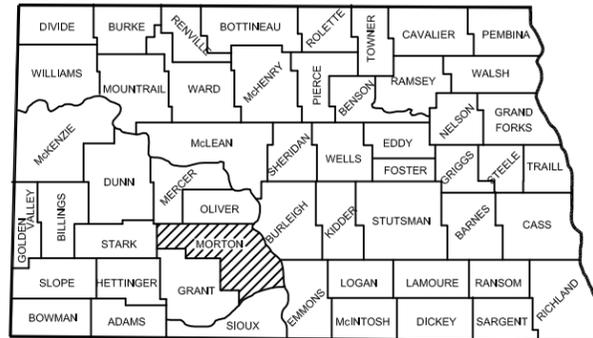


# NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

**JOB # 16**

STATE	PROJECT NO.	PCN	SEC. NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	21150	1	1
ND	TAU-LCT-1-988(041)052	21152	1	1

TAU-LCT-1-806(049)068 & TAU-LCT-1-988(041)052

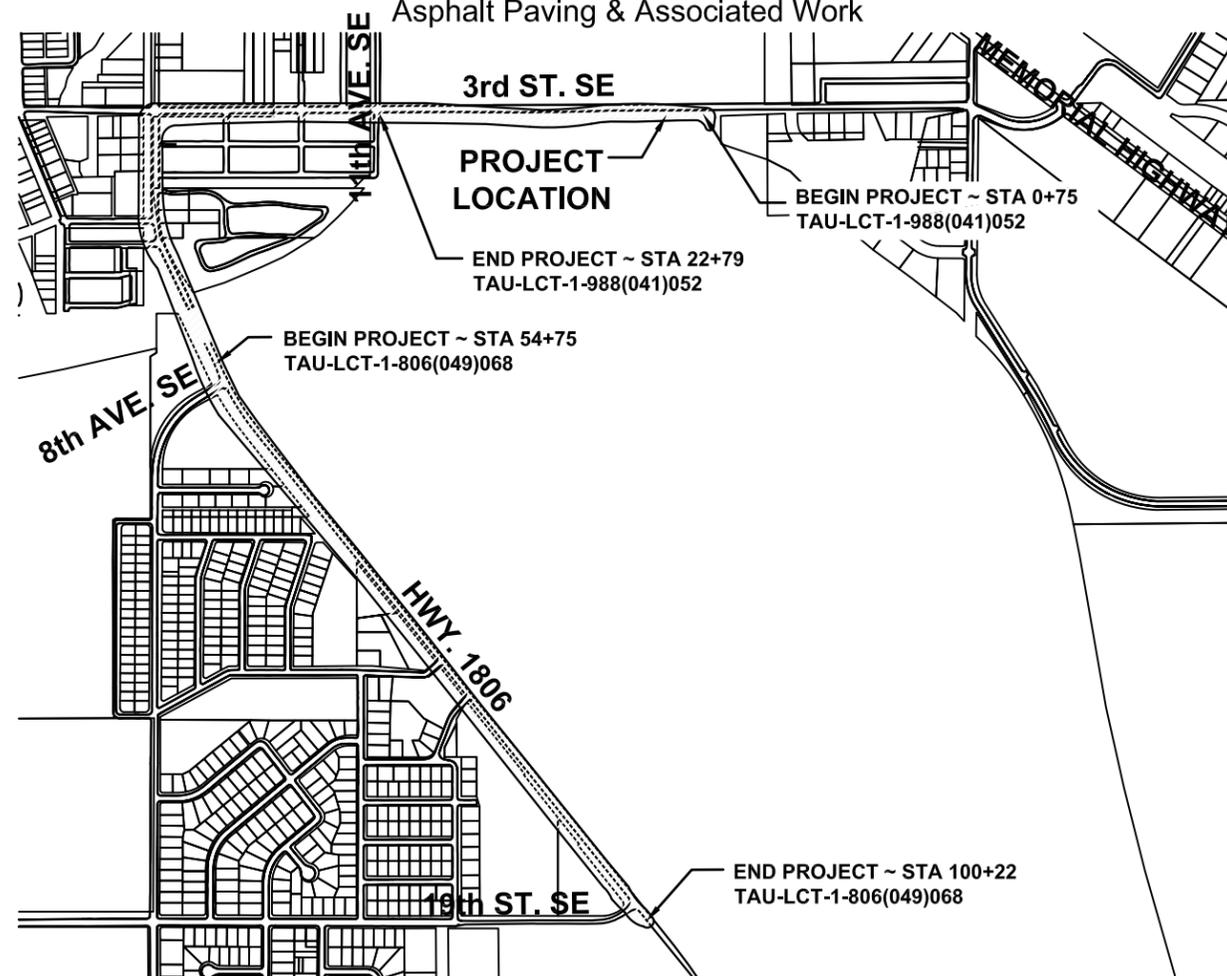


STATE OF NORTH DAKOTA

Morton County  
City of Mandan

3rd St SE ~ Trolley Station to 11th Ave SE  
1806 Hwy ~ 137' North of 8th Ave S to 19th St SE  
Asphalt Paving & Associated Work

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



PROJECT NUMBER	MILES-GROSS	MILES-NET
TAU-LCT-1-806(049)068	0.862	0.862
TAU-LCT-1-988(041)052	0.417	0.417
	1.279	1.279

Basis of Survey

All coordinates are Morton County ground coordinates derived from the "North Dakota Coordinate System of 1983", NAD83 (CORS96), South Zone Combination factor (cf) = 0.9998485, international foot. All vertical control is NGVD29. All units are English.



**DESIGNERS**

Andrew Werder, PE

David Mayer, PLA

AJ Welder, EIT

Jenna Machado

APPROVED DATE: 03/23/2016  
/s/Robert Fode  
OFFICE OF PROJECT DEVELOPMENT  
ND DEPARTMENT OF TRANSPORTATION

APPROVAL OF CITY ENGINEER  
I, JUSTIN FROSETH, CITY ENGINEER, FOR THE CITY OF MANDAN, NORTH DAKOTA, HEREBY APPROVE THESE PLANS FOR MILLENNIUM TRAIL. PROJECT NUMBERS TAU-LCT-1-806(049)068 AND TAU-LCT-1-988(041)052 AS SHOWN ON THE ACCOMPANYING PLANS.

APPROVED DATE: 3/21/2016  
/s/Justin Froseth  
JUSTIN FROSETH  
CITY ENGINEER MANDAN

I HEREBY CERTIFY THAT THE ATTACHED PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH DAKOTA.

APPROVED DATE: 3/21/2016  
/s/Andrew Werder  
ANDREW WERDER  
PROFESSIONAL ENGINEER

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	2	1
ND	TAU-LCT-1-988(041)052		

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006	2	ENVIRONMENTAL COMMITMENTS
008 & 010	1	ESTIMATE OF QUANTITIES & BASIS OF ESTIMATE
020	1-2	GENERAL DETAILS
060	1-7	PLAN LAYOUT
100	1	WORK ZONE TRAFFIC CONTROL

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D-748-1	CURB& GUTTER AND VALLEY GUTTER
D-750-03	CURB RAMP DETAILS
D-762-1	PAVEMENT MARKING MESSAGE DETAILS

**LIST OF SPECIAL PROVISIONS (SP)**

<u>SP #</u>	<u>DESCRIPTION</u>
SP 3(14)	TEMPORARY EROSION AND SEDIMENT BEST MANAGEMENT PRACTICES

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**NOTE:** CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

Rev'd.			
MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
	TABLE OF CONTENTS		
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	6	1
ND	TAU-LCT-1-988(041)052		

**100-P01** **EQUIPMENT OPERATING RESTRICTIONS:** SECTION 100 The Contractor shall not operate equipment outside the corridor. The corridor shall be defined as the edge of pavement shown on the plan sheets plus three feet on each side where earthwork will be performed or the width of the pavement section plus three feet on each side where only pavement removal and replacement will occur.

**107-P01** **HAUL ROAD RESTRICTIONS:** Before submitting a proposal, contact the appropriate State, County, Township, or City officials to determine if there are any roadways that will be designated as "no haul routes".

**202-P01** **REMOVAL OF CONCRETE:** SECTION 200 Contractor shall remove and reset existing concrete slab and surface mounted bench near Sta 81+50 to adjust the elevation of the pad and bench up to and level with the finished overlay surface of the asphalt trail for accessibility purposes. Slab and bench shall be carefully picked up and reset in one piece with forks or other means and methods so that the slab is not broken or damaged. If Contractor damages bench then a new one shall be provided at the Contractor's expense. All work including additional grading, gravel base, compaction, and equipment shall be included in the Contractor's lump sum bid for "Removal of Concrete".

**202-P02** **REMOVAL OF BITUMINOUS SURFACING:** The cost to sawcut asphalt shall be included in the unit bid price for "Removal of Bituminous Surfacing."

**203-P01** **TOPSOIL - IMPORTED:** All imported topsoil shall be applied to the shoulder of the asphalt overlay and cross slopes shall not exceed 6:1, unless otherwise noted. All imported topsoil must be approved by the Engineer. Installed topsoil shall be raked to grade prior to seeding. Additional raking may be required after seeding to create a uniform surface and eliminate roots. Payment for topsoil shall be contract quantity. All costs associated with this item shall be included in the cubic yard bid price for "Topsoil - Imported".

**251-P01** **SEEDING-CLASS III:** Areas to receive Class III seeding shall be all disturbed areas along the proposed trail. The seed mix and application shall be as follows:

% By Weight	Type	% Pure Live Seed
25	Dimension Perennial Rye	90
25	Brome Grass	90
25	Bonanza Tall Fescue	90
25	Geronimo Kent Blue	90

The above mix shall be applied at 60lbs. / Acre. The hydro mulch shall be applied after the seed is drilled into the topsoil. The seed shall be watered twice daily for three weeks minimum after placement in order to provide sufficient moisture for growth. All cost for labor, equipment, and materials necessary to complete the work will be included in the price bid for "Seeding Class III."

**253-P01** **HYDRAULIC MULCH:** Payment for hydraulic mulch shall be made by plan quantity.

**401-P01** **TRAIL PREPARATION:** SECTION 400 Contractor shall apply chemical weed control to vegetative growth within asphalt. Contractor shall allow 14 days before mechanical removal of dead growth. Work shall be incidental to other bid items.

**401-P02** **TACK COAT:** The Contractor shall apply tack coat to existing surface prior to installing hot bituminous pavement. All costs associated with obtaining, hauling, placing, and all other items associated with the completion of this item shall be included in the per gallon bid price for "Tack Coat".

**430-P01** **COMMERCIAL GRADE HOT MIX ASPHALT:** The Commercial Grade Hot Mix Asphalt must meet the requirements specified for Superpave FAA 40, modified as follows:

- Air voids of the mix design shall be between 1 and 3 percent.
- Asphalt content target shall be 6.5% with an allowable working range as listed in Table 430-07.

Contractor should submit the revised mix design to the Engineer at least 10 calendar days before placement of material.

Contractor shall limit vehicle weight on existing trail to be overlaid. Contractor will be responsible for damage caused to trail. Partial loaded trucks or other means of asphalt delivery are acceptable options. All costs associated with obtaining, hauling, placing, compacting, and all other items associated with the completion of this item shall be included in the per ton bid price for "Commercial Grade Hot Mix Asphalt".

**430-P03** **ORDINARY COMPACTION OF HOT MIX ASPHALT:** Compaction shall be in accordance with Section 430.04 I.3 of the Standard Specifications, 2014, modified as follows; the contractor shall use one self propelled roller such as a single drum or double drum steel roller of adequate size to obtain compaction without damage to the trail surface or the subgrade.

**430-P04** **ACCEPTANCE OF HOT MIX ASPHALT:** The finished trail shall have a smooth surface; free of surface irregularities that would cause a harsh or uneven ride, or would compromise the safety of the trail users. Surface irregularities may include, but are not limited to indentations, broken edges, grooves, blow-ups, pop-outs, imprints from heavy equipment tracks or tires, etc. Any isolated trip hazards of ¼ inch or greater height or depth shall be eliminated by methods to be approved by the engineer. The finished trail shall not be capable of holding standing water on any portion. Any trail surface determined to be in nonconformance with the above specifications shall be overlaid with a one inch minimum depth lift of fines at the contractor's expense. Prior to any overlay, the trail will be thoroughly swept, all irregularities cleaned, and the trail tacked, all at the Contractor's expense. Surface tension cracking will be kept to a minimum by monitoring the rolling, surface temperature, and if need be, adjusting the oil content. Adjusting the oil content in the mix will only be done with permission by the on-site Engineer.

**430-P05** **HOT MIX ASPHALT PATCHING:** In crack patch locations (indicated on plans and note in field by engineer) contractor shall install patch mix per detail 2/20 and 4/20. All mixtures shall be spread and finished by hand work if mechanical equipment is impractical. Compaction of patch areas shall be completed by mechanical tamper to achieve uniform compaction. All labor, materials, and equipment necessary to complete the work shall be included in the price bid for "Hot Bituminous Pavement Patching", oil and emulsion asphalt is incidental to this bid item. Asphalt Patch mix design shall have the same sieves percentages for all materials above the #4 sieve.

SECTION 700

**704-P01** **TRAIL TRAFFIC CONTROL:** Contractor is responsible for traffic control during construction which shall include both vehicle and pedestrian traffic. The majority of the work will be constructed away from vehicular traffic. A set of W21-1a-48 "Workers Symbol" signs is provided when construction activities take place near the road. R9-9-24 "Trail Closed" signs are provided to restrict access to the trail during paving operations and shall be placed near Sta 0+75, Sta 22+16.77, Sta 54+75.00, Sta 55+77.60, Sta 56+41.73, Sta 79+00, Sta 79+61.59, Sta 82+00, Sta 82+50.83, and Sta 99+23.84.

Traffic cones shall be set up per Standard Detail D-704-25 Type X when construction vehicles are located on the adjacent road.

**709-P01** **GEOTEXTILE FABRIC - TYPE R2:** The Contractor shall install an asphalt overlay geotextile fabric over the shared use path to be overlaid per the details shown in the plans. The geotextile fabric shall be Amoco Petromat 4597, Thrace LNQ AOH, US Fabrics Inc. US160NW, or approved equal nonwoven polypropylene paving fabric. The Contractor shall first apply an even spray coat of emulsion asphalt at a rate ranging from 0.30 to 0.40 gallons per square yard. The geotextile fabric shall then be placed over the area sprayed with minimal folds or overlap. The tack oil should absorb into the fabric without excessive bleeding. A minimum of two (2") inches of asphalt pavement shall be placed over the fabric. Measurement and payment for the geotextile fabric Type R-2 shall be by the square yard.

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MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
<b>CONSTRUCTION NOTES</b>			
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## ENVIRONMENTAL COMMITMENTS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	6	2
ND	TAU-LCT-1-806(049)052		

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

**COMMITMENT NO. 1:** Unavoidable impacts to wetlands will be mitigated onsite, adjacent to the project, or at a NDDOT approved mitigation site or bank.

**ACTION TAKEN/REQUIRED:** *No wetlands will be affected by this project.*

**COMMITMENT NO. 2:** Disturbed areas would be returned to pre-construction conditions following construction.

**ACTION TAKEN/REQUIRED:** All disturbed areas will be re-seeded upon completion of construction to match the surrounding vegetation. BMPs will be implemented to minimize the likelihood of invasive plant species while vegetation is being established.

**COMMITMENT NO. 3:** Erosion control devices will be used as needed during construction.

**ACTION TAKEN/REQUIRED:** The contractor shall install and maintain erosion control devices. The contractor is required to obtain a NDPDES Permit from the North Dakota Department of Health prior to construction. As part of the NDPDES Permit, the contractor must have a plan for erosion and sediment control during and post construction.

**COMMITMENT NO. 4:** Fugitive dust emissions created during construction would be minimized.

**ACTION TAKEN/REQUIRED:** The contractor will implement BMPs, such as using water as a palliative, to control dust during construction as appropriate.

**PERMITS REQUIRED:**

*NDPDES (North Dakota Pollutants Discharge Elimination System) – to be obtained by the contractor. The owner of the permit shall be listed as “Mandan Parks and Recreation.”*

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	8 & 10	1
ND	TAU-LCT-1-988(041)052		

**BASIS OF ESTIMATE**

AGGREGATE BASE COURSE CL 5

1.875 TON PER CUBIC YARD OF AGGREGATE BASE COURSE CL 5

COMMERCIAL GRADE HOT MIX ASPHALT

2.0 TON PER CUBIC YARD OF SUPERPAVE FAA 42

PG 58-28 ASPHALT CEMENT

6.5% PG 58-28 ASPHALT CEMENT PER TON OF COMMERCIAL GRADE HOT MIX ASPHALT

EARTHWORK

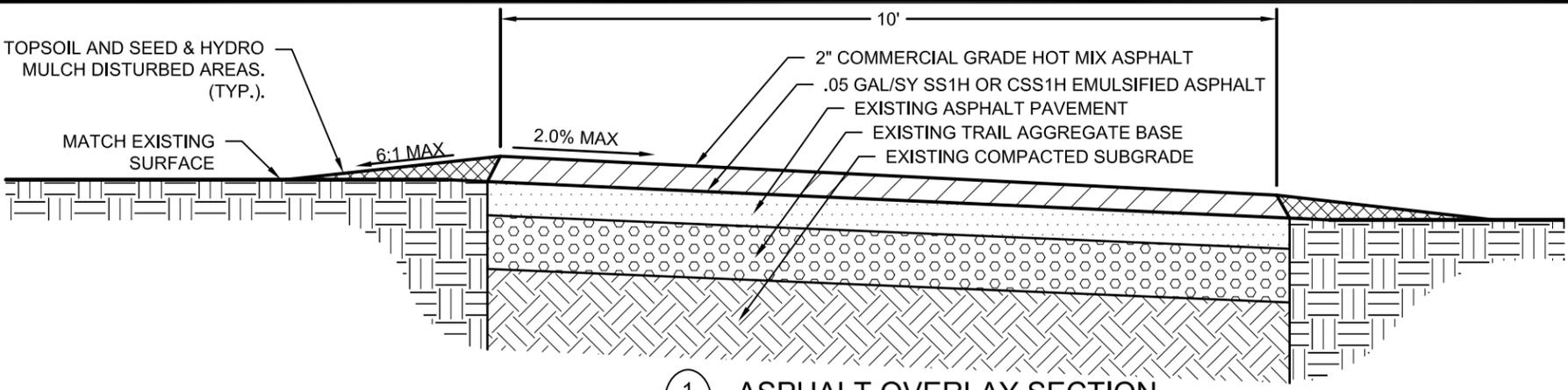
20% SHRINKAGE WAS USED IN THE CALCULATIONS FOR TOPSOIL - IMPORTED

MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION						
3rd ST. SE ~ TROLLEY STATION TO 11th AVE. SE						
1806 HWY ~ 137' NORTH OF 8th AVE. S TO 19th ST. SE						
Estimate Total Length = 6,751 LF (1.279 Miles)						
SPEC	CODE	ITEM	UNIT	QUANTITIES ~ TAU-LCT-1-988(041)052	QUANTITIES ~ TAU-LCT-1-806(049)068	TOTAL QUANTITIES
103	0100	CONTRACT BOND	L SUM	0.3	0.7	1
202	0115	REMOVAL OF CONCRETE-SITE 1	L SUM	0	1	1
202	0131	REMOVAL OF CURB - TYPE 1	LF	40	160	200
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	712	208	920
203	0119	TOPSOIL - IMPORTED	CY	46	155	201
234	0106	SS1H OR CSS1H EMULSIFIED ASPHALT	GAL	120	260	380
251	0300	SEEDING - CLASS III	AC	0.13	0.57	0.7
253	0201	HYDRUALIC MULCH	AC	0.13	0.57	0.7
302	0120	AGGREGATE BASE COURSE CL 5	TON	169	73	242
411	0602	MILLING 2IN BITUMINOUS PAVEMENT	SY	17	0	17
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	460	610	1070
430	2000	PATCHING	TON	5	6	11
430	5828	PG 58-28 ASPHALT CEMENT	TON	29.9	39.8	69.7
702	0100	MOBILIZATION	L SUM	0.3	0.7	1
704	0100	FLAGGING	MHR	24	56	80
704	1000	TRAFFIC CONTROL SIGNS	UNIT	81	81	162
704	1050	TYPE I BARRICADE	EA	2	2	4
704	1065	TRAFFIC CONES	EA	6	6	12
709	0702	GEOTEXTILE FABRIC-TYPE R2	SY	67	55	122
748	0100	CURB & GUTTER	LF	0	160	160
750	0115	CONCRETE SIDEWALK 4IN	SY	27	113	140
750	2115	DETECTABLE WARNING PANELS	SF	40	160	200
762	1325	PREFORMED PATTERNED PVMT MK 24 IN LINE-GROOVED	LF	70	300	370

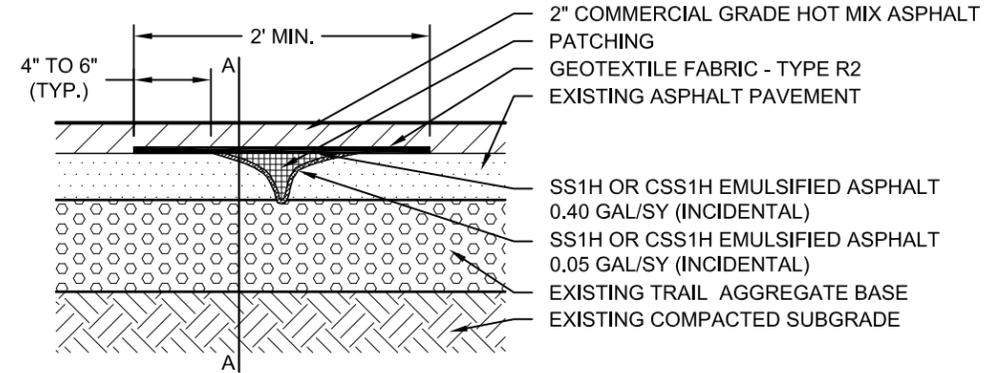
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MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
		ESTIMATED QUANTITIES & BASIS OF ESTIMATE	
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	20	1
ND	TAU-LCT-1-988(041)052		

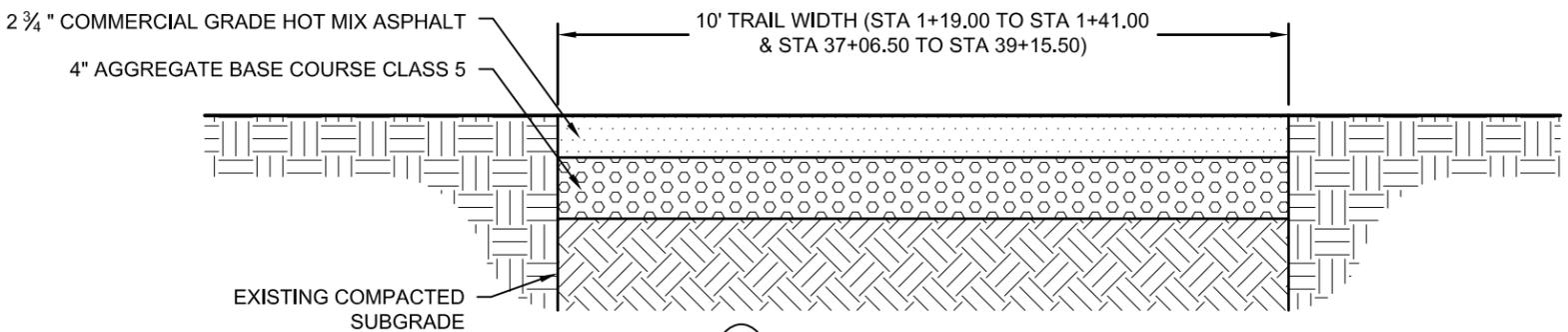


**1**  
20  
**ASPHALT OVERLAY SECTION**  
NOT TO SCALE

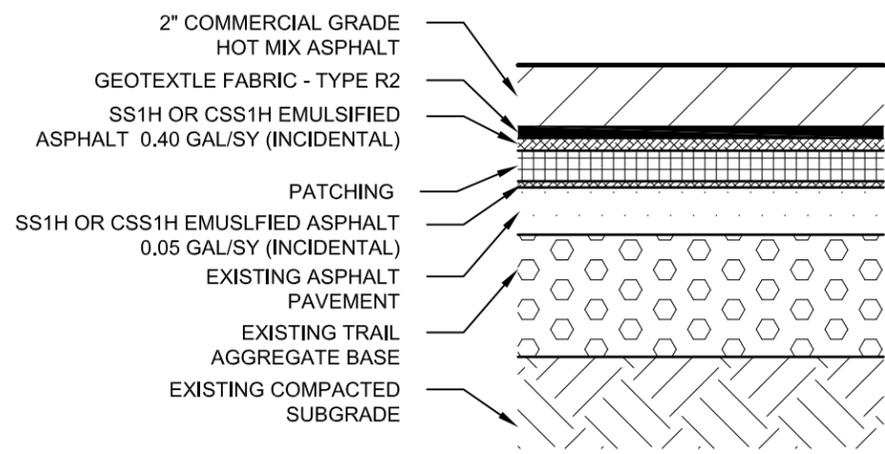


- NOTES:
1. CRACK SHALL BE BLOWN OUT WITH COMPRESSED AIR AT A WORKING PRESSURE OF AT LEAST 90 PSI.
  2. CRACK REPAIR TO BE COMPLETED IN MULTIPLE LOCATIONS THROUGHOUT THE PROJECT AREA. EXACT CRACK REPAIR LOCATIONS SHALL BE MARKED BY THE ENGINEER IN THE FIELD.

**2**  
20  
**ASPHALT CRACK REHABILITATION DETAIL**  
NOT TO SCALE



**3**  
20  
**NEW TRAIL SECTION**  
NOT TO SCALE



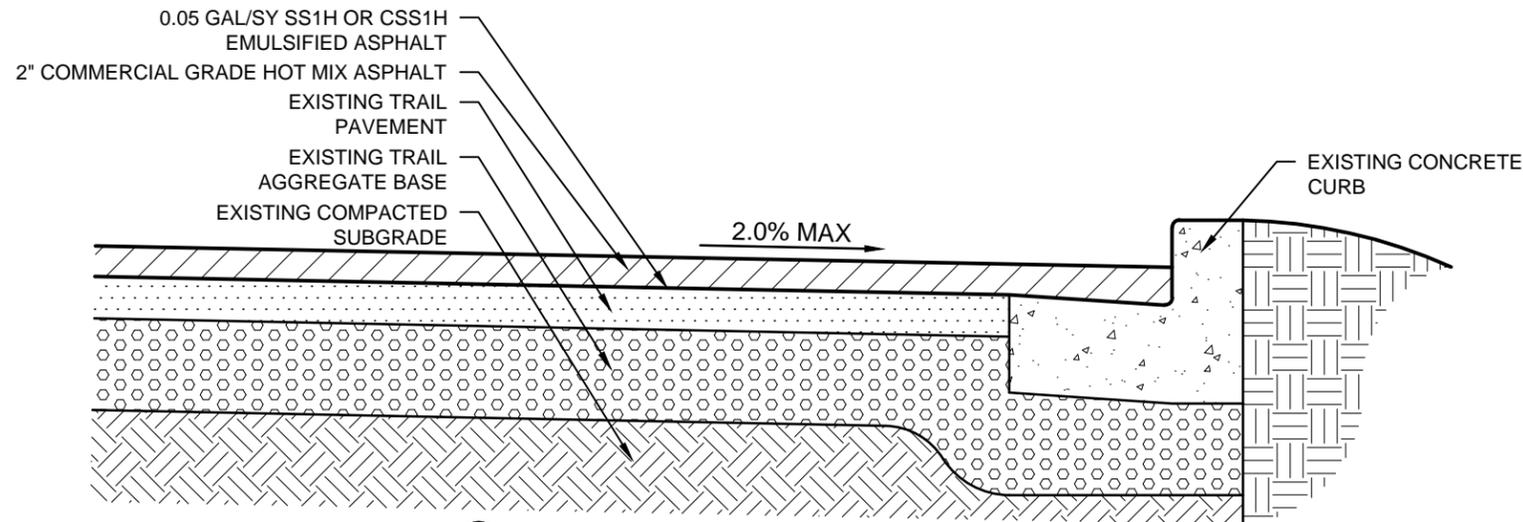
**SECTION A-A**

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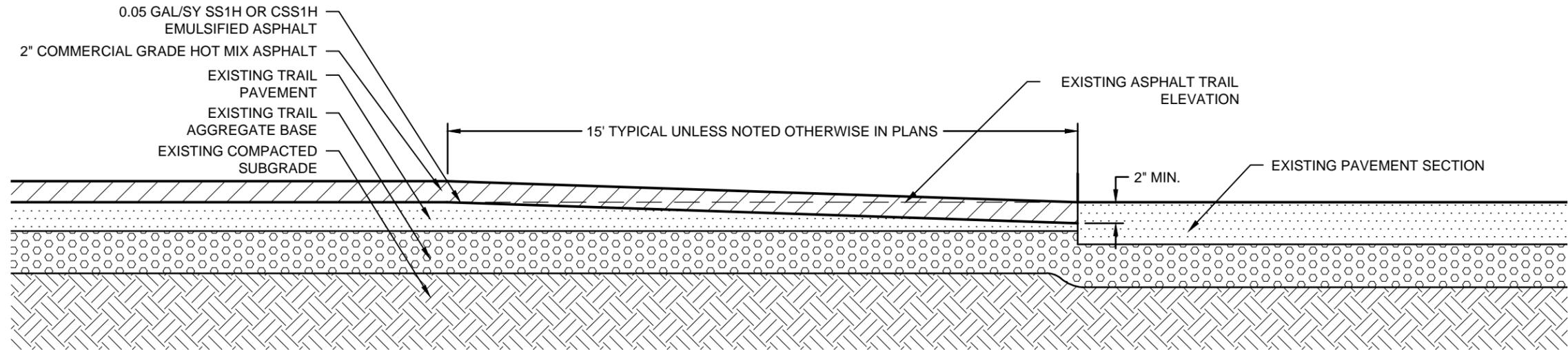
**NOTE:** CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

Rev'd.			
MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
<b>KLJ</b>		GENERAL DETAILS	
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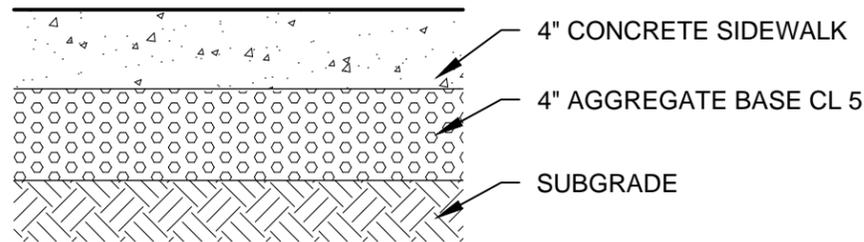
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	20	2
ND	TAU-LCT-1-988(041)052		



4  
20 CURB EDGE OVERLAY DETAIL  
NOT TO SCALE



5  
20 MILL TAPER AND OVERLAY DETAIL  
NOT TO SCALE



6  
20 CONCRETE SIDEWALK - 4IN  
NOT TO SCALE

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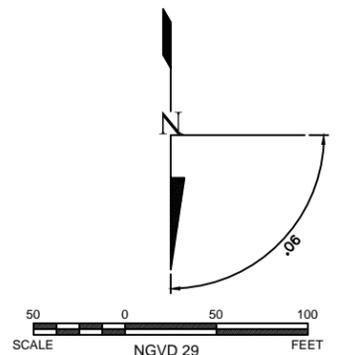
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MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
	GENERAL DETAILS		
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	60	1
ND	TAU-LCT-1-988(041)052		



**PLAN NOTES:**

- ① INSTALL 2IN OVERLAY ON EXISTING TRAIL. SEE DETAIL 1/20.
- ② APPLY HOT MIX ASPHALT PATCHING TO MATCH ELEVATION OF EXISTING TRAIL WHERE DEPRESSED CRACKS OCCUR PRIOR TO 2IN ASPHALT OVERLAY. THIS SHEET HAS APPROXIMATELY 170LF OF CRACKS REQUIRING PATCHING. SEE DETAIL 2/20.
- ③ ADD TOPSOIL BACKFILL ALONG TRAIL TO ELIMINATE TRAIL UNDERMINING ISSUE. 5 CY EACH LOCATION.
- ④ OVERLAY GUTTER PAN WITH 2IN ASPHALT OVERLAY. SEE DETAIL 4/20.
- ⑤ SAWCUT AND REMOVE EXISTING ASPHALT. INSTALL NEW TRAIL SECTION. SEE DETAIL 3/20. STA. 0+75 TO STA. 0+90.
- ⑥ MILL TAPER ENTIRE EXISTING ASPHALT TRAIL WIDTH 2IN DEPTH. SEE DETAIL 5/20. STA. 0+75 TO STA. 1+05.



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**LEGEND:**

- 2IN ASPHALT OVERLAY. SEE DETAIL ①/20.
- 2IN ASPHALT MILL SEE DETAILS ⑤/20.
- REMOVE AND REPLACE ASPHALT PAVEMENT ③/20.

REMOVAL OF BITUMINOUS SURFACING	17 SY	SEEDING - CLASS III	0.07 AC
TOPSOIL - IMPORTED	27 CY	HYDRO MULCH	0.07 AC
SS1H OR CSS1H EMULSIFIED ASPHALT	70 GAL	GEOTEXTILE FABRIC - TYPE R2	38 SY
AGGREGATE BASE COURSE CL 5	4 TON		
COMMERCIAL GRADE HOT MIX ASPHALT	160 TON		
PATCHING	3 TON		
MILLING 2IN BITUMINOUS PAVEMENT	17 SY		
PG-58-28 ASPHALT CEMENT	10.4 TON		

**NOTES:**

AERIAL IMAGE FOR REFERENCE ONLY.

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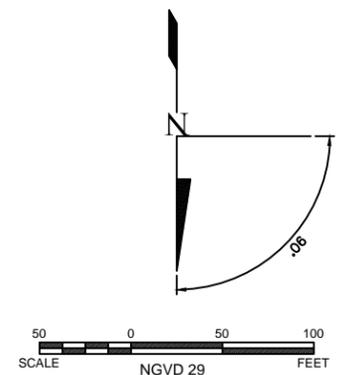
Rev'd.			
MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
	LAYOUT PLAN Sta 0+00 to 11+00		
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	60	2
ND	TAU-LCT-1-988(041)052		



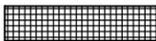
**PLAN NOTES:**

- ① INSTALL 2IN OVERLAY ON EXISTING TRAIL. SEE DETAIL 1/20.
- ② APPLY HOT MIX ASPHALT PATCHING TO MATCH ELEVATION OF EXISTING TRAIL WHERE DEPRESSED CRACKS OCCUR PRIOR TO 2IN ASPHALT OVERLAY. THIS SHEET HAS APPROXIMATELY 130LF OF CRACKING REQUIRING PATCHING. SEE DETAIL 2/20.
- ④ OVERLAY GUTTER PAN WITH 2IN ASPHALT OVERLAY. SEE DETAIL 4/20.
- ⑤ SAWCUT AND REMOVE EXISTING ASPHALT. INSTALL NEW TRAIL SECTION. SEE DETAIL 3/20. STA. 18+29 TO STA. 21+00.



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**LEGEND:**

-  2IN ASPHALT OVERLAY. SEE DETAIL (1/20).
-  REMOVE AND REPLACE ASPHALT PAVEMENT (3/20).

REMOVAL OF BITUMINOUS SURFACING	471 SY
TOPSOIL - IMPORTED	15 CY
AGGREGATE BASE COURSE CL5	105 TON
SS1H OR CSS1H EMULSIFIED ASPHALT	50 GAL
COMMERCIAL GRADE HOT MIX ASPHALT	260 TON
PATCHING	2 TON
PG-58-28 ASPHALT CEMENT	16.9 TON
SEEDING - CLASS III	0.05 AC
HYDRO MULCH	0.05 AC
GEOTEXTILE FABRIC - TYPE R2	29 SY

**NOTES:**

AERIAL IMAGE FOR REFERENCE ONLY.

**NOTE:** CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

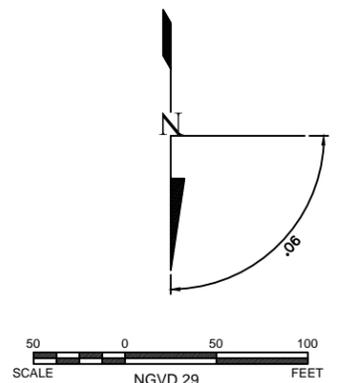
Rev'd.			
MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
		LAYOUT PLAN Sta 11+00 to 21+00	
DRWN. BY JMM	CHKD BY DMM	PROJECT NO. 1415131	DATE 03/08/2016
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	60	3
ND	TAU-LCT-1-988(041)052		



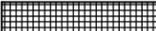
**PLAN NOTES:**

- ① INSTALL 2IN OVERLAY ON EXISTING TRAIL. SEE DETAIL 1/20.
- ⑤ SAWCUT AND REMOVE EXISTING ASPHALT. INSTALL NEW TRAIL SECTION. SEE DETAIL 3/20. STA. 21+00 TO STA. 22+17.
- ⑨ CURB RAMP. SEE DETAIL 6/20 & STANDARD DETAIL D-750-3.
- ⑩ INSTALL NEW CURB AND GUTTER.
- ⑬ 24 IN PAVEMENT MARKING (10' WIDE EA).



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**LEGEND:**

-  2IN ASPHALT OVERLAY. SEE DETAIL ①/20.
-  REMOVE AND REPLACE ASPHALT PAVEMENT ③/20.

REMOVAL OF BITUMINOUS SURFACING	224 SY	CURB & GUTTER	40 LF
REMOVAL OF CURB - TYPE 1	40 LF	CONCRETE SIDEWALK 4 IN	27 SY
TOPSOIL - IMPORTED	4 CY	DETECTABLE WARNING PANELS	40 SF
AGGREGATE BASE COURSE CL5	60 TON	PREFORMED PATTERNED PVMT MK 24 IN LINE-GROOVED	70LF
COMMERCIAL GRADE HOT MIX ASPHALT	40 TON		
PG-58-28 ASPHALT CEMENT	2.6 TON		
SEEDING - CLASS III	0.01 AC		
HYDRO MULCH	0.01 AC		

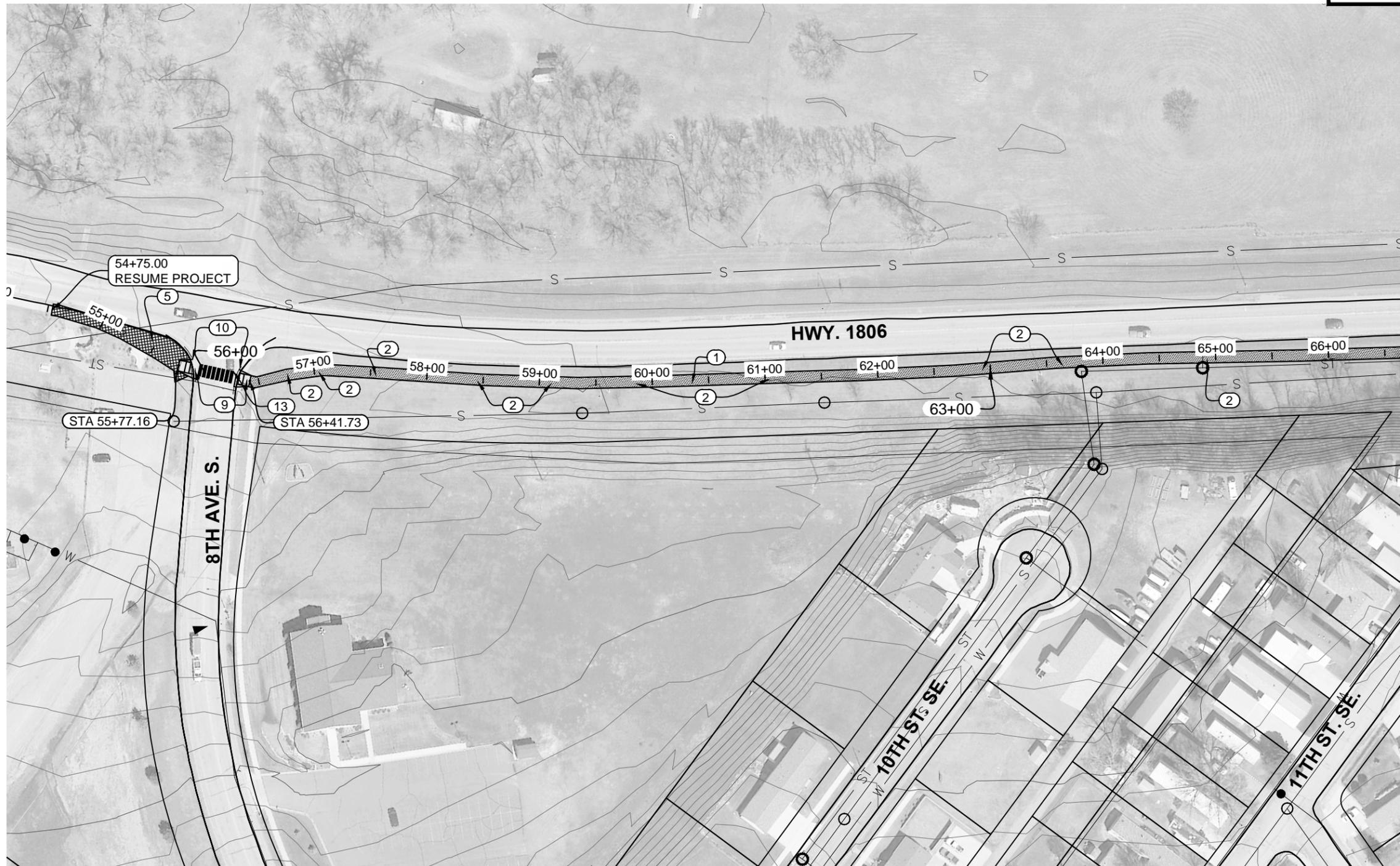
**NOTES:**

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**NOTE:** CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

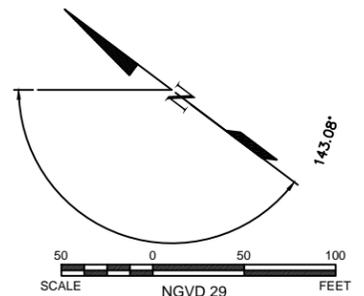
Rev'd.			
MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
		LAYOUT PLAN Sta 21+00 to 32+00	
DRWN. BY JMM	CHKD BY DMM	PROJECT NO. 1415131	DATE 03/08/2016
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	60	4
ND	TAU-LCT-1-988(041)052		



**PLAN NOTES:**

- ① INSTALL 2IN OVERLAY ON EXISTING TRAIL. SEE DETAIL 1/20.
- ② APPLY HOT MIX ASPHALT PATCHING TO MATCH ELEVATION OF EXISTING TRAIL WHERE DEPRESSED CRACKS OCCUR PRIOR TO 2IN ASPHALT OVERLAY. THIS SHEET HAS APPROXIMATELY 168LF OF CRACKING REQUIRING PATCHING. SEE DETAIL 2/20.
- ⑤ SAWCUT AND REMOVE EXISTING ASPHALT. INSTALL NEW TRAIL SECTION. SEE DETAIL 3/20. STA. 54+75 TO STA. 55.77.
- ⑨ CURB RAMP. SEE DETAIL 6/20 & STANDARD DETAIL D-750-3.
- ⑩ INSTALL NEW CURB AND GUTTER.
- ⑬ 24 IN PAVEMENT MARKING (10' WIDE EA).



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**LEGEND:**

-  2IN ASPHALT OVERLAY. SEE DETAIL ①/20.
-  REMOVE AND REPLACE ASPHALT PAVEMENT ③/20.

REMOVAL OF BITUMINOUS SURFACING	208 SY	SEEDING - CLASS III	0.13 AC
REMOVAL OF CURB & GUTTER	40 LF	HYDRO MULCH	0.13 AC
TOPSOIL - IMPORTED	35 CY	GEOTEXTILE FABRIC - TYPE R2	37 SY
AGGREGATE BASE COURSE CL5	55 TON	CURB AND GUTTER	40 LF
SS1H OR CSS1H EMULSIFIED ASPHALT	60 GAL	CONCRETE SIDEWALK - 4IN	33 SY
COMMERCIAL GRADE HOT MIX ASPHALT	170 TON	DETECTABLE WARNING PANELS	40 SF
PATCHING	2 TON	PREFORMED PATTERNED PVMT MK 24 IN LINE-GROOVED	80 LF
PG-58-28 ASPHALT CEMENT	11.1 TON		

**NOTES:**

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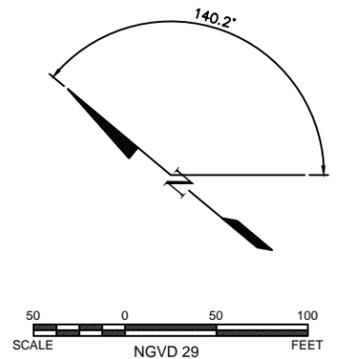
Rev'd.			
MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
		LAYOUT PLAN Sta 54+75 to 66+00	
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	60	5
ND	TAU-LCT-1-988(041)052		



**PLAN NOTES:**

- ① INSTALL 2IN OVERLAY ON EXISTING TRAIL. SEE DETAIL 1/20.
- ② APPLY HOT MIX ASPHALT PATCHING TO MATCH ELEVATION OF EXISTING TRAIL WHERE DEPRESSED CRACKS OCCUR PRIOR TO 2IN ASPHALT OVERLAY. THIS SHEET HAS APPROXIMATELY 10LF OF CRACKING REQUIRING PATCHING. SEE DETAIL 2/20.



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**LEGEND:**

2IN ASPHALT OVERLAY. SEE DETAIL

<u>TOPSOIL - IMPORTED</u>	41 CY
<u>SS1H OR CSS1H EMULSIFIED ASPHALT</u>	65 GAL
<u>COMMERCIAL GRADE HOT MIX ASPHALT</u>	150 TON
<u>PATCHING</u>	1 TON
<u>PG-58-28 ASPHALT CEMENT</u>	9.8 TON
<u>SEEDING - CLASS III</u>	0.15 AC
<u>HYDRO MULCH</u>	0.15 AC
<u>GEOTEXTILE FABRIC - TYPE R2</u>	2 SY

**NOTES:**

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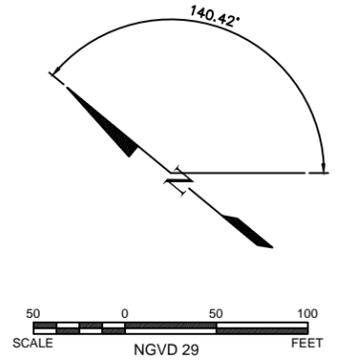
**NOTE:** CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

Rev'd.			
MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
 <b>KLJ</b>		LAYOUT PLAN	
		Sta 66+00 to 77+00	
DRWN. BY JMM	CHKD BY DMM	PROJECT NO. 1415131	DATE 03/08/2016
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	60	6
ND	TAU-LCT-1-988(041)052		



- PLAN NOTES:**
- ① INSTALL 2IN OVERLAY ON EXISTING TRAIL. SEE DETAIL 1/20.
  - ② APPLY HOT MIX ASPHALT PATCHING TO MATCH ELEVATION OF EXISTING TRAIL WHERE DEPRESSED CRACKS OCCUR PRIOR TO 2IN ASPHALT OVERLAY. THIS SHEET HAS APPROXIMATELY 30 LF OF CRACKING REQUIRING PATCHING. SEE DETAIL 2/20.
  - ⑨ CURB RAMP. SEE DETAIL 6/20 & STANDARD DETAIL D-750-3.
  - ⑩ INSTALL NEW CURB AND GUTTER.
  - ⑪ RAISE EXISTING BENCH, TRASH RECEPTACLE AND CONCRETE SLAB TO MATCH NEW TRAIL ELEVATION. STA. 81+50.
  - ⑫ TRANSITION TAPER TO ASPHALT TO BLEND WITH ADJACENT DRIVEWAY AND DRIVEWAY APRON.
  - ⑬ 24 IN PAVEMENT MARKING (10' WIDE EA).



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**LEGEND:**  
 2IN ASPHALT OVERLAY. SEE DETAIL 1/20.

REMOVAL OF CURB & GUTTER	80 LF	HYDRO MULCH	0.14 AC
TOPSOIL - IMPORTED	37 CY	GEOTEXTILE FABRIC - TYPE R2	7 SY
AGGREGATE BASE COURSE CL 5	12 TON	CURB & GUTTER	80 LF
SS1H OR CSS1H EMULSIFIED ASPHALT	60 GAL	CONCRETE SIDEWALK - 4IN	53 SY
COMMERCIAL GRADE HOT MIX ASPHALT	135 TON	DETECTABLE WARNING PANELS	80 SF
PATCHING	1 TON	REMOVAL OF CONCRETE	1 EA
PG-58-28 ASPHALT CEMENT	8.8 TON	PREFORMED PATTERNED PVMT MK 24 IN LINE-GROOVED	130 LF
SEEDING - CLASS III	0.14 AC		

**NOTE:** CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

**NOTES:**  
 AERIAL IMAGE FOR REFERENCE ONLY.

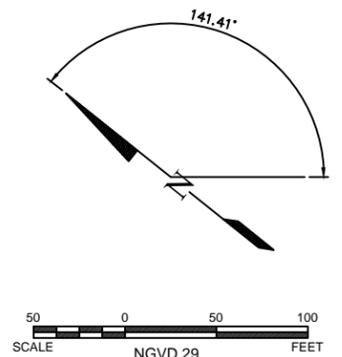
Rev'd.			
MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
LAYOUT PLAN		Sta 77+00 to 88+00	
DRWN. BY JMM	CHKD BY DMM	PROJECT NO. 1415131	DATE 03/08/2016
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAU-LCT-1-806(049)068	60	7
ND	TAU-LCT-1-988(041)052		



**PLAN NOTES:**

- ① INSTALL 2IN OVERLAY ON EXISTING TRAIL. SEE DETAIL 1/20.
- ② APPLY HOT MIX ASPHALT PATCHING TO MATCH ELEVATION OF EXISTING TRAIL WHERE DEPRESSED CRACKS OCCUR PRIOR TO 2IN ASPHALT OVERLAY. THIS SHEET HAS APPROXIMATELY 170LF OF CRACKING REQUIRING PATCHING. SEE DETAIL 2/20.
- ⑨ CURB RAMP. SEE DETAIL 6/20 & STANDARD DETAIL D-750-3.
- ⑩ INSTALL NEW CURB AND GUTTER.
- ⑫ TRANSITION TAPER ASPHALT TO BLEND WITH ADJACENT DRIVEWAY AND DRIVEWAY APRON.
- ⑬ 24 IN PAVEMENT MARKING (10' EA).



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**LEGEND:**

2IN ASPHALT OVERLAY. SEE DETAIL  $\frac{1}{20}$ .

REMOVAL OF CURB & GUTTER	40 LF	SEEDING - CLASS III	0.15 AC
TOPSOIL - IMPORTED	42 CY	HYDRAULIC MULCH	0.15 AC
AGGREGATE BASE COURSE CL 5	6 TON	GEOTEXTILE FABRIC - TYPE R2	9 SY
SS1H OR CSS1H EMULSIFIED ASPHALT	75 GAL	CURB & GUTTER	40 LF
COMMERCIAL GRADE HOT MIX ASPHALT	155 TON	CONCRETE SIDEWALK - 4IN	27 SY
PATCHING	2 TON	DETECTABLE WARNING PANEL	40 SF
PG-58-28 ASPHALT CEMENT	10.1 TON	PREFORMED PATTERNED PVMT MK 24 IN LINE-GROOVED	90 LF
MILLING 2IN BITUMINOUS PAVEMENT	6 SY		

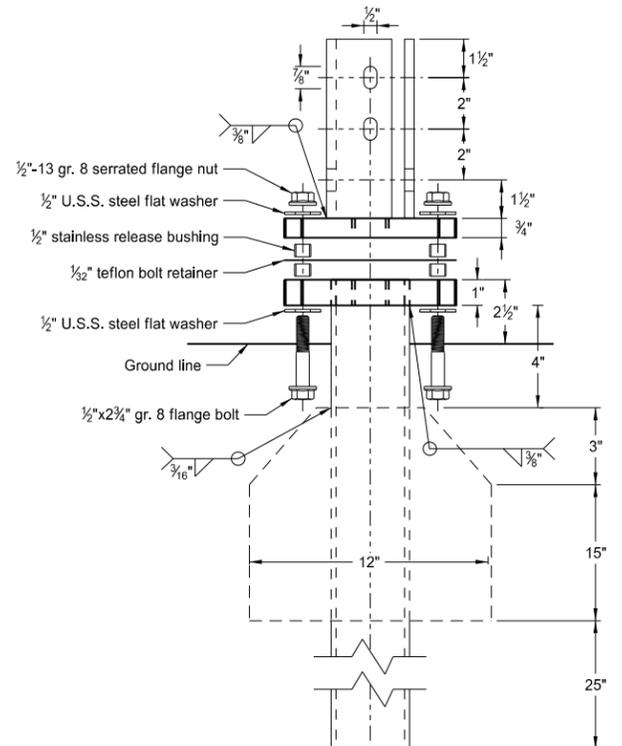
**NOTES:**

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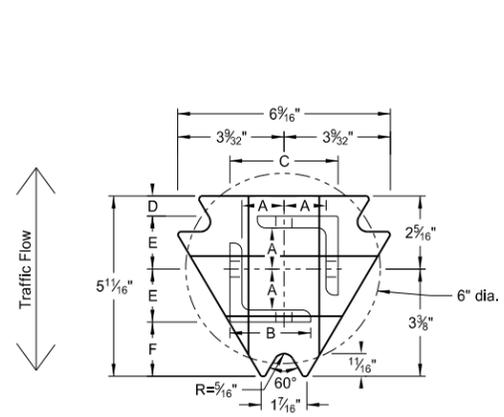
Rev'd.			
MILLENNIUM TRAIL - SHARED USE PATH REHABILITATION MANDAN PARKS AND RECREATION MANDAN, NORTH DAKOTA			
LAYOUT PLAN		Sta 88+00 to 100+42	
DRWN. BY JMM	CHKD BY DMM	PROJECT NO. 1415131	DATE 03/08/2016
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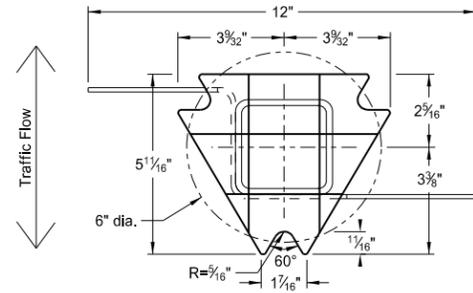


Multi-Directional Slip Base Assembly

Perforated Tube



Top Post Receiver  
Plate - ASTM A572 grade 50  
Angle Receiver - 2 1/2 x 2 1/2 x 3/8 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

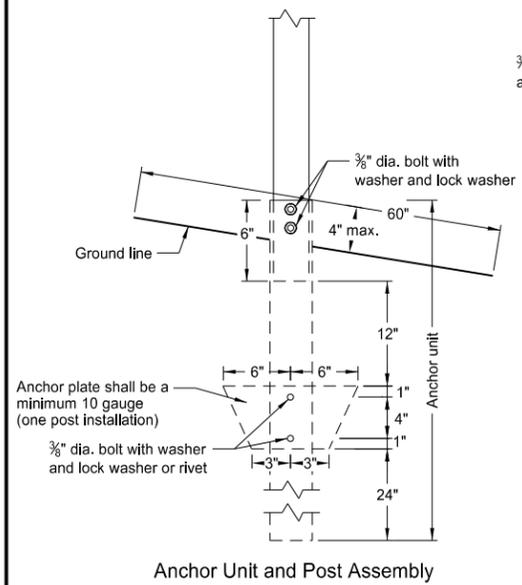
Notes:

1. Slip base bolts shall be torqued as specified by the manufacturer.
2. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI.
3. The 4" vertical clearance is required for the anchor or breakaway base. The 4"x60" measurement shall be made above and below post location and also back and ahead of the post.
4. When used in concrete sidewalk, anchor shall be same except without the wings.
5. Four post signs shall have over 7' between the first and the fourth posts.

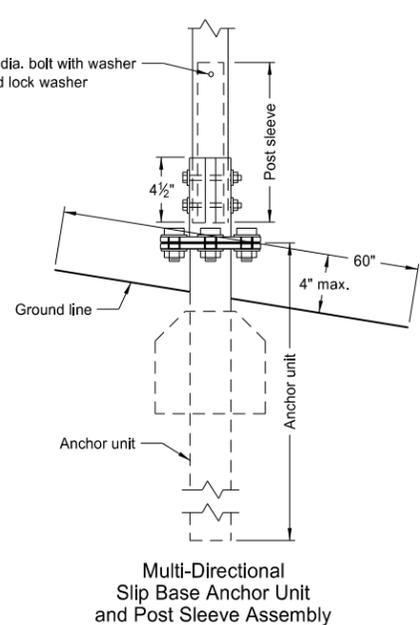
Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	12			Yes	
2	2 1/4	10	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in. <sup>4</sup>	Cross Sec. Area in. <sup>2</sup>	Section Modulus in. <sup>3</sup>
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785

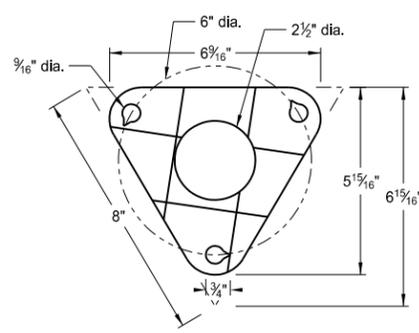
Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 9/64"	2 1/2"	3 1/32"	2 5/32"	1 33/64"	1 1/8"
2 1/2"x10 ga.	1 9/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"



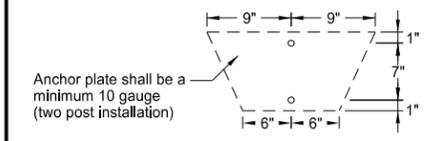
Anchor Unit and Post Assembly



Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



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



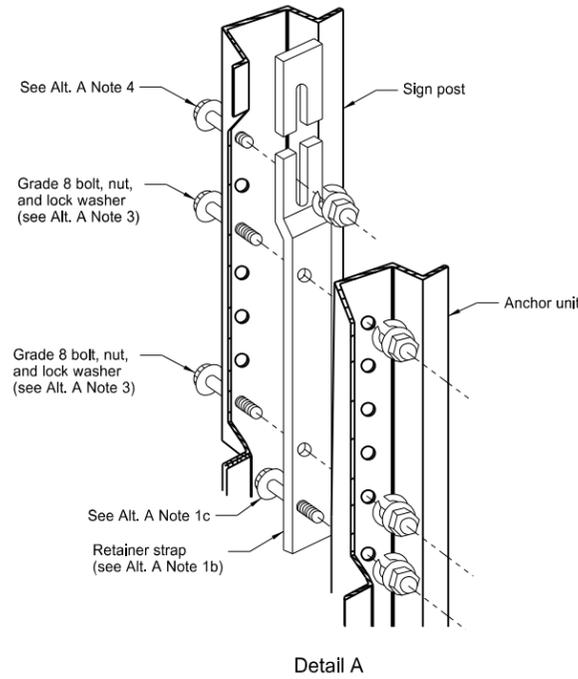
Anchor plate shall be a minimum 10 gauge (two post installation)

- (A) The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak.  
 (B) The 2 3/16"x10 ga. may be inserted into 2 1/2"x10 ga. for additional wind load.

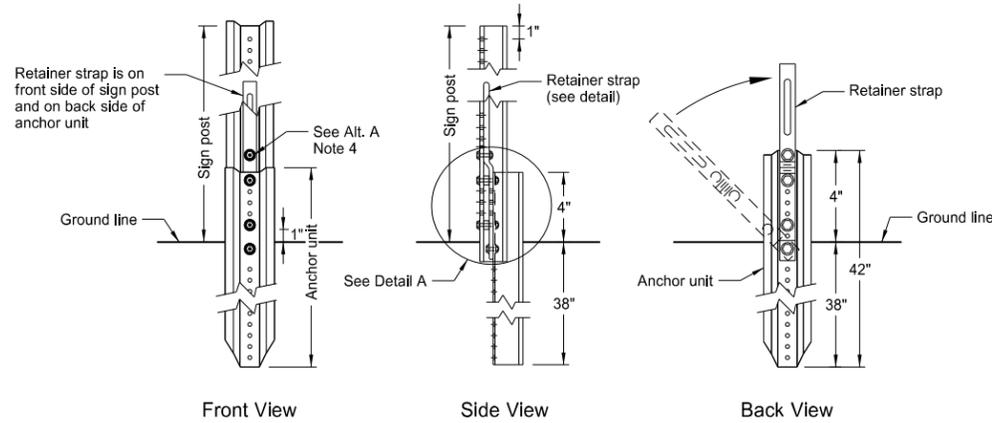
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE

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U-Channel Post



Detail A



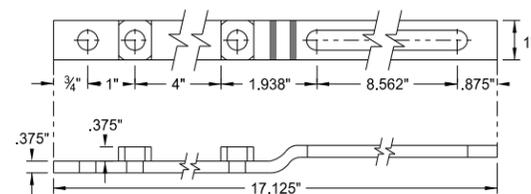
Front View

Side View

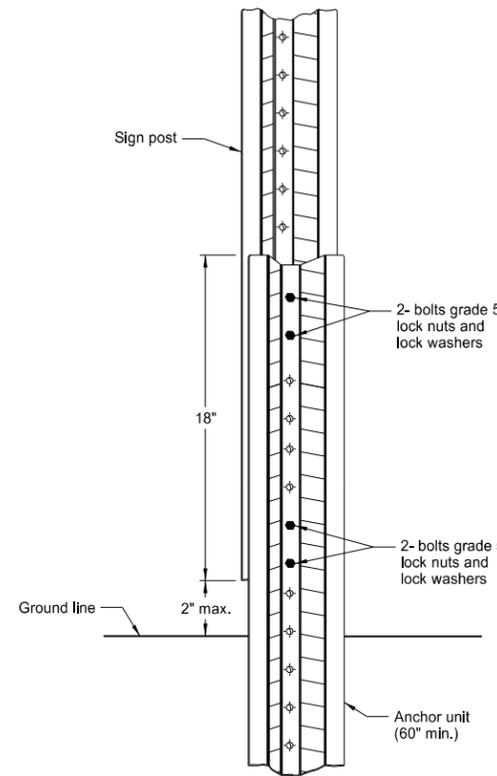
Back View

Breakaway U-Channel Detail Alternate A

A maximum of 2 posts shall be installed within 7'.

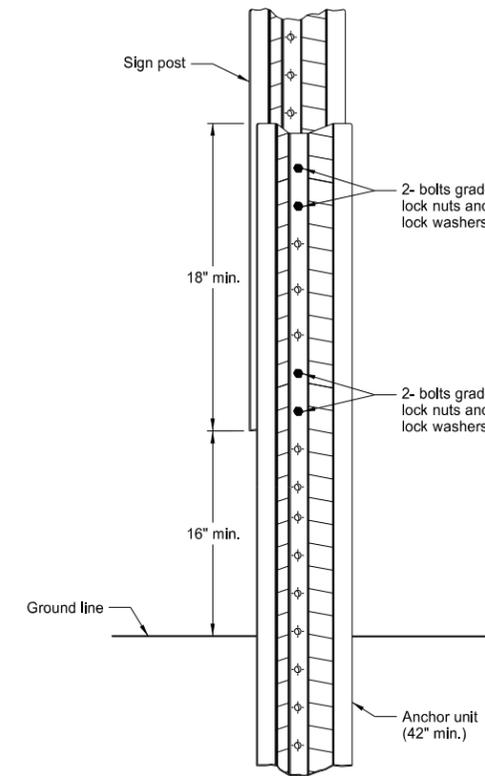


Retainer Strap Detail



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

A maximum of 3 posts shall be installed within 7'.



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

A maximum of 3 posts shall be installed within 7'.

Alternate A Steps of Installation:

1. a) Drive anchor unit to within 12" of ground level.  
b) Proper assembly established by lining up the bottom hole of retainer strap with the 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. The base post, strap and sign post shall be properly nested. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

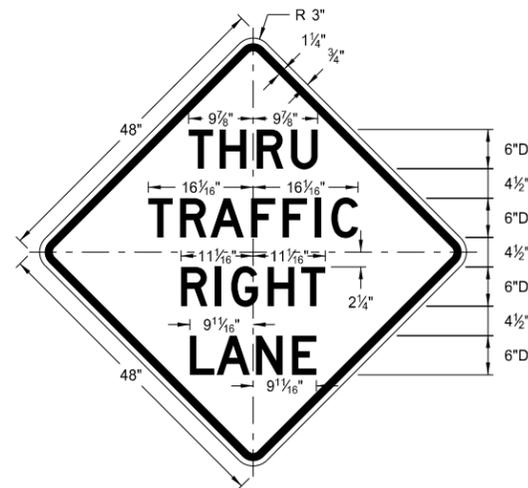
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE

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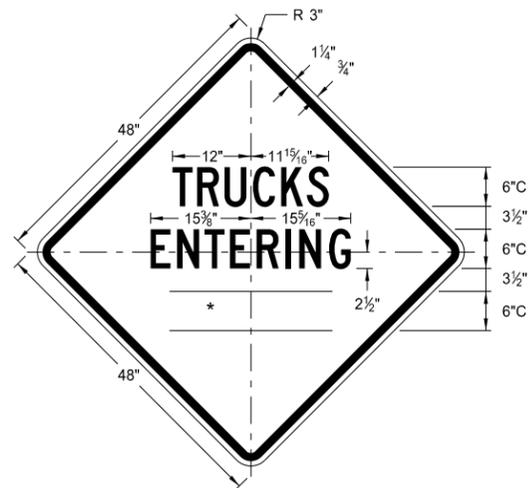
CONSTRUCTION SIGN DETAILS  
WARNING SIGNS

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

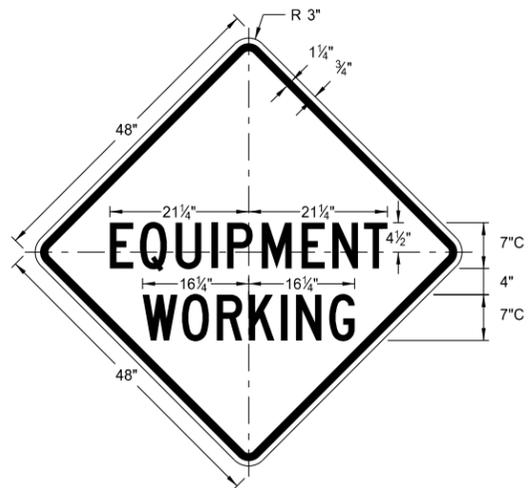
\* DISTANCE MESSAGES



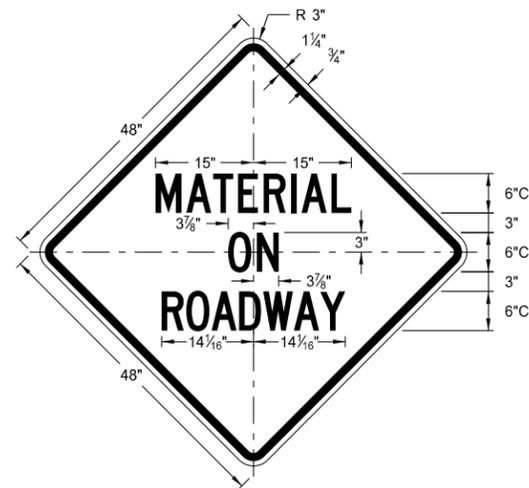
W5-8-48  
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Background: orange



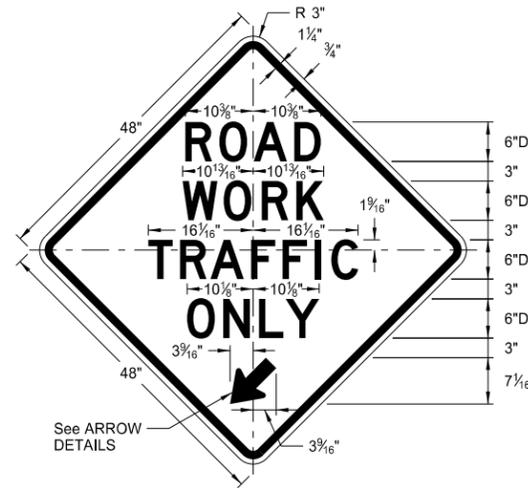
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Background: orange



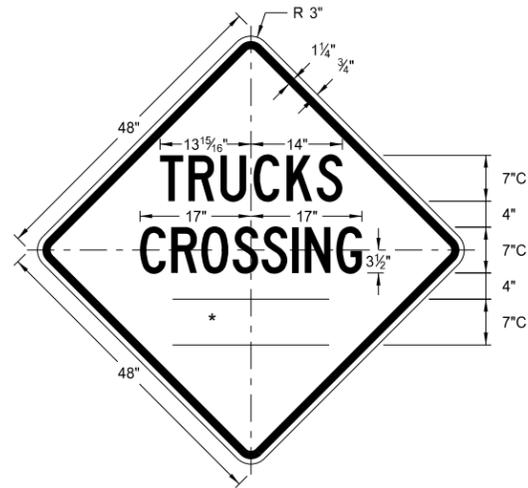
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Background: orange



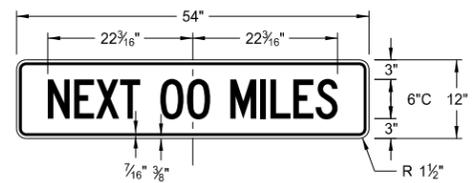
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Background: orange



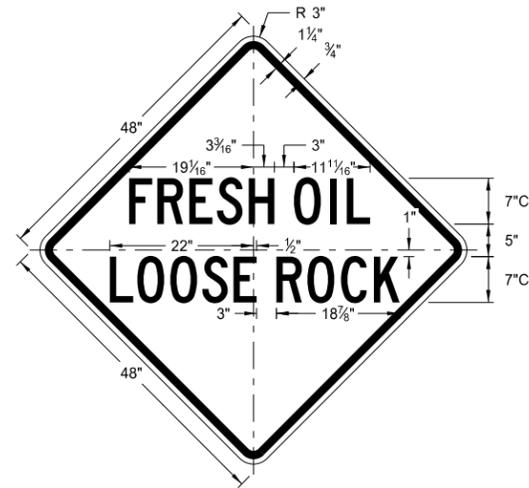
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Background: orange



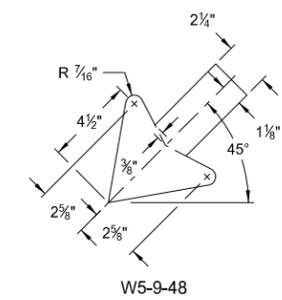
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Background: orange



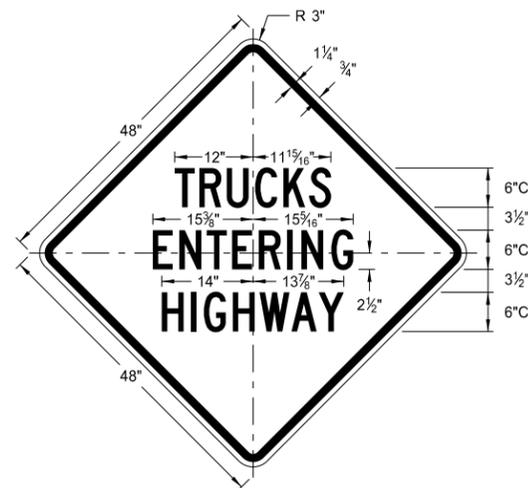
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Background: orange



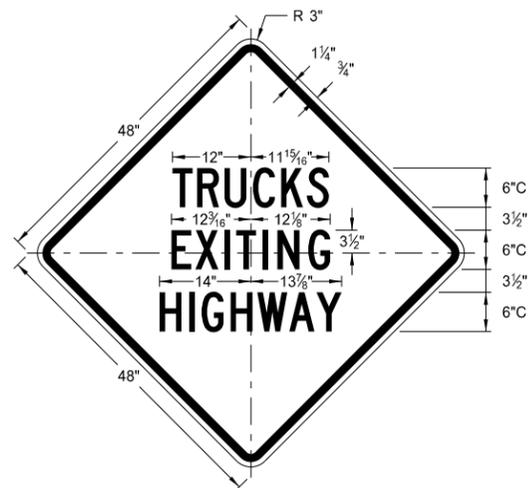
W22-8-48  
Legend: black (non-refl)  
Background: orange



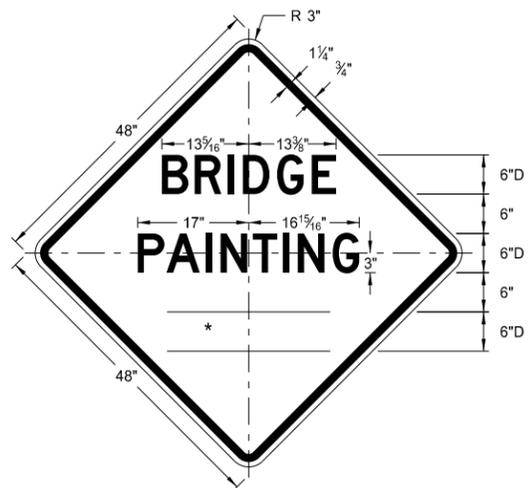
W5-9-48  
ARROW DETAILS



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



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

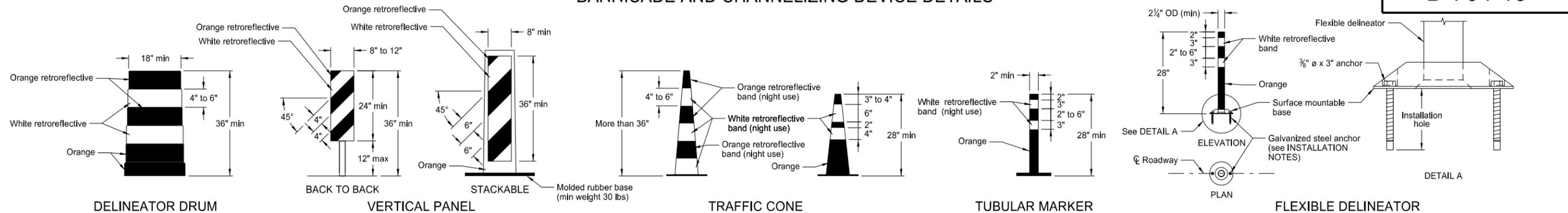


W21-50-48  
Legend: black (non-refl)  
Background: orange

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
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BARRICADE AND CHANNELIZING DEVICE DETAILS



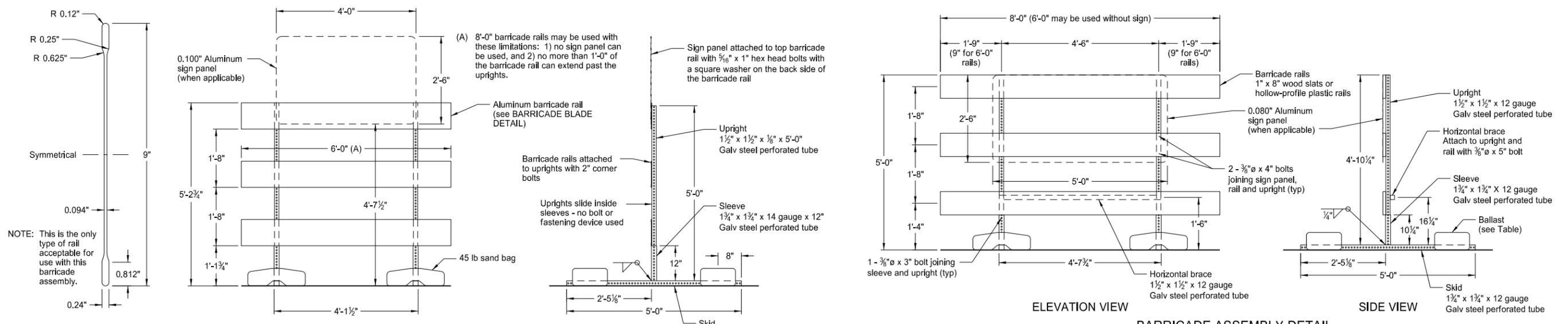
- INSTALLATION NOTES:**
1. Drill installation holes to diameter and depth as required by manufacturer's specifications.
  2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
  3. In lieu of bolted down base, the contractor may use an 8" x 8" butyl pad or hot melt butyl. Butyl shall be removed as close as possible to pavement surface.

The markings on drums shall be horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide. Each drum shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectORIZED spaces between the horizontal orange and white stripes shall not exceed 3" wide. Stripes shall not be placed on ribs or indentations in the drum. Drums shall have closed tops that will not allow collection of construction debris or other debris. Ballast shall not be placed on the top of a drum.

Markings for vertical panels shall be alternating orange and white retroreflective stripes, sloping downward in the direction vehicular traffic is to pass. Retroreflective sheeting shall be placed on both sides of panel and shall have 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, a stripe width of 6 inches shall be used.

RetroreflectORIZATION of cones more than 36" in height shall be provided by alternating orange and white retroreflective stripes. Each cone shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectORIZED space between the orange and white stripes shall not exceed 3" wide.

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



NOTE: Markings for barricades shall be alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Retroreflective sheeting shall be placed on both sides of the rails and shall have a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", the rail stripe width shall be 4".

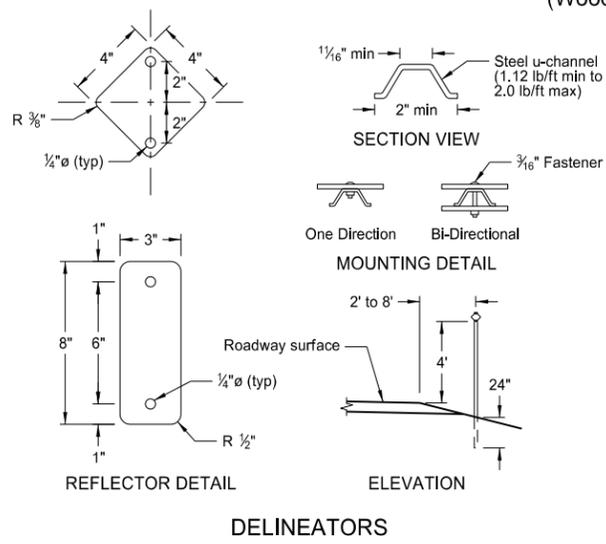
**MINIMUM BALLAST**  
(For each side of barricade support)

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

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

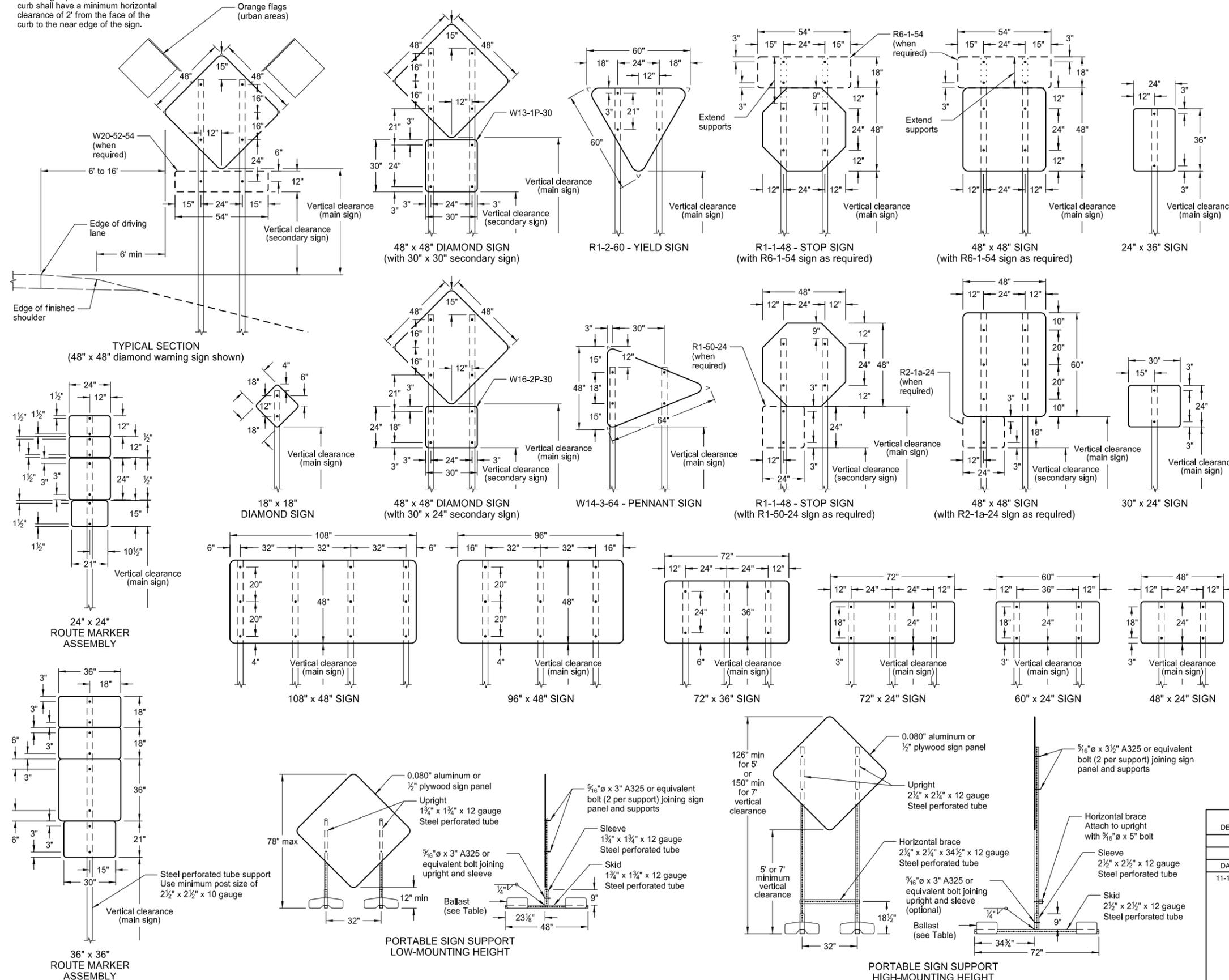
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10-3-13	
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CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

Note: Signs placed in sections with curb shall have a minimum horizontal clearance of 2' from the face of the curb to the near edge of the sign.



NOTES:

1. Sign Supports: Supports shall be galvanized or painted. 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, the minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes are based on a wind speed of 55 MPH.

Signs over 50 square feet should be installed on 2 1/2" x 2 1/2" perforated tube supports as a minimum.

Guy wires shall not be attached to sign supports. Wind beams may be attached to u-posts behind the sign panels.

2. Sign Panels: Provide sign panels made of 0.100" aluminum, 1/2" plywood, or other approved material, except where noted. All holes to be punched round for 3/8" bolts.

3. Alternate Messages: The signs that have alternate messages may have these alternate messages placed on a reflectorized plate (without a border) and installed and removed as required. (i.e. "Left" and "Right" message on a 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 as stated above.

Large signs having an area exceeding 50 square feet shall have a minimum clearance of 7'-0" from the ground at the post.

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

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

Signs mounted to the portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT Details shall have 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

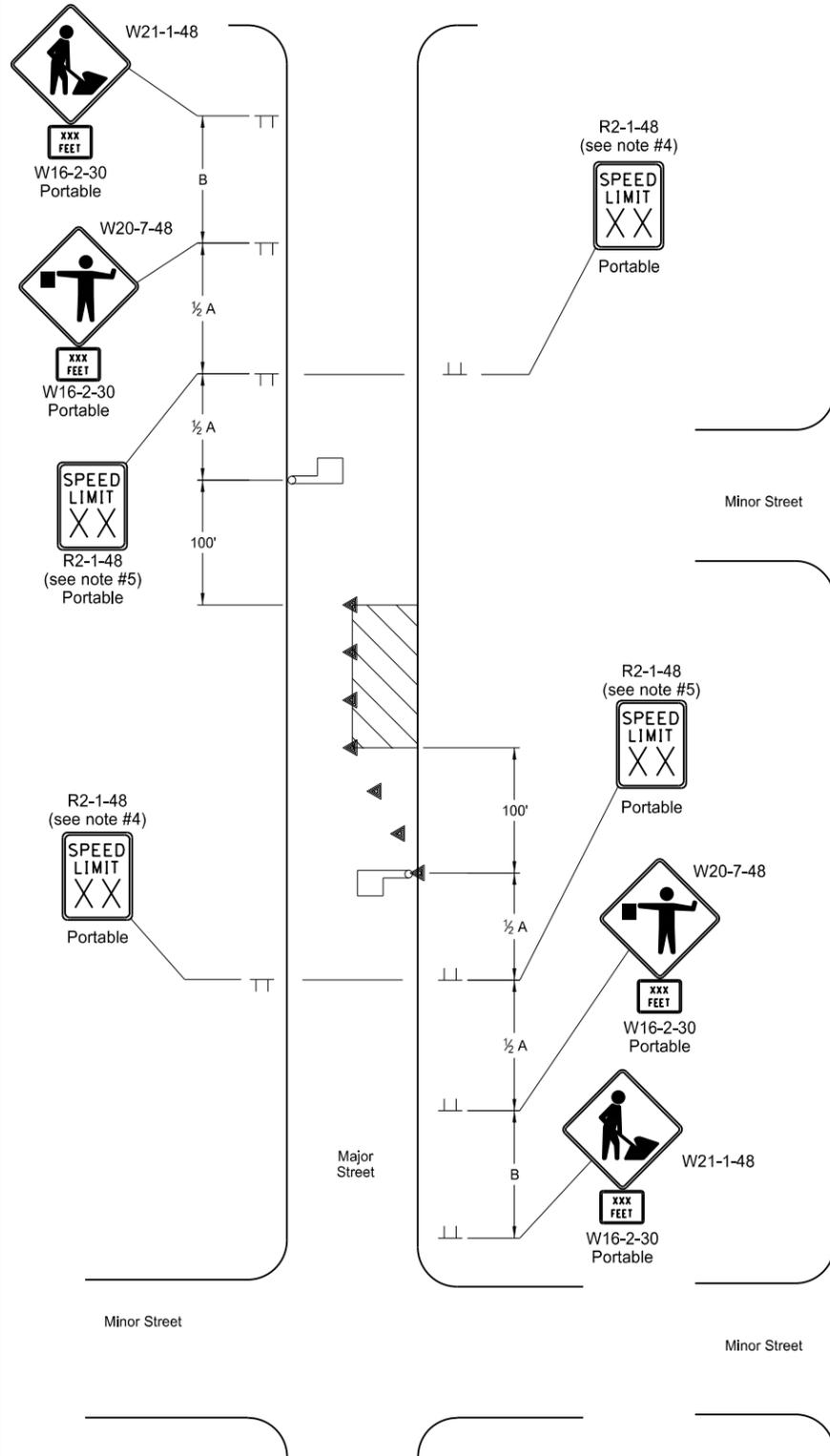
Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
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11-14-13	Revised Note 6.

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# LANE CLOSURES ON URBAN STREETS LAYOUTS

D-704-25

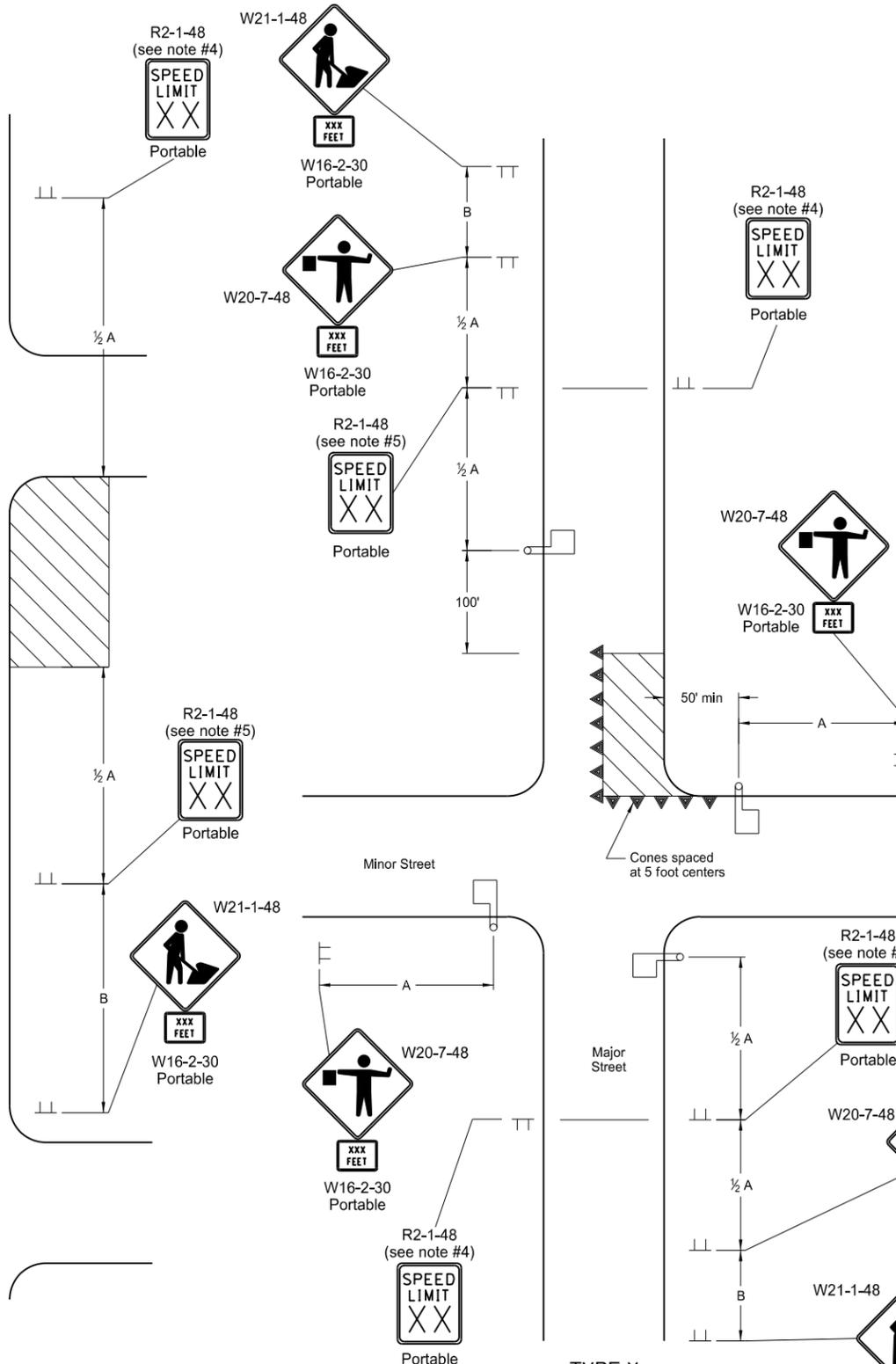


**TYPE V**  
LANE CLOSURE ON URBAN STREET

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

**TYPE W**  
WORK BEYOND CURB ON URBAN STREET

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



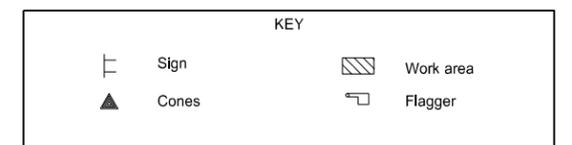
**TYPE X**  
LANE CLOSURE NEAR INTERSECTION ON URBAN STREET

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

**Notes**

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

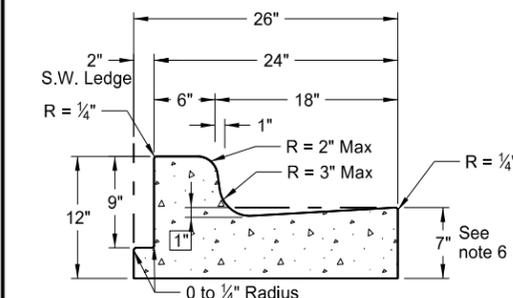
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60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



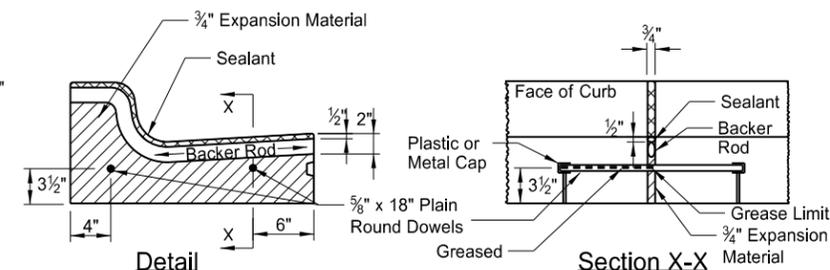
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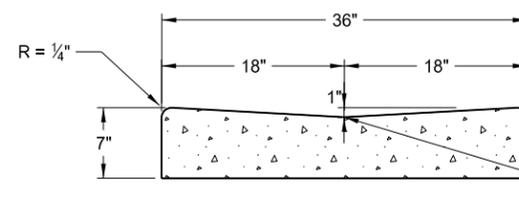
Curb & Gutter and Valley Gutter



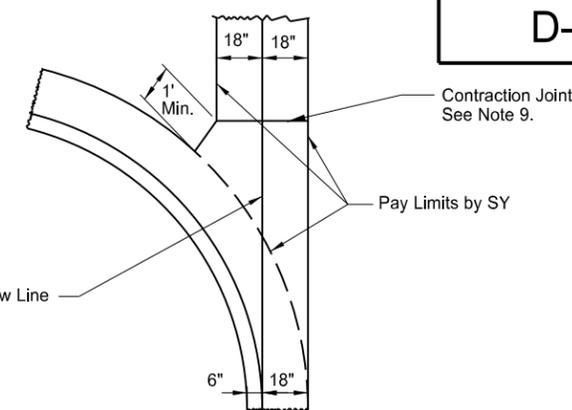
**Curb & Gutter Type 1 (Sec. A & B)**  
Adjacent to Concrete Sidewalk,  
Median, or Parking Lot.  
(Sec. A shown. See Sec B for  
additional details.)



**Isolation Joint**



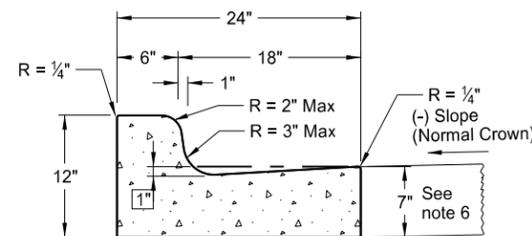
**36" Concrete Valley Gutter Detail**



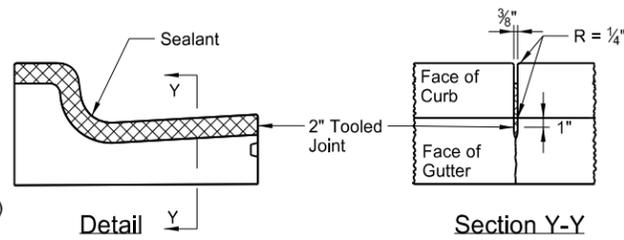
**36" Concrete Valley Gutter Plan**

**NOTES:**

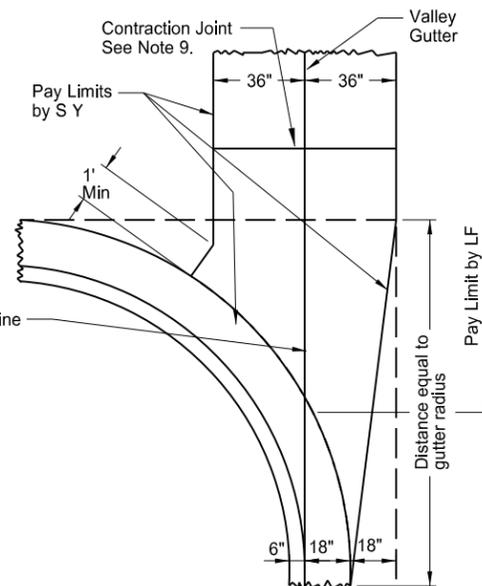
1. Curb and Gutter Type 1 (Sec. A & B) to be used. Section "A" to be used with (-) pavement slopes and section "B" to be used with (+) pavement slopes.
2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
3. Isolation Joints: Isolation joint material shall be 3/4"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



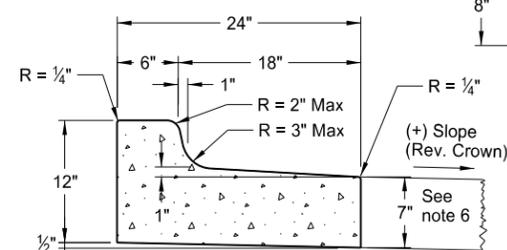
**Curb & Gutter Type 1 (Sec. A)**



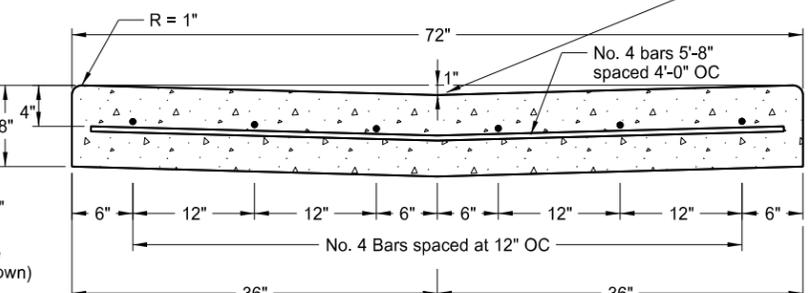
**Contraction Joint**



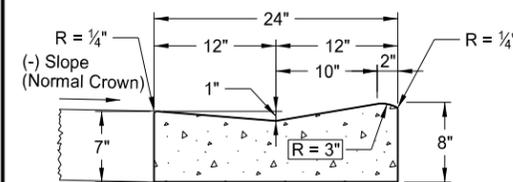
**72" Concrete Valley Gutter Plan**



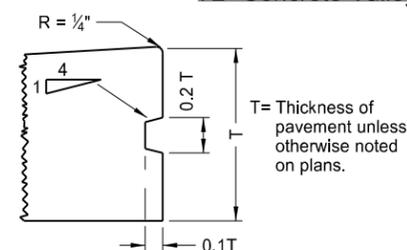
**Curb & Gutter Type 1 (Sec. B)**



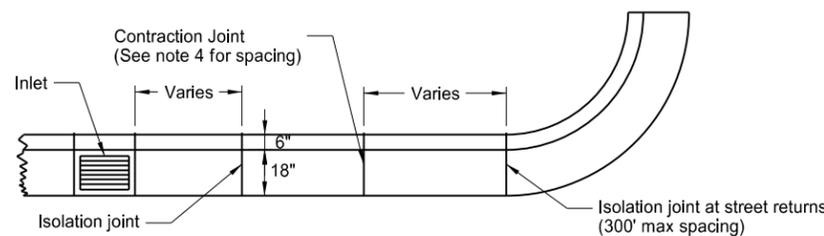
**72" Concrete Valley Gutter Detail**



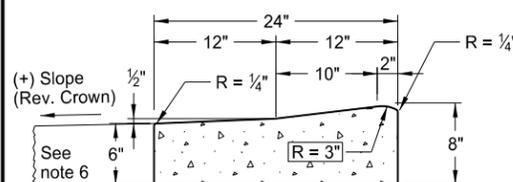
**Mountable Curb & Gutter Type 1 (Sec. A)**



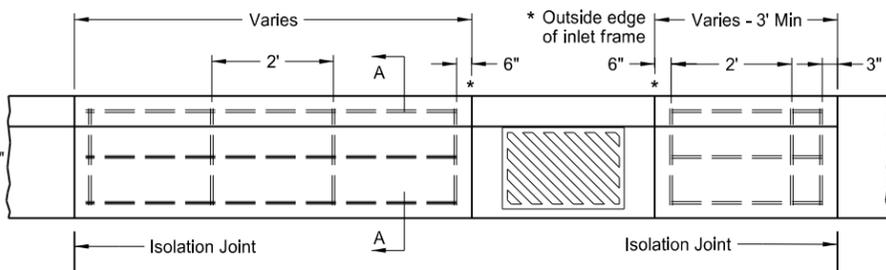
**Keyway Detail for Curb & Gutter**  
(To be used with PCC Pavement and Drives)



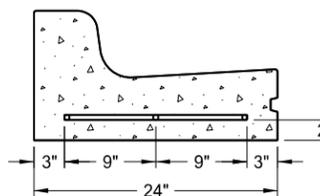
**Joint Location Detail**



**Mountable Curb & Gutter Type 1 (Sec. B)**



**Curb & Gutter Reinforcing at Inlets**



**Section A-A**

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

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# CURB RAMP DETAILS

D-750-3

+More Right of Way

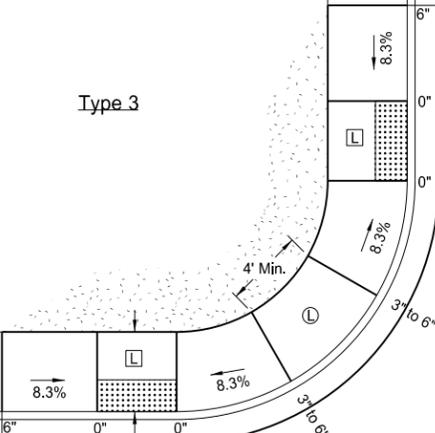
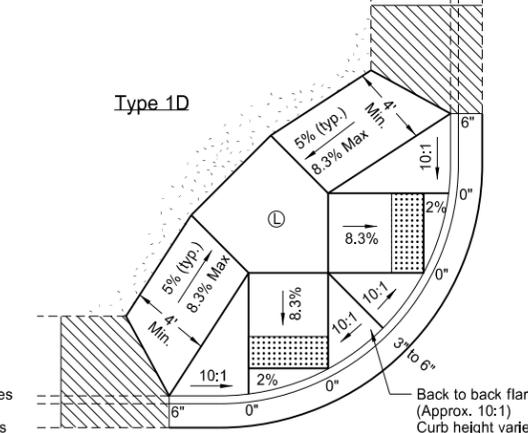
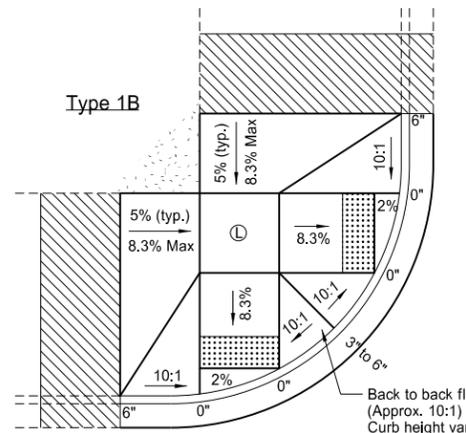
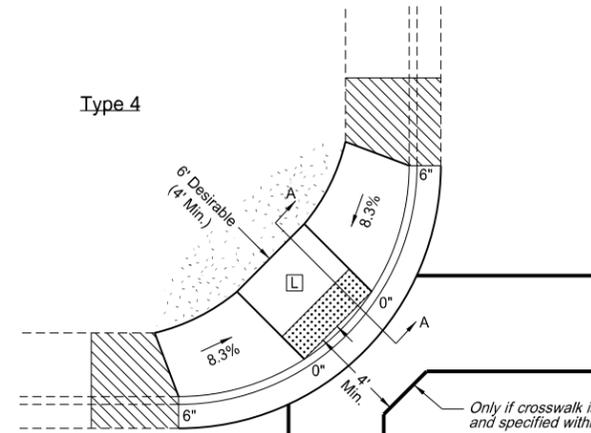
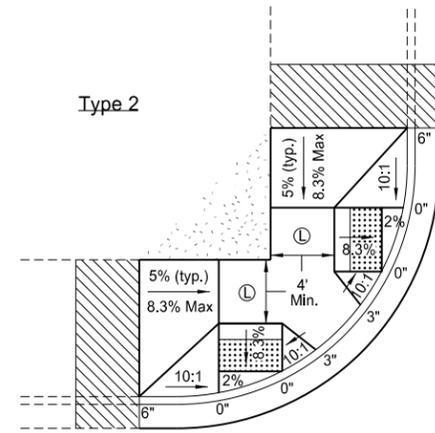
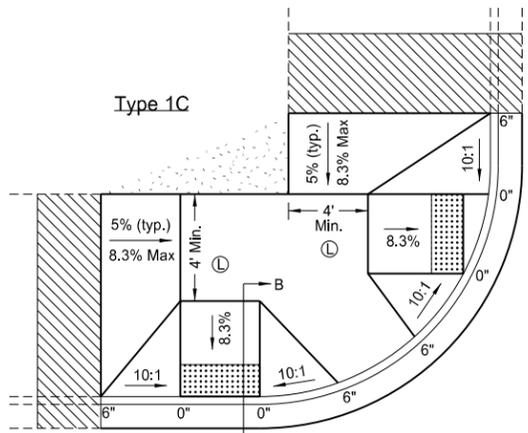
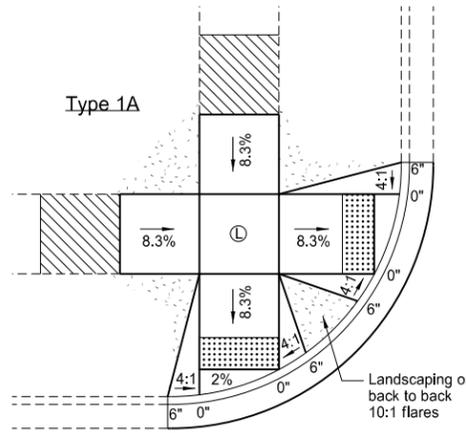
Less Right of Way

**NOTES:**

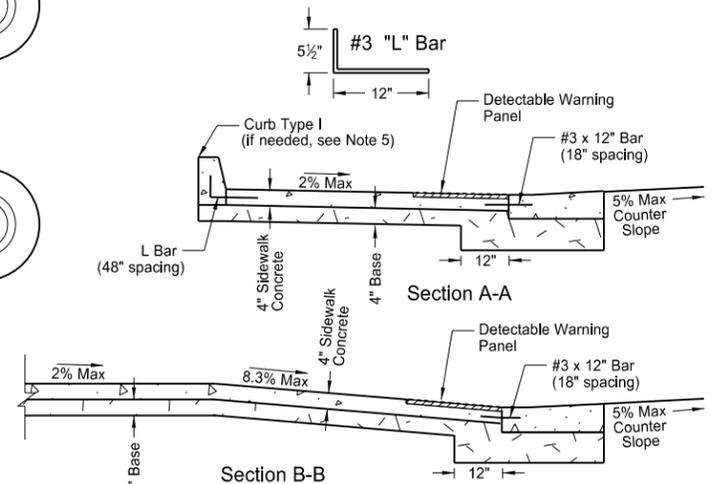
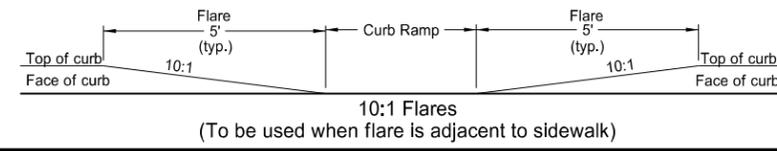
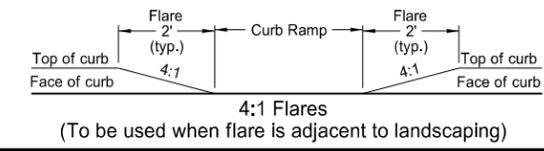
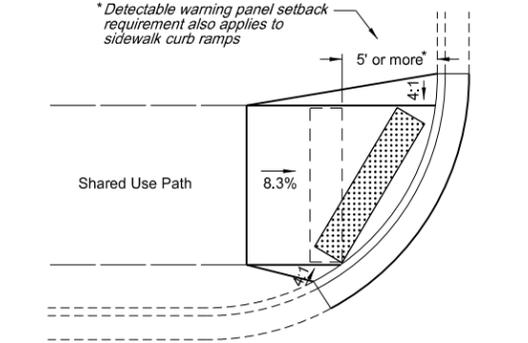
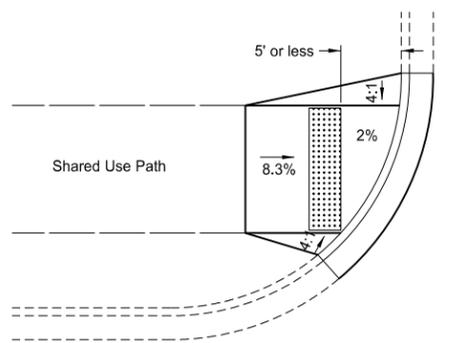
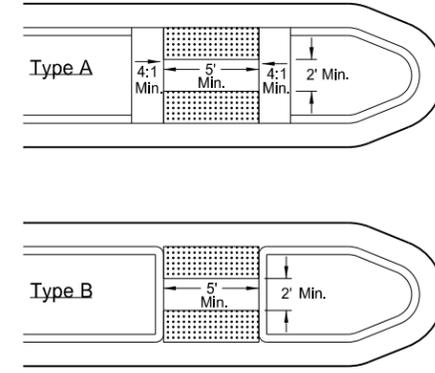
- Ramp width is defined as the useable portion of the ramp, excluding flares if used.  
Curb ramp width should match the existing sidewalk width. 4' width minimum.  
Ramp width for shared-use paths should match the existing shared use path width.  
Ramp length shall be maximum of 15'.
- Landings shall be a minimum of 4' x 4' and shall have a max 2% slope in any direction. Landings are desirably 5' x 5' or larger.
- Detectable warning panels shall match the ramp width. Radial panels may also be used. The detectable warning panel may be located within the lower landing.
- The pedestrian access route shall be continuous 4' min. width. Max 2% cross slope applies to all concrete, excluding flares.
- Landscaping is preferred to modify existing ground slope changes as needed. If not possible, such as adjacent buildings, a vertical curb may be used as shown in the detail below. The curb will be paid for at the unit price bid for the item "Curb - Type I" per lineal foot.

**LEGEND:**

- : Detectable Warning Panel
- : Landscaping
- : Transitional tie-in segment if needed for retrofits. Max grade slope 8.3%.
- : Upper Landing
- : Lower Landing
- 0", 3", or 6" : Curb Height
- 8.3% : All slopes shown are max grades. Flatter slopes may be used.



**Median Refuge Islands (Cut-Through)**



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