

**JOB #1  
CITY OF BOWMAN  
NORTH DAKOTA**

**TAC- 0006(022)**

BOWMAN COUNTY  
1ST STREET SE SIDEWALK PROJECT

ADA IMPROVMENTS, SIDEWALK,  
CURB & GUTTER, RETAINING WALL

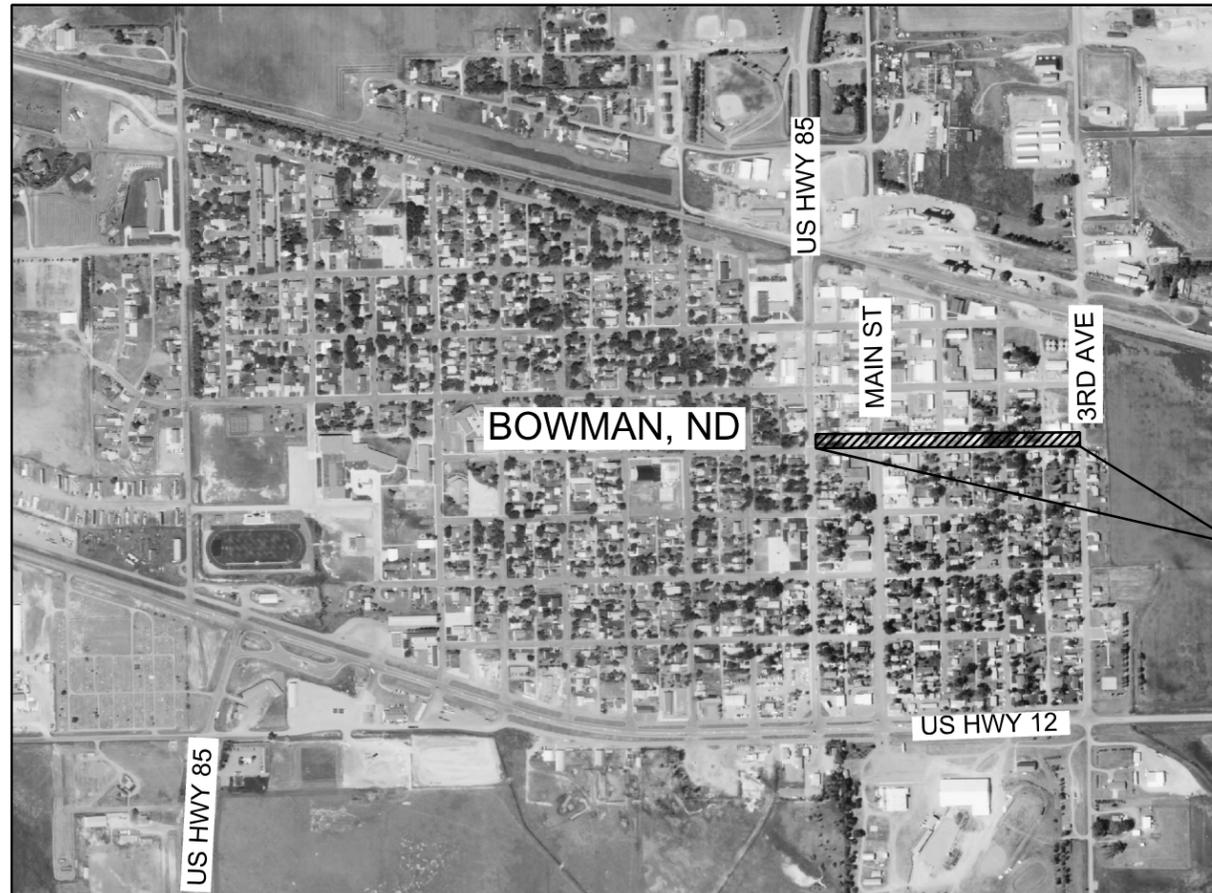
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	TAC- 0006(022)	20767	1	1



GOVERNING SPECIFICATIONS:

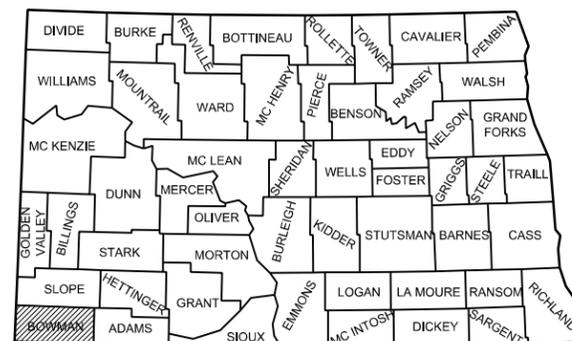
2014 Standard Specifications adopted by the North Dakota Department of Transportation and the supplemental specifications effective on the date the project is advertised.

<u>PROJECT NUMBER</u>	<u>NET MILES</u>	<u>GROSS MILES</u>
TAC-0006(022)	0.303	0.303



PROJECT VICINITY ( 1ST STREET )  
STA 0+00 TO 16+00  
LENGTH = 1,600 L.F.

NORTH DAKOTA ONE CALL:  
"Call Before You Dig & Dig Safely"  
1-800-795-0555



**STATE COUNTY MAP**

DESIGNERS
Danny S. Brosz, PE
Jon Brosz
Shannon Hewson

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

APPROVED DATE 08/14/2015

Danny S. Brosz /s/  
Brosz Engineering, Inc. Bowman, ND 58623

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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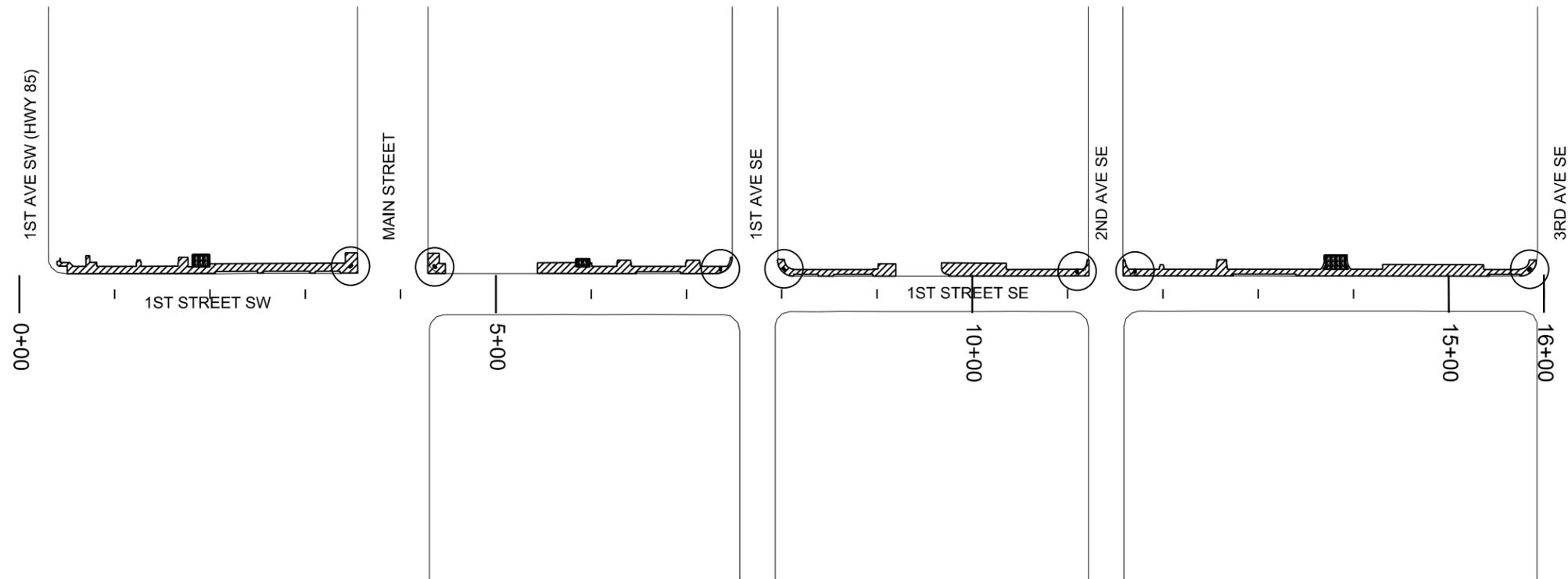
<u>Section No.</u>	<u>Sheet No.</u>	<u>Description</u>
1	1	Title Sheet
2	1	Table of Contents
4	1	Scope of Work
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6	3	Environmental Commitments
8	1	Quantities
20	1-11	General Details
30	1	Typical Sections
40	1-2	Removals
60	1-2	Plan Sheets
100	1	Traffic Control Devices List

LIST OF STANDARD DRAWINGS

<u>Standard No.</u>	<u>Description</u>
D-704-7	Breakaway System for Construction Zone Signs – Perforated Tube
D-704-8	Breakaway System for Construction Zone Signs – U-Channel Tube
D-704-9	Construction Sign Details – Terminal and Guide Signs
D-704-10	Construction Sign Details – Regulatory Signs
D-704-11	Construction Sign Details – Warning Signs
D-704-24	Shoulder Closures and Bridge Painting Layouts
D-704-25	Lane Closures on Urban Street Layouts
D-704-50	Portable Sign Support Assembly
D-748-1	Curb & Gutter and Valley Gutter
D-750-1	Concrete Driveway – Urban
D-750-2	Sidewalk
D-750-3	Curb Ramp Details
D-754-23	Perforated Tube Assembly Details

# SCOPE OF WORK

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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-  Cold Mix Pavement
-  ADA Improvements
-  Sidewalk Improvements

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Scope of Work  
 1st Street SE Sidewalk Project  
 Bowman, North Dakota

**NOTES**

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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202-P01 REMOVAL OF BITUMINOUS SURFACING: All Bituminous Surfacing removed shall be stockpiled at the yard behind the City/County Shop at 305 4th Street NE, Bowman, ND 58623. All costs associated with removing and stockpiling of the bituminous surfacing shall be included in the unit price bid for "Removal of Bituminous Surfacing."

203-P01 COMMON EXCAVATION – TYPE C: The Contractor shall be responsible for inspecting the site to determine how the excavation shall be completed, some handwork may be necessary. There is an estimated 500 cubic yards of excavation planned. Excavation shall be completed in a manner to provide drainage away from all buildings and towards new curb, sidewalk, and retaining walls. Any excess material generated shall be considered waste and shall become the property of the Contractor. No additional measurement for payment shall be made for the removal, stockpiling, placement, compaction, or disposal of any excavation. Payment shall be included in the lump sum price bid for "Common Excavation – Type C".

203-P02 TOPSOIL: No additional measurement for payment shall be made for the removal, stockpiling, replacement, and working of topsoil. Payment shall be included in the lump sum price bid for "Common Excavation – Type C".

251-P01 SEEDING: All disturbed areas within the project area shall be seeded. Apply seed within 48 hours of the final seedbed conditioning. Do not broadcast seed when weather conditions prevent uniform seed distribution. Rake or drag the soil after broadcast seeding, but do not cover seed with more than 1/2 inch of soil. The Class III mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Kentucky Bluegrass	Blue Angel	60.0
Perennial Ryegrass	Fiesta 4	20.0
Perennial Ryegrass	SR 4420	20.0
Hard Fescue	Firefly	20.0
Chewing Fescue	Longfellow II	40.0
Creeping Red Fescue	SR 5250	40.0
Total:		200.0

402-P01 COLD BITUMINOUS PAVEMENT: Furnish and install Cold Bituminous Pavement that meets the following requirements:

Aggregate shall meet the following:

<u>Sieve Size</u>	<u>Percent Passing</u>
5/8"	100
No. 4	40-75
No. 8	10-35
No. 200	2-7

Fractured Faces shall be a minimum 90%

Supply a mix design to be approved by the Engineer a minimum of two weeks prior to placing.

Conditioning Existing Surface: To provide bond, the longitudinal and transverse joints shall be sprayed with a light coating of bitumen applied to the exposed edge before the joint is made. The existing surface shall meet the approval of the Engineer before placing any material.

Heating of Bitumen: The bitumen shall be heated to avoid local overheating and provide a continuous supply of bitumen to the mixer at a uniform temperature.

Spreading and Finishing: Spreading and finishing shall be performed without segregation. The material shall be shaped and compacted so the completed course conforms to the required grade and cross section within tolerances specified.

If moisture content is excessive and compaction cannot be obtained with the normal operation, the material shall be aerated to remove excess moisture, re-laid, and re-compacted.

Materials shall not be mixed or laid when it is raining or when the roadbed or mixture is frozen. The presence of frost particles in the roadbed or in the material is sufficient evidence of being frozen.

Compaction shall be Ordinary Compaction per Section 430.

Completed Surface: The surface of the course shall be smooth, uniform, and have a 2.0% crown or match into the existing surface. Any low, high, or defective places shall be remedied by patching or removing and replacing the area with fresh mixture compacted to blend into the surrounding area. The patches shall be thoroughly bonded to the surface. The finished pavement shall be free from irregularities exceeding 1/4 inch as measured with a 10-foot straightedge parallel and perpendicular to the centerline of the roadway.

Payment for furnishing and placement of Cold Bituminous Pavement shall be made at the contract unit price per Ton for the bid item "Cold Bituminous Pavement" and shall include the cost for furnishing bitumen and aggregate, placing tack coat, mixing cold mix, hauling, placing, compacting, and any other incidentals required to complete this item of work including all labor and equipment.

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**NOTES**

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704-P01 TRAFFIC CONTROL: Provide signing deemed necessary for the protection of the general public and protection of work. At a minimum signing shall conform to the MUTCD and the Standard Drawings. Traffic Control shall be paid for as Lump Sum and shall include all traffic control signs, traffic control devices, maintenance, flagging, and pilot car operations. The Traffic Control Devices List includes signing for one block of work. No additional payments shall be made for any additional signing or devices required.

748-P01 CONCRETE: All Portland Cement Concrete shall have a minimum required 28 day compressive strength of 4,000 psi.

750-P02 REBAR: All rebar shall consist of grade 60 reinforcing steel. FY = 60 ksi. Furnish rebar certifications seven (7) days prior to placing any rebar. Slab Bolsters/Reinforcing Chairs shall be used under all rebar and placed at 4'-0" spacing or per the manufacture's recommendation, but shall not be less than 4'-0". The cost of all rebar, slab bolsters/chairs, and all work required to install shall be incidental to the unit price bid for the respective bid item.

750-P03 STEPS: Each step as completed and in place will be measured. Steps shall be constructed per details, Section 750, and conform to 2010 ADA Standards for Accessible Design, Chapter 5, Section 504. Steps shall be reinforced, at a minimum, with No. 4 rebar at 18 inch spacing. Where handrails are shown, they shall be constructed per details and conform to 2010 ADA Standards for Accessible Design, Chapter 5, Section 505. The cost of stairs, all rebar, slab bolsters/chairs, excavation, concrete, other materials, and all work required to install shall be incidental to the unit price bid per step for "Steps - Concrete".

754-225 RESET SIGN PANEL: Remove sign panels from existing supports. Reinstall sign panels, angles, stringers, and steel channels on new supports.

Provide all necessary brackets and hardware to attach sign panels, angles, stringers, and steel channels on new supports.

The Engineer will measure the item "Reset Sign Panel" by the number of locations a sign or sign assembly has been reset.

930-P01 RETAINING WALL: Portland Cement shall be Type II. All Portland Cement Concrete shall be Class AE, have a minimum required 28 day compressive strength of 4,000 psi. At the time of placement, the slump of the concrete shall not exceed 4 inches prior to the addition of a water reducing agent, the air content shall be between 4% and 7%, and shall also meet the requirements of Section 802.

Submit a mix design, which includes material gradations, a minimum of seven (7) days prior to any pour and may be required to submit a cement sample at that time.

All rebar shall consist of grade 60 reinforcing steel. FY = 60 ksi. Furnish rebar certifications seven (7) days prior to placing any rebar. Slab Bolsters/Reinforcing Chairs shall be used under all rebar and placed at 4'-0" spacing or per the manufacture's recommendation, but shall not be less than 4'-0".

All work completed shall conform to Section 602.04. Forms may be removed after one day or 70% of design strength is attained. Surface finish shall conform to Type C per Section 602.04.1.3.

The face of the retaining wall which lies above the finished grade of the sidewalk will be measured, when completed and in place as specified in Section 109.01. The cost of all rebar, slab bolsters/chairs, epoxy, excavation, other materials, and all work required to install shall be incidental to the unit price bid per square foot for "Retaining Wall".

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## ENVIRONMENTAL COMMITMENTS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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**ENVIRONMENTAL COMMITMENTS (EC):** The North Dakota Department of Transportation has made environmental commitments to secure approval of this project. The environmental commitments are as follows:

Based on the NEPA documentation, no additional permits or environmental commitments have been identified beyond what is covered by the NDDOT's Standard Specification of Road and Bridge Construction.

Wetland Number	Cowardin Classification	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands	Impacts to Wetlands	
						Temp.	Perm.
<b>**NO WETLANDS PRESENT**</b>							
<b>TOTALS:</b>			<b>0.00</b>			<b>0.00</b>	<b>0.00</b>

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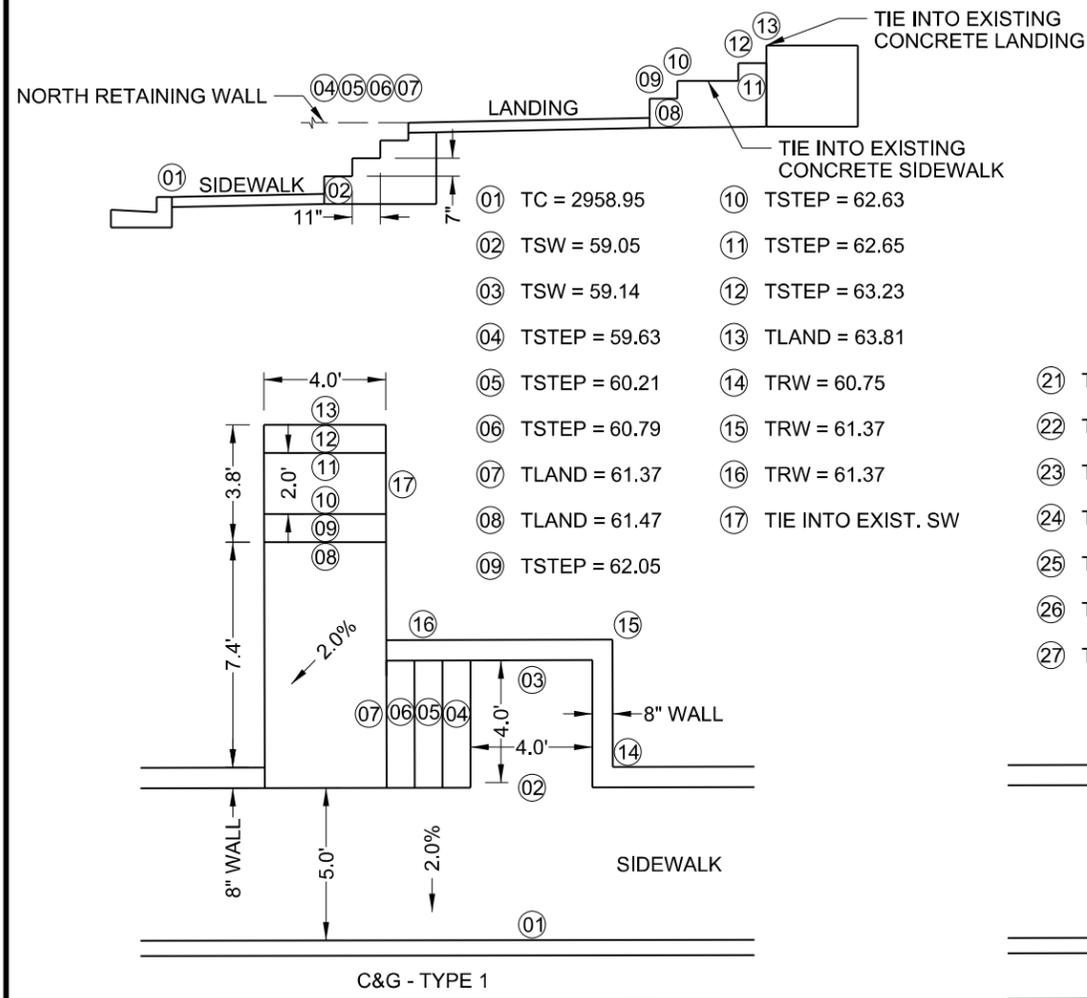
## ESTIMATE OF QUANTITIES

	STATE	PROJECT NO.	SECTION	SHEET
	ND	TAC-0006(022)	8	1

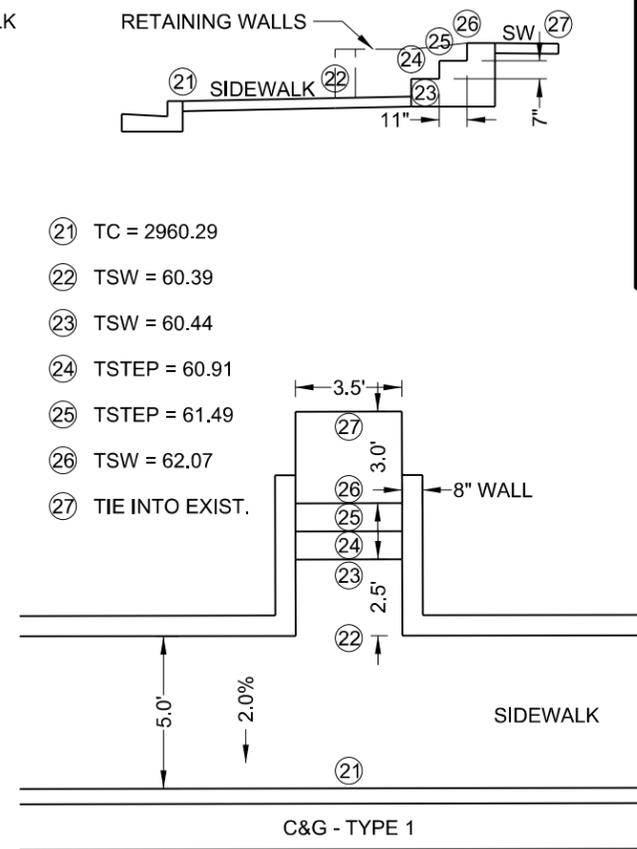
SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
103	100	Contract Bond	LSUM	1
201	330	Clearing & Grubbing	LSUM	1
201	390	Removal of Trees - 30 IN	EA	1
201	395	Stump Removal	EA	11
202	112	Removal of Concrete	SY	660
202	119	Saw Concrete	LF	212
202	130	Removal of Curb & Gutter	LF	850
202	132	Removal of Bituminous Surfacing	SY	164
202	153	Saw Bituminous Surfacing - Full Depth	LF	1027
203	106	Common Excavation - Type C	LSUM	1
251	300	Seeding Class III	ACRE	0.5
302	121	Aggregate Base Course CL 5	CY	200
402	110	Cold Bituminous Pavement	TON	46
702	100	Mobilization	LSUM	1
704	1100	Traffic Control	LSUM	1
748	120	Curb & Gutter Mountable - Type 1	LF	162
748	140	Curb & Gutter - Type 1	LF	643
748	141	Curb & Gutter - Type 1 Special	LF	134
748	520	Curb - Type 1	LF	302
748	1020	Valley Gutter 36 IN	SY	21
750	100	Sidewalk Concrete	SY	496
750	101	Sidewalk Concrete Reinf.	SY	271
750	150	Sidewalk Trench Drain	EA	3
750	301	Steps - Concrete	EA	16
750	1016	Driveway Concrete Reinforced - 6 IN	SY	168
750	2115	Detectable Warning Panels	SF	56
752	660	Fence Chain Link Remove & Reset	LF	95
754	592	Reset Sign Panel	EA	4
930	9543	Retaining Wall	SF	244

Estimate of Quantities

1st Street SE Sidewalk Project  
Bowman, North Dakota



- 01 TC = 2958.95
- 02 TSW = 59.05
- 03 TSW = 59.14
- 04 TSTEP = 59.63
- 05 TSTEP = 60.21
- 06 TSTEP = 60.79
- 07 TLAND = 61.37
- 08 TLAND = 61.47
- 09 TSTEP = 62.05
- 10 TSTEP = 62.63
- 11 TSTEP = 62.65
- 12 TSTEP = 63.23
- 13 TLAND = 63.81
- 14 TRW = 60.75
- 15 TRW = 61.37
- 16 TRW = 61.37
- 17 TIE INTO EXIST. SW

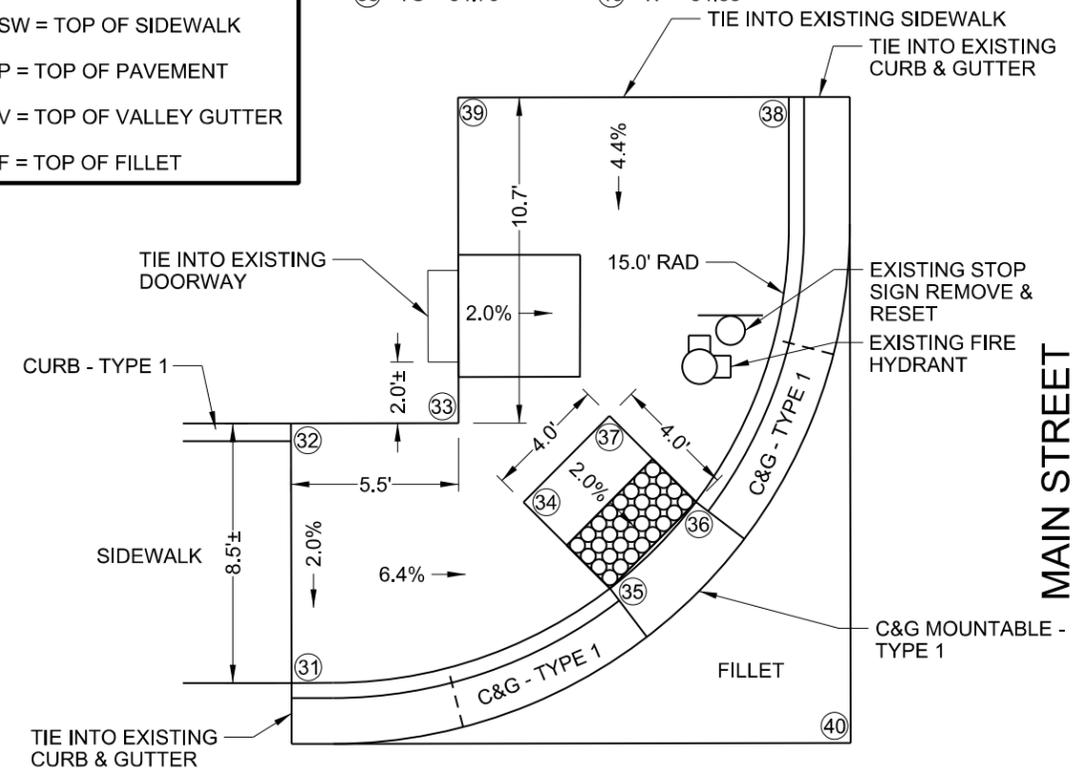


- 21 TC = 2960.29
- 22 TSW = 60.39
- 23 TSW = 60.44
- 24 TSTEP = 60.91
- 25 TSTEP = 61.49
- 26 TSW = 62.07
- 27 TIE INTO EXIST.

**LEGEND**

- FL = FLOWLINE
- TC = TOP OF CURB
- TS = TOP OF SLAB
- TSTEP = TOP OF STEP
- TSW = TOP OF SIDEWALK
- TP = TOP OF PAVEMENT
- TV = TOP OF VALLEY GUTTER
- TF = TOP OF FILLET

- 31 TC = 2964.70
- 32 TSW = 64.87
- 33 TSW = 65.22
- 34 TSW = 64.78
- 35 TC = 64.70
- 36 TC = 64.53
- 37 TSW = 64.88
- 38 TC = 65.35
- 39 TSW = 65.69
- 40 TF = 64.83



NOTE: FILLETS SHALL BE PAID FOR UNDER THE BID ITEM "SIDEWALK CONCRETE REINF."

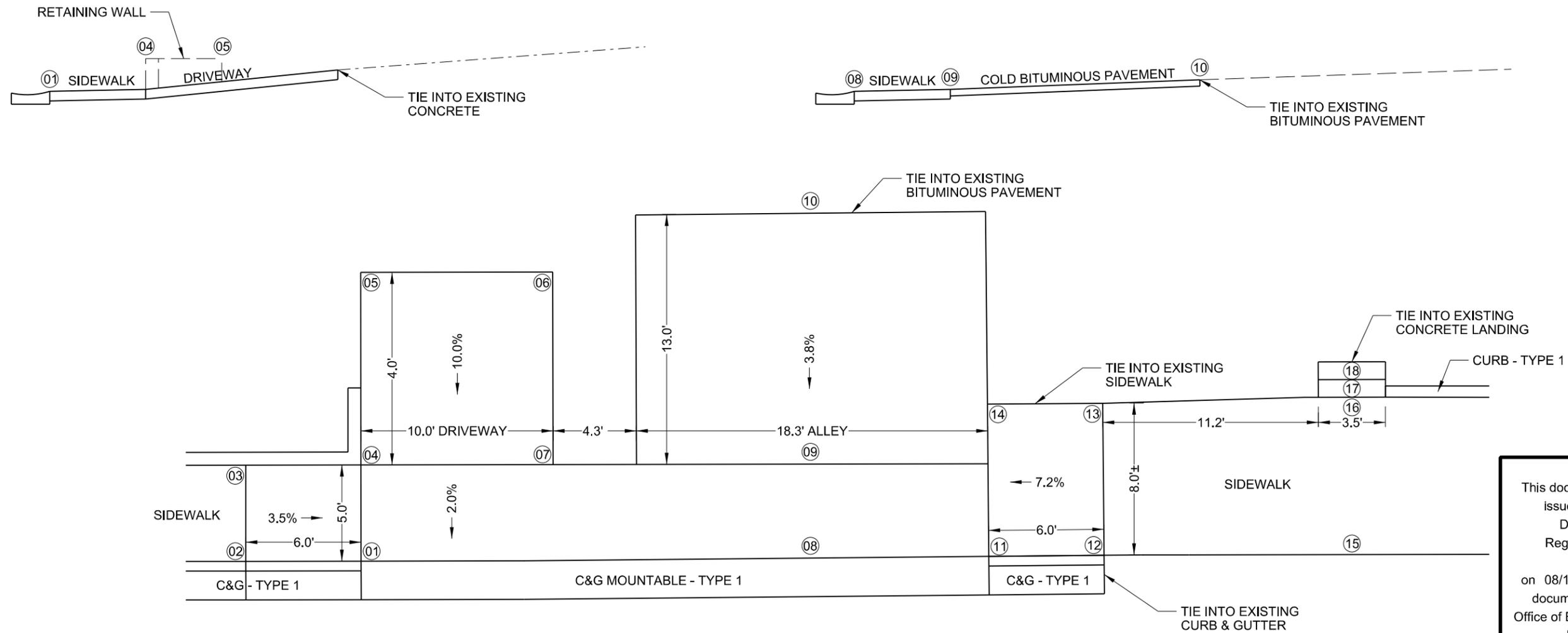
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Details

1st Street SE Sidewalk Project  
 Bowman, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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- ① TC = 2960.83      ⑧ TC = 61.35      ⑮ TC = 62.19
- ② TC = 61.04      ⑨ TSW = 61.45      ⑯ TSW = 62.36
- ③ TSW = 61.14      ⑩ TP = 61.95      ⑰ TSTEP = 62.94
- ④ TSW = 60.93      ⑪ TC = 61.54      ⑱ TSTEP = 63.52
- ⑤ TS = 61.93      ⑫ TC = 61.97
- ⑥ TS = 62.15      ⑬ TSW = 62.07
- ⑦ TSW = 61.15      ⑭ TSW = 61.64



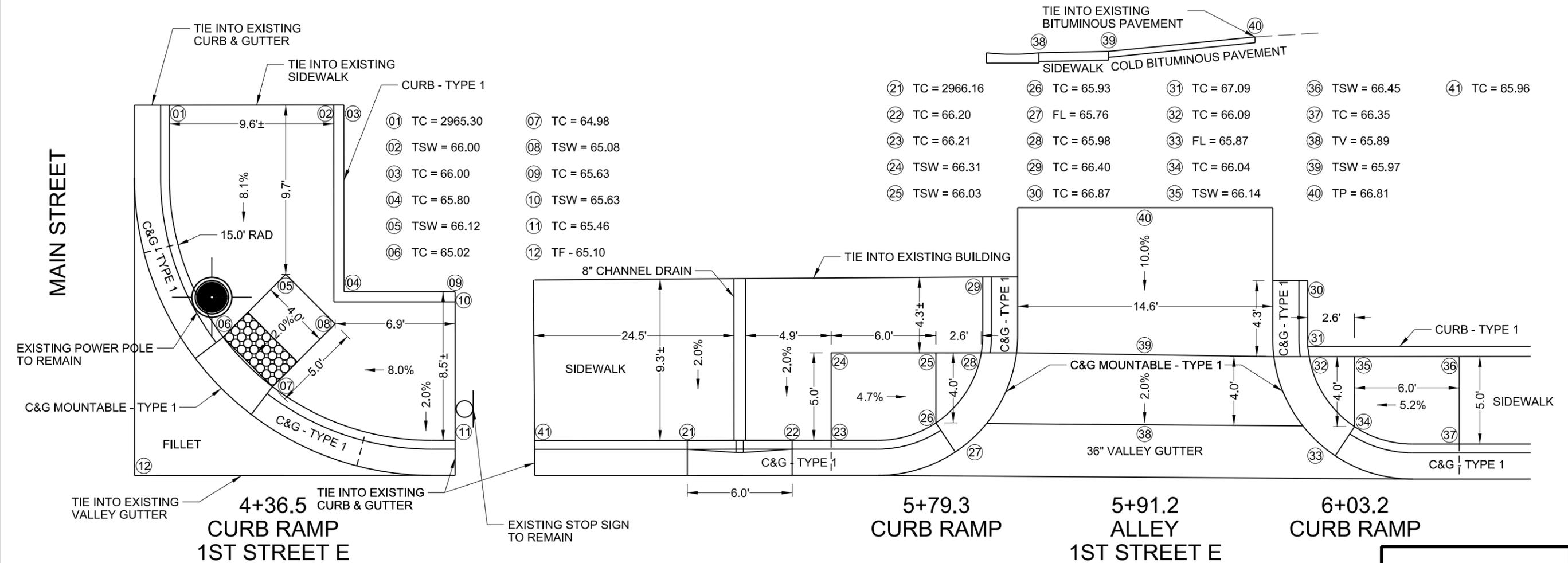
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Details  
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 Bowman, North Dakota

1+72.0  
 DRIVEWAY

1+91.5  
 ALLEY  
 1ST STREET W

A A A A



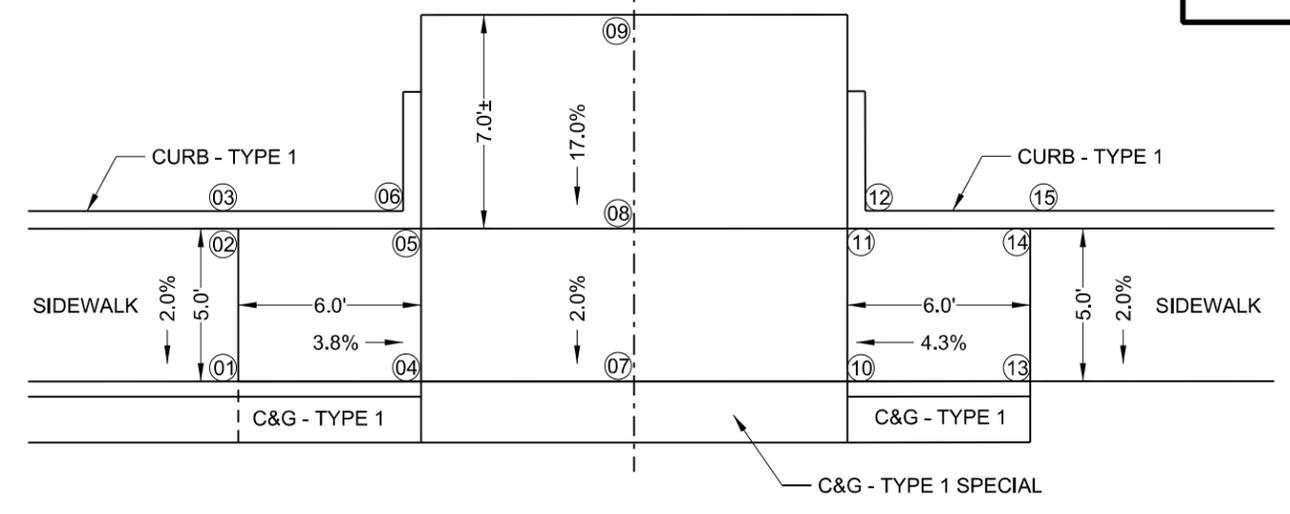
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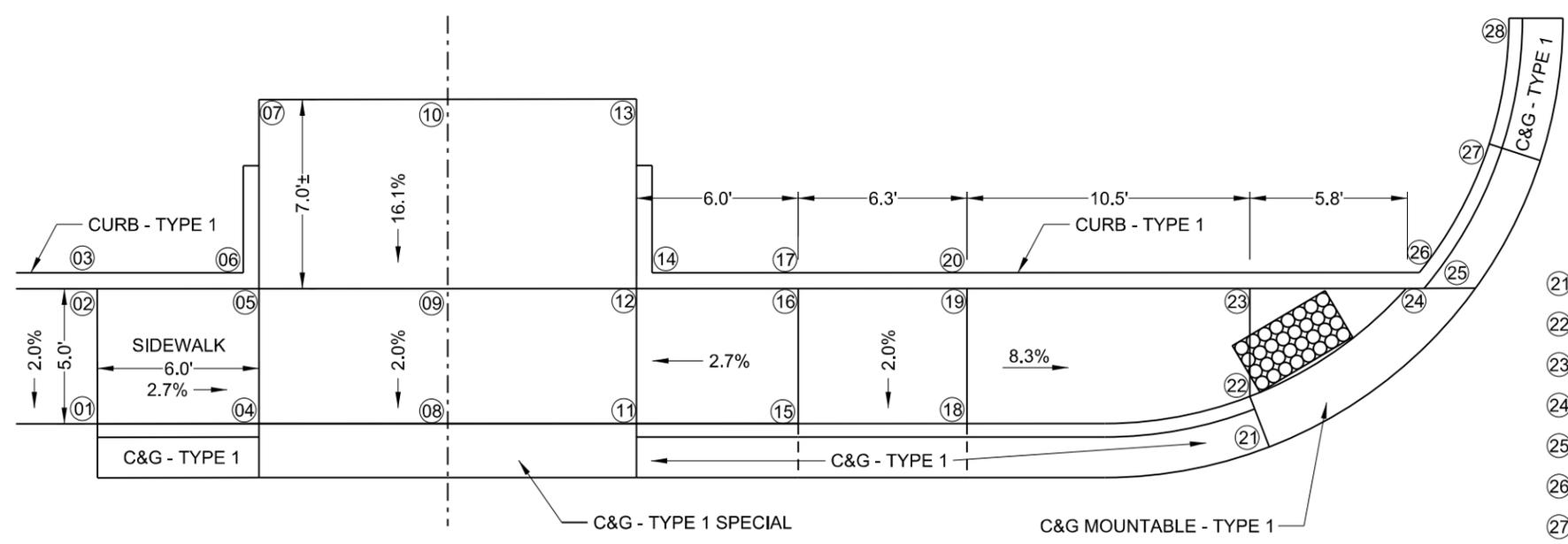
1st Street SE Sidewalk Project  
 Bowman, North Dakota

- ① TC = 2966.52    ⑪ TSW = 66.42
- ② TSW = 66.62    ⑫ TC = 67.42
- ③ TC = 67.62    ⑬ TC = 66.58
- ④ TC = 66.29    ⑭ TSW = 66.68
- ⑤ TSW = 66.39    ⑮ TC = 67.68
- ⑥ TC = 67.39
- ⑦ TC = 66.31
- ⑧ TSW = 66.41
- ⑨ TS = 67.60
- ⑩ TC = 66.32



**6+34.6  
DRIVEWAY  
1ST STREET E**

- ① TC = 2966.60    ⑪ TC = 66.49
- ② TSW = 66.70    ⑫ TSW = 66.59
- ③ TC = 67.70    ⑬ TC = 67.59
- ④ TC = 66.44    ⑭ TC = 67.70
- ⑤ TSW = 66.54    ⑮ TC = 66.65
- ⑥ TC = 67.54    ⑯ TSW = 66.75
- ⑦ TC = 67.70    ⑰ TC = 67.75
- ⑧ TSW = 66.47    ⑱ TC = 66.63
- ⑨ TSW = 66.57    ⑲ TSW = 66.73
- ⑩ TS = 67.70    ⑳ TC = 67.73



**7+06.8  
DRIVEWAY  
1ST STREET E**

**7+36.6  
CURB RAMP**

- ⑳ FL = 65.85
- ㉑ TC = 66.02
- ㉒ TSW = 65.86
- ㉓ TC = 65.72
- ㉔ FL = 65.72
- ㉕ TC = 66.22
- ㉖ TC = 65.86
- ㉗ TC = 65.79

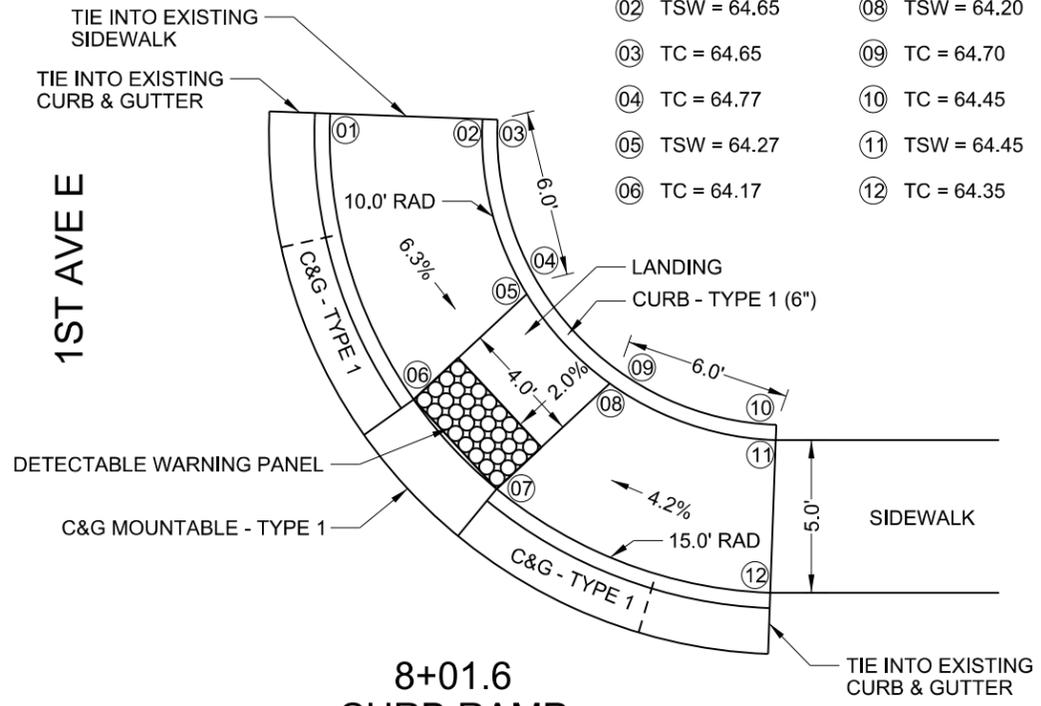
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**1ST AVE E**

Details  
  
 1st Street SE Sidewalk Project  
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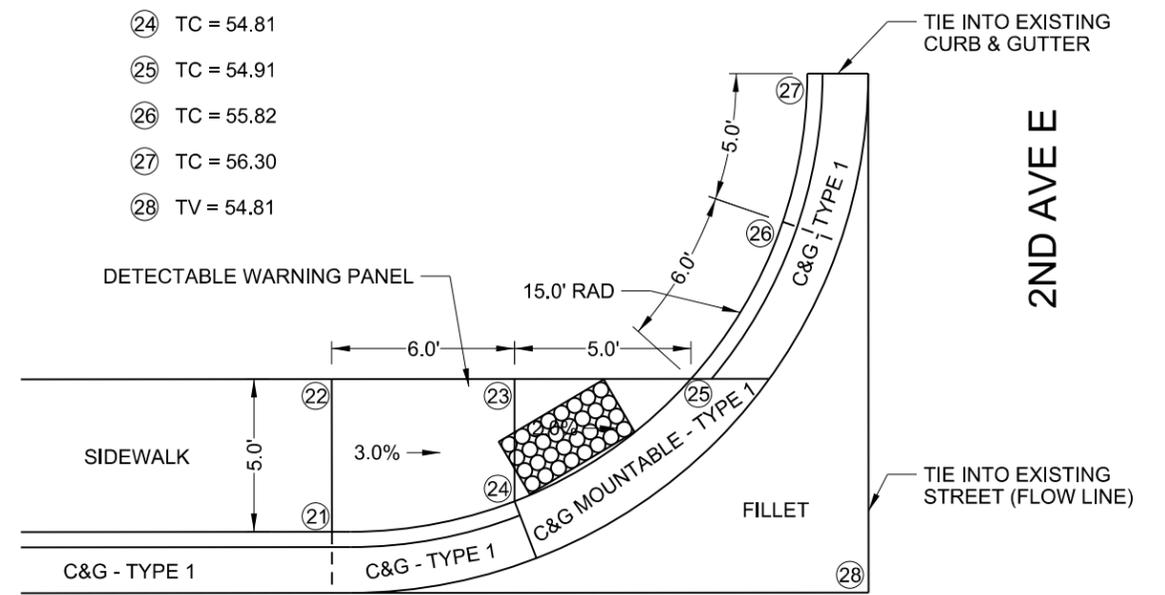
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-0006(022)	20	5

- 01 TC = 64.55
- 02 TSW = 64.65
- 03 TC = 64.65
- 04 TC = 64.77
- 05 TSW = 64.27
- 06 TC = 64.17
- 07 TC = 64.10
- 08 TSW = 64.20
- 09 TC = 64.70
- 10 TC = 64.45
- 11 TSW = 64.45
- 12 TC = 64.35



8+01.6  
CURB RAMP  
1ST STREET E

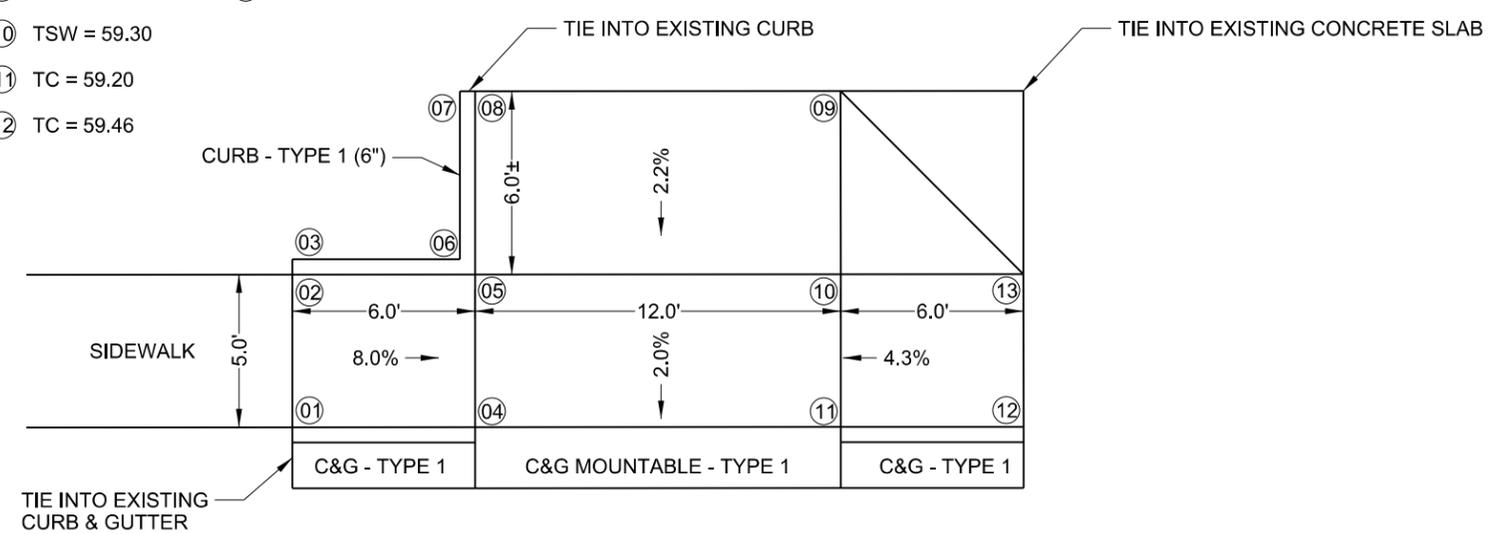
- 21 TC = 54.99
- 22 TSW = 55.09
- 23 TSW = 54.91
- 24 TC = 54.81
- 25 TC = 54.91
- 26 TC = 55.82
- 27 TC = 56.30
- 28 TV = 54.81



11+11.0  
CURB RAMP  
1ST STREET E

NOTE: FILLETS SHALL BE PAID FOR UNDER THE BID ITEM "SIDEWALK CONCRETE REINF."

- 01 TC = 60.44
- 02 TSW = 60.54
- 03 TC = 61.04
- 04 TC = 59.96
- 05 TSW = 60.06
- 06 TC = 60.56
- 07 TC = 60.40
- 08 TS = 59.90
- 09 TS = 59.40
- 10 TSW = 59.30
- 11 TC = 59.20
- 12 TC = 59.46
- 13 TSW = 59.56



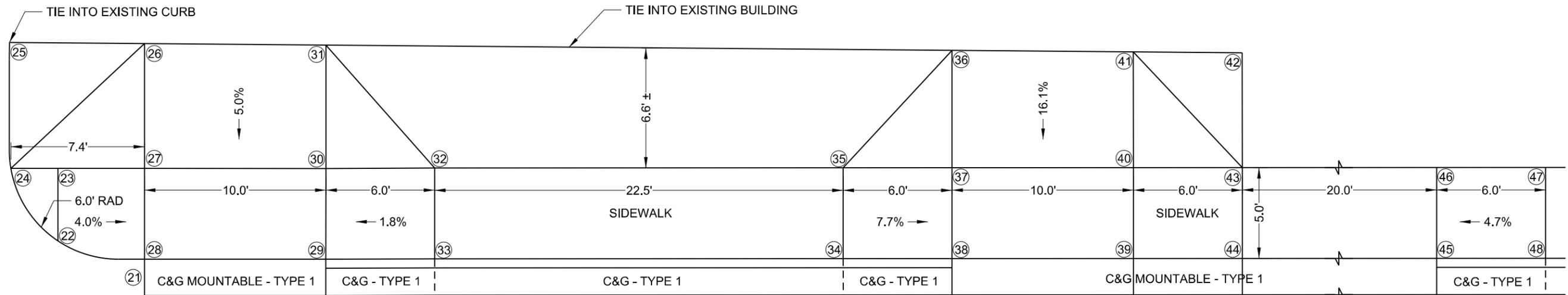
9+07.8  
DRIVEWAY  
1ST STREET E

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ND	TAC-0006(022)	20	6

②1 FL = 56.43	②5 TC = 57.01	②9 TC = 56.23	③3 TC = 56.34	③7 TSW = 55.53	④1 TS = 56.42	④5 TC = 54.94
②2 TC = 56.79	②6 TS = 56.85	③0 TSW = 56.33	③4 TC = 55.89	③8 TC = 55.43	④2 TS = 56.38	④6 TSW = 55.04
②3 TSW = 56.89	②7 TSW = 56.70	③1 TS = 56.78	③5 TSW = 55.99	③9 TC = 55.16	④3 TSW = 55.21	④7 TSW = 55.32
②4 TC = 56.87	②8 TC = 56.60	③2 TSW = 56.44	③6 TS = 56.50	④0 TSW = 55.26	④4 TC = 55.11	④8 TC = 55.22



9+80.3  
DRIVEWAY  
1ST STREET E

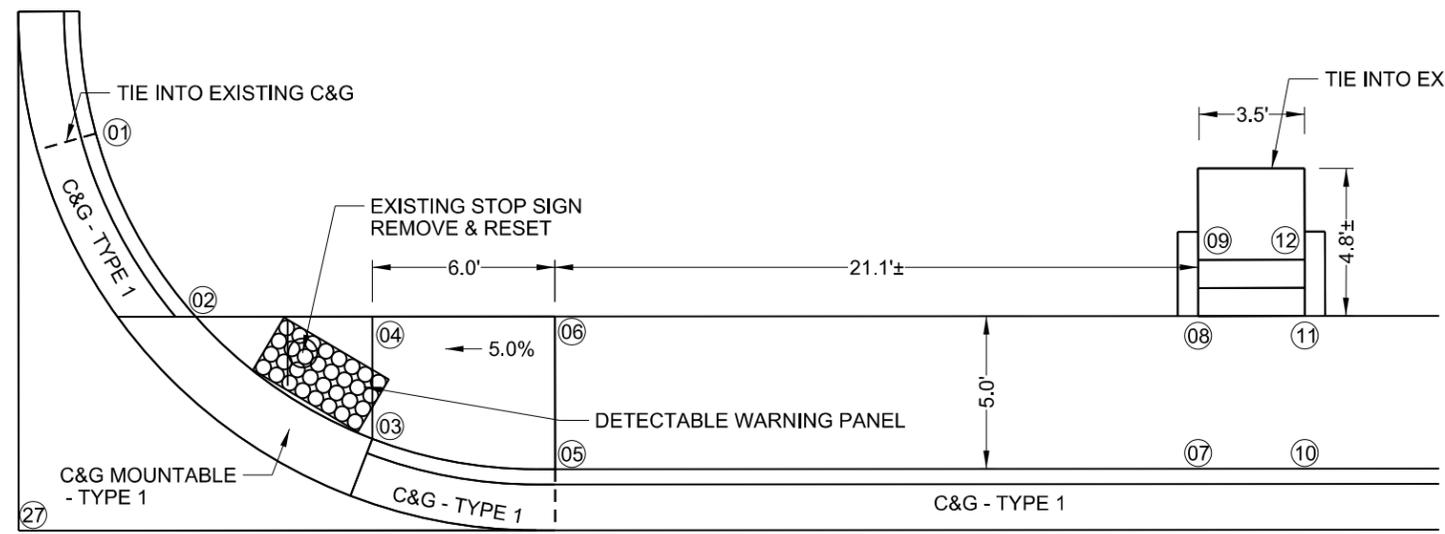
10+25.0  
DRIVEWAY  
1ST STREET E

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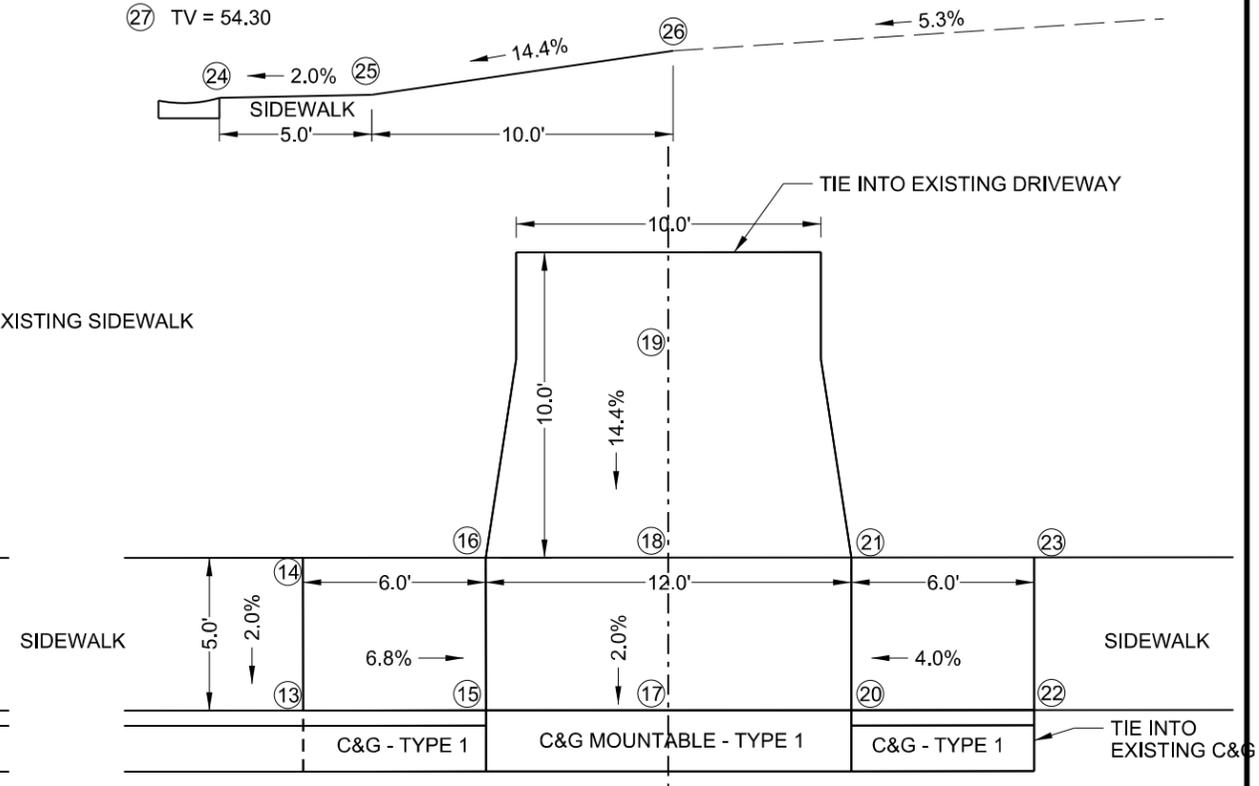
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-0006(022)	20	7

- 01 TC = 54.90      06 TSW = 54.42      11 TSW = 54.18      16 TSW = 53.29      21 TSW = 53.09
- 02 TSW = 54.070    07 TSW = 54.14      12 TSTEP = 55.92    17 TC = 53.09      22 TSW = 53.23
- 03 TC = 54.02      08 TSW = 54.24      13 TC = 53.60      18 TSW = 53.19      23 TSW = 53.33
- 04 TSW = 54.12      09 TSTEP = 55.92    14 TSW = 53.70      19 TS = 54.63      24 TC = 53.09
- 05 TSW = 54.32      10 TSW = 54.08      15 TC = 53.19      20 TC = 52.99      25 TSW = 53.19



11+69.8  
CURB RAMP  
1ST STREET E



12+61.7  
DRIVEWAY  
1ST STREET E

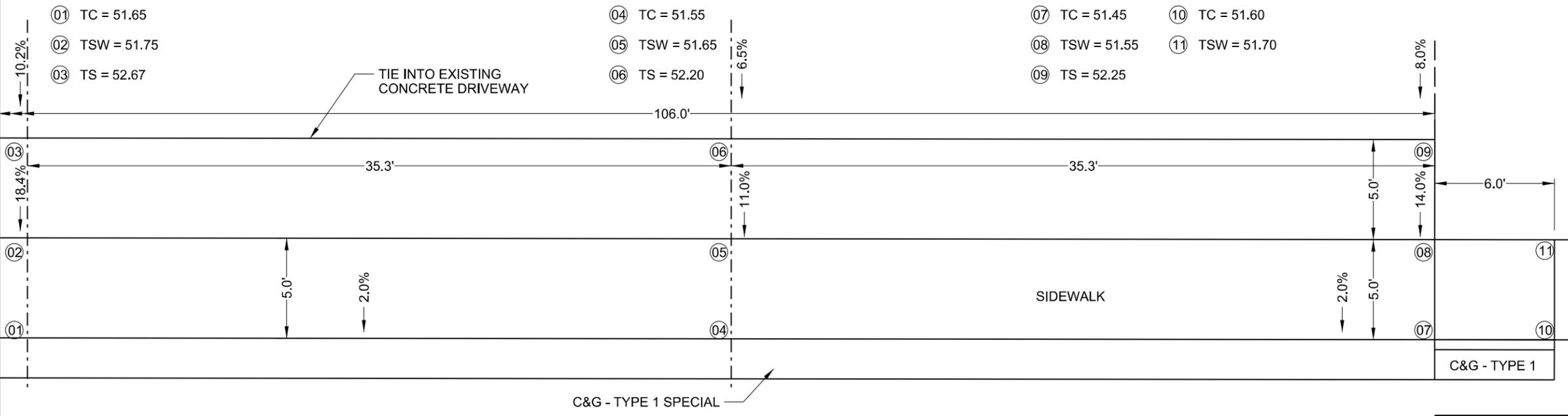
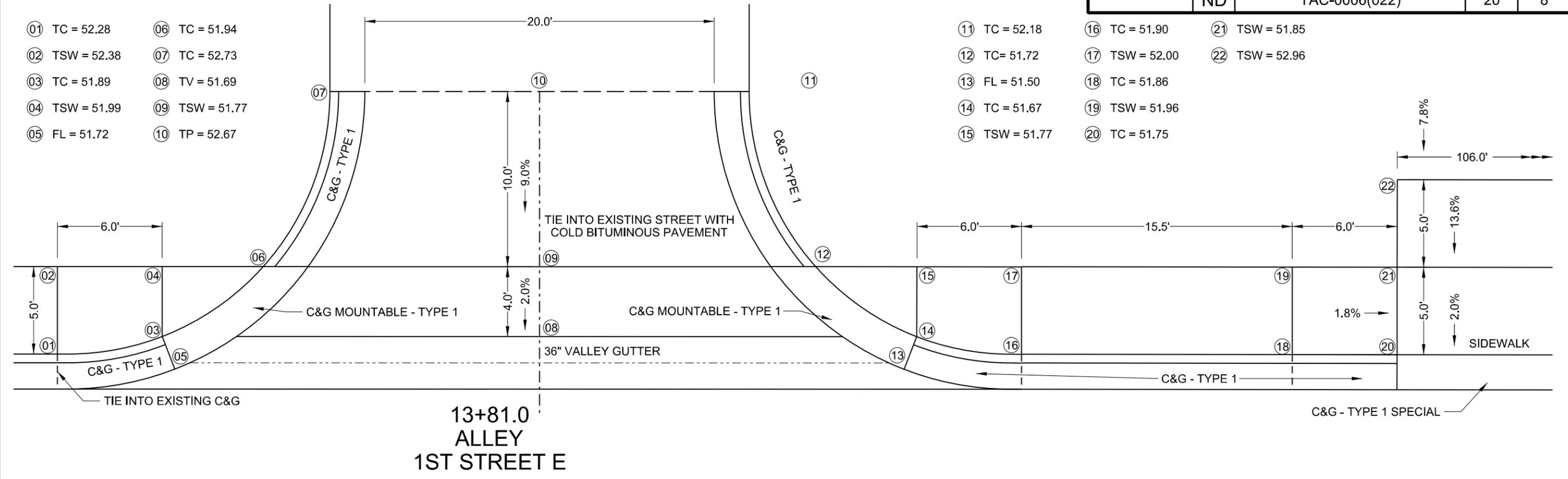
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Details  
 1st Street SE Sidewalk Project  
 Bowman, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-0006(022)	20	8

- 01 TC = 52.28
- 02 TSW = 52.38
- 03 TC = 51.89
- 04 TSW = 51.99
- 05 FL = 51.72
- 06 TC = 51.94
- 07 TC = 52.73
- 08 TV = 51.69
- 09 TSW = 51.77
- 10 TP = 52.67

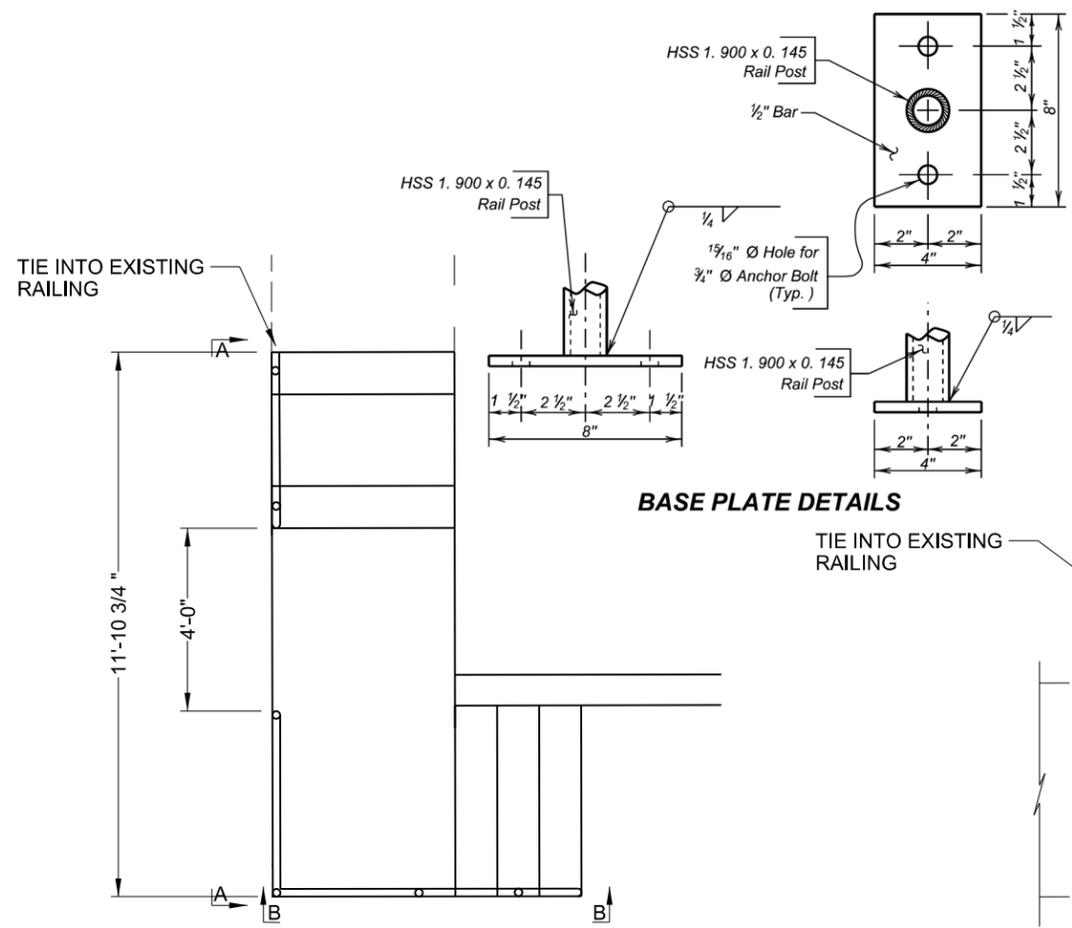
- 11 TC = 52.18
- 12 TC = 51.72
- 13 FL = 51.50
- 14 TC = 51.67
- 15 TSW = 51.77
- 16 TC = 51.90
- 17 TSW = 52.00
- 18 TC = 51.86
- 19 TSW = 51.96
- 20 TC = 51.75
- 21 TSW = 51.85
- 22 TSW = 52.96



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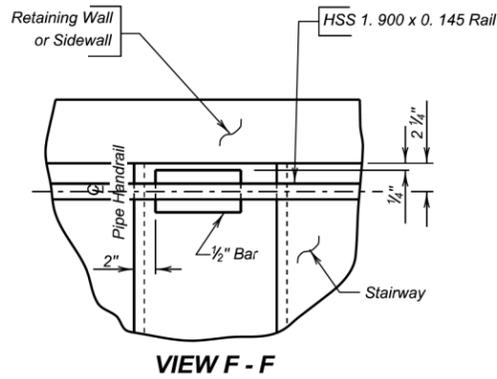
Details  
 1st Street SE Sidewalk Project  
 Bowman, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-0006(022)	20	9

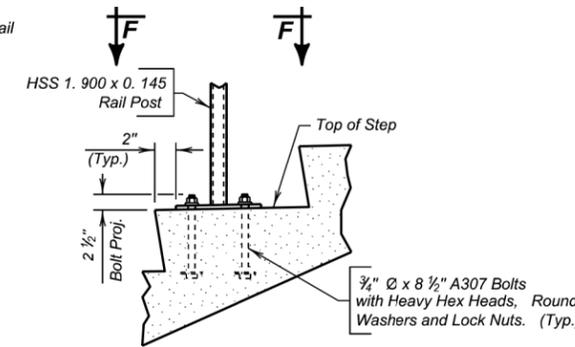


PLAN VIEW

BASE PLATE DETAILS



VIEW F - F



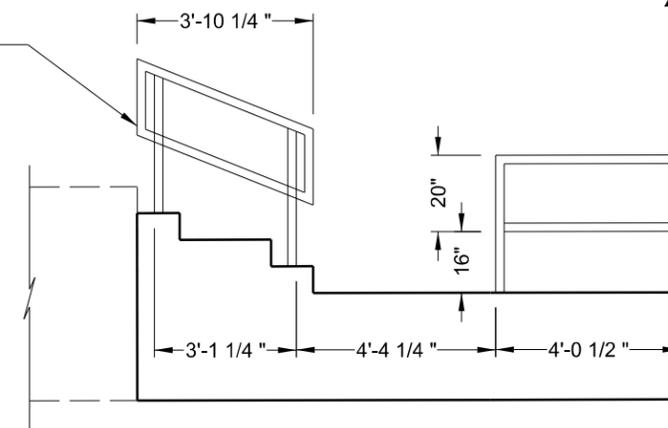
ANCHOR BOLT DETAIL

**GENERAL NOTES:**

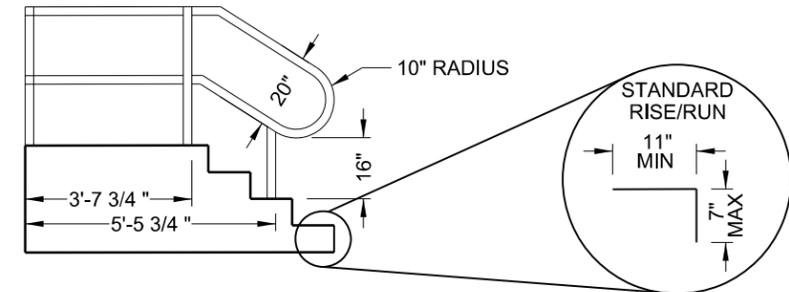
- All rail posts shall be built vertical.
- Steel pipe for railing and posts shall conform to ASTM A500, Grade B. Railpost base plates shall conform to ASTM A709, Grade 36.
- Anchor Bolts and nuts shall conform to ASTM A307. Washers shall be in accordance with ASTM F436. Hardware shall be galvanized in accordance with ASTM F2329. Bolts shall be hex head Structural type with heavy hex lock nuts and round washers.
- All anchor bolts shall be tightened to a Torque of 120 ft-lbs (approximated without the use of a calibrated torque wrench).
- Painting of steel railing shall be done in accordance with Section 411 of the Standard Specifications. The finish color shall be Federal Standard 595B, color 27038 (semi-gloss black) unless stated otherwise in the plans.
- Welding and weld inspection shall be done in accordance with AWS D1. 1-(Current Year) Structural Welding Code - Steel.

**SHOP PLANS**

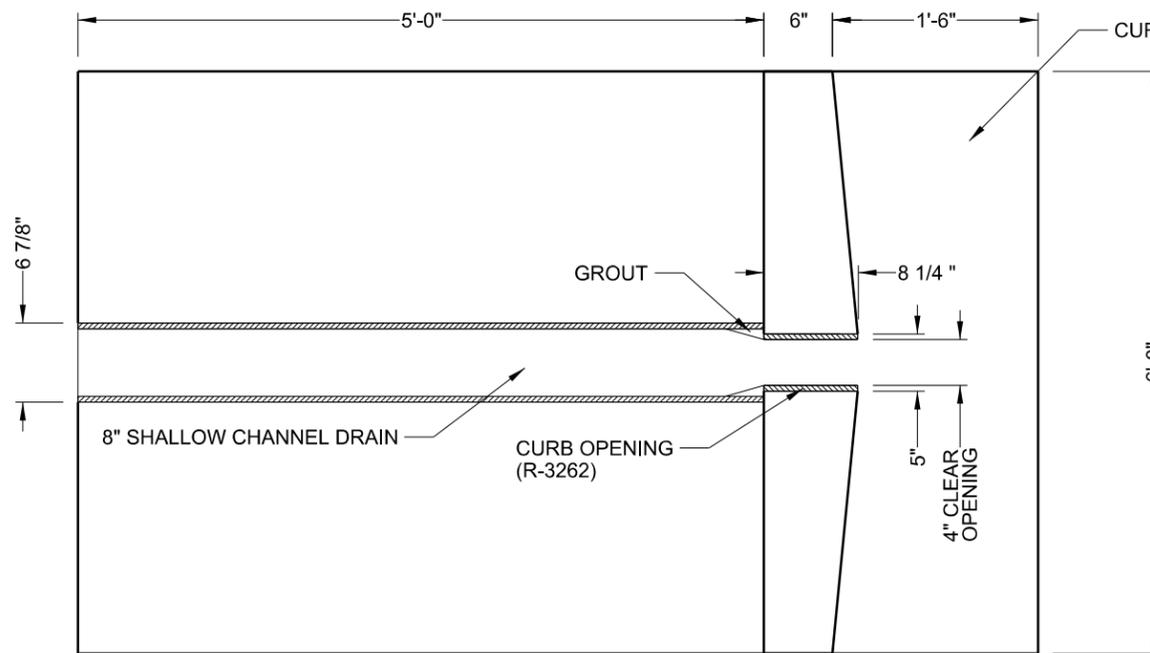
The fabricator shall submit shop drawings in accordance with the Standard Specifications.



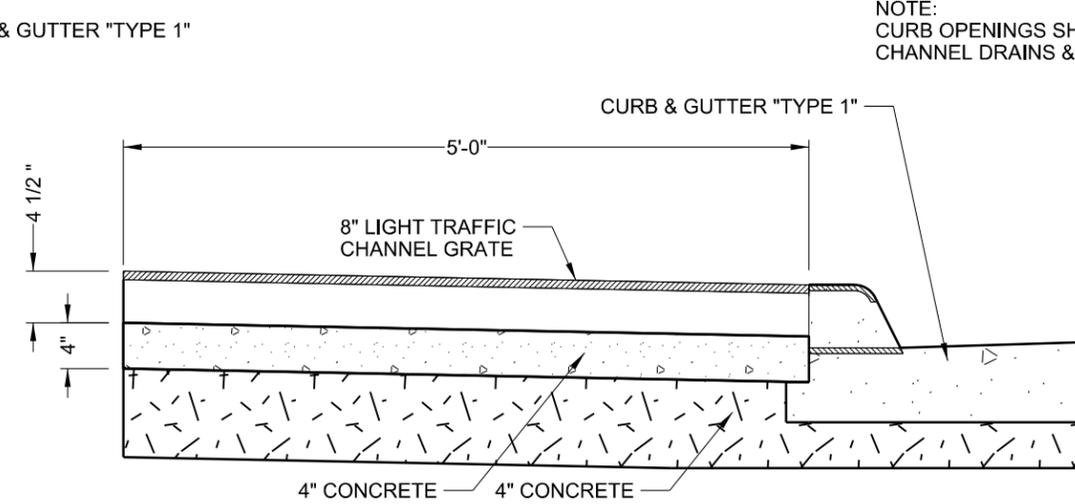
SEC A-A



SEC B-B



PLAN VIEW



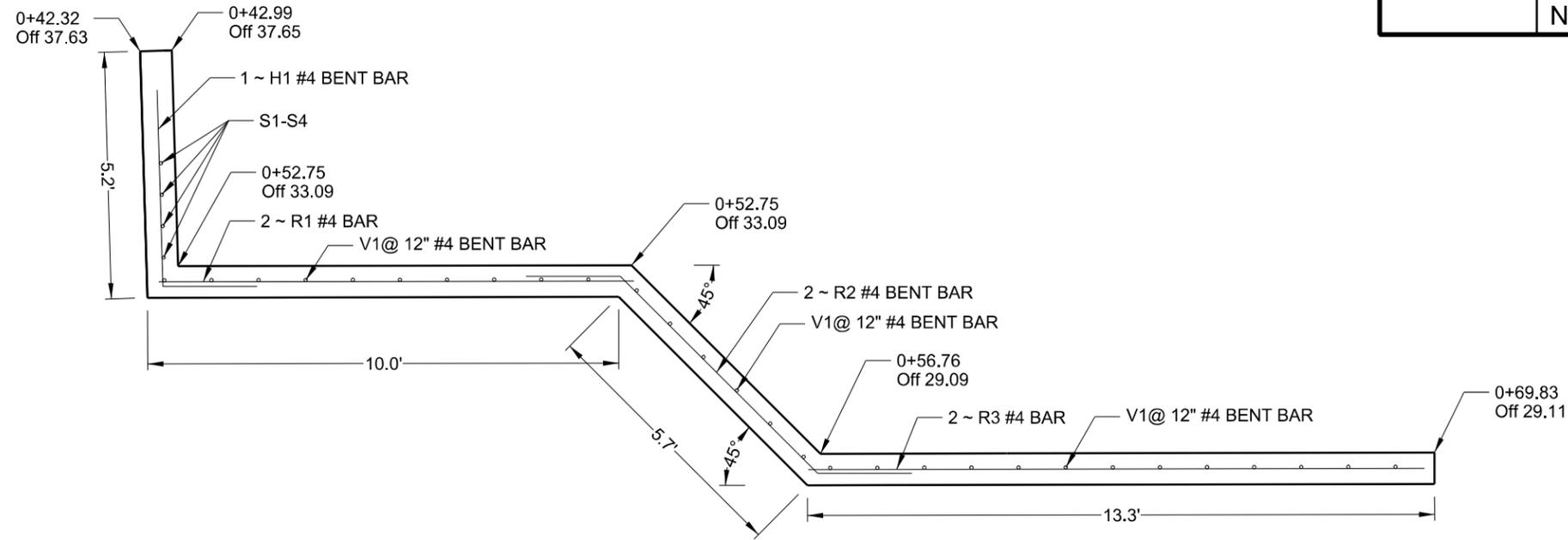
PROFILE

NOTE:  
CURB OPENINGS SHALL BE (R-3262) BY NEENAH FOUNDRY.  
CHANNEL DRAINS & GRATES SHALL BE BY NDS.

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Channel Drain & Handrail Details

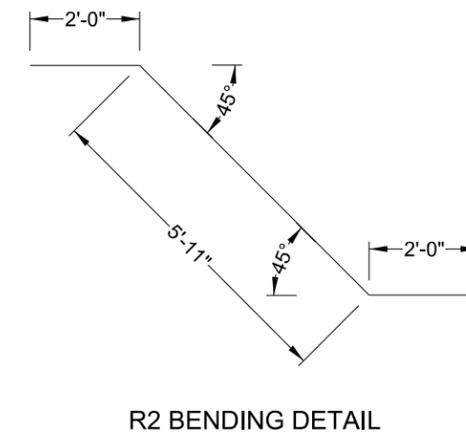
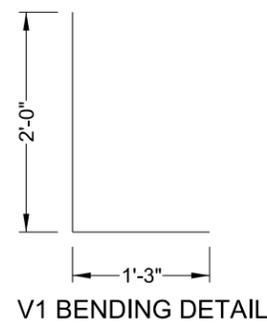
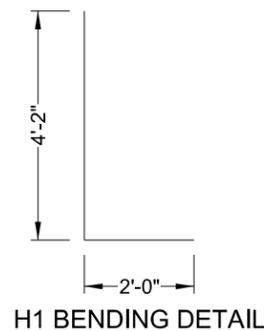
1st Street SE Sidewalk Project  
Bowman, North Dakota



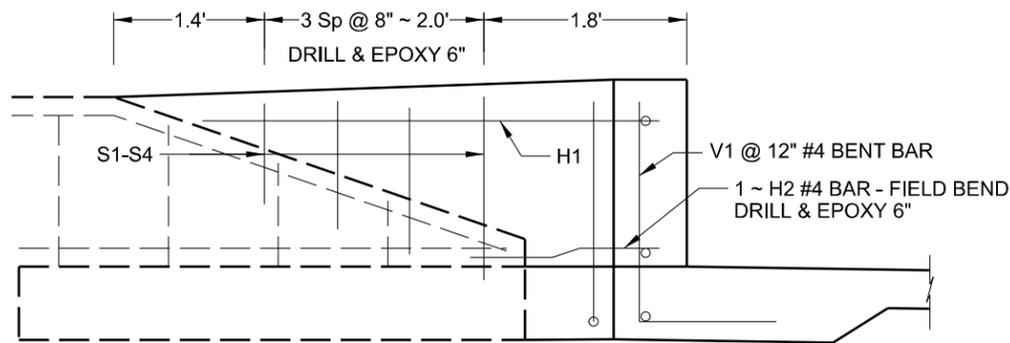
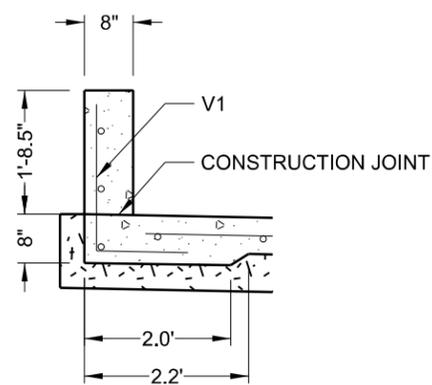
**1ST STREET SW**  
(Sta. 0+43 to Sta. 0+76.59)

**NOTE:**

1. Fabrication and tolerances shall be in accordance with the CRSI Manual of Standard Practice.
2. All dimensions are out to out of bars.
3. Nominal length of each bent bar or cut bar is the sum total of the detailing dimension for that bar, unless otherwise noted.
4. Bar list for wall has not been adjusted for the vertical taper. The contractor shall adjust the rebar in the field to maintain the required clearance.
5. Rebar list shall be used for estimating purposes only. All costs associated with all reinforcing for the retaining wall and sidewalk shall be included in the bid price for "Retaining Wall".
6. Where there are tapers in the sidewalk, cut rebar to appropriate lengths in order to maintain the required clearance.



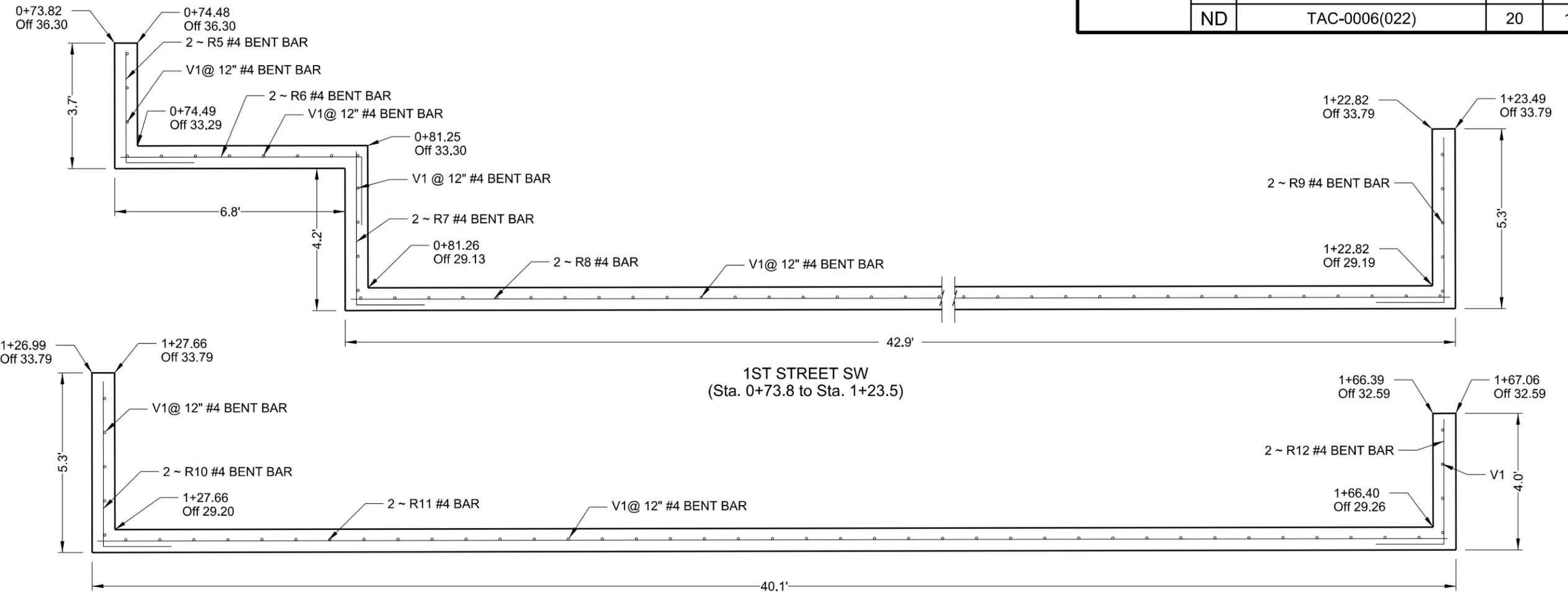
BILL OF REINFORCING STEEL, GRADE 60						
LOCATION	Mark	No.	Size	Length	Type	
1ST STREET SW Sta. 0+42 to Sta. 0+76.59	BARLIST RETAINING WALL WALL	R1	2	4	10' - 1"	Str.
		R2	2	4	9' - 11"	Bent
		R3	2	4	13' - 1"	Str.
		S1	1	4	0' - 11"	Str.
		S2	1	4	1' - 2"	Str.
		S3	1	4	1' - 4"	Str.
		S4	1	4	1' - 8"	Str.
		H1	1	4	6' - 2"	Bent
		H2	1	4	1' - 9"	Bent
		SIDEWALK	V1	33	4	3' - 3"



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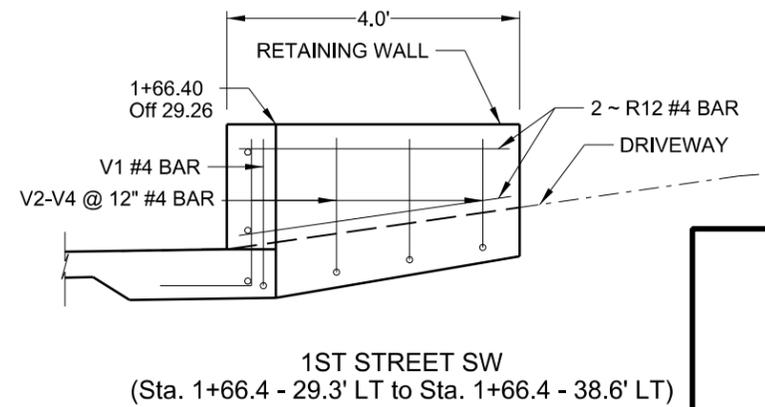
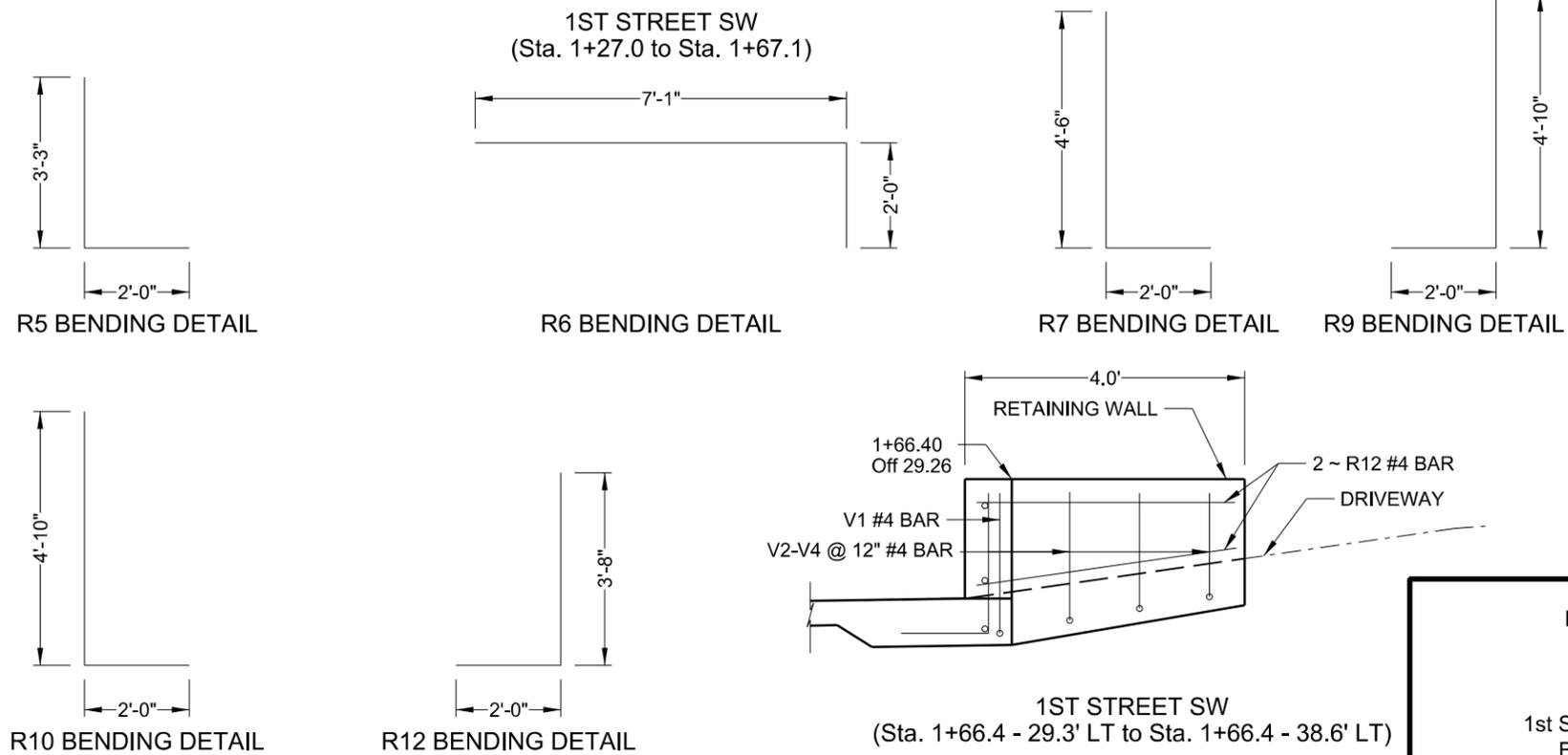
Retaining Wall Details  
 1st Street SE Sidewalk Project  
 Bowman, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-0006(022)	20	11



BILL OF REINFORCING STEEL, GRADE 60							
LOCATION	Mark	No.	Size	Length	Type		
1ST STREET SW (Sta. 0+73.8 to Sta. 1+23.5)	BARLIST RETAINING WALL	WALL	R5	2	4	5' - 3"	Bent
			R6	2	4	9' - 1"	Bent
			R7	2	4	6' - 6"	Bent
			R8	2	4	42' - 7"	Str.
			R9	2	4	6' - 10"	Bent
1ST STREET SW (Sta. 1+27.0 to Sta. 1+67.1)	BARLIST RETAINING WALL	WALL	R10	2	4	6' - 10"	Bent
			R11	2	4	39' - 8"	Str.
1ST STREET SW (Sta. 1+27.0 to Sta. 1+67.1)	BARLIST RETAINING WALL	SIDEWALK	V1	63	4	3' - 3"	Bent
			V2	1	4	3' - 1"	Bent
			V3	1	4	2' - 11"	Bent
			V4	1	4	2' - 9"	Bent
			V1	33	4	3' - 3"	Bent

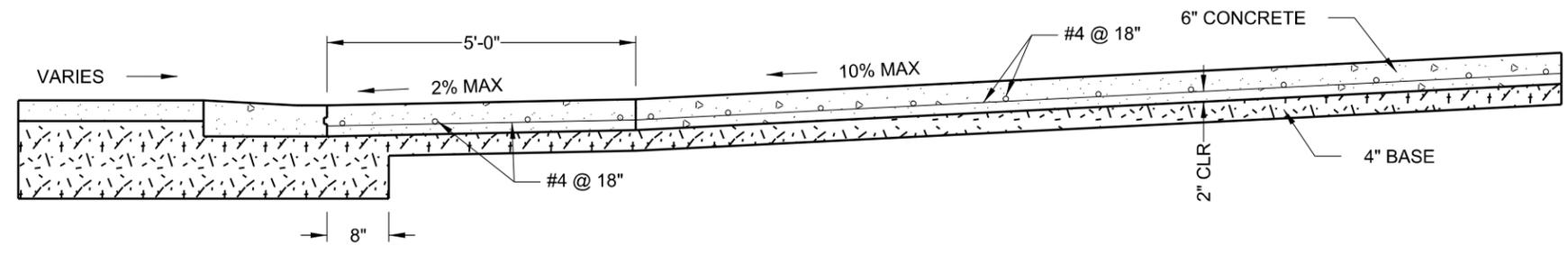
BILL OF REINFORCING STEEL, GRADE 60							
LOCATION	Mark	No.	Size	Length	Type		
1ST STREET SW (Sta. 1+27.0 to Sta. 1+67.1)	BARLIST RETAINING WALL	WALL	R10	2	4	6' - 10"	Bent
			R11	2	4	39' - 8"	Str.
			R12	2	4	5' - 8"	Bent
1ST STREET SW (Sta. 1+27.0 to Sta. 1+67.1)	BARLIST RETAINING WALL	SIDEWALK	V1	33	4	3' - 3"	Bent
			V2	1	4	3' - 1"	Bent
			V3	1	4	2' - 11"	Bent
			V4	1	4	2' - 9"	Bent
			V1	33	4	3' - 3"	Bent



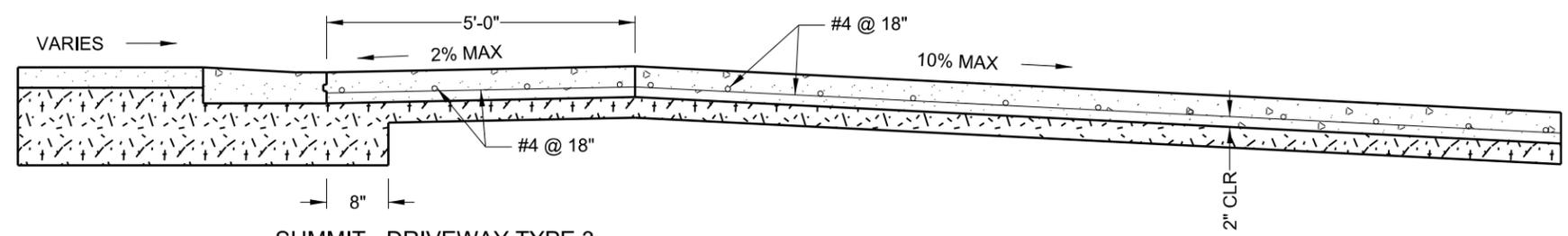
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Retaining Wall Details  
 1st Street SE Sidewalk Project  
 Bowman, North Dakota

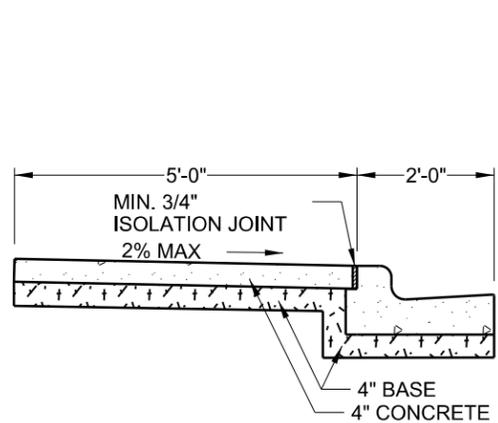
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-0006(022)	30	1



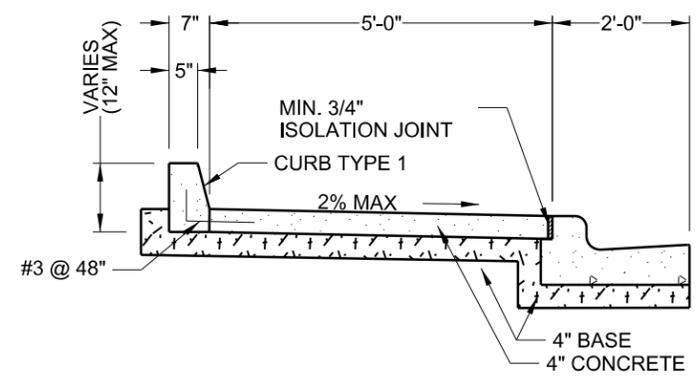
SAG - DRIVEWAY TYPE 3



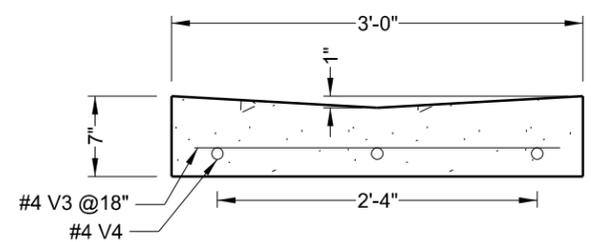
SUMMIT - DRIVEWAY TYPE 3



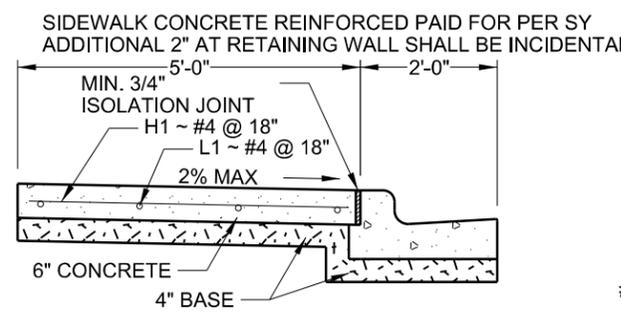
SIDEWALK DETAIL  
(INSTALLED ADJACENT TO CURB AND GUTTER)



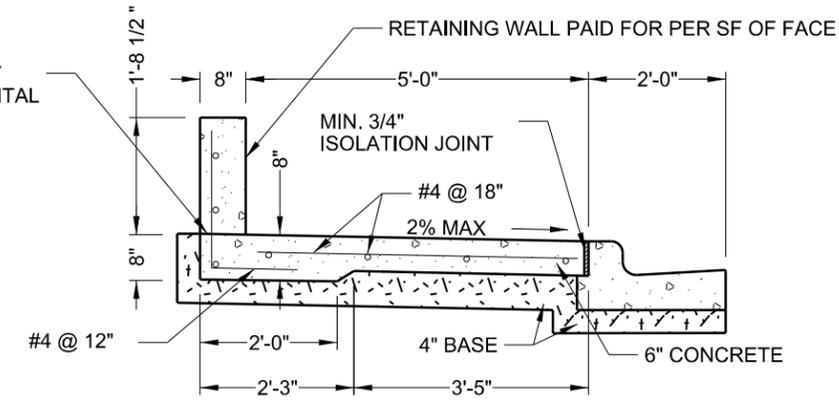
CURB DETAIL  
(INSTALLED ADJACENT TO CURB AND GUTTER)



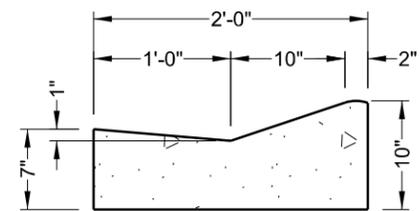
VALLEY GUTTER DETAIL



REINFORCED SIDEWALK DETAIL  
(INSTALLED ADJACENT TO CURB AND GUTTER)



RETAINING WALL DETAILS  
(INSTALLED ADJACENT TO CURB AND GUTTER)



CURB & GUTTER  
MOUNTABLE - SPECIAL

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Typical Sections  
 1st Street SE Sidewalk Project  
 Bowman, North Dakota

201 - STUMP REMOVAL	
STA 0+64 - 33' LT	1 EA
STA 0+83 - 25' LT TO 1+65 - 25' LT	6 EA
STA 1+70 - 34' LT	1 EA

201 - CLEARING & GRUBBING	
STA 0+50 TO 1+75 - LT (BUT NOT LIMITED TO)	LSUM

754 - REMOVE & RESET SIGN	
STA 0+52 - 25' LT (STOP)	1 EA
STA 3+51 - 37' LT (STOP)	1 EA

202 - REMOVAL OF CONCRETE	
STA 0+39 TO 1+67 - LT (SIDEWALK & STAIRS)	72 SY
STA 1+67 TO 1+81 - LT (DRIVEWAY)	20 SY
STA 1+81 TO 2+02 - LT (VALLEY GUTTER)	26 SY
STA 2+02 TO 3+53 - LT (SIDEWALK)	114 SY

202 - SAW BITUMINOUS SURFACING - FULL DEPTH	
STA 0+50 - 21' LT TO 2+08 - 21' LT	158 LF
STA 1+81 - 42' LT TO 2+00 - 42' LT	19 LF
STA 2+50 - 21' LT TO 2+56 - 21' LT	8 LF
STA 3+04 - 21' LT TO 3+10 - 21' LT	8 LF
STA 3+37 - 21' LT TO 3+56 - 43' LT	42 LF

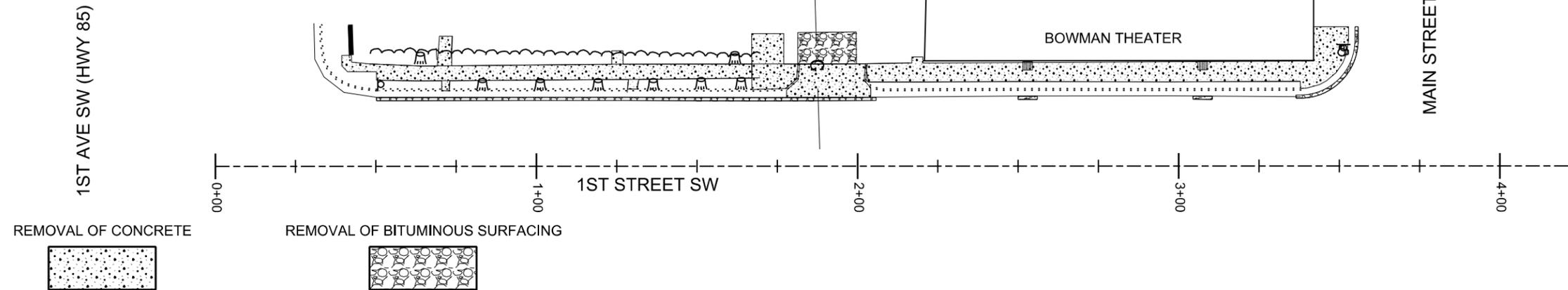
202 - REMOVAL OF CURB & GUTTER	
STA 0+50 - 24' LT TO 1+81 - 27' LT	132 LF
STA 2+03 - 26' LT TO 2+08 - 24' LT	5 LF
STA 2+50 - 24' LT TO 2+56 - 24' LT	6 LF
STA 3+04 - 24' LT TO 3+10 - 24' LT	6 LF
STA 3+37 - 24' LT TO 3+53 - 43' LT	29 LF

202 - SAW CONCRETE	
STA 0+39 - 34' LT TO 0+50 - 27' LT	20 LF
STA 1+23 - 36' LT TO 1+27 - 36' LT	4 LF
STA 1+69 - 39' LT TO 1+79 - 39' LT	10 LF
STA 2+17 - 34' LT TO 2+21 - 34' LT	4 LF
STA 3+42 - 43' LT TO 3+53 - 43' LT	11 LF

202 - REMOVAL OF BITUMINOUS SURFACING	
STA 0+50 TO 2+08 - LT (STREET)	17 SY
STA 1+81 TO 2+02 - LT (ALLEY)	20 SY
STA 2+50 TO 2+56 - LT (STREET)	1 SY
STA 3+04 TO 3+10 - LT (STREET)	1 SY
STA 3+37 TO 3+56 - LT (STREET)	8 SY



Scale: 1"=40.00



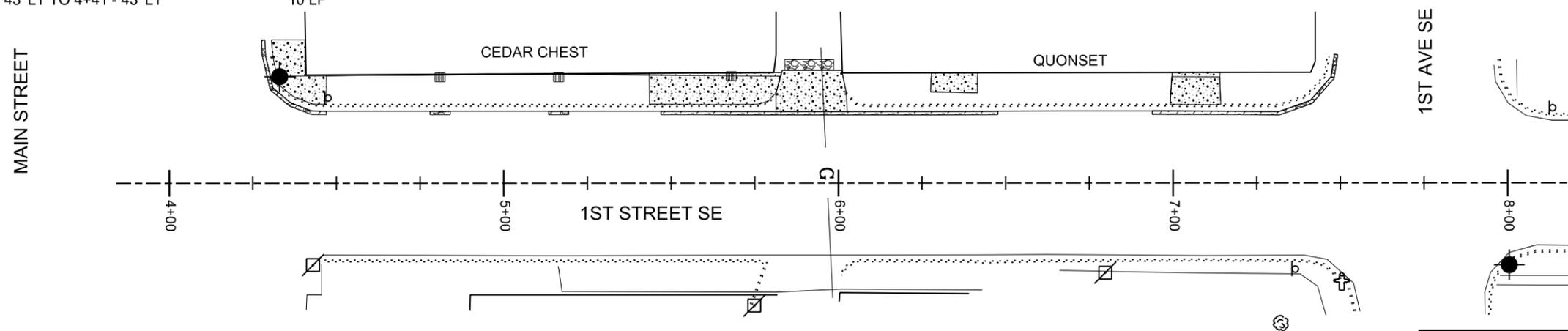
202 - REMOVAL OF CONCRETE	
STA 4+31 TO 4+47 - LT (SIDEWALK)	21 SY
STA 5+44 TO 5+82 - LT (SIDEWALK)	40 SY
STA 5+82 TO 5+99 - LT (VALLEY GUTTER)	27 SY
STA 6+28 TO 6+42 - LT (DRIVEWAY)	9 SY
STA 6+99 TO 7+14 - LT (DRIVEWAY)	16 SY

202 - REMOVAL OF CURB & GUTTER	
STA 4+28 - 43' LT TO 4+47 - 24' LT	30 LF
STA 5+47 - 24' LT TO 5+81 - 27' LT	36 LF
STA 6+02 - 27' LT TO 6+48 - 23' LT	47 LF
STA 6+94 - 23' LT TO 7+46 - 38' LT	61 LF

202 - REMOVAL OF BITUMINOUS SURFACING	
STA 4+25 TO 4+47 - LT (STREET)	8 SY
STA 5+47 TO 6+48 - LT (STREET)	11 SY
STA 5+82 TO 5+99 - LT (ALLEY)	5 SY
STA 6+94 TO 7+49 - LT (STREET)	7 SY

202 - SAW BITUMINOUS SURFACING - FULL DEPTH	
STA 4+25 - 43' LT TO 4+47 - 21' LT	42 LF
STA 5+47 - 21' LT TO 6+48 - 20' LT	103 LF
STA 5+82 - 37' LT TO 5+99 - 37' LT	17 LF
STA 6+94 - 20' LT TO 7+49 - 38' LT	63 LF

202 - SAW CONCRETE	
STA 4+31 - 43' LT TO 4+41 - 43' LT	10 LF



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Removals  
 1st Street SE Sidewalk Project  
 Bowman, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-0006(022)	40	2

202 - REMOVAL OF CONCRETE	
STA 7+98 TO 8+03 - LT (SIDEWALK)	4 SY
STA 9+02 TO 9+20 - LT (DRIVEWAY & PARKING LOT)	22 SY
STA 9+68 TO 10+34 - LT (DRIVEWAY & SIDEWALK)	87 SY

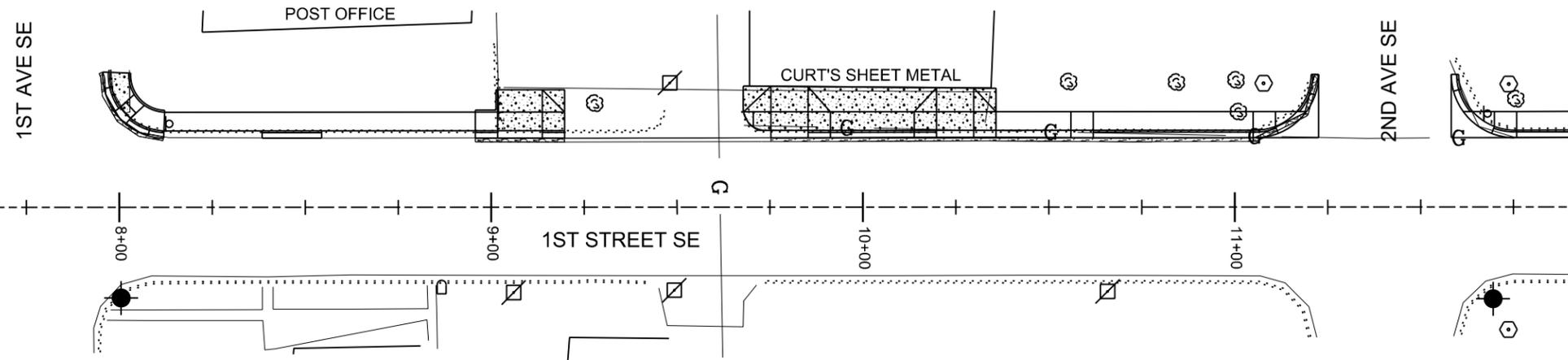
202 - SAW CONCRETE	
STA 7+98 - 36' LT TO 8+03 - 36' LT	5 LF
STA 9+02 - 33' LT TO 9+20 - 31' LT	30 LF

202 - REMOVAL OF CURB & GUTTER	
STA 7+98 - 36' LT TO 8+12 - 21' LT	24 LF
STA 8+38 - 21' LT TO 8+54 - 21' LT	16 LF
STA 8+96 - 21' LT TO 9+20 - 26' LT	24 LF
STA 9+68 - 26' LT TO 10+78 - 21' LT	96 LF
STA 11+05 - 21' LT TO 11+20 - 34' LT	22 LF

754 - REMOVE & RESET SIGN	
STA 8+13 - 22' LT (YIELD)	1 EA

202 - REMOVAL OF BITUMINOUS SURFACING	
STA 7+95 TO 8+12 - LT (STREET)	3 SY
STA 8+96 TO 9+20 - LT (STREET)	3 SY
STA 9+75 TO 11+23 - LT (STREET)	17 SY

202 - SAW BITUMINOUS SURFACING - FULL DEPTH	
STA 7+95 - 36' LT TO 8+42 - 18' LT	26 LF
STA 8+96 - 18' LT TO 9+20 - 18' LT	24 LF
STA 9+75 - 18' LT TO 11+23 - 34' LT	160 LF



202 - REMOVAL OF CONCRETE	
STA 11+97 TO 12+00 - LT (SIDEWALK)	2 SY
STA 12+53 TO 12+70 - LT (DRIVEWAY)	20 SY
STA 13+51 TO 14+08 - LT (VALLEY GUTTER)	67 SY
STA 14+27 TO 15+36 - LT (DRIVEWAY)	113 SY

201 - STUMP REMOVAL	
STA 11+76 - 29' LT	1 EA
STA 12+09 - 30' LT	1 EA
STA 12+43 - 30' LT	1 EA

201 - REMOVAL OF TREES 30 IN	
STA 11+76 - 29' LT	1 EA

202 - REMOVAL OF CURB & GUTTER	
STA 11+59 - 40' LT TO 12+74 - 21' LT	121 LF
STA 13+40 - 21' LT TO 13+51 - 25' LT	11 LF
STA 13+96 - 40' LT TO 15+43 - 21' LT	156 LF
STA 15+75 - 21' LT TO 15+92 - 35' LT	28 LF

202 - REMOVE & RESET CHAIN LINK FENCE	
STA 12+72 - 24' LT TO 13+61 - 24' LT	95 LF

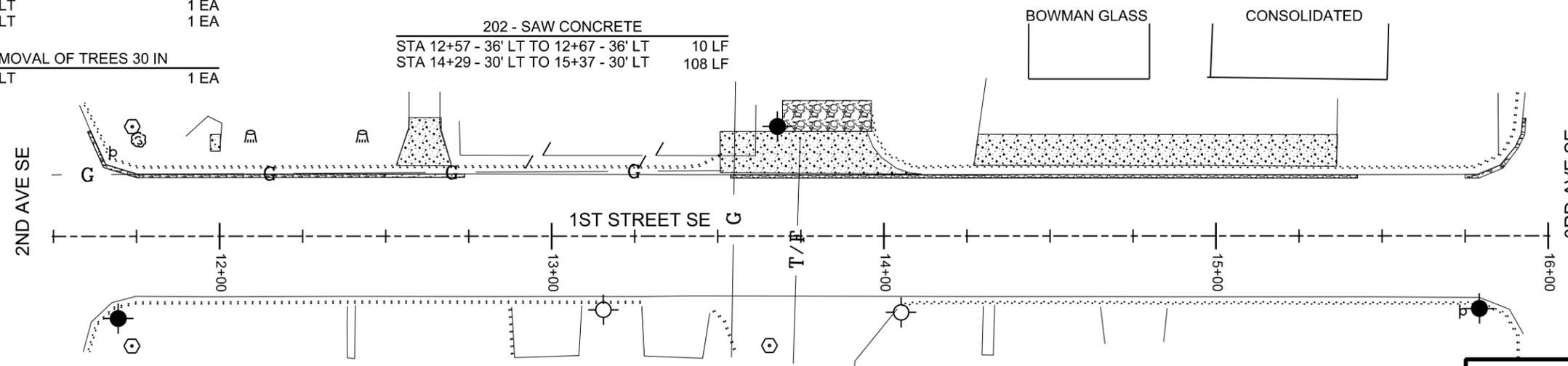
202 - SAW CONCRETE	
STA 12+57 - 36' LT TO 12+67 - 36' LT	10 LF
STA 14+29 - 30' LT TO 15+37 - 30' LT	108 LF

202 - REMOVAL OF BITUMINOUS SURFACING	
STA 11+56 TO 12+74 - LT (STREET)	14 SY
STA 13+40 TO 15+43 - LT (STREET)	21 SY
STA 13+69 TO 13+96 - LT (ALLEY)	28 SY

754 - REMOVE & RESET SIGN	
STA 11+68 - 25' LT (STREET)	1 EA

202 - SAW BITUMINOUS SURFACING - FULL DEPTH	
STA 11+56 - 40' LT TO 12+74 - 18' LT	125 LF
STA 13+40 - 18' LT TO 15+43 - 18' LT	205 LF
STA 13+69 - 41' LT TO 13+96 - 41' LT	27 LF

201 - CLEARING & GRUBBING	
STA 12+75 TO 13+50 - LT (BUT NOT LIMITED TO)	LSUM



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Removals  
 1st Street SE Sidewalk Project  
 Bowman, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-0006(022)	60	1

748 - CURB & GUTTER - TYPE 1	
STA 0+50 - 24' LT TO 1+67 - 24' LT	117 LF
STA 2+00 - 24' LT TO 2+06 - 24' LT	6 LF
STA 2+50 - 24' LT TO 2+56 - 24' LT	6 LF
STA 3+05 - 24' LT TO 3+11 - 24' LT	6 LF
STA 3+37 - 24' LT TO 3+47 - 27' LT	11 LF
STA 3+50 - 30' LT TO 3+53 - 43' LT	14 LF

748 - CURB & GUTTER MOUNTABLE - TYPE 1	
STA 1+67 - 24' LT TO 2+00 - 24' LT	33 LF
STA 3+47 - 27' LT TO 3+50 - 30' LT	4 LF

750 - SIDEWALK CONCRETE - 4 IN	
STA 2+06 TO 3+53 - LT	114 SY

402 - COLD BITUMINOUS PAVEMENT - 4 IN	
STA 0+50 TO 2+08 - LT (STREET)	4 TON
STA 1+81 TO 2+02 - LT (ALLEY)	6 TON
STA 2+50 TO 2+56 - LT (STREET)	0.5 TON
STA 3+04 TO 3+10 - LT (STREET)	0.5 TON
STA 3+37 TO 3+56 - LT (STREET)	1 TON

748 - CURB - TYPE 1	
STA 2+20 - 33' LT TO 3+37 - 33' LT	117 LF

750 - SIDEWALK CONCRETE REINFORCED - 6 IN	
STA 0+39 TO 2+06 - LT	104 SY

750 - DETECTABLE WARNING PANEL	
STA 3+48 - 29' LT	8 SF

930 - RETAINING WALL	
STA 0+43 - 38' LT TO 0+77 - 29' LT	54 SF
STA 0+74 - 33' LT TO 1+23 - 34' LT	107 SF
STA 1+28 - 34' LT TO 1+67 - 33' LT	83 SF

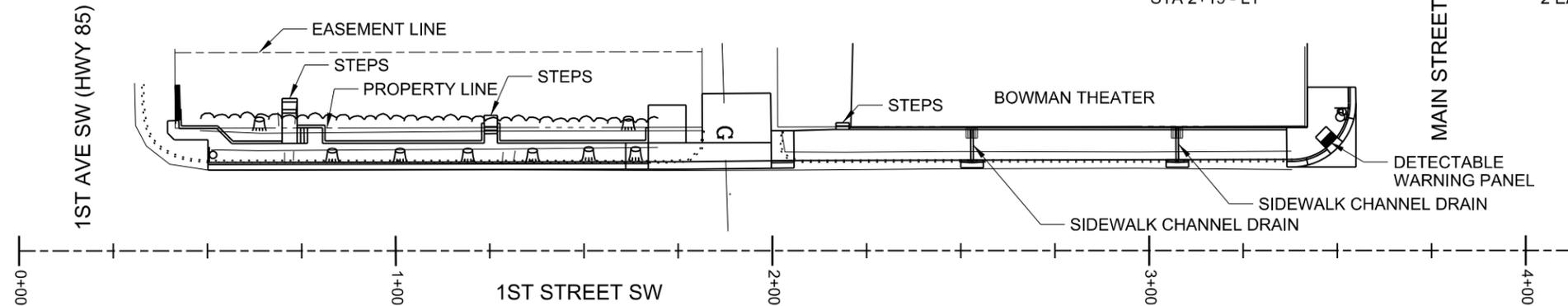
750 - DRIVEWAY CONCRETE REINFORCED - 6 IN	
STA 1+67 TO 1+77 - LT	11 SY
STA 3+50 - LT (FILLET)	7 SY

750 - STEPS CONCRETE	
STA 0+74 - LT	8 EA
STA 1+25 - LT	3 EA
STA 2+19 - LT	2 EA

750 - SIDEWALK TRENCH DRAIN	
STA 2+53 - 24' LT	1 EA
STA 3+07 - 24' LT	1 EA



Scale: 1"= 40.00



748 - CURB & GUTTER - TYPE 1	
STA 4+31 - 43' LT TO 4+34 - 30' LT	14 LF
STA 4+37 - 27' LT TO 4+47 - 24' LT	11 LF
STA 5+44 - 24' LT TO 5+79 - 25' LT	35 LF
STA 5+82 - 29' LT TO 5+82 - 33' LT	4 LF
STA 6+01 - 33' LT TO 6+01 - 28' LT	4 LF
STA 6+03 - 24' LT TO 6+28 - 23' LT	25 LF
STA 6+42 - 23' LT TO 6+48 - 23' LT	6 LF
STA 6+94 - 23' LT TO 7+00 - 23' LT	6 LF
STA 7+14 - 23' LT TO 7+37 - 24' LT	23 LF
STA 7+42 - 28' LT TO 7+46 - 38' LT	11 LF

748 - CURB & GUTTER MOUNTABLE - TYPE 1	
STA 4+34 - 30' LT TO 4+37 - 27' LT	4 LF
STA 5+79 - 25' LT TO 5+82 - 29' LT	5 LF
STA 6+01 - 28' LT TO 6+03 - 24' LT	5 LF
STA 7+37 - 24' LT TO 7+42 - 28' LT	5 LF

750 - SIDEWALK CONCRETE - 4 IN	
STA 4+31 TO 4+47 - LT	21 SY
STA 5+44 TO 5+82 - LT	39 SY
STA 6+01 TO 6+28 - LT	14 SY
STA 6+42 TO 7+00 - LT	32 SY
STA 7+14 TO 7+42 - LT	14 SY

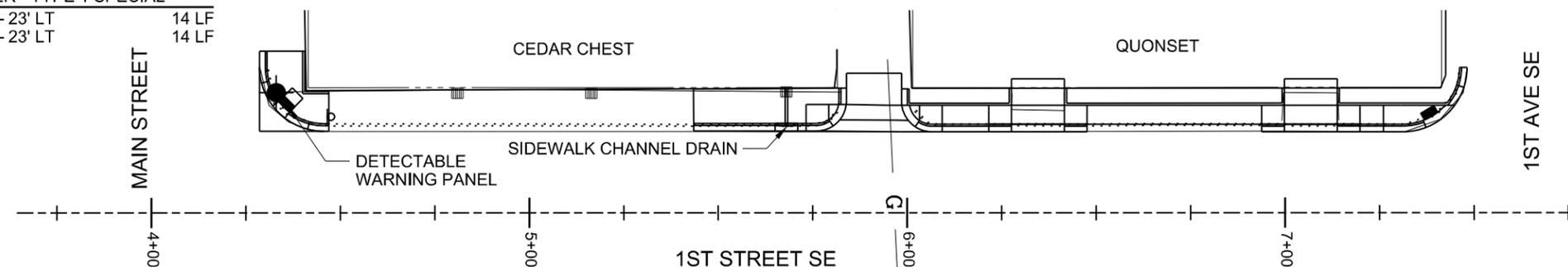
750 - DRIVEWAY CONCRETE REINFORCED - 6 IN	
STA 4+37 - LT (FILLET)	7 SY
STA 6+28 TO 6+42 - LT	11 SY
STA 7+00 TO 7+14 - LT	11 SY

402 - COLD BITUMINOUS PAVEMENT - 4 IN	
STA 4+25 TO 4+47 - LT (STREET)	1 TON
STA 5+47 TO 6+48 - LT (STREET)	3 TON
STA 5+82 TO 5+99 - LT (ALLEY)	3 TON
STA 6+94 TO 7+49 - LT (STREET)	2 TON

748 - CURB & GUTTER - TYPE 1 SPECIAL	
STA 6+28 - 23' LT TO 6+42 - 23' LT	14 LF
STA 7+00 - 23' LT TO 7+14 - 23' LT	14 LF

748 - CURB - TYPE 1	
STA 4+41 - 43' LT TO 4+47 - 32' LT	17 LF
STA 6+01 - 29' LT TO 6+27 - 33' LT	30 LF
STA 6+42 - 33' LT TO 6+99 - 33' LT	65 LF
STA 7+14 - 33' LT TO 7+43 - 29' LT	32 LF

750 - SIDEWALK CONCRETE REINFORCED - 6 IN	
STA 5+82 TO 6+00 - LT	7 SY
STA 6+28 TO 6+42 - LT	8 SY
STA 7+00 TO 7+14 - LT	8 SY



748 - VALLEY GUTTER - 36 IN REINFORCED	
STA 5+76 TO 6+06 - LT	7 SY

750 - SIDEWALK TRENCH DRAIN	
STA 5+68 - 24' LT	1 EA

750 - DETECTABLE WARNING PANEL	
STA 4+36 - 29' LT	8 SF
STA 7+36 - 26' LT	8 SF

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Plan Sheets  
 1st Street SE Sidewalk Project  
 Bowman, North Dakota

748 - CURB & GUTTER - TYPE 1	
STA 7+98 - 36' LT TO 8+00 - 27' LT	10 LF
STA 8+03 - 24' LT TO 8+12 - 21' LT	10 LF
STA 8+38 - 21' LT TO 8+54 - 21' LT	16 LF
STA 8+96 - 21' LT TO 9+02 - 21' LT	6 LF
STA 9+14 - 21' LT TO 9+20 - 21' LT	6 LF
STA 9+85 - 21' LT TO 10+20 - 21' LT	35 LF
STA 10+56 - 21' LT TO 11+11 - 22' LT	55 LF
STA 11+17 - 26' LT TO 11+21 - 36' LT	11 LF

748 - CURB & GUTTER MOUNTABLE - TYPE 1	
STA 8+00 - 27' LT TO 8+03 - 24' LT	4 LF
STA 9+02 - 21' LT TO 9+14 - 21' LT	12 LF
STA 9+75 - 26' LT TO 9+85 - 21' LT	10 LF
STA 10+20 - 21' LT TO 10+56 - 21' LT	36 LF
STA 11+11 - 22' LT TO 11+17 - 26' LT	7 LF

748 - CURB - TYPE 1	
STA 8+03 - 36' LT TO 8+12 - 26' LT	15 LF
STA 8+96 - 26' LT TO 9+01 - 32' LT	11 LF

750 - SIDEWALK CONCRETE - 4 IN	
STA 7+98 TO 8+96 - LT	57 SY
STA 9+85 TO 10+20 - LT	39 SY
STA 10+62 TO 11+17 - LT	29 SY

750 - SIDEWALK CONCRETE REINFORCED - 6 IN	
STA 8+96 TO 9+20 - LT	13 SY
STA 9+68 TO 9+91 - LT	12 SY
STA 10+14 TO 10+62 - LT	27 SY

750 - DETECTABLE WARNING PANEL	
STA 8+02 - 26' LT	8 SF
STA 11+10 - 24' LT	8 SF

750 - DRIVEWAY CONCRETE REINFORCED - 6 IN	
STA 9+02 TO 9+20 - LT	12 SY
STA 9+68 TO 9+91 - LT	13 SY
STA 10+14 TO 10+36 - LT	11 SY
STA 11+11 - LT (FILLET)	7 SY

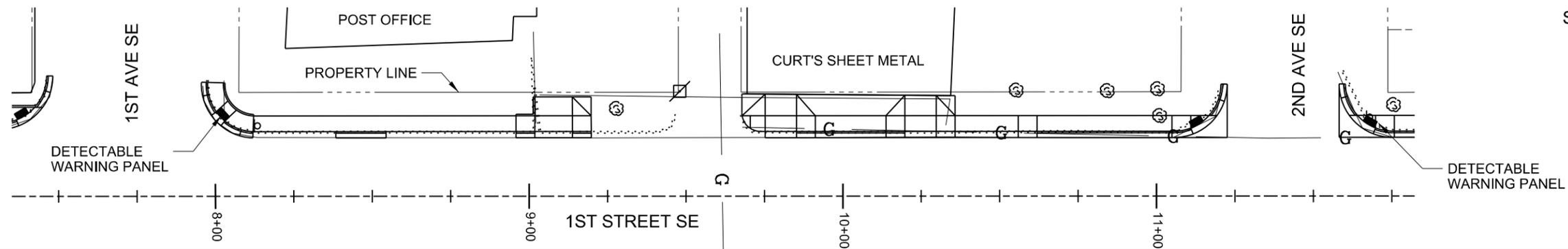
  

402 - COLD BITUMINOUS PAVEMENT - 4 IN	
STA 7+95 TO 8+12 - LT (STREET)	1 TON
STA 8+96 TO 9+20 - LT (STREET)	1 TON
STA 9+75 TO 11+23 - LT (STREET)	4 TON

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-0006(022)	60	2



Scale: 1"=40.00



748 - CURB & GUTTER - TYPE 1	
STA 11+61 - 32' LT TO 11+64 - 26' LT	7 LF
STA 11+70 - 22' LT TO 12+56 - 21' LT	86 LF
STA 12+68 - 21' LT TO 12+74 - 21' LT	6 LF
STA 13+40 - 21' LT TO 13+60 - 22' LT	20 LF
STA 13+66 - 26' LT TO 13+69 - 36' LT	11 LF
STA 13+93 - 36' LT TO 13+97 - 26' LT	11 LF
STA 14+03 - 22' LT TO 14+31 - 21' LT	28 LF
STA 15+37 - 21' LT TO 15+43 - 21' LT	6 LF
STA 15+75 - 21' LT TO 15+84 - 23' LT	10 LF
STA 15+87 - 26' LT TO 15+90 - 35' LT	10 LF

750 - DETECTABLE WARNING PANEL	
STA 11+71 - 24' LT	8 SF
STA 15+85 - 24' LT	8 SF

748 - CURB & GUTTER MOUNTABLE - TYPE 1	
STA 11+64 - 26' LT TO 11+70 - 22' LT	7 LF
STA 12+56 - 21' LT TO 12+68 - 21' LT	12 LF
STA 13+60 - 22' LT TO 13+66 - 26' LT	7 LF
STA 13+97 - 26' LT TO 14+03 - 22' LT	7 LF
STA 15+84 - 23' LT TO 15+87 - 26' LT	4 LF

748 - CURB & GUTTER - TYPE 1 SPECIAL	
STA 14+31 - 21' LT TO 15+37 - 21' LT	106 LF

750 - STEPS CONCRETE	
STA 11+99 - LT	3 EA

750 - SIDEWALK CONCRETE - 4 IN	
STA 11+64 TO 12+50 - LT	47 SY
STA 12+74 TO 13+66 - LT	49 SY
STA 14+00 TO 14+25 - LT	12 SY
STA 15+43 TO 15+90 - LT	29 SY

750 - SIDEWALK CONCRETE REINFORCED - 6 IN	
STA 12+50 TO 12+74 - LT	13 SY
STA 13+64 TO 13+99 - LT	13 SY
STA 14+25 TO 15+43 - LT	66 SY

748 - VALLEY GUTTER - 36 IN REINFORCED	
STA 13+54 TO 14+08 - LT	14 SY

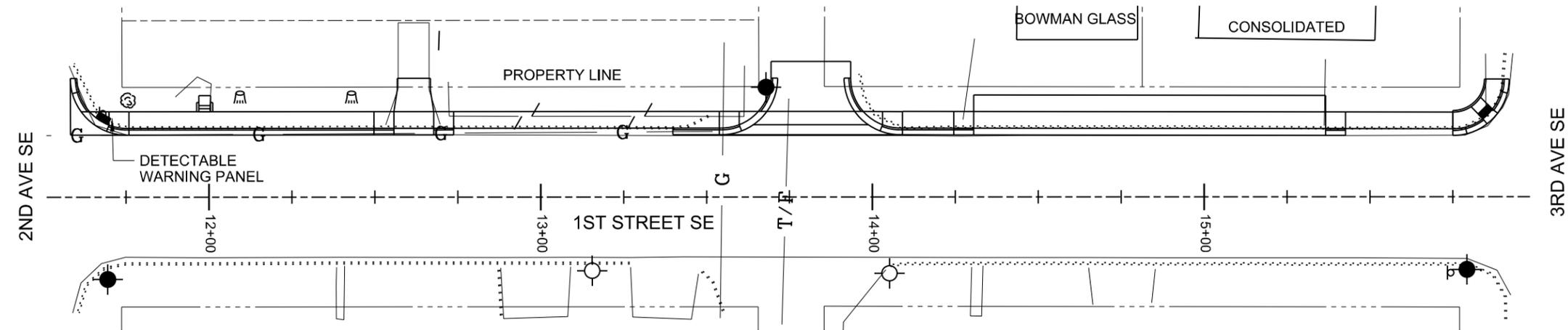
402 - COLD BITUMINOUS PAVEMENT - 4 IN	
STA 11+56 TO 12+74 - LT (STREET)	4 TON
STA 13+40 TO 15+43 - LT (STREET)	5 TON
STA 13+69 TO 13+96 - LT (ALLEY)	9 TON
STA 15+75 TO 15+92 - LT (STREET)	1 TON

750 - DRIVEWAY CONCRETE REINFORCED - 6 IN	
STA 11+69 - LT (FILLET)	7 SY
STA 12+56 TO 12+68 - LT	12 SY
STA 14+31 TO 15+37 - LT	59 SY

748 - CURB - TYPE 1	
STA 15+75 TO 15+85 - LT	15 LF



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Plan Sheets  
 1st Street SE Sidewalk Project  
 Bowman, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-0006(022)	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
D3-36	36"x6"	STREET NAME SIGN (Sign and installation only)		6	
G20-1-60	60"x24"	ROAD WORK NEXT ___ MILES		34	
G20-1b-60	60"x24"	WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)		26	
G20-2-48	48"x24"	END ROAD WORK		19	
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)		18	
G20-10-108	108"x48"	CONTRACTOR SIGN		64	
G20-50a-72	72"x36"	ROAD WORK NEXT ___ MILES RT & LT ARROWS		37	
G20-52a-72	72"x24"	ROAD WORK NEXT ___ MILES RT or LT ARROW		30	
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT		59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT		23	
M5-1-21	21"x15"	ARROW AHD AND RT or LT (Mounted on route marker post)		7	
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)		7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)		7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)		7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP		32	
R1-1a-18	18"x18"	STOP and SLOW PADDLE Back to Back		5	
R1-2-60	60"x60"	YIELD		29	
R2-1-48	48"x60"	SPEED LIMIT ___		39	
R2-1a-24	24"x18"	MINIMUM FEE \$80 (Mounted on Speed Limit post)		10	
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT SYMBOL		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT		13	
R7-1-12	12"x18"	NO PARKING		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED		28	
<b>R11-2a-48</b>	<b>48"x30"</b>	<b>STREET CLOSED</b>	<b>4</b>	<b>28</b>	<b>112</b>
R11-3a-60	60"x30"	ROAD CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-3c-60	60"x30"	STREET CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC		31	
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-4-48	48"x48"	RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-6-48	48"x24"	LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD SYMBOL		35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL		35	
W3-4-48	48"x48"	BE PREPARED TO STOP		35	
W3-5-48	48"x48"	SPEED REDUCTION AHEAD		35	
W4-2-48	48"x48"	RIGHT or LEFT LANE TRANSITION SYMBOL		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC SYMBOL		35	
W8-1-48	48"x48"	BUMP		35	
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
W8-12-48	48"x48"	NO CENTER STRIPE		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or ___ FT.		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or ___ FT.		35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL		35	
W13-1-24	24"x24"	___ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)		11	
W13-4-48	48"x60"	RAMP ARROW		39	
W14-3-48	48"x36"	NO PASSING ZONE		23	
<b>W20-1-48</b>	<b>48"x48"</b>	<b>ROAD WORK AHEAD or ___ FT or ___ MILE</b>	<b>4</b>	<b>35</b>	<b>140</b>
W20-2-48	48"x48"	DETOUR AHEAD or ___ FT		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or ___ FT.		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or ___ FT.		35	
W20-5-48	48"x48"	RIGHT or LEFT LANE CLOSED AHEAD or ___ FT.		35	
W20-7a-48	48"x48"	FLAGGING SYMBOL		35	
W20-7k-24	24"x18"	___ FEET (Mounted on warning sign post)		10	
W20-8-48	48"x48"	STREET CLOSED		35	
W20-51-48	48"x48"	EQUIPMENT WORKING		35	
W20-52-54	54"x12"	NEXT ___ MILES (Mounted on warning sign post)		12	
W21-1a-48	48"x48"	WORKERS SYMBOL		35	
W21-2-48	48"x48"	FRESH OIL		35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or ___ FT		35	

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

SPECIAL SIGNS					
SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
<b>R9-9-24</b>	<b>48"x24"</b>	<b>SIDEWALK CLOSED</b>	<b>2</b>	<b>10</b>	<b>20</b>

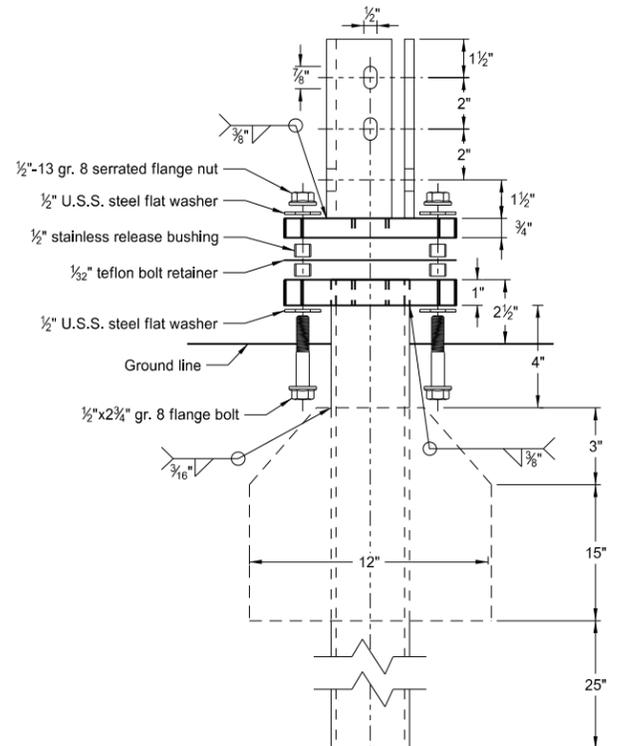
SPEC & CODE		TOTAL UNITS
<b>704-1000</b>	<b>TRAFFIC CONTROL SIGNS</b>	<b>412</b>

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	FLAGGING	MHR	
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH	
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH	
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1051	TYPE II BARRICADES	EACH	
<b>704-1052</b>	<b>TYPE III BARRICADES</b>	<b>EACH</b>	<b>12</b>
704-1060	DELINEATOR DRUMS	EACH	
704-1065	TRAFFIC CONES	EACH	
<b>704-1067</b>	<b>TUBULAR MARKERS</b>	<b>EACH</b>	<b>40</b>
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH	
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH	
704-1095	TYPE B FLASHERS	EACH	
704-1500	OBLITERATION OF PVMT MK	SF	
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	
772-2110	FLASHING BEACON - POST MOUNTED	EACH	

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

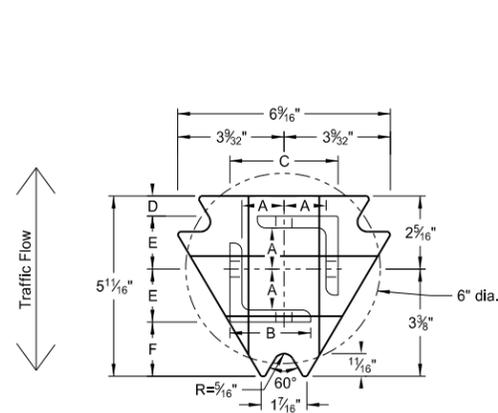
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Traffic Control Devices List

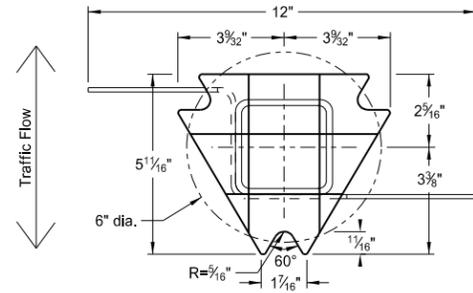


Multi-Directional Slip Base Assembly

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

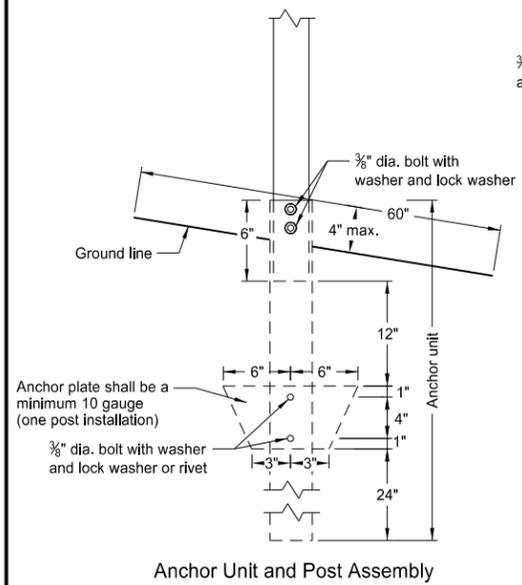
Notes:

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.

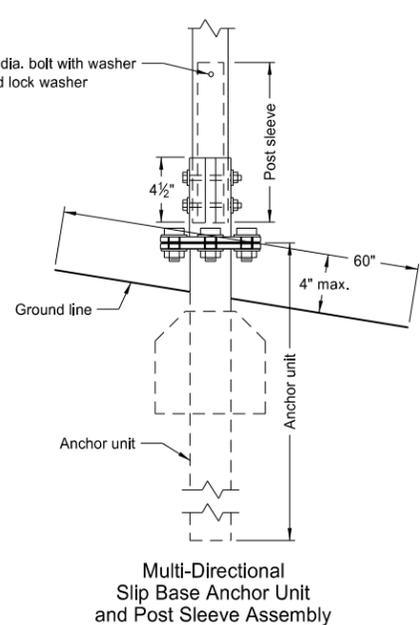
Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No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

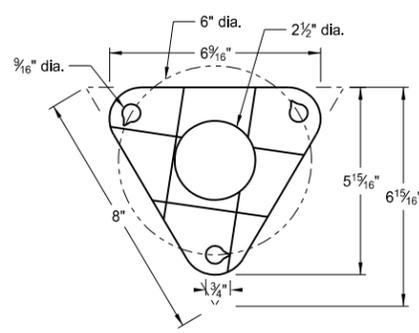
Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16" x 10 ga.	1 9/64"	2 1/2"	3 1/32"	2 5/32"	1 33/64"	1 1/8"
2 1/2" x 10 ga.	1 9/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"



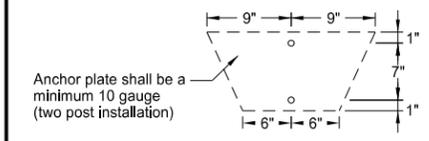
Anchor Unit and Post Assembly



Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



Bolt Retainer for Base Connection  
Bolt Retainer - 1/2" Reprocessed Teflon



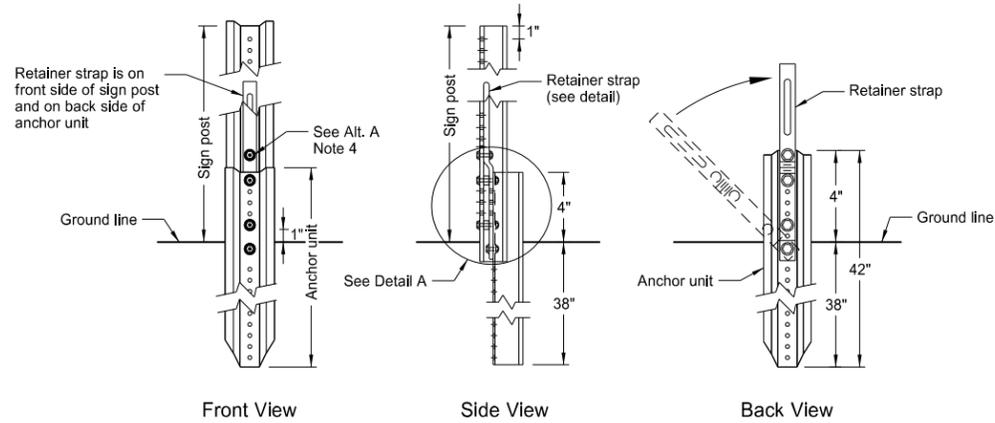
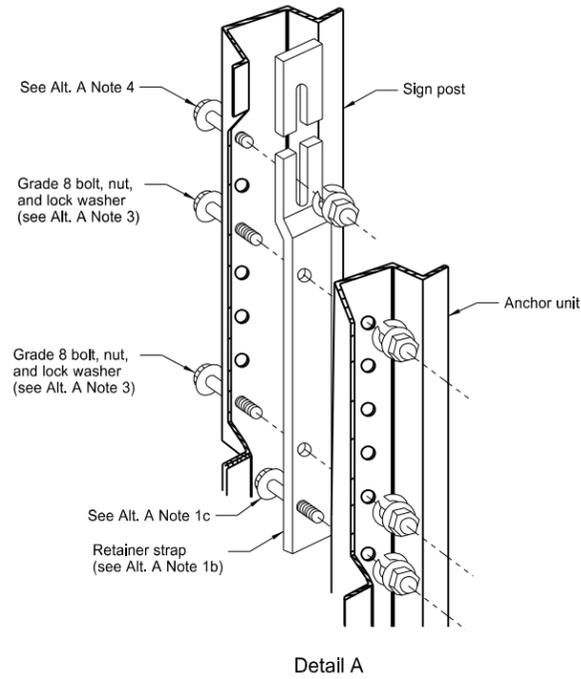
Anchor plate shall be a minimum 10 gauge (two post installation)

- (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" x 10 ga. may be inserted into 2 1/2" x 10 ga. for additional wind load.

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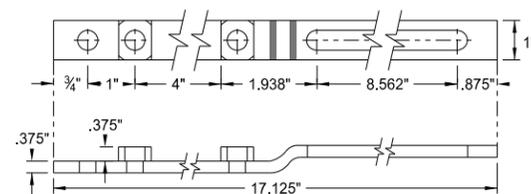
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U-Channel Post

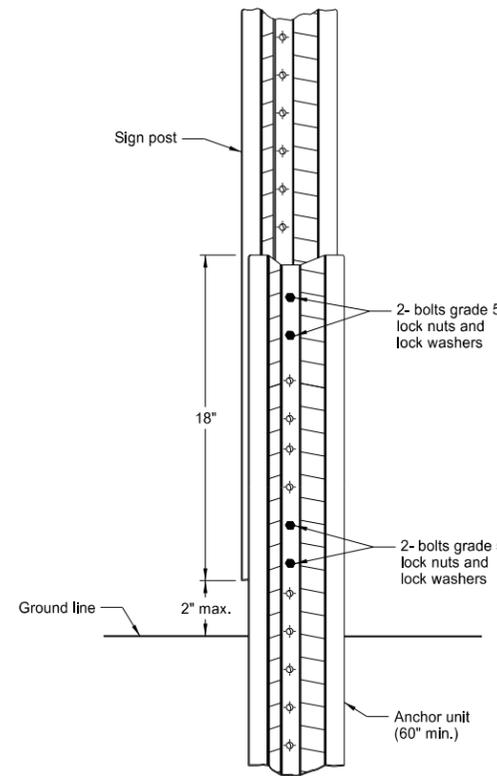


Breakaway U-Channel Detail Alternate A

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

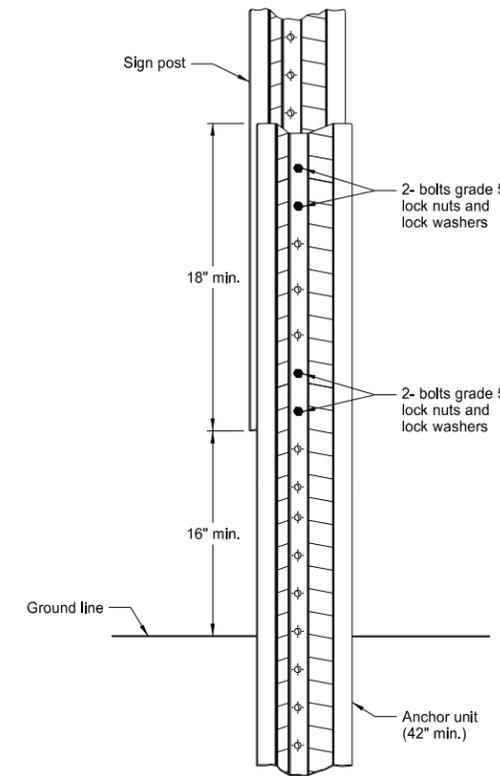


Retainer Strap Detail



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:

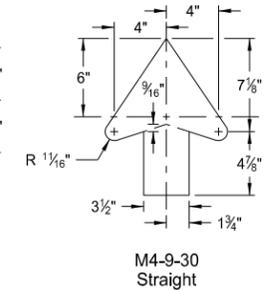
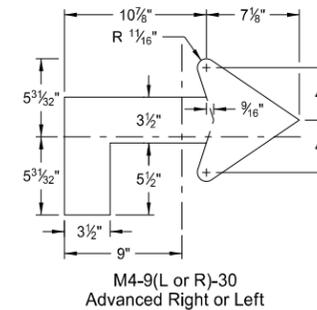
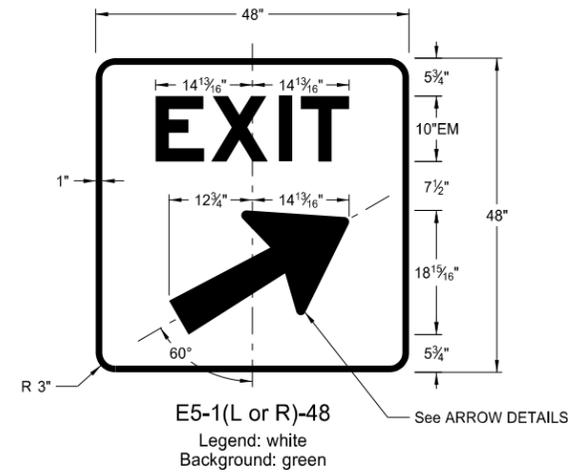
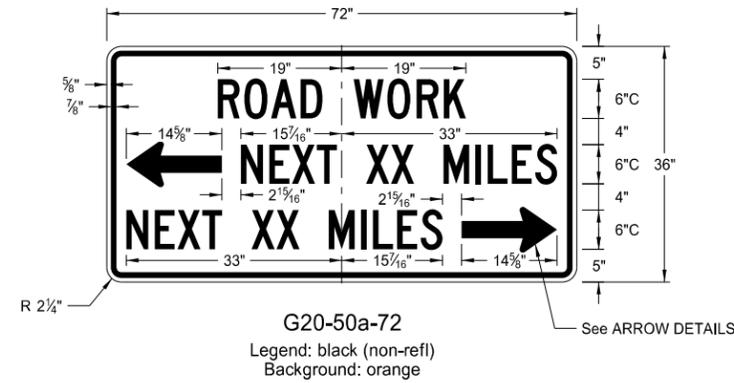
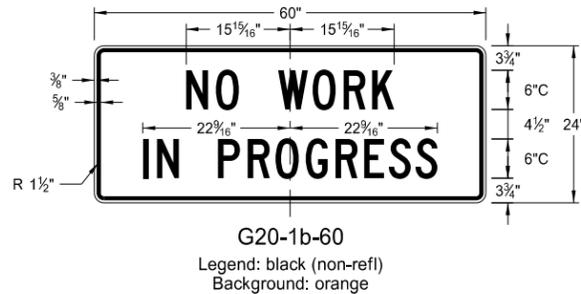
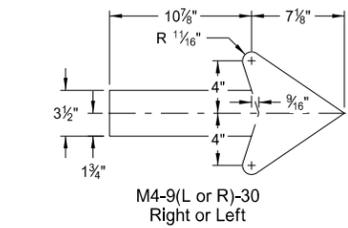
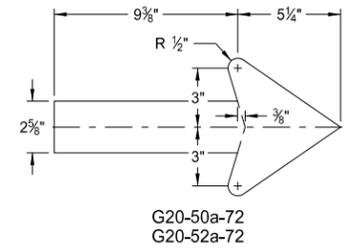
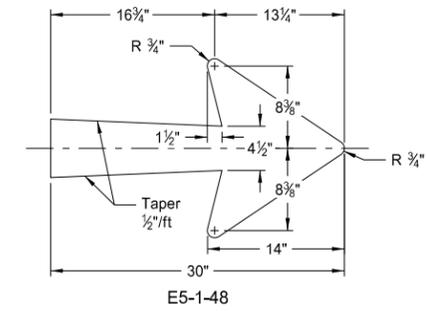
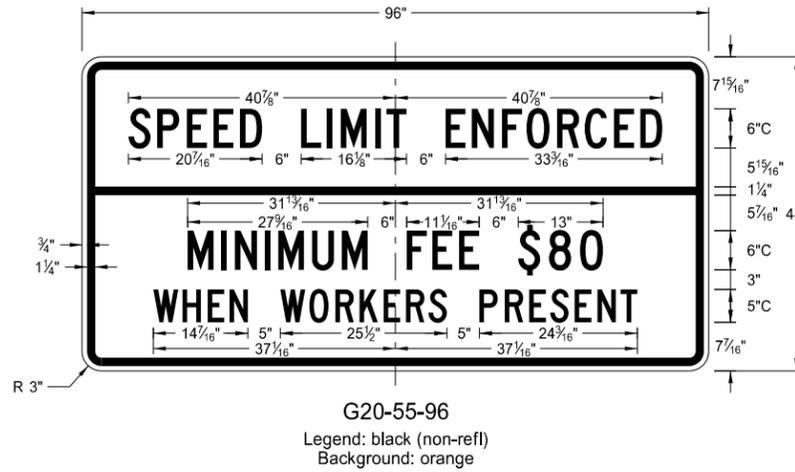
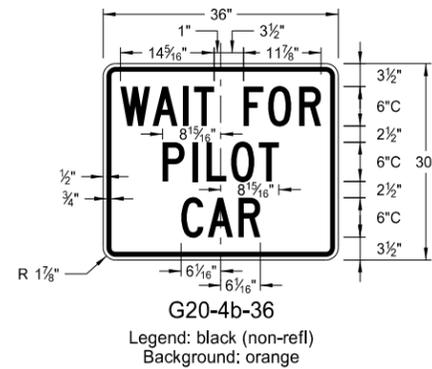
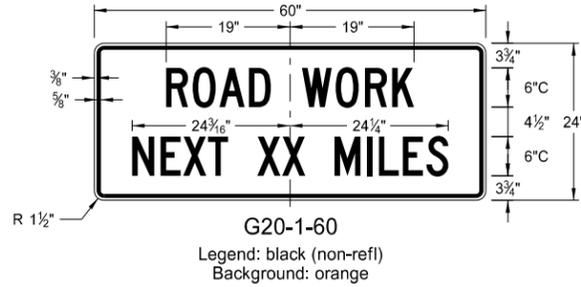
1. a) Drive anchor unit to within 12" of ground level.  
b) Proper assembly established by lining up the bottom hole of retainer strap with the 6th hole from the top of the anchor unit.  
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.  
d) Rotate strap 90° to left.
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.

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CONSTRUCTION SIGN DETAILS  
 TERMINAL AND GUIDE SIGNS

D-704-9



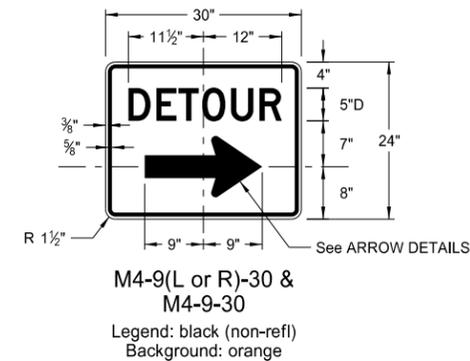
ARROW DETAILS

NOTES:

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

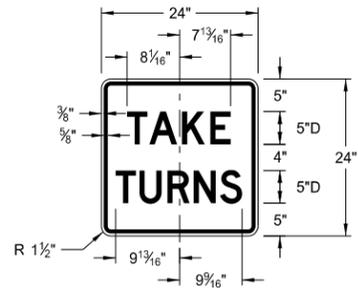
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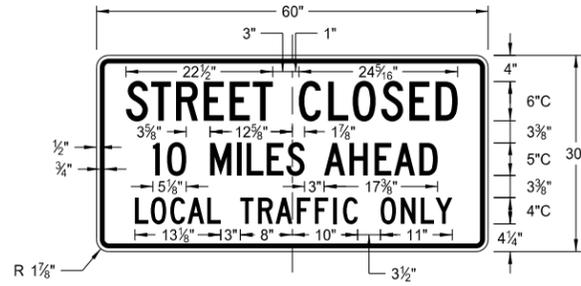


CONSTRUCTION SIGN DETAILS  
REGULATORY SIGNS

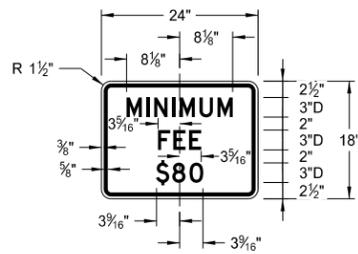
D-704-10



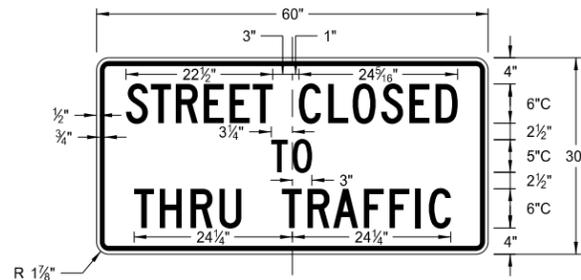
R1-50-24  
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Background: white



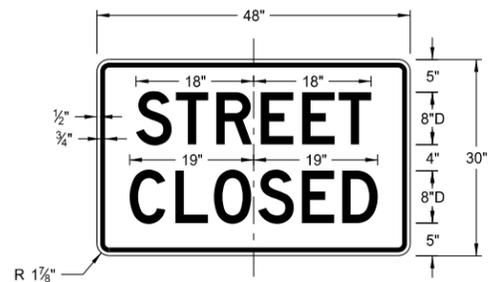
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R2-1a-24  
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Background: white



R11-4a-60  
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R11-2a-48  
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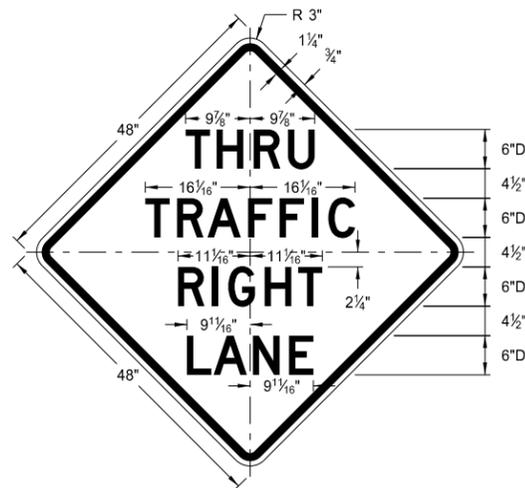
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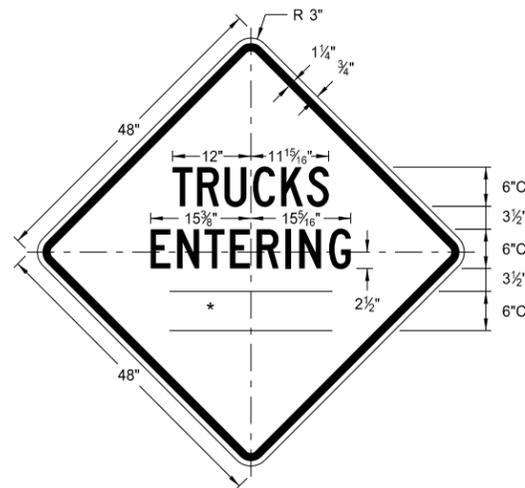
CONSTRUCTION SIGN DETAILS  
WARNING SIGNS

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

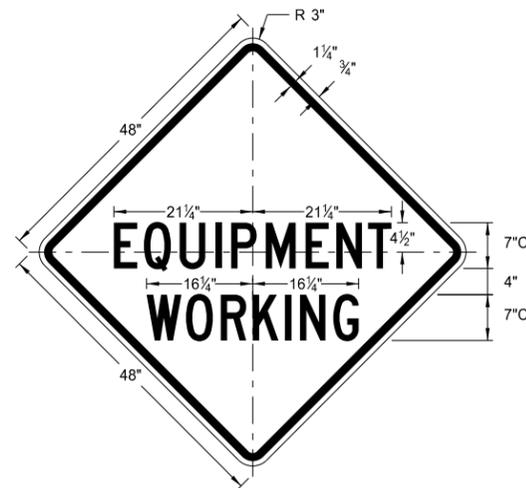
\* DISTANCE MESSAGES



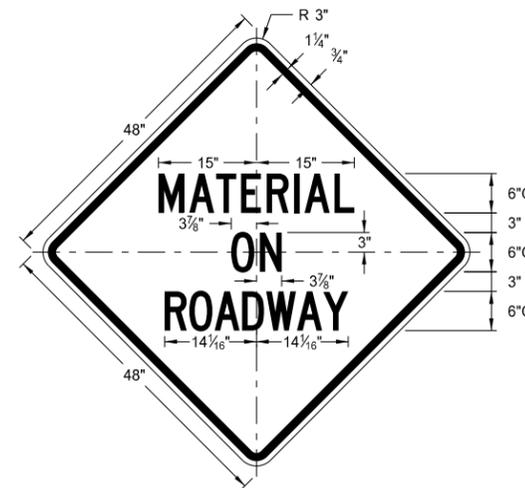
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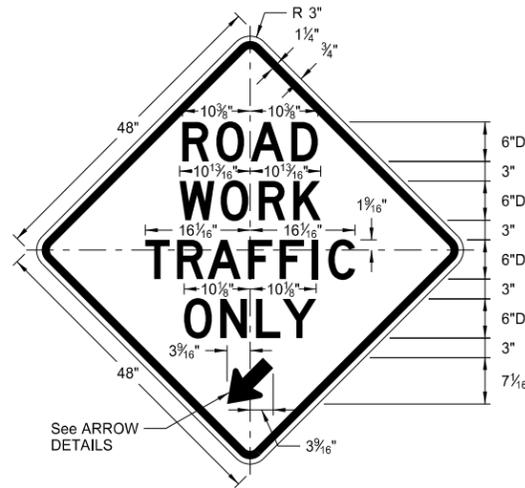
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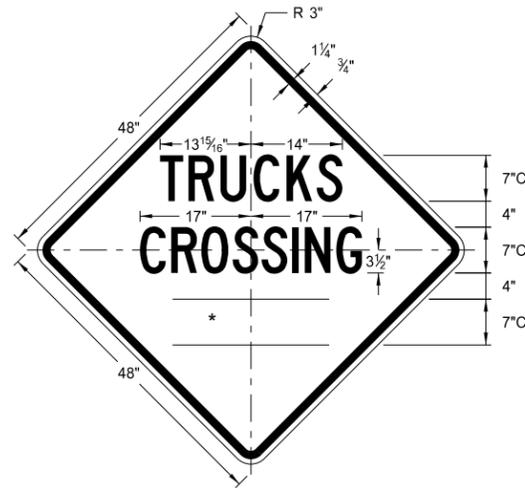
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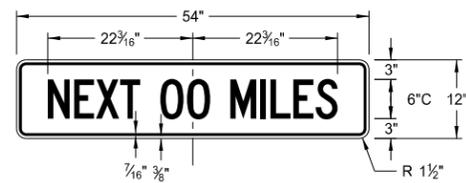
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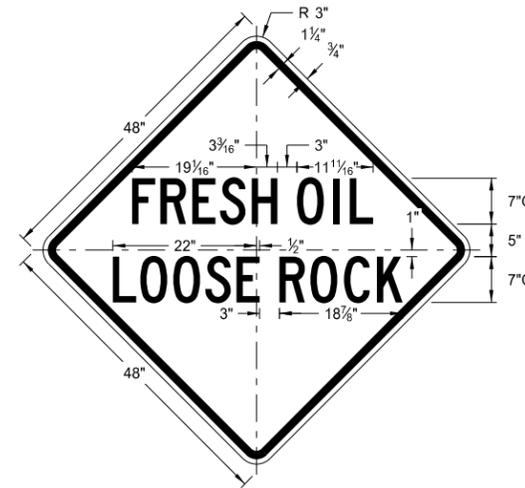
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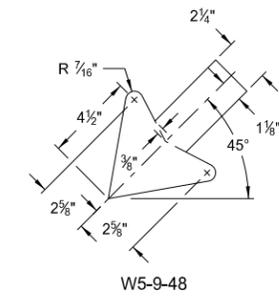
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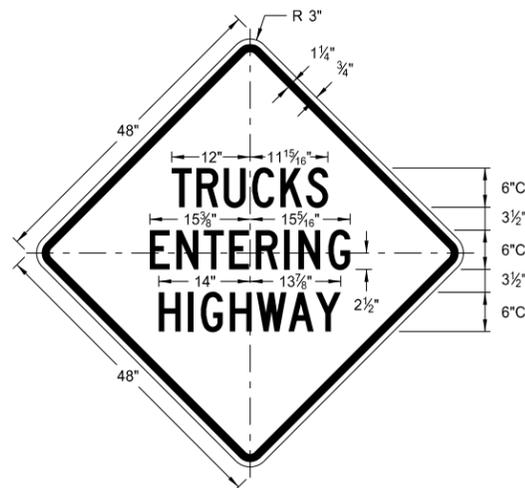
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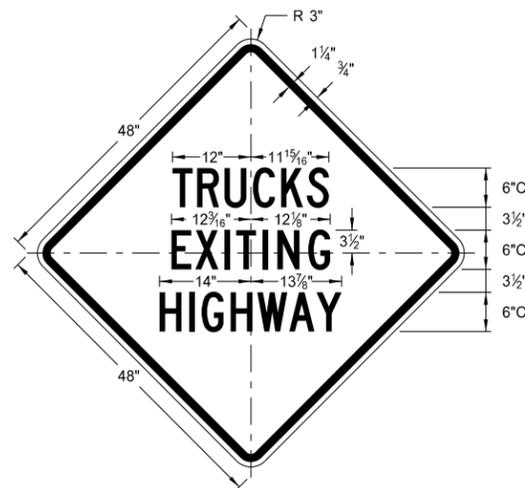
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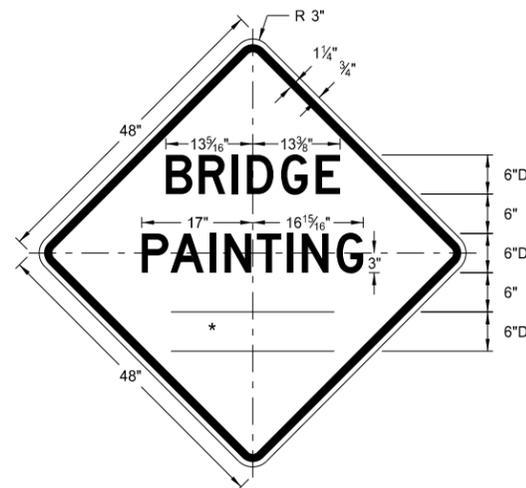
W5-9-48  
ARROW DETAILS



W8-53-48  
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Background: orange



W8-56-48  
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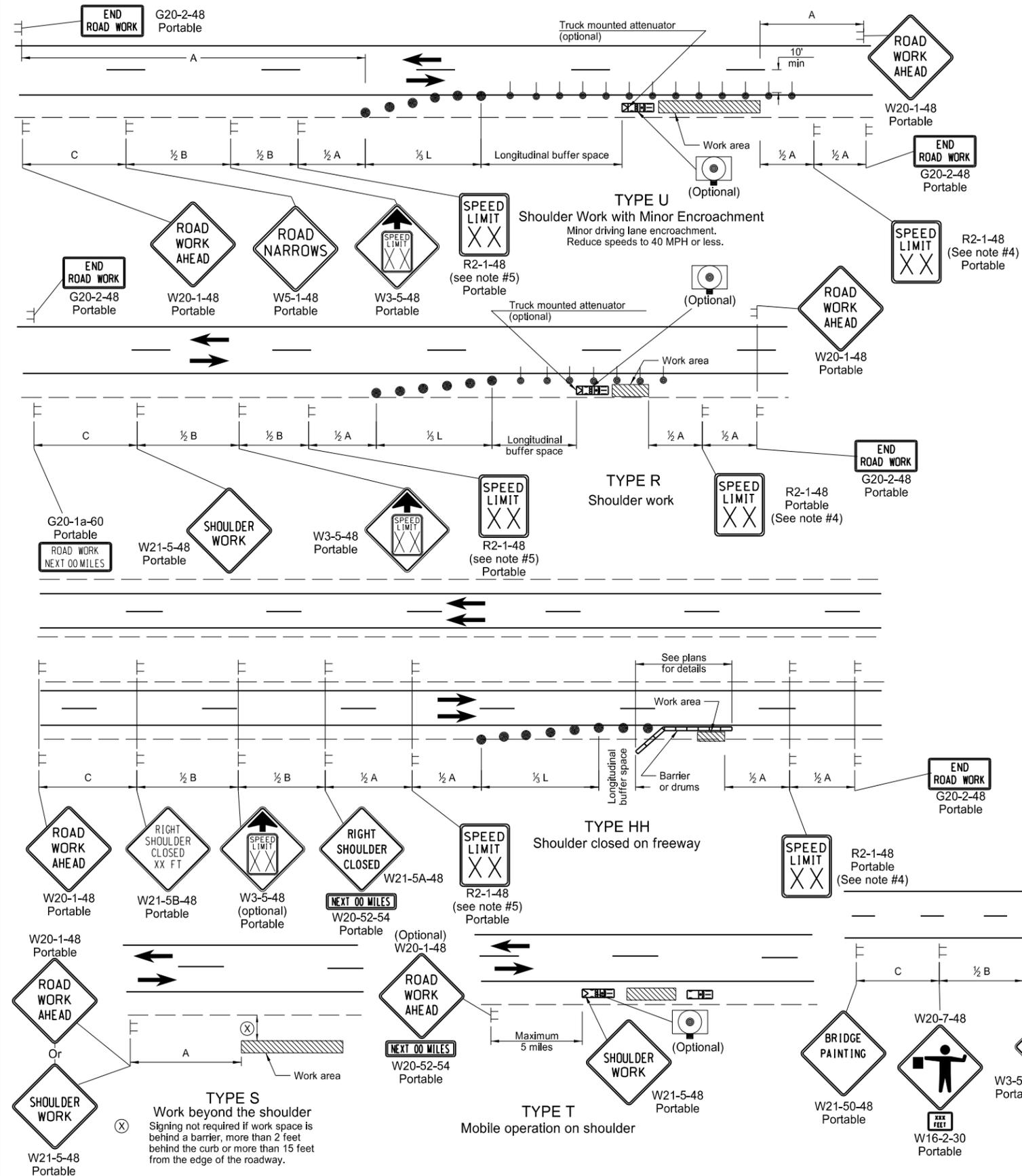
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# SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS

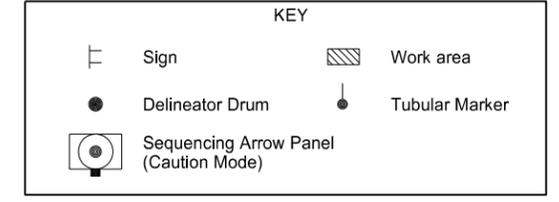
D-704-24



- Notes
- Variables  
S = Numerical value of speed limit or 85th percentile.  
W = The width of the taper.  
L = Minimum length of taper, or  $S \times W$  for freeways, expressways, and all other roads with speeds of 45 mph or greater, or  $W \times S^2 / 60$  for urban, residential, and other streets with speeds of 40 mph or less.
  - Delineator drums used for tapering traffic shall be spaced at dimension "S".  
Delineator drums or tubular markers used for tangents shall be spaced at 2 times "S".
  - Sequencing Arrow Panels  
Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).  
Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).  
Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
  - The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
  - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at  $\frac{1}{2}B$ .
  - 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.
  - Existing speed limit signs within a reduced speed zone shall be covered.
  - The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.

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

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

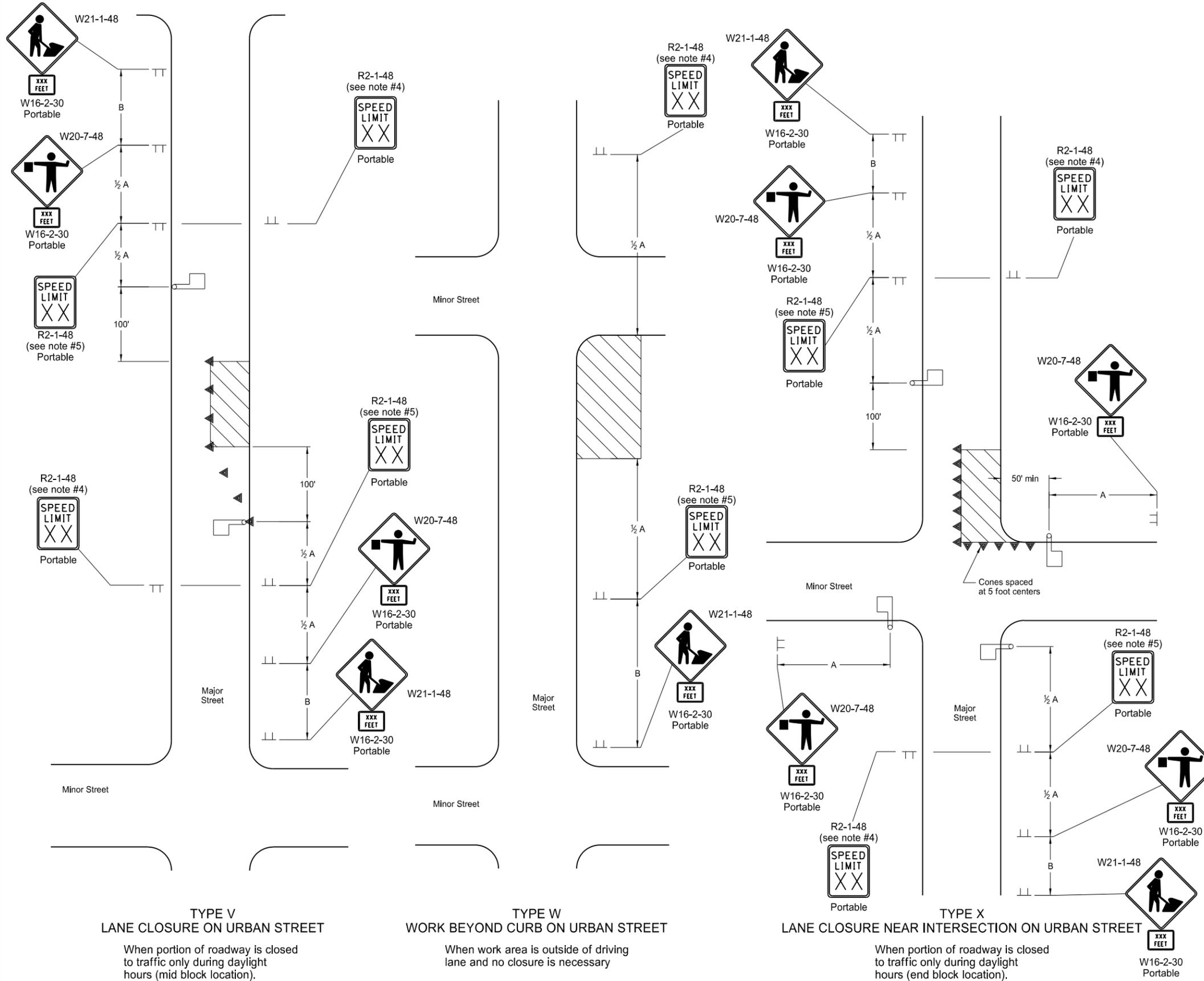


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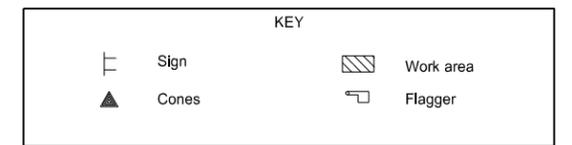
# LANE CLOSURES ON URBAN STREETS LAYOUTS

D-704-25



- Notes
- 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.
  - 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.
  - 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.
  - The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
  - 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.
  - 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.
  - Existing speed limit signs within a reduced speed zone shall be covered.
  - Where necessary, safe speed to be determined by the Engineer.
  - The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
  - 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

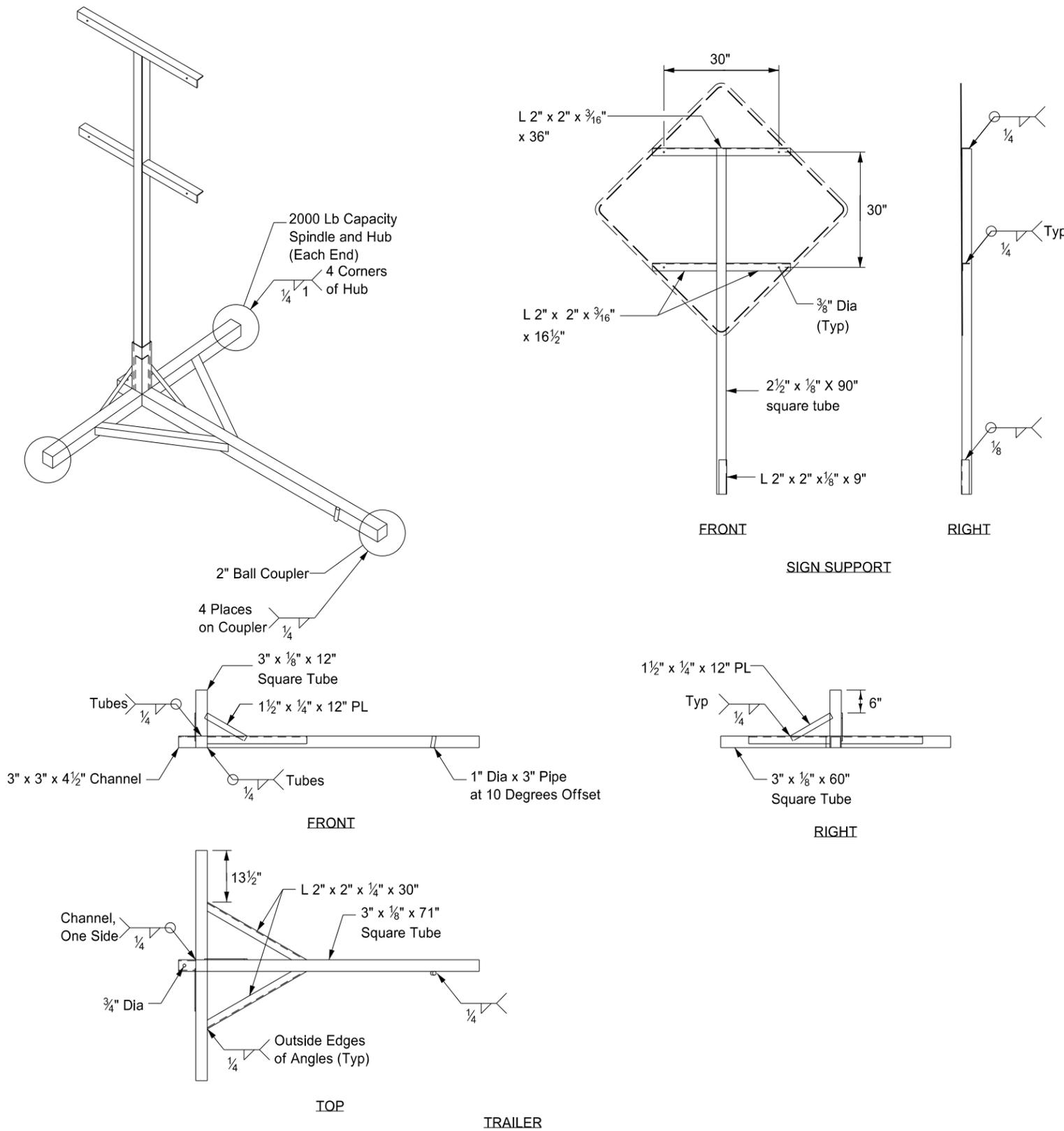


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PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



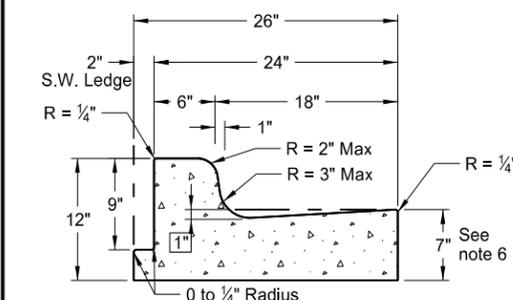
Notes:

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

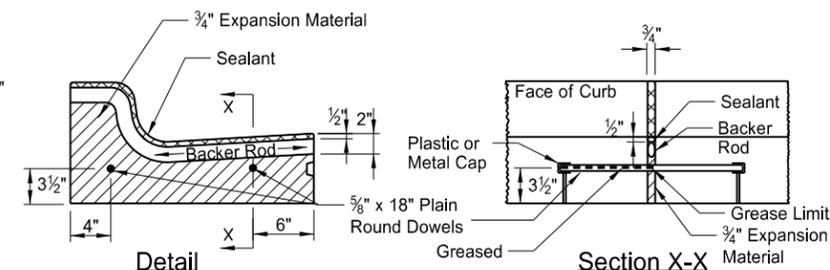
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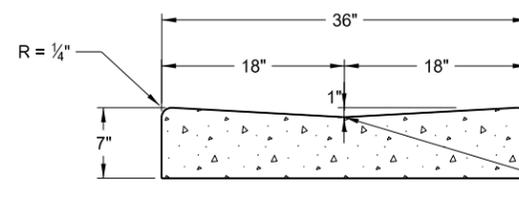
Curb & Gutter and Valley Gutter



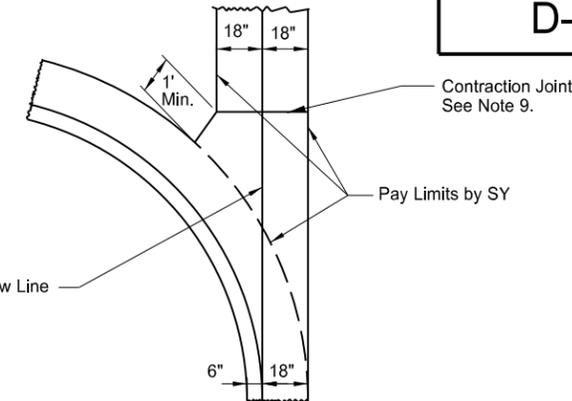
**Curb & Gutter Type 1 (Sec. A & B)**  
Adjacent to Concrete Sidewalk,  
Median, or Parking Lot.  
(Sec. A shown. See Sec B for  
additional details.)



**Isolation Joint**



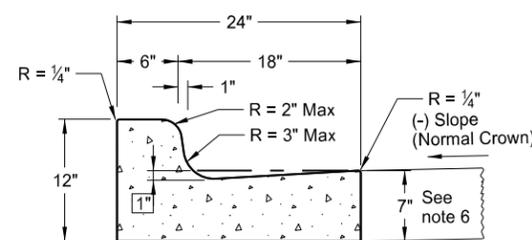
**36" Concrete Valley Gutter Detail**



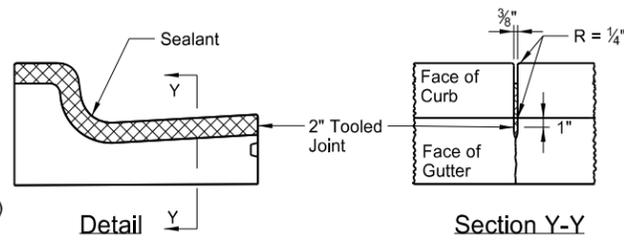
**36" Concrete Valley Gutter Plan**

**NOTES:**

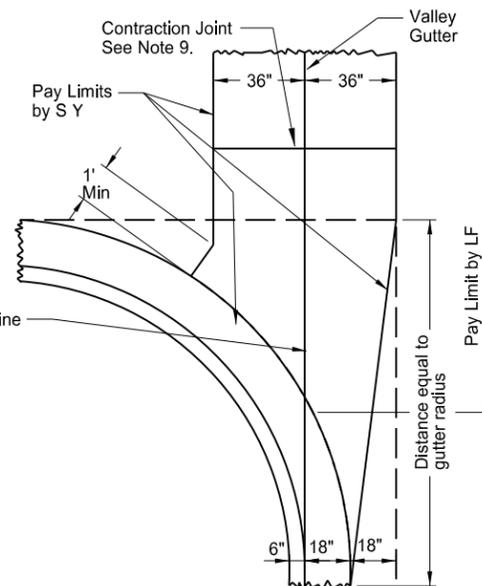
1. Curb and Gutter Type 1 (Sec. A & B) to be used. Section "A" to be used with (-) pavement slopes and section "B" to be used with (+) pavement slopes.
2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
3. Isolation Joints: Isolation joint material shall be 3/4" 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.



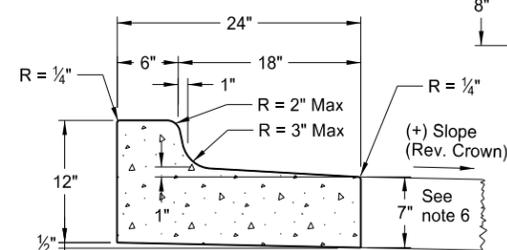
**Curb & Gutter Type 1 (Sec. A)**



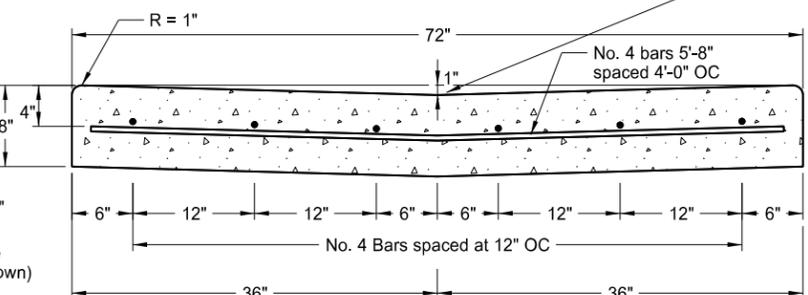
**Contraction Joint**  
(10' Max Spacing)



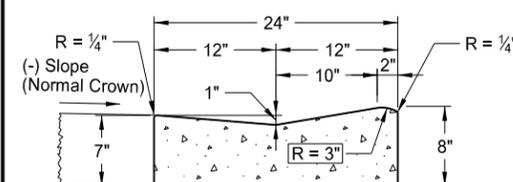
**72" Concrete Valley Gutter Plan**



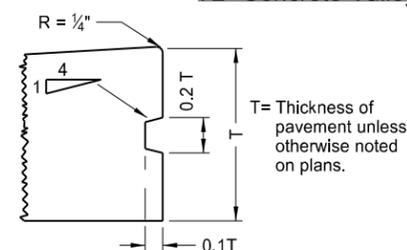
**Curb & Gutter Type 1 (Sec. B)**



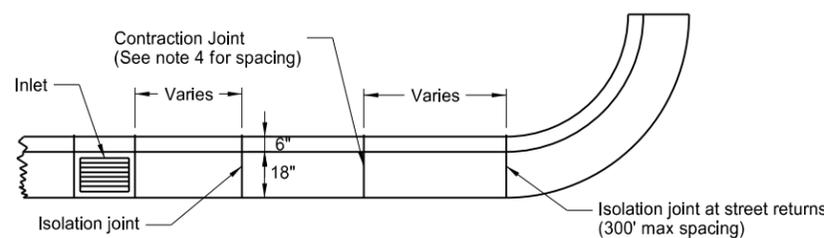
**72" Concrete Valley Gutter Detail**



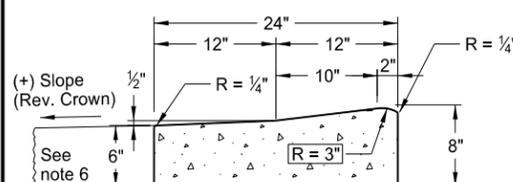
**Mountable Curb & Gutter Type 1 (Sec. A)**



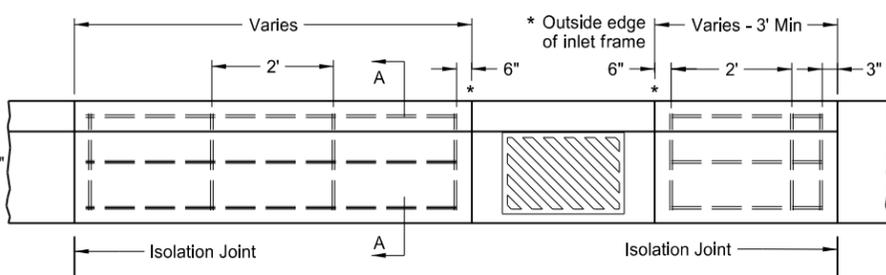
**Keyway Detail for Curb & Gutter**  
(To be used with PCC Pavement and Drives)



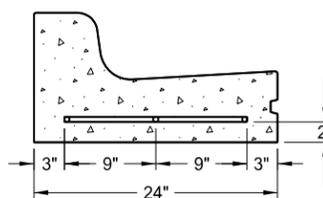
**Joint Location Detail**



**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.

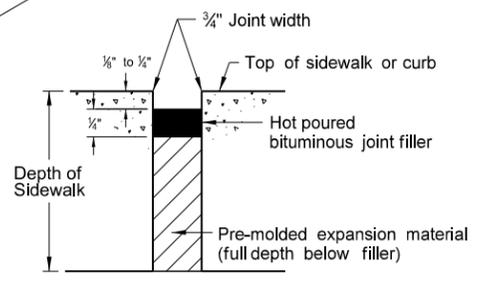
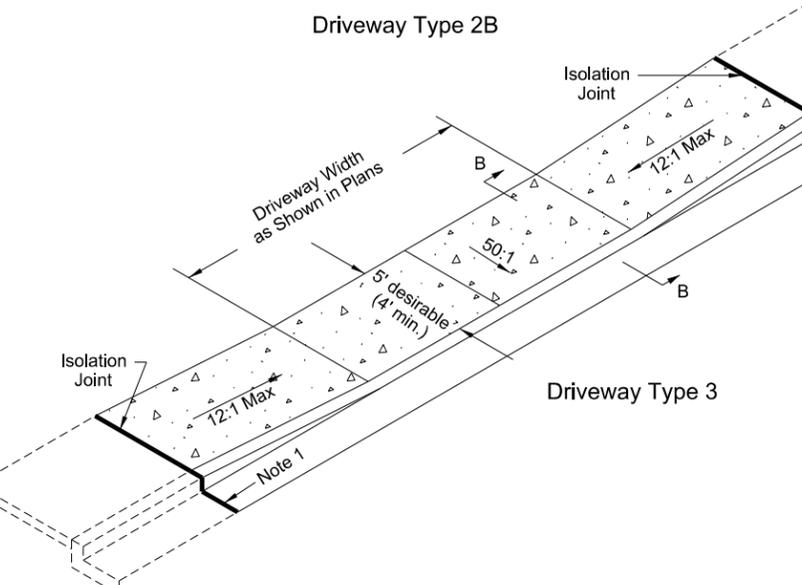
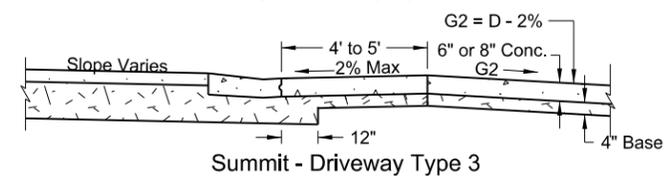
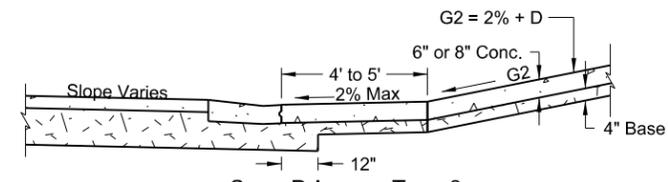
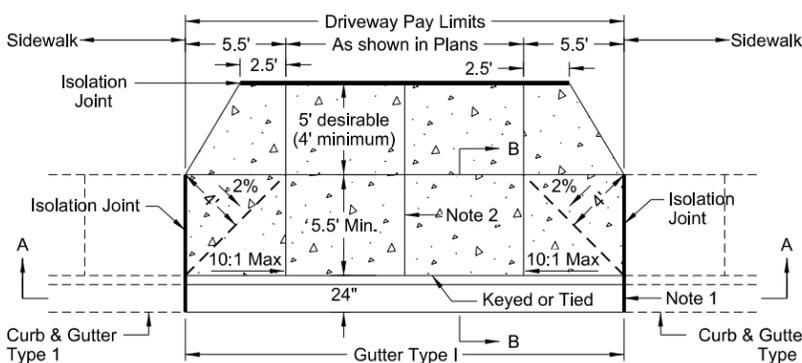
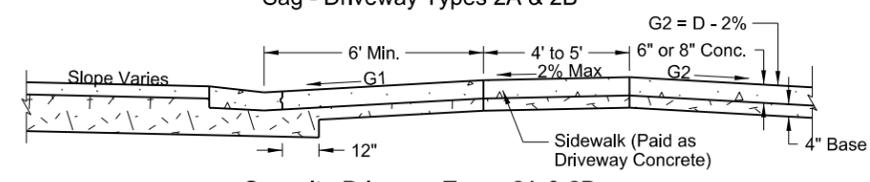
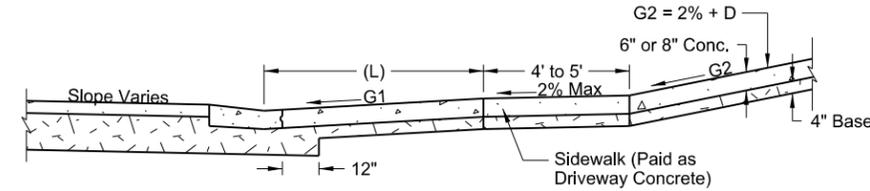
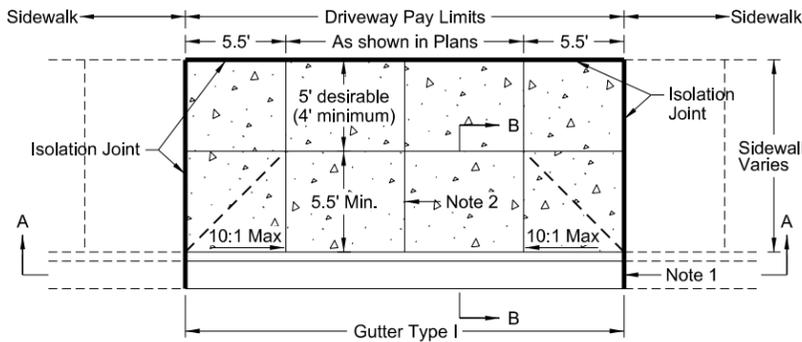
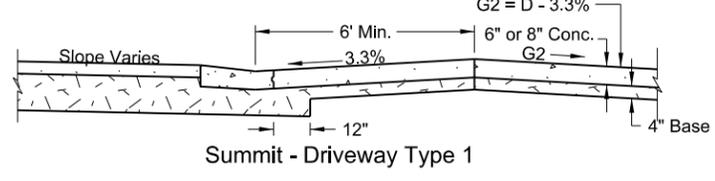
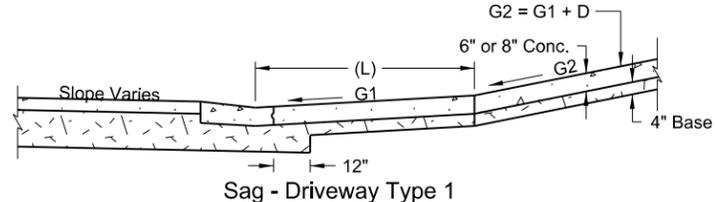
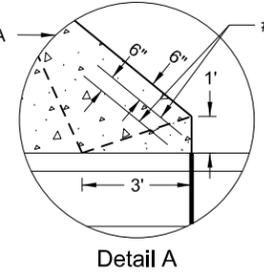
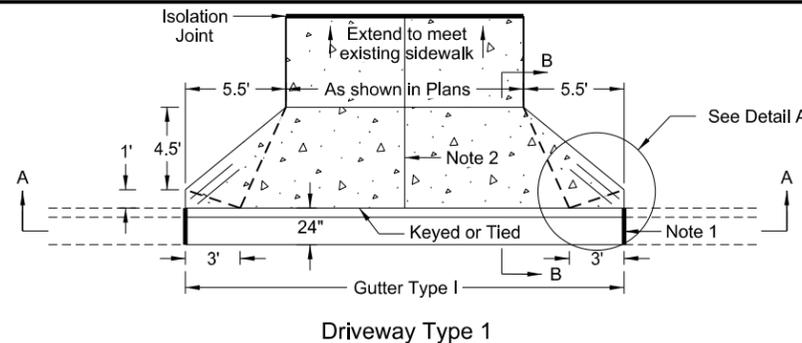
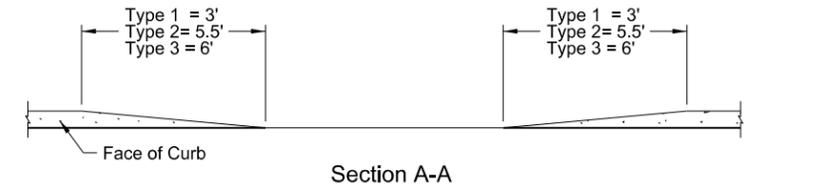
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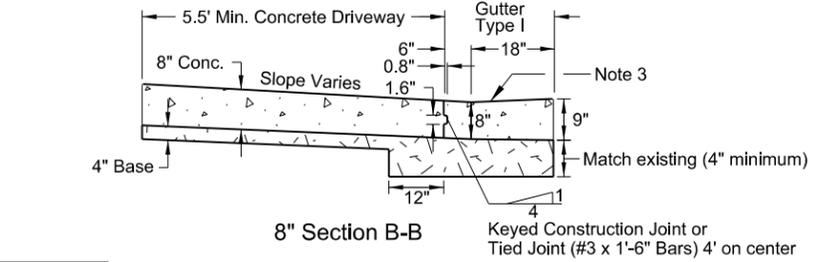
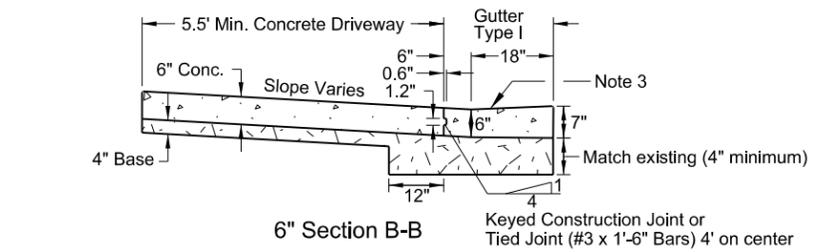
CONCRETE DRIVEWAY - URBAN

NOTES:

- See Standard D-748-1 for curb and gutter isolation joint detail. On PCC roadways, the curb and gutter joints should match those of the pavement as much as practical.
- Joint Spacing: 1 Center contraction joint to be used on all driveways 20' width or less, 2 center contraction joints for driveways > 20' to 30' width, and 3 center contraction joints for driveways greater than 30' width.  
The contraction joints may be sawed or a grooved joint, and shall be a minimum of 1/3 the depth of the concrete.  
Isolation joints should also be used between separately poured concretes, or between old and new concrete.  
All joints shall be sealed with hot pour bituminous filler or low modulus silicone. The sealant shall be installed and tooled in accordance with the manufacturer's recommendations.  
All costs for labor, equipment, and material necessary to construct and seal joints shall be included in the price bid for the driveway.
- Gutter-Type 1 shall be paid for at the unit price bid for "Curb and Gutter-Type 1".
- 6" Driveway to be used unless otherwise specified.
- 4" base material shall be placed under the concrete driveway. All labor and materials necessary to place the base material shall be included in the price bid for Salvage Base Course or Aggregate Base Course CL 5.
- Sidewalk that falls behind a driveway shall be constructed to the same thickness as the driveway and shall be paid for as driveway concrete.



Typical Isolation Joint Seal (longitudinal and transverse)



Driveway ADT	Grade G1		Dimension (L) ft.		Grade Changes (D)	
	Desirable	Maximum	Desirable	Maximum	Desirable	Maximum
(0-500)	5%	12% or controlled by vehicle clearance	12	6	6%	15% or controlled by vehicle clearance
(500-1500)	3%	8%	20	20	3%	6%
(> 1500)	2%	5%	40	40	0%	3%

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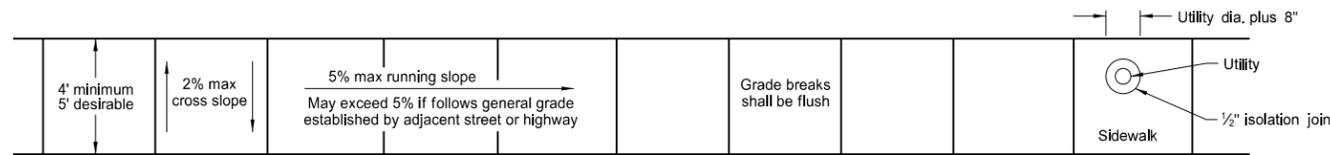
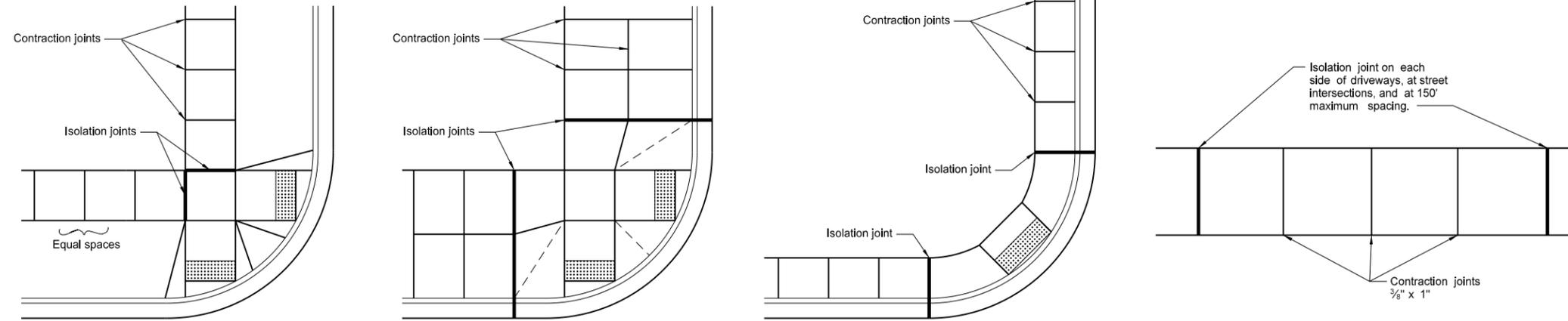
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# SIDEWALK

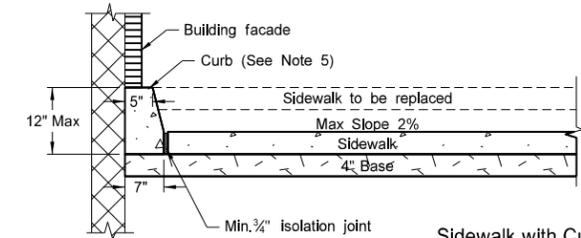
D-750-2

**NOTES:**

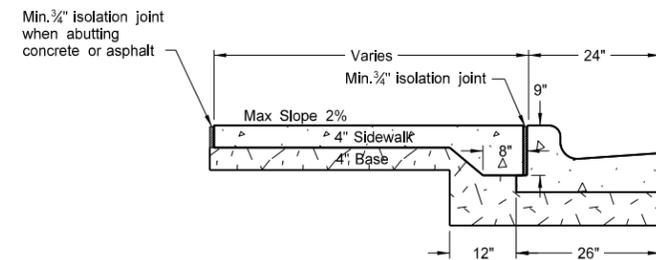
1. Curb ramp and detectable warning panel layouts are for informational purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
2. Joint Spacing: Transverse contraction joint spacing shall vary from 4' to 6' to create approximate square panels. Longitudinal contraction joints shall be used where the sidewalk width is 8' or greater, and shall be spaced at half the sidewalk width. The contraction joints may be sawed or a grooved joint, and shall be a minimum of 1/3 the depth of the concrete. When the sidewalk is adjacent to the curb & gutter, the sidewalk joint spacing shall be varied to match up with the curb & gutter joints. Isolation joints should also be used between separately poured concretes, or between old and new concrete. The cost for all labor, equipment, and material necessary to construct contraction and isolation joints shall be included in the price bid for sidewalk concrete.
3. 4" sidewalk concrete thickness to be used unless otherwise specified in the plans.
4. 4" base material thickness to be used unless otherwise specified in the plans. All labor and materials necessary to place the base material shall be included in the price bid for "Salvage Base Course" or "Aggregate Base Course CL 5."
5. 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.



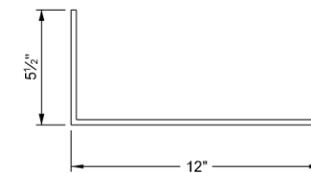
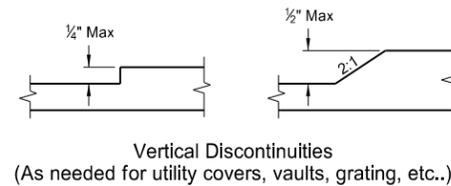
Utility Blockout



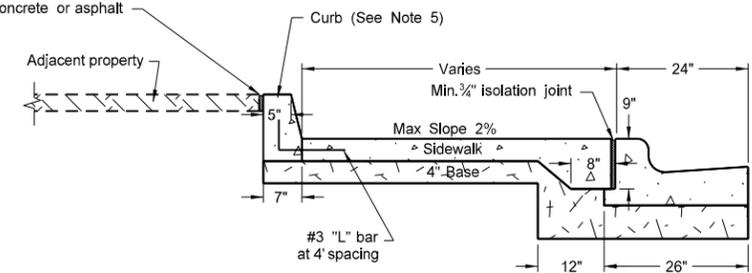
Sidewalk with Curb Detail (Building face application)



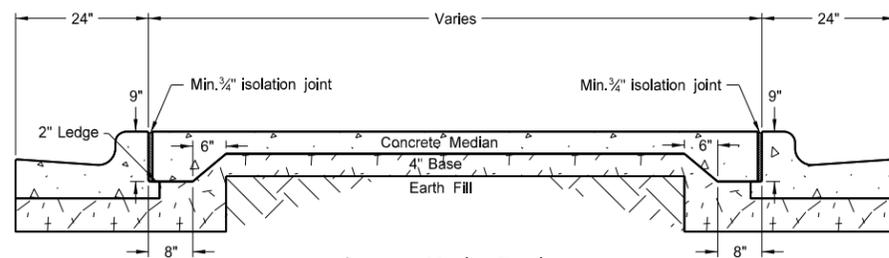
Sidewalk Detail (Installed adjacent to curb and gutter)



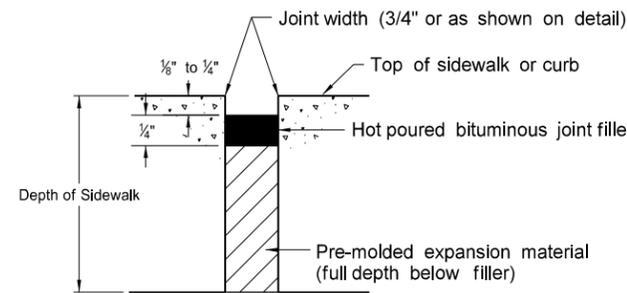
Min. 3/4" isolation joint when abutting concrete or asphalt



Sidewalk with Curb Detail (Adjacent property application)



Concrete Median Detail



Typical Isolation Joint Seal (longitudinal and transverse)

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# CURB RAMP DETAILS

D-750-3

+More Right of Way

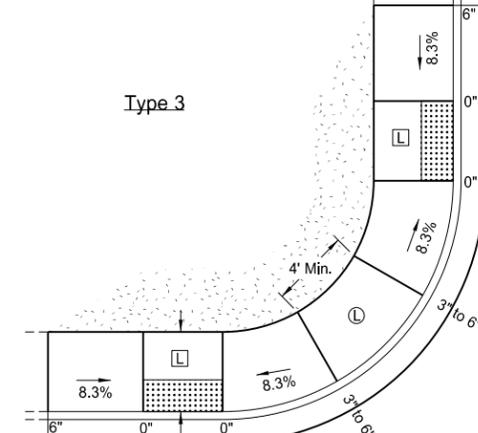
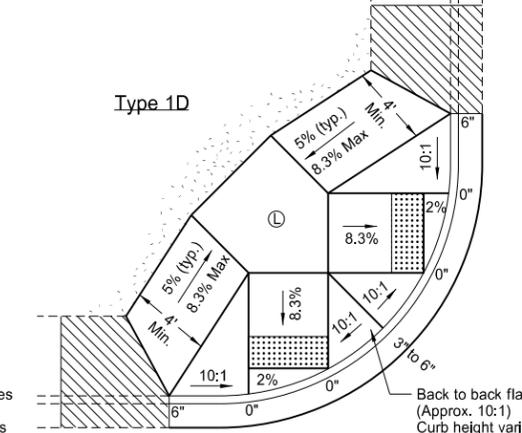
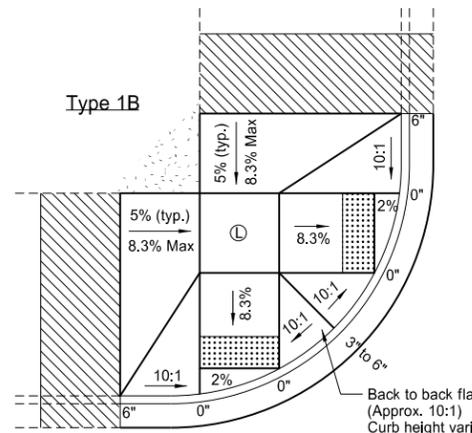
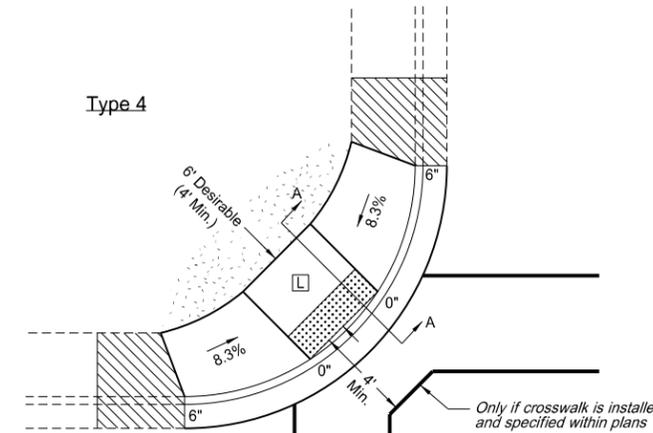
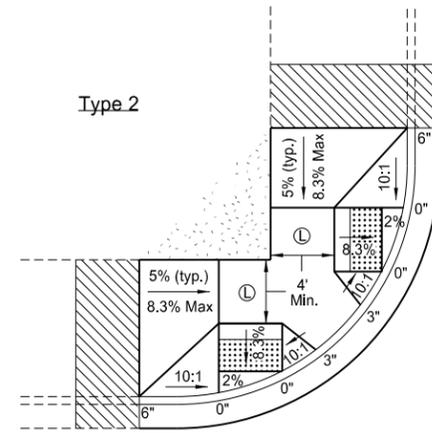
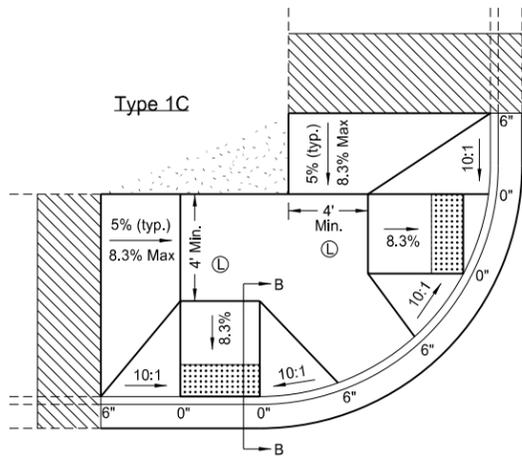
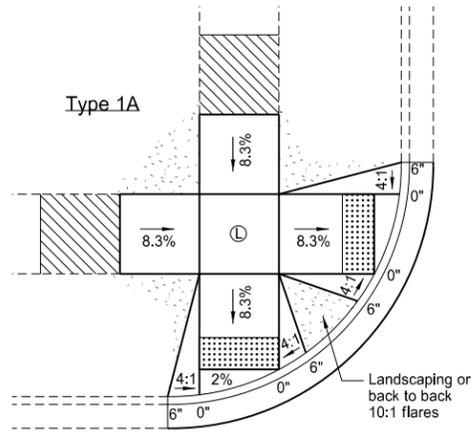
Less Right of Way

**NOTES:**

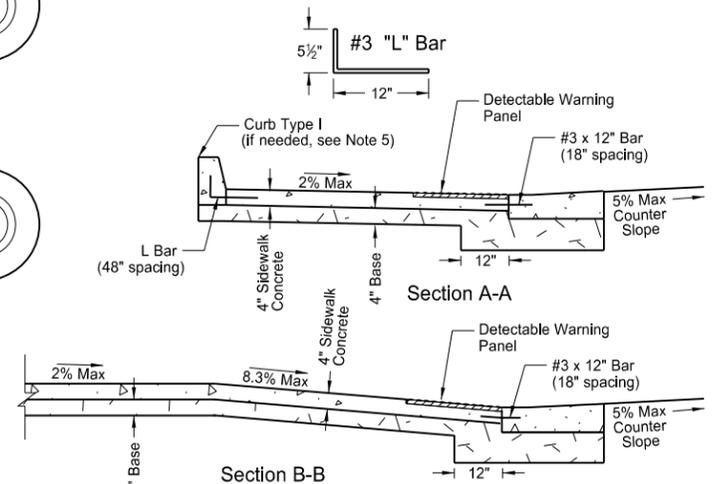
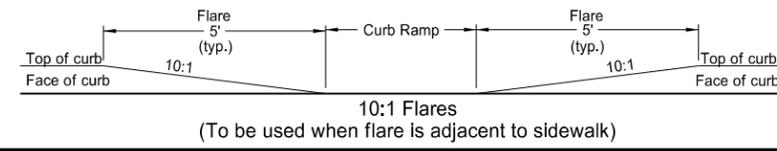
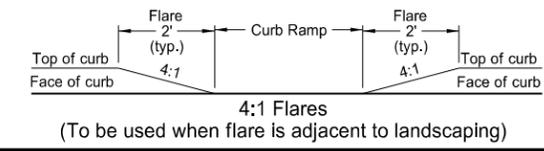
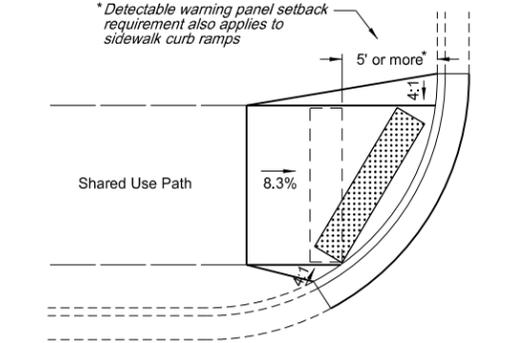
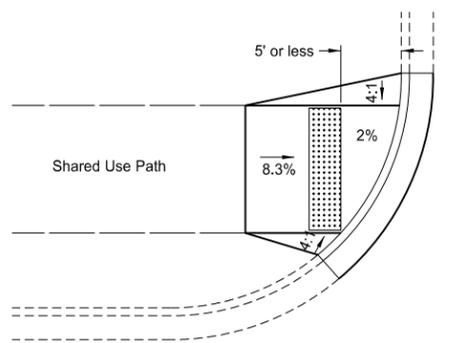
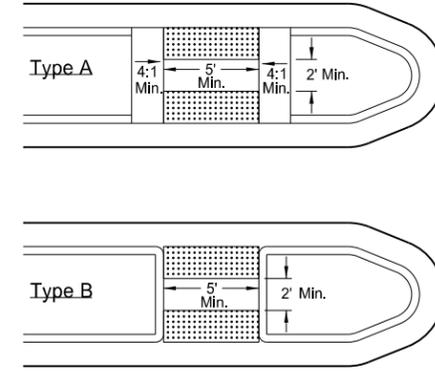
- Ramp width is defined as the useable portion of the ramp, excluding flares if used.  
Curb ramp width should match the existing sidewalk width. 4' width minimum.  
Ramp width for shared-use paths should match the existing shared use path width.  
Ramp length shall be maximum of 15'.
- Landings shall 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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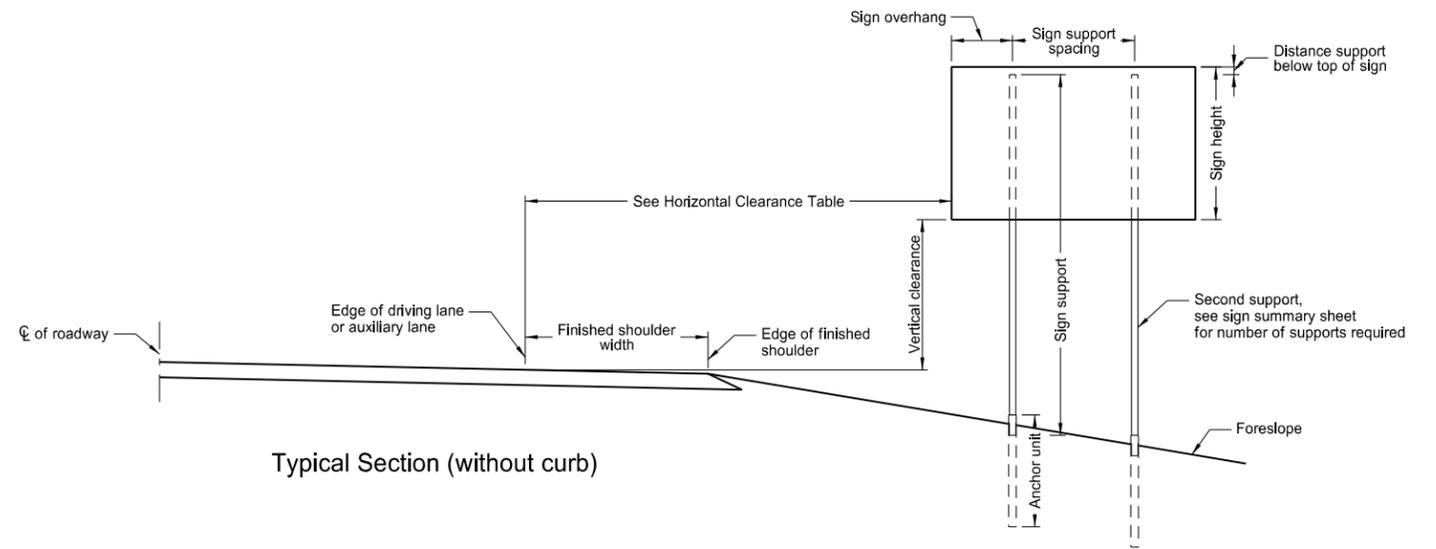
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# PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

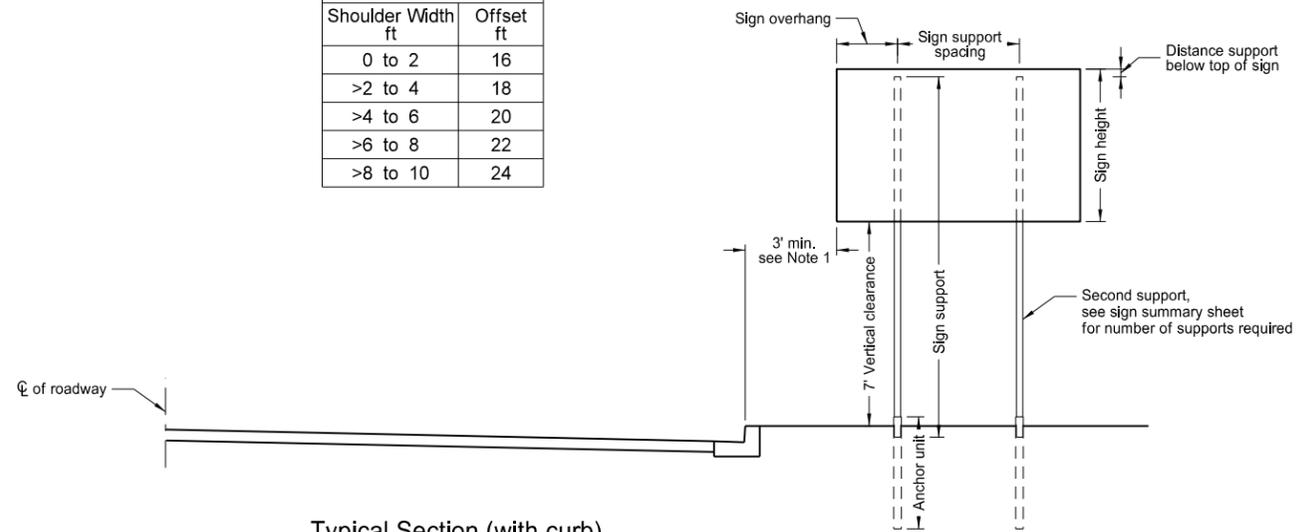
**Notes:**

1. Curbed Roadways: The clearance from the face of the curb should be 3' except where right of way or sidewalk width is limited, a minimum clearance of 2' shall be provided. The horizontal clearance may need to be increased to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.
2. Minimum vertical clearance: Signs installed at the side of the road in rural districts shall be at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane. Where parking or pedestrian movements occur, the clearance to the bottom of the sign shall be at least 7'.
- Signs on expressways shall be installed with a minimum height of 7'.
- Adopt-a-highway signs installed on Freeways shall be at least 7' above the edge of the driving lane.
- The vertical clearance shall have a maximum height of 6" above the vertical clearance specified above.
3. Offset signs: Where signs are placed at least 30 feet or more from the edge of the traveled way, the height to the bottom of such sign shall be 5' above the edge of the driving lane.
4. The clearance from edge of shared use path to edge of sign should be 3' except where width is limited, a minimum clearance of 2' shall be provided.

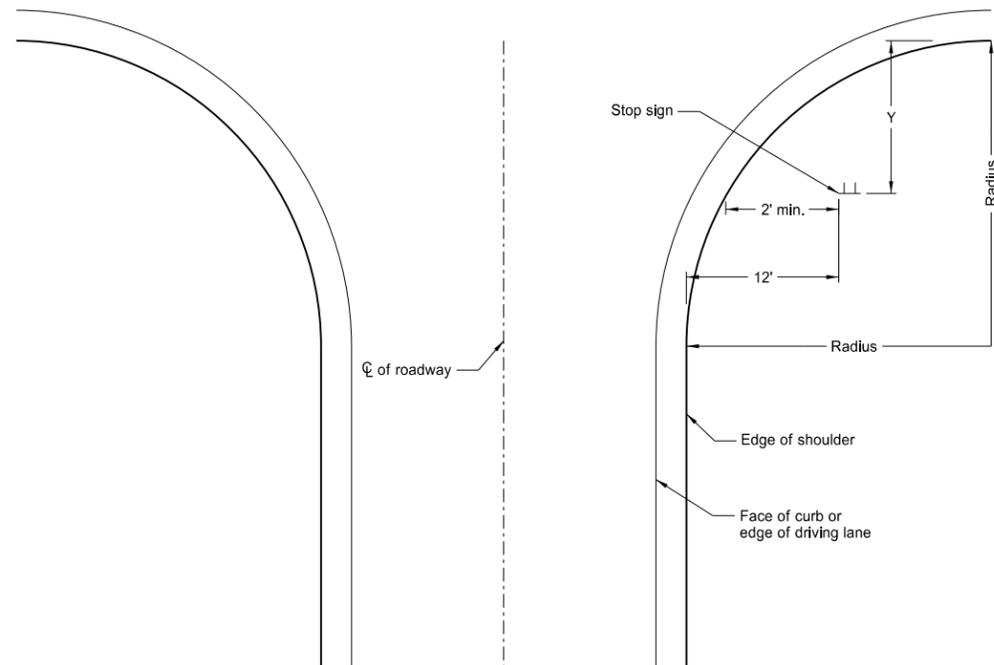


Typical Section (without curb)

Horizontal Clearance Table	
Shoulder Width ft	Offset ft
0 to 2	16
>2 to 4	18
>4 to 6	20
>6 to 8	22
>8 to 10	24



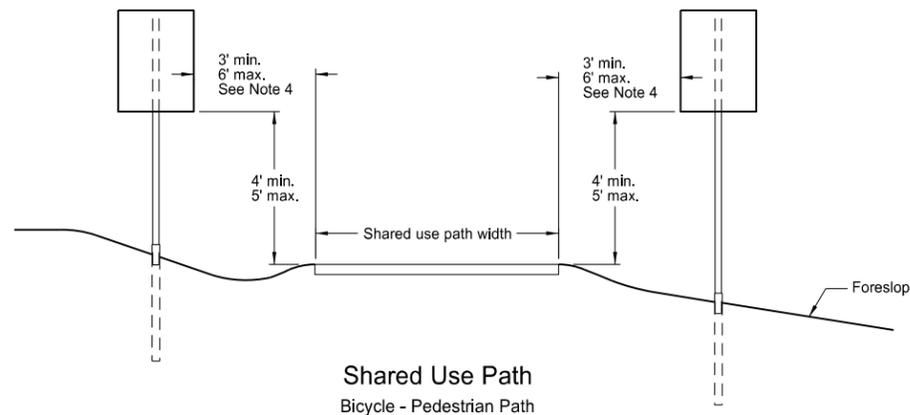
Typical Section (with curb)  
Residential or Business District



Stop Sign Location  
Wide Throat Intersection

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

Radius ft.	Y-max. ft.	Y-min. ft.
40	50	15
45	50	18
50	50	21
55	50	25
60	50	28
65	50	32
70	50	35
75	50	39
80	50	43



Shared Use Path  
Bicycle - Pedestrian Path

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10-3-13	
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7-8-14	Revised note 2, added note 4.

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