**	**2**	**2**	**2**	**2**		**2**	**11**	**22**
									15	

SPECIAL SIGNS

SPEC & CODE

SPEC & CODE			
704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**6653**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2	3	4		TOTAL QUANTITY
704-0100	**FLAGGING**	MHR	**1000**	**2000**	**1000**	**1000**		**5000**
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	**6**	**6**	**6**	**6**		**6**
704-1060	**DELINEATOR DRUMS**	EACH	**160**	**392**	**149**			**392**
704-1065	TRAFFIC CONES	EACH						
704-1067	**TUBULAR MARKERS**	EACH				**200**		**200**
704-1070	DELINEATOR	EACH						
704-1072	FLEXIBLE DELINEATORS	EACH						
704-1080	**STACKABLE VERTICAL PANELS**	EACH	**200**	**200**	**200**			**200**
704-1081	**VERTICAL PANELS - BACK TO BACK**	EACH		**91**				**91**
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	**500**	**1000**	**500**	**500**		**2500**
704-1500	OBLITERATION OF PVMT MK	SF						
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF						
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH						
762-0200	RAISED PAVEMENT MARKERS	EACH						
762-0420	SHORT TERM 4IN LINE - TYPE R	LF						
762-0430	**SHORT TERM 4IN LINE - TYPE NR**	LF				**281142**		**281142**
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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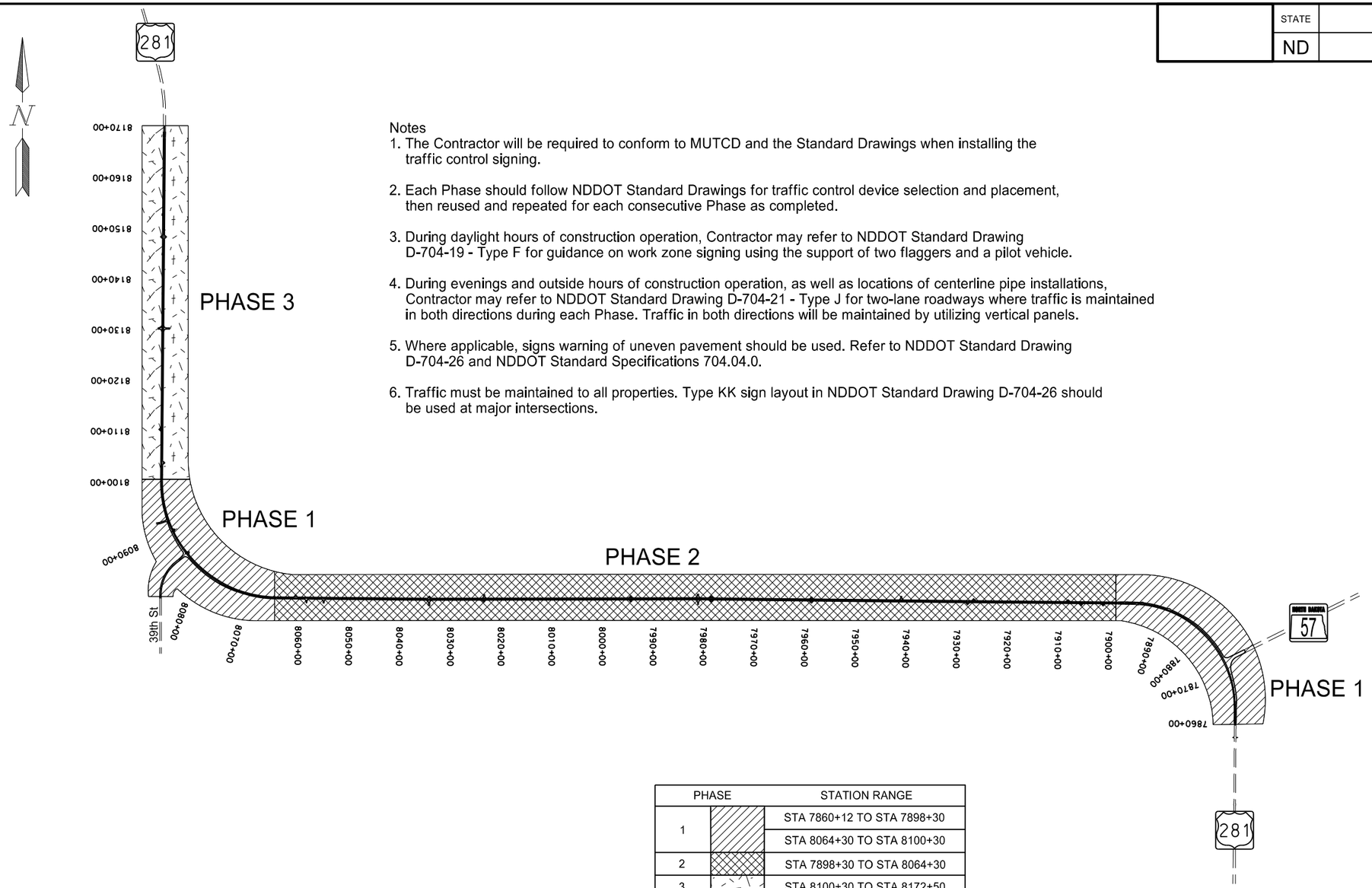
Traffic Control Devices List

US Highway 281

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	100	2



Notes
1. The Contractor will be required to conform to MUTCD and the Standard Drawings when installing the traffic control signing.
2. Each Phase should follow NDDOT Standard Drawings for traffic control device selection and placement, then reused and repeated for each consecutive Phase as completed.
3. During daylight hours of construction operation, Contractor may refer to NDDOT Standard Drawing D-704-19 - Type F for guidance on work zone signing using the support of two flaggers and a pilot vehicle.
4. During evenings and outside hours of construction operation, as well as locations of centerline pipe installations, Contractor may refer to NDDOT Standard Drawing D-704-21 - Type J for two-lane roadways where traffic is maintained in both directions during each Phase. Traffic in both directions will be maintained by utilizing vertical panels.
5. Where applicable, signs warning of uneven pavement should be used. Refer to NDDOT Standard Drawing D-704-26 and NDDOT Standard Specifications 704.04.0.
6. Traffic must be maintained to all properties. Type KK sign layout in NDDOT Standard Drawing D-704-26 should be used at major intersections.

PHASE		STATION RANGE
1		STA 7860+12 TO STA 7898+30
		STA 8064+30 TO STA 8100+30
2		STA 7898+30 TO STA 8064+30
3		STA 8100+30 TO STA 8172+50
4	PAVING - STA 7860+12 TO STA 8172+50	

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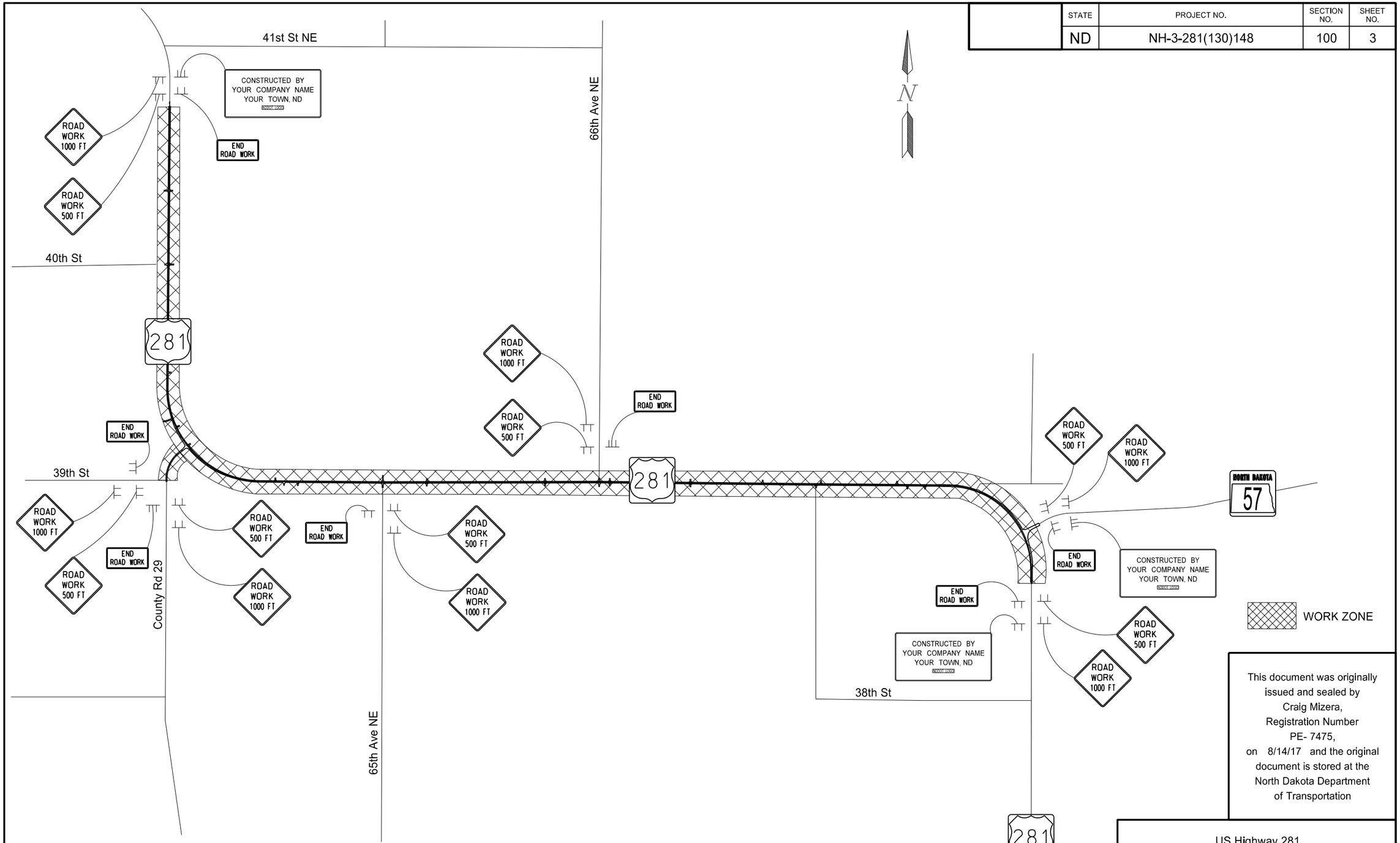
US Highway 281

Work Zone Traffic Control Phasing

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	100	3



Notes
1. Alternate route signing suggested locations are demonstrated in the layout shown.

2. Signing shown shall be in place prior to construction.

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US Highway 281

Work Zone Traffic Control

Alternate Route Signing

8/14/2017 5:41:58 PM dbergers c:\pwworking\central01\dms26485\100WZ_003_TCDL_PCN21506.dgn

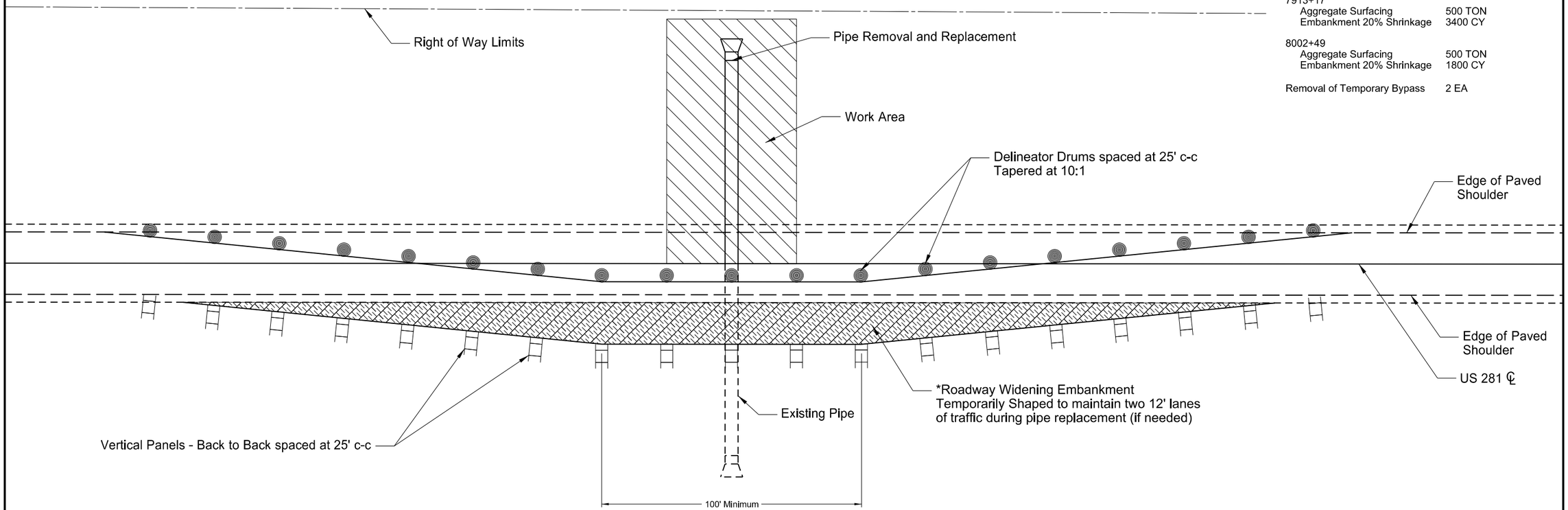
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	100	4

Temporary Bypass

7913+17
Aggregate Surfacing 500 TON
Embankment 20% Shrinkage 3400 CY

8002+49
Aggregate Surfacing 500 TON
Embankment 20% Shrinkage 1800 CY

Removal of Temporary Bypass 2 EA



Totals per Location				
SPEC	CODE	BID ITEM	UNIT	QUANTITY
704	1060	Delineator Drums	EA	19
704	1081	Vertical Panels-Back to Back	EA	19

Quantities included in the Traffic Control Device List

Note: Use in conjuction with standard drawing D-704-15 Layout Type B

*If aggregate surfacing is required by engineer, Traffic Service Aggregate or traffic service gravel will be used as temporary surfacing

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US Highway 281

Work Zone Traffic Control

Temporary Widening for Pipe Replacement When work is Present

8/28/2017 15:14:08 mhuettl c:\pwworking\central01\dms26485\100WZ_004 _TCDL_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	NH-3-281(130)148	110	1

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	2nd LF	3rd LF	4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
US 281 - Mainline																							
7858+74 Rt		391		6.2	12.50				5.0	2.25 x 2.25 12 ga	12.7						1	4	2.5 x 2.5 12 ga				
7862+74 Rt					12.30	12.80	13.30		5.0	2.5 x 2.5 12 ga	14.2	3.4	3.9	4.4		2.25 x 2.25 12 ga	3	12	3 x 3 7 ga	1		3	
7864+34 Lt		9		5.0	11.20				5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
7866+63 Rt		406		13.4	11.90				5.0	2.5 x 2.5 12 ga	12.6	4.1				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
7870+34 Rt		9		5.0	11.40				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
7870+49 Lt		372		7.0	11.80				5.0	2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga				
7872+75 Lt		402		13.2	11.70				5.0	2.5 x 2.5 12 ga	12.8	3.8				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
7872+90 Lt		34		8.0	10.60				5.0	2.5 x 2.5 12 ga	11.3						1	4	3 x 3 7 ga				
7875+80 Rt		372		7.0	11.90				5.0	2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga				
7877+43 Lt		406		13.4	12.00				5.0	2.5 x 2.5 12 ga	12.6	4.2				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
7881+40 Rt		9		5.0	10.90				5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
7882+68 Lt					12.60	13.20	13.70		5.0	2.5 x 2.5 10 ga	15.9	2.7	3.2	3.7		2.19 x 2.19 10 ga	3	12	3 x 3 7 ga	1		3	
7887+85 Lt		391		6.2	12.00				5.0	2.25 x 2.25 12 ga	12.7						1	4	2.5 x 2.5 12 ga				
7888+51 Rt		1		5.2	11.20				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
7977+00 Lt		9		5.0	11.30				5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
7981+39 Rt	SA2E			5.2	12.80				5.0	2.5 x 2.5 12 ga	16.3	2.7				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga	1		1	
7985+00 Rt		9		5.0	11.30				5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
7994+90 Rt		57		12.0	13.50				5.0	2.5 x 2.5 12 ga	15.2	4.0				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
8014+99 Lt		57		12.0	13.50				5.0	2.5 x 2.5 12 ga	15.2	4.0				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
8033+90 Lt	SA2E			5.2	12.80				5.0	2.5 x 2.5 12 ga	16.3	2.7				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga	1		1	
8071+17 Rt		391		6.2	12.30				5.0	2.25 x 2.25 12 ga	12.7						1	4	2.5 x 2.5 12 ga				
8075+66 Lt		9		5.0	11.10				5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
8075+84 Rt					10.70	11.50			5.0	2.5 x 2.5 12 ga	13.7						2	8	3 x 3 7 ga	1		2	
8080+20 Rt		399		6.2	12.50				5.0	2.25 x 2.25 12 ga	12.7						1	4	2.5 x 2.5 12 ga				
8081+83 Lt		372		7.0	11.70				5.0	2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga				
8084+48 Rt		34		8.0	11.10				5.0	2.5 x 2.5 10 ga	13.6						1	4	3 x 3 7 ga			1	
8085+07 Rt		400		7.2	12.70				5.0	2.5 x 2.5 12 ga	13.9						1	4	3 x 3 7 ga				
8087+55 Rt		372		7.0	12.30				5.0	2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga				
8089+49 Lt		399		6.2	11.80				5.0	2.25 x 2.25 12 ga	12.7						1	4	2.5 x 2.5 12 ga				
8093+62 Lt					10.10	10.90			5.0	2.5 x 2.5 12 ga	13.7						2	8	3 x 3 7 ga	1		2	
8093+82 Rt		9		5.0	11.50				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
8098+08 Lt		391		6.2	11.90				5.0	2.25 x 2.25 12 ga	12.7						1	4	2.5 x 2.5 12 ga				
8130+10 Lt	SA2E			5.2	12.20				5.0	2.25 x 2.25 12 ga	12.9	3.8				2 x 2 12 ga	1	4	3 x 3 7 ga	1		1	
8130+64 Rt		1		5.2	11.30				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
Sub Total			0.00	213.40	**Total**	477.80											**Total**	160		7	0	19	
ND 57																							
0+89 Lt		3		13.3	12.90				5.0	2.5 x 2.5 10 ga	14.6	4.0				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1	
1+62 Rt		4		3.9	12.60				5.0	2 x 2 12 ga	13.6						1	4	2.25 x 2.25 12 ga				
4+91 Rt		371		6.0	13.00				5.0	2.5 x 2.5 12 ga	16.2						1	4	3 x 3 7 ga				
Sub Total			0.00	23.20	**Total**	38.50											**Total**	12		0	0	1	

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Sign Summary
Perforated Tube

US Highway 281

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	N.D.	NH-3-281(130)148	110	2

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	2nd LF	3rd LF	4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
CR 29																							
104+45 Rt		19		6.3	13.10				5.0	2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
108+45 Rt		392		7.2	11.50				5.0	2.5 x 2.5 12 ga	13.9						1	4	3 x 3 7 ga				
111+00 Lt		14		4.0	11.30				5.0	2 x 2 12 ga	13.0						1	4	2.25 x 2.25 12 ga				
112+53 Rt	SA4E			7.5	12.00				5.0	2.5 x 2.5 12 ga	12.9	3.6				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga	1		1	
Sub Total			0.00	25.00		**Total**	47.90										**Total**	16		1	0	1	
Grand Total			**0.0**	**261.6**		**Total**	**564.20**										**Total**	**188**	**0**	**8**	**0**	**21**	

8/11/2017 3:03:55PM
Page 2 of 2

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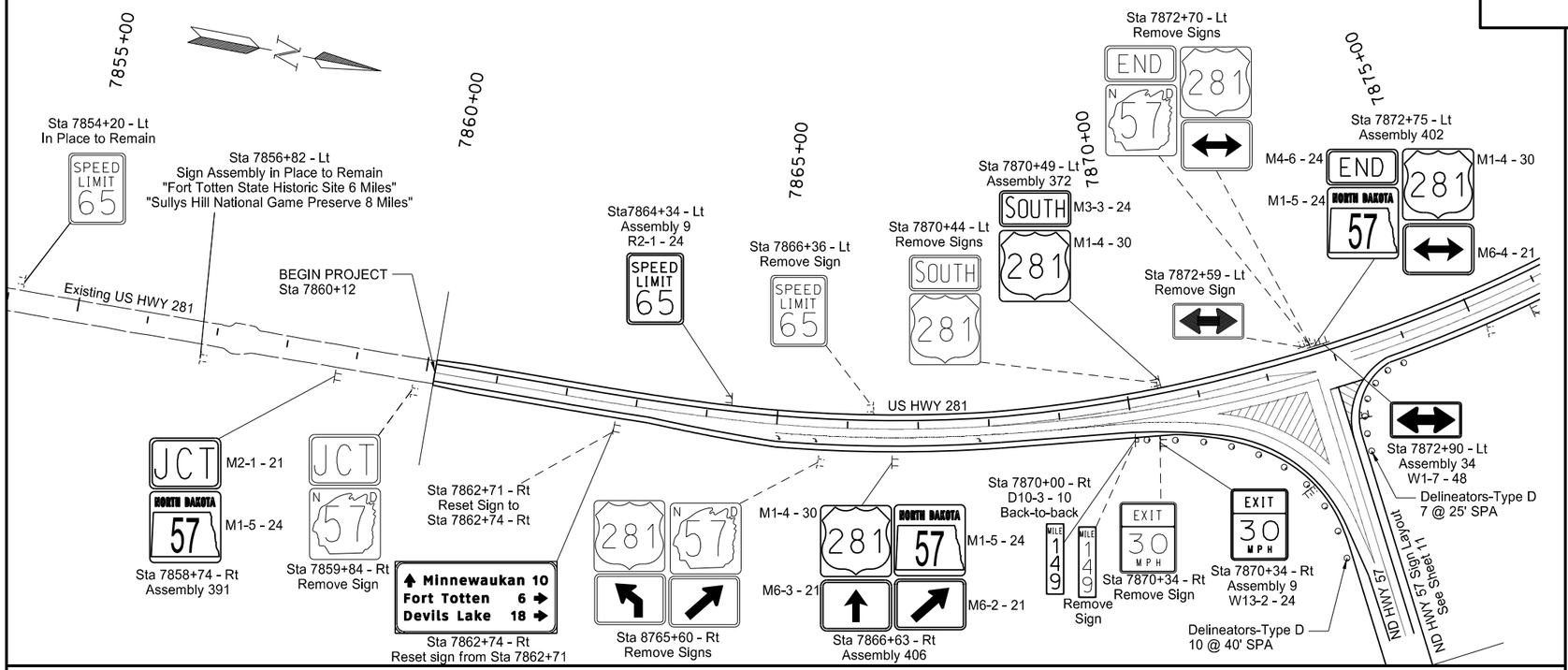
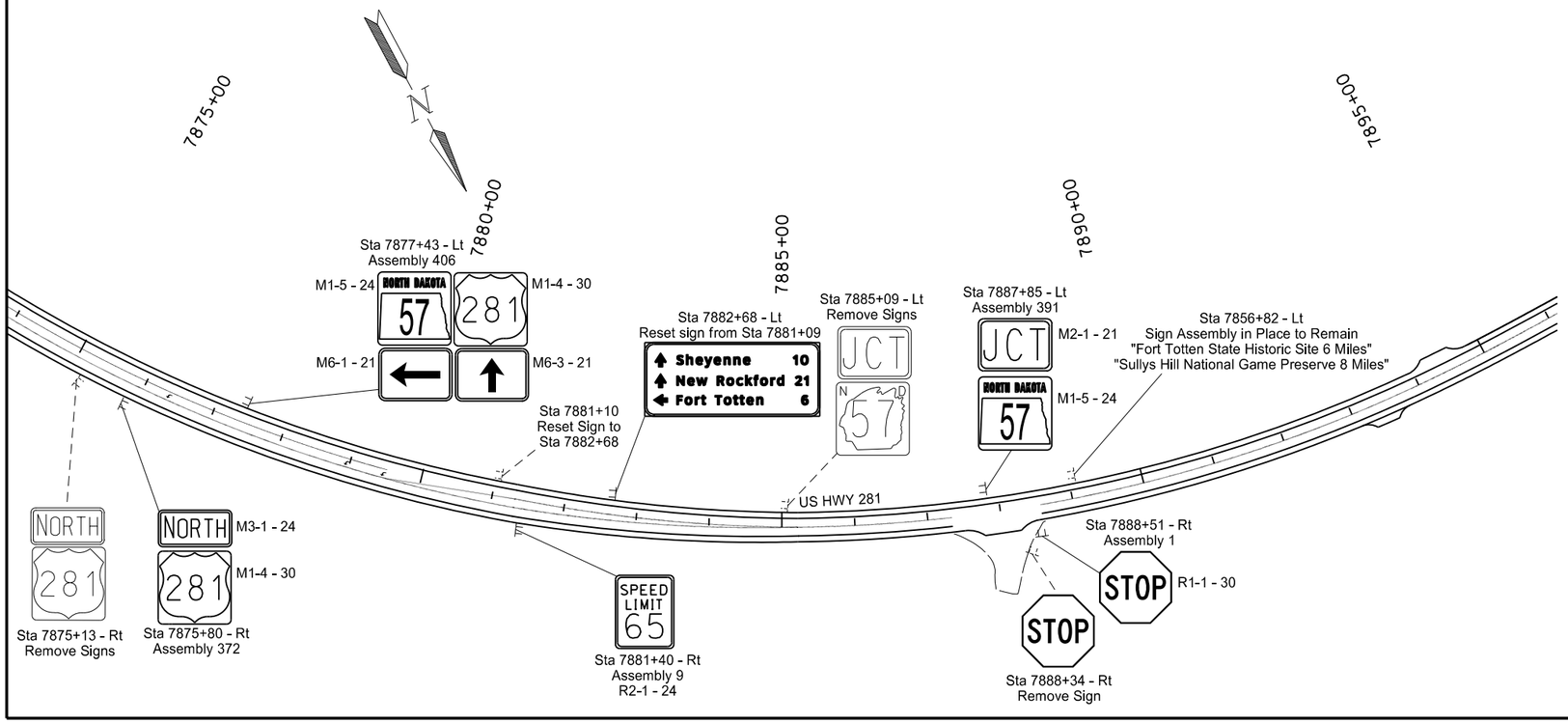
Sign Summary
Perforated Tube

US Highway 281

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	110	3





754 - 0168	DELINEATORS-TYPE D	
	STA. 7870+16 to 7873+00 - Rt	10 EA
	STA. 7873+09 to 7874+90 - Rt	7 EA
	TOTAL	17 EA
754 - 0563	REFERENCE MARKER - TYPE C	
	STA. 7870+00 - Rt	1 EA
	TOTAL	1 EA

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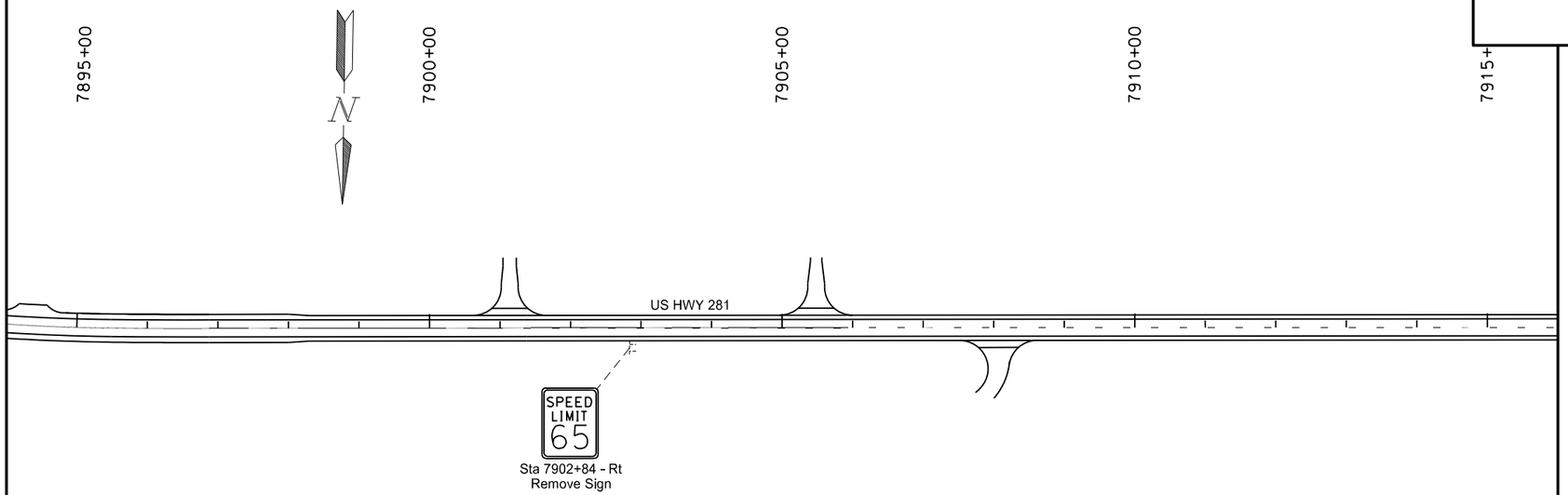
US Highway 281

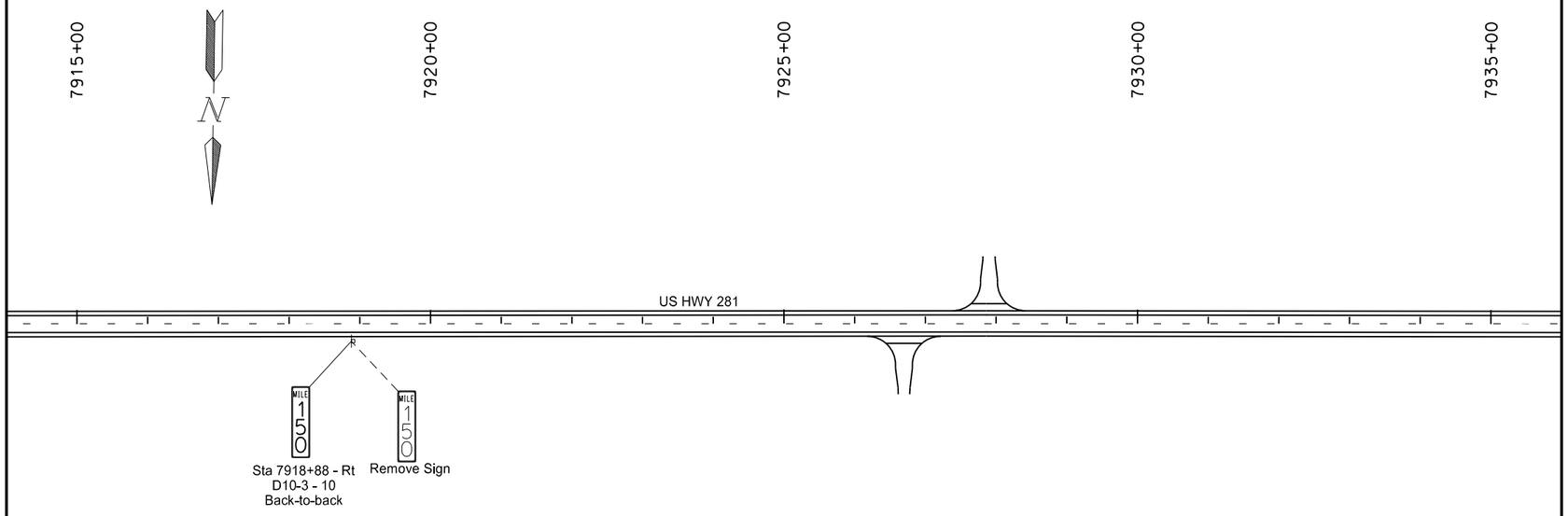
Signing Layout

Sta 7855+00 to 7895+00

8/14/2017 11:30:06 PM dbergers c:\pwworking\central01\dms26485\110SN_003_LSIGN_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	110	4





754 - 0563	REFERENCE MARKER - TYPE C	
	STA. 7918+88 - Rt	1 EA
	TOTAL	1 EA

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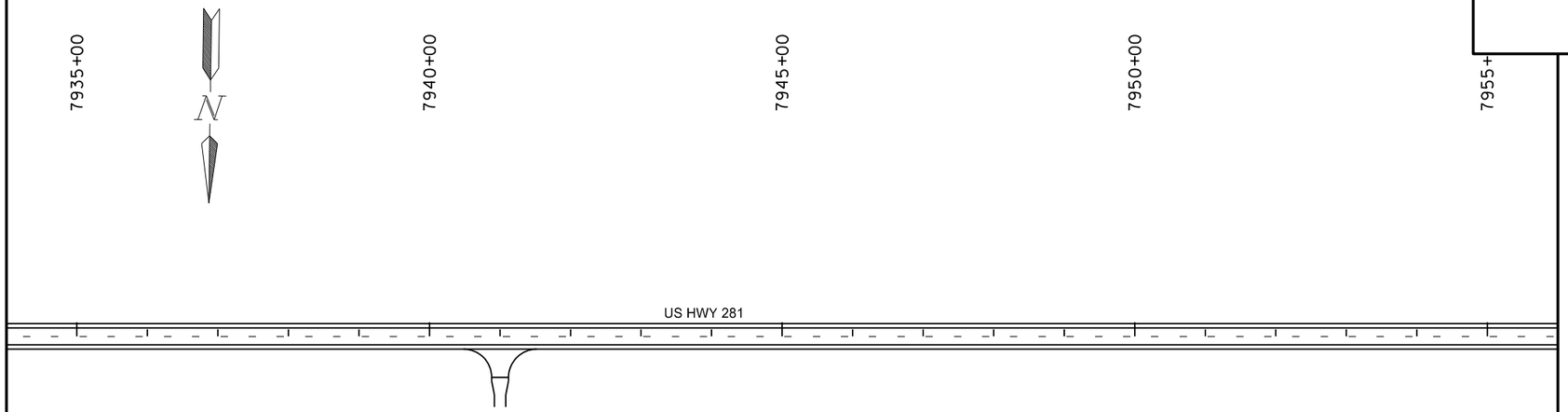
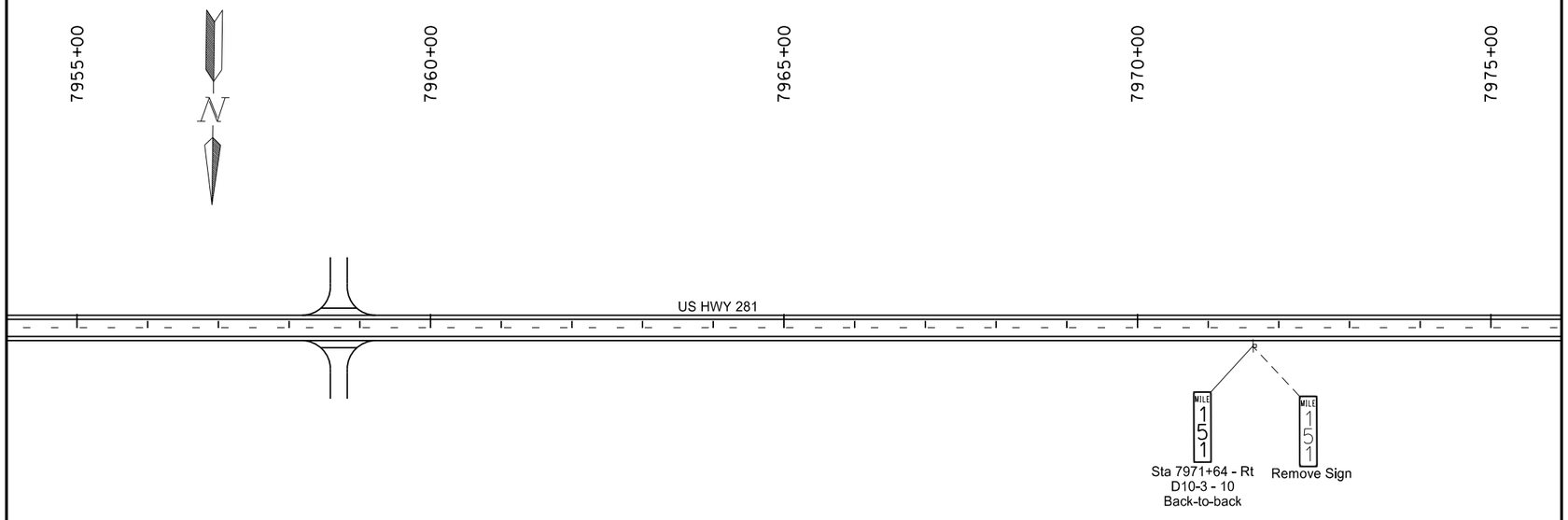
US Highway 281

Signing Layout

Sta 7895+00 to 7935+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	110	5





754 - 0563	REFERENCE MARKER - TYPE C	
	STA. 7971+64 - Rt	1 EA
	TOTAL	1 EA

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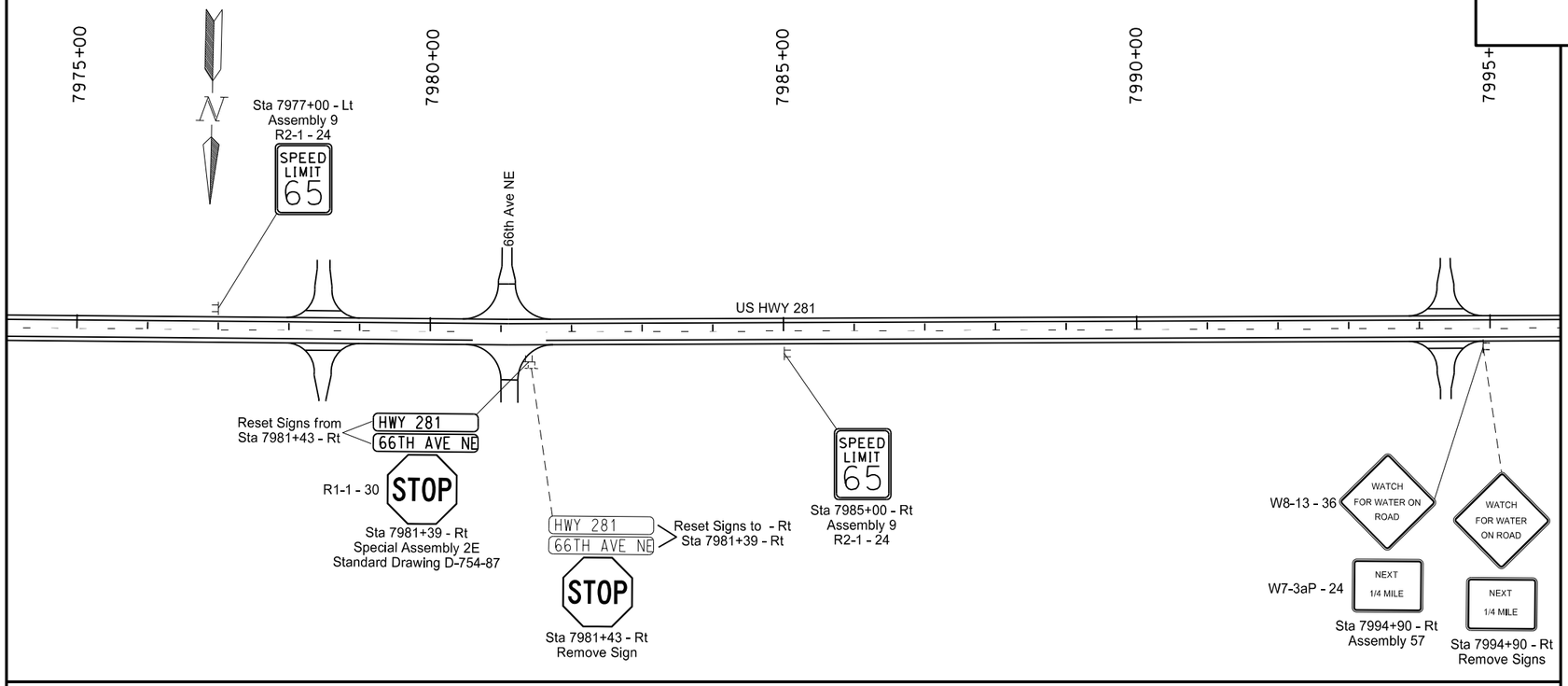
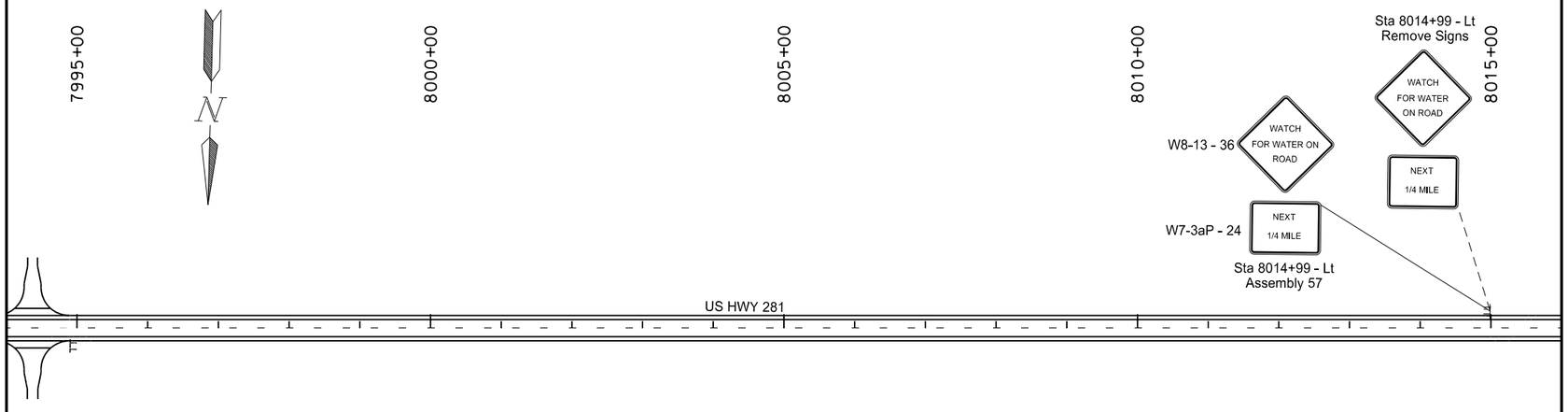
US Highway 281

Signing Layout

Sta 7935+00 to 7975+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	110	6





Remove Signs

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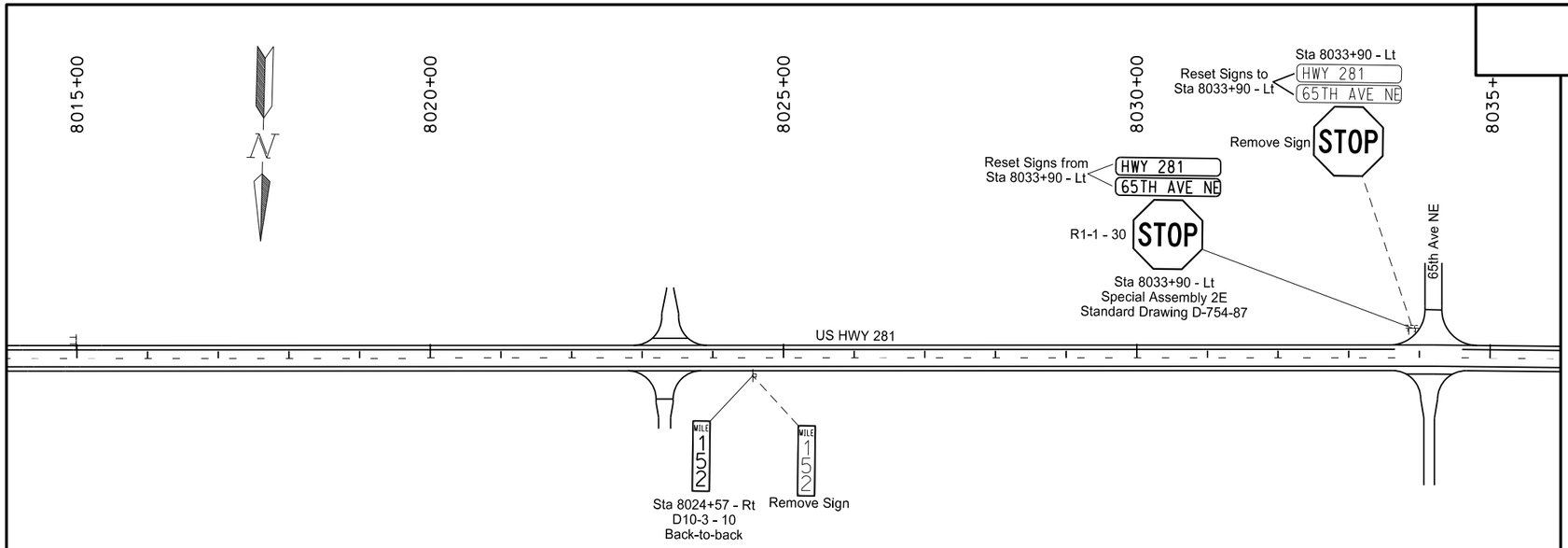
US Highway 281

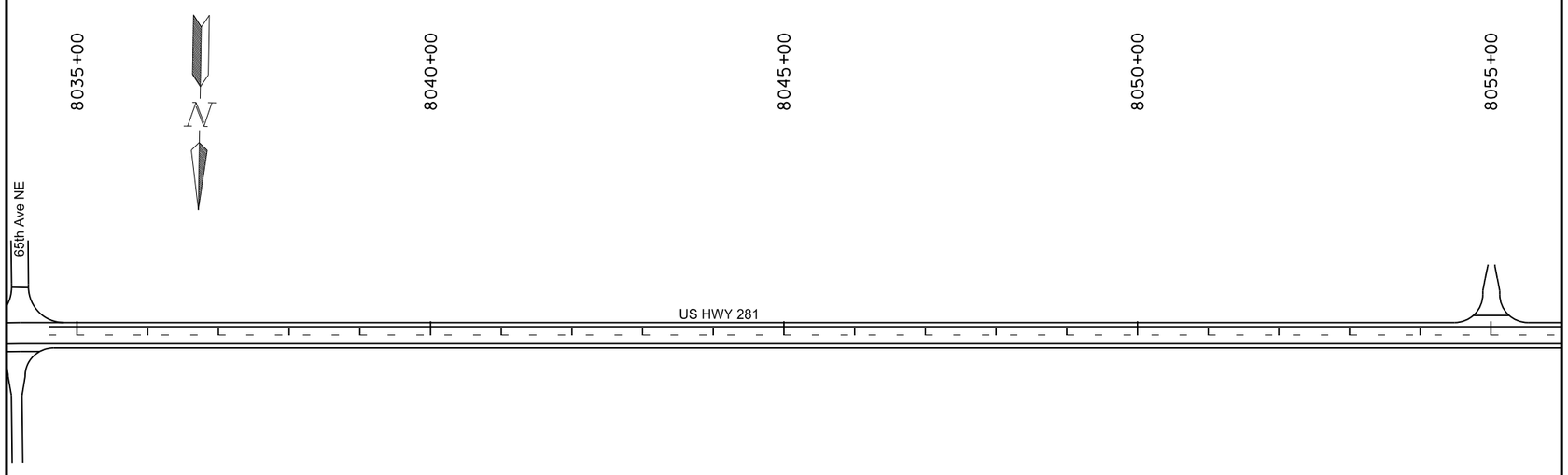
Signing Layout

Sta 7975+00 to 8015+00

8/14/2017 5:42:31 PM dbergers c:\pwworking\central01\dms26485\110SN_006_LSIGN_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	110	7





754 - 0563	REFERENCE MARKER - TYPE C	
	STA. 8024+57 - Rt	1 EA
	TOTAL	1 EA

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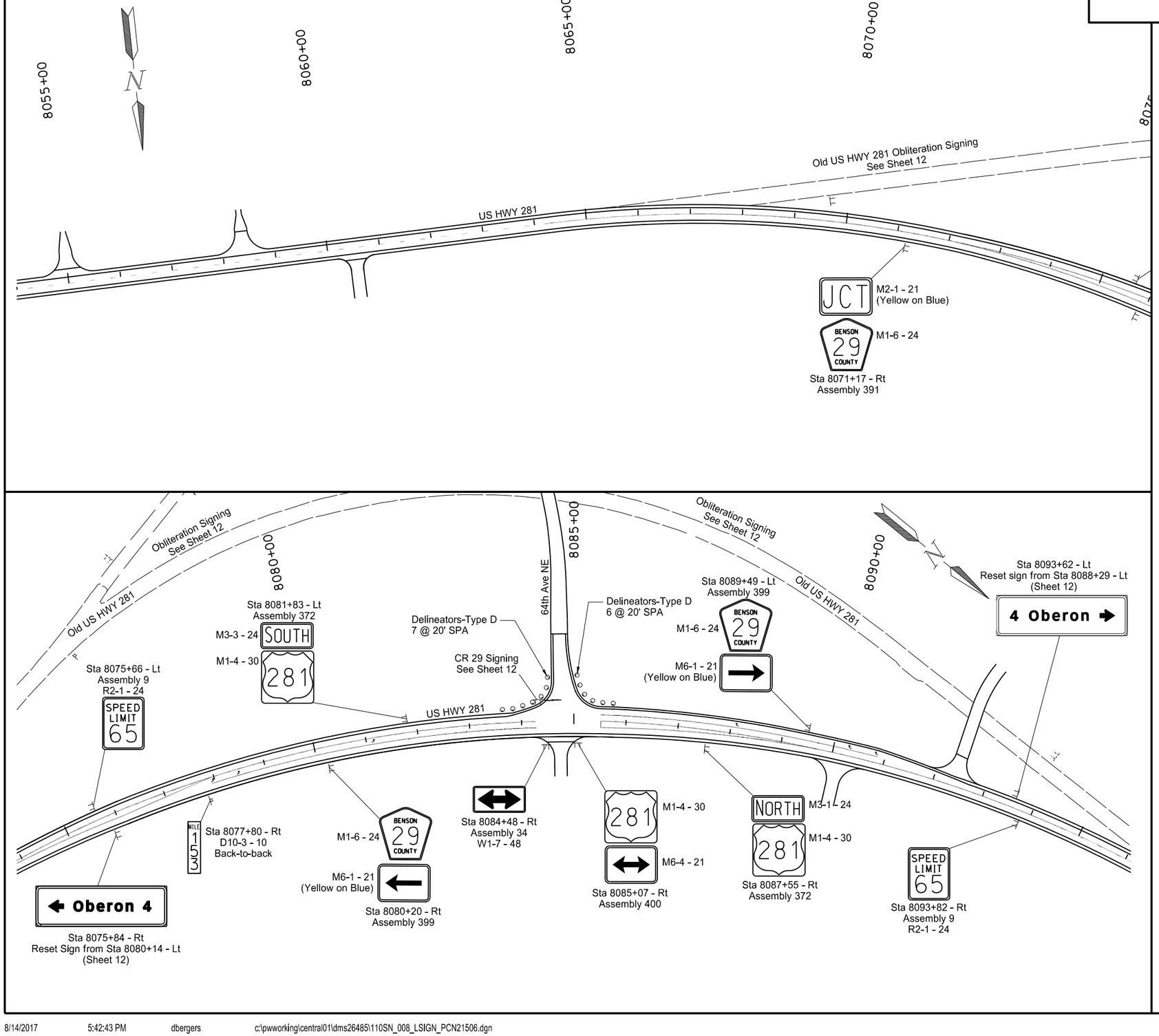
US Highway 281

Signing Layout

Sta 8015+00 to 8055+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	110	8



754 - 0168	DELINEATORS-TYPE D	
	STA. 8083+66 to 8084+54 - Lt	7 EA
	STA. 8085+06 to 8085+76 - Lt	6 EA
	TOTAL	13 EA
754 - 0563	REFERENCE MARKER - TYPE C	
	STA. 8077+80 - Rt	1 EA
	TOTAL	1 EA

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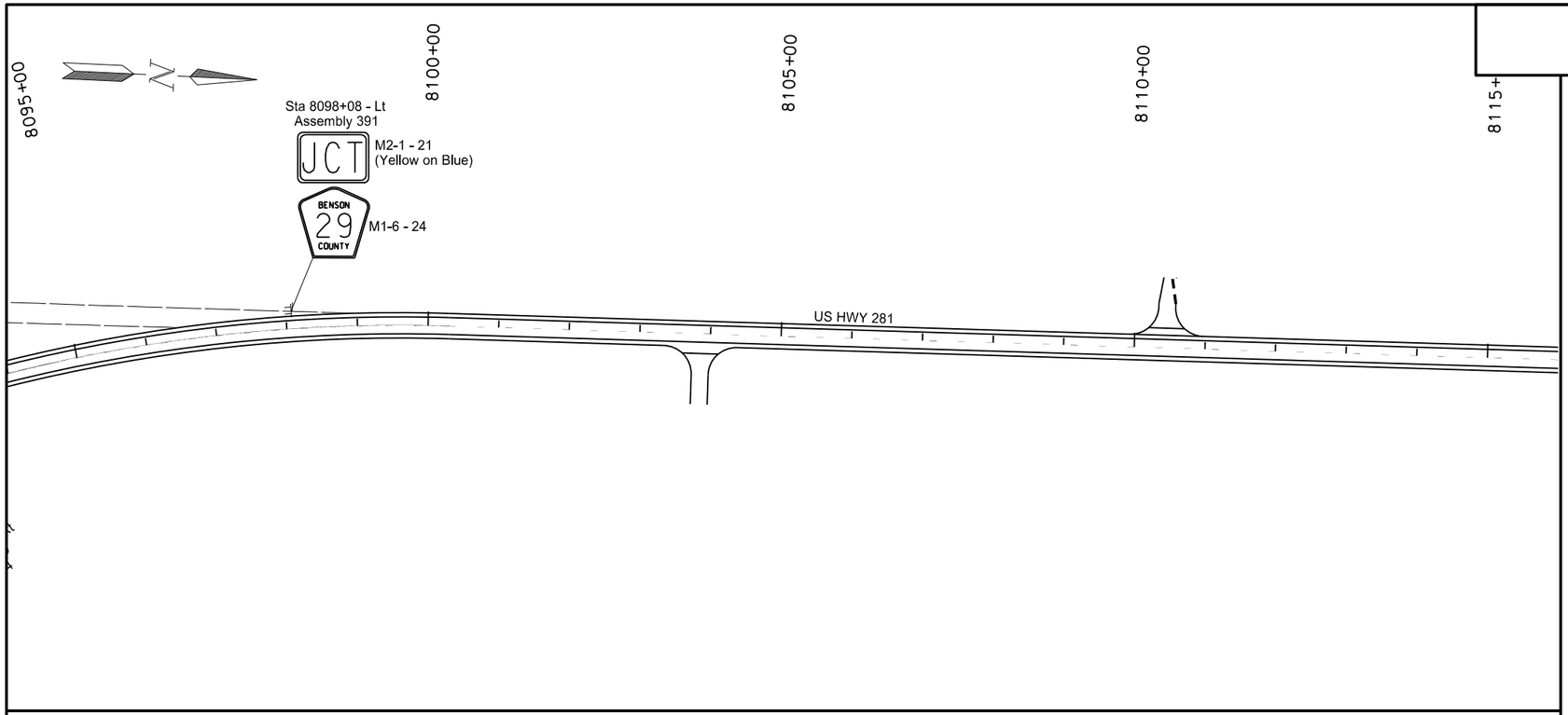
US Highway 281

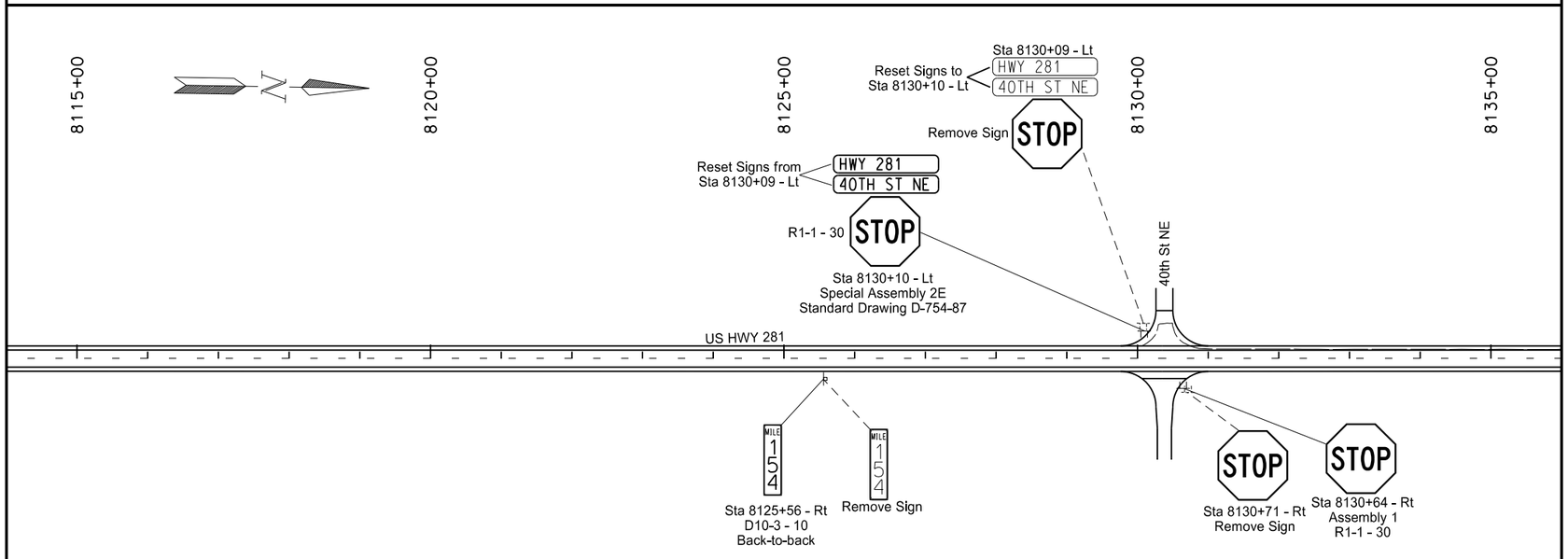
Signing Layout

Sta 8055+00 to 8095+00

8/14/2017 5:42:43 PM dbergers c:\pwworking\central01\dms26485\110SN_008_LSIGN_PCN21506.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	110	9





754 - 0563	REFERENCE MARKER - TYPE C	
	STA. 8125+56 - Rt	1 EA
	TOTAL	1 EA

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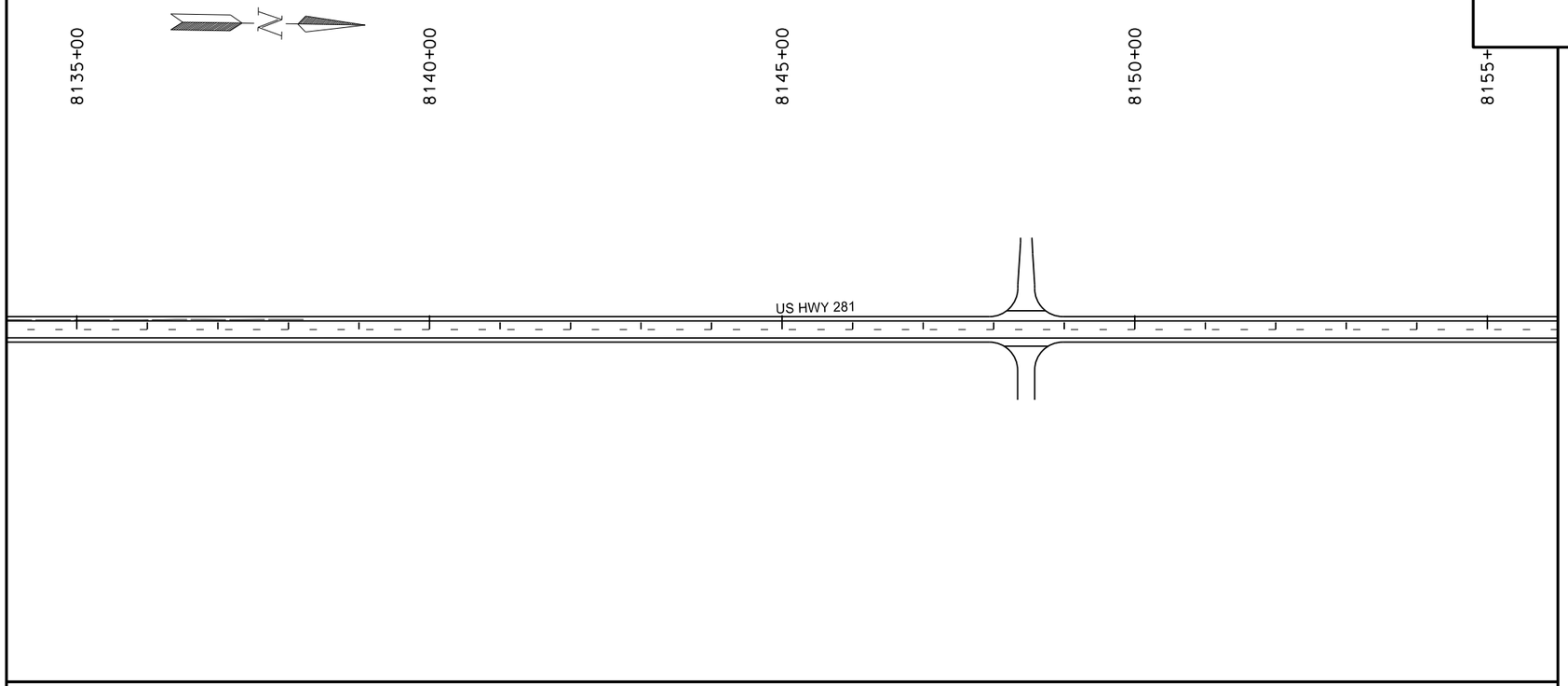
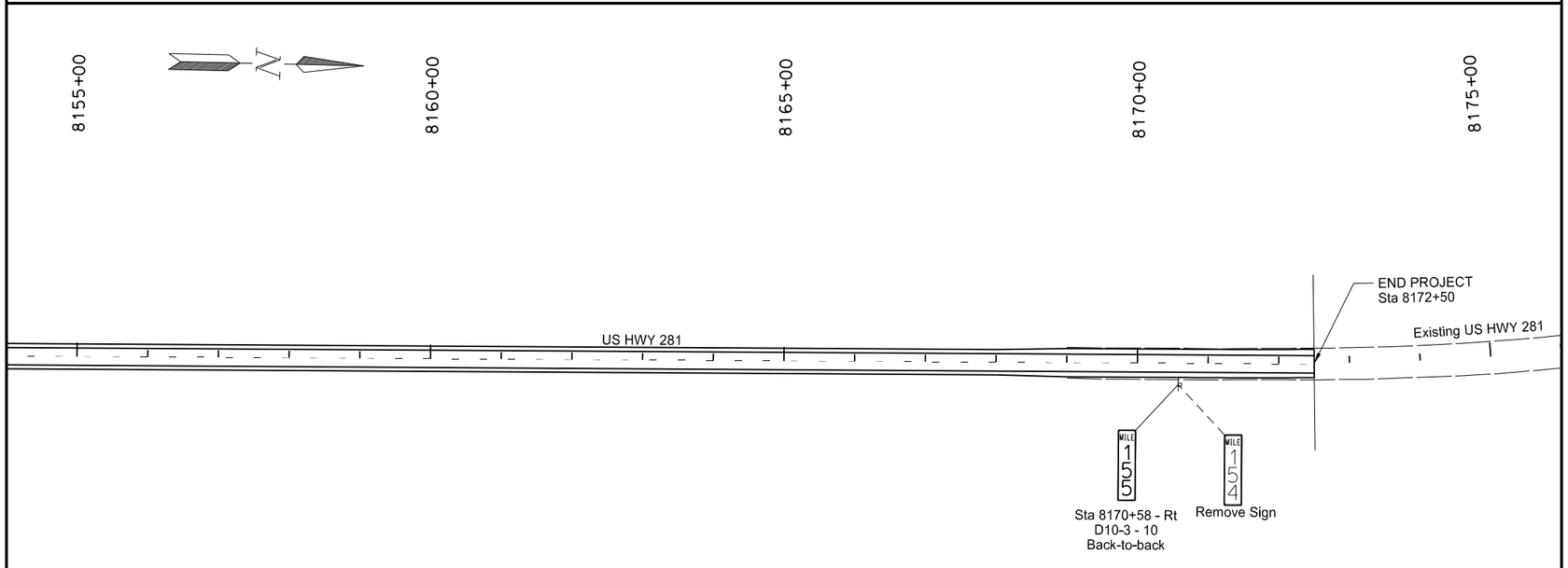
US Highway 281

Signing Layout

Sta 8095+00 to 8135+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	110	10





754 - 0563	REFERENCE MARKER - TYPE C	
	STA. 8170+58 - Rt	1 EA
	TOTAL	1 EA

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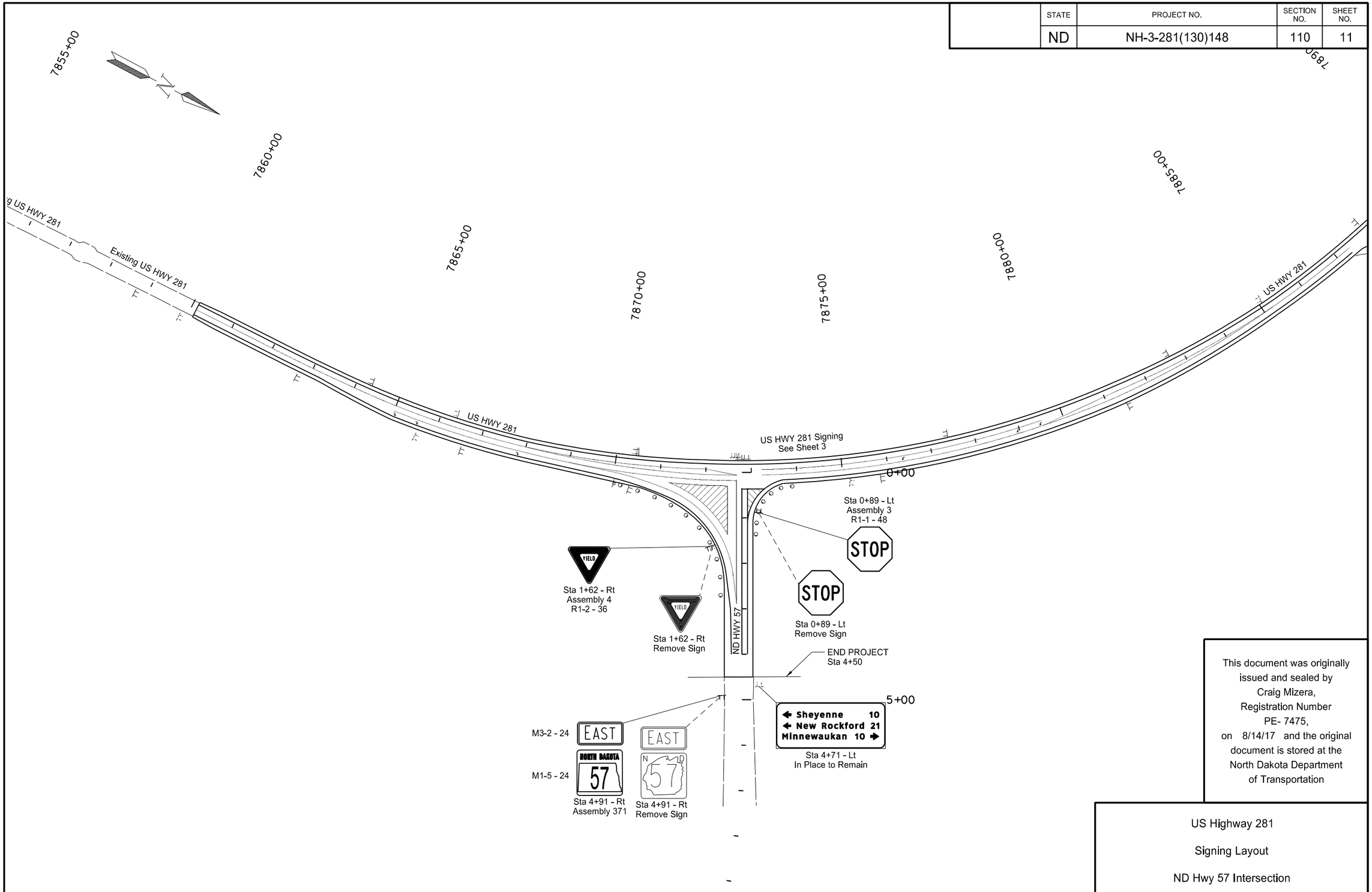
US Highway 281

Signing Layout

Sta 8135+00 to 8175+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	110	11



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US Highway 281

Signing Layout

ND Hwy 57 Intersection

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	110	12

N

Sta 104+45 - Rt
Assembly 19

W3-1 - 30

Sta 8088+29 - Lt
Reset sign to Sta 8093+62 - Rt
(Sheet 8)

4 Oberon

105+00

Reset Signs to
Sta 112+53 - Rt

HWY 281
64TH AVE NE

STOP

Sta 107+85 - Rt
Remove Sign

Sta 106+03 - Lt
Remove Sign

BENSON
29
COUNTY

Sta 8069+65 - Lt
Remove Signs

55
M.P.H.

8070+00

8075+00

STOP

Sta 8077+46 - Lt
Remove Sign

Old US HWY 281

8080+00

MILE
1
345

Sta 8076+40 - Lt
Remove Sign

BENSON
29
COUNTY

Sta 8079+01 - Lt
Remove Signs

Sta 108+45 - Rt
Assembly 392

JCT

M2-1 - 21

281

M1-4 - 30

Sta 112+53 - Rt
Special Assembly 4E
Standard Drawing D-754-87

Reset Signs from
Sta 107+85 - Rt

HWY 281
64TH AVE NE

R1-1 - 36

STOP

64th Ave NE

8085+00

4 Oberon

Sta 8088+29 - Lt
Reset sign to Sta 8093+62 - Lt
(Sheet 8)

110+00

Sta 8094+03 - Lt
Remove Signs

Old US HWY 281

8090+00

55
M.P.H.

US HWY 281

US HWY 281 Signing
See Sheet 8

BENSON
29
COUNTY

Sta 111+00 - Lt
Assembly 14
M1-6 - 24

115+00

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US Highway 281

Signing Layout

CR 29 Intersection

8/14/2017 5:43:10 PM dbergers c:\pwworking\central01\dms26485\110SN_012_LSIGN_PCN21506.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	120	1

PAINT
4IN WHITE EDGE LINE

Station to		Station		Quantity	
7860+12	Rt	7863+20	Rt	308	LF
7860+12	Lt	8033+66	Lt	17331	LF
7863+20	Rt	7865+00	Rt	182	LF
7865+00	Rt	7868+99	Rt	403	LF
7868+99	Rt	7869+82	Rt	84	LF
7869+82	Rt	7871+13	Rt	138	LF
7871+13	Rt	7872+49	Rt	233	LF
7872+49	Rt	7872+58	Rt	77	LF
7872+58	Rt	7872+60	Rt	97	LF
7872+90	Rt	7872+92	Rt	364	LF
7872+91	Rt	7873+70	Rt	133	LF
7872+92	Rt	7873+28	Rt	37	LF
7873+70	Rt	7887+33	Rt	1374	LF
7888+55	Rt	7980+60	Rt	9209	LF
7981+64	Rt	8172+50	Rt	19064	LF
8034+60	Lt	8064+30	Lt	2970	LF
8064+30	Lt	8083+72	Lt	1955	LF
8083+72	Lt	8084+63	Lt	124	LF
8084+63	Lt	8084+63	Lt	90	LF
8084+85	Lt	8085+02	Lt	109	LF
8085+02	Lt	8172+50	Lt	8777	LF
			TOTAL	63059	LF

PAINT
4IN YELLOW CENTERLINE

Station to		Station		Quantity	
7905+84	CL	7980+60	CL	1869	LF
7981+64	CL	8033+66	CL	1301	LF
8034+60	CL	8064+30	CL	743	LF
8100+30	CL	8172+50	CL	1805	LF
TOTAL				5717	LF

PAINT
4IN DOUBLE YELLOW

Station to		Station		Quantity	
7860+12	CL	7872+69	Rt	2514	LF
7868+05	CL	7872+69	Rt	928	LF
7872+80	Rt	7872+80	Rt	730	LF
7873+23	Rt	7885+22	CL	2404	LF
7879+52	Rt	7885+22	CL	1140	LF
7885+22	CL	7887+33	CL	422	LF
7888+55	CL	7896+88	CL	1664	LF
8067+18	CL	8072+22	CL	1008	LF
8072+22	CL	8076+12	Rt	780	LF
8072+22	CL	8084+27	Lt	2414	LF
8076+12	Rt	8077+92	Lt	360	LF
8085+52	Lt	8085+52	Rt	24	LF
8085+52	Rt	8089+69	CL	834	LF
8085+52	Lt	8089+69	CL	836	LF
8089+69	CL	8094+73	CL	1008	LF
			TOTAL	17066	LF

PAINT
4IN YELLOW STRIPE BARRIER
with LEFT CENTERLINE

Station to		Station		Quantity	
7896+88	CL	7905+84	CL	1120	LF
8094+73	CL	8100+30	CL	696	LF
			TOTAL	1816	LF

PAINT
4IN YELLOW STRIPE BARRIER
with RIGHT CENTERLINE

Station to		Station		Quantity	
8064+30	CL	8067+18	CL	360	LF
			TOTAL	360	LF

PAINT
24IN WHITE

Station to		Station		Quantity	
7872+80	Lt	7872+92	Lt	12	LF
8084+48	Lt	8084+77	Lt	29	LF
			TOTAL	41	LF

PAINT
8IN WHITE

Station to		Station		Quantity	
7865+00	Rt	7868+05	Rt	307	LF
7868+05	Rt	7871+95	Rt	393	LF
7869+75	Rt	7871+18	Rt	147	LF
7871+18	Rt	7872+62	Rt	249	LF
7871+22	Rt	7872+50	Rt	175	LF
7871+22	Rt	7872+48	Rt	128	LF
7871+95	Rt	7872+68	Rt	74	LF
7872+48	Rt	7872+50	Rt	107	LF
7872+62	Rt	7872+69	Rt	63	LF
7872+68	Rt	7872+69	Rt	269	LF
7873+23	Lt	7879+52	Lt	627	LF
8077+92	Rt	8084+27	Rt	633	LF
8085+52	Lt	8090+86	Lt	538	LF
			TOTAL	3710	LF

PAINT
TURN LANE ARROW

Station		Quantity	
7865+00	Rt	16	SF
7865+52	Rt	16	SF
7867+81	Rt	16	SF
7876+40	Lt	16	SF
7879+00	Lt	16	SF
7879+52	Lt	16	SF
8077+92	Rt	16	SF
8078+44	Rt	16	SF
8081+10	Rt	16	SF
8088+15	Lt	16	SF
8090+34	Lt	16	SF
8090+86	Lt	16	SF
TOTAL		192	SF

SUMMARY PERMANENT PAINT PAVEMENT MARKING

SPEC-CODE	ITEM	Quantity	
762-0103	PAINT PVMT MK-MESSAGE	192	SF
762-1104	PAINT PVMT MK-4IN LINE (YELLOW)	24,960	LF
762-1104	PAINT PVMT MK-4IN LINE (WHITE)	63,059	LF
762-1108	PAINT PVMT MK-8IN LINE (WHITE)	3,710	LF
762-1124	PAINT PVMT MK-24IN LINE (WHITE)	41	LF

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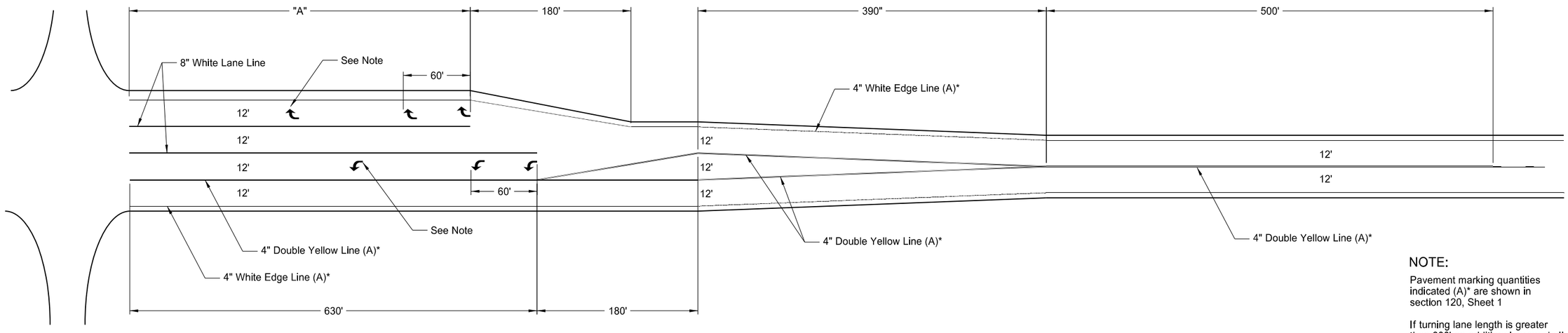
US Highway 281

Pavement Marking Quantites

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	120	2

Left Turn Lanes			
Station	to Station	Direction	"A"
7873+23	7881+32	SB	630
8076+12	8084+27	NB	630

Right Turn Lanes				
Station	to Station	Direction	"A"	"B"
7863+20	7869+00	NB	400	180
8085+52	8092+66	SB	530	180



NOTE:

Pavement marking quantities indicated (A)* are shown in section 120, Sheet 1

If turning lane length is greater than 300' an additional arrow shall be placed at ½ "A".

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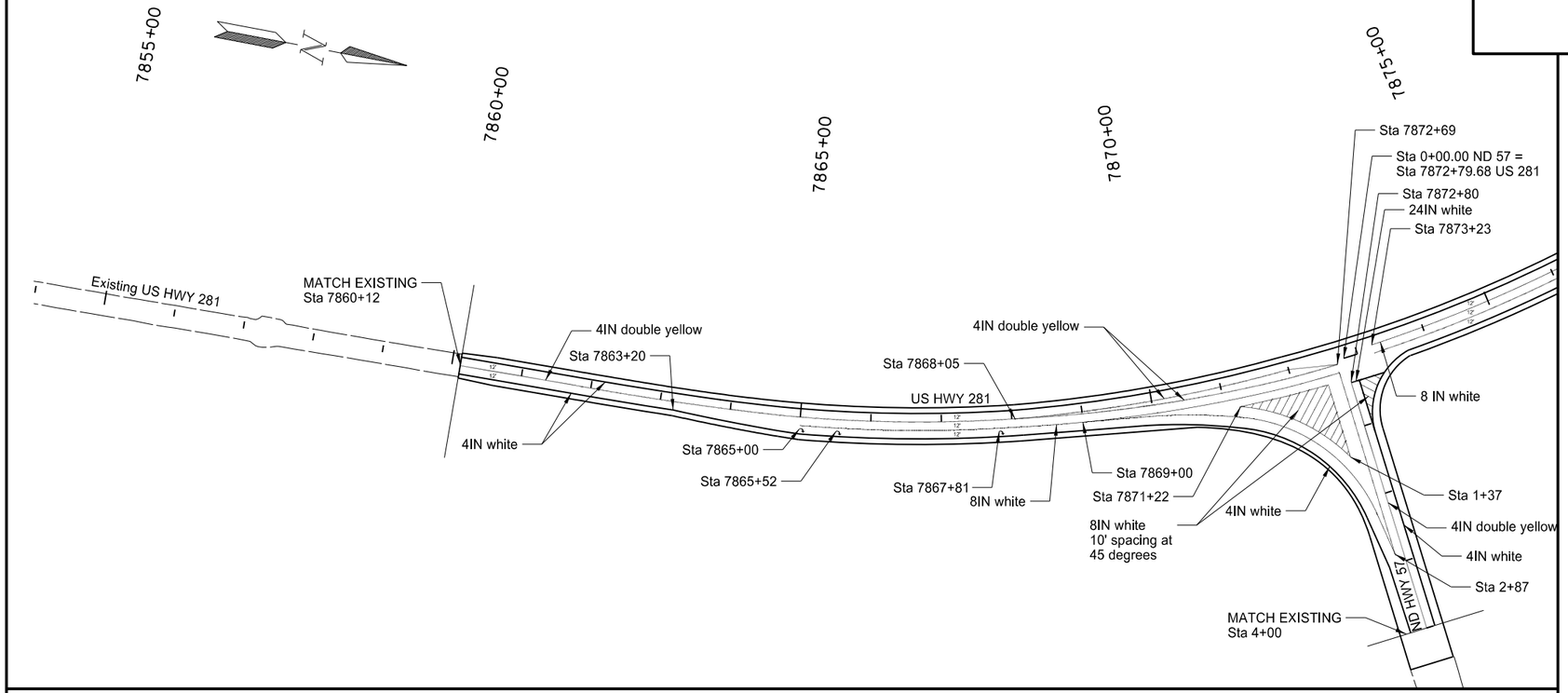
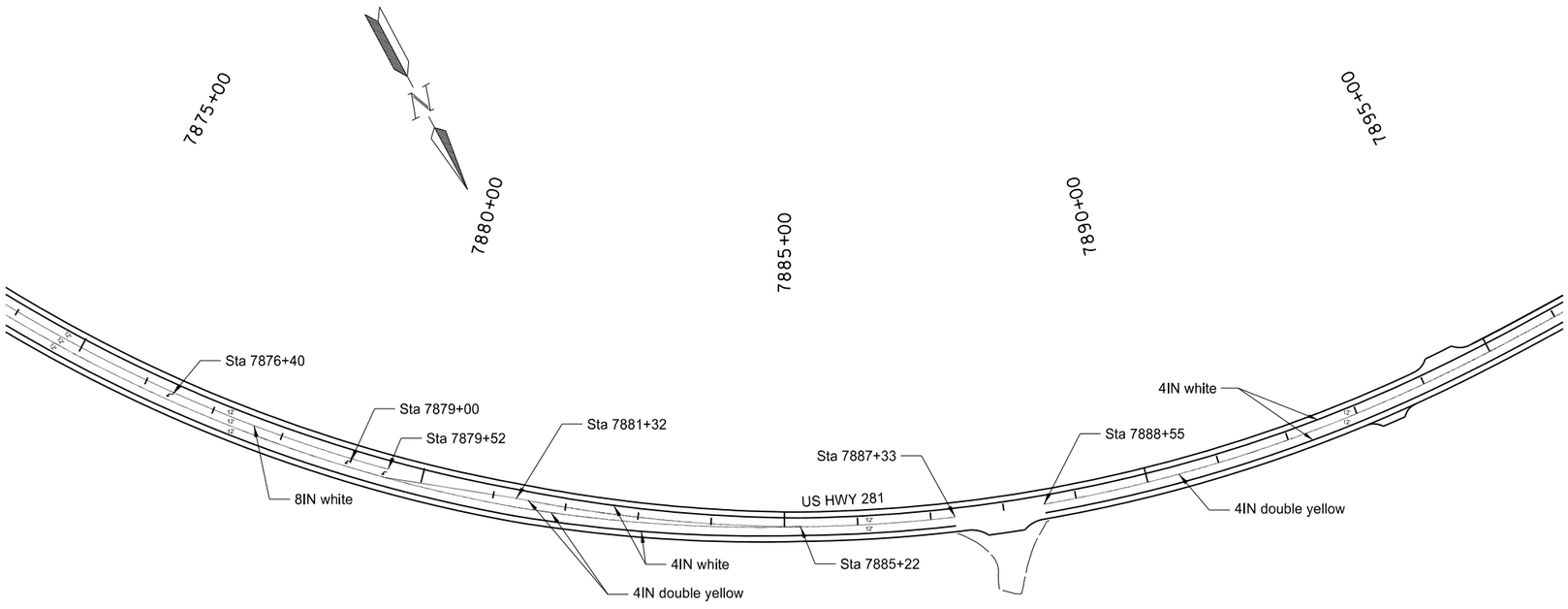
US Highway 281

Pavement Marking Details
Turning Lane Detail

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	120	3





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US Highway 281

Pavement Marking

Sta 7855+00 to 7895+00

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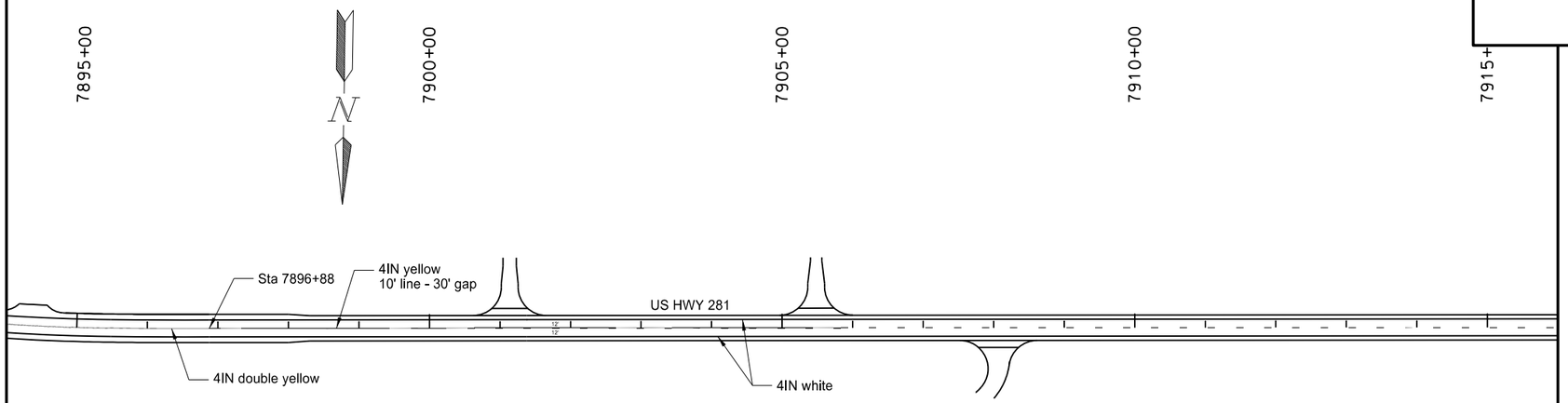
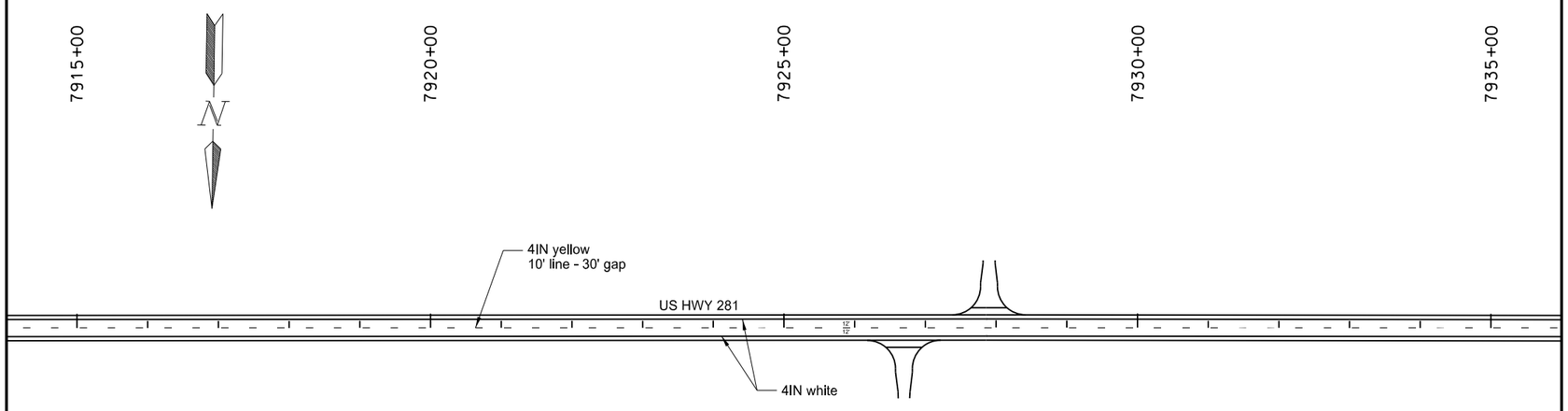
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	120	4





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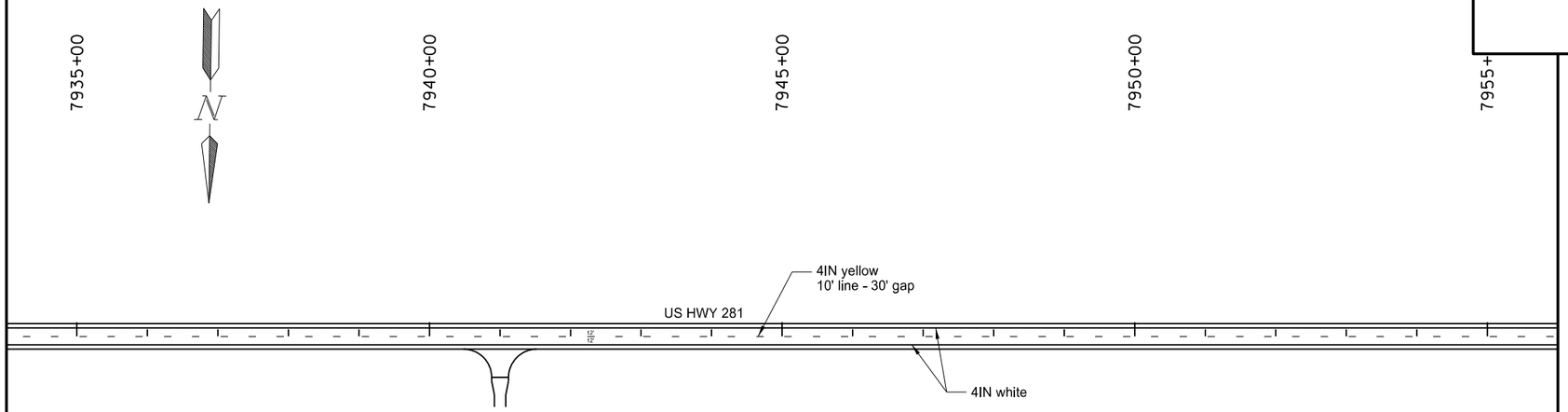
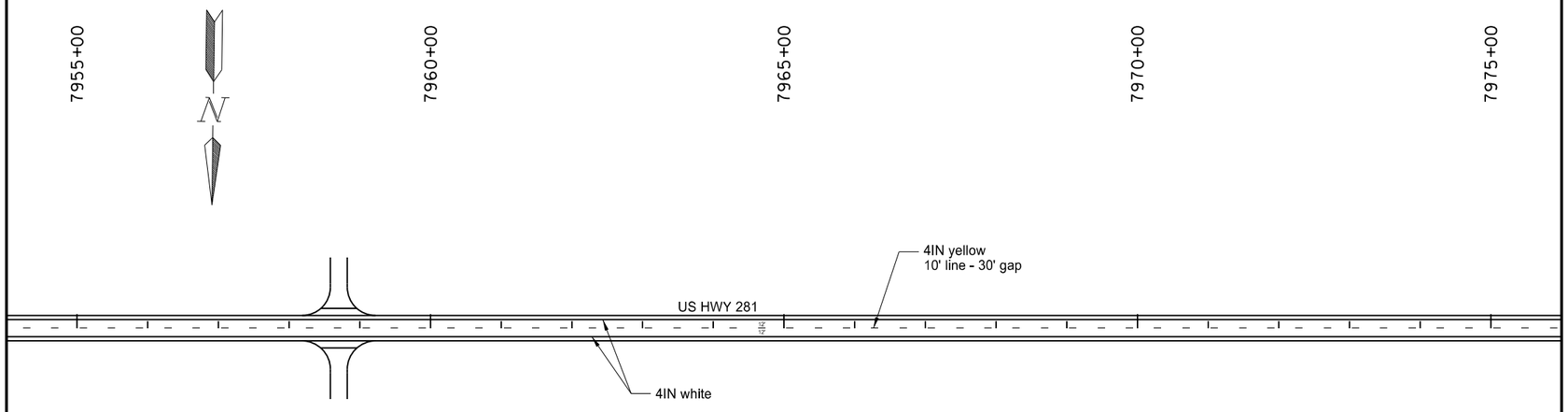
US Highway 281

Pavement Marking

Sta 7895+00 to 7935+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	120	5





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US Highway 281

Pavement Marking

Sta 7935+00 to 7975+00

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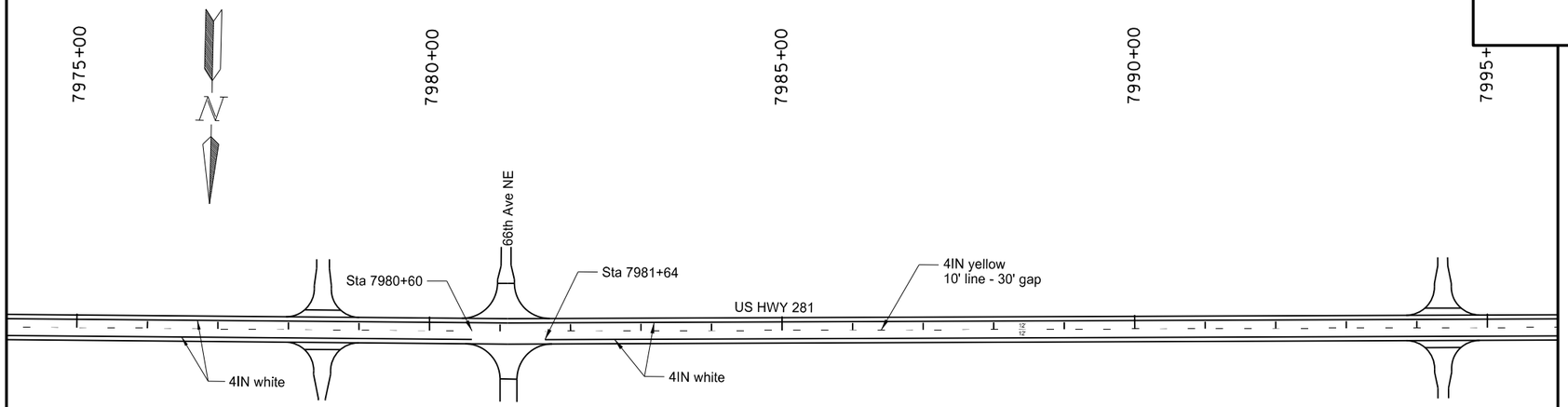
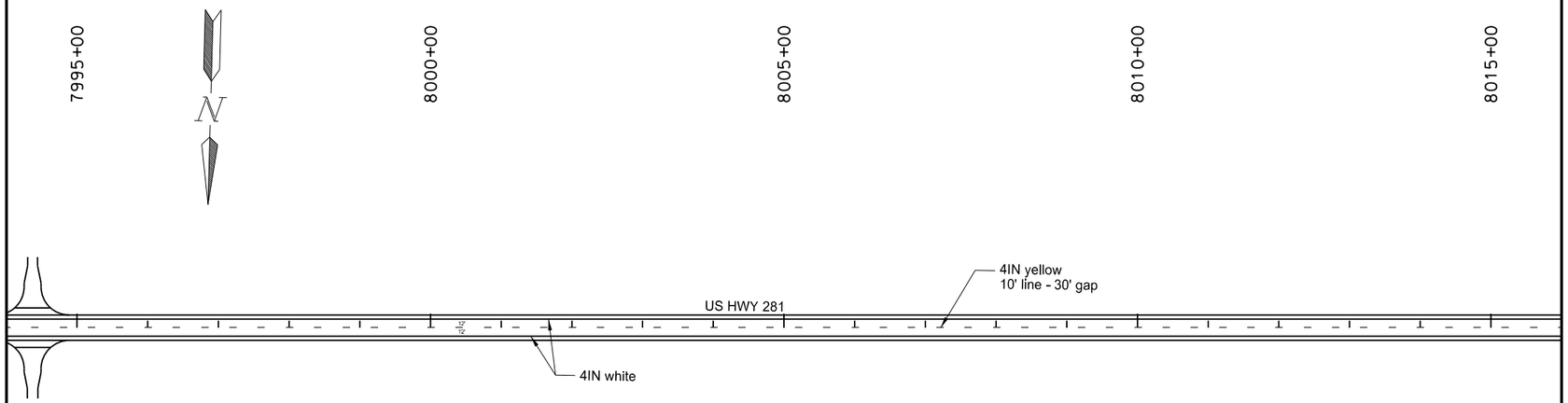
	ND	NH-3-281(130)148	120	6





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US Highway 281

Pavement Marking

Sta 7975+00 to 8015+00

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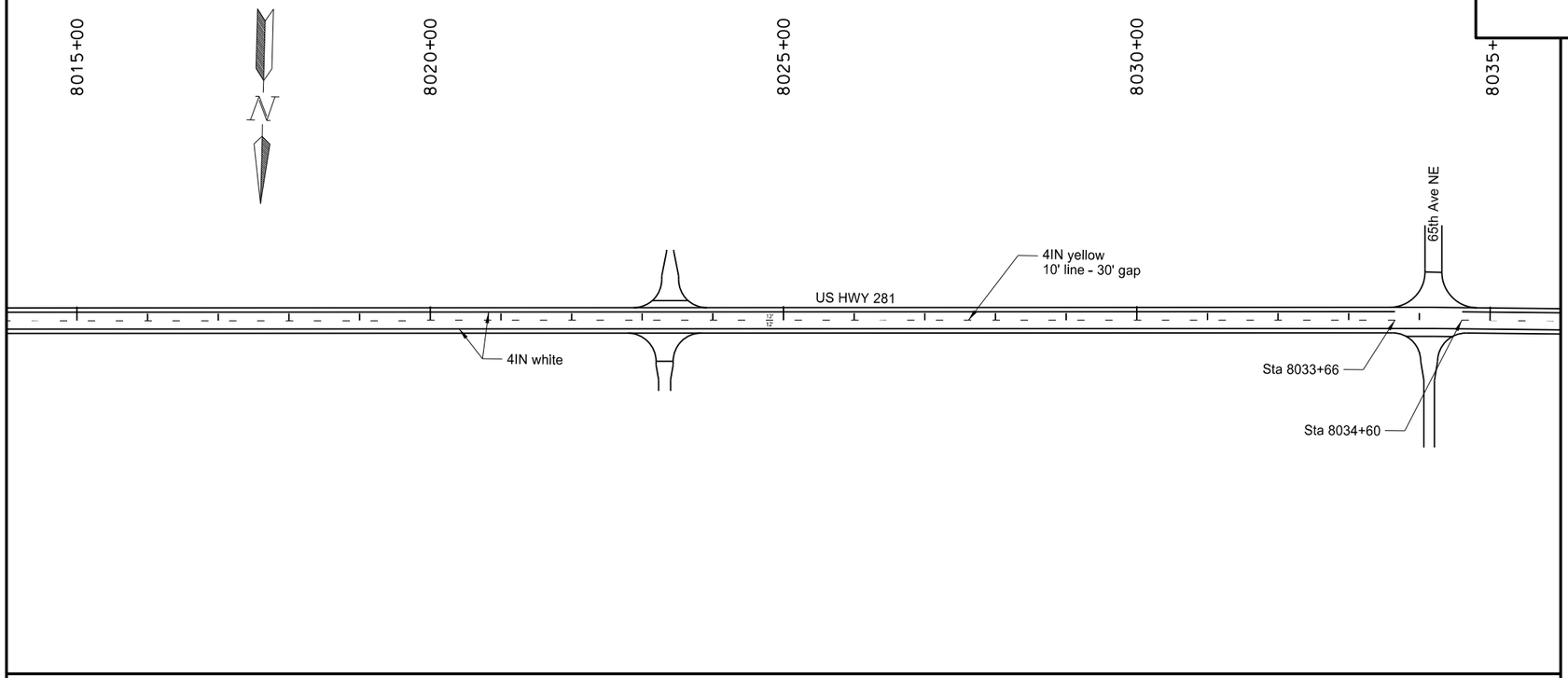
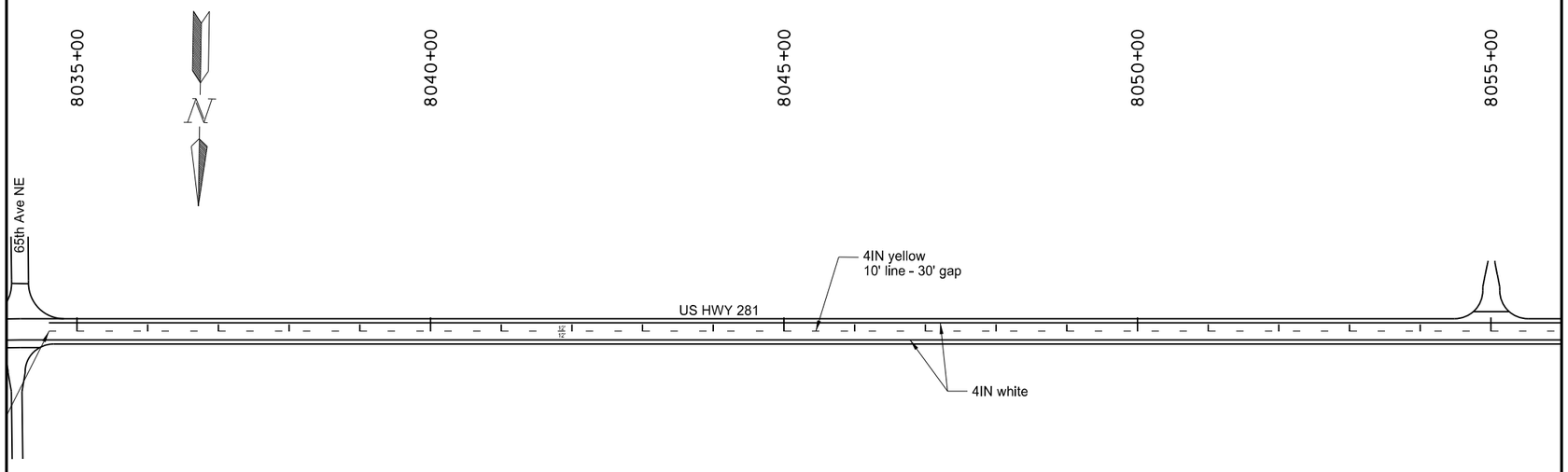
ND	NH-3-281(130)148	120	7





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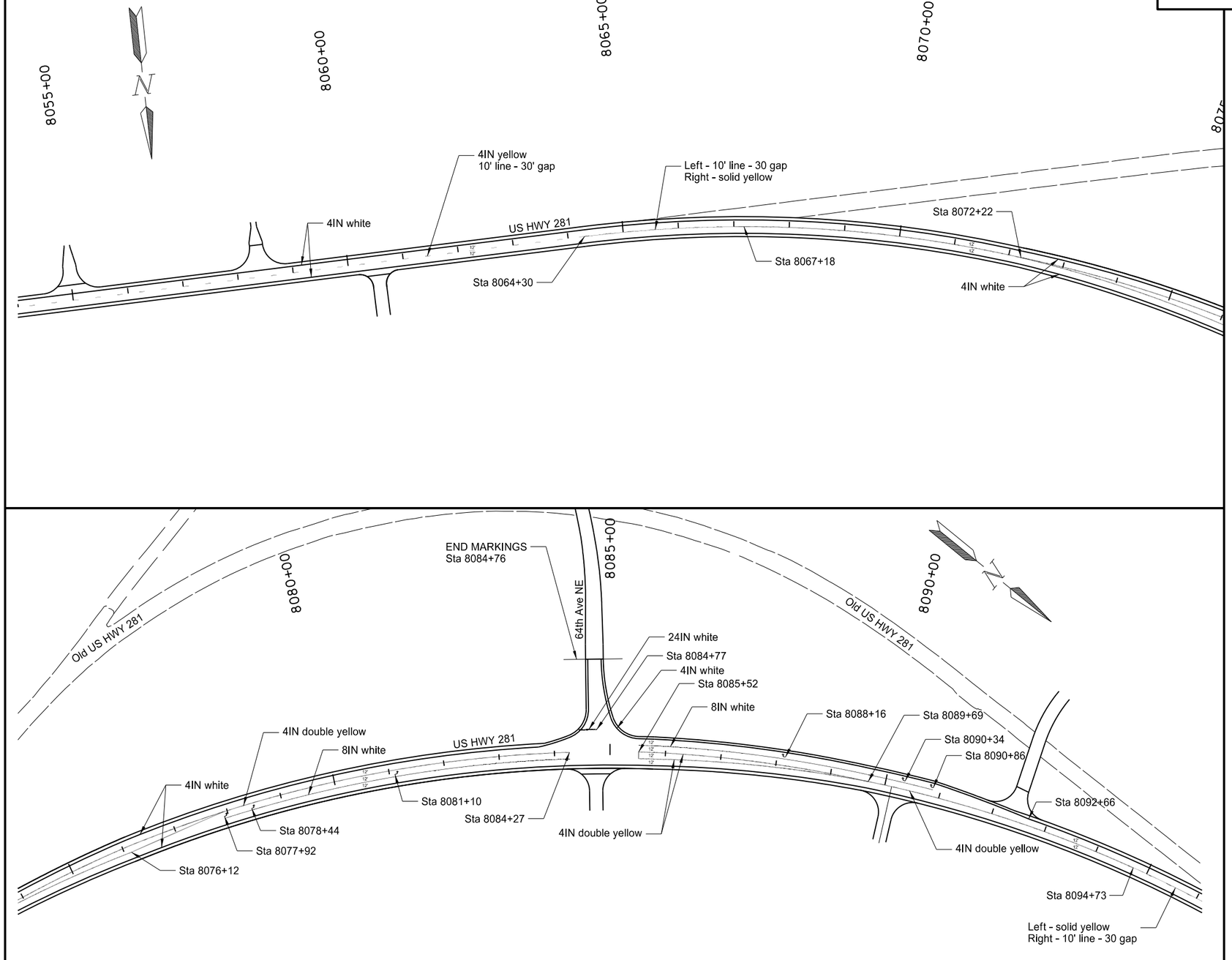
US Highway 281

Pavement Marking

Sta 8015+00 to 8055+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	120	8



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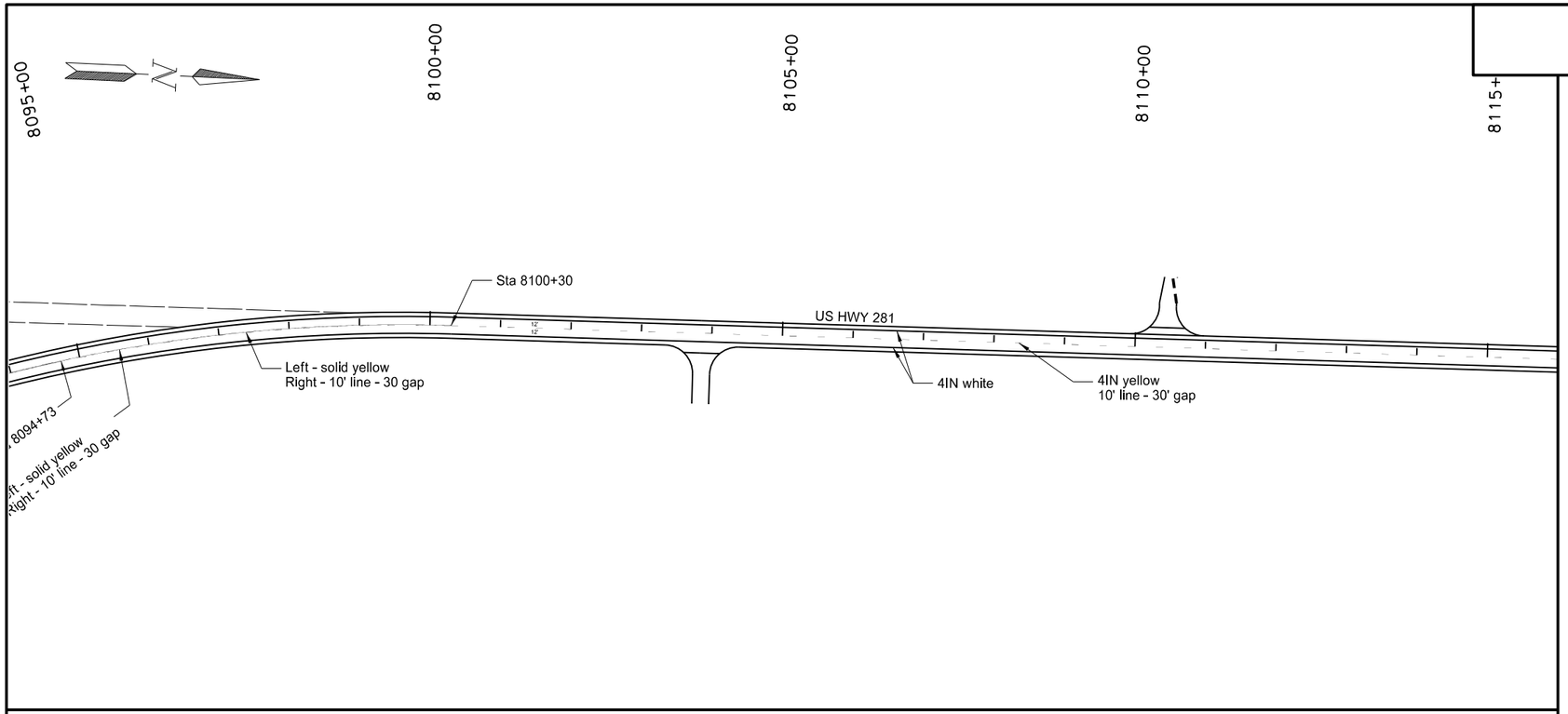
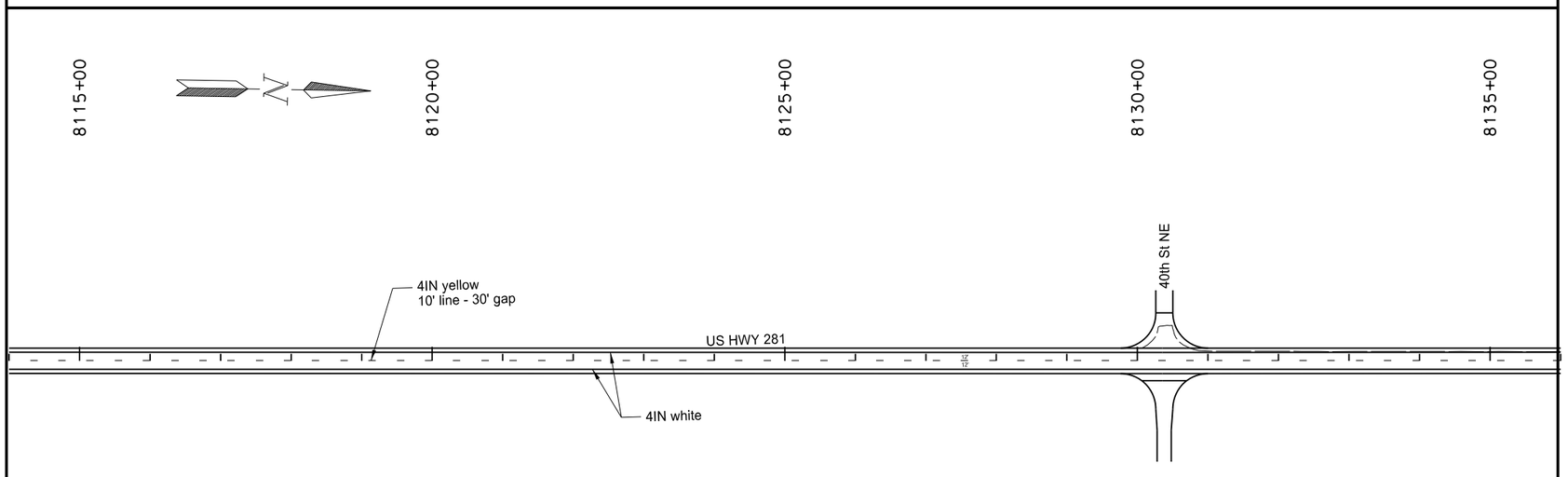
US Highway 281

Pavement Marking

Sta 8055+00 to 8095+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	120	9





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US Highway 281

Pavement Marking

Sta 8095+00 to 8135+00

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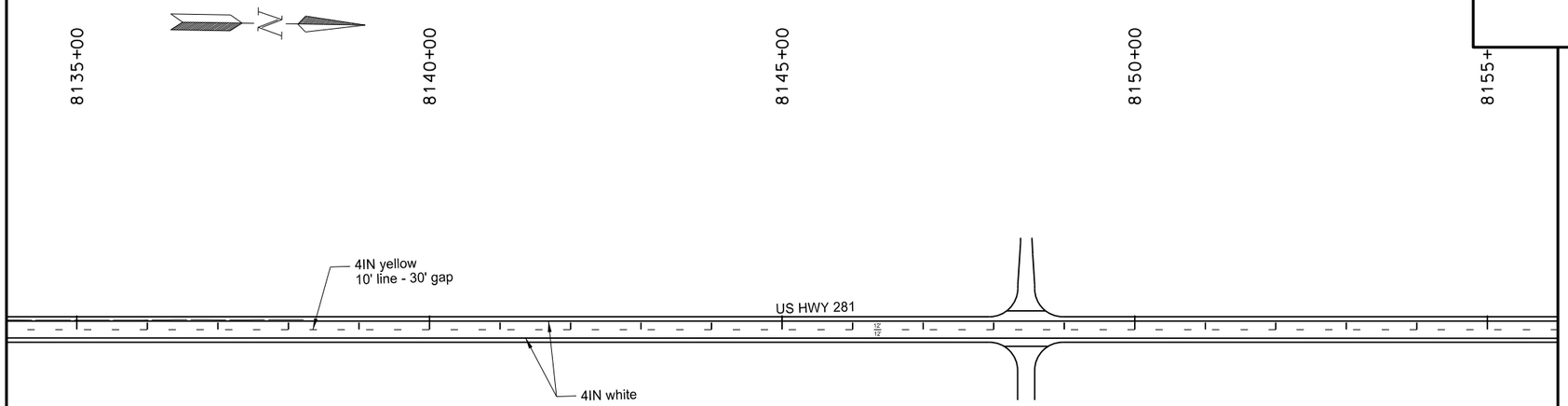
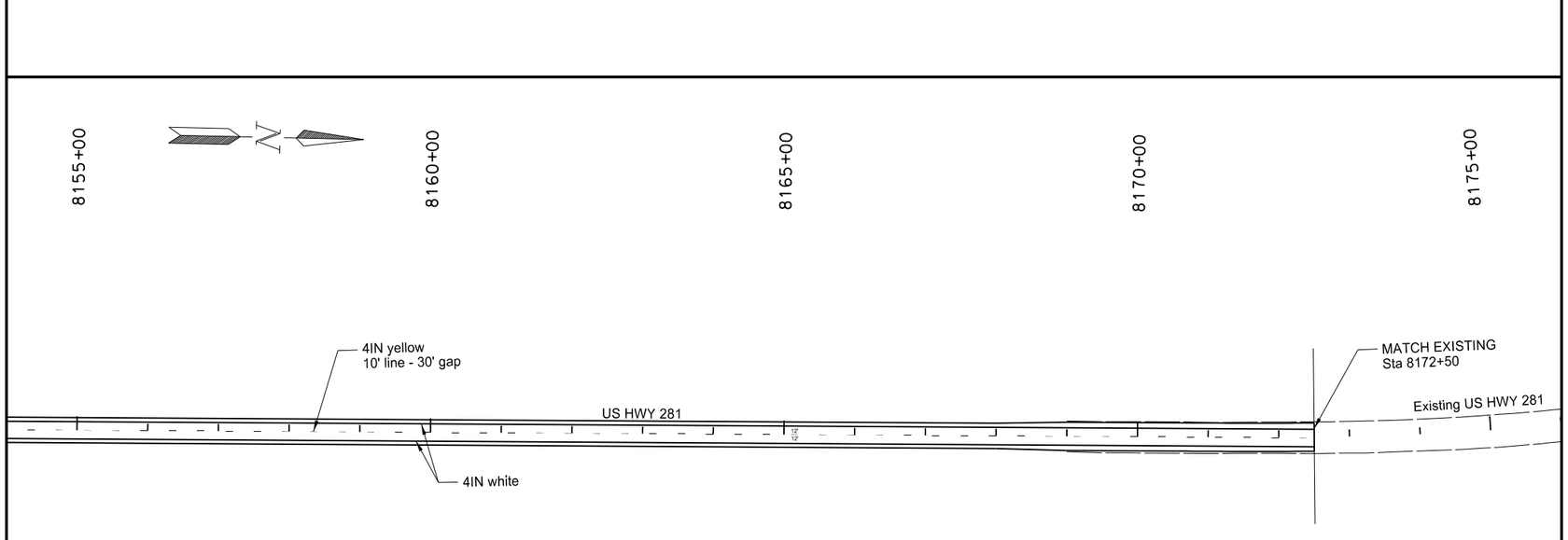
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	120	10





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US Highway 281

Pavement Marking

Sta 8135+00 to 8175+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	140	1

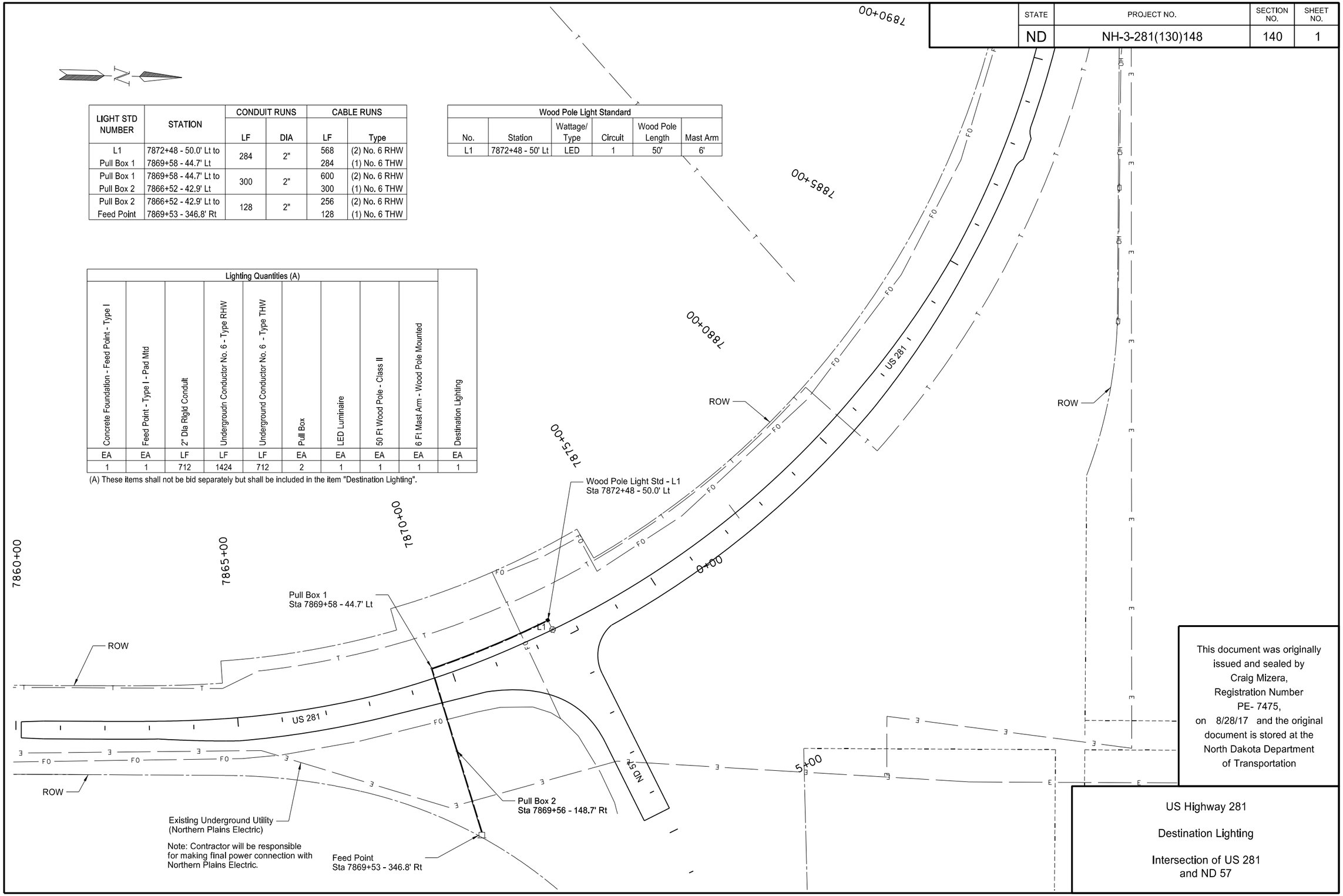
LIGHT STD NUMBER	STATION	CONDUIT RUNS		CABLE RUNS	
		LF	DIA	LF	Type
L1	7872+48 - 50.0' Lt to	284	2"	568	(2) No. 6 RHW
Pull Box 1	7869+58 - 44.7' Lt			284	(1) No. 6 THW
Pull Box 1	7869+58 - 44.7' Lt to	300	2"	600	(2) No. 6 RHW
Pull Box 2	7866+52 - 42.9' Lt			300	(1) No. 6 THW
Pull Box 2	7866+52 - 42.9' Lt to	128	2"	256	(2) No. 6 RHW
Feed Point	7869+53 - 346.8' Rt			128	(1) No. 6 THW

Wood Pole Light Standard					
No.	Station	Wattage/ Type	Circuit	Wood Pole Length	Mast Arm
L1	7872+48 - 50' Lt	LED	1	50'	6'

Lighting Quantities (A)

Concrete Foundation - Feed Point - Type I	Feed Point - Type I - Pad Mtd	2" Dia Rigid Conduit	Undergroudn Conductor No. 6 - Type RHW	Underground Conductor No. 6 - Type THW	Pull Box	LED Luminaire	50 Ft Wood Pole - Class II	6 Ft Mast Arm - Wood Pole Mounted	Destination Lighting
EA	EA	LF	LF	LF	EA	EA	EA	EA	EA
1	1	712	1424	712	2	1	1	1	1

(A) These items shall not be bid separately but shall be included in the item "Destination Lighting".



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US Highway 281

Destination Lighting

Intersection of US 281 and ND 57

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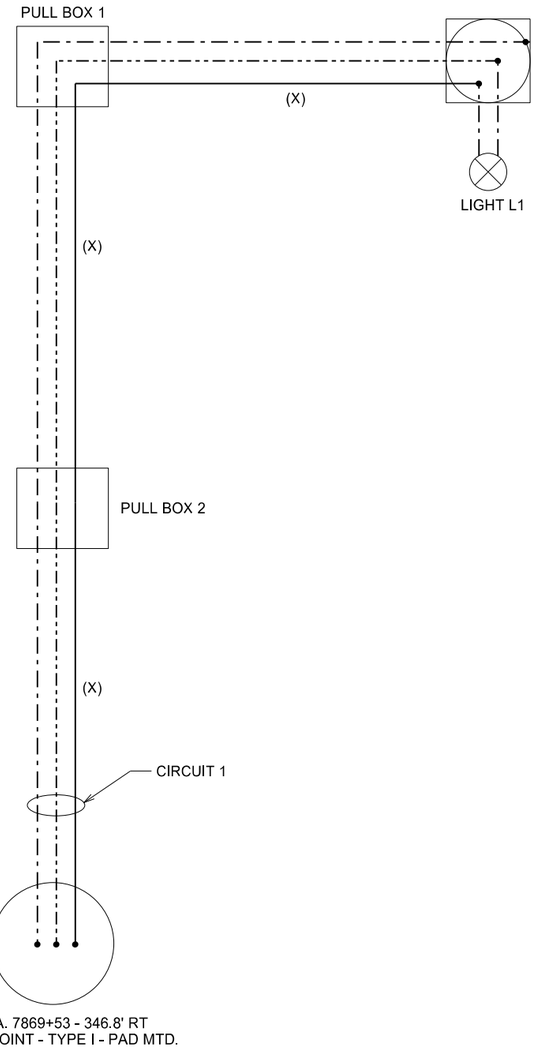
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	140	2



LEGEND

- LED Luminaire
- Feed Point - Pad Mounted
- 11 — Light Standard Number
- 50' Wood Pole - Class II
- Pull Box
- Phase Conductor
- Phase Conductor
- Ground
- (X) — (2) No 6 RHW, (1) No 6 THW

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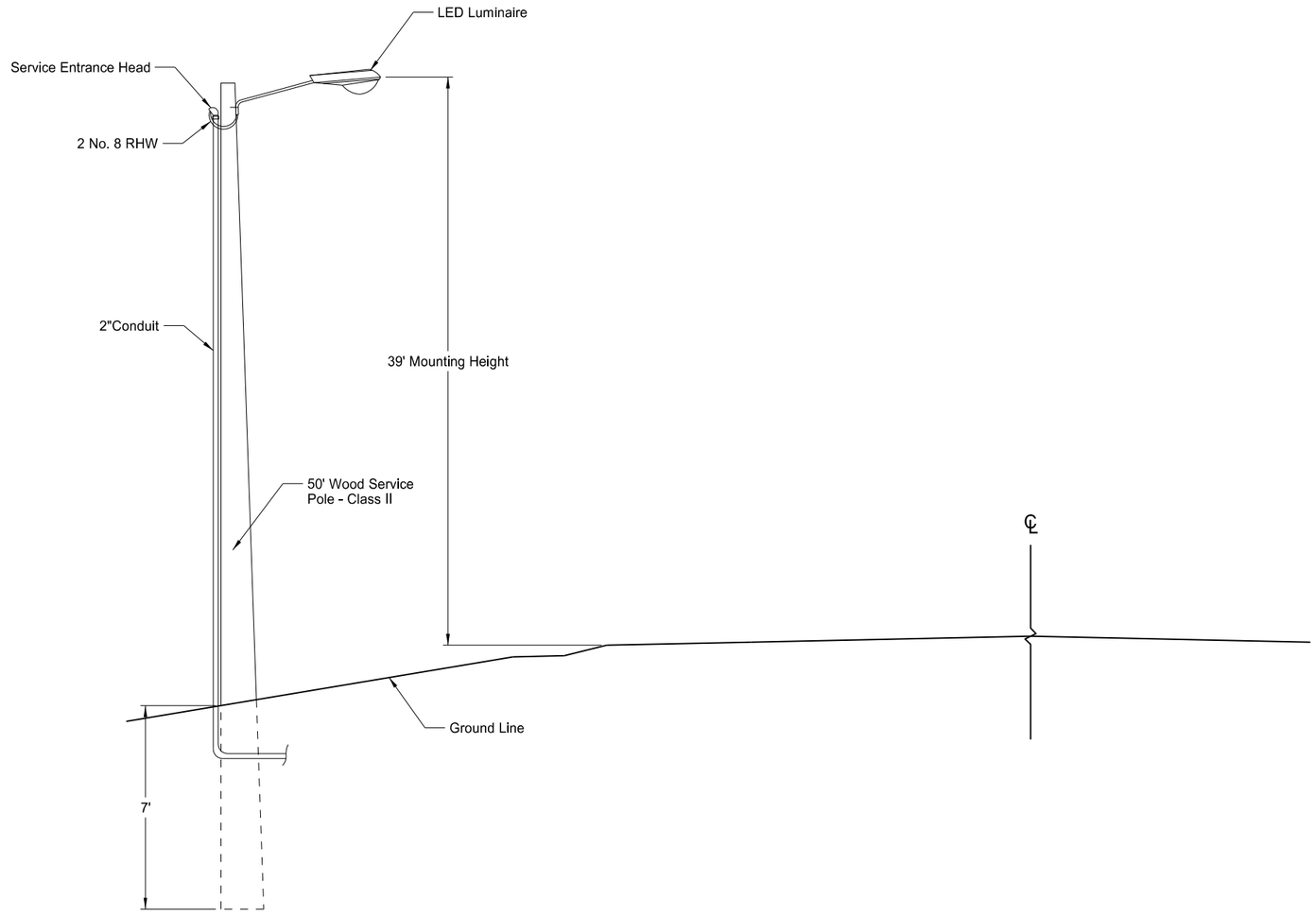
US Highway 281

Destination Lighting Schematic

Intersection of US 281 and ND 57

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	140	3



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US Highway 281

Destination Lighting Detail

Intersection of US 281 and ND 57

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-281(130)148	180	1

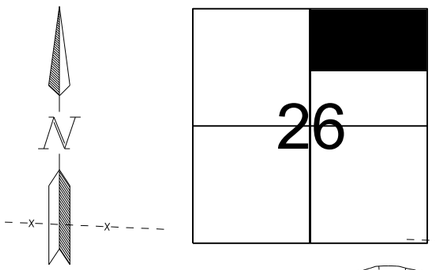
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

TEST HOLE PLAT

Location: N1/2 NE1/4 26-151-68 County: Benson

Ownership: Carol Tweten, Fargo, North Dakota

LOCATION OF PIT IN SECTION



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

PIT "B"

PIT "A"

Area "A" consists of Test Holes 1-9
Area "B" consists of Test Holes 10-21
Area "C" consists of Test Holes 22-35
Area "D" consists of Test Holes 36- 44
Area "E" consists of Test Holes 45 - 51
Area "F" consists of Test Holes 52-60
Area "G" consists of Test Holes 61-69
Area "H" consists of Test Holes 70-78
Area "I" consists of Test Holes 79-87
Area "J" consists of Test Holes 88-94
Area "K" consists of Test Holes 95-101
Area "L" consists of Test Holes 102-109
Area "M" consists of Test Holes 110-118
Area "N" consists of Test Holes 119-127
Area "O" consists of Test Holes 128-137
Area "P" consists of Test Holes 138-145

Creek & Low Area
Creek & Low Area
Creek & Low Area
Gravel Roadway Centerline
Gravel Roadway Centerline
Gate
Gate
Orange Post & Rebar
Orange Post
Rebar

Scale 1"=200'

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PIT "A"

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	180	2

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1" Screen	% Retained on " Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
1	4.0	8.0 CGr	7	22	33	43	WL
2	1.0	2.0 CGr	6	18	31	43	WL
		2.0 gr					
		5.0 CGr					
		1.0 gr					
		1.0 CGr					
3	3.0	5.0 CGr	3	11	23	37	WL
		2.5 gr					
4	1.5	4.5 CGr	7	20	32	43	WL
		2.0 gr					
		3.0 CGr					
5	0.5	11.5 CGr	6	26	41	53	WL
6	2.0	10.0 CGr	3	18	31	43	WL
7	0.5	10.5 CGr	3	18	33	43	WL
		1.0 gr					
8	0.5	7.5 CGr	3	18	30	42	WL
		2.0 gr					
9	1.0	2.0 gr	2	20	33	43	WL
		3.0 CGr					
		2.0 Fgr					
		2.0 gr					
		1.0 CGr					
10	2.0	5.0 CGr	2	14	28	38	WL
		4.0 gr					
11	0.5	3.5 CGr	0	5	11	15	WL
		7.0 sd					
12	1.0	4.0 CGr	3	8	13	17	WL
		3.0 Fgr					
		4.0 sd					
13	2.0	5.0 CGr	3	15	28	38	FS
		2.0 gr					
		1.0 Fgr					
14	1.0	5.0 CGr	7	20	31	42	WL
		4.0 gr					
		2.0 gr CoS					
15	2.0	4.5 CGr	6	15	23	30	WL
		2.5 gr					
		2.0 FS					
		0.5 gr					
16	1.5	2.5 CGr	1	14	28	44	WL
		8.5 gr					
17	1.0	5.0 CGr	8	22	34	44	WL
		2.0 gr sh					
		4.0 gr					
18	1.5	4.5 CGr					
		1.0 FS					
		4.0 gr					
		1.0 FS					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1" Screen	% Retained on " Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
19	1.0	1.5 CGr	9	22	30	38	sd sh
		0.5 gr sh					
		2.0 CGr					
		2.0 gr					
		1.0 sd sh					
20	0.5	3.5 CGr	4	16	26	34	FS
		1.0 Fgr					
		1.0 FS					
21	0.5	3.5 CGr	3	15	25	34	FS
		0.5 gr					
		0.5 FS					
22	0.5	5.5 CGr	8	22	35	45	WL
23	1.5	3.5 CGr	3	15	28	40	gr SiCl
		1.0 gr sh					
24	1.5	2.5 CGr	6	16	29	42	WL
		6.0 gr					
		1.0 FS					
		1.0 gr					
25	1.5	1.5 CGr	1	5	8	11	FS
		1.0 Fgr					
		6.0 sd sh					
26	1.0	3.0 CGr	5	13	21	27	FS
		4.0 sd sh					
27	2.0	2.0 CGr	3	8	14	18	sd
		2.0 Fgr					
		3.0 sd					
28	1.5	1.5 CGr	1	6	11	16	SiCl
		2.0 gr					
		4.0 sd					
29	1.5	1.5 CGr	3	8	13	17	SiCl
		3.0 CS					
30	3.5	4.5 gr	2	12	23	37	WL
31	2.5	0.5 gr	2	15	27	40	WL
		2.0 FS					
		3.0 gr					
		1.0 sd					
32	2.0	4.0 gr	2	15	31	43	WL
		2.0 sd					
33	1.0	2.0 CGr	4	13	19	31	sd
		2.5 gr					
		1.5 sd					
		1.0 sd sh					
34	0.5	3.5 CGr	3	12	23	31	WL
		3.0 CS					
		3.0 gr					
35	1.0	4.0 gr	7	21	32	41	WL
		4.0 Fgr					
		2.5 gr					
36	2.0	4.0 CGr	5	18	30	40	WL
		4.0 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1" Screen	% Retained on " Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
37	2.0	3.0 CGr	4	15	24	32	WL
		4.0 Fgr					
		1.0 CGr					
38	1.5	3.5 CGr	2	11	18	28	WL
		2.0 Fgr					
		2.0 Fgr sh					
39	1.0	7.0 CGr	10	23	38	50	WL
		3.0 gr					
40	2.0	5.0 CGr	6	16	24	33	WL
		2.0 Fgr					
		2.0 sd sh					
41	1.0	8.0 CGr	6	20	31	41	WL
		3.0 gr					
42	1.5	6.5 CGr	5	23	35	45	WL
		2.0 gr					
		2.0 Fgr					
43	2.0	8.5 CGr	8	25	35	44	WL
		0.5 sd sh					
44	1.0	3.5 CGr	2	13	26	37	WL
		1.5 Fgr					
		3.5 gr					
		1.5 Fgr					
		2.0 gr					
45	0.5	4.5 gr	7	18	30	41	WL
		1.0 Fgr					
		2.0 CGr					
		2.0 Fgr					
		1.0 sd					
		2.0 gr					
46	2.0	4.5 gr	0	8	20	31	WL
		2.5 Fgr					
47	2.5	1.5 gr	12	27	36	43	WL
		1.0 FS					
		2.0 CGr					
48	4.0	1.0 CGr	2	11	18	25	WL
		2.0 Fgr sh					
		2.5 gr					
49	1.0	5.0 CGr	3	16	24	34	WL
		2.0 gr					
		3.5 Fgr					
50	1.0	3.5 CGr	9	18	26	32	WL
		1.5 gr					
		3.0 sd sh					
51	2.5	1.5 CGr	2	11	18	25	WL
		2.0 gr					
		1.0 Fgr sh					
		2.0 CS					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1" Screen	% Retained on " Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	
A	2.0	1.0 FS	8	14	18	22	SiCl
		1.0 gr					
		2.0 FS					
		1.0 CGr					
B	3.0	3.0 Fgr					WL
C	1.5	2.5 CGr					SiCl
D	1.0	3.0 CGr					rk
E	2.0	3.0 CGr					SiCl
F	3.0	2.0 CGr					gr SiCl
J	1.0	3.0 CGr	6	17	28	34	SiCl
		2.0 gr					
		2.0 FS					
		1.0 CGr					
		1.0 gr					

Letter Holes are not included in pit quanities or calculations.

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COUNTY Benson Oct-12

PROSPECTED BY Swank / Rogstad

INSPECTED & APPROVED B. Hoesel Dec-12

PIT "B"

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	180	3

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1" Screen	% Retained on " Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
52	1.0	4.0 gr	0	1	4	15	WL
		4.0 sd					
53	1.0	6.0 gr	1	4	14	35	WL
		1.0 CS					
		2.0 Fgr					
54	0.5	10.0 gr	1	13	33	52	WL
55	1.0	7.0 gr	4	20	40	54	WL
		2.0 CGr					
56	1.0	9.5 gr	1	11	30	51	WL
57	1.0	4.0 gr	0	3	16	37	WL
		5.0 Fgr					
58	1.0	9.0 gr	1	14	36	54	WL
59	1.0	5.0 gr	5	23	40	55	WL
		5.0 CGr					
60	1.0	4.0 gr	6	28	45	58	WL
		5.5 CGr					
61	1.0	9.0 CGr	10	33	48	60	WL
62	0.5	10.0 CGr	10	36	54	64	WL
63	1.0	10.0 CGr	8	33	51	64	WL
64	0.5	10.5 CGr	13	35	51	63	WL
65	1.0	11.0 CGr	8	26	43	54	WL
66	1.0	10.5 CGr	7	30	48	60	WL
67	0.5	10.5 CGr	3	23	43	53	WL
68	1.0	10.5 CGr	8	32	50	60	WL
69	0.5	8.5 CGr	3	21	48	59	WL
		2.5 CgrSiCl					
70	1.0	11.0 CGr	8	33	51	64	WL
71	0.5	9.5 CGr	3	32	50	60	WL
		0.5 gr SiCl					
72	0.5	11.5 CGr	12	40	55	65	WL
73	0.5	8.5 CGr	4	26	50	63	WL
		2.0 CgrSiCl					
74	0.5	10.5 CGr	8	37	56	69	WL
75	2.0	1.0 CS	3	29	46	62	WL
		3.0 CGr					
		1.0 gr					
		2.0 CGr					
		2.0 gr SiCl					
76	1.0	9.5 CGr	8	31	48	62	WL
77	1.0	9.0 CGr	3	22	45	60	WL
78	1.0	4.0 CGr	8	21	43	61	WL
		1.0 CgrSiCl					
		4.0 CGr					
79	1.0	2.0 CGr	1	14	33	55	WL
		2.0 gr					
		2.0 CgrSiCl					
		2.0 CGr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1" Screen	% Retained on " Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
80	1.0	1.5 gr	7	24	43	58	WL
		2.5 CGr					
		1.0 CGrSiCl					
		2.5 CGr					
81	1.0	1.0 CGr	1	11	35	47	WL
		2.0 gr					
		2.0 CGrSiCl					
		1.0 gr					
		1.0 CGr					
82	1.0	7.0 CGr	5	20	38	53	WL
83	0.5	3.5 CGr	1	12	31	49	WL
		2.0 gr SiCl					
		1.0 gr CoS					
		2.5 CGr					
84	0.5	9.5 CGr	5	23	44	61	WL
85	0.5	7.5 CGr	3	22	45	61	WL
		1.0 CGrSiCl					
		1.0 gr					
86	0.5	6.5 CGr	6	23	48	64	WL
		2.0 CGrSiCl					
87	0.5	5.5 CGr	3	25	45	60	WL
		2.0 CGrSiCl					
		2.0 CGr					
88	1.0	8.0 CGr	4	22	43	59	WL
89	1.0	1.0 CGr	2	12	28	46	WL
		1.0 Fgr					
		2.0 CGrSiCl					
		1.0 CGr					
		1.0 Fgr					
		2.0 CGr					
		1.0 CS					
		2.0 Fgr					
		2.0 CGr					
90	1.0	7.0 gr	3	13	28	49	WL
91	2.0	2.0 gr	3	9	23	40	WL
		1.0 Fgr					
		2.5 CGr					
92	1.0	1.0 CGr	1	6	22	38	WL
		1.0 Fgr					
		2.0 CGrSiCl					
		1.0 CS					
		2.0 Fgr					
		1.0 CGr					
93	1.0	3.0 CGr	4	22	39	55	WL
		3.0 CGrSiCl					
		3.0 Fgr					
94	1.0	3.0 CGr	1	6	26	46	WL
		1.0 sd					
		2.0 CGrSiCl					
		1.5 Fgr					
95	1.5	5.5 Fgr	0	8	20	42	WL

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1" Screen	% Retained on " Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
96	0.5	3.5 CGr	2	12	27	50	WL
		3.0 gr					
97	3.0	1.0 CGr	1	11	33	53	WL
		1.0 Fgr					
		1.0 gr SiCl					
		2.0 gr CoS					
98	2.5	2.5 CGr	3	18	38	61	WL
		1.0 CGrSiCl					
		3.0 gr					
99	0.5	2.5 CGr	1	11	24	38	WL
		4.0 Fgr					
100	2.0	7.0 Fgr	2	8	15	32	WL
101	1.0	2.0 gr	1	8	25	44	WL
		2.0 CGr					
		2.0 Fgr					
		1.0 CGr					
102	1.0	4.0 CGr	2	12	32	51	WL
		2.0 CGrSiCl					
		3.0 CGr					
103	0.5	2.5 CGr	6	22	41	58	WL
		1.0 Fgr					
		3.0 CGr					
		1.0 CGrSiCl					
104	0.5	4.5 CGr	3	14	32	53	WL
		4.0 CGrSiCl					
		1.0 CGr					
105	1.0	2.0 CGr	8	18	33	52	WL
		1.0 gr CoS					
		1.0 CGr					
		1.0 CGrSiCl					
		1.5 gr					
		0.5 gr CoS					
		2.0 gr					
106	0.5	5.5 CGr	2	13	31	47	WL
		1.0 gr SiCl					
		1.0 Fgr					
		1.5 gr CoS					
107	1.0	3.0 CGr	6	18	38	56	WL
		1.0 CGrSiCl					
		1.0 CGr					
		3.0 CGrSiCl					
		2.0 gr					
108	1.0	3.0 CGr	3	15	31	48	WL
		2.0 gr CoS					
		2.0 CGr					
		1.0 gr					
		1.5 CGr					
109	1.0	2.0 CGr	1	8	23	44	WL
		6.5 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1" Screen	% Retained on " Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	
110	0.5	10.5 CGr	7	30	47	61	WL
111	1.0	3.0 CGr	6	27	48	61	WL
		1.0 CGrSiCl					
		6.0 CGr					
112	0.5	6.5 CGr	8	33	53	65	WL
		1.0 gr					
		3.0 CGr					
113	1.0	6.0 CGr	3	17	38	56	WL
		1.0 gr CoS					
		2.0 gr SiCl					
		2.0 CGr					
114	1.5	8.5 CGr	3	22	41	56	gr SiCl
		1.0 CGrSiCl					
115	1.0	4.0 CGr	7	25	48	64	WL
		1.0 CGrSiCl					
		3.0 CGr					
		1.0 CGrSiCl					
		4.0 CGr					
116	1.0	5.0 CGr	5	22	41	56	WL
		1.0 CGrSiCl					
		1.0 Fgr					
		1.0 gr					
		2.0 CGrSiCl					
117	1.0	7.0 CGr	6	21	38	56	WL
		1.0 gr CoS					
		1.0 CGrSiCl					
		2.5 CGr					
118	1.0	6.0 CGr	5	16	34	53	WL
		1.0 gr CoS					
		0.5 gr SiCl					
		0.5 CGr					
		2.5 Fgr					
119	0.5	10.5 CGr	8	33	50	61	WL
120	0.5	10.0 CGr	6	28	48	58	WL
121	1.0	9.0 CGr	2	22	46	59	WL
122	1.0	12.0 CGr	8	28	51	64	WL
		1.0 gr SiCl					
123	1.0	10.0 CGr	10	36	51	62	WL

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PROSPECTED BY Swank / Rogstad

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-281(130)148	180	4

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ⅜" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
124	1.0	5.0 gr	7	26	43	54	WL
		5.0 CGr					
125	1.0	12.5 CGr	11	39	55	66	rk
126	1.0	2.0 gr	13	39	56	65	gr SiCl
		8.0 CGr					
		1.0 CGrSiCl					
		2.0 CGr					
127	1.0	8.0 CGr	12	36	55	68	WL
		1.0 CGrSiCl					
		3.5 CGr					
128	1.0	2.0 gr	9	34	55	67	WL
		9.0 CGr					
		1.0 CGrSiCl					
		2.0 CGr					
129	1.0	5.0 CGr	3	22	46	64	WL
		2.0 gr SiCl					
		2.0 CGr					
		3.0 gr SiCl					
		1.0 CGr					
130	1.0	7.0 gr	2	14	35	53	WL
		4.0 gr SiCl					
		2.0 gr					
131	1.0	3.0 CGr	3	20	40	55	WL
		1.5 gr					
		0.5 gr CoS					
		1.0 Fgr					
		2.0 gr SiCl					
		1.0 gr					
		1.0 gr SiCl					
		2.0 gr					
132	1.0	1.0 CGr	3	19	38	55	WL
		3.0 gr					
		1.5 gr SiCl					
		0.5 Fgr CoS					
		1.0 FgrSiCl					
		1.0 gr					
		4.0 gr SiCl					
133	1.0	5.0 CGr	5	17	39	56	gr SiCl
		0.5 gr SiCl					
		0.5 gr					
		1.5 gr SiCl					
		0.5 gr					
134	1.0	4.0 CGr	1	13	34	53	SiCl
		1.0 FgrSiCl					
		1.0 Fgr					
		1.5 FgrSiCl					
		0.5 Fgr					
		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 ⅜" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
135	1.0	3.0 CGr	4	18	33	51	WL
		5.0 gr SiCl					
		1.0 gr					
		1.0 gr SiCl					
		2.0 gr					
136	1.0	3.0 gr	1	16	34	50	WL
		6.0 gr SiCl					
		2.0 Fgr					
137	1.0	4.0 CGr	4	20	38	56	WL
		0.5 Fgr					
		0.5 Fgr CoS					
		3.0 FgrSiCl					
		4.0 gr					
138	1.0	5.0 gr	1	18	38	59	WL
		5.5 gr SiCl					
		0.5 gr					
139	1.0	4.0 CGr	3	15	32	48	WL
		6.5 gr					
140	1.0	6.0 gr	1	15	30	51	WL
		0.5 Fgr					
		0.5 gr					
		0.5 gr CoS					
		0.5 gr					
		2.0 Fgr					
141	4.0	2.0 CGr	5	12	25	44	WL
		1.0 gr SiCl					
		3.5 gr					
142	3.0	4.0 Fgr	1	6	18	35	SiCl
143	1.5	5.0 CGr	8	20	35	48	WL
		0.5 gr SiCl					
		4.0 gr					
144	2.0	2.0 CGr	1	15	36	56	WL
		3.0 gr SiCl					
		0.5 gr CoS					
		3.0 gr SiCl					
		2.5 gr					
145	2.5	2.5 CGr	2	13	26	42	SiCl
		6.0 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ⅜" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
G	3.0	2.0 gr					WL
H	3.0	1.0 gr SiCl					WL
I	4.0	3.0 sd					WL
K	1.0	11.0 CGr	15	41	58	68	WL

Letter Holes are not included in pit quanities or calculations.

For informational use only.

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ⅜" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole

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