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DESIGN DATA				
Traffic	Average Daily			
Current 2024	Pass: 1,627	Trucks: 250	Total: 1,877	
Preventive Maintenance				

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	24107	1	1

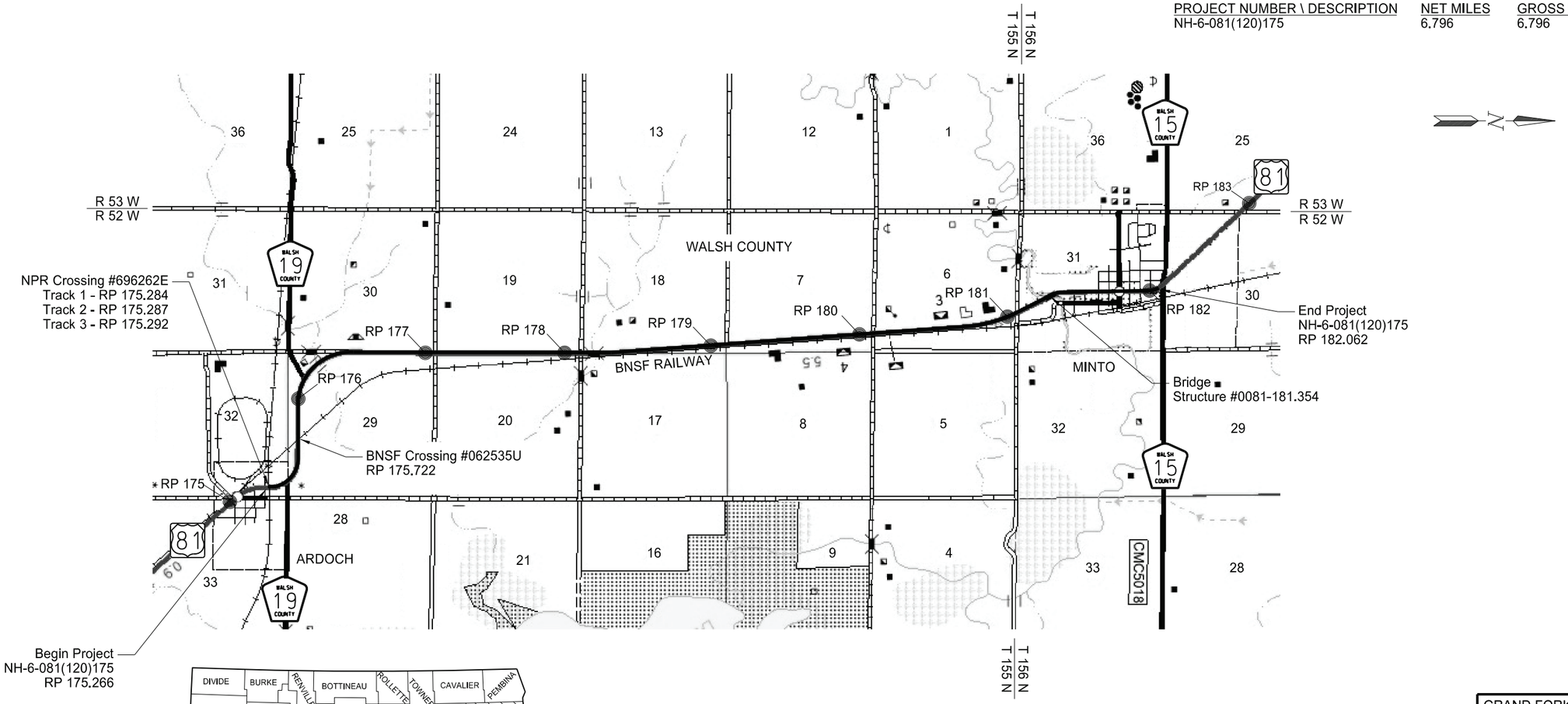
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

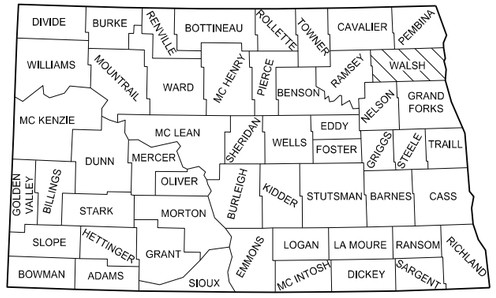
NH-6-081(120)175

Walsh County
Ardoch N thru Minto
Milling & HMA, ADA Curb Ramp Revisions

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	7/1/2025
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
NH-6-081(120)175	6.796	6.796





STATE COUNTY MAP

DESIGNER
Lynnette Steyn
DESIGNER
DESIGNER

ND DEPARTMENT OF TRANSPORTATION
GRAND FORKS DISTRICT

5/01/26

GRAND FORKS DISTRICT

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 05/01/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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PLAN SECTIONS

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2	1 - 2	Table of Contents
4	1 - 2	Scope of Work
6	1 - 3	Notes
8	1 - 2	Quantities
10	1 - 3	Basis of Estimate
20	1 - 8	General Details
30	1 - 6	Typical Sections
40	1 - 7	Removals
77	1 - 7	Permanent Erosion Control
80	1 - 7	Layouts
90	1 - 3	Paving Layouts
100	1 - 7	Work Zone Traffic Control
120	1 - 4	Pavement Marking

SPECIAL PROVISIONS

Number	Description
PSP 60(25)	Permits and Environmental Considerations
SP 379(25)	Utility Coordination
SP 411(25)	Railroad Coordination BNSF
SP 412(25)	Railroad Coordination NP
SP 420(25)	Railroad Coordination CPKC
SP 428(25)	E-Ticketing (Mandatory)
SP 429(25)	Intelligent Compaction for HMA
SP 430(25)	Paver Mounted Thermal Profiler
SP 431(25)	Flexible Pavement Surface Tolerance
SP 432(25)	Percent Within Limits
SP 433(25)	Temporary Pedestrian Facilities
SP 434(25)	Commercial Grade Asphalt
SSP 4	Longitudinal Joint Density

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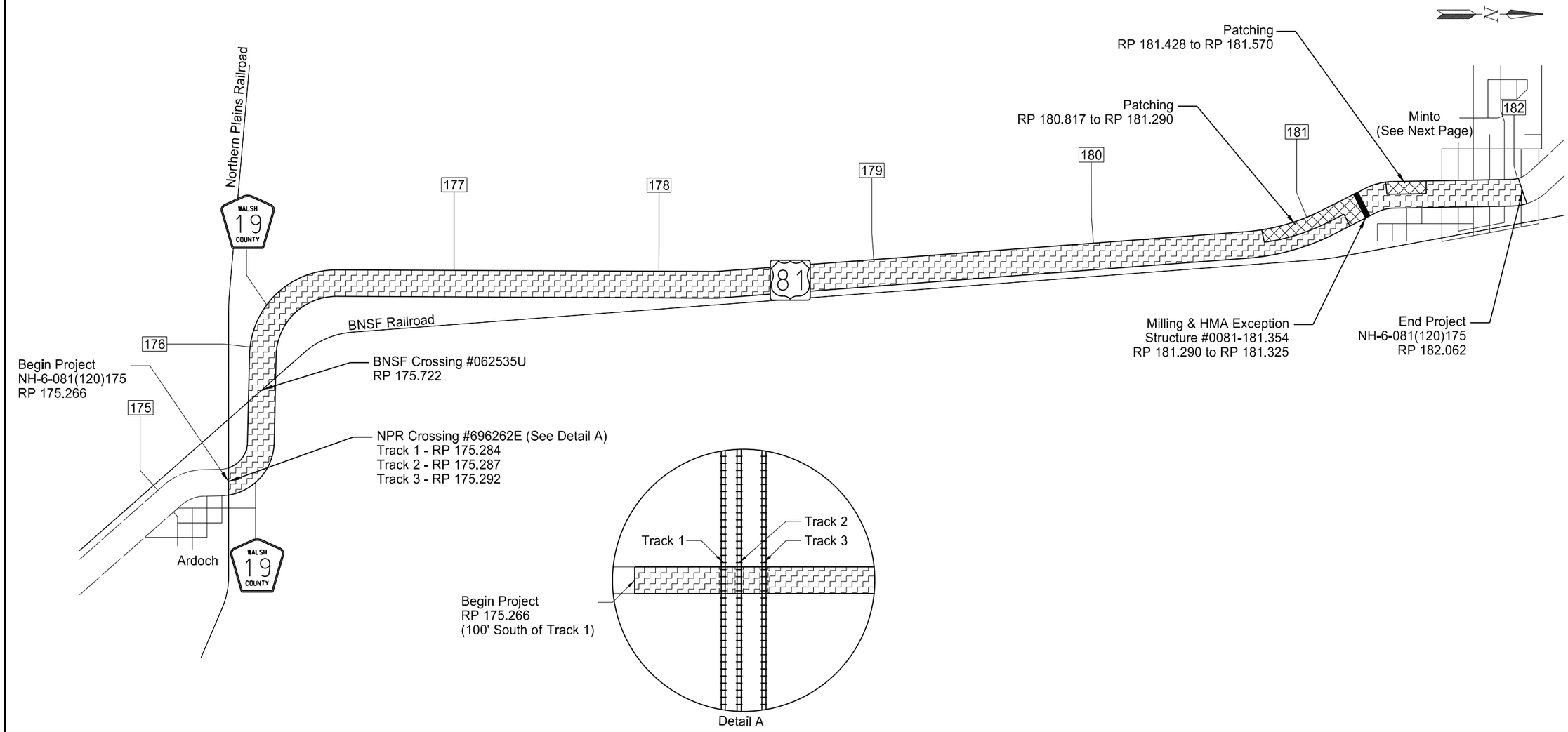
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D-101-1, 2,3,4	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
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D-101-30, 31,32,33	Symbols
D-704-2	Traffic Control For Coring Of Hot Bituminous Pavement
D-704-7	Breakaway Systems For Construction Zone Signs - Perforated Tube
D-704-8	Breakaway Systems For Construction Zone Signs - U-Channel Post
D-704-9	Construction Sign Details - Terminal And Guide Signs
D-704-10	Construction Sign Details - Regulatory Signs
D-704-11, 11A	Construction Sign Details - Warning Signs
D-704-13	Barricade And Channelizing Device Details
D-704-14	Construction Sign Punching And Mounting Details
D-704-15	Road Closure Layouts
D-704-20	Terminal And Seal Coat Sign Layouts
D-704-22	Construction Truck And Temporary Detour Layouts
D-704-26	Miscellaneous Sign Layouts
D-704-27	Mobile Operation (Pavement Marking)
D-704-33	Two-Lane Roadway Portable Rumble Strips
D-704-50	Portable Sign Support Assembly
D-704-56	Mobile Operation - Grinding Shoulder Rumble Strips
D-706-1	Bituminous Laboratory
D-722-5	Manhole Details
D-748-1	Curb & Gutter And Valley Gutter
D-750-2	Sidewalk
D-750-3	Curb Ramp Retrofit Details
D-750-4	Curb Ramp Retrofit Transitional Area Details
D-760-3	Rumble Strips Undivided Highways (Shoulders 4' Or Greater)
D-762-1	Pavement Marking Message Details
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Number	Description

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2" Milling & 2" RAP - Superpave FAA 43

Patching, 2" Milling & 2" RAP - Superpave FAA 43

Scope of Work

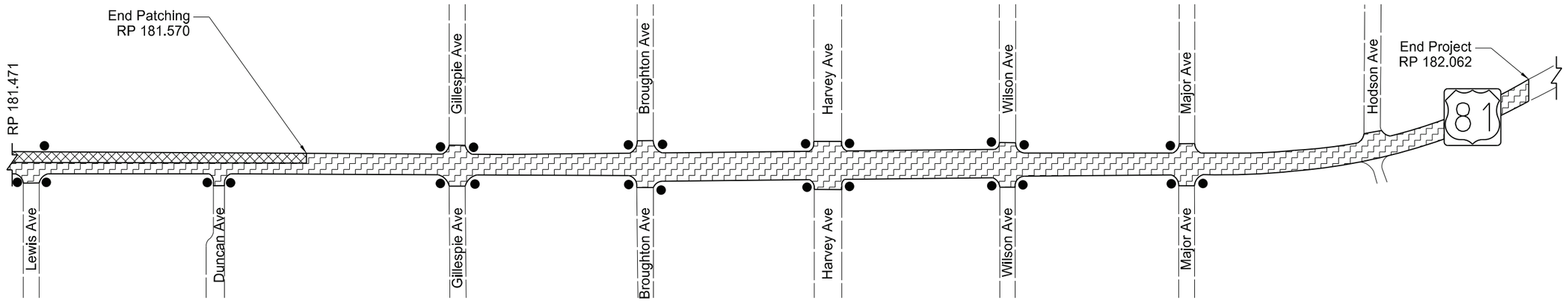
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/24/26
NORTH DAKOTA

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Minto

2" Milling & 2" RAP - Superpave FAA 43

Patching, 2" Milling & 2" RAP - Superpave FAA 43

● ADA Curb Ramp Revision

Scope of Work
ADA Curb Ramp Revision Locations

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/24/26
NORTH DAKOTA

4/20/2026 4:32:55 PM lsteyn R:\project\60081175.120\District\Sheets\004SW_Scope\004SW_002_Scope Minto ADA locations.dgn

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NOTES

100-P01 MINTO DAYS: Minto Days is scheduled for 2nd or 3rd weekend in June. Contact the City of Minto at (701)-248-3858 prior to beginning work in the city and project limits to verify the dates.

Coordinate work so that US 81 is completely open to traffic & pedestrians. Move all traffic control from downtown Minto off the project to an area approved by the Engineer a minimum of 1 day before the event.

No work will be allowed during Minto Days within the city and project limits.

100-P02 PUBLIC NOTIFICATION: Provide written notices to each property and business adjacent to the perimeter of the project limits a minimum of 7 days in advance of work. Include proposed start/end date of construction, description of construction activities (Milling, Paving, ADA Ramps, etc.), and general schedule of activities for the project from start to end. Prior to delivering notices, submit notice to the Engineer for approval.

100-P03 ORDER OF OPERATION:

1. ADA Curb Ramp Revisions
2. Milling
3. Patching
4. HMA (RAP – Superpave FAA 43)

105-P01 The Engineer will establish centerline prior to milling if requested by the Contractor. No additional horizontal control will be provided.

105-P02 PROTECTION OF UTILITIES: Cover and protect all manholes, catch basins and appurtenances from milling and HMA operations.

107-P01 MAINTAIN PUBLIC ACCESS: The Minto City Park does not have secondary access. Access to the Minto City Park must be maintained at all times during construction.

107-P02 PAVEMENT SWEEPING: Sweep the roadway within Minto using a vacuum or pickup type sweeper. Perform sweeping after ADA Curb Ramp revisions and prior to opening them to the public. Perform sweeping after milling & HMA operations.

107-P03 MAINTAINING TRAFFIC - DROP-OFFS: If, at the end of the workday, drop-offs greater than 2 inches and less than 18 inches or slopes steeper than 4:1 exist between the edge of a traffic lane and the outside edge of the proposed roadway, perform one of the following actions:

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

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

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

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

The Engineer will not measure material used to construct the wedge. Include the cost of materials, equipment, labor, and incidentals required for this operation in the price bid for other pay items.

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

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

202-P01 REMOVALS (ADA CURB RAMP REVISIONS): Removal and disposal of existing aggregate (if needed) or common excavation is included in the costs of “REMOVAL OF CONCRETE PAVEMENT” or “REMOVAL OF CURB AND GUTTER”.

202-P02 REMOVAL OF CONCRETE PAVEMENT: Removal of concrete pavement consists of removing sidewalks and aggregate base.

202-P03 REMOVAL OF CONCRETE PAVEMENT: When work begins at the NE quadrant of Harvey Ave and 2nd Street, contact the City of Minto to coordinate the elevation adjustment of the valve access cover as shown on Section 40 Sheet 5.

202-P04 REMOVAL OF CONCRETE PAVEMENT: Remove street sign and support on the NE quadrant of Broughton Ave and 2nd Street as shown on Section 40 Sheet 4. Deliver the removed street sign and support to the City of Minto Public Works at 621 2nd Street. Replace removed sign or support if damaged during removal at no additional cost to the Department or City of Minto. Include the cost in the unit price bid for “REMOVAL OF CONCRETE PAVEMENT”.

202-P05 REMOVAL OF BITUMINOUS SURFACING: Removal of bituminous surfacing has been estimated as 2FT width x 7IN depth to accommodate the removal and replacement of curb & gutter and valley gutter.

Include costs for all removals, including aggregates or embankment beneath the bituminous surfacing in the unit price bid for “REMOVAL OF BITUMINOUS SURFACING”.

302-P01 AGGREGATE BASE COURSE CL 5: 50 tons Aggregate Base Course Cl 5 has been provided in the quantities to fill in around the radii of approaches. This material will be required when sloughs are steeper than 4:1 and at the direction of the Engineer.

411-P01 TEMPORARY ASPHALT WEDGES: Place temporary asphalt wedges at the beginning and end of this project, intersecting routes and beginning and end of the patch locations to allow smooth passage of vehicles at these locations. Place wedges at these milled areas prior to the traffic being allowed back on the milled roadway section. Millings may be used instead of asphalt for all wedges. Include all costs associated with labor, materials, and equipment for the installation, maintenance and removal of the wedges in the contract price bid for “MILLING PAVEMENT SURFACE”.

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/29/26
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

411-P02 MILLING PAVEMENT SURFACE: Completely remove the depth of bituminous surfacing shown in the typical sections for milling pavement surface around all manholes, appurtenances, and concrete utility/inlet box-outs. Refer to Section 20, Sheet 3 for details.

Include all costs associated with this work in the contract price for “MILLING PAVEMENT SURFACE”.

411-P03 MILLING ADJACENT TO ADA CURB RAMPS: Completely remove bituminous surfacing the depth of the proposed paving up to the curb ramp where the pedestrian route intersects the approach.

430-200 FOG SEAL: Apply a fog seal at a rate of 0.05 Gal/SY to the final surface of the hot mix asphalt if the ND T 113 “Lightweight Pieces in Virgin Aggregate” test results exceed 3.0% during mix design or production of the hot mix asphalt. Apply the fog seal behind the finish roller before the mat temperature drops below 130 degrees Fahrenheit. Use the same emulsion material as the Tack Coat. Apply the fog seal at no additional cost to the Department.

430-P01 HMA ADJACENT TO ADA CURB RAMPS: Place HMA adjacent to curb ramps in a manner so that the HMA abuts the curb ramp and the surfacing is flush with the curb ramp.

430-P02 HMA LONGITUDINAL JOINTS: Construct the joints within the final lift of pavement as detailed within this note for Typical Sections 2-6.

Place a longitudinal joint at the centerline of the roadway.

Construct each lane and the adjoining shoulder or turn lane within the curb and gutter section in Minto and the curves at the junctions of Walsh County 19 using a single pass or a hot seam. A hot seam is defined as follows:

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

430-P03 PROTECTION OF UTILITIES: Protect manholes, catch basins, and valves during the HMA paving operations. Protect monuments that are not shown within the limits of the HMA paving operations shall be protected.

704-500 PORTABLE RUMBLE STRIPS (PRS): Use PRS made of rubber or engineered polymers.

Install PRS as part of the temporary traffic control when the following signs are also part of the required traffic control set up:

- "Be Prepared to Stop" (W3-4); and
- "Flagger" symbol (W20-7)

Install PRS that meet the following criteria:

- Have no adhesives or fasteners required for placement;
- Have a manufacture's speed rating that meets or exceeds the posted speed limit; and
- Each strip in the array must weigh a minimum of 100 pounds.

Use individual PRS constructed in one of the following manners:

- A single piece;
- Interlocking segments; or
- Two pieces hinged at the midpoint.

An installed array of PRS consists of a minimum of 3 individual strips.

Move rumble strips with the flagging operation. Do not place rumble strips on horizontal curves. The Engineer will count and measure each array as one unit. Include the cost of providing, installing, maintaining, and relocating PRS in the unit price bid for "PORTABLE RUMBLE STRIPS”.

704-P01 TRAFFIC CONTROL FOR MILLING, HMA, AND PATCHING: Provide traffic control consisting of a temporary road closure, flagging, and a pilot car.

Traffic control device quantities are based on the project length and the list below. The Department will pay for all necessary deployed devices.

1. Standard D-704-15, Type A;
2. Standard D-704-20, Type G – signing will be required at junctions: Walsh County 19 West & East, 55th Street Northeast, and Ordway Ave West & East;
3. Standard D-704-22, Types K and L;
4. Standard D-704-26, Types CC, EE, and GG; and
5. Standard D-704-33.

Place flaggers and traffic control devices as shown on Standard D-704-15, layout A at the following intersections when the lane closure spans across them:

1. Walsh County 19 West & East
2. 55th Street Northeast
3. Ordway Ave West & East

704-P02 TRAFFIC CONTROL FOR PATCHING: Traffic will not be allowed to run on the base overnight. Place at least 1 lift of HMA before allowing traffic on a repair or continue flagging.

704-P03 TRAFFIC CONTROL PHASING: Traffic control phasing is to be followed when constructing the project unless an alternate traffic control phasing plan is submitted to the Engineer for review and approval at least 1 week in advance of the proposed work.

704-P04 SIDEWALK CLOSURES: Traffic control and accessibility devices have been provided based on 12 concurrent work locations.

706-P01 BITUMINOUS LABORATORY: Provide cellular internet service with Wi-Fi capabilities. Also provide a cell phone signal booster that allows for the reliable use of cellular voice and data services throughout the lab. Include all costs for installation and monthly fees for the cellular internet service and cellular signal booster in the contract price for “BITUMINOUS LABORATORY”.



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

708-P01 INLET PROTECTION-SPECIAL: Furnish, install, and maintain (clean) drainage inlet filter assemblies to collect sediment in surface storm water runoff. Dispose of debris or silt that has accumulated in the bag. Periodic cleaning of the filter is needed as necessary. Remove drainage inlet filter when vegetation has established.

Provide Wimco, Lange IPD, Flexstorm, Dandy Curbsack, or an approved equal.

Keep filter in place until after the gradient surfaces are stabilized and the surrounding street is clean of debris. Include all costs related to the material, installation, maintenance, replacement, and removal in the price bid for “INLET PROTECTION-SPECIAL”.

722-P01 ADJUST MANHOLE: Adjust or modify the manhole and casting so that the casting matches the roadway cross slope and sits between 1/4" and 5/8” below the surface. This may require removal of bituminous surfacing around the casting.

Include all costs to remove and reset the casting, modify the manhole, remove and patch surfacing material in the contract price for “ADJUST MANHOLE”.

750-P01 SIDEWALK AGGREGATE: Provide aggregate needed to grade sidewalk base meeting specifications of “AGGREGATE BASE COURSE CL 5”.

Include all costs associated with aggregate in the unit price bid for “SIDEWALK CONCRETE 4IN”.

750-P02 SIDEWALK CONCRETE: Construct sidewalk and ADA ramps as per Standard Drawings D-750-2, D-750-3, and as shown on the detail layouts in Section 80.

At replacement areas, excavate material to accommodate the proposed aggregate base and dispose of excess excavation.

Place a #3 deformed reinforcing bar placed 24 inches on center both longitudinally and transversely in all replacement areas. Use bars 6 inches shorter than the width of the slab and placed accurately at one-half the depth of the slab. Use plastic chairs. Construct contraction joints according to D-750-2. Place one-half-inch expansion joints as directed by the Engineer.

Saw all longitudinal and transverse contraction joints. Saw joints in a timely manner to prevent any uncontrolled random cracking. If random cracking occurs, remove and replace all damaged panels.

Include the cost of materials, equipment, and labor to perform the above referenced work in the contract unit price for “SIDEWALK CONCRETE 4IN”.

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

970-P01 LANDSCAPE PREPARATION: Areas requiring “LANDSCAPE PREPARATION” have been designated in Section 77 and will include grading, topsoil, seeding, hydraulic mulch, and watering

Remove topsoil and earth necessary for placement of new sidewalk concrete, curb & gutter, and base material. Grade existing ground to blend into newly constructed curb ramps and replace topsoil prior to seeding.

It has been estimated to blend topsoil in to the existing ground at a width of 2 feet. Widths may vary at the discretion of the Engineer.

Seed areas disturbed during the removal and construction of ADA Curb Ramps. Seed with the seed mix listed below. Hydraulic mulch after areas have been seeded.

Grass Species	Variety	PLS per Acre
Western Blue Grass	Park	100
Perennial Rye Grass	-----	40
Six-Week Fescue or Dural-hard Fescue	-----	60
Annual Rye Grass	-----	50

Water seed for three weeks minimum after placement in order to provide sufficient moisture for growth as determined by the Engineer. Prevent run-off and puddling. Water trucks will not be driven over turf areas.

Include all costs to remove and replace earth, topsoil, seed, mulch, and water in the contract unit price for “LANDSCAPE PREPARATION”.

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/29/26
NORTH DAKOTA

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
107	0121	RAILWAY PROTECTION INSURANCE - COMPANY A	L SUM	1	1
107	0122	RAILWAY PROTECTION INSURANCE - COMPANY B	L SUM	1	1
107	0123	RAILWAY PROTECTION INSURANCE - COMPANY C	L SUM	1	1
107	0141	RAILROAD COORDINATION - COMPANY A	L SUM	1	1
107	0142	RAILROAD COORDINATION - COMPANY B	L SUM	1	1
107	0143	RAILROAD COORDINATION - COMPANY C	L SUM	1	1
109	1000	E-TICKETING	L SUM	1	1
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	457	457
202	0130	REMOVAL OF CURB & GUTTER	LF	715	715
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	212	212
302	0101	SALVAGED BASE COURSE	CY	1,381	1,381
302	0120	AGGREGATE BASE COURSE CL 5	TON	253	253
401	0050	TACK COAT	GAL	10,106	10,106
401	0070	FOG SEAL	GAL	1,787	1,787
411	0105	MILLING PAVEMENT SURFACE	SY	134,693	134,693
430	0143	RAP - SUPERPAVE FAA 43	TON	15,027	15,027
430	0400	HMA INTELLIGENT COMPACTION	L SUM	1	1
430	0425	PAVER MOUNTED THERMAL PROFILER	L SUM	1	1
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	83	83
430	1000	CORED SAMPLE	EA	83	83
430	2000	PATCHING	TON	1,381	1,381
430	5815	PG 58S-34 ASPHALT CEMENT	TON	789	789
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	540	540
704	1000	TRAFFIC CONTROL SIGNS	UNIT	2,940	2,940
704	1048	PORTABLE RUMBLE STRIPS	EA	3	3
704	1054	SIDEWALK BARRICADE	EA	18	18
704	1058	PEDESTRIAN WALKWAY	LF	1,200	1,200
704	1067	TUBULAR MARKERS	EA	280	280
704	1080	STACKABLE VERTICAL PANELS	EA	45	45
704	1185	PILOT CAR	HR	180	180
704	2108	TEMPORARY CURB RAMP	EA	18	18

ESTIMATE NUMBER: 25607 ESTIMATE TYPE: FINAL FINALIZED: Y RUN DATE: 04/29/2026 TIME: 15:56:20

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	8	2

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
706	0550	BITUMINOUS LABORATORY	EA	1	1
706	0600	CONTRACTOR'S LABORATORY	EA	1	1
708	1540	INLET PROTECTION-SPECIAL	EA	24	24
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	6,209	6,209
722	6200	ADJUST MANHOLE	EA	6	6
748	0100	CURB & GUTTER	LF	715	715
748	1020	VALLEY GUTTER 36IN	SY	33	33
750	0115	SIDEWALK CONCRETE 4IN	SY	455	455
750	2115	DETECTABLE WARNING PANELS	SF	298	298
760	0025	SINUSOIDAL RUMBLE STRIP - ASPHALT SHOULDER	MILE	8.226	8.226
760	0027	SINUSOIDAL RUMBLE STRIP - ASPHALT CENTERLINE	MILE	4.113	4.113
762	0103	PVMT MK PAINTED-MESSAGE	SF	705.5	705.5
762	0432	SHORT TERM 6IN LINE-TYPE NR	LF	48,138	48,138
762	1106	PVMT MK PAINTED 6IN LINE	LF	88,552	88,552
762	1112	PVMT MK PAINTED 12IN LINE	LF	843	843
762	1124	PVMT MK PAINTED 24IN LINE	LF	90	90
970	0008	LANDSCAPE PREPARATION	SY	289	289

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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BASIS OF ESTIMATE

Design Calculations			
Description	**Unit**	**Width**	**Quantity**
Typical Section 1: 5.687 Miles			
Milling Pavement Surface *(30 FT X 5,280 LF/Mi. ÷ 9 SF/SY = 17,600 SY/Mi.)*	SY	30'	100,092
RAP - Superpave FAA 43 *(5.0000 SF X 5,280 LF/Mi. X 2 Ton/CY ÷ 27 CF/CY = 1,956 Ton/Mi.)*	Ton	30'	11,124
PG 58S-34 Asphalt Cement @ 5.2% *(1,956 Tons/Mi. X 0.052 = 102 Ton/Mi.)*	Ton	30'	581
Tack Coat @ 0.075 Gal/SY *(30 FT X 5,280 LF/Mi. ÷ 9 SF/SY X 0.075 Gal/SY = 1,320 Gal/Mi.)*	Gal	30'	7,507
Fog Seal @ 0.05 Gal/SY *(10 FT X 5,280 LF/Mi. ÷ 9 SF/SY X 0.05 Gal/SY = 294 Gal/Mi.)*	Gal	5' LT 5' RT	1,672
Typical Section 4: 0.156 Miles			
Milling Pavement Surface *(40 FT X 5,280 LF/Mi. ÷ 9 SF/SY = 23,467 SY/Mi.)*	SY	40'	3,661
RAP - Superpave FAA 43 *(6.6643 SF X 5,280 LF/Mi. X 2 Ton/CY ÷ 27 CF/CY = 2,607 Ton/Mi.)*	Ton	40'	407
PG 58S-34 Asphalt Cement @ 5.2% *(2,607 Tons/Mi. X 0.052 = 136 Ton/Mi.)*	Ton	40'	22
Tack Coat @ 0.075 Gal/SY *(40 FT X 5,280 LF/Mi. ÷ 9 SF/SY X 0.075 Gal/SY = 1,760 Gal/Mi.)*	Gal	40'	275
Typical Section 5: 0.438 Miles			
Milling Pavement Surface *(45 FT X 5,280 LF/Mi. ÷ 9 SF/SY = 26,400 SY/Mi.)*	SY	45'	11,564
RAP - Superpave FAA 43 *(7.4966 SF X 5,280 LF/Mi. X 2 Ton/CY ÷ 27 CF/CY = 2,933 Ton/Mi.)*	Ton	45'	1,285
PG 58S-34 Asphalt Cement @ 5.2% *(2,933 Tons/Mi. X 0.052 = 153 Ton/Mi.)*	Ton	45'	68
Tack Coat @ 0.075 Gal/SY *(45 FT X 5,280 LF/Mi. ÷ 9 SF/SY X 0.075 Gal/SY = 1,980 Gal/Mi.)*	Gal	45'	868
Typical Section 6: 0.143 Miles			
Milling Pavement Surface *(57 FT X 5,280 LF/Mi. ÷ 9 SF/SY = 33,440 SY/Mi.)*	SY	57'	4,782
RAP - Superpave FAA 43 *(9.4968 SF X 5,280 LF/Mi. X 2 Ton/CY ÷ 27 CF/CY = 3,715 Ton/Mi.)*	Ton	57'	532
PG 58S-34 Asphalt Cement @ 5.2% *(3,715 Tons/Mi. X 0.052 = 194 Ton/Mi.)*	Ton	57'	28
Tack Coat @ 0.075 Gal/SY *(57 FT X 5,280 LF/Mi. ÷ 9 SF/SY X 0.075 Gal/SY = 2,508 Gal/Mi.)*	Gal	57'	359

Additional Design Calculations			
Description	**Unit**	**Basis**	**Quantity**
Approaches			
Milling Pavement Surface	SY	Sec. 20 Sheets 1-2, Sec. 90 Sheets 1-3	4,209
RAP Superpave FAA 43	Ton		470
PG 58S-34 Asphalt Cement @ 5.2%	Ton		26
Tack Coat @ 0.075 Gal/SY	Gal		318
Aggregate Base Course Cl 5	Ton		253
Patching			
Patching	Ton	Sec. 20 Sheets 6-7	1,381
Salvaged Base Course	CY		1,381
Geosynthetic Material Type G	SY		6,209
Typical Sections 2 & 3			
Milling Pavement Surface	SY	Sec. 90 Sheets 1-2	10,385
RAP Superpave FAA 43	Ton		1,157
PG 58S-34 Asphalt Cement @ 5.2%	Ton		61
Tack Coat @ 0.075 Gal/SY	Gal		779
Fog Seal @ 0.05 Gal/SY	Gal		115
BNSF Railroad Crossing Profile Repair			
RAP Superpave FAA 43	Ton	Sec. 20 Sheet 4	52
PG 58S-34 Asphalt Cement @ 5.2%	Ton		3

Estimated Available Milled Material Quantities			
Milled Material	**Milled Area (SF)**	**Length (Mi)**	**Tons (1.875 Ton/CY)**
Typical Section 1	5.0000	5.687	10,427
Typical Section 4	6.6643	0.156	382
Typical Section 5	7.4966	0.438	1,204
Typical Section 6	9.4968	0.143	498
Additional Quantities	See Sec. 20 Sheets 1-2, Sec. 90 Sheets 1-3		1,524
		Total (Less 10% for losses)	**12,632**

Estimated Required & Remaining Milled Material Quantities		
	% RAP by Mix Design	
	10% Min	25% Max
Milled Material required for production of RAP - Superpave FAA 43 *(15,027 tons RAP-Superpave FAA 43)*	**1,503**	**3,757**
Milled Material to become Property of the Contractor	**11,129**	**8,875**

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/29/26
NORTH DAKOTA

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BASIS OF ESTIMATE

Temporary Pavement Marking		
Location	Basis	Quantity
RP 176.290 to RP 180.403 (4.113 Mi) *(3 Applications-Milled & paved surfaces, rumble strips)*		
Short Term 6IN Line-Type NR Yellow Skip Line *(10' Line, 30' Skip)*	1,320 LF/Mi	16,290 LF
RP 175.266 to RP 175.327, RP 175.468 to RP 175.930, RP 176.222 to RP 176.290, & RP 180.403 to RP 182.062 (2.250 Mi) *(2 Applications-Milled & paved surfaces)*		
Short Term 6IN Line-Type NR Yellow Skip Line *(10' Line, 30' Skip)*	1,320 LF/Mi	4,618 LF
Short Term 6IN Line-Type NR Yellow Single Barrier	5,280 LF/Mi	3,296 LF
Short Term 6IN Line-Type NR Yellow Double Barrier	10,560 LF/Mi	10,582 LF
Additional Temporary Pavement Marking Quantities		
S Jct Walsh Co 19 & N Jct Walsh Co 19 *(2 Applications-Milled & paved surfaces)*		
Short Term 6IN Line-Type NR Yellow Double Barrier	Section 120 Sheets 1-2	13,352 LF

Barrier Striping Locations			
From RP to RP		**Single Barrier (Mi)**	**Double Barrier (Mi)**
175.266	175.281		0.015
175.296	175.327		0.031
175.468	175.712		0.244
175.722	175.930	0.208	
181.212	181.262	0.050	
181.262	181.415		0.153
181.415	181.469	0.054	
182.004	182.062		0.058
		0.312	**0.501**

Sinusoidal Rumble Strips - Asphalt Shoulder and Centerline		
Location	Basis	Quantity
RP 176.290 to RP 180.403 (4.113 Mi)		
Sinusoidal Rumble Strips - Asphalt Shoulder	2 Mi/Mi	8.226 Mi
Sinusoidal Rumble Strips - Asphalt Centerline	1 Mi/Mi	4.113 Mi

Permanent Pavement Marking		
Location	Basis	Quantity
RP 175.266 to RP 175.327, RP 175.468 to RP 175.930, RP 176.222 to RP 181.425, & RP 182.004 to RP 182.062 (5.784 Mi)		
Pvmt Mk Painted 6IN Yellow Skip Line *(10' Line, 30' Skip)*	1,320 LF/Mi	6,974 LF
Pvmt Mk Painted 6IN Yellow Single Barrier Line	5,280 LF/Mi	1,416 LF
Pvmt Mk Painted 6IN Yellow Double Barrier Line	10,560 LF/Mi	5,291 LF
Pvmt Mk Painted 6IN White Edge Line	5,280 LF/Mi	61,080 LF
RP 181.425 to RP 182.004-Minto Municipal (0.579 Mi)		
Pvmt Mk Painted 6IN Yellow Skip Line *(10' Line, 30' Skip)*	1,320 LF/Mi	765 LF
Pvmt Mk Painted 6IN Yellow Single Barrier Line	5,280 LF/Mi	233 LF

Additional Permanent Pavement Marking Quantities		
Northern Plains Railroad		
Pvmt Mk Painted-Message (RR Crossing) *(SB Approach-1 set consisting of a RR cross, 2 R's & 3 bands and NB Approach-1 band)*	D-762-1	156.5 SF
BNSF Railroad		
Pvmt Mk Painted-Message (RR Crossing) *(2 sets, each set consisting of a RR cross, 2 R's & 3 bands)*	D-762-1	265 SF
S Jct Walsh Co 19 & N Jct Walsh Co 19		
Pvmt Mk Painted-Message (White Arrows) *6 Right Turn Arrows & 5 Left Turn Arrows*	Sec. 120 Sheets 1-2 & D-762-1	176 SF
Pvmt Mk Painted 6IN Yellow Double Barrier Line	Sec. 120 Sheets 1-2	6,676 LF
Pvmt Mk Painted 6IN White Edge Line		5,142 LF
Pvmt Mk Painted 12IN White Channel Line		843 LF
Pvmt Mk Painted 24IN White Line (Stop Bars)		90 LF
Minto Municipal		
Pvmt Mk Painted 6IN White Line (Crosswalks)	Sec. 120 Sheets 3-4 & D-762-1	975 LF
Pvmt Mk Painted-Message (Continental Crosswalk)		108 SF

Total 6IN Pavement Marking		
	White	Yellow
Short Term 6IN Line - Type NR		48,138 LF
Pvmt Mk Painted 6IN Line	67,197 LF	21,355 LF

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BASIS OF ESTIMATE

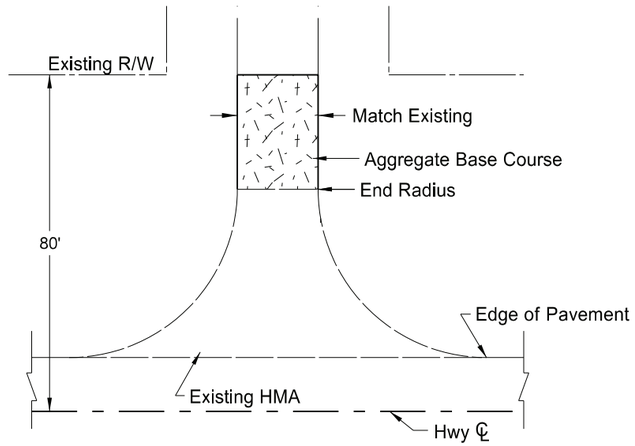
Estimated Flagging Hours			
Operation	**Basis**	**Flagging**	**Pilot Car**
Milling Pavement Surface	*5 Days x 12 Hrs/Day x 3 Flaggers* *5 Days x 12 Hrs/Day x 1 Pilot Car*	180 MHR	60 HR
HMA	*6 Days x 12 Hrs/Day x 3 Flaggers* *48 additional flagging hours estimated for Junctions/Intersections/Street Returns* *6 Days x 12 Hrs/Day x 1 Pilot Car*	264 MHR	72 HR
Patching	*4 Days x 12 Hrs/Day x 2 Flaggers* *4 Days x 12 Hrs/Day x 1 Pilot Car*	96 MHR	48 HR
Total Flagging and Pilot Car Hours		**540 MHR**	**180 HR**

HMA Cored Samples				
Specification	**Basis of Estimate**	**Quantity**	**Quantity** (1 per mile)	**Unit**
SP 432(25) B.1, "Mat Density"	14,505 Mainline Tons ÷ 900 Ton/Sublot x 2 EA/Lot	34	N/A	EA
430.04 I.2.b(1), "General" *(Patching-Section 20 Sheets 6 & 7)*	1 Core per 1,000 LF per Lift x 2 Lifts *(3,350 LF total)*	6	N/A	EA
SSP 4 Longitudinal Joint Density	35,883 LF ÷ 1,000 FT/Sublot x 1 EA/Sublot	36	N/A	EA
430.04 I.2.b(2) "Pavement Thickness Determination Cores"		N/A	7	EA
		76	**7**	**EA**

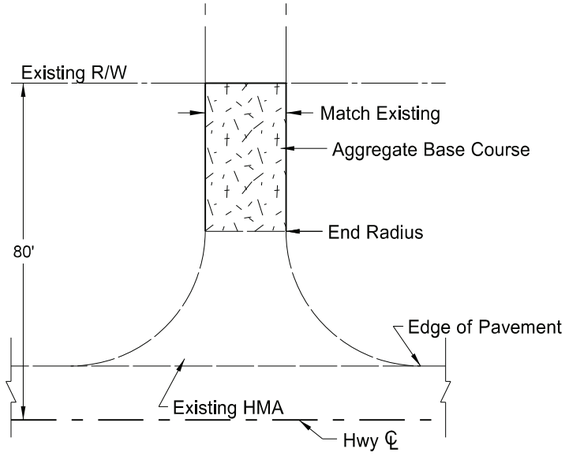
Adjust Manhole Locations			
RP	Offset	Diameter	Adjacent Surfacing
181.551	LT	26"	Bituminous
181.710	LT	26"	Bituminous
181.750	LT	26"	Bituminous
181.821	RT	24"	Bituminous
181.914	LT	26"	Bituminous
181.957	LT	26"	Bituminous

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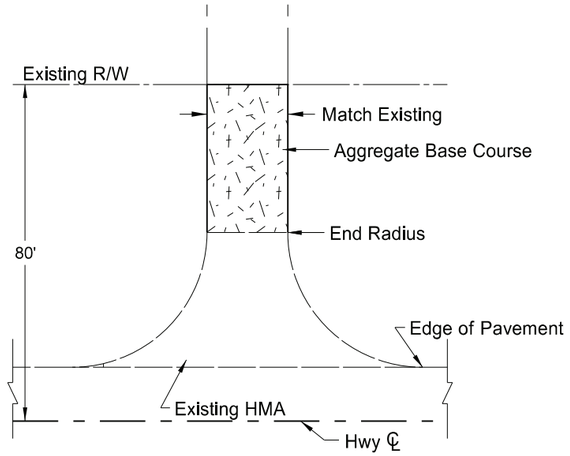
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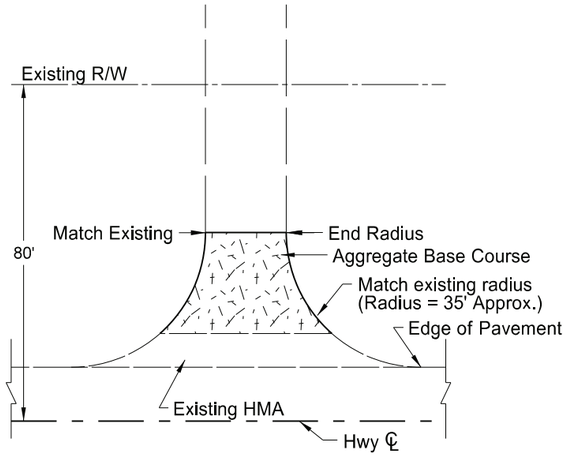
(1) Gravel Section Line or County Road



(2) Gravel Private Drive Approach



(3) Gravel Commercial Drive Approach



(4) Field Drive Approach

Notes:

1. Actual aggregate base course locations may vary in the field, as directed by the Engineer.
2. Quantity totals have been included in the bid items of the "Estimate of Quantities" of the plans.
3. 50 tons Aggregate base course has been provided in the quantities to fill in around the radii, as directed by the Engineer.

Approach Locations		
175.423	Lt	Gravel Section Line
175.490	Rt	Field Drive
175.708	Rt	Field Drive
176.126	Rt	Field Drive
176.498	Lt	Gravel Commercial Drive
176.550	Lt	Gravel Commercial Drive
176.565	Rt	Field Drive
176.650	Lt	Gravel Commercial Drive
177.050	Lt & Rt	Gravel Section Line
177.586	Lt & Rt	Field Drive
178.099	Lt & Rt	Gravel Section Line
178.393	Lt	Gravel Private Drive
178.708	Lt & Rt	Field Drive
179.080	Lt	Gravel Section Line
179.080	Rt	Field Drive
179.185	Lt	Field Drive
179.390	Rt	Gravel Commercial Drive
179.586	Lt	Field Drive
179.761	Rt	Gravel Commercial Drive
179.997	Rt	Gravel Commercial Drive
180.079	Lt & Rt	Gravel Section Line
180.137	Lt	Gravel Private Drive
180.201	Rt	Gravel Commercial Drive
180.323	Lt	Field Drive
180.723	Lt	Gravel Private Drive
180.825	Lt	Gravel Private Drive
180.903	Lt	Gravel Private Drive
181.050	Lt & Rt	Gravel Section Line
181.153	Lt	Gravel Private Drive

BASIS OF ESTIMATE		(1)	(2)	(3)	(4)	
ITEM	UNIT	Gravel Section Line	Gravel Private Drive	Gravel Commercial Drive	Field Drive	TOTALS
Number of Locations	#	10	6	7	12	35
Aggregate Base Course CL 5	TON	4.8	6.5	7.5	3.8	186

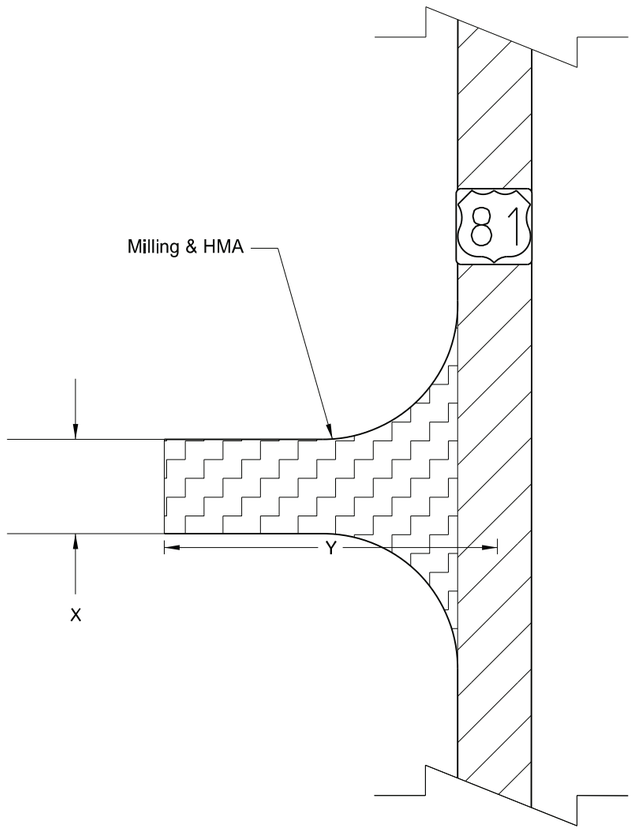
Approach Paving Details - Existing Rural Approaches

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

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Paved Approaches

	RP	X	Y	Area
Minto City Park	181.406	~28'	45'	124 SY
Lewis Ave	181.476	~33'	47'	111 SY
Duncan Ave	181.545	~21'	47'	82 SY
W Gillespie Ave	181.639	~33'	47'	113 SY
E Gillespie Ave	181.639	~33'	45'	106 SY
W Broughton Ave	181.714	~33'	47'	92 SY
E Broughton Ave	181.714	~33'	47'	90 SY
W Harvey Ave	181.783	~57'	48'	142 SY
E Harvey Ave	181.783	~57'	52'	149 SY
W Wilson Ave	181.852	~33'	48'	103 SY
E Wilson Ave	181.852	~33'	50'	103 SY
W Major Ave*	181.927	~33'	48'	88 SY
E Major Ave	181.927	~33'	48'	114 SY
W Hodson Ave	182.001	~33'	49'	119 SY

*Concrete Valley Gutter

Estimated Additional Quantities

Milling Pavement Surface	1,536 SY
RAP - Superpave FAA 43 @ 2 Tons/CY	171 Ton
PG 58S-34 Asphalt Cement @ 5.2%	9 Ton
Tack Coat @ 0.075 Gal/SY	116 Gal

2" Milling & HMA - Paved Approaches

Typical Milling & HMA Surface

Approach Details
Minto City Paved Approaches

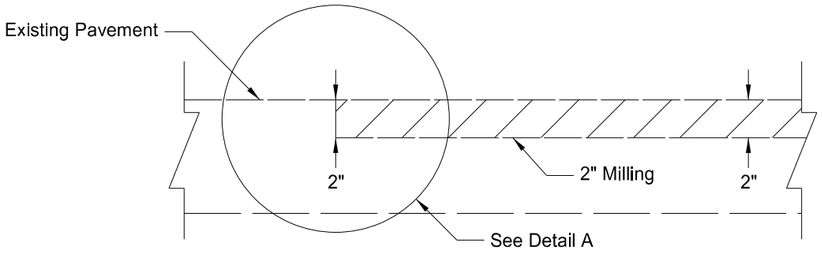
Milling & HMA, ADA Curb Ramp Revisions

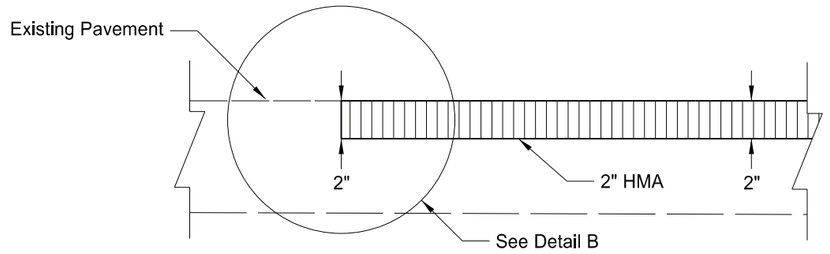
Ardoch N thru Minto

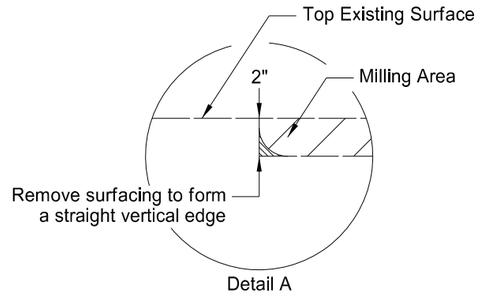
REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

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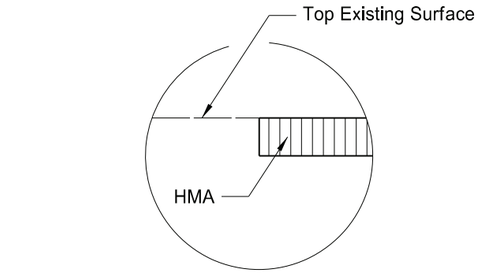


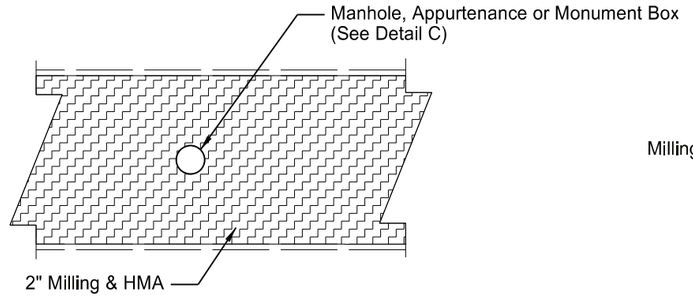


Manhole Locations	
RP	Offset
181.472	LT
181.477	RT
181.485	LT
181.551	LT
181.559	RT
181.568	RT
181.594	LT
181.638	LT
181.642	RT
181.710	LT
181.714	RT
181.750	RT
181.764	LT
181.787	RT
181.821	RT
181.858	RT
181.862	LT
181.914	LT
181.925	RT
181.957	LT
181.995	LT

Milling & HMA Details

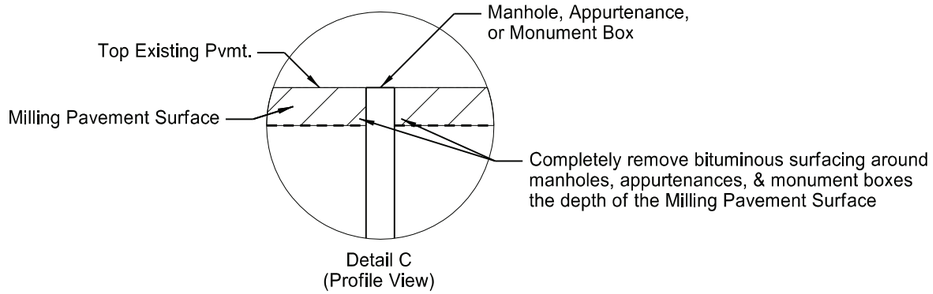
Beginning & End of Project
NPR Crossing #696262E - South & North sides of Track 1
NPR Crossing #696262E - South & North sides of Track 2
NPR Crossing #696262E - South & North sides of Track 3
BNSF Crossing #062535U - West & East sides of Track
Structure #0081-181.354 - South & North ends of Bridge deck
Paved Section Lines/City Street Returns





Milling Detail

Refer to note 411-P02



Appurtenance Locations	
RP	Offset
181.479	RT
181.645	LT & RT
181.717	2 on LT
181.717	RT
181.791	LT & RT
181.932	LT & RT

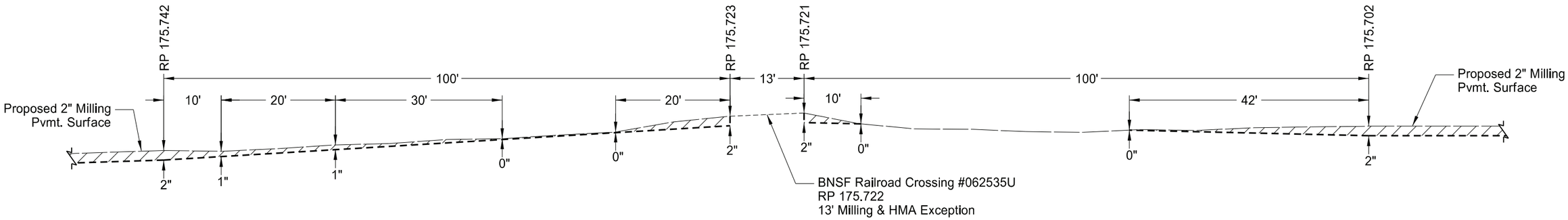
Milling & HMA Details

Milling & HMA, ADA Curb Ramp Revisions

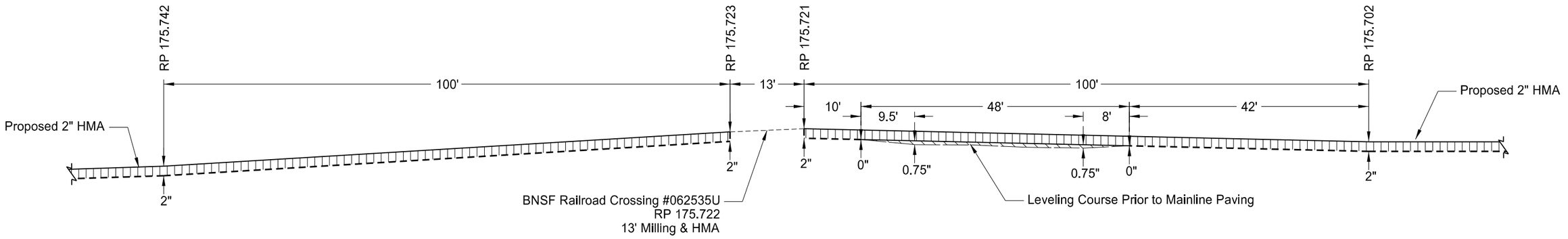
Ardoch N thru Minto

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DUSTIN LANG
PE-6394
DATE 04/28/26
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Proposed Milled Profile
BNSF Railroad Crossing #062535U



Proposed HMA Profile
BNSF Railroad Crossing #062535U

Additional Quantities for Leveling Course

RAP - Superpave FAA 43 @ 2 Tons/CY	52 Ton
PG 58S-34 Asphalt Cement @ 5.2%	3 Ton

2" Milling Pavement Surface

2" RAP - Superpave FAA 43

Leveling Course (RAP - Superpave FAA 43)

Milling & HMA Detail
BNSF Railroad Crossing #062535U
Profile Repair

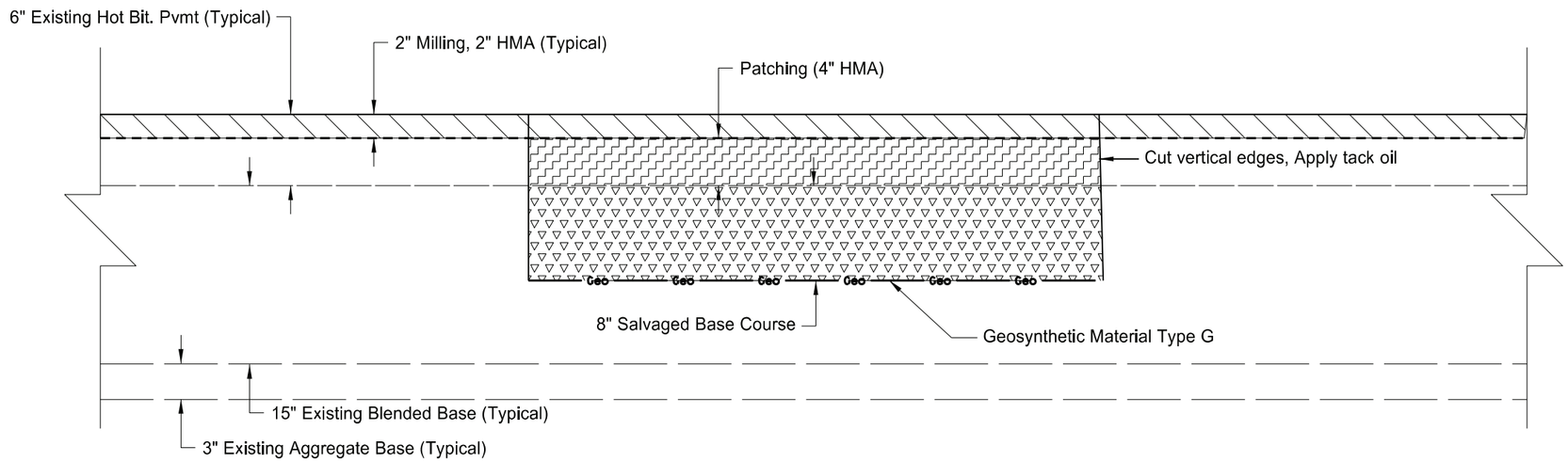
Milling & HMA, ADA Curb Ramp Revisions

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PE-6394
DATE 04/28/26
NORTH DAKOTA

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1. The exact locations, lengths and widths to be patched will be determined by the Engineer in the field.
2. Broken or unstable bituminous surfacing will be removed and replaced according to Section 430.04 G.
3. Remove existing base and subgrade material to the depth required to obtain a stable subgrade. Replace removed base and subgrade material with salvaged base course and compact.
4. The patching must meet specified density. The requirements of Section 430.04 I.2 apply.
5. Include all costs to remove & dispose of unstable material, cut vertical edges, apply tack oil, produce & place HMA in the contract price for PATCHING.
   Include all costs to haul, place and compact salvaged base course in the contract price for SALVAGED BASE COURSE.

Basis of Estimate							
Location					Patching (Ton)	Salvaged Base Course (CY)	Geosynthetic Material Type G (SY)
Begin RP	End RP	Lane	Length (Ft)	Width (Ft)			
180.817	181.271	SB	2,400	15	889	889	4,000
181.271	181.290	SB & NB	100	30	75	75	334
				Totals	**964**	**964**	**4,334**

Patching

Salvaged Base Course

Typical Milling Pavement Surface & HMA

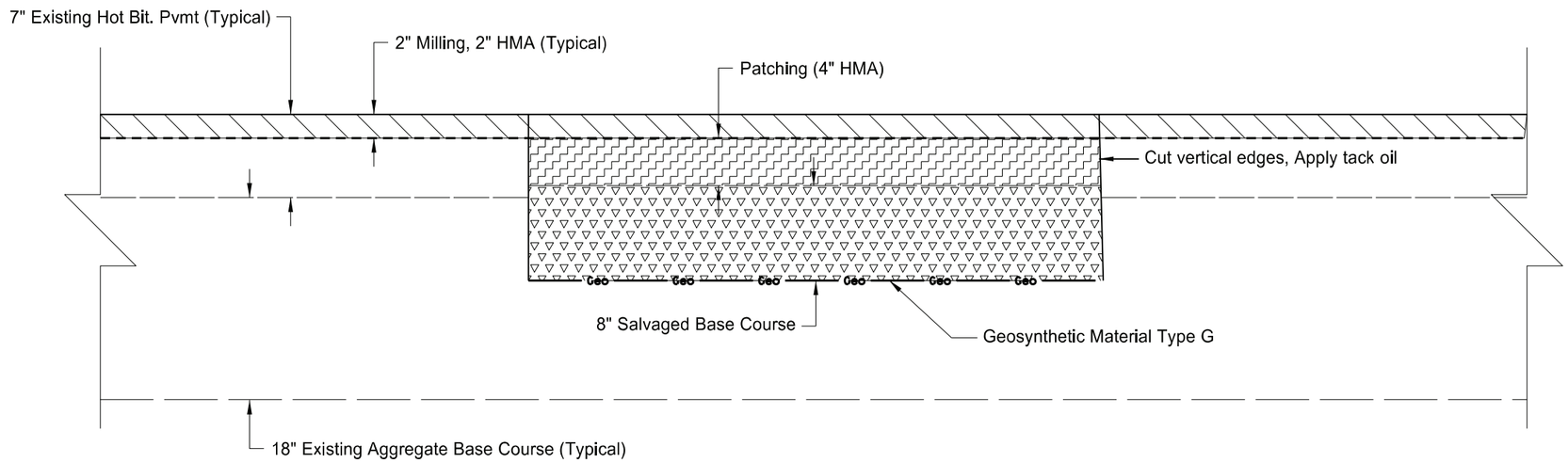
Patching Detail

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

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DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	20	6



1. The exact locations, lengths and widths to be patched will be determined by the Engineer in the field.
2. Broken or unstable bituminous surfacing will be removed and replaced according to Section 430.04 G.
3. Remove existing base and subgrade material to the depth required to obtain a stable subgrade. Replace removed base and subgrade material with salvaged base course and compact.
4. The patching must meet specified density. The requirements of Section 430.04 I.2 apply.
5. Include all costs to remove & dispose of unstable material, cut vertical edges, apply tack oil, produce & place HMA in the contract price for PATCHING.
   Include all costs to haul, place and compact salvaged base course in the contract price for SALVAGED BASE COURSE.

Basis of Estimate							
Location					Patching (Ton)	Salvaged Base Course (CY)	Geosynthetic Material Type G (SY)
Begin RP	End RP	Lane	Length (Ft)	Width (Ft)			
181.428	181.570	SB	750	22.5	417	417	1,875
				Totals	**417**	**417**	**1,875**

Patching

Salvaged Base Course

Typical Milling Pavement Surface & HMA

Patching Detail

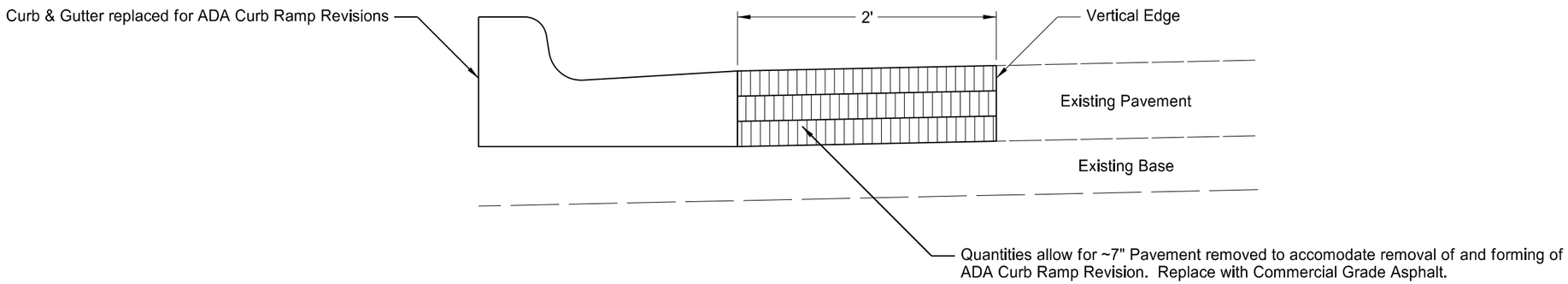
Milling & HMA, ADA Curb Ramp Revisions

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	ND	NH-6-081(120)175	20	7



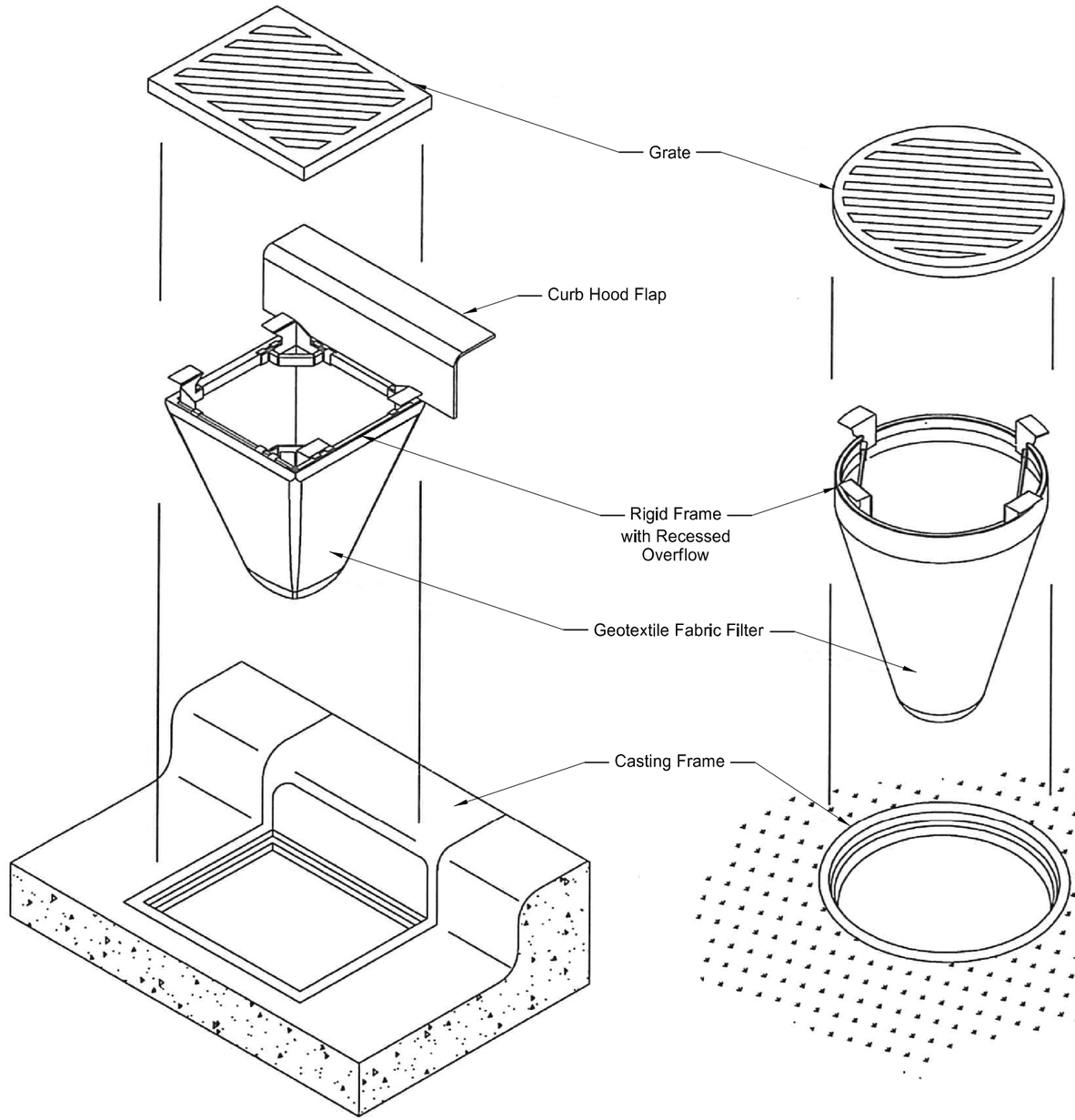
Pavement Removal & HMA
for ADA Curb Ramp Revision

Milling & HMA, ADA Curb Ramp Revisions

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PE-6394
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Catch Basin

Area Drain

Notes:

1. Inlet protection device will be manufactured to be recessed within specified or existing casting.
2. Overflow to be sized at a minimum to accommodate the grate flow capacity.
3. Furnish, install and maintain (clean) drainage inlet filter assemblies to collect sediment in surface storm water runoff. Dispose of debris or silt tha has accumulated in the bag. Periodic cleaning of the filter is needed as necessary. Remove drainage inlet filter when vegetation has established.
4. Provide Wimco, Lange IPD, Flexstorm, Dandy Curbsack, or an approved equal.
5. Keep filter in place until after the gradient surfaces are stabilized and the surrounding street is clean of debris.
6. Include all costs to furnish, install, maintain, replace, and remove devices in the contract unit price for "INLET PROTECTION - SPECIAL".

Inlet Protection-Special			
RP	Offset	Size	Quantity
181.472	RT	36"	1
181.485	LT & RT	36"	2
181.551	LT & RT	36"	2
181.638	LT & RT	24"	2
181.647	LT & RT	36"	2
181.710	LT & RT	36"	2
181.719	LT & RT	36"	2
181.764	LT & RT	36"	2
181.854	LT & RT	36"	2
181.862	LT & RT	24"	2
181.914	LT & RT	24"	2
181.995	LT & RT	36"	2
182.008	LT	36"	1
		Total	24

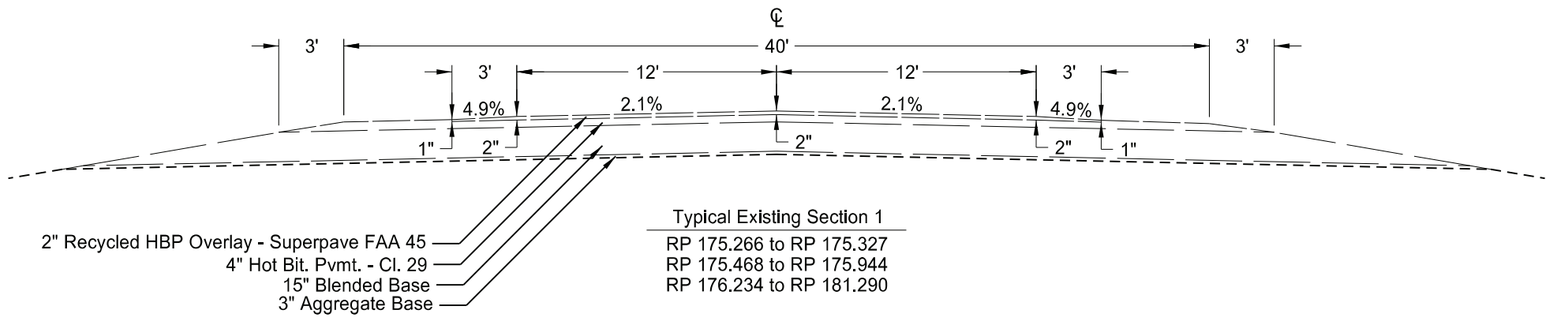
Inlet Protection Device

Milling & HMA, ADA Curb Ramp Revisions

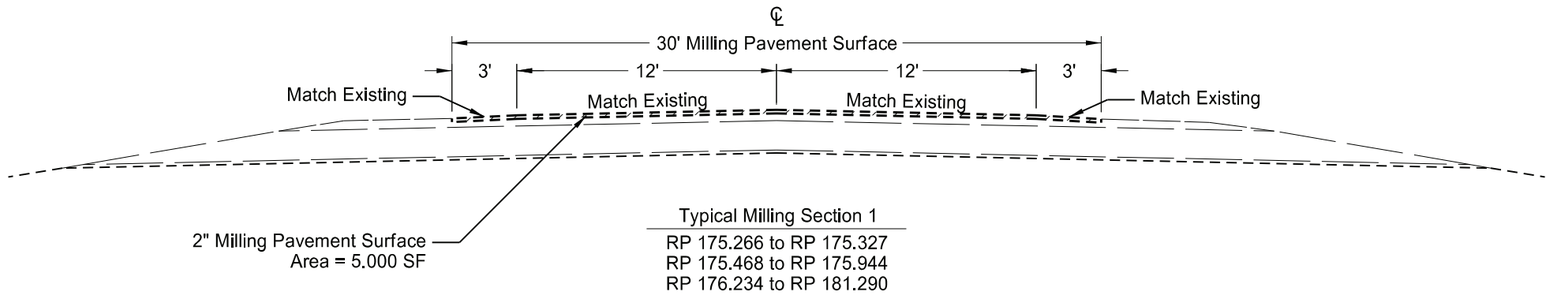
Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

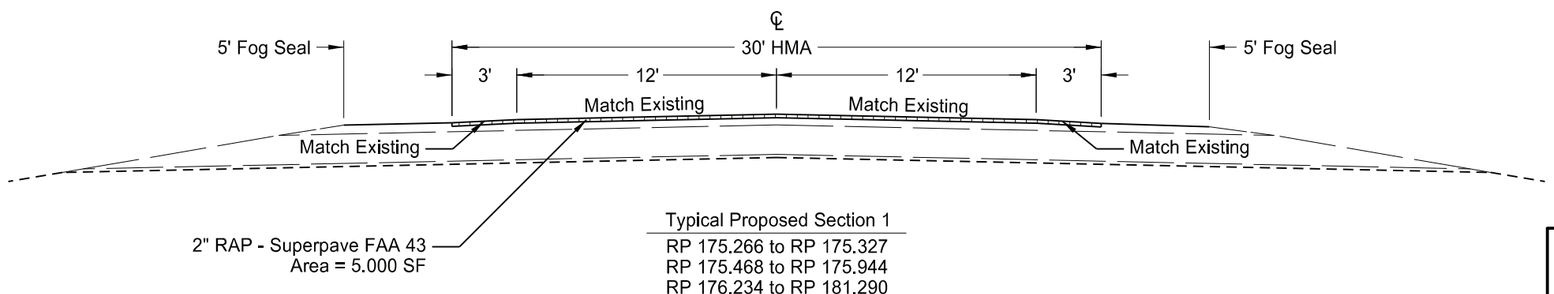
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	1



Typical Existing Section 1
RP 175.266 to RP 175.327
RP 175.468 to RP 175.944
RP 176.234 to RP 181.290



Typical Milling Section 1
RP 175.266 to RP 175.327
RP 175.468 to RP 175.944
RP 176.234 to RP 181.290



Typical Proposed Section 1
RP 175.266 to RP 175.327
RP 175.468 to RP 175.944
RP 176.234 to RP 181.290

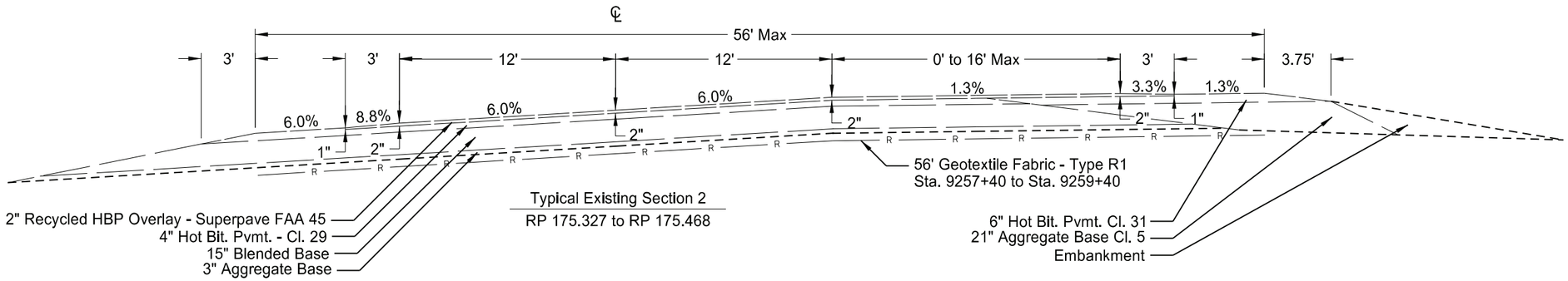
Typical Sections

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

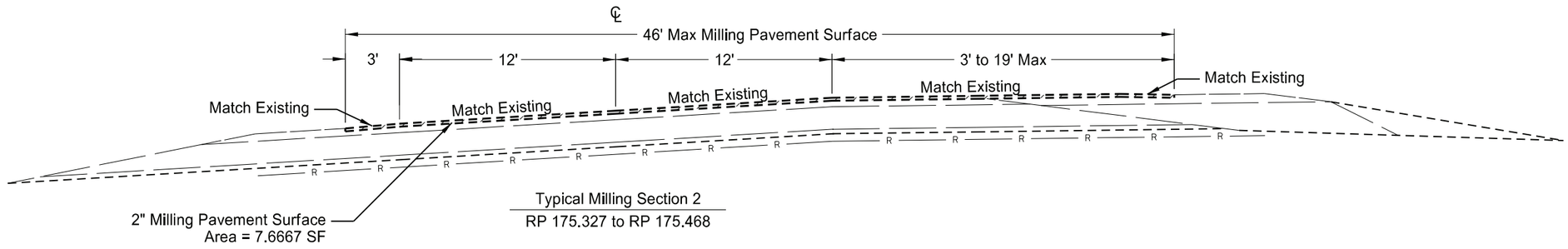
REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	2



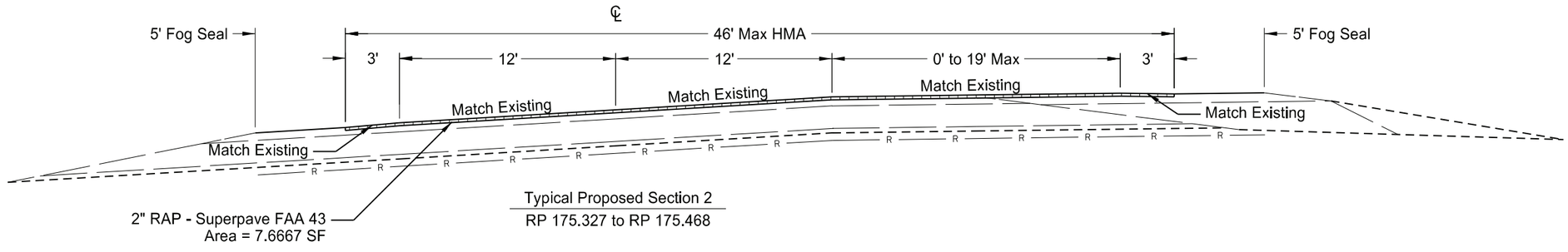
Typical Existing Section 2

RP 175.327 to RP 175.468



Typical Milling Section 2

RP 175.327 to RP 175.468



Typical Proposed Section 2

RP 175.327 to RP 175.468

Typical Sections

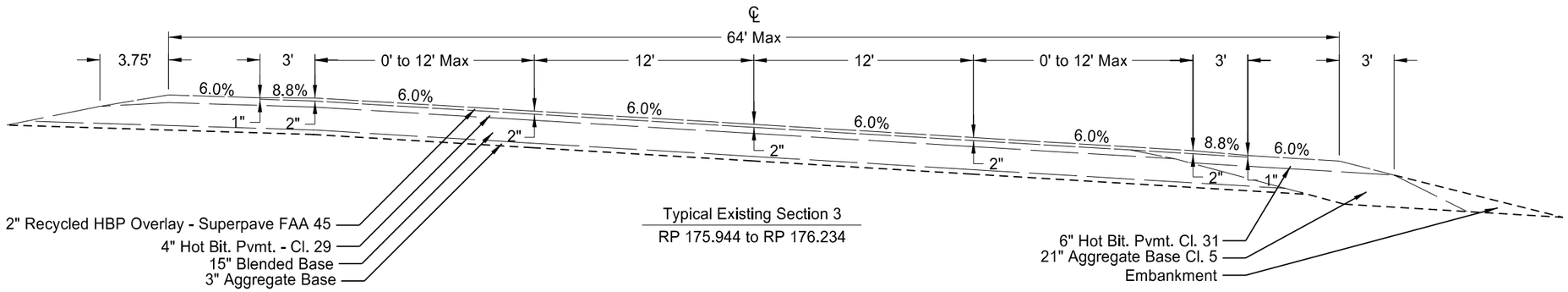
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

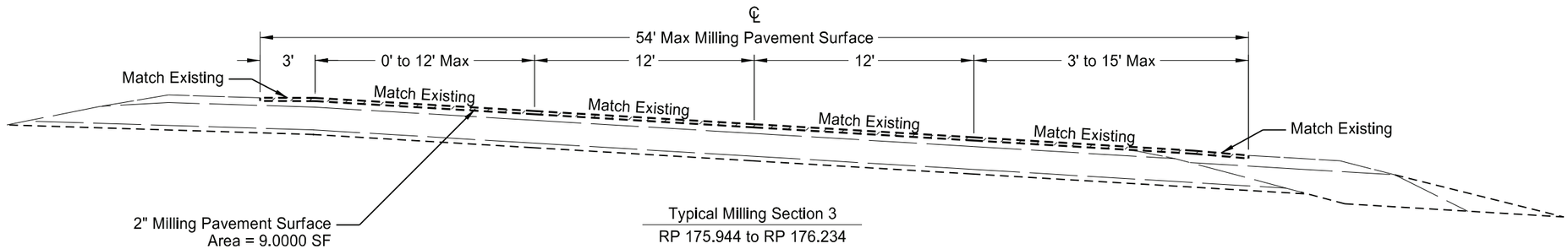
REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

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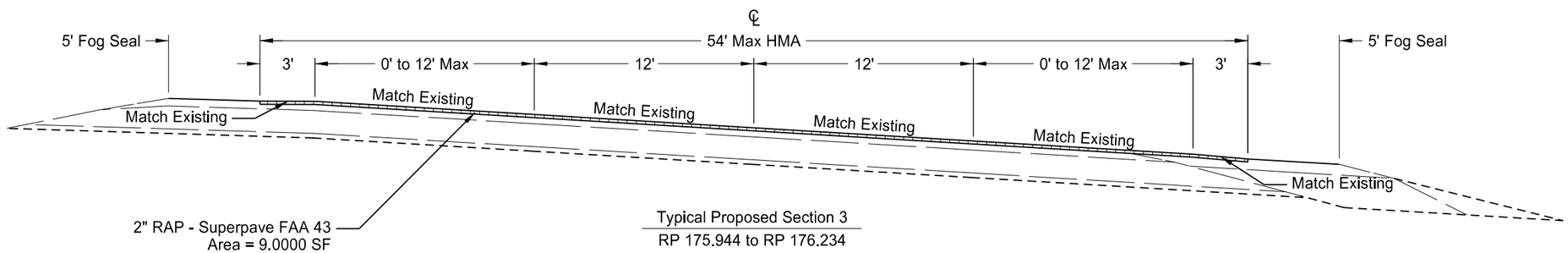
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	3



Typical Existing Section 3
RP 175.944 to RP 176.234



Typical Milling Section 3
RP 175.944 to RP 176.234



Typical Proposed Section 3
RP 175.944 to RP 176.234

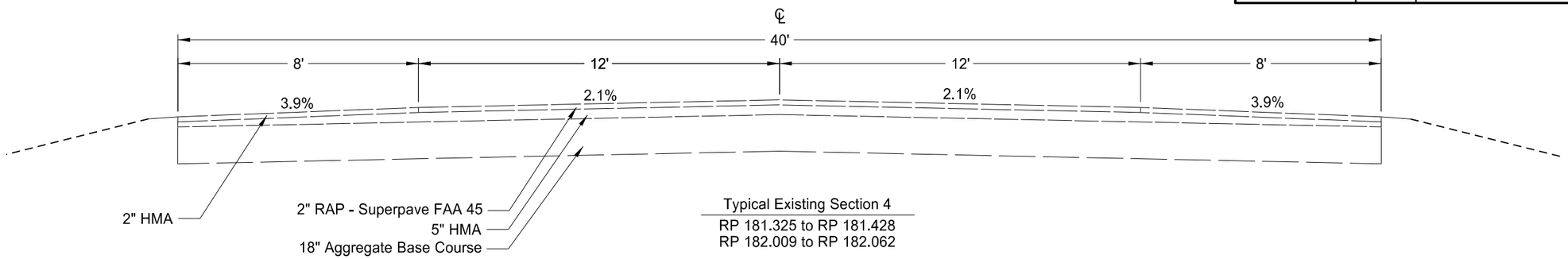
Typical Sections

Milling & HMA, ADA Curb Ramp Revisions

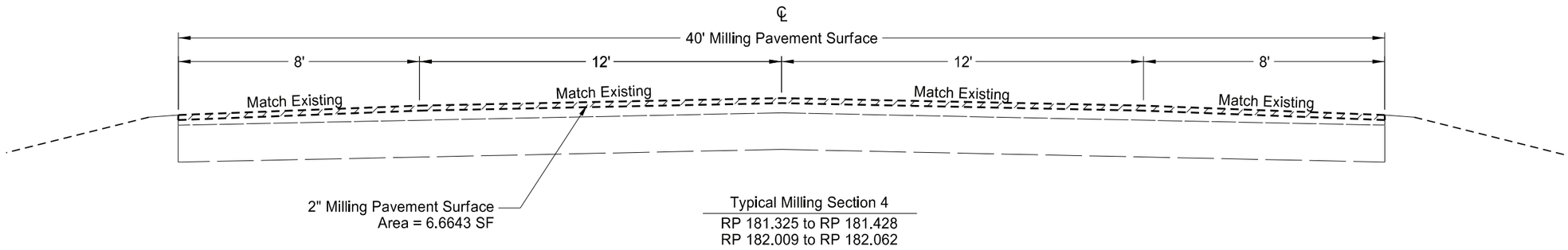
Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

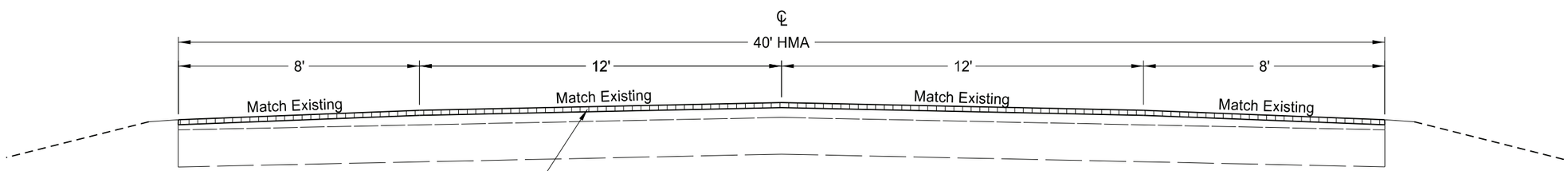
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	4



Typical Existing Section 4
RP 181.325 to RP 181.428
RP 182.009 to RP 182.062



Typical Milling Section 4
RP 181.325 to RP 181.428
RP 182.009 to RP 182.062



Typical Proposed Section 4
RP 181.325 to RP 181.428
RP 182.009 to RP 182.062

Typical Sections

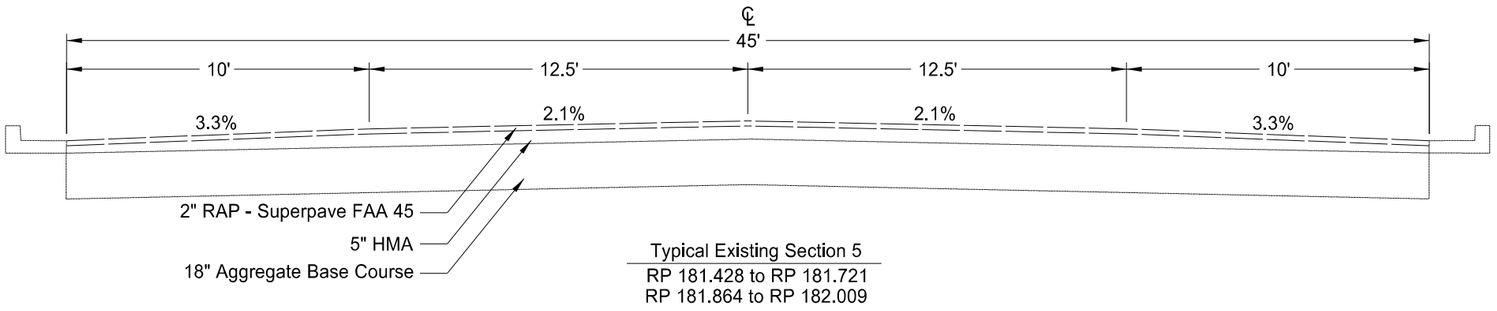
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

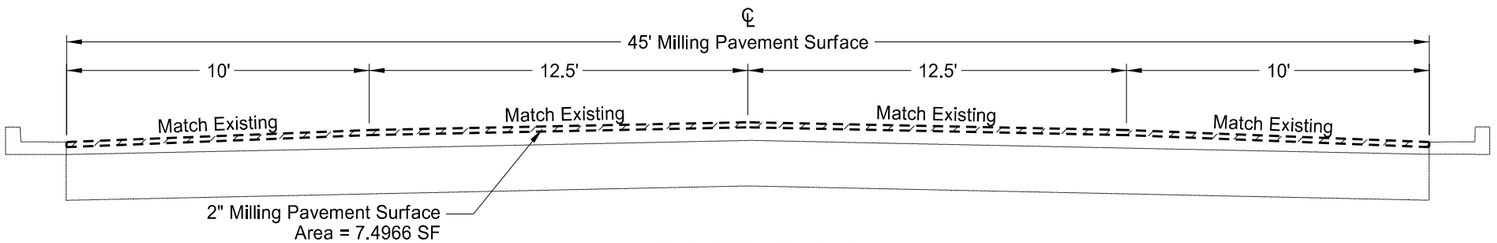
REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

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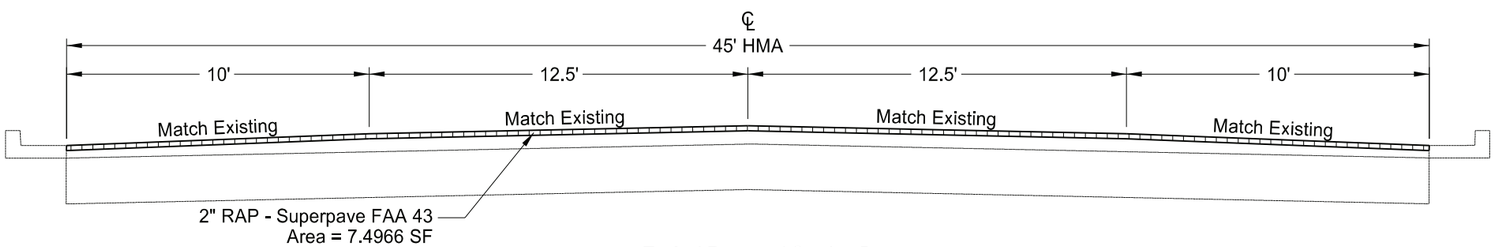
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	5



Typical Existing Section 5
RP 181.428 to RP 181.721
RP 181.864 to RP 182.009



Typical Milling Section 5
RP 181.428 to RP 181.721
RP 181.864 to RP 182.009



Typical Proposed Section 5
RP 181.428 to RP 181.721
RP 181.864 to RP 182.009

Typical Sections

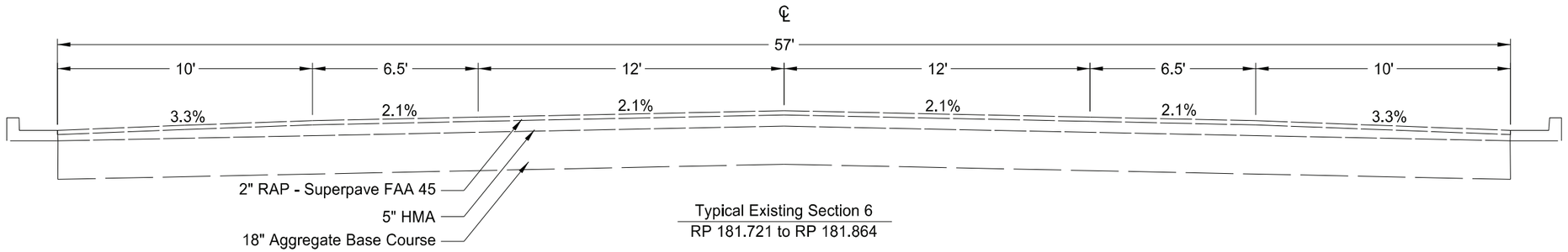
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

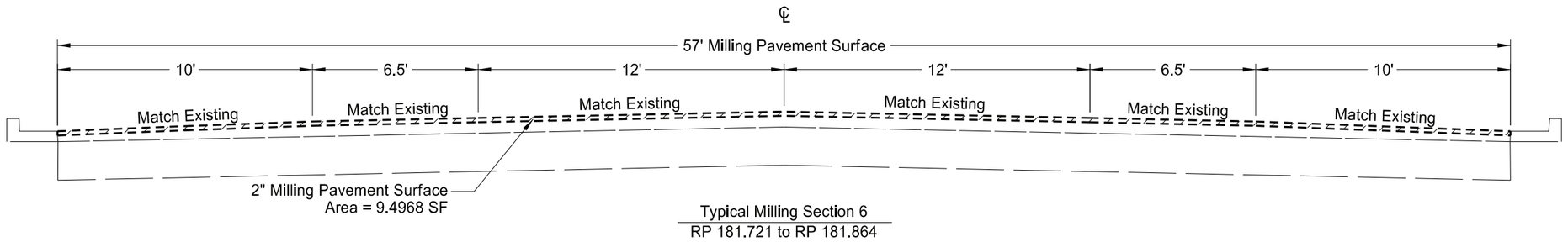
REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
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DATE 04/28/26
NORTH DAKOTA

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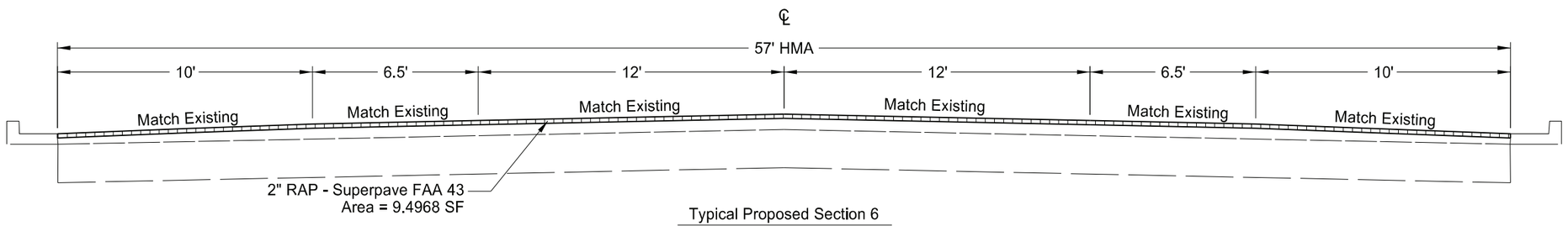
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	30	6



Typical Existing Section 6
RP 181.721 to RP 181.864



Typical Milling Section 6
RP 181.721 to RP 181.864



Typical Proposed Section 6
RP 181.721 to RP 181.864

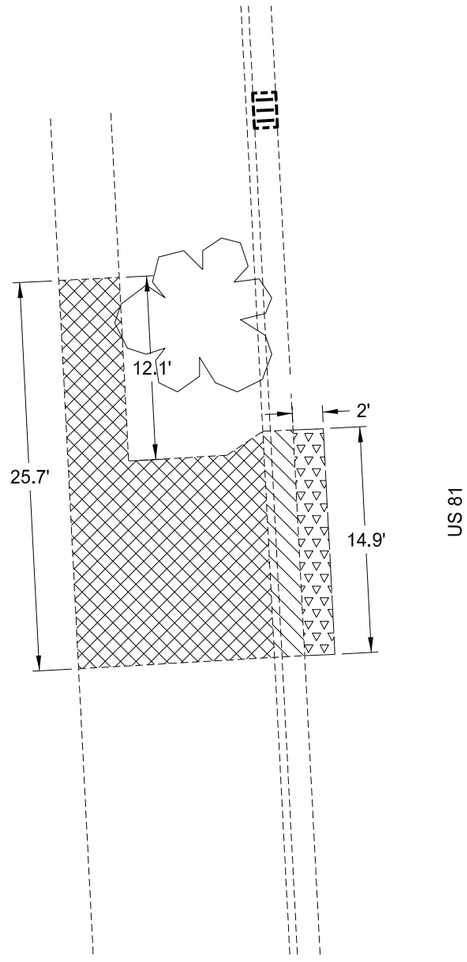
Typical Sections

Milling & HMA, ADA Curb Ramp Revisions

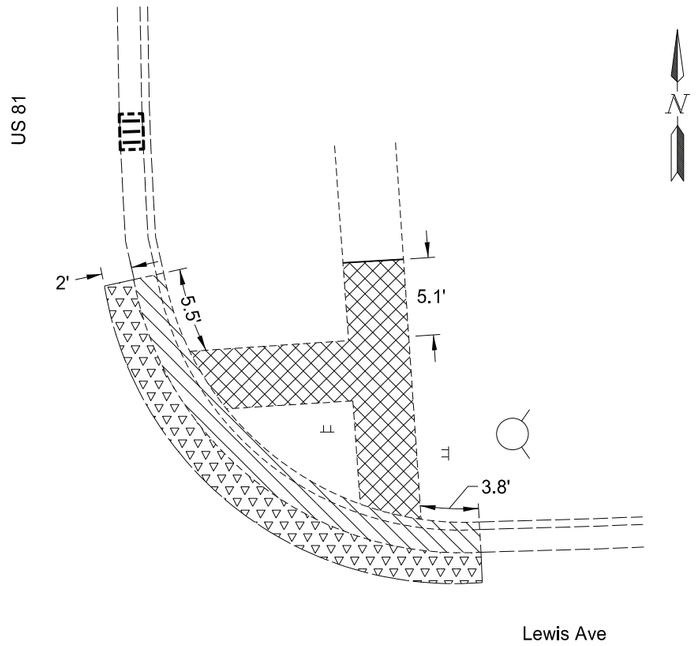
Ardoch N thru Minto

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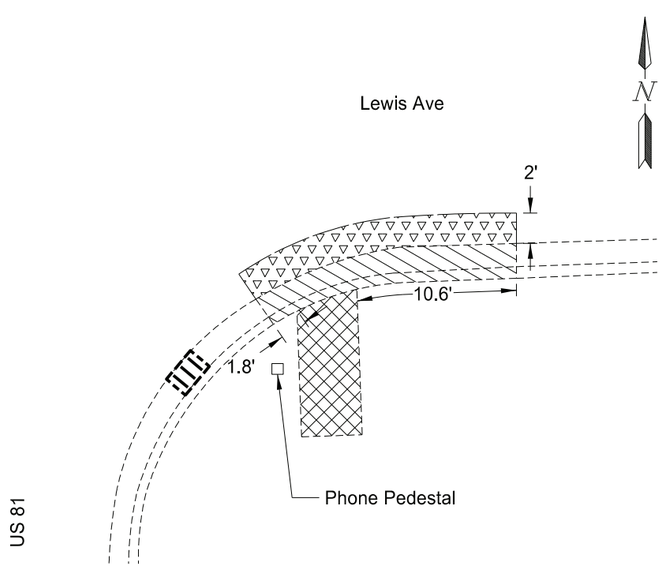
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	40	1



Location 1-NWQ & SWQ Lewis Ave



Location 2-NEQ Lewis Ave



Location 3-SEQ Lewis Ave

202 0114 Removal of Concrete Pavement	
Location 1	25.0 SY
Location 2	11.5 SY
Location 3	4.0 SY

202 0130 Removal of Curb & Gutter	
Location 1	14.9 LF
Location 2	28.9 LF
Location 3	16.6 LF

202 0132 Removal of Bituminous Surfacing	
Location 1	3.3 SY
Location 2	7.9 SY
Location 3	4.2 SY

Removal of Concrete Pavement

Removal of Curb & Gutter

Removal of Bituminous Surfacing

Stormwater Inlet

Removals

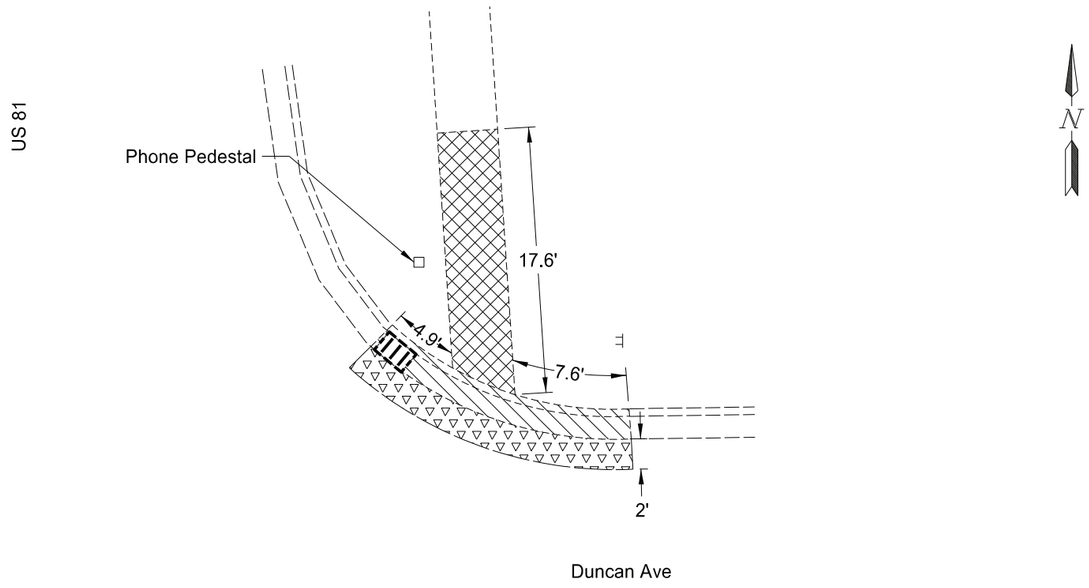
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

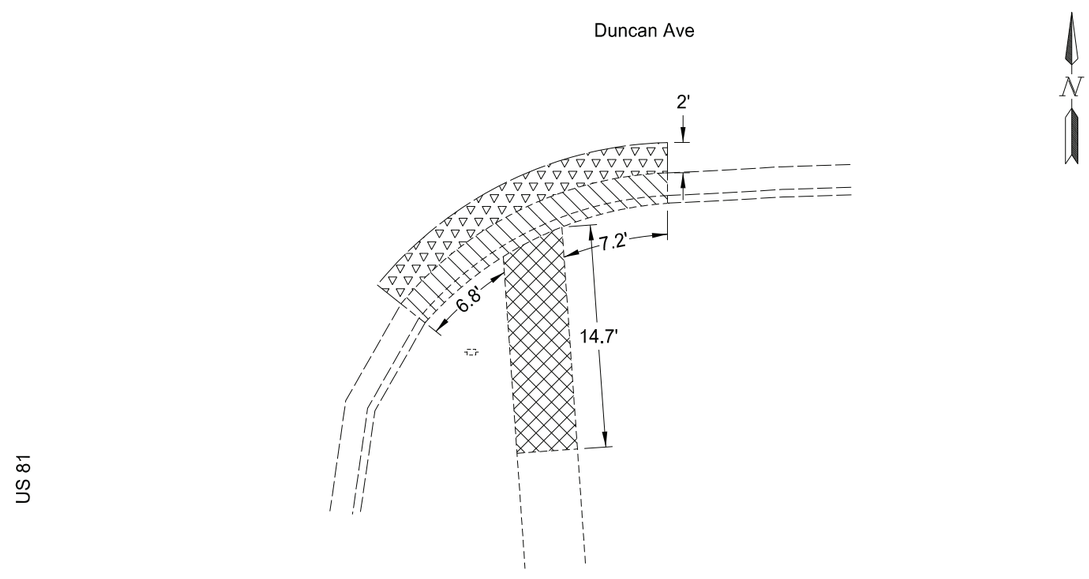
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DUSTIN LANG
PE-6394
DATE 07/23/26
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	40	2



Location 4-NEQ Duncan Ave



Location 5-SEQ Duncan Ave

202 0114 Removal of Concrete Pavement	
Location 4	7.4 SY
Location 5	6.2 SY
202 0130 Removal of Curb & Gutter	
Location 4	17.2 LF
Location 5	18.3 LF
202 0132 Removal of Bituminous Surfacing	
Location 4	4.3 SY
Location 5	4.8 SY

Removal of Concrete Pavement

Removal of Curb & Gutter

Removal of Bituminous Surfacing

Stormwater Inlet

Removals

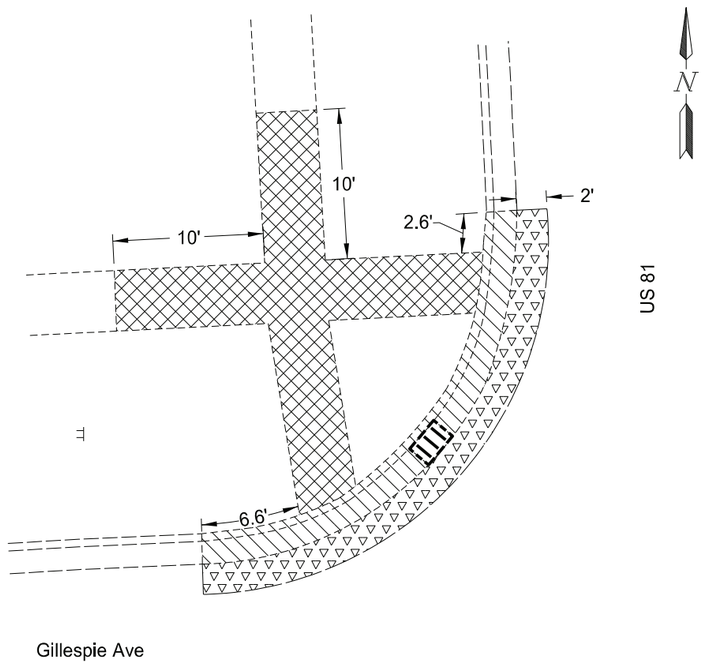
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

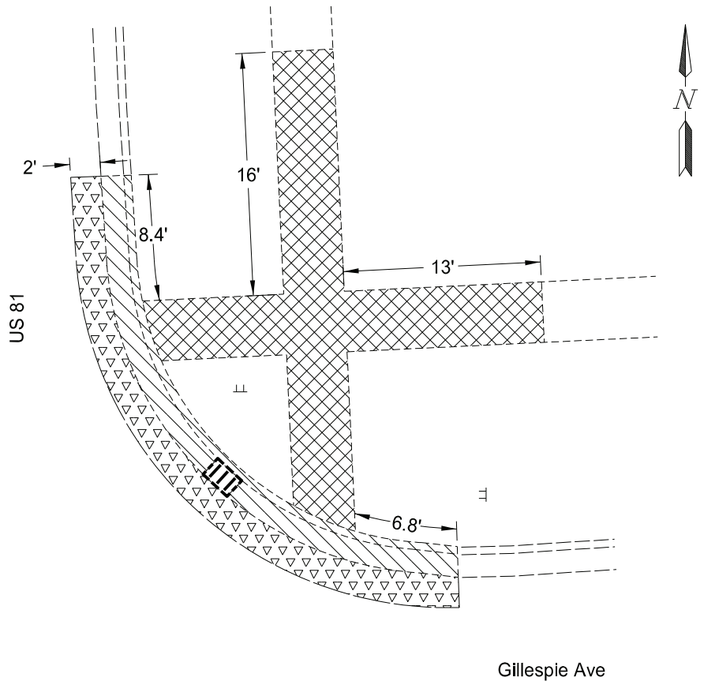
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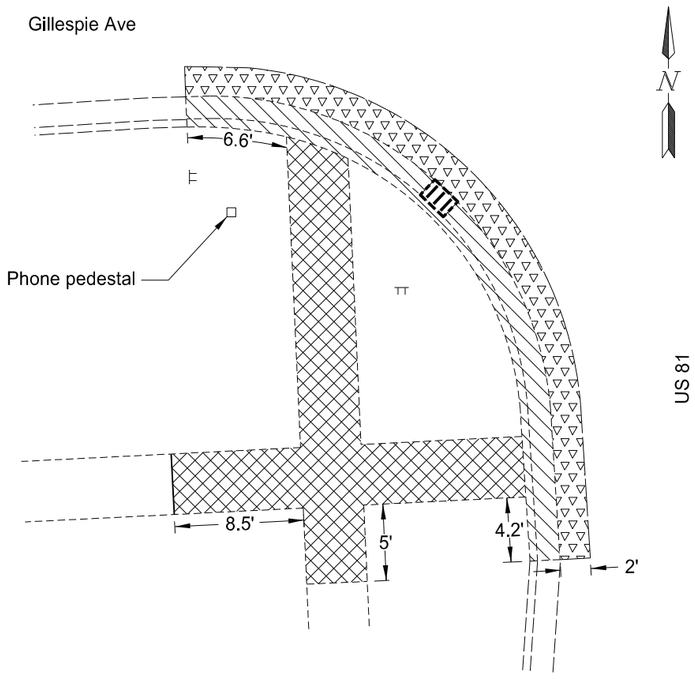
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	40	3



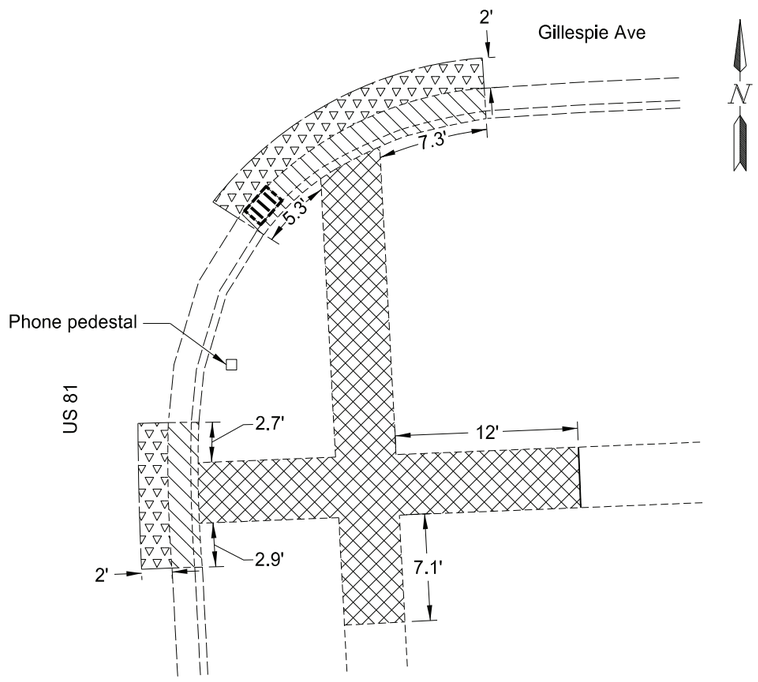
Location 6-NWQ Gillespie Ave



Location 7-NEQ Gillespie Ave



Location 8-SWQ Gillespie Ave



Location 9-SEQ Gillespie Ave

202 0114 Removal of Concrete Pavement	
Location 6	20.4 SY
Location 7	23.5 SY
Location 8	21.4 SY
Location 9	23.0 SY

202 0130 Removal of Curb & Gutter	
Location 6	31.7 LF
Location 7	36.9 LF
Location 8	41.9 LF
Location 9	26.6 LF

202 0132 Removal of Bituminous Surfacing	
Location 6	8.4 SY
Location 7	9.4 SY
Location 8	10.5 SY
Location 9	6.5 SY

Removal of Concrete Pavement

Removal of Curb & Gutter

Removal of Bituminous Surfacing

Stormwater Inlet

Removals

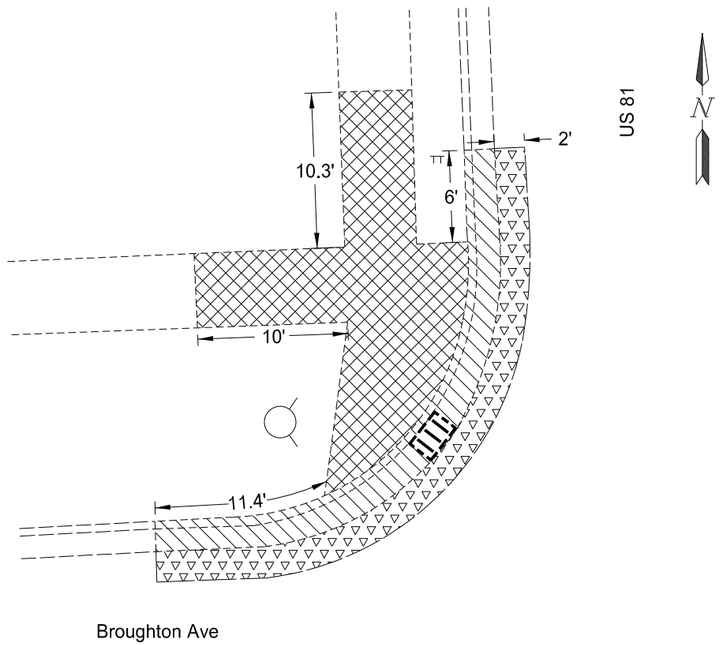
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

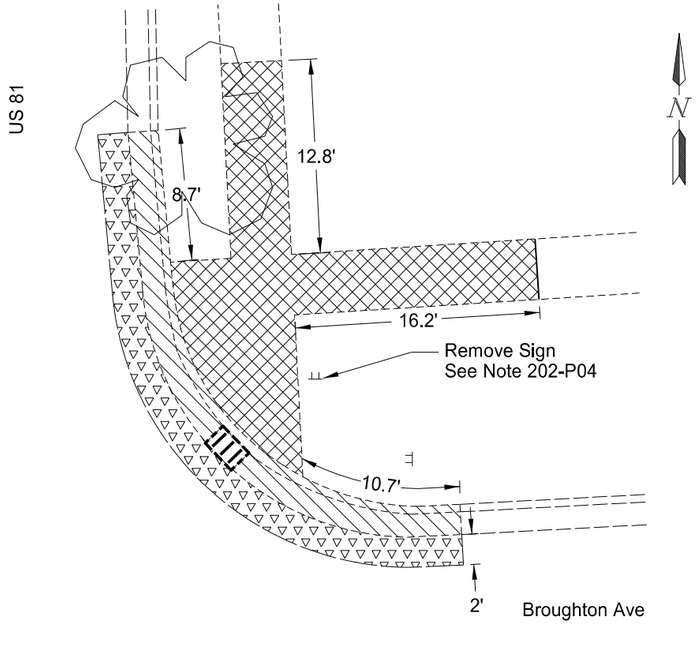
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DUSTIN LANG
PE-6394
DATE 07/23/26
NORTH DAKOTA

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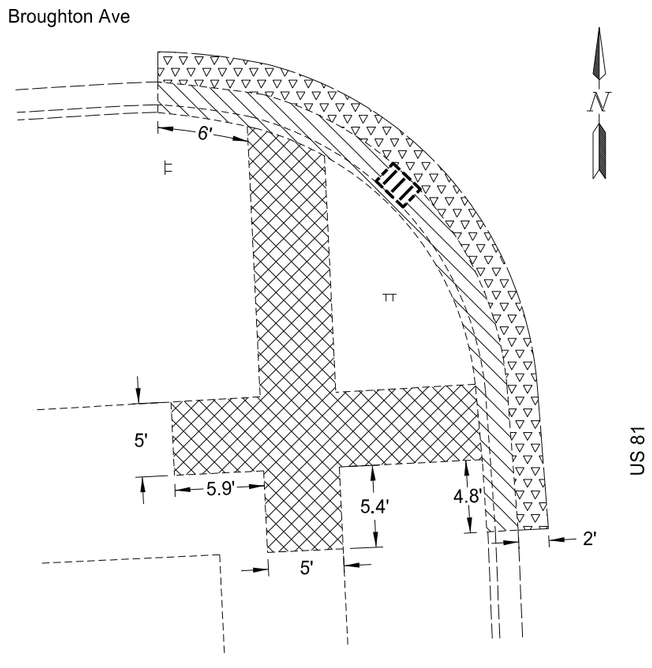
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	40	4



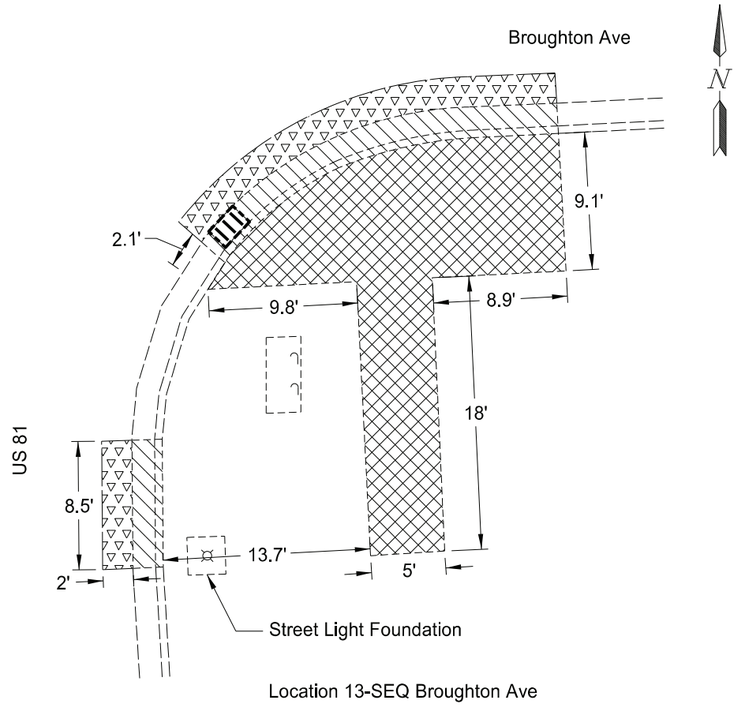
Location 10-NWQ Broughton Ave



Location 11-NEQ Broughton Ave



Location 12-SWQ Broughton Ave



Location 13-SEQ Broughton Ave

202 0114 Removal of Concrete Pavement

Location 10	22.2 SY
Location 11	22.3 SY
Location 12	23.4 SY
Location 13	28.8 SY

202 0130 Removal of Curb & Gutter

Location 10	38.0 LF
Location 11	36.8 LF
Location 12	40.0 LF
Location 13	33.0 LF

202 0132 Removal of Bituminous Surfacing

Location 10	9.5 SY
Location 11	9.3 SY
Location 12	10.0 SY
Location 13	7.9 SY

Removal of Concrete Pavement

Removal of Curb & Gutter

Removal of Bituminous Surfacing

Stormwater Inlet

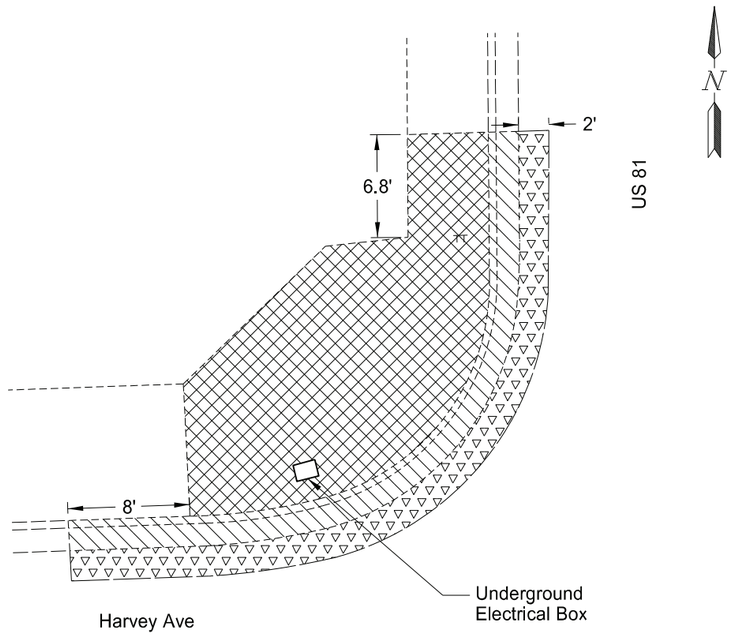
Removals

Milling & HMA, ADA Curb Ramp Revisions

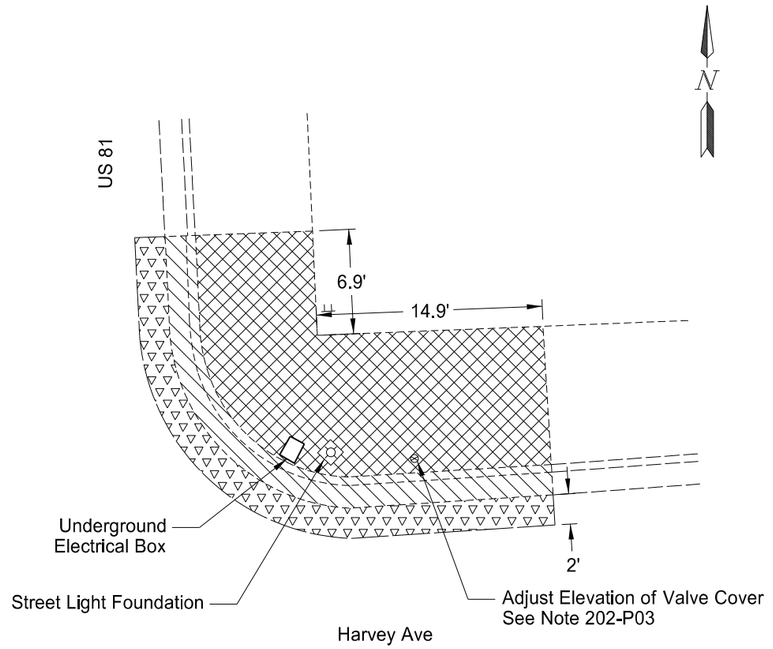
Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 07/23/26
NORTH DAKOTA

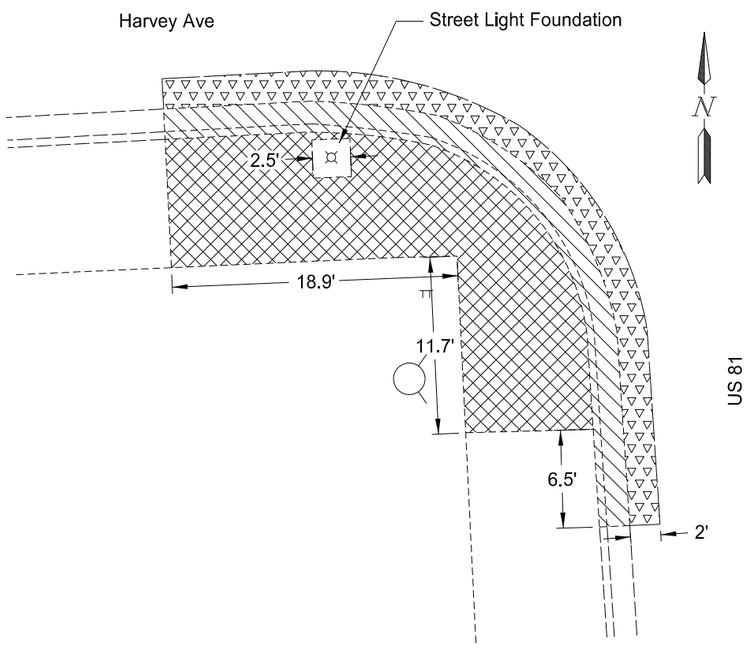
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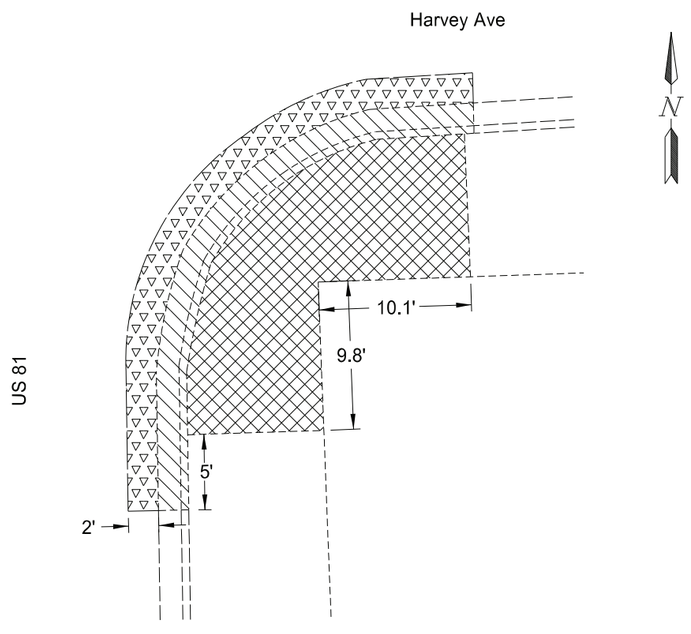
Location 14-NWQ Harvey Ave



Location 15-NEQ Harvey Ave



Location 16-SWQ Harvey Ave



Location 17-SEQ Harvey Ave

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	40	5

202 0114 Removal of Concrete Pavement	
Location 14	33.1 SY
Location 15	26.7 SY
Location 16	29.9 SY
Location 17	23.5 SY

202 0130 Removal of Curb & Gutter	
Location 14	46.2 LF
Location 15	34.8 LF
Location 16	47.5 LF
Location 17	36.9 LF

202 0132 Removal of Bituminous Surfacing	
Location 14	11.2 SY
Location 15	8.8 SY
Location 16	11.1 SY
Location 17	9.5 SY

Removal of Concrete Pavement

Removal of Curb & Gutter

Removal of Bituminous Surfacing

Removals

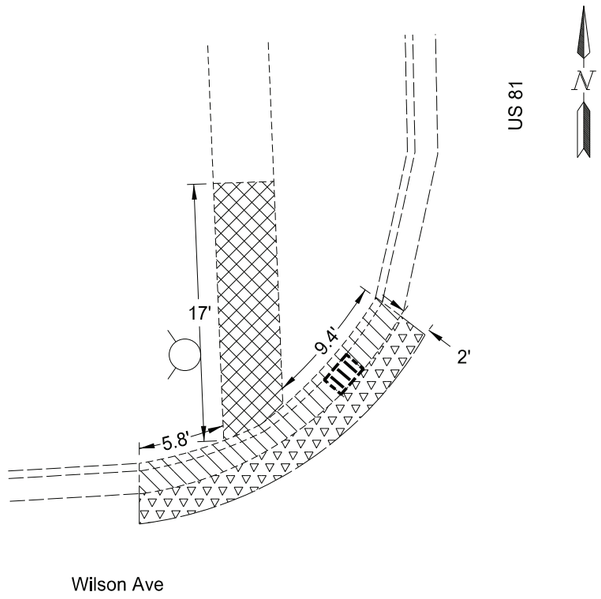
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

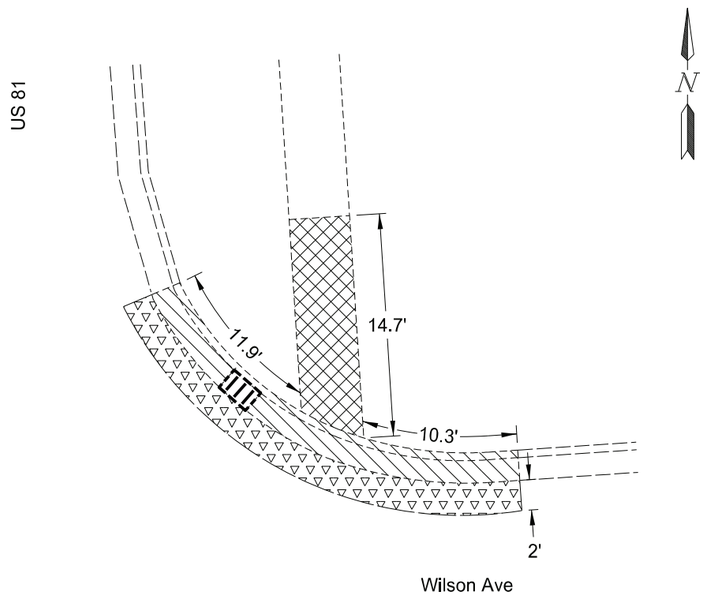
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DUSTIN LANG
PE-6394
DATE 07/23/26
NORTH DAKOTA

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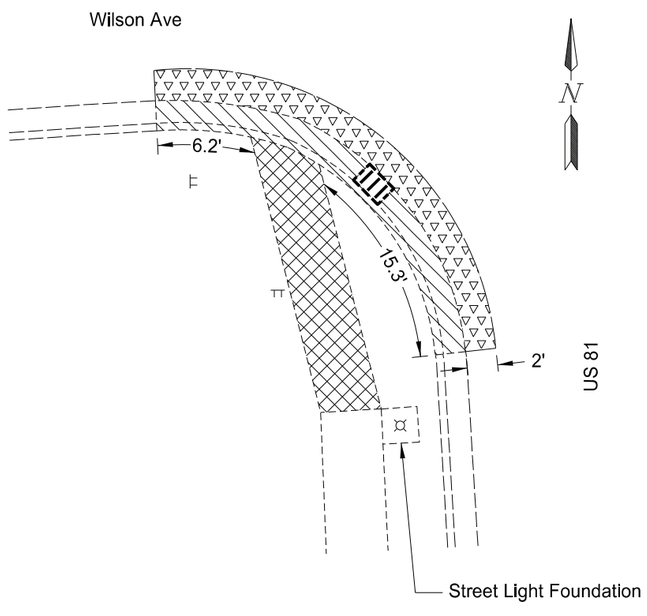
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	40	6



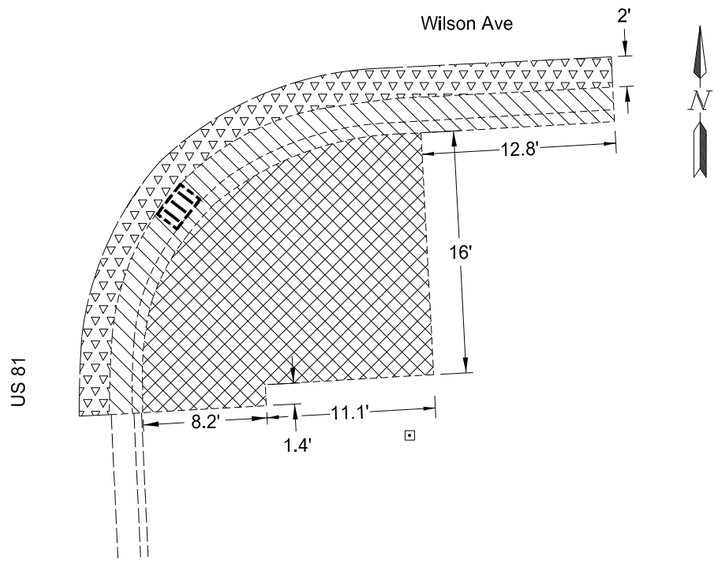
Location 18-NWQ Wilson Ave



Location 19-NEQ Wilson Ave



Location 20-SWQ Wilson Ave



Location 21-SEQ Wilson Ave

202 0114 Removal of Concrete Pavement

Location 18	7.2 SY
Location 19	6.1 SY
Location 20	7.8 SY
Location 21	29.4 SY

202 0130 Removal of Curb & Gutter

Location 18	19.7 LF
Location 19	26.7 LF
Location 20	26.4 LF
Location 21	29.9 LF

202 0132 Removal of Bituminous Surfacing

Location 18	5.0 SY
Location 19	6.9 SY
Location 20	6.9 SY
Location 21	10.6 SY

Removal of Concrete Pavement

Removal of Curb & Gutter

Removal of Bituminous Surfacing

Stormwater Inlet

Removals

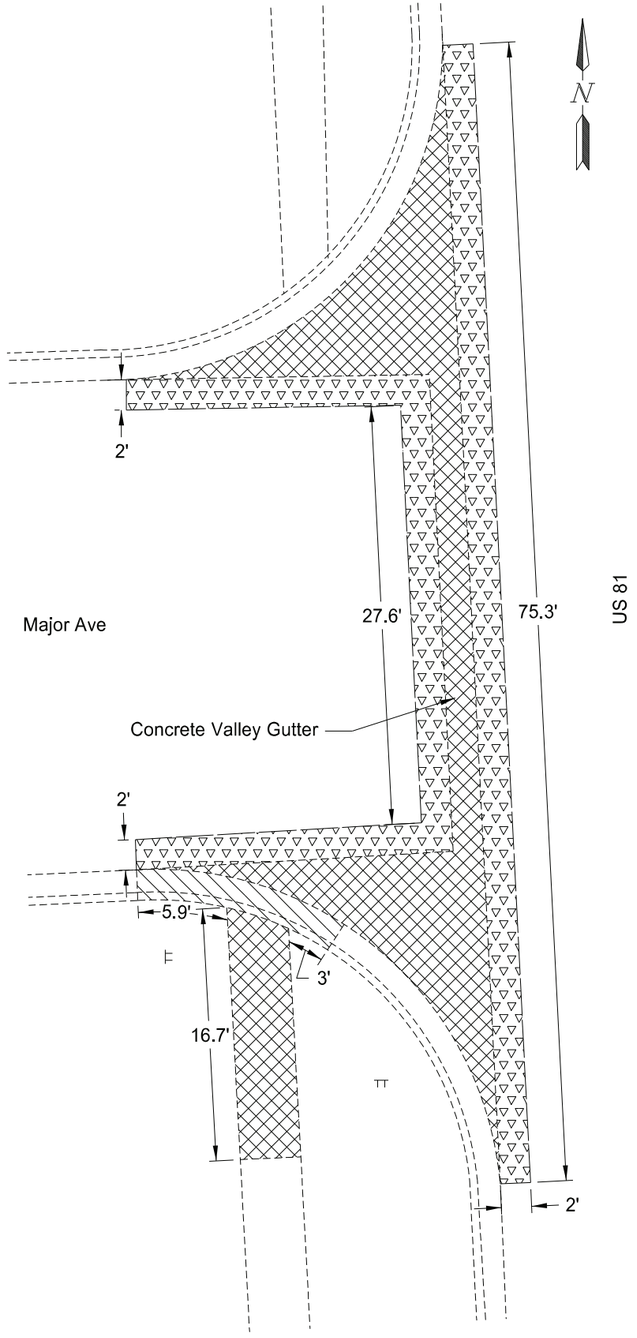
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

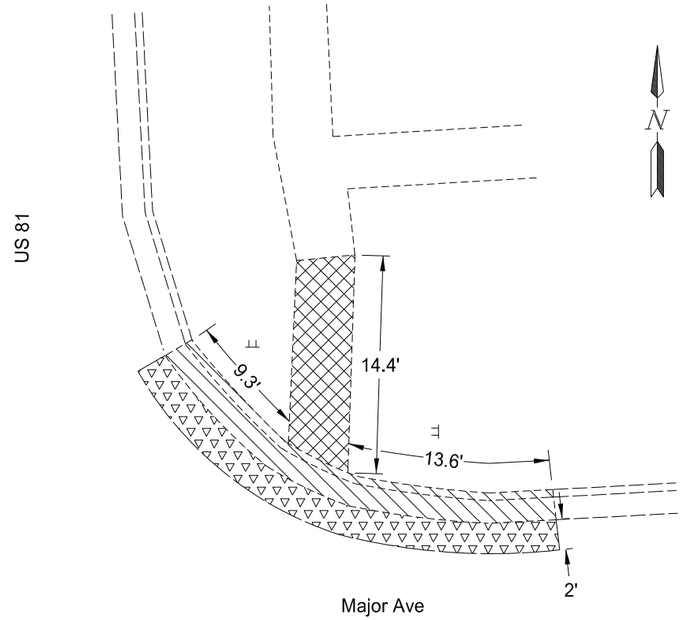
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DUSTIN LANG
PE-6394
DATE 07/23/26
NORTH DAKOTA

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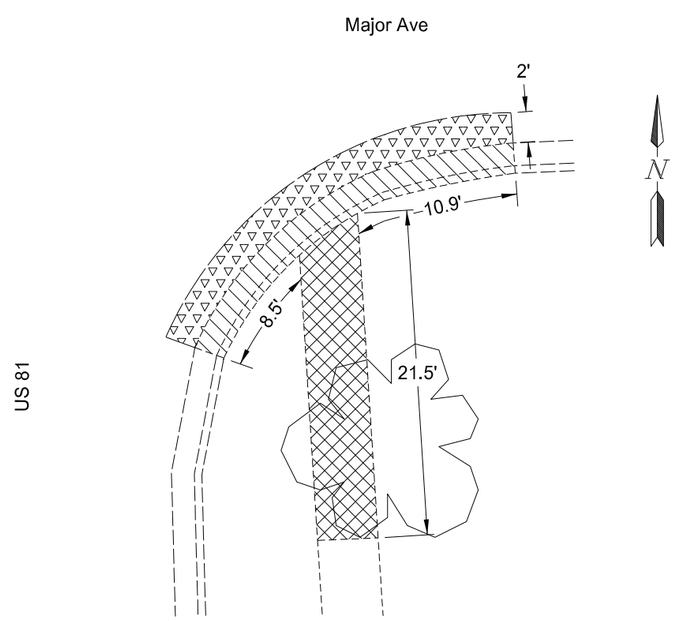
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	40	7



Location 22-SWQ Major Ave



Location 23-NEQ Major Ave



Location 24-SEQ Major Ave

202 0114 Removal of Concrete Pavement

Location 22	39.2 SY
Location 23	5.8 SY
Location 24	9.0 SY

202 0130 Removal of Curb & Gutter

Location 22	14.4 LF
Location 23	27.3 LF
Location 24	24.1 LF

202 0132 Removal of Bituminous Surfacing

Location 22	31.9 SY
Location 23	7.2 SY
Location 24	6.3 SY

Removal of Concrete Pavement

Removal of Curb & Gutter

Removal of Bituminous Surfacing

Removals

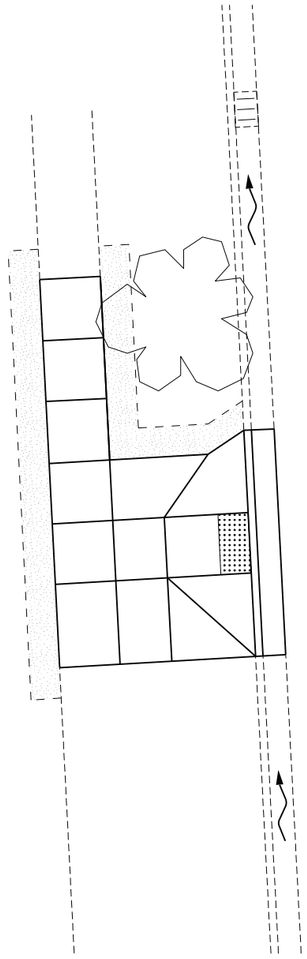
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

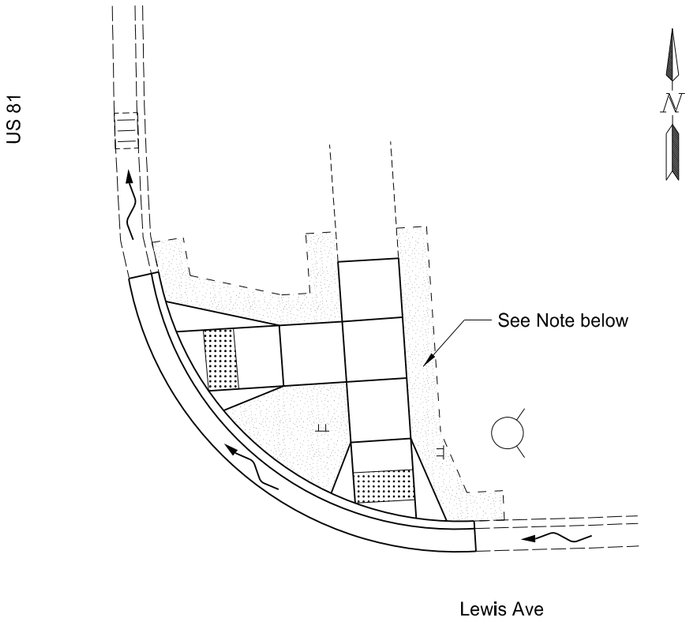
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DUSTIN LANG
PE-6394
DATE 07/23/26
NORTH DAKOTA

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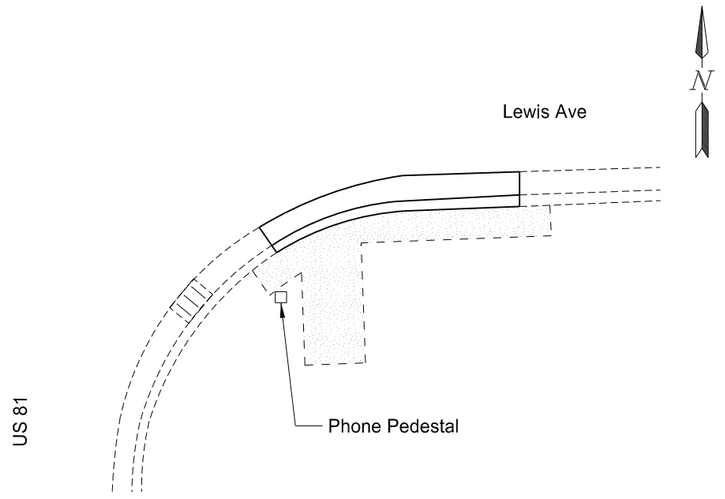
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	77	1



Location 1-NWQ & SWQ Lewis Ave



Location 2-NEQ Lewis Ave



Location 3-SEQ Lewis Ave

970 0008 Landscape Preparation

Location 1	11.3 SY
Location 2	13.0 SY
Location 3	7.5 SY

Landscape Preparation

Note: Include all costs to remove & replace earth and salvage & replace landscaping rock in the contract unit price for "LANDSCAPE PREPARATION".

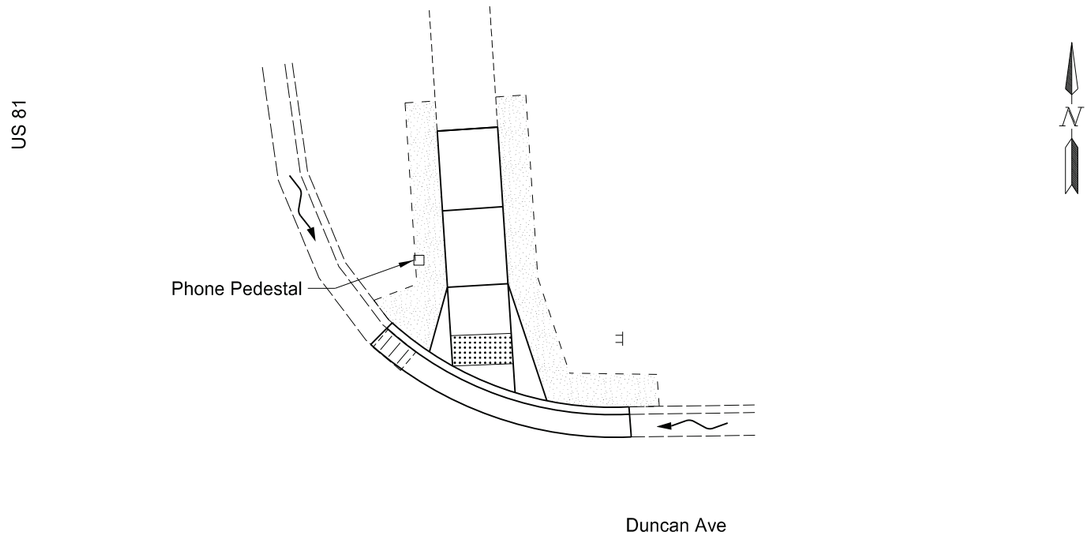
Permanent Sediment & Erosion Control

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

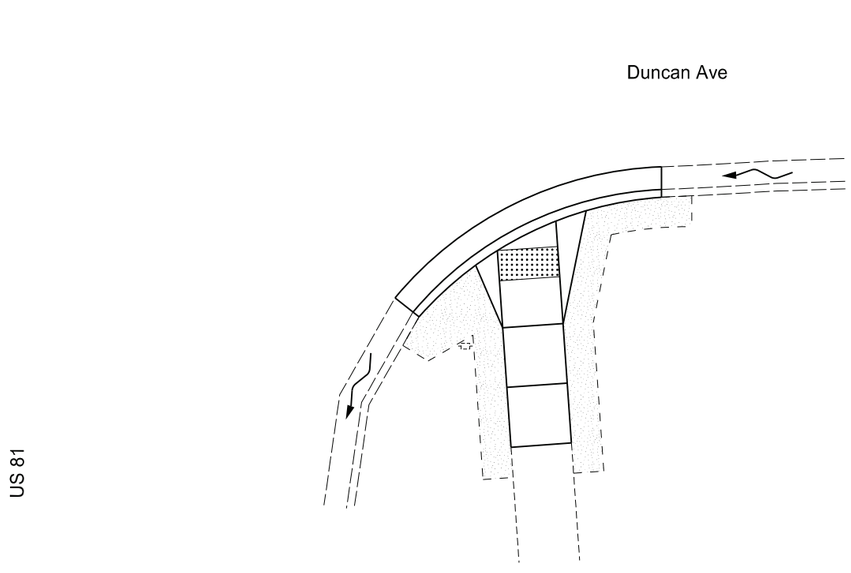
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	77	2



Location 4-NEQ Duncan Ave

970 0008 Landscape Preparation

Location 4	10.0 SY
Location 5	9.4 SY



Location 5-SEQ Duncan Ave

Landscape Preparation

Permanent Sediment & Erosion Control

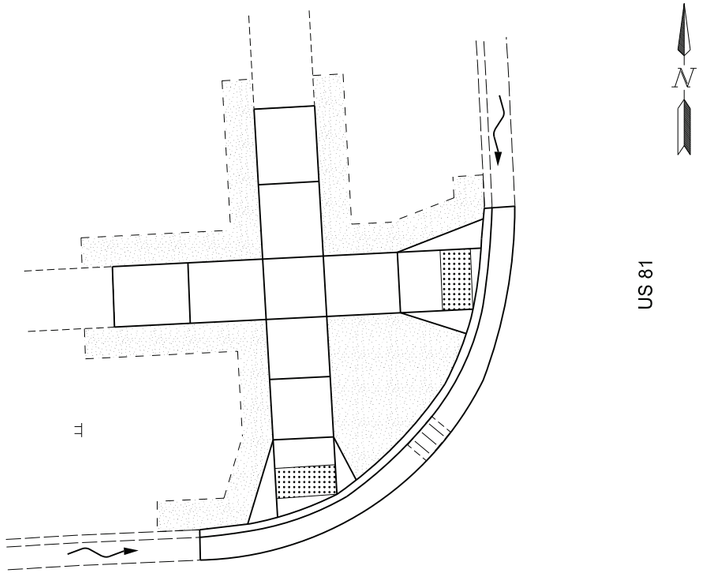
Milling & HMA, ADA Curb Ramp Revisions

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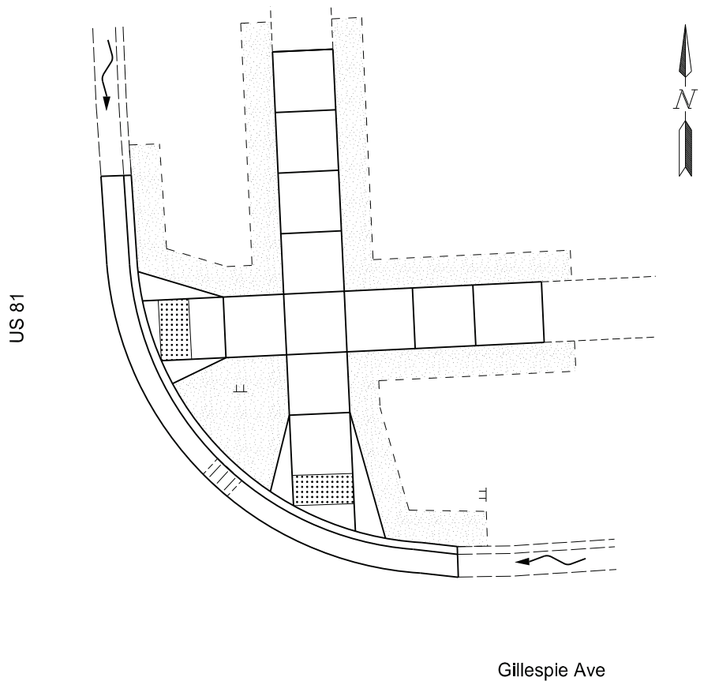
REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	77	3

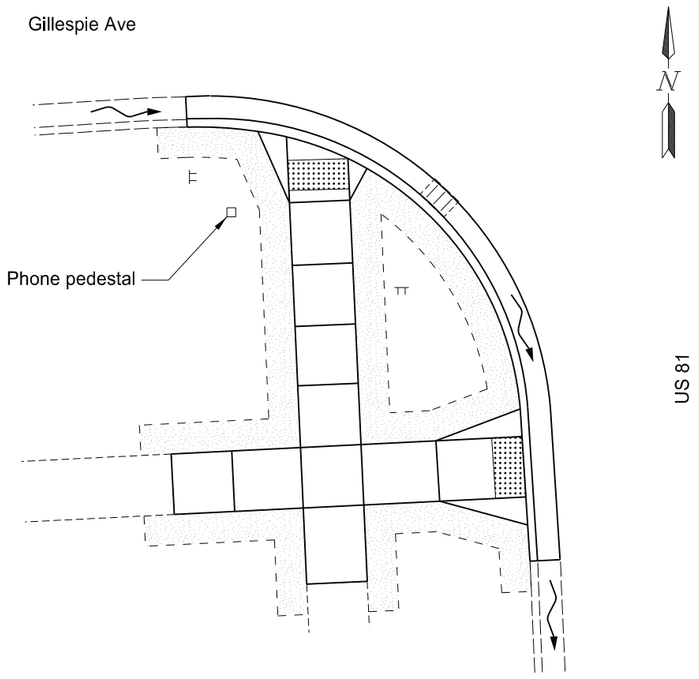
970 0008 Landscape Preparation	
Location 6	23.2 SY
Location 7	25.8 SY
Location 8	24.6 SY
Location 9	23.8 SY



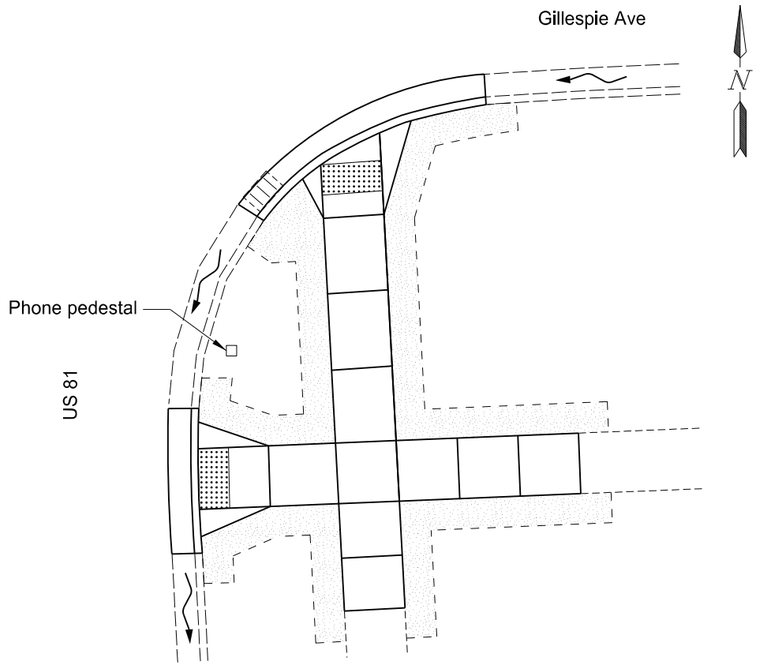
Location 6-NWQ Gillespie Ave



Location 7-NEQ Gillespie Ave



Location 8-SWQ Gillespie Ave



Location 9-SEQ Gillespie Ave

Landscape Preparation

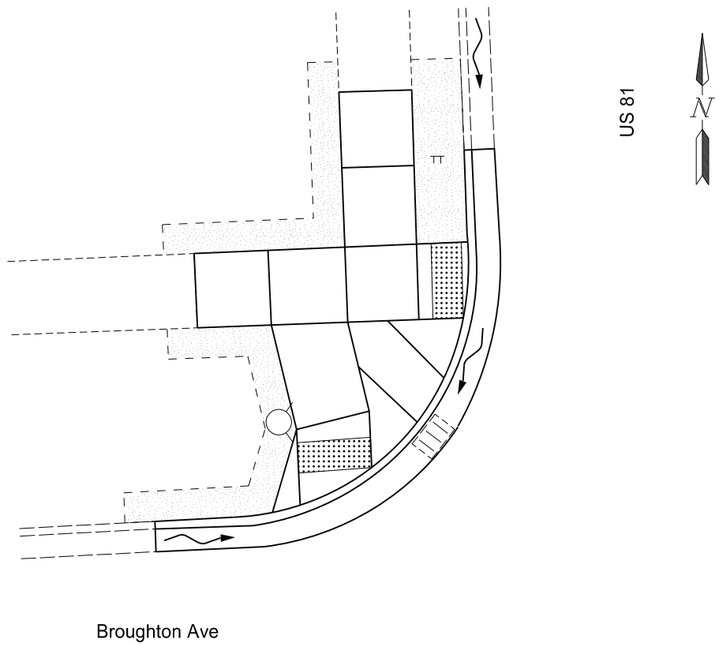
Permanent Sediment & Erosion Control

Milling & HMA, ADA Curb Ramp Revisions

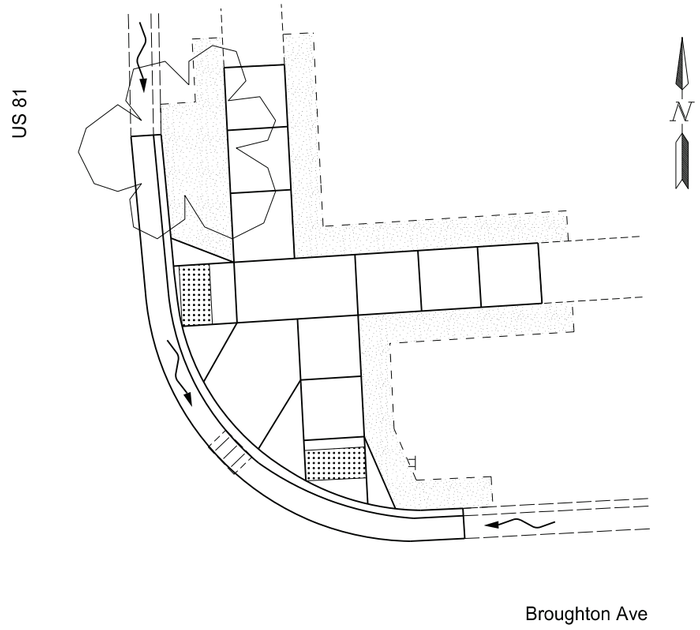
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REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
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NORTH DAKOTA

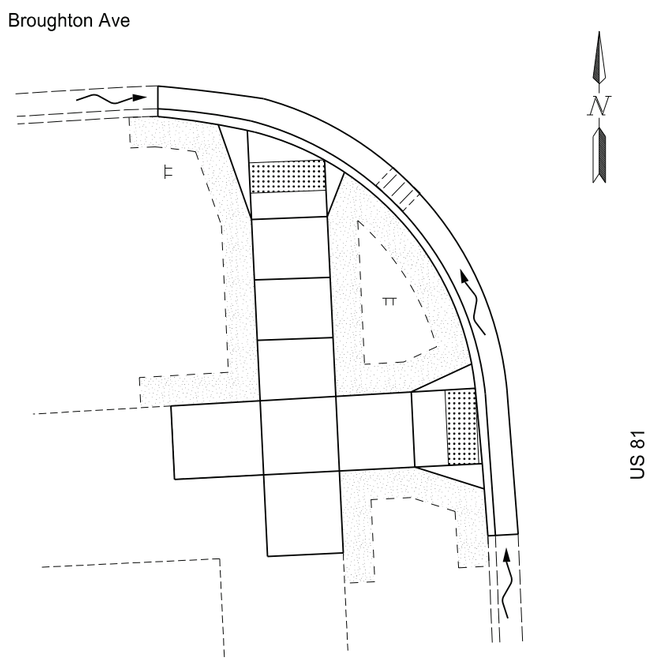
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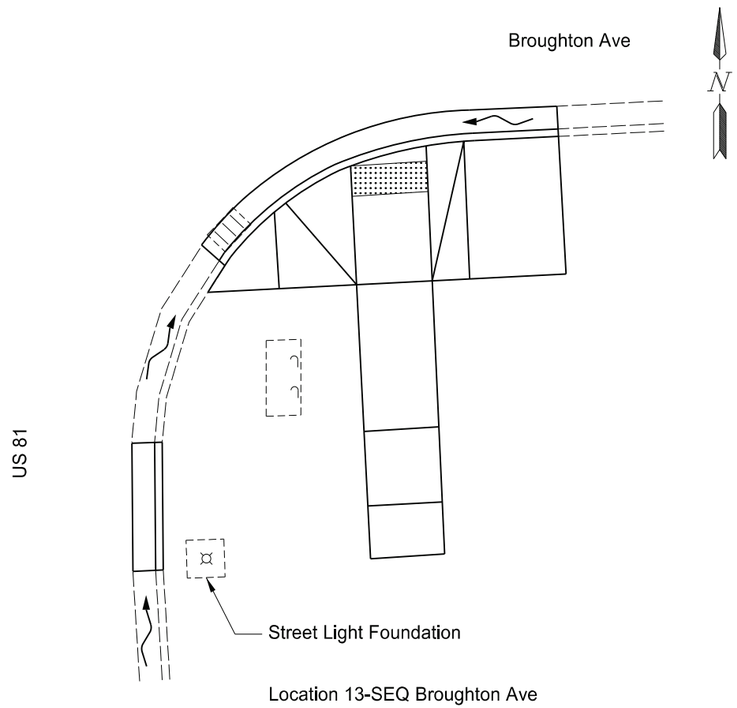
Location 10-NWQ Broughton Ave



Location 11-NEQ Broughton Ave



Location 12-SWQ Broughton Ave



Location 13-SEQ Broughton Ave

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	77	4

970 0008 Landscape Preparation

Location 10	14.9 SY
Location 11	19.1 SY
Location 12	17.7 SY

Landscape Preparation

Permanent Sediment & Erosion Control

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

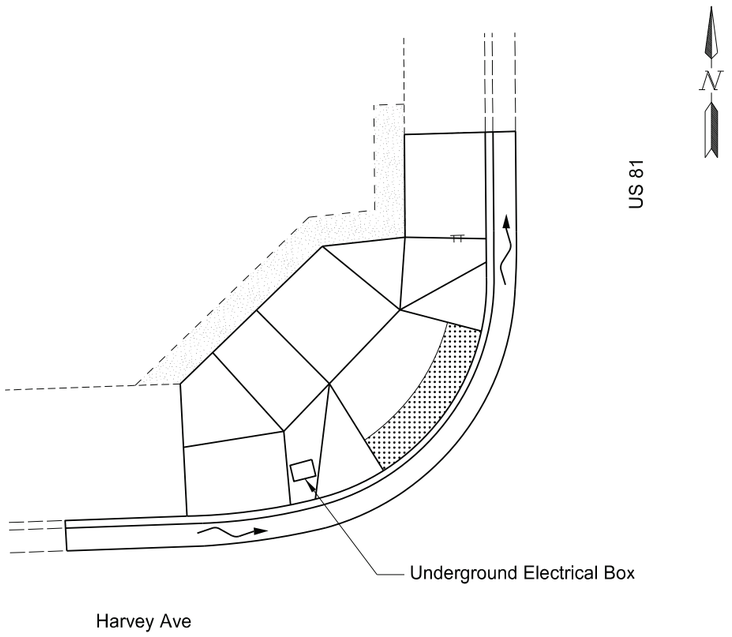
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DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

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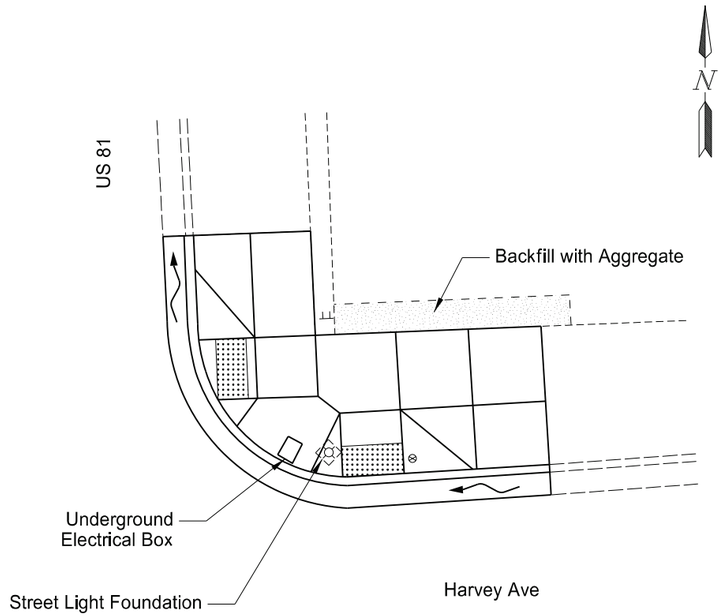
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	77	5

970 0008 Landscape Preparation

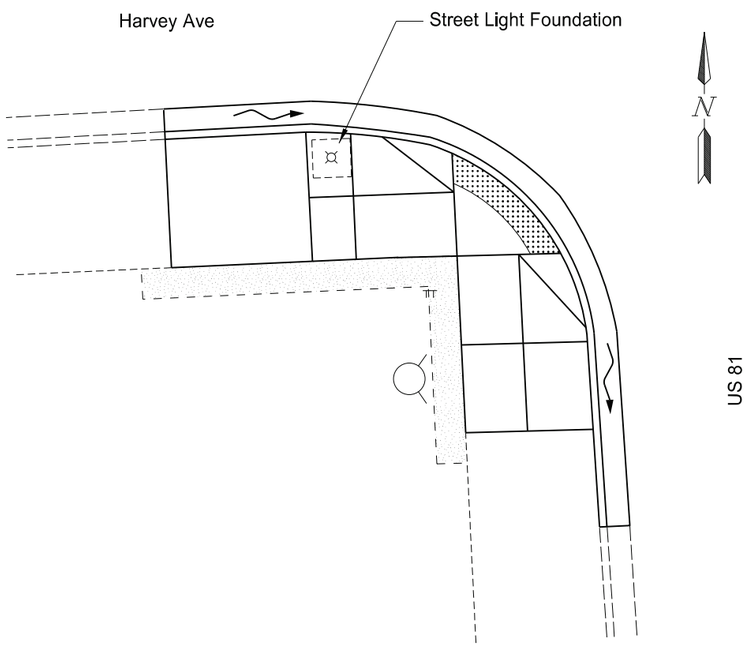
Location 14	6.1 SY
Location 15	3.5 SY
Location 16	7.2 SY
Location 17	4.9 SY



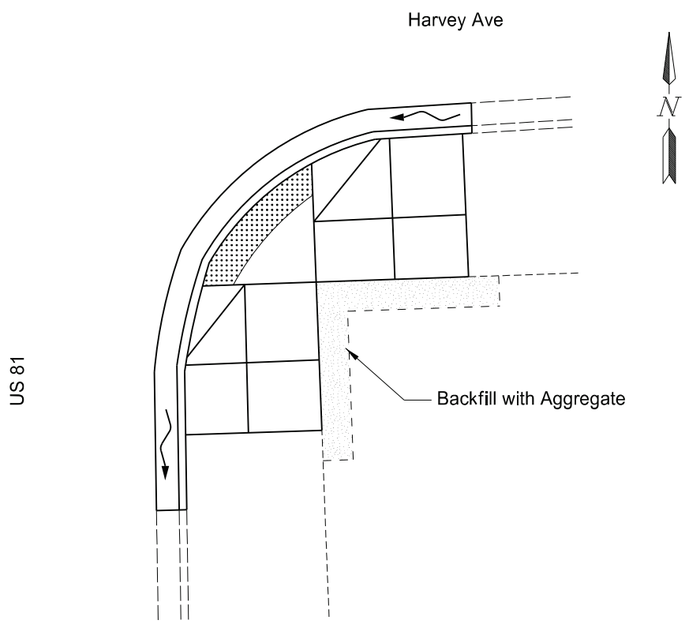
Location 14-NWQ Harvey Ave



Location 15-NEQ Harvey Ave



Location 16-SWQ Harvey Ave



Location 17-SEQ Harvey Ave

Landscape Preparation

Permanent Sediment & Erosion Control

Milling & HMA, ADA Curb Ramp Revisions

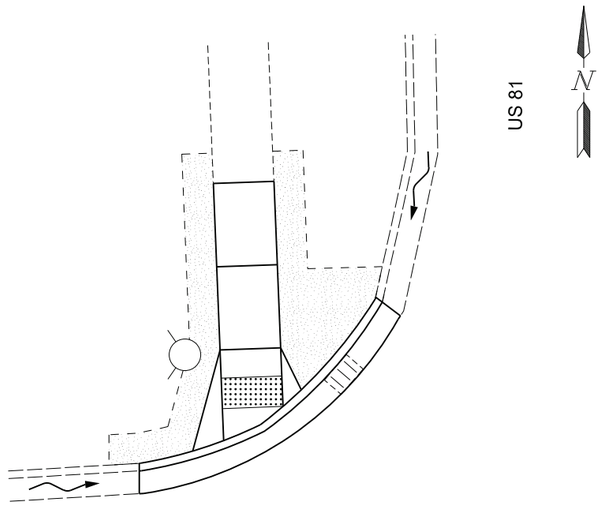
Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

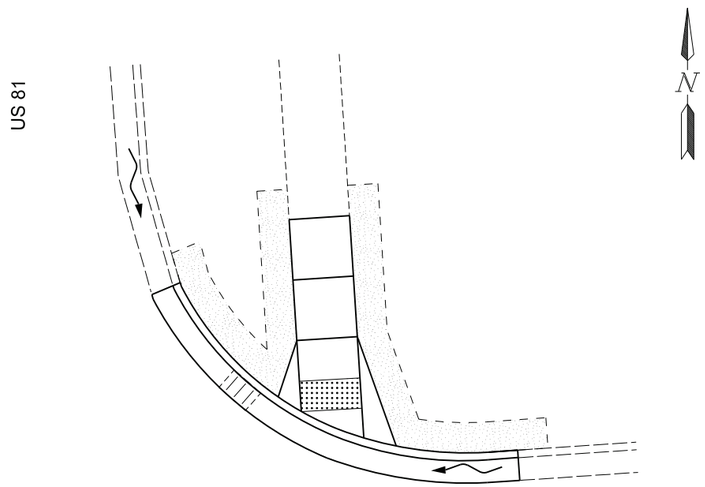
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	77	6

970 0008 Landscape Preparation

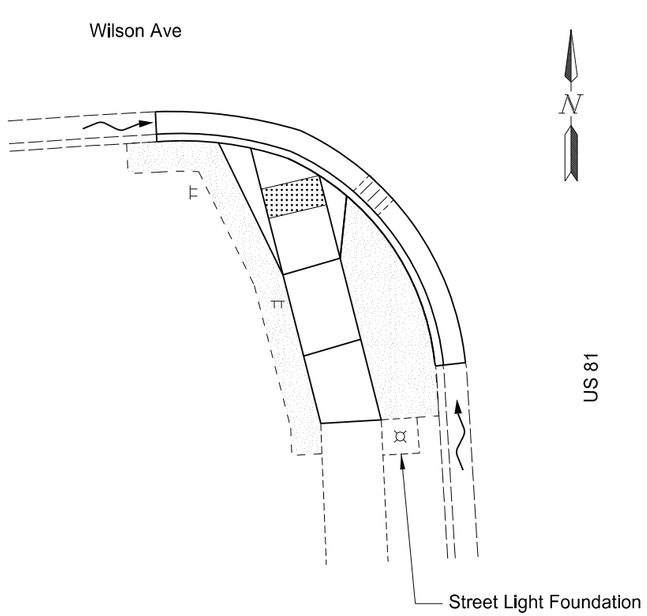
Location 18	10.9 SY
Location 19	10.7 SY
Location 20	11.9 SY



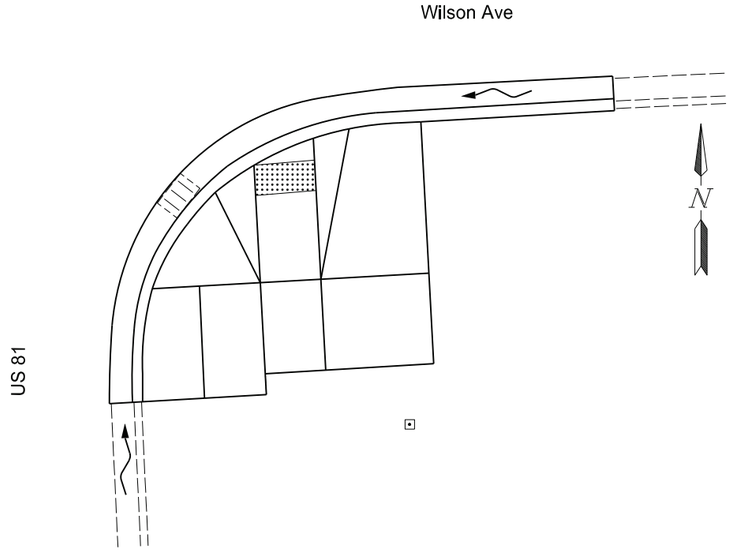
Location 18-NWQ Wilson Ave



Location 19-NEQ Wilson Ave



Location 20-SWQ Wilson Ave



Location 21-SEQ Wilson Ave

Landscape Preparation

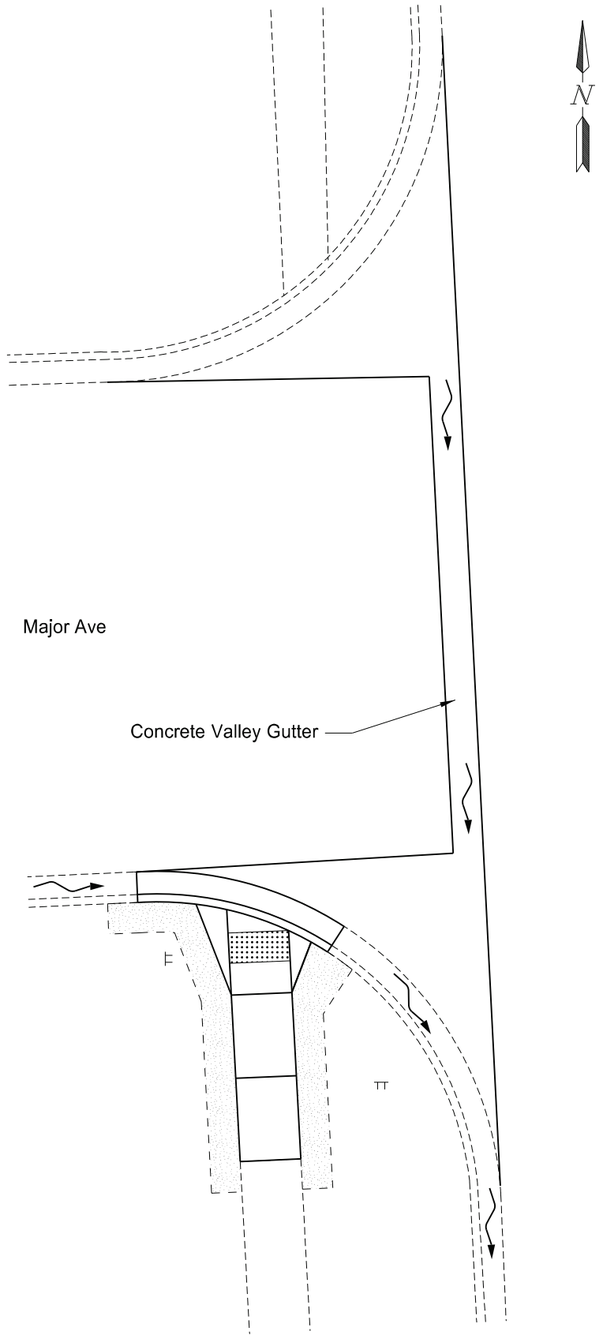
Permanent Sediment & Erosion Control

Milling & HMA, ADA Curb Ramp Revisions

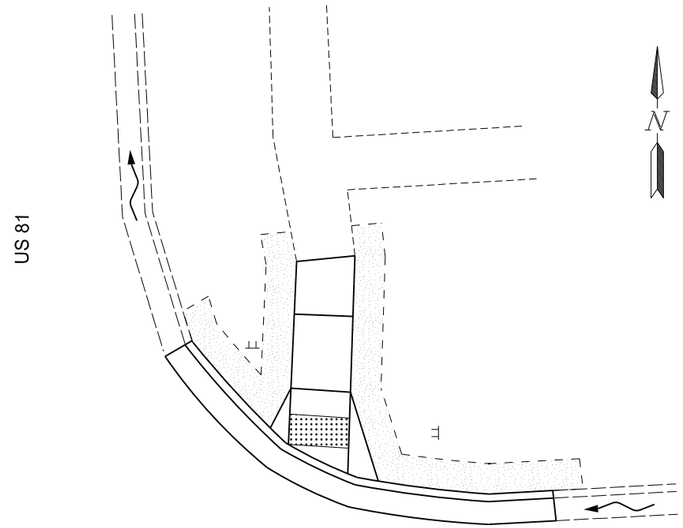
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REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

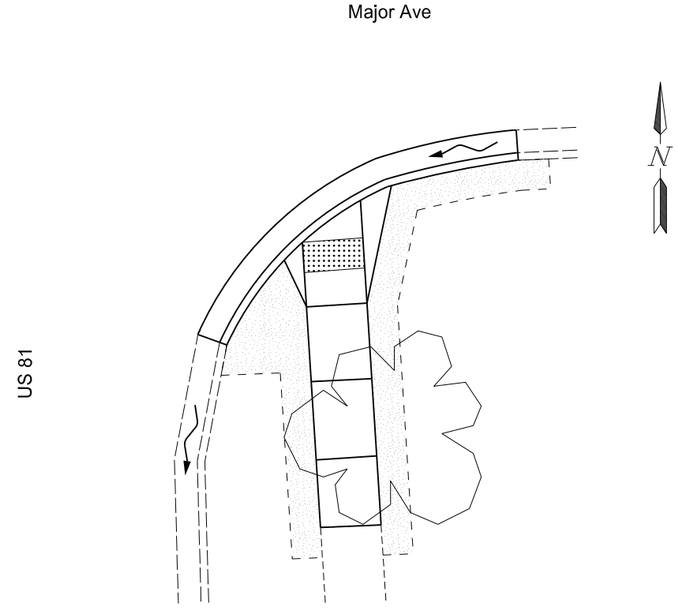
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	77	7



Location 22-SWQ Major Ave



Location 23-NEQ Major Ave



Location 24-SEQ Major Ave

970 0008 Landscape Preparation

Location 22	9.1 SY
Location 23	10.8 SY
Location 24	13.3 SY

Landscape Preparation

Permanent Sediment & Erosion Control

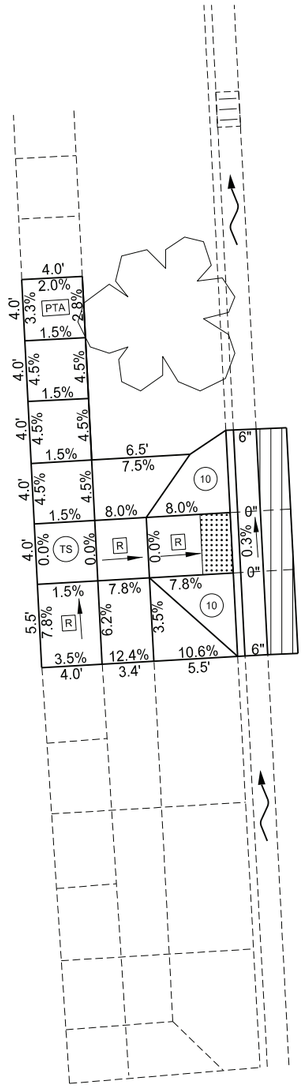
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

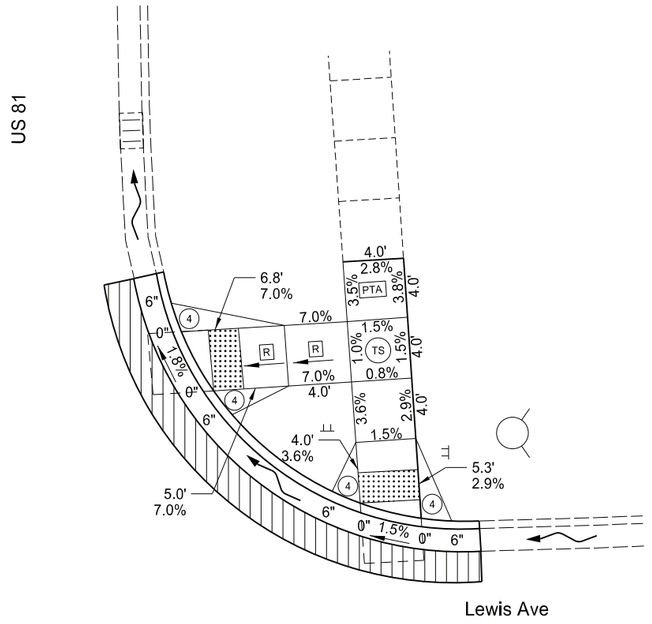
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PE-6394
DATE 04/28/26
NORTH DAKOTA

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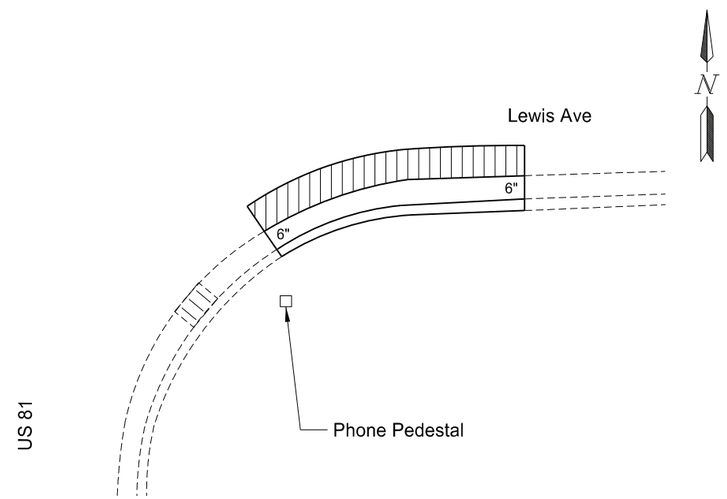
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	80	1



Location 1-NWQ & SWQ Lewis Ave



Location 2-NEQ Lewis Ave



Location 3-SEQ Lewis Ave

430 0500	Commercial Grade Hot Mix Asphalt	
Location 1		1.3 Ton
Location 2		3.1 Ton
Location 3		1.6 Ton
748 0100	Curb & Gutter	
Location 1		14.9 LF
Location 2		28.9 LF
Location 3		16.6 LF
750 0115	Sidewalk Concrete 4IN	
Location 1		25.0 SY
Location 2		14.1 SY
750 2115	Detectable Warning Panels	
Location 1		8 SF
Location 2		16 SF

Commercial Grade HMA

Detectable Warning Panel

Clear Space
- 4' long x width of PAR or
- 4' minimum clear space outside of traffic lanes of travel.

Cross Slope	Running and Counter Slope
1.5% preferred	< 4.5% preferred
2.0% maximum	5.0% maximum

PTA Pedestrian Access Transition Area (PTA)
Tie-in to nearest joint (if needed)

Transition Cross Slope	Running Slope
< 0.5% change per foot longitudinally	< 4.5% preferred

TS Turning Space
Used at top of ramp or when changing directions.
Slope (all directions)
1.5% preferred
2.0% maximum

R Ramp

Cross Slope	Running Slope
1.5% preferred	<7.5% preferred
2.0% maximum	8.3% maximum

Flare
Cross Slope
4 4:1 maximum (adjacent to non-walkable surface)
10 10:1 maxiumum (adjacent to walkable surface)

Curb heights are noted adjacent to curb
0", 3" or 6"

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

Layouts

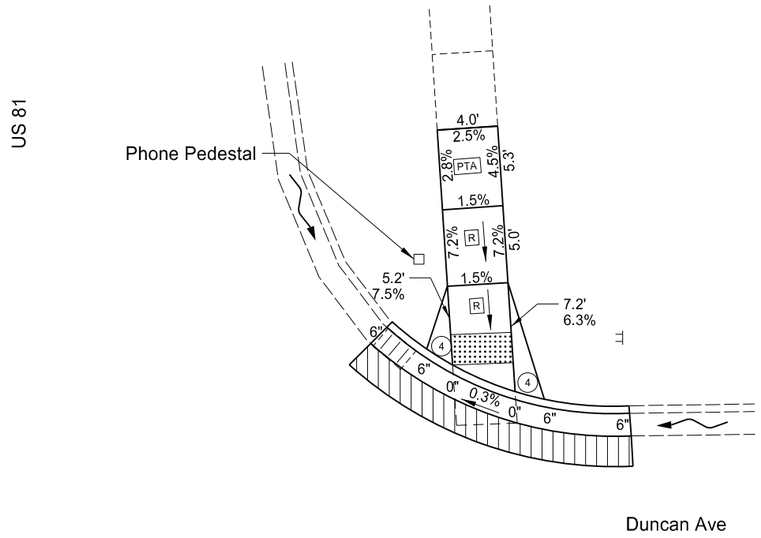
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

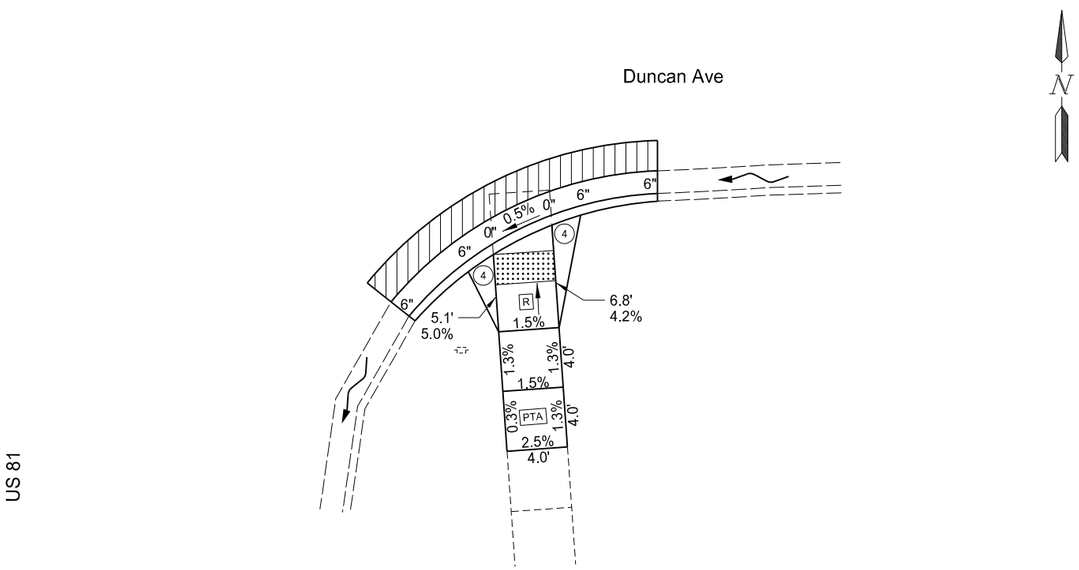
REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	80	2



Location 4-NEQ Duncan Ave



Location 5-SEQ Duncan Ave

430 0500 Commercial Grade Hot Mix Asphalt	
Location 4	1.7 Ton
Location 5	1.8 Ton
748 0100 Curb & Gutter	
Location 4	17.2 LF
Location 5	18.3 LF
750 0115 Sidewalk Concrete 4IN	
Location 4	8.6 SY
Location 5	7.4 SY
750 2115 Detectable Warning Panels	
Location 4	8 SF
Location 5	8 SF

Commercial Grade HMA

Detectable Warning Panel

Clear Space
- 4' long x width of PAR or
- 4' minimum clear space outstide of traffic lanes of travel.

Cross Slope	Running and Counter Slope
1.5% preferred	< 4.5% preferred
2.0% maximum	5.0% maximum

PTA — Pedestrian Access Transition Area (PTA)
Tie-in to nearest joint (if needed)

Transition Cross Slope	Running Slope
< 0.5% change per foot longitudinally	< 4.5% preferred

TS — Turning Space
Used at top of ramp or when changing directions.
Slope (all directions)
1.5% preferred
2.0% maximum

R — Ramp

Cross Slope	Running Slope
1.5% preferred	<7.5% preferred
2.0% maximum	8.3% maximum

Flare
Cross Slope
4 — 4:1 maximum (adjacent to non-walkable surface)
10 — 10:1 maxiumum (adjacent to walkable surface)

Curb heights are noted adjacent to curb
0", 3" or 6"

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

Layouts

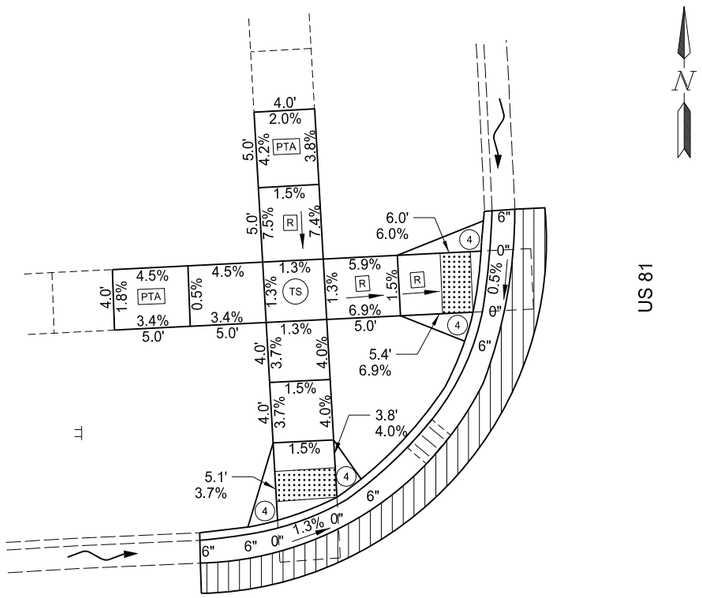
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

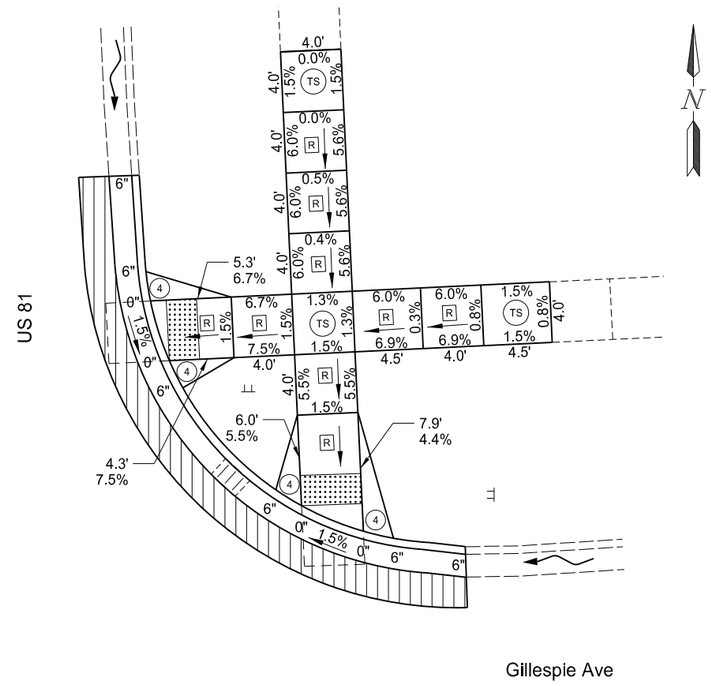
REGISTERED PROFESSIONAL ENGINEER
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DATE 04/28/26
NORTH DAKOTA

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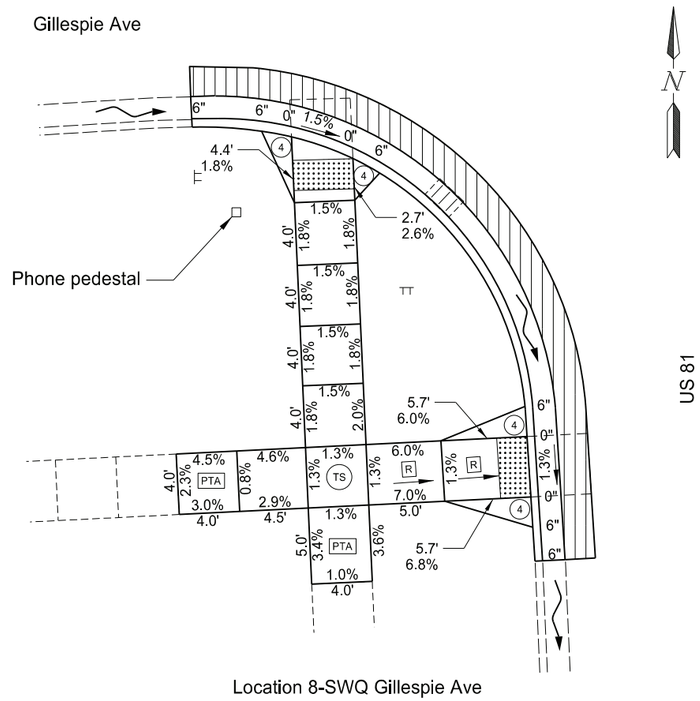
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	80	3



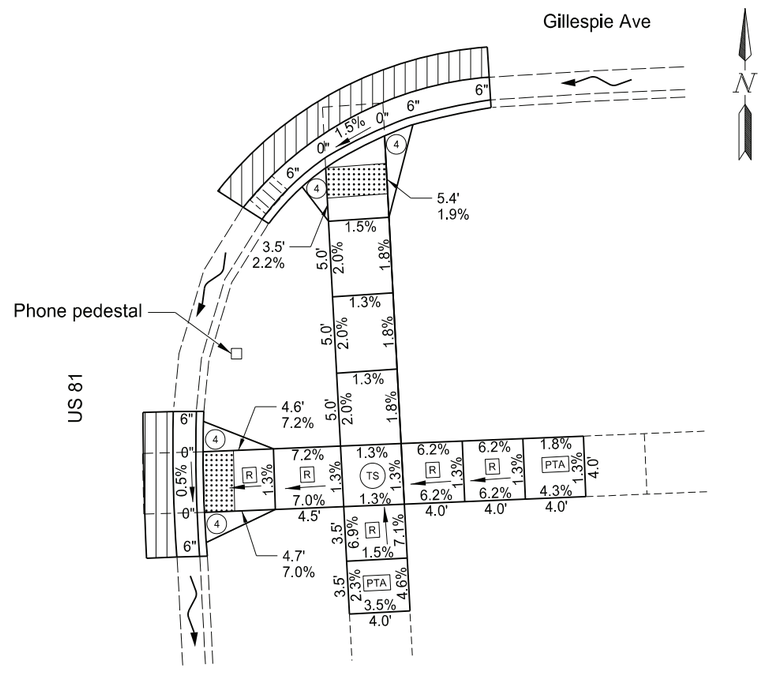
Location 6-NWQ Gillespie Ave



Location 7-NEQ Gillespie Ave



Location 8-SWQ Gillespie Ave



Location 9-SEQ Gillespie Ave

430 0500	Commercial Grade Hot Mix Asphalt	
Location 6		3.3 Ton
Location 7		3.7 Ton
Location 8		4.1 Ton
Location 9		2.5 Ton
748 0100	Curb & Gutter	
Location 6		31.7 LF
Location 7		36.9 LF
Location 8		41.9 LF
Location 9		26.6 LF
750 0115	Sidewalk Concrete 4IN	
Location 6		22.7 SY
Location 7		26.0 SY
Location 8		23.4 SY
Location 9		24.9 SY
750 2115	Detectable Warning Panels	
Location 6		16 SF
Location 7		16 SF
Location 8		16 SF
Location 9		16 SF

Commercial Grade HMA

Detectable Warning Panel

Clear Space
- 4' long x width of PAR or
- 4' minimum clear space outside of traffic lanes of travel.

Cross Slope	Running and Counter Slope
1.5% preferred	< 4.5% preferred
2.0% maximum	5.0% maximum

PTA Pedestrian Access Transition Area (PTA)
Tie-in to nearest joint (if needed)

Transition Cross Slope	Running Slope
< 0.5% change per foot longitudinally	< 4.5% preferred

TS Turning Space
Used at top of ramp or when changing directions.
Slope (all directions)
1.5% preferred
2.0% maximum

R Ramp

Cross Slope	Running Slope
1.5% preferred	<7.5% preferred
2.0% maximum	8.3% maximum

Flare
Cross Slope
4 4:1 maximum (adjacent to non-walkable surface)
10 10:1 maxiumum (adjacent to walkable surface)

Curb heights are noted adjacent to curb
0", 3" or 6"

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

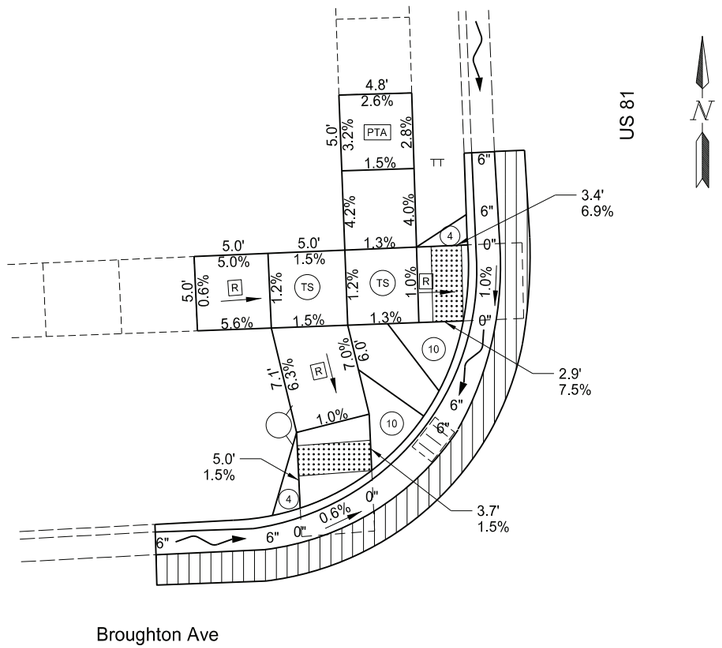
Layouts

Milling & HMA, ADA Curb Ramp Revisions

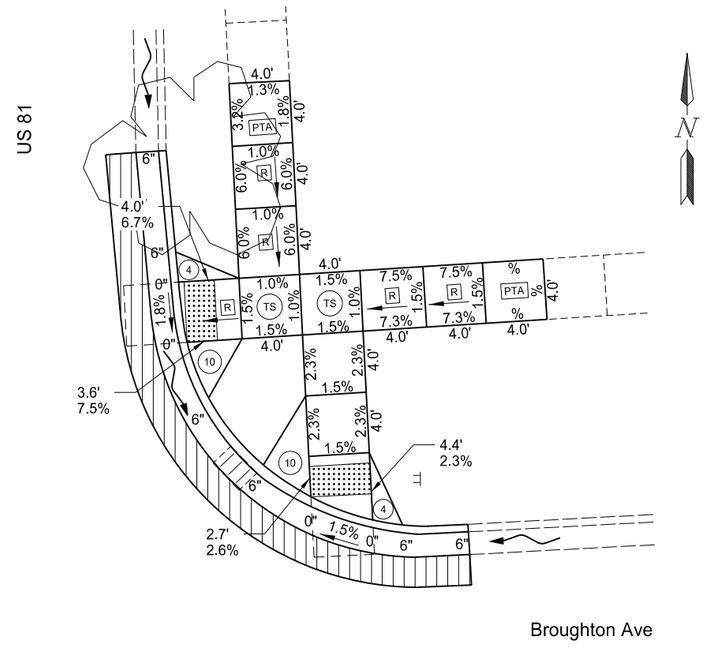
Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

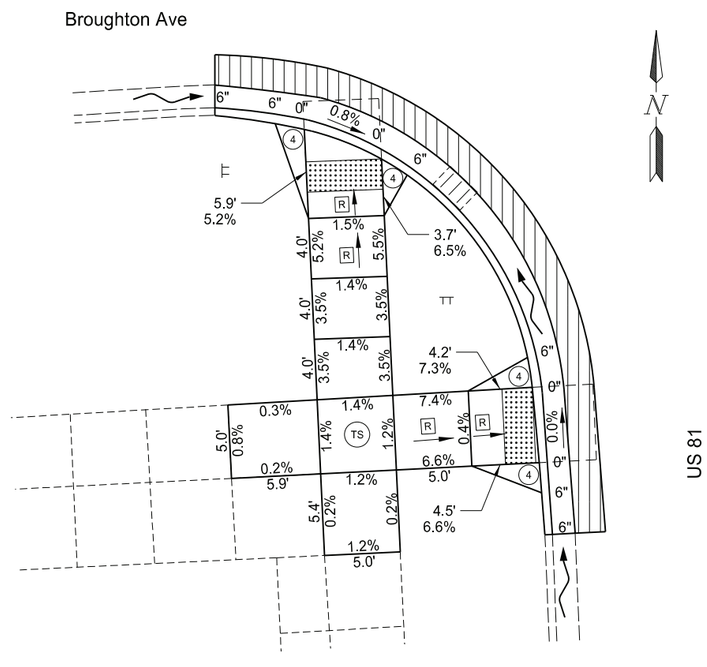
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	80	4



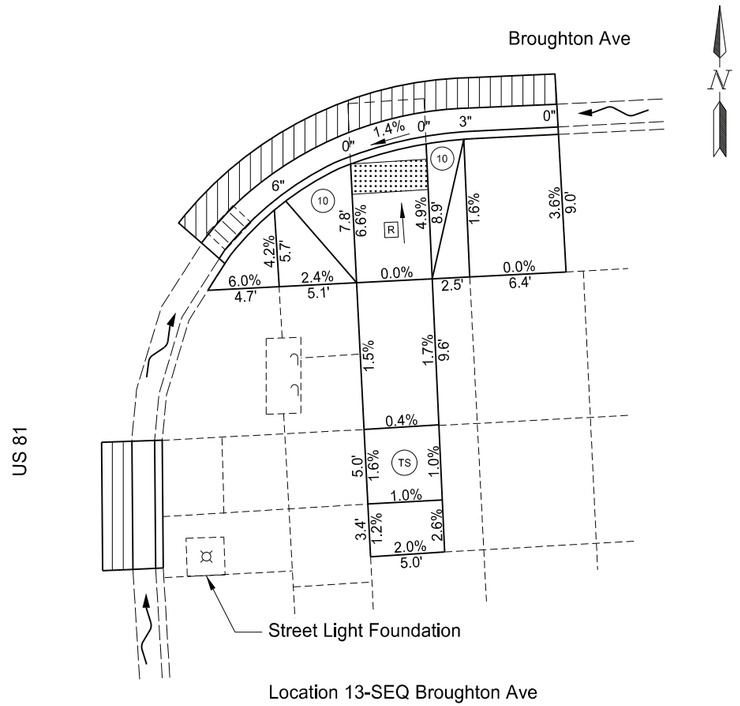
Location 10-NWQ Broughton Ave



Location 11-NEQ Broughton Ave



Location 12-SWQ Broughton Ave



Location 13-SEQ Broughton Ave

430 0500 Commercial Grade Hot Mix Asphalt	
Location 10	3.7 Ton
Location 11	3.6 Ton
Location 12	3.9 Ton
Location 13	3.0 Ton

748 0100 Curb & Gutter	
Location 10	38.0 LF
Location 11	36.8 LF
Location 12	40.0 LF
Location 13	33.0 LF

750 0115 Sidewalk Concrete 4IN	
Location 10	27.0 SY
Location 11	28.4 SY
Location 12	25.4 SY
Location 13	28.8 SY

750 2115 Detectable Warning Panels	
Location 10	20 SF
Location 11	16 SF
Location 12	20 SF
Location 13	10 SF

Commercial Grade HMA

Detectable Warning Panel

Clear Space
- 4' long x width of PAR or
- 4' minimum clear space outstide of traffic lanes of travel.

Cross Slope	Running and Counter Slope
1.5% preferred	< 4.5% preferred
2.0% maximum	5.0% maximum

PTA Pedestrian Access Transition Area (PTA)
Tie-in to nearest joint (if needed)

Transition Cross Slope	Running Slope
< 0.5% change per foot longitudinally	< 4.5% preferred

TS Turning Space
Used at top of ramp or when changing directions.
Slope (all directions)
1.5% preferred
2.0% maximum

R Ramp

Cross Slope	Running Slope
1.5% preferred	<7.5% preferred
2.0% maximum	8.3% maximum

Flare
Cross Slope
4 4:1 maximum (adjacent to non-walkable surface)
10 10:1 maxiumum (adjacent to walkable surface)

Curb heights are noted adjacent to curb
0", 3" or 6"

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

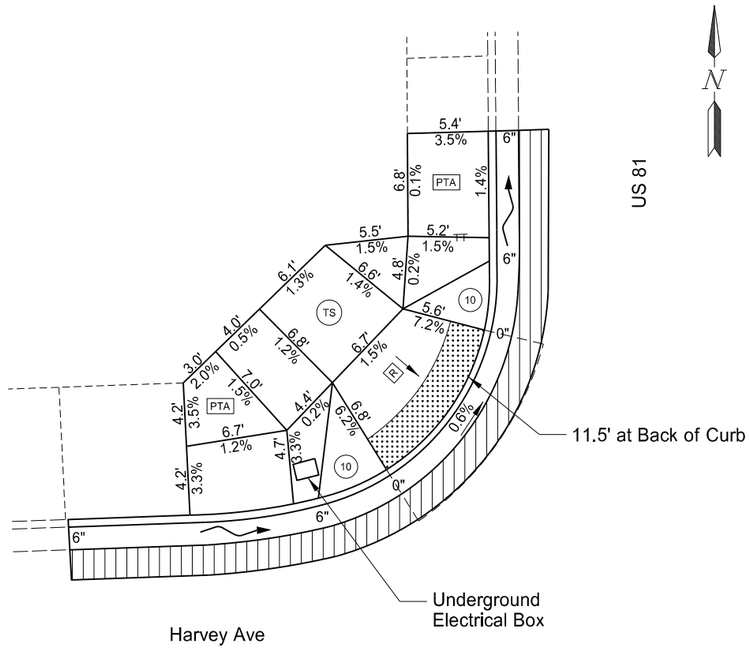
Layouts

Milling & HMA, ADA Curb Ramp Revisions

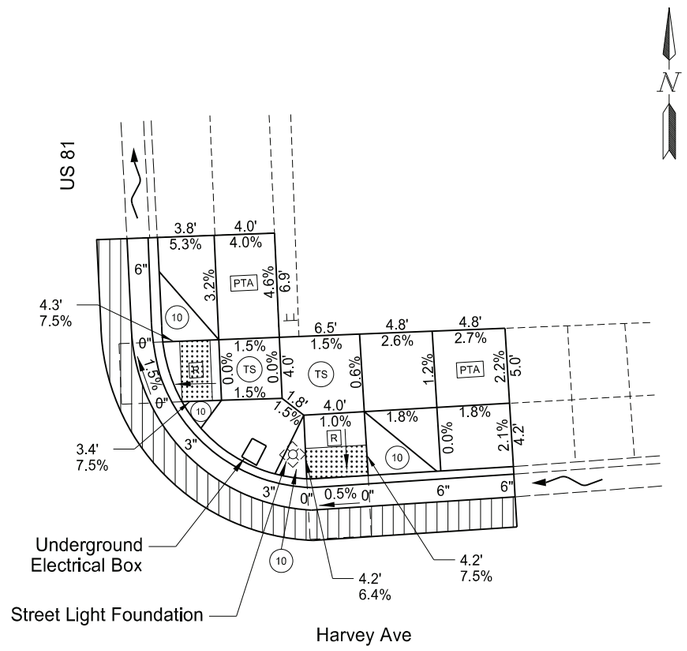
Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

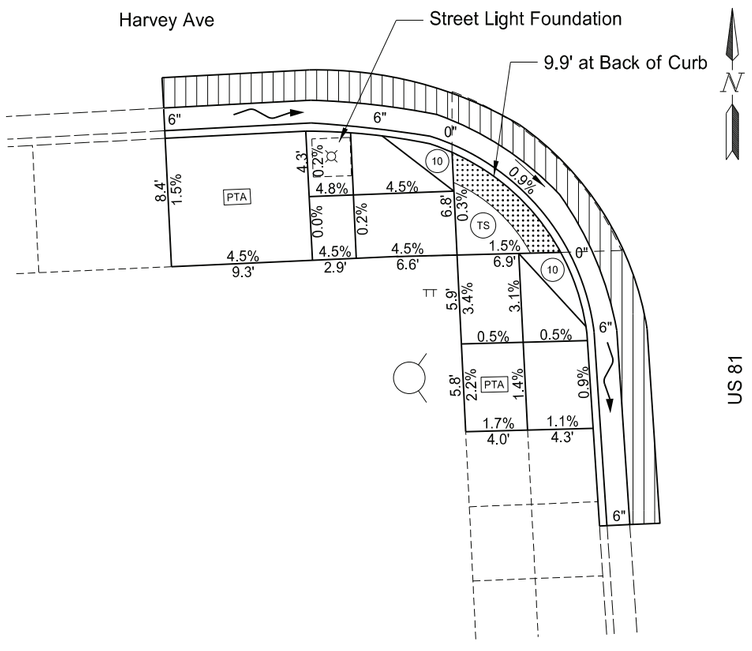
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	80	5



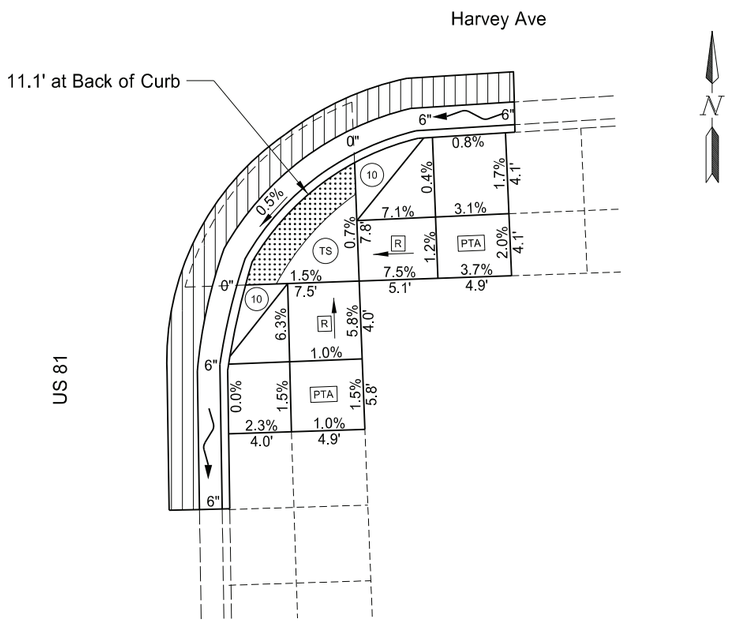
Location 14-NWQ Harvey Ave



Location 15-NEQ Harvey Ave



Location 16-SWQ Harvey Ave



Location 17-SEQ Harvey Ave

430 0500 Commercial Grade Hot Mix Asphalt

Location 14	4.4 Ton
Location 15	3.4 Ton
Location 16	4.3 Ton
Location 17	3.7 Ton

748 0100 Curb & Gutter

Location 14	46.2 LF
Location 15	34.8 LF
Location 16	47.5 LF
Location 17	36.9 LF

750 0115 Sidewalk Concrete 4IN

Location 14	33.3 SY
Location 15	27.1 SY
Location 16	30.2 SY
Location 17	23.5 SY

750 2115 Detectable Warning Panels

Location 14	23 SF
Location 15	16 SF
Location 16	14 SF
Location 17	19 SF

Commercial Grade HMA

Detectable Warning Panel

Clear Space
- 4' long x width of PAR or
- 4' minimum clear space outstide of traffic lanes of travel.

Cross Slope	Running and Counter Slope
1.5% preferred	< 4.5% preferred
2.0% maximum	5.0% maximum

PTA Pedestrian Access Transition Area (PTA)
Tie-in to nearest joint (if needed)

Transition Cross Slope	Running Slope
< 0.5% change per foot longitudinally	< 4.5% preferred

TS Turning Space
Used at top of ramp or when changing directions.
Slope (all directions)
1.5% preferred
2.0% maximum

R Ramp

Cross Slope	Running Slope
1.5% preferred	<7.5% preferred
2.0% maximum	8.3% maximum

Flare
Cross Slope
4 4:1 maximum (adjacent to non-walkable surface)
10 10:1 maxiumum (adjacent to walkable surface)

Curb heights are noted adjacent to curb
0", 3" or 6"

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

Layouts

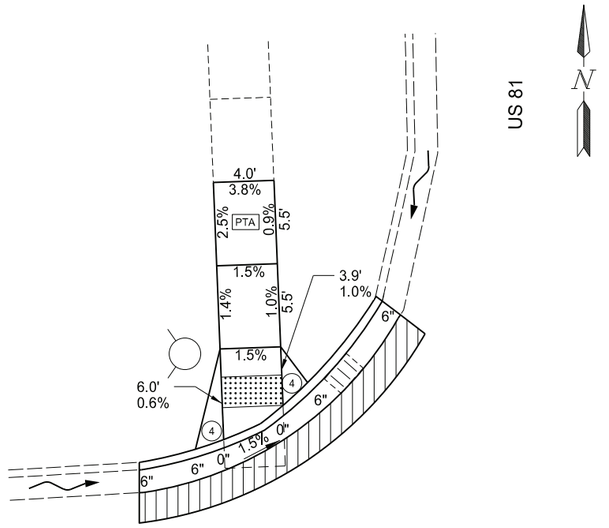
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

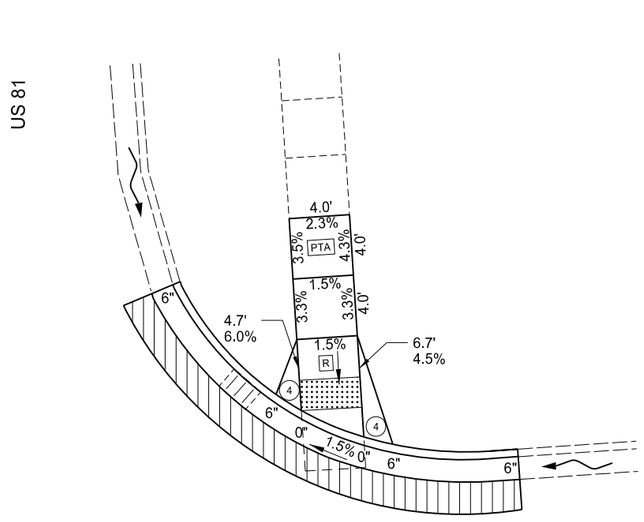
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	80	6



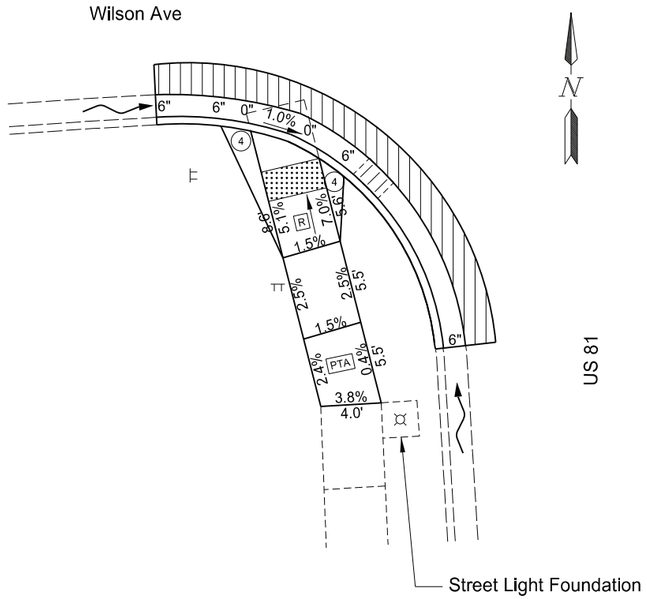
Wilson Ave

Location 18-NWQ Wilson Ave

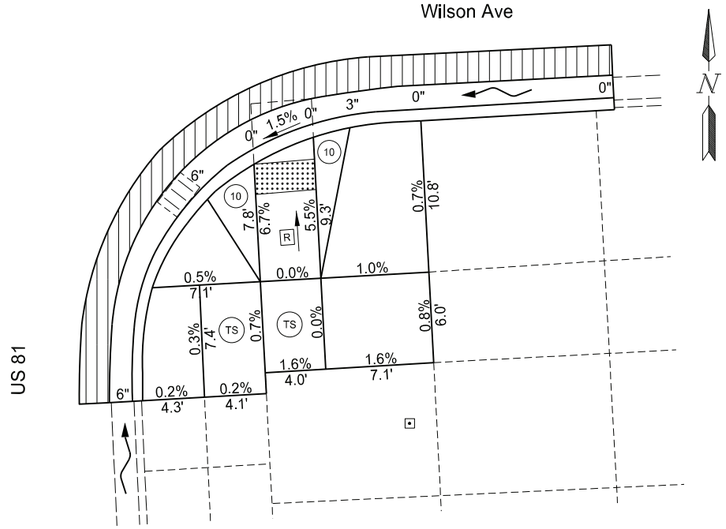


Wilson Ave

Location 19-NEQ Wilson Ave



Location 20-SWQ Wilson Ave



Location 21-SEQ Wilson Ave

430 0500 Commercial Grade Hot Mix Asphalt	
Location 18	1.9 Ton
Location 19	2.7 Ton
Location 20	2.7 Ton
Location 21	4.1 Ton

748 0100 Curb & Gutter	
Location 18	19.7 LF
Location 19	26.7 LF
Location 20	26.4 LF
Location 21	29.9 LF

750 0115 Sidewalk Concrete 4IN	
Location 18	8.2 SY
Location 19	7.3 SY
Location 20	9.1 SY
Location 21	29.4 SY

750 2115 Detectable Warning Panels	
Location 18	8 SF
Location 19	8 SF
Location 20	8 SF
Location 21	8 SF

Commercial Grade HMA

Detectable Warning Panel

Clear Space
- 4' long x width of PAR or
- 4' minimum clear space outstide of traffic lanes of travel.

Cross Slope	Running and Counter Slope
1.5% preferred	< 4.5% preferred
2.0% maximum	5.0% maximum

PTA Pedestrian Access Transition Area (PTA)
Tie-in to nearest joint (if needed)

Transition Cross Slope	Running Slope
< 0.5% change per foot longitudinally	< 4.5% preferred

TS Turning Space
Used at top of ramp or when changing directions.
Slope (all directions)
1.5% preferred
2.0% maximum

R Ramp

Cross Slope	Running Slope
1.5% preferred	<7.5% preferred
2.0% maximum	8.3% maximum

Flare
Cross Slope
4 4:1 maximum (adjacent to non-walkable surface)
10 10:1 maxiumum (adjacent to walkable surface)

Curb heights are noted adjacent to curb
0", 3" or 6"

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

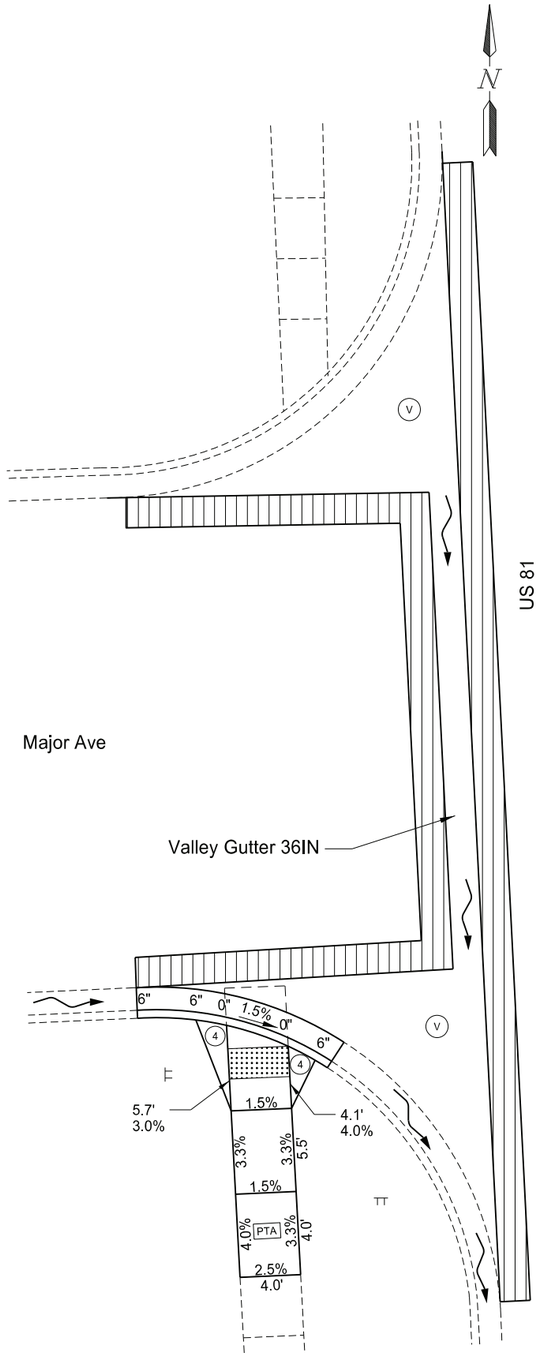
Layouts

Milling & HMA, ADA Curb Ramp Revisions

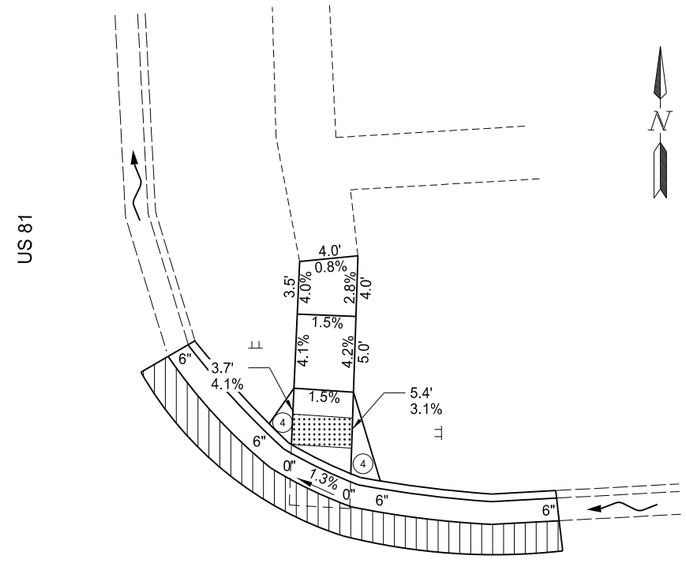
Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	80	7

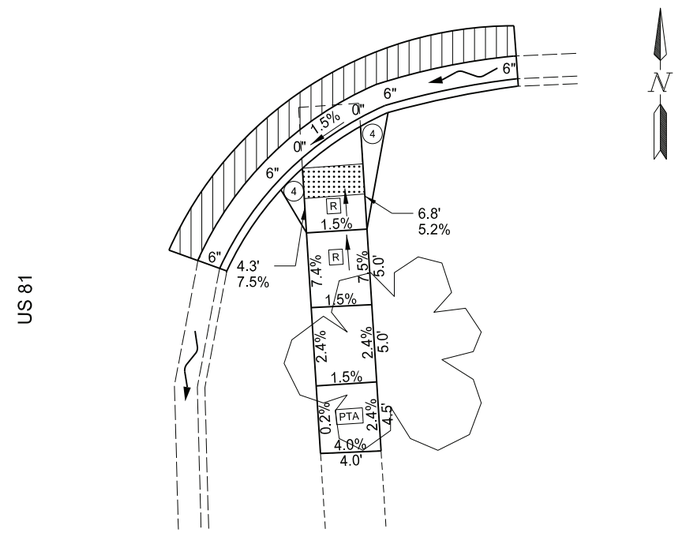


Location 22-SWQ Major Ave



Major Ave

Location 23-NEQ Major Ave



Major Ave

Location 24-SEQ Major Ave

430 0500 Commercial Grade Hot Mix Asphalt	
Location 22	12.4 Ton
Location 23	2.8 Ton
Location 24	2.4 Ton
748 0100 Curb & Gutter	
Location 22	14.4 LF
Location 23	27.3 LF
Location 24	24.1 LF
748 1020 Valley Gutter 36IN	
Location 22	32.1 SY
750 0115 Sidewalk Concrete 4IN	
Location 22	8.1 SY
Location 23	6.7 SY
Location 24	10.1 SY
750 2115 Detectable Warning Panels	
Location 22	8 SF
Location 23	8 SF
Location 24	8 SF

Commercial Grade HMA

Detectable Warning Panel

Clear Space
- 4' long x width of PAR or
- 4' minimum clear space outstide of traffic lanes of travel.

Cross Slope	Running and Counter Slope
1.5% preferred	< 4.5% preferred
2.0% maximum	5.0% maximum

PTA — Pedestrian Access Transition Area (PTA)
Tie-in to nearest joint (if needed)

Transition Cross Slope	Running Slope
< 0.5% change per foot longitudinally	< 4.5% preferred

TS — Turning Space
Used at top of ramp or when changing directions.
Slope (all directions)
1.5% preferred
2.0% maximum

R — Ramp

Cross Slope	Running Slope
1.5% preferred	<7.5% preferred
2.0% maximum	8.3% maximum

V — Valley Gutter 36IN

Flare
Cross Slope
4 — 4:1 maximum (adjacent to non-walkable surface)
10 — 10:1 maxiumum (adjacent to walkable surface)

Curb heights are noted adjacent to curb
0", 3" or 6"

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

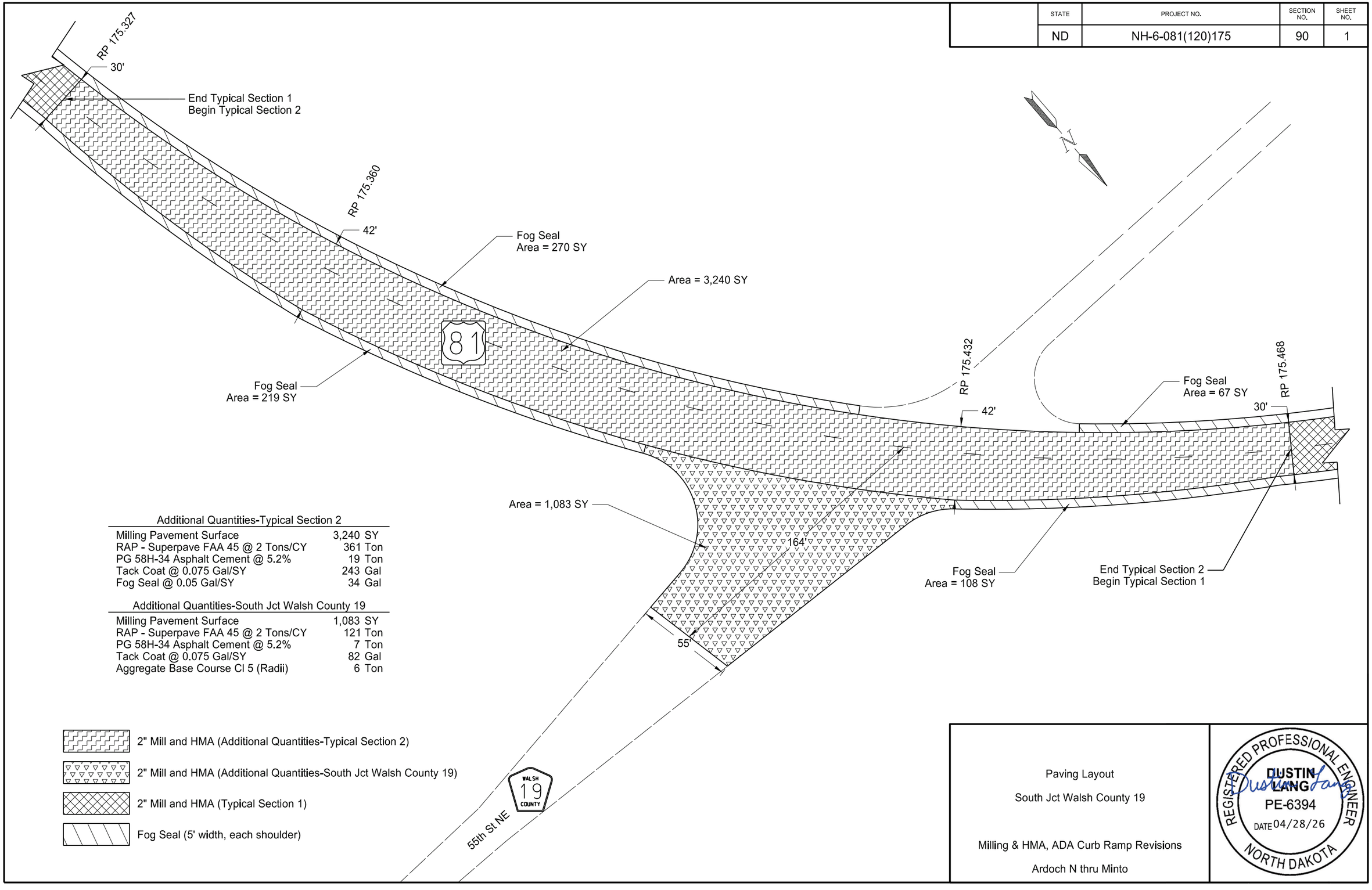
Layouts

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Additional Quantities-Typical Section 2	
Milling Pavement Surface	3,240 SY
RAP - Superpave FAA 45 @ 2 Tons/CY	361 Ton
PG 58H-34 Asphalt Cement @ 5.2%	19 Ton
Tack Coat @ 0.075 Gal/SY	243 Gal
Fog Seal @ 0.05 Gal/SY	34 Gal

Additional Quantities-South Jct Walsh County 19	
Milling Pavement Surface	1,083 SY
RAP - Superpave FAA 45 @ 2 Tons/CY	121 Ton
PG 58H-34 Asphalt Cement @ 5.2%	7 Ton
Tack Coat @ 0.075 Gal/SY	82 Gal
Aggregate Base Course Cl 5 (Radii)	6 Ton

2" Mill and HMA (Additional Quantities-Typical Section 2)

2" Mill and HMA (Additional Quantities-South Jct Walsh County 19)

2" Mill and HMA (Typical Section 1)

Fog Seal (5' width, each shoulder)

Paving Layout

South Jct Walsh County 19

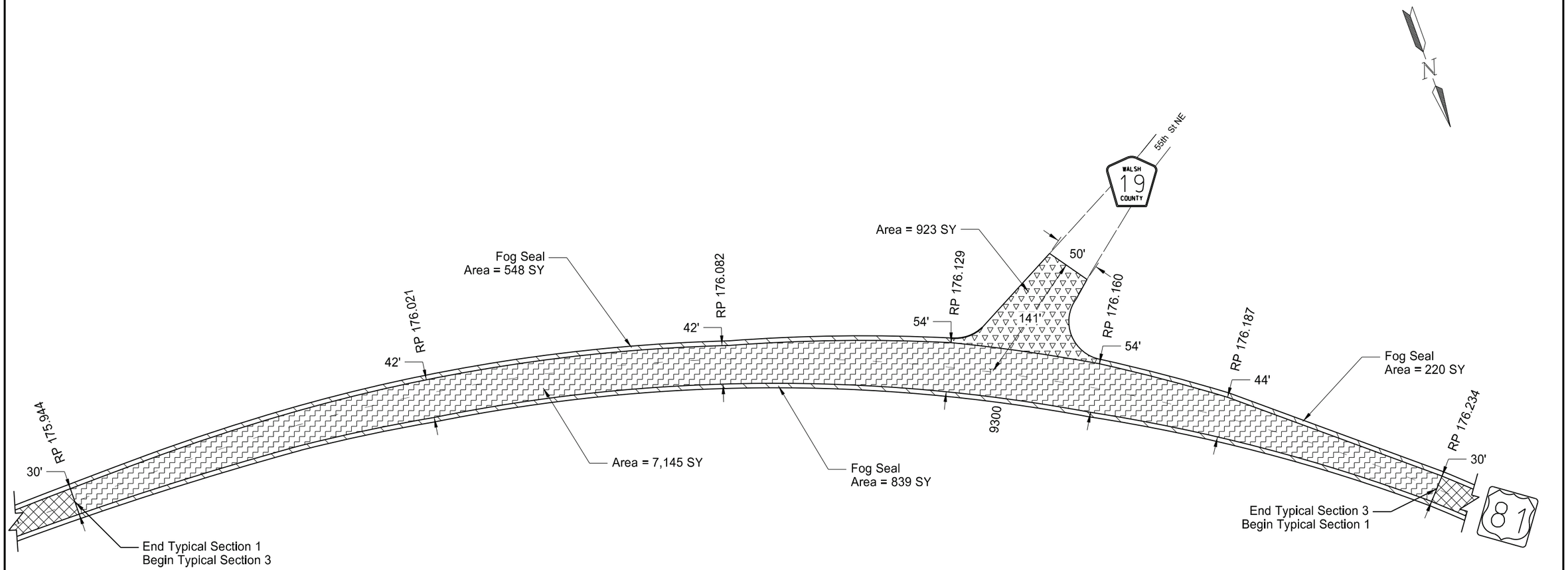
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

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DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	90	2



2" Mill and HMA (Additional Quantities-Typical Section 3)

2" Mill and HMA (Additional Quantities-North Jct Walsh County 19)

2" Mill and HMA (Typical Section 1)

Fog Seal (5' width, each shoulder)

Additional Quantities-Typical Section 3	
Milling Pavement Surface	7,145 SY
RAP - Superpave FAA 45 @ 2 Tons/CY	796 Ton
PG 58H-34 Asphalt Cement @ 5.2%	42 Ton
Tack Coat @ 0.075 Gal/SY	536 Gal
Fog Seal @ 0.05 Gal/SY	81 Gal

Additional Quantities-North Jct Walsh County 19	
Milling Pavement Surface	923 SY
RAP - Superpave FAA 45 @ 2 Tons/CY	103 Ton
PG 58H-34 Asphalt Cement @ 5.2%	6 Ton
Tack Coat @ 0.075 Gal/SY	70 Gal
Aggregate Base Course Cl 5 (Radii)	6 Ton

Paving Layout

North Jct Walsh County 19

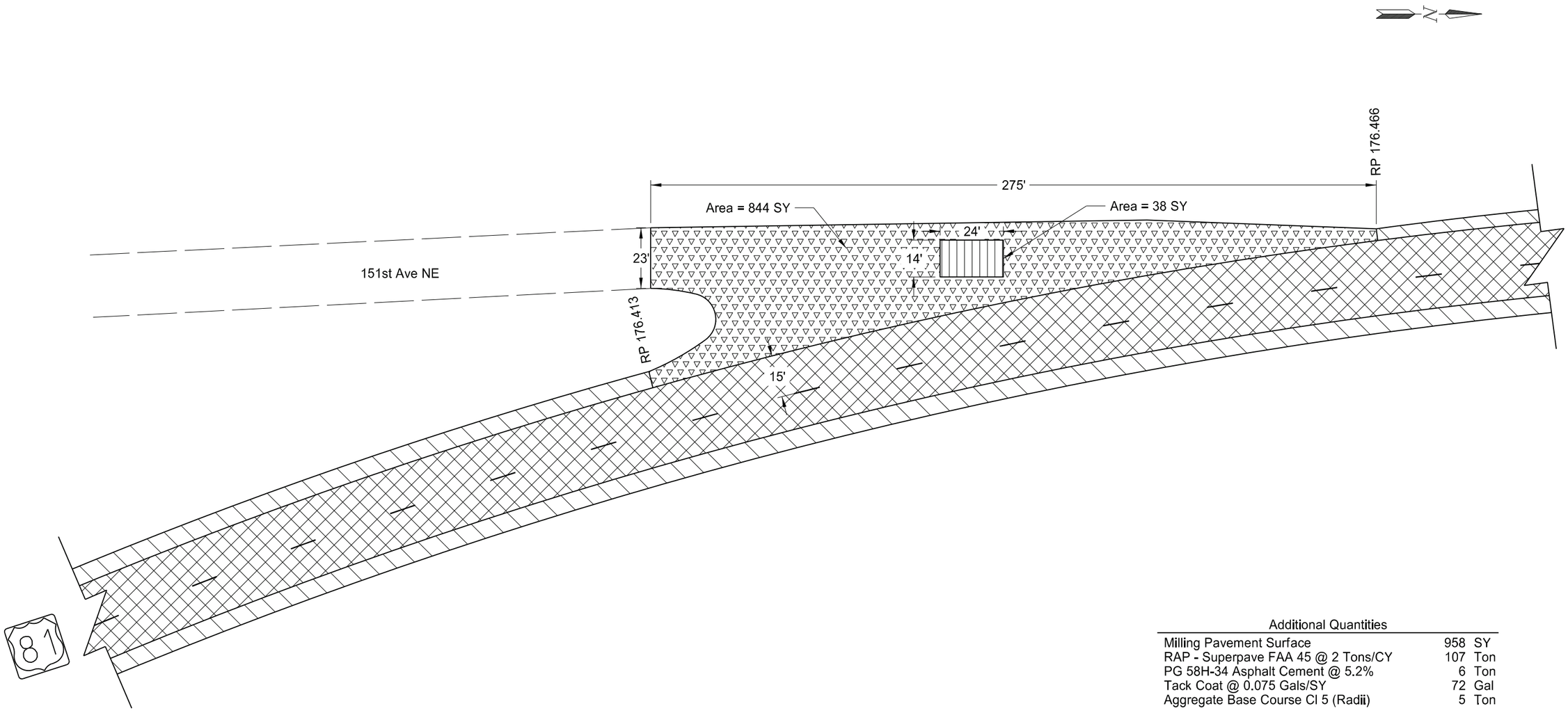
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	90	3



2" Mill and HMA (Additional Quantities-151st Ave NE)

6" Mill and HMA (Additional Quantities-151st Ave NE)

2" Mill and HMA (Typical Section 1)

Fog Seal (5' width, each shoulder)

Additional Quantities

Milling Pavement Surface	958	SY
RAP - Superpave FAA 45 @ 2 Tons/CY	107	Ton
PG 58H-34 Asphalt Cement @ 5.2%	6	Ton
Tack Coat @ 0.075 Gals/SY	72	Gal
Aggregate Base Course Cl 5 (Radii)	5	Ton

**The quantities for a 6" mill & 6" HMA for the 38 SY shown are included in the Additional Quantities.

Paving Layout

Jct US 81 & 151st Ave NE

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/28/26
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-6-081(120)175	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE		35	
G20-1-60	**60"x24"**	**ROAD WORK NEXT __ MILES**	**3**	**28**	**84**
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)		18	
G20-2-48	**48"x24"**	**END ROAD WORK**	**2**	**26**	**52**
G20-4-36	**36"x18"**	**PILOT CAR FOLLOW ME (Mounted to back of pilot car)**	**1**	**18**	**18**
G20-4b-36	36"x30"	WAIT FOR PILOT CAR		18	
G20-50a-72	**72"x36"**	**ROAD WORK NEXT __ MILES RT & LT ARROWS**	**1**	**43**	**43**
G20-52a-72	**72"x24"**	**ROAD WORK NEXT __ MILES RT or LT ARROW**	**3**	**36**	**108**
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $150 WHEN WORKERS PRESENT**	**2**	**59**	**118**
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		11	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)		7	
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)		7	
R1-1-48	**48"x48"**	**STOP**	**4**	**32**	**128**
R1-2-60	60"x60"	YIELD		29	
R2-1-36	**36"x48"**	**SPEED LIMIT __ (Portable only)**	**8**	**30**	**240**
R2-1-48	48"x60"	SPEED LIMIT __		39	
R2-1aP-24	**24"x18"**	**MINIMUM FEE $150 (Mounted on Speed Limit post)**	**4**	**10**	**40**
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)		14	
R7-1-12	12"x18"	NO PARKING ANY TIME		11	
R9-9-24	**24"x12"**	**SIDEWALK CLOSED (Mounted on barricade)**	**18**	**3**	**54**
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)		12	
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)		12	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)		15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT		35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT		35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT		35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD		35	
W3-3-48	48"x48"	SIGNAL AHEAD		35	
W3-4-48	**48"x48"**	**BE PREPARED TO STOP**	**4**	**35**	**140**
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**4**	**35**	**140**
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT		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		35	
W8-1-48	**48"x48"**	**BUMP**	**6**	**35**	**210**
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-11-48	**48"x48"**	**UNEVEN LANES**	**4**	**35**	**140**
W8-12-48	**48"x48"**	**NO CENTER LINE**	**4**	**35**	**140**
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	**48"x48"**	**TRUCKS ENTERING AHEAD or __ FT or _ MILE**	**2**	**35**	**70**
W8-55-48	**48"x48"**	**TRUCKS CROSSING AHEAD or __ FT or _ MILE**	**2**	**35**	**70**
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)		14	
W14-3-64	64"x48"	NO PASSING ZONE		28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)		10	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**22**	**35**	**770**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT or _ MILE		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or _ MILE		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or _ MILE		35	
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE		35	
W20-7-48	**48"x48"**	**FLAGGER**	**5**	**35**	**175**
W20-8-18	**18"x18"**	**STOP - SLOW PADDLE Back to Back**	**5**	**5**	**25**
W20-52P-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)		12	
W21-1-48	48"x48"	WORKERS		35	
W21-2-48	**48"x48"**	**FRESH OIL**	**2**	**35**	**70**
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or _ MILE		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 or _ MILE		35	
W21-6-48	48"x48"	SURVEY CREW		35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT		35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY		35	
W21-52-48	48"x48"	PAVEMENT BREAKS		35	
W21-53-48	**48"x48"**	**RUMBLE STRIPS AHEAD**	**3**	**35**	**105**
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK		35	
W24-1-48	48"x48"	DOUBLE REVERSE CURVE		35	

SPECIAL SIGNS

SPEC & CODE

704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	2940

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	**FLAGGING**	**MHR**	**540**
704-1048	**PORTABLE RUMBLE STRIPS**	**EACH**	**3**
704-1050	TYPE I BARRICADES	EACH	
704-1052	TYPE III BARRICADES	EACH	
704-1054	**SIDEWALK BARRICADE**	**EA**	**18**
704-1058	**PEDESTRIAN WALKWAY**	**LF**	**1200**
704-1060	DELINEATOR DRUMS	EACH	
704-1065	TRAFFIC CONES	EACH	
704-1067	**TUBULAR MARKERS**	**EACH**	**280**
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1080	**STACKABLE VERTICAL PANELS**	**EACH**	**45**
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	
704-1185	**PILOT CAR**	**HR**	**180**
704-1500	OBLITERATION OF PVMT MK	SF	
704-2108	**TEMPORARY CURB RAMP**	**EA**	**18**
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	
762-0432	**SHORT TERM 6IN LINE-TYPE NR**	**LF**	**48138**

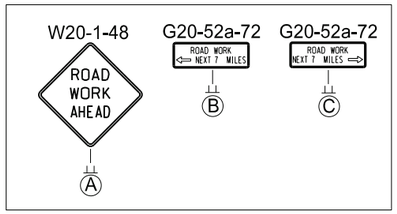
NOTE:
If additional signs are required, units will be calculated using the formula from Section III-18.06 of the Design Manual.
http://www.dot.nd.gov/

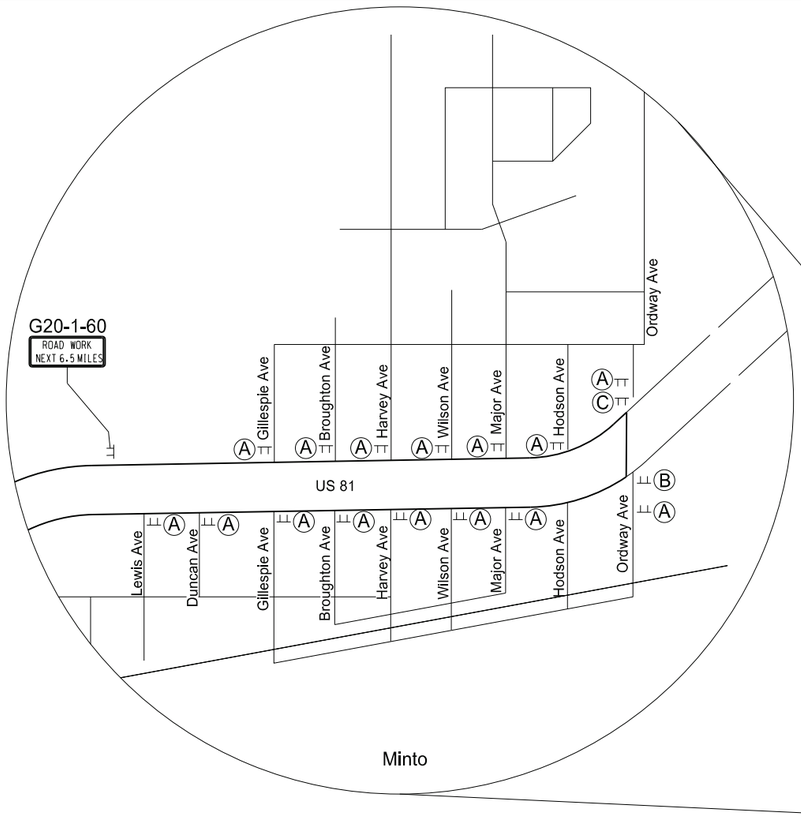
REGISTERED PROFESSIONAL ENGINEER
DUSTIN LANG
PE-6394
DATE 04/29/26
NORTH DAKOTA

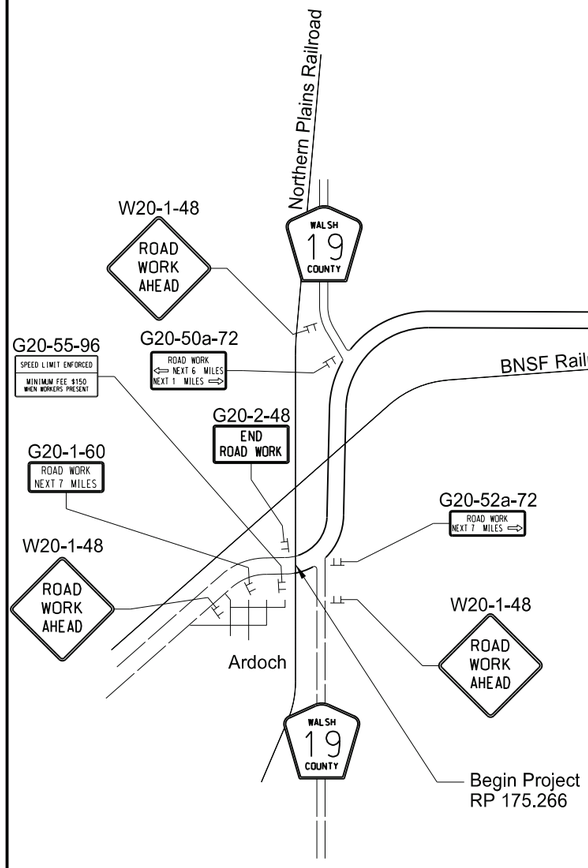
Traffic Control Devices List

Milling & HMA, ADA Curb Ramp Revisions
Ardoch N thru Minto

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	100	2







Work Zone Traffic Control

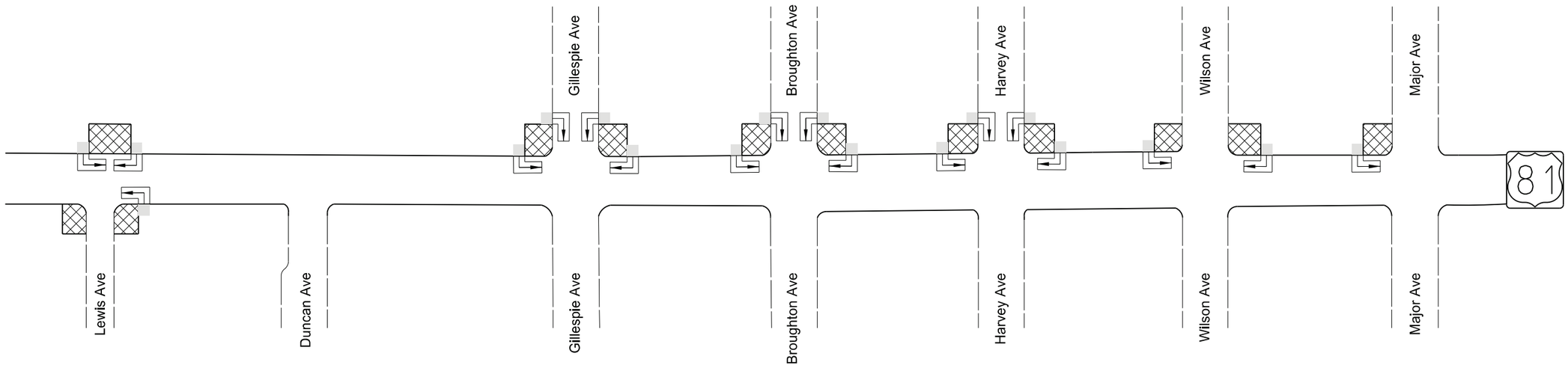
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	100	3



ADA Curb Ramp Revision

Temporary Curb Ramp

Temporary Pedestrian Surfacing

Construction Phasing
ADA Curb Ramp Revisions

Phase 1

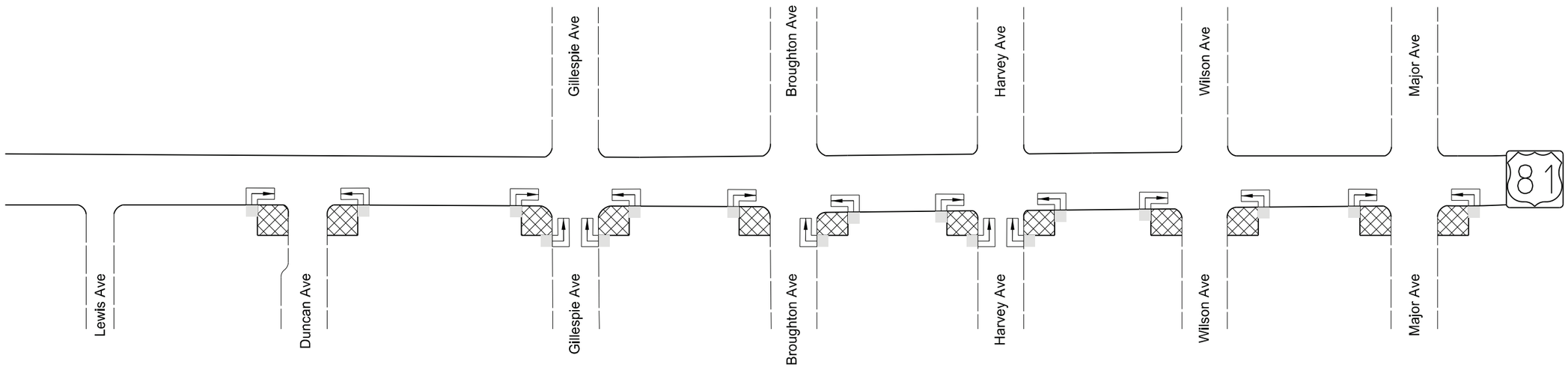
Milling & HMA, ADA Curb Ramp Revisions

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	100	4



ADA Curb Ramp Revision

Temporary Curb Ramp

Temporary Pedestrian Surfacing

Construction Phasing
ADA Curb Ramp Revisions

Phase 2

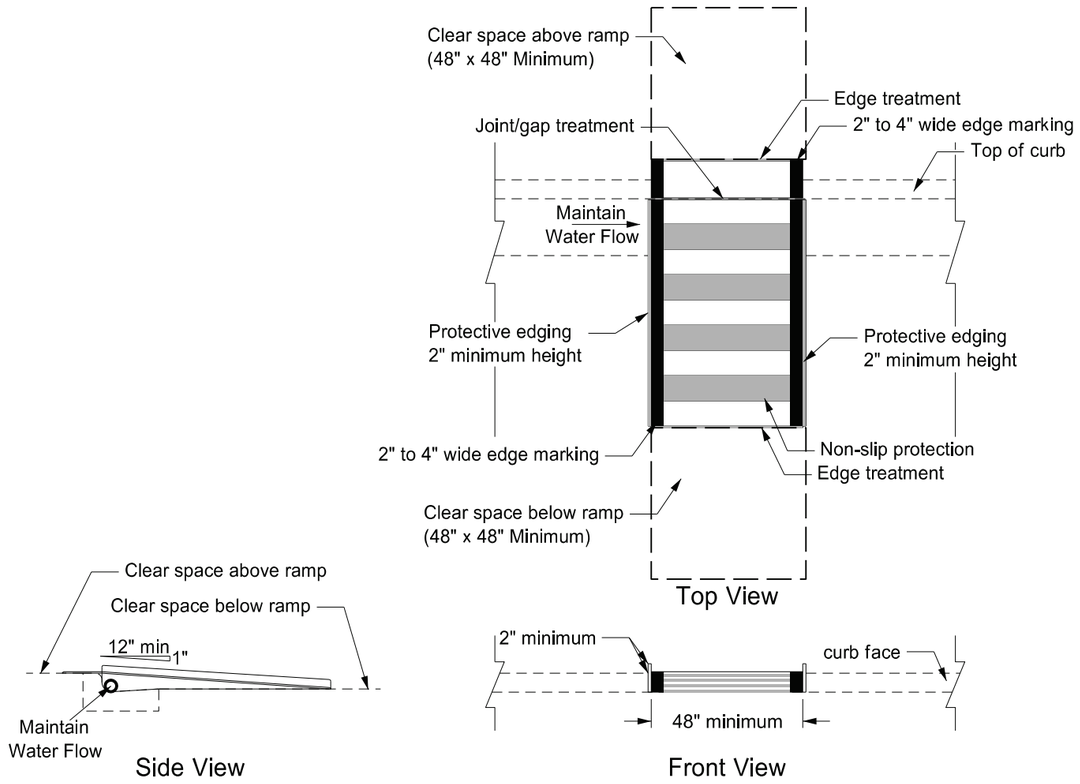
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

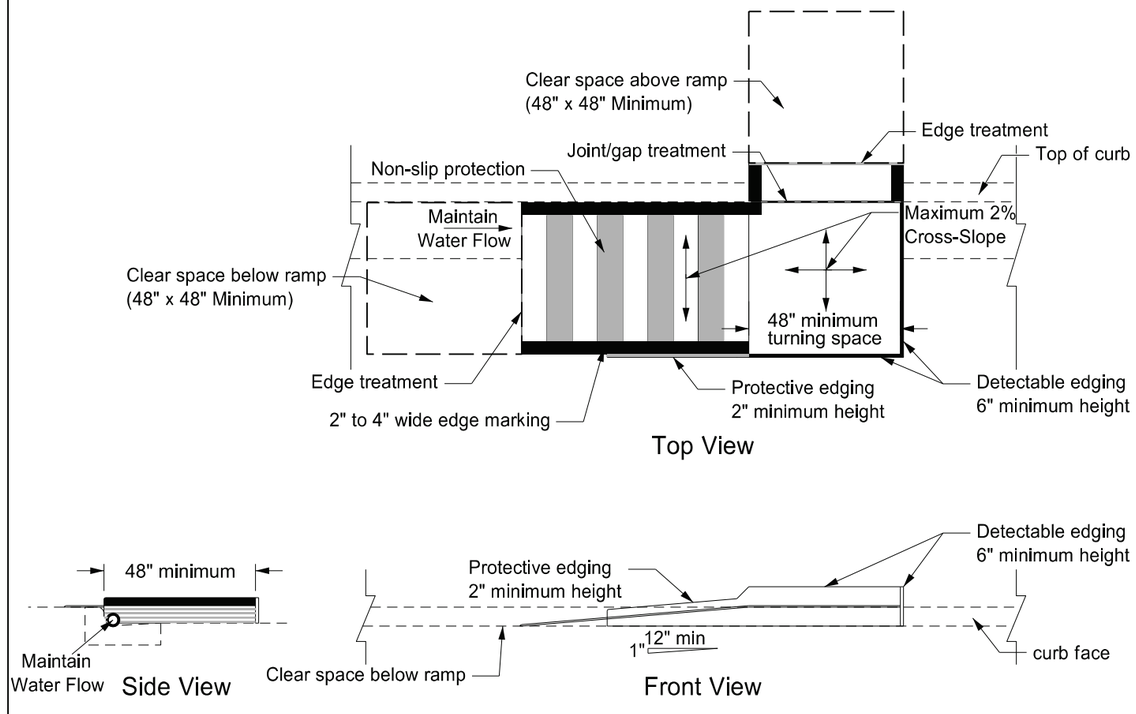
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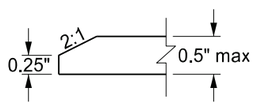


Temporary Perpendicular Curb Ramp



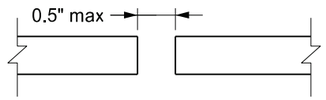
Temporary Parallel Curb Ramp

Edge Treatment



Maximum Surface
Height Change Detail

Joint/Gap Treatment



Maximum Width
Lateral Joints or Gaps

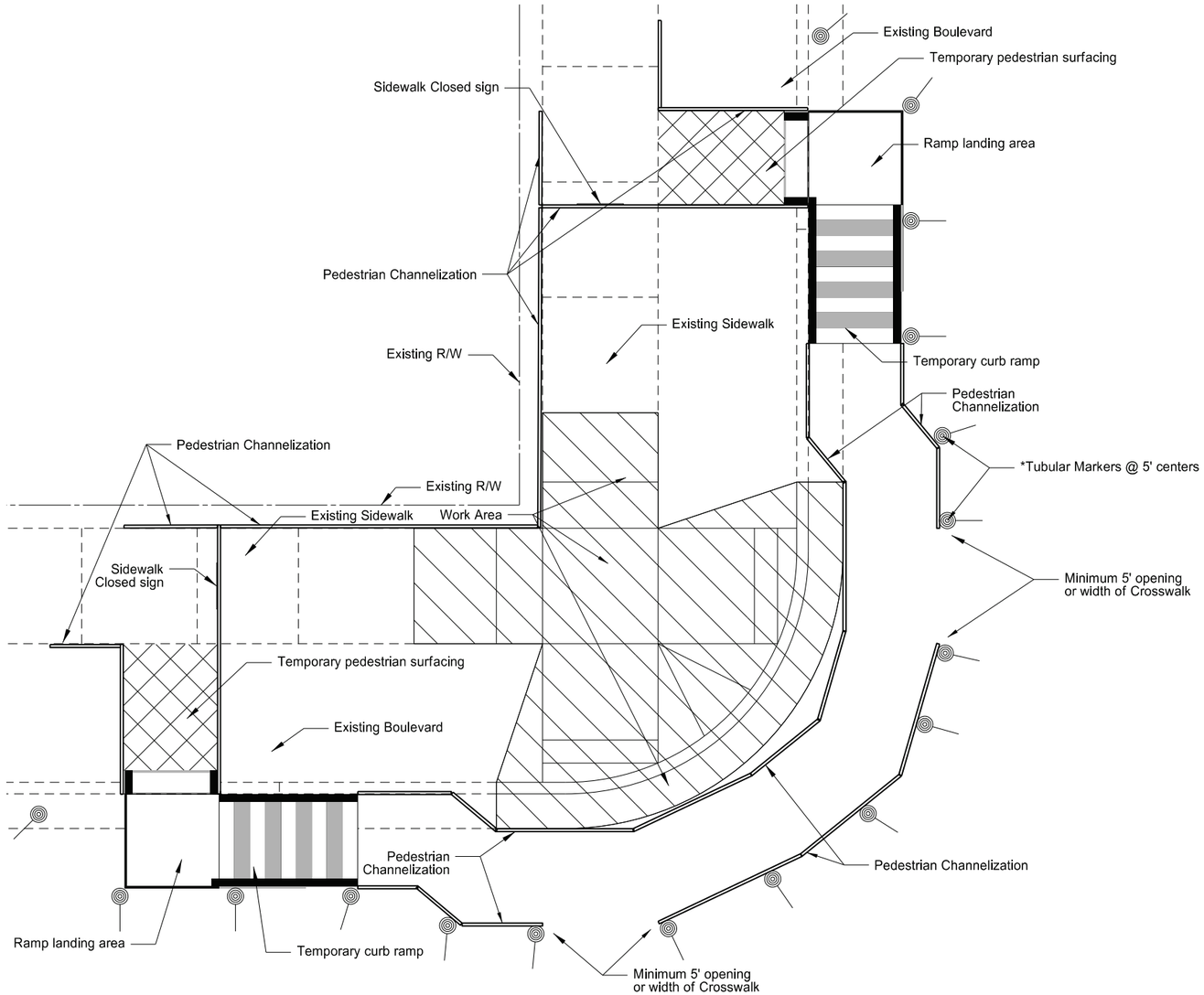
Temporary Pedestrian Curb Ramp Details

Milling & HMA, ADA Curb Ramp Revisions

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	100	6



*NOTE: Eliminate tubular markers if pedestrian channelization is retro-reflective

Temporary Pedestrian Access Route

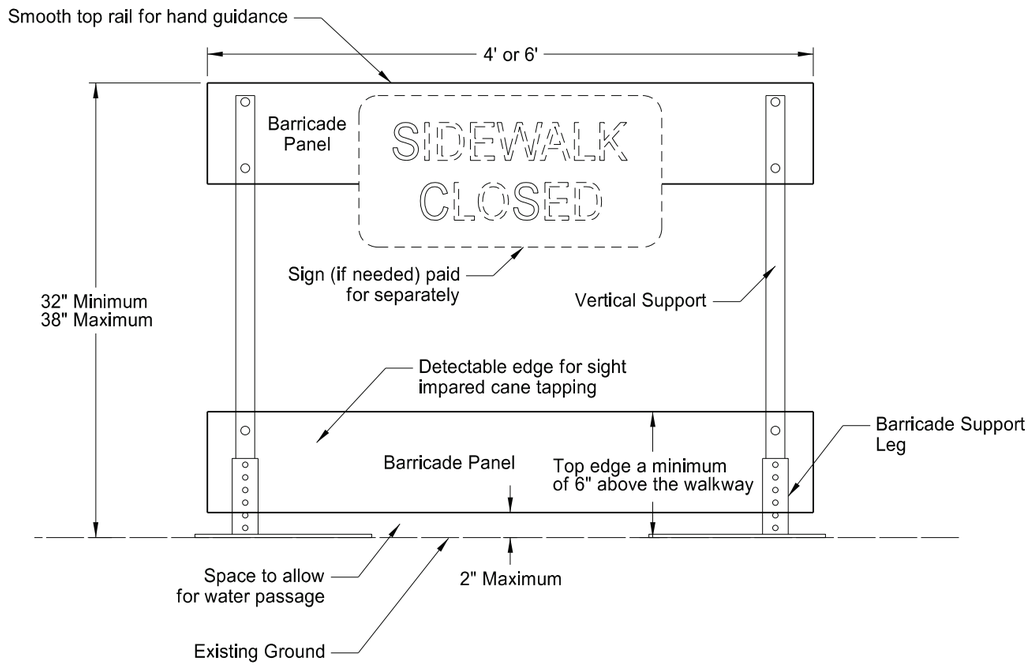
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

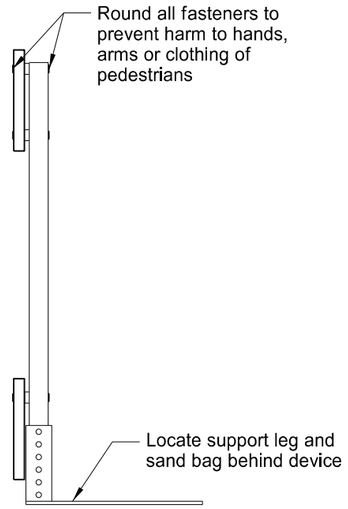
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	100	7



Front View

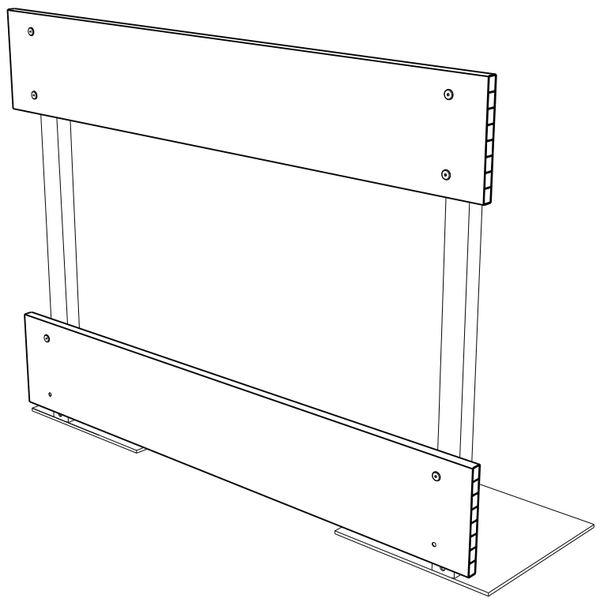


End View

NOTES:

Sidewalk Barricades

1. Provide self standing sidewalk barricade with no supports extending into the pedestrian's path.
2. Use orange or orange and white diagonal striped barricade panels contrasting with the walkway surface.
3. Provide ADA compliant and NCHRP 350 or Mash Test Level 3 (TL3) approved sidewalk barricades.
4. Include all costs to furnish, maintain and remove sidewalk barricades in the price bid for "Sidewalk Barricade".



Perspective View

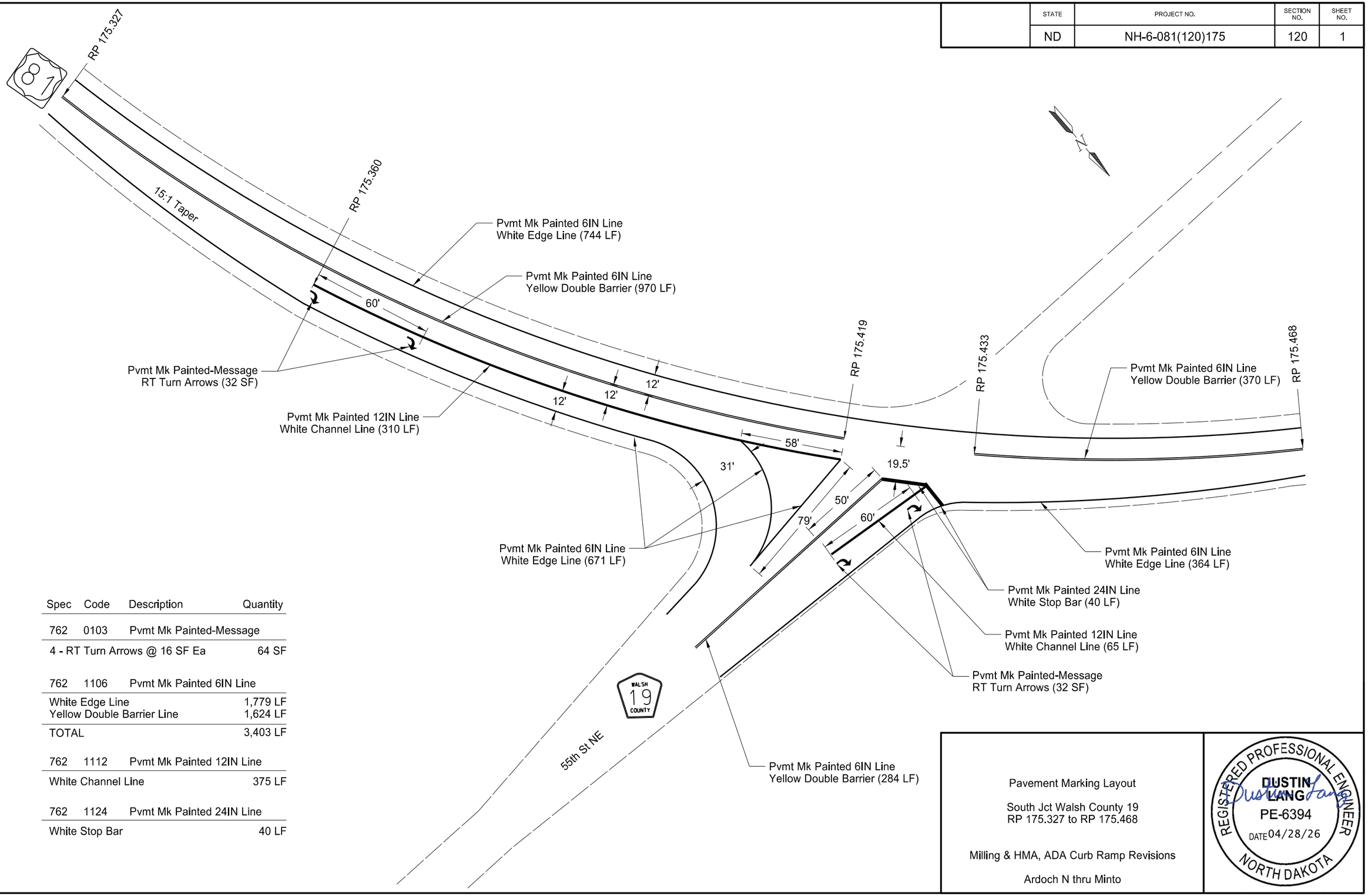
Sidewalk Barricade

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

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DATE 04/29/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	120	1



Spec	Code	Description	Quantity
762	0103	Pvmt Mk Painted-Message	
4 - RT Turn Arrows @ 16 SF Ea			64 SF
762	1106	Pvmt Mk Painted 6IN Line	
White Edge Line			1,779 LF
Yellow Double Barrier Line			1,624 LF
TOTAL			3,403 LF
762	1112	Pvmt Mk Painted 12IN Line	
White Channel Line			375 LF
762	1124	Pvmt Mk Painted 24IN Line	
White Stop Bar			40 LF

Pavement Marking Layout

South Jct Walsh County 19
RP 175.327 to RP 175.468

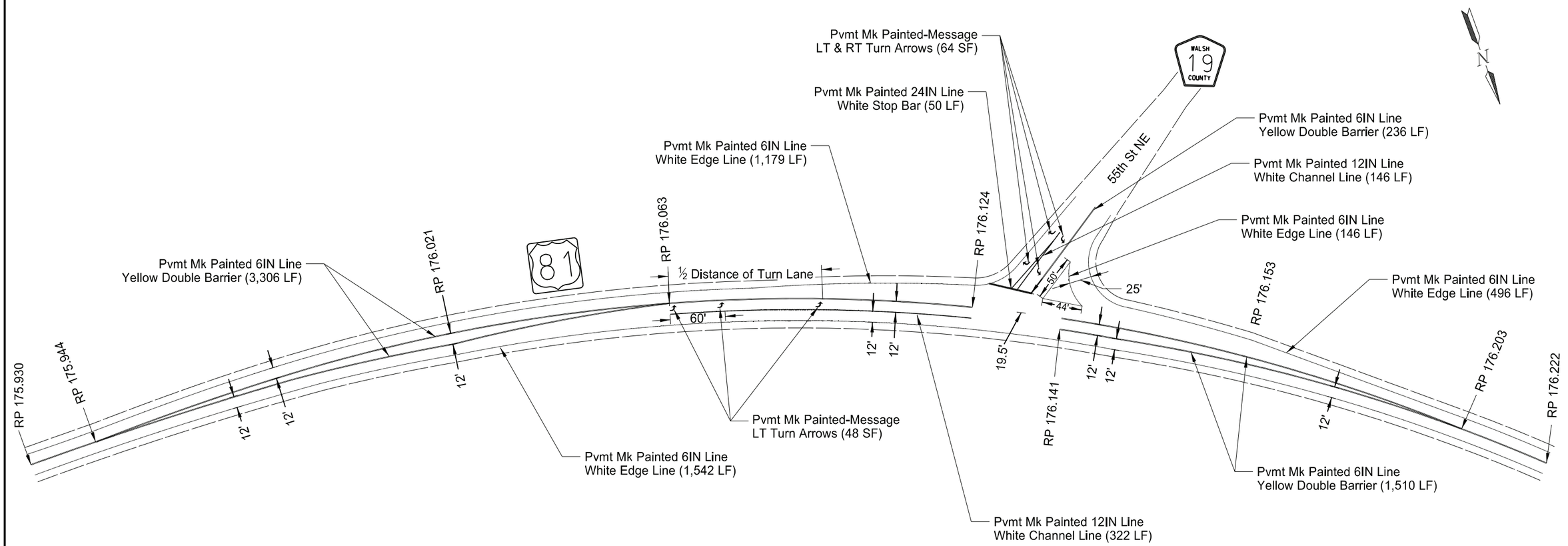
Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

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NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	120	2



Spec	Code	Description	Quantity
762	0103	Pvmt Mk Painted-Message	
5-LT Turn Arrows @ 16 SF Ea			80 SF
2-RT Turn Arrows @ 16 SF Ea			32 SF
TOTAL			112 SF
762	1106	Pvmt Mk Painted 6IN Line	
White Edge Line			3,363 LF
Yellow Double Barrier Line			5,052 LF
TOTAL			8,415 LF
762	1112	Pvmt Mk Painted 12IN Line	
White Channel Line			468 LF
762	1124	Pvmt Mk Painted 24IN Line	
White Stop Bar			50 LF

Pavement Marking Layout

North Jct Walsh County 19
RP 175.930 to RP 176.222

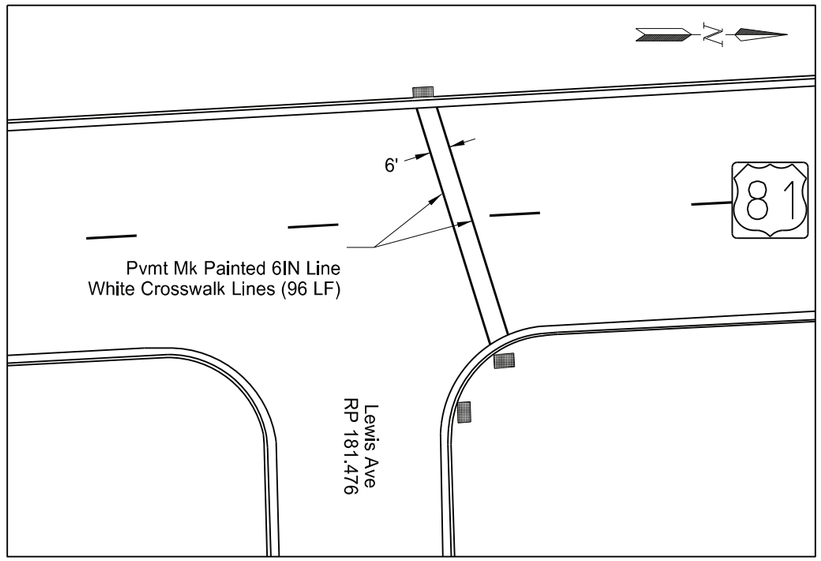
Milling & HMA, ADA Curb Ramp Revisions

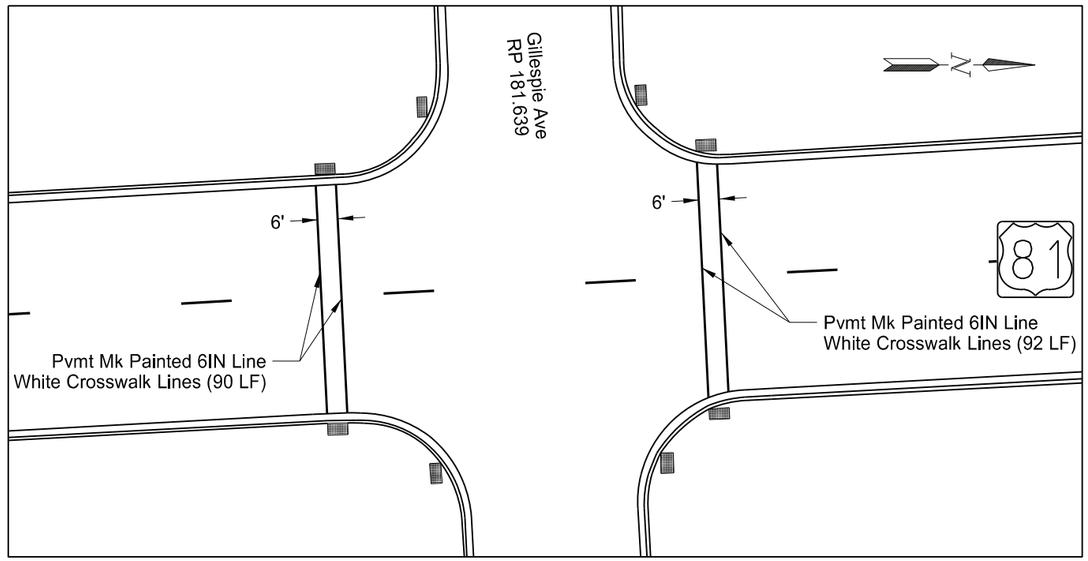
Ardoch N thru Minto

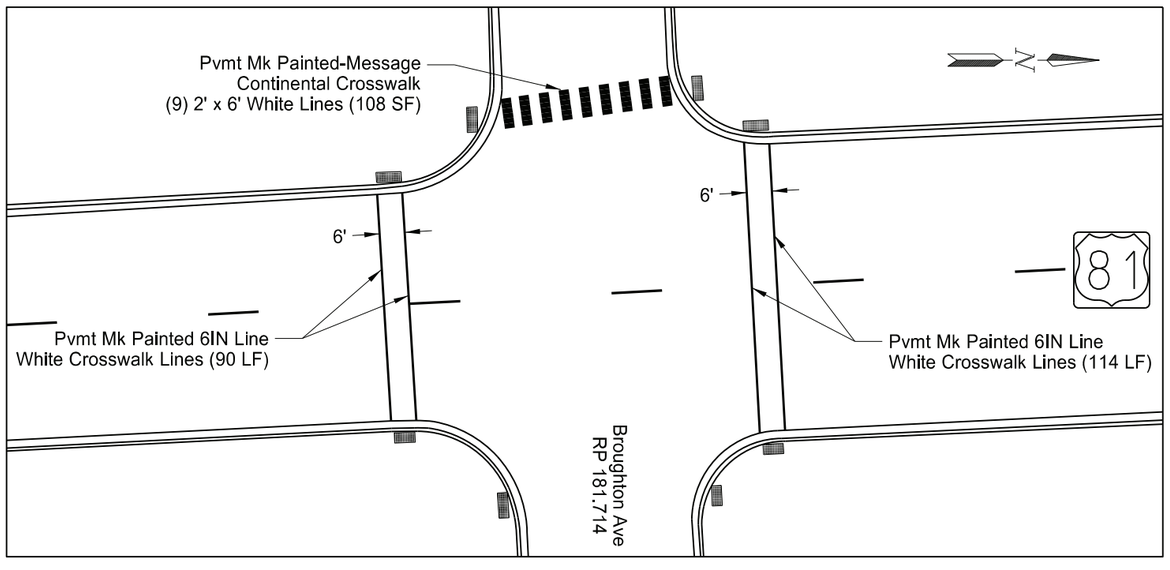
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	120	3







Spec	Code	Description	Quantity
762	0103	Pvmt Mk Painted-Message Continental Crosswalk	108 SF
762	1106	Pvmt Mk Painted 6IN Line White Crosswalk Lines	482 LF

Pavement Marking Layout

City of Minto-Crosswalks

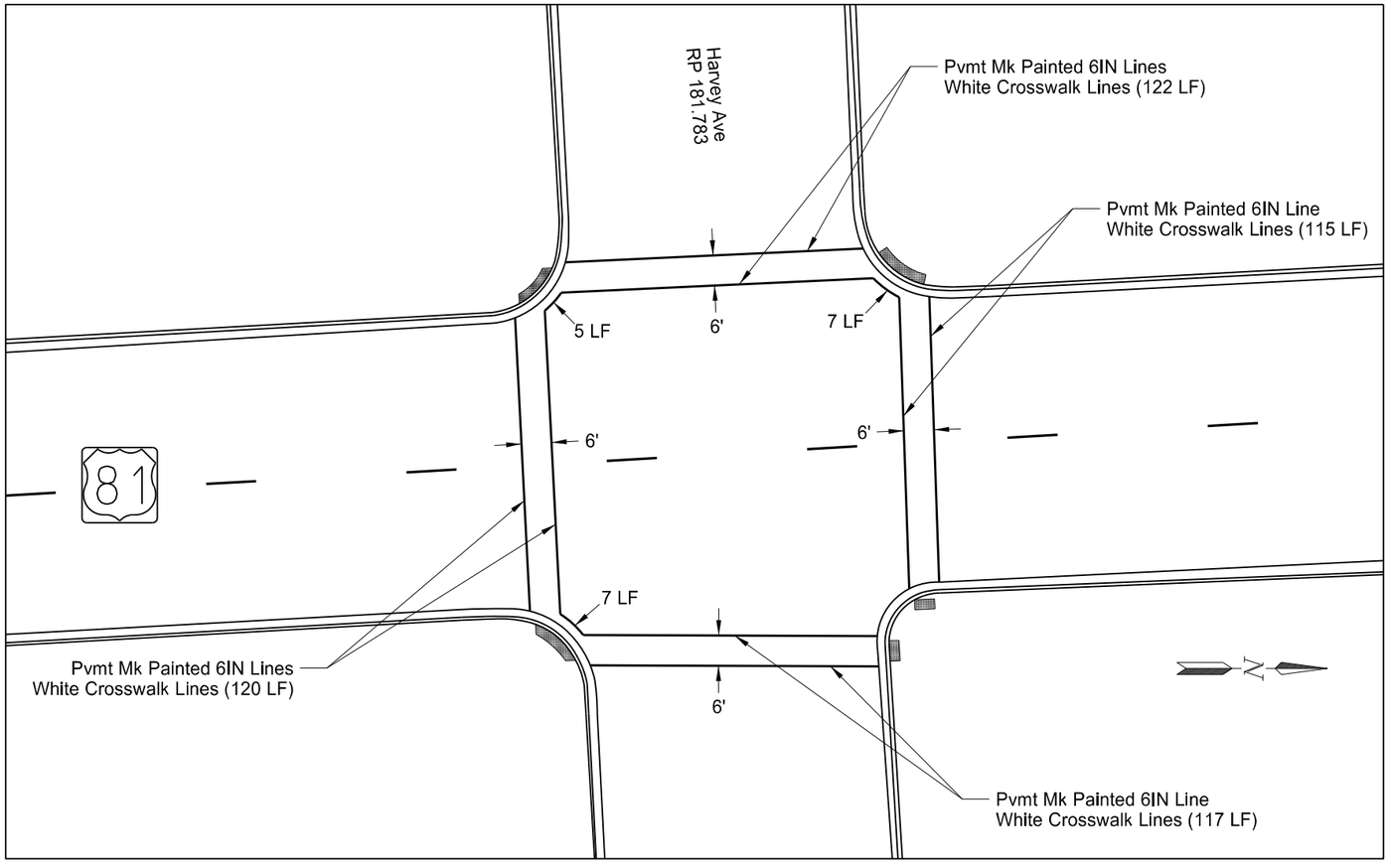
Milling & HMA, ADA Curb Ramp Revisions

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NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-6-081(120)175	120	4



Spec	Code	Description	Quantity
762	1106	Pvmt Mk Painted 6IN Line	
White Crosswalk Lines			493 LF

Pavement Marking Layout

City of Minto-Crosswalks

Milling & HMA, ADA Curb Ramp Revisions

Ardoch N thru Minto

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NDDOT ABBREVIATIONS

?	This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.
Abn	abandoned
Abut	abutment
Adj	adjusted
Aggr	aggregate
Ahd	ahead
ARV	air release valve
Align	alignment
Al	alley
Alt	alternate
Alum	aluminum
ADA	Americans with Disabilities Act
&	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
Bk	back
BF	back face
Balc	balcony
B Wire	barbed wire
Barr	barricade
Btry	battery
BI	beehive inlet
Beg	begin
BG	below grade
BM	bench mark
Bkwy	bikeway
Bit	bituminous
Blk	block
BH	bore hole
Bot	bottom
Blvd	Boulevard
Bndry	boundary
Brkwy	breakaway
Br	bridge
Bldg	building
Bus.	business
BV	butterfly valve
Byp	bypass
C Gdrl	cable guardrail
Calc	calculate
CIP	cast iron pipe
CB	catch basin
CRS	cationic rapid setting
C Gd	cattle guard
C To C	center to center
CL or ℄	centerline
Ch	chain
Chnlk	chain-link
Ch Blk	channel block
Ch Ch	channel change
Chk	check
Chsld	chiseled
Cir	circle
Cl	class
Clnt	clean-out
Clr	clear
Cl&gr	clearing & grubbing
Comb.	combination
Coml	commercial
Compr	compression
CADD	computer aided drafting & design
Conc	concrete
CECB	concrete erosion control blanket
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
CSFES	corrugated steel flared end section
CSP	corrugated steel pipe
CSTES	corrugated steel traversable end section
Co	County
Crse	course
Ct	Court
Xarm	cross arm
Xbuck	cross buck
Xsec	cross sections
Xing	crossing
Xrd	crossroad
Crn	crown
Culv	culvert
C&G	curb & gutter
CI	curb inlet
CR	curb ramp
C	cut
Dd Ld	dead load
Defl	deflection
Defm	deformed
Dlnt	delineate
Dlntr	delineator
Depr	depression
Desc	description
Det	detail
DWP	detectable warning panel
Dtr	detour
Dia or ø	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
EVSE	electric vehicle supply equipment
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
Evgr	evergreen
Exc	excavation
Exst	existing
Exp	expansion
Expy	Expressway
E	external of curve
Extru	extruded
FOS	factor of safety
Fed	Federal
FP	feed point
Fn	fence
Fn P	fence post
FO	fiber optic
FD	field drive
F	fill
FAA	fine aggregate angularity
FH	fire hydrant
Fl	flange
Flrd	flared
FES	flared end section
F Bcn	flashing beacon
FA	flight auger sample
FL	flow line
Ftg	footing
FM	force main
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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
09-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions

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NDDOT ABBREVIATIONS

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
Gov	government
Grd	graded/grade
Grnd	ground
GWM	ground water monitor
Gdrl	guardrail
Gtr	gutter
H Plg	H piling
Hdwl	headwall
Ht	height
Hel	helical
HDPE	high density polyethylene
HM	high mast
HP	high pressure
HPS	high pressure sodium
HTCG	high tension cable guardrail
Hwy	highway
Hor	horizontal
HBP	hot bituminous pavement
HMA	hot mix asphalt
Hyd	hydrant
Ph	hydrogen ion content
Id	identification
Incl	inclinometer tube
IMH	inlet manhole
ID	inside diameter
Inst	instrument
Intchg	interchange
Intmdt	intermediate
Intscn	intersection
Inv	invert
IP	iron pipe
Jt	joint
Jct	junction
Ln	lane
Lg	large
Lat	latitude
Lt	left
Lens	lenses
Lvl	level
Lvlng	leveling
Lht	light
LP	light pole
Ltg	lighting
Liq	liquid
LL	liquid limit
Loc	location
Long.	longitude
Lp	loop
LD	loop detector
Lum	luminaire
Mb	mailbox
ML	main line
MH	manhole
Mkd	marked
Mkr	marker
Mkg	marking
MA	mast arm
Matl	material
Max	maximum
Meas	measure
Mdn	median
MD	median drain
MC	medium curing
MGS	Midwest Guardrail System
MM	mile marker
MP	mile post
Min	minimum
Misc	miscellaneous
Mon	monument
Mnd	mound
Mtbl	mountable
Mtd	mounted
Mtg	mounting
Mk	muck
Neop	neoprene
Ntwk	network
N	North
NE	Northeast
NW	Northwest
NB	Northbound
No. or #	number
Obsc	obscure(d)
Ocpd	occupied
Ocpy	occupy
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
PSD	passing sight distance
Pvmt	pavement
Ped	pedestal
Ped	pedestrian
PPP	pedestrian pushbutton post
Pen.	penetration
Perf	perforated
Per.	perimeter
Perm	permanent
PL	pipeline
Pl	place
P&P	plan & profile
PL	plastic limit
Pl or ℄	plate
Pt	point
PE	polyethylene
PVC	polyvinyl chloride
PCC	Portland Cement concrete
PP	power pole
Preempt	preemption
Prefab	prefabricated
Prfmd or Pref	preformed
Prep	preperation
Press.	pressure
PRV	pressure relief valve
Prestr	prestressed
Pvt	private
PD	private drive
Prod.	production/produce
Prog	programmed
Prop.	property
Ppsd	proposed
PB	pull box
Qty	quantity
Qtr	quarter
Rad or R	radius
RR	railroad
Rlwy	railway
Rsd	raised
RC	rapid curing
Rec	record
Rcy	recycle
RAP	recycled asphalt pavement
RPCC	recycled portland cement concrete
Ref	reference
R Mkr	reference marker
RM	reference monument
RP	reference point
Refl	reflectorized
RCB	reinforced concrete box
RCES	reinforced concrete end section
RCFES	reinforced concrete flared end section
RCP	reinforced concrete pipe
RCPS	reinforced concrete pipe sewer
RCTES	reinforced concrete traversable end section
Reinf	reinforcement
Res	reservation
Res	residence
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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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08-03-15	General Revisions
04-23-18	General Revisions
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NDDOT ABBREVIATIONS

D-101-3

Salv	salvage(d)
San	sanitary sewer line
Sec	section
SL	section line
Sep	separation
Seq	sequence
Serv	service
Sht	sheet
Shtng	sheeting
Shldr	shoulder
Sw or Sdwk	sidewalk
SD	sight distance
SN	sign number
Sig	signal
Sgl	single
SRCP	slotted reinforced concrete pipe
SC	slow curing
SS	slow setting
Sm	small
S	South
SE	Southeast
SW	Southwest
SB	Southbound
Sp	spaces
Spcl	special
SA	special assembly
SP	special provisions
G	specific gravity
Spk	spike
SB	split barrel sample
SH	sprinkler head
SV	sprinkler valve
Sq	square
Stk	stake
Std	standard
N	standard penetration test
Std Specs	standard specifications
Stm L	steam line
SEC	steel encased concrete
SMA	stone matrix asphalt
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
SS	supplement specification
Supp	supplemental
Surf	surfacing
Surv	survey
Sym	symmetrical

Tel	telephone
Tel B	Telephone Booth
Tel P	telephone pole
Tv	television
Temp	temperature
Temp	temporary
TBM	temporary bench mark
T	thinwall tube sample
Ts	topsoil
Traf	traffic
TSCB	traffic signal control box
Tr	trail
Transf	transformer
Trans	transition
TT	transmission tower
TES	traversable end section
Trans	transverse
Trtd	treated
Trmt	treatment
Qc	triaxial compression
TERO	tribal employment rights ordinance
Tpl	triple
Typ	typical
Qu	unconfined compressive strength
Ugrnd	underground
Util	utility
VG	valley gutter
Vap	vapor
Vert	vertical
VCP	vitrified clay pipe
Vol	volume
VSFS	vehicle speed feedback sign
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
Wrng	wearing
WIM	weigh in motion
W	west
WB	westbound
Wrng	wiring
W/	with
W/o	without

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
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NDDOT ABBREVIATIONS

MEASUREMENTS

ac	acres
A	ampere
Bd Ft	board feet
Cd	candela
cm	centimeter
C	coulomb
CF	cubic feet
m3	cubic meter
m3/s	cubic meters per second
CY	cubic yard
CY/mi	cubic yards per mile
D or Deg	degree
F	Fahrenheit
F	farad
ft	feet/foot
Gal	gallon
G	giga
Ha	hectare
H	henry
Hz	hertz
hr	hour(s)
in.	inch
J	joule
K	kelvin
kN	kilo newton
kPa	kilo pascal
kg	kilogram
kg/m3	kilogram per cubic meter
km	kilometer
K	Kip(s)
LF	linear foot
L	litre
Lm	lumen
L sum	lump sum
Lx	lux
M Hr	man hour
M	mega
m	meter
m/s	meters per second
mi	mile
mL	milliliter
mm	millimeter
mm/hr	millimeters per hour
n	nano
N	newton
Pa	pascal
lb	pounds
sec	seconds
S	siemens
SF	square feet
km2	square kilometer
m2	square meter
SY	square yard
Sta Yd	station yards
SI	Systems International
T	tesla
T/mi	tons per mile
V	volt
W	watt
Wb	weber

SURVEY DESCRIPTIONS

Az	azimuth
Bs	backsight
Brg	bearing
BP Cap	blue plastic cap
BS	both sides
BC	brass cap
CC	closing corner
CS	curve to spiral
Eq	equation
E	external of curve
FS	far side
FB	field book
Fs	foresight
Geod	geodetic
GIS	Geographical Information System
GPS	Global Positioning System
HI	height of instrument
IM	iron monument
I Pn	iron pin
LS	Land Surveyor (licensed)
LSIT	Land Surveyor In Training
L	length of curve
LC	long chord
LB	level book
MC	meander corner
Mer	meridian
M	mid ordinate of curve
NGS	National Geodetic Survey
NS	near side
Obsn	observation
Off Loc	office location
OP Cap	orange plastic cap
PK	Parker-Kalon nail
P Cap	plastic cap
PP Cap	pink plastic cap
PCC	point of compound curve
PC	point of curve
PI	point of intersection
PRC	point of reverse curvature
PT	point of tangent
POC	point on curve
POT	point on tangent
RTP	random traverse point
Rge	range
RP Cap	red plastic cap
SC	spiral to curve
SC	standard corner
ST	spiral to tangent
Sta	station
SE	superelevation
Tan	tangent
T	tangent (semi)
TS	tangent to spiral
Twp	township
TB	transit book
TP	traverse point
TP	turning point
USC&G	US Coast & Geodetic Survey
USGS	US Geologic Survey
VC	vertical curve
WC	witness corner
WGS	World Geodetic System
YP Cap	yellow plastic cap
Z	zenith

SOIL TYPES

Cl	clay
Cl F	clay fill
Cl Hvy	clay heavy
Cl Lm	clay loam
Co S	coal slack
C Gr	coarse gravel
CS	coarse sand
FS	fine sand
Gr	gravel
Lig Co	lignite coal
Lig Sl	lignite slack
Lm	loam
Rk	rock
Sd	sand
Sdy Cl	sandy clay
Sdy Cl Lm	sandy clay loam
Sdy Fl	sandy fill
Sdy Lm	sandy loam
Sc	scoria
Sh	shale
Si Cl	silt clay
Si Cl Lm	silty clay loam
Si Lm	silty loam

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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DATE	CHANGE
12-18-20	Sheet Added - Continued from D-101-3
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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM	702 Communications
ACCENT	Accent Communications
AGASSIZ WU	Agassiz Water Users District
AGC	Associated General Contractors of America
ALL PL	Alliance Pipeline
ALL SEAS WU	All Seasons Water Users District
AMOCO PI	Amoco Pipeline Company
AMRDA HESS	Amerada Hess Corporation
AT&T	AT&T Corporation
B PAW	Bear Paw Energy Incorporated
BAKER ELEC	Baker Electric
BASIN ELEC	Basin Electric Cooperative Incorporated
BEK TEL	Bek Communications Cooperative
BELLE PL	Belle Fourche Pipeline Company
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe Railway
BOEING	Boeing
BRNS RWD	Barnes Rural Water District
BURK-DIV ELEC	Burke-Divide Electric Cooperative
BURL WRD	Burleigh County Water Resource District
CABLE ONE	Cable One
CABLE SERV	Cable Services
CAP ELEC	Capital Electric Cooperative Incorporated
CASS CO ELEC	Cass County Electric Cooperative
CASS RWU	Cass Rural Water Users District
CAV ELEC	Cavalier Rural Electric Cooperative
CBLCOM	Cablecom Of Fargo
CENEX PL	Cenex Pipeline
CENT PL WATER DIST	Central Pipe Line Water District
CENT PWR ELEC	Central Power Electric Cooperative
CENTURYLINK	CenturyLink
COE	Corps of Engineers
CONS COMM	Consolidated Communications
CONS TELCOM	Consolidated Telcom
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 WRD	Dickey County Water Resource District
DICKEY TEL	Dickey Telephone
DNRR	Dakota Northern Railroad
DOME PL	Dome Pipeline Company
DVELEC	Dakota Valley Electric Cooperative
DVMW	Dakota, Missouri Valley & Western
E CENT REG WD	East Central Water District
ENBRDG	Enbridge Pipelines Incorporated
ENVENTIS	Enventis Telephone
EQUINOR	Equinor Pipeline
FALK MNG	Falkirk Mining Company
FHWA	Federal Highway Administration
G FKS-TRL WD	Grand Forks-traill Water District
GETTY TRD & TRAN	Getty Trading & Transportation
GLDN W ELEC	Golden West Electric Cooperative
GTR RAMSEY WD	Greater Ramsey Water District
GT PLNS NAT GAS	Great Plains Natural Gas Company
HALS TEL	Halstad Telephone Company
IDEA1	Idea1
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
LWR YELL R ELEC	Lower Yellowstone Rural Electric
LUMEN	Lumen Technologies Incorporated
MCKNZ CON	McKenzie Consolidated Telcom
MCKNZ ELEC	McKenzie Electric Cooperative
MCKNZ WRD	McKenzie County Water Resource District
MCLEOD	McLeod USA
MCLN ELEC	McLean Electric Cooperative
MCLN-SHRDN R WAT	McLean-Sheridan Rural Water District
MDU	Montana-dakota Utilities
MIDCO	MidContinent Communications
MIDSTATE TEL	Midstate Telephone Company
MINOT CABLE	Minot Cable Television
MINOT TEL	Minot Telephone Company
MISS VALL COMM	Missouri Valley Communications Incorporated
MISS W W S	Missouri West Water System
MNKOTA PWR	Minnkota Power
MOR-GRAN-SOU ELEC	Mor-gran-sou Electric Cooperative
MOUNT-WILLI ELEC	Mountrail-williams Electric Cooperative
MLGC	Moore & Liberty - Griggs County
MUNICIPAL	City Water And Sewer
MUNICIPAL	City Of '.....'
N CENT ELEC	North Central Electric Cooperative
N PRAIR REG WD	North Prairie Regional Water District
ND PKS & REC	North Dakota Parks And Recreation
ND TEL	North Dakota Telephone Company
NDDOT	North Dakota Department of Transportation
NE REG WD	Northeast Regional Water District
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
NTHN BRDR PL	Northern Border Pipeline
NTHN PLNS ELEC	Northern Plains Electric Cooperative Incorporated
NTHWSTRN REF	Northwestern Refinery Company
NW COMM	Northwest Communication Cooperation
NWRWD	Northwest Rural Water District
ONEOK	Oneok gas
OSHA	Occupational Safety and Health Administration
OTTR TL PWR	Otter Tail Power Company
PAAP	Plains All American Pipeline
P L E M	Prairielands Energy Marketing
POLAR COM	Polar Communications
PVT ELEC	Private Electric
QWEST	Qwest Communications
R&T REG WD	R & T Water District
RED RIV COMM	Red River Communications
RESVTN TEL	Reservation Telephone
ROBRTS TEL	Roberts Company Telephone
R-RIDER ELEC	Roughrider Electric Cooperative
RRVW	Red River Valley & Western Railroad
S CENT REG WD	South Central Regional Water District
SE W U	Southeast 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 Incorporated
SOURIS RIV TELCOM	Souris River Telecommunications
ST WAT COMM	State Water Commission
STATE LN WATER	State Line Water Cooperative
STER ENG	Sterling Energy
STUT RWD	Stutsman Rural Water District
SW PL PRJ	Southwest Pipeline Project
SWWA	Southwest Water Authority
SUNOCO	Sunoco LP
T M C	Turtle Mountain Communications
TCI	TCI of North Dakota
TESORO HGH PLNS PL	Tesoro High Plains Pipeline
TRI-CNTY WU	Tri-County Water Users Incorporated
TRL CO WRD	Traill County Water Resource District
UNTD TEL	United Telephone
UPPR SOUR WD	Upper Souris Water District
US SPRINT	U.S. Sprint
USAF MSL CABLE	U.S.A.F. Missile Cable
USFWS	US Fish and Wildlife Service
USW COMM	U.S. West Communications
VRNDRY ELEC	Verendrye Electric Cooperative
W RIV TEL	West River Telephone Incorporated
WAPA	Western Area Power Administration
WAWSA	Western Area Water Supply Authority
WEB	W. E. B. Water Development Association
WILLI WRD	Williams County Water Resource District
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

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LINE STYLES

D-101-20

Existing Topography

- Existing Ground Void
- Existing Cemetary Boundary
- Existing Box Culvert Bridge
- Existing Concrete Surface
- Existing Drainage Structure
- Existing Gravel Surface
- Existing Riprap
- Existing Dirt Surface
- Existing Asphalt Surface
- Existing Tie Point Line
- Existing Railroad Centerline
- Existing Guardrail Cable
- Existing Guardrail Metal
- Existing Edge of Water
- Existing Fence
- Existing Railroad
- Existing Field Line
- Exst Flow
- Existing Curb
- Existing Valley Gutter
- Existing Driveway Gutter
- Existing Curb and Gutter
- Existing Mountable Curb and Gutter
- Existing 3-Cable w Posts
- Site Boundary
- Existing Berm, Dike, Pit, or Earth Dam
- Existing Ditch Block
- Existing Tree Boundary
- Existing Brush or Shrub Boundary
- Existing Retaining Wall
- Existing Planter or Wall
- Existing W-Beam Guardrail with Posts
- Existing Railroad Switch
- Gravel Pit - Borrow Area
- Existing Wet Area-Vegetation Break
- Existing High Tension Cable Guardrail
- Existing High Tension Cable Guardrail with Posts

Proposed Topography

- 3-Cable w Posts
- Flow
- Fence
- Remove Line
- Wall
- Retaining Wall (Plan View)
- W-Beam w Posts
- High Tension Cable Guardrail with Posts

Existing Utilities

- Existing Electrical
- Existing Fiber Optic Line
- Existing TV Fiber Optic
- Existing Gas Pipe
- Existing Overhead Utility Line
- Existing Power
- Existing Fuel Pipeline
- Existing Undefined Above Ground Pipe Line
- Existing Sanitary Sewer
- Existing Sanitary Force Main
- Existing Storm Drain
- Existing Storm Drain Force Main
- Existing Culvert
- Existing Telephone Line
- Existing TV Line
- Existing Water or Steam Line
- Existing Under Drain
- Existing Slotted Drain
- Existing Conduit
- Existing Conductor
- Existing Down Guy Wire Down Guy
- Existing Underground Vault or Lift Station

Proposed Utilities

- 24 Inch Pipe
- Reinforced Concrete Pipe
- Under Drain
- Edge Drain

Traffic Utilities

- Conductor
- Fiber Optic
- Existing Loop Detector
- Existing Double Micro Loop Detector
- Micro Loop Detector Double
- Existing Micro Loop Detector
- Micro Loop Detector
- Signal Head with Mast Arm
- Existing Signal Head with Mast Arm

Sign Structures

- Existing Overhead Sign Structure
- Existing Overhead Sign Structure Cantilever
- Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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REVISIONS

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09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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LINE STYLES

D-101-21

Right Of Way

- Easement
- Existing Easement
- Right of Way
- Existing Right of Way
- Existing Right of Way Railroad
- Existing Right of Way Not State Owned
- Existing Government Lot Line
- Existing Adjacent Block Lines
- Existing Adjacent Lot Lines
- Existing Adjacent Property Line
- Existing Adjacent Subdivision Lines
- Sight Distance Triangle Line
- Dimension Leader

Boundary Control

- Existing City Corporate Limits or Reservation Boundary
- Existing State or International Line
- Existing Township
- Existing County
- Existing Section Line
- Existing Quarter Section Line
- Existing Sixteenth Section Line
- Existing Centerline
- Tangent Line

Cross Sections and Typicals

- Existing Ground
- Existing Topsoil (Cross Section View)
- Existing Ground Void (Not Surveyed) (void — void — void — v)
- Existing Concrete
- Existing Aggregate (Cross Section View)
- Existing Curb and Gutter (Cross Section View)
- Existing Asphalt (Cross Section View)
- Existing Reinforcement Rebar

Geotechnical

- Geotextile Fabric Type D (D — D)
- Geogrid (Geo — Geo)
- Geotextile Fabric Type R (R — R)
- Geotextile Fabric Type R1 (R — R)
- Geotextile Fabric Type RR (RR — RR)
- Geotextile Fabric Type S (S — S)
- Subgrade Reinforcement
- Failure Line

Countours

- Depression Contours
- Supplemental Contour

Profile

- Subgrade, Subcut or Ditch Grade
- Topsoil Profile

Striping

- 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

Pavement Joints

- Doweled Joint
- Tie Bar 30 Inch 4 Foot Center to Center
- Tie Bar 18 Inch 3 Foot Center to Center
- Tie Bar at Random Spacing

Bridge Details

- Small Hidden Object
- Large Hidden Object
- Phantom Object
- Existing Conditions Object
- Centerline Main
- Centerline Secondary
- Excavation Limits
- Proposed Ground
- Sheet Piling

Erosion Control

- Limits of Const Transition Line
- Bale Check
- Rock Check
- Floating Silt Curtain (S — S)
- Silt Fence (SF — SF)
- Excavation Limits
- Fiber Rolls

Environmental

- Wetland Mitigation
- Existing Wetland Easement USFWS
- Existing Wetland Jurisdictional
- Existing Wetland
- Tree Row

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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12 18 2020

SYMBOLS

D-101-30

North Arrow (Half Scale)

Alignment Data Point

Alignment Monument

Spot Elevation

Existing Miscellaneous Spot

Existing Access Control Arrow

Existing Benchmark

Reset USGS Marker

Iron Monument Found

Iron Pin R/W Monument

Property Corner

Iron Pin Reference Monument

Right of Way Marker (Exst, Ppsd, Reset)

Existing Federal Reference Corner

Existing Section Corner (Full, Quarter, Sixteenth, Meander)

Existing Witness Corner

Existing Control Point (CP, GPS-RTK, TRI)

Existing Traverse PI Aerial Panel

Existing Reference Marker Point NGS

Existing EFB Misc

Existing Bush or Shrub

Existing Large Evergreen Tree

Existing Small Evergreen Tree

Existing Large Tree

Existing Small Tree

Existing Tree Trunk

Cairn or Stone Circle

Existing Artifact

Existing Satellite Dish

Existing Weather Station

Existing Windmill or Tower

Reinforced Pavement

CSB Continuous Split Barrel Sample

FA Flight Auger Sample

SB Split Barrel Sample

T Thinwall Tube Sample

N Standard Penetration Test

Incl Inclinometer Tube

Excavation Unit

Existing Ground Water Well Bore Hole

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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12 18 2020

SYMBOLS

D-101-31

- Flexible Delineator
- Flexible Delineator Type A (Exst, Ppsd)
- Flexible Delineator Type B (Exst, Ppsd)
- Flexible Delineator Type C (Exst, Ppsd)
- Flexible Delineator Type D (Exst, Ppsd)
- Flexible Delineator Type E (Exst, Ppsd)
- Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)
- Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)
- Delineator Type C (Exst, Ppsd, Diamond Grade)
- Delineator Type D (Exst, Ppsd, Diamond Grade)
- Delineator Type E (Exst, Ppsd, Diamond Grade)
- Barricade (Type I, Type II, Type III}
- Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)
- Attenuation Device
- Truck Mounted Attenuator
- Delineator Drums
- Flagger
- Tubular Marker
- Traffic Cone
- Back to Back Vertical Panel Sign

- Highway Sign (Exst, Ppsd)
- Mile Post Type A (Exst-Ppsd-Reset)
- Mile Post Type B (Exst, Ppsd)
- Mile Post Type C (Exst, Ppsd)
- Object Marker Type I (Exst, Ppsd)
- Object Marker Type II (Exst, Ppsd)
- Object Marker Type III (Exst, Ppsd)
- Existing Reference Marker
- Road Closure Gate 18 Ft (Exst, Ppsd)
- Road Closure Gate 28 Ft (Exst, Ppsd)
- Road Closure Gate 40 Ft (Exst, Ppsd)
- Existing Railroad Battery Box
- Existing RR Profile Spot
- Existing Railroad Crossbuck
- Existing Railroad Frog
- Existing Mailbox (Private, Federal)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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12 18 2020

SYMBOLS

D-101-32

- Existing Luminaire
- Luminaire LED
- Existing Light Standard Luminaire
- Relocate Light Standard
- Light Standard Light LED Luminaire
- Light Standard 35 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 100 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 150 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 400 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 700 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire
- Emergency Vehicle Detector
- Video Detection Camera

- High Mast Light Standard 3 Luminaire (Exst, Ppsd)
- High Mast Light Standard 4 Luminaire (Exst, Ppsd)
- High Mast Light Standard 5 Luminaire (Exst, Ppsd)
- High Mast Light Standard 6 Luminaire (Exst, Ppsd)
- High Mast Light Standard 7 Luminaire (Exst, Ppsd)
- High Mast Light Standard 8 Luminaire (Exst, Ppsd)
- High Mast Light Standard 9 Luminaire (Exst, Ppsd)
- High Mast Light Standard 10 Luminaire (Exst, Ppsd)
- Overhead Sign Structure Load Center (Exst, Ppsd)
- Traffic Signal Controller (Exst, Ppsd)
- Pad Mounted Traffic Signal Controller (Exst, Ppsd)
- Flashing Beacon (Exst, Ppsd)
- Concrete Foundation (Exst, Ppsd)
- Pipe Mounted Flasher (Exst, Ppsd)
- Pad Mounted Feed Point (Exst, Ppsd)
- Pipe Mounted Feed Point with Pad (Exst, Ppsd)
- Pole Mounted Feed Point (Exst, Ppsd)
- Junction Box (Exst, Ppsd)
- Existing Pedestrian Head with Number
- Existing Signal Head
- Pole Mounted Head
- Existing Lighting Standard Pole

- Existing Traffic Signal Standard
- Pull Box (Exst-Ppsd-Undefined)
- Intelligent Transportation Pull Box (Exst, Ppsd)
- Transformer (Exst, Ppsd)
- Power Pole (Exst-Ppsd-with Transformer)
- Wood Pole (Exst, Ppsd)
- Pedestrian Push Button Post (Exst, Ppsd)
- Existing Pole
- Existing Telephone Pole
- Existing Post
- Connection Conductor (Ground, Neutral, Phase 1, Phase 2)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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SYMBOLS

D-101-33

Existing Manhole (Electrical, Gas, Telephone)

Water Manhole (Exst, Exst with Valve)

Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)

Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)

Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)

Force Main Storm Drain Manhole (Exst, Exst with Valve)

Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)

Existing Water Appurtenance

Sprinkler Head (Exst, Ppsd)

Fire Hydrant (Exst, Ppsd)

Cleanout (Exst Sanitary, Underdrain)

Existing Catch Basin Inlet (Round, Square)

Existing Curb Inlet (Round, Square)

Existing Slotted Reinforced Concrete Pipe

Catch Basin (Riser 30 Inch, Beehive, Type A)

Inlet Mountable Curb (Type A, Type B)

Inlet Saddle Base (Type 1, Type 2)

Inlet Special (Catch Basin, Type 1, Type A)

Inlet (Tee, Type 1, Type 2, Type 2 Double)

Median Drain

Headwall (Exst, Ppsd, Ppsd Single with Vegitation Barrier, Ppsd Double with Vegitation Barrier)

Cap or Stub
Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water

Existing Pedestal
Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined

Existing Pipe Vent
Gas, Fuel, Sanitary, Storm Drain, Water, Undefined

Valve
Exst Gas, Exst Water, Ppsd Water, Exst Undefined

Pump
Sanitary, Storm Drain, Exst Water

Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)

Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)

Existing Utility Marker

Existing Meter

Existing Fuel Dispensers

Existing Fuel Filler Pipes

Existing Fuel Leak Sensors

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions Sheet added - Continued from D-101-32

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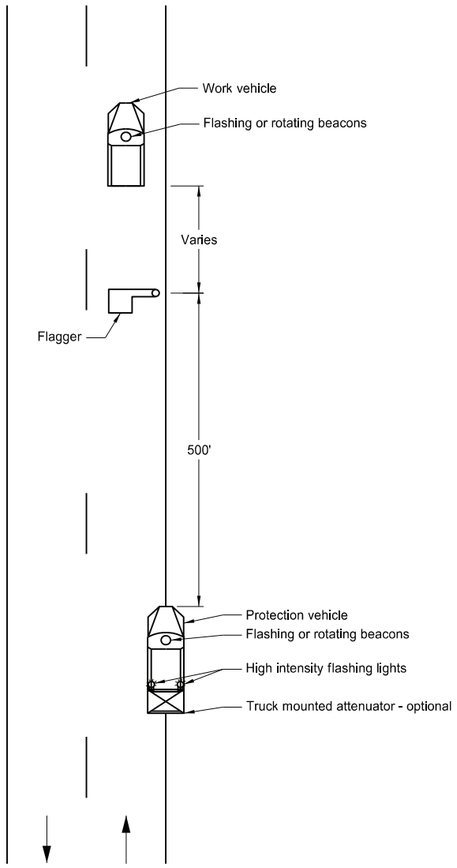
12 18 2020

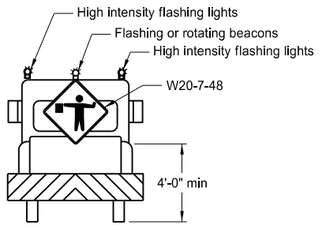
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TRAFFIC CONTROL FOR CORING OF HOT BITUMINOUS PAVEMENT

D-704-2

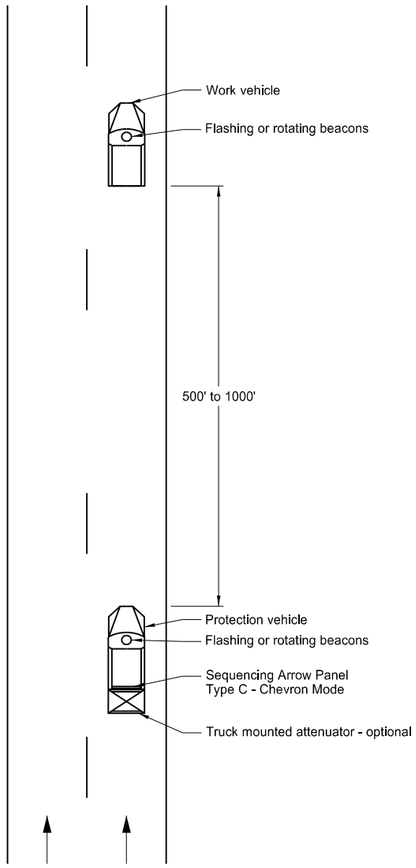
Two Lane, Two Way Roadways

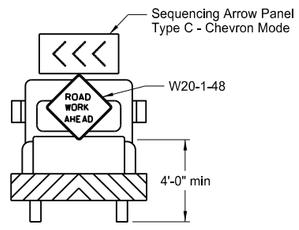




Typical Protection Vehicle

Multilane Roadways





Typical Protection Vehicle

Notes:

1. Display a 360 degree rotating, flashing, oscillating or strobe light on the working vehicle.

2. Display a 360 degree rotating, flashing, oscillating or strobe light on the shadow vehicle. Operate a sequencing arrow panel Type C in chevron mode on the shadow vehicle for Multilane Roadway.

3. Use these layouts during daylight hours and in areas of good visibility only.

4. Use flagger to protect the work area and warn oncoming traffic for two lane, two way roadway.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

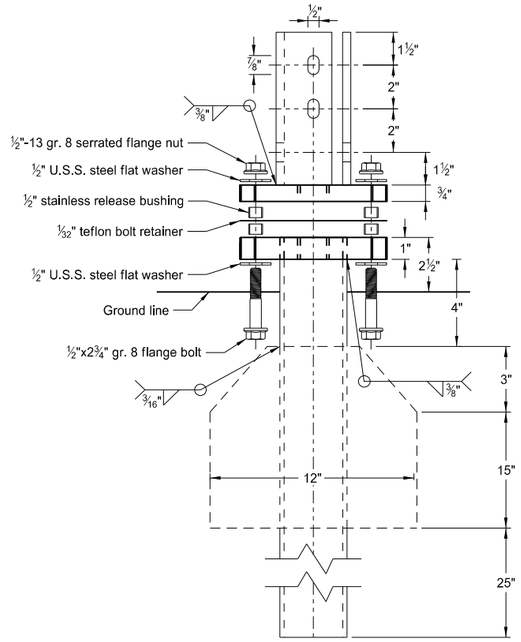
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08/01/24

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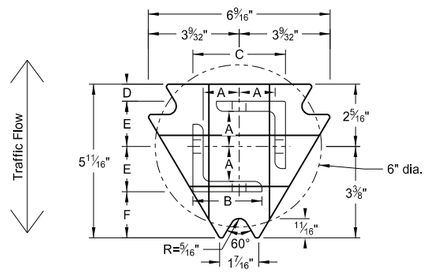
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

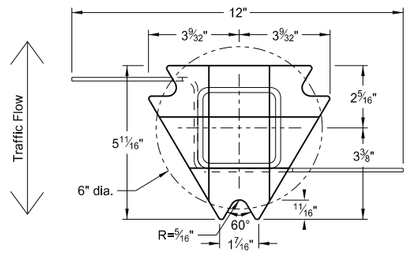


Multi-Directional
Slip Base Assembly

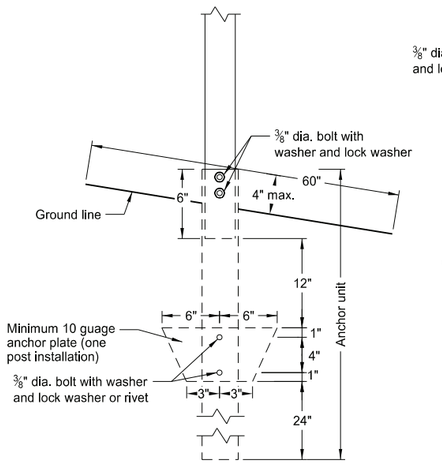
Perforated Tube



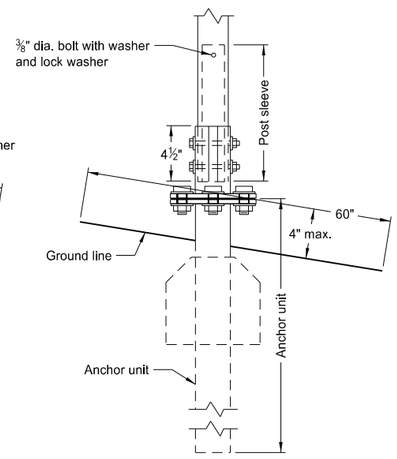
Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2½"x2½"x⅜" ASTM A36 structural angle



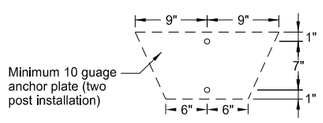
Bottom Soil Stub
Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50

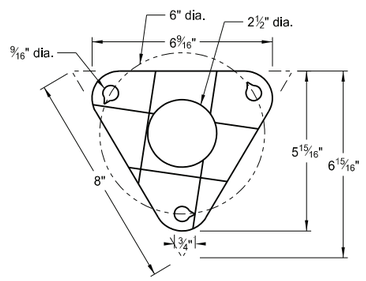


Anchor Unit and Post Assembly



Multi-Directional
Slip Base Anchor Unit
and Post Sleeve Assembly





Bolt Retainer for Base Connection
Bolt Retainer- 1/32" Reprocessed Teflon

Notes:

1. Torque slip base bolts as specified by manufacturer.
2. Use anchor with 43.9 KSI yield strength and 59.3 KSI tensile strength.
3. Provide 4" vertical clearance for anchor or breakaway base. Measure the 4"x60" measurement above and below post location and back and ahead of post.
4. In concrete sidewalk, use same anchor without wings.
5. Provide more than 7' between the first and fourth posts of a four post sign.

Telescoping Perforated Tube						
Number of Posts	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	2¼
1	2¼	12			No	2½
1	2½	12			(A)	3
1	2½	10			Yes	
1	2¼	12	2	12	Yes	
1	2½	12	2¼	12	Yes	
2	2	12			No	2¼
2	2¼	12			No	2½
2	2½	12			Yes	
2	2½	12			Yes	
2	2¼	10	2	12	Yes	
2	2½	12	2¼	12	Yes	
3 & 4	2½	12			Yes	
3 & 4	2½	10			Yes	
3 & 4	2½	12	2¼	12	Yes	
3 & 4	2¼	12	2	12	Yes	
3 & 4	2½	10	2 3/16	10	Yes	

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in.⁴	Cross Sec. 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	0.785

Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 9/64"	2½"	3 1/32"	25/32"	1 33/64"	1 7/8"
2½"x10 ga.	1 9/32"	2½"	3 5/16"	⅝"	1 21/32"	1¾"

(A) Use breakaway base when support is placed in weak soils. Engineer determines if soils are weak.

(B) For additional wind load, insert the 2 3/16"x10 ga. into 2½"x10 ga.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

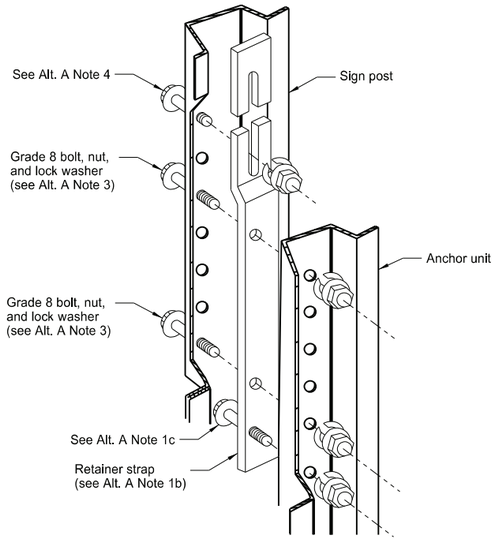
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08/01/24

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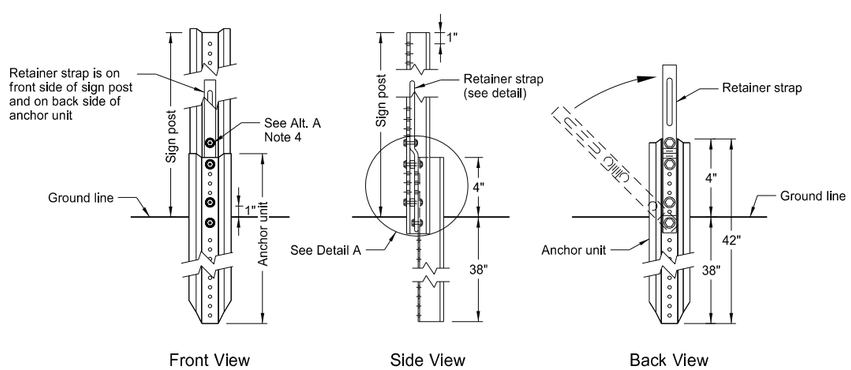
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post



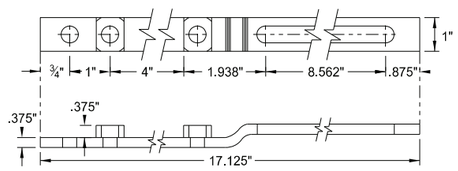
Detail A



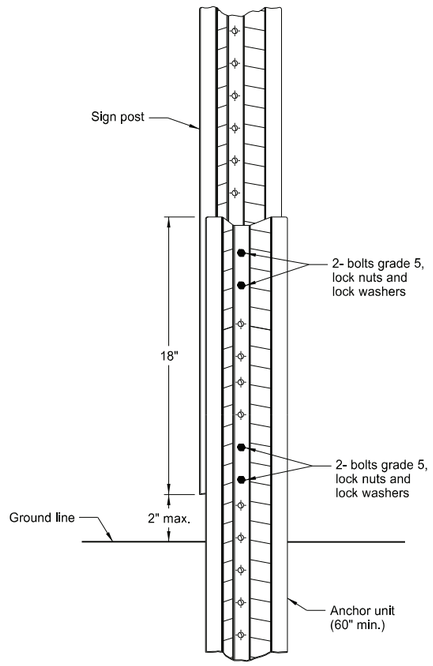
Front View | Side View | Back View

Breakaway U-Channel Detail Alternate A

Install a maximum of 2 posts within 7'.

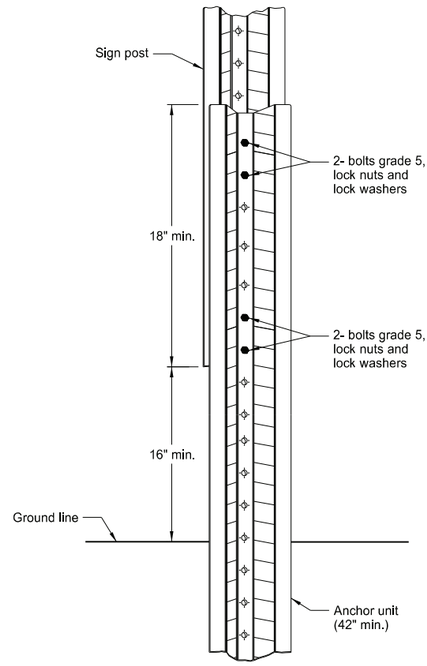


Retainer Strap Detail



Breakaway U-Channel Splice Detail Alternate B (2.5 and 3 lb/ft)

Install a maximum of 3 posts within 7'.



Breakaway U-Channel Splice Detail Alternate C (2.5 and 3 lb/ft)

Install a maximum of 3 posts within 7'.

Alternate A Steps of Installation:

1. a) Drive anchor unit to within 12" of ground level.
   b) Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
   c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
   d) Rotate strap 90° to left.
2. a) Drive anchor unit to 4" above ground.
   b) Rotate strap to vertical position.
3. a) Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
   b) Alternately tighten two connector bolts.
4. Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
5. Properly nest base post, strap, and sign post. 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.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

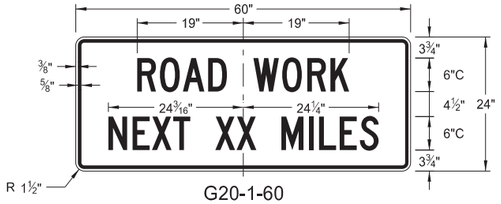
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08/01/24

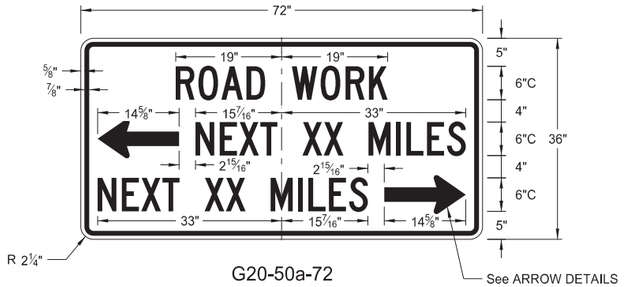
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CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS

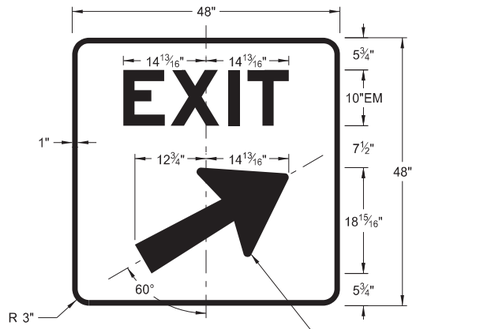
D-704-9



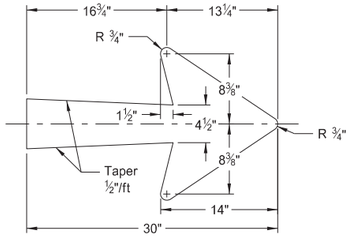
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Background: orange



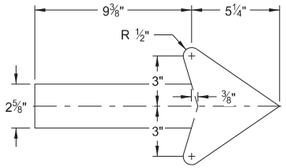
G20-50a-72
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Background: orange



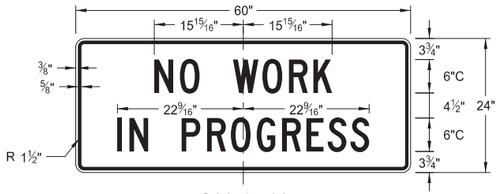
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



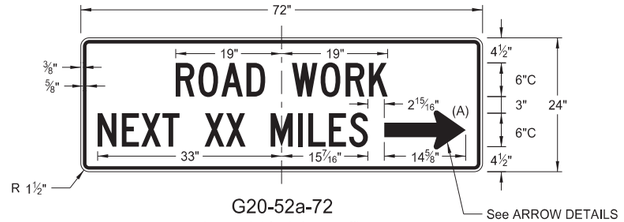
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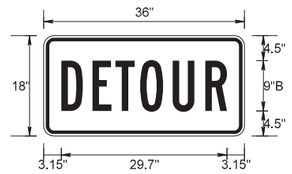
G20-50a-72
G20-52a-72



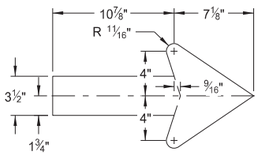
G20-1b-60
Legend: black (non-refl)
Background: orange



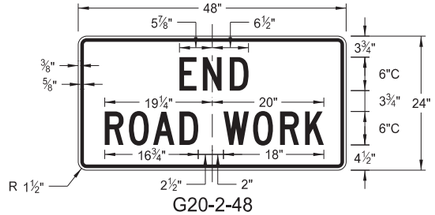
G20-52a-72
Legend: black (non-refl)
Background: orange



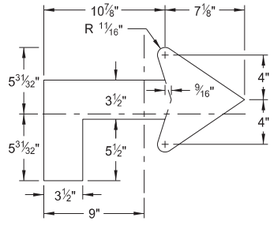
M4-8-36
Legend: black (non-refl)
Background: orange



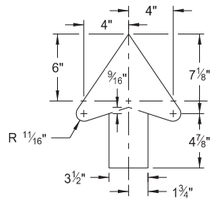
M4-9(L or R)-30
Right or Left



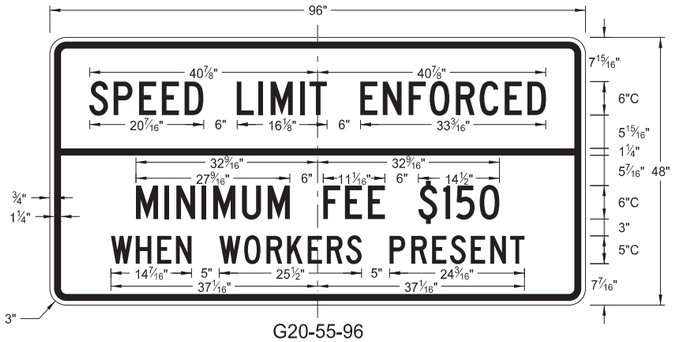
G20-2-48
Legend: black (non-refl)
Background: orange



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



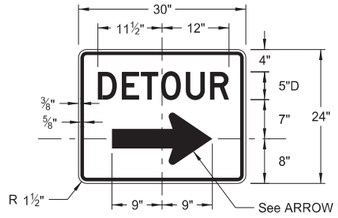
M4-9-30
Straight



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



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



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

ARROW DETAILS

NOTES:

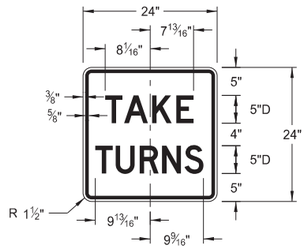
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Added sign & background color
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

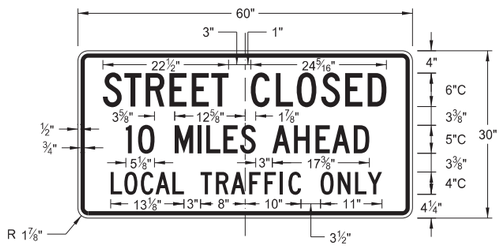
KIRK J. HOFF
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PROFESSIONAL
PE-4683
06/30/25
ENGINEER
NORTH DAKOTA

Docusign Envelope ID: 2F5C9714-A0E1-42BB-B36B-42204844BFCB

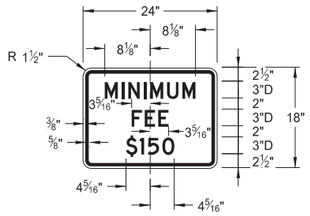
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



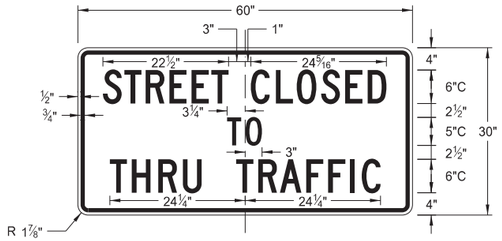
R1-50P-24
Legend: black (non-refl)
Background: white



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



R2-1aP-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

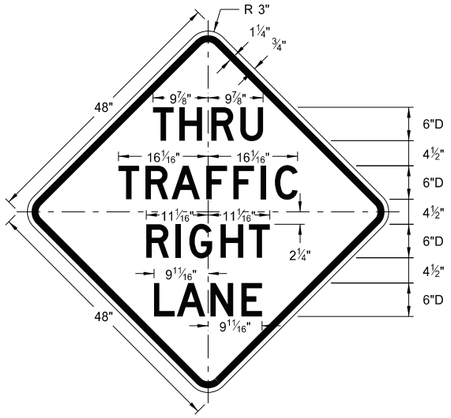
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

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06/30/25
ENGINEER
NORTH DAKOTA

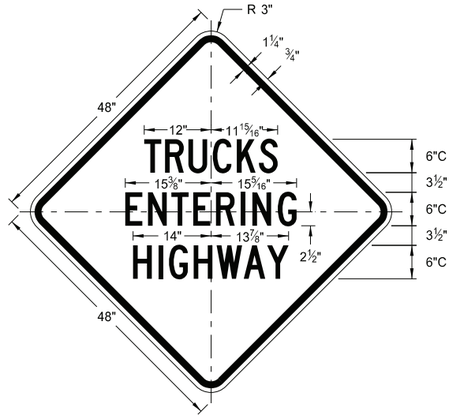
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CONSTRUCTION SIGN DETAILS
WARNING SIGNS

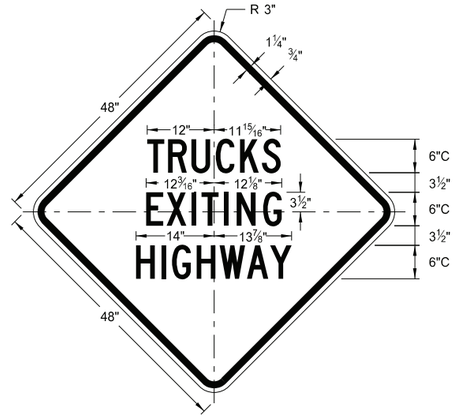
D-704-11



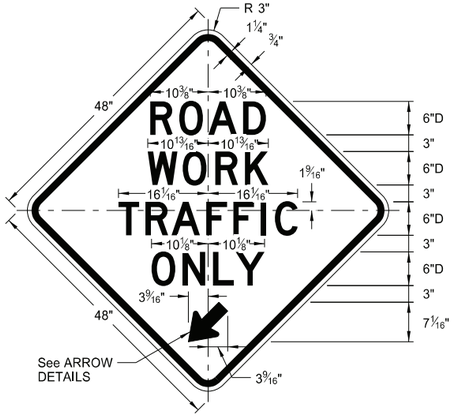
W5-8-48
Legend: black (non-refl)
Background: orange



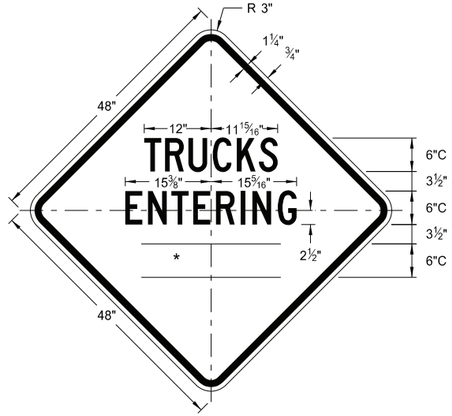
W8-53-48
Legend: black (non-refl)
Background: orange



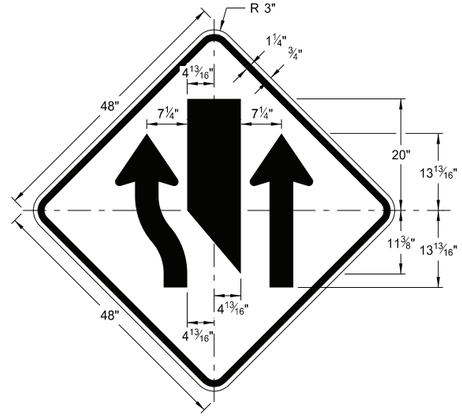
W8-56-48
Legend: black (non-refl)
Background: orange



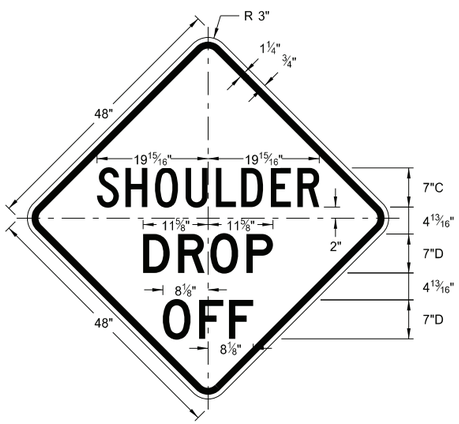
W5-9-48
Legend; black (non-refl)
Background: orange



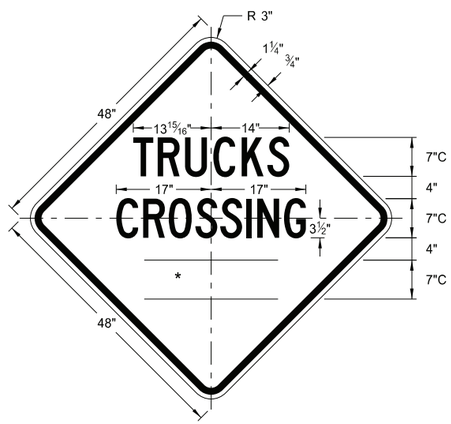
W8-54-48
Legend; black (non-refl)
Background: orange



W9-3a-48
Legend; black (non-refl)
Background: orange



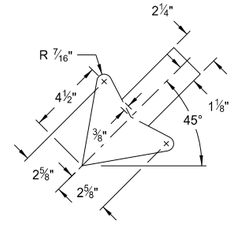
W8-9a-48
Legend: black (non-refl)
Background: orange



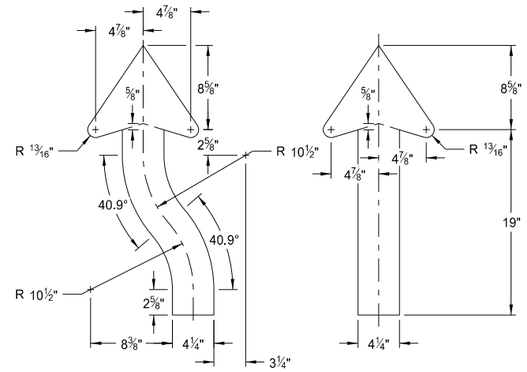
W8-55-48
Legend: black (non-refl)
Background: orange

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



W9-3a-48

ARROW DETAILS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp
8-01-24	Electronic Stamp/Signature

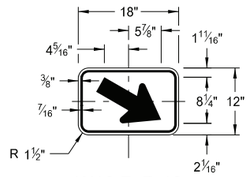
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PE-4683
ENGINEER
NORTH DAKOTA

08/01/24

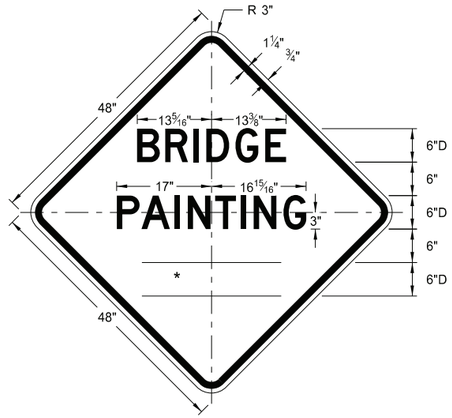
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CONSTRUCTION SIGN DETAILS
WARNING SIGNS

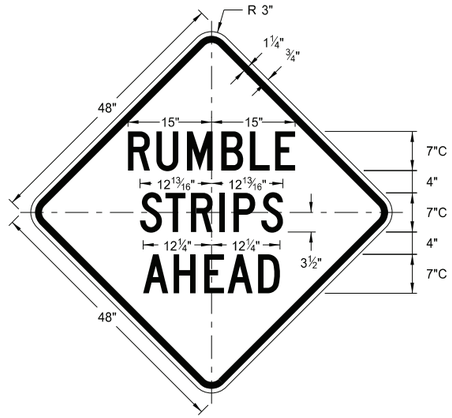
D-704-11A



W16-7aP-18
Legend: black (non-refl)
Background: orange



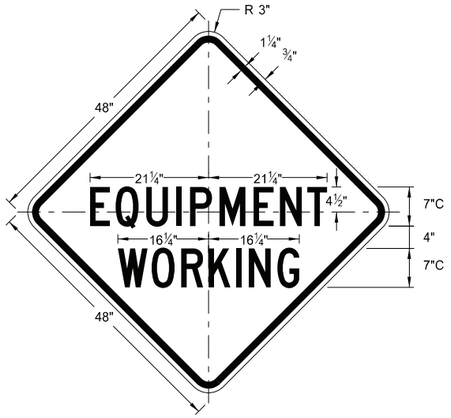
W21-50-48
Legend: black (non-refl)
Background: orange



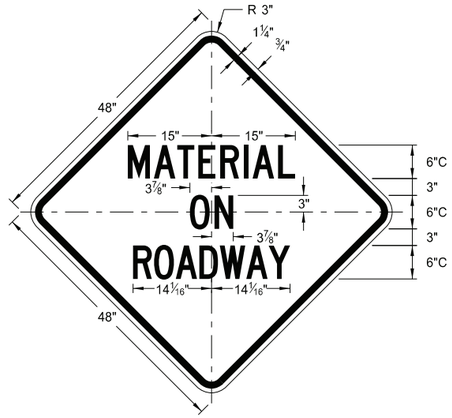
W21-53-48
Legend: black (non-refl)
Background: orange

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

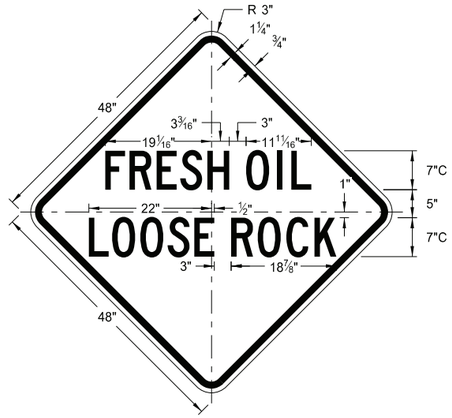
* DISTANCE MESSAGES



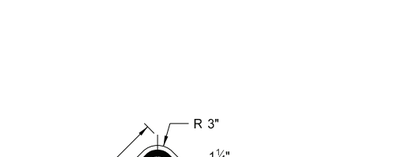
W20-51-48
Legend: black (non-refl)
Background: orange



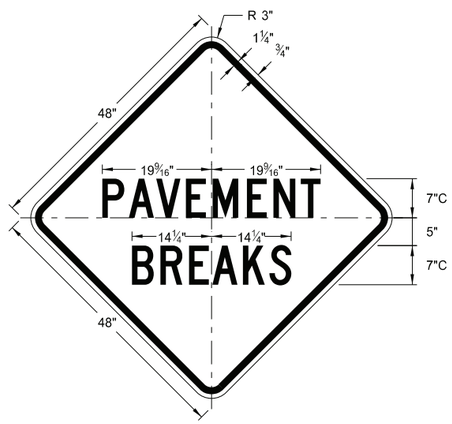
W21-51-48
Legend: black (non-refl)
Background: orange



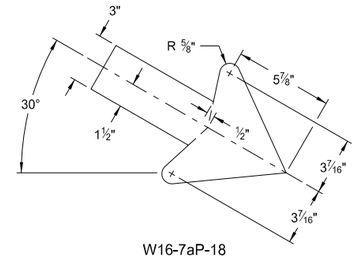
W22-8-48
Legend: black (non-refl)
Background: orange



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



W21-52-48
Legend: black (non-refl)
Background: orange



W16-7aP-18

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.
8-01-24	Electronic Stamp/Signature.

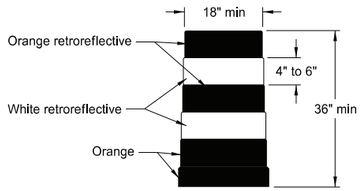
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/01/24

DocuSign Envelope ID: B6D1C72A-6E5E-4E5C-A02F-4D3D1C582775

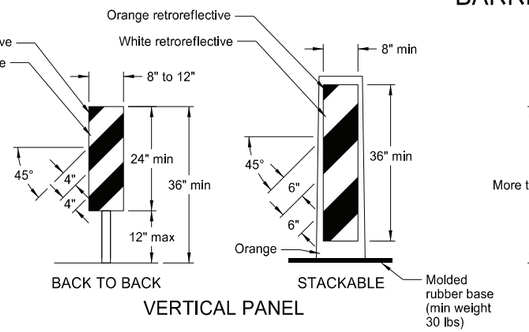
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



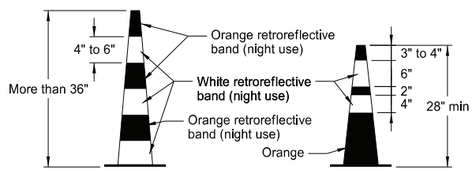
DELINEATOR DRUM

Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflectorized spaces between the horizontal orange and white stripes. Avoid placement of stripes on drum ribs or indentations. Use closed top drums that will not allow collection of debris. Do not place ballast on the top of drum.



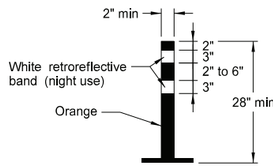
VERTICAL PANEL

Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, use a stripe width of 6 inches.



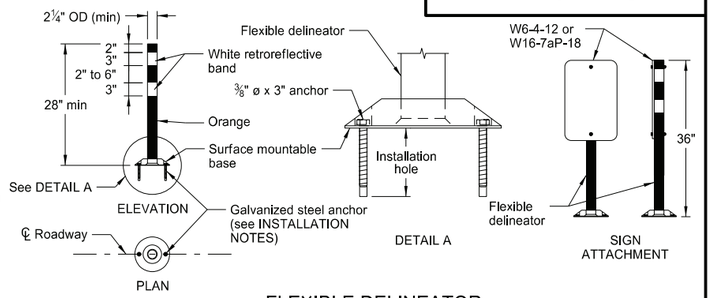
TRAFFIC CONE

Provide retroreflectorization of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflectorized space between the orange and white stripes.



TUBULAR MARKER

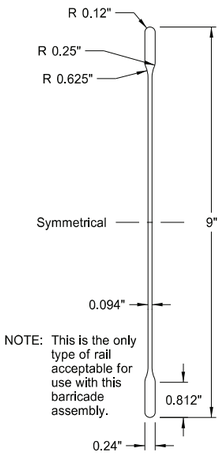
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



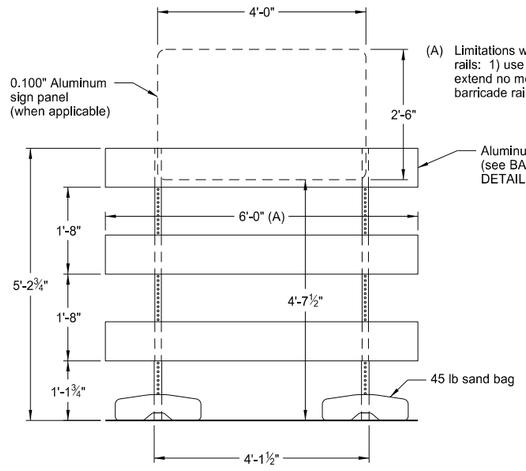
FLEXIBLE DELINEATOR

INSTALLATION NOTES:

1. Drill installation holes to diameter and depth required by manufacturer's specifications.
2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
3. In lieu of bolted down base, use an 8" x 8" butyl pad or hot melt butyl. Remove butyl as close as possible to pavement surface.

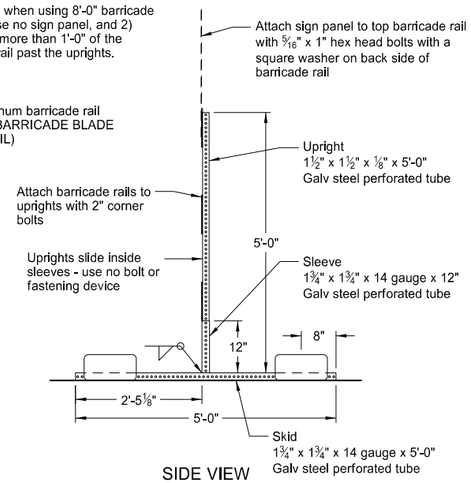


BARRICADE BLADE DETAIL



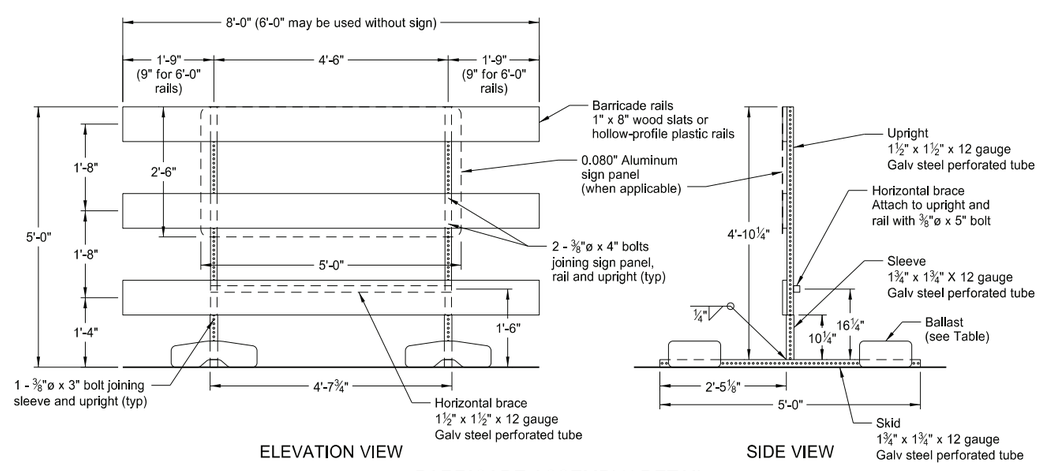
ELEVATION VIEW

(A) Limitations when using 8'-0" barricade rails: 1) use no sign panel, and 2) extend no more than 1'-0" of the barricade rail past the uprights.



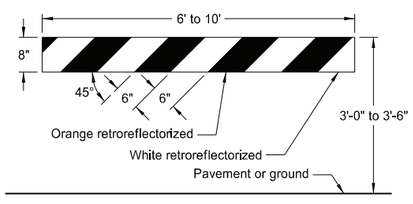
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

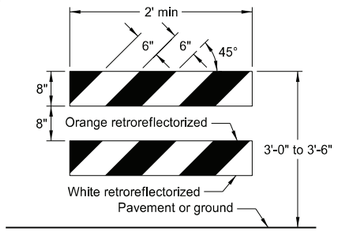


BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

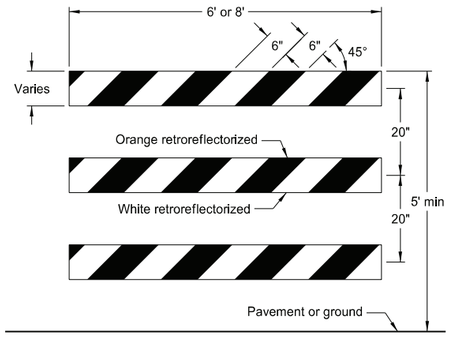
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", use a rail stripe width of 4".



TYPE I BARRICADE

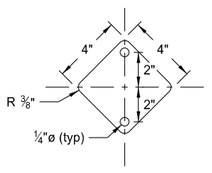


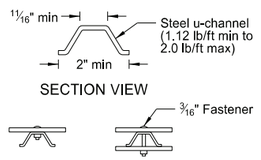
TYPE II BARRICADE

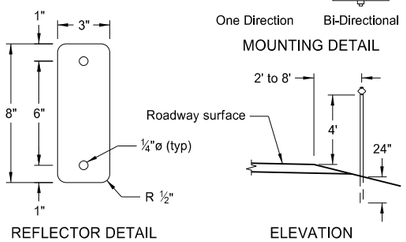


TYPE III BARRICADE

BARRICADE RAIL DETAILS







DELINEATORS

MINIMUM BALLAST
(For each side of barricade support)

Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
11-01-19	Revised details for Flexible Delineator
8-01-24	Electronic Stamp/Signature

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

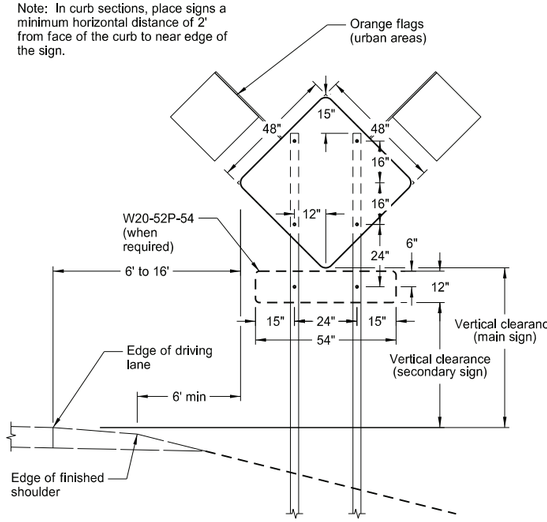
08/01/24

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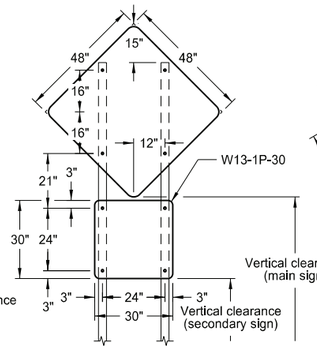
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

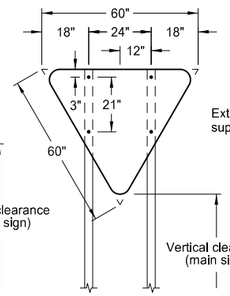
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



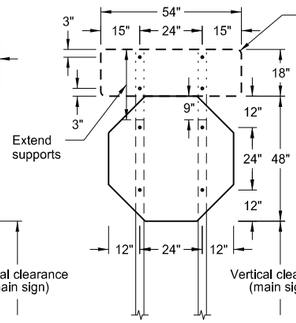
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



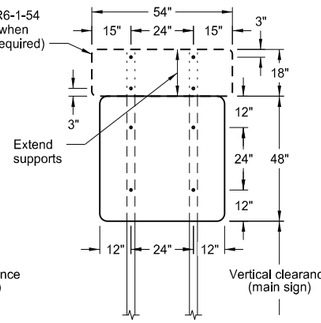
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



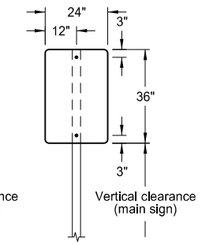
R1-2-60 - YIELD SIGN



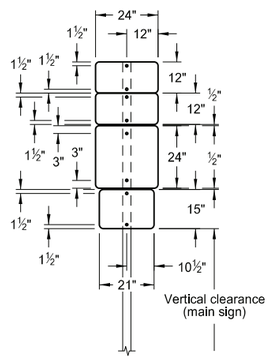
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



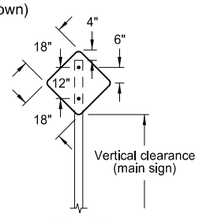
48" x 48" SIGN
(with R6-1-54 sign as required)



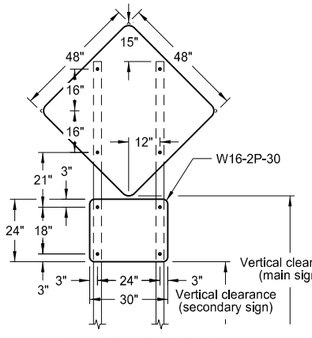
24" x 36" SIGN



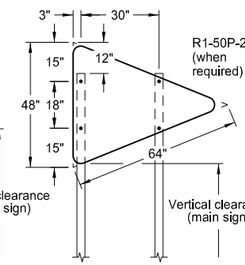
24" x 24"
ROUTE MARKER
ASSEMBLY



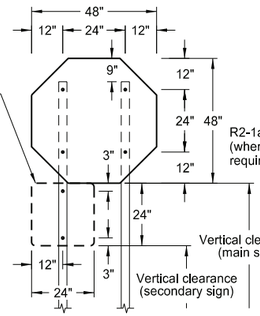
18" x 18"
DIAMOND SIGN



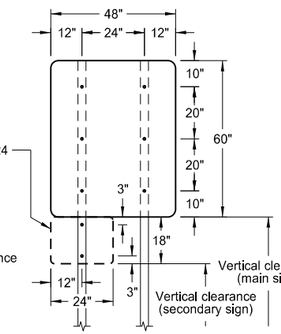
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



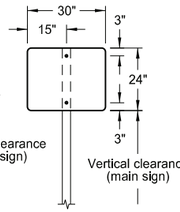
W14-3-64 - PENNANT SIGN



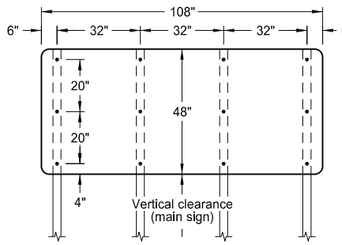
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



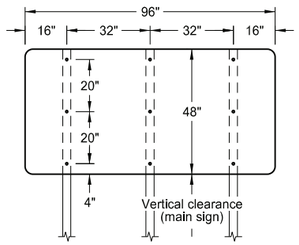
48" x 48" SIGN
(with R2-1aP-24 sign as required)



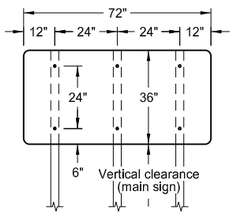
30" x 24" SIGN



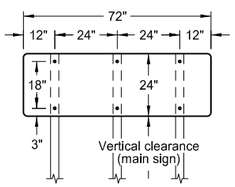
108" x 48" SIGN



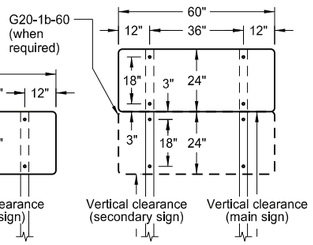
96" x 48" SIGN



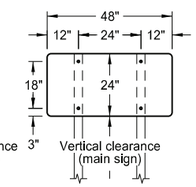
72" x 36" SIGN



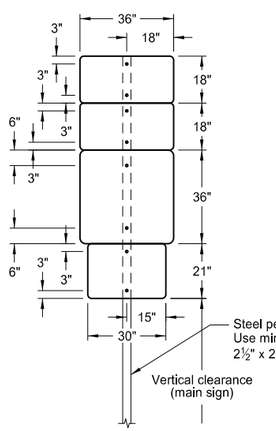
72" x 24" SIGN



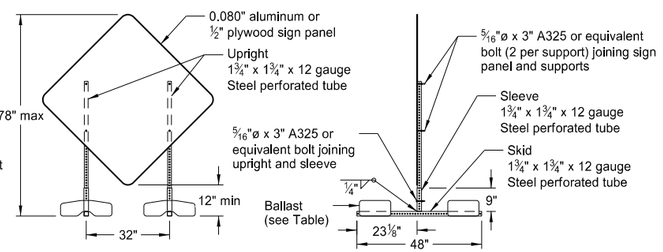
60" x 24" SIGN



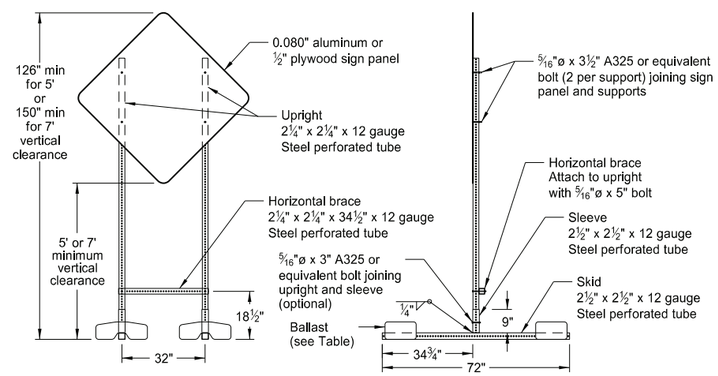
48" x 24" SIGN



36" x 36"
ROUTE MARKER
ASSEMBLY



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

1. Sign Supports: Galvanize or paint supports. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH.

   Place signs over 50 square feet on 2½" x 2½" perforated tube supports as a minimum.

   Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.

2. Sign Panels: Provide sign panels made of 0.100" aluminum, ½" plywood, or other approved material, except where noted. Punch all holes round for ⅜" bolts.

3. Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on lane closure sign)

4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

   Interstate - white legend on blue background
   Interstate Business Loop - white legend on green background
   US and State - black legend on white background
   County - yellow legend on blue background

5. Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.

   The vertical clearance to secondary signs is 1'-0" less than the vertical clearance stated above.

   Provide a minimum clearance of 7'-0" from the ground at the post for signs with an area exceeding 50 square feet.

6. Portable Signs: Provide portable signs that meet the vertical clearance stated above when it is necessary to place signs within the pavement surface.

   Use of low-mounting height (minimum 12" vertical clearance) portable signs for 5 days or less, is allowed as long as the view of the sign is not obstructed. Time delays caused by unforseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. Use of R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 is allowed for longer than 5 days.

   Restrict signs mounted on portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT details to a maximum surface area of 16 square feet.

MINIMUM BALLAST
(For each side of sign support base)

Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of skids.

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

10-4-13

REVISIONS

DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail
8-01-24	Electronic Stamp/Signature

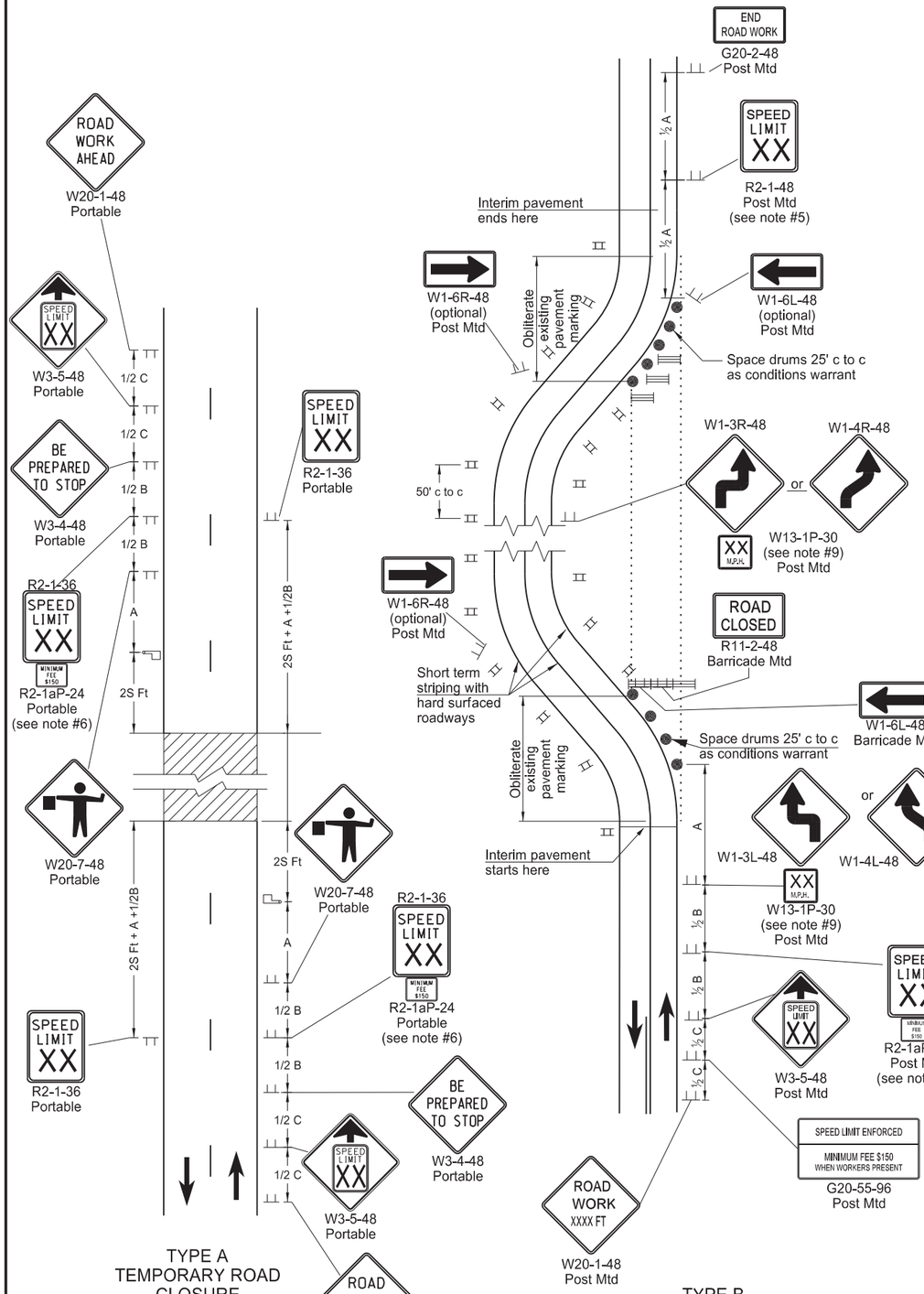
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/01/24

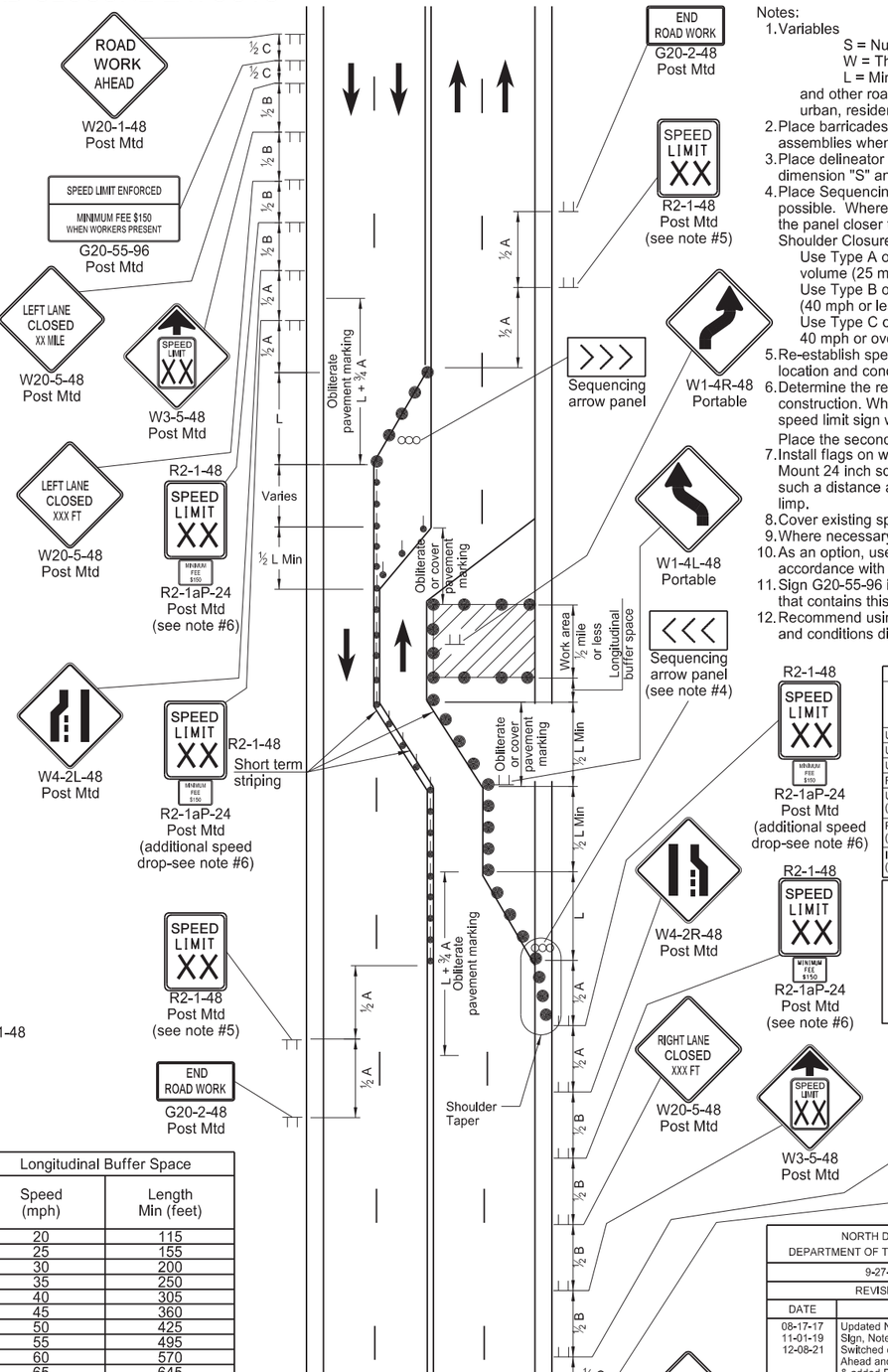
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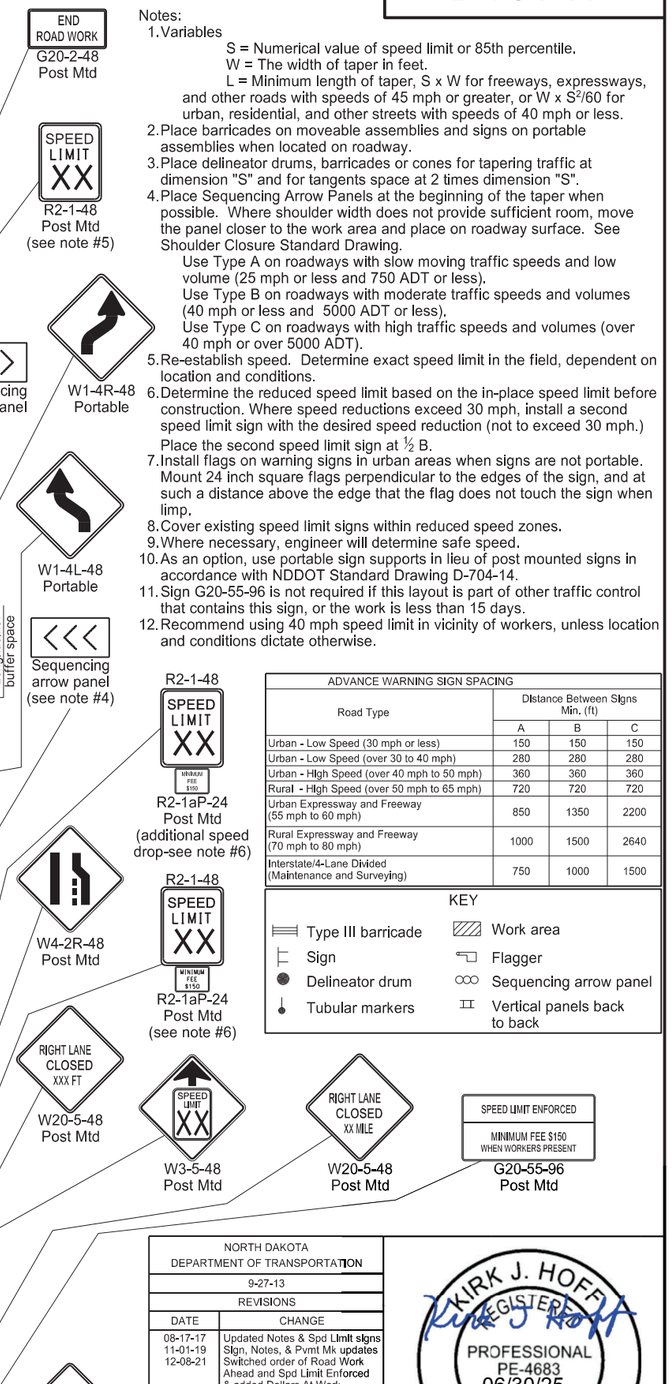
ROAD CLOSURE LAYOUTS

D-704-15



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
80	910





Notes:

1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper in feet.
   L = Minimum length of taper, S x W for freeways, expressways, and 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. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
3. Place delineator drums, barricades or cones for tapering traffic at dimension "S" and for tangents space at 2 times dimension "S".
4. Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on roadway surface. See Shoulder Closure Standard Drawing.
   Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
   Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
5. Re-establish speed. Determine exact speed limit in the field, dependent on location and conditions.
6. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B.
7. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
8. Cover existing speed limit signs within reduced speed zones.
9. Where necessary, engineer will determine safe speed.
10. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
11. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

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 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

- Type III barricade
- Sign
- Delineator drum
- Tubular markers
- Work area
- Flagger
- Sequencing arrow panel
- Vertical panels back to back

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

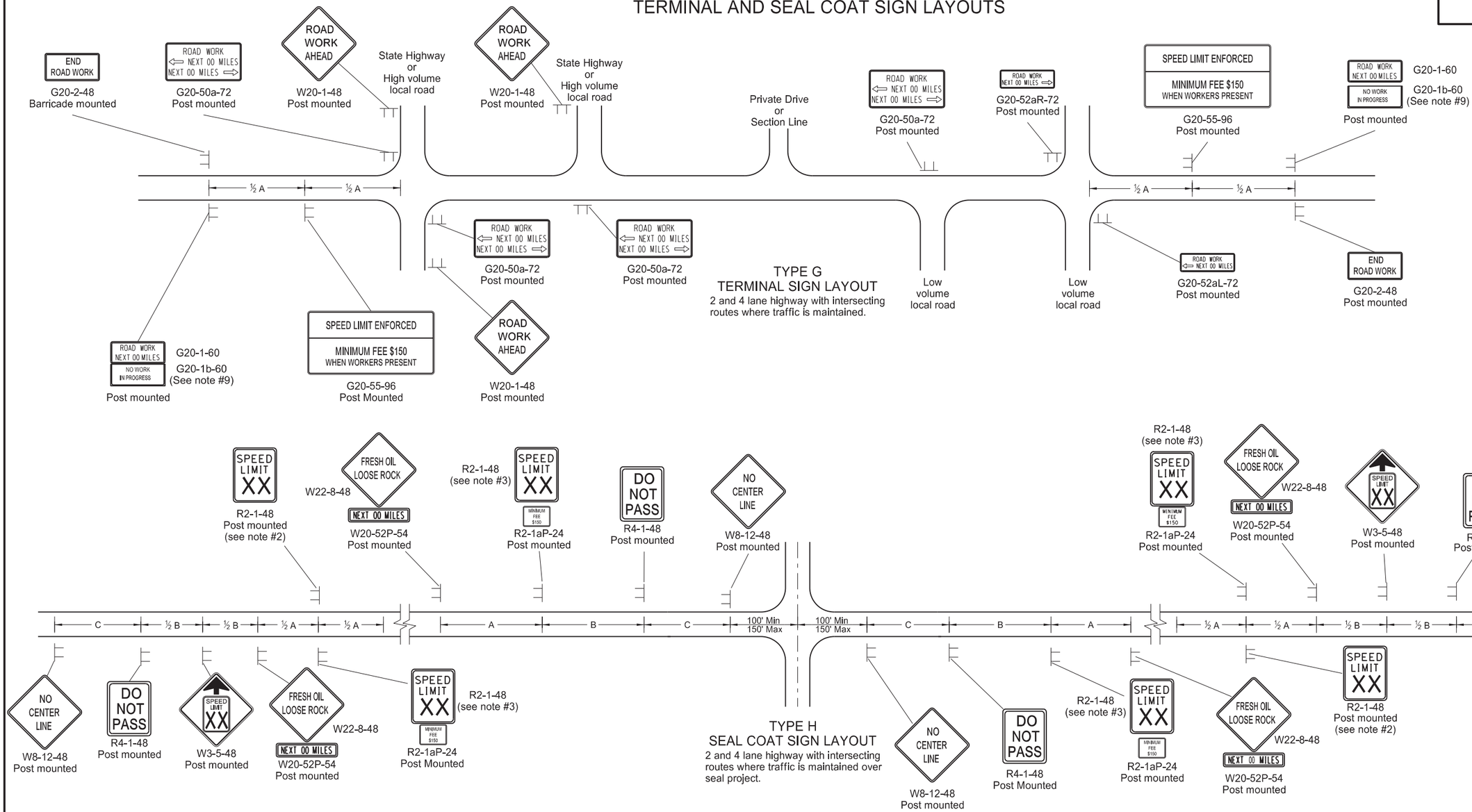
DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pvmt Mk updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 06/30/25 ENGINEER NORTH DAKOTA

Docusign Envelope ID: 2F5C9714-A0E1-42BB-B36B-42204844BFCB

TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



Notes:

1. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
2. Determine the exact speed limit in the field, based on location and conditions.
3. Determine the reduced speed limit based on the in place speed limit before construction. Where speed limit reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 MPH.) Place the second speed limit sign at ½ B.
4. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
5. Cover existing speed limit signs within a reduced speed zone.
6. On seal coat projects, place signs R2-1-48, R2-1aP-24, R4-1-48, W22-8-48 and W20-52P-54 after all important intersections and at five mile intervals. Place sign W8-12-48 after all important intersections and at 2 mile intervals until short term center line pavement marking is placed.
7. As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Drawing D-704-14.
8. Cover or remove speed limit signs from layout Type H when loose aggregate is removed.
9. Install sign G20-1b-60 when work is suspended for winter.
10. Use other traffic control layouts in immediate work areas. Place sign R2-1aP-24 below speed limit signs in reduced speed limit work areas.
11. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

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 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Updated notes & sign numbers
11-01-19	Updated note & sign
12-08-21	Switched order of Road Work and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

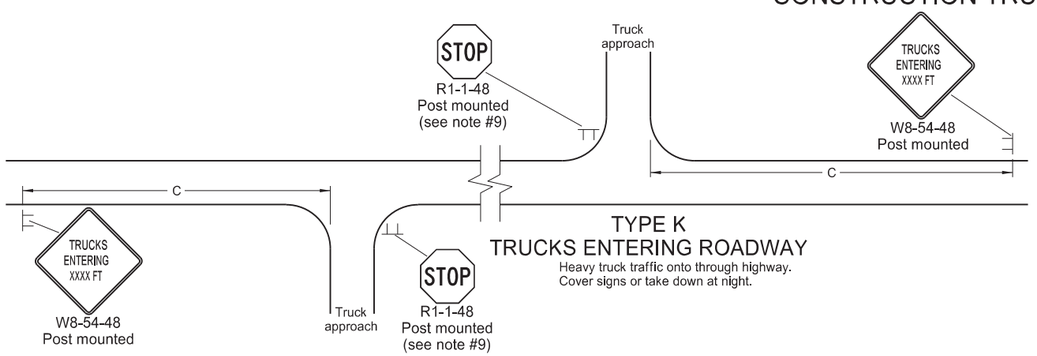
KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 06/30/25 ENGINEER NORTH DAKOTA

Docusign Envelope ID: 2F5C9714-A0E1-42BB-B36B-42204844BFCB

CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

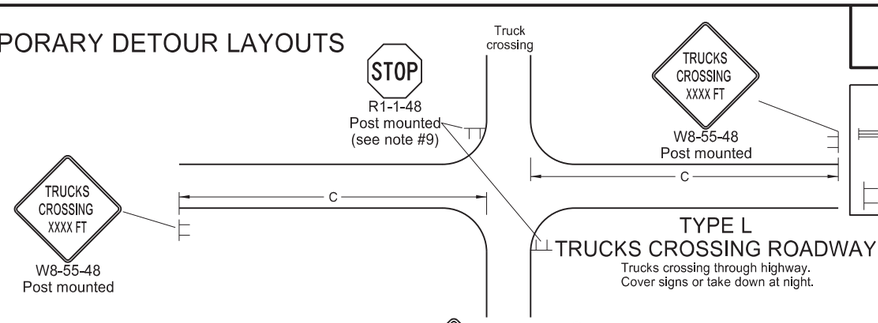
D-704-22

KEY: Type III barricade; Work area; Sign; Flagger



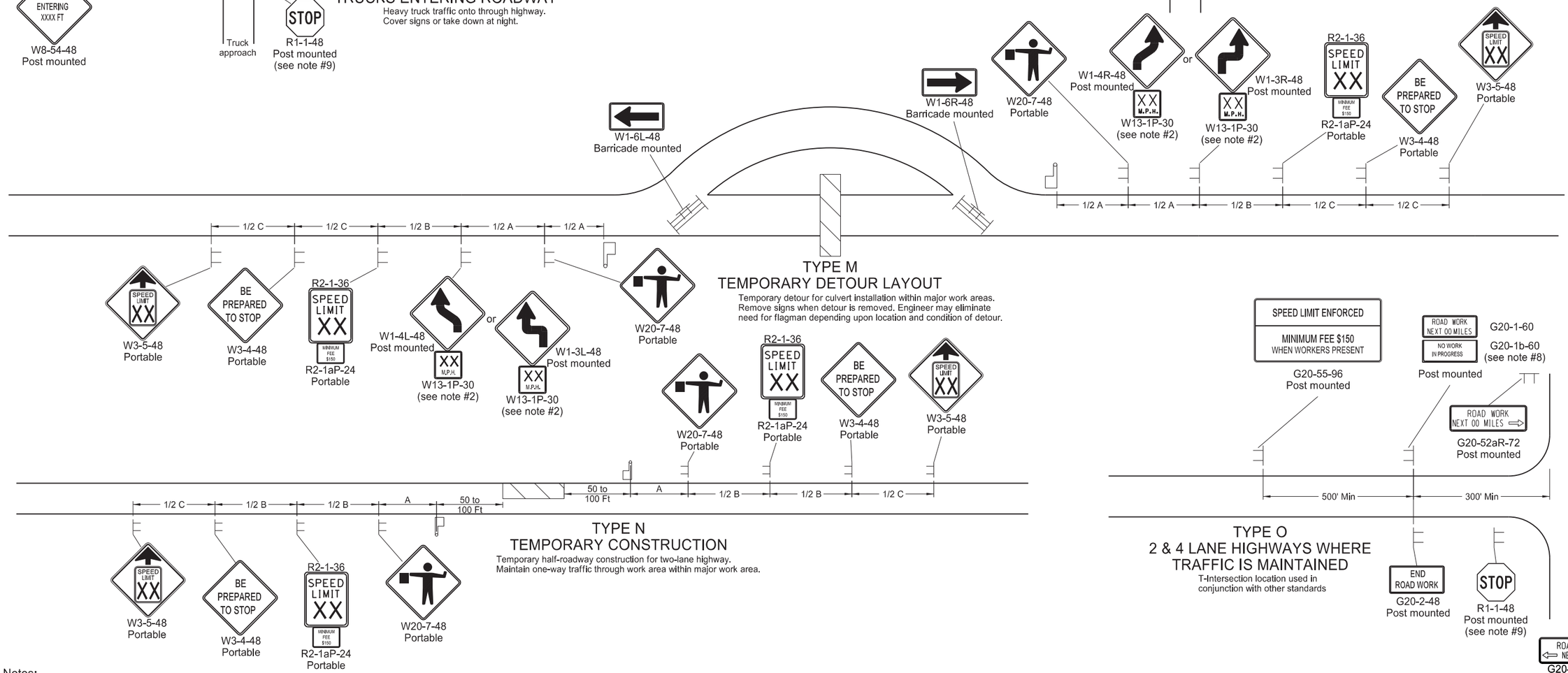
TYPE K
TRUCKS ENTERING ROADWAY

Heavy truck traffic onto through highway.
Cover signs or take down at night.



TYPE L
TRUCKS CROSSING ROADWAY

Trucks crossing through highway.
Cover signs or take down at night.



TYPE M
TEMPORARY DETOUR LAYOUT

Temporary detour for culvert installation within major work areas.
Remove signs when detour is removed. Engineer may eliminate need for flagman depending upon location and condition of detour.

TYPE N
TEMPORARY CONSTRUCTION

Temporary half-roadway construction for two-lane highway.
Maintain one-way traffic through work area within major work areas.

TYPE O
2 & 4 LANE HIGHWAYS WHERE TRAFFIC IS MAINTAINED

T-Intersection location used in conjunction with other standards

Notes:

1. Place barricades on a moveable assemblies and signs on portable assemblies when located on roadway.
2. Where necessary, safe speed to be determined by the Engineer.
3. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B.
4. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
5. Cover existing speed limit signs within a reduced speed zone.
6. Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
7. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
8. Install sign G20-1b-60 when work is suspended for winter.
9. If existing stop sign is in place, a 48" stop sign is not required.
10. Sign G20-55-96 is not required if layout is part of other traffic control that contains this sign, or if work is less than 15 days.
11. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

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 40mph)	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 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

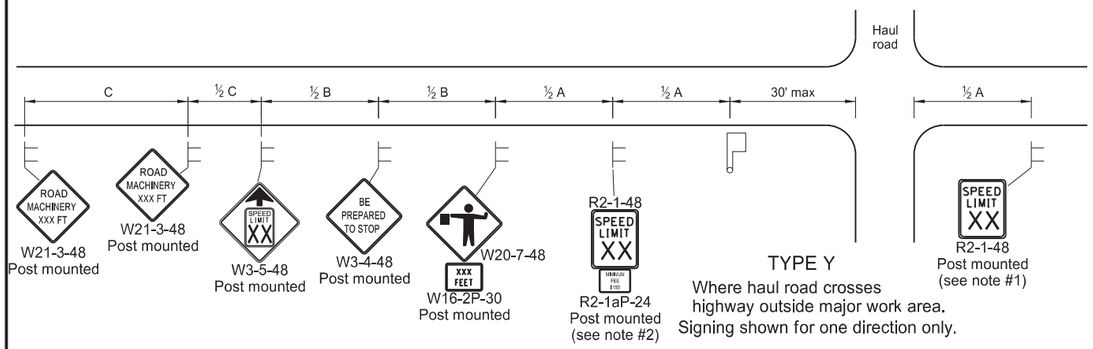
DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

KIRK J. HOFFMANN
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06/30/25
ENGINEER
NORTH DAKOTA

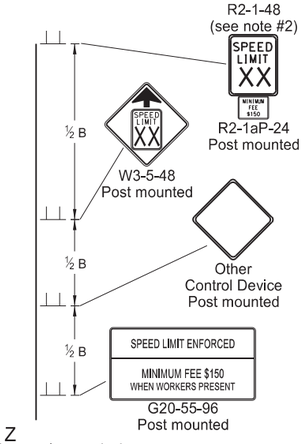
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MISCELLANEOUS SIGN LAYOUTS

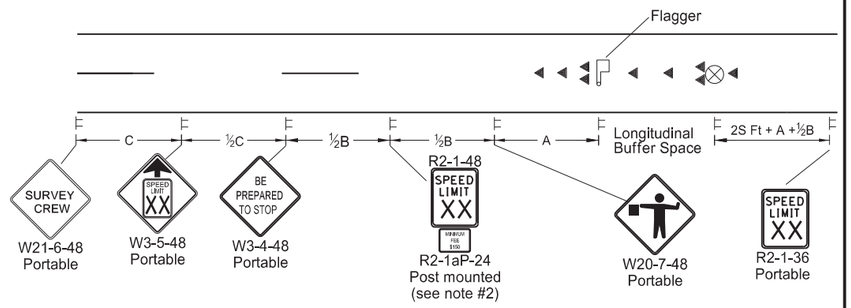
D-704-26



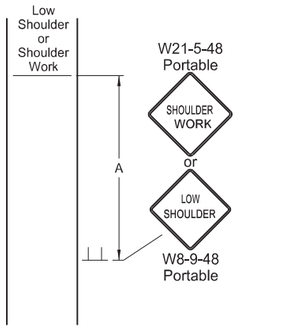
TYPE Y
Where haul road crosses highway outside major work area.
Signing shown for one direction only.



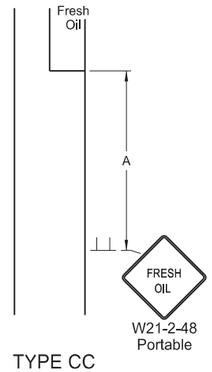
TYPE Z
Where speed zone is needed
Signing shown for one direction only.



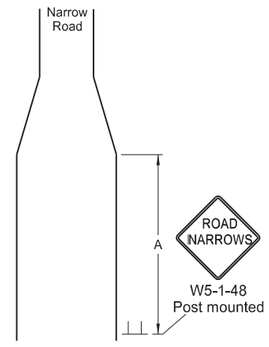
TYPE AA
Where survey crew is used
Signing shown for one direction only.



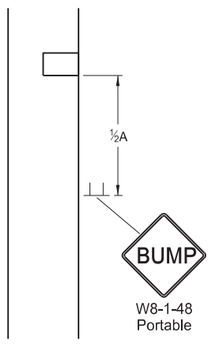
TYPE BB
Within major work area where sign conditions exist



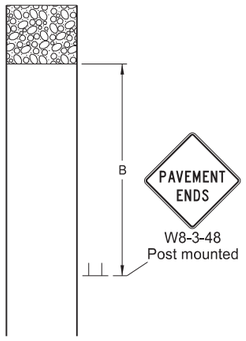
TYPE CC
Where sign conditions exist



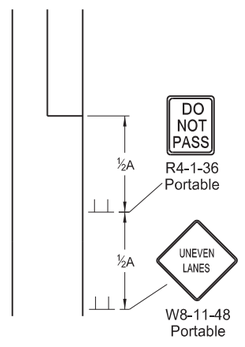
TYPE DD
Where sign conditions exist



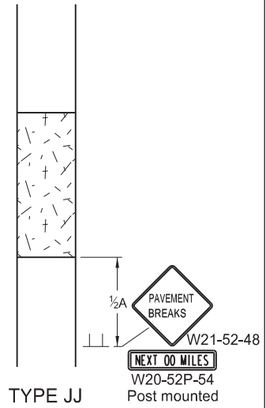
TYPE EE
Where sign conditions exist



TYPE FF
Where sign conditions exist
Signing shown for one direction only.

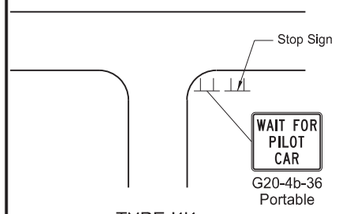


TYPE GG
Where elevation difference exists between lanes



TYPE JJ
For break in pavement.
Install signs when conditions exist and remove when not applicable.
Signing shown for one direction only.

KEY
Flagger
Sign
Cones
Survey Equipment
S = Numerical value of speed limit or 85th percentile.



TYPE KK
At major intersections within pilot car control area

Notes
1. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
2. Determine reduced speed limit based on in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½B.
3. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
4. Cover existing speed limit signs within reduced speed zones.
5. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
6. Sign G20-55-96 is not required if this standard is part of other traffic control layouts, or work is less than 15 days.
7. When pilot car operation is used, place sign G20-4b-36 "Wait For Pilot Car" at major intersections within pilot car control area.
8. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
9. Layouts shown for one direction only.

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 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

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
80	910

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

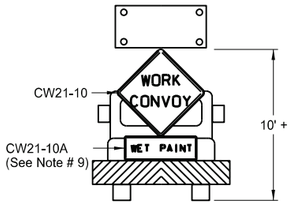
DATE	CHANGE
08-17-17	Added speed limit signs. Updated notes & sign numbers
11-01-19	Revised note 5 & sign numbers
02-23-23	Revised distance & removed signs
06-30-25	Legislative Changes

KIRK J. HOFF
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PROFESSIONAL
PE-4683
06/30/25
ENGINEER
NORTH DAKOTA

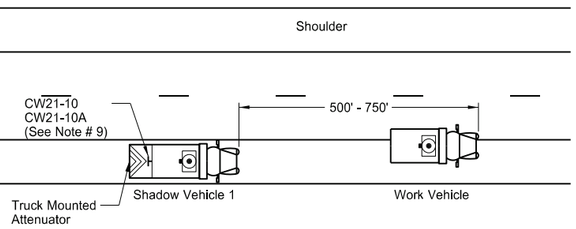
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MOBILE OPERATION
(PAVEMENT MARKING)

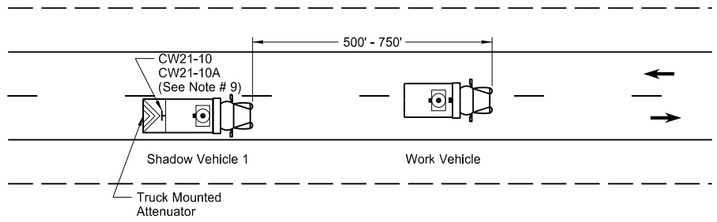
D-704-27



Typical Shadow Vehicle 1
Two-Way Roaday

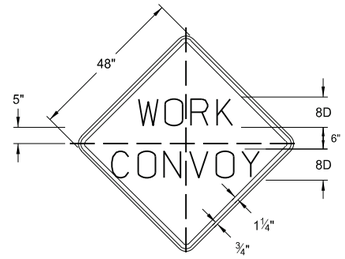


Two-Way Roadway with Paved Shoulders

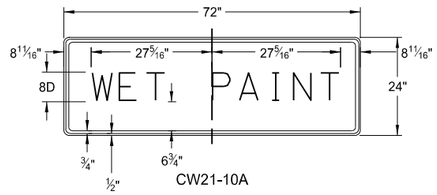


Two-Way Roadway without Paved Shoulders

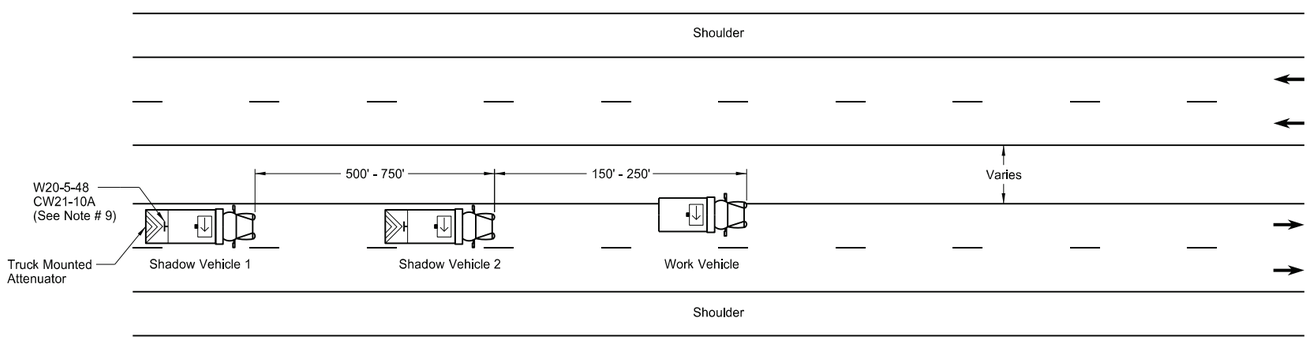
Sign Details



CW21-10

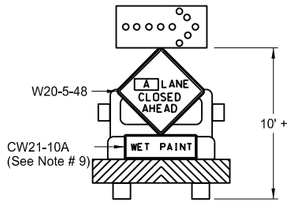


CW21-10A



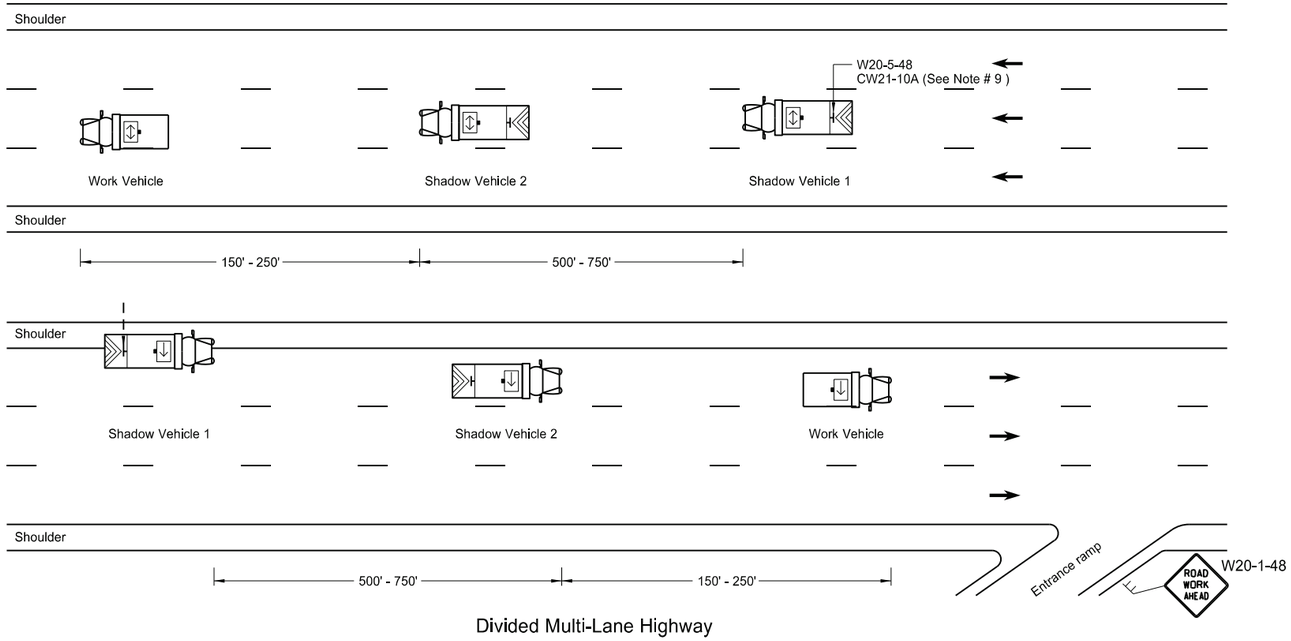
Undivided Multi-Lane Roadway

Notes
1. Use additional vehicles you choose to be in the convoy with truck mounted attenuators, at your own expense.
2. Display yellow rotating beacons or stobe lights on shadow and work vehicles, unless otherwise stated in the plans.
3. Use Type B or Type C flashing arrow panels controlled from inside the vehicle.
4. Provide each vehicle with two-way electronic communication capability.
5. Move shadow vehicle 1 first to shadow other convoy vehicles when convoy changes lane.
6. Vary vehicle spacing between shadow vehicle 1 and shadow vehicle 2 based on sight distance restrictions. Motorists approaching the work convoy need to see trail vehicle in time to slow down and/or change lanes as they approach shadow vehicle.
7. Sign Colors
   Letters = Black
   Border = Black
   Background = Orange
8. As an option, use shadow vehicle 2 the paint tender vehicle.
9. Use sign CW21-10A only during painting operation.
10. Pull over work and shadow vehicles periodically to allow motor vehicle traffic to pass on two lane - two way roadways.



Typical Shadow Vehicle 1 & 2
Multi-Lane Highways

A = Left Right Center



Divided Multi-Lane Highway

KEY

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

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways
9-27-17	Updated to active voice
11-08-19	Changed Standard Heading
8-02-24	Electronic Stamp/Signature.

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08/02/24

Docusign Envelope ID: E17899F0-B912-4482-BF85-7148763D5F5D

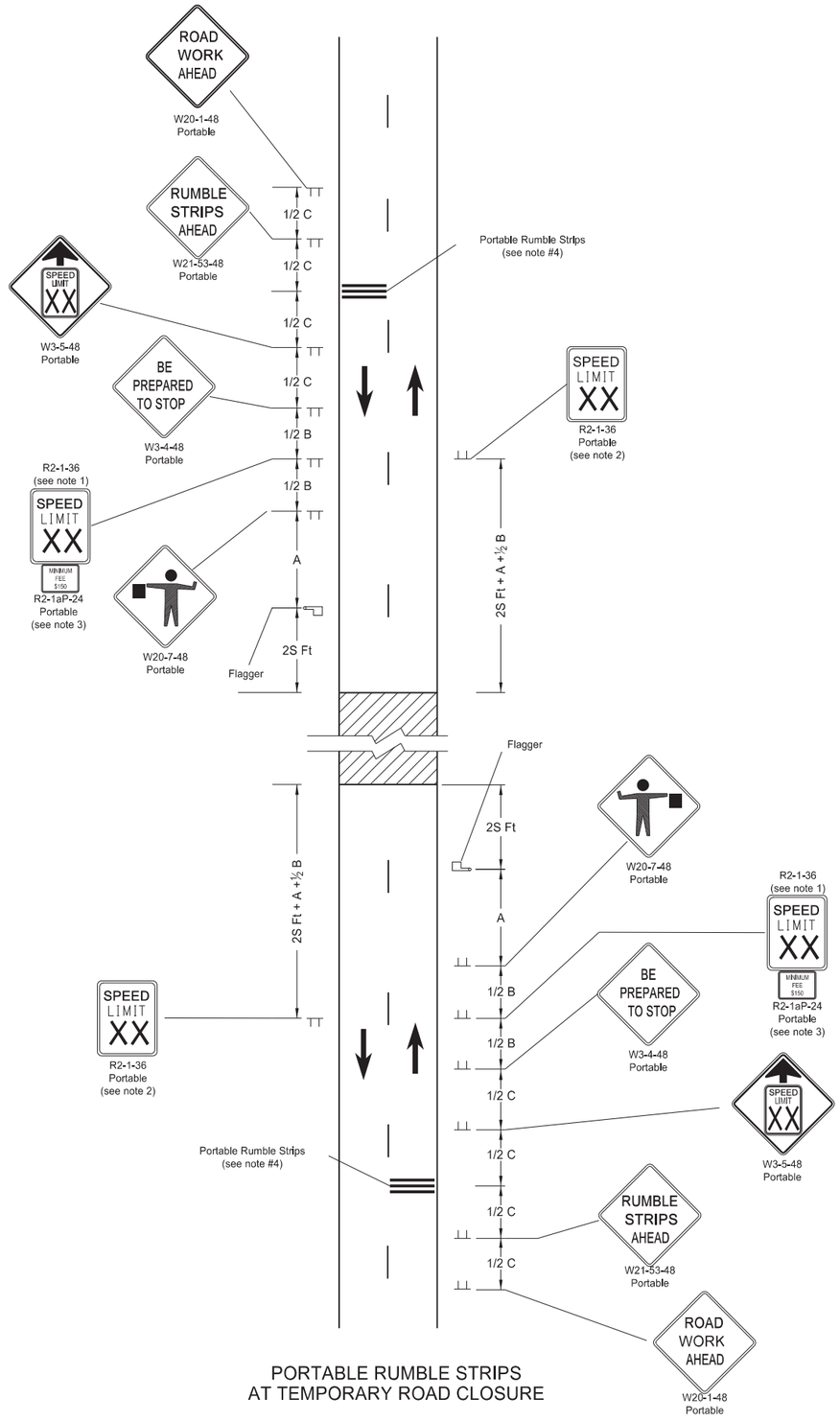
Two-Lane Roadway Portable Rumble Strips

KEY

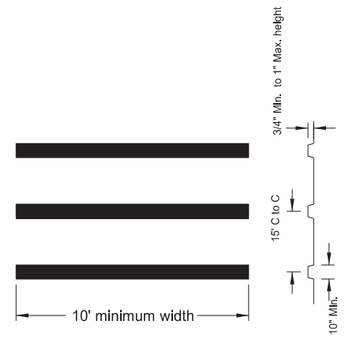
- Work area
- Flagger
- Sign

S = Numerical value of speed limit or 85th percentile.

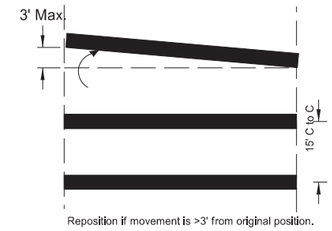
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - High Speed (over 45 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720



PORTABLE RUMBLE STRIPS
AT TEMPORARY ROAD CLOSURE

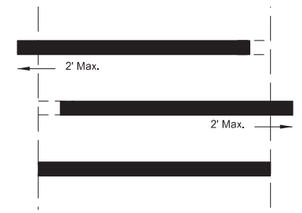


PORTABLE RUMBLE STRIPS ARRAY DETAIL



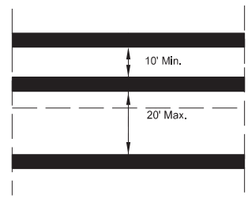
Reposition if movement is >3' from original position.

Skewing



Reposition if movement is >2' from original position.

Lateral



Reposition if distance between strips is <10' or >20'.

Perpendicular to Travel with or against traffic

PORTABLE RUMBLE STRIPS ARRAY TYPES OF MOVEMENT AND MAXIMUM ALLOWANCES

Notes:

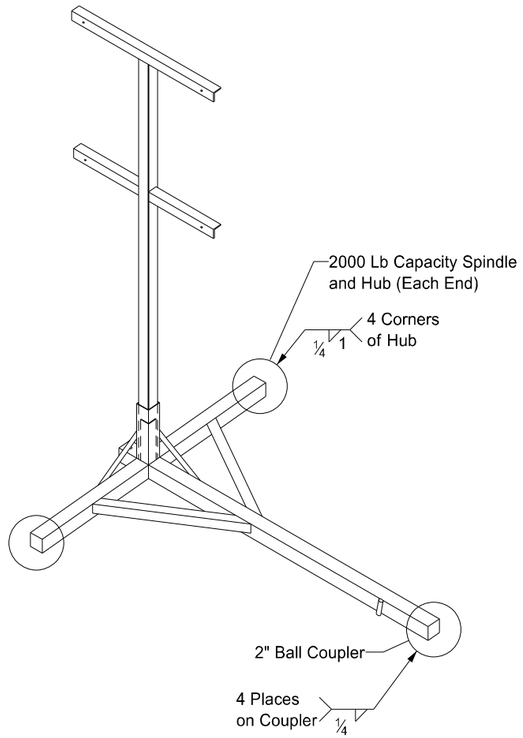
1. Determine speed in the field based on location and conditions.
2. Re-establish the speed limit. Determine the exact speed limit in the field, dependent on location and conditions.
3. Sign R2-1aP-24 is not required when pilot car operation is used.
4. Do not use rumble strips on a non paved surface or in a pre-construction speed zone of 45 mph or less.

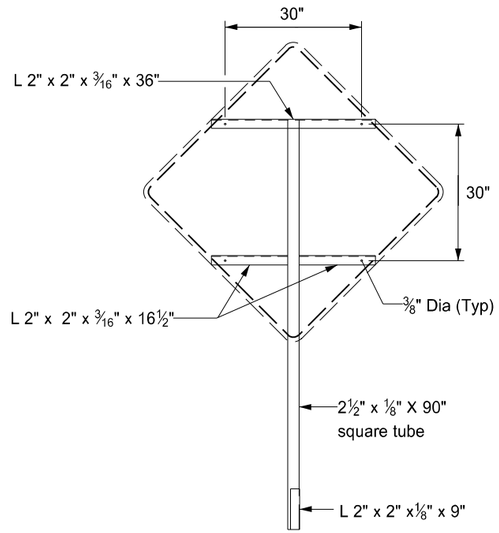
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
02-22-22	
REVISIONS	
DATE	CHANGE
03-07-23	Use changed to min 45 mph
06-30-25	Legislative Changes

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06/30/25
ENGINEER
NORTH DAKOTA

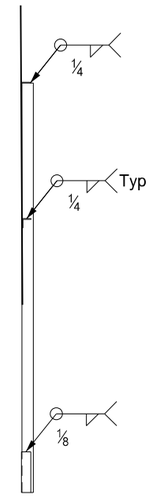
PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50





FRONT

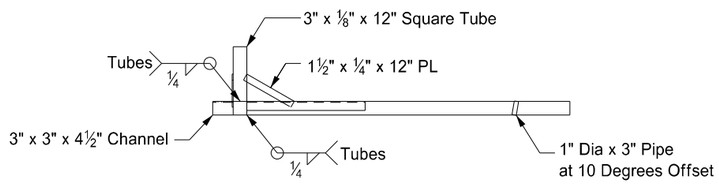


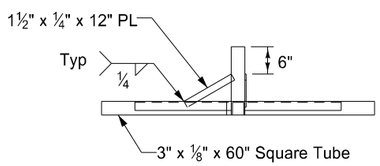
RIGHT

SIGN SUPPORT

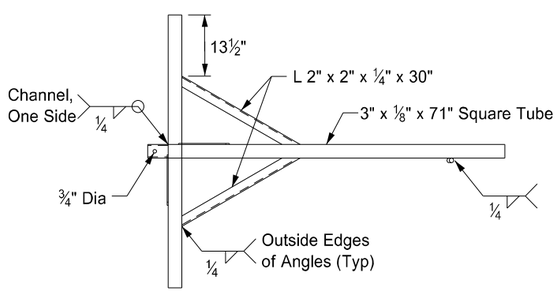
Notes:

1. Maximum 250 pound weight of assembly.
2. Use a 14" wheel and tire.
3. Use no automotive and equipment axle assemblies for trailer-mounted sign supports.
4. Other NCHRP 350 or MASH crash tested assemblies are acceptable.





RIGHT



TOP

TRAILER

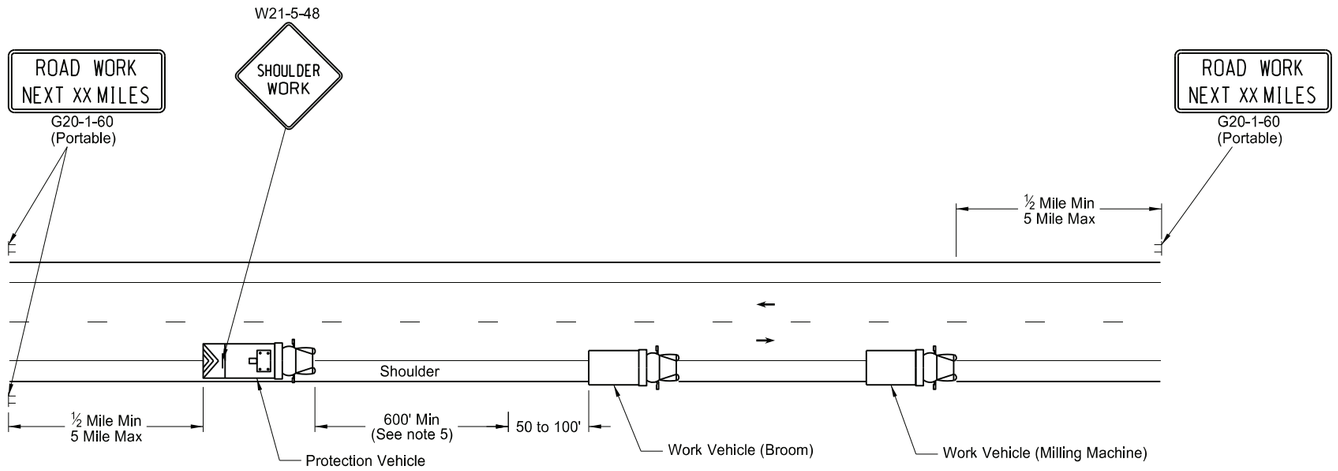
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE
12/02/2020	Updated Note to active voice.

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Kirk J Hoff
12 02 2020

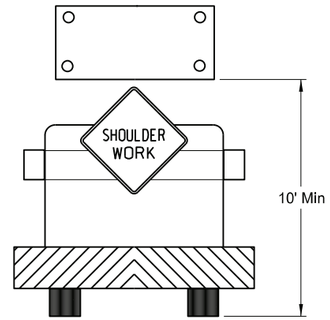
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MOBILE OPERATION
Grinding Shoulder Rumble Strips

D-704-56



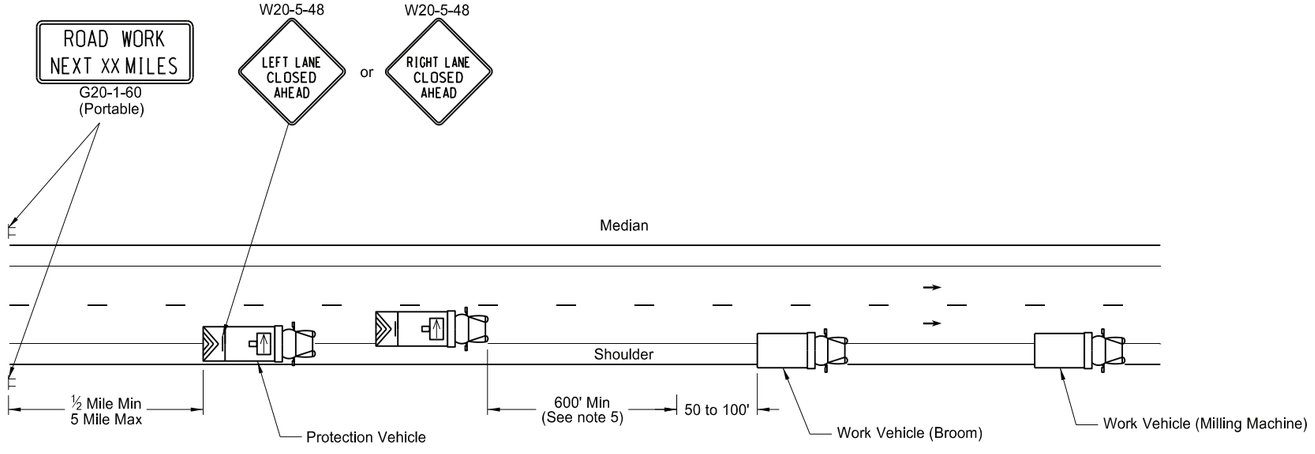
TWO LANE - TWO WAY ROADWAY



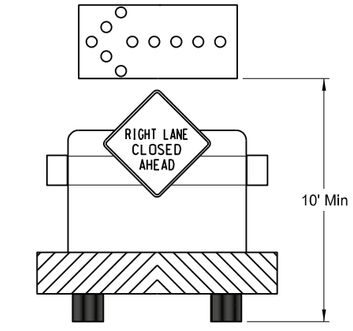
TWO LANE - TWO WAY ROADWAY

Typical Protection Vehicle with Flashing Arrow Panel In Caution Mode

Notes:
1. Provide truck mounted attenuators on additional vehicles in the convoy, at no additional cost.
2. Provide rotating, flashing, oscillating, or strobe lights on vehicles.
3. Provide Type B or Type C flashing arrow panels that are controlled from inside the vehicle.
4. Provide two - way electronic communication capability in each vehicle.
5. Vary vehicle spacing between the protection vehicle and work vehicle depending on sight distance restrictions. Keep the spacing of the convoy vehicles such that motorists approaching the work convoy can see the protection vehicle in time to slow down and safely pass the work vehicles.
6. Move advance Road Work Ahead signs as the work area moves through the construction zone.

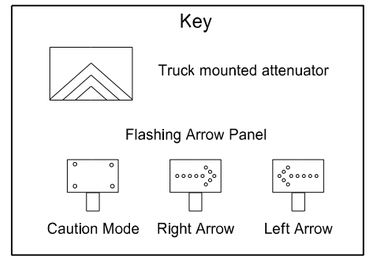


INTERSTATE & 4 LANE DIVIDED HIGHWAY



INTERSTATE & 4 LANE DIVIDED HIGHWAY

Typical Protection Vehicle with Flashing Arrow Panel In Flashing Arrow Mode



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-15-12	
REVISIONS	
DATE	CHANGE
8-17-17	Updated notes & signs
10-03-19	New Design Engineer PE Stamp
8-02-24	Electronic Stamp/Signature

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ENGINEER
NORTH DAKOTA

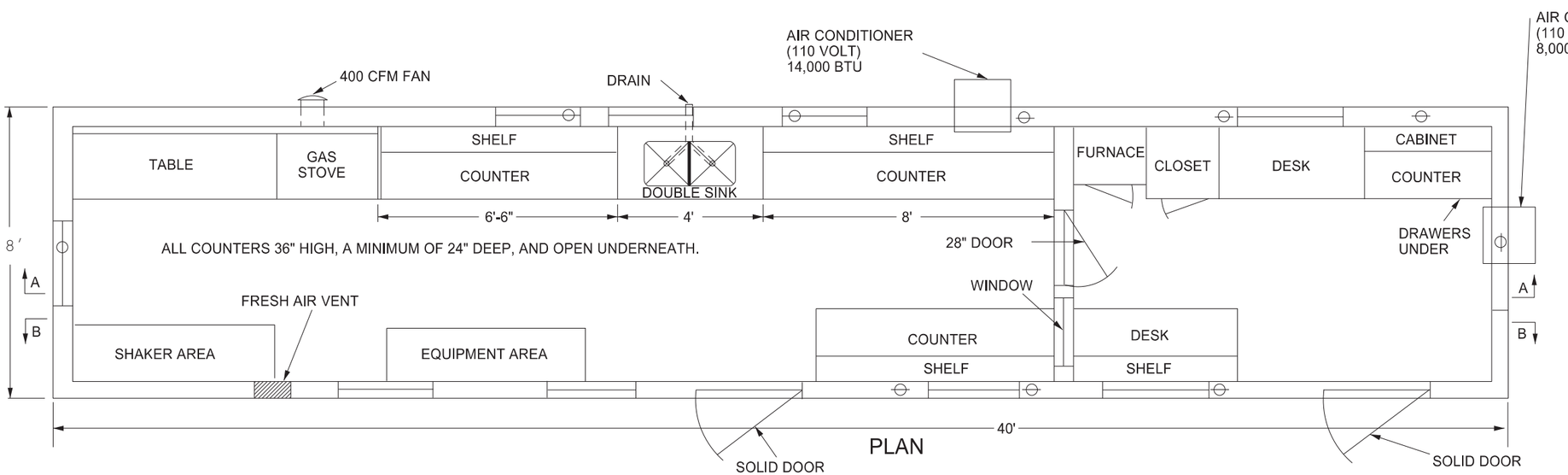
Kirk J Hoff

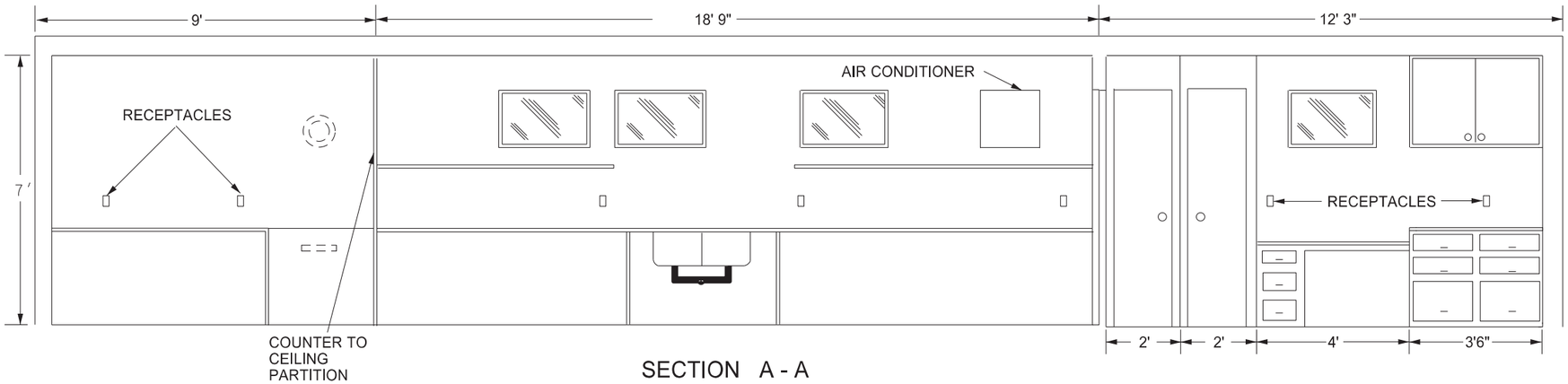
08/02/24

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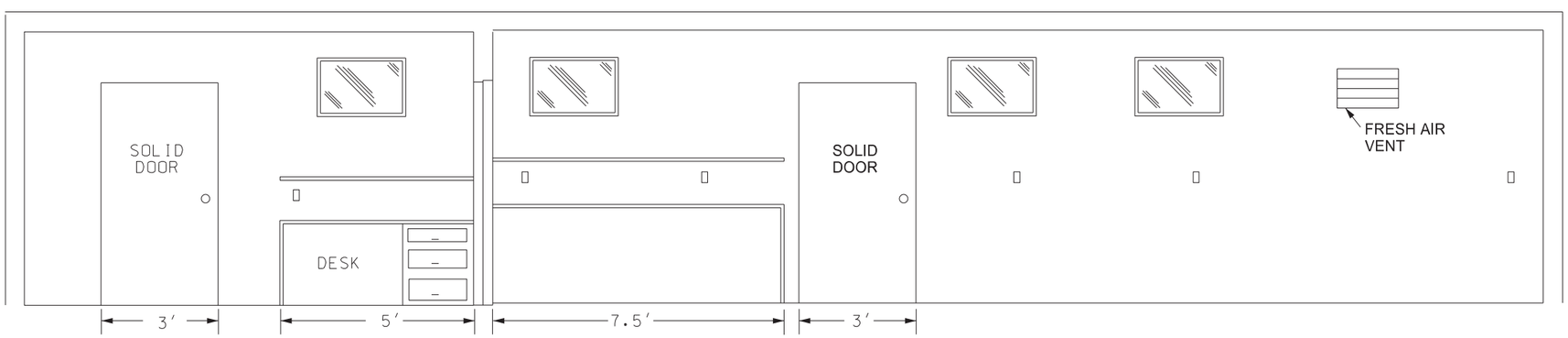
BITUMINOUS LABORATORY

D-706-1





SECTION A - A



SECTION B - B

Provide a laboratory with the following:

1. A 1'x1' shelf at 36" above the regular countertop.
2. Double compartment stainless steel sink, with each compartment a minimum of 16"x14"x10" deep. Provide water service lines made of copper or plastic and a diameter of ½ inch.
3. An exhaust fan capable of removing inside air at a rate of 400 CFM.
4. Fresh air vent hinged to open or close manually.
5. 24" x 48" table capable of holding a 200 lb masonry saw with a minimum clearance of 36" above the table.
6. A water supply tank with a capacity of 500 gallons and a 20 gallon capacity pressure tank on the pump.
7. Heavy duty type locks, latches, and hinges for doors made to withstand the intense use in service.
8. A wall between the office and the work area properly insulated to prevent the transmission of heat and noise.
9. The steel cable tie downs and ground anchors at each corner of the lab.
10. Electrical service entrance wired for 100 amps and separate circuits for air conditioners. Space convenience outlets in counter areas a minimum of four feet apart.

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

10-03-13

REVISIONS

DATE	CHANGE
07-30-14	Changed standard's title and revised notes.
01-11-16	Revised notes.
08-27-19	New Design Engineer PE Stamp
08-09-24	Electronic Stamp/Signature.

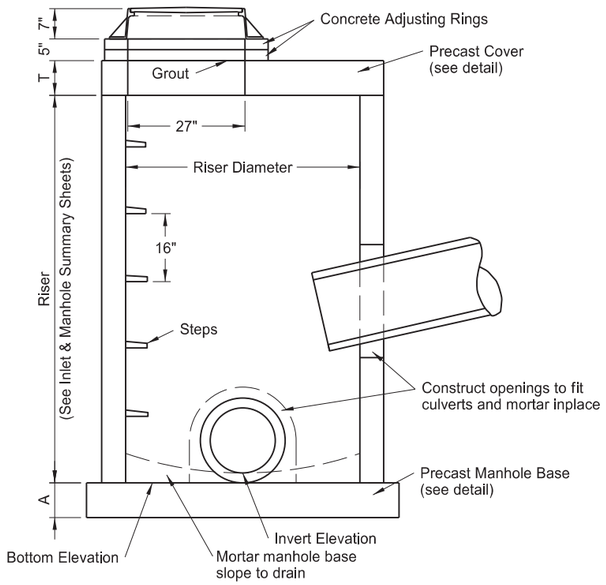
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/09/24

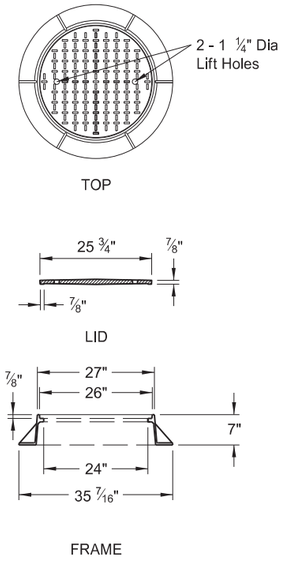
Docusign Envelope ID: 1230AB8B-A127-47B2-99B3-064304788F03

MANHOLE DETAILS

D-722-5



ELEVATION



MANHOLE CAST IRON RING & COVER

PRECAST MANHOLE COVERS

RISER DIAMETER	COVER DIAMETER	WEIGHT OF SECTION	T	K	L	BOTTOM * BARS	TOP * BARS
48"	58"	1,080 Lb	6"	6"	8"	#4 at 6"	----
54"	65"	1,910 Lb	8"	6"	8"	#4 at 6"	----
60"	72"	2,430 Lb	8"	7"	9"	#4 at 6"	#4 at 11"
66"	79"	3,010 Lb	8"	7"	9"	#4 at 6"	#4 at 11"
72"	86"	3,640 Lb	8"	8"	10"	#4 at 6"	#4 at 11"
84"	100"	5,060 Lb	8"	9"	11"	#5 at 6"	#5 at 11"
96"	114"	6,695 Lb	8"	9"	11"	#5 at 6"	#5 at 11"
108"	128"	12,810 Lb	12"	10"	12"	#5 at 6"	#5 at 11"
120"	142"	15,900 Lb	12"	11"	13"	#5 at 6"	#5 at 11"

* - Place reinforcement listed in each direction.

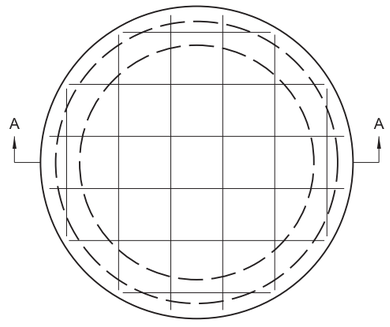
MANHOLE BASES

RISER DIAMETER	BASE DIAMETER	WEIGHT OF SECTION	A	BARS *
48"	66"	1,785 Lb	6"	#4 at 12"
54"	72"	2,830 Lb	8"	#4 at 12"
60"	78"	3,320 Lb	8"	#4 at 12"
66"	86"	4,035 Lb	8"	#4 at 12"
72"	92"	4,620 Lb	8"	#4 at 12"
84"	107"	6,245 Lb	8"	#4 at 12"
96"	120"	7,855 Lb	8"	#4 at 12"
108"	132"	14,255 Lb	12"	#4 at 8"
120"	148"	17,925 Lb	12"	#4 at 8"

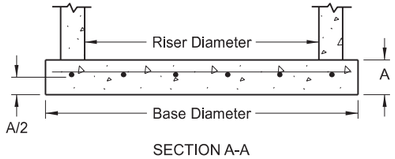
* - Place reinforcement listed in each direction.

NOTES:

1. Use class AE concrete precast or cast-in-place bases constructed in accordance with NDDOT Standard Specifications. Use aggregate size approved by the engineer.
2. Use precast concrete manholes, risers and steps conforming to AASHTO M199.
3. Reinforce precast concrete bases and covers as shown in the table for the corresponding riser diameter.
4. Use Grade 60 reinforcing steel.
5. Cut or Precast manhole riser bottoms square to fit the manhole base. Grout joint between base and riser with cement mortar.
6. The manhole riser length listed in the plans is based on a 7" manhole casting, plus 2 concrete adjusting rings (5"), plus the "T" dimension shown in the Precast Manhole Covers table.
7. Use corrosion resistant manhole steps with a minimum 800 pound vertical load resistance and a minimum 400 pound horizontal pull-out resistance. Use configuration of steps approved by the Engineer.
8. Precast concrete manhole covers shown are designed for an HS-20 wheel load and maximum fill height of 15'-0". Special design is required for heavier wheel loads and/or greater fill heights.
9. Use of other castings, similar in dimension, is allowed if the casting conforms to the manhole cover and has a lid style specified in the plans. Modifications to the manhole cover to facilitate similar castings are only allowed with written approval from the Engineer.
10. Use castings manufactured in accordance with AASHTO M306-09. Use metal conforming to AASHTO M105 Class 35B in the manufacture of castings.
11. Pipe shall be installed to extend a minimum of 2 inches beyond the inside face of the structure wall at each end. Payment will be based on the actual installed length of pipe between structures, measured end-to-end and rounded to the nearest whole foot.

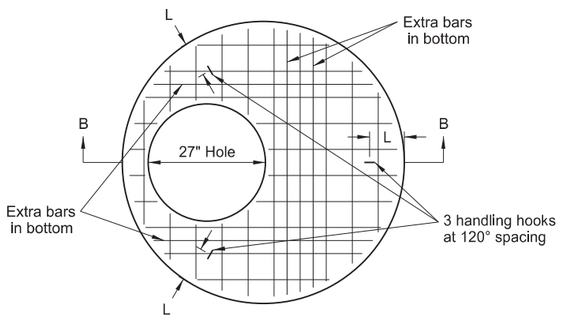


TOP VIEW

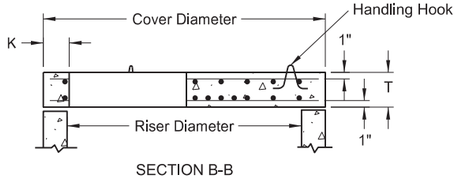


SECTION A-A

PRECAST MANHOLE BASE

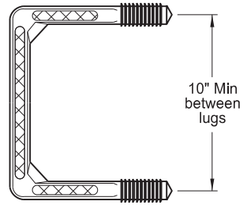


TOP VIEW

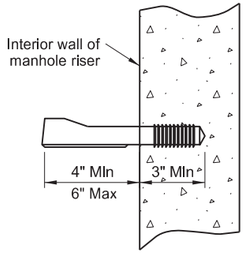


SECTION B-B

PRECAST COVER



TOP VIEW



STEP DETAIL

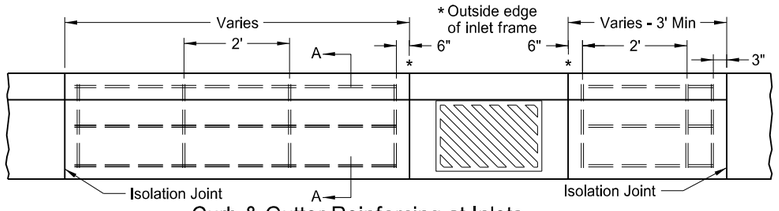
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-14-2013	
REVISIONS	
DATE	CHANGE
6-24-14	Revised notes 1 & 6, added dimensions to Elev. drawing.
10-17-17	Updated to active voice.
12-02-20	Updated PE stamp and signature.
07-24-25	Note Revisions

REGISTERED PROFESSIONAL ENGINEER
JASON R. THORENSON
PE - 5048
DATE 07/24/25
NORTH DAKOTA

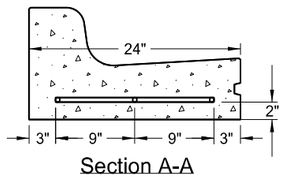
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Curb & Gutter and Valley Gutter

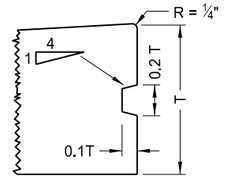
D-748-1



Curb & Gutter Reinforcing at Inlets



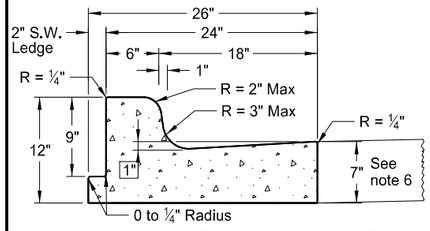
Section A-A



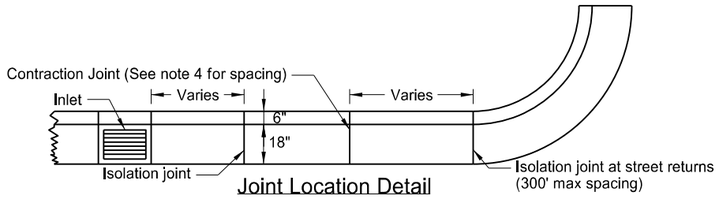
Keyway Detail for Curb & Gutter

(To be used with PCC Pavement and Drives)

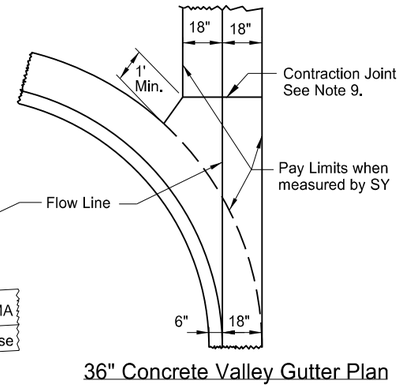
T= Thickness of pavement unless otherwise noted on plans.



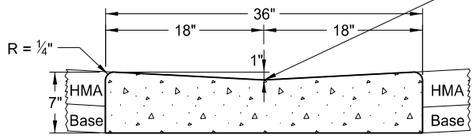
Curb & Gutter Type 1 (Sec. A & B)
Adjacent to Concrete Sidewalk, Median, or Parking Lot. (Sec. A shown. See Sec B for additional details.)



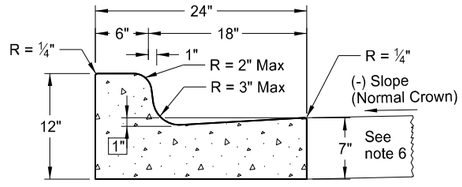
Joint Location Detail



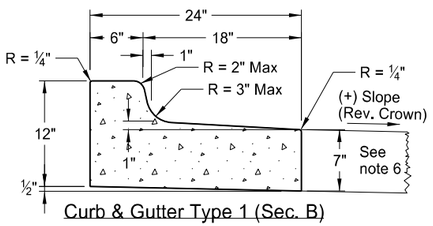
36" Concrete Valley Gutter Plan



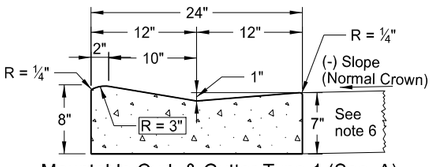
36" Concrete Valley Gutter Detail



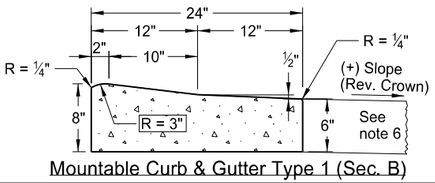
Curb & Gutter Type 1 (Sec. A)



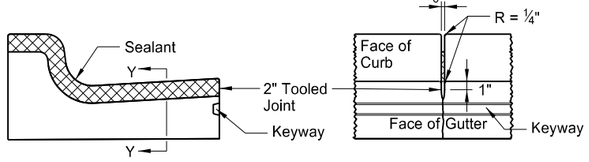
Curb & Gutter Type 1 (Sec. B)



Mountable Curb & Gutter Type 1 (Sec. A)



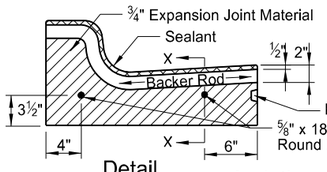
Mountable Curb & Gutter Type 1 (Sec. B)



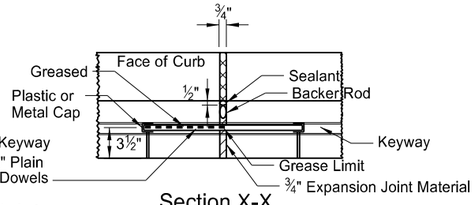
Detail
(10' Max Spacing)

Section Y-Y

Contraction Joint

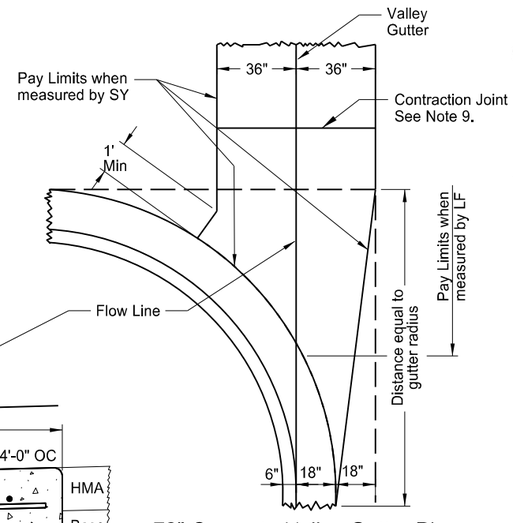


Detail

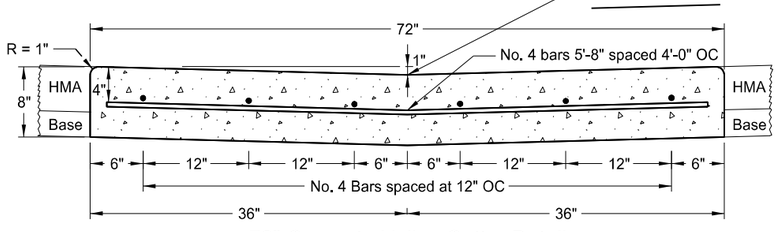


Section X-X

Isolation Joint



72" Concrete Valley Gutter Plan



72" Concrete Valley Gutter Detail

NOTES:

1. Use Curb and Gutter Type 1 (Sec. A & B). Use section "A" with (-) pavement slopes and section "B" with (+) pavement slopes.
2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
3. Isolation Joints: Use ¾" expansion joint material for isolation joints. Form the backer rod and joint sealant opening with 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. Install plastic or metal caps and greased dowels in the cold joint for the second pour.
4. Joint Spacing: For hot mix asphalt pavements use a 10' max joint spacing for the curb and gutter with panels on each side of the inlets. For concrete pavements match the joint spacing for the curb and gutter to the pavement joint on PCC Pavements (approximately 15' spacing.)
5. Joint sealing: For contraction joint, use joint sealant that conforms to section 826.02B. Use sealant for expansion joints specified in note 3 above. Tool and install sealant in accordance with the manufacturer's recommendations.
6. Curb & Gutter-Pavement Interface: For hot mix asphalt pavement use gutter depth shown. For PCC pavements, either match gutter depth to adjacent pavement depth or construct gutter depth shown.
7. Tie curb and gutter to abutting PCC pavement with No. 4 bars, 2'-0" in length, spaced at 3'-9" centers for 15' joint spacing (maximum spacing of 4' centers).
8. On street returns and other locations where new curb and gutter ends and does not abut existing curb and gutter, taper the last two (2) feet of the curb from 6" in height to 0". Install a 1/2" premolded full depth isolation joint (the same shape as the curb and gutter just ahead of the taper) with an 18" plain round bar across the joint.
9. Valley Gutter Joints: Form, saw, or score ⅛" min. to ⅜" max. width contraction joints (a minimum 2" depth) at approx 10' intervals. Seal the joints with hot poured elastic type joint sealer (Section 826.02A.2 of the Standard Specifications.) Include all costs for the joint and sealant in the price bid for Valley Gutter.
10. Reinforcing at Inlets: Use #4 deformed reinforcing bars without splices. Include all costs for reinforcing bars at inlets (even inlets located on radii) in the price bid for "Curb & Gutter - Type 1" or "Curb & Gutter Mountable - Type 1." Extend reinforcement to the second joint (with rebar placed through the first joint) in cases where the 3' minimum panel length can't be obtained.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-7-2013	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engr PE Stamp.
10-30-24	Revised bar size & notes.

KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 ENGINEER NORTH DAKOTA

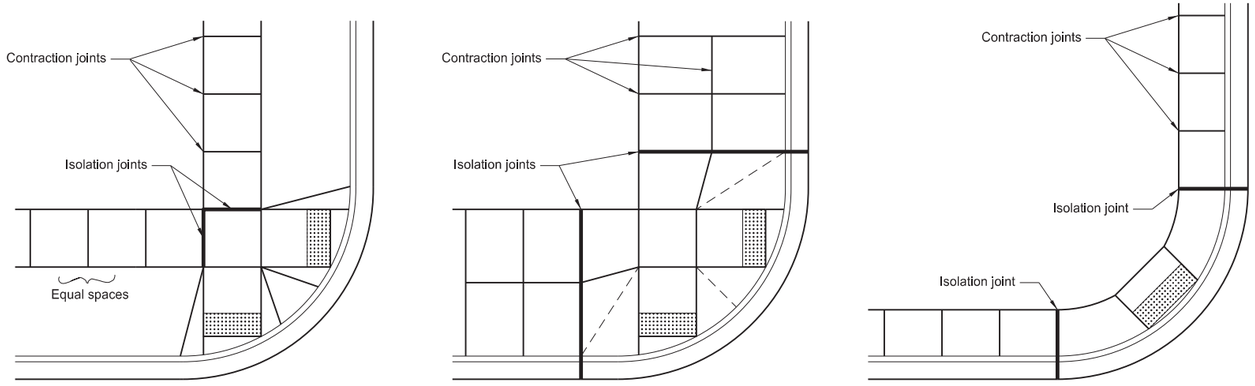
Kirk J Hoff

10/30/24

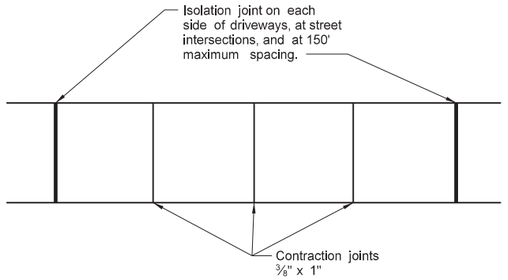
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SIDEWALK

D-750-2



Typical Joint Layouts



NOTES:

1. Curb ramp and detectable warning panel layouts for informational purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
2. Joint Spacing: Vary transverse contraction joint spacing from 4' to 6' to create approximate square panels.

   Use longitudinal contraction joints when sidewalk width is 8' or greater, and space at half the sidewalk width.

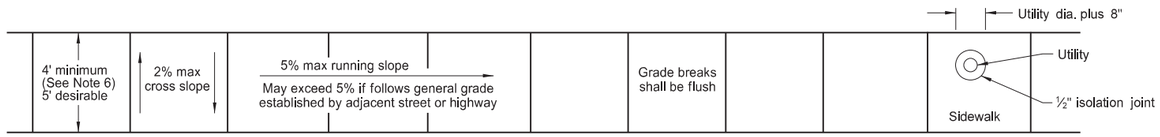
   Saw or groove contraction joints to a minimum depth of 1/3 the depth of the concrete.

   When sidewalk is adjacent to curb & gutter, vary the sidewalk joint spacing to match curb & gutter joints.

   Use isolation joints between separate concrete pours, or between old and new concrete.
3. Include all costs for labor, equipment, and material necessary to construct contraction and isolation joints in the price bid for sidewalk concrete.
4. Use 4" sidewalk concrete thickness unless otherwise specified.
5. Use 4" base material thickness unless otherwise specified. Include all costs for labor and materials necessary to place the base material in the price bid for "Salvage Base Course" or "Aggregate Base Course CL 5."

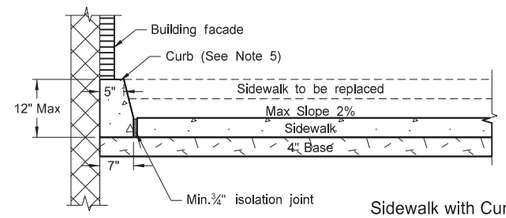
   Modify existing ground slope with landscaping as needed. If not possible, such as adjacent buildings, use a vertical curb as shown in the detail below. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Sidewalk Width & Grade: Provide a continuous 4' min clear width pedestrian access route with max 2% concrete cross slope, excluding flares. The width of the curb cannot be counted as part of the pedestrian access route.

   When clear width of pedestrian access routes is less than 5.0', provide passing spaces at a maximum of 200' with a minimum size of 5.0' by 5.0'.

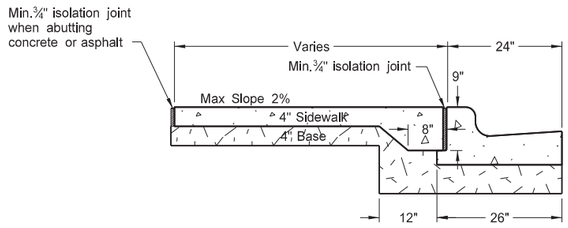


Sidewalk Width and Grade

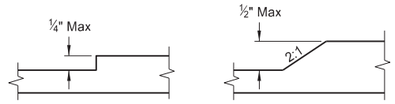
Utility Blockout



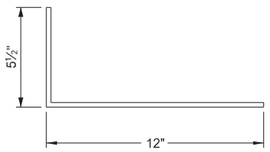
Sidewalk with Curb Detail
(Building face application)



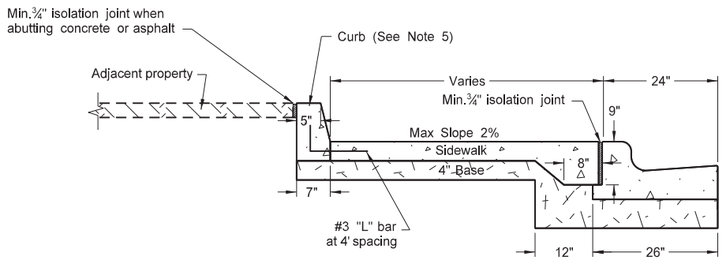
Sidewalk Detail
(Installed adjacent to curb and gutter)



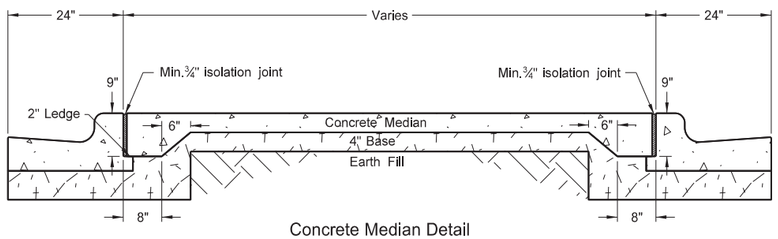
Vertical Discontinuities
(As needed for utility covers, vaults, grating, etc..)



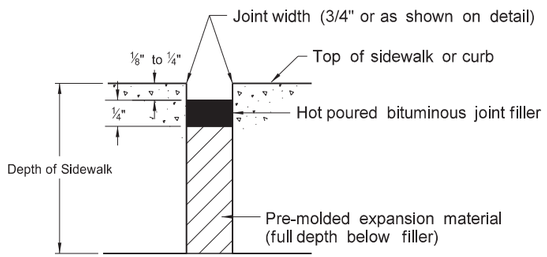
"L"Bar Detail
#3 Bar



Sidewalk with Curb Detail
(Adjacent property application)



Concrete Median Detail



Typical Isolation Joint Seal
(longitudinal and transverse)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Added sidewalk details for width & grade & passing lane requirements.
08-27-19	New Design Engineer PE Stamp.
08-09-24	Electronic Stamp/Signature.

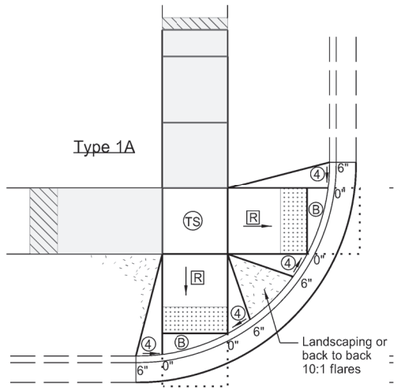
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/09/24

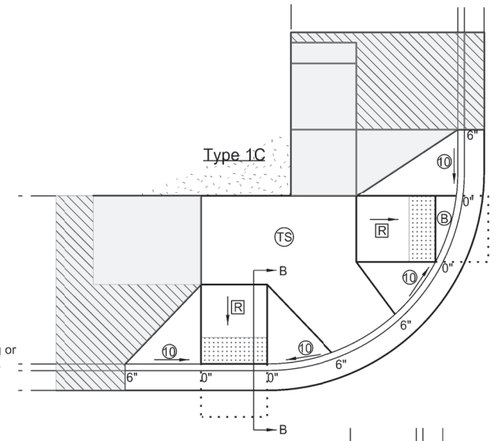
CURB RAMP RETROFIT DETAILS

D-750-3

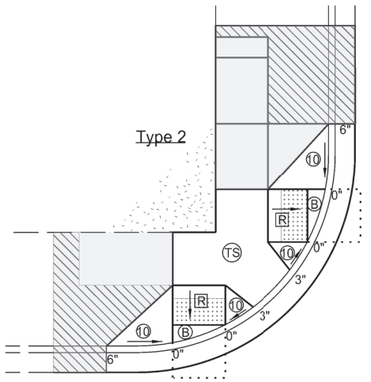
Type 1A



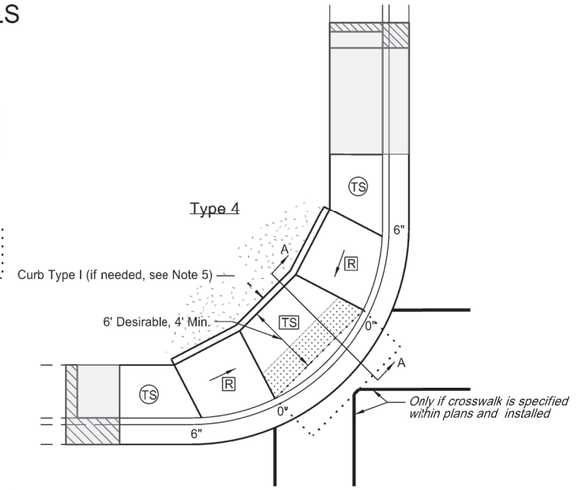
Type 1C



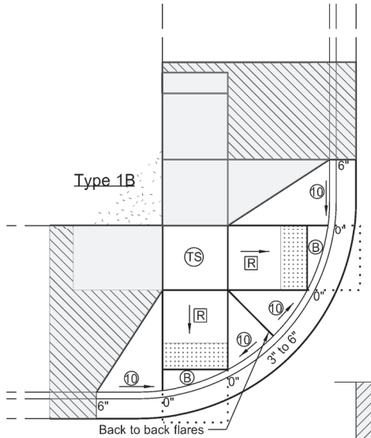
Type 2



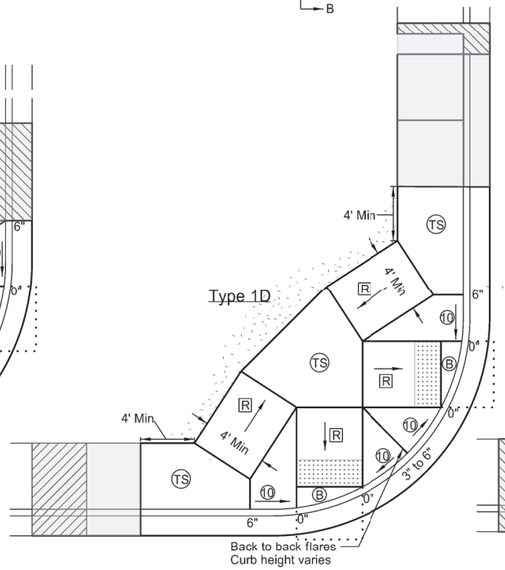
Type 4



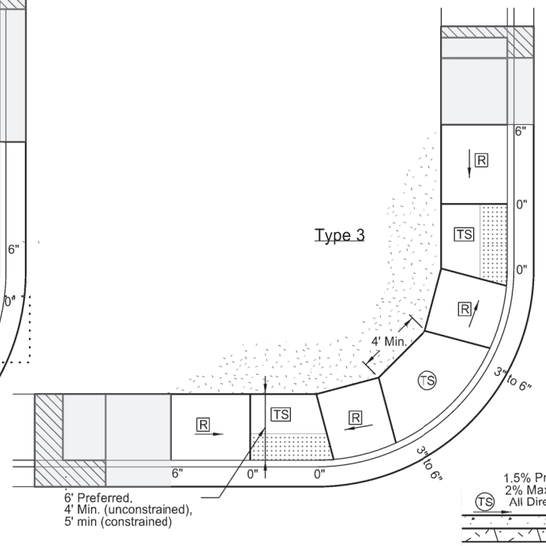
Type 1B



Type 1D



Type 3



5½"
12"
#3 "L" Bar

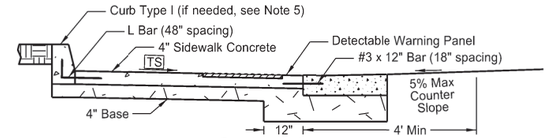
NOTES:

1. Ramp width is the useable portion of the ramp, excluding flares. Match curb ramp width to Existing Pedestrian Facility (EPF) width (4' minimum or 5' for island ramps.) Match ramp width to existing shared use path width. Maximum ramp length is 15'.
2. Provide turning space with desirable 5' x 5' size or larger and minimum 4' x 4' unconstrained size, for any change of direction. Provide landing 5' long x width of path at the bottom and top of parallel ramps and at the top of perpendicular ramps. Turning spaces and Landings may overlap.
3. Match detectable warning panel width to ramp width. Radial panels are allowed. Place detectable warning panel within the lower turning space.
4. Provide a continuous 4' minimum width EPF with 1.5% preferred cross slope and max 2% constructed cross slope.
5. Modify existing ground slope with landscaping, as needed. If not possible, use a vertical curb as detailed on Standard D-750-2. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Islands: If the profile of the island curb ramp is 2% or less, provide a minimum distance of 2' between warning panels. If the profile of the island curb ramp is steeper than 2%, provide a turning space between the ramps.
7. Provide generally planar vertical alignments. Provide grade breaks, perpendicular to the direction of the pedestrian travel, at the top and bottom of curb ramps (1.5% preferred, 2% max constructed cross slope).
8. See Curb Ramp Retrofit Transition Details Standard D-750-4 for additional information. Also See PROWAG for full compliance in the curb ramp area.
9. Grade transitions shall be flush.

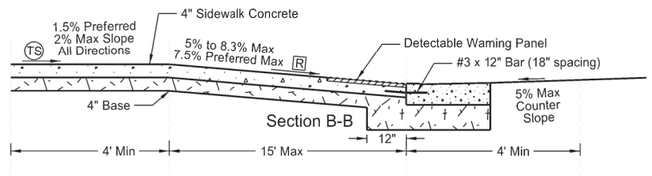
LEGEND:

- : Detectable Warning Panel.
- : Landscaping.
- : Transitional tie-in to nearest joint, if needed.
- : Curb Ramp Retrofit Transitional Area (See Standard Drawing D750-4)
- : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% preferred running and counter slope 5% maximum running and counter slope
- TS : Turning Space Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions.
- R : Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2%.
- B : 1.5% preferred cross slope 2% maximum constructed cross slope running slope consistent with the EPF 4.7% preferred max counter slope 5.0% max constructed counter slope
- 10 : 10:1 maximum constructed slope.
- 4 : 4:1 maximum constructed slope.

0", 3", or 6" : Curb Height.

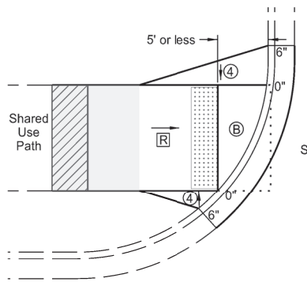


Section A-A



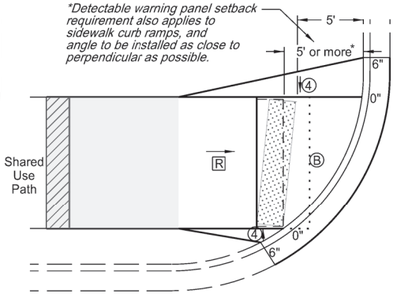
Section B-B

5' or less

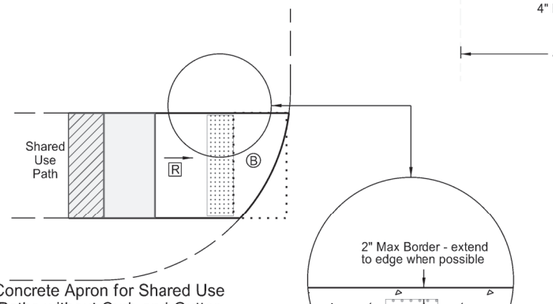


*Detectable warning panel setback requirement also applies to sidewalk curb ramps, and angle to be installed as close to perpendicular as possible.

5' or more*

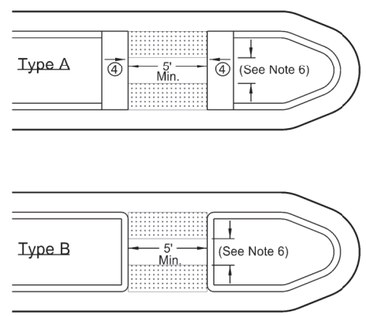


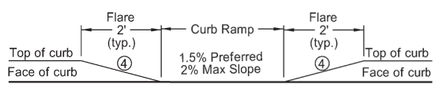
Concrete Apron for Shared Use Paths with Curb and Gutter



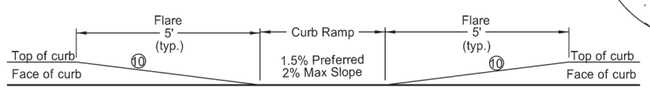
Concrete Apron for Shared Use Paths without Curb and Gutter

Median Refuge Islands (Cut-Through)





4:1 Flares
(To be used when flare is adjacent to landscaping)



10:1 Flares
(To be used when flare is adjacent to sidewalk)

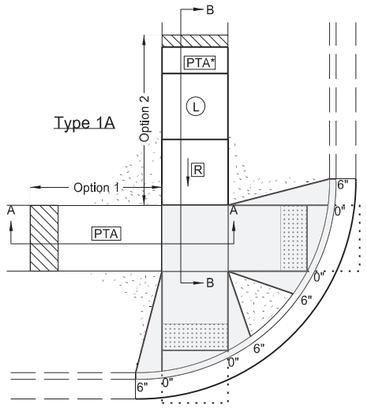
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Revised Notes, Revision for Turning Space, Added Passing Space Requirements, Turned Detectable Warning Panel
03-15-21	Slope & other clarifications.
05-19-21	Separate Curb Ramp Transition Area from Curb Ramp area

KIRK J. HOFF
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PE-4683
ENGINEER
NORTH DAKOTA
05 19 2021

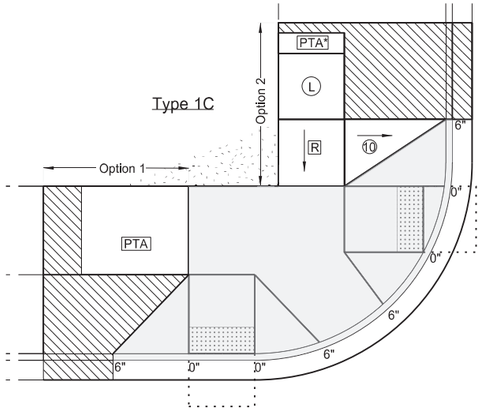
CURB RAMP RETROFIT TRANSITIONAL AREA DETAILS

D-750-4

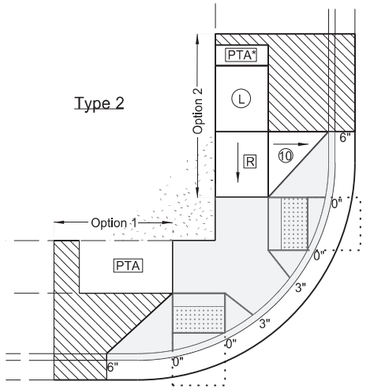
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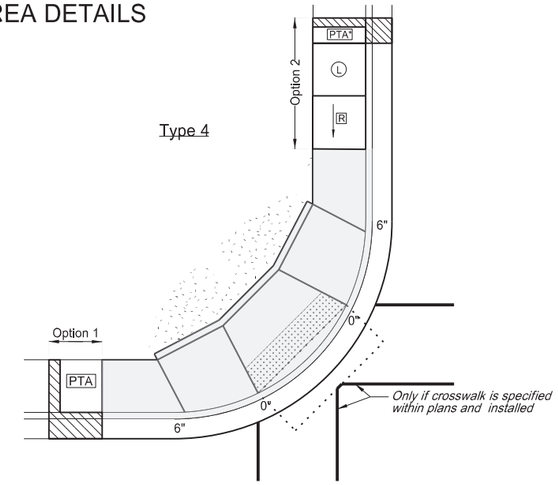
Type 1C



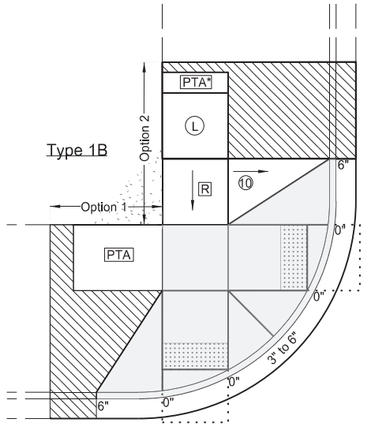
Type 2



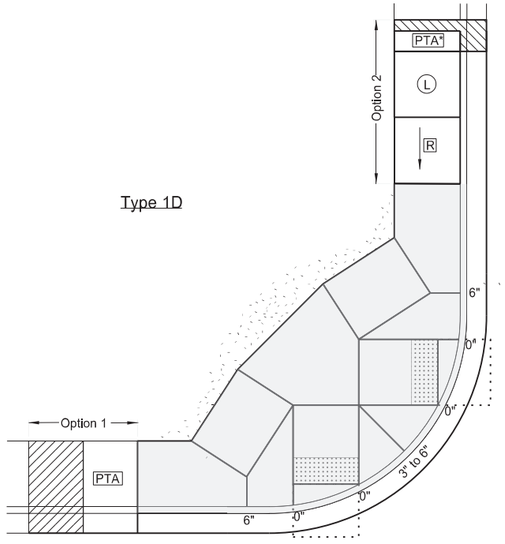
Type 4



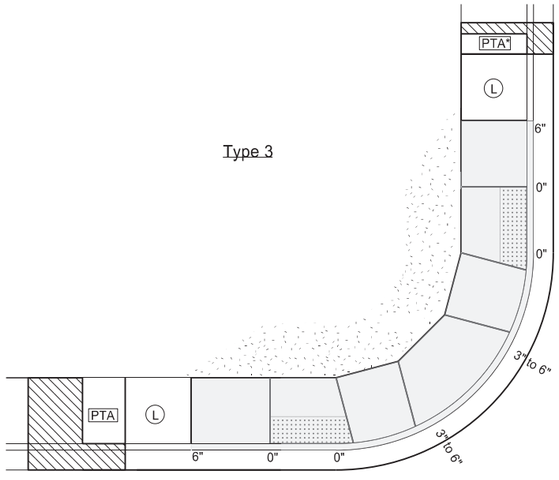
Type 1B

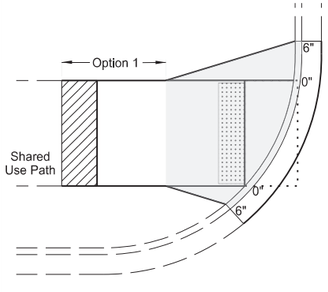


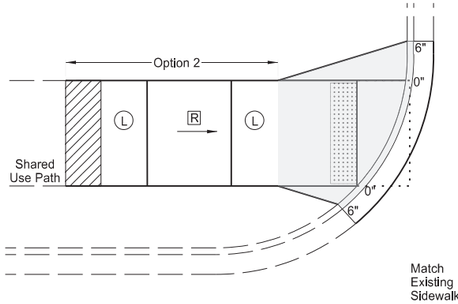
Type 1D



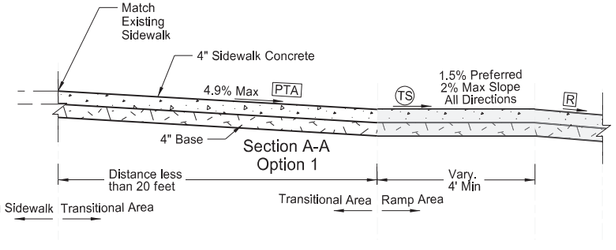
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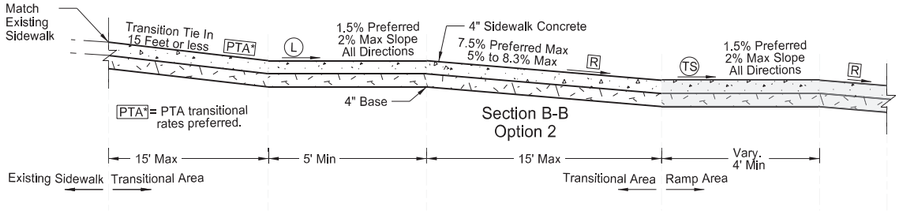






Transition Areas for Shared Use Paths





NOTES:

1. Curb Ramp Transitional Areas are to transition from the Curb Ramp area into the Existing Pedestrian Facility (EPF). Each layout shows example transitions. Use any combination for transitions from the Ramp Area into the EPF that allows for similar or gentler slopes to that of the existing condition, yet transitions in the shortest distance possible. In some cases, if grades allow, the Ramp area can immediately transition into the EPF and no transitional area is needed.
2. Option 1: Use this transition when existing running slope grades are less than 5%. Transition from the ramp area to the EPF using the Pedestrian Access Transition Area (PTA) transition rates and in less than 20 feet.
3. Option 2: Use this transition when existing running slopes are greater than 5% and option 1 is not able to be met.

   Add a ramp and a landing immediately after the ramp area. Then transition from the compliant landing into the EPF using the PTA rates (preferred), or in less than 15 feet (which ever is shorter).
4. Transitional Areas for Shared Use Paths can be concrete or asphalt.
5. See Curb Ramp Retrofit Details Standard D-750-3 for additional information.

LEGEND:

- : Detectable Warning Panel.
- : Landscaping.
- : Transitional tie-in to nearest joint, if needed.
- : Curb Ramp Retrofit Area (See Standard Drawing D750-3)
- : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% preferred running slope 5% maximum running slope
- PTA : Pedestrian Access Transition Area Running Slope less than 4.9%. Transition Cross Section at 1/2 percent per foot from the from Ramp Area to EPF.
- (L) (TS) : Turning Space/Landing Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions.
- R :Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2% Maximum Length = 15 feet
- (10) : 10:1 maximum constructed slope.
- (4) : 4:1 maximum constructed slope.

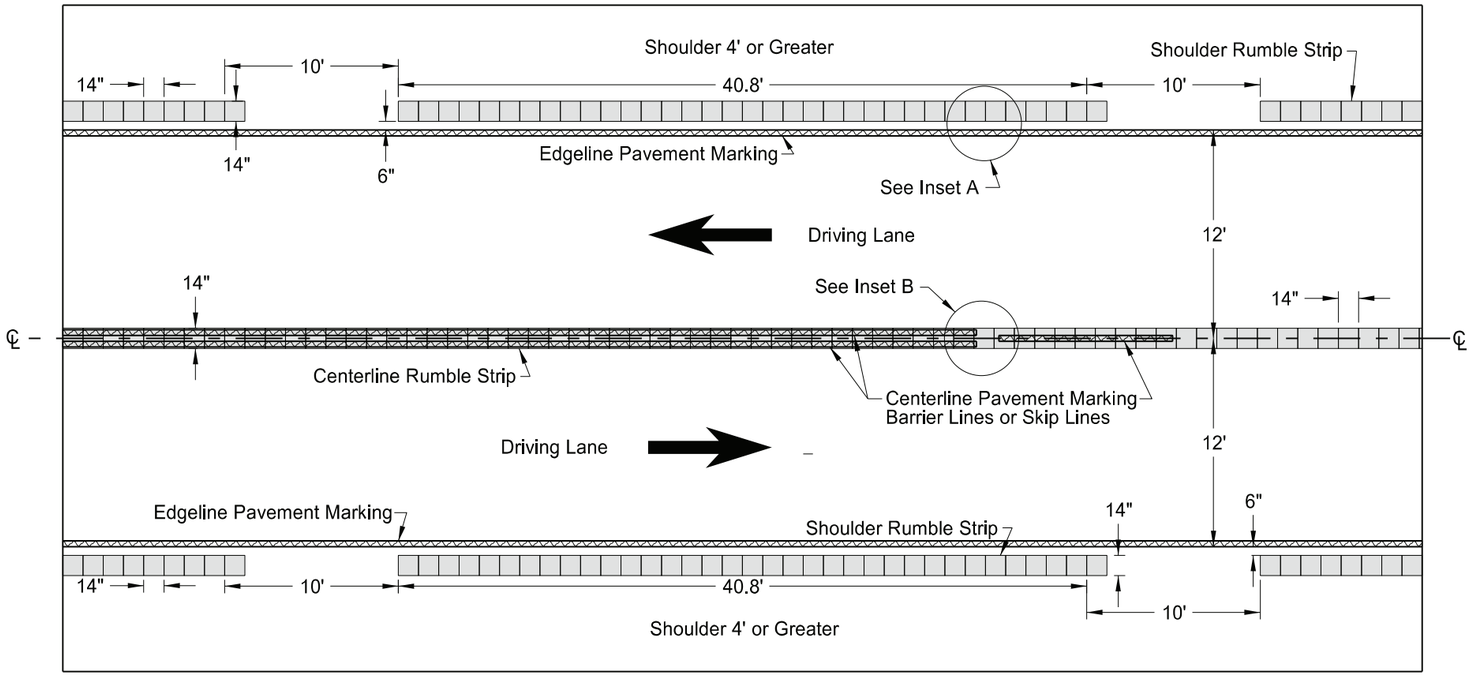
0", 3", or 6" : Curb Height.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-19-21	
REVISIONS	
DATE	CHANGE

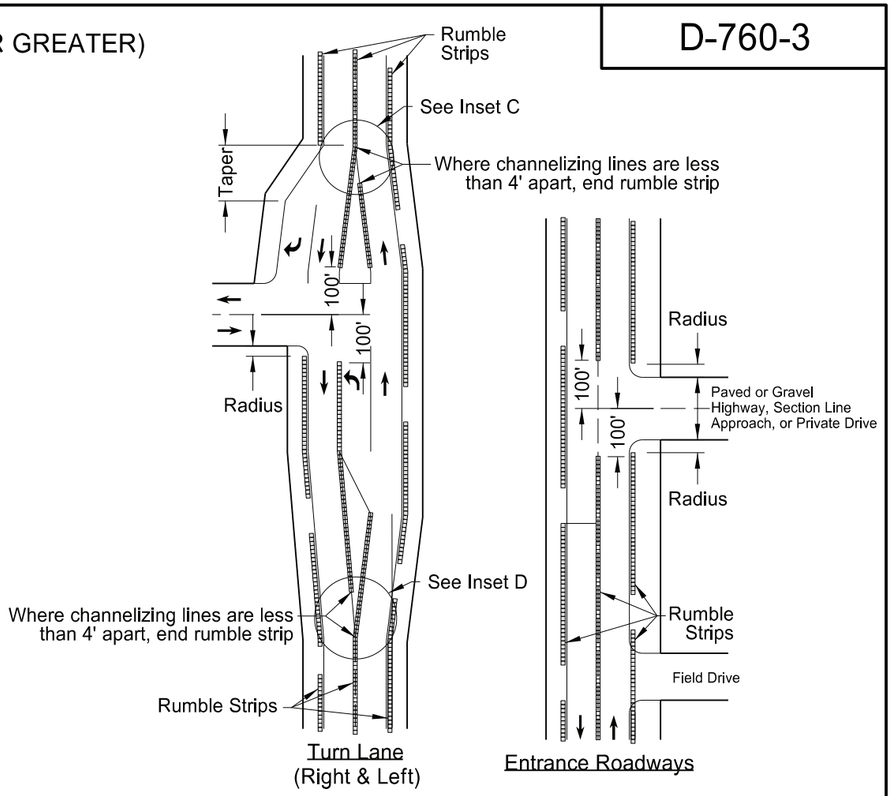
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
05 19 2021

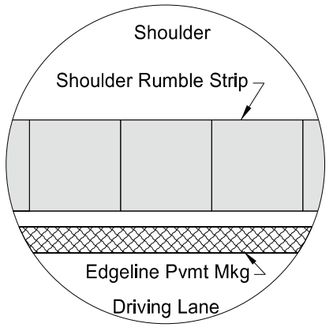
RUMBLE STRIPS UNDIVIDED HIGHWAYS (SHOULDERS 4' OR GREATER)

D-760-3

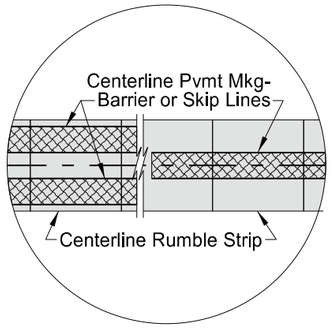


Undivided Highways (Shoulders 4' or Greater)

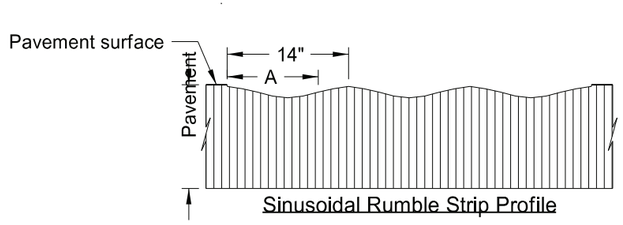




Inset A - Shoulder Rumble Strip
(Layout for opposite shoulder reversed)

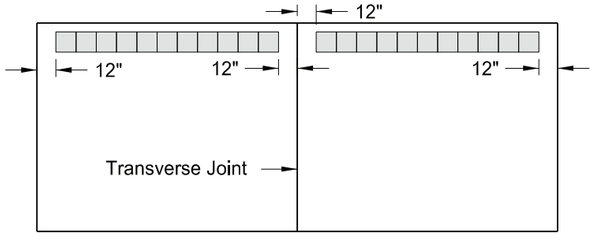


Inset B - Centerline Rumble Strip

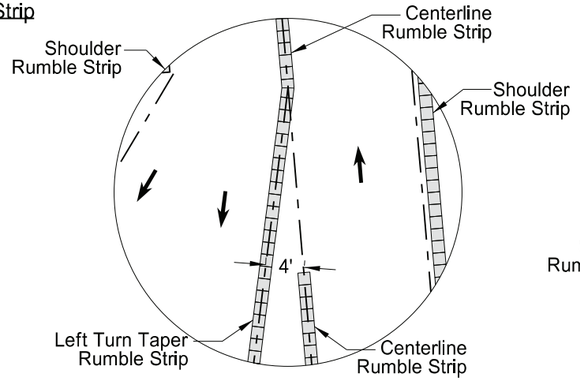


Sinusoidal Rumble Strip Profile

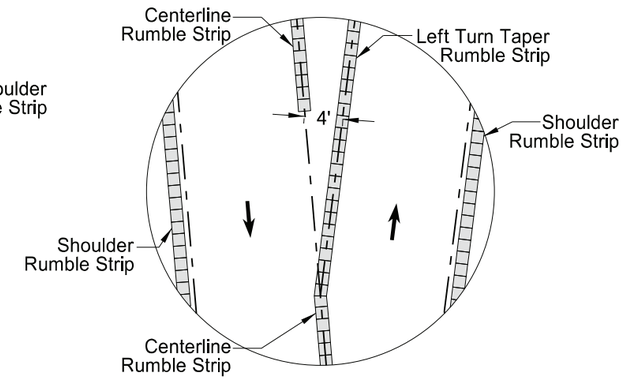
Milling Depths		
Location A (in)	Depth MIL	Depth in
0	62.5	1/16
1 3/4	156	5/32
3 1/2	281	9/32
5 1/4	438	7/16
7	500	1/2
8 3/4	438	7/16
10 1/2	281	9/32
12 1/4	156	5/32
14	62.5	1/16



Discontinue rumble strip approx. 12" on both sides of PCC transverse joint



Inset C



Inset D

NOTES:

1) Discontinue shoulder rumble strips through the entire length of right turn lanes and tapers, and at the radius of paved or gravel highways, section line approaches, or private drives.

2) Discontinue centerline rumble strips 100' before and after paved or gravel highways, section line approaches, or private drives. Place rumble strips at left turn lanes as shown below.

3) No additional quantity provided for centerline rumble strips on left turn tapers. Include all costs for centerline rumble strips on left turn tapers in the price bid for "Sinusoidal Rumble Strip - Asphalt Centerline" or "Sinusoidal Rumble Strip - Concrete Centerline".

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

12-29-09

REVISIONS

DATE	CHANGE
2-25-10	Note 4 was added.
4-19-10	Revised Note 5, Note 6, and Turn Lane (Right & Left).
9-08-11	Revised Notes and D-760-3.
10-25-19	Added missing dimensions.
11-16-21	Changed turn lane rumble layouts.
3-07-23	Added Note 3.
5-26-23	Made rumble strips sinusoidal.

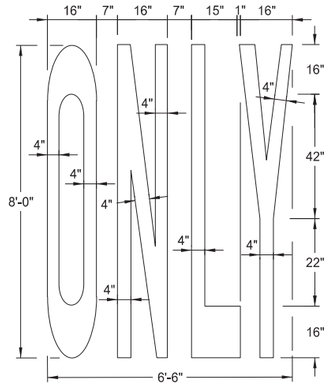
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

05/26/23

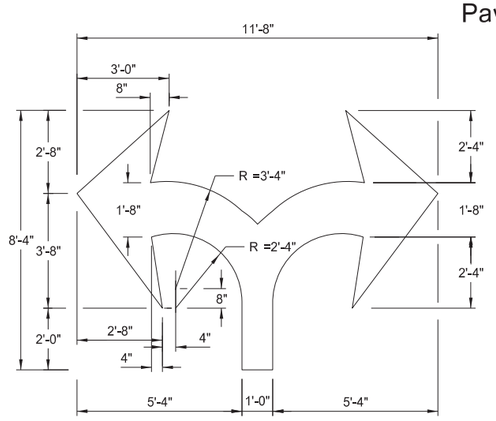
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Pavement Marking Message Details

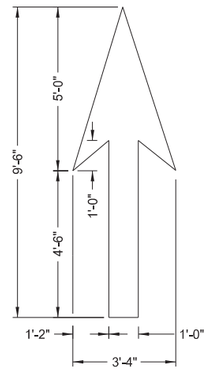
D-762-1



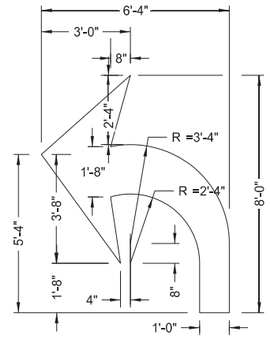
22 S. F.



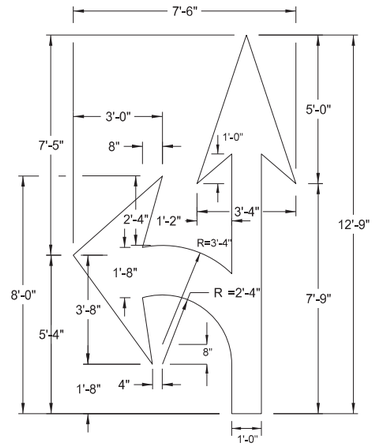
29 S. F.



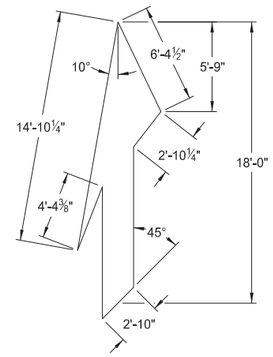
12 S. F.



16 S. F.

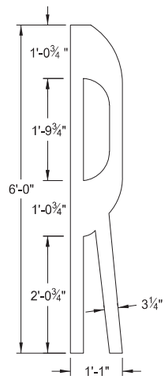


27 S. F.

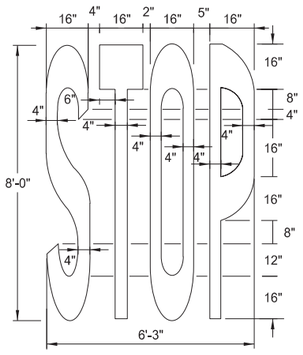


41 S. F.

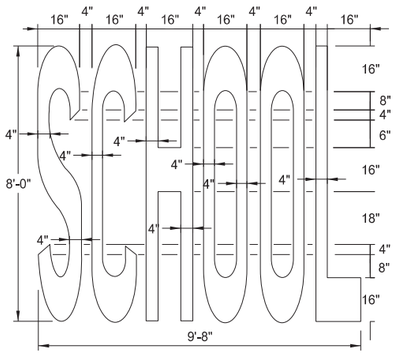
Note: Rotate merge arrow 20° from edge of roadway.



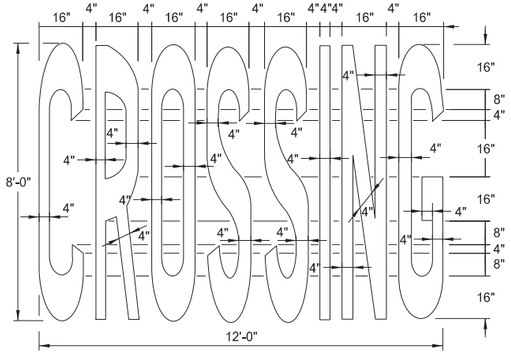
4 S. F.



22 S. F.



34.5 S. F.

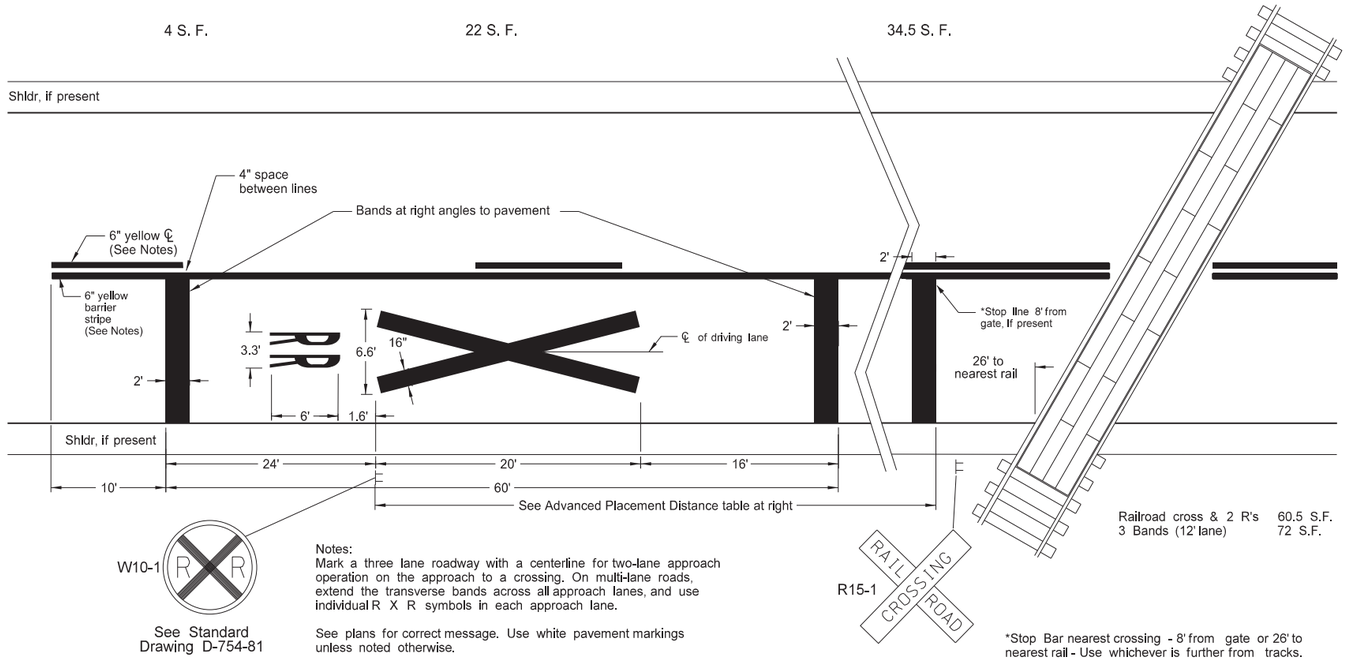


46 S. F.

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



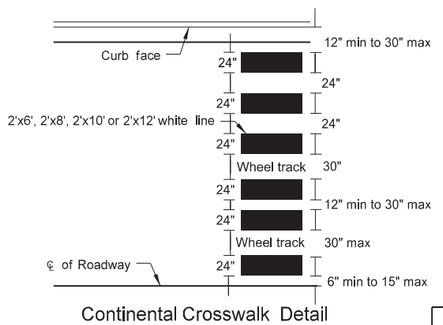
Notes:
Mark a three lane roadway with a centerline for two-lane approach operation on the approach to a crossing. On multi-lane roads, extend the transverse bands across all approach lanes, and use individual R X R symbols in each approach lane.

See plans for correct message. Use white pavement markings unless noted otherwise.

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

*Stop Bar nearest crossing - 8' from gate or 26' to nearest rail - Use whichever is further from tracks.

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



Continental Crosswalk Detail

NOTES:

1. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
2. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

12-6-11

REVISIONS

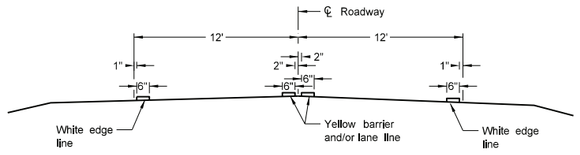
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
01-28-2020	Revised min Stop Bar distance to rail.
11-22-2023	Revised pavement marking widths.

KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 11/22/23 ENGINEER NORTH DAKOTA

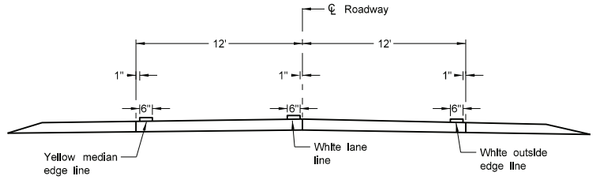
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PAVEMENT MARKING

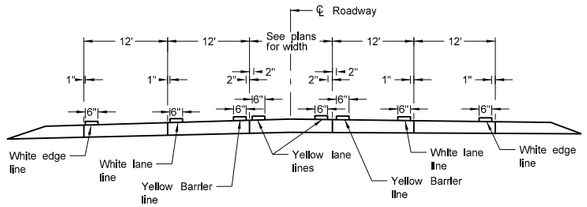
D-762-4



Two Lane Two Way
RURAL ROADWAY



Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



RURAL FIVE LANE ROADWAY
Concrete Section

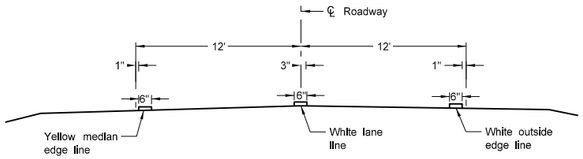
NOTES:

1. Continue edge lines through private drives and field drives. Break edge lines for intersections.

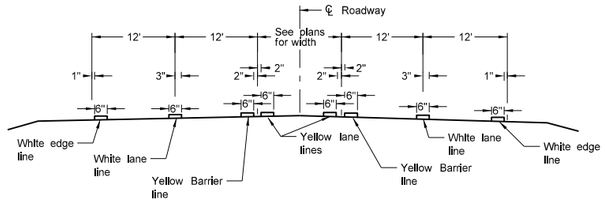
   For section lines, county roads, and street approaches, stripe the radii and edge lines of the paved surface within the right of way except where curb and gutter is present.

2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph,

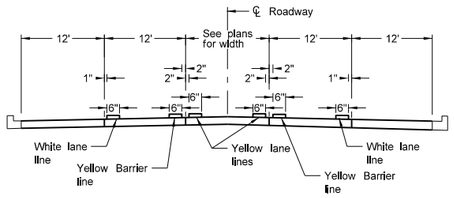
3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits < 40 mph.



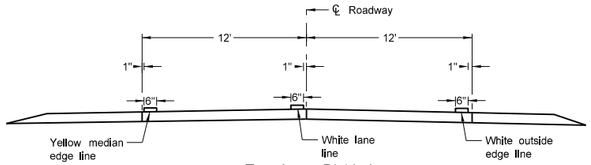
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



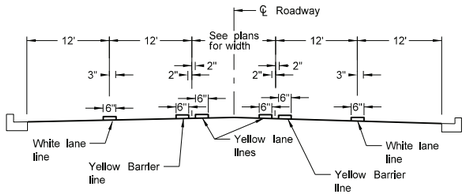
RURAL FIVE LANE ROADWAY
Asphalt Section



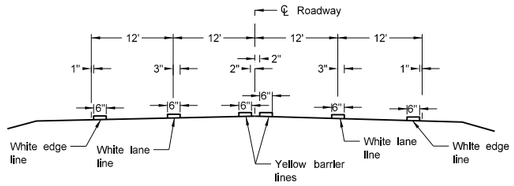
URBAN FIVE LANE SECTION
Concrete Section



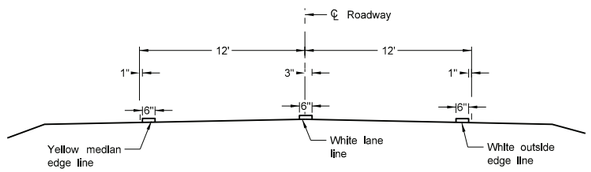
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Concrete Section



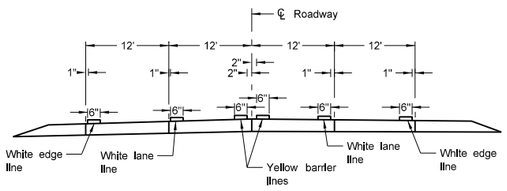
URBAN FIVE LANE SECTION
Asphalt Section



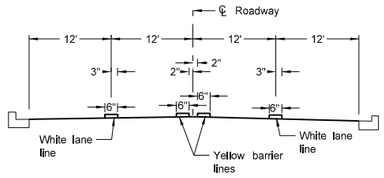
RURAL FOUR LANE ROADWAY
Asphalt Section



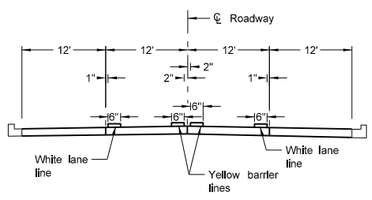
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



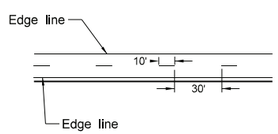
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

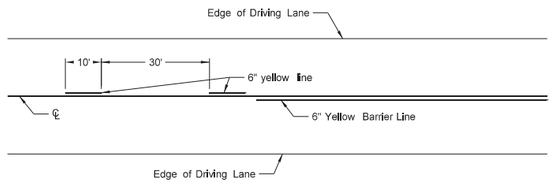
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
07-09-24	Modified Note 1.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
07/09/24
ENGINEER
NORTH DAKOTA

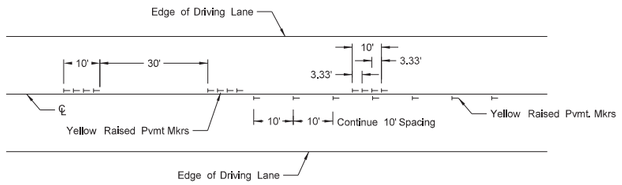
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SHORT-TERM PAVEMENT MARKING

D-762-11

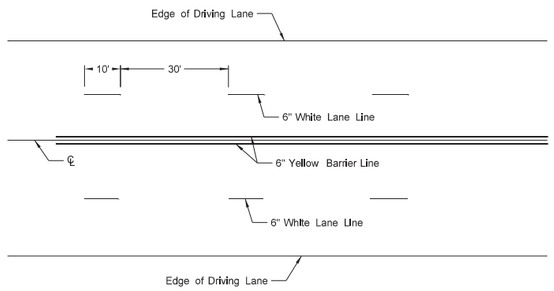


Painted or Tape Lines

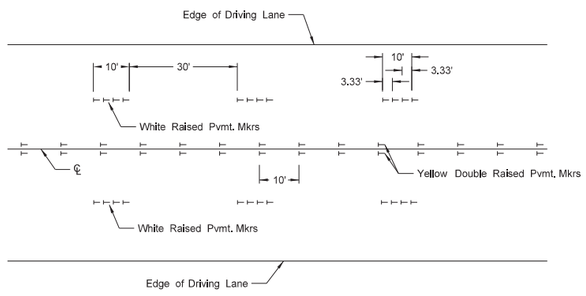


Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

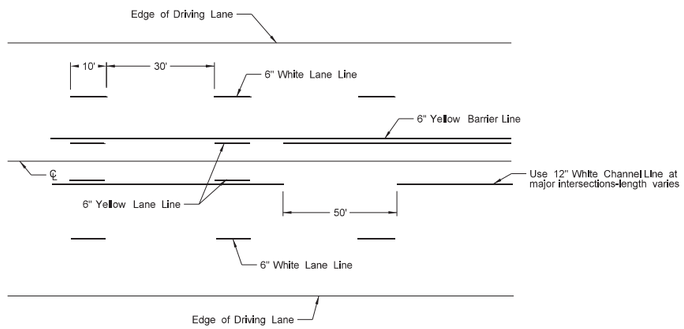


Painted or Tape Lines

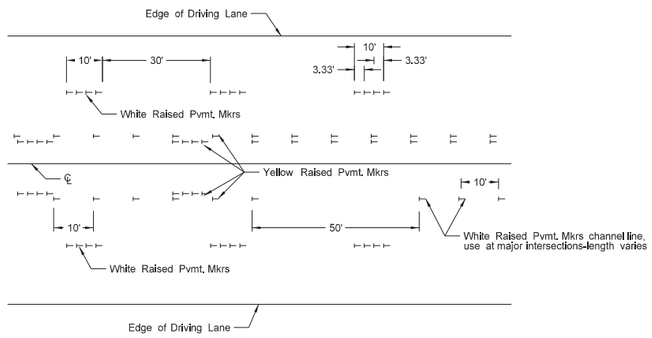


Raised Pavement Markers

FOUR LANE ROADWAY

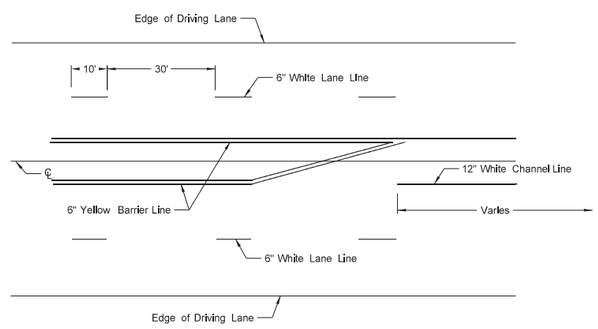


Painted or Tape Lines

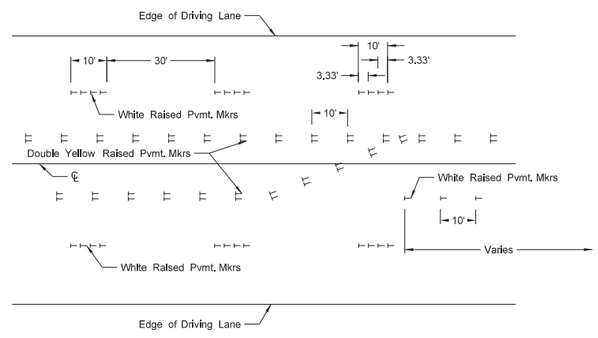


Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTES:

1. Place no passing zones on two-lane two-way roadways as shown. In lieu of short term no passing zone pavement markings, place no passing zone signs. Replace no passing zone signs with short term no passing zone pavement marking within three days.
2. Place short term center line stripe (paint) on top lift to match exact placement of permanent stripe.
3. Remove raised markers and tape markings after permanent pavement marking is installed.
4. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
5. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.
6. Wide lines - 8 inches wide if 4 inch normal width lines are used and 12 inches wide if 6 inch normal width lines are used.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
3-29-16	Re-numbered to be D-762-11 (previously was D-762-6)
10-17-17	Updated to active voice.
8-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
1-17-24	Revised wide pvmt marking width.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
01/17/24
ENGINEER
NORTH DAKOTA