DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 2013	Pass: 1095	Trucks: 180	Total: 1275	130
Forecast 2033	Pass: 1415	Trucks: 260	Total: 1675	170
Clear Zone Distance: N/A		Design Speed: 25		
Minimum Sight Dist. for Stopping: N/A		Bridges: N/A		
Sight Dist. for No Passing Zone: N/A				
Pavement Design Life 20 (years)		Design ESALs: ____		

	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	19254	1	1

JOB # 11

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

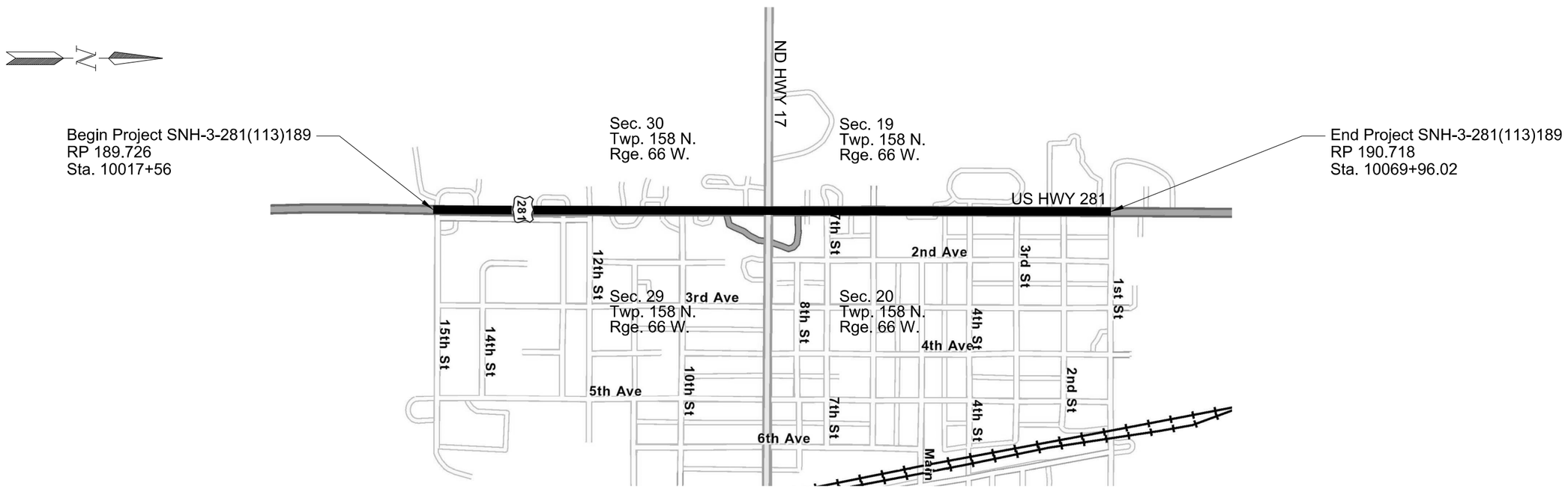
SNH-3-281(113)189
FHWA Limited Involvement

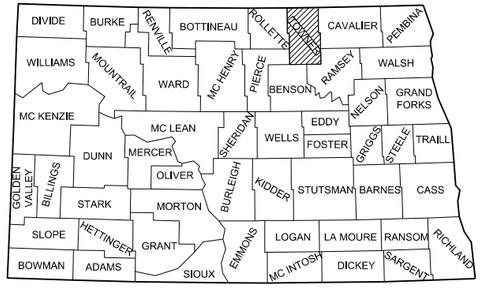
Towner County
US Hwy 281 through the City of Cando

Milling, Hot Bituminous Pavement, Subgrade Repair, Flashing Beacon, Signing, Curb Ramp Improvements

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

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SNH-3-281(113)189	0.992	0.992





STATE COUNTY MAP

DESIGNERS

Michael R. Rivinius, PE

Jason Robertson, LSI

Jason Mayfield, PE

APPROVED DATE 8/21/13

Roger Weigel /s/ for
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 08/19/13

Michael R. Rivinius
Wold Engineering, P.C.

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446 , on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	2	1

TABLE OF CONTENTS

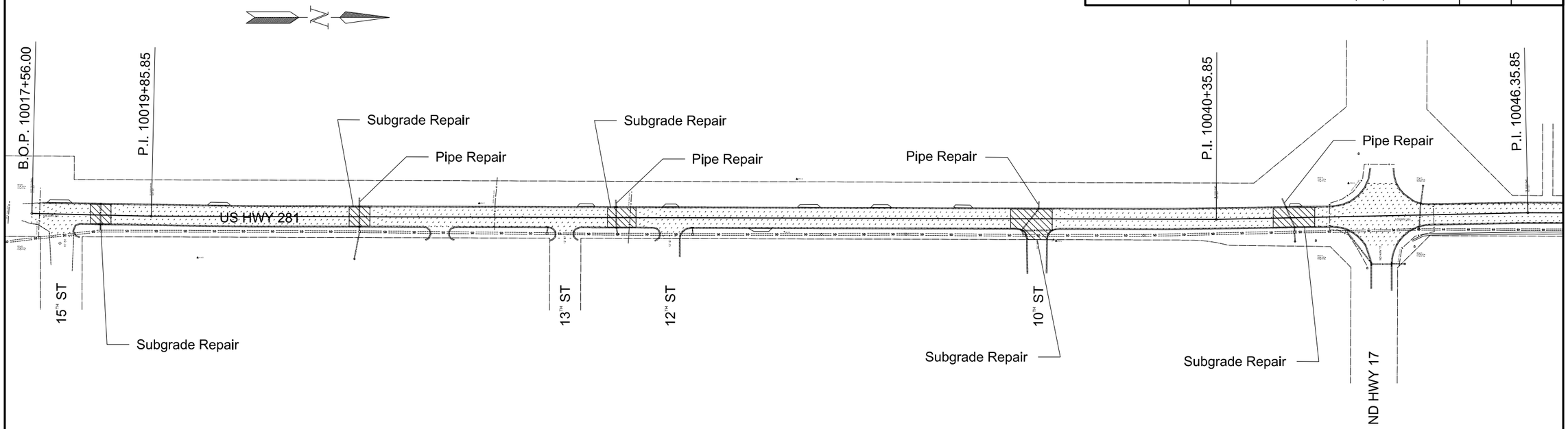
LIST OF STANDARD DRAWINGS

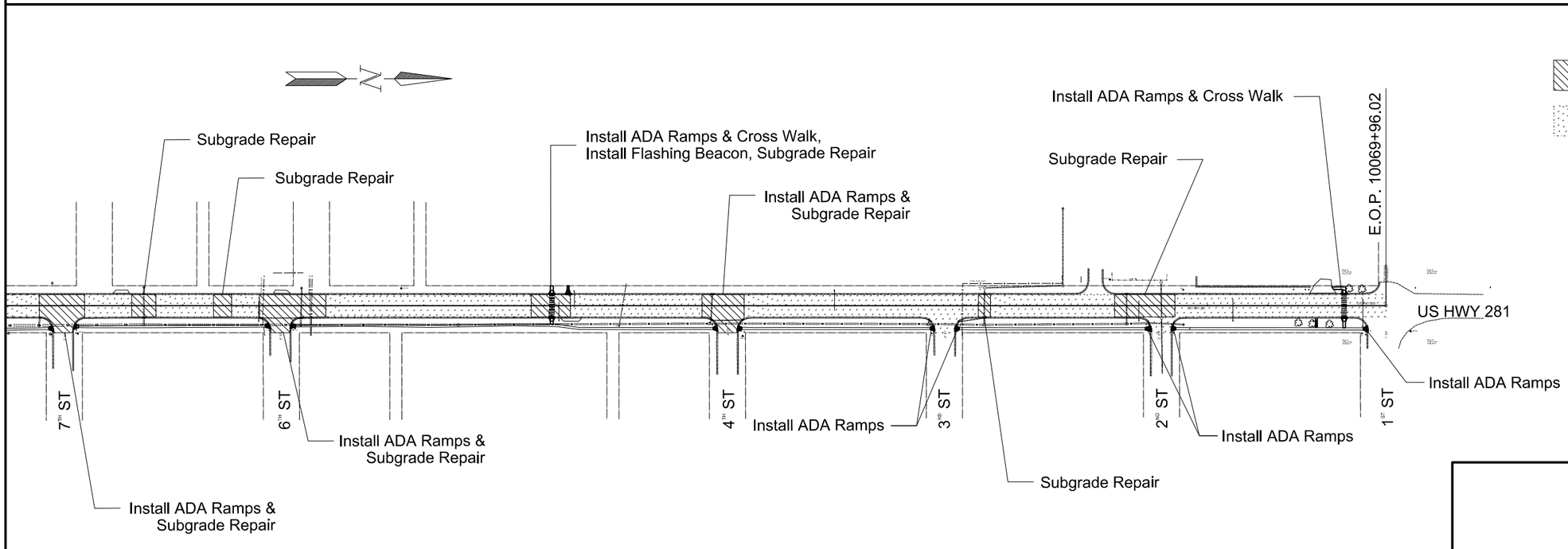
Standard No.	Description
D-20-1, 2, 3, 10	NDDOT Abbreviations
D-20-20, 21	Line Styles
D-20-30, 31, 32	Symbols
D-704-2	Traffic Control For Coring of Hot Bituminous Pavement
D-704-4	Work Zone Business Sign Details
D-704-7, 8	Breakaway Systems for Construction Zone Signs
D-704-9, 10, 11	Construction Sign Details
D-704-13, 14	Construction Sign and Barricade Assembly Details
D-704-15, 19, 20	Construction Sign and Barricade Location Details
D-704-22, 25, 27	Construction Sign and Barricade Location Details
D-704-28	Traffic Control for Mobile Operations
D-704-50	Portable Sign Support Assembly
D-706-1	Type C Field Laboratory
D-708-6	Erosion Control Median or Ditch Inlet Protection
D-708-7	Erosion Control Fiber Roll Staking Details
D-714-25	Transverse Centerline Pipe Backfill for Pipes more than 4 Feet Below The Proposed Base
D-714-26	Transverse Centerline Pipe Backfill for Pipes 4 Feet Or Less Below The Proposed Base
D-748-1	Valley Gutter and Curb & Gutter
D-750-2	Sidewalk and Curb Ramps
D-750-3	Curb Ramp Details
D-754-4	Multi-Directional Break Away Base
D-754-9	Letter and Arrow Details for Variable Length Signs
D-754-23	Assembly Details
D-754-24A	Breakaway Coupler System for Perforated Tubes
D-754-24, 25	Mounting Details Perforated Tube
D-754-26, 28	Sign Punching, Stringer, and Support Location Details
D-762-1	Pavement Marking and Message Details
D-762-4	Pavement Marking
D-762-6	Short Term Parking
D-772-2	Traffic Signal Standards
D-772-7	Flashing Beacon

LIST OF SPECIAL PROVISIONS

SP 1101(08)	Split Sampling and Testing Requirements for Aggregate Base
SP 1275(08)	Weather Limitations for Hot Bituminous Mix

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	4	1





Legend

Subgrade Repair

Mill & Overlay

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

SCOPE OF WORK

8/14/2013 11:28:50 AM Scott S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\004SW_001_SCOPE.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	6	1

NOTES

100-P01 **WEEKLY PUBLIC INFORMATIONAL MEETING:** A weekly public informational meeting will be held to better disseminate the information to all interested parties.

A. Purpose of Weekly Meeting:

1. To review the previous and next week's schedule.
2. To review the traffic operations.
3. Discuss project expectations and goals.

B. Contractor's Requirements:

1. The Contractor shall provide a suitable meeting facility-room that has been approved by the engineer. The cost of providing this meeting facility-room shall be included in the price bid for other items.
2. The Contractor will be responsible for sending the designated Public Relations Coordinator to conduct the Weekly Public Informational Meeting. It will be the Contractor's responsibility to prepare and distribute the minutes for each meeting within three working days.
3. The Contractor will be required to provide a written schedule of the next week's work and a tentative schedule of the following week.
4. Public Informational Meeting will include discussion of schedule delays during the current week, information of interest to local authorities, utilities, and the local communities.
5. Inform the NDDOT, Local Agencies, and utility companies of the time and location these meetings will be held.

100-P02 **WEEKLY PROJECT MEETING:** The contractor will plan a meeting each week with the Engineer and sub-contractors to go over the project.

A. Purpose of Weekly Meeting:

1. To review the previous and next week's schedule.
2. To review the traffic operations.
3. Discuss project expectations and goals.

B. Contractor's Requirements:

1. The Contractor shall provide a suitable meeting facility-room that has been approved by the engineer. The cost of providing this meeting facility-room shall be included in the price bid for other items.
2. The Contractor shall invite all active sub-contractors and also those that will be required to perform work within the next week.
3. The Contractor will be required to provide a written schedule of the next week's work and a tentative schedule of the following week.
4. It will be the Contractor's responsibility to prepare and distribute the minutes for each meeting within three working days.

100-P03 **NOISE ORDINANCE:** No construction activities shall occur between the hours of 10:00 p.m. to 7:00 a.m. unless the Contractor obtains written permission from the Engineer.

100-P04 **UNDERGROUND UTILITIES COORDINATION:** The Contractor shall arrange a Post Bid Utility Coordination Meeting with affected Utility Companies, NDDOT Devils Lake District Office, and the Project Engineer. This meeting shall be in addition to the preconstruction meeting. The Post Bid Utility Coordination Meeting shall be held near the project area or at the District office and shall be held no later than two weeks after the Department and the Contractor have executed the contract, as approved by the Engineer. The contractor shall provide an agenda for the meeting, and be prepared to discuss the items on it. Items to discuss shall include, but not be limited to; plan for constructing the project, work schedule, utility adjustment/relocates needed prior to project start, utility adjustment/relocates that can be done concurrent with project, utility locates and site access. The contractor shall publish meeting minutes and distribute the minutes to all attendees and the NDDOT Utilities Engineer within one week after the meeting.

100-P05 **UTILITIES:** Notice shall be given to the utility companies a minimum of 2 weeks prior to work on the project. Utilities that the Engineer has been made aware of are shown on the plans. Other utilities may exist that are not shown. Power lines, telephone cables, rural water lines, and other utilities may be encountered on this project. The contractor shall be responsible to verify the locations and to notify all utility and pipeline companies to have the locations flagged and marked prior to beginning construction. Any charges by the utility companies for locates shall be paid by the contractor. The contractor will be liable for any costs resulting from damage to utilities or pipelines.

One-Call Service: 1-800-795-0555

100-P06 **EQUIPMENT OPERATING RESTRICTIONS:** The Contractor shall not operate equipment outside the corridor shown on the plan sheets. The corridor shall be defined as the width of cut or fill section as shown on the cross section sheets plus two feet on each side.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	6	2

NOTES

105-P01 **COORDINATION OF WORK:** It shall be the contractor's responsibility to coordinate activities, including but not limited to, haul routes, access, scheduling, and traffic control delineation with the contractors working on other projects in the area.

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

107-P02 **HAUL ROAD RESTORATION:** Any gravel or water needed for haul road restoration will be paid for under the NDDOT Price Schedule for Miscellaneous Items (PS-1). All gravel needed for haul road restoration will be CL-13 aggregate, accepted under Section 302 of the Standard Specifications.

202-P01 **REMOVAL OF CONCRETE SURFACING, CONCRETE, AND CURB & GUTTER:** Concrete surfacing, concrete, and curb and gutter designated for removal may vary in thickness. There will be no additional compensation for removal of extra thickness.

All removed material shall become the property of the Contractor. All disturbed areas not covered by concrete shall be seeded. All costs to remove concrete surfacing, concrete, curb and gutter, ensure proper grading, and full depth sawing, shall be included in the price bid for "Removal of Concrete" and "Removal of Curb and Gutter".

202-P02 **REMOVAL OF BITUMINOUS SURFACING:** The item is to be measured by the square yard. Payment includes all material removed, regardless of the depth encountered.

Areas designated for "Removal of Bituminous Surfacing" are shown in the plans. Remove the material by milling or backhoe. Do not use front end loaders or other similar equipment. All removals will become the property of the Contractor and must be disposed of by the Contractor off site.

Include full depth sawing, removal, loading, hauling, and disposal of the material in the price bid for "Removal of Bituminous Surfacing".

202-P03 **ABUTTING PAVEMENT:** Where the new pavement will abut existing pavement, a full-depth vertical saw cut shall be made along the entire length of the butt joint. The material to be removed shall then be removed without disturbing the material that is designated to remain. The new pavement shall be placed so as to match the existing pavement and so as to provide a satisfactory surface profile.

203-P01 **SHRINKAGE:** Twenty-five percent (25%) additional volume is included for shrinkage in earth embankment.

203-P02 **COMMON EXCAVATION-WASTE:** In subgrade repair areas, excavation of the roadway subgrade and the existing aggregate base shall be performed with a tracked excavator using a smooth cutting edge to minimize disturbance to underlying soils. Construction equipment will not be allowed to travel over the subgrade. A transitional slope of approximately 10:1 must be constructed prior to placing the Borrow-Excavation to avoid differential heave. "Common Excavation – Waste" will be measured by the Cubic Yard at the time of removal.

All excess excavation becomes the property of the Contractor and must be disposed of by the Contractor off site. All costs associated with disposal of the excess excavation shall be included in the price bid for "Common Excavation – Waste".

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	6	3

NOTES

203-P03 BORROW–EXCAVATION

1. GENERAL: Borrow required for this project should consist of silts or lean Clay materials and shall meet the material type and specifications as stated in the following.

   Borrow material shall not be excavated beyond the dimensions and elevations established, or before staking and cross sectioning the site. After excavation is complete, the borrow area shall be reshaped to insure accurate final cross sectioning of the borrow area and provide adequate drainage. Borrow material shall not be removed within 5 feet of any buried facility, within 10 feet of any utility pole, or within 25 feet of any utility structure until the utility has been relocated, removed or adjusted. The slopes around utilities shall not be steeper than 3:1.

   After relocation, removal or adjustment of the utility, all remaining material shall be removed to match the final adjacent elevations. The Contractor's operations shall be coordinated with the utility companies. The Contractor shall be responsible for any utility adjustment work in Contractor-furnished borrow areas.

2. SUBMITTALS: Submit the following to the Project Engineer. It should be noted that the Preapproval of the material will be required prior to work beginning on the project.

   A. Work Plan:

   The Contractor shall submit a plan indicating the intended sequence of work. The plan shall clearly indicate the proposed schedules for excavation, the schedule for backfilling, how rain events will be handled, and the equipment proposed, including the number of pieces and production rates, to perform the work.

   B. Borrow Source and Testing Reports:

   The contractor shall provide the following for approval of the material source:

   I. Certificate of Authorization (COA) for the borrow source location.

   II. The contractor shall put up the borrow material in a stockpile prior to work beginning.

      a. From the stockpile the contractor shall submit the following for three random samples while putting up the stockpile:

         1. Test Results which meet the requirements:

Liquid Limits	45 or Less
Plasticity Index	8-25
1" Sieve	100% Passing
200 Sieve	75% Minimum Passing

         2. Split Samples of tested material to the District Materials Coordinator.

         3. A Proctor test from each sample.

      The Engineer will have 10 working days to confirm the results and provide notification of approval or denial.

3. LOCATION: Stockpiled materials shall be kept in a neat and well drained condition, giving due consideration to drainage at all times. The ground surface at each stockpile location shall be cleared, grubbed, and sealed. Satisfactory materials shall be protected from contamination which may alter the quality or fitness of the stockpiled material. Any material that becomes contaminated, frozen, or too moist for use shall be removed and replaced with satisfactory material from approved sources at no additional cost to the Department.

4. DEFINITIONS:

   A. Satisfactory Materials:

      Satisfactory materials for borrow include soils approved by the Engineer. Satisfactory material shall be free from ice, snow, frozen earth, debris, and organic material, and stones larger than 1 inch in any dimension.

   B. Unsatisfactory Materials:

      Unsatisfactory materials shall be materials that do not comply with the requirements for satisfactory materials. Unsatisfactory materials include but are not limited to those materials containing roots and other organic matter, trash, debris, frozen materials and stones larger than 1 inch in any dimension. Unsatisfactory materials also may include manmade fills, refuse, or backfills from previous construction.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	6	4

NOTES

5. PLACEMENT COMPACTION:

Trench backfill should be placed in loose lift thicknesses of six inches or less. The backfill should be compacted to between 90 to 95 percent of the maximum dry density as determined by AASHTO T-180. The moisture content at the time of compaction shall not be less than the optimum moisture content and no more than 5 percentage points above the optimum moisture.

Compaction tests will be done for each one foot lift of placed materials for each open repair area, by the NDDOT. If the lift fails on moisture, the material shall be removed and new brought in to replace it.

Moisture conditioning will not be allowed in the repair area. All moisture conditioning required to obtain compaction specifications will need to be done outside of the repair area. If water must be applied to placed layers that have dried out, the water shall be applied in an accurately controlled amount so the free water will not appear on the surface during or subsequent to compacting.

203-P04 **TOPSOIL:** All cost to remove and replace of six inches of topsoil in areas to be seeded shall be included in the price bid for “SEEDING-HYDRO MULCH”.

302-P01 **AGGREGATE BASE COURSE CL 5:** CL 5 will be used where aggregate is required on the project. Salvaged Base Course cannot be substituted for Aggregate Base Course CL 5. The aggregate material should be placed in 6 inch lifts and compacted to a minimum of 95 percent of the maximum dry density as determined by AASHTO T-180, where the moisture content of the aggregate at the time of compaction shall be -2 to +3 percentage points of the optimum moisture content. The Contractor shall provide a minimum of one moisture-density relationship and sieve analysis should be performed for each source.

302-P02 **SACRIFICIAL AGGREGATE:** Sacrificial CL 5 aggregate shall be placed up to the top of existing asphalt in subgrade repair areas after the removals have been completed. MC 70 or 250 Liquid Asphalt shall be placed on the sacrificial aggregate as temporary seal. 5.5” of the CL 5 aggregate will be removed before paving occurs. All sacrificial aggregate will be the property of the NDDOT and delivered to NDDOT Section Yard in Cando, 7411 68th Ave. NE.

The maintenance of the subgrade repair areas before pavement is placed will be the responsibility of the Contractor.

401-P01 **BLOTTER MATERIAL CL 44:** The blotter material required for this project will not be measured for payment but shall be included in the price bid for "MC70 or 250 Liquid Asphalt." Based on 15 LBS/SY approximately 29 tons will be required.

410-P01 **CONTRACTOR MIX DESIGN:** The final mix design shall be Contractor-developed mix design as per NDDOT Specifications 410.04B and submitted 10 days prior to beginning hot bituminous pavement production.

410-P02 **HOT BITUMINOUS PAVEMENT:** The hot bituminous pavement shall be paver laid in two 1.5 inch lifts. In areas where subgrade repair and common excavation take place, one 2.5 inch lift will be paver laid before the two 1.5 inch lifts are paver laid throughout the project. The first lift of pavement shall set overnight before laying the second lift.

PG-58-28 Asphalt Cement shall be used in all hot bituminous pavements.

The Superpave FAA 43 shall conform to Section 410 of the Standard Specifications and Supplemental Specifications along with the following aggregate and mix design properties:

TEST	CRITERIA	REFERENCE
Coarse Aggregate Angularity	75% min.	NDDOT Field Sampling & Testing Manual
Fine Aggregate Angularity	43% min.	AASHTO T 304
Gyratory Effort, # Gyrations	N_{ini}=7,N_{des}=75,N_{max}=115	AASHTO R 35
Voids Filled with Asphalt	65-78%	AASHTO M 323, T 166
$\%G_{mm}$ @ N_{ini}	89% max.	AASHTO M 323, T 166

410-P03 **CONTRACTOR CORING:** Immediately after the cores have been cut, the Contractor shall fill the core holes as follows:

- Remove any free standing water;
- Tack the hole as specified in Section 401;
- Place the same type of bituminous material; and
- Compact each lift with hand tamper.

If the core hole is 2 inches or greater, the Contractor shall fill the core hole with the same type of bituminous material in a minimum of two lifts.

410-P04 **PAVING SEAMS:** All seams must be at least 11.5’ from the centerline of the roadway unless a hot seam is used. Hot seams can be located at any offset distance. A hot seam will be defined as a seam created when two pavers are paving at the same time, with no more than 300’ between the pavers. The seam must be rolled in a way to join and hide the seam so it is not visible to the traveling public.

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE-4446, on 8/26/2013 and the original document is stored at the North Dakota Department of Transportation.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	6	5

NOTES

411-P01 **MILLING PAVEMENT SURFACE:** "Milling Pavement Surface" shall be measured by the square yard of area milled, regardless of depth. All costs associated with labor, materials and equipment for milling, hauling and dumping the material, shall be included in the bid price "Milling Pavement Surface".

411-P02 **MILLING PAVEMENT SURFACE:** All milled material will be the property of the NDDOT and delivered to NDDOT Section Yard in Cando, 7411 68th Ave. NE.

411-P03 **TEMPORARY ASPHALT WEDGES:** The Contractor shall place temporary asphalt wedges at the beginning and end of the pavement sections as well as all intersections to allow smooth passage of vehicles at these milled locations. All costs associated with labor materials, and equipment for the installation and removal of the asphalt wedges shall be included in the price bid for "Superpave FAA 43".

704-P01 **TRAFFIC CONTROL PHASING:** See Section 100, "General Traffic Control Layout", for overview of construction plan. Through traffic shall be maintained on US Highway 281 (1st Avenue) throughout the project. Traffic control phasing shall be completed in three phases to keep one lane of traffic during daylight hours and two lane traffic at night. If flagging is needed due to not having two lane traffic at night, it will be at the Contractor's expense.

Phase 1: Work will consist of removal of curb and gutter, concrete, bituminous surfacing, and common excavation from 4.5' west of Hwy 281 centerline east to project limits at the subgrade repair locations. Placement of sidewalk, curb and gutter, borrow, and one 2.5" lift of HBP with a pavement wedge no steeper than 4:1 slope will be completed during this phase from 4.5' west of Hwy 281 centerline east.

Phase 2: Work will consist of removal of curb and gutter, concrete, bituminous surfacing, and common excavation from 4.5' west of Hwy 281 centerline west to project limits at the subgrade repair locations. Placement of sidewalk, curb and gutter, borrow, and one 2.5" lift of HBP with a pavement wedge no steeper than 4:1 slope will be completed during this phase from 4.5' west of Hwy 281 centerline west.

Phase 3: Work will consist of 3" milling and 3" overlay of HBP.

704-P02 **TRAFFIC CONTROL DEVICES:** The traffic control devices list has been developed using the following layouts on the Standard Drawings for traffic control:

1) D-704-2, 4, 7, 8, 9, 10, 11, 13, and 14 as applicable.

2) D-704-19, Layout Type F, for 2 lane highway with one lane closed.

3) D-704-20, Layout Type G, for terminal signing.

4) D-704-22, Layouts Type K and L, for trucks hauling material.

5) D-704-25, Layouts Type V, W, and X, for Repair Area Work during daylight.

6) D-704-27, for application of pavement marking.

Quantities are based on the Standard Drawings listed above. 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. No extra compensation will be allowed for relocation due to work progression.

704-P03 **MAINTAIN DRIVEWAY ACCESS:** The Contractor shall be responsible for providing access to all adjacent properties during construction. The Contractor shall coordinate with the adjacent properties for access to their facilities. Final details on location of access points and construction procedures shall be approved by the Engineer prior to the start of the work. No additional compensation will be made to the Contractor for any costs associated with this item.

706-P01 **FIELD LABORATORY - TYPE C:** The Contractor shall provide two Gyratory Compactors. One Gyratory Compactor shall be placed in the Engineer's laboratory and one placed in the Contractor's laboratory. Both laboratories shall be wired for DSL Broadband internet capabilities. The internet shall have a wireless Wi-Fi router and also the capabilities of hard wiring to a computer. The cost of installation and monthly fee for the internet will be included in the cost of the laboratory.

706-P02 **FIELD LABORATORY – TYPE B:** A concrete pad sufficient to run a proctor on shall accompany the Type B laboratory and be setup directly adjacent to the building.

The laboratory shall be wired for DSL Broadband internet capabilities. The internet shall have a wireless Wi-Fi router and also the capabilities of hard wiring to a computer. The cost of installation and monthly fee for the internet will be included in the cost of the laboratory.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	6	6

NOTES

708-P01 **WEIGHTED FIBER ROLLS:** Weighted Fiber Rolls have been provided for erosion control around inlets. Place fiber rolls at every inlet within project limits and as per SWPPP. All costs for materials, labor, equipment, installation, maintenance and removal shall be included in the price bid for "Weighted Fiber Rolls". The Contractor may use any form of inlet protection that meets or exceeds the requirements of the SWPPP. The inlet protection will be paid for as "Weighted Fiber Rolls".

Provide Materials that meet the following specifications:

A photodegradable, extruded netting tube filled with wood curled excelsior and weighted inner core.
Roll Diameter – 6 Inches
Roll Length – 6 Feet
Roll Weight – 8.33 Pounds/Foot

708-P02 **SEEDING-HYDRO MULCH:** The contractor shall place 6" of topsoil in areas where seeding is required. Hydro mulch shall be used for all seeding locations. The seeding shall be as specified in the NDDOT Standard Specification 708.02B. 3a. Fertilizer shall be a mixture of 5-10-5 applied at a rate of 100 pounds per acre. The seed shall be watered for three weeks minimum after placement in order to provide sufficient moisture for growth as determined by the Engineer.

The seed mixture shall be as follows:

Species	Pounds Pure Live Seed/Acre
Kentucky Bluegrass	1.5
Durar Hard Fescue	3.5
Perennial Ryegrass	4.5
Annual Ryegrass	5.5
Total	15

The contractor is responsible for regular maintenance of seeded areas which includes keeping these areas free of weeds to the satisfaction of the engineer.

All costs for labor, materials, and equipment necessary to complete the work shall be included in the unit price bid for "SEEDING - HYDRO MULCH."

709-P01 **GEOTEXTILE FABRIC:** The geotextile fabric should meet the requirements of NDDOT Section 858 Type S2. The seams should be overlapped a minimum of 18 inches. In lieu of overlapping, the seams may be sewn.

714-P01 **REMOVE & RELAY PIPE-ALL TYPES & SIZES:** The Contractor shall remove and reset the existing concrete culverts with care. Any damaged pipe, curb and gutter, drainage structures, and edge drain shall be replaced at the Contractor's expense. All concrete pipe shall be tied. Additional ties and drilling of the existing sections required to tie the relayed sections shall be included in the price bid for "Remove & Relay Pipe-All Types & Sizes".

All removed material shall become the property of the Contractor. All disturbed areas shall be seeded. All costs to remove and relay pipe and end sections, including tying of pipe, shall be included in the price bid for "Remove and Relay Pipe – All Types and Sizes".

714-P02 **REMOVE & RELAY END SECTIONS-ALL TYPES & SIZES:** The Contractor shall remove and reset the existing concrete end sections with care. Damaged sections shall be replaced at the Contractor's expense. Additional ties and drilling of the existing sections required to tie the relayed sections shall be included in the price bid for "Remove & Relay End Sections-All Types & Sizes".

748-P01 **CURB RAMPS:** Curb ramps shall be placed at all intersections of the sidewalk and street as shown in the plans. The type of curb ramp to be used at each intersection is shown on Section 20 Sheet 4 of these plans. See Standard Drawing D-750-2 for typical curb ramp joint details. All costs to install the curb ramps shall be included shall be included in the price bid for "Sidewalk Concrete 4 IN" and "Curb and Gutter – Type 1".

SIGNING AND LIGHTING NOTES

754-P01 **PEDESTRIAN/SCHOOL CROSSING SIGNS:** The pedestrian and school crossing signs shall have a fluorescent yellow green background with black letters and border. The signs shall be furnished with sheeting consisting of prismatic lenses formed in a transparent synthetic resin, sealed, and backed with an aggressive pressure sensitive adhesive protected by a removable liner. The sheeting shall have a smooth surface with a distinctive interlocking diamond seal pattern and orientation marks visible on their face. The cost for furnishing the fluorescent yellow green background shall not be bid separately but shall be included in the price bid for the item "Flat Sheet Signs-Type XI Refl Sheeting".

772-P01 **UTILITY COORDINATION:** The Contractor shall be responsible for coordination with Northern Plans Electric for the incoming electrical service to the flasher cabinet. Northern Plains shall supply all conductors, conduit, and connections from the transformer to the meter. The Contractor shall be responsible for all cable, conduit, meter socket, and service disconnect from the meter to the flasher cabinet. Any cost by Northern Plains for the new installation shall be paid for by the NDDOT.

772-P02 **REMOVALS:** The removed beacon heads, flashers, posts, signs and cabinet shall remain the property of the NDDOT and shall be delivered to NDDOT Section Yard in Cando, 7411 68th Ave. NE. The contractor shall coordinate delivery with the Devils Lake District office. This work is included in the price bid for "Flashing Beacon – Post Mounted – School".

772-P03 **CONDUIT:** Conduit shall be installed at the location shown on the plans. Conduit shall be pushed under existing pavement. Pushing conduit shall be included in the bid price for "Flashing Beacon – Post Mounted - School".

All conduits shall be sealed with duct seal at the flasher cabinet and at the traffic signal standard foundations.

772-P04 **FLASHING BEACON – POST MOUNTED - SCHOOL:** The Contractor shall provide all materials, labor, and equipment to remove the existing flasher system and install the new, complete, operating, pedestrian actuated flasher system. This work is included in the price bid for "Flashing Beacon – Post Mounted – School"

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

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	6	8

ENVIRONMENTAL COMMITMENTS

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

Commitment No. 1: Unavoidable wetland impacts will be minimized or mitigated either on-site or at an appropriate mitigation site.

Action Taken/Required: The project will not result in an impact to wetlands.

Wetland Number	Location	LONG / LAT (Dec. Deg.)	Cowardin Classification	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands*	Wetlands Protected Under E.O. 11990	Impacts to Wetlands	
									Temp.	Perm.
1	Sec. 30,T158N, R66W	-99.209819 W 48.485366 N	PEMAx	Ditch	0.72	Artificial	N/A	N/A	0.040	0.000
TOTALS					**0.72**				**0.040**	**0.000**

*A Preliminary Jurisdictional Determination was issued by the USACE on 06/15/11; NWO-2011-00896-BIS.

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	8	1

Spec	Code	Item Description	Unit	Total Qty
103	0100	Contract Bond	L SUM	1
202	0112	Removal of Concrete	SY	63
202	0130	Removal of Curb & Gutter	LF	144
202	0132	Removal of Bituminous Surfacing	SY	3853
203	0113	Common Excavation - Waste	CY	4200
203	0140	Borrow - Excavation	CY	2048
216	0100	Water	M GAL	170
302	0120	Aggregate Base Course Cl 5	TON	5945
401	0100	MC70 OR 250 Liquid Asphalt	GAL	963
401	0150	SS1H or CSS1H or MS1 Emulsified Asphalt	GAL	2370
410	0213	Superpave FAA 43	TON	4484
410	0445	PG 58-28 Asphalt Cement	TON	269
410	0910	Cored Sample	EA	24
411	0105	Milling Pavement Surface	SY	19825
702	0100	Mobilization	L SUM	1
704	0100	Flagging	MHR	600
704	1000	Traffic Control Signs	UNIT	3461
704	1052	Type III Barricades	EA	30
704	1060	Delineator Drums	EA	150
704	1067	Tubular Markers	EA	120
704	1185	Pilot Car	MHR	120
706	0200	Field Laboratory-Type B	EA	1
706	0300	Field Laboratory-Type C	EA	2
708	1400	Weighted Fiber Rolls	LF	297
708	1430	Fiber Rolls 12 IN	LF	388
708	2900	Seeding - Hydro Mulch	SY	571
709	0402	Geotextile Fabric - Type S2	SY	3853
714	9659	Remove and Relay Pipe - All Types and Sizes	LF	24
714	9660	Remove and Relay End Section - All Types and Sizes	EA	4
748	0140	Curb & Gutter - Type 1	LF	144
750	0115	Sidewalk Concrete 4 IN	SY	94
750	2115	Detectable Warning Panels	SF	120
754	0110	Flat Sheet For Signs - Type XI Refl Sheeting	SF	70.4
754	0112	Flat Sheet For Signs - Type IV Refl Sheeting	SF	37.4
754	0206	Steel Galv Posts - Telescoping Perforated Tube	LF	177
762	0430	Short Term 4IN Line-Type NR	LF	27684
762	1104	PVMT MK Painted-4IN Line	LF	9228
762	1124	PVMT MK Painted-24IN Line	LF	108
772	2120	Flashing Beacon - Post Mounted - School	EA	1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	10	1

BASIS OF ESTIMATE

BASIS OF ESTIMATE	
ITEM	UNIT
Milling Pavement Surface	SY
Removal of Concrete	SY
Removal of Curb and Gutter	LF
Aggregate Base Course Class 5 @ 1.875 Ton/CY (Includes 25% For Shrinkage)	TON
Blotter Material Class 44 @ 15 Lbs./SY	TON
MC 70 or 250 Liquid Asphalt @ 0.25 Gal/SY	GAL
SS1H or CSS1H or MS1 Emulsified Asphalt For Tack Coat @ 0.05 Gal/SY	GAL
Superpave FAA 43 @ 2 Ton/CY	TON
Asphalt Cement PG 58-28 @ 6.0% of HBP	TON
Common Excavation – Waste	CY

Water

50 M Gal for Dust Palliative
20 Gal/Ton for Aggregate Base Course CL 5
10 Gal/CY for Embankment

Coring

STA 10017+56 to STA 10069+96 = 5,240 LF

5,240 LF/2,000 LF * 2 Lifts * 2 Lanes = 11 Sublots
11 Sublots * 2 Cores/Sublot = **22 Cores + 2 Cores for District Lab**

Pavement Marking

Pavement Marking Painted Line (Short Term and Permanent)
4” Yellow Solid Centerline, 4” between Lines – No Passing Zone (NPZ)
24” White Line – Stop Bars & Pedestrian Crossing Bars

Note: Three applications for Short Term pavement marking are required, (1 after milling, 1 after 1st lift and 1 after top lift).

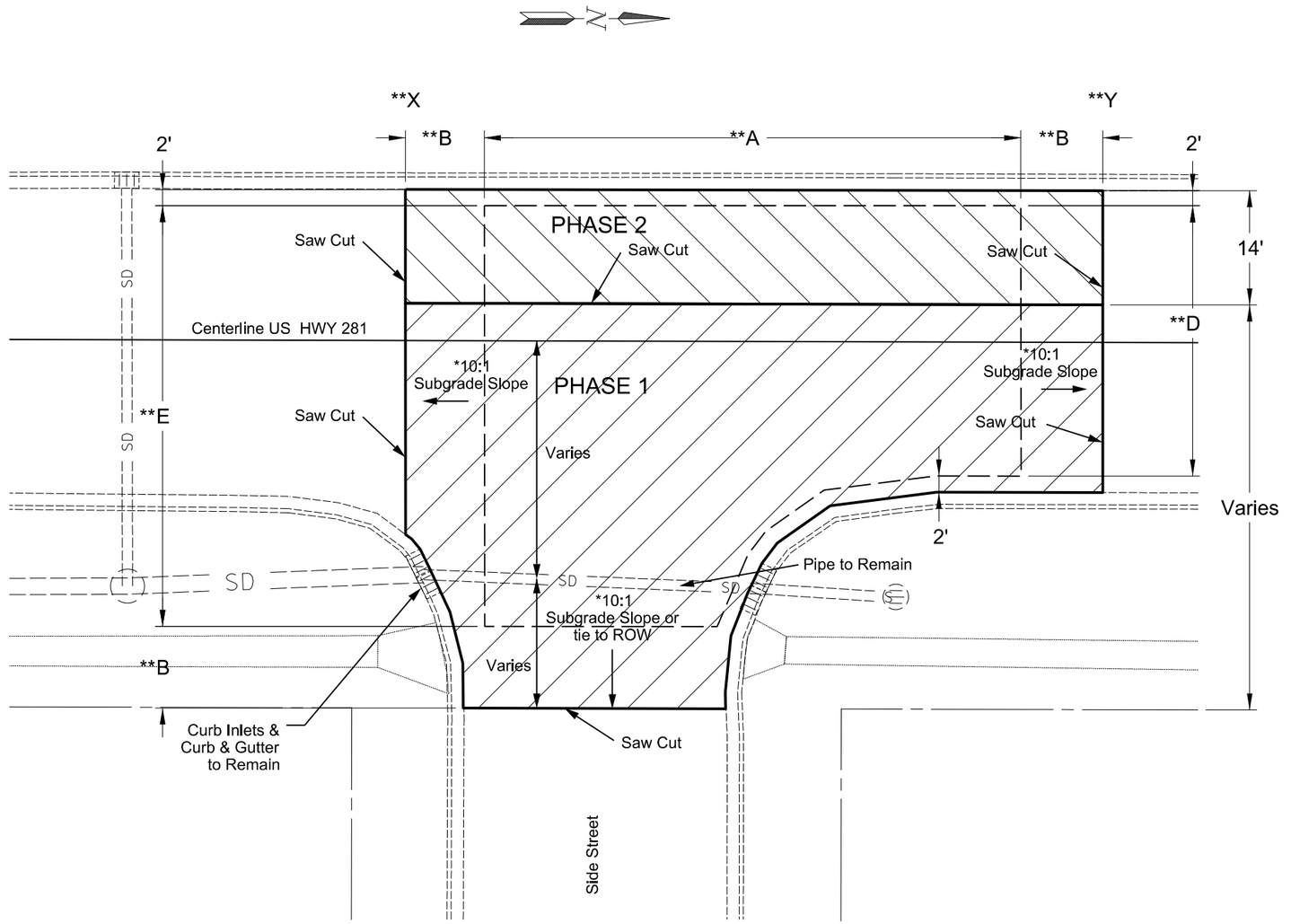
Pedestrian Crossing Bars Locations

STA 56+00	54 LF
STA 68+50	54 LF

BASIS OF ESTIMATE - MARKING	
NPZ BARRIER LINES	
STA 10017+56 TO 10017+85 LT – 29 LF	STA 10048+20 TO 10051+60 LT – 340 LF
STA 10017+56 TO 10017+85 RT – 29 LF	STA 10048+20 TO 10051+60 RT – 340 LF
STA 10018+45 TO 10027+70 LT – 925 LF	STA 10052+00 TO 10058+85 LT – 685 LF
STA 10018+45 TO 10027+70 RT – 925 LF	STA 10052+00 TO 10058+85 RT – 685 LF
STA 10028+05 TO 10029+70 LT – 165 LF	STA 10059+25 TO 10062+45 LT – 320 LF
STA 10028+05 TO 10029+70 RT – 165 LF	STA 10059+25 TO 10062+45 RT – 320 LF
STA 10030+10 TO 10036+60 LT – 650 LF	STA 10062+90 TO 10065+95 LT – 305 LF
STA 10030+10 TO 10036+60 RT – 650 LF	STA 10062+90 TO 10065+95 RT – 305 LF
STA 10037+15 TO 10042+50 LT – 535 LF	STA 10066+40 TO 10069+60 LT – 320 LF
STA 10037+15 TO 10042+50 RT – 535 LF	STA 10066+40 TO 10069+60 RT – 320 LF
STA 10044+40 TO 10047+80 LT – 340 LF	TOTAL BARRIER LINES = 9228 LF
STA 10044+40 TO 10047+80 RT – 340 LF	

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE-4446, on 8/19/2013 and the original document is stored at the North Dakota Department of Transportation.

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	20	1



LEGEND

PHASE 1

PHASE 2

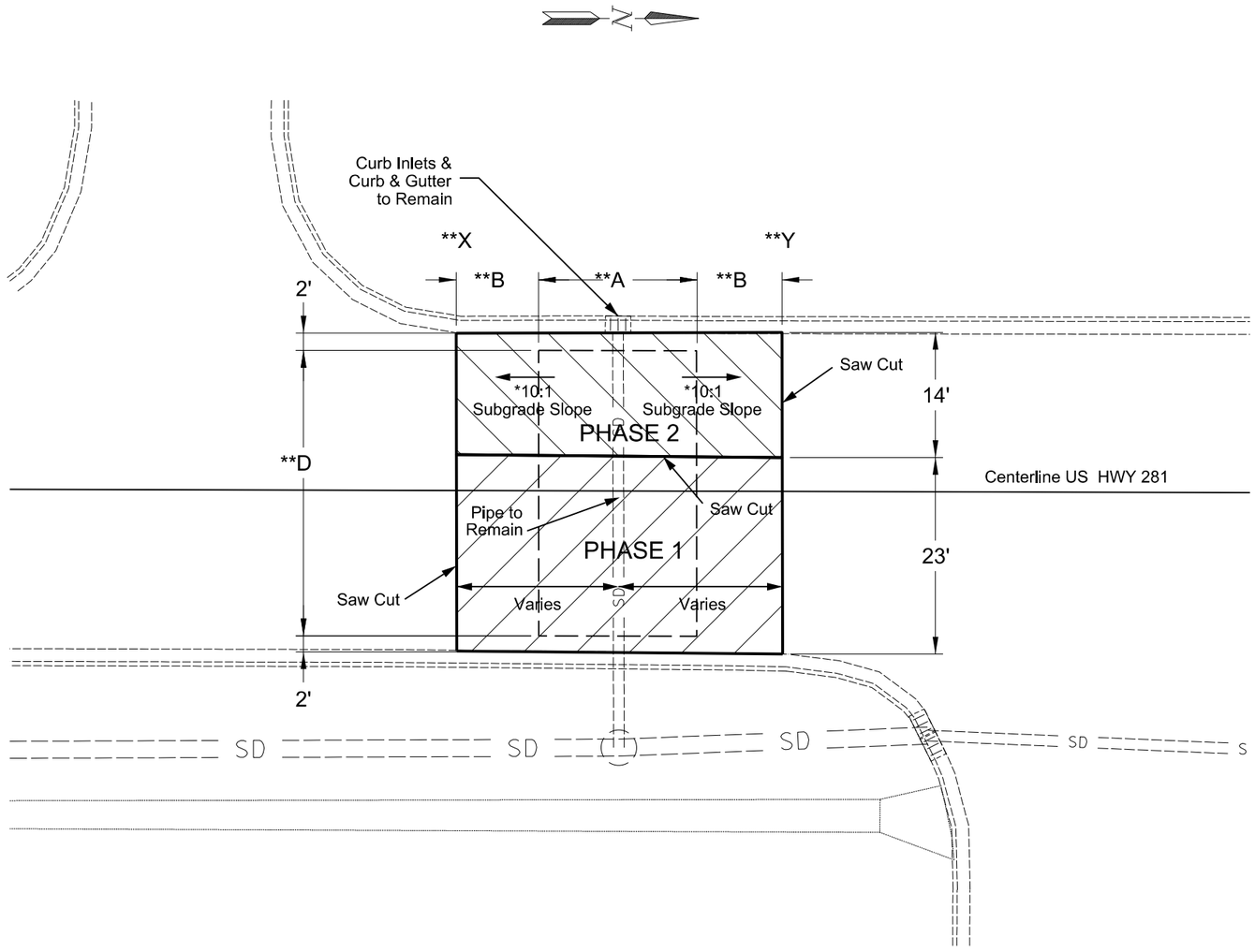
*NOTE: Slope shall be 10:1 perpendicular to the center of the repair.

**NOTE: See Section 20-3 for dimension table.

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

TYPICAL SUBGRADE REPAIR DETAILS THROUGH APPROACH

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	20	2



LEGEND

PHASE 1

PHASE 2

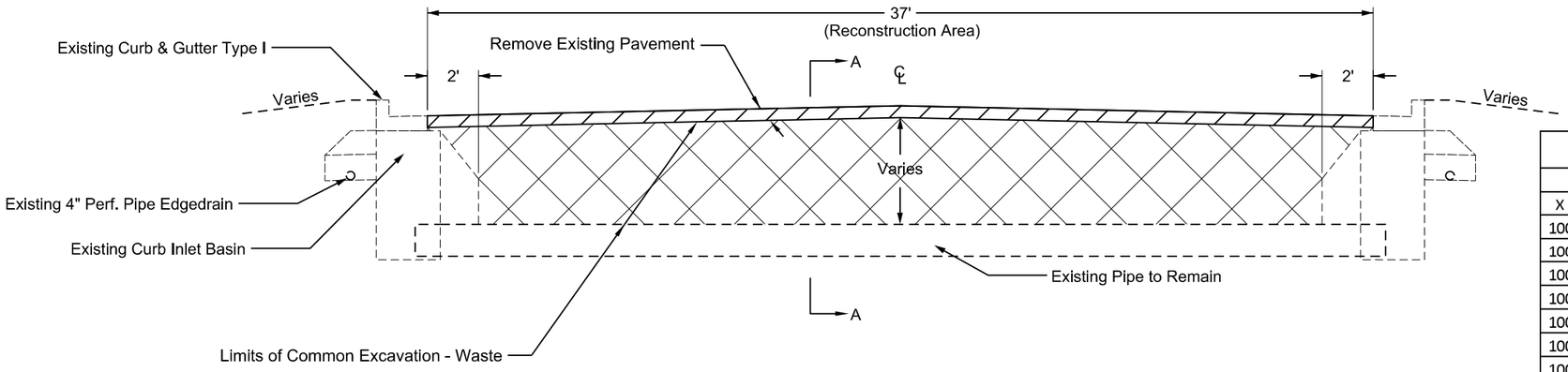
*NOTE: Slope shall be 10:1 perpendicular to the center of the repair.

**NOTE: See Section 20-3 for dimension table.

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

TYPICAL SUBGRADE REPAIR DETAILS
MAINLINE

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	20	3

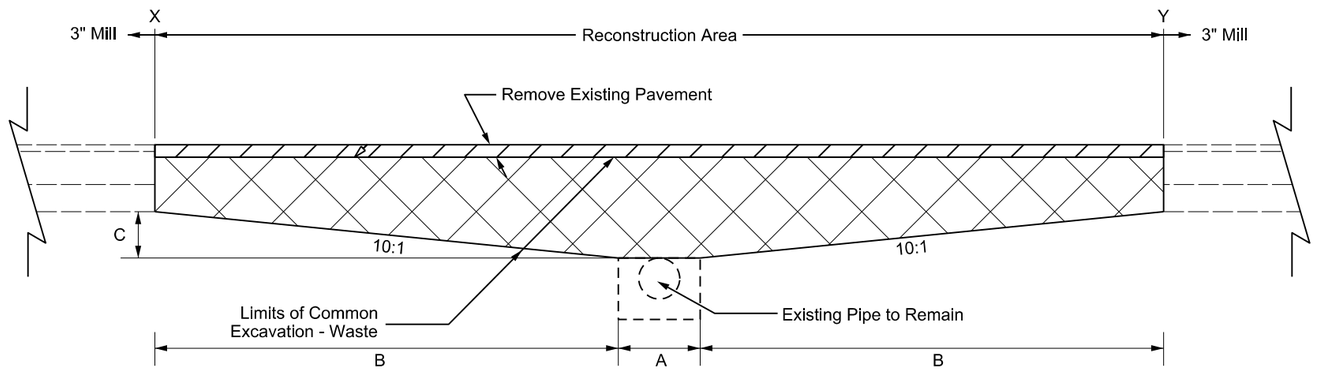


Typical Repair Detail - Removals

SUBGRADE REPAIR AREA TABLE

X (STA)	Y (STA)	A (ft)	B (ft)	C (ft)	D (ft) *	E(ft) *
10018+72	10019+12	5.9	16.7	1.7	33.5	
10023+68	10024+08	9.9	14.6	1.5	33.4	
10028+64	10029+19	27.7	13.7	1.4	33.3	
10036+40	10037+20	47.9	15.7	1.6	33.2	43.3
10041+45	10042+25	24.9	27.2	2.7	33.2	
10047+62	10048+37	42.4	16.3	1.6	33.6	47.2
10049+16	10049+56	8.9	15.3	1.5	33.4	
10050+51	10050+81	0.0	15.0	1.5	33.1	
10051+27	10052+37	65.4	22.2	2.2	33.5	47.0
10055+78	10056+43	34.2	15.4	1.5	33.0	
10058+61	10059+31	45.4	12.3	1.2	33.4	47.9
10063+20	10063+40	8.7	5.6	0.6	33.1	
10065+46	10066+46	67.9	16.0	1.6	33.5	

*Dimensions are found on Sheets 1 & 2 of Section 20.

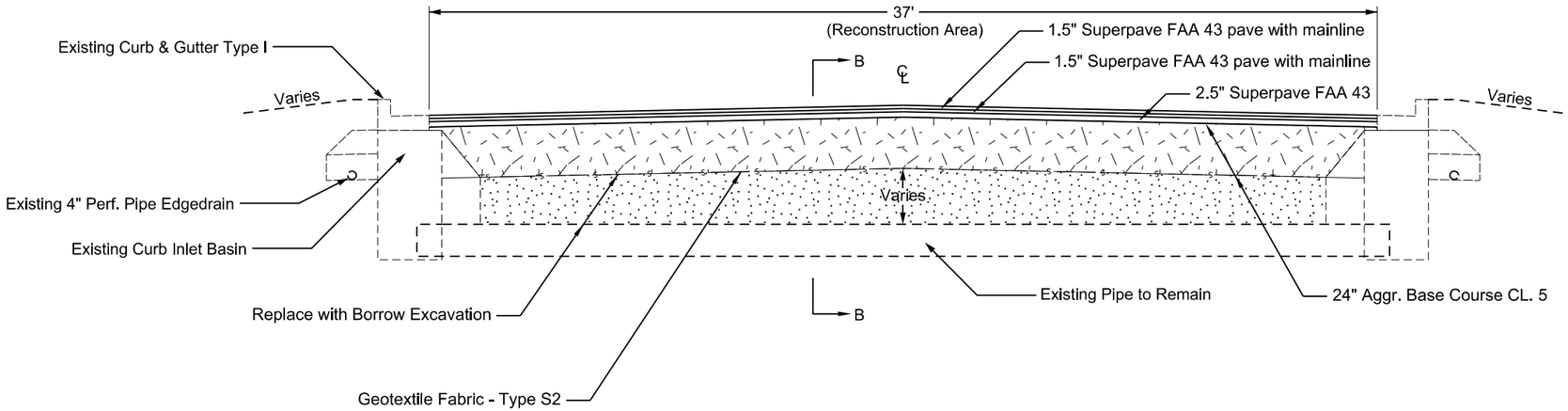


Section A-A

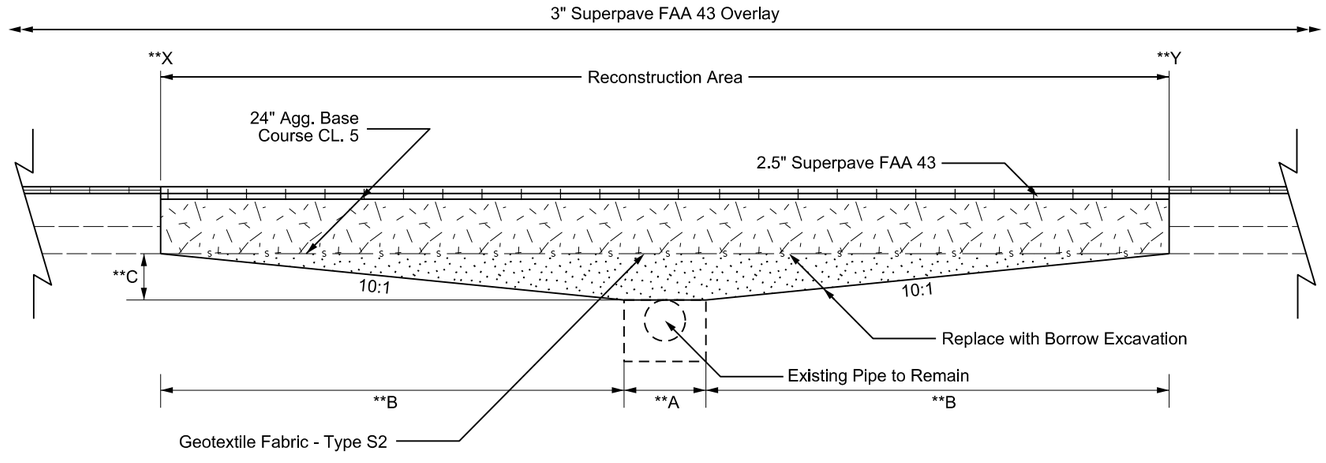
This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

TYPICAL REPAIR DETAILS

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	20	4



Typical Repair Detail - Final



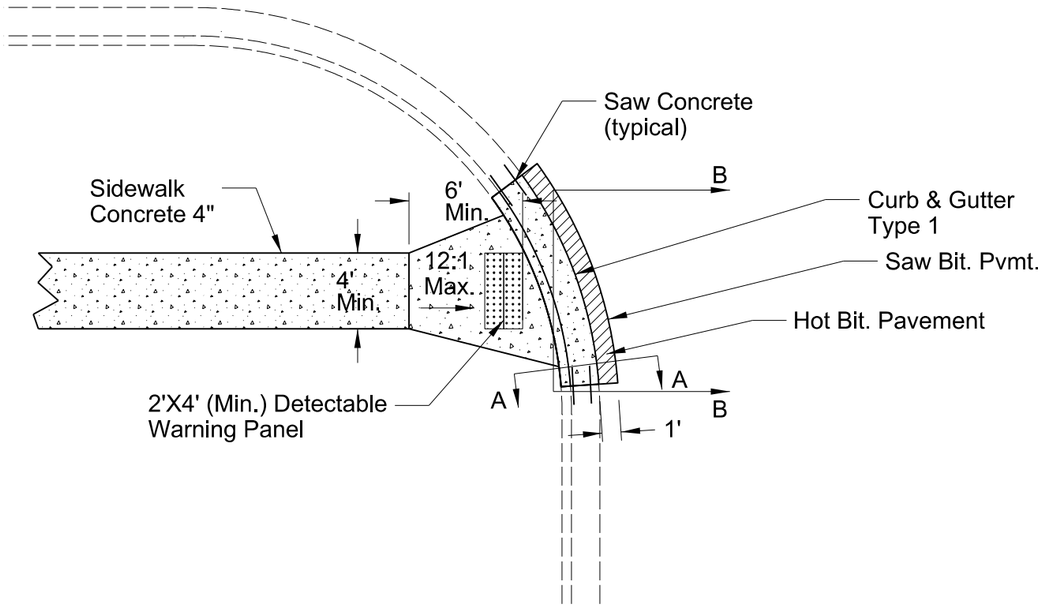
Section B-B

**NOTE: See Section 20-3 for dimension table.

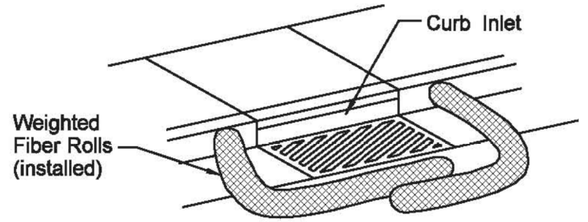
This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

TYPICAL REPAIR DETAILS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	20	5



SIDEWALK & ADA RAMP PLAN VIEW



WEIGHTED FIBER ROLL DETAIL

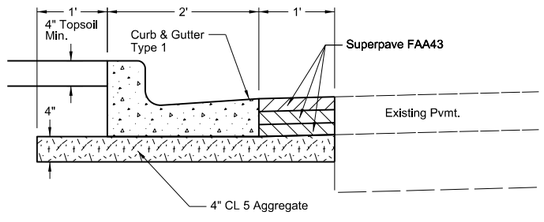
NOTES:

1. Place and adequate number of weighted fiber rolls around the inlet to provide complete protection. Leave approximately 3"-6" between the weighted fiber rolls and the inlet. Ends shall overlap a minimum of 12 inches.

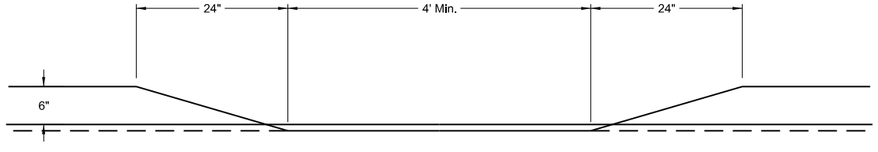
2. Remove and properly dispose of accumulated silt and debris to allow for proper function of device after every rain event, or as necessary for proper function.

3. Provide materials that meet the following specifications:
   A photo degradable extruded netting tube filled with wood curled excelsior and weighted inner core.
   Roll Diameter: 6 inches
   Weight: 8.33 Pounds per Lineal Foot

4. Price includes weighted fiber roll, placement, maintenance after each rain event, and removal of weighted fiber rolls after the gradient surfaces are stabilized and surrounding street is cleaned of debris. All cost related to this work shall be included in the price bid for "Weighted Fiber Rolls".



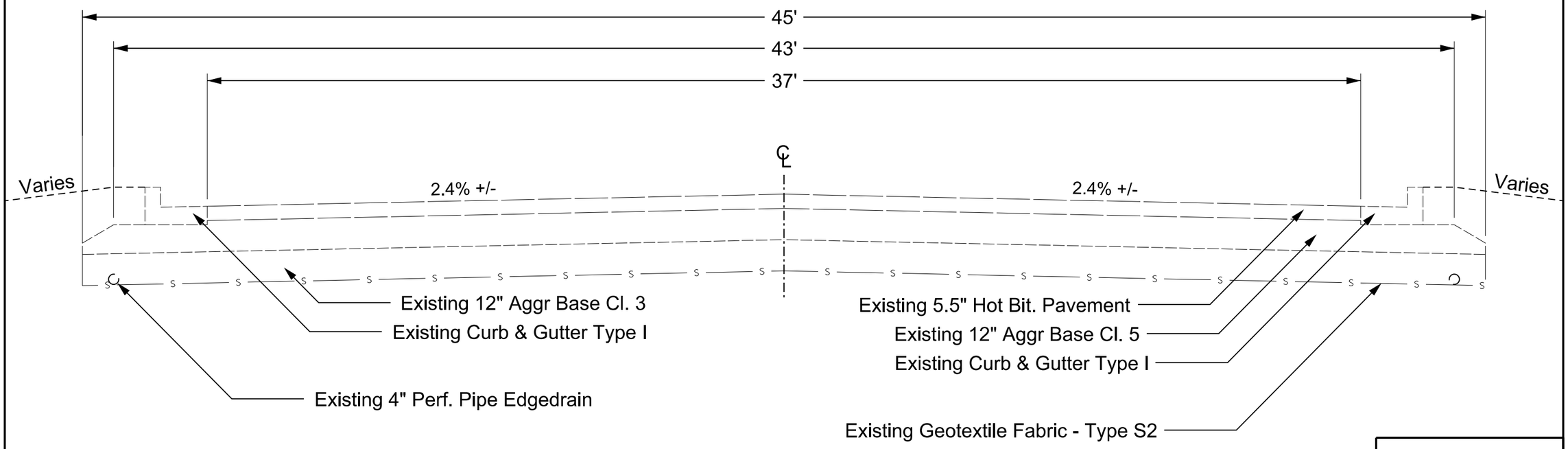
SECTION A-A



SECTION B-B

INLET PROTECTION DETAIL
CURB RAMP DETAIL

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	30	1



Existing Typical Section

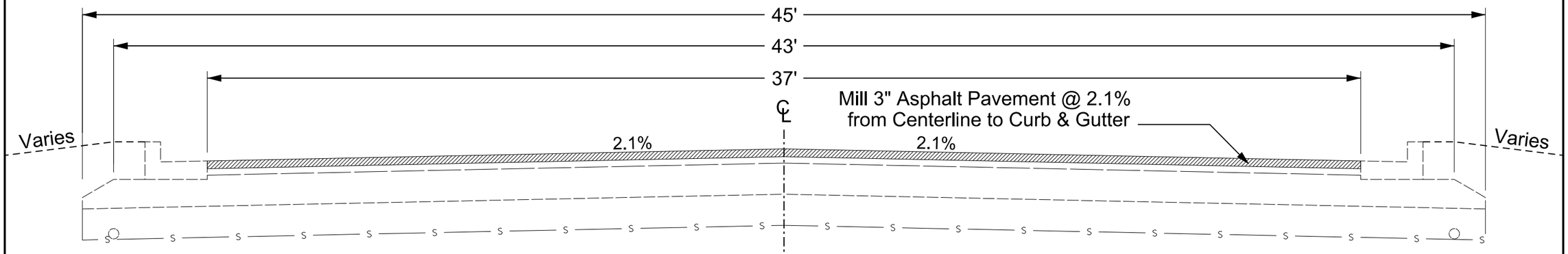
R.P. 189.726 to 190.718

Sta. 10017+56 to 10069+96

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

EXISTING
TYPICAL SECTION

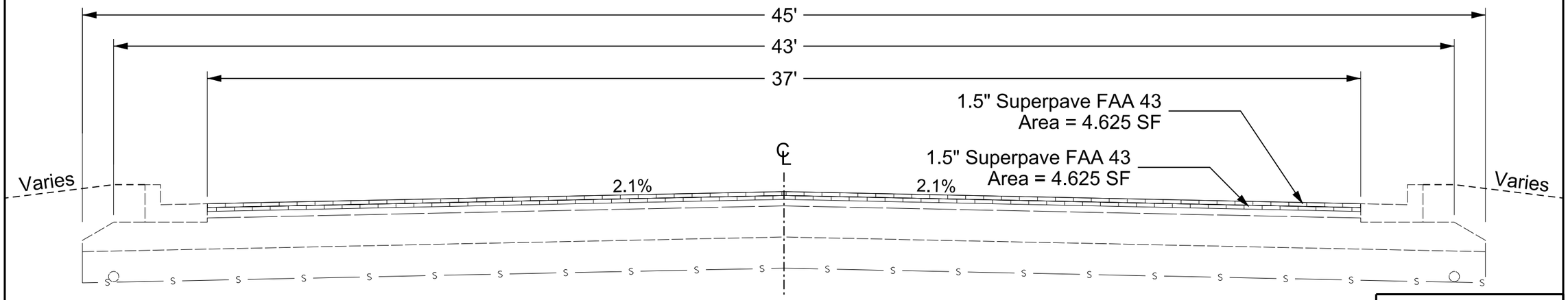
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	30	2



Milling Typical Section

R.P. 189.726 to 190.718

Sta. 10017+56 to 10069+96



Proposed Typical Section - Hot Bituminous Pavement

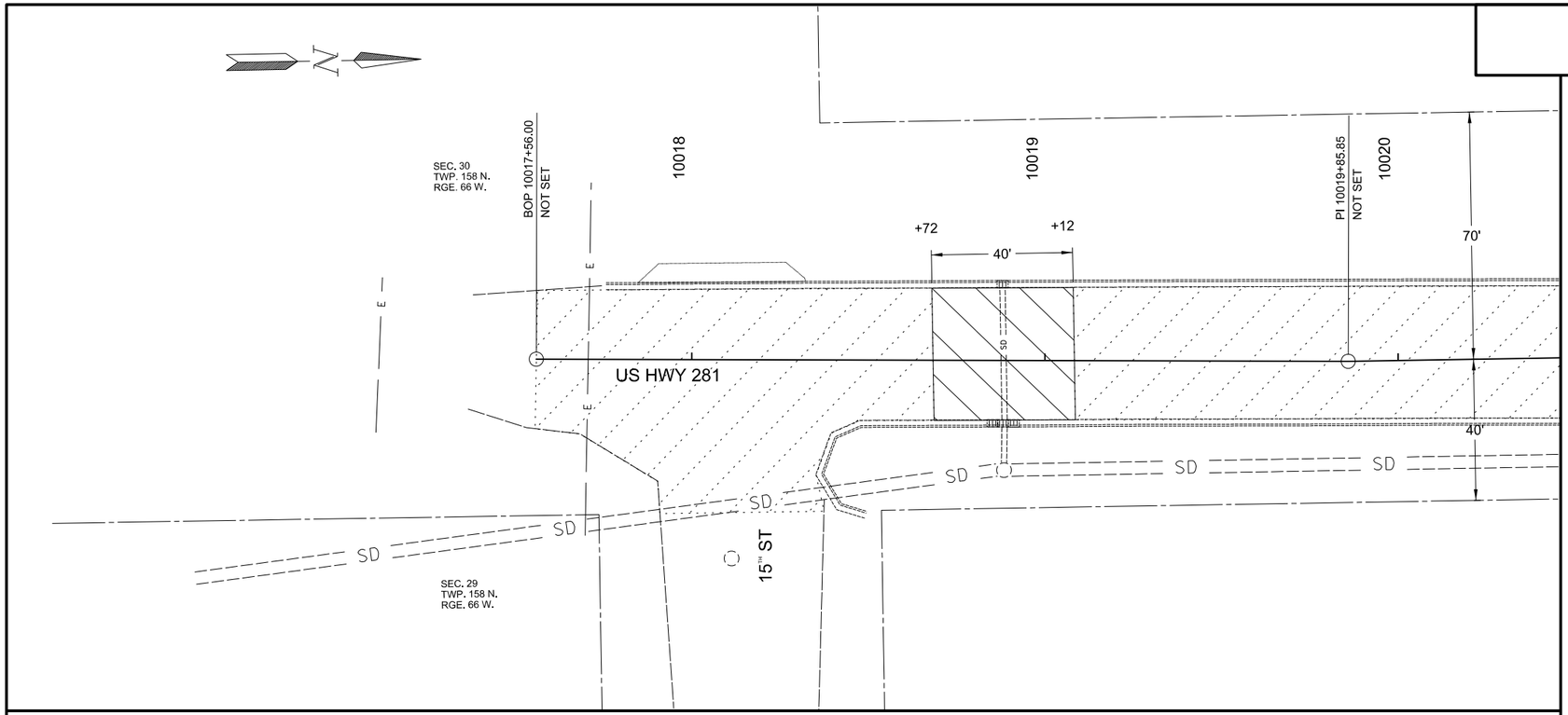
R.P. 189.726 to 190.718

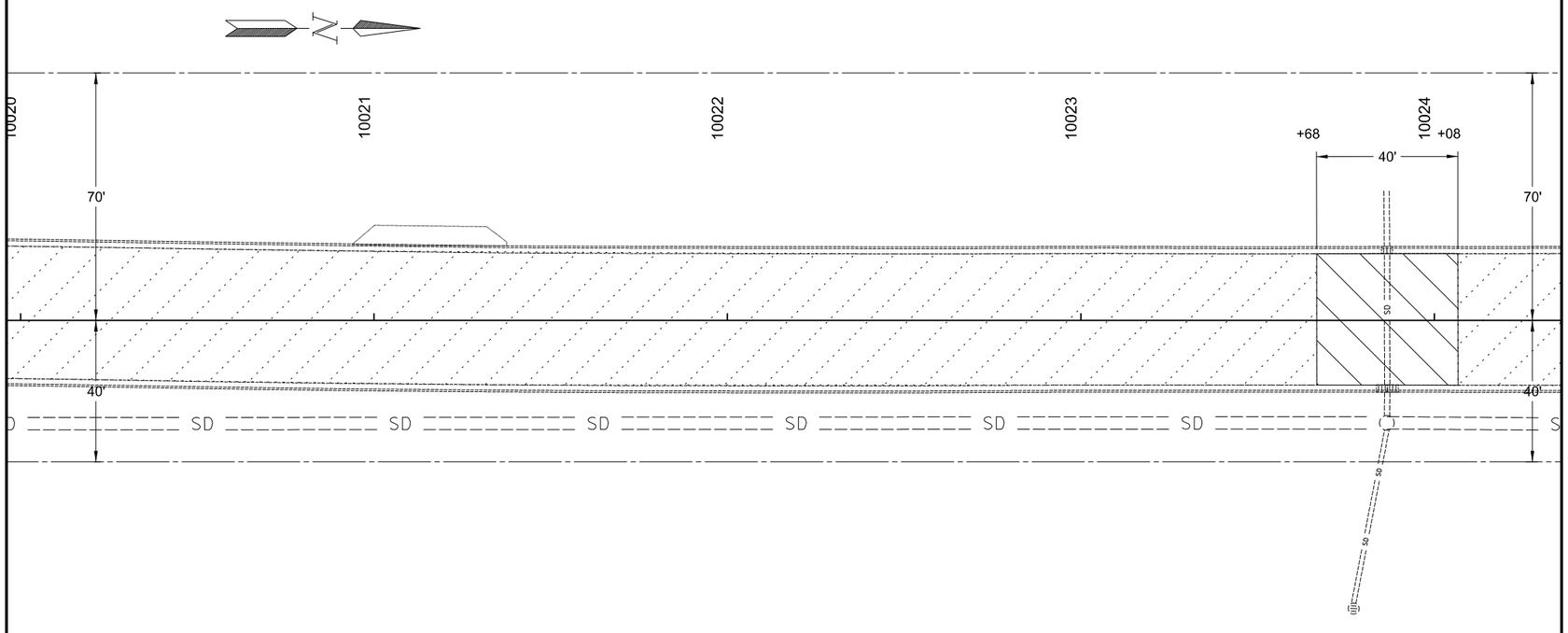
Sta. 10017+56 to 10069+96

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

PROPOSED
TYPICAL SECTION

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	40	1





REMOVAL OF BITUMINOUS SURFACING

STA. 10018+72 to 10019+12	167 SY
STA. 10023+68 to 10024+08	167 SY

COMMON EXCAVATION - WASTE

STA. 10018+72 to 10019+12	164 CY
STA. 10023+68 to 10024+08	160 CY

MILLING PAVEMENT SURFACE

STA. 10017+56 to 10018+72	631 SY
STA. 10019+12 to 10023+68	1900 SY

Remove Concrete Curb Ramp
Remove Concrete Sidewalk

Remove Curb & Gutter

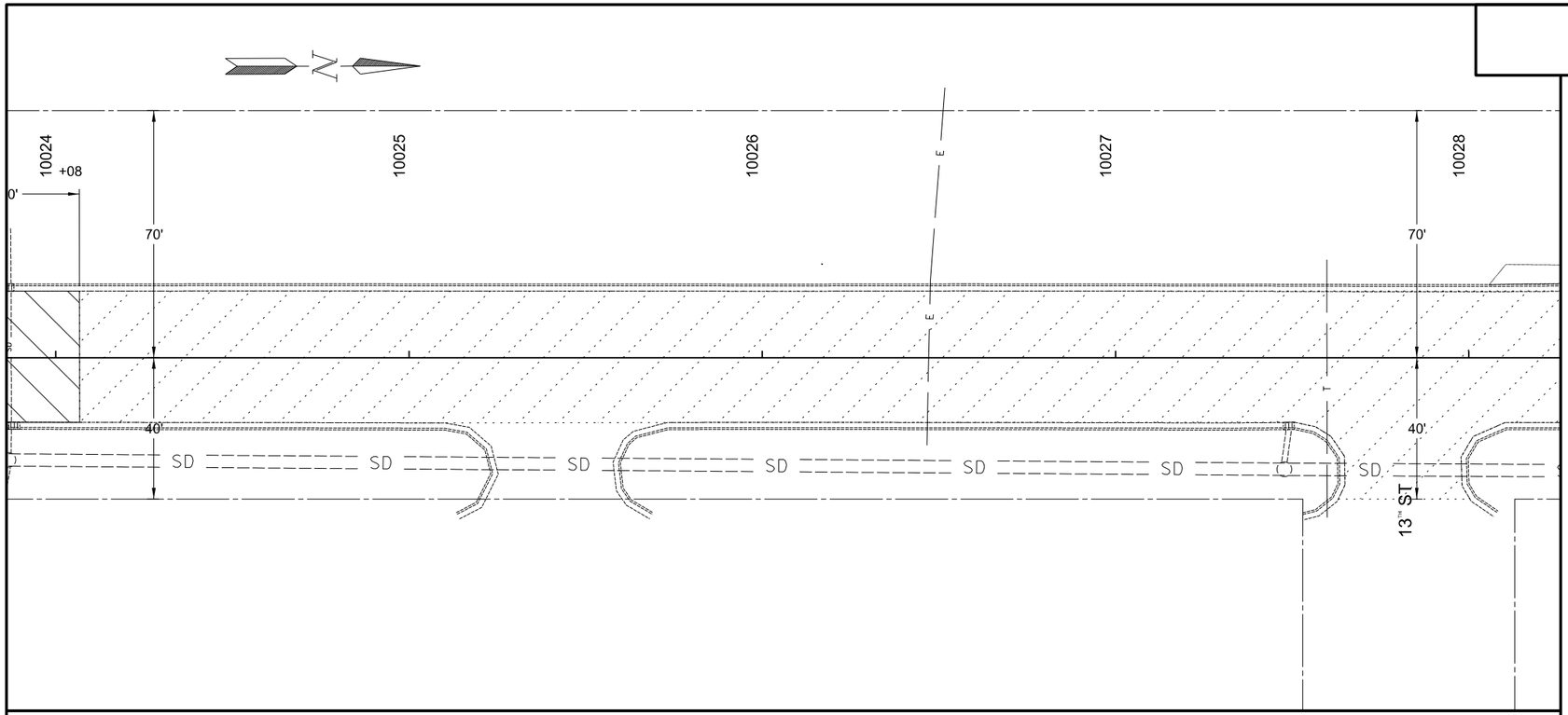
Subgrade Repair

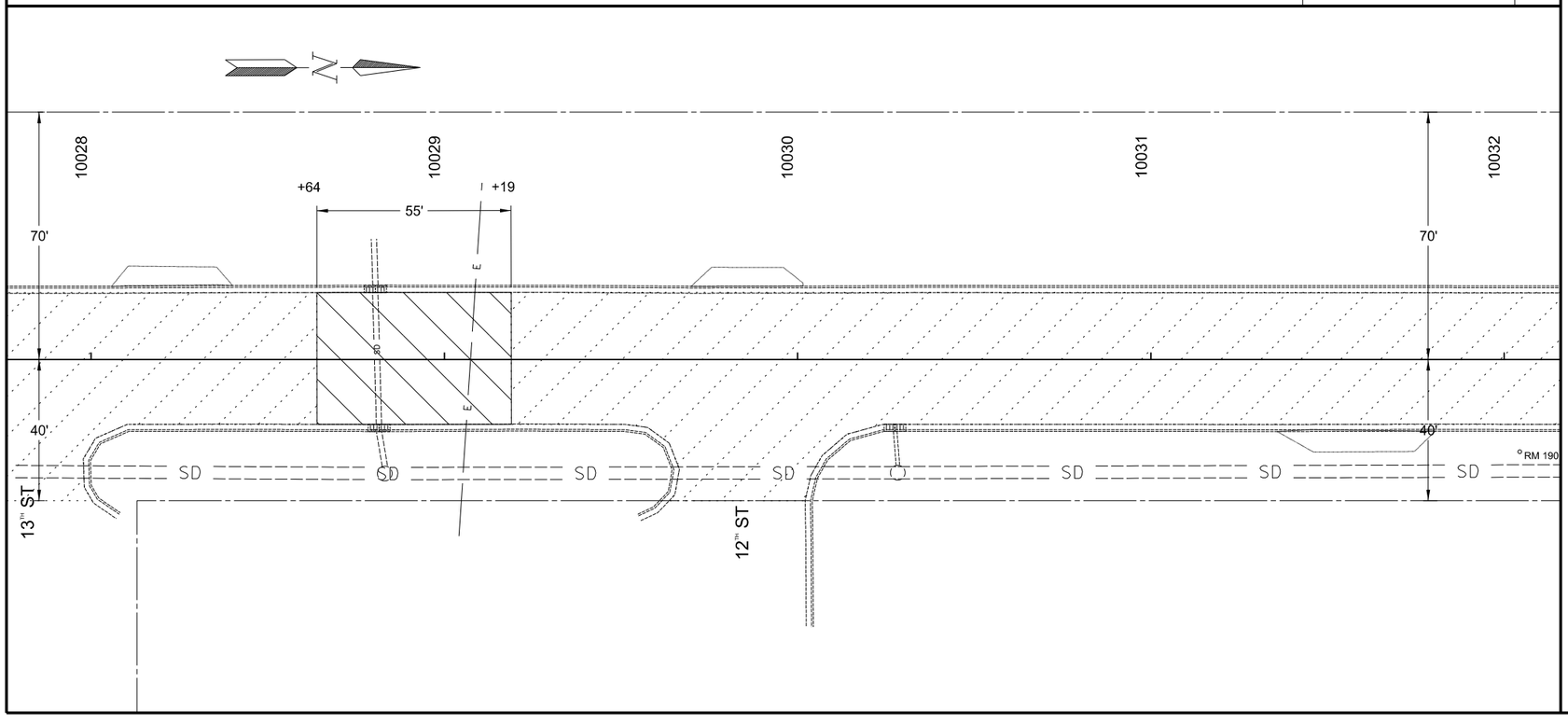
Mill Pavement Surface
3" Depth

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

REMOVALS
STA. 10017+56 to 10024+08

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	40	2





REMOVAL OF BITUMINOUS SURFACING

STA. 10028+64 to 10029+19 — 229 SY

COMMON EXCAVATION - WASTE

STA. 10028+64 to 10029+19 — 231 CY

MILLING PAVEMENT SURFACE

STA. 10024+08 to 10028+64 — 1983 SY

STA. 10029+19 to 10032+00 — 1271 SY

Remove Concrete Curb Ramp
Remove Concrete Sidewalk

Remove Curb & Gutter

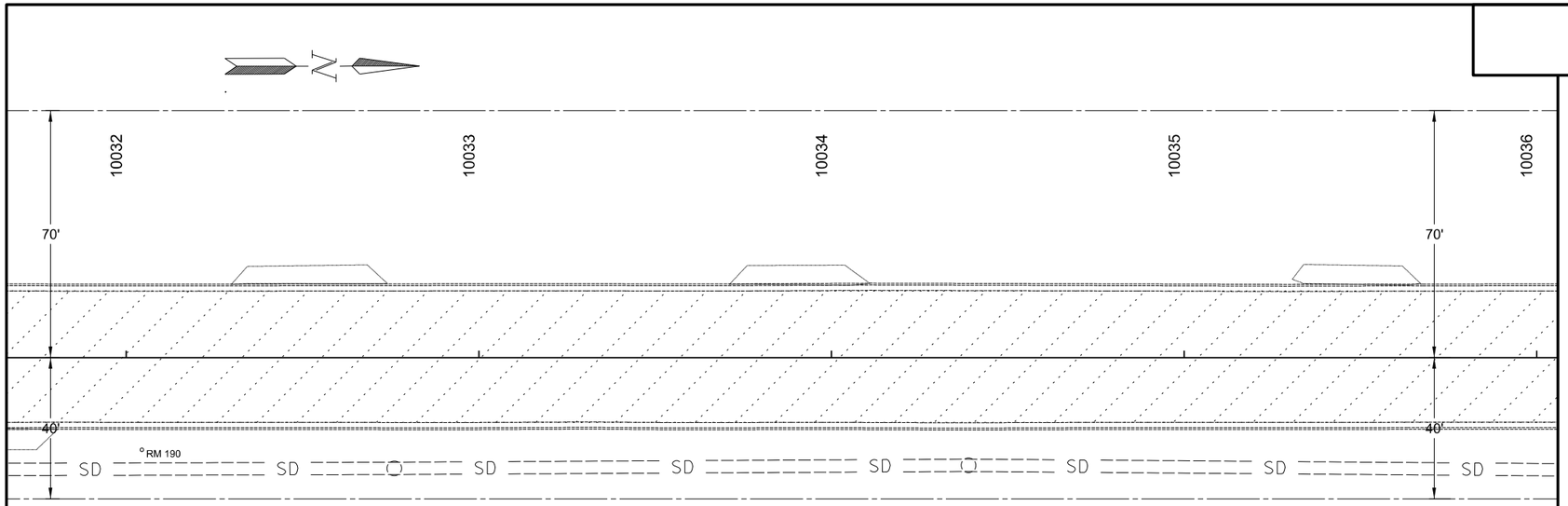
Subgrade Repair

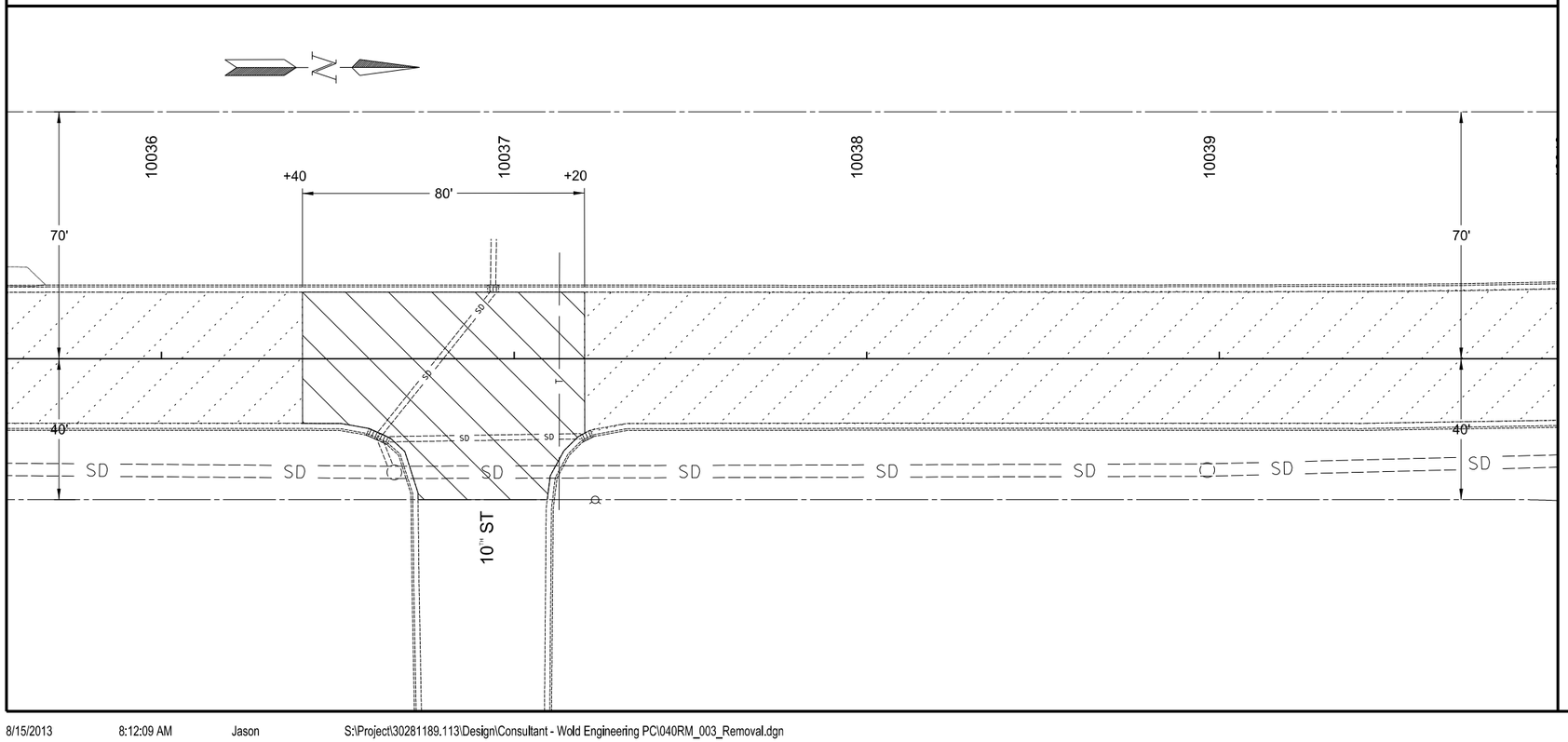
Mill Pavement Surface
3" Depth

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

REMOVALS
STA. 10024+08 to 10032+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	40	3





REMOVAL OF BITUMINOUS SURFACING
STA. 10036+40 to 10037+20 417 SY

COMMON EXCAVATION - WASTE
STA. 10036+40 to 10037+20 495 CY

MILLING PAVEMENT SURFACE
STA. 10032+00 to 10036+40 1820 SY
STA. 10037+20 to 10039+50 956 SY

Remove Concrete Curb Ramp
Remove Concrete Sidewalk

Remove Curb & Gutter

Subgrade Repair

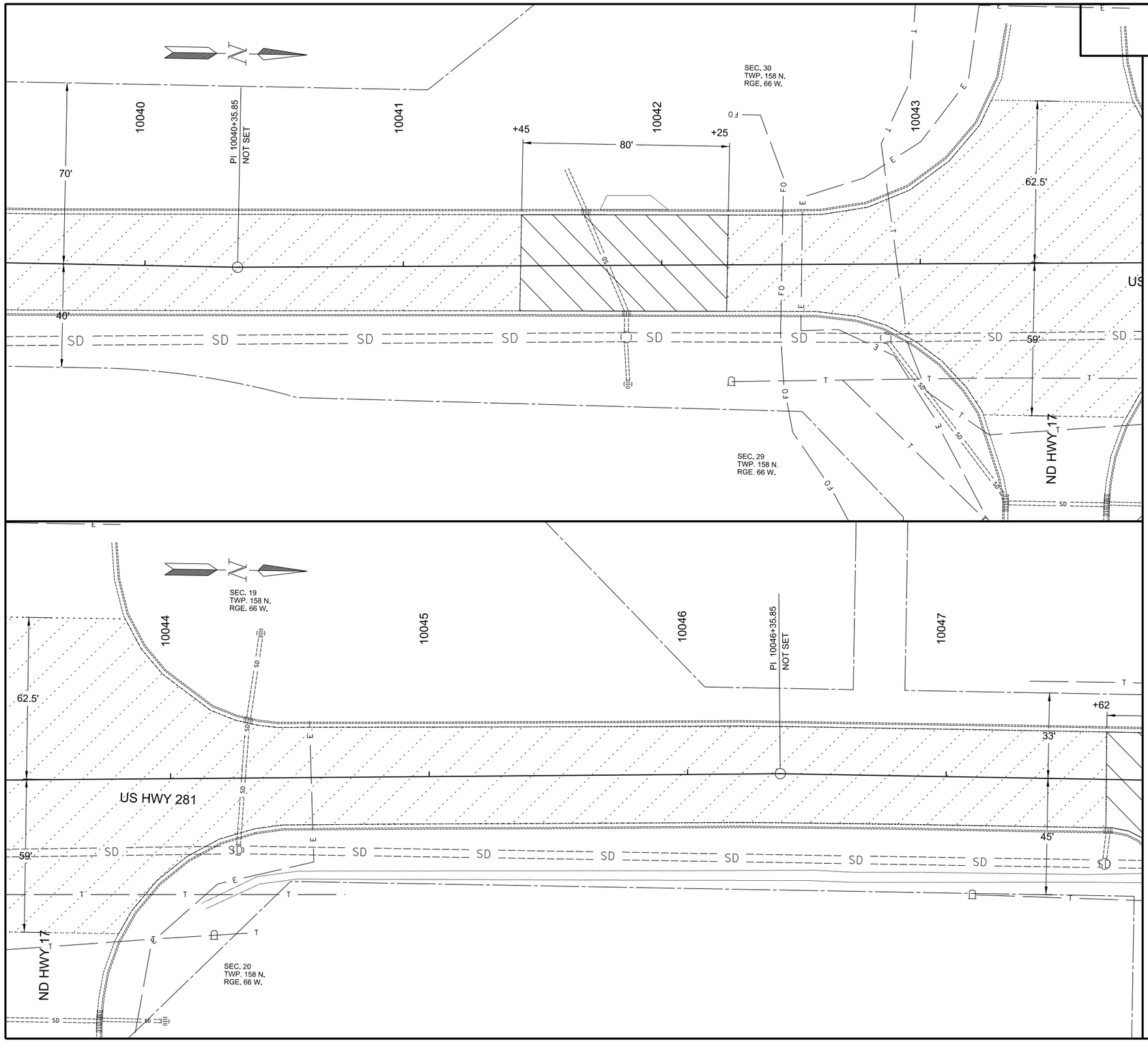
Mill Pavement Surface
3" Depth

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

REMOVALS
STA. 10032+00 to 10039+50

8/15/2013 8:12:09 AM Jason S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\040RM_003_Removal.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	40	4



REMOVAL OF BITUMINOUS SURFACING

STA. 10041+45 to 10042+25 — 331 SY

COMMON EXCAVATION - WASTE

STA. 10041+45 to 10042+25 — 416 CY

MILLING PAVEMENT SURFACE

STA. 10039+50 to 10041+45 — 808 SY

STA. 10042+25 to 10047+62 — 3099 SY

Remove Concrete Curb Ramp
Remove Concrete Sidewalk

Remove Curb & Gutter

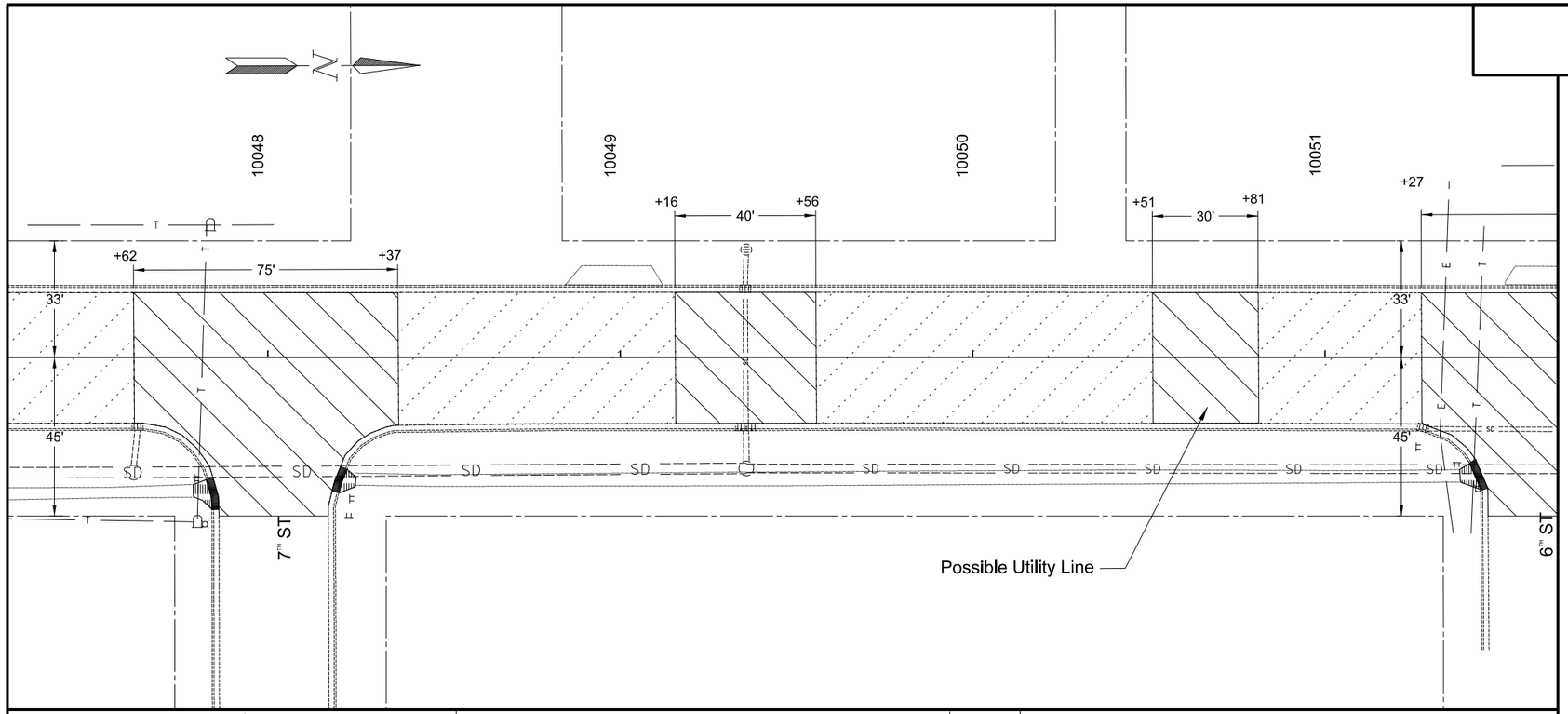
Subgrade Repair

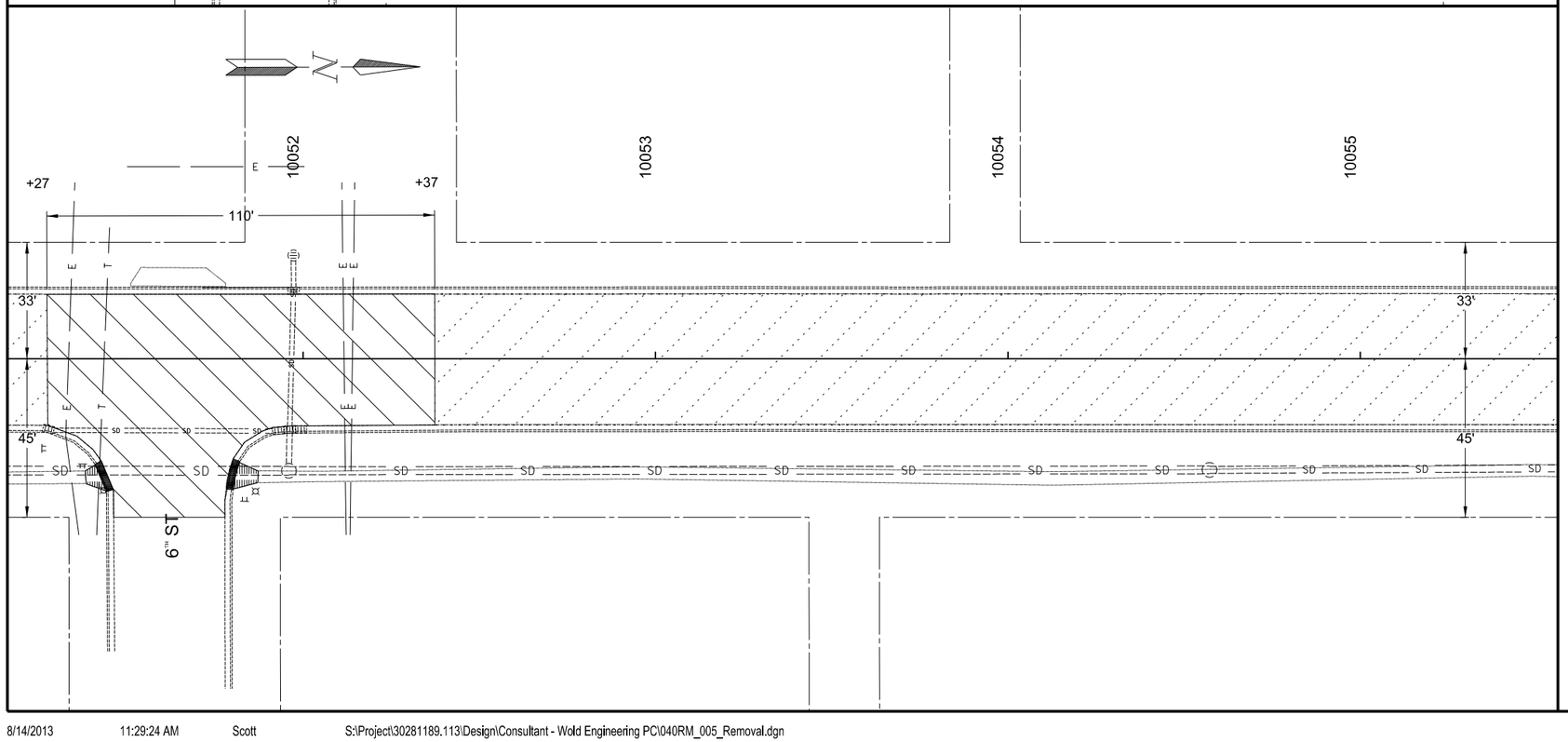
Mill Pavement Surface
3" Depth

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

REMOVALS
STA. 10039+50 to 10047+62

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	40	5





REMOVAL OF BITUMINOUS SURFACING

STA. 10047+62 to 10048+37	451 SY
STA. 10049+16 to 10049+56	167 SY
STA. 10050+51 to 10050+81	124 SY
STA. 10051+27 to 10052+37	604 SY

COMMON EXCAVATION - WASTE

STA. 10047+62 to 10048+37	484 CY
STA. 10049+16 to 10049+56	162 CY
STA. 10050+51 to 10050+81	113 CY
STA. 10051+27 to 10052+37	734 CY

MILLING PAVEMENT SURFACE

STA. 10048+37 to 10049+16	327 SY
STA. 10049+56 to 10050+51	394 SY
STA. 10050+81 to 10051+27	191 SY
STA. 10052+37 to 10055+50	1289 SY

REMOVAL OF CURB AND GUTTER

STA. 10047+85 RT	9 LF
STA. 10048+20 RT	9 LF
STA. 10051+57 RT	9 LF
STA. 10051+81 RT	9 LF

REMOVAL OF CONCRETE

STA. 10058+86 RT	4 SY
STA. 10048+20 RT	4 SY
STA. 10051+37 RT	4 SY
STA. 10051+71 RT	5 SY

Remove Concrete Curb Ramp
Remove Concrete Sidewalk

Remove Curb & Gutter

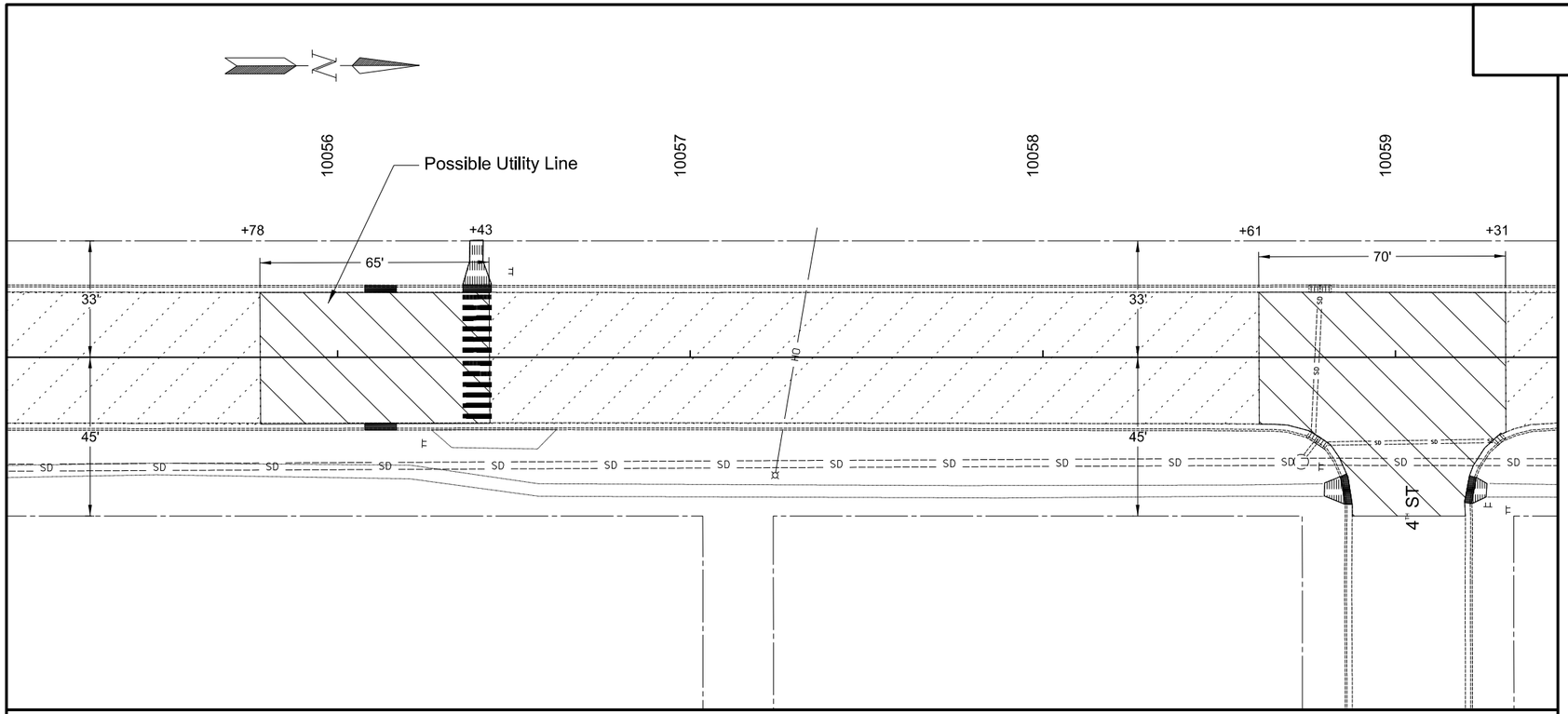
Subgrade Repair

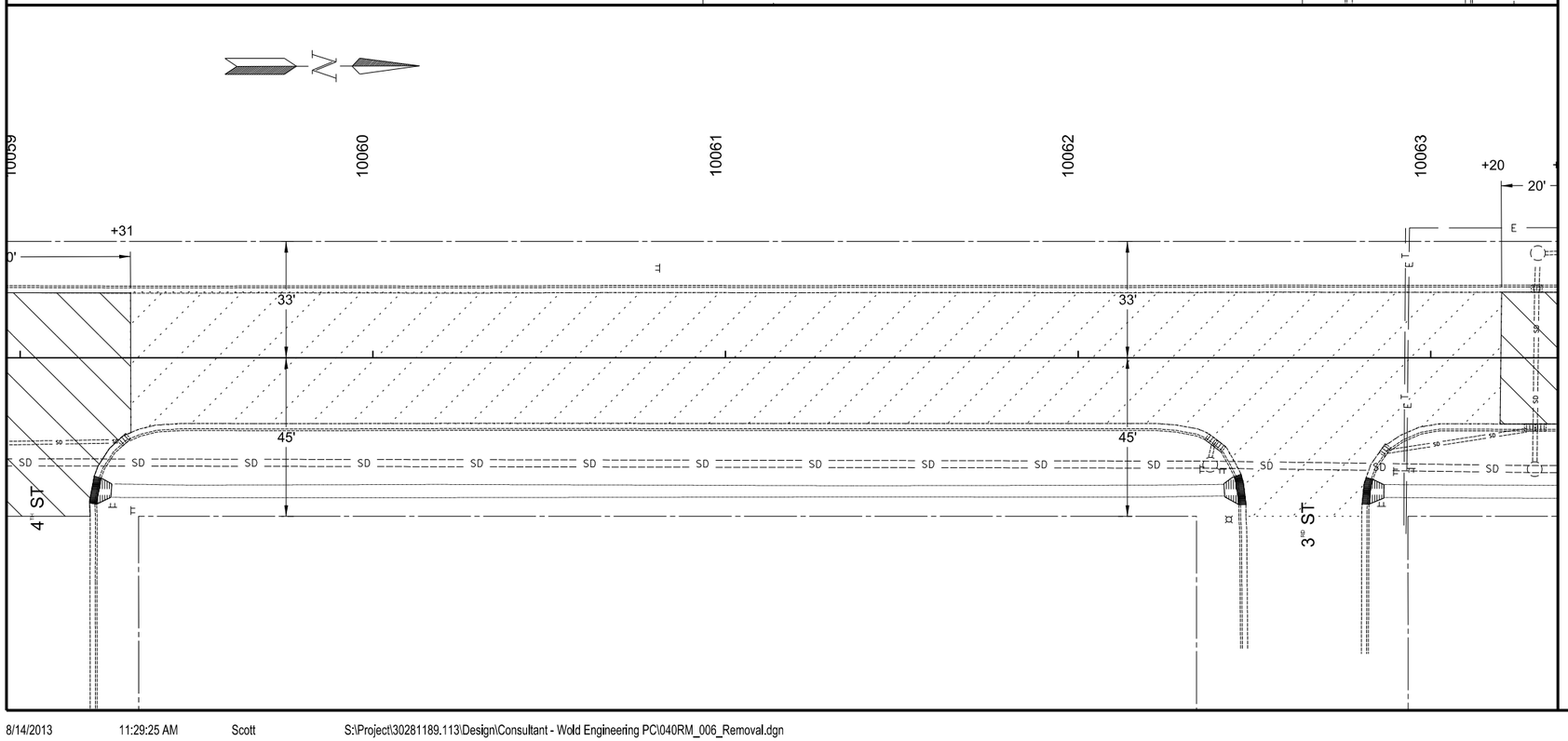
Mill Pavement Surface
3" Depth

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

REMOVALS
STA. 10047+62 to 10055+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	40	6





REMOVAL OF BITUMINOUS SURFACING

STA. 10055+78 to 10056+43	268 SY
STA. 10058+61 to 10059+31	427 SY

COMMON EXCAVATION - WASTE

STA. 10055+78 to 10056+43	283 CY
STA. 10058+61 to 10059+31	427 CY

MILLING PAVEMENT SURFACE

STA. 10055+50 to 10055+78	116 SY
STA. 10056+43 to 10058+61	901 SY
STA. 10059+31 to 10063+20	1728 SY

REMOVAL OF CURB AND GUTTER

STA. 10056+11 RT	9 LF
STA. 10056+11 LT	9 LF
STA. 10056+37 LT	8 LF
STA. 10058+84 RT	9 LF
STA. 10059+21 RT	9 LF
STA. 10062+44 RT	9 LF
STA. 10062+82 RT	9 LF

REMOVAL OF CONCRETE

STA. 10056+37 LT	7 SY
STA. 10058+79 RT	4 SY
STA. 10059+21 RT	4 SY
STA. 10062+38 RT	5 SY
STA. 10062+82 RT	5 SY

Remove Concrete Curb Ramp
Remove Concrete Sidewalk

Remove Curb & Gutter

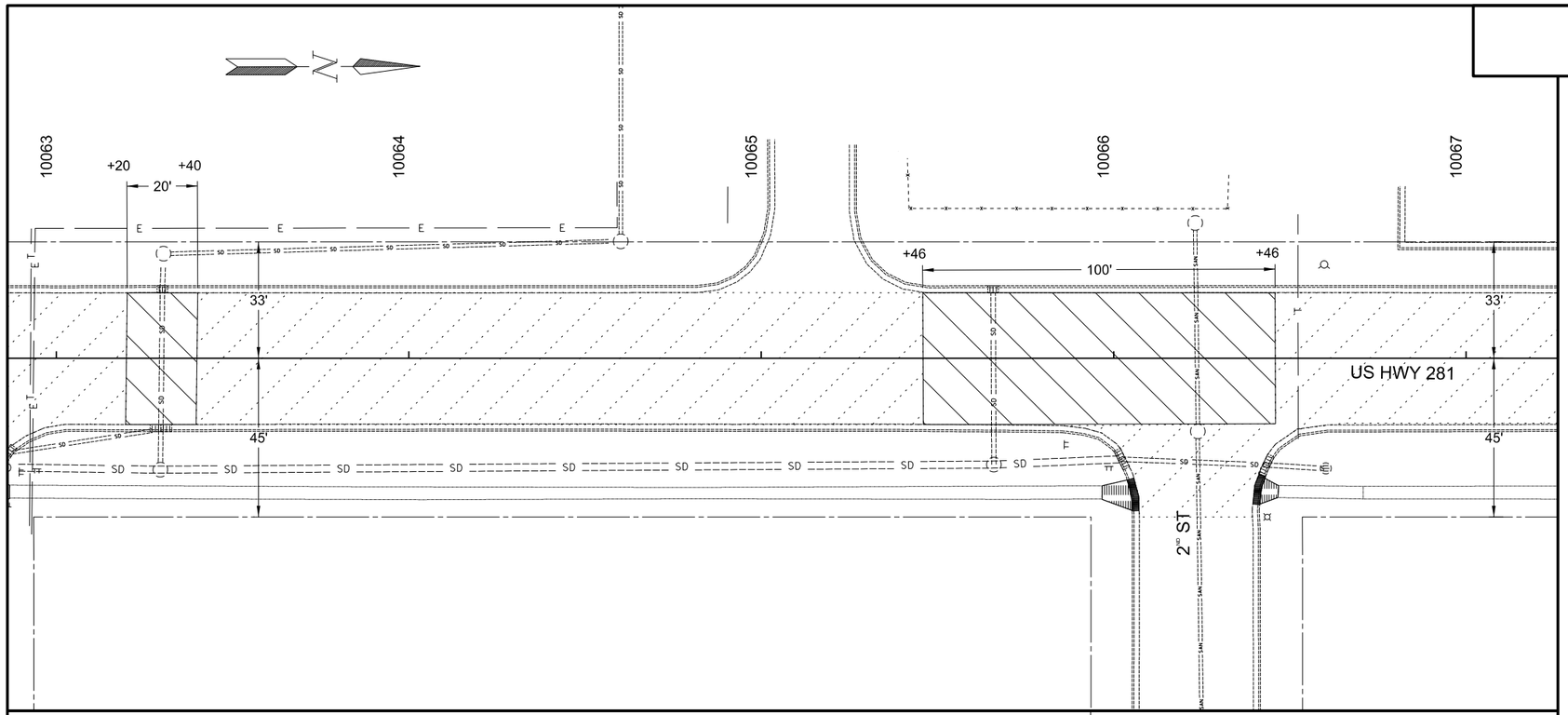
Subgrade Repair

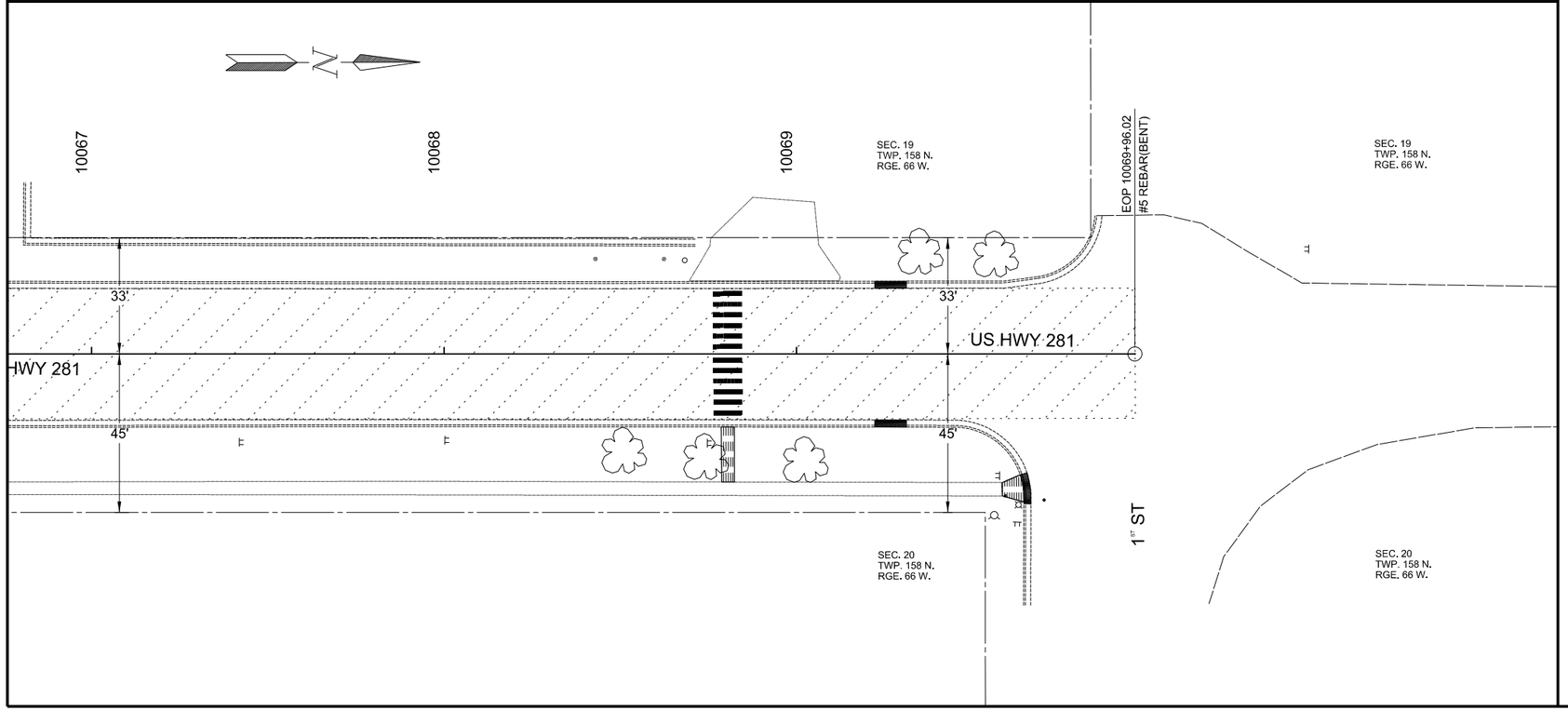
Mill Pavement Surface
3" Depth

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

REMOVALS
STA. 10055+50 to 10063+20

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	40	7





REMOVAL OF BITUMINOUS SURFACING

STA. 10063+20 to 10063+40	83 SY
STA. 10065+46 to 10066+46	418 SY

COMMON EXCAVATION - WASTE

STA. 10063+20 to 10063+40	67 CY
STA. 10065+46 to 10066+46	464 CY

MILLING PAVEMENT SURFACE

STA. 10063+40 to 10065+46	856 SY
STA. 10066+46 to 10069+96	1555 SY

REMOVAL OF CURB AND GUTTER

STA. 10066+08 RT	10 LF
STA. 10066+43 RT	9 LF
STA. 10069+24 LT	9 LF
STA. 10069+24 RT	9 LF
STA. 10066+65 RT	9 LF

REMOVAL OF CONCRETE

STA. 10065+96 RT	6 SY
STA. 10066+41 RT	4 SY
STA. 10068+79 RT	7 SY
STA. 10069+58 RT	4 SY

Remove Concrete Curb Ramp
Remove Concrete Sidewalk

Remove Curb & Gutter

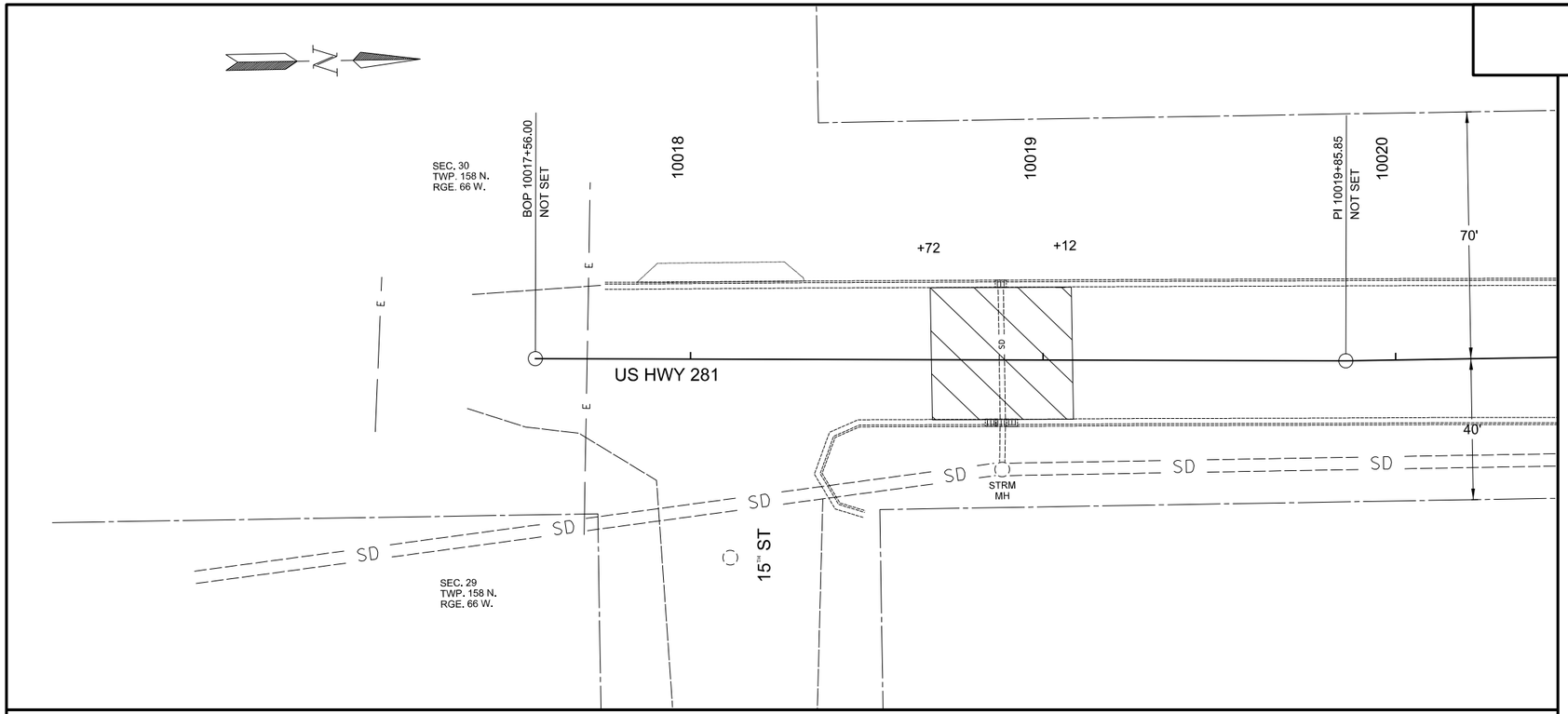
Subgrade Repair

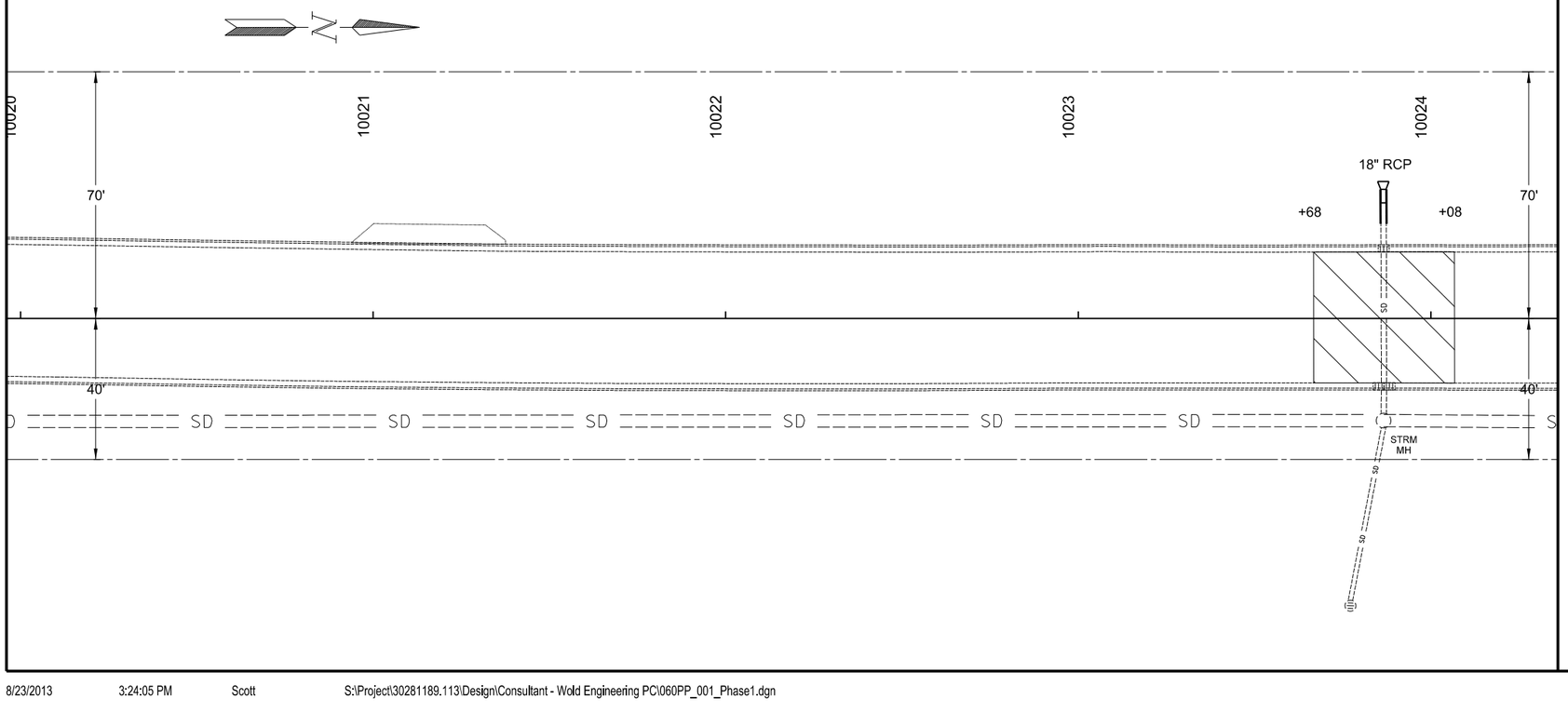
Mill Pavement Surface
3" Depth

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

REMOVALS
STA. 10063+20 to 10069+96

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	60	1





BORROW - EXCAVATION

STA. 10018+72 to 10019+12	66 CY
STA. 10023+68 to 10024+08	61 CY

AGGREGATE BASE COURSE CL. 5

STA. 10018+72 to 10019+12	258 TONS
STA. 10023+68 to 10024+08	258 TONS

SUPERPAVE FAA 43

STA. 10018+72 to 10019+12	23.2 TONS
STA. 10023+68 to 10024+08	23.2 TONS

PG58-28 ASPHALT CEMENT

STA. 10018+72 to 10019+12	1.4 TONS
STA. 10023+68 to 10024+08	1.4 TONS

GEOTEXTILE FABRIC - TYPE S2

STA. 10018+72 to 10019+12	167 SY
STA. 10023+68 to 10024+08	167 SY

REMOVE & RELAY END SECTION - ALL TYPES AND SIZES

STA. 10023+83 LT	1 EA

REMOVE & RELAY PIPE - ALL TYPES AND SIZES

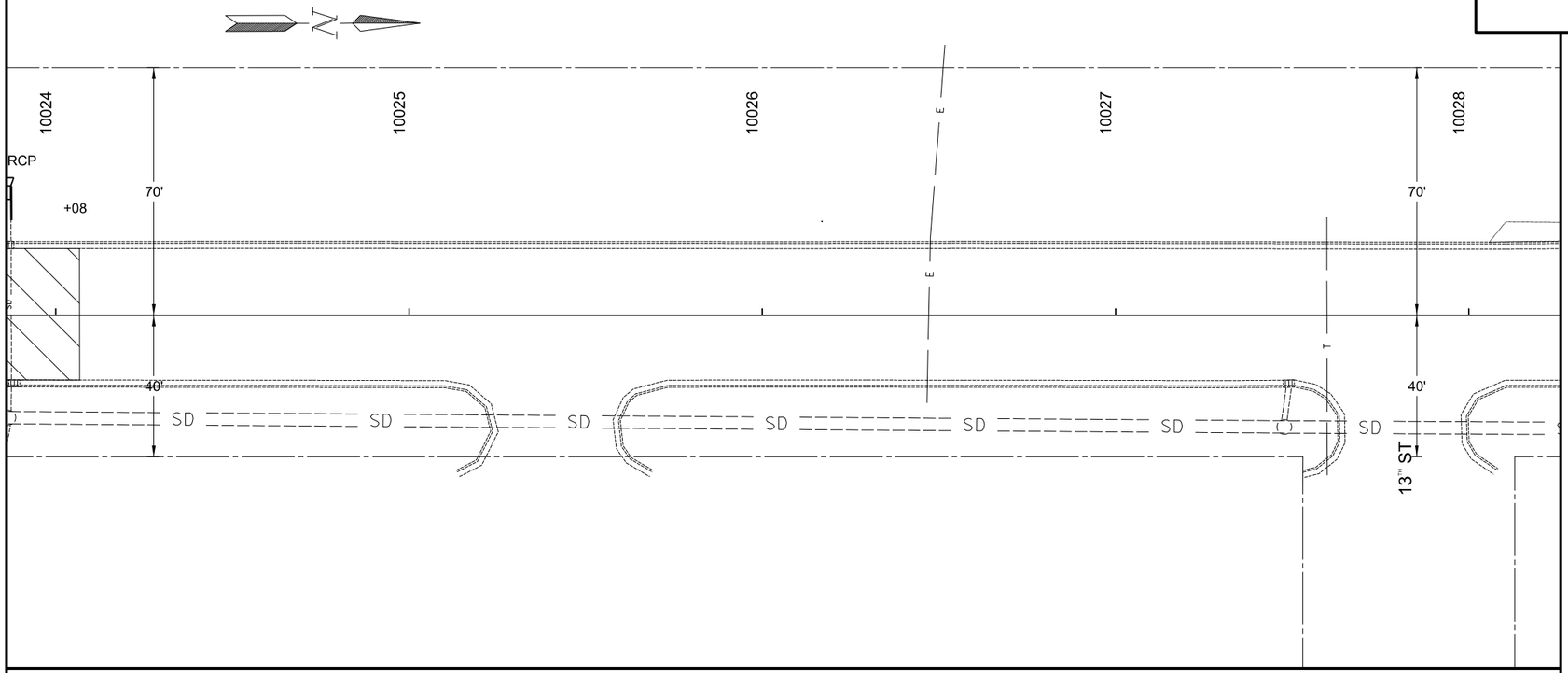
STA. 10023+83 LT	6 LF

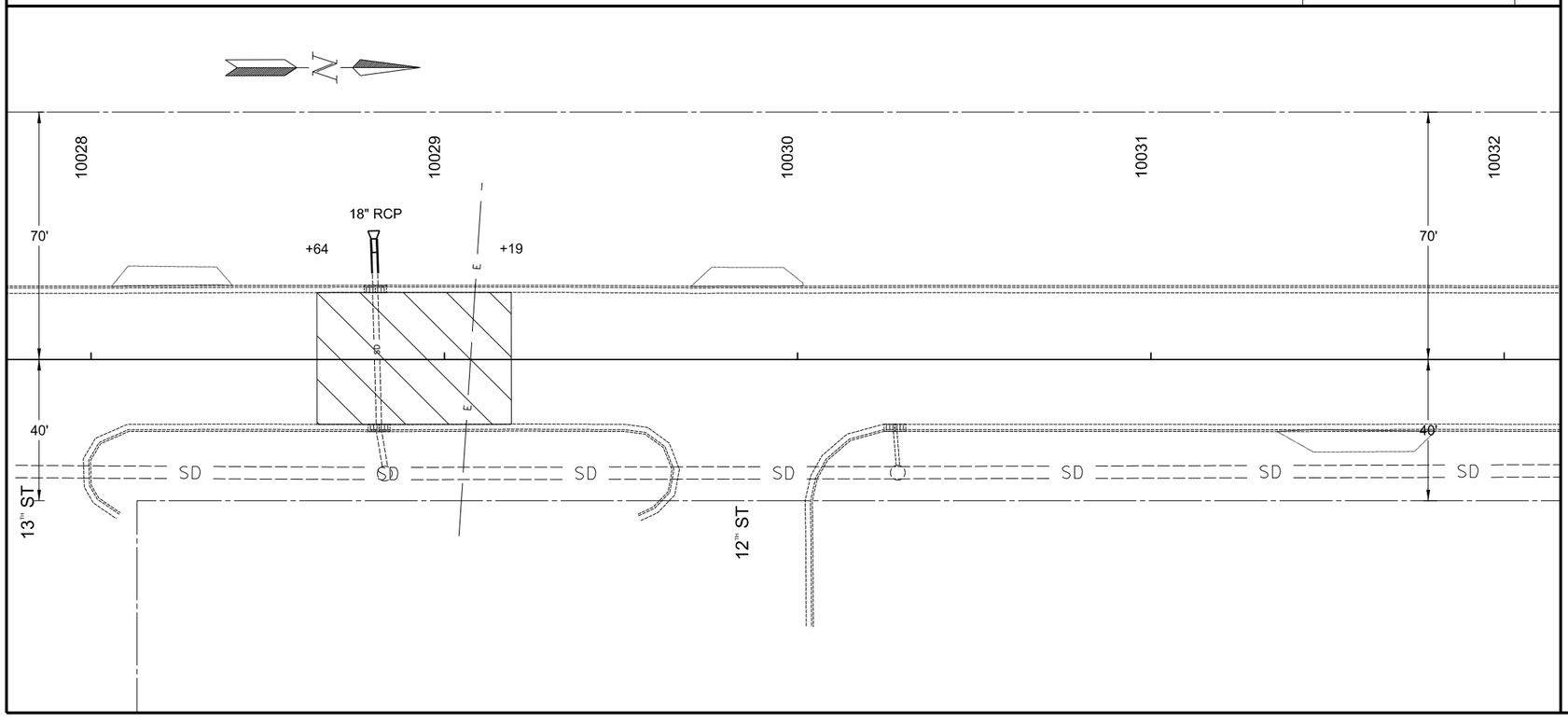
This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

PLAN VIEW

STA. 10017+56 to 10024+08

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	60	2





BORROW - EXCAVATION

STA. 10028+64 to 10029+19 — 98 CY

AGGREGATE BASE COURSE CL. 5

STA. 10028+64 to 10029+19 — 352 TONS

SUPERPAVE FAA 43

STA. 10028+64 to 10029+19 — 31.8 TONS

PG58-28 ASPHALT CEMENT

STA. 10028+64 to 10029+19 — 1.9 TONS

GEOTEXTILE FABRIC - TYPE S2

STA. 10028+64 to 10029+19 — 229 SY

REMOVE & RELAY END SECTION - ALL TYPES AND SIZES

STA. 10028+80 LT — 1 EA

REMOVE & RELAY PIPE - ALL TYPES AND SIZES

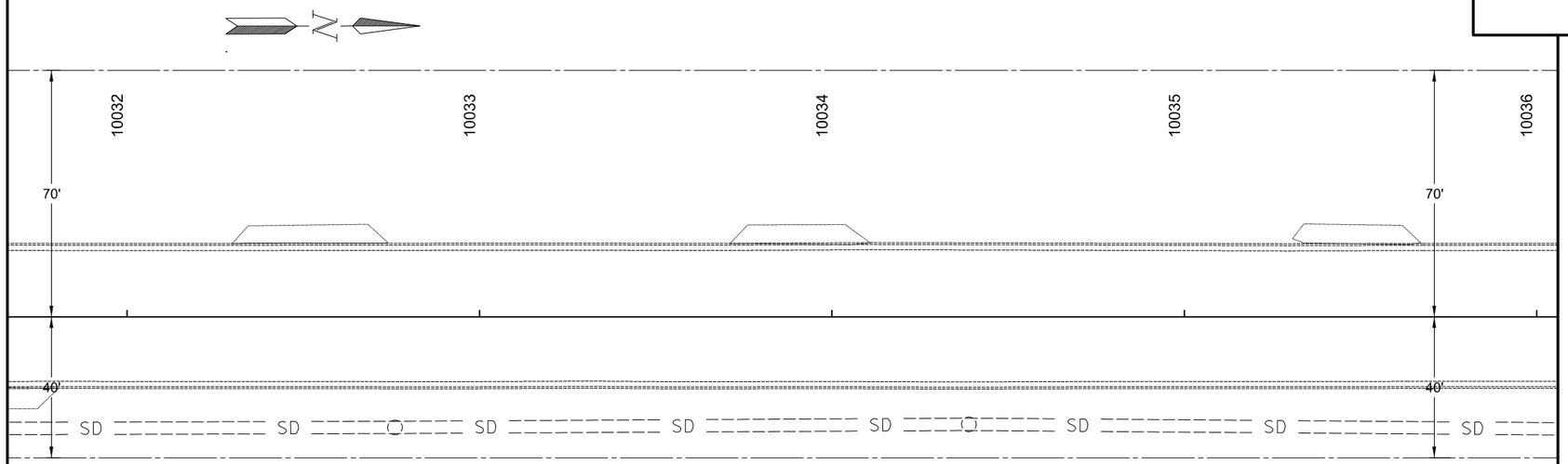
STA. 10028+80 LT — 6 LF

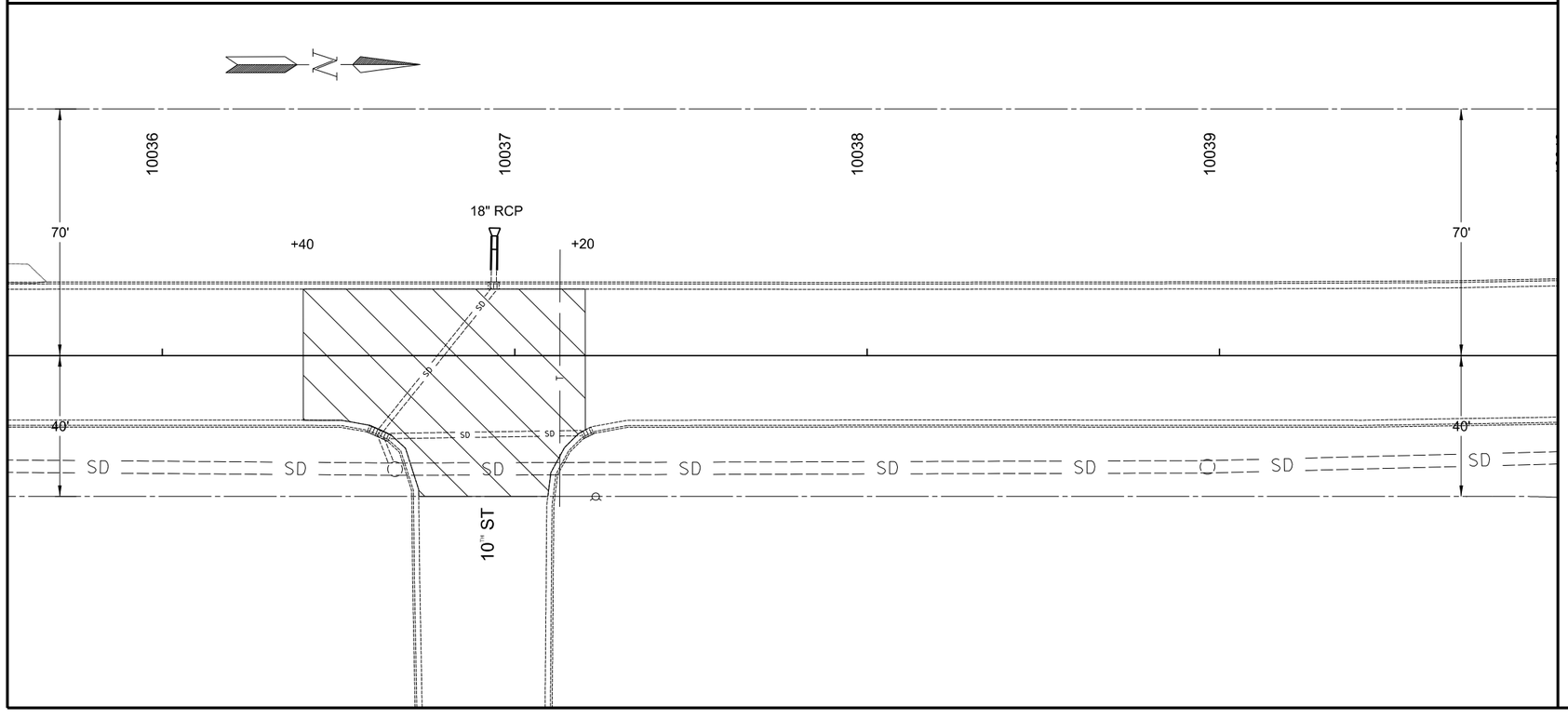
This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

PLAN VIEW

STA. 10024+08 to 10032+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	60	3





BORROW - EXCAVATION
STA. 10036+40 to 10037+20 — 273 CY

AGGREGATE BASE COURSE CL. 5
STA. 10036+40 to 10037+20 — 642 TONS

SUPERPAVE FAA 43
STA. 10036+40 to 10037+20 — 58.0 TONS

PG58-28 ASPHALT CEMENT
STA. 10036+40 to 10037+20 — 3.4 TONS

GEOTEXTILE FABRIC - TYPE S2
STA. 10036+40 to 10037+20 — 417 SY

REMOVE & RELAY END SECTION - ALL TYPES AND SIZES
STA. 10036+96 LT — 1 EA

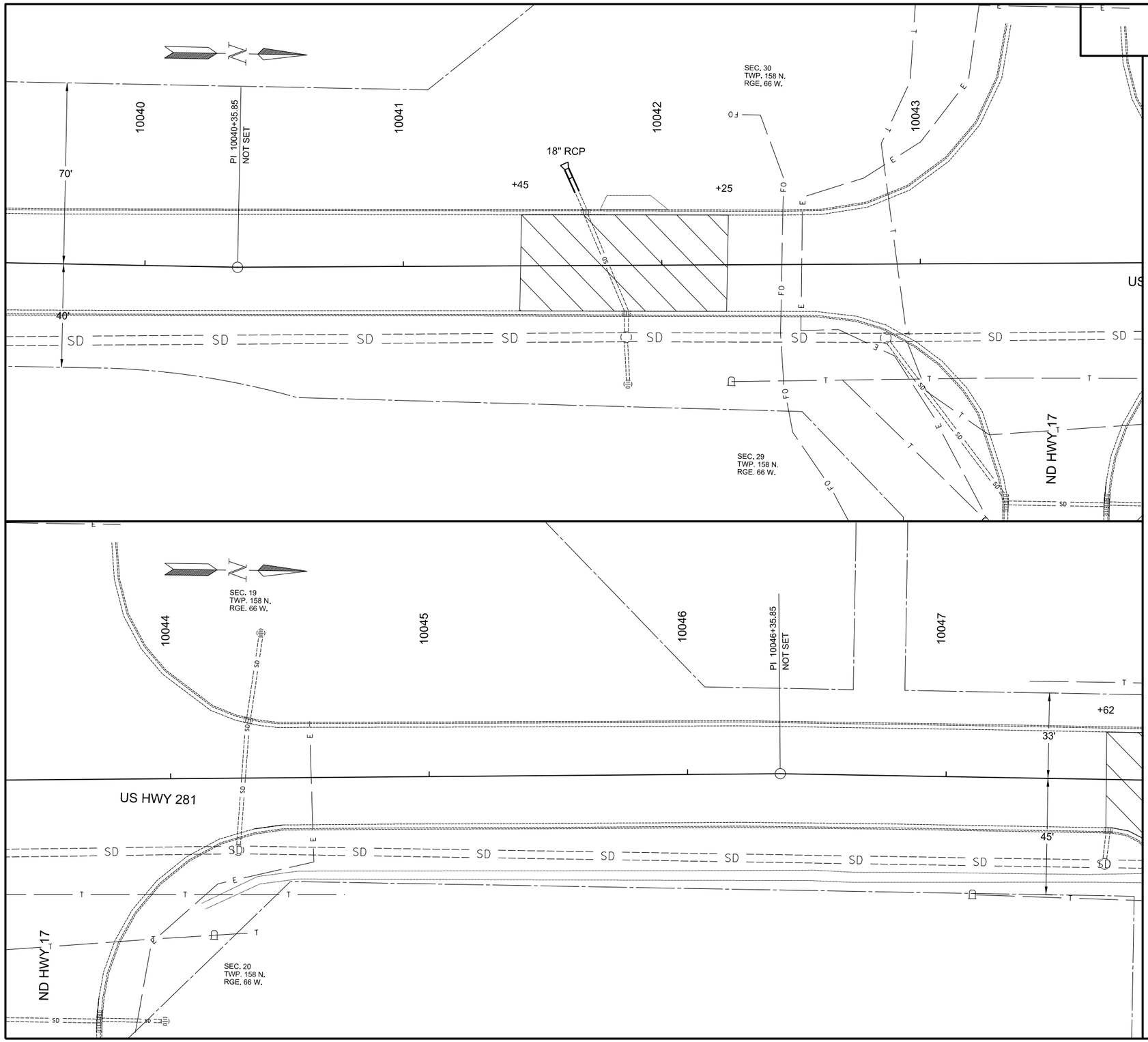
REMOVE & RELAY PIPE - ALL TYPES AND SIZES
STA. 10036+96 LT — 6 LF

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

PLAN VIEW

STA. 10032+00 to 10039+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	60	4



BORROW - EXCAVATION

STA. 10041+45 to 10042+25 — 244 CY

AGGREGATE BASE COURSE CL. 5

STA. 10041+45 to 10042+25 — 509 TONS

SUPERPAVE FAA 43

STA. 10041+45 to 10042+25 — 46.0 TONS

PG58-28 ASPHALT CEMENT

STA. 10041+45 to 10042+25 — 2.7 TONS

GEOTEXTILE FABRIC - TYPE S2

STA. 10041+45 to 10042+25 — 331 SY

REMOVE & RELAY END SECTION - ALL TYPES AND SIZES

STA. 10041+65 LT — 1 EA

REMOVE & RELAY PIPE - ALL TYPES AND SIZES

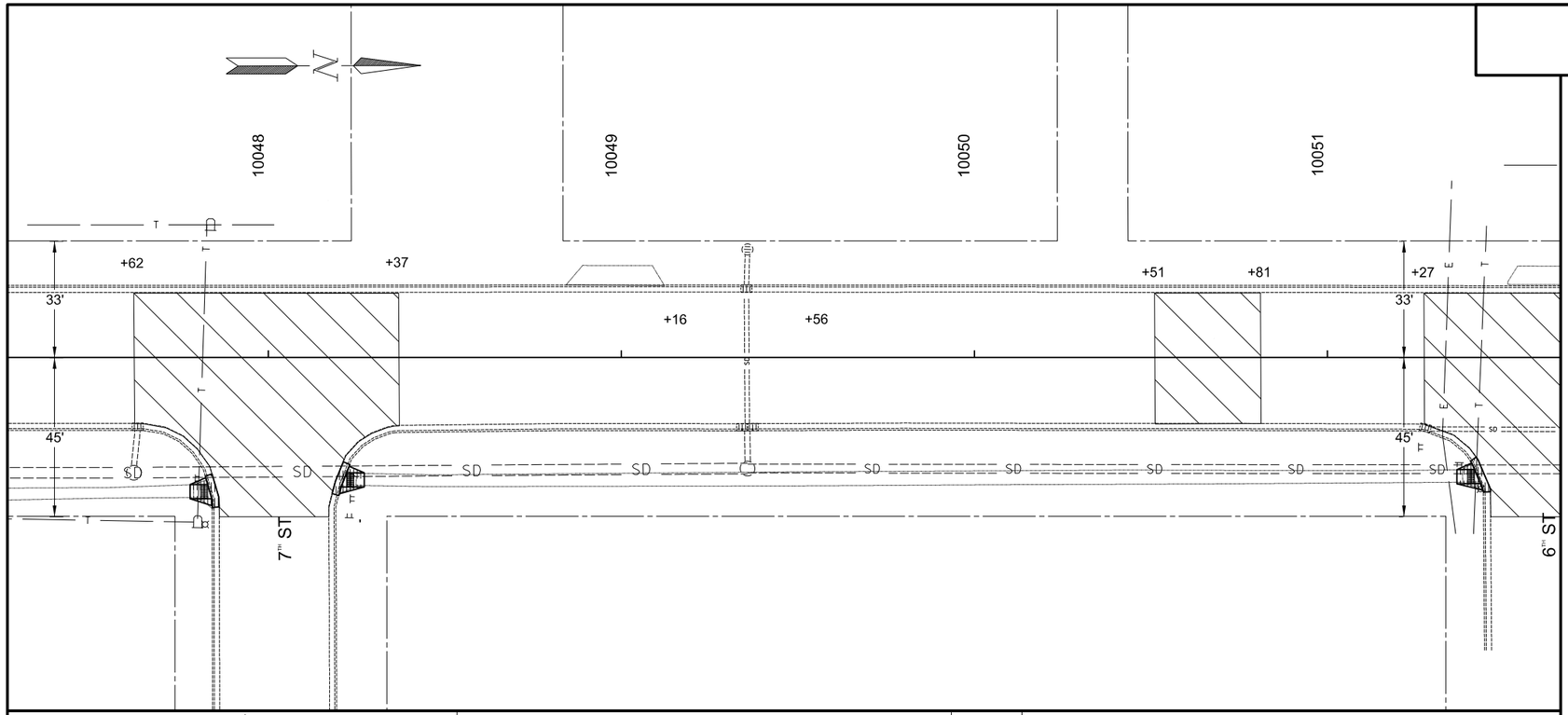
STA. 10041+65 LT — 6 LF

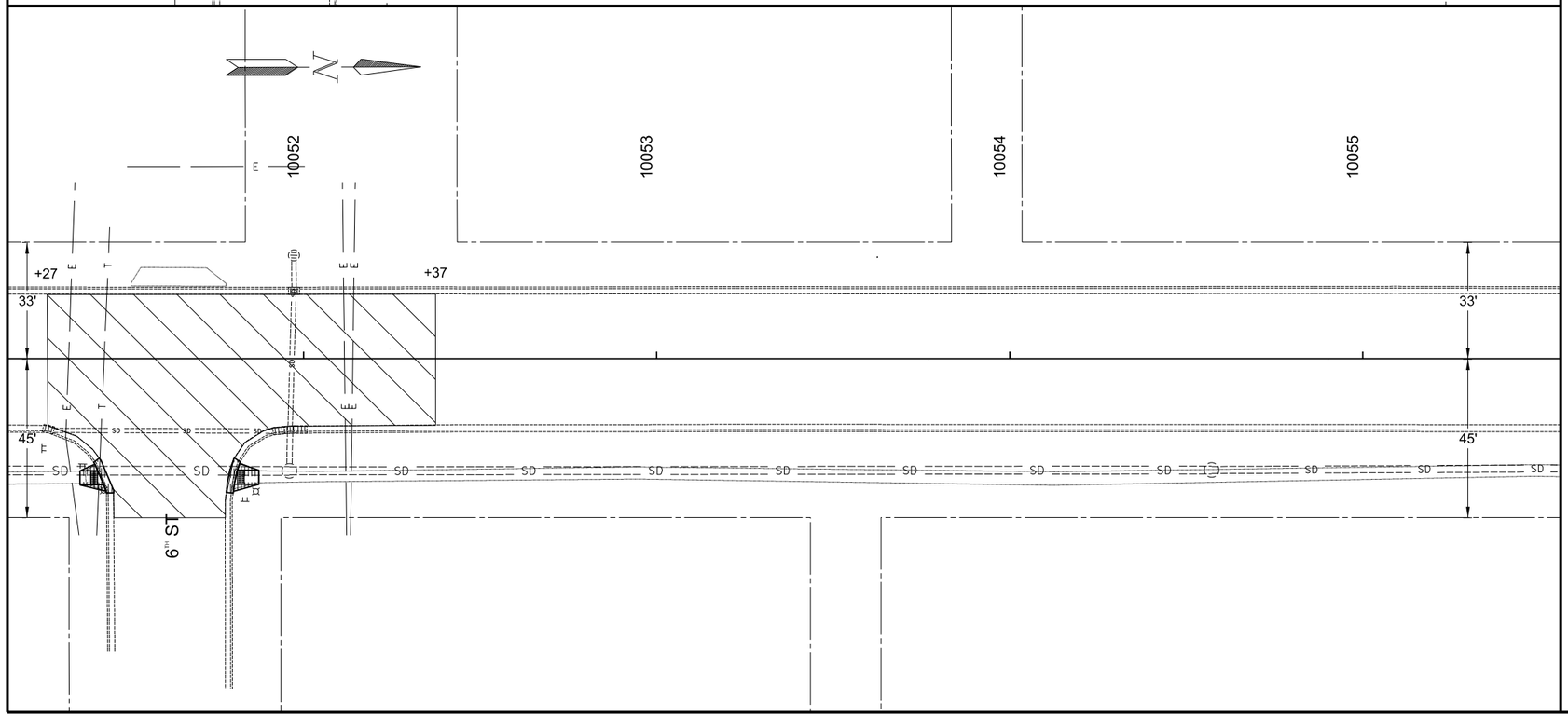
This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

PLAN VIEW

STA. 10039+50 to 10047+62

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	60	5





BORROW - EXCAVATION

STA. 10047+62 to 10048+37	230 CY
STA. 10049+16 to 10049+56	65 CY
STA. 10050+51 to 10050+81	39 CY
STA. 10051+27 to 10052+37	414 CY

AGGREGATE BASE COURSE CL. 5

STA. 10047+62 to 10048+37	693 TONS
STA. 10047+76 RT	0.8 TONS
STA. 10048+20 RT	1 TONS
STA. 10049+16 to 10049+56	256 TONS
STA. 10050+51 to 10050+81	189 TONS
STA. 10051+27 to 10052+37	929 TONS
STA. 10051+37 RT	0.8 TONS
STA. 10051+71 RT	1 TONS

SUPERPAVE FAA 43

STA. 10047+62 to 10048+37	62.7 TONS
STA. 10049+16 to 10049+56	23.2 TONS
STA. 10050+51 to 10050+81	17.2 TONS
STA. 10051+27 to 10052+37	83.9 TONS

PG58-28 ASPHALT CEMENT

STA. 10047+62 to 10048+37	3.8 TONS
STA. 10049+16 to 10049+56	1.4 TONS
STA. 10050+51 to 10050+81	1.0 TONS
STA. 10051+27 to 10052+37	5.0 TONS

GEOTEXTILE FABRIC - TYPE S2

STA. 10047+62 to 10048+37	451 SY
STA. 10049+16 to 10049+56	167 SY
STA. 10050+51 to 10050+81	124 SY
STA. 10051+27 to 10052+37	604 SY

CURB & GUTTER - TYPE 1

STA. 10047+83 RT	9 LF
STA. 10048+20 RT	9 LF
STA. 10051+44 RT	9 LF
STA. 10051+81 RT	9 LF

SIDEWALK CONC. 4 IN.

STA. 10047+76 RT	4 SY
STA. 10048+20 RT	5 SY
STA. 10051+37 RT	4 SY
STA. 10051+71 RT	5 SY

DETECTABLE WARNING PANELS

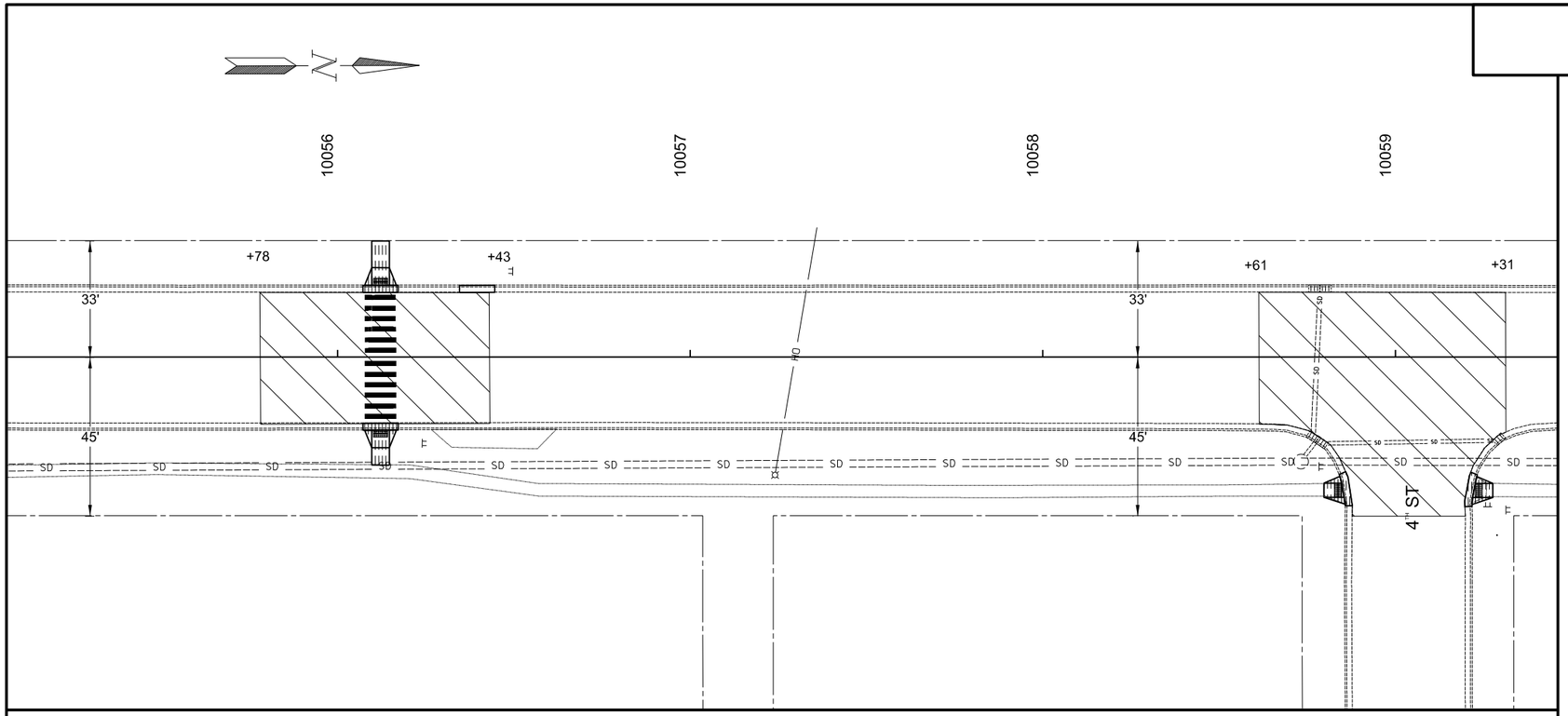
STA. 10047+76 RT	8 SF
STA. 10048+20 RT	8 SF
STA. 10051+37 RT	8 SF
STA. 10051+71 RT	8 SF

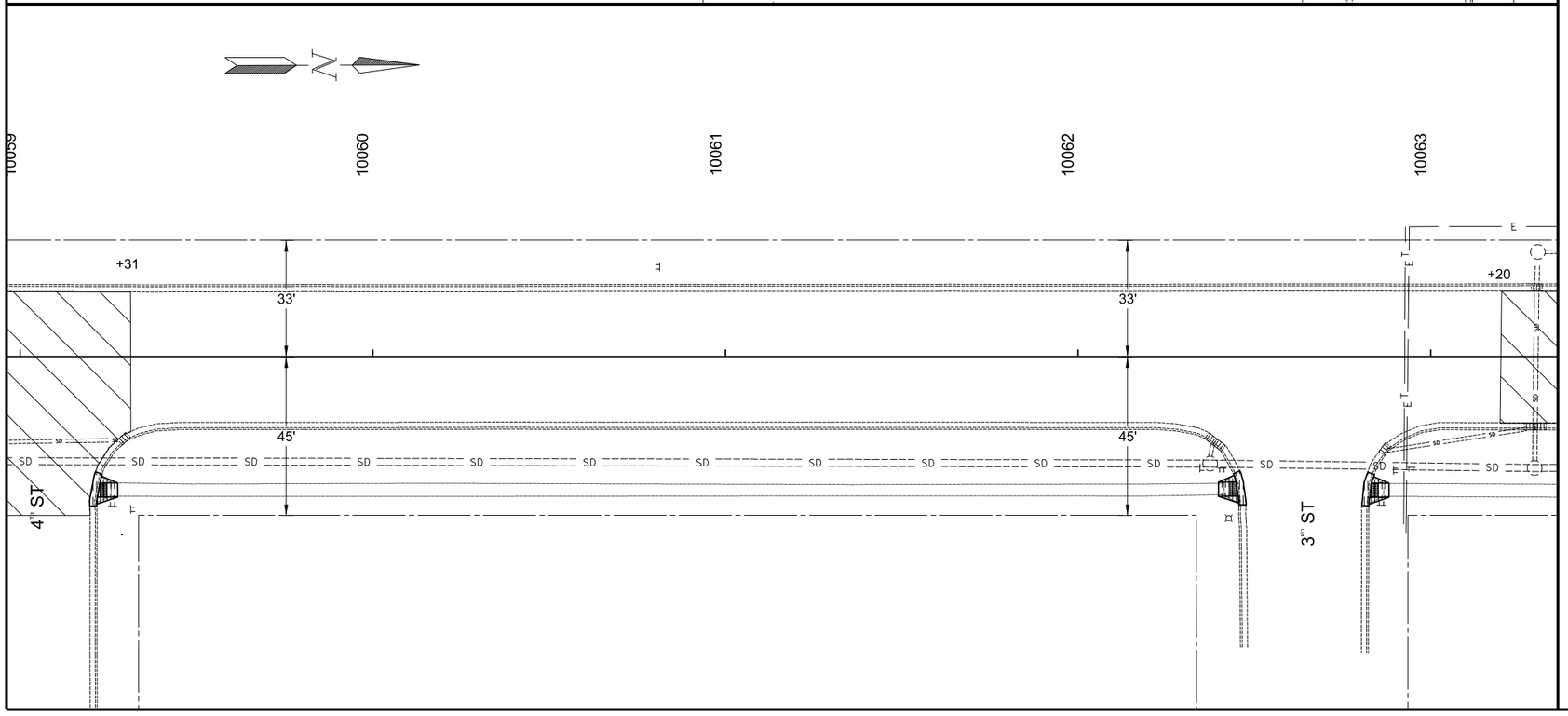
This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

PLAN VIEW

STA. 10047+62 to 10055+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	60	6





BORROW - EXCAVATION

STA. 10055+78 to 10056+43	131 CY
STA. 10058+61 to 10059+31	179 CY

AGGREGATE BASE COURSE CL. 5

STA. 10055+78 to 10056+43	411 TONS
STA. 10056+11 LT	1.7 TONS
STA. 10056+11 RT	1.5 TONS
STA. 10058+61 to 10059+31	656 TONS
STA. 10058+79 RT	0.8 TONS
STA. 10059+21 RT	1 TONS
STA. 10062+38 RT	1 TONS
STA. 10062+82 RT	1.3 TONS

SUPERPAVE FAA 43

STA. 10055+78 to 10056+43	37.2 TONS
STA. 10058+61 to 10059+31	59.3 TONS

PG58-28 ASPHALT CEMENT

STA. 10055+78 to 10056+43	2.2 TONS
STA. 10058+61 to 10059+31	3.6 TONS

GEOTEXTILE FABRIC - TYPE S2

STA. 10055+78 to 10056+43	268 SY
STA. 10058+61 to 10059+31	427 SY

CURB & GUTTER - TYPE 1

STA. 10056+11 LT	9 LF
STA. 10056+11 RT	9 LF
STA. 10056+37 LT	8 LF
STA. 10058+84 RT	9 LF
STA. 10059+21 RT	9 LF
STA. 10062+44 RT	9 LF
STA. 10062+82 RT	9 LF

SIDEWALK CONC. 4 IN.

STA. 10056+11 LT	8 SY
STA. 10056+11 RT	7 SY
STA. 10058+79 RT	4 SY
STA. 10059+21 RT	5 SY
STA. 10062+38 RT	5 SY
STA. 10062+82 RT	6 SY

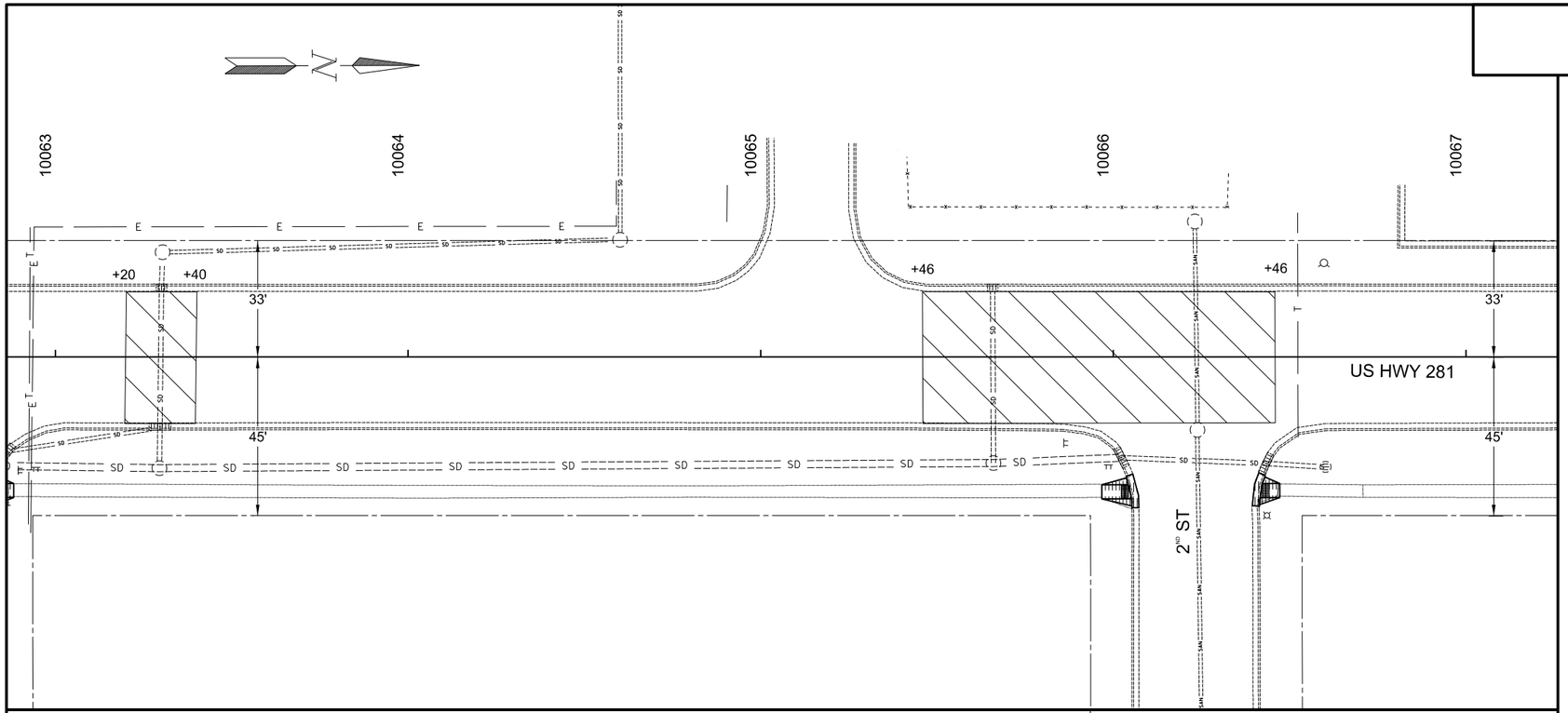
DETECTABLE WARNING PANELS

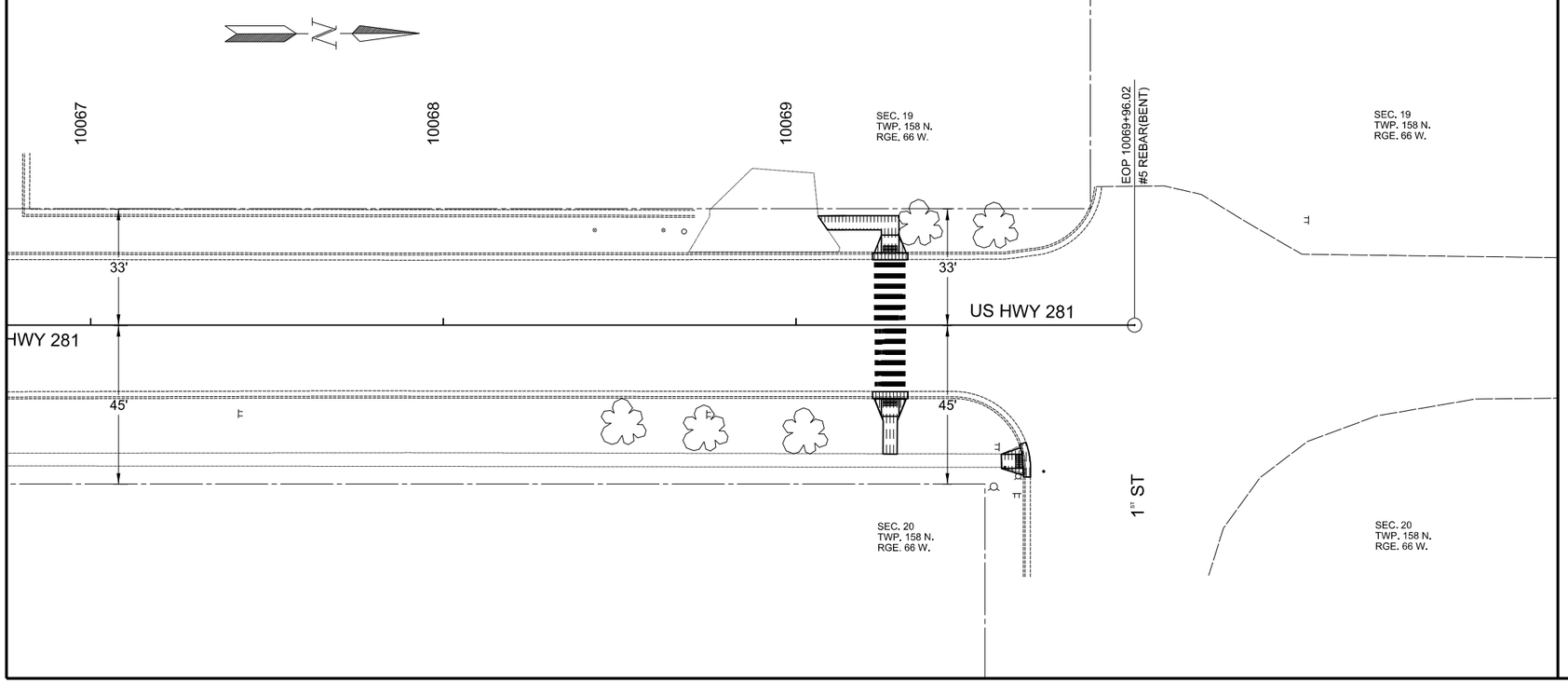
STA. 10056+11 LT	8 SF
STA. 10056+11 RT	8 SF
STA. 10058+79 RT	8 SF
STA. 10059+21 RT	8 SF
STA. 10062+38 RT	8 SF
STA. 10062+82 RT	8 SF

PLAN VIEW

STA. 10055+50 to 10063+20

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	60	7





BORROW - EXCAVATION

STA. 10060+20 to 10063+40	15 CY
STA. 10065+46 to 10066+46	233 CY

AGGREGATE BASE COURSE CL. 5

STA. 10060+20 to 10063+40	128 TONS
STA. 10065+46 to 10066+46	644 TONS
STA. 10065+96 RT	1.3 TONS
STA. 10066+41 RT	1.3 TONS
STA. 10069+24 LT	3.3 TONS
STA. 10069+24 RT	1.9 TONS
STA. 10069+58 RT	0.8 TONS

SUPERPAVE FAA 43

STA. 10060+20 to 10063+40	11.5 TONS
STA. 10065+46 to 10066+46	58.1 TONS

PG58-28 ASPHALT CEMENT

STA. 10060+20 to 10063+40	0.7 TONS
STA. 10065+46 to 10066+46	3.5 TONS

GEOTEXTILE FABRIC - TYPE S2

STA. 10060+20 to 10063+40	83 SY
STA. 10065+46 to 10066+46	418 SY

CURB & GUTTER - TYPE 1

STA. 10066+05 RT	10 LF
STA. 10066+42 RT	9 LF
STA. 10069+24 LT	9 LF
STA. 10069+24 RT	9 LF
STA. 10069+64 RT	9 LF

SIDEWALK CONC. 4 IN.

STA. 10065+96 RT	6 SY
STA. 10066+41 RT	6 SY
STA. 10069+24 LT	16 SY
STA. 10069+24 RT	9 SY
STA. 10069+58 RT	4 SY

DETECTABLE WARNING PANELS

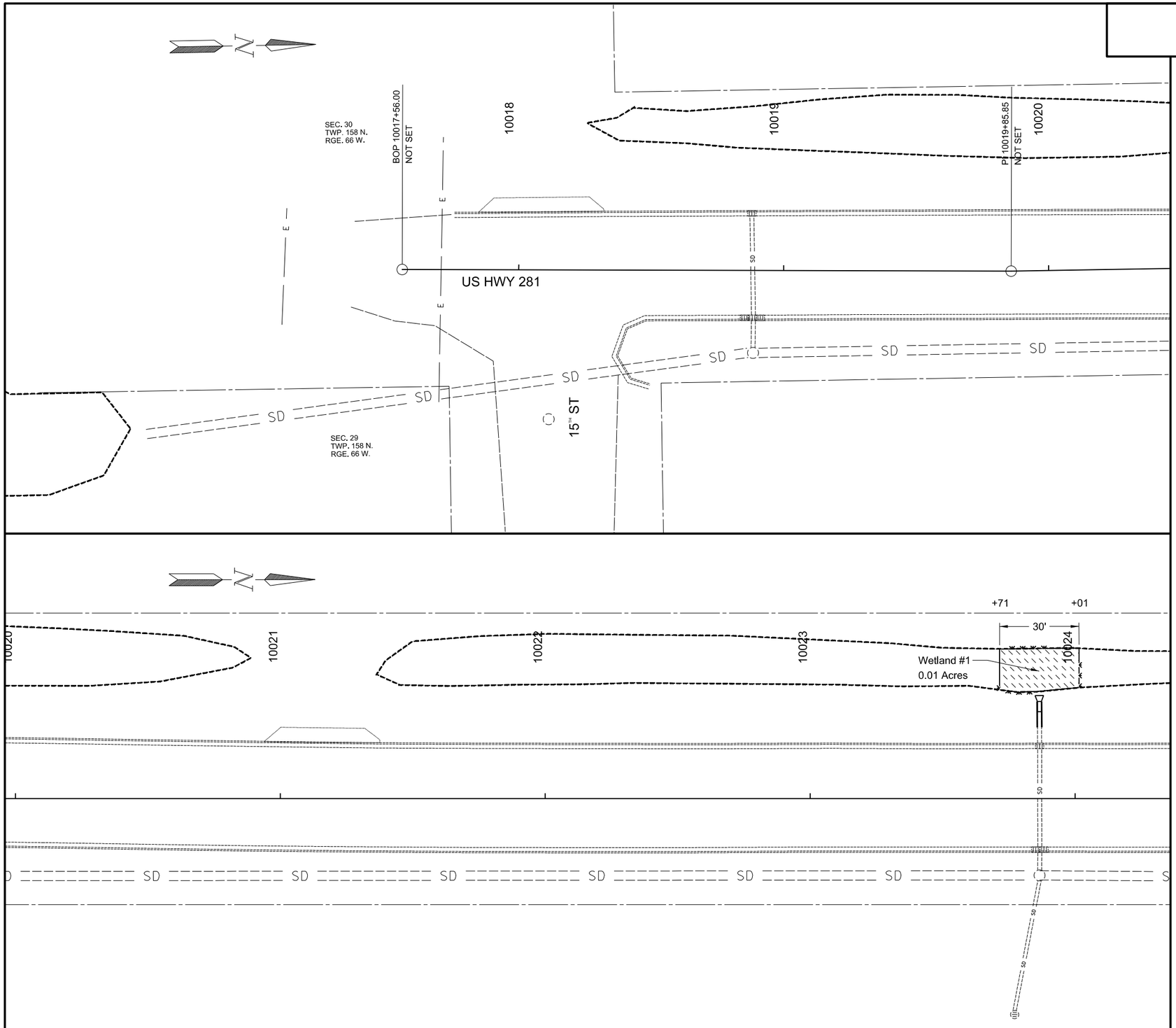
STA. 10065+96 RT	8 SF
STA. 10066+41 RT	8 SF
STA. 10069+24 LT	8 SF
STA. 10069+24 RT	8 SF
STA. 10069+58 RT	8 SF

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/26/13 and the original document is stored at the North Dakota Department of Transportation

PLAN VIEW

STA. 10063+20 to 10069+96

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	75	1



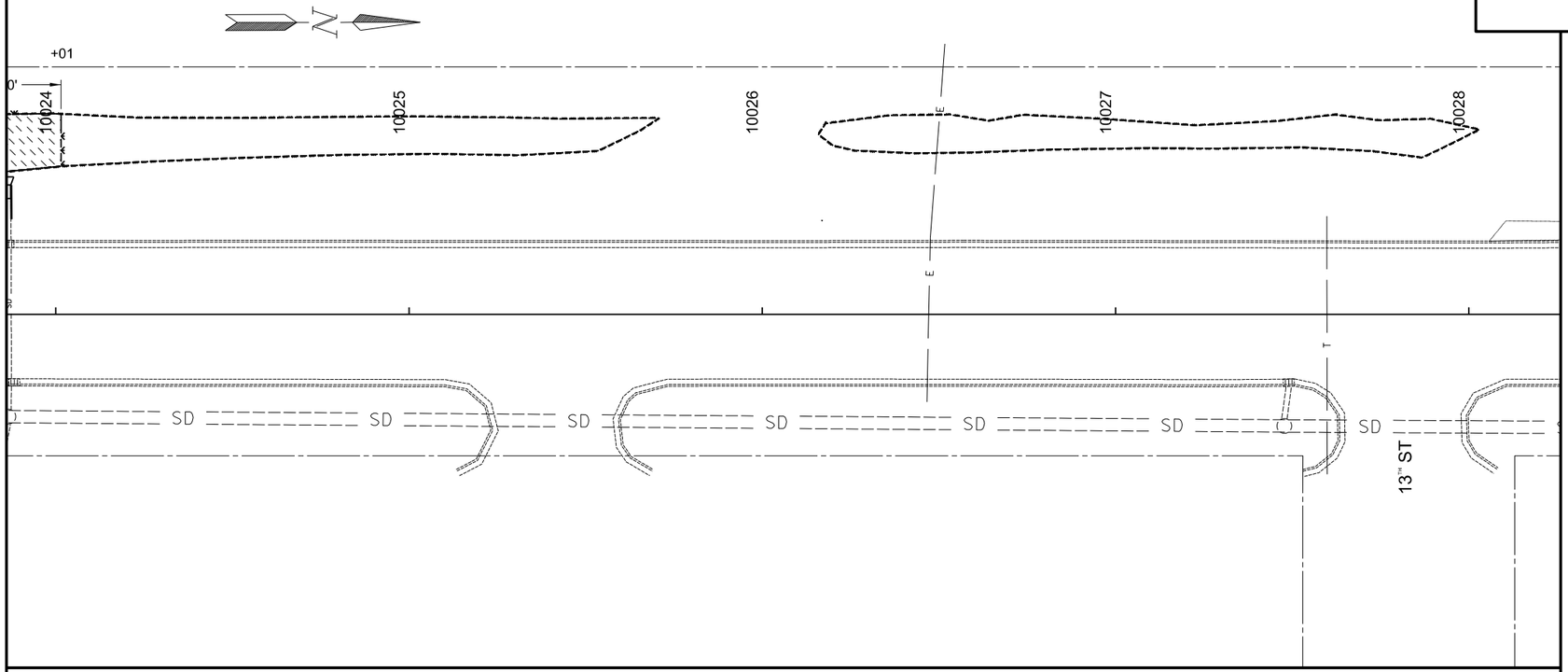
Temporary Wetland Impact

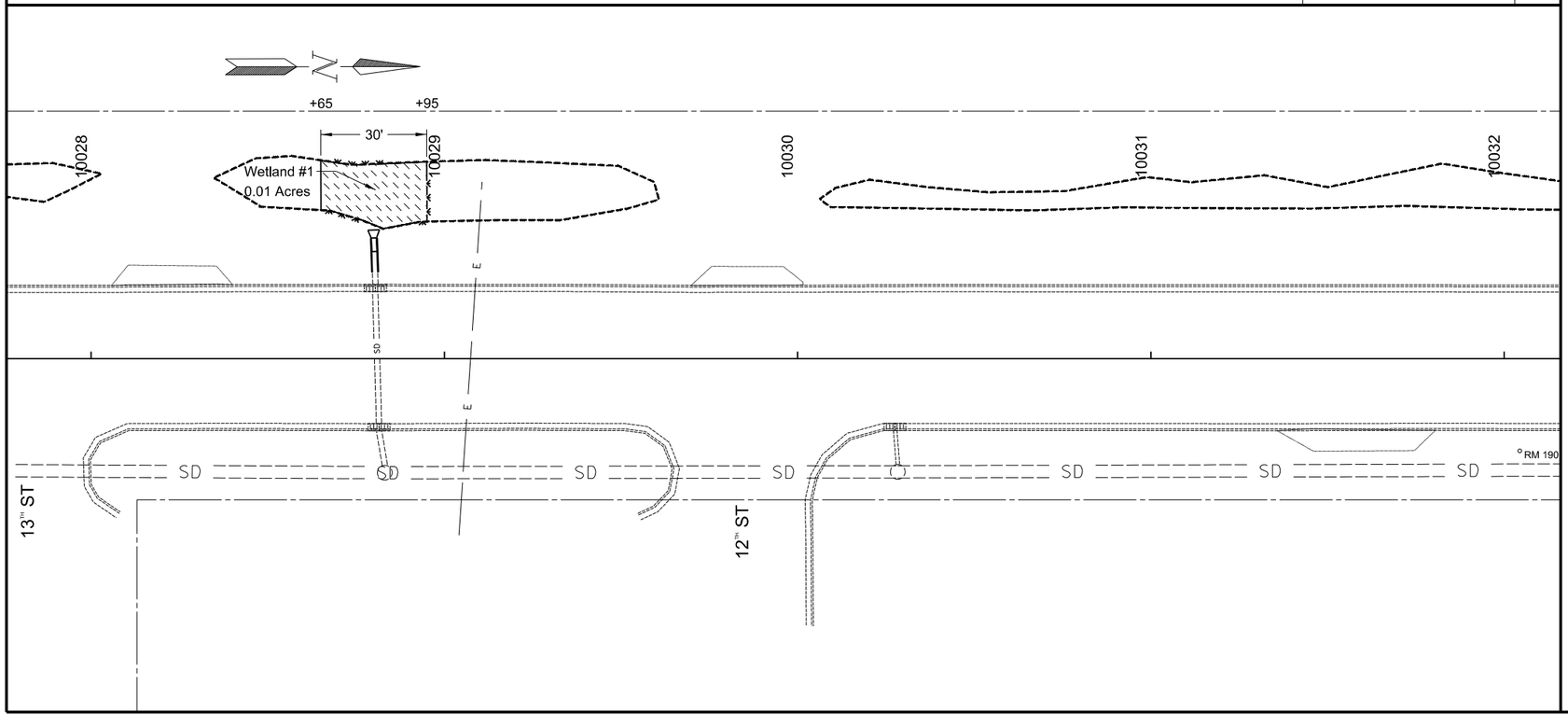
This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

WETLANDS
STA. 10017+56 to 10024+08

8/14/2013 11:29:40 AM Scott S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\075WL_001_Wetlands.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	75	2



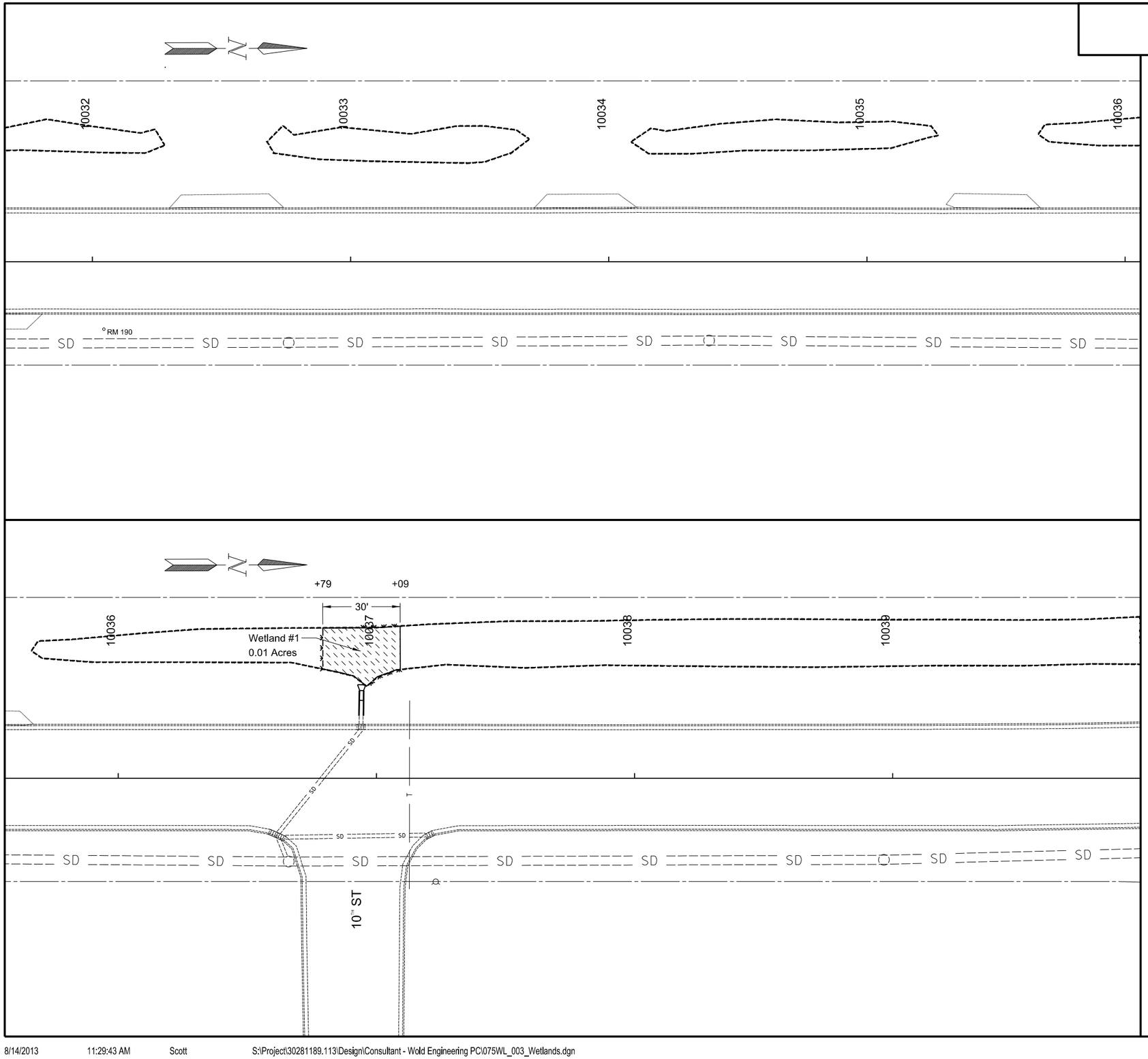


Temporary Wetland Impact

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

WETLANDS
STA. 10024+08 to 10032+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	75	3

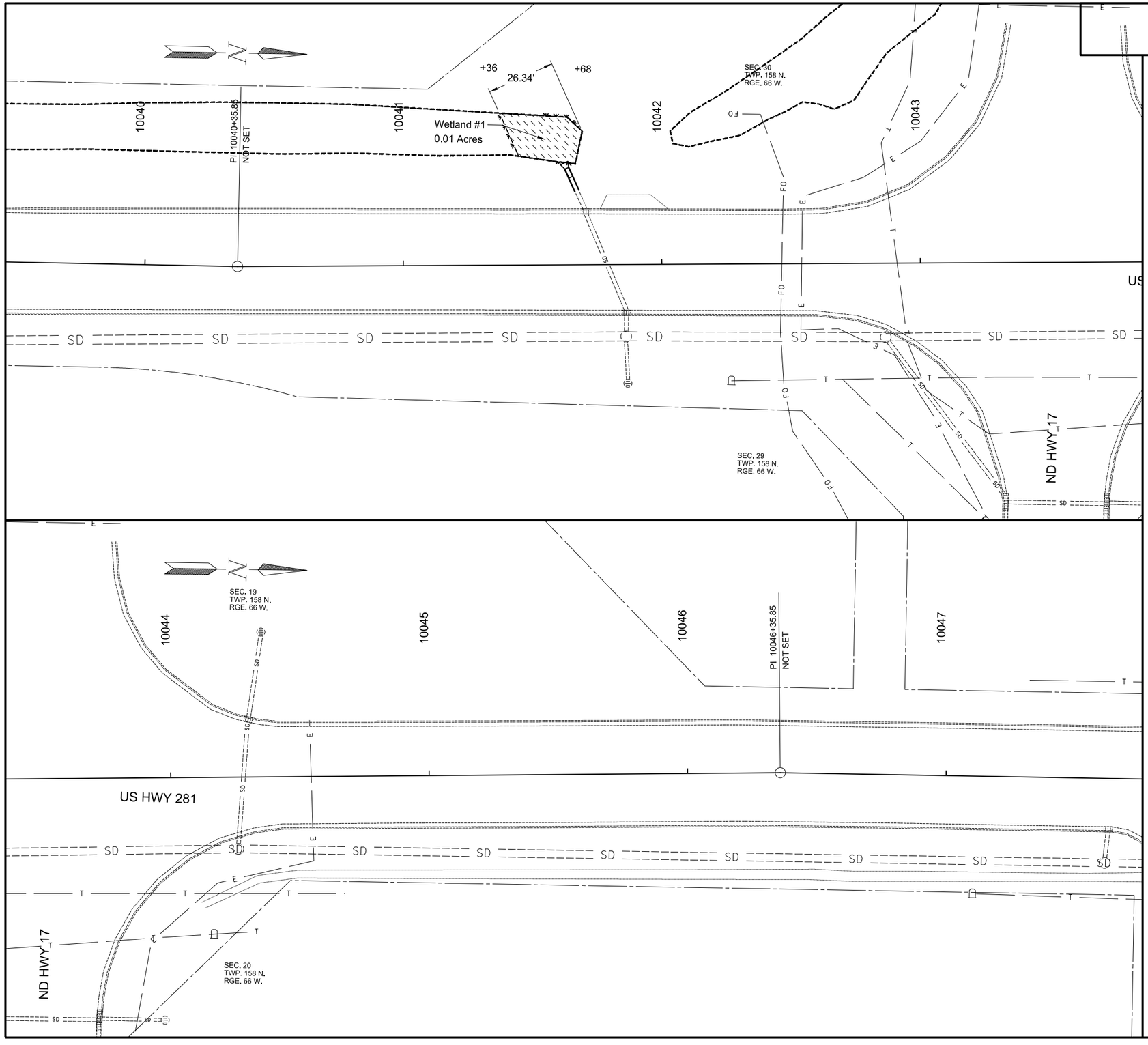


Temporary Wetland Impact

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

WETLANDS
STA. 10032+00 to 10039+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	75	4



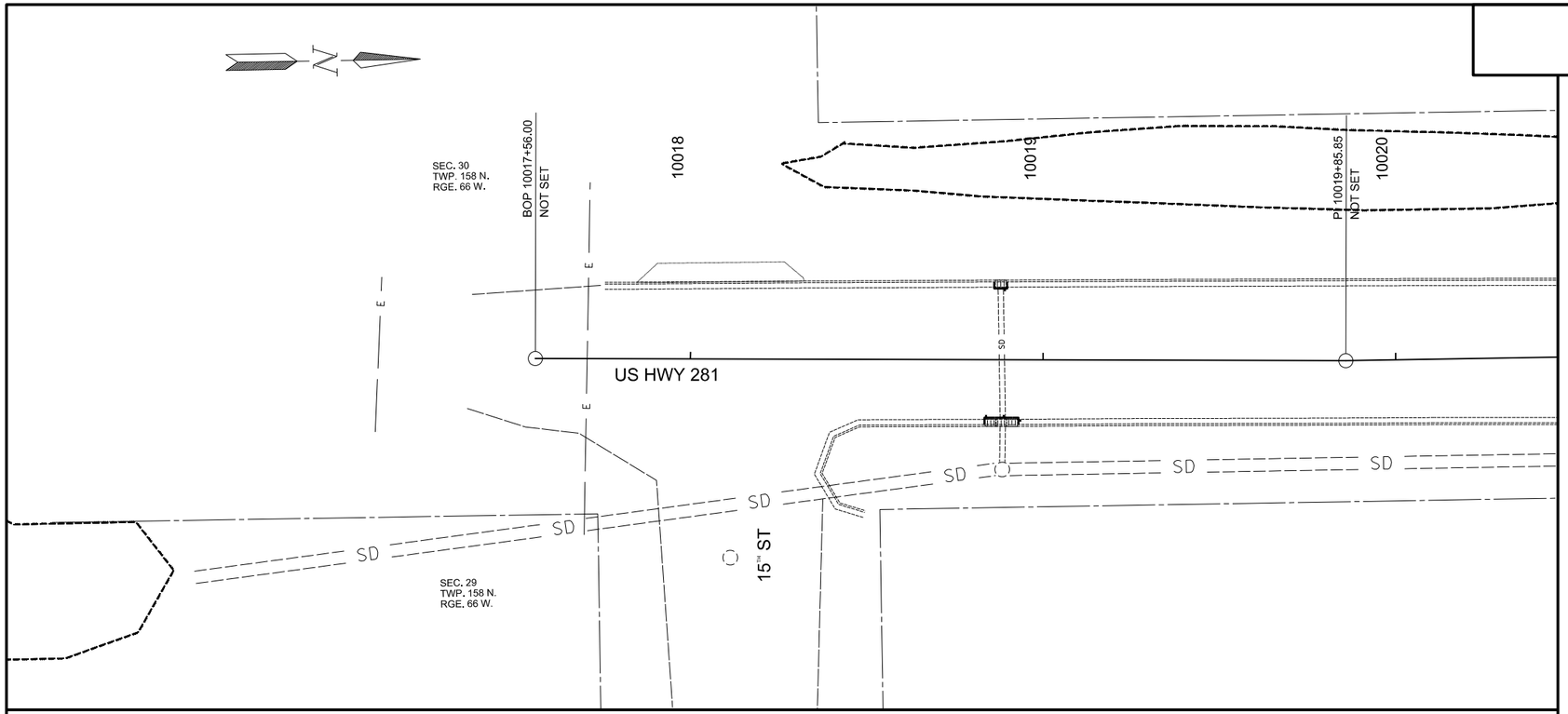
Temporary Wetland Impact

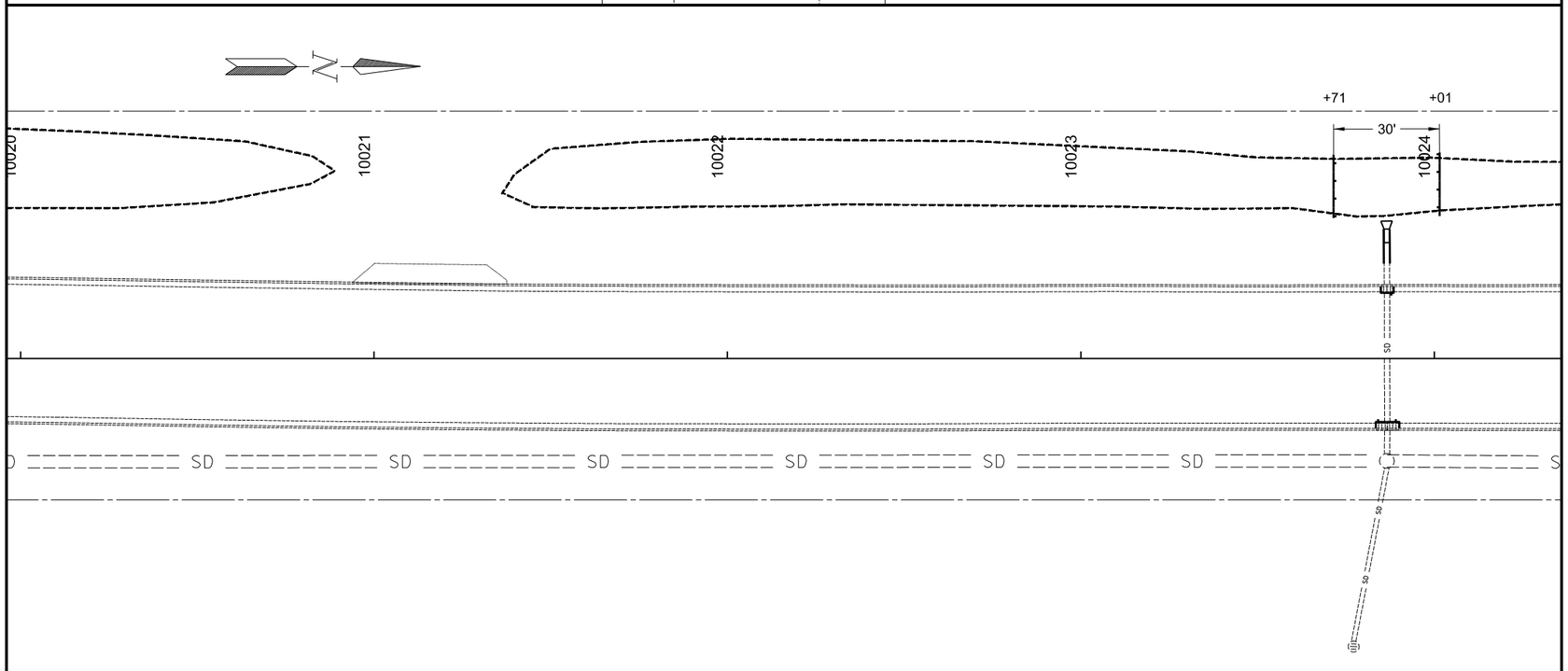
This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

WETLANDS
STA. 10039+50 to 10047+62

8/14/2013 11:29:44 AM Scott S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\075WL_004_Wetlands.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	75	5





FIBER ROLLS 12IN

STA. 10023+71	18 LF
STA. 10024+01	18 LF

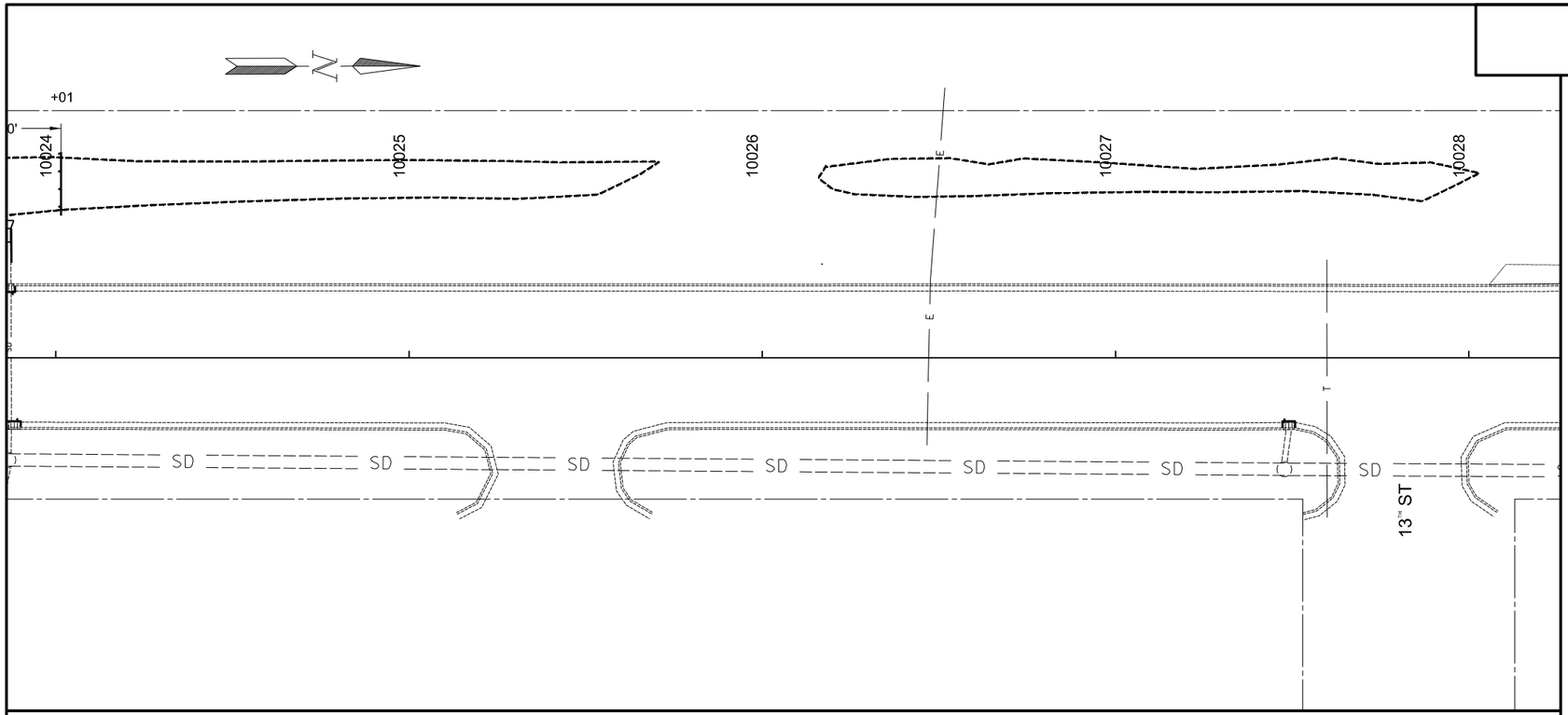
WEIGHTED FIBER ROLLS

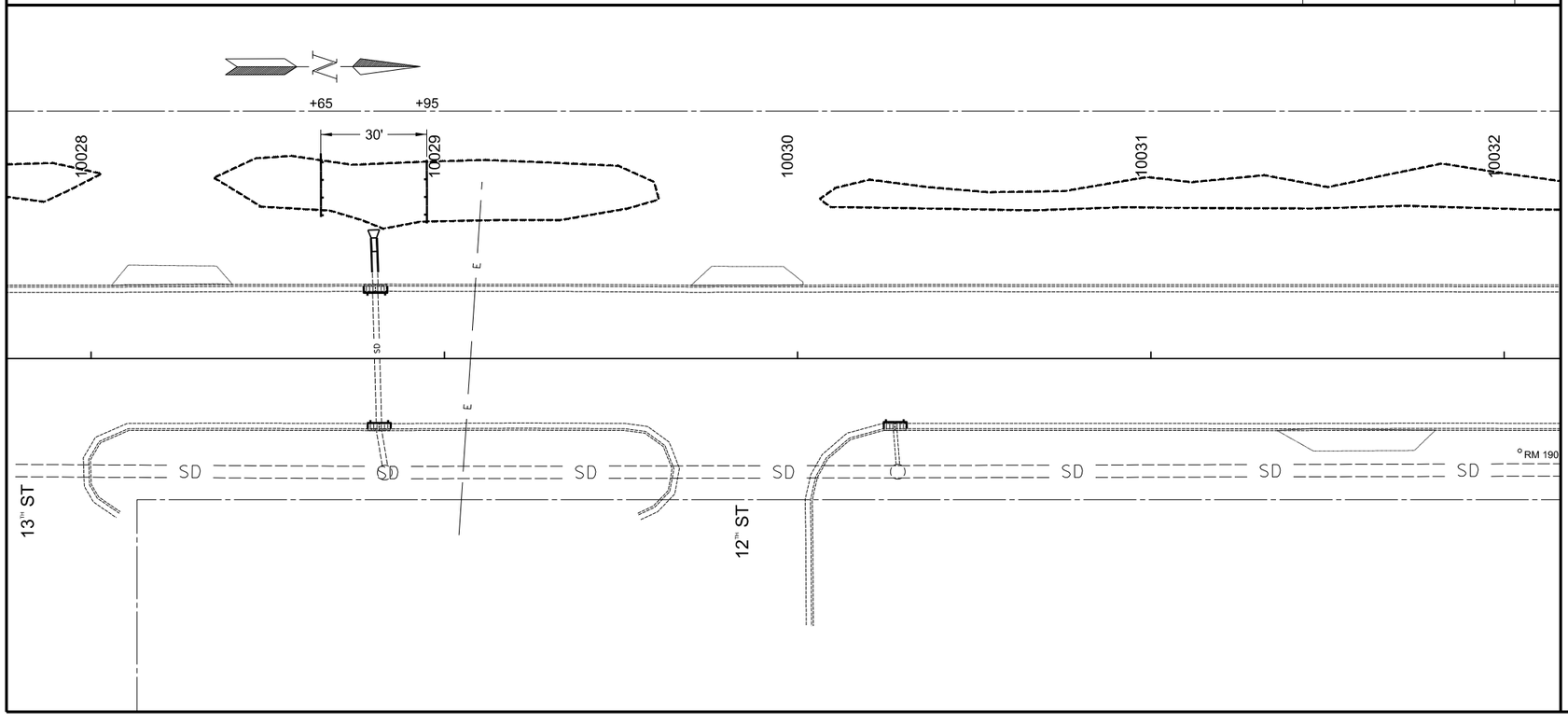
STA. 10018+87	21LF
STA. 10023+86	18 LF

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

TEMPORARY EROSION CONTROL
STA. 10017+56 to 10024+08

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	75	6





FIBER ROLLS 12IN

STA. 10028+65	18 LF
STA. 10028+95	18 LF

WEIGHTED FIBER ROLLS

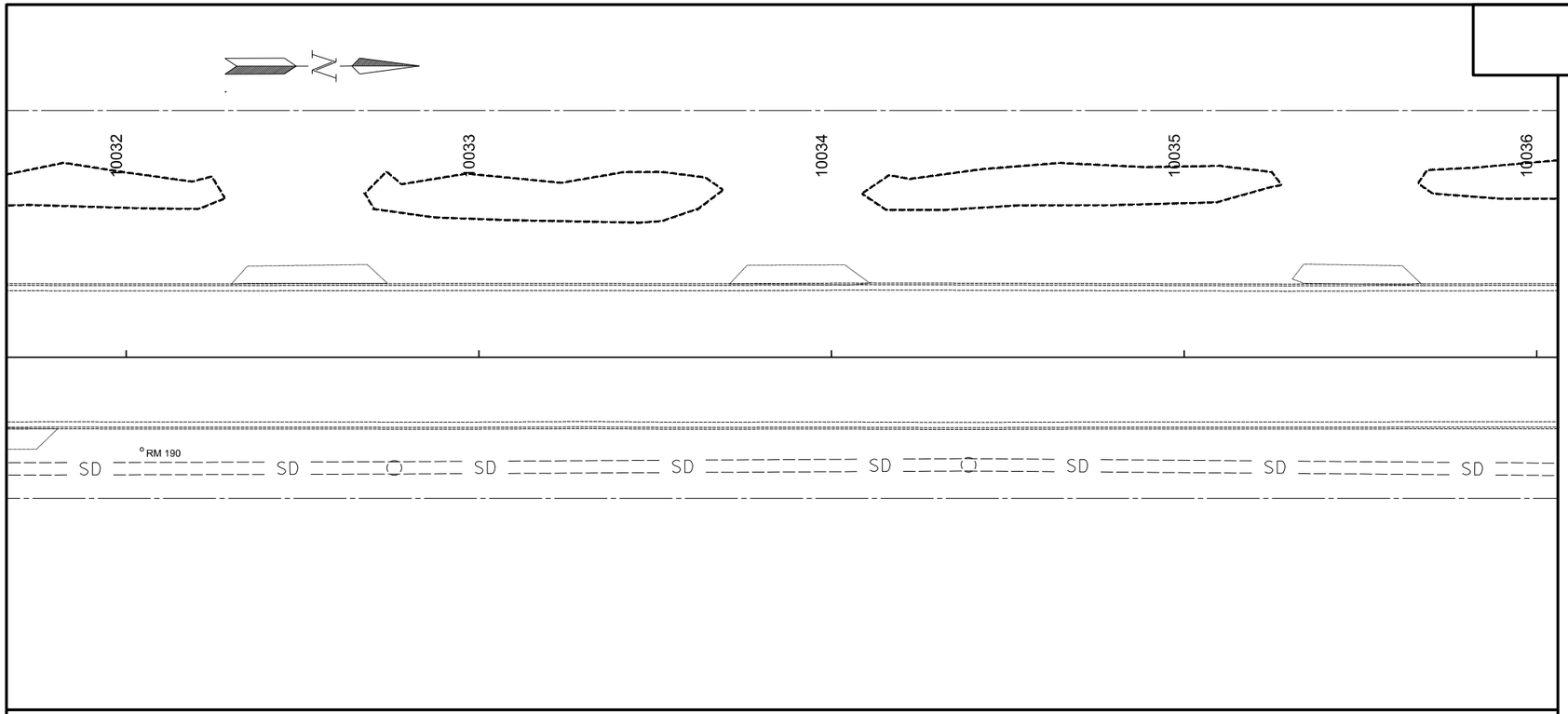
STA. 10027+49	7 LF
STA. 10028+80	22 LF
STA. 10030+28	11 LF

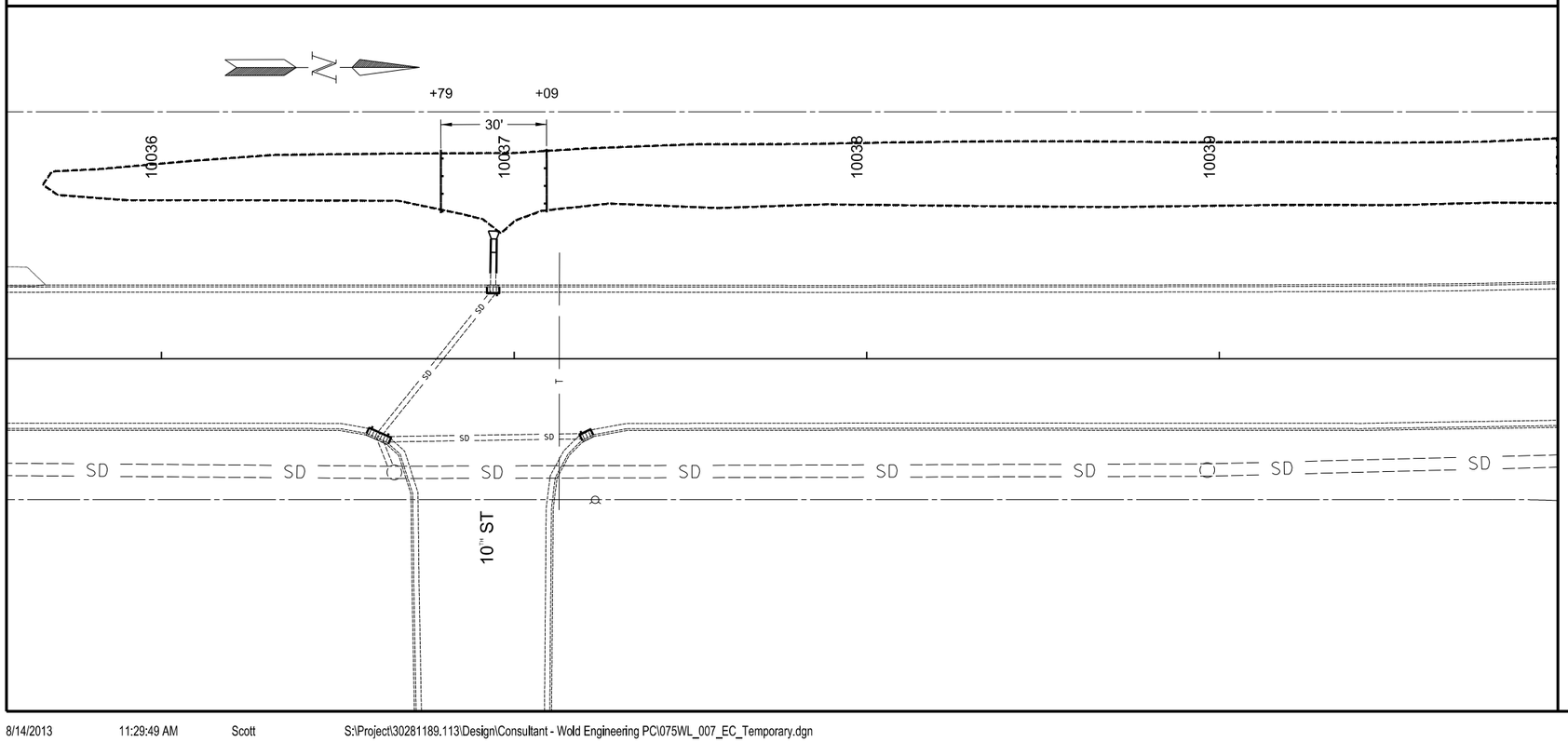
This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

TEMPORARY EROSION CONTROL
STA. 10024+08 to 10032+00

8/14/2013 11:29:47 AM Scott S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\075WL_006_EC_Temporary.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	75	7





FIBER ROLLS 12IN

STA. 10036+79	18 LF
STA. 10037+09	18 LF

WEIGHTED FIBER ROLLS

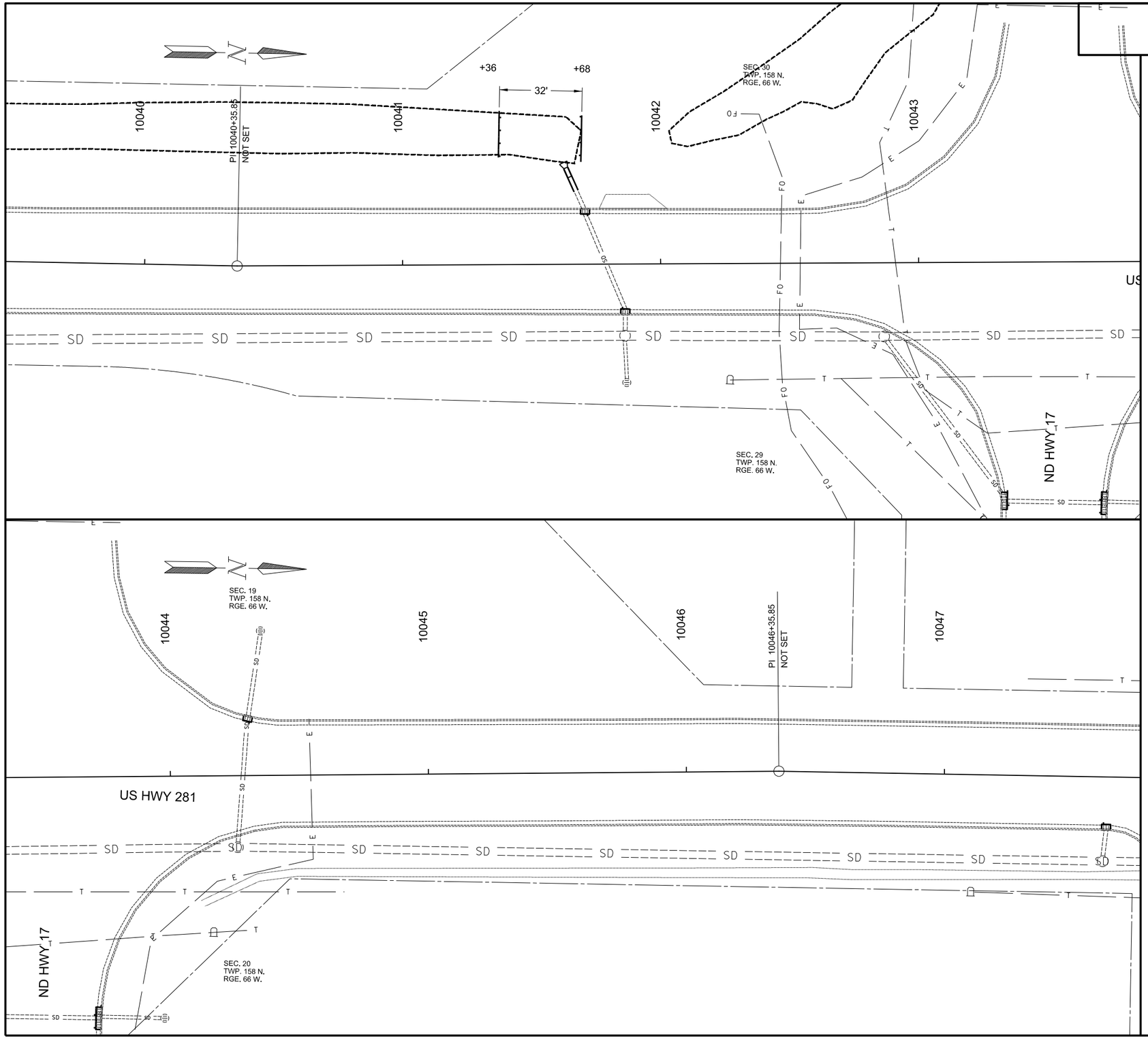
STA. 100236+62	11 LF
STA. 10036+94	7 LF
STA. 10037+20	7 LF

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

TEMPORARY EROSION CONTROL
STA. 10032+00 to 10039+50

8/14/2013 11:29:49 AM Scott S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\075WL_007_EC_Temporary.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	75	8



FIBER ROLLS 12IN

STA. 10041+36	18 LF
STA. 10041+68	18 LF

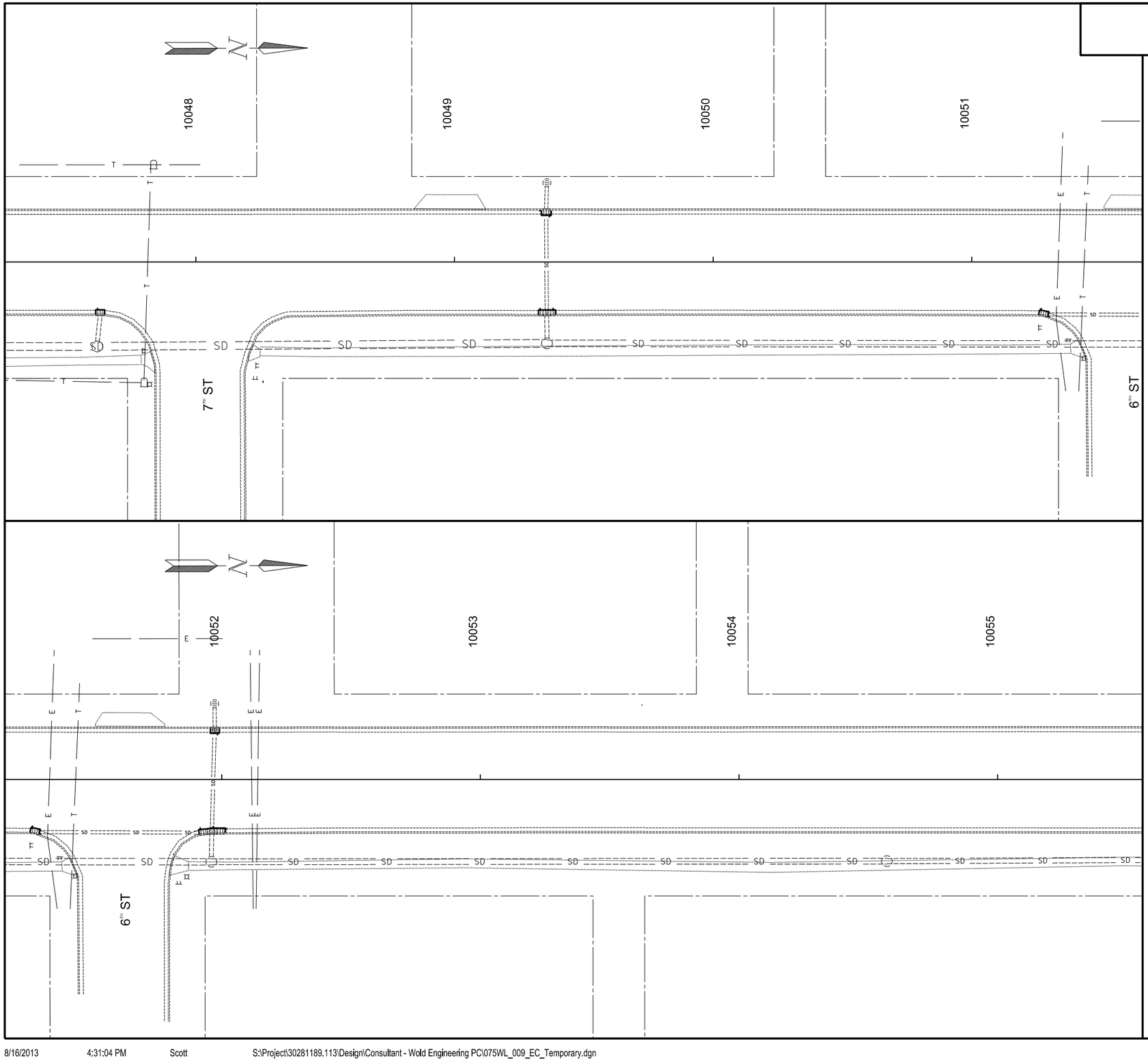
WEIGHTED FIBER ROLLS

STA. 10041+71	7 LF
STA. 10041+85	7 LF
STA. 10043+33	11 LF
STA. 10043+72	14 LF
STA. 10044+30	7 LF

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

TEMPORARY EROSION CONTROL
STA. 10039+50 to 10047+62

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	75	9



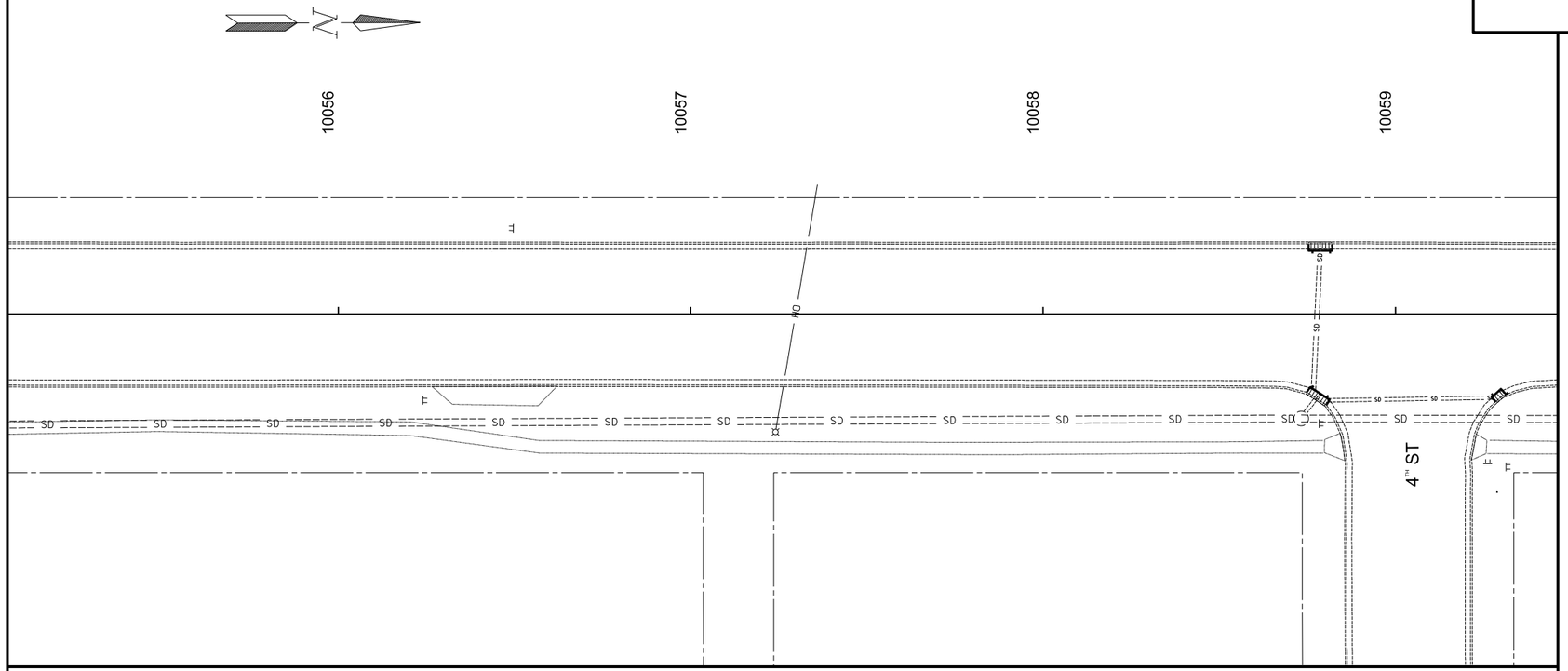
WEIGHTED FIBER ROLLS

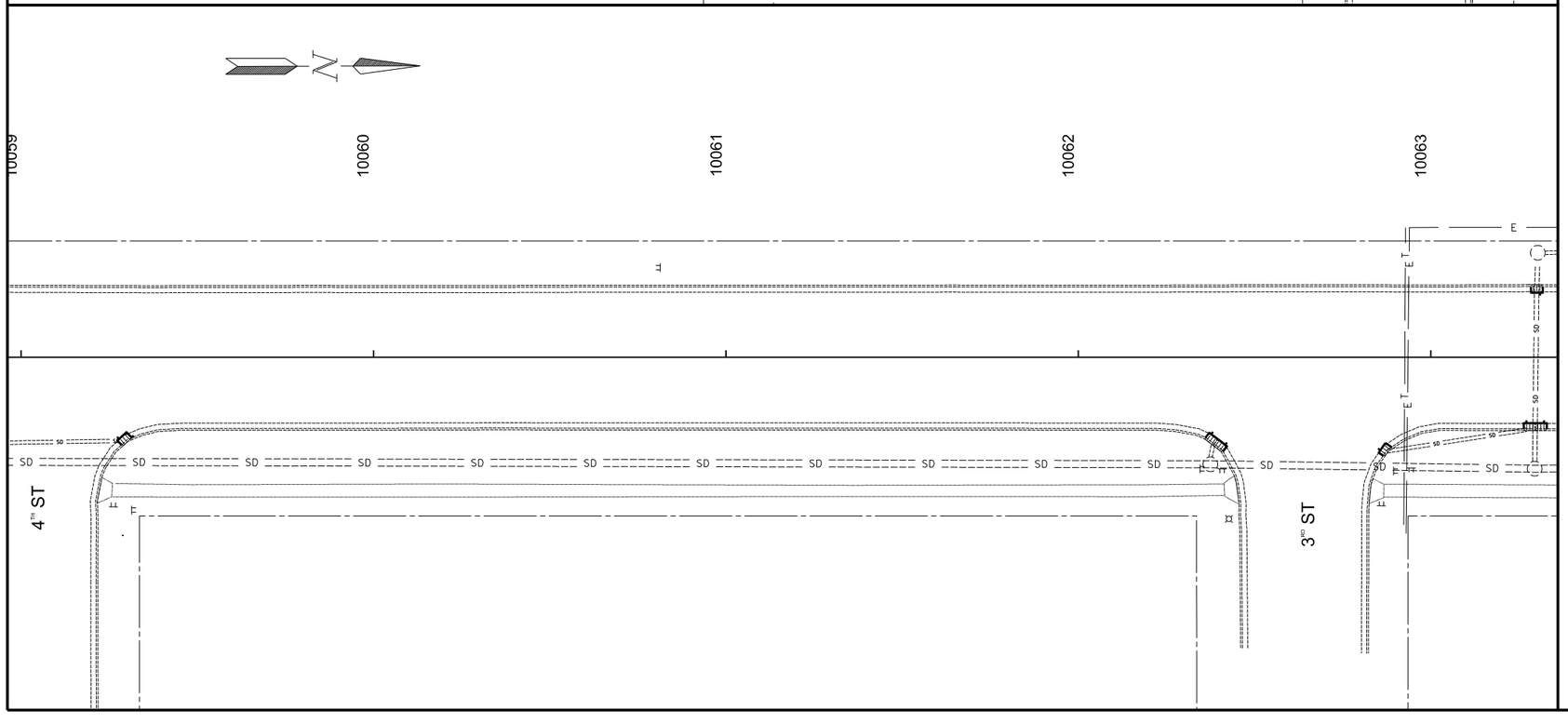
STA. 10047+63	7 LF
STA. 10049+36	18 LF
STA. 10051+28	7 LF
STA. 10051+97	21 LF

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

TEMPORARY EROSION CONTROL
STA. 10047+62 to 10055+50

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	75	10





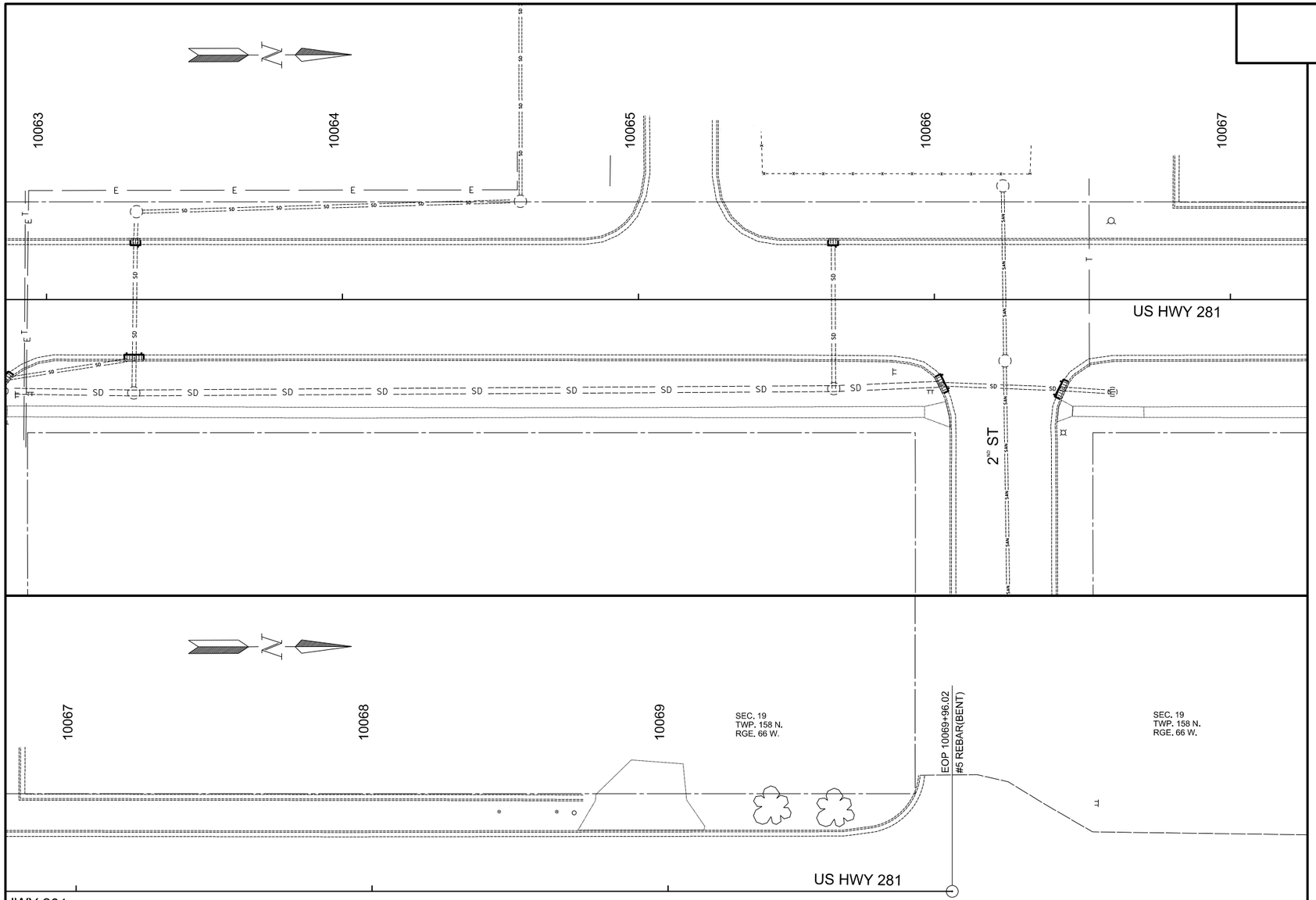
WEIGHTED FIBER ROLLS

STA. 10058+79	22 LF
STA. 10059+29	7 LF
STA. 10062+39	11 LF
STA. 10062+86	7 LF

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

TEMPORARY EROSION CONTROL
STA. 10055+50 to 10063+20

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	75	11



WEIGHTED FIBER ROLLS

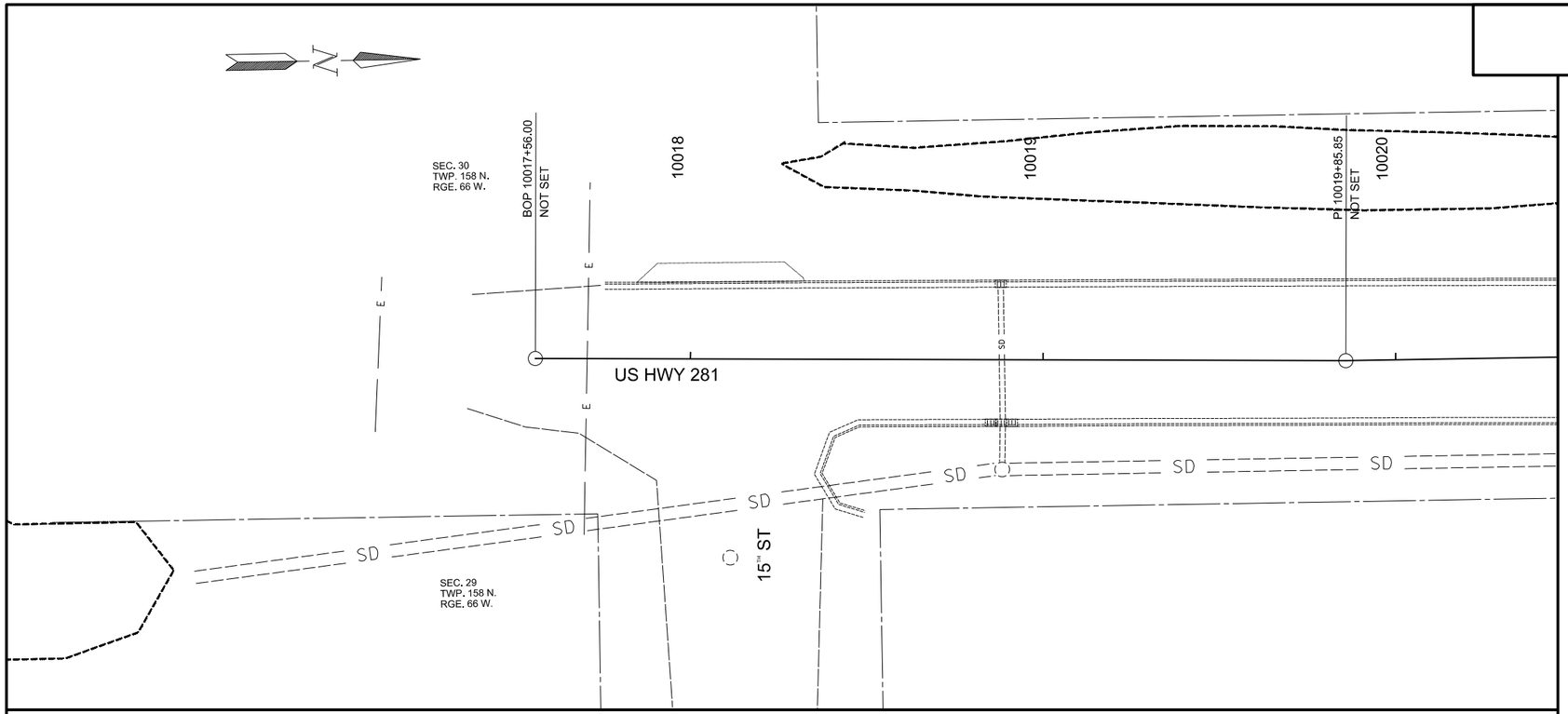
STA. 10063+30	18 LF
STA. 10065+66	7 LF
STA. 10066+03	11 LF
STA. 10066+43	11 LF

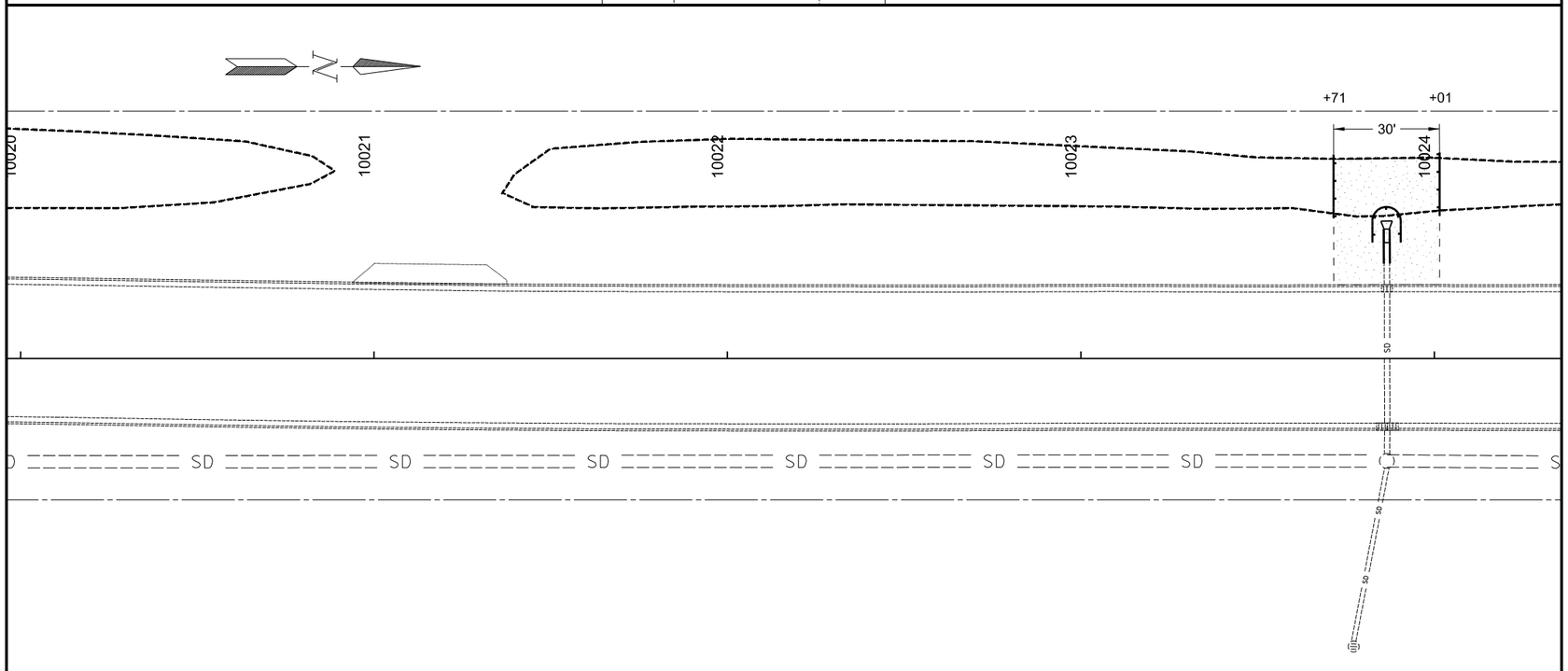
This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

TEMPORARY EROSION CONTROL
STA. 10063+20 to 10069+96

8/16/2013 4:31:07 PM Scott S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\075WL_011_EC_Temporary.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	75	12





FIBER ROLLS 12IN

STA. 10023+71 LT	18 LF
STA. 10023+83 LT	25 LF
STA. 10024+01 LT	18 LF

SEEDING-HYDRO MULCH

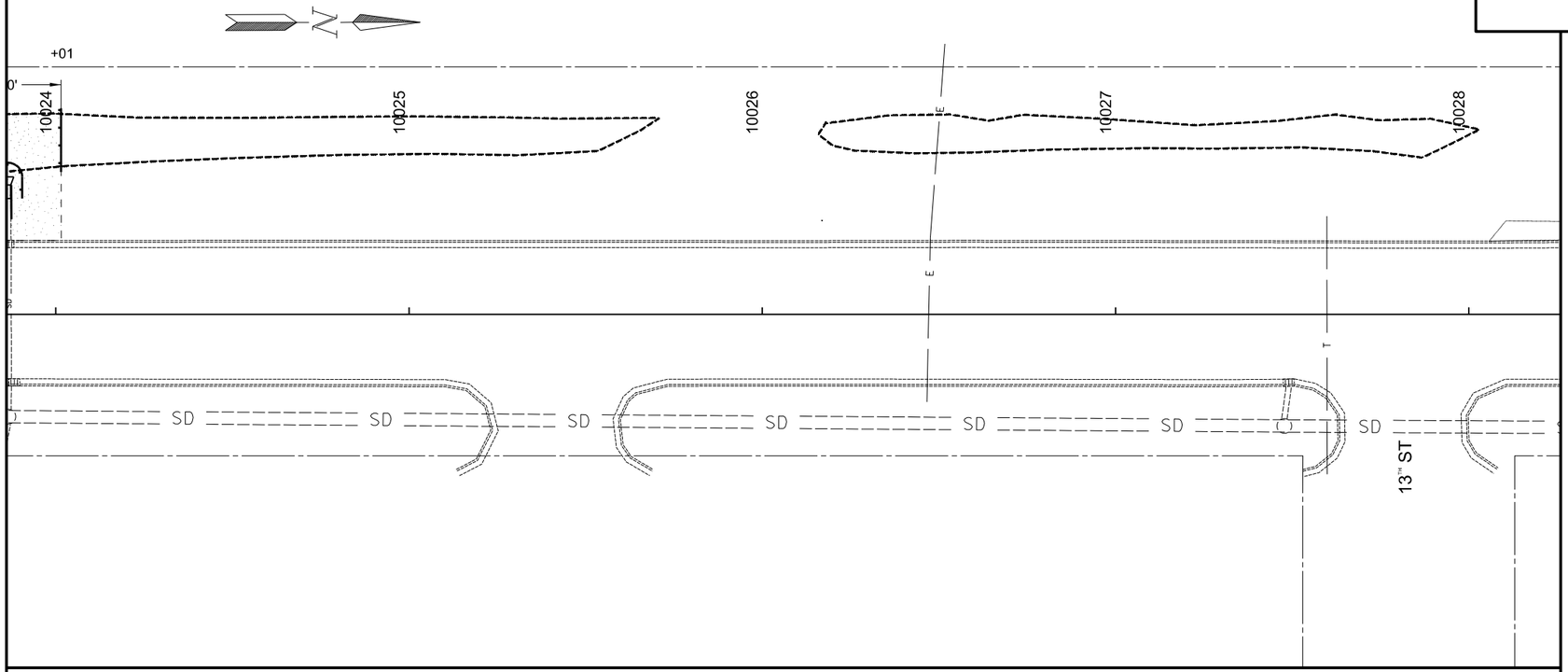
STA. 10023+71 to 10024+01 LT	119.1 SY

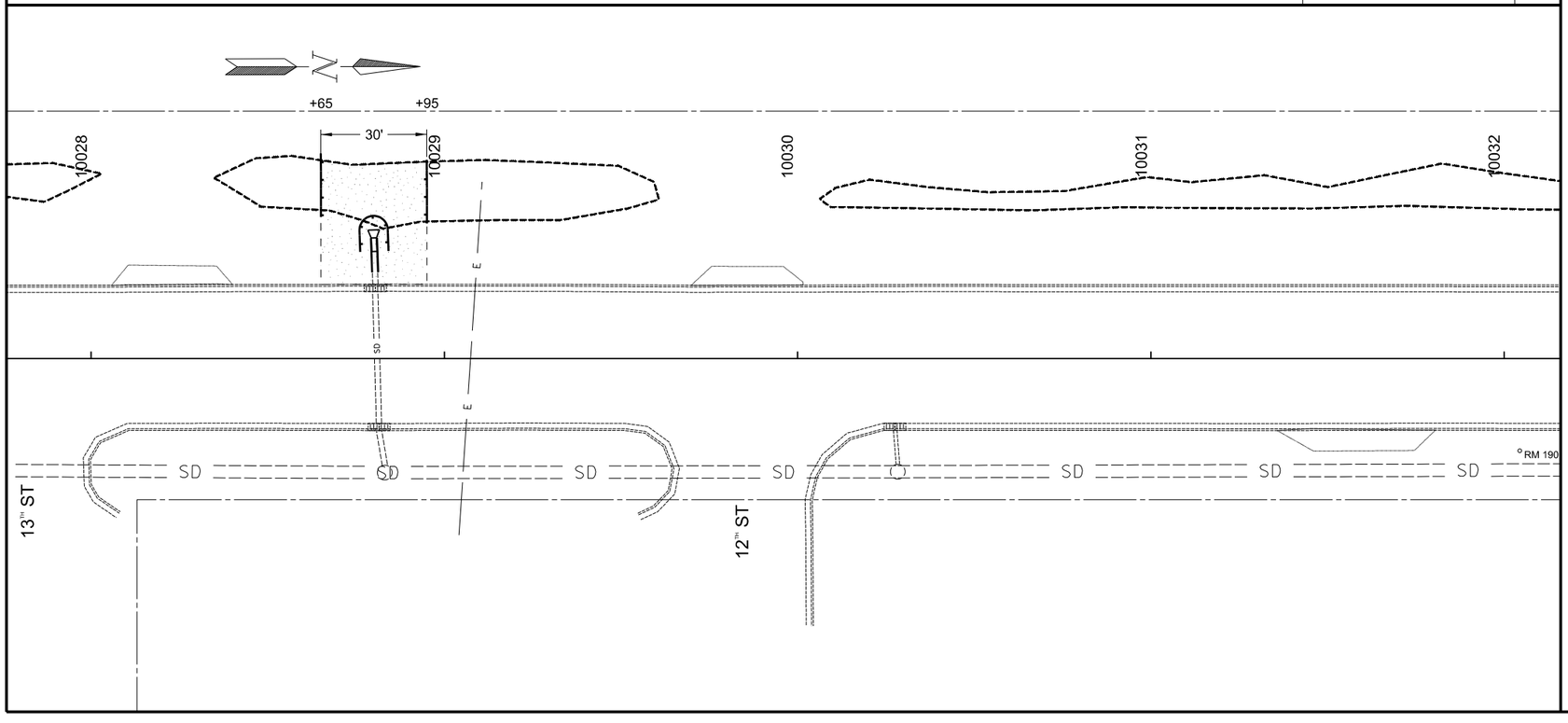
SEEDING-HYDRO MULCH

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

PERMANENT EROSION CONTROL
STA. 10017+56 to 10024+08

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	75	13





FIBER ROLLS 12IN

STA. 10028+65 LT	18 LF
STA. 10028+80 LT	25 LF
STA. 10028+95 LT	18 LF

SEEDING-HYDRO MULCH

STA. 10028+65 to 10028+95 LT	114.4 SY

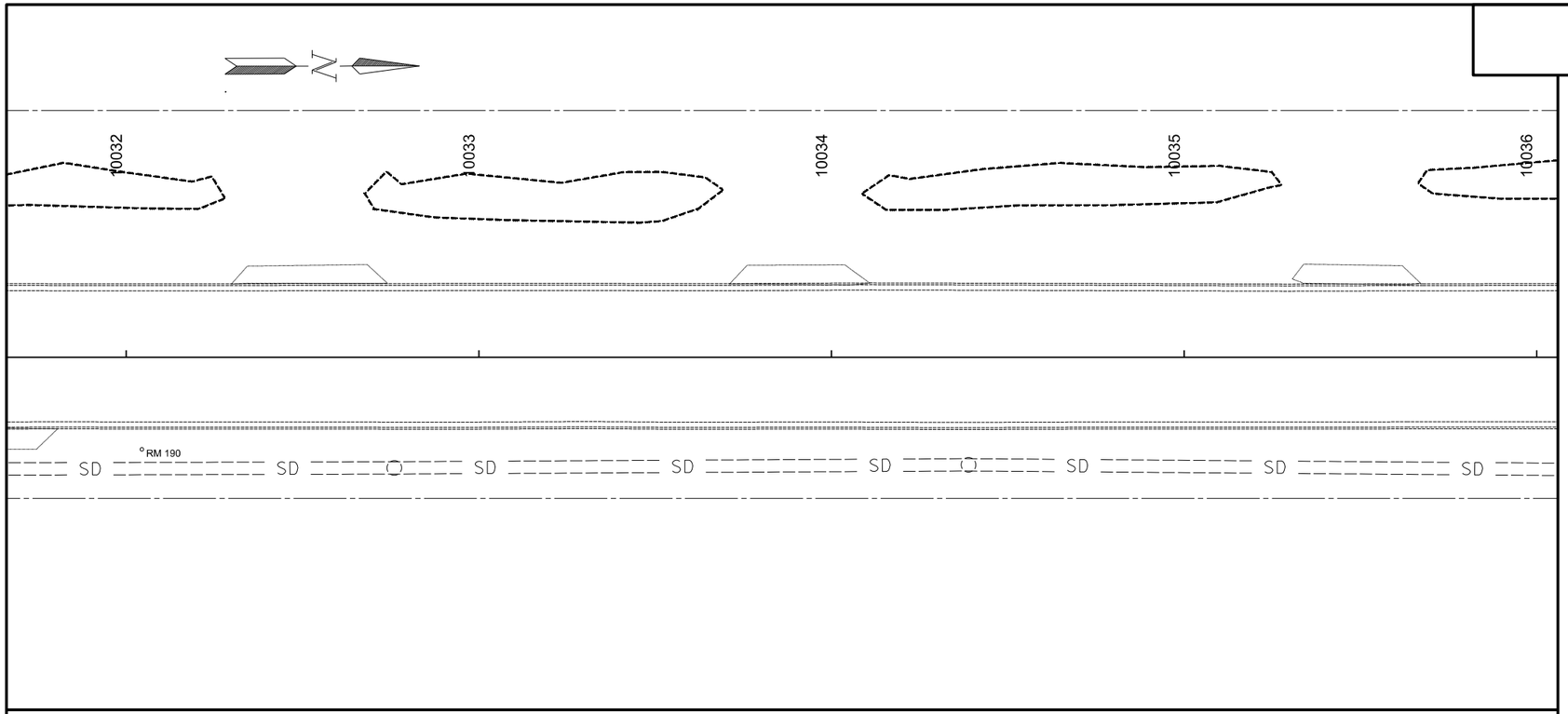
SEEDING-HYDRO MULCH

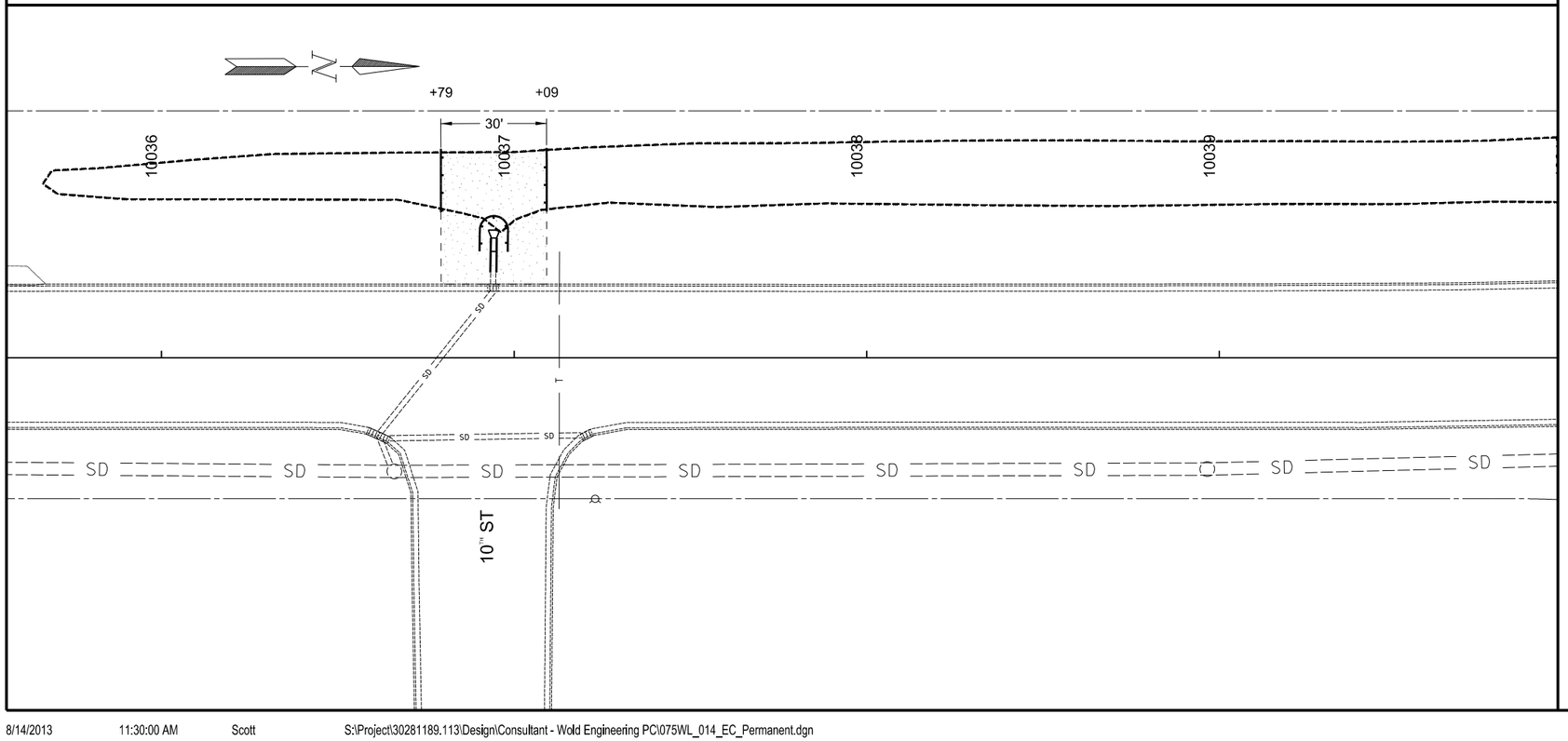
This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

PERMANENT EROSION CONTROL
STA. 10024+08 to 10032+00

8/15/2013 8:14:02 AM Jason S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\075WL_013_EC_Permanent.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	75	14





FIBER ROLLS 12IN

STA. 10036+79 LT	18 LF
STA. 10036+96 LT	25 LF
STA. 10037+09 LT	18 LF

SEEDING-HYDRO MULCH

STA. 10036+79 to 10037+09 LT	125.0 SY

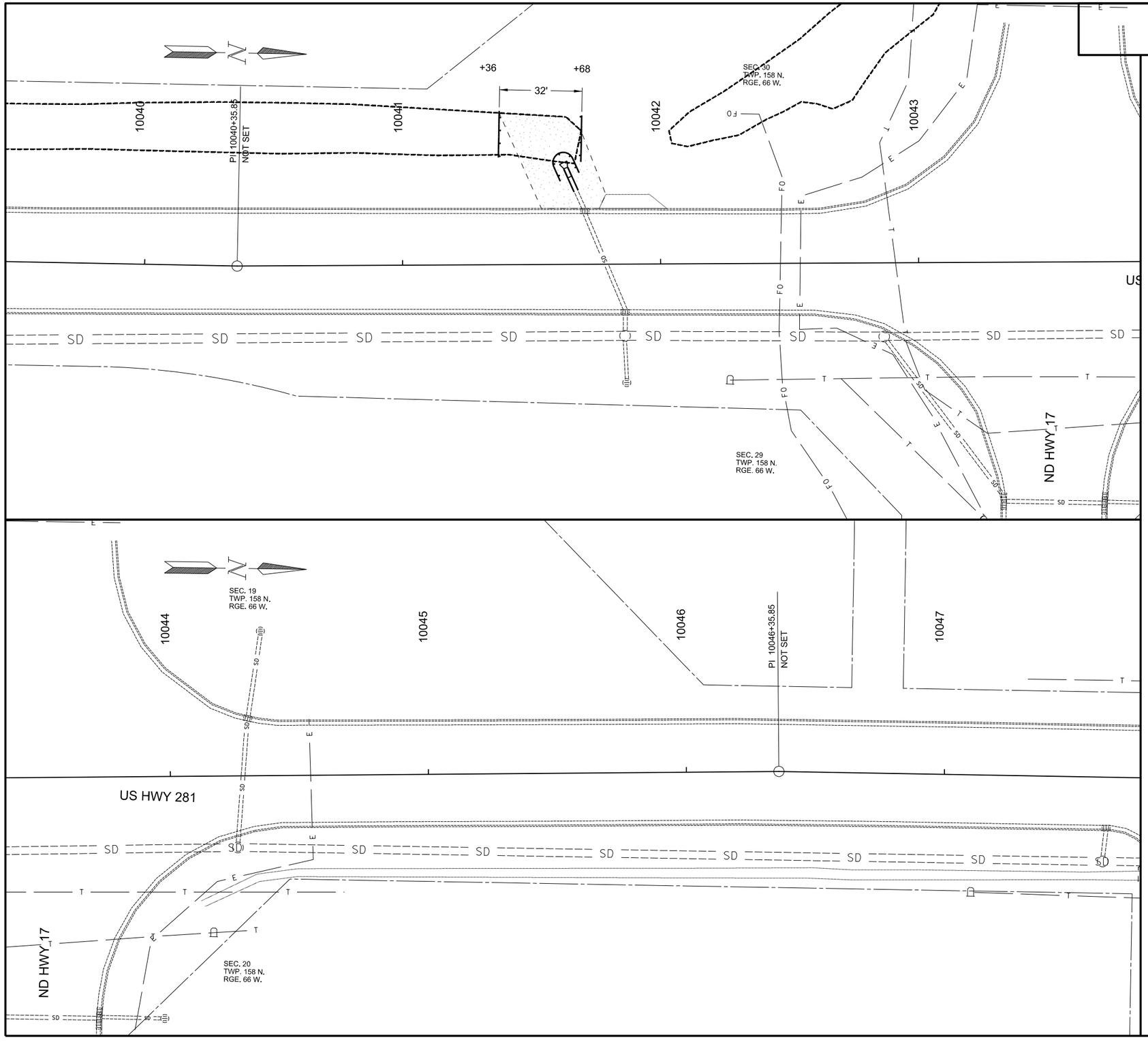
SEEDING-HYDRO MULCH

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

PERMANENT EROSION CONTROL
STA. 10032+00 to 10039+50

8/14/2013 11:30:00 AM Scott S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\075WL_014_EC_Permanent.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	75	15



FIBER ROLLS 12IN

STA. 10041+36 LT	18 LF
STA. 10041+65 LT	25 LF
STA. 10041+68 LT	18 LF

SEEDING-HYDRO MULCH

STA. 10041+36 to 10041+68 LT	109.9 SY

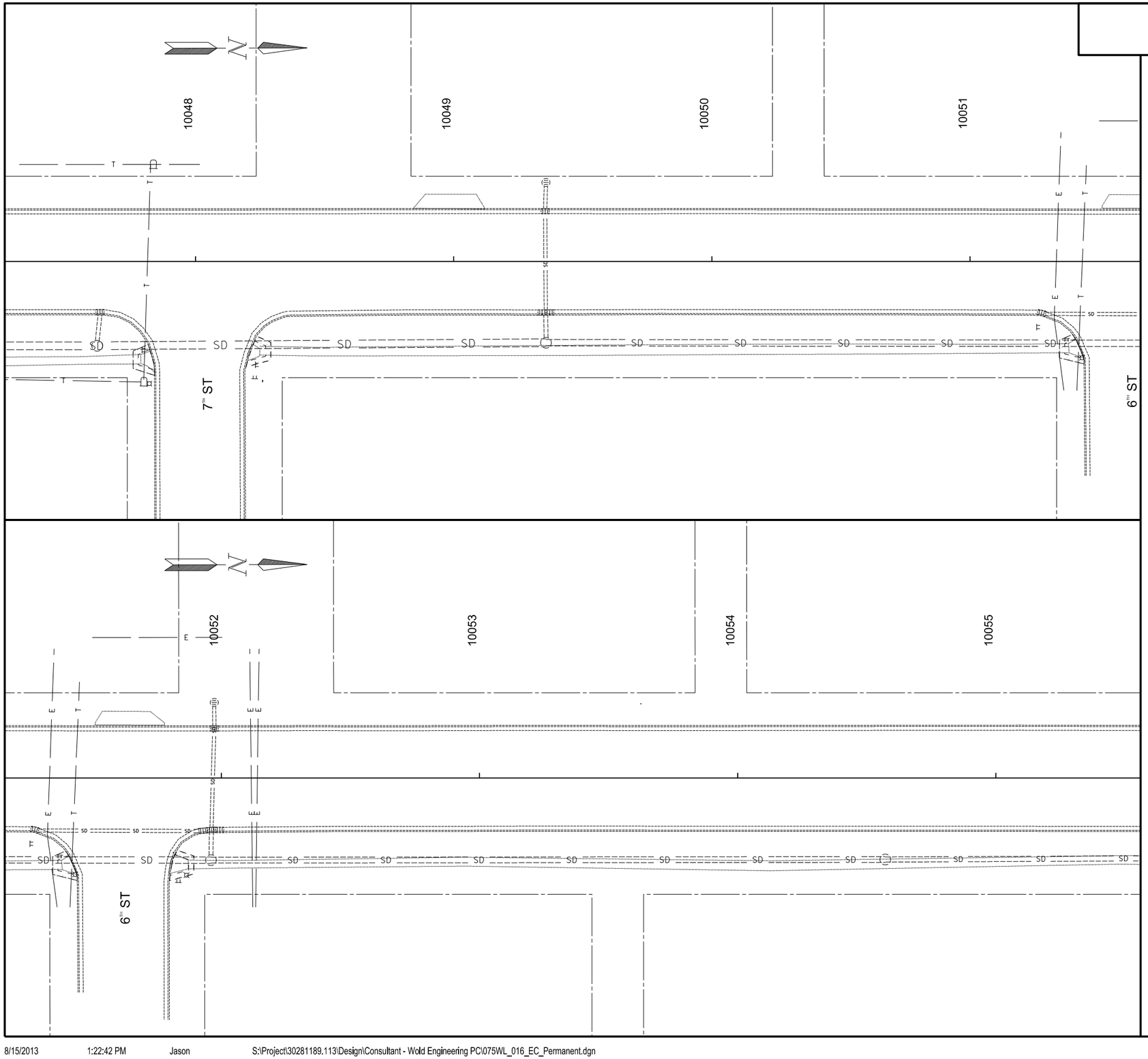
SEEDING-HYDRO MULCH

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

PERMANENT EROSION CONTROL
STA. 10039+50 to 10047+62

8/14/2013 11:30:02 AM Scott S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\075WL_015_EC_Permanent.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	75	16



SEEDING-HYDRO MULCH

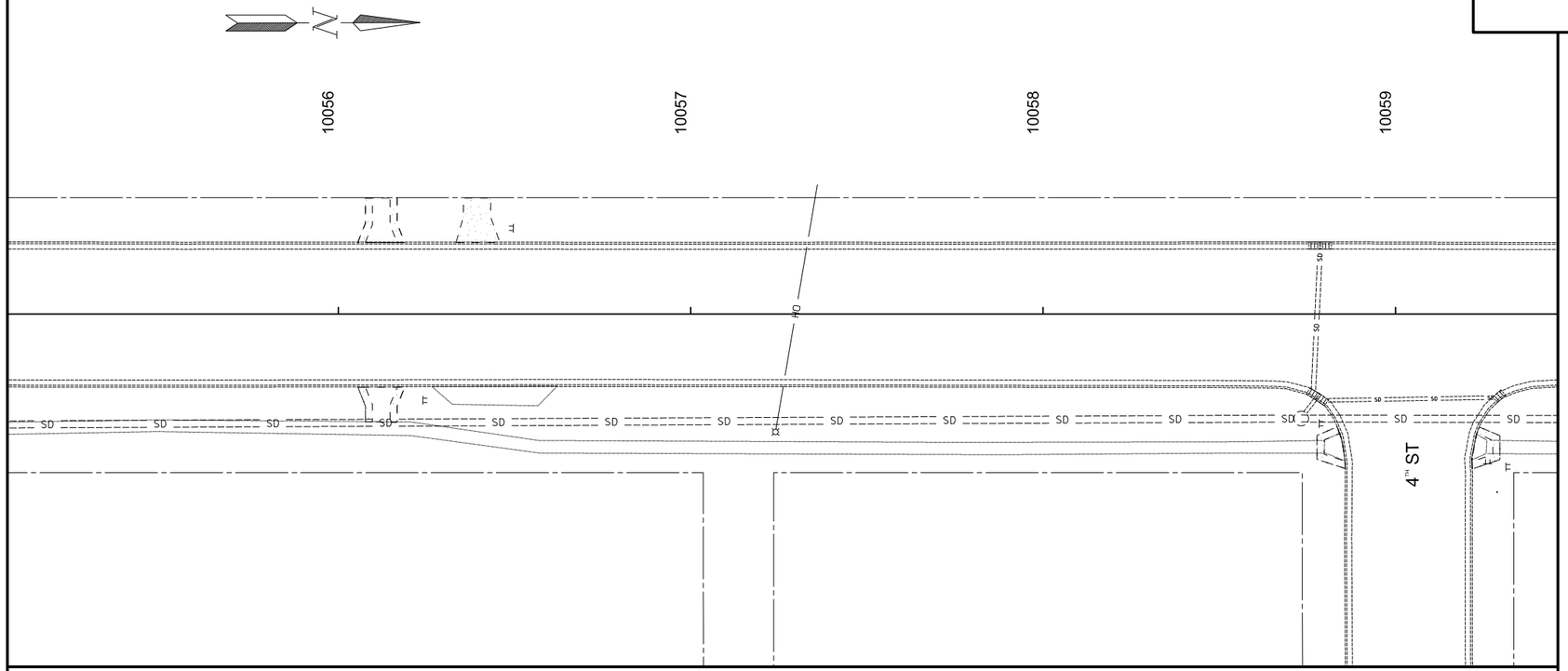
STA. 10047+76 RT	4.1 SY
STA. 10048+20 RT	4.3 SY
STA. 10051+37 RT	4.3 SY
STA. 10051+71 RT	4.4 SY

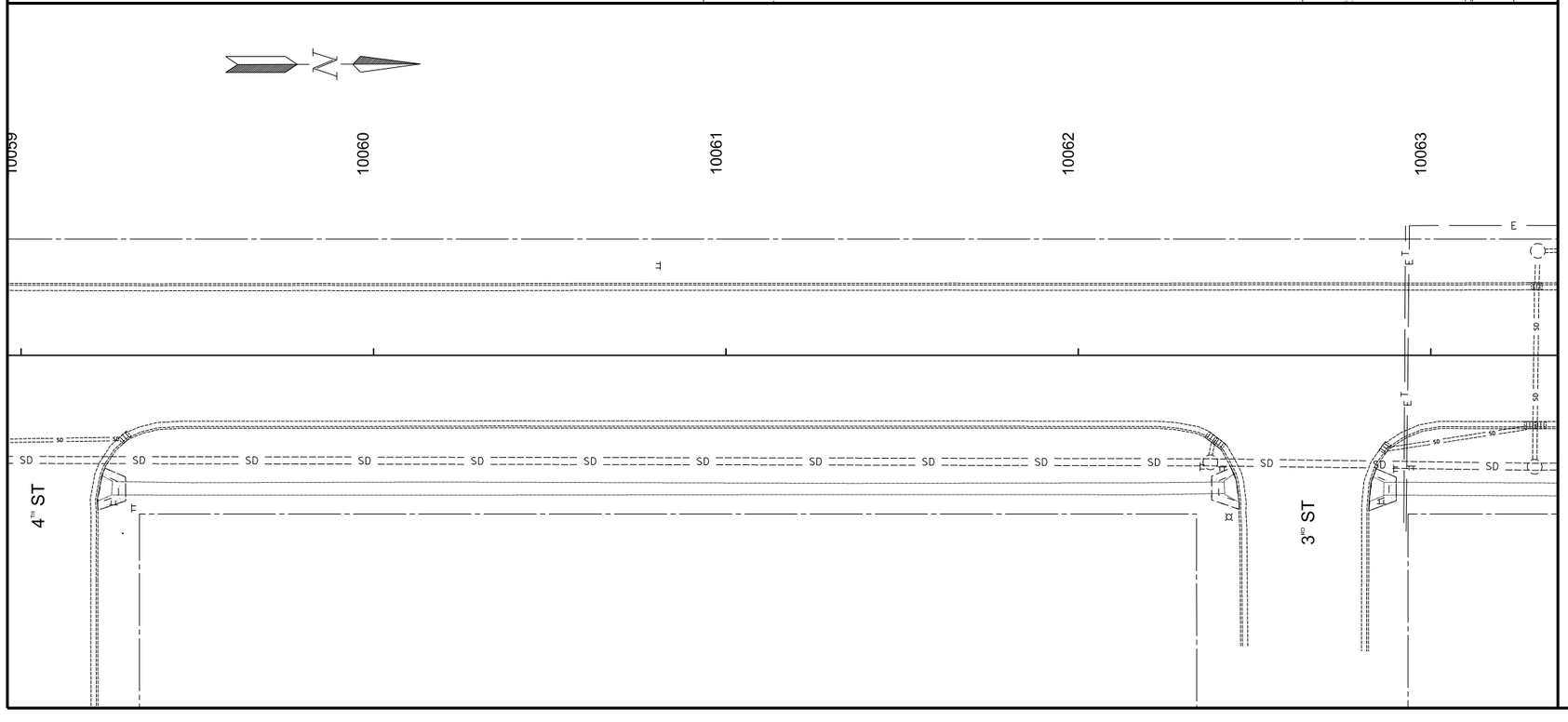
SEEDING-HYDRO MULCH

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

PERMANENT EROSION CONTROL
STA. 10047+62 to 10055+50

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	75	17





SEEDING-HYDRO MULCH

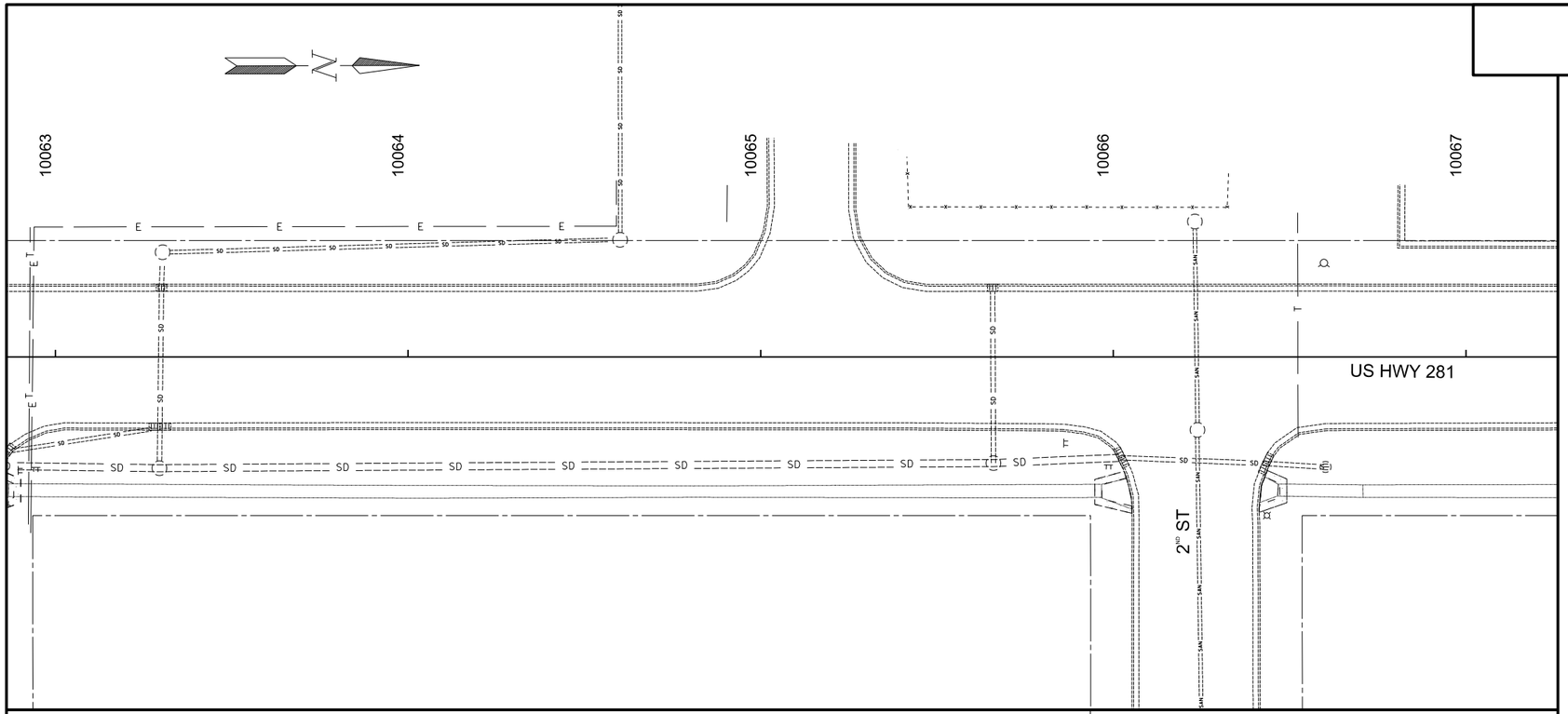
STA. 10056+11 LT	5.8 SY
STA. 10056+11 RT	4.6 SY
STA. 10056+40 LT	12.8 SY
STA. 10058+79 RT	4.0 SY
STA. 10059+21 RT	4.1 SY
STA. 10062+38 RT	4.0 SY
STA. 10062+82 RT	4.0 SY

SEEDING-HYDRO MULCH

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

PERMANENT EROSION CONTROL
STA. 10055+50 to 10063+20

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	75	18



SEEDING-HYDRO MULCH

STA. 10065+96 RT	5.1 SY
STA. 10066+41 RT	4.0 SY
STA. 10068+81 RT	13.0 SY
STA. 10069+24 LT	12.3 SY
STA. 10069+24 RT	7.1 SY
STA. 10069+58 RT	4.4 SY

SEEDING-HYDRO MULCH

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

PERMANENT EROSION CONTROL
STA. 10063+20 to 10069+96

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - US 281 Through the City of Cando

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
56 BOP	17+56.00	542361.31	2281652.79
54 PI	19+85.85	542591.16	2281653.65
52 PI	40+35.85	544640.91	2281621.67
50 PI	46+35.85	545240.43	2281597.67
200 EOP	69+96.02	547600.36	2281563.76

CURVE DATA

ARC DEFINITION

US PUBLIC LAND SURVEY DATA

DESC.	SEC-TWP-RGE	NORTHING	EASTING
SE SEC COR	SEC 19 T158N R66W	544960.69	2281601.68
E 1/4 SEC COR	SEC 19 T158N R66W	547600.36	2281563.76
SE SEC COR	SEC 30 T158N R66W	539676.58	2281684.11

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	CONTROL POINT DESCRIPTION
GPS1	548198.93	2281604.50	1484.92	Off Chain	Off Chain	
GPS2	540926.92	2281603.20	1477.25	Off Chain	Off Chain	
RTK9	547641.85	2281605.66	1485.25	Off Chain	Off Chain	
RTK10	547141.87	2281526.95	1481.01	65+38.11	-43.40	
RTK11	546534.01	2281629.63	1478.25	59+28.84	50.54	
RTK12	545966.61	2281558.46	1478.35	53+62.52	-28.76	
RTK13	545431.22	2281641.10	1477.82	48+26.00	46.17	
RTK14	544894.04	2281547.25	1475.50	42+91.76	-64.23	
RTK15	544333.41	2281668.96	1476.96	37+27.66	42.48	
RTK16	543832.16	2281558.99	1477.18	32+28.18	-75.29	
RTK17	543221.75	2281617.27	1475.94	26+16.93	-26.54	
RTK18	542681.77	2281731.88	1476.05	20+75.23	79.64	

NOTES:

Date Survey Completed 07/12/13

☐ Assumed Coordinates

☒ All coordinates on this sheet are TOWNER County ground coordinates.
They are derived from the "North Dakota Coordinate System of 1983", NAD83(86).NORTH Zone
Combination Factor (cf) = 0.9999160

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

INITIALIZING BENCH MARK
NGS OPUS SOLUTION FOR GPS1&2

☒ NAVD-88
☐ NGVD-29

☒ GEOID 12
☐ GEOID 03

This document was originally issued and sealed by Hugh W. Edwards Registration Number LS- 8158 , on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
D3-36	36"x6"	STREET NAME SIGN (Sign and installation only)		6	
G20-1-60	**60"x24"**	**ROAD WORK NEXT __ MILES**	**4**	**34**	**136**
G20-1b-60	60"x24"	WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)		26	
G20-2-48	**48"x24"**	**END ROAD WORK**	**2**	**19**	**38**
G20-4-36	**36"x18"**	**PILOT CAR FOLLOW ME (Mounted to back of pilot car)**	**1**	**18**	**18**
G20-10-108	**108"x48"**	**CONTRACTOR SIGN**	**2**	**64**	**128**
G20-50a-72	**72"x36"**	**ROAD WORK NEXT __ MILES RT & LT ARROWS**	**2**	**37**	**74**
G20-52a-72	**72"x24"**	**ROAD WORK NEXT __ MILES RT or LT ARROW**	**1**	**30**	**30**
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT**	**2**	**59**	**118**
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT		23	
M5-1-21	21"x15"	ARROW AHD AND RT or LT(Mounted on route marker post)		7	
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)		7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)		7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)		7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP		32	
R1-1a-18	**18"x18"**	**STOP and SLOW PADDLE Back to Back**	**2**	**5**	**10**
R1-2-60	60"x60"	YIELD		29	
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**2**	**39**	**78**
R2-1a-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**2**	**10**	**20**
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT SYMBOL		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT		13	
R7-1-12	12"x18"	NO PARKING		11	
r9-9-24	**24"x18"**	**SIDEWALK CLOSED**	**15**	**10**	**150**
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	**48"x30"**	**ROAD CLOSED**	**2**	**28**	**56**
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**	**2**	**31**	**62**
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-4-48	48"x48"	RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-6-48	**48"x24"**	**LARGE ARROW**	**4**	**26**	**104**
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**	**2**	**35**	**70**
W4-2-48	48"x48"	RIGHT or LEFT LANE TRANSITION SYMBOL		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC SYMBOL		35	
W8-1-48	**48"x48"**	**BUMP**	**26**	**35**	**910**
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	**48"x48"**	**LOOSE GRAVEL**	**26**	**35**	**910**
W8-9a-48	48"x48"	SHOULDER DROP-OFF		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
W8-12-48	48"x48"	NO CENTER STRIPE		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT.		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**	**9**	**35**	**315**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT.		35	
W20-4-48	**48"x48"**	**ONE LANE ROAD AHEAD or __ FT.**	**2**	**35**	**70**
W20-5-48	48"x48"	RIGHT or LEFT LANE CLOSED AHEAD or __ FT.		35	
W20-7a-48	**48"x48"**	**FLAGGING SYMBOL**	**4**	**35**	**140**
W20-7k-24	24"x18"	__ FEET (Mounted on warning sign post)		10	
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)**	**2**	**12**	**24**
W21-1a-48	48"x48"	WORKERS SYMBOL		35	
W21-2-48	48"x48"	FRESH OIL		35	

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

SPECIAL SIGNS

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**3461**

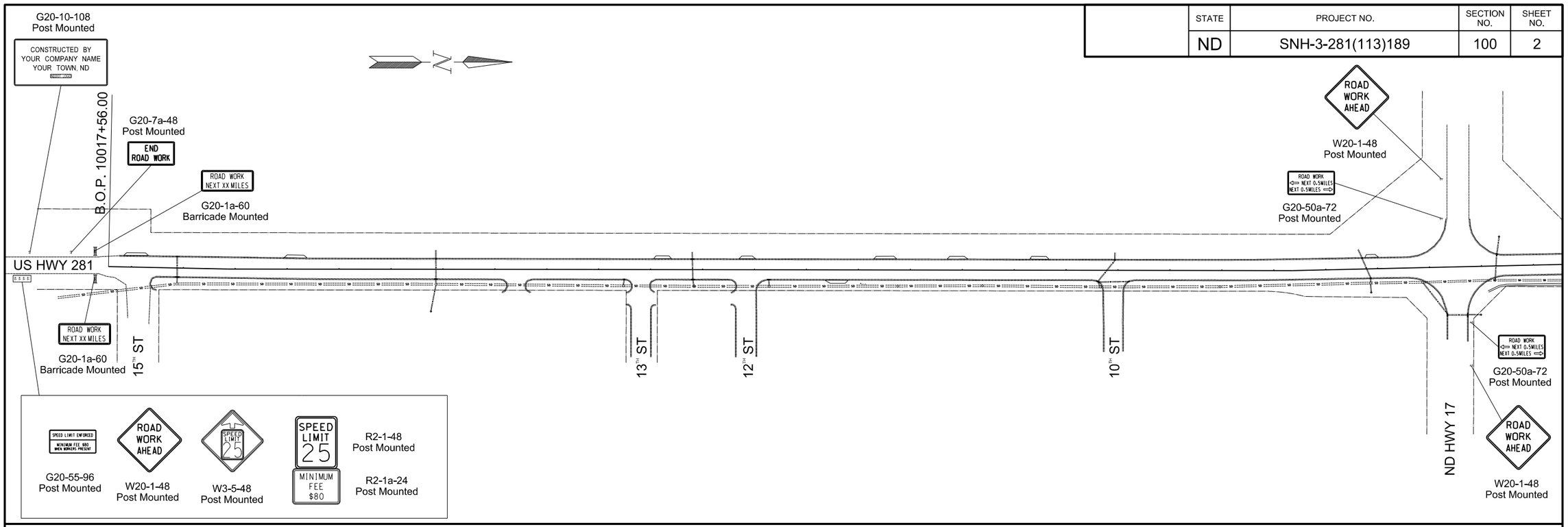
SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	**FLAGGING**	**MHR**	**600**
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH	
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH	
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1051	TYPE II BARRICADES	EACH	
704-1052	**TYPE III BARRICADES**	**EACH**	**30**
704-1060	**DELINEATOR DRUMS**	**EACH**	**150**
704-1065	TRAFFIC CONES	EACH	
704-1067	**TUBULAR MARKERS**	**EACH**	**120**
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH	
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH	
704-1095	TYPE B FLASHERS	EACH	
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**	**27684**
762-1500	OBLITERATION OF PVMT MK	SF	
772-2110	FLASHING BEACON - POST MOUNTED	EACH	

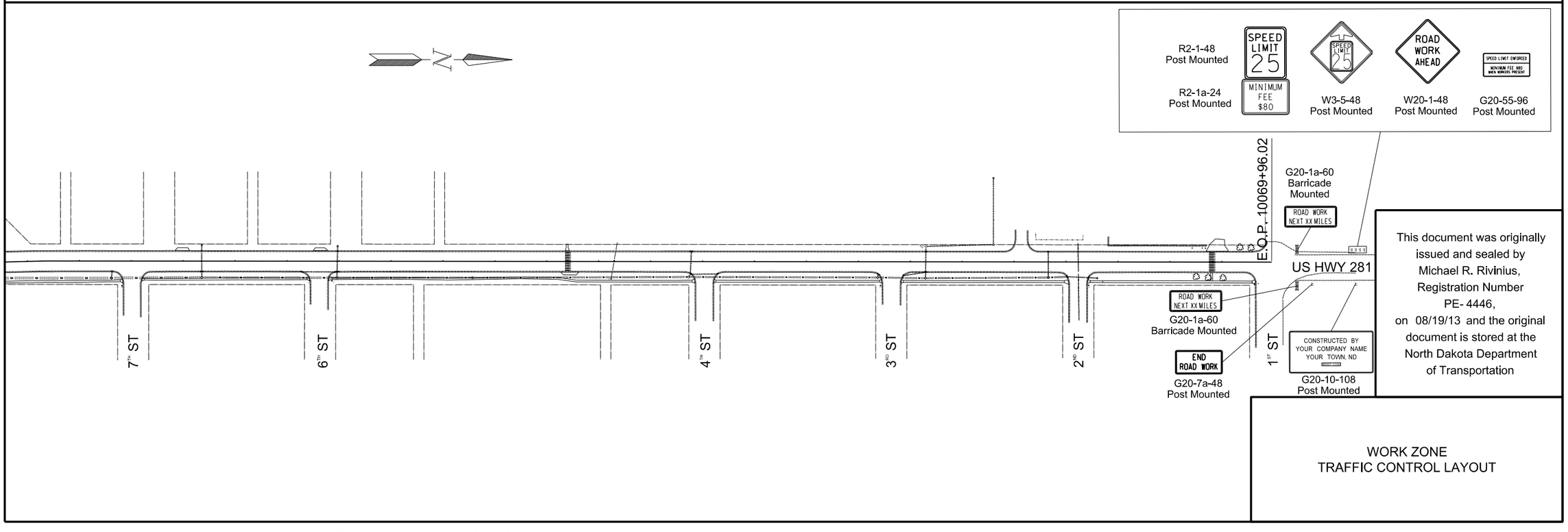
NOTE:
If additional signs are required, units will be calculated using the formula from Section III-19.06 of the Design Manual.
http://www.dot.nd.gov/

This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE-4446, on 8/19/13 and the original document is stored at the North Dakota Department of Transportation.

Traffic Control Devices List

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	100	2



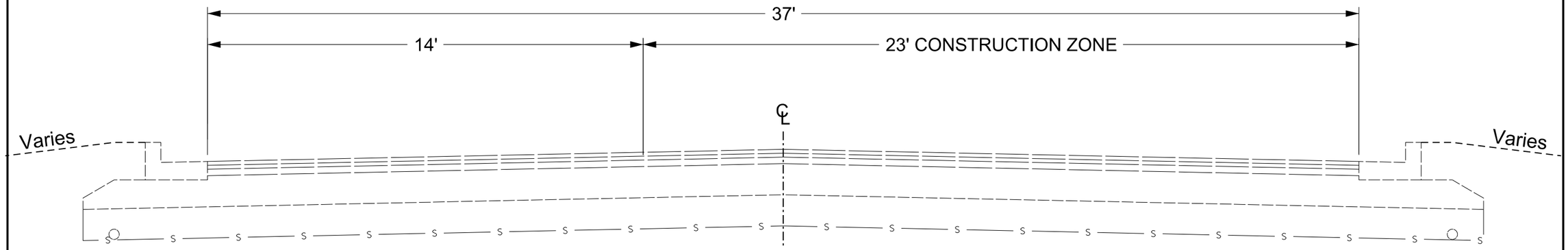


This document was originally issued and sealed by Michael R. Rivinius, Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

WORK ZONE TRAFFIC CONTROL LAYOUT

8/14/2013 11:30:10 AM Scott S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\100WZ_002_ConSign.dgn

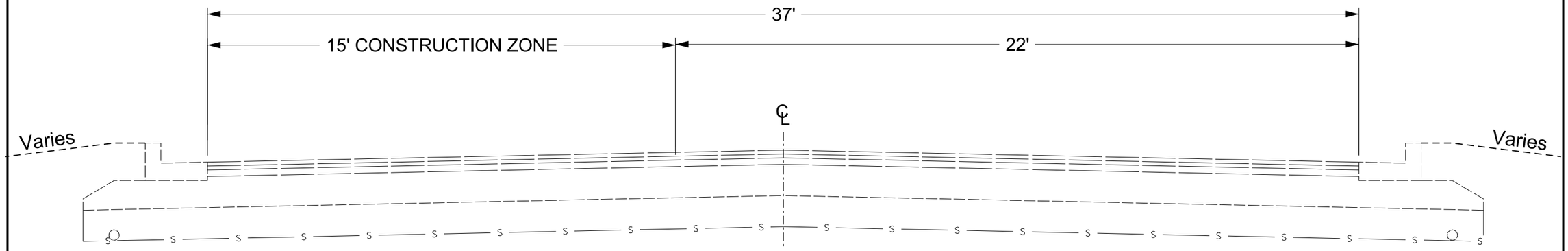
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	100	3



TYPICAL PHASE 1 CONSTRUCTION SECTION

R.P. 189.726 to 190.718

Sta. 10017+56 to 10069+96



TYPICAL PHASE 2 CONSTRUCTION SECTION

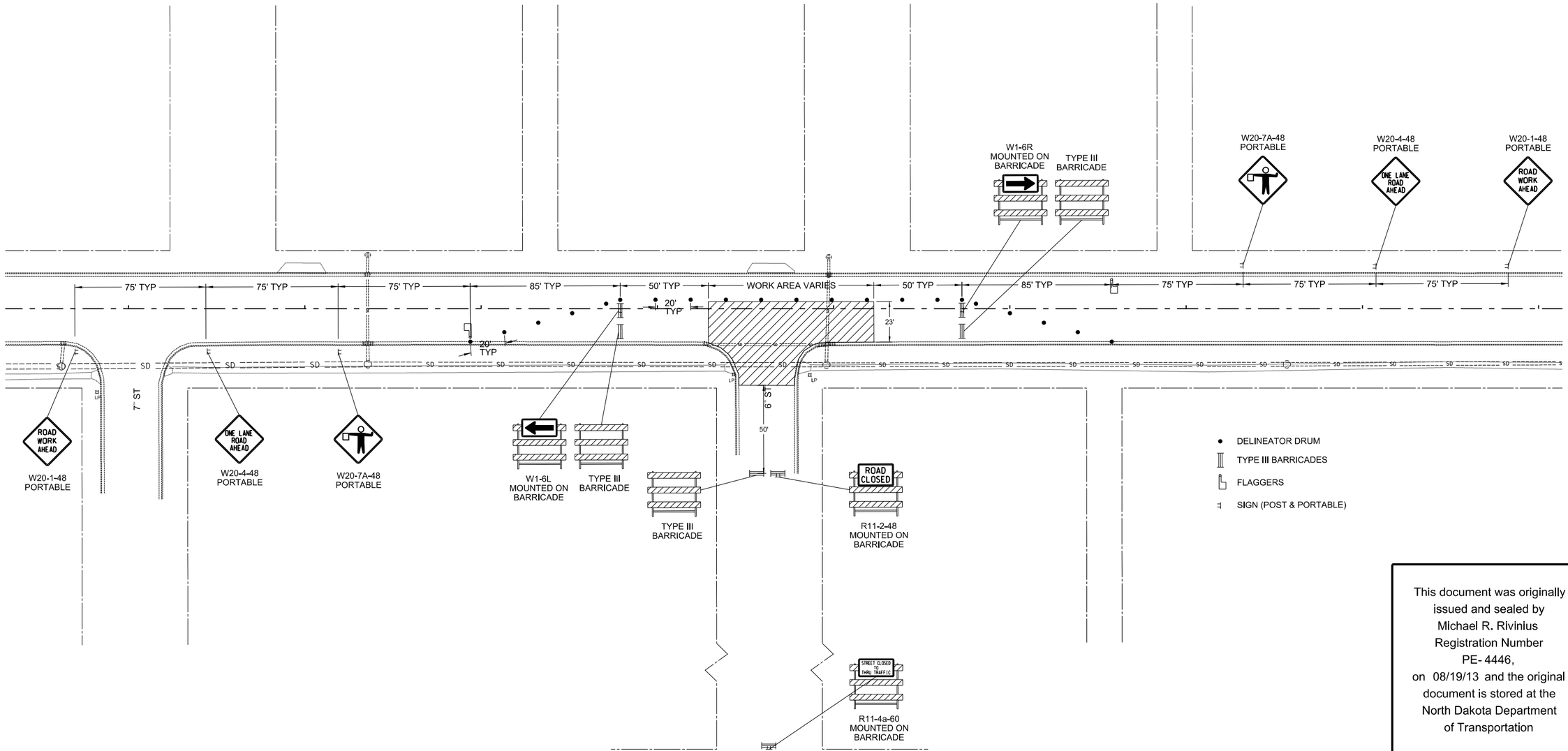
R.P. 189.726 to 190.718

Sta. 10017+56 to 10069+96

This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

WORK ZONE TRAFFIC CONTROL
PHASES 1 & 2

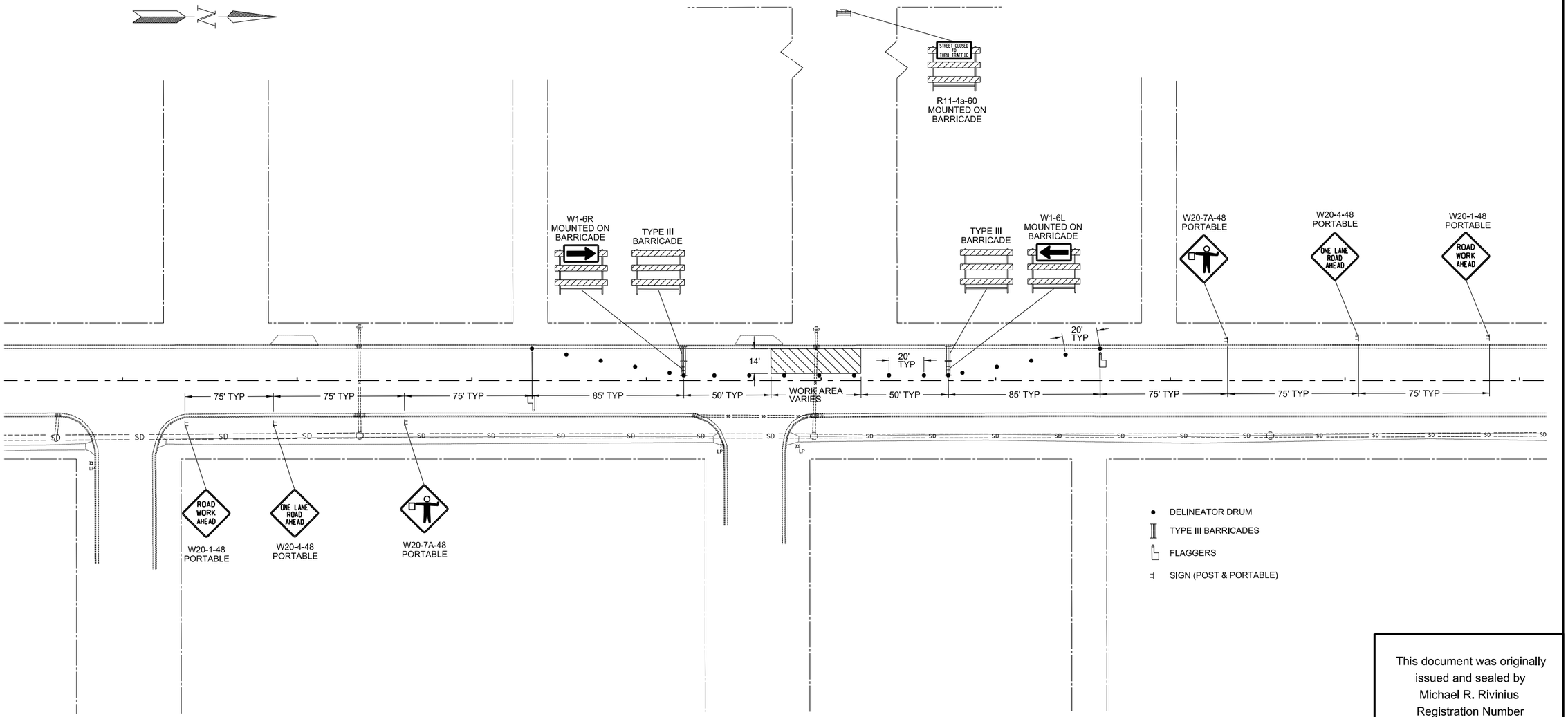
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	100	4



This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

WORK ZONE TRAFFIC CONTROL
PHASE 1
SUBGRADE REPAIR

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	100	5

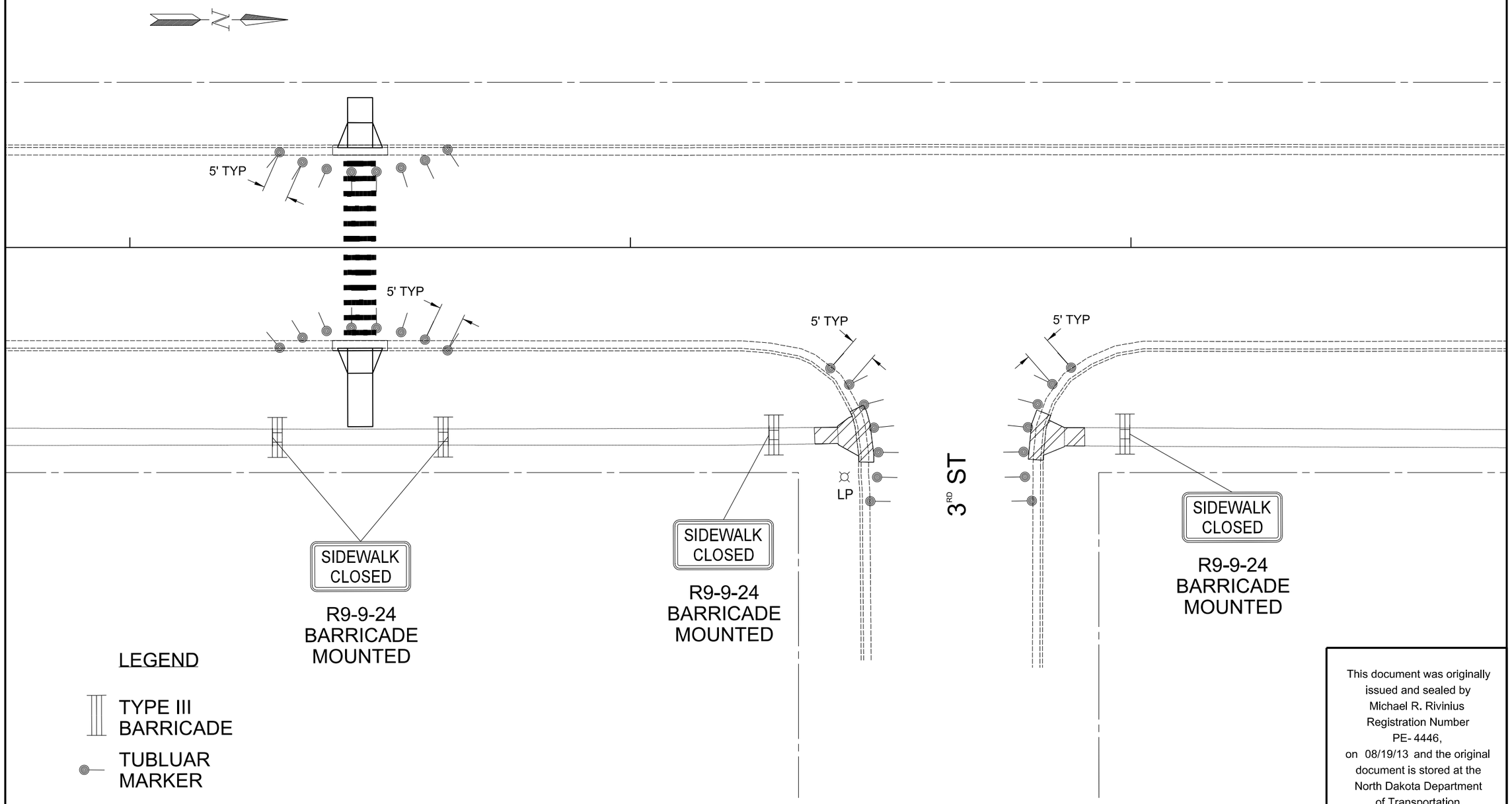


This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

WORK ZONE TRAFFIC CONTROL
PHASE 2
SUBGRADE REPAIR

8/14/2013 11:30:15 AM Scott S:\Project\30281189.113\Design\Consultant - Wold Engineering PC\100WZ_005_ConSign.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	100	6



This document was originally issued and sealed by Michael R. Rivinius Registration Number PE- 4446, on 08/19/13 and the original document is stored at the North Dakota Department of Transportation

WORK ZONE
TRAFFIC CONTROL
ADA RAMP INSTALLATION

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	110	1

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	Support Size	Max Post Len LF	Sleeve Length 1st LF	2nd LF	3rd LF	4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
51+26 Rt	SA B			8.3		12.2			2.5 x 2.5 12 ga	13.4						1	4	3 x 3 7 ga				Black on Fluorescent Yellow-Green
56+08 Rt				8.3																		Mount on Flashing Beacon Type II Pole
56+16 Lt				8.3																		Mount on Flashing Beacon Type II Pole
60+80 Lt	SA B			8.3	12.2				2.5 x 2.5 12 ga	13.4						1	4	3 x 3 7 ga				Black on Fluorescent Yellow-Green
66+65 Rt	SA B			8.3	12.2				2.5 x 2.5 12 ga	13.4						1	4	3 x 3 7 ga				Black on Fluorescent Yellow-Green
67+42 Rt	SN 1, SA A		18.7		12.7	12.7			2.5 x 2.5 10 ga	14.4						2	4	3 x 3 7 ga			2	
69+17 Rt	SA B			8.3	12.2				2.5 x 2.5 12 ga	13.4						1	4	3 x 3 7 ga				Black on Fluorescent Yellow-Green
69+37 Lt	SA B			8.3	12.2				2.5 x 2.5 12 ga	13.4						1	4	3 x 3 7 ga				Black on Fluorescent Yellow-Green
69+58 Lt		14		4.0	9.4				2 x 2 12 ga	13.0						1	4	2.25 x 2.25 12 ga				
71+69 Lt	SA B			8.3	12.2				2.5 x 2.5 12 ga	13.4						1	4	3 x 3 7 ga				Black on Fluorescent Yellow-Green
73+53 Lt	SN 1, SA A		18.7		12.7	12.7			2.5 x 2.5 10 ga	14.4						2	4	3 x 3 7 ga			2	
Sub Total			37.4	70.4		**Total**	133.1									**Total**	44		0	0	4	
Grand Total			37.4	70.4		**Total**	133.1									**Total**	44		0	0	4	

Basis of Estimate
Sign Support Length

The sign support lengths have been calculated
using the following vertical clearances: 84”
Areas where parking and/or pedestrian movement will occur - 84"
Bike route - 60"

This document was originally issued and sealed by Jacob Nordick, Registration Number PE-6736, on 8/15/2013 and the original document is stored at the North Dakota Department of Transportation.

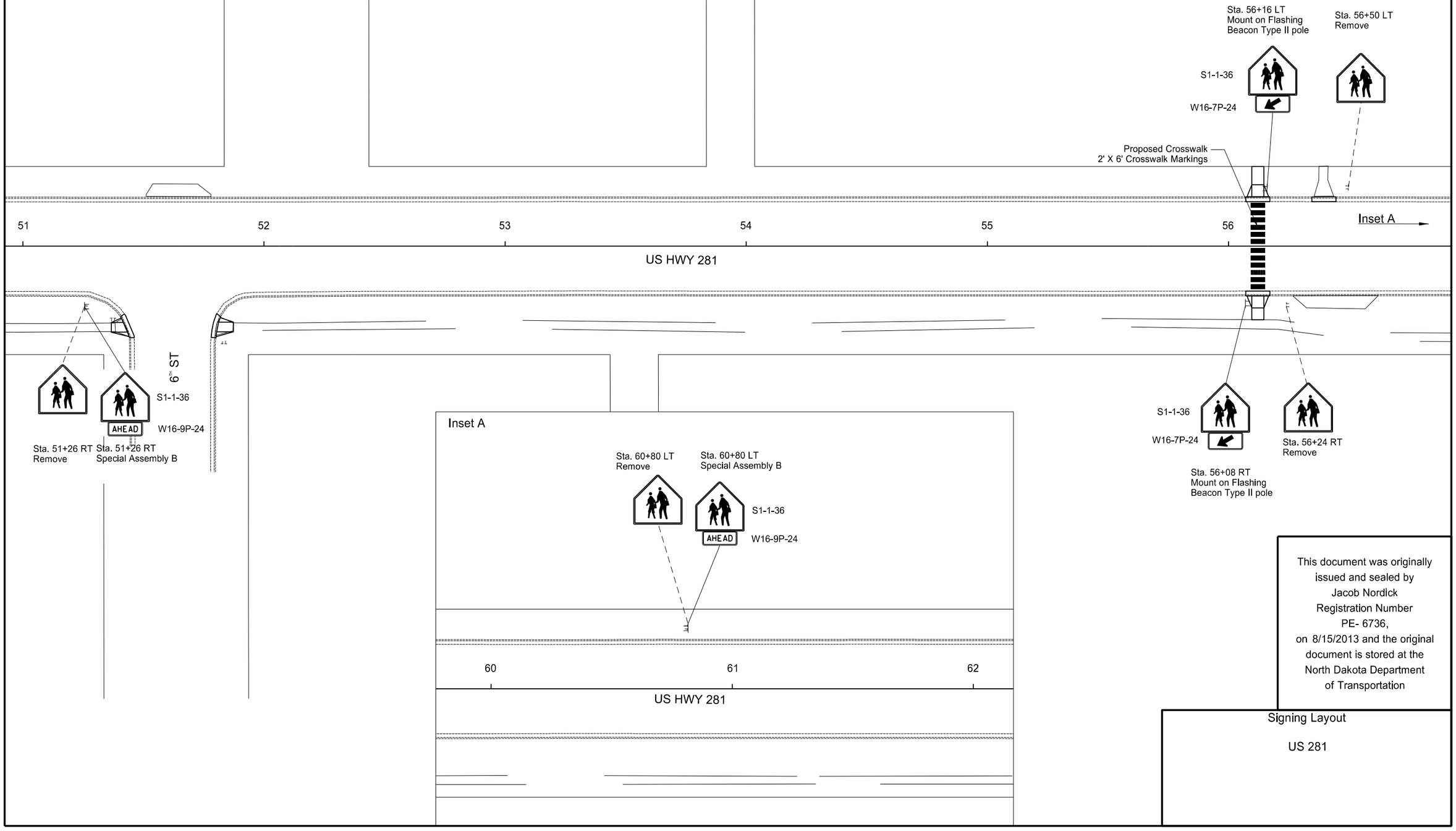
Signing Summary

US 281

Perforated Tube

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	110	2

Notes:
See section 150 for flashing beacon details.

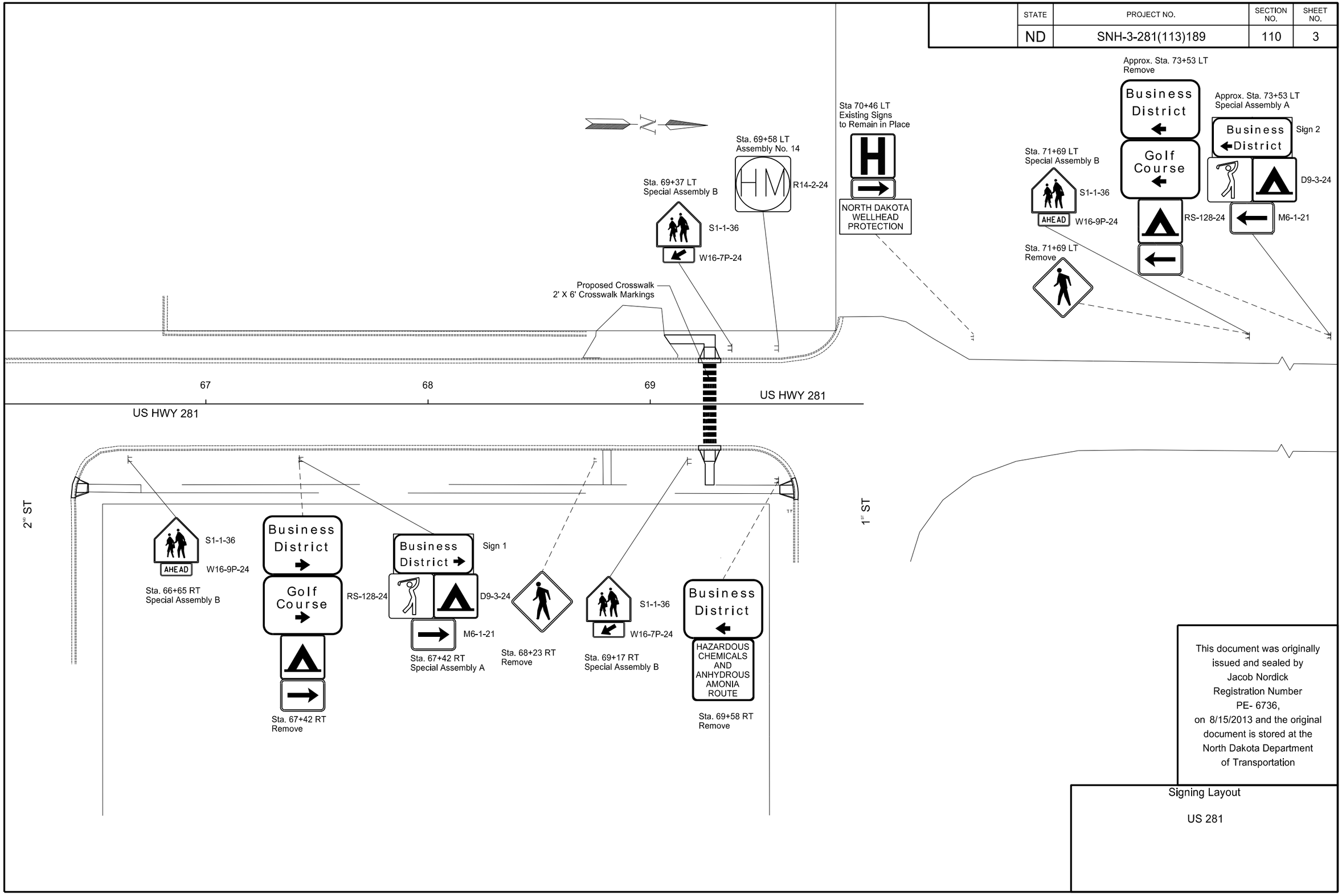


This document was originally issued and sealed by Jacob Nordick Registration Number PE- 6736, on 8/15/2013 and the original document is stored at the North Dakota Department of Transportation

Signing Layout

US 281

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	110	3



This document was originally issued and sealed by Jacob Nordick Registration Number PE- 6736, on 8/15/2013 and the original document is stored at the North Dakota Department of Transportation

Signing Layout

US 281

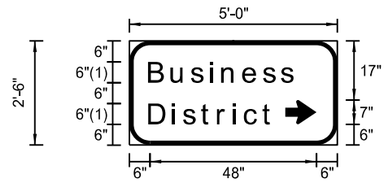
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	110	4

SIGN NUMBER	Sign 1
WIDTH x HEIGHT	5'-0" x 2'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	6"
MOUNTING	Ground
BACKGROUND	TYPE: IV Retroreflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Retroreflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ARDD	45	6	7	9	0

STATION(S):
67+42 RT

AREA: 12.5 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

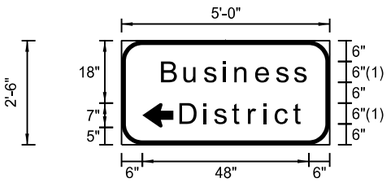
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
B	u	s	i	n	e	s	s												42	6/4.9	ClearviewHwy-5-W
6	12.4	18.2	23.7	27.1	33.1	39	44.2														
D	i	s	t	r	i	c	t												35.8	6/4.9	ClearviewHwy-5-W
6	12.8	15.9	21.1	25.9	30.3	33.6	38.8														

SIGN NUMBER	Sign 2
WIDTH x HEIGHT	5'-0" x 2'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	6"
MOUNTING	Ground
BACKGROUND	TYPE: IV Retroreflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Retroreflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ARDD	6	5	7	9	180

STATION(S):
71+08 LT, 73+53 LT

AREA: 12.5 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
B	u	s	i	n	e	s	s												42	6/4.9	ClearviewHwy-5-W
12	18.5	24.2	29.7	33.1	39.1	45	50.2														
D	i	s	t	r	i	c	t												35.7	6/4.9	ClearviewHwy-5-W
17.3	24.1	27.1	32.3	37.1	41.4	44.7	50														

This document was originally issued and sealed by Jacob Nordick Registration Number PE- 6736 , on 8/15/2013 and the original document is stored at the North Dakota Department of Transportation

Sign Details

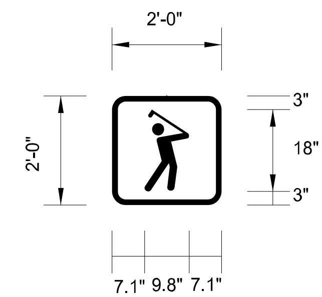
US 281

SIGN NUMBER	RS-128	
WIDTH x HEIGHT	2'-0" x 2'-0"	
BORDER WIDTH	1.25" (inset 0")	
CORNER RADIUS	3"	
MOUNTING	Overhead	
BACKGROUND	TYPE:	IV Retroreflective
	COLOR:	Brown
LEGEND/BORDER	TYPE:	IV Retroreflective
	COLOR:	White

SYMBOL	X	Y	WID	HT	ANGLE
RS-128	7.1	3	9.8	18	0

STATION(S):
67+42 RT

AREA: 4.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Recreation.ssi

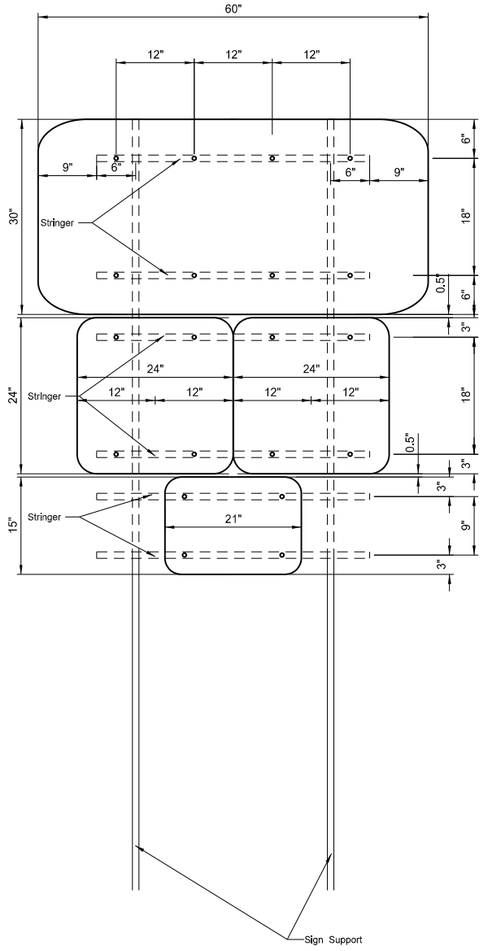
LETTER POSITION (X)	LENGTH	SIZE	SERIES

This document was originally issued and sealed by Jacob Nordick Registration Number PE- 6736, on 8/15/2013 and the original document is stored at the North Dakota Department of Transportation

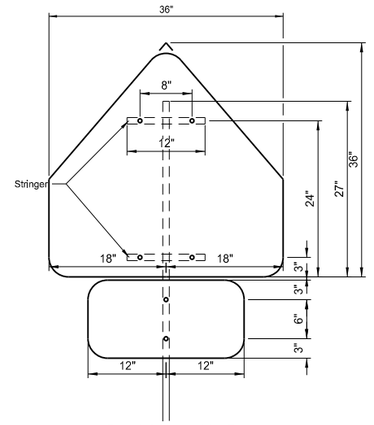
Signing Details

US 281

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	110	6



Special Assembly A
Sta. 67+42 RT
Approx. Sta. 73+53 LT
Design Area 31 SF



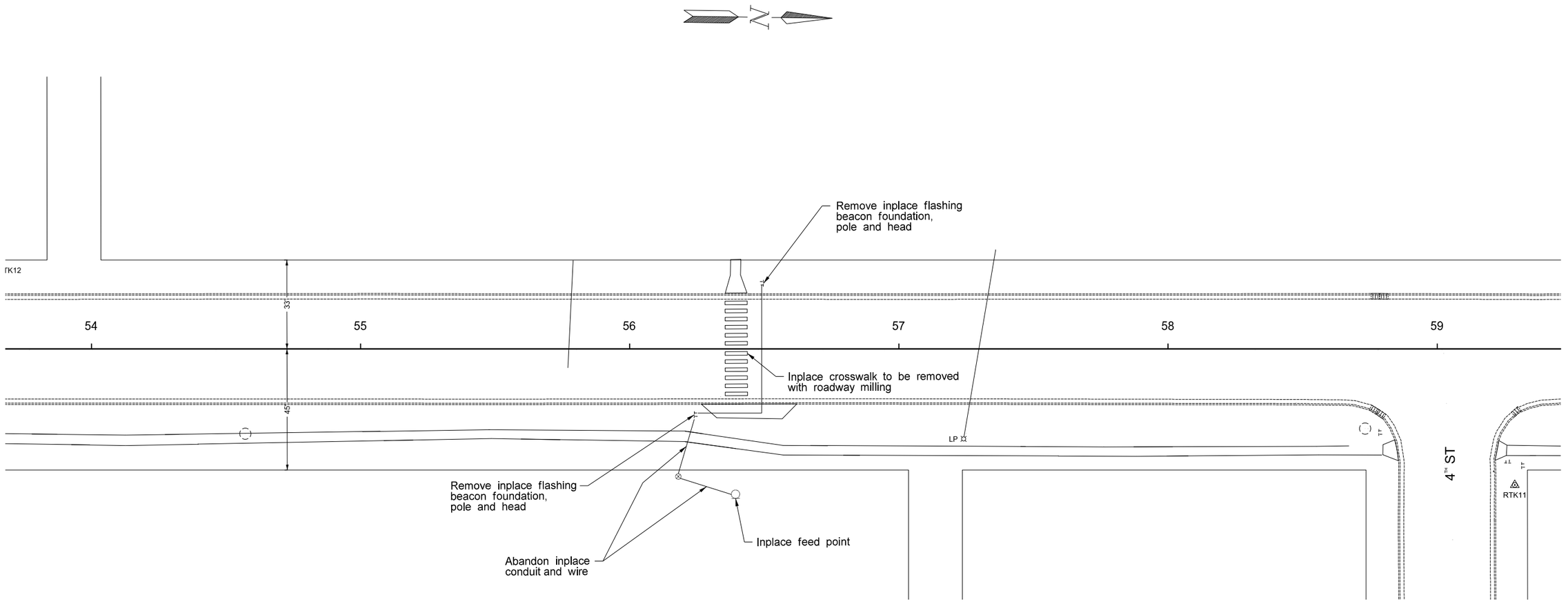
Special Assembly B
Sta. 51+26 RT , Sta 60+80 LT
Sta 66+65 RT, Sta 69+17 RT, Sta 69+37 LT Sta 71+69 LT
Design Area 8.4 SF

This document was originally issued and sealed by Jacob Nordick Registration Number PE- 6736, on 8/15/2013 and the original document is stored at the North Dakota Department of Transportation

Sign Details

US 281

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	150	1



This document was originally issued and sealed by Nicholas J. Erpelding Registration Number PE- 5870, on 8/15/2013 and the original document is stored at the North Dakota Department of Transportation

Flashing Beacon Removal Layout

US 281

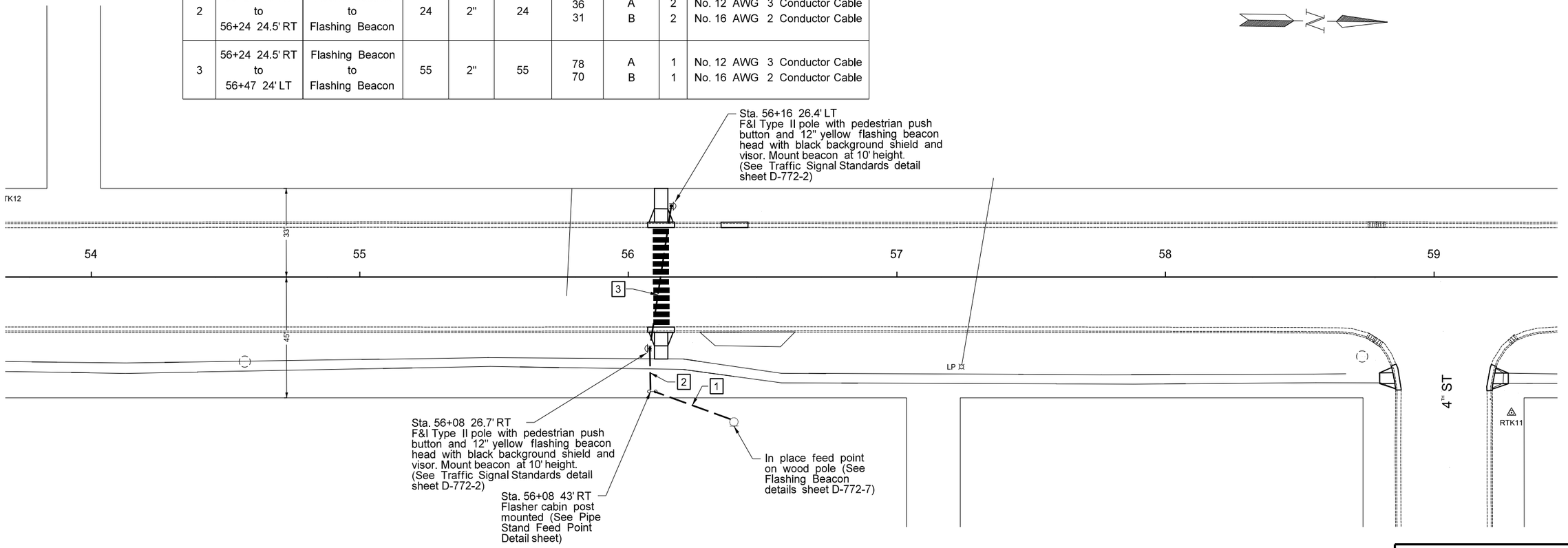
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	150	2

CABLE AND CONDUIT SCHEDULES									
Run	Station	Location	Conduit Run		Cable Trench	Cable Run			
			Length	Size	Length	Length	Code	QTY	Type
1	In Place to 56+25 43' RT	Feed Point to Flasher Cabinet	60	2"	60	66	C	1	No 6 USE
2	56+25 43' RT to 56+24 24.5' RT	Flasher Cabinet to Flashing Beacon	24	2"	24	36 31	A B	2 2	No. 12 AWG 3 Conductor Cable No. 16 AWG 2 Conductor Cable
3	56+24 24.5' RT to 56+47 24' LT	Flashing Beacon to Flashing Beacon	55	2"	55	78 70	A B	1 1	No. 12 AWG 3 Conductor Cable No. 16 AWG 2 Conductor Cable

A = Flashing Beacon
B = Push Button
C = Power Cable

Legend

[1] Cable and Conduit Run Number



SIGNAL QUANTITIES				
SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
770	0445	NO6 USE	LF	66
772	0240	2IN DIAMETER RIGID CONDUIT	LF	117
772	0401	NO12 AWG 3 CONDUCTOR CABLE	LF	150
772	0420	NO16 AWG 2 CONDUCTOR CABLE	LF	132
772	0520	FEED POINT FLASHER BEACON	EA	1
772	0601	TYPE II SIGNAL STANDARD	EA	2
772	2160	12" YELLOW FLASHING BEACON	EA	2
772	2215	PEDESTRIAN PUSHBUTTON AND SIGN	EA	2
772	3150	REMOVE FLASHING BEACON	EA	2

Items shown above are for informational purposes; contractor shall provide all labor and equipment necessary for the flasher system to be fully operational as shown in the Plans. Items shall be included in the corresponding price bid for "FLASHING BEACON - POST MOUNTED - SCHOOL"

FLASHING BEACON TIMING	
INTERVAL	TIME (SEC.)
PEDESTRIAN CLEARANCE	22

This document was originally issued and sealed by Nicholas J. Erpelding Registration Number PE- 5870, on 8/15/2013 and the original document is stored at the North Dakota Department of Transportation

Flashing Beacon Layout

US 281

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	150	3

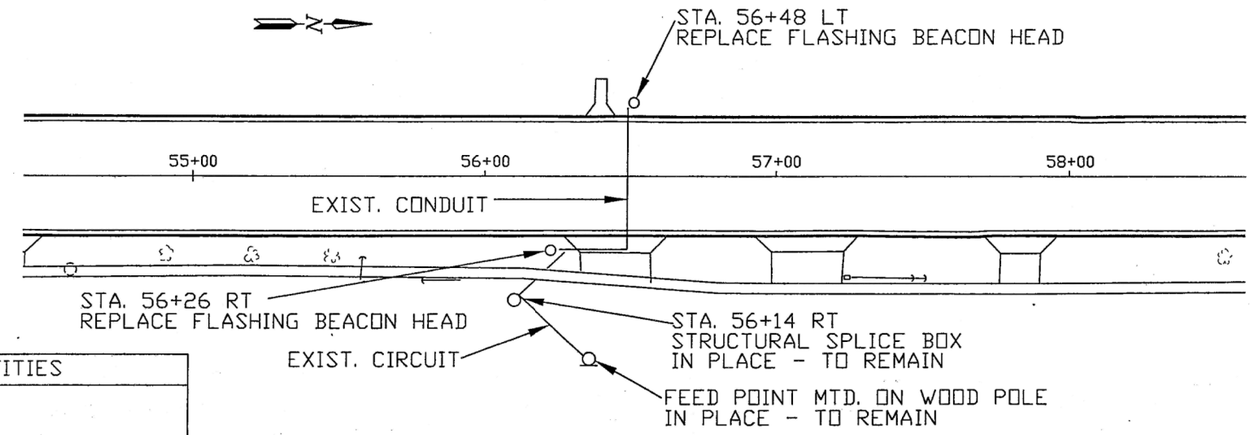
FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	NH-3-281(061)190	19

FLASHING BEACON - POST MOUNTED - SCHOOL

STA. 56+37 2 EA.

FLASHING BEACON - POST MOUNTED

STA. 26+54 RT 1 EA.
STA. 76+42 LT 1 EA.



QUANTITIES		
EA 12" YELLOW BEACON HEAD	EA FLASHER AND FLASHING CABINET	
2	1	SCHOOL CROSSING
2	2	SPEED LIMIT SIGN
4	3	TOTAL

TRAFFIC CONTROL SYSTEM
FLASHING BEACON HEAD

US 281
CANDO, ND

Wold Engineering, P.C.

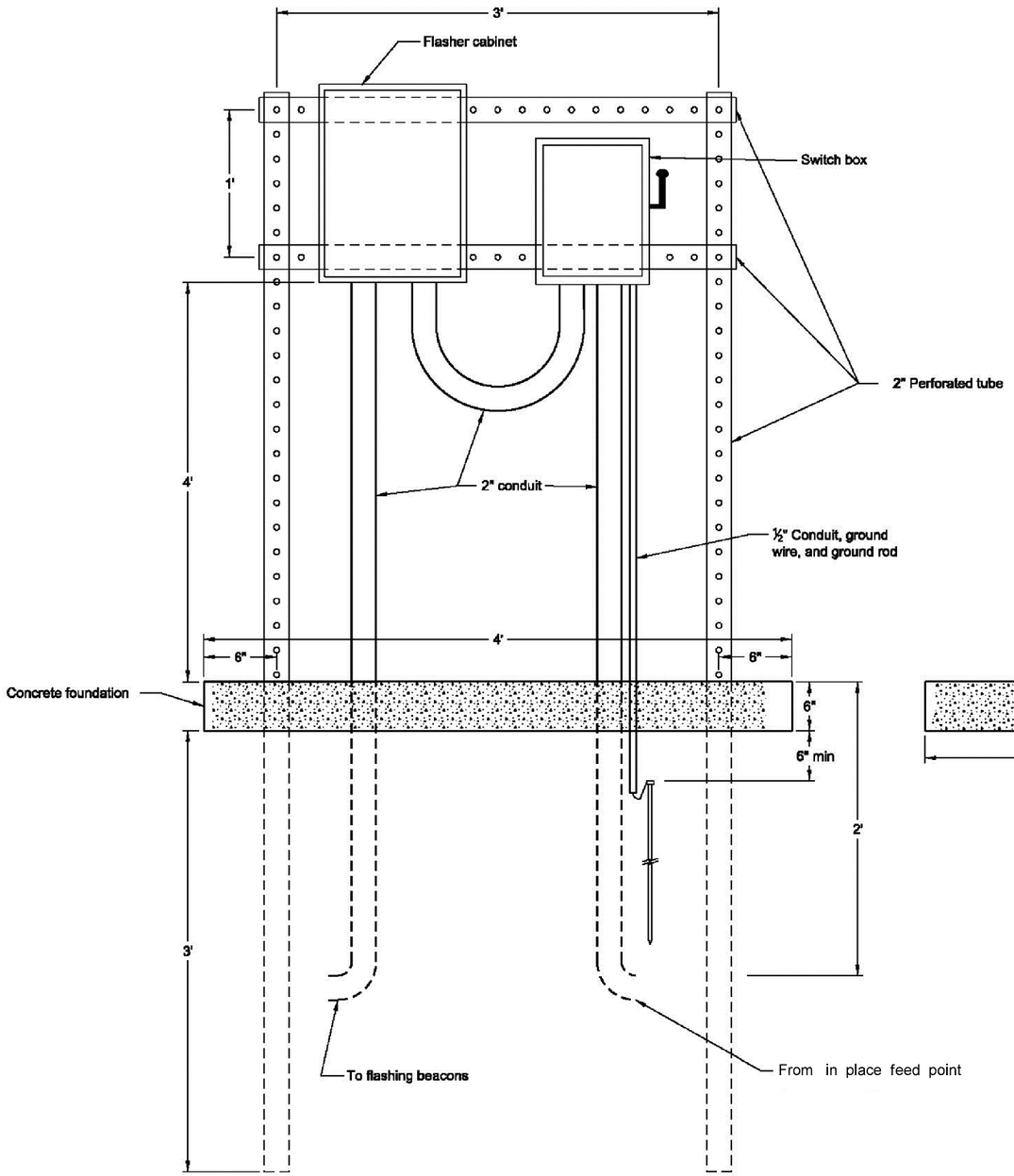
This document was originally issued and sealed by Nicholas J. Erpelding Registration Number PE- 5870, on 8/15/2013 and the original document is stored at the North Dakota Department of Transportation

For Information Only

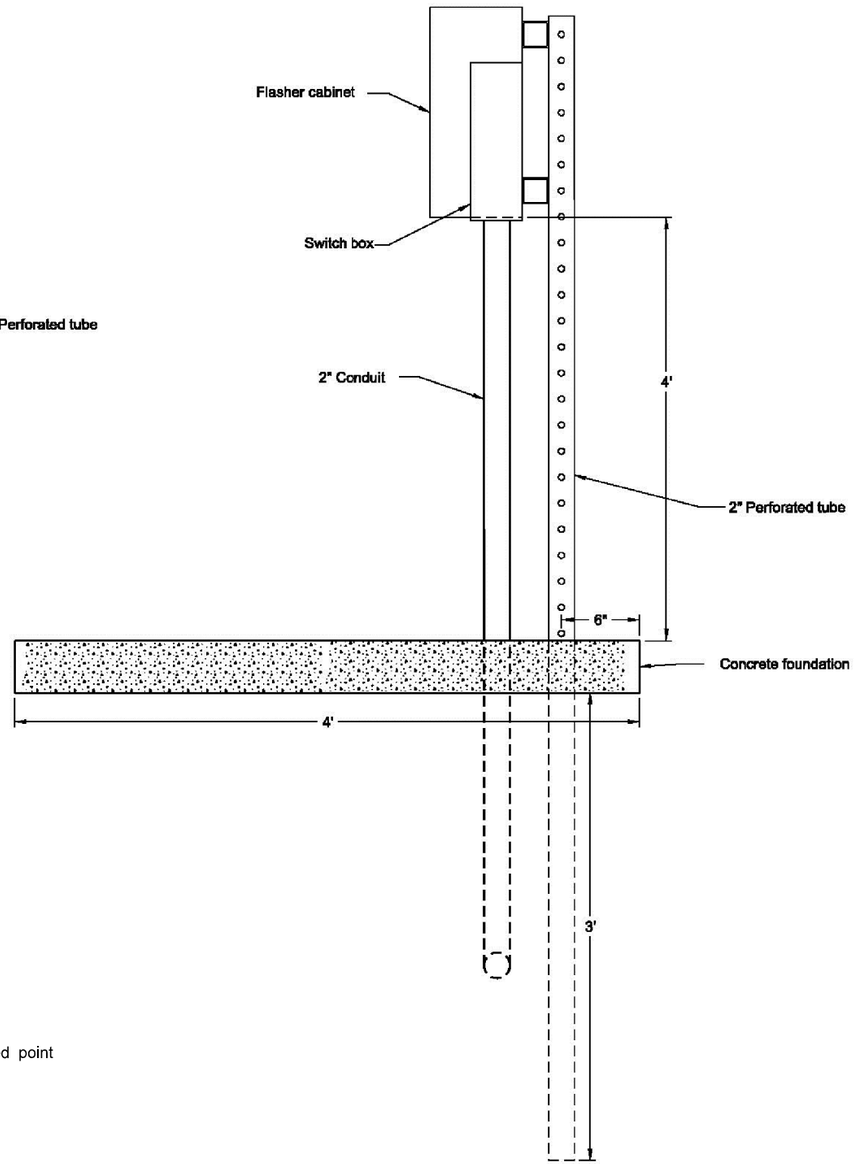
US 281

8/15/2013 12:52:01 PM mzeis I:\ProjFRGO\8014\3281178.103\Design\Plan\150SN_003_BEACON.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	150	4



Front View



Side View

Pipe Stand Feed Point Detail

This document was originally issued and sealed by Nicholas J. Erpelding Registration Number PE- 5870, on 8/15/2013 and the original document is stored at the North Dakota Department of Transportation

Pipe Stand Feed Point Detail

US 281

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SNH-3-281(113)189	180	1

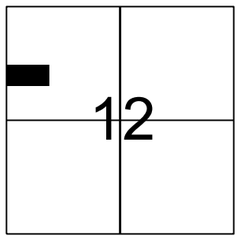
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

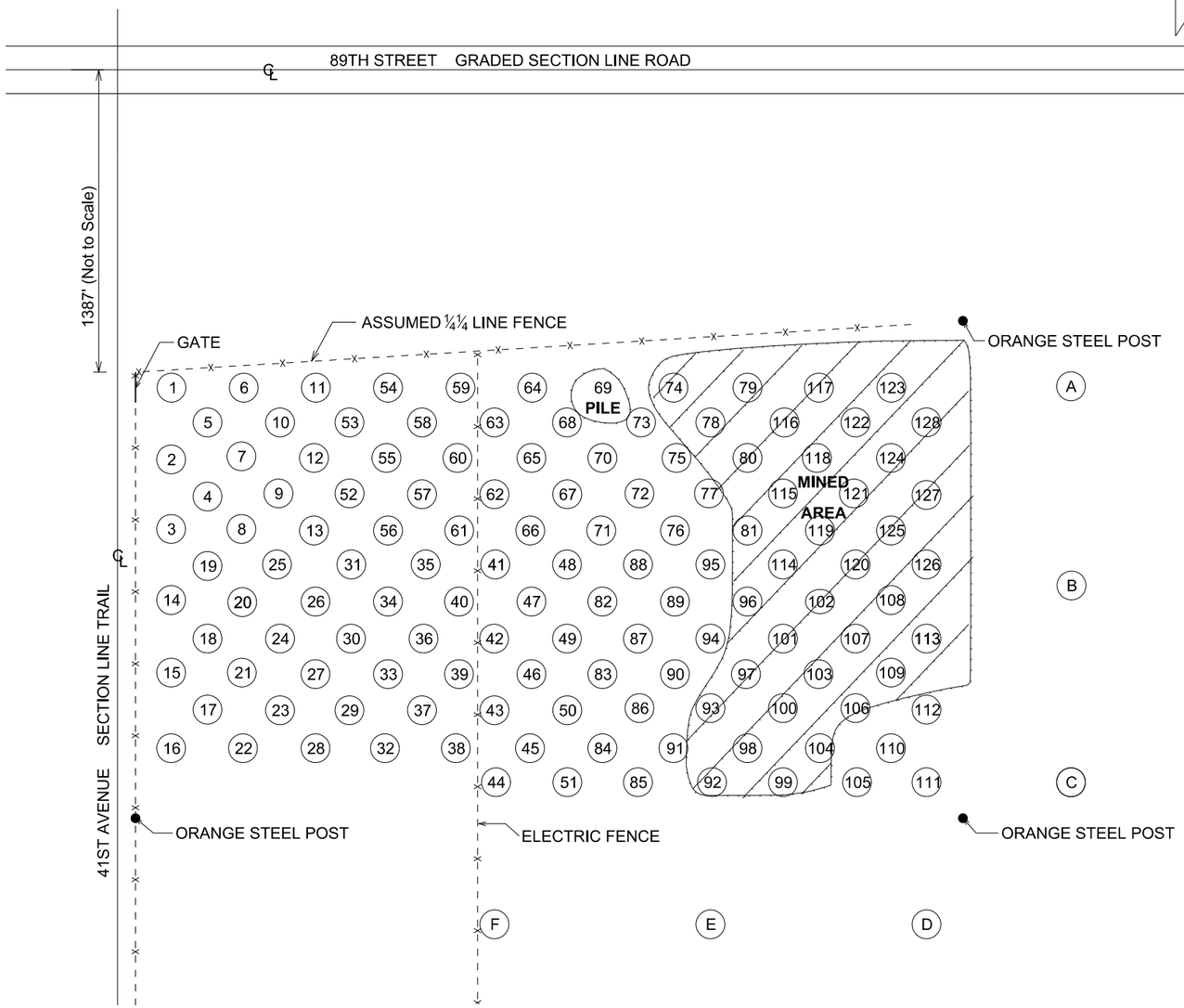
TEST HOLE PLAT

Location: SW1/2NW1/4 12-160-71 County: Rolette

Ownership: Kermit Knudson, Margaret Tumey, and Peter Knudson, Rolette, ND

LOCATION OF PIT IN SECTION





Area "A" consists of test holes 1 - 13
Area "B" consists of test holes 14 - 31
Area "C" consists of test holes 32 - 51
Area "D" consists of test holes 52 - 66
Area "E" consists of test holes 67 - 81
Area "F" consists of test holes 82 - 98
Area "G" consists of test holes 99 - 113
Area "H" consists of test holes 114 - 128

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
DM = disturbed material

**MATERIAL HAS BEEN REMOVED FROM THIS PIT SINCE BORINGS WERE TAKEN

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	180	2

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 ½" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on # 4 Screen	Bottom of Test Hole
1	1.5	3.5gr	1	14	23	35	sdsh
		1.0grsh					
		1.0gr					
		1.0sd					
		1.0gr					
2	1.5	5.0gr	0	11	23	32	+ WL 9.0
		1.0sdsh					
		0.5gr					
		1.0sd					
3	2	1.0gr	0	11	22	33	+ WL 9.0
		1.0grsh					
		4.0gr					
		1.0sd					
4	1.5	2.0grsh	0	10	17	29	Si Cl
		1.0gr					
		1.0sd					
		2.gr					
5	1	2.0sd	0	8	16	27	sdsh
		5.5gr					
6	2	1.0Fgrsh	0	4	15	26	sdsh
		1.0gr					
		1.0sd					
		1.0gr					
7	2	1.0gr	0	6	20	31	+ WL 9.0
		1.5grsh					
		1.5gr					
		0.5grsh					
		1.5gr					
		1.0grsh					
8	1	1.0grsh	0	5	15	25	+ WL8.5
		1.0gr					
		1.0sd					
		1.0gr					
		1.0sd					
9	1	2.0sd	0	6	17	28	+ WL9.0
		1.0grsh					
		3.0gr					
		1.0sd					
		1.0gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on # 4 Screen	Bottom of Test Hole
10	1.5	2.5gr	0	7	15	26	+ WL8.5
		1.0sd					
		1.0gr					
		1.0Fgr					
		1.5gr					
11	1	0.5gr	0	9	17	26	sdWL8.5
		1.5sd					
		3.0gr					
		2.0sd					
		0.5gr					
12	2	1.0FS	0	5	13	24	sdWL9.0
		3.5gr					
		1.5sdsh					
		1.0grsh					
13	1	2.0gr	0	6	16	25	+ WL 9.0
		1.0grsh					
		2.0gr					
		1.0sdsh					
		2.5gr					
		1.0grsh					
14	2	1.0sd	0	3	10	18	Si Cl
		2.5gr					
		1.0sdsh					
		1.0sd					
		1.0grsh					
15	1.5	3.5gr	0	10	24	35	sdWL8.0
		1.0grsh					
		1.0sd					
		1.5sd					
		1.0sdsh					
16	1	3.0grsh	0	3	15	25	+ WL8.0
		1.5gr					
		1.5sd					
		1.0sdsh					
17	1	5.5gr	0	7	19	31	+ WL8.0
		1.5sdsh					
18	1	1.0gr					
		1.0grsh	0	7	17	25	+ WL8.0
		1.0gr					
		1.0grsh					
		1.0sd					
19	1.5	2.0gr	0	11	20	29	Si Cl
		1.0sd					
		1.5gr					
		1.5sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2 Screen	% Retained on 3/4 Screen	% Retained on 3/8 Screen	% Retained on # 4 Screen	Bottom of Test Hole
20	1	1.0gr	0	7	18	28	sdWL8.5
		2.0sd					
		2.5gr					
		1.0sd					
		1.0gr					
21	1.5	1.5grsh	0	7	18	29	+ WL8.5
		1.0gr					
		1.0sd					
		2.0gr					
		1.5sdsh					
22	1	6.0gr	0	14	25	36	+ WL8.5
		1.5sdsh					
23	1	4.0gr	0	9	20	29	+ WL8.5
		1.0Fgr					
		1.0sd					
24	1	4.0gr	0	5	16	27	+ WL8.5
		2.0sd					
		1.0sd					
		1.5gr					
25	2	1.5sd	0	7	14	22	+ WL9.0
		3.0gr					
		1.5Fsd					
		1.0sd					
26	1	1.0gr	0	4	14	24	Si Cl
		1.0sd					
		3.5gr					
		1.0Fsd					
		0.5gr					
27	1.5	4.5gr	0	9	21	34	+ WL8.0
		1.0grsh					
		1.0sd					
28	1	4.0gr	0	9	21	31	+ WL8.0
		1.0Fgr					
		2.0sd					
29	1	1.0grsh	0	7	19	30	+ WL9.0
		1.0gr					
		1.0sd					
		1.0gr					
		1.0sdsh					
		1.0sd					
		2.0gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2 Screen	% Retained on 3/4 Screen	% Retained on 3/8 Screen	% Retained on # 4 Screen	Bottom of Test Hole
30	1.5	1.0grsh	0	8	19	35	+ WL8.5
		0.5sd					
		3.0gr					
		1.0sd					
		1.5gr					
31	0.5	0.5gr	0	8	19	26	+ WL7.5
		1.5sd					
		3.0gr					
		1.0sd					
		1.0sdsh					
32	0.5	1.0gr	0	9	24	37	+ WL8.0
		0.5sd					
		1.0grsh					
		5.0gr					
33	1.5	4.5gr	0	7	21	33	sdWL8.5
		1.0sd					
		1.0sdsh					
		0.5gr					
34	1.5	1.0grsh	0	5	15	25	grWL8.0
		0.5gr					
		1.0sd					
		1.0gr					
		1.5gr					
35	3	3.0gr	0	7	17	26	+ WL8.5
		2.5sd					
36	1.5	3.5gr	0	8	19	31	Si Cl
		2.0sd					
		1.0gr					
37	0.5	3.0gr	0	5	19	32	+ WL8.5
		1.5sd					
		1.0grsh					
		2.5gr					

RANGE 71 **TWP.** 160 **SEC.** 12

Rolette **COUNTY**

PIT PROSPECTED BY Willie Heinrich 9-99

INSPECTED & APPROVED

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	180	3

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 ½" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on # 4 Screen	Bottom of Test Hole
38	0.5	4.5gr	1	6	18	31	+ WL8.0
		1.0Fgr					
		1.0FS					
		1.0gr					
39	0.5	4.0gr	0	5	16	28	+ WL9.0
		1.0sd					
		0.5gr					
		1.0Fgrsh					
		1.0sd					
		1.0gr					
40	1	4.0grsh	0	4	16	24	+ WL8.0
		1.0sd					
		2.0FS					
41	1.5	2.5gr	1	10	20	31	+ WL9.0
		1.0Fgr					
		3.0gr					
		1.0sdsh					
42	1.5	4.5gr	0	5	16	28	Si Cl
		1.5sd					
43	1	2.0grsh	0	7	20	33	+ WL8.5
		5.5gr					
44	1.5	0.5gr	0	7	20	32	+ WL7.5
		1.0grsh					
		3.0gr					
		1.5sd					
45	1	2.0grsh	1	9	22	34	+ WL8.5
		3.0gr					
		1.0Fgr					
		1.5gr					
46	1.5	1.5grsh	0	12	25	40	sdsh
		3.5gr					
		1.0sd					
47	1	1.0grsh	0	12	27	40	+ WL8.5
		4.5gr					
		1.0sdsh					
		1.0gr					
48	0.5	2.0gr	0	10	23	35	+ WL7.0
		1.0sd					
		1.5gr					
		1.0sd					
		1.0sdsh					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on # 4 Screen	Bottom of Test Hole
49	0.5	3.5grsh	0	6	20	34	+ WL8.0
		1.0sd					
		1.5gr					
		1.0FS					
		0.5gr					
50	1.5	1.5gr	0	10	22	35	+ WL8.0
		1.0grsh					
		4.0gr					
51	2	0.5sd	0	3	12	23	+ WL7.5
		2.5gr					
		1.0sd					
52	1	5.0grsh	1	7	17	29	+ WL8.5
		2.0sd					
		0.5gr					
53	1.5	1.5grsh	0	6	17	30	sdsh
		4.0gr					
		1.0grsh					
54	1	2.0grsh	1	10	18	28	sdWL9.0
		3.5gr					
		1.5sd					
		1.0gr					
55	2	2.0gr	0	7	19	28	FgrWL8.5
		1.0sd					
		1.0gr					
56	0.5	2.5grsh	0	7	19	30	sdsh
		1.5gr					
		2.5sd					
57	0.5	4.5gr	0	9	26	39	+ WL9.0
		1.0grsh					
		1.0gr					
58	0.5	3.5grsh	0	10	21	31	+ WL8.5
		1.0gr					
		1.0sdsh					
		2.5gr					
59	1.5	3.5gr	0	8	16	24	sdWL8.5
		1.0sdsh					
		1.0Fgr					
		1.0sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2 Screen	% Retained on 3/4 Screen	% Retained on 3/8 Screen	% Retained on # 4 Screen	Bottom of Test Hole
60	1.5	4.0gr	0	8	23	33	+ WL8.5
		2.5sd					
		0.5gr					
61	2	4.0gr	0	17	28	38	sdsh
		1.0Fgr					
62	1.5	2.0gr	0	9	21	31	+ WL8.5
		1.0sd					
		1.0gr					
		1.0sdsh					
		0.5sd					
63	1	1.0sd	0	7	16	25	+ WL8.5
		3.0grsh					
		3.5sdsh					
64	1.5	3.5gr	1	11	23	33	+ WL8.5
		0.5FS					
		0.5gr					
		1.0sdsh					
		2.0gr					
65	1.5	1.0gr	0	13	23	32	sdsh
		0.5grsh					
		2.0sd					
		2.0gr					
66	1.5	1.5gr	1	14	27	38	+ WL8.0
		1.0sd					
		2.0gr					
		1.0sdsh					
		1.0grsh					
67	1	3.0grsh	1	9	23	35	+ WL8.0
		2.0gr					
		1.0sd					
		1.0gr					
68	1	1.0sd	0	5	15	25	+ WL8.0
		1.0gr					
		1.0sd					
		2.0gr					
69	0.5	2.5gr	0	9	23	35	+ WL8.0
		1.0grsh					
		2.0gr					
		0.5sd					
		0.5sdsh					
		1.0gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2 Screen	% Retained on 3/4 Screen	% Retained on 3/8 Screen	% Retained on # 4 Screen	Bottom of Test Hole
70	1.5	2.5grsh	0	7	18	28	+ WL8.0
		1.5gr					
		1.0sd					
		1.5gr					
71	1	5.0gr	0	11	23	35	+ WL8.5
		1.0sd					
		1.5gr					
72	3	3.5gr	0	5	15	26	+ WL8.5
		1.0sd					
		1.0gr					
73	1	2.0grsh	0	8	20	31	+ WL8.0
		2.0gr					
		1.0FS					
		1.0gr					
		1.0sd					
74	2	4.0gr	0	7	19	31	+ WL8.0
		1.0sdsh					
		1.0Fgrsh					
75	1	3.0gr	0	6	17	27	+ WL8.0
		1.0grsh					
		1.5sd					
		0.5sdsh					
		1.0Fgr					
76	1	6.0gr	0	6	23	37	+ WL8.0
		1.0grsh					
77	1.5	6	0	8	23	41	+ WL7.5
78	0.5	5.5gr	0	5	18	29	+ WL8.0
		1.5FS					
		0.5gr					
79	1.5	5.5gr	1	10	24	39	+ WL8.5
		1.0grsh					
		0.5gr					

RANGE 71 **TWP.** 160 **SEC.** 12

Rolette **COUNTY**

PIT PROSPECTED BY Willie Heinrich 9-99

INSPECTED & APPROVED

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	180	4

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 ½" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on # 4 Screen	Bottom of Test Hole
80	1	6.5gr	0	9	22	34	+ WL8.5
		0.5sd					
		0.5sd					
81	0.5	6.5	1	14	30	44	sdsh
82	1.5	3.0grsh	1	11	20	31	+ WL8.0
		0.5sd					
		3.0gr					
83	1	3.0gr	0	7	21	35	+ WL7.5
		1.0grsh					
		1.0gr					
		1.0grsh					
		0.5sd					
84	2	2.5gr	0	3	12	25	+ WL7.5
		1.0sdsh					
		1.0Fgr					
		1.0gr					
85	0.5	6.5	1	11	25	42	sdWL7.0
86	2	1.0grsh	0	7	17	31	+ WL8.0
		3.0gr					
		1.0sd					
		1.0grsh					
87	1	3.0gr	0	6	17	29	+ WL8.0
		1.0FS					
		2.0Fgr					
		1.0sd					
88	1	1.0gr	0	10	24	39	+ WL8.0
		1.0grsh					
		5.0gr					
89	0.5	5.5gr	0	7	22	35	sdWL7.5
		1.5sd					
90	0.5	4.5gr	0	5	16	28	+ WL8.0
		1.0sdsh					
		1.0FS					
		1.0gr					
91	1	6.5	0	14	29	43	+ WL7.5
92	1	1.0grsh	0	6	18	32	+ WL8.0
		1.0sd					
		1.0grsh					
		1.0gr					
93	1.5	3.5grsh	0	9	23	34	+ WL7.0
		1.0sd					
		1.0gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on # 4 Screen	Bottom of Test Hole
94	1.5	1.5gr	1	9	23	35	+ WL8.0
		1.0sd					
		3.0gr					
		1.0sd					
95	1	5.0gr	1	15	28	40	+ WL7.5
		1.5sdsh					
96	1	1.0gr	0	5	15	28	+ WL8.0
		2.0DM					
		2.0gr					
		1.0Fgrsh					
		1.0sd					
97	2	1.0grsh	1	10	25	36	+WL7.0
		2.5gr					
		1.5sd					
98	1	2.0grsh	1	14	26	38	+ WL7.5
		2.0gr					
		1.0sdsh					
		1.0sd					
		4.5gr					
		1.0sd					
		0.5gr					
99	1	1.5FS	0	11	24	37	+ WL8.5
		4.5gr					
		1.0sd					
		0.5gr					
100	2	3.5gr	0	5	17	29	sdWL7.0
		0.5sd					
		1.0gr					
101	2	5.0gr	0	9	22	33	+ WL8.0
		1.0sd					
102	1.5	2.0grsh	0	11	25	38	+ WL8.5
		0.5sd					
		3.0gr					
		1.0sdsh					
		0.5gr					
103	1.5	4.0gr	0	13	24	34	sdWL7.0
		1.5sd					
104	1.5	1.0FS	0	7	19	31	+ WL7.5
		3.0gr					
		1.0sd					
		0.5gr					
		0.5FS					
105	1.5	5.5gr	0	8	18	29	+ WL8.0
		1.0sd					
106	2.5	3.0gr	0	9	23	35	+ WL7.5
		1.0sd					
		1.0gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2 Screen	% Retained on 3/4 Screen	% Retained on 3/8 Screen	% Retained on # 4 Screen	Bottom of Test Hole
107	1.5	1.5FS	0	8	22	34	sdsh
		1.0Fgr					
		3.5gr					
108	1.5	1.5FS	1	8	21	32	+ WL8.5
		5.5gr					
109	1.5	2.5grsh	0	5	17	29	+ WL7.5
		2.0gr					
		1.5sd					
110	1	6	0	8	20	33	+ WL7.0
111	1	1.0gr	0	10	23	34	grWL7.0
		1.0grsh					
		3.0gr					
		1.0sd					
112	1.5	1.0gr	0	8	21	34	sdWL7.0
		1.0sd					
		2.5gr					
113	1.5	1.5grsh	0	9	22	34	+ WL8.0
		1.0gr					
		1.0sd					
		2.0gr					
		1.5Fgrsh					
114	1.5	5.5gr	1	10	24	37	+ WL8.5
		1.0sd					
115	1.5	6.5	0	12	27	40	sdsh
116	2	6.0gr	0	9	25	37	+ WL9.5
		1.5sd					
117	1.5	5.0gr	0	5	16	27	+ WL8.5
		2.0sd					
118	2	2.0FS	0	9	21	33	+ WL9.5
		5.5gr					
119	1	5.5gr	0	12	25	37	+ WL8.0
		1.5sd					
120	2	2.0gr	0	8	21	33	+ WL9.0
		1.0sd					
		1.0gr					
		1.0grsh					
		0.5sd					
		0.5gr					
121	1	6.0gr	0	10	25	39	+ WL8.0
		1.0sdsh					
122	1.5	7	0	9	24	38	+ WL8.5
123	1.5	0.5grsh	0	9	22	34	+ WL8.5
		4.0gr					
		2.5grsh					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2 Screen	% Retained on 3/4 Screen	% Retained on 3/8 Screen	% Retained on # 4 Screen	Bottom of Test Hole
124	1.5	0.5grsh	1	11	26	38	+ WL
		4.0gr					
		2.0sd					
		1.0gr					
125	1.5	2.5gr	0	13	28	143	+ WL8.5
		1.0grsh					
		2.0gr					
		1.5grsh					
126	3	1.0grSiCl	0	5	15	27	+ WL7.5
		2.0gr					
		1.5sd					
127	1.5	1.0gr	0	7	22	37	+ WL8.0
		1.0grsh					
		4.5gr					
128	2	4.5gr	0	5	18	32	+ WL8.5
		1.5sd					
		0.5gr					

RANGE 71 **TWP.** 160 **SEC.** 12

Rolette **COUNTY**

PIT PROSPECTED BY Willie Heinrich 9-99

INSPECTED & APPROVED

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SNH-3-281(113)189	180	5

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 ½" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on # 4 Screen	Bottom of Test Hole
A	1.5	4.5gr	0	8	26	40	sdWL8.0
		1.0grsh					
		1.0gr					
B	1.5	1.0FS	0	8	19	33	+ WL8.0
		3.0gr					
		1.0FS					
		1.0gr					
C	1.5	1.5FS	0	5	17	29	sdWL8.0
		4.0gr					
		1.0sd					
D	1.5	2.5gr	0	9	23	35	+ WL8.0
		1.0sd					
		1.0grsh					
		2.0gr					
E	1	4.0gr	0	11	27	38	sdWL7.0
		1.0sd					
		1.0gr					
F	1	1.0Fgrsh	0	7	16	29	+ WL8.0
		1.0Fgr					
		1.0gr					
		1.0grsh					
		1.0gr					
		1.0grsh					
		1.0sd					
		1.0gr					
		1.0sdsh					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on # 4 Screen	Bottom of Test Hole

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2 Screen	% Retained on 3/4 Screen	% Retained on 3/8 Screen	% Retained on # 4 Screen	Bottom of Test Hole

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft.)	Depth of Gravel (Ft.)	% Retained on 1 1/2 Screen	% Retained on 3/4 Screen	% Retained on 3/8 Screen	% Retained on # 4 Screen	Bottom of Test Hole

RANGE 71 **TWP.** 160 **SEC.** 12

Rolette **COUNTY**

PIT PROSPECTED BY Willie Heinrich 9-99

INSPECTED & APPROVED

NDDOT ABBREVIATIONS

D-20-1

Abn	abandoned
Abut	abutment
Ac	acres
Adj	adjusted
Aggr	aggregate
Ahd	ahead
ARV	air release valve
Align	alignment
Al	alley
Alt	alternate
Alum	aluminum
A	ampere
&	and
Appr	approach
Approx	approximate
ACP	asbestos cement pipe
Asph	asphalt
AC	asphalt cement
Assmd	assumed
@	at
Atten	attenuation
ATR	Automatic Traffic Recorder
Ave	Avenue
Avg	average
ADT	average daily traffic
Az	azimuth
Bk	back
BF	back face
Bs	backsight
Balc	balcony
B Wire	barbed wire
Barr	barricade
Btry	battery
Brg	bearing
BI	beehive inlet
Beg	begin
BM	bench mark
Bkwy	bikeway
Bit	bituminous
Blk	block
Bd Ft	board feet
BH	bore hole
BS	both sides
Bot	bottom
Blvd	Boulevard
Bndry	boundary
BC	brass cap
Brkwy	breakaway
Br	bridge
Bldg	building
BLM	Bureau of Land Management
BV	butterfly valve
Byp	bypass
C Gdrl	cable guardrail
Calc	calculate
Cd	candela
CIP	cast iron pipe
CB	catch basin
CRS	cationic rapid setting
C Gd	cattle guard
C To C	center to center
Cl or ℄	centerline
Cm	centimeter
Ch	chain
Chnlk	chain-link
Ch Blk	channel block
Ch Ch	channel change
Chk	check
Chsld	chiseled
Cir	circle
Cl	class
Cl	clay
Cl F	clay fill
Cl Hvy	clay heavy
Cl Lm	clay loam
Clnt	clean-out
Clr	clear
Cl&gr	clearing & grubbing
Co S	coal slack
Comb.	combination
Coml	commercial
Compr	compression
CADD	computer aided drafting & design
Conc	concrete
Cond	conductor
Const	construction
Cont	continuous
CSB	continuous split barrel sample
Contr	contraction
Contr	contractor
CP	control point
Coord	coordinate
Cor	corner
Corr	corrected
CAES	corrugated aluminum end section
CAP	corrugated aluminum pipe
CMES	corrugated metal end section
CMP	corrugated metal pipe
CPVCP	corrugated poly-vinyl chloride pipe
CSES	corrugated steel end section
CSP	corrugated steel pipe
C	coulomb
Co	County
Crse	course
C Gr	course gravel
CS	course sand
Ct	Court
Xarm	cross arm
Xbuck	cross buck
Xsec	cross sections
Xing	crossing
Xrd	Crossroad
Crn	crown
CF	cubic feet
M3	cubic meter
M3/s	cubic meters per second
CY	cubic yard
Cy/mi	cubic yards per mile
Culv	culvert
C&G	curb & gutter
CI	curb inlet
CR	curb ramp
CS	curve to spiral
C	cut
Dd Ld	dead load
Defl	deflection
Defm	deformed
Deg or D	degree
Dlnt	delineate
Dlntr	delineator
Depr	depression
Desc	description
Det	detail
DWP	detectable warning panel
Dtr	detour
Dia	diameter
Dir	direction
Dist	distance
DM	disturbed material
DB	ditch block
DG	ditch grade
Dbl	double
Dn	down
Dwg	drawing
Dr	drive
Drwy	driveway
DI	drop inlet
D	dry density
Ea	each
Esmt	easement
E	East
EB	Eastbound
Elast	elastomeric
EL	electric locker
E Mtr	electric meter
Elec	electric/al
EDM	electronic distance meter
Elev or El	elevation
Ellipt	elliptical
Emb	embankment
Emuls	emulsion/emulsified
ES	end section
Engr	engineer
ESS	Environmental Sensor Station
Eq	equal
Eq	equation
Evgr	evergreen
Exc	excavation
Exst	existing
Exp	expansion
Expy	Expressway
E	external of curve
Extru	extruded
FOS	factor of safety
F	Fahrenheit
FS	far side
F	farad
Fed	Federal
FHWA	Federal Highway Administration
FP	feed point
Ft	feet/foot
Fn	fence
Fn P	fence post
FO	fiber optic
FB	field book
FD	field drive
F	fill
FAA	fine aggregate angularity
FS	fine sand
FH	fire hydrant
Fl	flange
Flrd	flared
FES	flared end section

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
06-15-10	
REVISIONS	
DATE	CHANGE
04-20-11 03-15-13	Added Items Added Items

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 3/15/13 and the original document is stored at the North Dakota Department of Transportation

NDDOT ABBREVIATIONS

D-20-2

F Bcn	flashing beacon
FA	flight auger sample
FL	flow line
Ftg	footing
FM	force main
Fs	foresight
Fnd	found
Fdn	foundation
Frac	fractional
Frwy	freeway
Frt	front
FF	front face
F Disp	fuel dispenser
FFP	fuel filler pipes
FLS	fuel leak sensor
Furn	furnish/ed
Gal	gallon
Galv	galvanized
Gar	garage
Gs L	gas line
G Reg	gas line regulator
GMV	gas main valve
G Mtr	gas meter
GSV	gas service valve
GVP	gas vent pipe
GV	gate valve
Ga	gauge
Geod	geodetic
GIS	Geographical Information System
G	giga
GPS	Global Positioning System
Gov	government
Grd	graded/grade
Gr	gravel
Grnd	ground
GWM	ground water monitor
Gdrl	guardrail
Gtr	gutter
H Plg	H piling
Hdwl	headwall
Ha	hectare
Ht	height
HI	height of instrument
Hel	helical
H	henry
Hz	hertz
HDPE	High Density Polyethylene
HM	high mast
HP	high pressure
HPS	high pressure sodium
Hwy	highway
Hor	horizontal
HBP	hot bituminous pavement
Hr	hour(s)
Hyd	hydrant
Ph	hydrogen ion content
Id	identification
In or "	inch
Incl	inclinometer tube
IMH	inlet manhole
ID	inside diameter
Inst	instrument
Intchg	interchange
Intmdt	intermediate
Intscn	intersection
Inv	invert
IM	iron monument
I Pn	Iron Pin
IP	iron Pipe
Jt	joint
J	joule
Jct	junction
K	kelvin
Kn	kilo newton
Kpa	kilo pascal
Kg	kilogram
Kg/m3	kilogram per cubic meter
Km	kilometer
K	Kip(s)
LS	Land Surveyor (licensed)
LSIT	Land Surveyor In Training
Ln	lane
Lg	large
Lat	latitude
Lt	left
L	length of curve
Lens	lenses
Lvl	level
LB	level book
Lvlng	leveling
Lht	light
LP	light pole
Ltg	lighting
Lig Co	lignite coal
Lig Sl	lignite slack
LF	linear foot
Liq	liquid
LL	liquid limit
L	litre
Lm	loam
Loc	location
LC	long chord
Long.	longitude
Lp	loop
LD	loop detector
Lm	lumen
Lum	luminaire
L Sum	lump sum
Lx	lux
ML	main line
M Hr	man hour
MH	manhole
Mkd	marked
Mkr	marker
Mkg	marking
MA	mast arm
Matl	material
Max	maximum
MC	meander corner
Meas	measure
Mdn	median
MD	median drain
MC	medium curing
M	mega
Mer	meridian
M	meter
M/s	meters per second
M	mid ordinate of curve
Mi	mile
MM	mile marker
MP	mile post
Ml	milliliter
Mm	millimeter
Mm/hr	millimeters per hour
Min	minimum
Misc	miscellaneous
Mon	monument
Mnd	mound
Mtbl	mountable
Mtd	mounted
Mtg	mounting
Mk	muck
Mun	municipal
N	nano
NGS	National Geodetic Survey
NS	near side
Neop	neoprene
Ntwk	network
N	newton
N	North
NDDOT	North Dakota Department of Transportation
NE	North East
NW	North West
NB	Northbound
No. or #	number
Obsc	obscure(d)
Obsn	observation
Ocpd	occupied
Ocpy	occupy
Off Loc	office location
O/s	offset
OC	on center
C	one dimensional consolidation
OC	organic content
Orig	original
O To O	out to out
OD	outside diameter
OH	overhead
PMT	pad mounted transformer
Pg	pages
Pntd	painted
Pr	pair
Pnl	panel
Pk	park
PK	Parker-Kalon nail
Pa	pascal
PSD	passing sight distance
Pvmt	pavement
Ped	pedestal
Ped	pedestrian
PPP	pedestrian pushbutton post
Pen.	penetration
Perf	perforated
Per.	perimeter
PL	pipeline
Pl	place
P&P	plan & profile
PL	plastic limit
Pl	plate
Pt	point
PCC	point of compound curve
PC	point of curve
PI	point of intersection
PRC	point of reverse curvature

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
06-15-10	
REVISIONS	
DATE	CHANGE
04-20-11	Added Items
03-15-13	Added Items

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 3/15/13 and the original document is stored at the North Dakota Department of Transportation

NDDOT ABBREVIATIONS

D-20-3

PT	point of tangent
POC	point on curve
POT	point on tangent
PE	polyethylene
PVC	polyvinyl chloride
PCC	Portland Cement concrete
Lb or #	pounds
PP	power pole
Preempt	preemption
Prefab	prefabricated
Prfmd	preformed
Prep	preperation
Press.	pressure
PRV	pressure relief valve
Prestr	prestressed
Pvt	private
PD	private drive
Prod.	production/produce
Prog	programmed
Prop.	property
Prop Ln	property line
Ppsd	proposed
PB	pull box
Qty	quantity
Qtr	quarter
Rad or R	radius
RR	railroad
Rlwy	railway
Rsd	raised
RTP	random traverse point
Rge or R	range
RC	rapid curing
Rec	record
Rcy	recycle
RPCC	recycled Portland cement concrete
Ref	reference
R Mkr	reference marker
RM	reference monument
Refl	reflectorized
RCB	reinforced concrete box
RCES	reinforced concrete end section
RCP	reinforced concrete pipe
RCPS	reinforced concrete pipe sewer
Reinf	reinforcement
Res	reservation
Ret	retaining
Rev	reverse
Rt	right
R/W	right of way
Riv	river
Rd	road
Rdbd	road bed
Rdwy	roadway
RWIS	Roadway Weather Information System
Rk	rock
Rt	route
Salv	salvage(d)
Sd	sand
Sdy Cl	sandy clay
Sdy Cl Lm	sandy clay loam
Sdy Fl	sandy fill
Sdy Lm	sandy loam
San	sanitary sewer line
Sc	scoria
Sec	seconds
Sec	section
SL	section line
Sep	separation
Seq	sequence
Serv	service
Sh	shale
Sht	sheet
Shtng	sheeting
Shldr	shoulder
Sw	sidewalk
S	siemens
SD	sight distance
Sig	signal
Si Cl	silt clay
Si Cl Lm	silty clay loam
Si Lm	silty loam
Sgl	single
SC	slow curing
SS	slow setting
Sm	small
S	South
SE	South East
SW	South West
SB	Southbound
Sp	spaces
Spcl	special
SP	special provisions
G	specific gravity
Spk	spike
SC	spiral to curve
ST	spiral to tangent
SB	split barrel sample
SH	sprinkler head
SV	sprinkler valve
Sq	square
SF	square feet
Km2	square kilometer
M2	square meter
SY	square yard
Stk	stake
Std	standard
N	standard penetration test
Std Specs	Standard Specifications
Sta	station
Sta Yd	station yards
Stm L	steam line
SEC	steel encased concrete
SSD	stopping sight distance
SD	storm drain
St	street
SPP	structural plate pipe
SPPA	structural plate pipe arch
Str	structure
Subd	subdivision
Sub	subgrade
Sub Prep	subgrade preperation
Ss	subsoil
SE	superelevation
SS	supplement specification
Supp	supplemental
Surf	surfacing
Surv	survey
Sym	symmetrical
SI	Systems International
Tan	tangent
T	tangent (semi)
TS	tangent to spiral
Tel	telephone
Tel B	Telephone Booth
Tel P	telephone pole
Tv	television
Temp	temperature
Temp	temporary
TBM	temporary bench mark
T	tesla
T	thinwall tube sample
T/mi	tons per mile
Ts	topsoil
Twp or T	township
Traf	traffic
TSCB	traffic signal control box
Tr	trail
Transf	transformer
TB	transit book
Trans	transition
TT	transmission tower
Trans	transverse
Trav	traverse
TP	traverse point
Trtd	treated
Trmt	treatment
Qc	triaxial compression
TERO	Tribal Employment Rights Ordinance
Tpl	triple
TP	turning point
Typ	typical
Qu	unconfined compressive strength
Ugrnd	underground
USC&G	US Coast & Geodetic Survey
USGS	US Geologic Survey
Util	utility
VG	valley gutter
Vap	vapor
Vert	vertical
VC	vertical curve
VCP	vitrified clay pipe
V	volt
Vol	volume
Wkwy	walkway
W	water content
WGV	water gate valve
WL	water line
WM	water main
WMV	water main valve
W Mtr	water meter
WSV	water service valve
WW	water well
W	watt
Wrng	wearing
Wb	weber
WIM	weigh in motion
W	West
WB	Westbound
Wrng	wiring
W/	with
W/o	without
WC	witness corner
WGS	World Geodetic System
Z	zenith

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
06-15-10	
REVISIONS	
DATE	CHANGE
04-20-11 03-15-13	Added Items Added Items

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 3/15/13 and the original document is stored at the North Dakota Department of Transportation

NDDOT UTILITY COMPANY ABBREVIATIONS

D-20-10

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
6-15-10	
REVISIONS	
DATE	CHANGE
04-20-11	Added Items
03-15-13	Added Items

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930, on 3/15/13 and the original document is stored at the North Dakota Department of Transportation

Line Styles

- Limits of Const Transition Line
- Bale Check
- Rock Check
- Sight Distance Triangle Line
- Small Hidden Object
- Dimension Leader
- Existing Ground
- Existing Topsoil (Cross Section View)
- Large Hidden Object
- Edge Drain
- Geotextile Fabric Type D
- Existing Electrical
- Existing Fiber Optic Line
- Existing TV Fiber Optic
- Existing Gas Pipe
- Geogrid
- Existing Overhead Utility Line
- Existing Power
- Existing Fuel Pipeline
- Existing Undefined Above Ground Pipe Line
- Geotextile Fabric Type R
- Geotextile Fabric Type R1
- Remove Line
- Geotextile Fabric Type RR
- Geotextile Fabric Type S
- Floating Silt Curtain
- Existing Telephone Line
- Existing TV Line
- Existing Assumed Ground (Not Surveyed)
- Tentative Ground Line
- Existing Water or Steam Line
- Existing Under Drain
- Under Drain
- Wall
- Existing Slotted Drain
- Existing Cemetary Boundary
- Centerline Pavement Marking
- Barrier with Centerline Pavement Marking
- Barrier Pavement Marking
- Stripe 4 IN Dotted Extension White
- Stripe 8 IN Dotted Extension White
- Stripe 8 IN Lane Drop
- Wetland Mitigation
- Existing Box Culvert Bridge
- Existing Concrete Surface
- Existing Drainage Structure
- Easement
- Existing Concrete
- Existing Easement
- Existing Gravel Surface
- Existing Aggregate (Cross Section View)
- Existing Curb and Gutter (Cross Section View)
- Existing Riprap
- Existing Underground Vault or Lift Station
- Tangent Line
- Hidden Object
- Existing Dirt Surface
- Existing Conduit
- Topsoil Profile
- Existing Conductor
- Conductor
- Fiber Optic
- Existing Loop Detector
- Subgrade, Subcut or Ditch Grade
- Existing Asphalt Surface
- Existing Asphalt (Cross Section View)
- Existing Reinforcement Rebar
- Existing Tie Point Line
- Existing State or International Line
- Existing Quarter Section Line
- Existing County
- Existing Section Line
- Existing Township
- Existing Railroad Centerline
- Centerline
- Existing Centerline
- Supplemental Contour
- Right of Way
- Existing Right of Way
- Existing Right of Way Railroad
- Failure Line
- Existing Conditions
- Existing Ground (Details)
- Existing Sixteenth Section Line
- Existing Right of Way Not State Owned
- Phantom Object
- Centerline Main
- Existing Guardrail Cable
- Existing Guardrail Metal
- Existing Edge of Water
- Excavation Limits
- Existing Government Lot Line
- Existing Adjacent Block Lines
- Existing Adjacent Lot Lines
- Existing Adjacent Property Line
- Existing Adjacent Subdivision Lines

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 4/20/11 and the original document is stored at the North Dakota Department of Transportation

Line Styles

- Subgrade Reinforcement
- Existing Down Guy Wire Down Guy
- Existing Fence
- Existing Railroad
- Existing Sanitary Sewer
- Existing Sanitary Force Main
- Existing Storm Drain
- Existing Storm Drain Force Main
- Fence
- Silt Fence
- Existing Field Line
- Exst Flow
- Flow
- Existing Culvert
- Existing Curb
- Existing Valley Gutter
- Existing Driveway Gutter
- Existing Curb and Gutter
- Existing Mountable Curb and Gutter
- Existing Double Micro Loop Detector
- Micro Loop Detector Double
- Existing Overhead Sign Structure
- Existing Micro Loop Detector
- Micro Loop Detector
- Existing Overhead Sign Structure Cantilever
- Existing Railroad Switch
- Overhead Sign Structure Cantilever
- 24 Inch Pipe
- Reinforced Concrete Pipe
- Signal Head with Mast Arm
- Existing Signal Head with Mast Arm
- Tie Bar at Random Spacing
- 3-Cable w Posts
- Existing 3-Cable w Posts
- Site Boundary
- Fiber Rolls
- Doweled Joint
- Tie Bar 30 Inch 4 Foot Center to Center
- Tie Bar 18 Inch 3 Foot Center to Center
- Existing Berm, Dike, Pit, or Earth Dam
- Existing Ditch Block
- Depression Contours
- Existing City Corporate Limits or Reservation Boundary
- Gravel Pit - Borrow Area
- Existing Tree Boundary
- Tree Row
- Existing Brush or Shrub Boundary
- Existing Retaining Wall
- Existing Planter or Wall
- Retaining Wall (Plan View)
- Sheet Piling
- W-Beam w Posts
- Existing W-Beam Guardrail with Posts
- Exst Wet Area-Vegetation Break
- Existing Wetland Delineated

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 4/20/11 and the original document is stored at the North Dakota Department of Transportation

Symbols

D-20-30

North Arrow (Half Scale)

Truck Mounted Attenuator

Type I Barricade

Type II Barricade

Type III Barricade

Catch Basin

Cairn or Stone Circle

Video Detection Camera

Storm Drain Cap or Stub

Corrugated Metal End Section 18 Inch

Corrugated Metal End Section 24 Inch

Corrugated Metal End Section 30 Inch

Corrugated Metal End Section 36 Inch

Corrugated Metal End Section 42 Inch

Corrugated Metal End Section 48 Inch

Concrete Foundation

Ground Connection Conductor

Neutral Connection Conductor

Phase 1 Connection Conductor

Phase 2 Connection Conductor

Traffic Cone

Signal Controller

Pad Mounted Signal Controller

Alignment Data Point

Emergency Vehicle Detector

Attenuation Device

Diamond Grade Delineator Type A

Diamond Grade Delineator Type B

Diamond Grade Delineator Type C

Diamond Grade Delineator Type D

Diamond Grade Delineator Type E

Flexible Delineator

Flexible Delineator Type A

Flexible Delineator Type B

Flexible Delineator Type C

Flexible Delineator Type D

Flexible Delineator Type E

Delineator Type A

Delineator Type A Reset

Delineator Type B

Delineator Type B Reset

Delineator Type C

Delineator Type D

Delineator Type E

Delineator Drums

Spot Elevation

Existing Access Control Arrow

Existing Artifact

Existing Flashing Beacon

Existing Benchmark

Existing Railroad Battery Box

Existing Bush or Shrub

Existing Gas Cap or Stub

Existing Sanitary Cap or Stub

Existing Storm Drain Cap or Stub

Existing Water Cap or Stub

Existing Sanitary Cleanout

Existing Concrete Foundation

Existing Traffic Signal Controller

Existing Pad Mounted Signal Controller

Existing Sixteenth Section Corner

Existing Quarter Section Corner

Existing Section Corner

Existing Railroad Crossbuck

Existing Satellite Dish

Existing Fuel Dispensers

Existing Flexible Delineator Type A

Existing Flexible Delineator Type B

Existing Flexible Delineator Type C

Existing Flexible Delineator Type D

Existing Flexible Delineator Type E

Existing Delineator Type A

Existing Delineator Type B

Existing Delineator Type C

Existing Delineator Type D

Existing Delineator Type E

Existing EFB Misc

Existing Flashing Beacon

Existing Pipe Mounted Flasher

Existing Pad Mounted Feed Point

Existing Pipe Mounted Feed Point with Pad

Existing Pole Mounted Feed Point

Existing Railroad Frog

Existing Snow Gate 18

Existing Snow Gate 28

Existing Snow Gate 40

Existing Headwall

Existing Pedestrian Head with Number

Existing Signal Head

Existing Sprinkler Head

Existing Fire Hydrant

Existing Catch Basin Drop Inlet

Existing Curb Inlet

Existing Manhole Inlet

Existing Junction Box

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930 , on 4/20/11 and the original document is stored at the North Dakota Department of Transportation

Symbols

D-20-31

- Existing Light Standard
- Existing High Mast Light Standard 10 Luminaire
- Existing High Mast Light Standard 3 Luminaire
- Existing High Mast Light Standard 4 Luminaire
- Existing High Mast Light Standard 5 Luminaire
- Existing High Mast Light Standard 6 Luminaire
- Existing High Mast Light Standard 7 Luminaire
- Existing High Mast Light Standard 8 Luminaire
- Existing High Mast Light Standard 9 Luminaire
- Existing Overhead Sign Structure Load Center
- Existing Luminaire
- Existing Light Standard Luminaire
- Existing Federal Mailbox
- Existing Private Mailbox
- Existing Meander Section Corner
- Existing Meter
- Existing Electrical Manhole
- Existing Gas Manhole
- Existing Sanitary Manhole
- Existing Sanitary Force Main Manhole
- Existing Sanitary Manhole with Valve
- Existing Storm Drain Manhole
- Existing Force Main Storm Drain Manhole
- Existing Force Main Storm Drain Manhole with Valve
- Existing Telephone Manhole
- Existing Manhole with Valve Water
- Existing Water Manhole
- Existing Mile Post Type A
- Existing Mile Post Type B
- Existing Mile Post Type C
- Existing Reference Marker
- Existing RW Marker
- Existing Utility Marker
- Existing Monument Found
- Existing Monument set
- Existing RW Property Monument Found
- Existing RW PropertyMonument set
- Existing Object Marker Type I
- Existing Object Marker Type II
- Existing Object Marker Type III
- Existing Electrical Pedestal
- Existing Telephone Pedestal
- Existing Fiber Optic Telephone Pedestal
- Existing TV Pedestal
- Existing Fiber Optic TV Pedestal
- Existing Fuel Filler Pipes
- Existing Traverse PI Aerial Panel
- Existing Pole
- Existing Power Pole
- Existing Power Pole with Transformer
- Existing Telephone Pole
- Existing Wood Pole
- Existing Post
- Existing Pedestrian Push Button Post
- Existing Control Point CP
- Existing Control Point GPS-RTK
- Existing Control Point TRI
- Existing Reference Marker Point NGS
- Existing Pull Box
- Existing Intelligent Transportation Pull Box
- Existing Water Pump
- Existing Slotted Reinforced Concrete Pipe
- Existing RR Profile Spot
- Existing Fuel Leak Sensors
- Existing Highway Sign
- Existing Miscellaneous Spot
- Existing Lighting Standard Pole
- Existing Traffic Signal Standard
- Existing Transformer
- Existing Large Evergreen Tree
- Existing Small Evergreen Tree
- Existing Large Tree
- Existing Small Tree
- Existing Tree Trunk
- Existing Pad Mounted Traffic Signal Control Box
- Existing Undefined Manhole
- Existing Undefined Pull Box
- Existing Undefined Pedestal
- Existing Undefined Valve
- Existing Undefined Pipe Vent
- Existing Gas Valve
- Existing Water Valve
- Existing Fuel Pipe Vent
- Existing Gas Pipe Vent
- Existing Sanitary Pipe Vent
- Existing Storm Drain Pipe Vent
- Existing Water Pipe Vent
- Existing Weather Station
- Existing Ground Water Well Bore Hole
- Existing Windmill or Tower
- Existing Witness Corner
- Flashing Beacon
- Flagger
- Pipe Mounted Flasher
- Sanitary Force Main with Valve

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930 , on 4/20/11 and the original document is stored at the North Dakota Department of Transportation

Symbols

D-20-32

- Pad Mounted Feed Point
- Pipe Mounted Feed Point with Pad
- Pole Mounted Feed Point
- Headwall
- Double Headwall with Vegitation Barrier
- Single Headwall with Vegitation Barrier
- Pole Mounted Head
- Sprinkler Head
- Fire Hydrant
- Inlet Type 1
- Inlet Type 2
- Double Inlet Type 2
- Inlet Grate Type 2
- Junction Box
- High Mast Light Standard 10 Luminaire
- High Mast Light Standard 3 Luminaire
- High Mast Light Standard 4 Luminaire
- High Mast Light Standard 5 Luminaire
- High Mast Light Standard 6 Luminaire
- High Mast Light Standard 7 Luminaire
- High Mast Light Standard 8 Luminaire
- High Mast Light Standard 9 Luminaire
- Relocate Light Standard
- Overhead Sign Structure Load Center
- Light Standard 100 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 150 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 175 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 200 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 250 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 310 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 35 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 400 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 50 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 70 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 700 Watt High Pressure Sodium Vapor Luminaire
- Manhole
- Manhole 48 Inch
- Sanitary Force Main Manhole
- Sanitary Sewer Manhole
- Storm Drain Manhole
- Storm Drain Manhole with Inlet
- Reset Mile Post
- Mile Post Type A
- Mile Post Type B
- Mile Post Type C
- Right of Way Marker
- Tubular Marker
- Concrete Monument to Be Set
- RW Property Monument to Be Set
- Object Marker Type I
- Object Marker Type II
- Object Marker Type III
- Caution Mode Arrow Panel
- Back to Back Vertical Panel Sign
- Double Direction Arrow Panel
- Left Directional Arrow Panel
- Right Directional Arrow Panel
- Sequencing Arrow Panel
- Truck Mounted Arrow Panel
- Power Pole
- Wood Pole
- Pedestrian Push Button Post
- Property Corner
- Pull Box
- Intelligent Transportation Pull Box
- Sanitary Pump
- Storm Drain Pump
- Reinforced Pavement
- Reinforced Concrete End Section 15 Inch
- Reinforced Concrete End Section 18 Inch
- Reinforced Concrete End Section 24 Inch
- Reinforced Concrete End Section 30 Inch
- Reinforced Concrete End Section 36 Inch
- Reinforced Concrete End Section 42 Inch
- Reinforced Concrete End Section 48 Inch
- Reinforced Concrete End Section 54 Inch
- Reset Right of Way Marker
- Reset USGS Marker
- Right of Way Markers
- Riser 30 Inch
- Continuous Split Barrel Sample (CSB)
- Flight Auger Sample (FA)
- Split Barrel Sample (SB)
- Thinwall Tube Sample
- Highway Sign
- SNOW GATE 18 FT
- SNOW GATE 28 FT
- SNOW GATE 40 FT
- Standard Penetration Test (N)
- Transformer
- Inclinometer Tube (Incl)
- Underdrain Cleanout
- Excavation Unit
- Water Valve

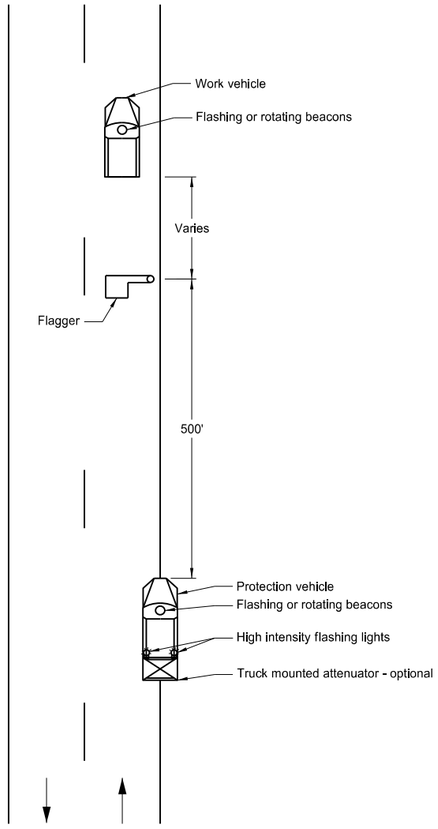
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

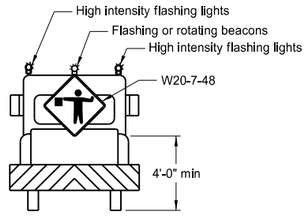
This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930 , on 4/20/11 and the original document is stored at the North Dakota Department of Transportation

TRAFFIC CONTROL FOR CORING OF HOT BITUMINOUS PAVEMENT

D-704-2

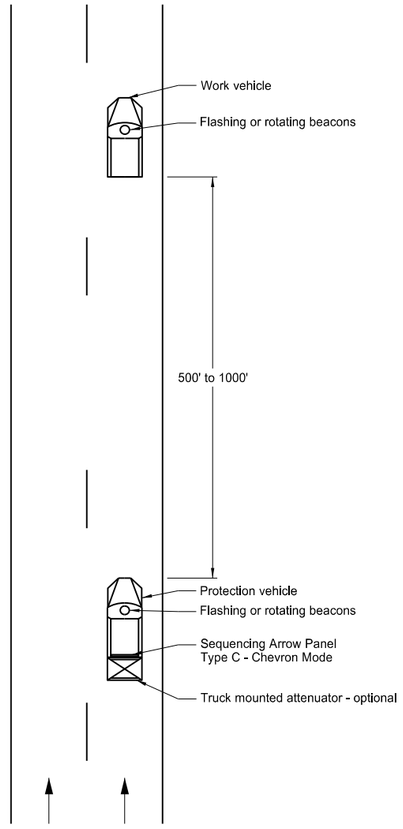
Two Lane, Two Way Roadways

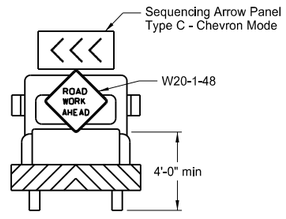




Typical Protection Vehicle

Multilane Roadways





Typical Protection Vehicle

Notes:

1. The working vehicle shall display a 360 degree rotating, flashing, oscillating or strobe light.
2. The shadow vehicle shall display a 360 degree rotating, flashing, oscillating or strobe light. The shadow vehicle for Multilane Roadway shall also have a sequencing arrow panel Type C operated in the chevron mode.
3. This application is for use during daylight hours and in areas of good visibility only.
4. Two lane, two way roadway, a flagger shall be used to protect the work area and warn oncoming traffic.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930 , on 9/25/2012 and the original document is stored at the North Dakota Department of Transportation

WORK ZONE BUSINESS SIGN DETAILS

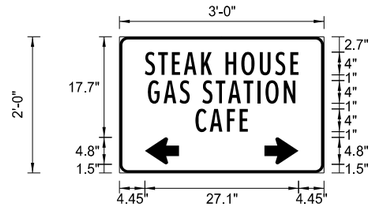
D-704-4

SIGN NUMBER	Con Sign
WIDTH x HEIGHT	3'-0" x 2'-0"
BORDER WIDTH	0.5" (inset 0")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: 3A Reflective
	COLOR: Blue
LEGEND/BORDER	TYPE: 3A Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ARDD	4.5	1.5	4.8	6	180
ARDD	25.5	1.5	4.8	6	0

STATION(S):

AREA: 6.0 Sq.Ft.



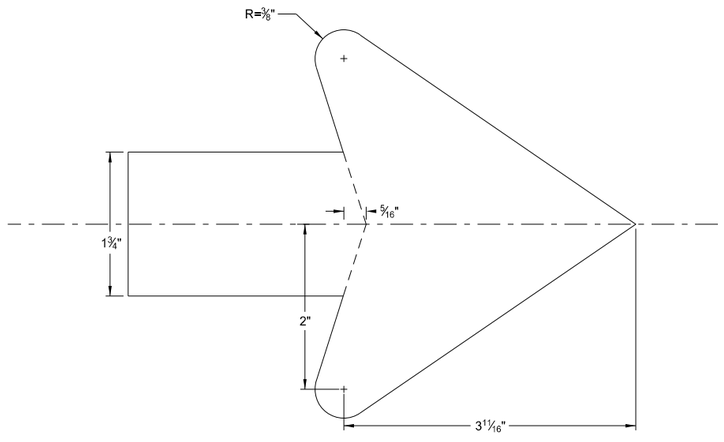
Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
S	T	E	A	K		H	O	U	S	E									27.1	4	ClearviewHwy-1-W
4.5	6.8	9.2	11.3	14.4	16.3	18.7	21.5	24.7	27.4	30.1											
G	A	S		S	T	A	T	I	O	N									26	4	ClearviewHwy-1-W
5	7.8	10.6	12.4	14.6	16.9	19.1	21.9	24.3	25.7	28.9											
C	A	F	E																9.2	4	ClearviewHwy-1-W
13.4	15.9	18.9	21.2																		

Note:

The ground mounted business name sign area has been calculated using a 36"x 24" sign panel. The contractor shall determine the size needed and the exact length required to accommodate the message. The maximum size of the sign shall be 36"x24". The letters shall be 4" Clearview 1-W. The color shall be blue background with white legend and border. The sign shall be post mounted. The arrow shall be positioned either on the right or left side of the sign as required.



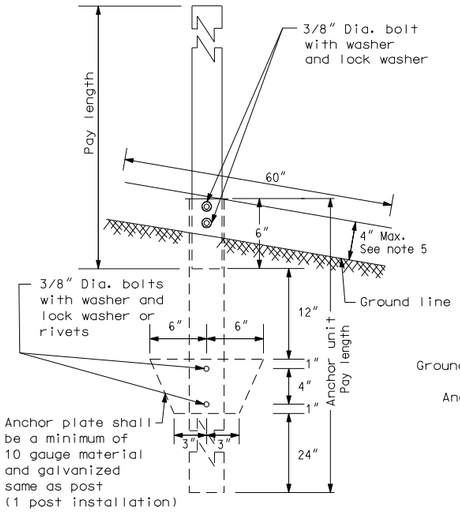
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930, on 9/25/2012 and the original document is stored at the North Dakota Department of Transportation

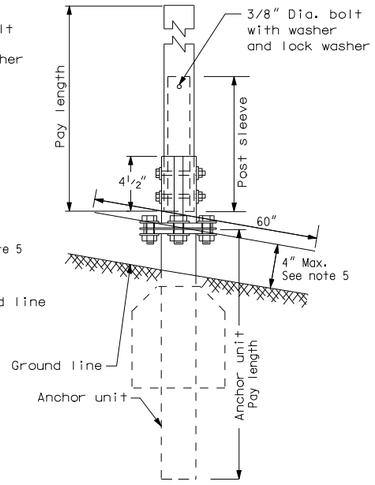
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

PERFORATED TUBE

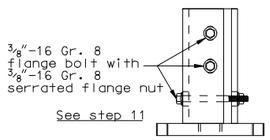
D-704-7

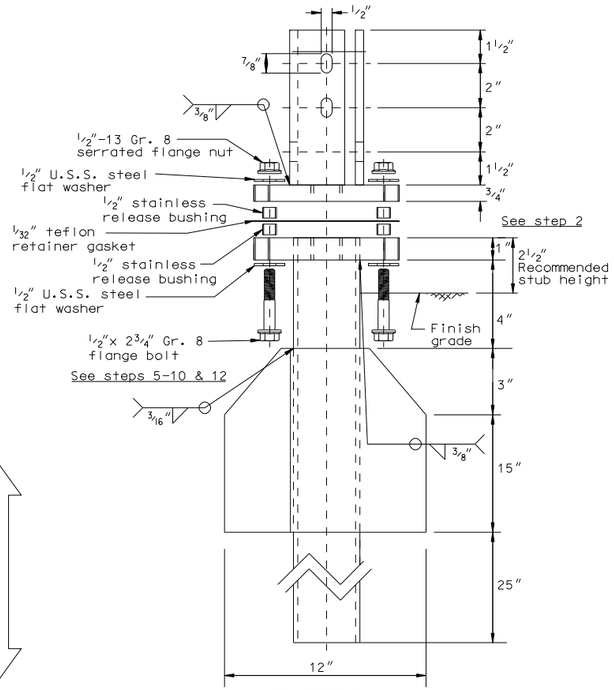


ANCHOR UNIT AND POST ASSEMBLY

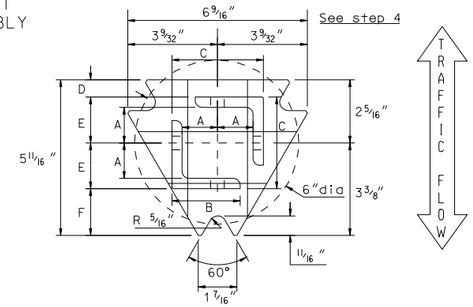


SLIP BASE ANCHOR UNIT AND POST SLEEVE ASSEMBLY





MULTI-DIRECTIONAL SLIP BASE ASSEMBLY

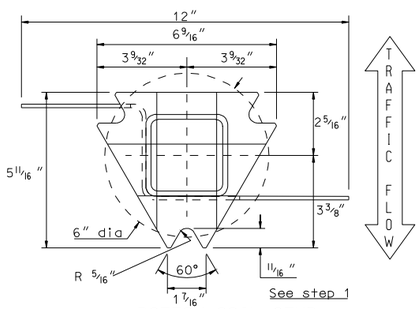


TOP POST RECEIVER

Materials: Plate - ASTM A572 grade 50
Angle receiver - $2\frac{1}{2}$"x $2\frac{1}{2}$"x $\frac{3}{8}$" ASTM A36 structural angle

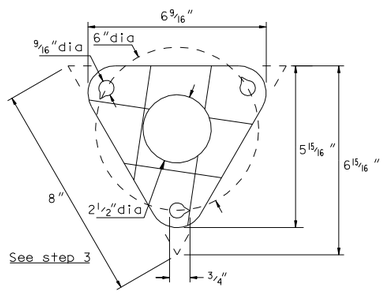
TOP POST RECEIVER DATA TABLE						
Square Post Sizes	A	B	C	D	E	F
2 3/16" x 10 Ga. Square Post	1 9/64"	2 1/2"	3 1/32"	25/32"	1 33/64"	1 7/8"
2 1/2" x 10 Ga. Square Post	1 9/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"

$2\frac{3}{16}$" x 10 gauge may be inserted into $2\frac{1}{2}$" x 10 gauge for additional wind load.



BOTTOM SOIL STUB

Materials: Tube - 3"x 3"x 7 gauge ASTM A500 Gr B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A 569
Plate - ASTM A572 grade 50



BOLT RETAINER FOR BASE CONNECTION

Materials: 1/32" reprocessed Teflon

Notes
1. Slip base bolts shall be torqued as specified by the manufacturer.
2. The $2\frac{3}{16}$" size 10 gauge is shown as 2.19" size on the plans. The $2\frac{1}{2}$" size 10 gauge is shown as 2.51" size on the plans.
3. Anchor for 2", $2\frac{1}{4}$", and $2\frac{1}{2}$" posts.
4. Anchor material shall be 7 gauge H.R.P.O. Commercial quality ASTM A569 and 3"x 3"x 7 gauge ASTM A500 Grade B. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI. Anchor shall be hot dipped galvanized per ASTM A123/A153. All tolerances on anchor unit and slip base bottom assembly are ± 0.005 unless otherwise noted.
5. 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
6. When used in concrete sidewalk, anchor shall be the same except without the wings.
7. Four post signs shall have over 8' between the first and fourth posts.

MULTI-DIRECTIONAL SLIP BASE ASSEMBLY	
STEP	INSTALLATION PROCEDURE
1.	Install bottom soil anchor stub plumb and squared up with road, with point of plate facing oncoming traffic.
2.	Depth of imbedment to leave $2\frac{1}{2}$" from grade to top of anchor plate.
3.	Place teflon bolt retainer gasket on top of bottom plate (make sure that notches in holes are pointing counter clockwise).
4.	Place top post receiver on to retainer gasket, properly indexed so that angle receivers are squared up with road.
5.	Slide 1 each $\frac{1}{2}$" flat washer on to 1 each inverted $\frac{1}{2}$"-13 gr. 8 flange bolt, followed by 1 each stainless steel release bushing.
6.	Insert above bolt with washer and bushing up through notched points of top and bottom plates, passing through hole in gasket.
7.	Slide second bushing down on to above bolt until it rests on top of gasket followed by second washer.
8.	Complete by threading $\frac{1}{2}$"-13 gr. 8 serrated flange nut snugly down against top of washer.
9.	Repeat steps 5,6,7 & 8 at the two remaining notched triangle points.
10.	Insert sign post into angle receivers on top half until post(s) bottom out. *NOTE: Where higher wind load is desired, insert the next size smaller square post inside bottom of main upright post (Minimum of 48", not to exceed beyond bottom edge of sign).
11.	Secure posts into receivers using 3 each $\frac{3}{8}$"-16 gr. 8 flange bolts and 3 each $\frac{3}{8}$"-16 serrated flange nuts in receiver slots (top 2 bolts should be parallel to highway) do not tighten nuts until all bolts are in place.
12.	After all sub-assembly hardware is tightened, then torque the three $\frac{1}{2}$"-13 nuts to 42 ft-lbs, in a circular pattern until all bolt assemblies reach the required torque. *NOTE: On multi-leg installations, be sure that all anchors are squared and lined up with each other.

Telescoping Perforated Tubes							
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In.^{4}	Cross Sect. area In.^{2}	Section Modulus In.^{3}
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785
4 x 4	0.250	1/4	6.600	3.040	1.940	1.050

Number of Posts	Telescoping Perforated Tube					
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			B	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	10			Yes	
2	2 1/4	12	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

B - The $2\frac{1}{2}$", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

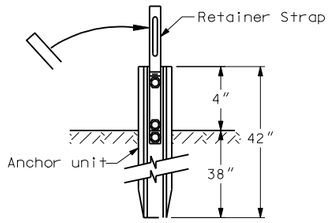
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-21-02	
REVISIONS	
DATE	CHANGE
12-01-04	PE stamp added

This document was originally issued and sealed by MARK S GAYDOS, Registration Number PE-4518, on 12/01/04 and the original document is stored at the North Dakota Department of Transportation

BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

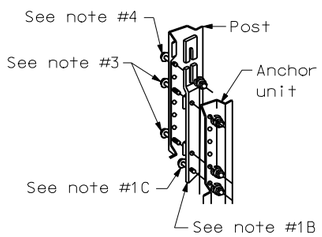
FLANGED CHANNEL



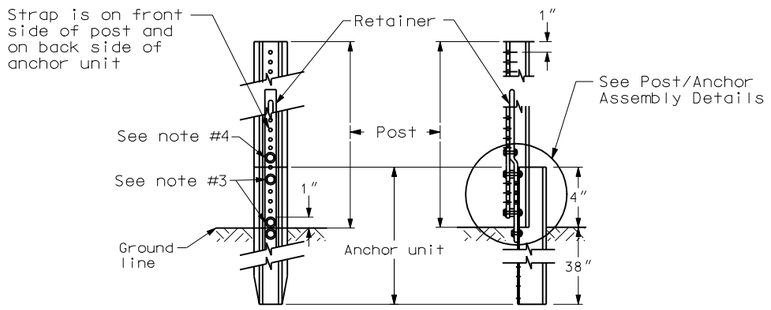
Anchor Unit &
Strap Assembly Detail

STEPS OF INSTALLATION

1. A) Drive anchor unit to within 12″ of ground level.
   B) Proper assembly established by lining up the top 3/4″ slot of retainer spacer strap with top hole of anchor unit.
   C) Assemble strap to back of anchor unit using 3/8″-16 UNC x 2.0″ long bolt, lock washer and nut.
   D) Rotate strap 90° to left.
2. A) Drive anchor unit to 4″ dimension.
   B) Rotate strap to vertical position.
3. A) Place 3/8″-16 UNC x 2″ bolt, lock washer & nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit (this coincides with the bottom 3/4″ slot in the strap).
   B) Alternately tighten two connector bolts.
4. A) Complete assembly by tightening 3/8″-16 UNC x 2″ long retainer bolt (this fastens sign post to retainer spacer strap).
5. The base post, strap & sign post shall be properly nested. Proper nesting occurs when all flat surfaces of the base post, strap and sign post at the bolts have full contact across the entire width.

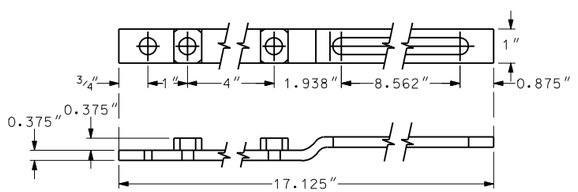


Post/Anchor
Assembly Details



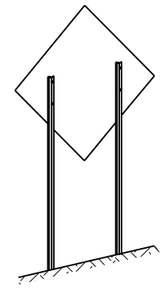
Front View Side View

Sign Post Assembly Detail

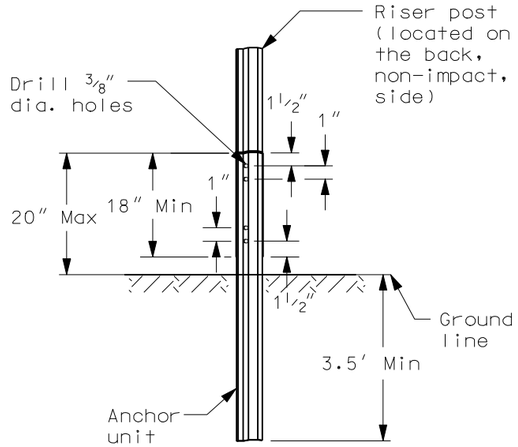


Retainer/Spacer Strap Detail

CHANNEL SIZE IN.	WALL THICKNESS IN.	WEIGHT PER FOOT LBS.	MOMENT OF INERTIA IN.4	CROSS SECT. AREA IN. SQ.	SECTION MODULUS IN.3
1.516 x 3.125"	.116	2.00	.179	.590	.225
1.532 x 3.125"	.124	2.25	.201	.648	.254
1.562 x 3.125"	.132	2.50	.233	.748	.289
1.578 x 3.125"	.140	2.75	.271	.819	.329
1.750 x 3.500"	.150	3.00	.372	.918	.403
1.750 x 3.500"	.175	4.00	.500	1.190	.560



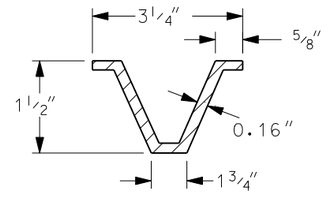
Typical
Installation



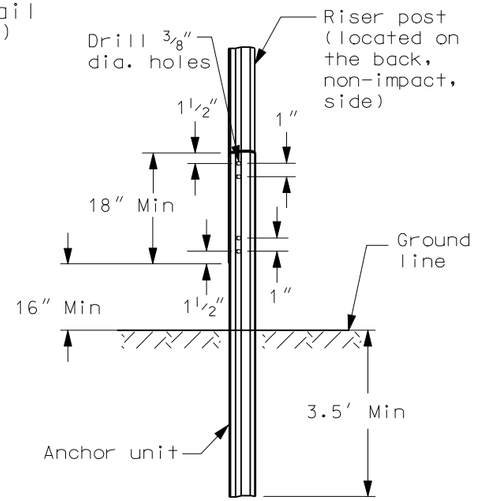
U-Channel Splice
Option 1

3 LB/FT U POSTS

Notes
1. Use 3 lb/ft riser anchor units and risers
2. Driven riser posts shall be at least 7′ long and embedded at least 3.5′.
3. A splice shall overlap a minimum of 18″.
4. Use 4 bolts 5/16″ diameter with washers and nuts. Two at top and two at bottom of splice.
5. Anchor unit for guy wires shall be no more than 4″ above ground and embedded at least 3.5′.



U-Post Detail
(3 lb/ft)

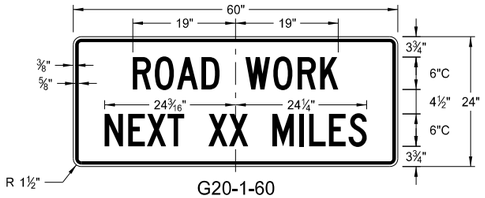


U-Channel Splice
Option 2

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-28-93	
REVISIONS	
DATE	CHANGE
03-07-01	Revised U-post details
11-21-02	Deleted perforated tube
05-08-03	Revised U-Channel splice
12-01-04	PE stamp added
06-29-05	Revised flanged channel note

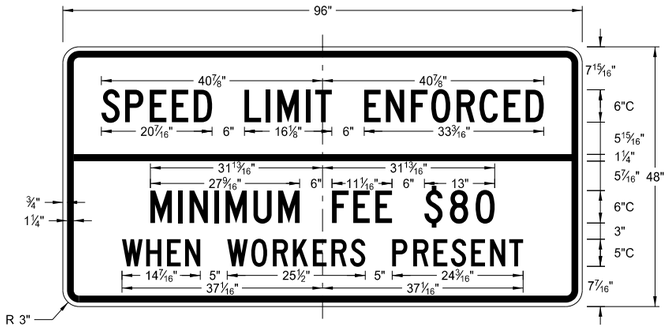
This document was originally issued and sealed by MARK S GAYDOS Registration Number PE-4518, on 06/29/05 and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS

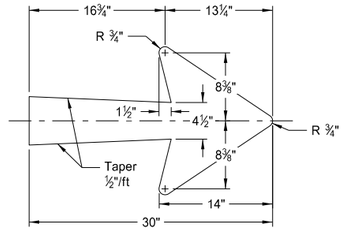


G20-1-60
Legend: black (non-refl)
Background: orange

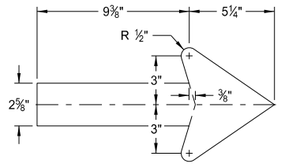
G20-4b-36
Legend: black (non-refl)
Background; orange



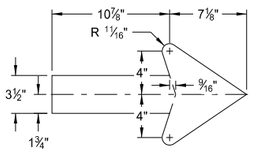
G20-55-96
Legend: black (non-refl)
Background: orange



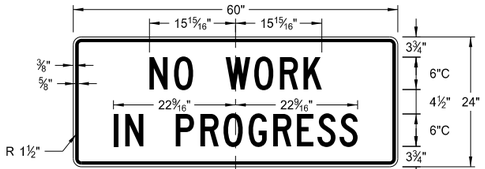
E5-1-48



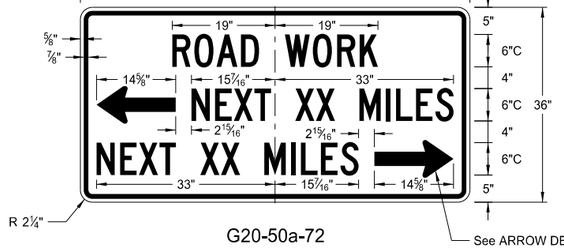
G20-50a-72
G20-52a-72



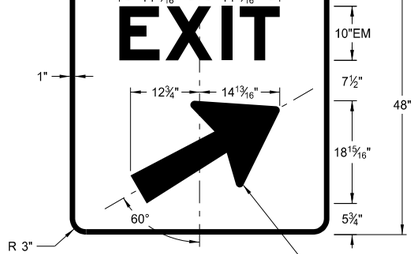
M4-9(L or R)-30
Right or Left



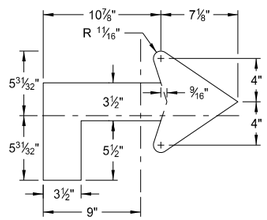
G20-1b-60
Legend: black (non-refl)
Background: orange



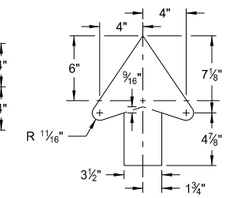
G20-50a-72
Legend: black (non-refl)
Background: orange



E5-1(L or R)-48
Legend: white
Background: green

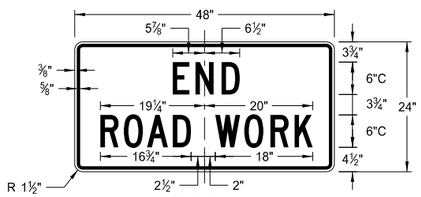


M4-9(L or R)-30
Advanced Right or Left

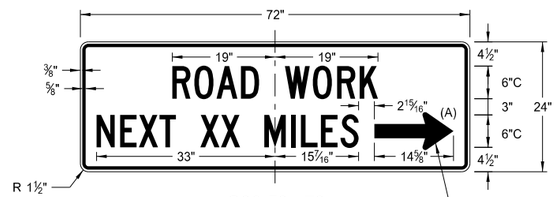


M4-9-30
Straight

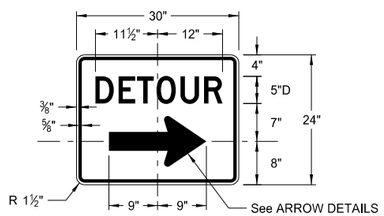
ARROW DETAILS



G20-2-48
Legend: black (non-refl)
Background: orange



G20-52a-72
Legend: black (non-refl)
Background: orange



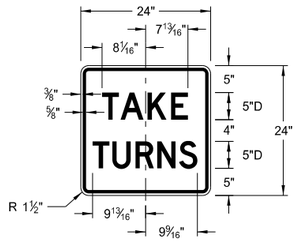
M4-9(L or R)-30 &
M4-9-30
Legend: black (non-refl)
Background: orange

NOTES:

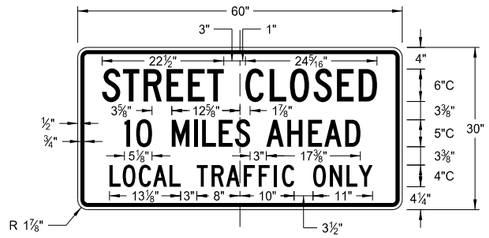
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

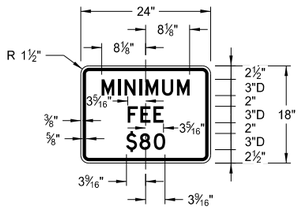
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



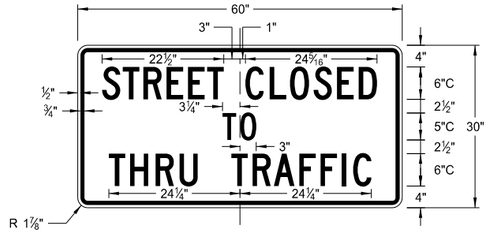
R1-50-24
Legend: black (non-refl)
Background: white



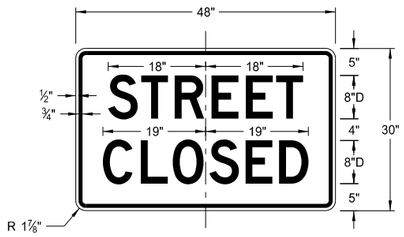
R11-3c-60
Legend: black (non-refl)
Background: white



R2-1a-24
Legend: black (non-refl)
Background: white



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

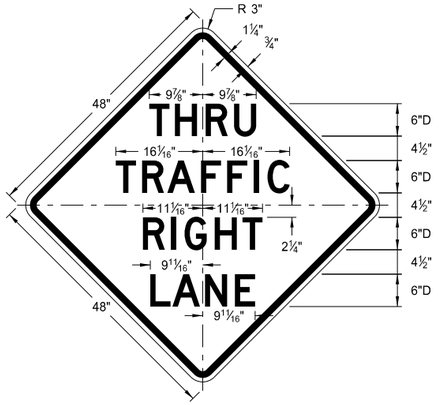


R11-2a-48
Legend: black (non-refl)
Background: white

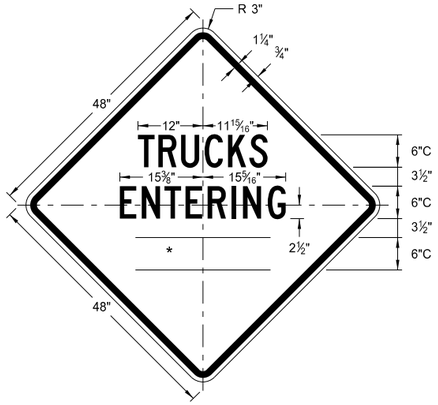
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 8/13/13 and the original document is stored at the North Dakota Department of Transportation

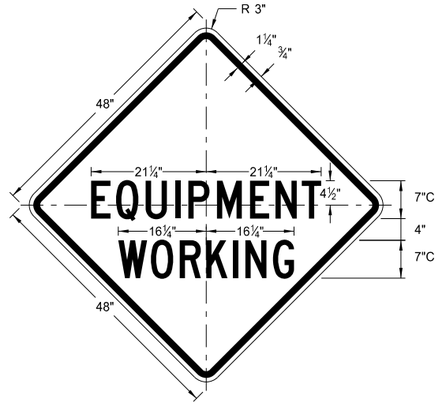
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



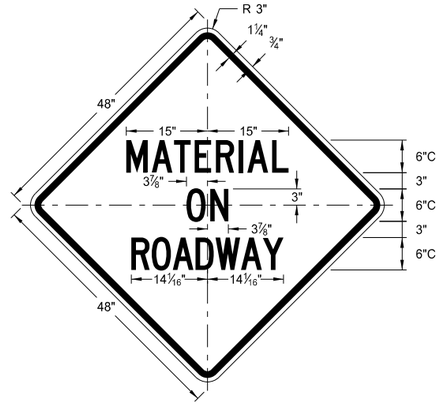
W5-8-48
Legend: black (non-refl)
Background: orange



W8-54-48
Legend: black (non-refl)
Background: orange



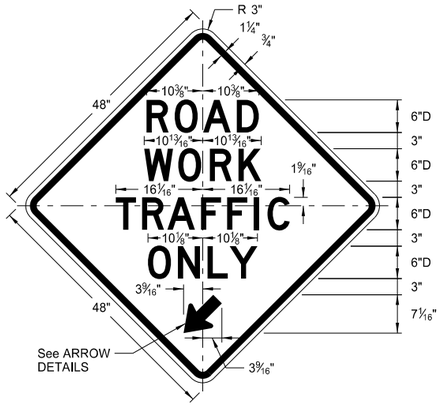
W20-51-48
Legend: black (non-refl)
Background: orange



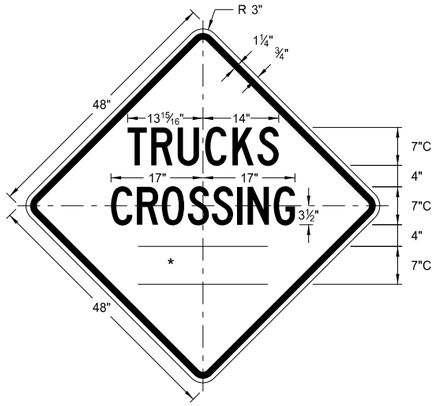
W21-51-48
Legend: black (non-refl)
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

* DISTANCE MESSAGES

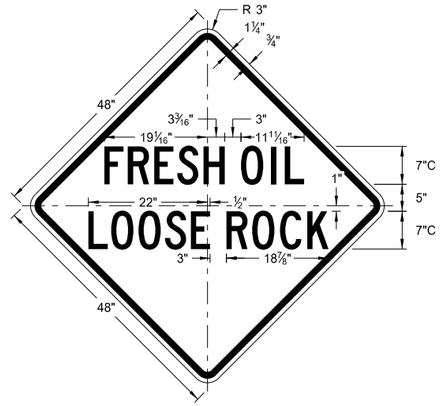


W5-9-48
Legend: black (non-refl)
Background: orange

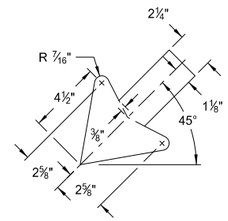


W8-55-48
Legend: black (non-refl)
Background: orange

W20-52-54
Legend: black (non-refl)
Background: orange

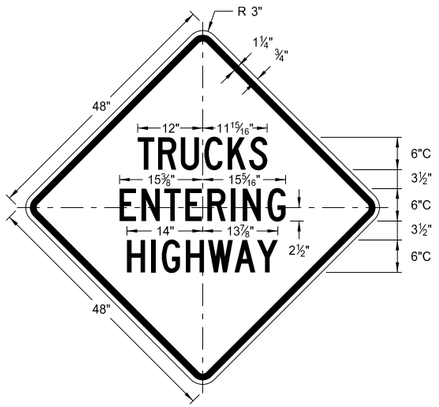


W22-8-48
Legend: black (non-refl)
Background: orange

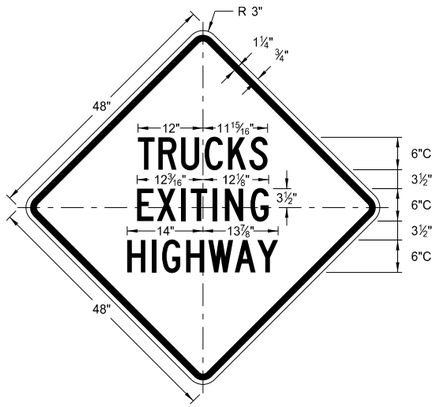


W5-9-48

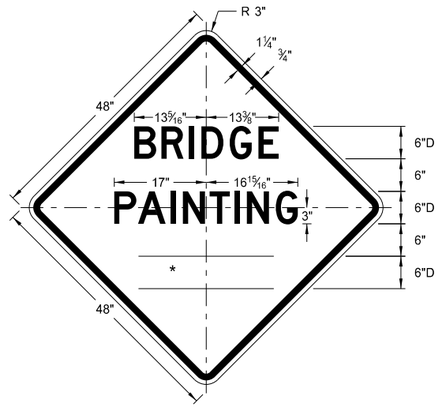
ARROW DETAILS



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



W8-56-48
Legend: black (non-refl)
Background: orange

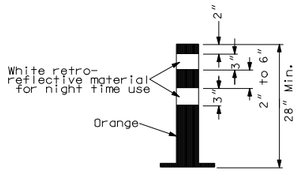


W21-50-48
Legend: black (non-refl)
Background: orange

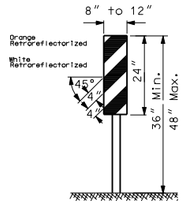
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 8/13/13 and the original document is stored at the North Dakota Department of Transportation

BARRICADE DETAILS AND CHANNELIZING DEVICES



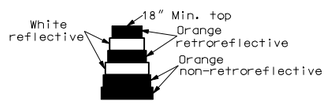
TUBULAR MARKER



VERTICAL PANEL

(Retroreflective sheeting shall be placed on both sides)

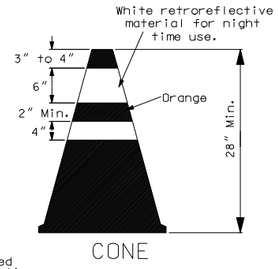
NOTE: Vertical panels used on the expressways or other high speed roadways shall be 12" by 24"



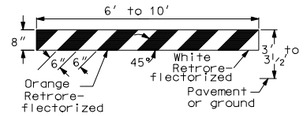
DELINEATOR DRUM

36" Min. height

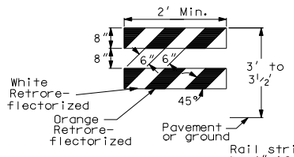
The markings on drums shall be orange and white stripes 4 to 6 inches wide. There shall be at least two orange and two white stripes. Where drums have ribs or indentations, there shall be no retroreflectorized sheeting in this area. This space shall be no more than 2 inches wide. The drum surface shall be prepared as recommended by the sheeting manufacturer before retro reflective sheeting is applied



CONE

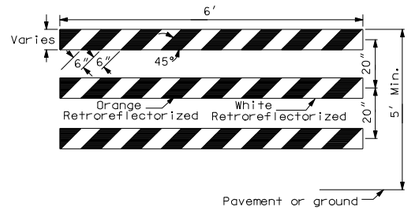


TYPE I BARRICADE



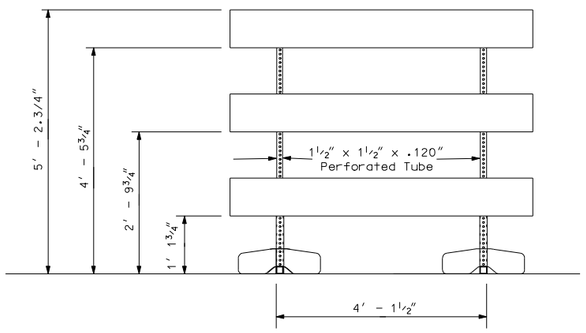
Rail stripe width shall be 4" if barricade length is less than 36".

TYPE II BARRICADE

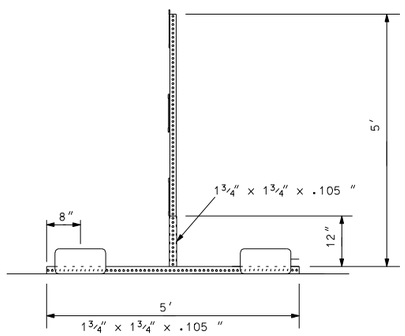


TYPE III BARRICADE

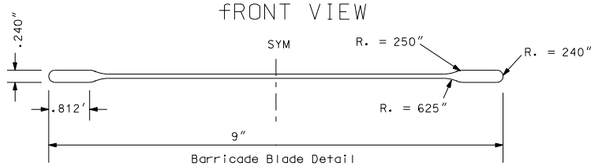
BARRICADES:
Number of retroreflectorized rail faces:
Type I - 2 (One each direction)
Type II - 4 (Two each direction)
Type III- 6 (Three in each direction)



FRONT VIEW



END VIEW



Barricade Blade Detail

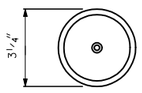
Ballast = 45lb sandbag at the end of each leg.

Barricade blade fastened to vertical supports with 2" corner bolts.

Vertical potion of leg is welded to horizontal portion on all four sides.

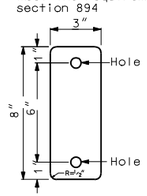
Masts slide inside vertical portion of legs. No bolts or fastenings devices used.

BARRICADE ASSEMBLY DETAIL
(Use when aluminum blade as detailed above)



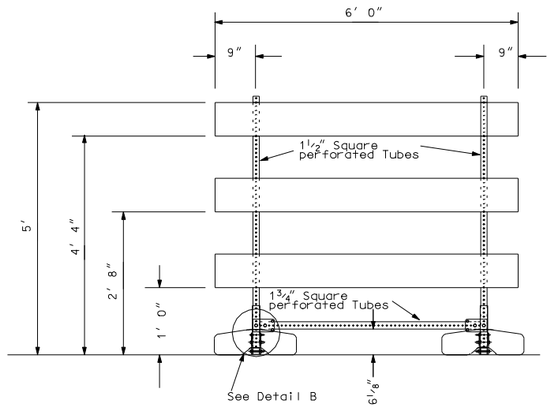
ACRYLIC PLASTIC REFLECTOR

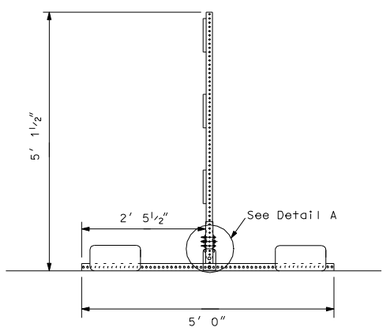
Delineator reflector shall meet the requirements of section 894

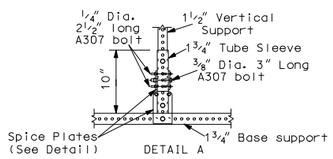


DELINEATOR REFLECTOR

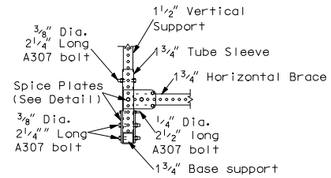
3"x8"- 18 Gauge galvanized steel sheet or 0.080" aluminum plate with white retroreflective sheeting (Type 3A or 3B) as specified in section 894 of the Standard Specifications.



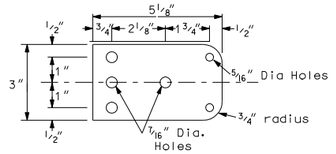




DETAIL A



DETAIL B



SPLICE PLATE

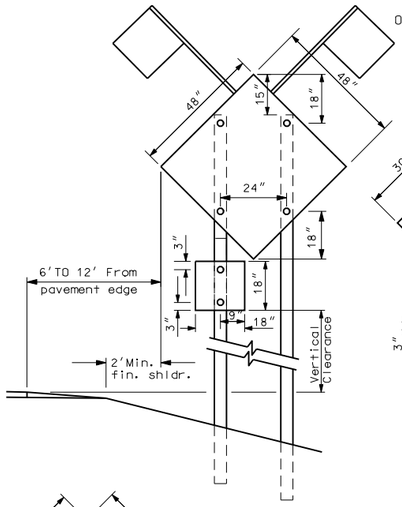
BARRICADE ASSEMBLY DETAIL
(Use when Plastic I-Beam w/ 1½" Hollow Core Flanges or 1" x 8" x72" wood boards.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
08-03-87	Type sheeting
10-01-87	Delineator drum note
06-08-88	Barricade type III
06-01-92	General revision
06-10-93	General revision
09-23-93	Vertical panel
06-09-95	Reflective sheeting
03-01-02	Barricade type III assembly details
04-01-02	Type III barricade
12-01-04	PE stamp added
06-29-05	Revised Type II barricade stripe

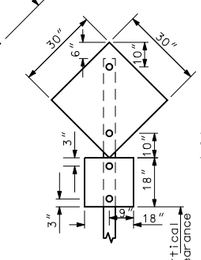
This document was originally issued and sealed by MARK S GAYDOS Registration Number PE-4518, on 06/29/05 and the original document is stored at the North Dakota Department of Transportation

D-704-14

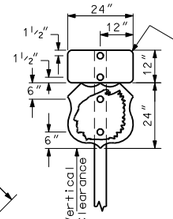
CONSTRUCTION SIGN AND BARRICADE ASSEMBLY DETAILS



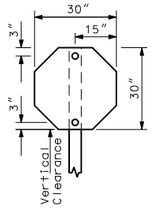
POST MOUNTING
48"x48" Signs



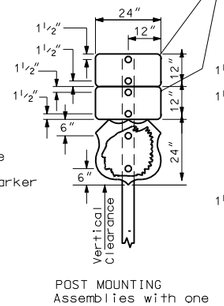
POST MOUNTING
30"x30" Signs



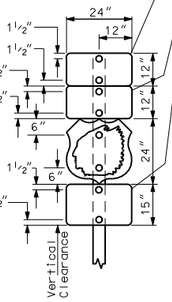
POST MOUNTING
Assemblies with one cardinal direction sign & one route marker



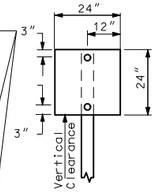
POST MOUNTING
Sign R1-1-30



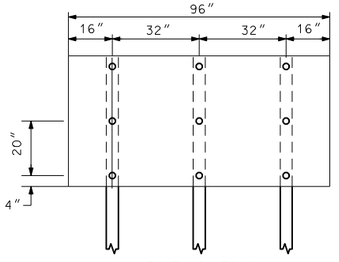
POST MOUNTING
Assemblies with one cardinal direction sign, one detour sign & one route marker



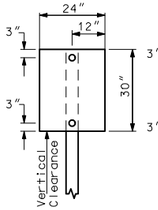
POST MOUNTING
Assemblies with one cardinal direction sign, one detour sign, one route marker & one directional arrow.



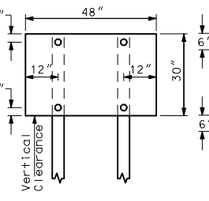
POST MOUNTING
24"x24" Signs



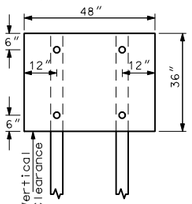
POST MOUNTING
48"x96" Signs



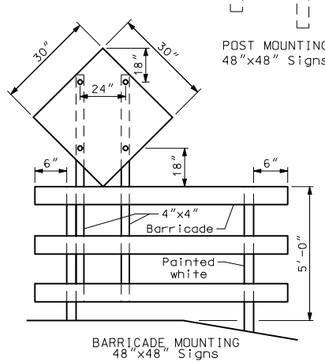
POST MOUNTING
24"x30" Signs



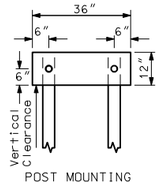
POST MOUNTING
48"x30" Signs



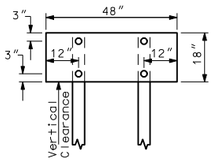
POST MOUNTING
48"x36" Signs



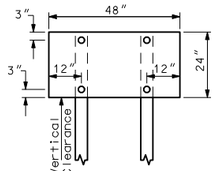
BARRICADE MOUNTING
48"x48" Signs



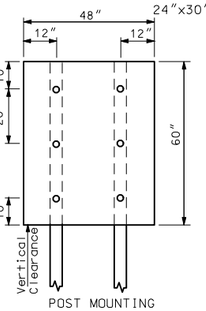
POST MOUNTING
36"x12" Signs



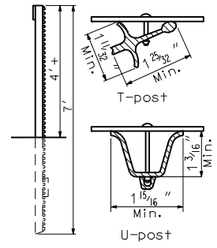
POST MOUNTING
48"x18" Signs



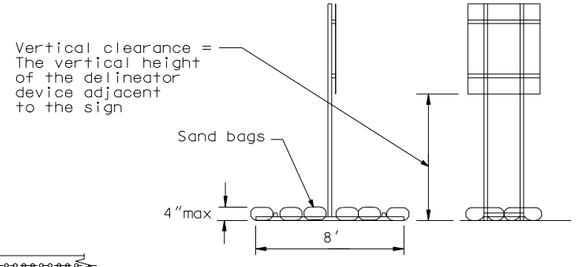
POST MOUNTING
48"x24" Signs



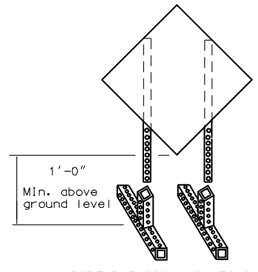
POST MOUNTING
48"x60" Signs



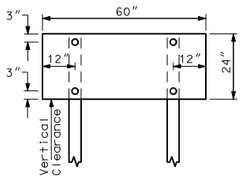
DELINEATOR ATTACHMENT AND POST MOUNTING DETAILS



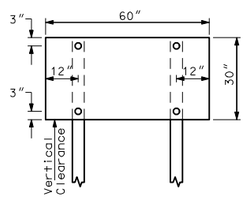
SKID MOUNTED SIGNS



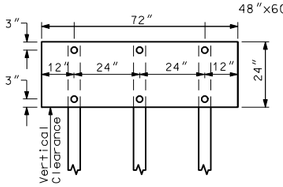
PORTABLE SIGN MOUNTING



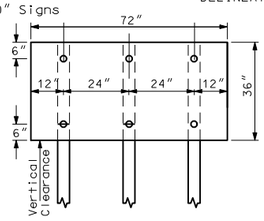
POST MOUNTING
60"x24" Signs



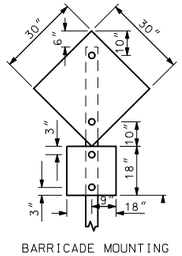
POST MOUNTING
60"x30" Signs



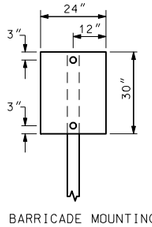
POST MOUNTING
72"x24" Signs



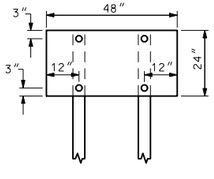
POST MOUNTING
72"x36" Signs



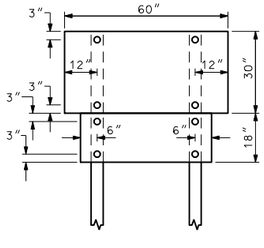
BARRICADE MOUNTING
30"x30" Signs



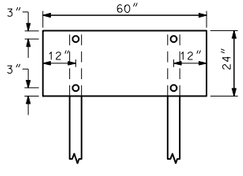
BARRICADE MOUNTING
24"x30" Signs



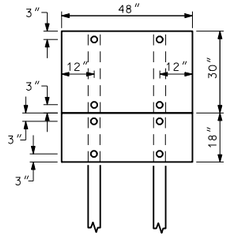
BARRICADE MOUNTING
48"x24" Signs



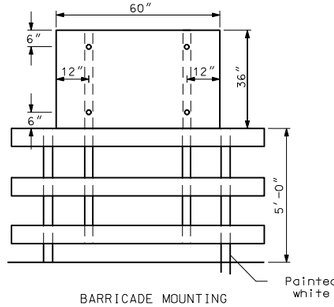
BARRICADE MOUNTING
60"x30" & 48"x18" Signs



BARRICADE MOUNTING
60"x24" Signs



BARRICADE MOUNTING
48"x30" & 48"x18" Signs



BARRICADE MOUNTING
G20-1-60 Signs

NOTES:

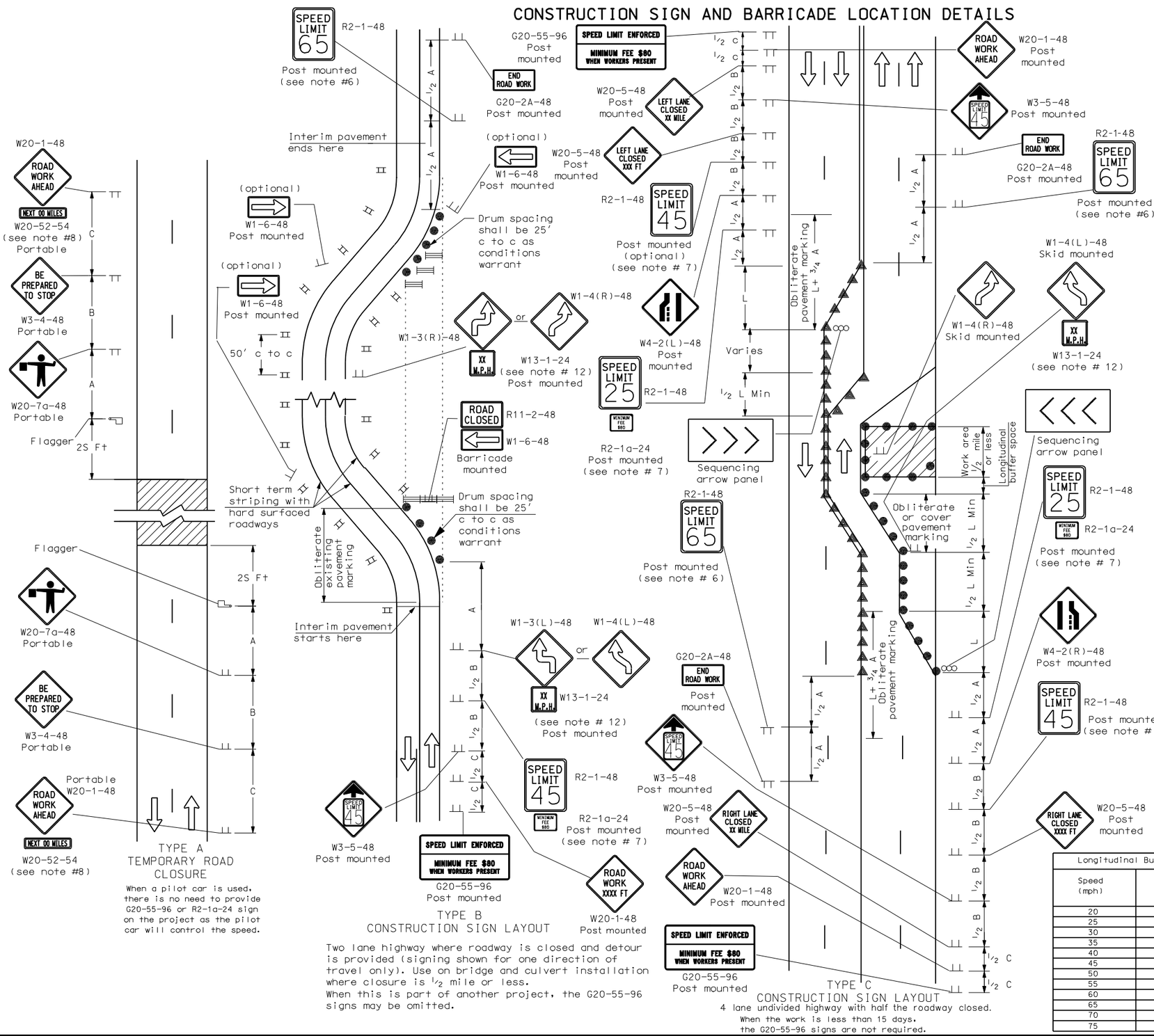
1. Barricade and Sign Supports: Wooden supports shall be painted white. Steel supports shall be galvanized or painted.
2. Barricade Mounting Signs: The bottom of the sign shall be flush with the top of the top rail. Wood sign posts shall be 4"x4" min. SFS or equivalent steel posts. All barricades and barricade mounted signs shall be assembled with 3/8" bolts.
3. Sign Supports: Sign supports shall be 4"x4" min. SFS or equivalent steel post. The anchor for steel supports shall have a stub height of 4" or less. Wood posts more than 4"x4" shall be breakaway. Sign supports shall be imbedded to a sufficient depth so that signs will remain plumb throughout duration of project. It is suggested that wood posts have a min. depth of embedment of 5' and steel posts be embedded a min. 3'-6".
   Material: All signs shall be 0.100" aluminum, 12 gauge steel, 1/2" plywood or other approved material.
   Holes: All holes to be punched round for 3/8" bolts.
4. Alternate Messages: The signs that have alternate messages may have these alternate messages placed on a reflectorized plate without a border and this plate installed and removed as required.
5. Advance Warning Flashing or Sequencing Arrow Panels: The minimum mounting height shall be 7 feet above the roadway to the bottom of the panel, except on vehicle mounted panels which shall be as high as practicable.
6. Delineator Posts: Typical fence post sections are shown in Attachment Details. Other types of metal fence posts may be substituted upon approval of the engineer. These substituted posts shall have reflectors attached similar to the ones shown.
7. Route Marker Auxiliary Signs: The route marker auxiliary signs such as the cardinal direction and directional arrows shall have background colors the same as the route marker they are used with (Interstate route markers, blue background, US and State route markers, white background, Interstate Business loop and spur, green background, and County route markers, blue background).
8. Vertical Clearance: Post mounted signs placed in rural areas shall have a vertical clearance of at least 5 feet measured from the bottom of the sign to the near edge of the driving lane. In business, commercial and residential districts where parking and/or pedestrian movement is likely to occur or where other obstructions to view, the distance between the bottom of the sign to the near edge of the driving lane shall be at least 7 feet. The height to the bottom of secondary signs mounted below another sign may be 1 foot less than the appropriate height specified. Large signs having an area exceeding 50 square feet that are installed on multiple breakaway posts shall be mounted a minimum of 7 feet above the ground.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
08-01-88	Sign assembly
05-01-92	Sign assembly
03-30-93	Sign supports note
03-04-96	Sign height
08-15-96	Note 8
07-10-97	Note revision
07-31-98	Note & portable sign
10-01-99	Skid mounted sign
02-07-03	Vertical clearance note
11-30-04	Third post added to some signs
12-01-04	PE stamp added

This document was originally issued and sealed by MARK S GAYDOS, Registration Number PE-4518, on 12/01/04 and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

D-704-15



Notes

1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper.
   L = Minimum length of taper, or S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or W x $S^2/60$ for urban, residential, and other streets with speeds of 40 mph or less.
2. Barricade shown to be placed on roadway shall be on a moveable assembly. Sign to be mounted on barricades shall be mounted with the sign bottom on the top of the top barricade bar. Sign shown to be placed on roadway shall be placed on skid mounted assemblies.
3. Delineator drums, barricades or cones used for tapering traffic shall be spaced at the dimension "S". Delineator drums or cones used for tangents shall be spaced at 2 times dimension "S".
4. Existing striping shall be removed as required. Delineators will only be used when foreslope is 1V:4H or better and roadway alignment is visible to approaching vehicles. Vertical panels shall be used where roadways has steep slopes and alignment is not visible to approaching vehicles. Delineators and vertical panels shall be installed back to back.
5. Sequencing Arrow Panels
   Panels should normally be placed at the beginning of the taper. Where shoulder width does not provide sufficient room, the panel should be moved closer to the work area so that it can be placed on the roadway surface.
   Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph and 750 ADT or less).
   Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph and 5000 ADT or less).
   Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph and 5000 ADT).
6. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
7. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
8. Use when work area is 1 mile or longer.
9. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
10. Existing speed limit signs within a reduced speed zone shall be covered.
11. Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
12. Where necessary, safe speed to be determined by the Engineer.
13. The contractor has the option of using portable sign supports in lieu of post mounted sign as shown on the standard drawings as specified in section 704.03 C.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

- Type I barricade
- Type II barricade
- Type III barricade
- Sign
- Delineator drum
- Cones
- Work area
- Flagger
- Sequencing arrow panel
- Type A delineator or vertical panels back to back

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

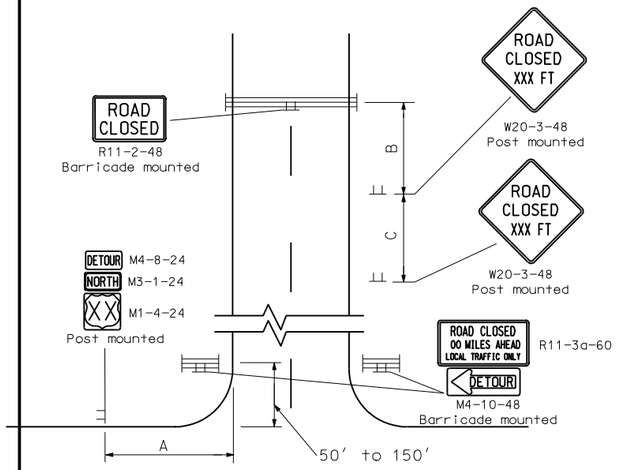
10-1-86

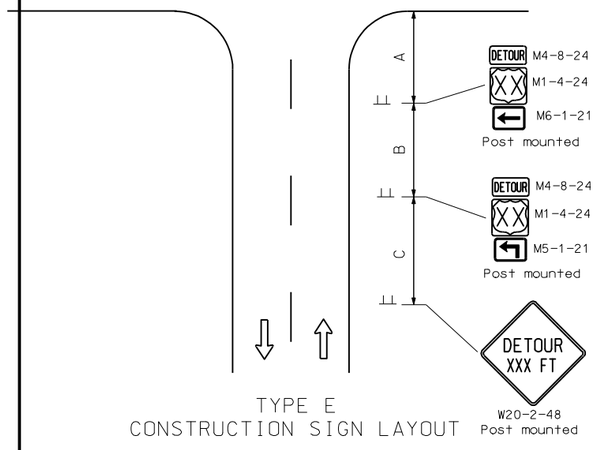
REVISIONS

DATE	CHANGE
01-05-01	Revised note 3
07-19-02	Reversed End Road Work & Speed Signs
07-25-03	Revised R2-1, R2-1a and W20-1
04-01-04	Change Fee Sign, Warning & Buffer Spacing
12-18-03	Relocated reverse curve
12-01-04	PE stamp added
06-29-05	Revised W4-2, Replaced R2-5a with W3-5, Rev. Adv. Warning Table, Rev. Note 7.
07-05-05	Changed W20-7b to W3-4

CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

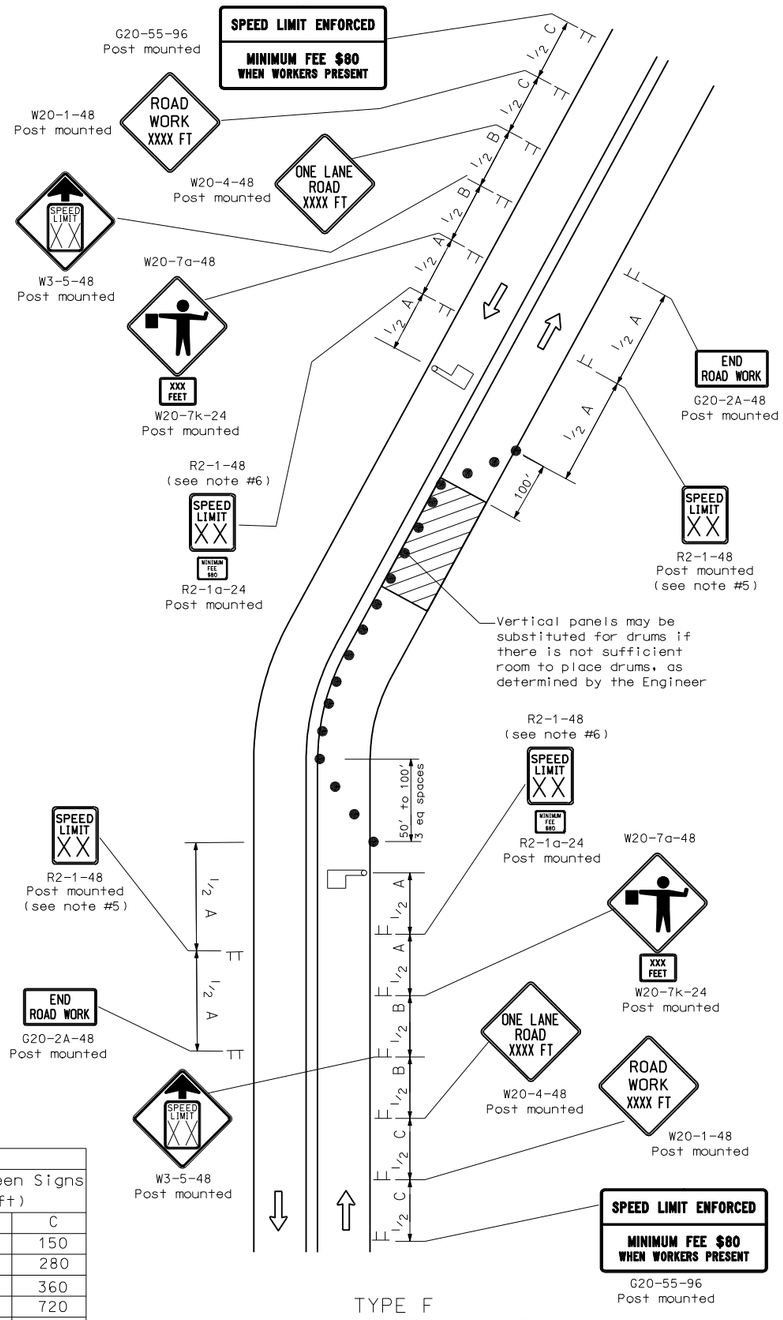
D-704-19





TYPE E
CONSTRUCTION SIGN LAYOUT

Used where a road is closed beyond a detour point. Signing shown for one direction only. Sign not shown on detour shall be shown in plans and installed and maintained by the contractor.



TYPE F
CONSTRUCTION SIGN LAYOUT

Two lane highway with one lane closed. Flagger is at a point where it is visible to approaching traffic.

Notes
1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper
   L = Minimum length of taper, or S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or
   $W \times S^2/60$ for urban, residential, and other streets with speeds of 40 mph or less.
2. Barricade shown to be placed on roadway shall be on a moveable assembly. Sign to be mounted on barricades shall be mounted with the sign bottom on the top of the top barricade bar. Sign shown to be placed on the roadway shall be placed on skid mounted assemblies.
3. Delineator drums used for tapering traffic shall be placed at 3 equal spaces. Delineator drums for tangents shall be spaced at 2 times dimension "S".
4. Sequencing Arrow Panels
   Panels should normally be placed at the beginning of the taper. Where shoulder width does not provide sufficient room, the panel should be moved closer to the work area so that it can be placed on the roadway surface.
   Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph and 750 ADT or less).
   Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph and 5000 ADT or less).
   Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph and 5000 ADT).
5. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
6. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
7. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
8. Existing speed limit signs within a reduced speed zone shall be covered.
9. Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
10. Where necessary, safe speed to be determined by the Engineer.
11. The contractor has the option of using portable sign supports in lieu of post mounted sign as shown on the standard drawings as specified in section 704.03 C.
12. G20-55-96 or R2-1a-24 sign are not required when a pilot car operation is used.

KEY

● Delineator Drum	Type I Barricade	Flagger
⊢ Type A Delineator	Type II Barricade	Sequencing Arrow Panel
⊢ Sign	Type III Barricade	Work/Hazard Area
▲ Cone		

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
10-1-86

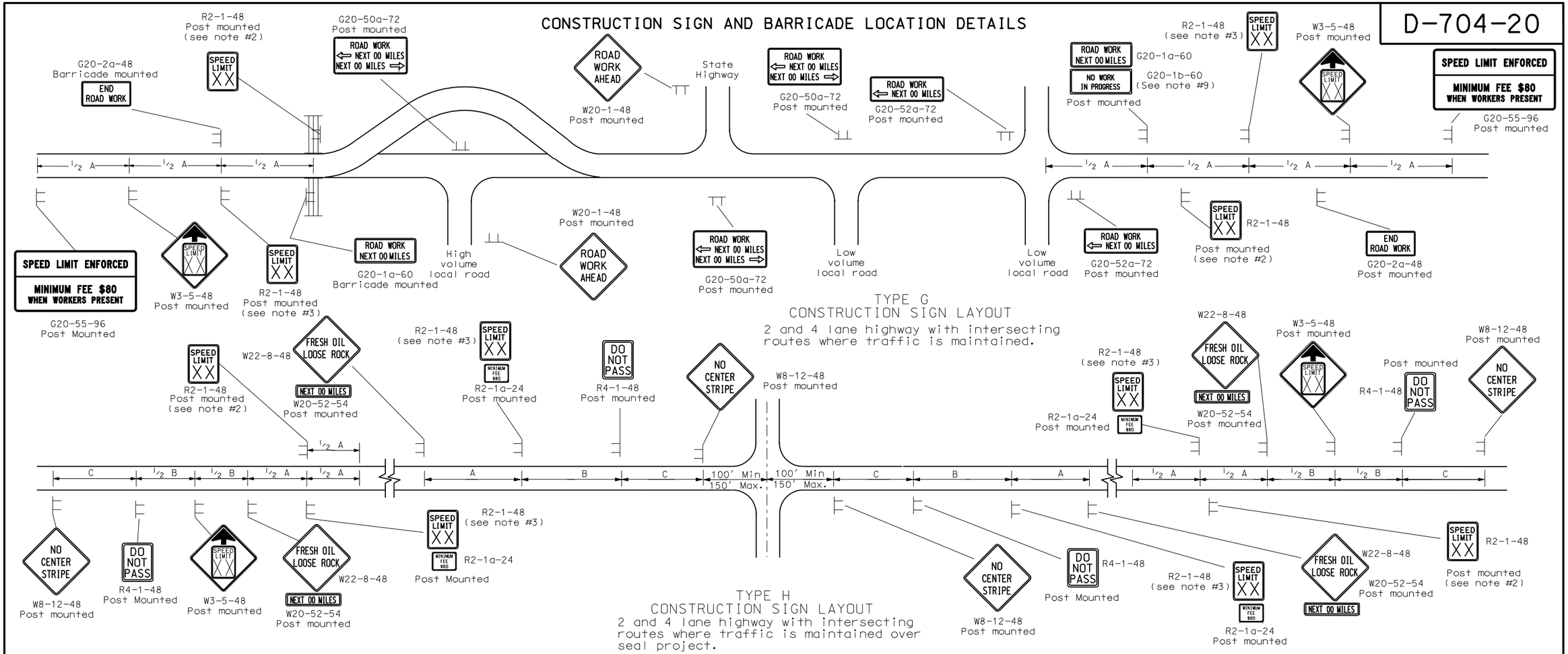
REVISIONS

DATE	CHANGE
07-19-02	Reversed End Road Work & Speed Limit Signs
07-25-03	Revised R2-1a and W20-1
01-16-04	Revised type F
04-01-04	Revised fee sign & Warning sign spacing. Rev. note 6. add note 12
12-01-04	PE stamp added
06-29-05	Added W3-5 to type F. Rev. Adv. Warning Table. Rev. Note 6
04-05-06	Showed signing for opposite direction
02-16-07	Added W3-5-48 to opposite direction of Type F layout

This document was originally issued and sealed by MARK S GAYDOS Registration Number PE-4518, on02/16/2007and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

D-704-20



1. Barricade shown to be placed on roadway shall be on a moveable assembly. Sign to be mounted on barricades shall be mounted with the sign bottom on the top of the top barricade bar. Sign shown to be placed on the roadway shall be placed on skid mounted assemblies.
2. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
3. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 MPH below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 MPH. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at ½ B.
4. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
5. Existing speed limit signs within a reduced speed zone shall be covered.
6. Sign no. R2-1-48, R2-1a-24, R4-1-48, W22-8-48, W20-52-54, and W8-12-48 shall be placed just after all important intersections and every five miles in either direction. Sign no W8-12-48 shall be placed when traffic volumes are 750 ADT or less. No short term markings are placed when this condition exists.
7. The contractor has the option of using portable sign supports in lieu of post mounted sign as shown on the standard drawings as specified in section 704.03 C.
8. Type H construction sign traffic control shall have the speed limit signs covered or removed once the loose aggregate has been removed.
9. The contractor shall install the G20-1b-60 sign when work is suspended for winter.
10. The layouts show the signs needed before work begins. The requirements at the actual work areas will require the use of other standards. If the speed limit is reduced in the work areas, the speed limit signs shall have the R2-1a-24 sign placed below.

KEY

Type I barricade	Work area
Type II barricade	Flagger
Type III barricade	Sequencing arrow panel
Sign	Type A delineator or vertical panels back to back
Delineator drum	
Cones	

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

10-1-86

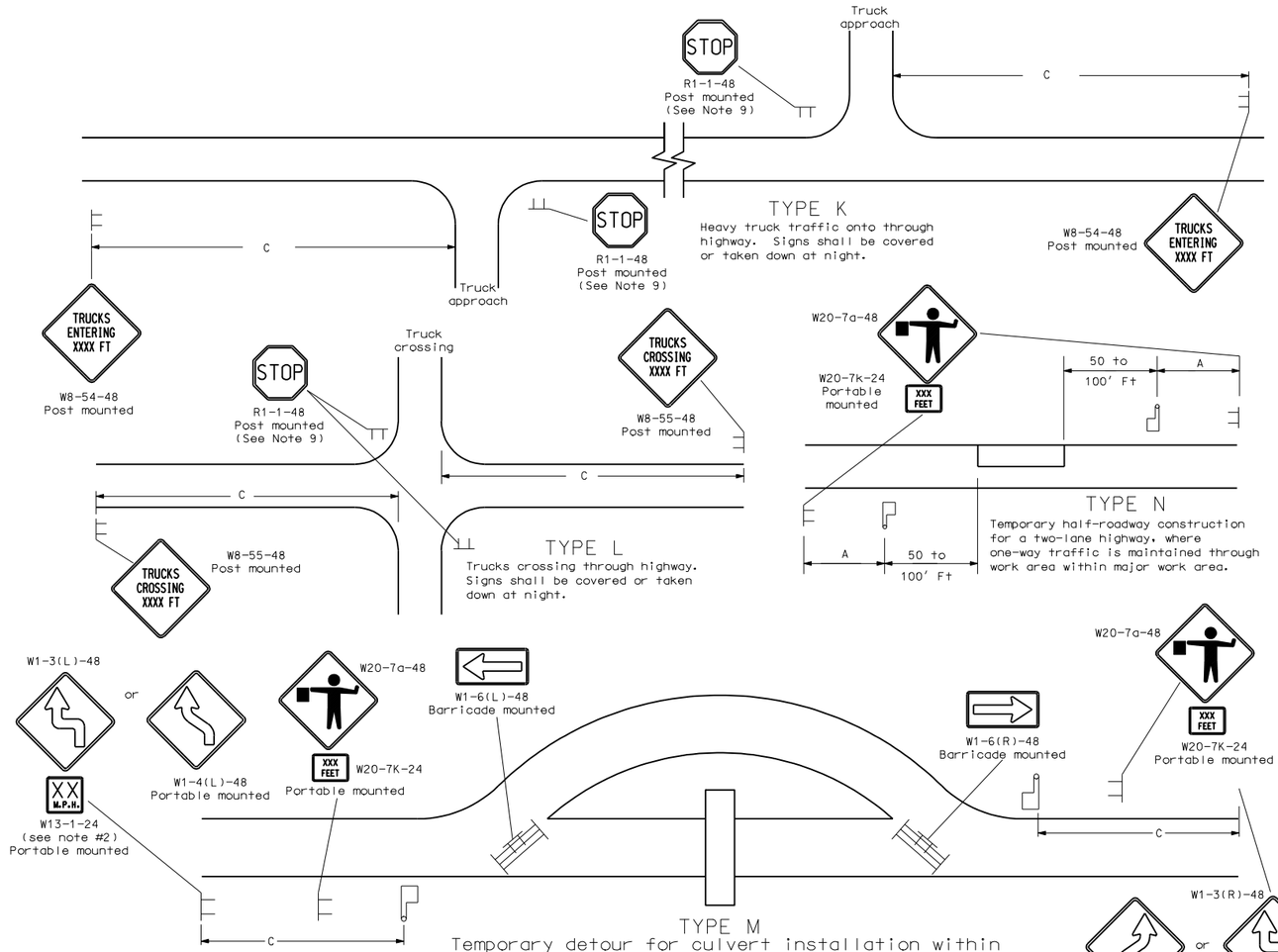
REVISIONS

DATE	CHANGE
08-15-96	Revise flag note
10-01-99	General revisions
10-18-01	Added note 8 & 9
07-19-02	Rev. end road work & speed limit sign
07-25-03	Rev. R2-1a & W20-1
04-01-04	Rev. fee sign & warning sign spacing Rev note 3, add note 10
12-01-04	PE Stamp added
06-29-05	Added W3-5 to Type H and Type G. Rev. Adv. Warning Table. Rev. Note 3
04-05-06	Corrected sign W3-5

This document was originally issued and sealed by MARK S. GAYDOS, Registration Number PE-4518, on 04/05/06 and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

D-704-22



Notes

1. Barricade shown to be placed on roadway shall be on a moveable assembly. on the top of the top barricade bar. Sign shown to be placed on the roadway Sign to be mounted on barricades shall be mounted with the sign bottom shall be placed on skid mounted assemblies.
2. Where necessary, safe speed to be determined by the Engineer.
3. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at $\frac{1}{2}$ B.
4. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
5. Existing speed limit signs within a reduced speed zone shall be covered.
6. Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
7. The contractor has the option of using portable sign supports in lieu of post mounted sign as shown on the standard drawings as specified in section 704.03 C.
8. The contractor shall install the G20-1b-60 sign when work is suspended for winter.
9. If existing stop sign is in place, a 48" stop sign is not required.

KEY

	Type I barricade		Work area
	Type II barricade		Flagger
	Type III barricade		Sequencing arrow panel
	Sign		Type A delineator or vertical panels back to back
	Delineator drum		
	Cones		

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

10-1-86

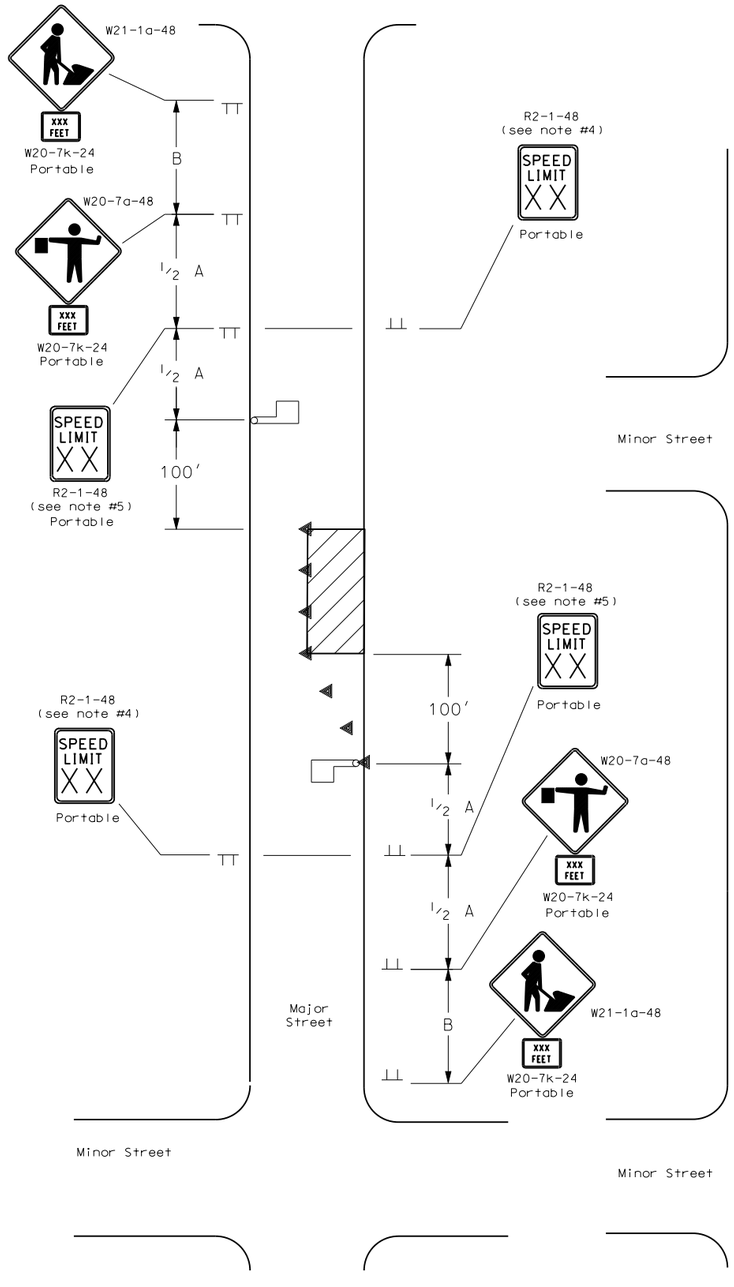
REVISIONS

DATE	CHANGE
09-30-93	General revisions
06-21-95	General revisions
08-15-96	Revise flag note
10-01-99	General revisions
02-02-00	W8-55-48
10-17-02	Deleted Work In Progress Sign
07-25-03	Revised R2-1a
04-01-04	Revised fee sign & Warning sign spacing. Revised note 3
12-01-04	PE stamp added
02-14-05	Added note 9 and revised stop sign size
06-29-05	Rev. Adv. Warning Table. Rev. Note 3

This document was originally issued and sealed by Mark S Gaydos Registration Number PE-4518, on 06/29/05 and the original document is stored at the North Dakota Department of Transportation

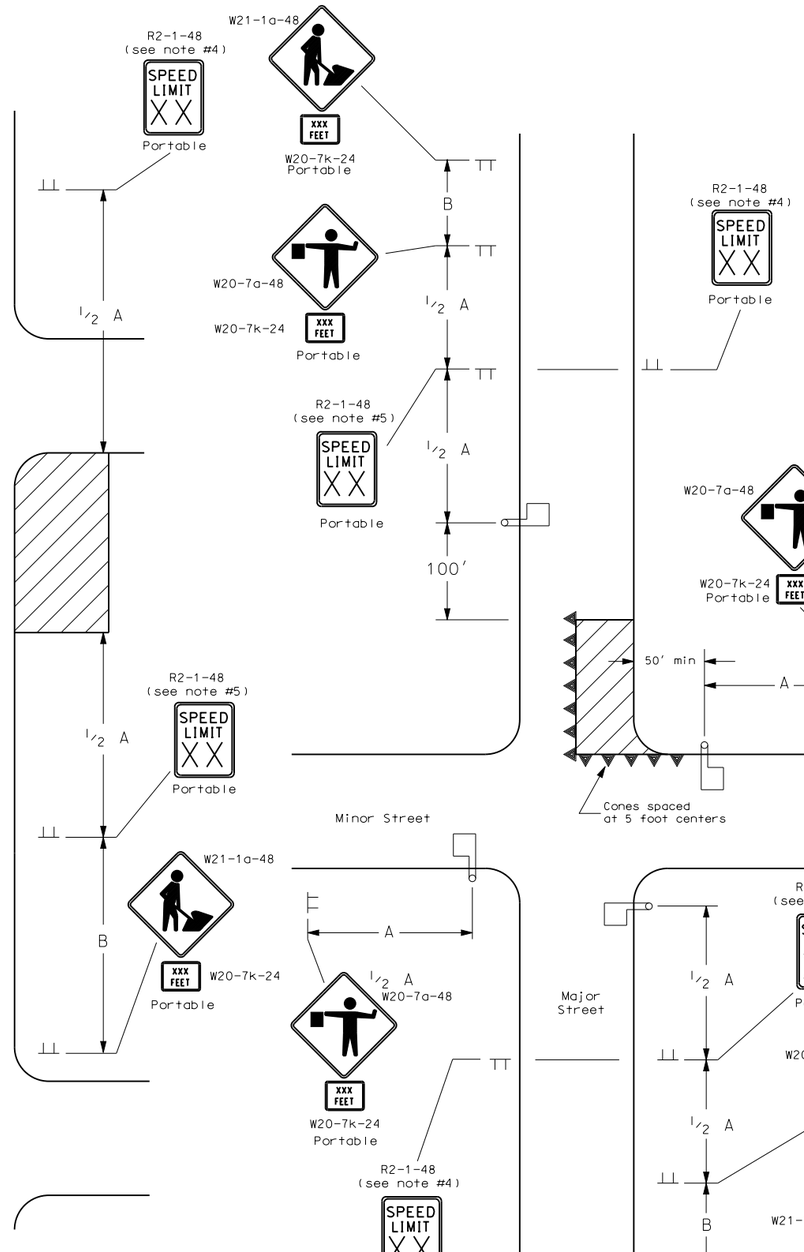
CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

D-704-25



TYPE V

When portion of roadway is closed to traffic only during daylight hours (mid block location).



TYPE W

When work area is outside of driving lane and no closure is necessary

TYPE X

When portion of roadway is closed to traffic only during daylight hours (end block location).

Notes
1. For Type V: The contractor will be allowed to work only on one side of the roadway at a time so as not to block off any more than one lane of traffic.
2. When parking is present, the signs shall be placed so they are entirely visible above the parked vehicles or placed at the edge of the parking area so they are visible to oncoming traffic. These signs may be skid mounted when placed on the roadway surface.
3. Delineator cones used for tapering traffic shall be placed at 3 equal spaces. Delineator cones for tangents shall be spaced at dimension "S". "S" = the numerical value of speed limit.
4. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
5. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
6. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
7. Existing speed limit signs within a reduced speed zone shall be covered.
8. Where necessary, safe speed to be determined by the Engineer.
9. The contractor has the option of using portable sign supports in lieu of post mounted sign as shown on the standard drawings as specified in section 704.03 C.
10. Urban projects do not need the G20-55-96 and R2-1a-24 signs.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

- Type I barricade
- Type II barricade
- Type III barricade
- Sign
- Delineator drum
- Cones
- Work area
- Flagger
- Sequencing arrow panel
- Type A delineator or vertical panels back to back

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

10-1-86

REVISIONS

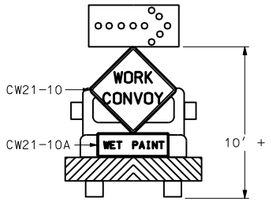
DATE	CHANGE
07-25-03	Removed R2-1a
04-01-04	Rev warning sign spacing. Add note 10
10-19-04	Signs shown in both directions of traffic
12-01-04	PE Stamp added
06-29-05	Rev. Adv. Warning Table. Rev. Note 5

This document was originally issued and sealed by MARK S. GAYDOS Registration Number PE- 4518 , on 06/29/05 and the original document is stored at the North Dakota Department of Transportation

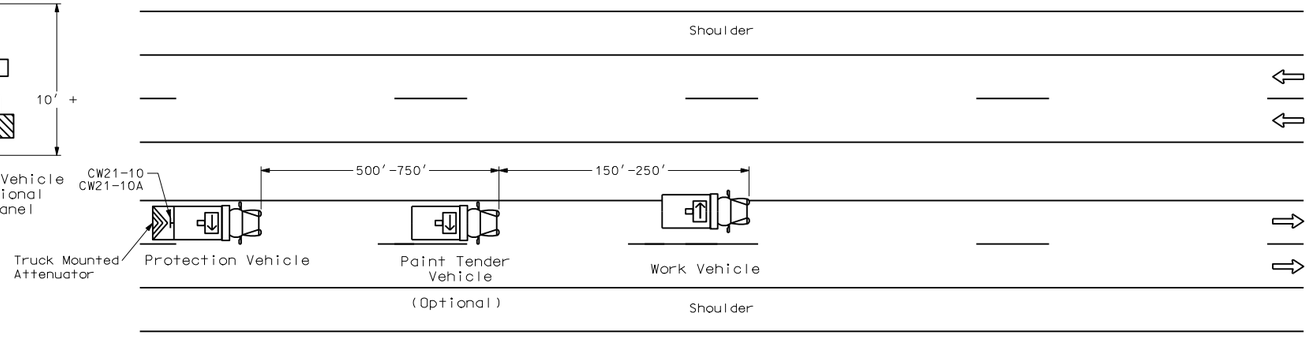
TRAFFIC CONTROL PLAN FOR MOVING OPERATIONS ON CONVENTIONAL HIGHWAYS

(Pavement Marking)

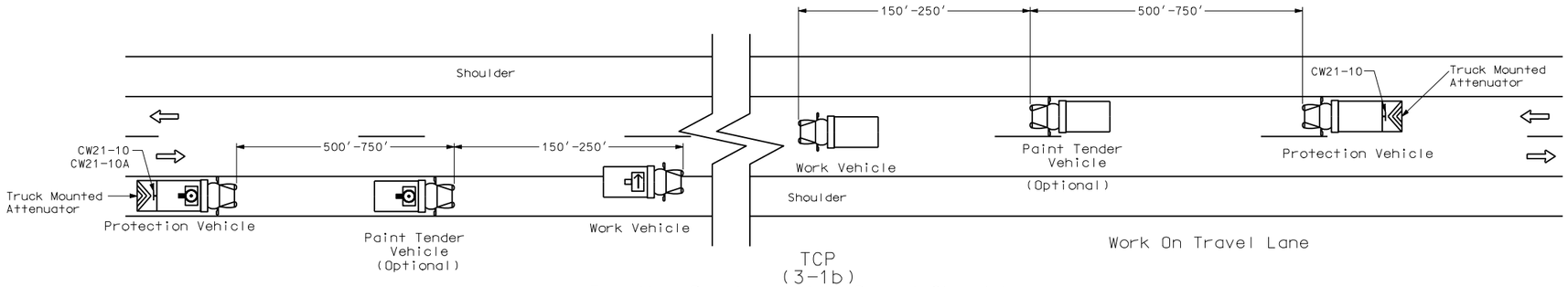
D-704-27



Typical Protection Vehicle
with Right Directional
Flashing Arrow Panel

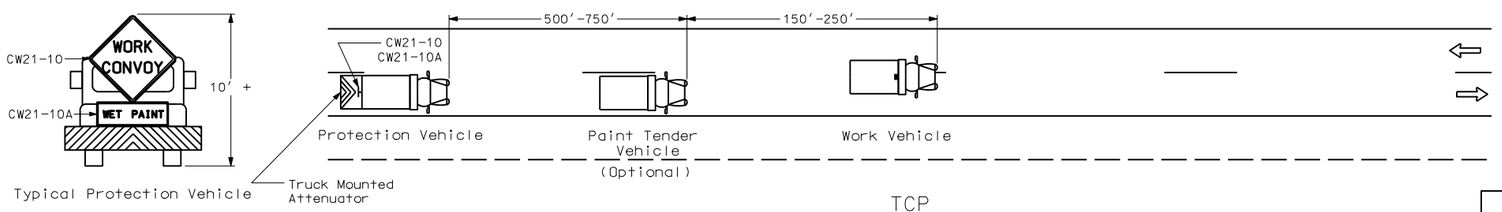


TCP
(3-1a)
Undivided Multi lane Roadway



TCP
(3-1b)

Work On Shoulder — Two-Way Roadway with Paved Shoulders — Work On Travel Lane

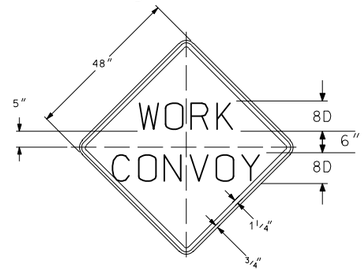


Typical Protection Vehicle

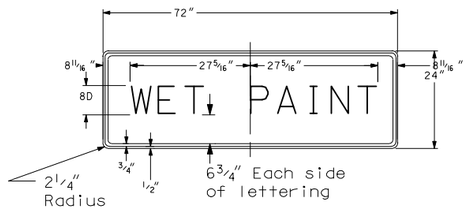
TCP
(3-1c)
Two-Way Roadway without Paved Shoulders

Notes
1. If the contractor chooses to place more vehicles in the convoy than are shown, these vehicles shall have the truck mounted attenuator and shall be at the contractors expense.
2. All traffic control devices shall be in accordance with the "Manual on Uniform Traffic Control Devices" (MUTCD), latest edition.
3. The use of yellow rotating beacons or strobe lights on vehicles is required unless otherwise stated elsewhere in the plans.
4. Flashing arrow panels shall be Type B or Type C. The panel operation shall be controlled from inside the vehicle.
5. Each vehicle shall have two-way radio communication capability.
6. When work convoys must change lanes, the protection vehicle should change lanes first to shadow other convoy vehicles.
7. Vehicle spacing between the protection vehicle and paint tender vehicle will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the protection vehicle in time to slow down and/or change lanes as they approach the trail vehicle.
8. Sign Colors
   Letters = Black
   Border = Black
   Background = Orange

Sign Details



CW21-10



CW21-10A

KEY

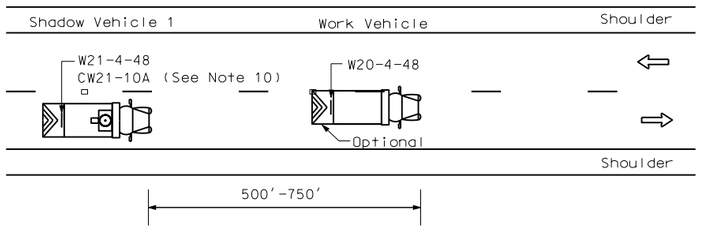
- Truck mounted attenuator
- Flashing arrow panels:
  - Right directional
  - Left directional
  - Double arrow directional
  - Caution Mode

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
01-22-92	
REVISIONS	
DATE	CHANGE
02-24-93	General
03-15-95	General
06-21-95	Remove caution mode
10-01-99	General Revisions
07-25-00	General Revisions
12-01-04	PE Stamp added

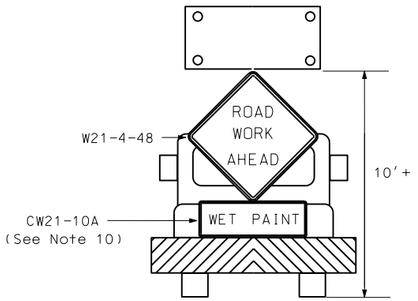
This document was originally issued and sealed by MARK S GAYDOS, Registration Number PE-4518, on 12/01/04 and the original document is stored at the North Dakota Department of Transportation

TRAFFIC CONTROL FOR MOBILE OPERATIONS

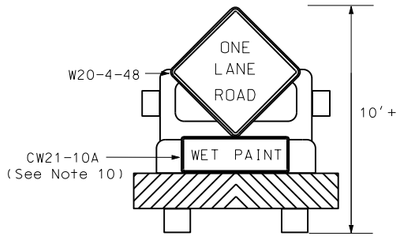
D-704-28



Two Lane Highway
(Work on Travel Lane)

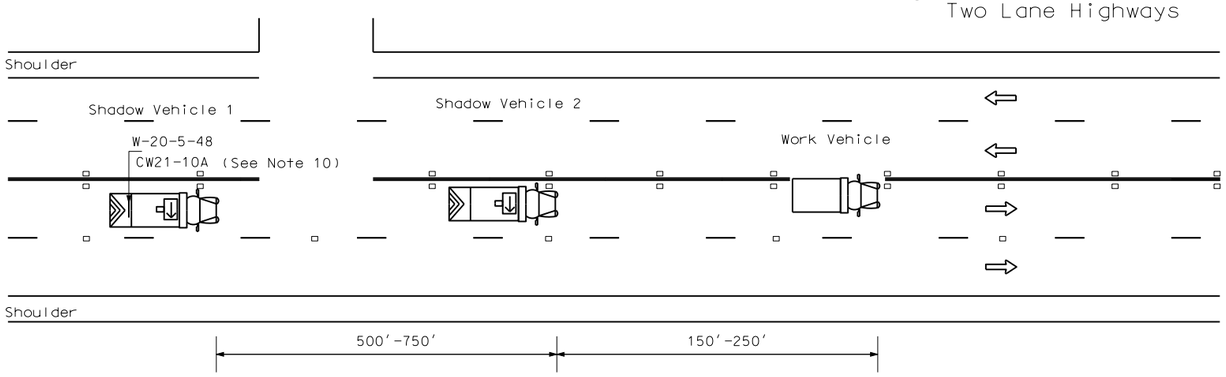


Typical Shadow Vehicle 1
Two Lane Highways



Work Vehicle
Two Lane Highways

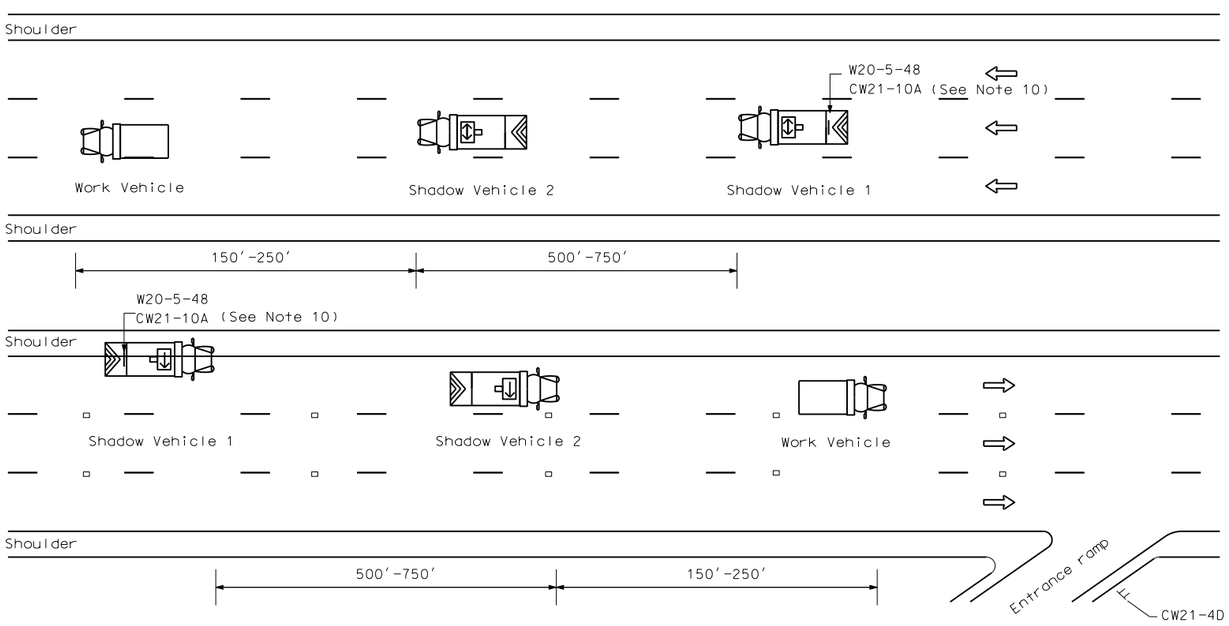
Notes
1. If the contractor chooses to place more vehicles in the convoy than are shown, these vehicles shall have the truck mounted attenuator and shall be at the contractors expense.
2. All traffic control devices shall be in accordance with the "Manual on Uniform Traffic Control Devices" (MUTCD), latest edition.
3. Shadow and work vehicles shall display yellow rotating beacons or strobe lights.
4. Flashing arrow panels shall be Type B. The panel operation shall be controlled from inside the vehicle.
5. Each vehicle shall have two-way radio communication capability.
6. When work convoys must change lanes, the shadow vehicle should change lanes first to shadow other convoy vehicles.
7. Vehicle spacing between shadow vehicle 1 and shadow vehicle 2 will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the trail vehicle in time to slow down and/or change lanes as they approach the shadow vehicle.
8. Sign Colors
   Letters = Black
   Border = Black
   Background = Orange
9. Shadow vehicle 2 may be used as the paint tender vehicle.
10. Sign CW21-10A shall only be used during a painting operation.
11. On two lane - two way roadways, the work and shadow vehicles should pull over periodically to allow motor vehicle traffic to pass.



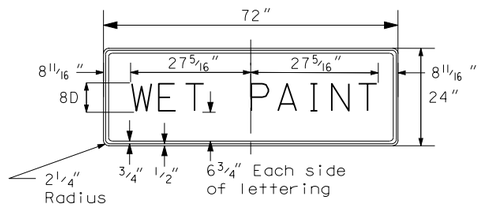
Undivided Multi lane Highway

Sign Details

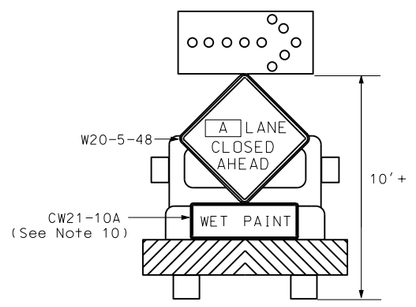
W20-5-48



Divided Multi lane Highway



CW21-10A



Typical Shadow Vehicle 1 & 2
Multi Lane Highways

KEY

A = Left Right Center

Truck mounted attenuator

Flashing arrow panels:

Right directional

Left directional

Double arrow directional

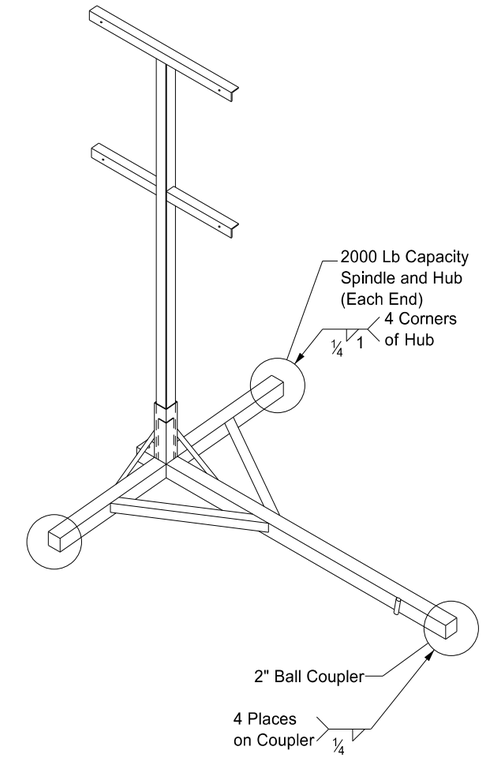
Caution Mode

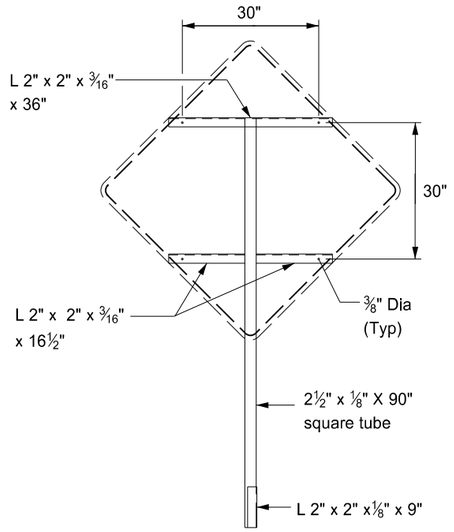
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
01-22-92	
REVISIONS	
DATE	CHANGE
02-24-93	General
06-21-95	Remove arrow panels
06-04-99	W21-4-48 sign
10-01-99	General revisions
07-25-00	General revisions
05-24-02	Major revisions
12-01-04	PE Stamp added

This document was originally issued and sealed by MARK S. GAYDOS Registration Number PE- 4518 , on 12/01/04 and the original document is stored at the North Dakota Department of Transportation

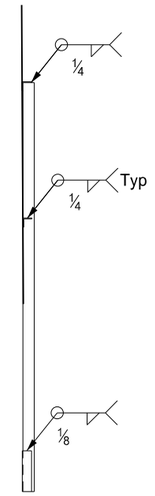
PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



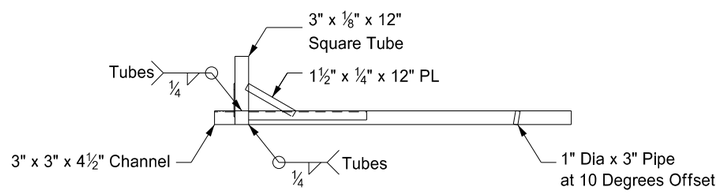


FRONT

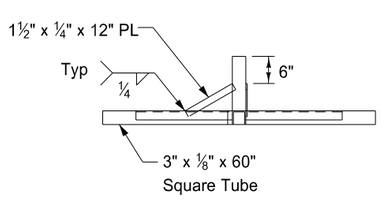


RIGHT

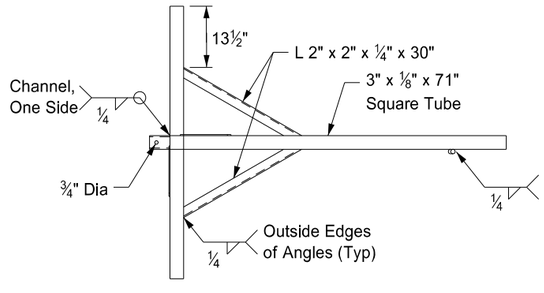
SIGN SUPPORT



FRONT



RIGHT



TOP

TRAILER

Notes:

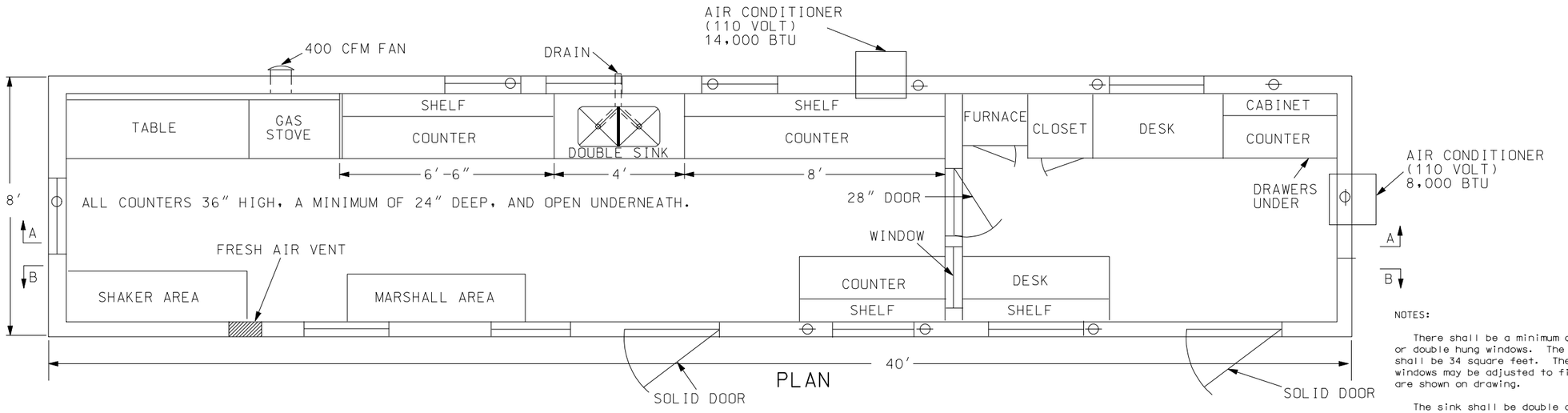
1. The maximum weight of the assembly is 250 pounds.
2. Use a 14" wheel and tire.
3. Automotive and equipment axle assemblies may not be used for trailer-mounted sign supports.
4. Other NCHRP 350 crash tested assemblies are acceptable.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE

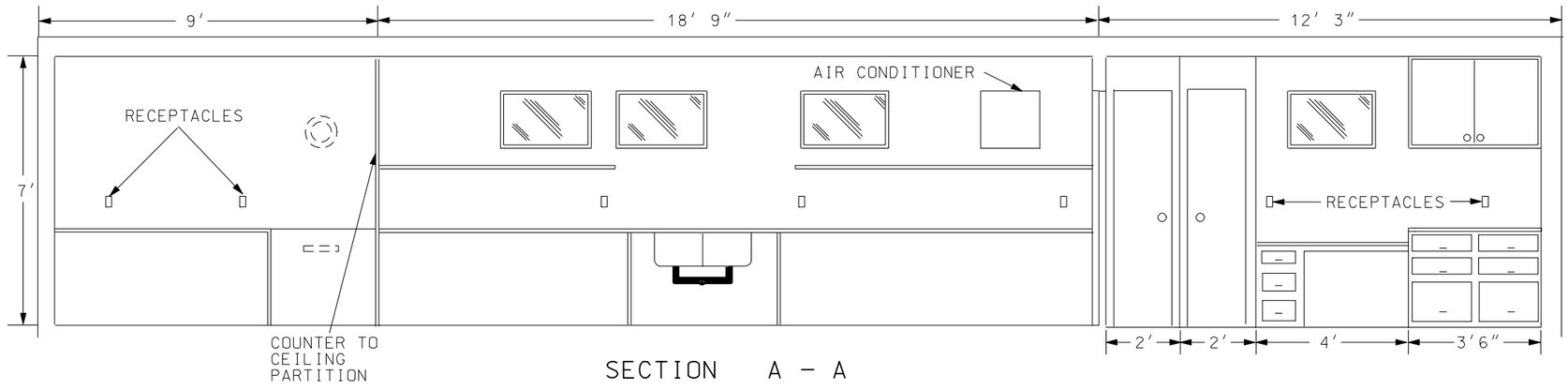
This document was originally issued and sealed by Roger Weigel Registration Number PE-2930, on 11/23/10 and the original document is stored at the North Dakota Department of Transportation

TYPE C FIELD LABORATORY

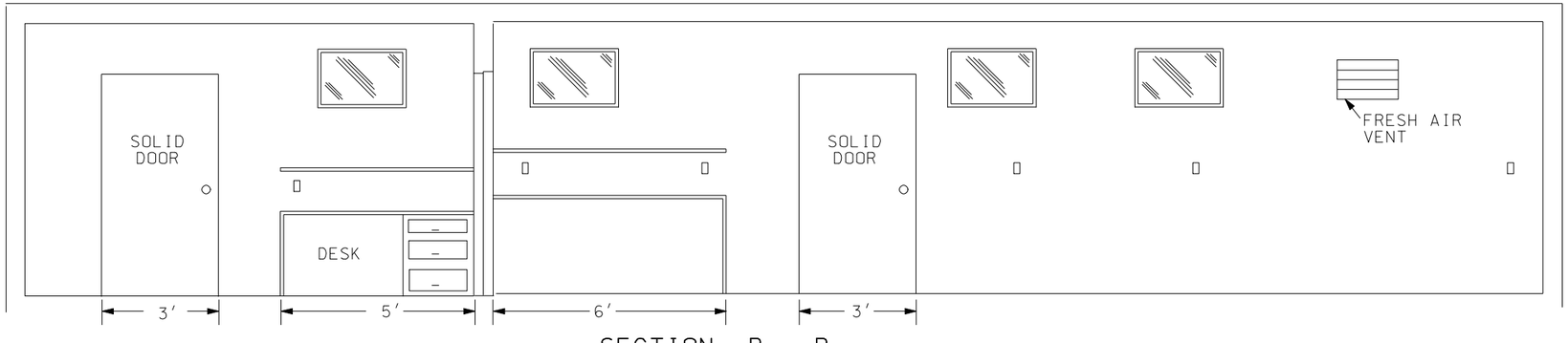
D-706-1



PLAN



SECTION A - A



SECTION B - B

NOTES:

There shall be a minimum of 6 exterior ventilated casement or double hung windows. The minimum total area of opening shall be 34 square feet. The number, size, and location of windows may be adjusted to fit conditions. Suggested locations are shown on drawing.

The sink shall be double compartment stainless steel. Each compartment shall be a minimum of 16"x14"x10" deep. The sink shall be drained to an outside wasteline. A trap is not required. Water service lines shall be copper or plastic having a diameter of ½ inch.

The lab shall be equipped with an exhaust fan capable of removing inside air at a rate of 400 CFM.

The fresh air vent shall be hinged to open or close manually.

24" x 48" table shall be provided capable of holding a 200 lb. masonry saw. The table shall have a minimum clearance of 36" overhead.

The water supply tank shall have a capacity of 500 gallons.

Steps shall be provided for each of two entrance doors. Steps for each area shall be made of, or covered with, a material providing for a non-slip surface. They shall be heavy duty steps that are capable of withstanding heavy loadings and extensive use.

The pressure tank on the pump shall be 20 gallon capacity.

Locks, latches, and hinges for main doors shall be heavy duty type to withstand the intense use in service.

The wall between the office and the work area shall be properly insulated to prevent the transmission of heat & noise.

The floor beneath the marshall area shall be heavily reinforced.

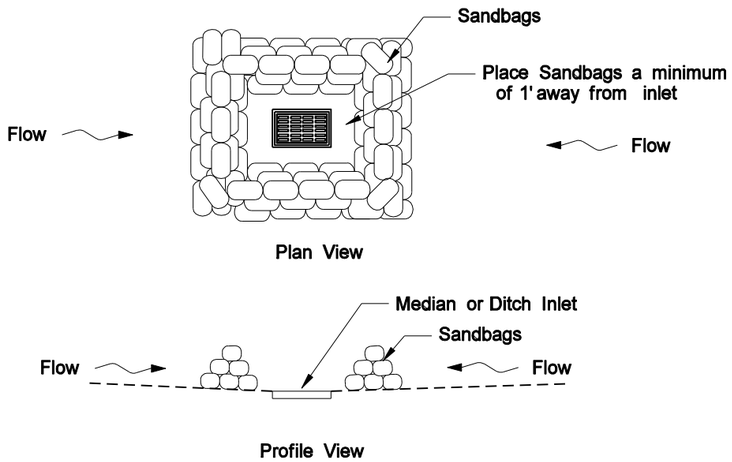
The lab shall be equipped with steel cable tie downs and ground anchors at each corner of the lab.

Electrical service entrance shall be wired for 100 amps, and have separate circuits for air conditioners. Convenience outlets shall have a minimum spacing of 4 feet in counter areas.

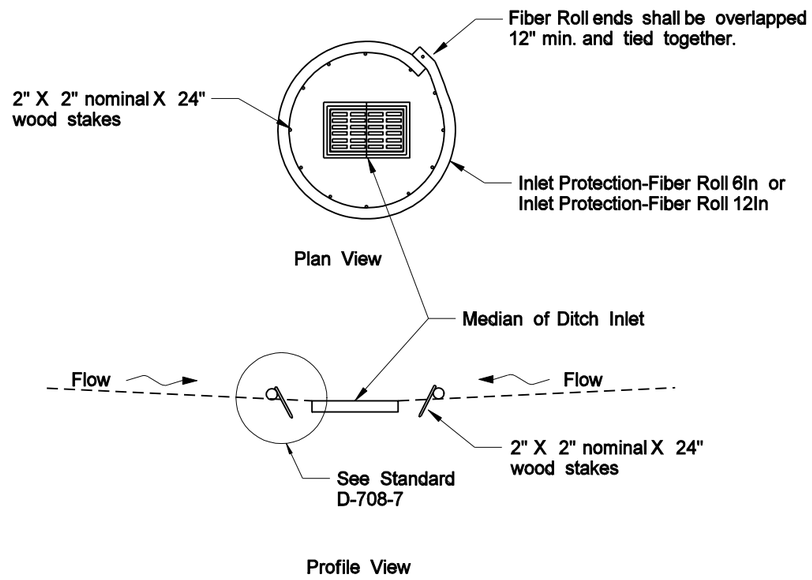
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
05-05-88	Drawing and notes
06-20-03	General revisions
12-01-04	PE Stamp added

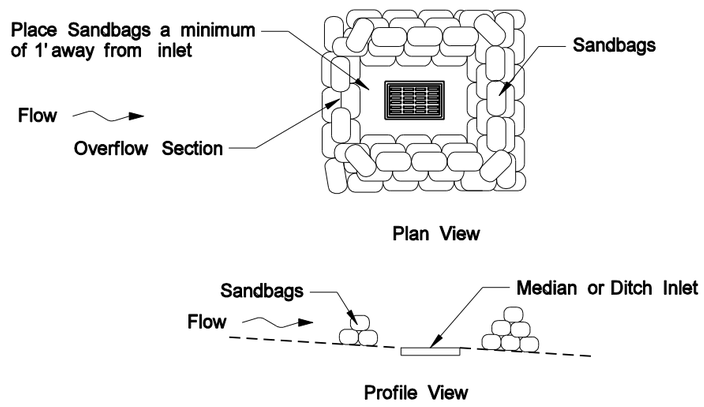
This document was originally issued and sealed by MARK S GAYDOS, Registration Number PE-4518, on 12/01/04 and the original document is stored at the North Dakota Department of Transportation

EROSION CONTROL
MEDIAN OR DITCH INLET PROTECTION

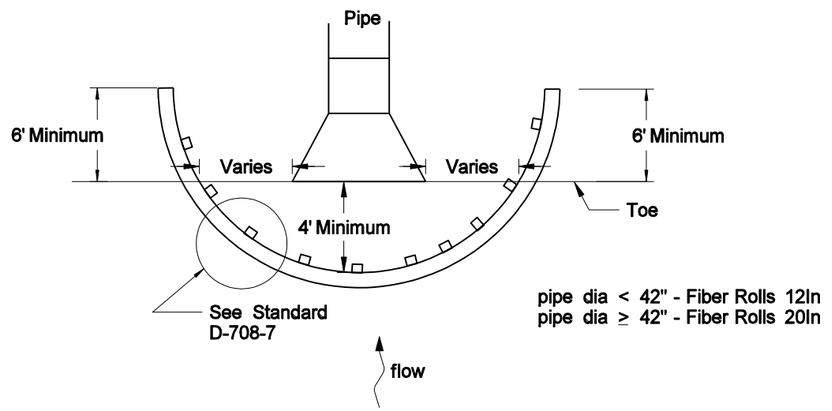


SANDBAG PROTECTION
LOW POINT





SANDBAG PROTECTION
ON SLOPE



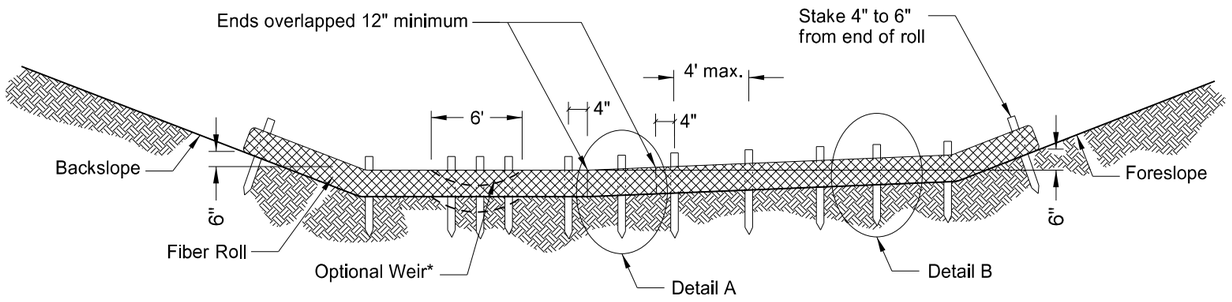
pipe dia < 42" - Fiber Rolls 12In
pipe dia ≥ 42" - Fiber Rolls 20In

FIBER ROLL PROTECTION
INLET OF PIPE END

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-13-06	
REVISIONS	
DATE	CHANGE
12-14-07	Added 12" Fiber roll overlap, option of butting fiber roll ends removed.

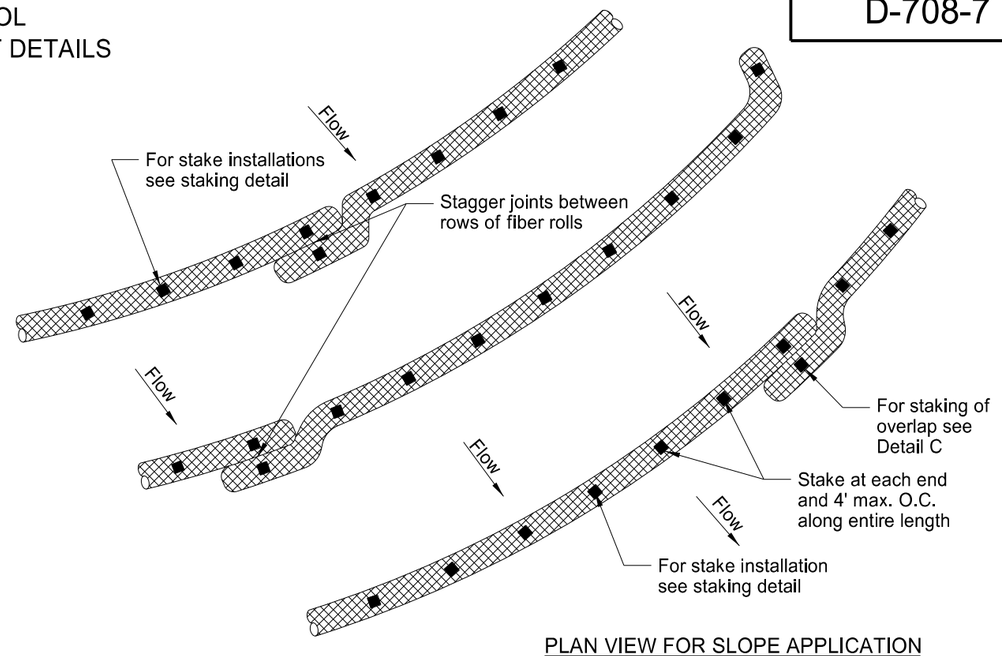
This document was originally issued and sealed by MARK S GAYDOS Registration Number PE-4518, on 12/14/07 and the original document is stored at the North Dakota Department of Transportation

EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS

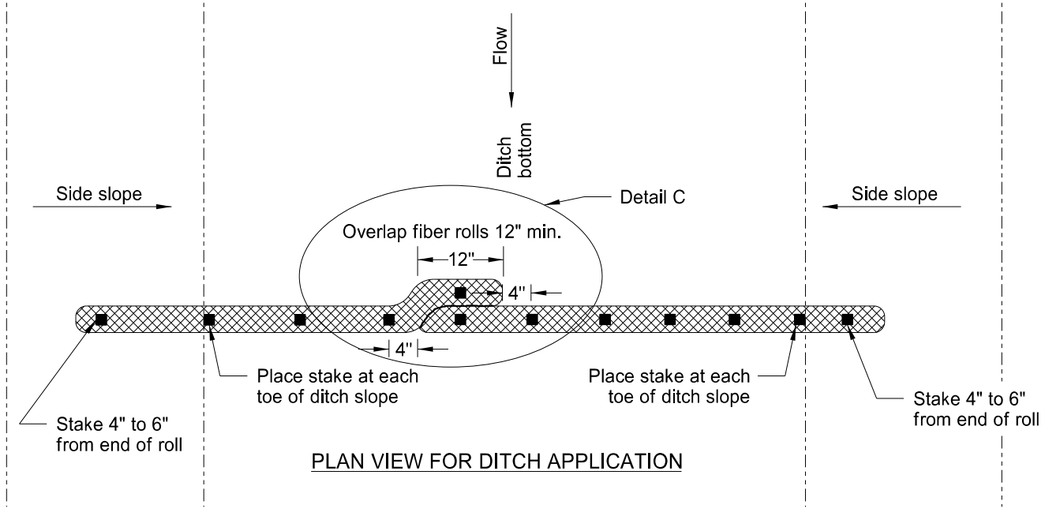


*Optional Weir. Use in flat areas, such as the Red River Valley, where there is potential for water to back up on adjacent property. Lower fiber roll enough to prevent water from backing up on adjacent property. Do not use 20-inch fiber rolls in flat areas where there is potential for water to back up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

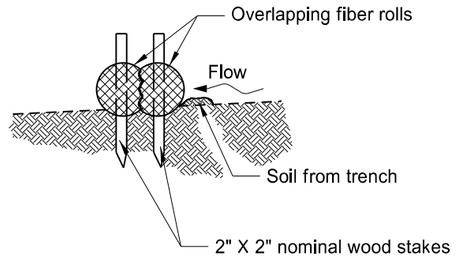
12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



PLAN VIEW FOR SLOPE APPLICATION

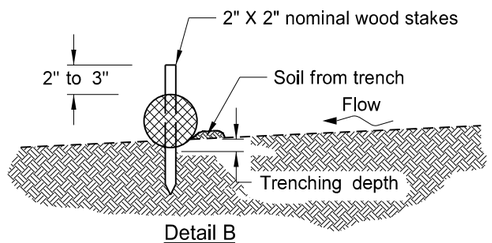


PLAN VIEW FOR DITCH APPLICATION



Detail A

Fiber Roll Overlapping Staking Detail



Detail B

Fiber Roll Staking Detail

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

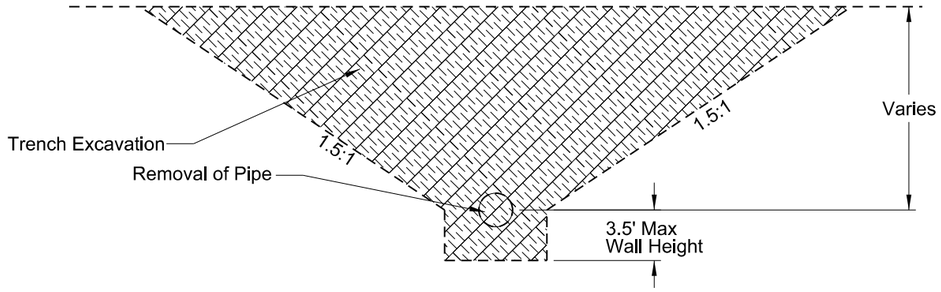
NOTE: Runoff must not be allowed to run under or around roll.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-18-10	
REVISIONS	
DATE	CHANGE
06-10-13	Added plan view for ditch and slope application. Added table with values for stake and trench dimensions.

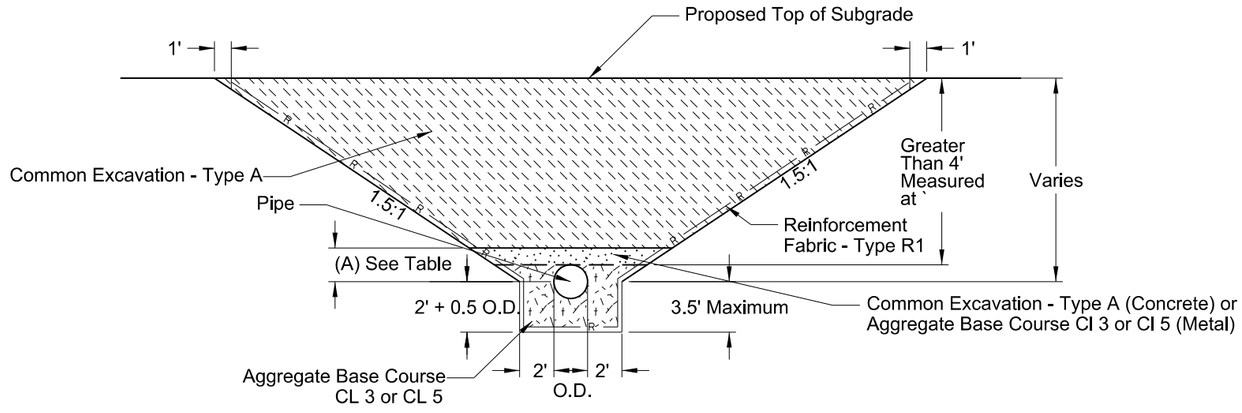
This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 06/10/13 and the original document is stored at the North Dakota Department of Transportation

TRANSVERSE MAINLINE PIPE EXCAVATION AND INSTALLATION DETAIL FOR PIPES MORE THAN 4 FEET BELOW THE TOP OF PROPOSED SUBGRADE

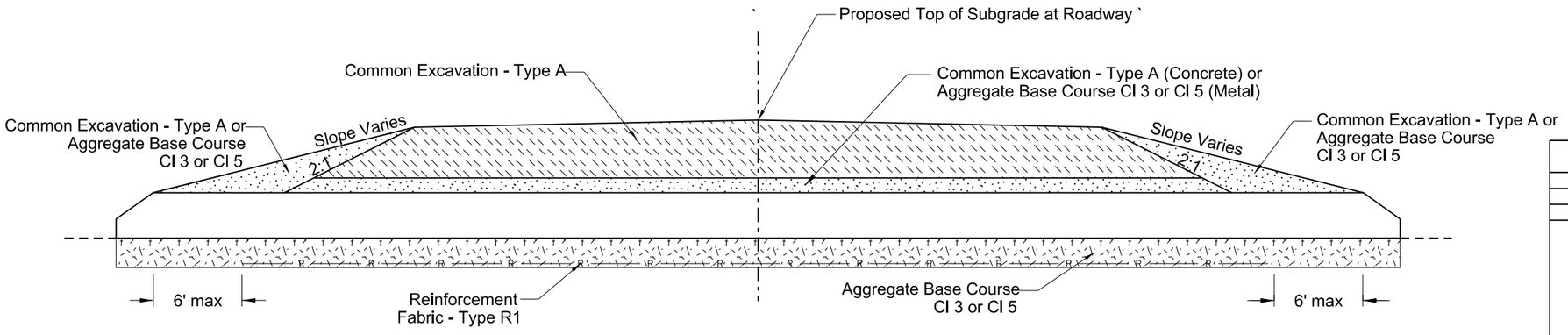
D-714-25



EXCAVATION DETAIL



INSTALLATION DETAIL



CROSS SECTION

Pay Items
1) Pipe*
2) Reinforcement Fabric - Type R1
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) Common Excavation - Type A

NOTES:

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

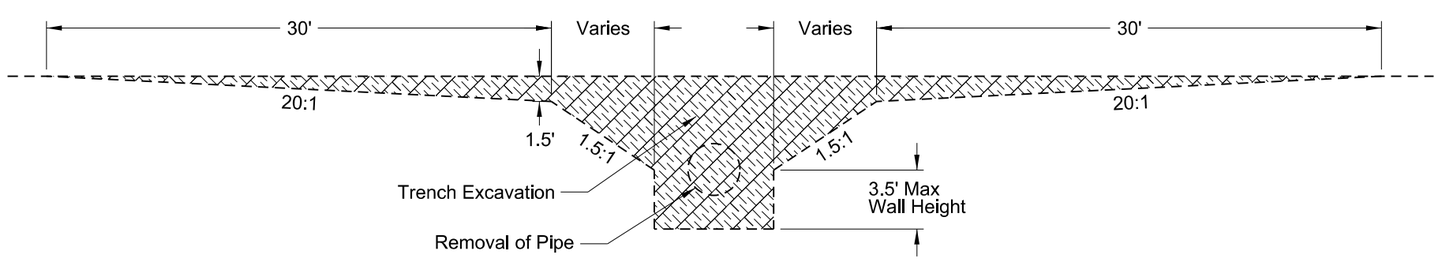
Backfill Dimensions	
Pipe Materials	Dimension (A)
Concrete	0.5 O.D.
Metal	0.5 O.D. + 1 Foot

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-26-13	
REVISIONS	
DATE	CHANGE

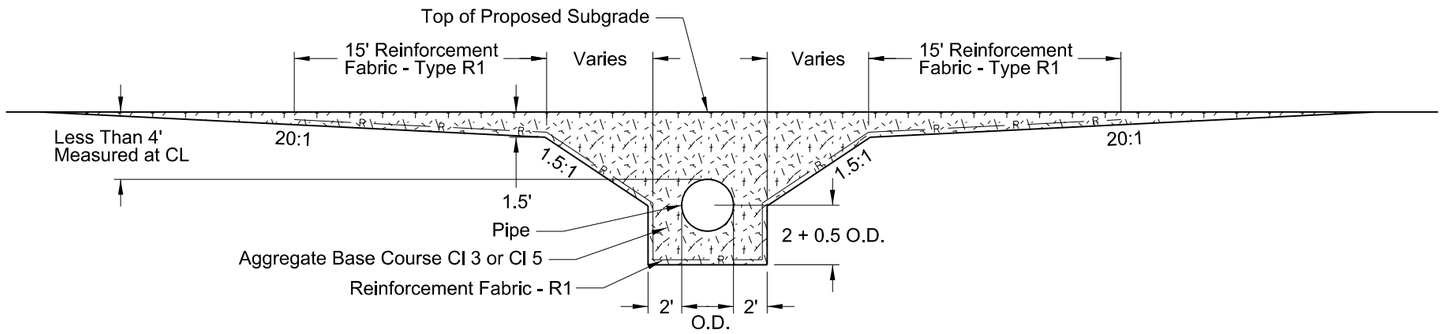
This document was originally issued and sealed by Ron Horner, Registration Number PE-2087, on 7/26/13 and the original document is stored at the North Dakota Department of Transportation

TRANSVERSE MAINLINE PIPE EXCAVATION AND INSTALLATION DETAIL FOR PIPES 4 FEET OR LESS BELOW THE TOP OF THE PROPOSED SUBGRADE

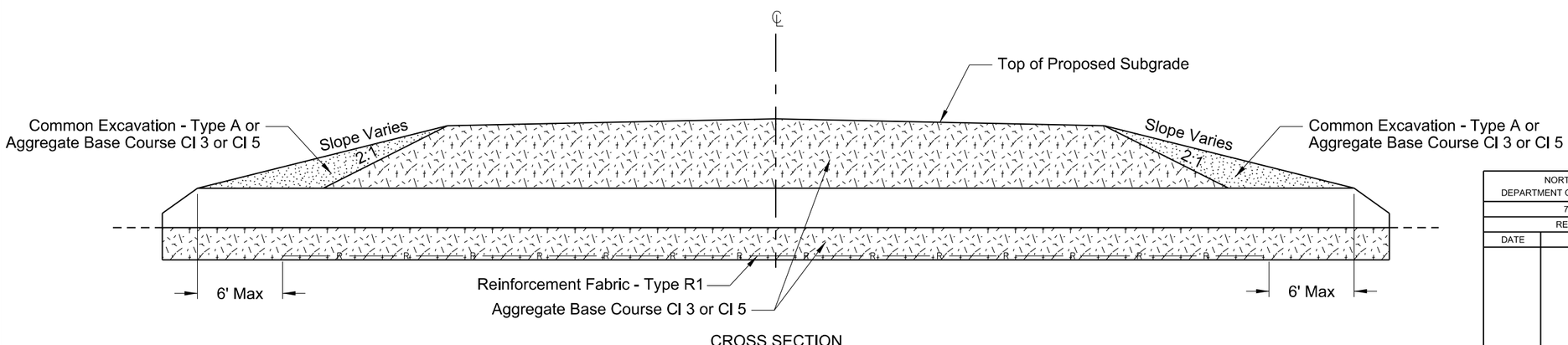
D-714-26



EXCAVATION DETAIL - PROFILE VIEW



INSTALLATION DETAIL - PROFILE VIEW



CROSS SECTION

Pay Items
1) Pipe*
2) Reinforcement Fabric - Type R1
3) Removal of Pipe (if required)

*Included in Pipe Pay Item
1) Pipe
2) Trench Excavation
3) Aggregate Base Course CI 3 or CI 5
4) Common Excavation - Type A

NOTES:

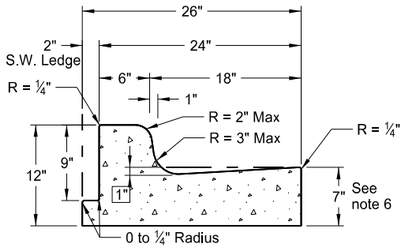
1) This drawing applies to new/replaced mainline and paved intersection roadway pipes only (including ramps). It does not include pipes in approaches.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-26-13	
REVISIONS	
DATE	CHANGE

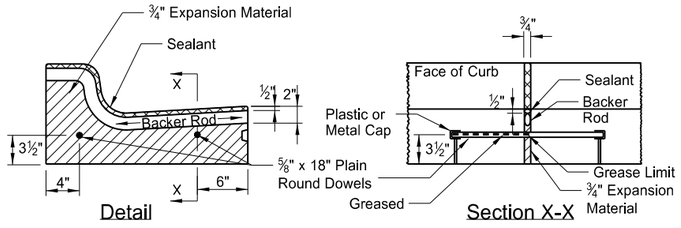
This document was originally issued and sealed by Ron Horner, Registration Number PE-2087, on 7/26/13 and the original document is stored at the North Dakota Department of Transportation

Curb & Gutter and Valley Gutter

D-748-1

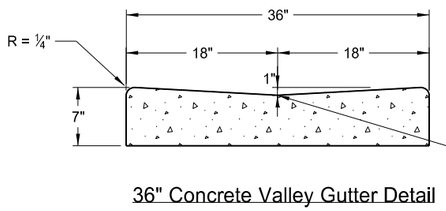


Curb & Gutter Type 1 (Sec. A & B)
Adjacent to Concrete Sidewalk, Median, or Parking Lot.
(Sec. A shown. See Sec B for additional details.)

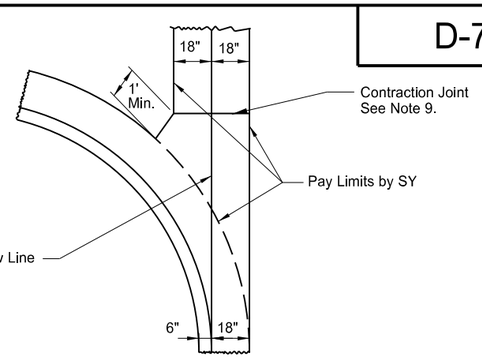


Detail — Section X-X

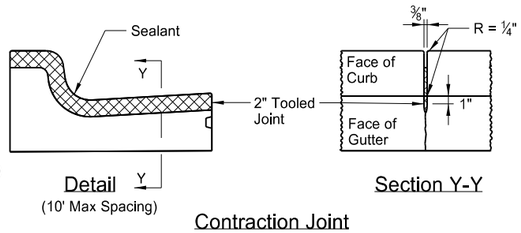
Isolation Joint



36" Concrete Valley Gutter Detail

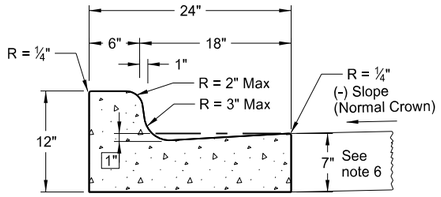


36" Concrete Valley Gutter Plan

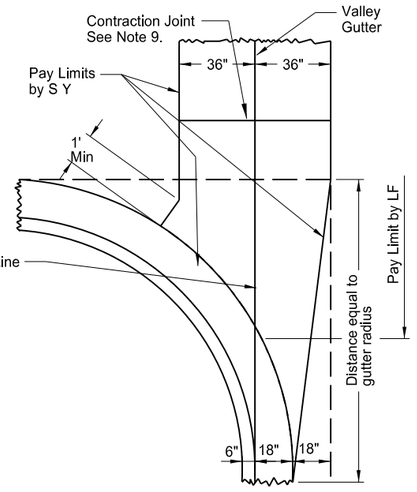


Detail (10' Max Spacing) — Section Y-Y

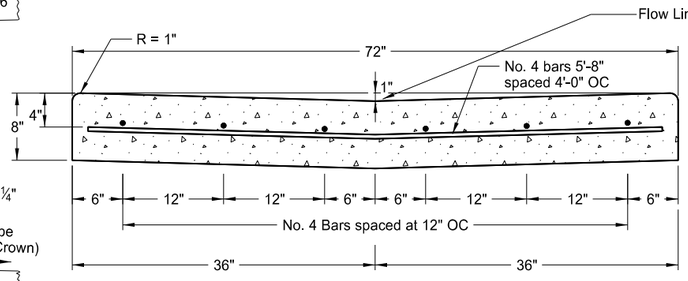
Contraction Joint



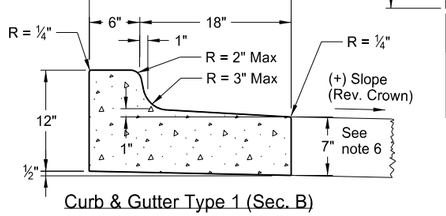
Curb & Gutter Type 1 (Sec. A)



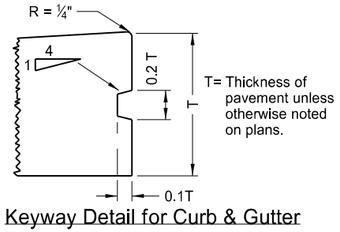
72" Concrete Valley Gutter Plan



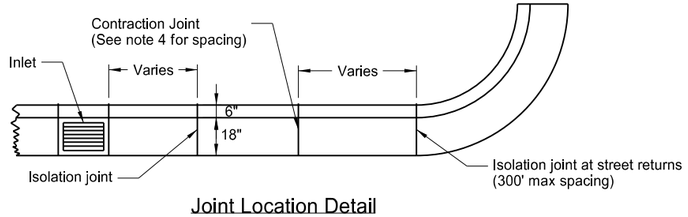
72" Concrete Valley Gutter Detail



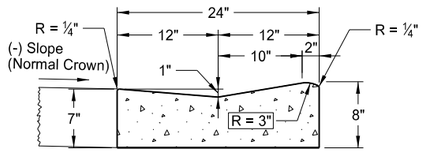
Curb & Gutter Type 1 (Sec. B)



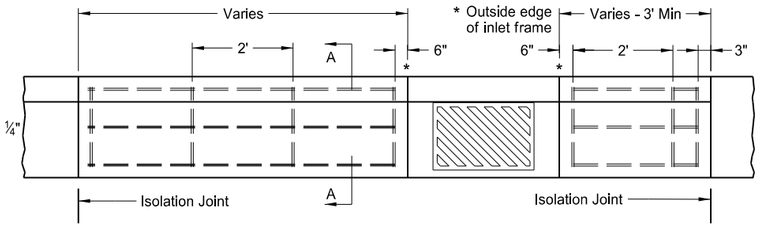
Keyway Detail for Curb & Gutter
(To be used with PCC Pavement and Drives)



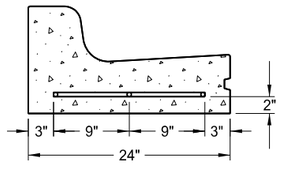
Joint Location Detail



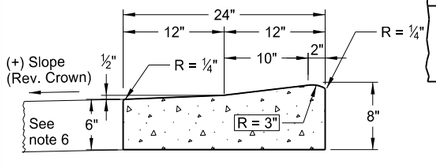
Mountable Curb & Gutter Type 1 (Sec. A)



Curb & Gutter Reinforcing at Inlets



Section A-A



Mountable Curb & Gutter Type 1 (Sec. B)

NOTES:

1. Curb and Gutter Type 1 (Sec. A & B) to be used. Section "A" to be used with (-) pavement slopes and section "B" to be used with (+) pavement slopes.
2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
3. Isolation Joints: Isolation joint material shall be 3/4" preformed expansion joint filler conforming to the standard specifications. The opening for the backer rod and joint sealant shall be formed by a pre-cut piece of wood or other material approved by the engineer. Dowel supports are not required on the second pour at a cold joint, plastic or metal caps and greased dowels shall be installed in the cold joint for the second pour.
4. Joint Spacing: For hot bituminous pavements the joint spacing for the curb and gutter shall be 10' max. with the panels on each side of the inlets. For concrete pavements the joint spacing for the curb and gutter shall match the pavement joint on PCC Pavements of approximately 15' spacing.
5. Joint sealing: All contraction and isolation joints shall be sealed as shown in the details. The joint sealant for contraction joints shall conform to section 826.02B.The sealant for expansion joints shall be as specified in note 3 above. The sealant shall be tooled and installed in accordance with the manufacturer's recommendations.
6. Depth of Face of Gutter: For hot bituminous pavement the depth of gutter shall be 7" as shown. For PCC pavements, the Contractor has the option to match the depth of gutter to the depth of the adjacent PCC pavement or to construct a 7" depth as shown.
7. When the curb and gutter abuts PCC pavement, it shall be tied to the PCC pavement. The tie bar shall consist of a No. 3 bar, 1'-6" in length spaced 4' center to center.
8. On street returns and other locations where the new curb and gutter ends and does not abut existing curb and gutter, the end two (2) feet of the curb shall be tapered from 6" in height to 0". A 1/2" premolded isolation joint which is full depth and the same shape as the curb and gutter shall be installed just ahead of the taper. An 18" tie bar shall be installed across the joint.
9. Valley Gutter Joints: Contraction joints are required at approx. 10' intervals. The contraction joints shall be ⅛" min. to ⅜" max. in width. The joints shall be formed by sawing or scoring to a minimum depth of 2". The joint sealant shall be a hot poured elastic type joint sealer in accordance with Section 826.02A.2 of the Standard Specifications. The joint and sealant shall be included in the price bid for Valley Gutter.

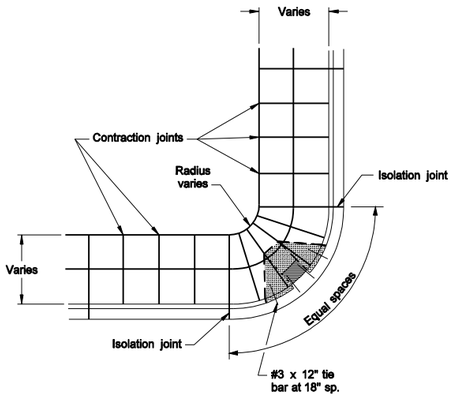
NOTE: All bars shall be #4 deformed reinforcing bars. Splices will not be permitted. Reinforcing bars at inlet locations will not be paid for separately, but shall be included in the price bid for "Curb and Gutter - Type 1." This includes inlets located on radii. The reinforcement shall be extended to the second joint (rebar placed through the first joint) in cases where the 3' min. panel length cannot be obtained.

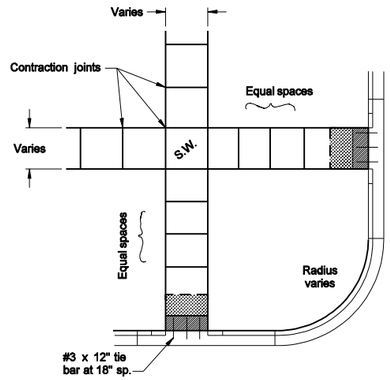
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-7-2013	
REVISIONS	
DATE	CHANGE

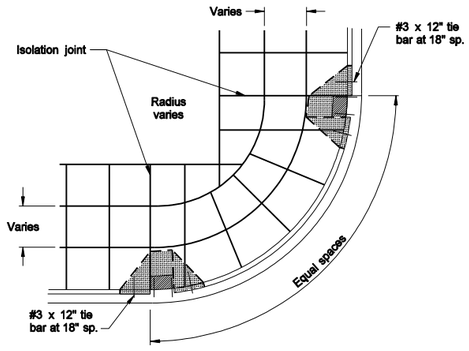
This document was originally issued and sealed by Roger Weigel Registration Number PE-2930, on 08/07/2013 and the original document is stored at the North Dakota Department of Transportation

SIDEWALK

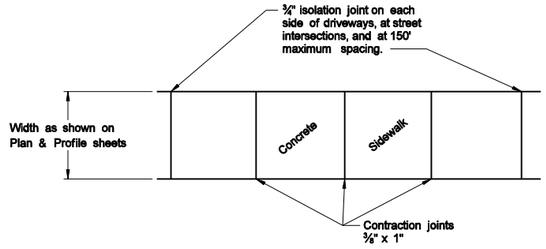
D-750-2



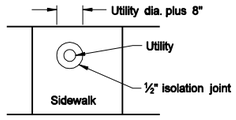




TYPICAL JOINT LAYOUTS



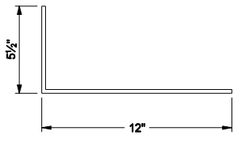
CONCRETE SIDEWALK DETAILS



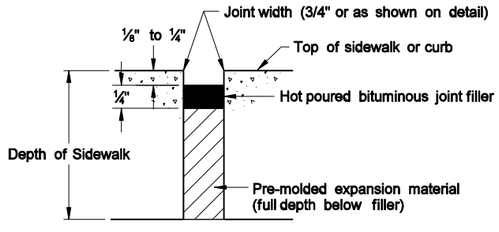
UTILITY BLOCKOUT

Notes:

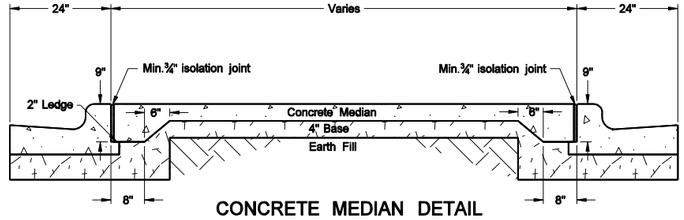
1. Method of payment: The curb ramp will not be paid for separately, but shall be included in the quantities & paid for at the unit price for concrete sidewalk and curb & gutter.
2. The cost for all labor, equipment, and material (pre-molded expansion material & hot bituminous joint filler) necessary to construct contraction and isolation joints shall be included in the price bid for sidewalk.
3. 4" base material shall be placed under the concrete sidewalk. All labor and materials necessary to place the base material shall be included in the price bid for Salvage Base Course or Aggregate Base Course CL 5.
4. Details showing curb ramps and detectable warning panels on this drawing are for joint and reinforcing layout purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
5. As shown in the plans or as directed by the engineer, a curb shall be constructed where the existing sidewalk is to be lowered, or abuts a building or adjacent property. The curb will be paid for at the unit price bid for the item "Curb - Type I" per lineal foot.
6. Transverse sidewalk joint spacing shall vary from 4'-6' to create approximate square panels. When the sidewalk is adjacent to the curb & gutter, the sidewalk joint spacing shall be varied so that the sidewalk joints match up with the curb & gutter joints.
7. Longitudinal joints shall be used where the sidewalk width is 8' or greater, and shall be spaced at half the sidewalk width.



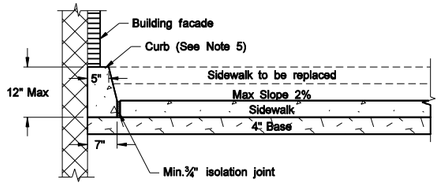
"L"BAR DETAIL
#3 BAR



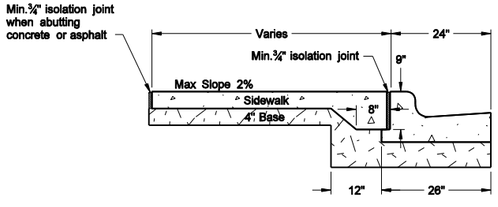
TYPICAL ISOLATION JOINT SEAL
(longitudinal and transverse)



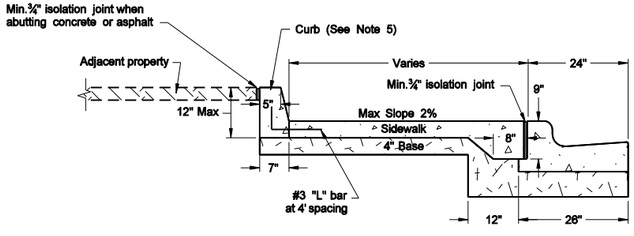
CONCRETE MEDIAN DETAIL



SIDEWALK WITH CURB DETAIL
(Building face application)



SIDEWALK DETAIL
(Installed adjacent to curb and gutter)



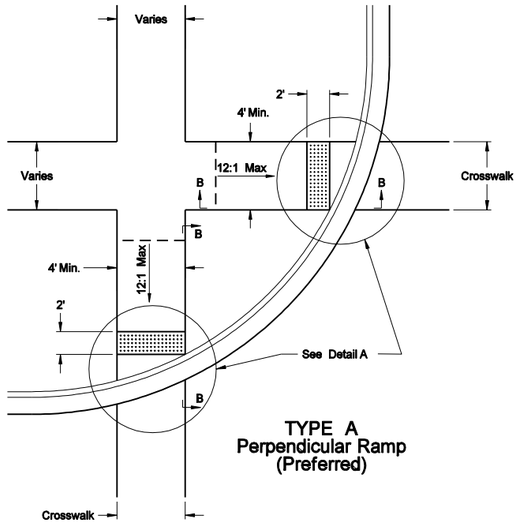
SIDEWALK WITH CURB DETAIL
(Adjacent property application)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
09-01-92	Remove Detectable Warning
09-23-92	Revised Expansion Joint
12-05-93	Isolation Joint
02-16-94	General Revisions
07-18-01	Revised joints
03-11-02	Revised Section A-A
10-23-03	Added detectable warning
01-15-04	Added Maximum Slopes
01-24-04	Rev notes - Added base
12-01-04	PE Stamp added
09-12-07	Major Revisions
11-02-07	Thickened sidewalk abutting curb & gutter,added concrete median detail

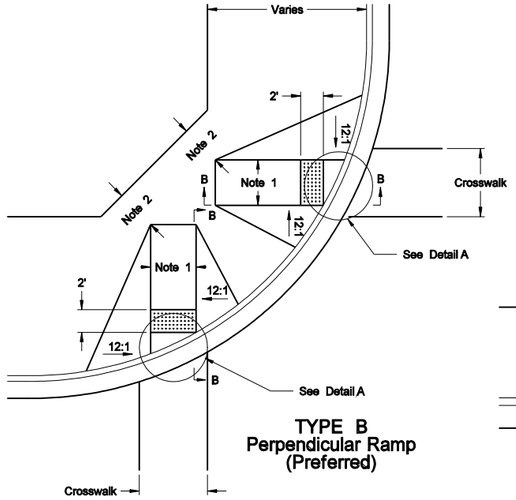
This document was originally issued and sealed by Mark S Gaydos, Registration Number PE- 4518 , on 11/02/07 and the original document is stored at the North Dakota Department of Transportation

CURB RAMP DETAILS

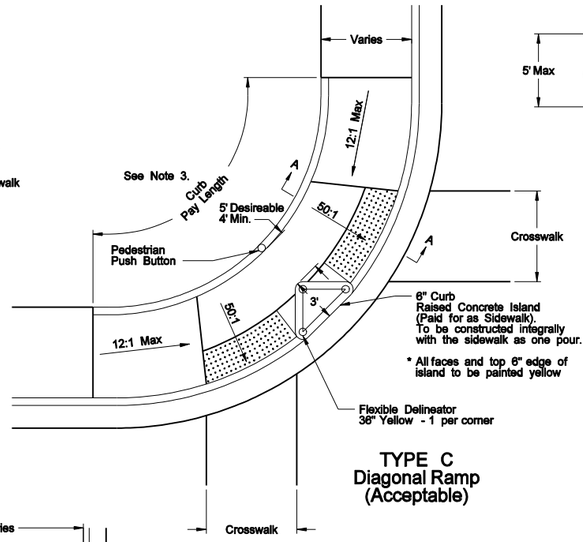
D-750-3



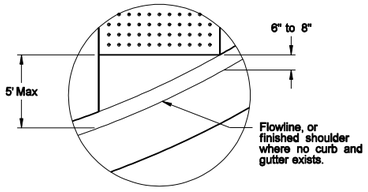
TYPE A
Perpendicular Ramp
(Preferred)



TYPE B
Perpendicular Ramp
(Preferred)



TYPE C
Diagonal Ramp
(Acceptable)



Detail A

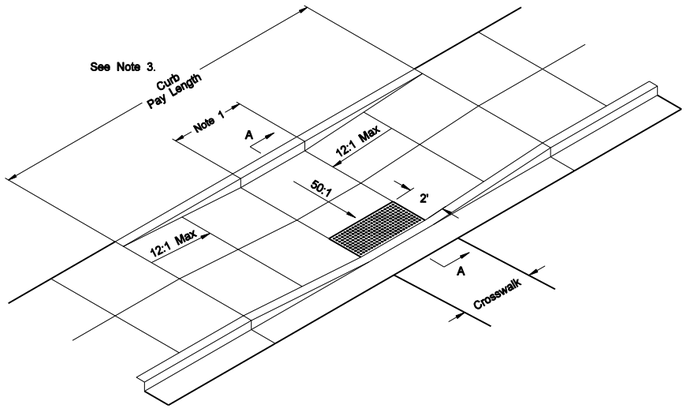
Notes:

1. For sidewalk installations, a 5' ramp width should be used. Where site conditions do not allow a 5' ramp width, a 4' ramp width may be used. Detectable warning panels shall be installed to match the ramp width (Ramp width is defined as the useable portion of ramp,excluding flared aprons if used).

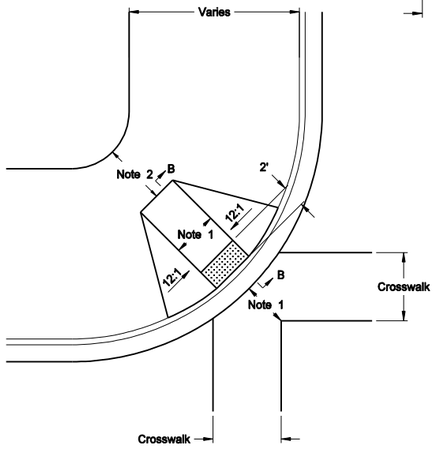
   Where ramps are installed for shared-use paths, the ramp width and detectable warning panel width shall be equal to the width of the shared-use path.

2. 5' is desireable but 4' is the minimum allowable distance. If the 4' minimum distance cannot be provided, Ramp Type C shall be used.

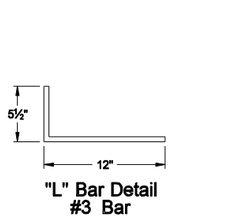
3. The curb shown in the details for Type C and D curb ramps shall be measured by the lineal foot, and paid for at the unit price bid for the item "Curb - Type I."



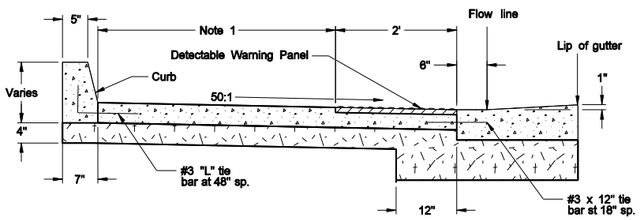
TYPE D
Perpendicular Ramp
(Acceptable)



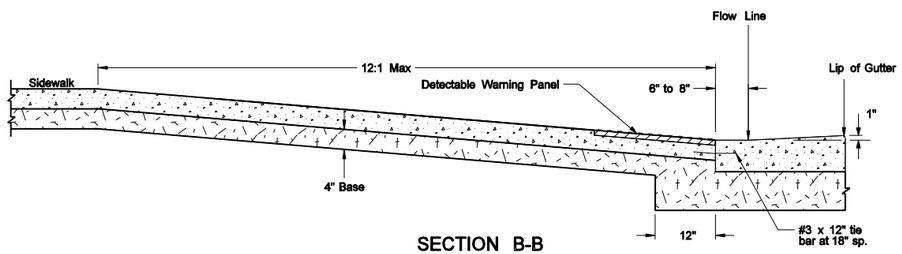
TYPE E
Diagonal Ramp
(Where Necessary)



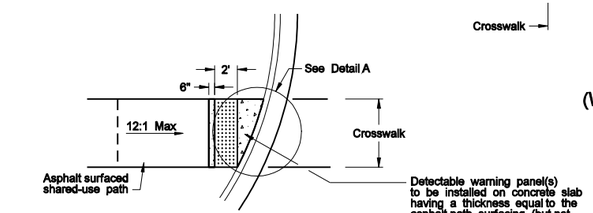
"L" Bar Detail
#3 Bar



SECTION A-A

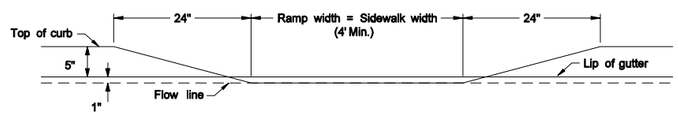


SECTION B-B

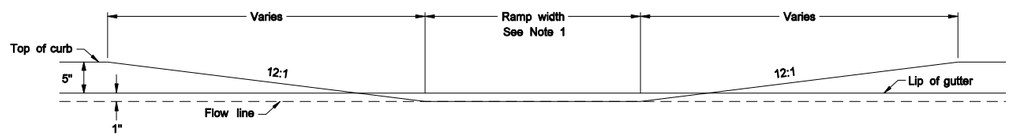


Concrete Pad Detail For
Asphalt Surfaced Shared-Use Path

Detectable Warning Panel(s)



DEPRESSED CURB FOR PEDESTRIAN CROSSING
(TYPE A RAMP)



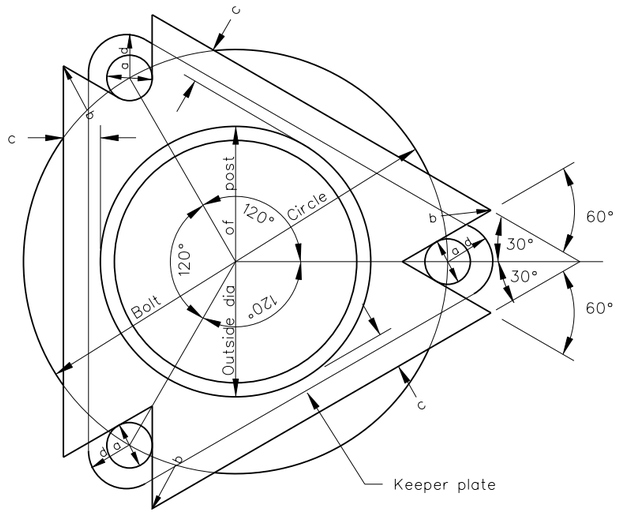
DEPRESSED CURB FOR PEDESTRIAN CROSSING
(TYPE B & E RAMPS)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
09-13-07	
REVISIONS	
DATE	CHANGE
09-20-07	Revised detail A
10-26-07	Revised Section B-B, detail C, misc. labeling, Notes, and added concrete pad detail.
12-18-07	Revised Note 1.

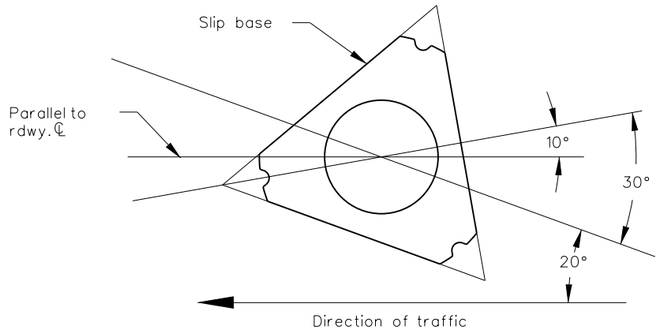
This document was originally issued and sealed by Mark S Gaydos, Registration Number PE- 4518 , on 12/18/07 and the original document is stored at the North Dakota Department of Transportation

MULTI-DIRECTIONAL BREAK AWAY BASE

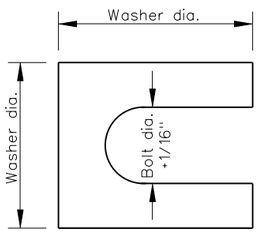
D-754-4



PLAN

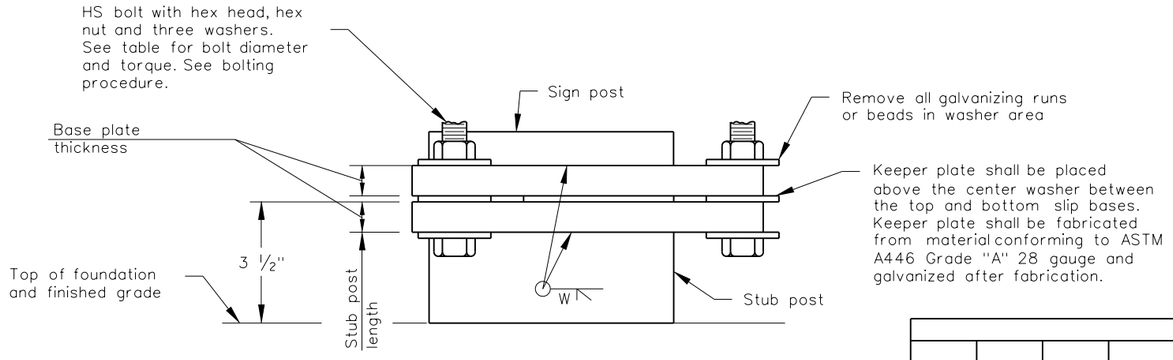


SLIP BASE PLACEMENT DETAIL



Furnish 2 ea. .012"± thick and 2 ea. .032"± thick shims per post. Shims shall be fabricated from brass shim stock or strip conforming to ASTM-B36.

SHIM DETAIL



ELEVATION
MULTI. DIRECTION SIGN POST
TYPE D

NOTES:

Foundations shall be similar to those shown on the break away and foundation details except for the type of slip base, in lieu of stub post shown, the anchor bolt connection shown on the break away and foundation details may be used.

Assembly Procedure

1. Assemble post to stub with bolts and with one flat washer between base plates and keeper plate.
2. Shim as required to plumb post.
3. Tighten all bolts the maximum possible with 12" to 15" wrench to bed washers and shims and to clean bolt threads, then loosen.
4. Retighten bolts in a systematic order to prescribed torque. (see table)
5. Loosen each bolt and apply thread locking liquid resin. The liquid locking resin shall be "Locktite" manufactured by Locktite Corporation or equal. The thread locker shall secure the entire assembly from vibration, pressure and corrosion. The thread locker shall fill the gaps between the thread and the mating surface to form solid one part assemblies.
6. Retighten each bolt to prescribed torque in the same order as initial retightening.

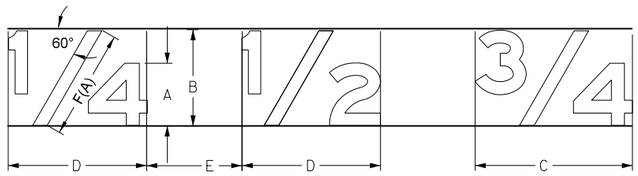
MULTI-DIRECTIONAL SLIP BASE											
NOMINAL POST DIA.	OUTSIDE POST DIA.	BOLT CIRCLE	a Radius	b Radius	c Radius	BOLT SIZE	BASE PLATE THICKNESS	W	BASE BOLT TORQUE Ft. lbs.	d Radius	STUB POST LENGTH
STEEL											
3 ½"	4"	7"	1 1/16"	1/8"	1 1/8"	1" x 4"	1 1/4"	5/16"	55	1 1/8"	1'-6"
4"	4.5"	7 ½"	1 1/16"	1/8"	1 1/8"	1"x 4 ½"	1 1/2"	3/8"	98	1 1/8"	1'-6"
5"	5.563"	9 ½"	1 5/16"	1/8"	1 1/8"	1 1/4" x 5"	1 1/2"	3/8"	167	1 3/8"	2'-0"
ALUMINUM											
3 ½"	4"	7"	13/16"	1/8"	7/8"	3/4"x3 ½"	1"	5/16"	43	7/8"	1'-6"
4"	4.5"	7 ½"	13/16"	1/8"	3/4"	3/4"x 4"	1 1/4"	5/16"	76	7/8"	1'-6"
5"	5.563"	9 ½"	1 1/16"	1/8"	1 1/8"	1" x 4"	1 1/4"	5/16"	98	1 1/8"	2'-0"
6"	6.625"	10 1/4"	1 1/16"	1/8"	3/4"	1" x 4 ½"	1 1/2"	3/8"	134	1 1/8"	2'-0"
8"	8.625"	12 ½"	1 5/16"	1/8"	3/4"	1 1/4" x 5"	1 1/2"	1/2"	189	1 3/8"	2'-6"

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-15-94	
REVISIONS	
DATE	CHANGE
06-20-95	Notes
08-14-95	Stub post dimension
03-07-01	Layout revision
03-05-03	Welding symbol
08-09-04	Revised elevation view
12-01-04	PE Stamp added

This document was originally issued and sealed by MARK S. GAYDOS Registration Number PE- 4518 , on 12/01/04 and the original document is stored at the North Dakota Department of Transportation

LETTER AND ARROW DETAILS FOR VARIABLE LENGTH SIGNS

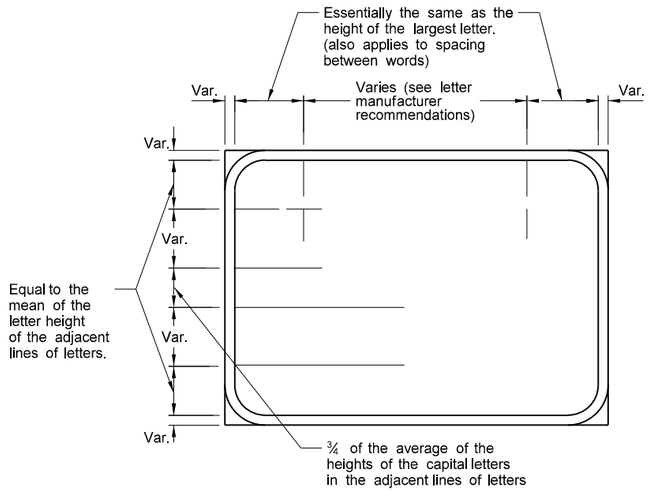
D-754-9



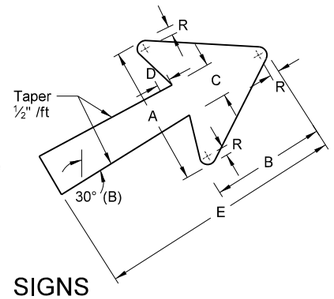
SIZE OF THE FRACTION IS DETERMINED AS FOLLOWS:

SYMBOL	TITLE	RATIO TO HEIGHT OF CAPITAL OR UPPER CASE
A	Letter height	1.0 of capital or upper case
B	Fraction height	1.5 X A
C	Fraction width	2.5 X A
D	Fraction width	2 X A
E	Space to next character	1 to 1.5 X A
F(A)	Length of diagonal	1.75 X A

(A) Diagonal stroke of fraction is to be centered optically.



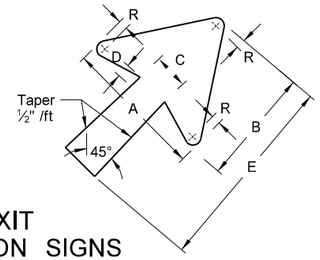
TYPICAL SPACING



(B) When exit number is within the sign face, the arrow shall be at 45°

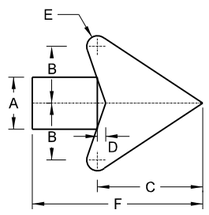
GORE SIGNS

"EXIT" LETTER SIZE (Upper Case)	A	B	C	D	E	R
8"	15⅛"	11 9/16"	3¾"	1 5/16"	25"	13/16"
10" - 13⅓"	18¼"	14"	4½"	1½"	30"	¾"



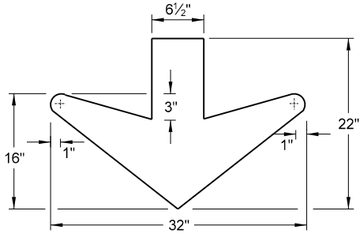
EXIT DIRECTION SIGNS

LETTER SIZE (Upper Case)	A	B	C	D	E	R
8"	15⅛"	11 9/16"	3¾"	1 5/16"	17"	13/16"
10" - 13⅓"	18¼"	14"	4½"	1½"	20"	¾"
16" - 20"	22¼"	17"	5⅜"	1¾"	25"	1"



DISTANCE AND DESTINATION SIGNS

LETTER SIZE (Upper Case)	A	B	C	D	E	F
6"	2¾"	3"	5 9/16"	7/16"	9/16"	9"
8"	3½"	4"	7⅛"	9/16"	11/16"	12"
12"	5¼"	6"	10⅝"	13/16"	1 1/16"	18"



DOWN ARROW

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-3-11	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 08/03/11 and the original document is stored at the North Dakota Department of Transportation

NOTES:

1. Curbed Roadways: The clearance from the face of the curb should be 3' except where right of way or sidewalk width is limited, a minimum clearance of 2' shall be provided. The horizontal clearance may need to be increased to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.

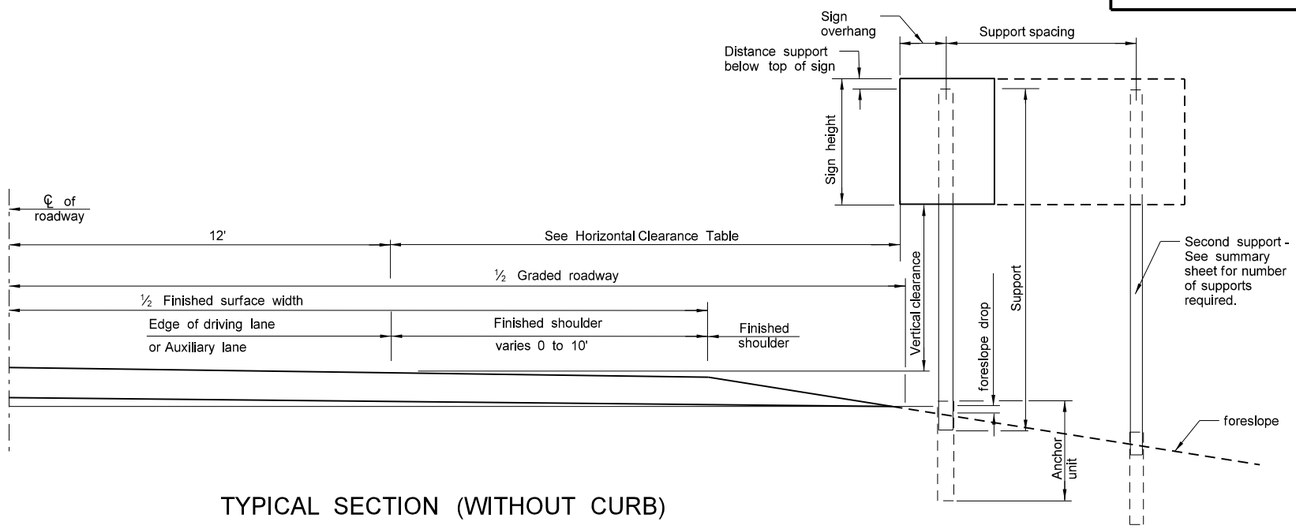
2. Minimum Vertical clearance: Signs installed at the side of the road in rural districts shall be at least 5' measured from the bottom of the sign to the edge of the driving lane or auxillary lane. Where parking or pedestrian movements occur, the clearance to the bottom of the sign shall be at least 7'.

Directional signs on expressways and freeways shall be installed with a minimum height of 7'. If the secondary sign is mounted below another sign, the major sign shall be installed at least 8' and the secondary sign shall be installed at least 5' above the edge of the driving lane. All route signs, warning signs, and regulatory signs on expressways and freeways shall be at least 7' above the edge of the driving lane. Where signs are placed at least 30 feet or more from the edge of the traveled way, the height to the bottom of such sign shall be 5' above the edge of the driving lane.

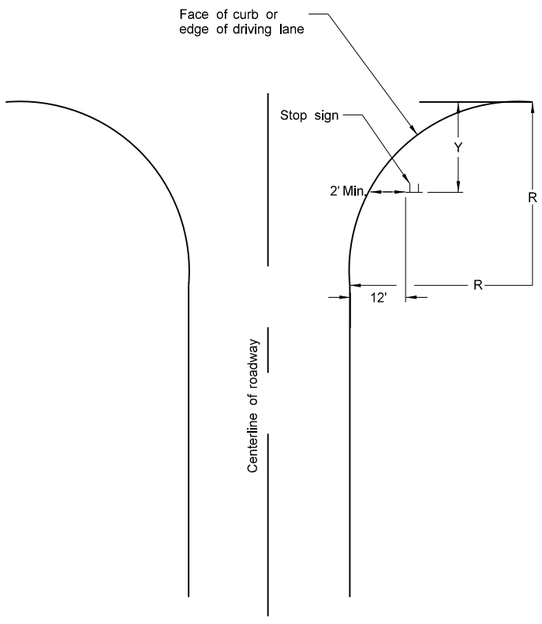
The vertical clearance shall have a maximum height of 6" above the vertical clearance specified above.

HORIZONTAL CLEARANCE TABLE	
SHOULDER WIDTH ft	OFFSET ft
0 to 2	16
>2 to 4	18
>4 to 6	20
>6 to 8	22
>8 to 10	24

ASSEMBLY DETAILS



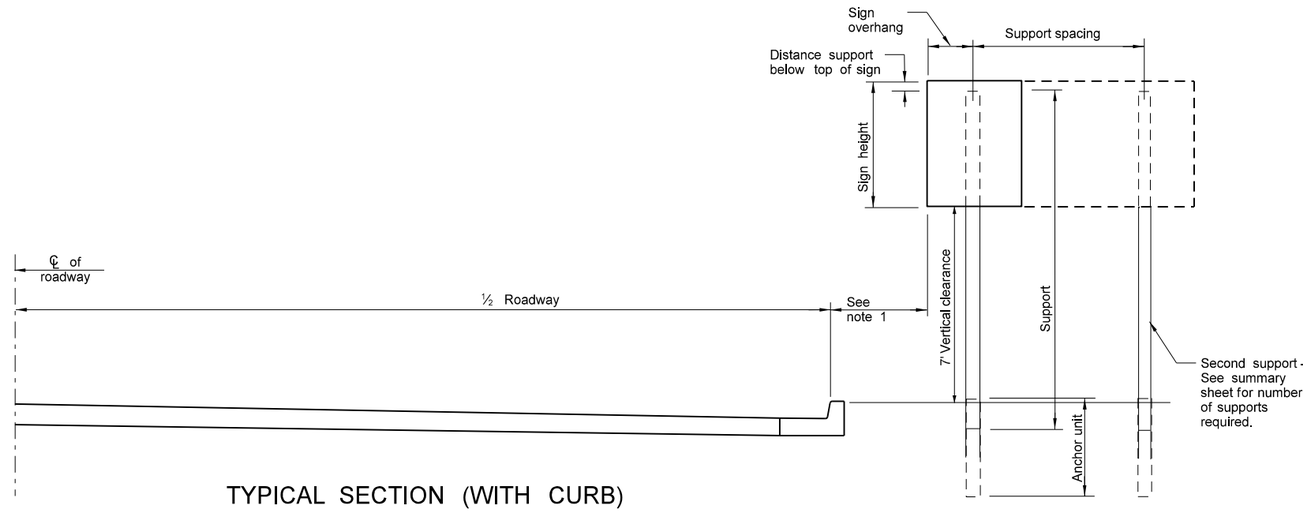
TYPICAL SECTION (WITHOUT CURB)



R=Radius	Y-Max	Y-Min
40'	50'	15'
45'	50'	18'
50'	50'	21'
55'	50'	25'
60'	50'	28'
65'	50'	32'
70'	50'	35'
75'	50'	39'
80'	50'	43'

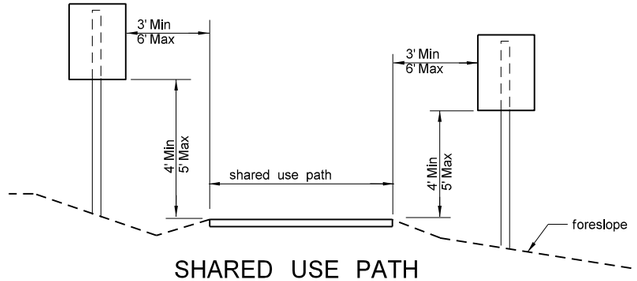
STOP SIGN LOCATION WIDE THROAT INTERSECTION

Note: This layout is to be used for the placement of "Stop" signs.



TYPICAL SECTION (WITH CURB)

Residential or Business District



SHARED USE PATH

Bicycle - Pedestrian Path

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

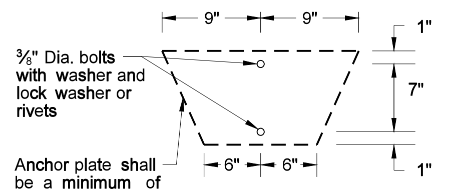
This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 12-1-10 and the original document is stored at the North Dakota Department of Transportation

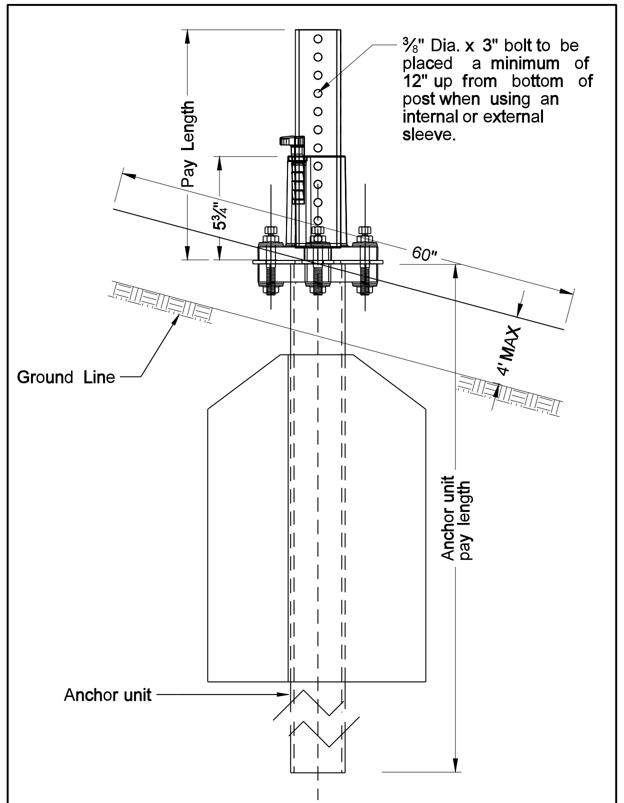
Mounting Details Perforated Tube

D-754-24

Number of Posts	Telescoping Perforated Tube: Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thick-ness Gauge
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2½(D)	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2½(D)	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2½(D)	12	Yes		7
3 & 4	2½	10	2³⁄₁₆	10	Yes		7

(B) - The 2½", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
(C) - 3" anchor unit
(D) - 2½" x 12 ga. x 18" minimum length external sleeve required.

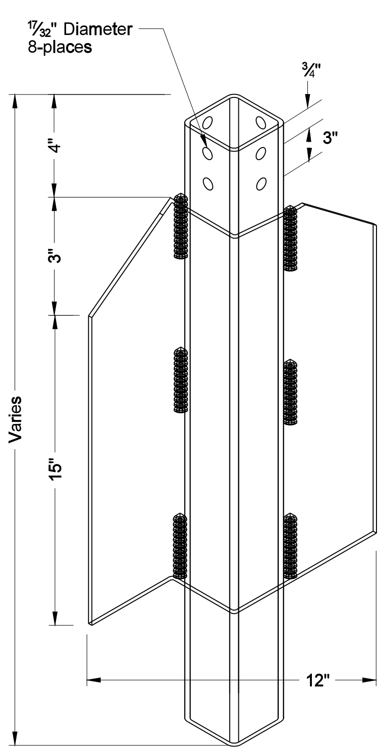




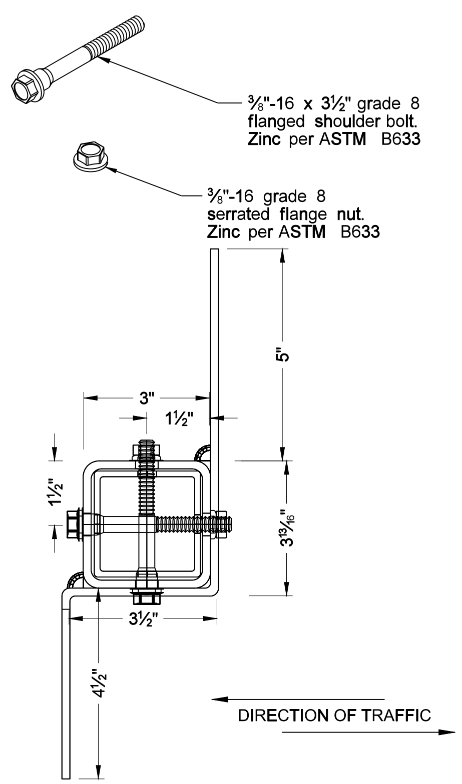
MULTI-DIRECTIONAL SLIP BASE ASSEMBLY:
2½" x 12 ga. may be inserted with 2¼" x 12 ga. & 2½" 10 ga. may be inserted with 2¹³⁄₁₆" x 10 ga. to achieve higher load ability.

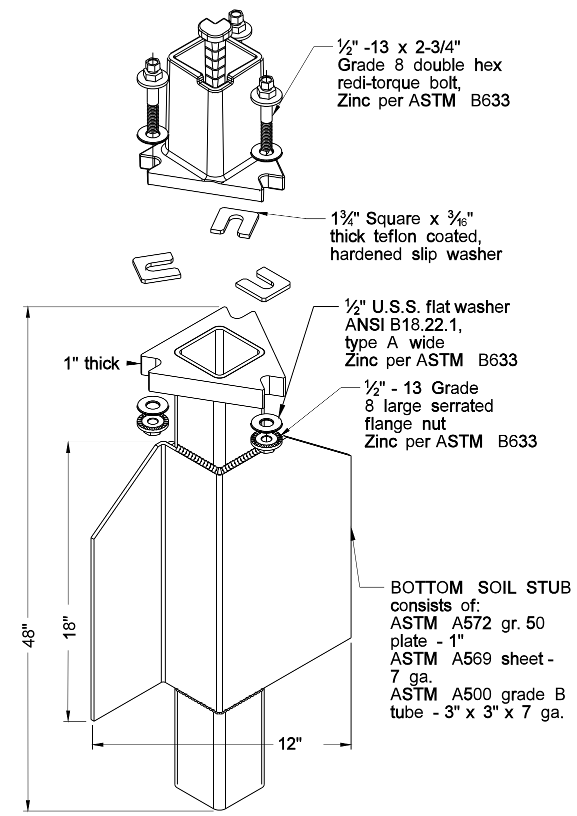
SHOULDER BOLT

Shimming agent to reduce tolerance between 3" anchor unit and 2½" post.
(standard ⅜" diameter grade 8 bolt may be used with proper shim)

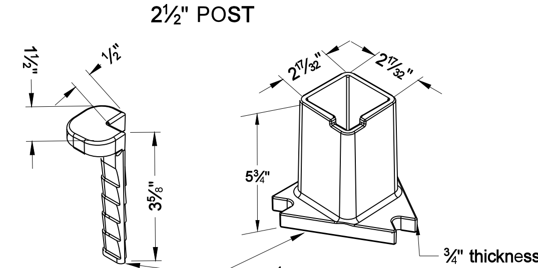


3" ANCHOR UNIT





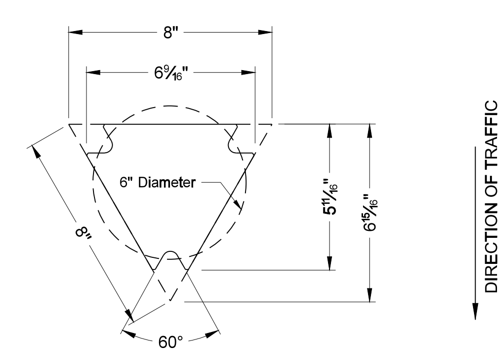
SLIP BASE FOR 2½" POST



POST LOCKING WEDGE

2½" SQUARE POST RECEIVER

Ductile Iron Casting class 65-45-12. Hot Dip Galvanize ASTM A153



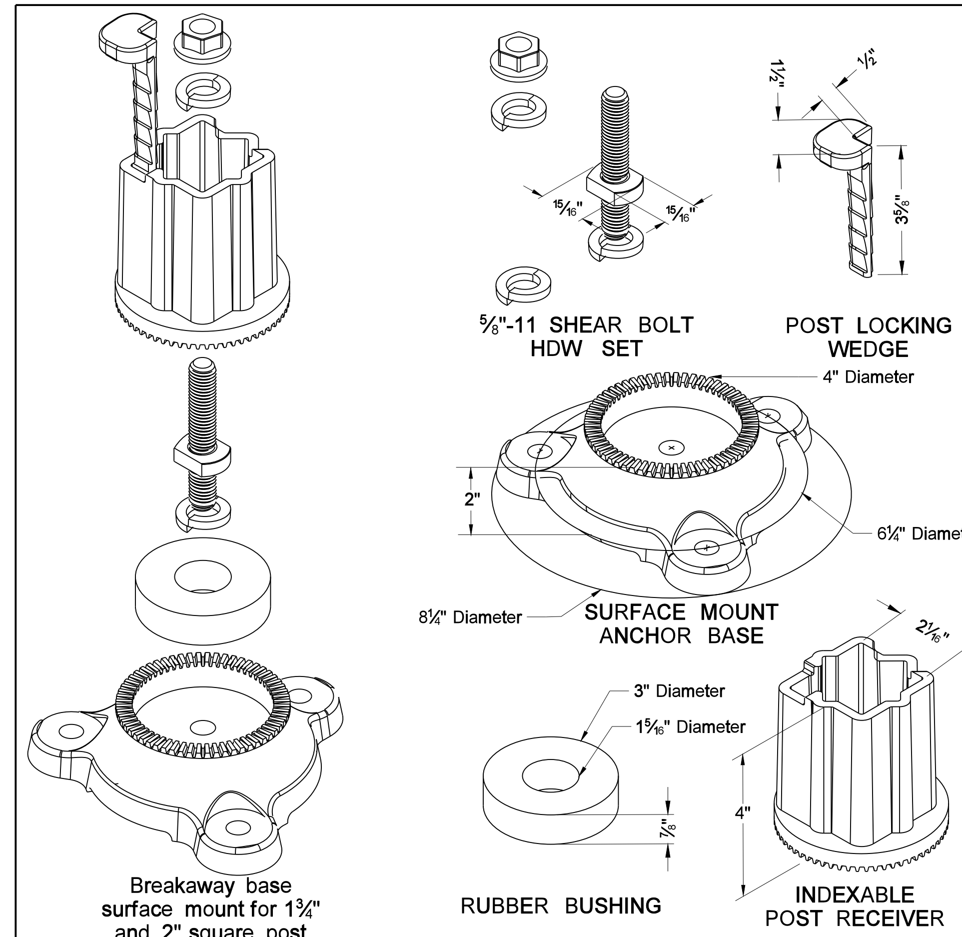
SLIP BASE DETAIL

Properties of Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness in.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia $In.^4$	Cross Sect. Area $In.^2$	Section Modulud $In.^3$
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2³⁄₁₆ x 2³⁄₁₆	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.783

The 2 ³⁄₁₆" size 10 gauge is shown as 2.19" size on the plans;
The 2½" size is shown as 2.51" size on the plans.

NOTE:

1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
2. Anchor material shall be 7 guage H.R.P.O. Commmercial quality ASTM A569 and 3" x 3" x 7" guage ASTM A500 grade B. Anchor shall have a yield strength 43.9 KSI and tensile strength of 59.3 KSI. Anchor shall be hot dipped galvanized per ASTM A123/153. All tolerances on anchor unit and slip base bottom assembly are +/- 0.005" unless ortherwise noted.
3. When used in concrete sidewalk, anchor shall be the same concept without the wings
4. Four post signs shall have over 8' between the first and fourth posts.
5. Installation procedures as per manufacturers recommendation.
6. Concrete fasteners for surface mount breakaway base shall be a minimum ½" diameter x 4" grade 8.



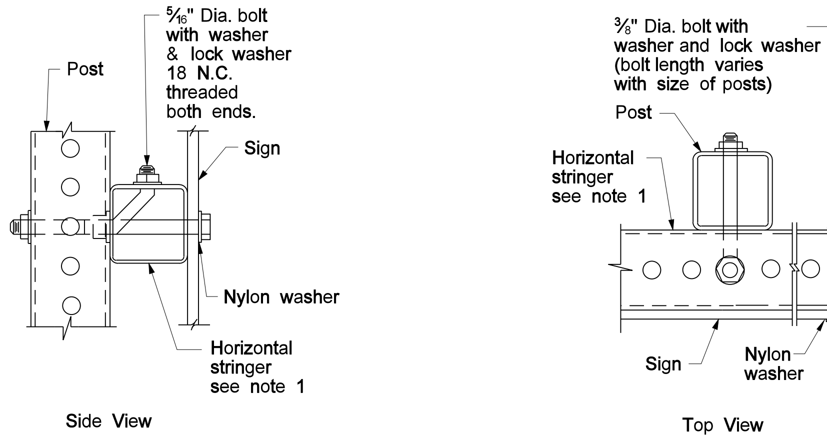
SURFACE MOUNT ANCHOR BASE

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-6-09	
REVISIONS	
DATE	CHANGE

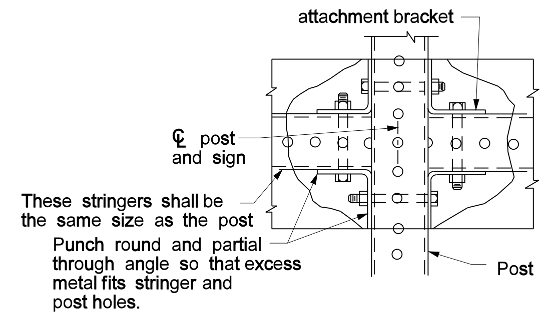
This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930, on 08/06/09 and the original document is stored at the North Dakota Department of Transportation

Mounting Details Perforated Tube

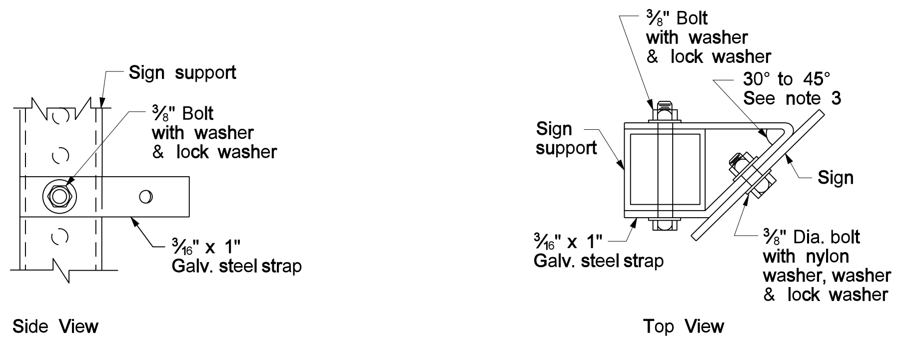
D-754-25



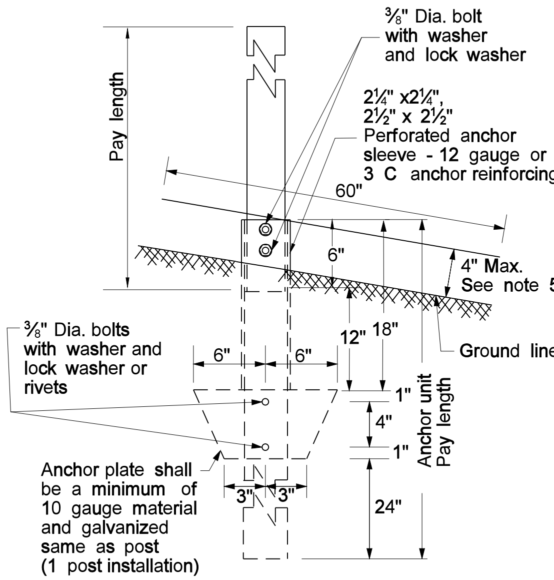
STRINGER MOUNTING
(WITH STRINGER IN FRONT OF POST)



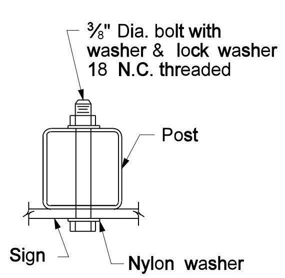
STREET NAME SIGNS
AND ONE WAY SIGNS
SINGLE POST ASSEMBLY
ONE STRINGER OR
BACK TO BACK MOUNTING



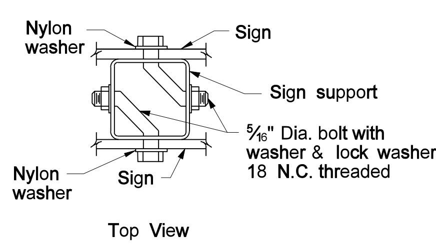
STRAP DETAIL



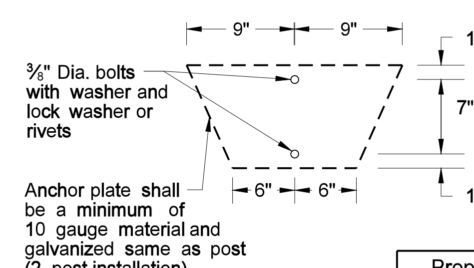
ANCHOR UNIT AND
POST ASSEMBLY



BOLT MOUNTING



BACK TO BACK
MOUNTING



Note:

1. Horizontal stringers - In lieu of perforated tubes, the contractor may substitute z bar stringers. The z bar stringers shall be 1¾" x 3⁄16" thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel.
2. Metal washers used on sign face shall have a minimum outside diameter of 15⁄16" ± 1⁄16" and 10 gauge thickness.
3. No Parking Signs: All no parking signs with directional arrows shall be placed at a 30 to 45 degree angle with the line of traffic flow. No parking signs required at the above angles may have the support turned to the correct angle. If the no parking sign is placed with another sign that has to be placed at a 90 degree angle with the line of traffic flow, the detailed angle strap should be used to mount the no parking sign. Flat washers and lock washers shall be used with all nylon washers. Material used for the attachment strap shall be included in the price bid for "Flat sheet for signs."
4. In lieu of using the bent bolt to attach the post to the stringer, the contractor may choose to punch the sign backing and place the bolt through the sign, the stringer and the post.
5. 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thick-ness Gauge
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2½(D)	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2½(D)	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2½(D)	12	Yes		7
3 & 4	2½	10	2 3⁄16	10	Yes		7

(B) - The 2½", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
(C) - 3" anchor unit
(D) - 2½" x 12 ga. x 18" minimum length external sleeve required.

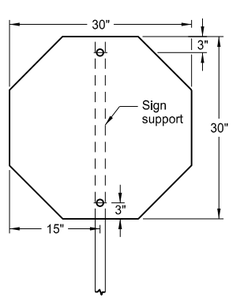
Properties of Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia $In.^4$	Cross Sect. area $In.^2$	Section Modulus $In.^3$
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2 3⁄16 x 2 3⁄16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.783

The 2 3⁄16" size 10 gauge is shown as 2.19" size on the plans.
The 2½" size is shown as 2.51" size on the plans.

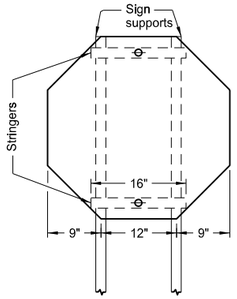
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-6-09	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930 , on 08/06/09 and the original document is stored at the North Dakota Department of Transportation

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS

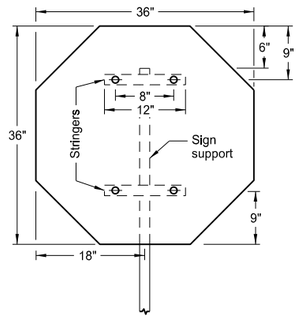


1 Post

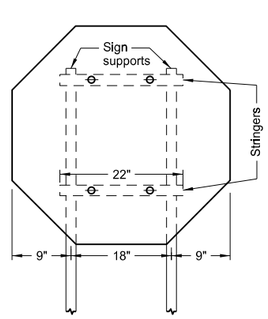


2 Posts

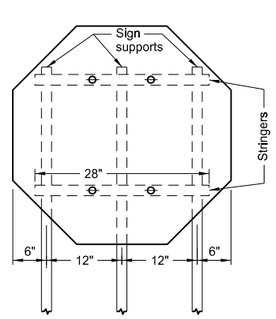
Assembly No. 1



1 Post



2 Posts



3 Posts

Assembly No. 2

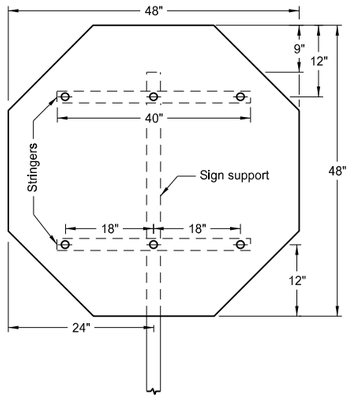
Notes:

1. See Standard D-754-25 for mounting details.

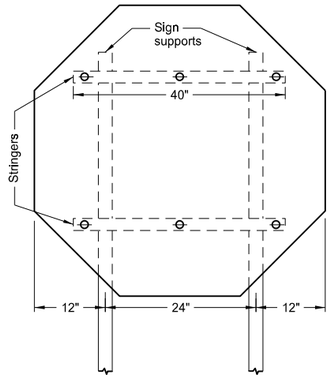
2. The minimum sign backing material thickness shall be 0.100 inch.

3. Perforated square tube stringer shall be 1½" x 1½".

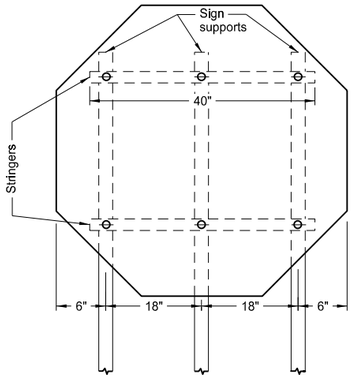
4. All holes shall be punched round for ⅜" bolt.



1 Post

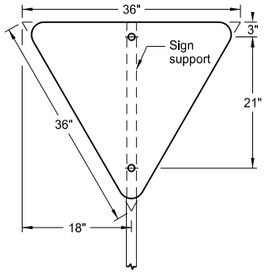


2 Posts

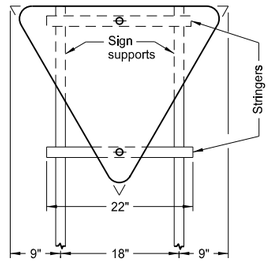


3 Posts

Assembly No. 3

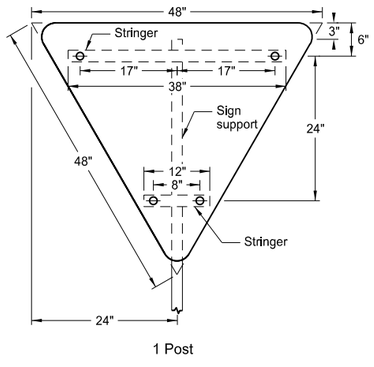


1 Post

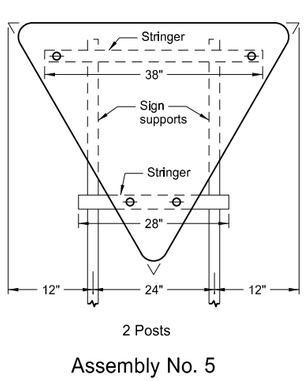


2 Posts

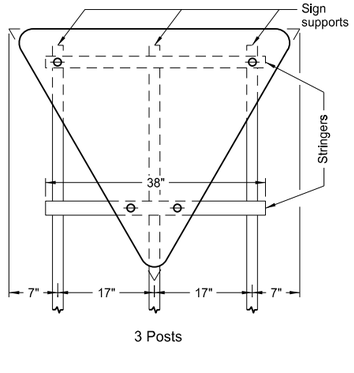
Assembly No. 4



1 Post



2 Posts



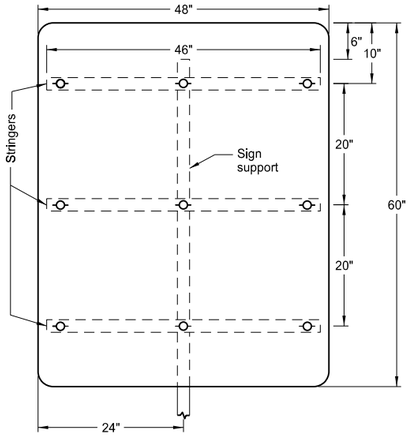
3 Posts

Assembly No. 5

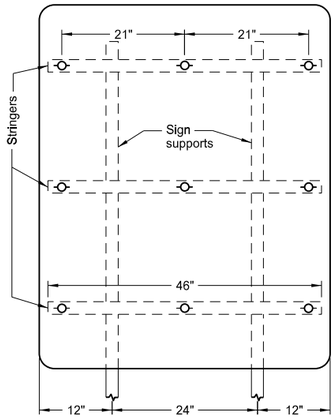
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930 , on 12-1-10 and the original document is stored at the North Dakota Department of Transportation

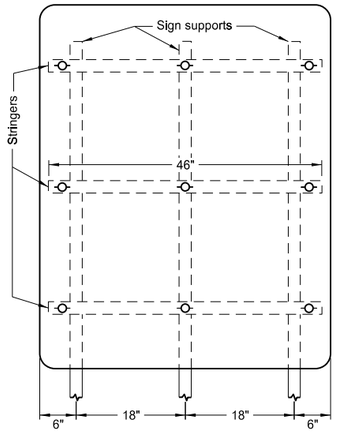
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION
DETAILS REGULATORY, WARNING AND GUIDE SIGNS



1 Post

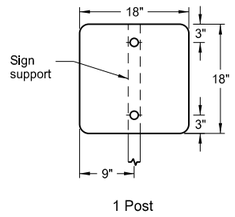


2 Posts



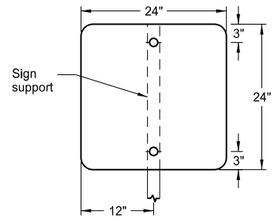
3 Posts

Assembly No. 12

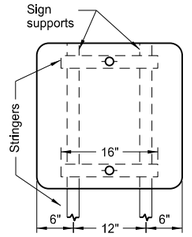


1 Post

Assembly No. 13

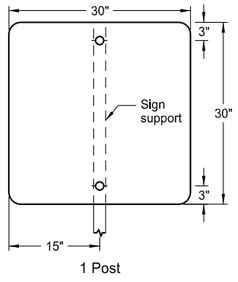


1 Post

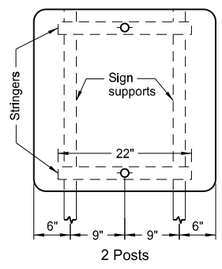


2 Posts

Assembly No. 14

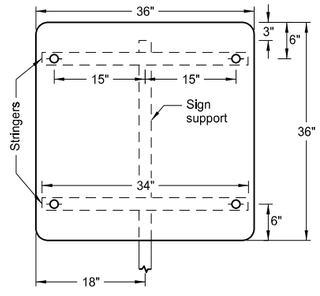


1 Post

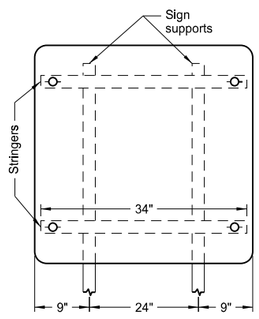


2 Posts

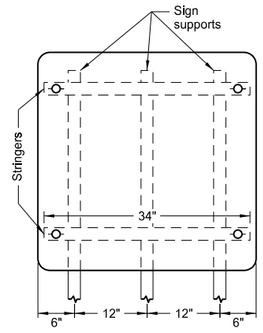
Assembly No. 15



1 Post

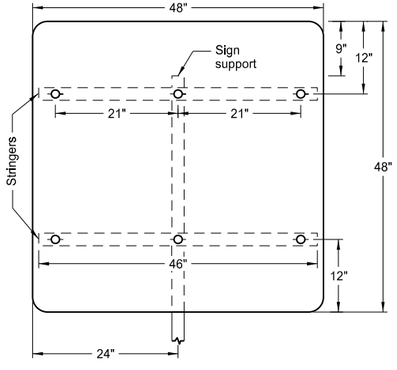


2 Posts

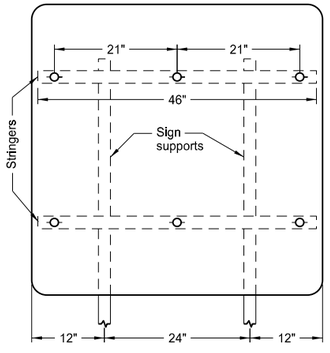


3 Posts

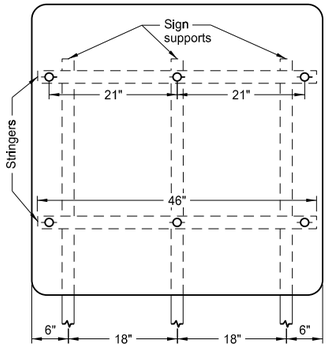
Assembly No. 16



1 Post



2 Posts



3 Posts

Assembly No. 17

Notes:

1. See Standard D-754-25 for mounting details.

2. The minimum sign backing material thickness shall be 0.100 inch.

3. Perforated square tube stringer shall be 1½" x 1½".

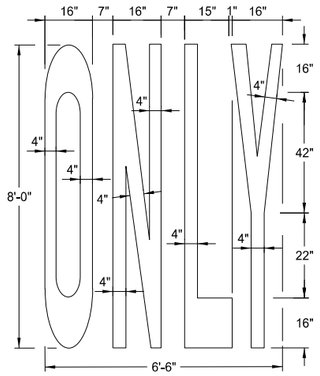
4. All holes shall be punched round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

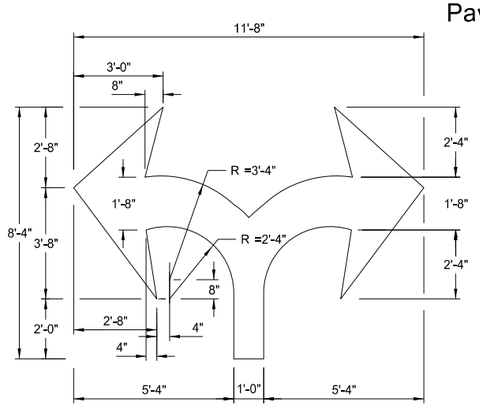
This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 12-1-10 and the original document is stored at the North Dakota Department of Transportation

Pavement Marking Message Details

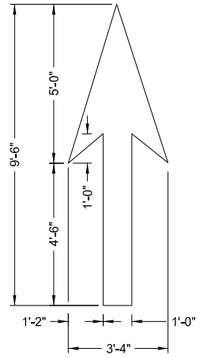
D-762-1



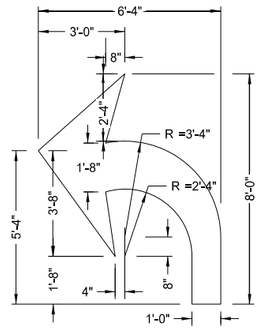
22 S. F.



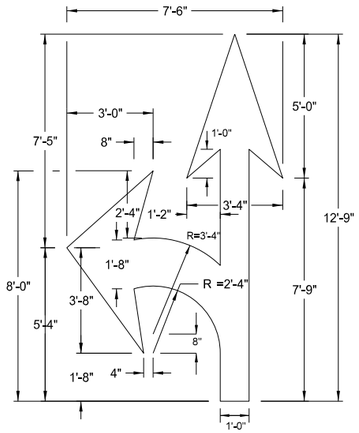
29 S. F.



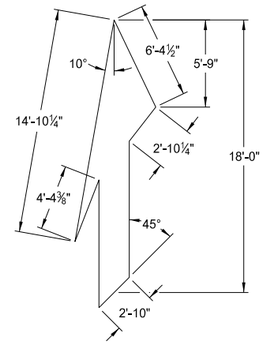
12 S. F.



16 S. F.

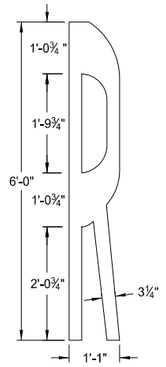


27 S. F.

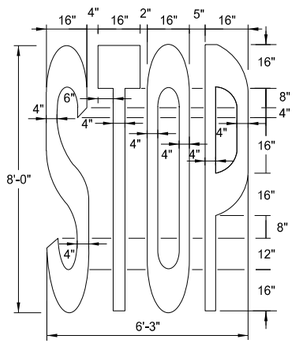


41 S. F.

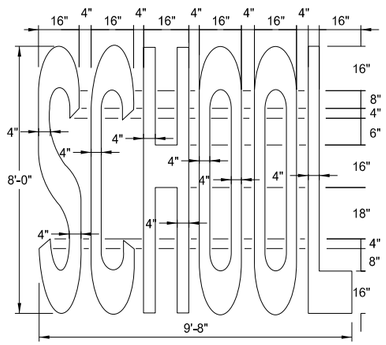
Note:
The merge arrow shall be rotated 20° from the edge of the roadway.



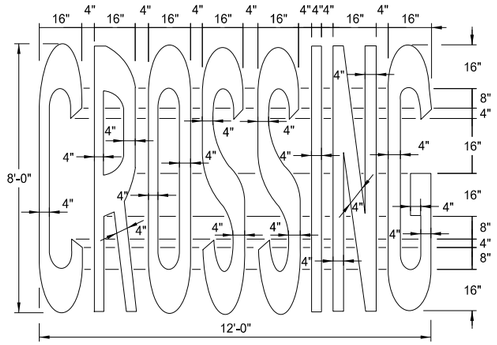
4 S. F.



22 S. F.



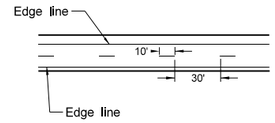
34.5 S. F.



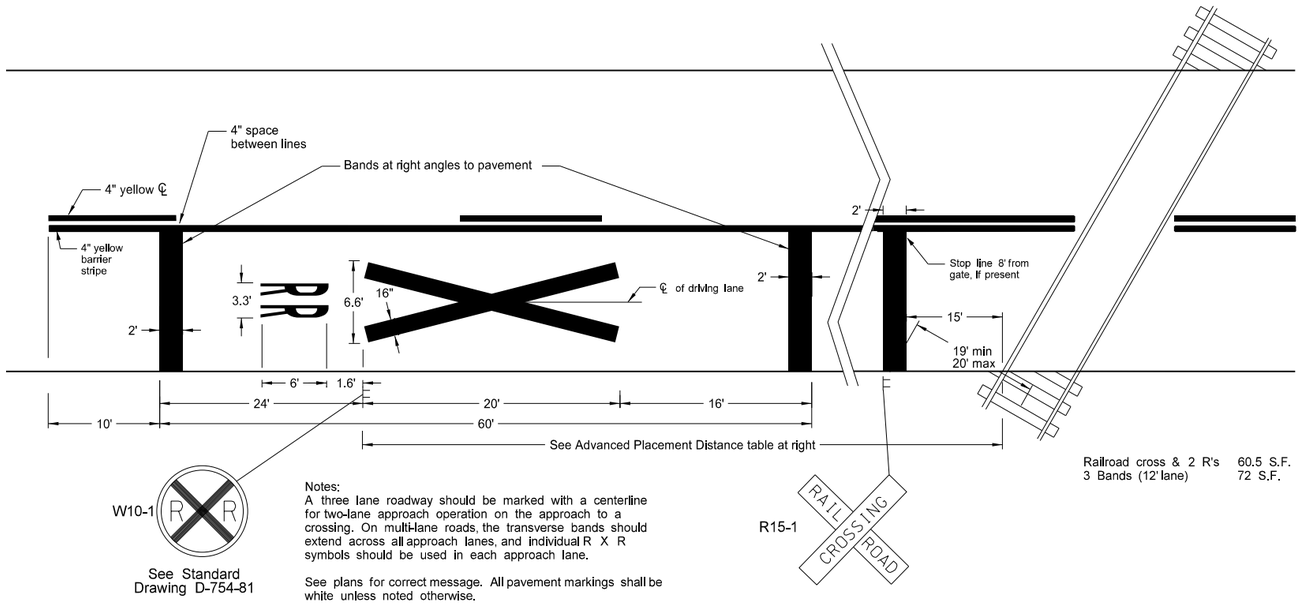
46 S. F.

Speed Limit	Chevron Width	Chevron Spacing 45° to Traffic
0-25 mph	8"	5'
30-40 mph	8"	15'
45 mph and above	12"	25'

Chevron Crosshatching Table



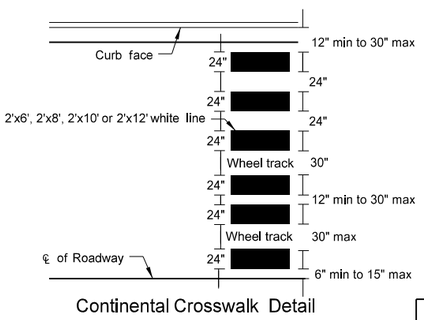
Centerline Pavement Marking Skip Spacing Detail



Railroad cross & 2 R's 60.5 S.F.
3 Bands (12' lane) 72 S.F.

Notes:
A three lane roadway should be marked with a centerline for two-lane approach operation on the approach to a crossing. On multi-lane roads, the transverse bands should extend across all approach lanes, and individual R X R symbols should be used in each approach lane.

See plans for correct message. All pavement markings shall be white unless noted otherwise.



Continental Crosswalk Detail

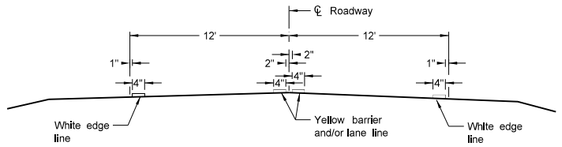
Advance Placement Distance for Railroad Warning Signs	
Posted or 85th Percentile Speed	Advance Distance
20 mph	min. 100 ft
25 mph	min. 100 ft
30 mph	min. 100 ft
35 mph	min. 100 ft
40 mph	125 ft
45 mph	175 ft
50 mph	250 ft
55 mph	325 ft
60 mph	400 ft
65 mph	475 ft
70 mph	550 ft

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-6-11	
REVISIONS	
DATE	CHANGE

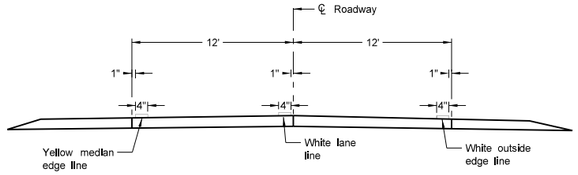
This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 12/06/11 and the original document is stored at the North Dakota Department of Transportation

PAVEMENT MARKING

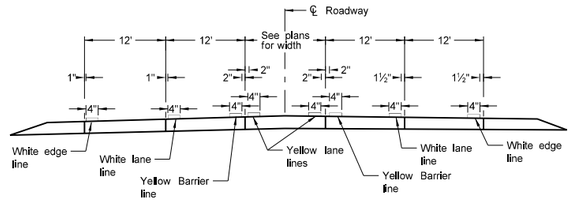
D-762-4



Two Lane Two Way
RURAL ROADWAY



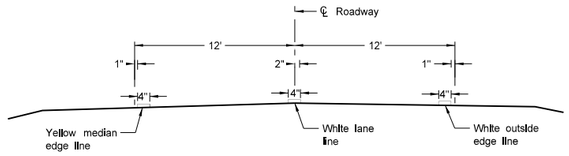
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



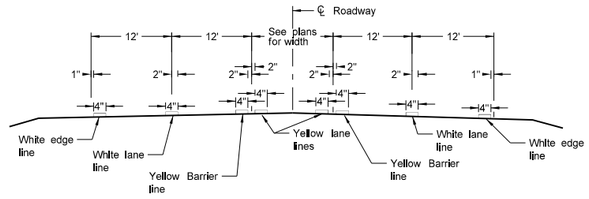
RURAL FIVE LANE ROADWAY
Concrete Section

NOTES:

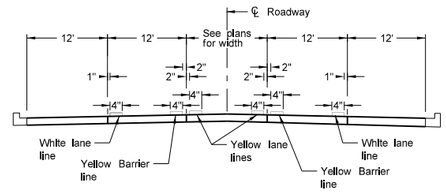
1. Edge lines shall be continued through private drives and field drives and broken for intersections.



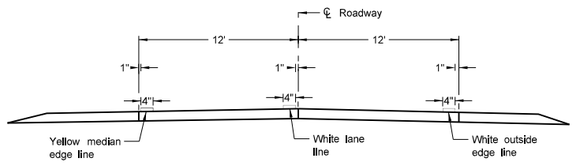
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



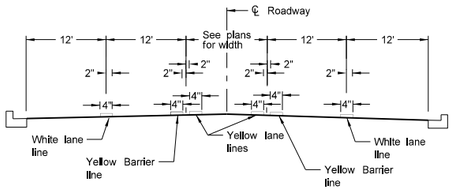
RURAL FIVE LANE ROADWAY
Asphalt Section



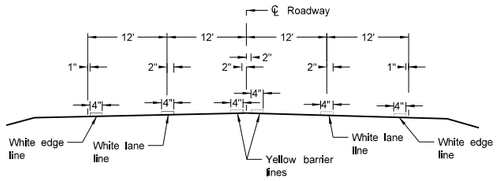
URBAN FIVE LANE SECTION
Concrete Section



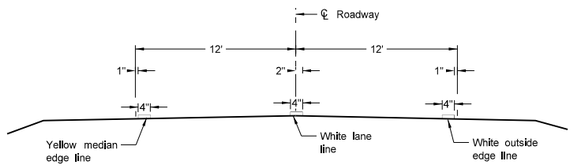
Two Lane Roadway
PRIMARY HIGHWAY
Concrete Section



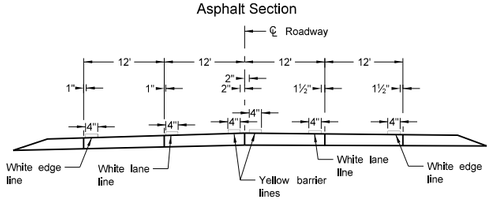
URBAN FIVE LANE SECTION
Asphalt Section



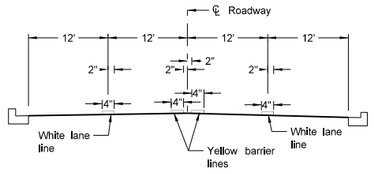
RURAL FOUR LANE ROADWAY
Asphalt Section



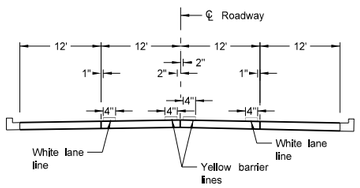
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



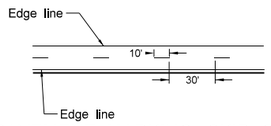
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



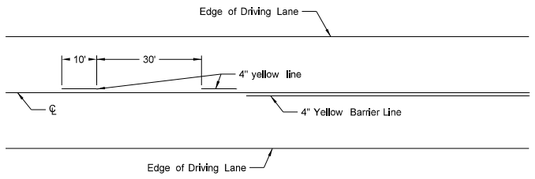
CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

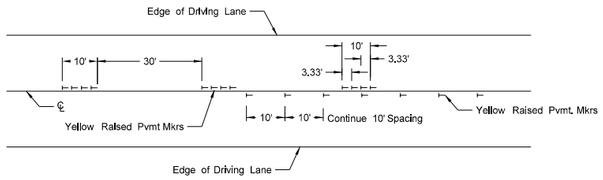
This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930 , on 12-1-10 and the original document is stored at the North Dakota Department of Transportation

SHORT-TERM PAVEMENT MARKING

D-762-6

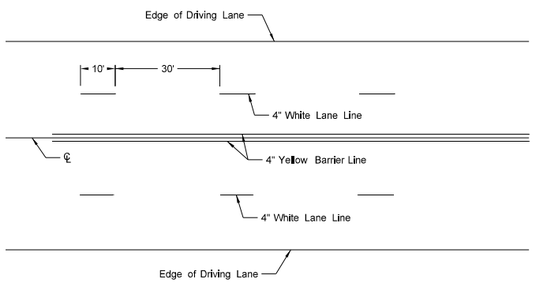


Painted or Tape Lines

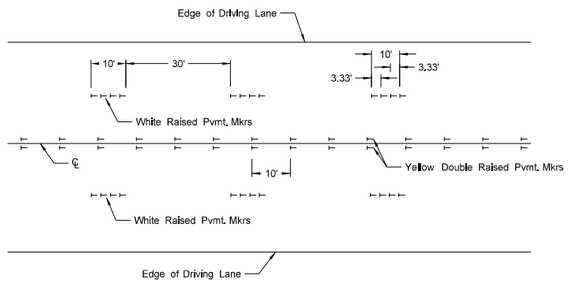


Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

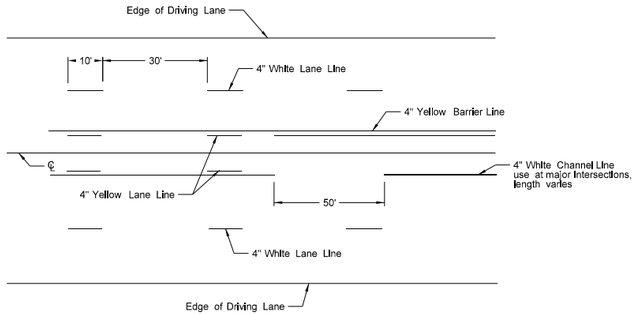


Painted or Tape Lines

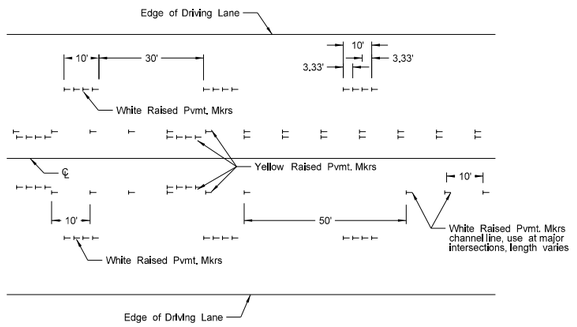


Raised Pavement Markers

FOUR LANE ROADWAY

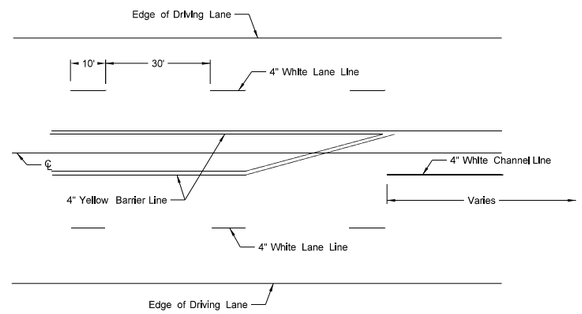


Painted or Tape Lines

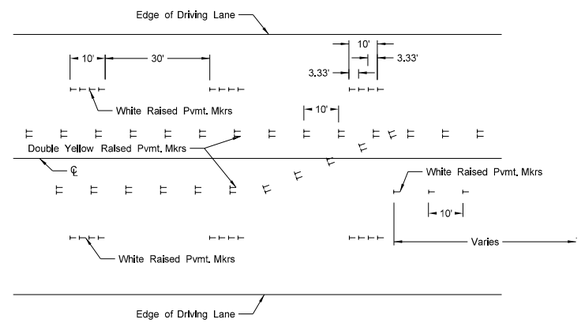


Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTES:

1. Two-lane two-way roadways shall have no passing zones placed as shown. No passing zone signs may be placed in lieu of short term no passing zone pavement markings. These signs will be allowed to remain in place for three days, at which time the short term no passing zone pavement marking shall be placed.

2. Short term center line stripe (paint) on top lift shall be carefully placed with exact spacing so that the permanent stripe will match when applied.

3. Raised markers and tape markings shall be removed after permanent pavement marking has been installed. Removed markings shall become the property of the contractor.

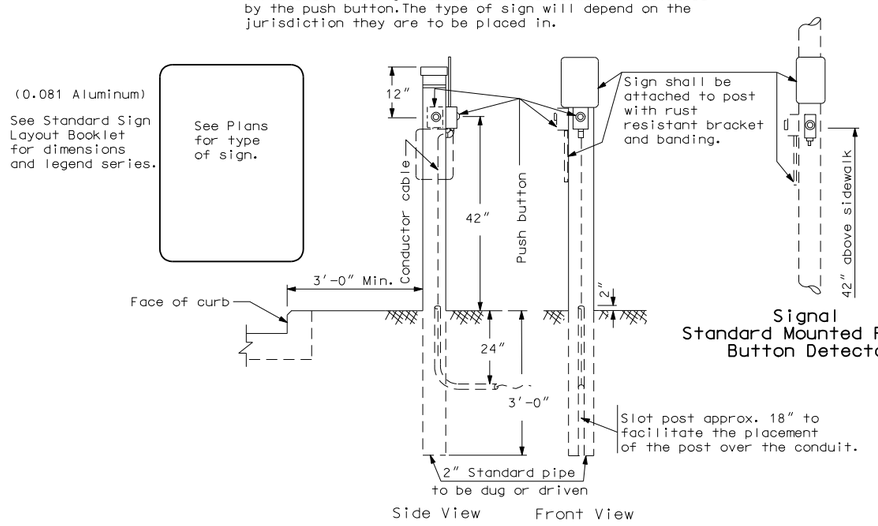
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 12-1-10 and the original document is stored at the North Dakota Department of Transportation

TRAFFIC SIGNAL STANDARDS

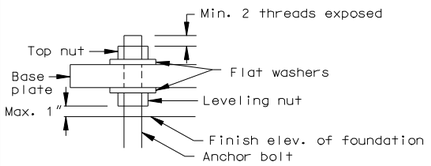
D-772-2

The positioning of the sign & pushbutton & direction of arrow shall clearly indicate which crosswalk is actuated by the push button. The type of sign will depend on the jurisdiction they are to be placed in.

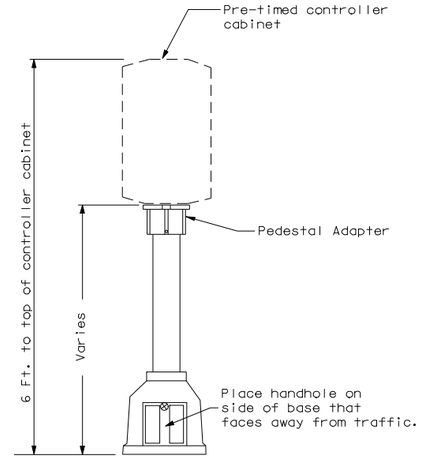


Pedestrian Push Button Post Details

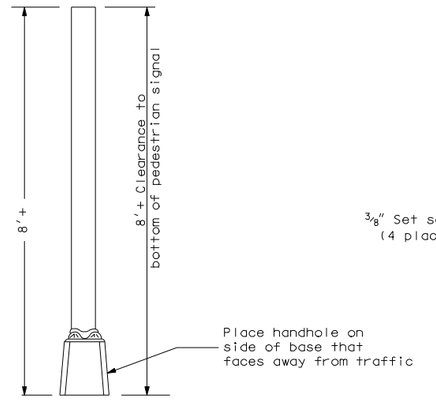
Signal Standard Mounted Push Button Detector



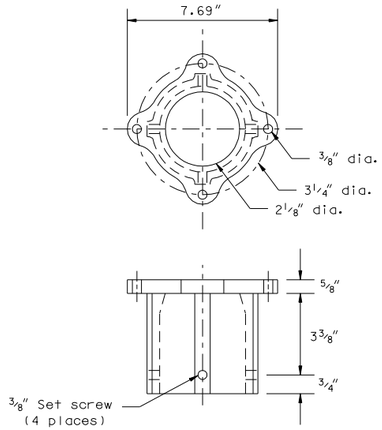
Anchor Bolt Detail



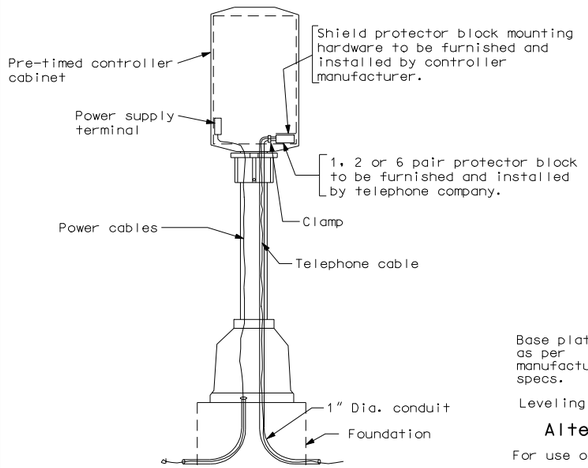
Type I



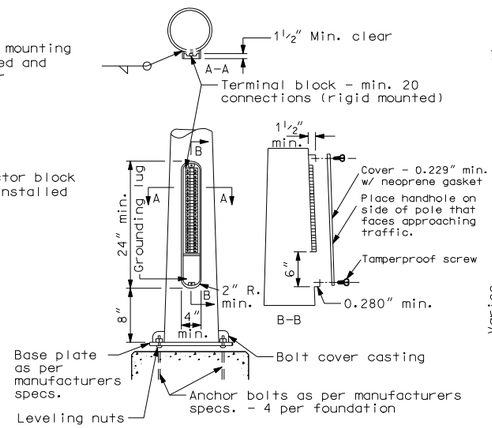
Type II



Pedestal Adapter Detail

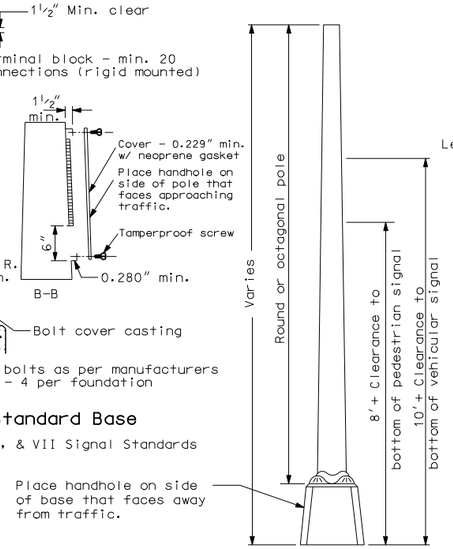


Telephone Interconnect Schematics Detail
(Control circuits not shown)

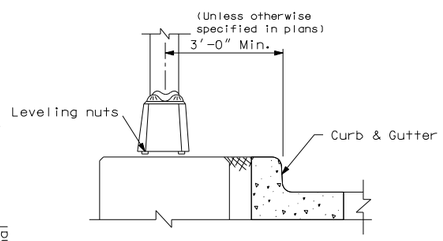


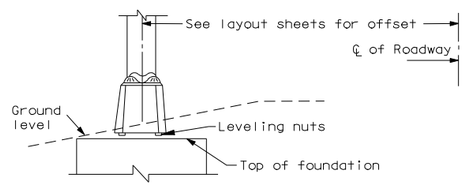
Alternate Signal Standard Base

For use only with Type V, VI, & VII Signal Standards



Type V, VI, VII





Signal Standard Min. Clearance Detail

NOTES:
Signal Heads: See traffic signal layout for correct mounting position, number, size, and arrangement of lenses.

Steel Standards: The center of the signal standard shall be a minimum of 3 feet from the face of the curb unless shown otherwise on the layout sheets.

Paint: See note sheet for required color of paint.

Transformer Base: In lieu of the transformer base the contractor may use the alternate signal standard base.

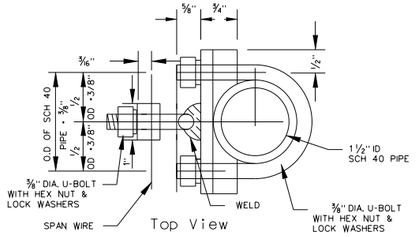
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
12-01-88	Min. Clearance
06-16-94	Leveling nuts
08-29-95	Delete Type III
11-27-95	Pedestal adapter
12-15-00	Pushbutton height
12-01-04	PE Stamp added
04-24-06	Pedestrian sign rev.

This document was originally issued and sealed by MARK S. GAYDOS, Registration Number PE-4518, on 04/24/06 and the original document is stored at the North Dakota Department of Transportation

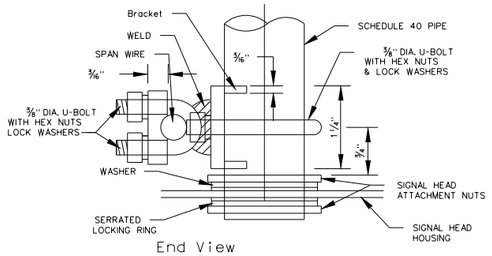
FLASHING BEACON

D-772-7

SPAN LENGTHS & SIZE OF SPAN WIRE								
Number of Beacon Heads Per Span	3/8" Span wire 1/8" Stability wire		3/8" Span wire 3/8" Stability wire		1/2" Span wire 1/2" Stability wire		5/8" Span wire 5/8" Stability wire	
	Max. Length		Max. Length		Max. Length		Max. Length	
	High Strength	Extra High Strength	High Strength	Extra High Strength	High Strength	Extra High Strength	High Strength	Extra High Strength
1	140'	170'	150'	180'	160'	195'	170'	210'
2	110'	140'	130'	160'	150'	185'	160'	200'
3	85'	115'	110'	140'	140'	170'	160'	195'
4	68'	90'	90'	120'	125'	160'	150'	185'

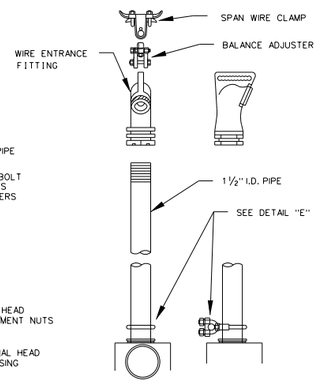


Top View

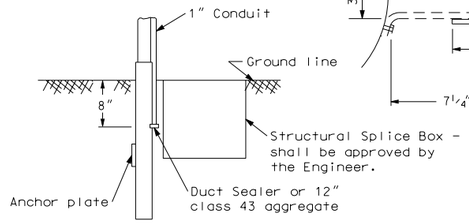


End View

Detail "E"

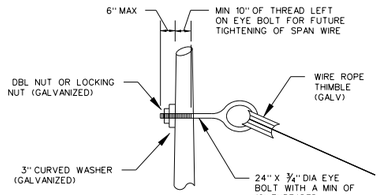


Detail "D"

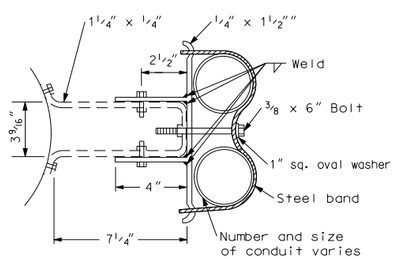


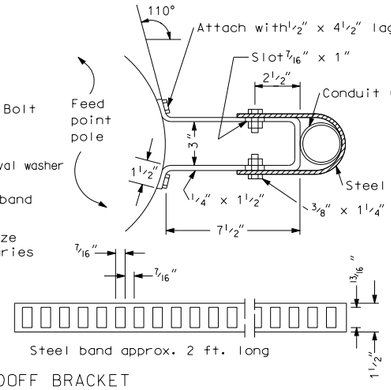
Detail "C"

Detail where more than one set of wires pass thru Flashing Beacon location.



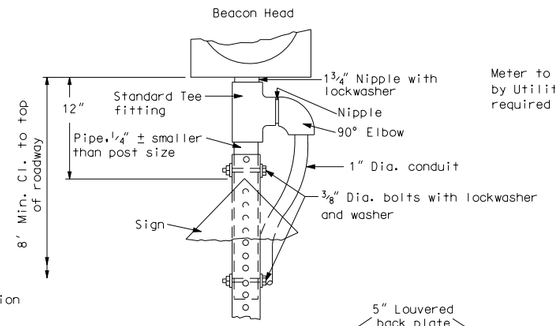
Eye Bolt Detail



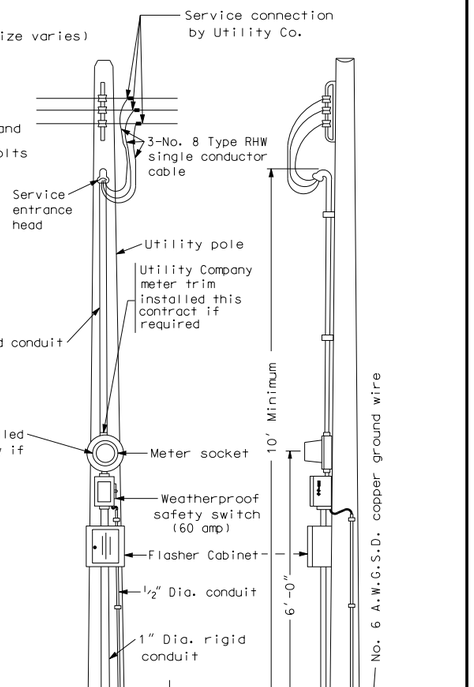


CONDUIT STANDOFF BRACKET

(To be used when required by local utility company)



Detail "A"

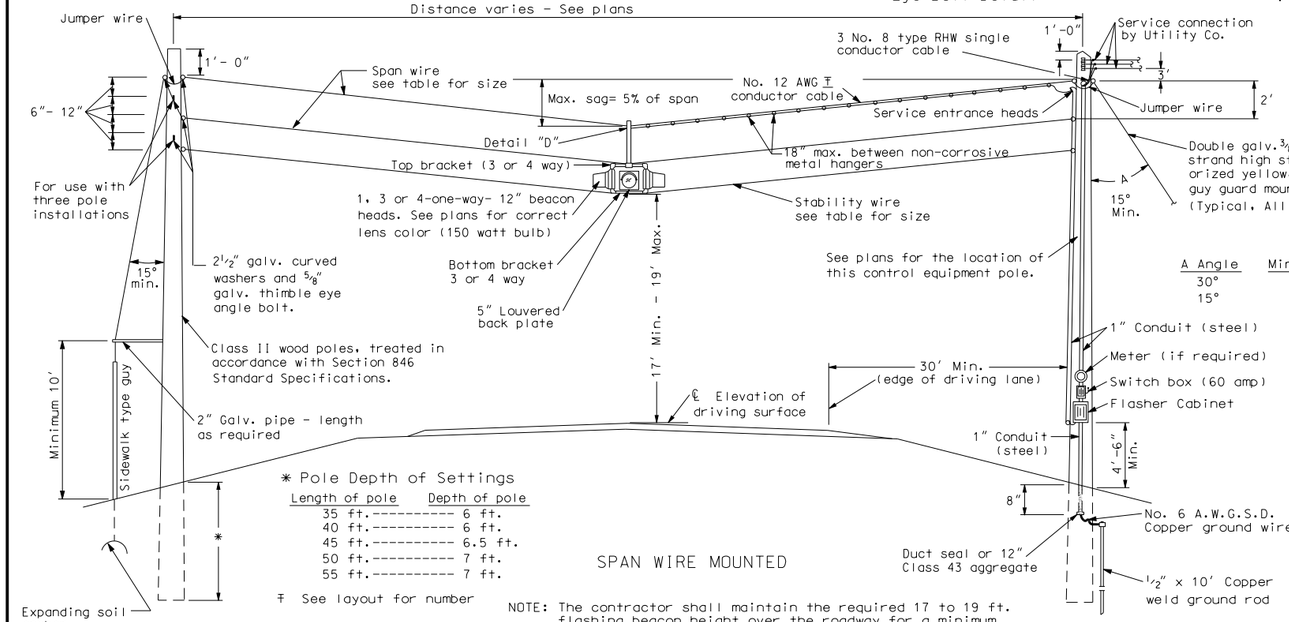


Front View

Side View

FEED POINT

(Post Mounted)



A Angle	Min. Anchor Resistance
30°	12,000 lbs.
15°	24,500 lbs.

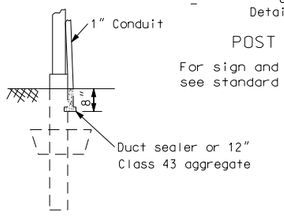
∗ Pole Depth of Settings

Length of pole	Depth of pole
35 ft.	6 ft.
40 ft.	6 ft.
45 ft.	6.5 ft.
50 ft.	7 ft.
55 ft.	7 ft.

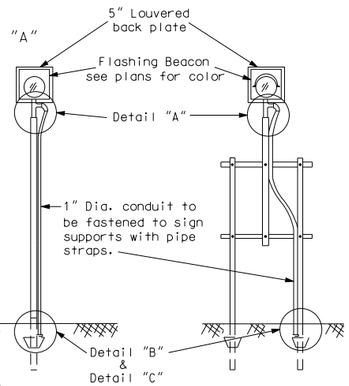
∓ See layout for number

SPAN WIRE MOUNTED

NOTE: The contractor shall maintain the required 17 to 19 ft. flashing beacon height over the roadway for a minimum period of 90 calendar days after installation unless written permission is granted by the Engineer to wave the 90 day requirement. The cost of maintaining the signal head elevation shall not be bid separately but shall be included in the price bid for flashing beacon.



Detail "B"



POST MOUNTED

For sign and sign support details, see standard drawings for signing.

NOTE: Flasher shall be operated on 120 volts.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
08-01-90	Depth of pole
05-01-92	General revisions
09-07-95	Back plates & detail D
08-15-96	Add span wire
06-18-03	Minor revisions
12-01-04	PE Stamp added

This document was originally issued and sealed by MARK S. GAYDOS Registration Number PE- 4518 , on 12/01/04 and the original document is stored at the North Dakota Department of Transportation