

<p>MINNESOTA DEPARTMENT OF TRANSPORTATION</p> <p>DEVELOPED BY: Design Standards</p> <p>ISSUED BY: Office of Technical Support Design Services Section</p>	<p>TRANSMITTAL LETTER NO. (11-04)</p> <p>MANUAL: Standard Plates</p> <p>DATED: August 4, 2011</p>
<p>SUBJECT: Standard Plates 7020K, 7035N, 7102J, 7107I, and 7108G</p>	

Standard Plates 7020, 7102, 7107 and 7108 have been updated upon recommendation of the Office of Technical Support, Engineering Services Division. Standard Plate 7035 has been updated upon recommendation of Operations Division. See the associated Summary of Changes documents for specifics.

7020K - Concrete Curb (Design B, V, S, DR & BR)
7035N - Concrete Walk & Curb Returns as Entrances
7102J - Concrete Curb & Gutter (Design BR, D, S, B4, B5, & D3)
7107I - Entrance Nose (Urban Design)
7108G - Exit Nose (Urban Design)

INSTRUCTIONS:

1. Record the transmittal letter number, date, and subject on the transmittal record sheet located in the front of the manual. The previous Transmittal Letter No. issued for this manual was 11-03, dated April 20, 2011.
2. Remove from the Standard Plate manual:
 - Standard Plate Index, Sheets 1-4 of 4, Numerical Index of Standard Plates (April 20, 2011)
 - Standard Plate 7020J, Sheets 1-2 of 2, Concrete Curb Design B, Design V, Design S, Design DR and Design BR (August 11, 1983)
 - Standard Plate 7035M, Concrete Walk and Curb Return at Entrances (May 25, 2004)
 - Standard Plate 7102I, Sheets 1 of 2, Concrete Curb and Gutter Design BR, Design D and Design S. (Revised 2-16-2000)
 - Standard Plate 7102I, Sheets 2 of 2, Concrete Curb and Gutter – Optional Design B4, Design B5 and Design D3. (March 11, 1994)
 - Standard Plate 7107H, Entrance Nose Urban Design (Revised 3-20-2001)
 - Standard Plate 7108F, Exit Nose Urban Design (Revision Date 5-28-2003)
3. Insert into the Standard Plate manual:
 - Standard Plate Index, Sheets 1-4 of 4, Numerical Index of Standard Plates (July 25, 2011)
 - Standard Plate 7020K, Sheets 1-2 of 2, Concrete Curb Design B, Design V, Design S, Design DR and Design BR (July 25, 2011)
 - Standard Plate 7035N, Concrete Walk and Curb Return at Entrances (July 25, 2011)
 - Standard Plate 7102J, Sheets 1-2 of 2, Concrete Curb and Gutter Design D, Design S, Design B4, Design B5, and Design D3 (July 25, 2011)
 - Standard Plate 7107I, Entrance Nose Urban Design (July 25, 2011)
 - Standard Plate 7108G, Exit Nose Urban Design (July 25, 2011)
4. Current Standard Plates including Transmittal Letters are available on the web at: <http://standardplates.dot.state.mn.us/stdplate.aspx>
5. Direct any technical questions regarding this transmittal to Tim Brown, Design Standards Unit at (651) 366-4613.



James A Rosenow P.E.
Design Standards Engineer, Acting

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Summary of Changes
Standard Plate 7020K – Concrete Curb – Design B, Design V, Design S, Design DR,
and Design BR
Transmittal Letter No. (11-04)

General:

1. Plate number incremented from 7020J to 7020K.
2. Notes 1 and 3, and Standard Keyway reference note on sheet 2 have been modified.

Sheet 1 of 2

1. No changes.

Sheet 2 of 2

Design BRH-H₁ details:

1. Dimension “A” removed from Curb Section.
2. Dimension A Table removed.
3. The following table: “Table of Cu. Yds. Per Lin. Ft.” updated to include 4” H dimension and 11” and 12” H₁ dimensions.
4. The quantities in the “Table of Cu. Yds. Per Lin. Ft.” table has been modified based on a 2% pavement cross slope and a standard keyway design.
5. Joint type changed from L2KTH to L2KT.

Design DR4-H₁ details:

1. The following table: “Table of Cu. Yds. Per Lin. Ft.” updated to include 11” and 12” H₁ dimensions.
2. The quantities in the “Table of Cu. Yds. Per Lin. Ft.” table has been modified based on a 2% pavement cross slope and a standard keyway design.
3. Joint type changed from L2KTH to L2KT.

Keyway detail:

1. The “Keyway Alternate” detail renamed to “Alternate Keyway Detail”.

Summary of Changes
Standard Plate 7035N – Concrete Walk & Curb Returns at Entrances
Transmittal Letter No. (11-04)

General:

1. Plate number incremented from 7035M to 7035N
2. Note 10 added: The minimum continuous and unobstructed clear width of a pedestrian access route shall be 4.0 ft. See plans for proposed cross slope of the pedestrian access route which may not exceed 0.02 ft. /ft. as constructed.

Concrete Walk Detail:

1. Note added requiring 6" walk.

Section Thru Walk Detail

1. Slope label modified to" "0.015 ft./ft. towards roadway (3/16" per ft.) Typical"
2. Note 10 added.
3. Note 11 added.

Half Plan Perspective Detail

1. 4' Min width dimension added at the top of the ramp in the Pedestrian Access Route.
2. Note 10 added.

Curb Return Detail

1. 4' Min width, and 0.02 ft./ft. Maximum slope notes added in the Pedestrian Access Route.
2. Note 10 added.
3. Following label removed from ramp area. "0.12 ft./ft. slope (when b6 curb and adjacent walk)

Summary of Changes
Standard Plate 7102J – Concrete Curb and Gutter–Design D, Design S, Design B4, Design B5,
Design D3
Transmittal Letter No. (11-04)

General:

1. Plate renamed from “Concrete Curb and Gutter – Design BR Design D and Design S” to “Concrete Curb and Gutter –Design D, Design S, Design B4, Design B5, Design D3”
2. Plate number incremented from 7102I to 7020J.

Sheet 1 of 2

1. Details (Design Br H-H1, and Keyway Alternate) and table (Table of Cu. Yds. Per Lin Ft.) associated with curb type Design BR H-H₁, removed.
2. Detail “Section when adjacent to Conc. Base” removed.
3. Note 1 modified. (old note 3)
4. Note 3 removed.

Sheet 2 of 2

1. No changes.

Summary of Changes
Standard Plate 7107I – Entrance Nose Urban Design
Transmittal Letter No. (11-04)

General:

1. Plate number incremented from 7107H to 7107I.
2. Following note removed; “Payment for nose shall be included as curb & gutter (or curb).”

Plan View Detail:

1. Gutter on entrance ramp modified from D424 curb and gutter to DR4 curb with L2KTH joint.
2. Gutter on mainline modified from B424 curb and gutter to D4 curb and gutter.
3. D4/DR4 gutter shown to extend to the end of nose.
4. 10’ Curb transition moved from end of nose to the distance of 110’ to 100’ from the end of nose. (10’ prior to nose concrete walk)
5. Concrete Walk area modified from 559 Sq. Ft. to 481 Sq. Ft.
6. Note 2 added: “Based on standard entrance geometry.”
7. Note 3 added: “D424 C. & G. when ramp pavement is bituminous.”
8. Note 4 added : “Integrant curb when shoulder is concrete.”

Entrance Nose Details – Plan View

1. Modified to show DR4 and D4 curb types.

Entrance Nose Details – Section X-X

1. Bottom of 4’ nose transition modified to show full depth throughout.

Entrance Nose Details – Section Y-Y

1. Modified to show DR4 and D4 curb types.

Summary of Changes
Standard Plate 7108G – Exit Nose Urban Design
Transmittal Letter No. (11-04)

General:

1. Plate number incremented from 7108F to 7108G.

Plan View Detail:

1. Gutter on exit ramp modified from D424 curb and gutter to DR4 curb with L2KTH joint.
2. Gutter on mainline modified from B424 curb to generic curb and gutter.
3. 10' Transition to D424 curb and gutter at exit nose removed.
4. Note 3 modified.
5. Note 4 added.

Exit Nose Details – Plan View

1. Modified to show DR4 curb and generic curb types.
2. Curb and gutter dimensions modified.
3. Note 1 modified.

Exit Nose Details – Section Y-Y

1. Modified to show DR4 curb/L2KTH joint and generic curb type.

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STANDARD PLATES

BLANK	0000 SERIES
PAVEMENT	1000 SERIES
BLANK	2000 SERIES
CULVERTS AND APPURTENANCES	3000 SERIES
SEWER APPURTENANCES	4000 SERIES
EROSION CONTROL STRUCTURES	5000 SERIES
BLANK	6000 SERIES
CURB, CURB AND GUTTER, SIDEWALK.....	7000 SERIES
BARRICADES, SIGNALS, MARKERS, ETC.....	8000 SERIES
MISCELLANEOUS	9000 SERIES

PLATE NO.

0000 SERIES—BLANK

1000 SERIES—PAVEMENT

1070M	Supplemental Pavement Reinforcement
1103K	Typical Dowel Bar Assembly
1150R	Concrete Header Joints
1210G	Concrete Pavement Adjacent to Railway Crossing

2000 SERIES—BLANK

3000 SERIES—CULVERTS AND APPURTENANCES

3000L	Reinforced Concrete Pipe (5 Sheets)
3001B	Reinforced Concrete Reducer Pipe
3002B	Reinforced Concrete Increaser Pipe
3006G	Gasket Joint for R.C. Pipe (2 Sheets)
3007D	Shear Reinforcement for Precast Drainage Structures
3014J	Reinforced Concrete Pipe Arch (2 Sheets)
3020F	Reinforced Precast Concrete Cattle Pass (60" & 72")
3022C	Precast Concrete Safety Apron (3 Sheets)
3030A	Precast Cattle Pass Transition Section
3031B	Connection between Existing 4 Ft. X 6 Ft. Cattle Pass and New Precast Transition Section
3040F	Corrugated Metal Pipe Culvert (Standard 2-2/3" x 1/2" Corrugation)
3041D	Corrugated Metal Pipe (3" x 1" Corrugation)
3050B	Design Data Structural Plate Structures (18" Corner Radius)
3051B	Design Data Structural Plate Structures (31" Corner Radius)
3065C	Connection between Existing Culv. & New "C" Culv. Barrel (2 Sheets)
3066A	C.M. Extension for Box Culvert
3100G	Concrete Apron for Reinforced Concrete Pipe
3110G	Concrete Apron for Reinforced Concrete Pipe-Arch
3114H	Sectional Concrete Apron for Reinforced Concrete Pipe-Arch
3122K	Metal Apron for C.M. Pipe-Arch Culvert
3123J	Metal Apron for C.S. Pipe
3124B	Metal Apron Connection
3125A	Inlet Protection for Metal Culverts (90" dia. to 96" dia.)
3126B	Inlet Protection for Structural Plate Pipe (60" thru 96" dia. or span)
3127A	Inlet Protection for Structural Plate Pipe (102" thru 180" dia. or span)

PLATE NO.

3128H	Metal Safety Apron & Grate (2 Sheets)
3129A	Metal Apron for Corrugated Polyethylene Pipe (Use at Entrances and Driveways)
3131C	Precast Concrete Headwall for Subsurface Drains
3132A	Grate for 1:4 Precast Concrete Aprons
3133C	Riprap at RCP Outlets
3134C	Riprap at CMP Outlets
3135A	Hand-Placed Riprap at Precast Concrete Cattle Pass
3136B	Slotted Vane Drain for P.V.C. Pipe
3137B	Slotted Drain for 12" thru 30" Dia. C.M. Pipe (Stackable)
3138B	Slotted Drain for 12" thru 30" Dia. C.M. Pipe (Not Stackable)
3139A	Riprap at Precast Concrete End Sections
3142A	Outlet Screen for C.M. & S.C. Pipes
3143C	Inspection Tees
3145F	Concrete Pipe Ties
3146C	Anti-Seepage Diaphragm (For CMP and CMP-A)
3148A	Safety Slope Metal End Section for Circular & Arched Pipes (2 Sheets)
3221C	Corrugated Steel Pipe Coupling Band (3 Sheets)

4000 SERIES--SEWER APPURTENANCES

List of Castings for Design Structures (2 sheets)

Standard Casting Assemblies

Typical Concrete Manhole or Catch Basin and Casting Combinations

4000J	Manhole or Catch Basin (Masonry, Field Constructed) - Design A
4002F	Manhole or Catch Basin (Masonry, Field Construction) - Design C
4003B	30" Precast Catch Basin – Design N
4005L	Manhole or Catch Basin Type A & B Cone Sections Precast - Design F
4006L	Manhole or Catch Basin Precast - Designs G and H
4007C	Precast Mechanical Joint Sewer Manhole
4008E	Catch Basin (Sectional Concrete Pipe) - Design I
4009H	Manhole or Catch Basin (Sectional Concrete Pipe) - Design J
4010H	Concrete Short Cone & Adjusting Ring (Sectional Concrete)
4011E	Precast Concrete Base
4017C	Catch Basin (Concrete Pipe and Metal Pipe) - Designs PC and PM
4018A	Manhole or Catch Basin (Reducer Cone Section Precast) Design D
4020J	Manhole or Catch Basin (For Use With or Without Traffic Loads) (2 sheets)
4021F	Precast Curb Opening Catch Basin
4022A	Manhole or Catch Basin Cover (3 ft. X 2 ft. Opening)
4024A	48" Dia. Precast Shallow Depth Catch Basin - Design SD
4025B	Drop Inlets or Catch Basins - Design DI (Concrete & Metal)
4026A	Concrete Encased Concrete Adjusting Rings
4101D	Ring Casting For Manhole or Catch Basin
4108F	Adjusting Rings for Catch Basins and Manholes
4110F	Cover Casting for Manhole (For Use in all Traffic Areas) – Casting No. 715 and 716
4125D	Catch Basin Frame Casting (For Square Grate) – Casting No. 806
4126F	Catch Basin Frame Casting – Casting No. 801
4129G	Catch Basin Frame Casting (For Square Grate) - Casting No. 802A
4132F	Catch Basin Frame Casting (For Square Grate) – Casting No. 805
4133A	Curb Box Casting for Catch Basin - Casting No. 824
4134A	Curb Box Casting for Catch Basin (For Design B Curbs) - Casting No. 825
4140D	Special Grate Castings for Catch Basin (Convex and Concave) - Casting No. 720 and 721
4143E	Stool Grate & Concrete Frame (Median Drains) - Casting No. 731
4149C	Grate Casting for Catch Basin - Casting No. 810

PLATE NO.

4150C Grate Casting for All Pipe Drainage Structures
 4151B Grate Casting for Catch Basin (Square Type) - Casting No. 811
 4152C Catch Basin Grate Casting - Casting No. 814A
 4153A Catch Basin Grate Casting - Casting No. 815
 4154B Catch Basin Grate Casting - Casting No. 816
 4160D Curb Box Casting for Catch Basin - Casting No. 823A and 833A
 4161F Curb Box Casting for Catch Basin - Casting No. 821B, 822 and 831A
 4180J Manhole or Catch Basin Step

5000 SERIES--EROSION CONTROL STRUCTURES

5010A Reinforced Concrete Pipe Energy Dissipator

6000 SERIES -- Blank**7000 SERIES--CURB, CURB AND GUTTER, SIDEWALK**

7000E Integrant Curbs (Design B, Design V and Design D)
 7020K Concrete Curb (Design B, Design V, Design S, Design DR and Design BR) (2 Sheets)
 7035N Concrete Walk & Curb Returns at Entrances
 7036G Pedestrian Curb Ramp Perpendicular Design
 7038A Detectable Warning Surface Truncated Domes
 7065C Bituminous Curb
 7100H Concrete Curb and Gutter (Design B and Design V)
 7102J Concrete Curb and Gutter (Designs D, S, B4, B5 and D3) (2 Sheets)
 7105C Concrete Median (Mountable Type)
 7107I Entrance Nose (Urban Design)
 7108G Exit Nose (Urban Design)
 7109C Median Nose and Island (Undivided to Divided Roadway)
 7111J Installation of Catch Basin Castings (Concrete Curb and Gutter)
 7112C Installation & Reinforcement of Catch Basin & Manhole Castings (Concrete Integrant Curbs)
 7113A Concrete Approach Nose Detail

8000 SERIES -- BARRICADES, SIGNALS, MARKERS, ETC.

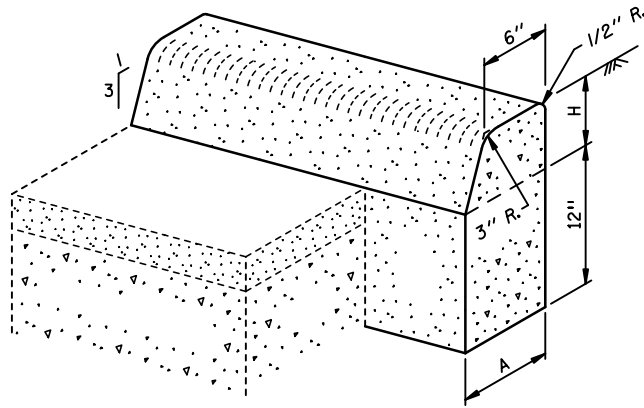
8000I Standard Barricades
 8002G Permanent Barricade
 8105B Equipment Pad A (Cast-in-Place or Precast)
 8106B Equipment Pad B (Cast-in-Place or Precast)
 8110E Traffic Signal Bracketing (Pole Mounted)
 8111E Traffic Signal Bracketing (Pedestal Mounted) (3 Sheets)
 8112F Pedestal Foundation (Traffic Control Signals)
 8114A P.V.C. Handhole/Pullbox (No Vehicle Load) (2 Sheets)
 8117F Precast Concrete Hand Hole (Or Pullbox) (2 Sheets)
 8118D Service Equipment & Pole Traffic Control Signals
 8119C Ground Mounted Cabinet Foundation
 8120N Pole Foundation (PA85)
 8121F Transformer Base and Pole Base Plate (PA85M, PA90 and PA100) (2 Sheets)
 8122E Pedestal and Pedestal Base (For Traffic Control Signals Support)
 8123F Pole and Mast Arm (Luminaires and Traffic Lights Assembly) For All Pole Types (2 Sheets)
 8126I Pole Foundation (PA90 and PA100)
 8127B Light Base - Design E (40 ft. Pole or Less)
 8128B Light Base - Design H (49 ft. Pole)

PLATE NO.

8130E Saw Cut Loop Detectors
8132A Preformed Rigid PVC Conduit Loop Detector
8150C Installation of Culvert Markers
8307S W-Beam Guardrail & End Anchorages (Installation with Wood Posts) (4 Sheets)
8308A Reinforced Concrete Median Barrier Type F (Non-Glare Screen Type) Design 8308 (3 Sheets)
8309A Reinforced Concrete Median Barrier Type F & Glare Screen Design 8309 (3 Sheets)
8316C Post Seat for Anchorage on Footing or Box Culverts
8318C Guardrail Anchorage Plate for Bridges and BCT'S
8326D Flexible Plastic Glare Screen
8329I Eccentric Loader Breakaway Cable Terminal (ELT) (4 Sheets)
8330G 3-Cable Guardrail (With Wood Posts) (Assembly Details) (2 Sheets)
8331B 3-Cable Guardrail (With Steel Posts) (3 Sheets)
8332B Anchor Bolt Cluster for Light Poles
8333B 3-Cable Guardrail Anchor (Anchor Details) (4 Sheets)
8337C Temporary Portable Precast Concrete Barrier (Type "F") (3 Sheets)
8338D W-Beam Guardrail & End Anchorages (Installation with Steel Posts) (4 Sheets)
8339A 3-Cable (Steel Posts) to W Beam (Wood Posts) Guardrail Transition
8340A 3-Cable (Steel Posts) to W Beam (Steel Posts) Guardrail Transition
8400E Pipe Railing
8401C At Grade Pipe Railing (Adjacent to Sidewalk)

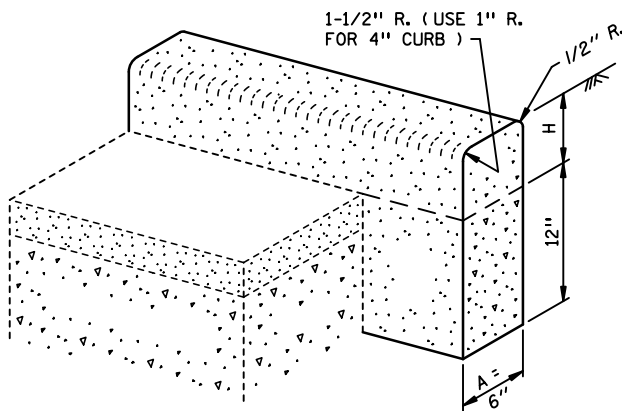
9000 SERIES--MISCELLANEOUS

9000D Approaches and Entrances (Recommended Standards)
9101B Shaping and Sodding of Slopes at Box Culvert Ends
9102D Turf Establishment Areas (At Pipe Culvert Ends)
9303B Geodetic Survey Disks (Aluminum) (2 Sheets)
9308A Survey Monument Cap (2 Sheets)
9309G PLS (Public Land Survey) Monument (2 Sheets)
9320G Woven Wire Fence (Wood Post)
9321E Woven Wire Fence (Steel Post)
9322K Chain Link Fence (2 Sheets)
9323D Barbed Wire Fence (Wood Post)
9324C Barbed Wire Fence (Steel Post)
9350A Mailbox Support (Swing-Away Type)



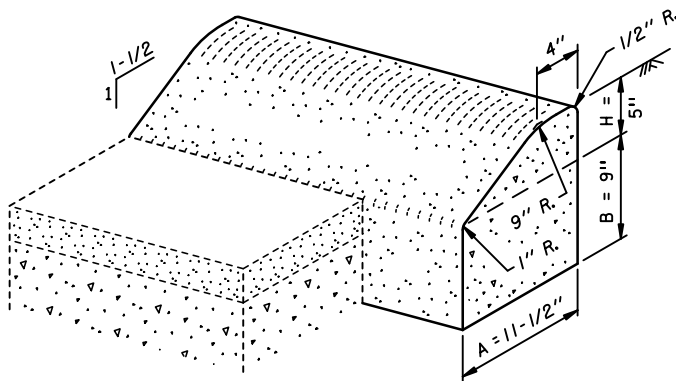
DESIGN B

DESIGN NO.	CURB WIDTH A	CURB HEIGHT H	CONCRETE	
			CU. YDS. PER LIN. FT.	LIN. FT. PER CU. YD.
B4	7-3/8"	4"	0.0294	34.0
B6	8"	6"	0.0352	28.4
B8	8-5/8"	8"	0.0414	24.2
B9	9"	9"	0.0449	22.3
B10	9-3/8"	10"	0.0485	20.6



DESIGN V

DESIGN NO.	CURB HEIGHT H	CONCRETE	
		CU. YDS. PER LIN. FT.	LIN. FT. PER CU. YD.
V4	4"	0.0247	40.5
V6	6"	0.0277	36.1
V8	8"	0.0308	32.5
V9	9"	0.0323	31.0
V10	10"	0.0338	29.6



DESIGN S

DESIGN NO.	CONCRETE	
	CU. YDS. PER LIN. FT.	LIN. FT. PER CU. YD.
S5	0.0364	27.5

NOTE:
ALL CURB SLOPE MEASUREMENTS ARE IN RELATION TO ADJACENT PAVEMENT SLOPE.

APPROVED JULY 25, 2011

M. J. Henneman
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCRETE CURB
DESIGN B, DESIGN V, DESIGN S, DESIGN DR AND DESIGN BR

SPECIFICATION
REFERENCE

2531

STANDARD
PLATE
NO.

7020K

1 OF 2

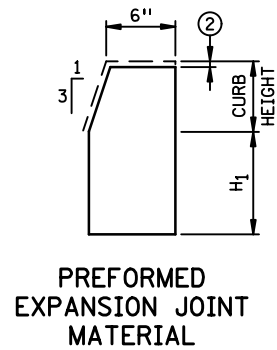
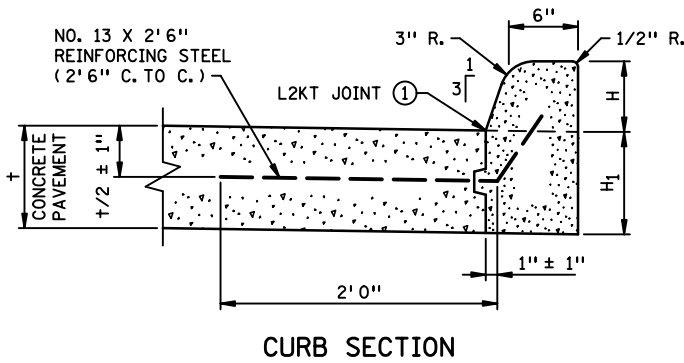


TABLE OF CU. YDS. PER LIN. FT. ③

DIMENSION H ₁	DIMENSION H					
	4"	6"	7"	8"	9"	10"
8"	0.0222	0.0275	0.0303	0.0332	0.0361	0.0392
9"	0.0240	0.0295	0.0324	0.0354	0.0384	0.0415
10"	0.0259	0.0315	0.0345	0.0375	0.0407	0.0439
11"	0.0277	0.0335	0.0366	0.0397	0.0429	0.0462
12"	0.0295	0.0355	0.0387	0.0419	0.0452	0.0486

DESIGN BRH-H₁
(EXAMPLE: DESIGN BR6-9)

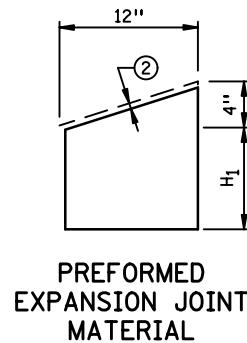
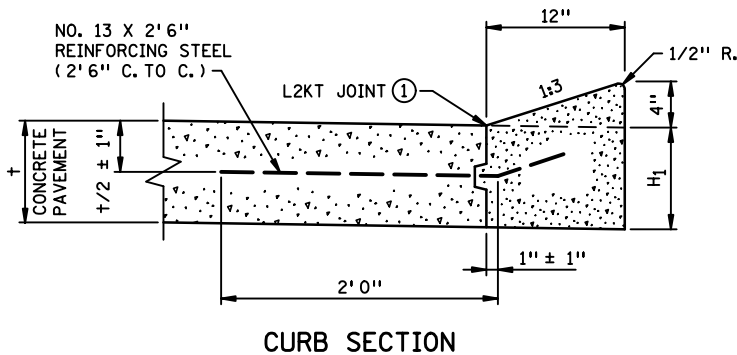


TABLE OF
CU. YDS. PER
LIN. FT. ③

DIMENSION H ₁	CU. YDS. CONC.
8"	0.0313
9"	0.0344
10"	0.0374
11"	0.0404
12"	0.0435

DESIGN DR4-H₁
(EXAMPLE: DESIGN DR4-9)

NOTES:

ALL REBARS ARE IN METRIC DESIGNATIONS

ALL CURB SLOPE MEASUREMENTS ARE IN RELATION TO ADJACENT PAVEMENT SLOPE.

SEE STANDARD PLAN 5-297.221 FOR STANDARD PAVEMENT KEYWAY DETAIL.

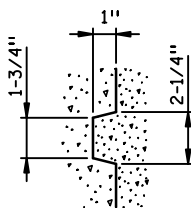
JOINT MATERIAL SHALL BE OF 1/2" THICKNESS.

1 THICKNESS REQUIRED AT 1/2" EXPANSION JOINTS AND 3 THICKNESSES REQUIRED AT 1" EXPANSION JOINTS.

① SEE PLANS FOR SEALING REQUIREMENTS.

② 1/2" LESS THAN CURB DIMENSIONS FOR APPLICATION OF SEALER.

③ BASED ON A 2% PAVEMENT CROSS SLOPE AND STANDARD KEYWAY DESIGN.



ALTERNATE KEYWAY DETAIL

APPROVED JULY 25, 2011

Michael J. Henneman
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCRETE CURB
DESIGN B, DESIGN V, DESIGN S, DESIGN DR AND DESIGN BR

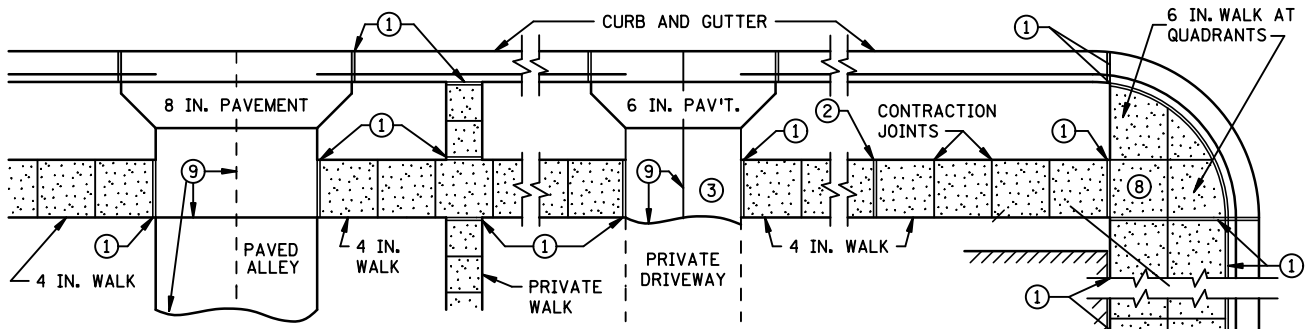
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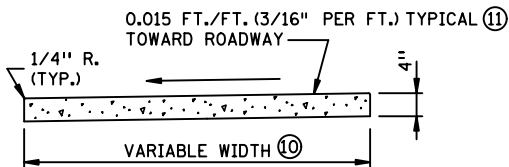
STANDARD
PLATE
NO.

7020K

2 OF 2



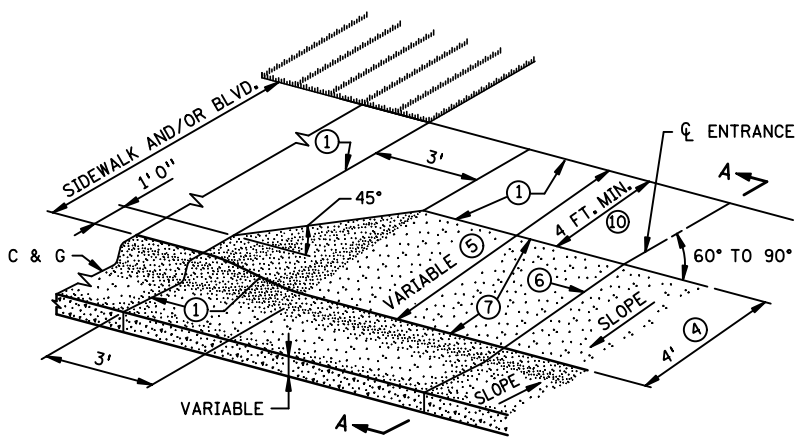
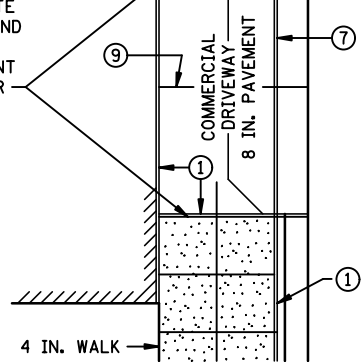
PLAN



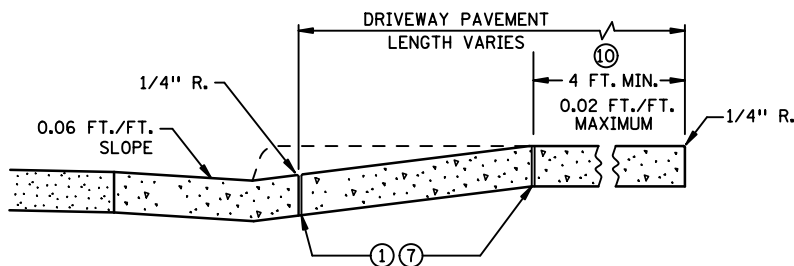
SECTION THRU WALK

CONCRETE WALK

PROVIDE INTERMEDIATE JOINT AT SQUARED END IN SIDEWALK, WHEN SIDEWALK IS ADJACENT TO CURB AND GUTTER



HALF PLAN PERSPECTIVE



SECTION A-A
CURB RETURN

NOTES:

- SEE ROAD DESIGN MANUAL, CHAPTER 5, FOR GEOMETRIC DESIGN OF ENTRANCES.
- WHERE THE MAX. ALLOWABLE ENTRANCE GRADIENT WOULD BE EXCEEDED, DUE TO THE POSITION OF EXISTING WALK, THE WALK SHALL BE REMOVED AND REPLACED, OR THE PAVEMENT WARPED TO PROVIDE THE REQUIRED ENTRANCE SLOPE.
- SEE PLANS FOR PLACEMENT OF WALK AND DIMENSIONS FOR CONSTRUCTION OF DRIVEWAYS.
- NO DEDUCTION SHALL BE MADE IN CURB & GUTTER FOR ENTRANCE.
- ① 1/2 IN. EXPANSION JOINT. 1/2 IN. PREFORMED JOINT FILLER MATERIAL, AASHTO M 213 (REQUIRED WHEN 2 CONCRETE AREAS ARE POURED SEPARATELY).
- ② 1/2 IN. EXPANSION JOINTS AT 60 FT. (APPROX.) MAXIMUM INTERVALS.
- ③ MATCH INPLACE DRIVEWAY THICKNESS (6 IN. MIN.).
- ④ WITHOUT SIDEWALK, PAVE ONLY TO THE END OF CURB RETURN WHEN ENTRANCE IS UNSURFACED OR CONSTRUCTION IS NOT NEEDED BEYOND THIS POINT.
- ⑤ WITH SIDEWALK, PAVE TO THE BACK OF SIDEWALK. PAID FOR AS CONCRETE DRIVEWAY PAVEMENT.
- ⑥ CONTRACTION JOINT (FORMED OR SAWED).
- ⑦ EXPANSION JOINT NOT REQUIRED IF ADJACENT SECTIONS ARE POURED MONOLITHICALLY. SEE SECTION A-A.
- ⑧ SEE PLANS FOR PLACEMENT OF PED. CURB RAMP.
- ⑨ FORM CONTRACTION JOINT AS NEEDED TO PRODUCE APPROXIMATELY SQUARE PANELS (MAXIMUM WIDTH 15 FT. BETWEEN JOINTS).
- ⑩ THE MINIMUM CONTINUOUS AND UNOBSTRUCTED CLEAR WIDTH OF A PEDESTRIAN ACCESS ROUTE SHALL BE 4.0 FT.
- ⑪ SEE PLANS FOR PROPOSED CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE, WHICH MAY NOT EXCEED 0.02 FT./FT. AS CONSTRUCTED.

APPROVED JULY 25, 2011

[Signature]
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCRETE WALK &
CURB RETURNS AT ENTRANCES

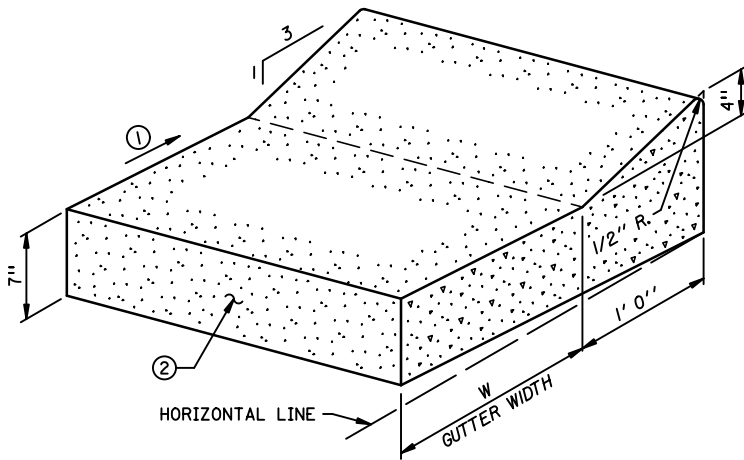
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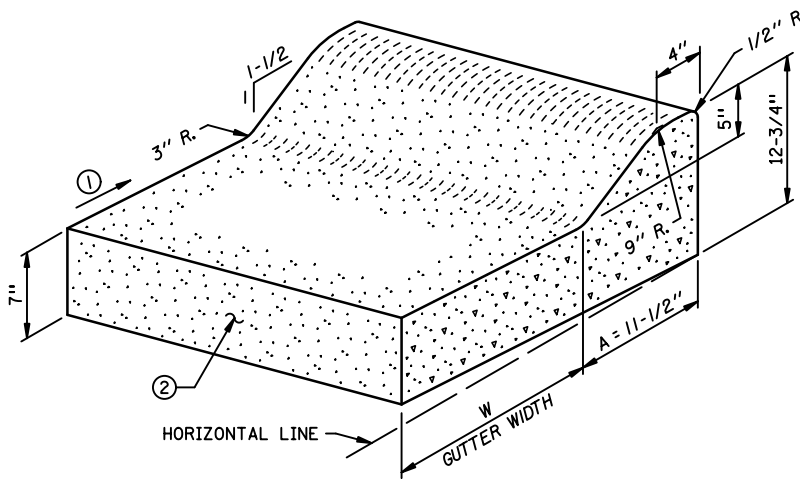
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DESIGN D

D DESIGN NO.	GUTTER WIDTH W	CONCRETE	
		CU. YDS. PER LIN. FT.	LIN. FT. PER CU. YD.
D412	12"	0.0494	20.2
D418	18"	0.0602	16.6
D424	24"	0.0710	14.1



DESIGN S

S DESIGN NO.	GUTTER WIDTH W	CONCRETE	
		CU. YDS. PER LIN. FT.	LIN. FT. PER CU. YD.
S512	12-1/2"	0.0541	18.5
S518	18-1/2"	0.0649	15.4
S524	24-1/2"	0.0757	13.2
S530	30-1/2"	0.0865	11.6
S536	36-1/2"	0.0973	10.3

NOTES:

- ① SLOPE 3/4" PER FOOT NORMAL, UNLESS OTHERWISE SPECIFIED. IF A DIFFERENT GUTTER SLOPE IS PERMITTED, THE FORM MAY BE TILTED.
- ② LONGITUDINAL JOINT WHEN ADJACENT TO RIGID PAVEMENT OR BASE. SEE STANDARD PLANS MANUAL FOR JOINT INFORMATION.

APPROVED JULY 25, 2011

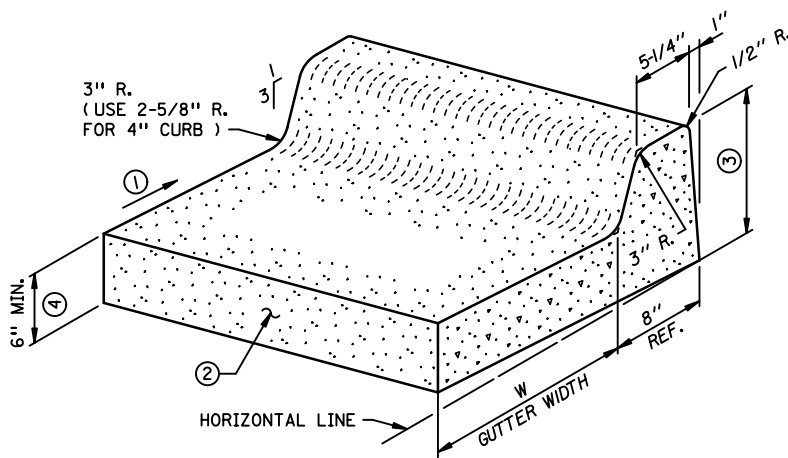
Michael J. Henneman
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCRETE CURB AND GUTTER
DESIGN D, DESIGN S, DESIGN B4, DESIGN B5, DESIGN D3

SPECIFICATION
REFERENCE
2531

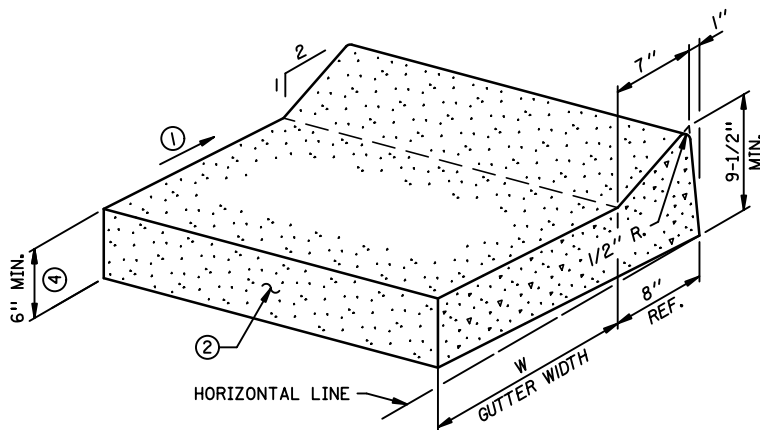
STANDARD
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1 OF 2



OPTIONAL DESIGN B4 & B5

B4 DESIGN NO.	GUTTER WIDTH W	CONCRETE	
		CU. YDS. PER LIN. FT.	LIN. FT. PER CU. YD.
B412	12"	0.0370	27.0
B418	18"	0.0461	21.7
B424	24"	0.0556	18.0
B436	36"	0.0742	13.5
B448	48"	0.0928	10.8

B5 DESIGN NO.	GUTTER WIDTH W	CONCRETE	
		CU. YDS. PER LIN. FT.	LIN. FT. PER CU. YD.
B512	12"	0.0389	25.7
B518	18"	0.0482	20.7
B524	24"	0.0575	17.4
B536	36"	0.0761	13.1
B548	48"	0.0947	10.6



OPTIONAL DESIGN D3

D3 DESIGN NO.	GUTTER WIDTH W	CONCRETE	
		CU. YDS. PER LIN. FT.	LIN. FT. PER CU. YD.
D312	12"	0.0335	29.9
D318	18"	0.0428	23.4
D324	24"	0.0521	19.2
D336	36"	0.0707	14.1
D348	48"	0.0893	11.2

NOTES:

- ① SLOPE 3/4" PER FT. NORMAL, UNLESS OTHERWISE SPECIFIED. IF A DIFFERENT GUTTER SLOPE IS PERMITTED, THE GUTTER FORM MAY BE TILTED.
- ② LONGITUDINAL JOINT WHEN ADJACENT TO RIGID PAVEMENT OR BASE. SEE STANDARD PLANS MANUAL FOR JOINT INFORMATION.
- ③ B4 MINIMUM HEIGHT = 10". B5 MINIMUM HEIGHT = 11-1/4".
- ④ ANY ADDITIONAL BASE MATERIAL REQUIRED IS INCIDENTAL WITH THESE OPTIONAL DESIGNS.

APPROVED JULY 25, 2011

Michael J. Henneman
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STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCRETE CURB AND GUTTER
DESIGN D, DESIGN S, DESIGN B4, DESIGN B5, DESIGN D3

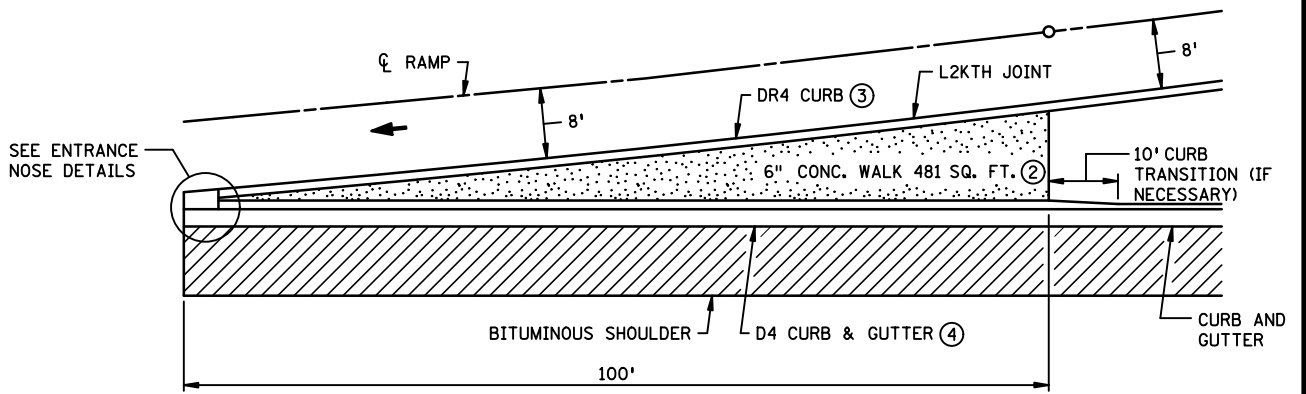
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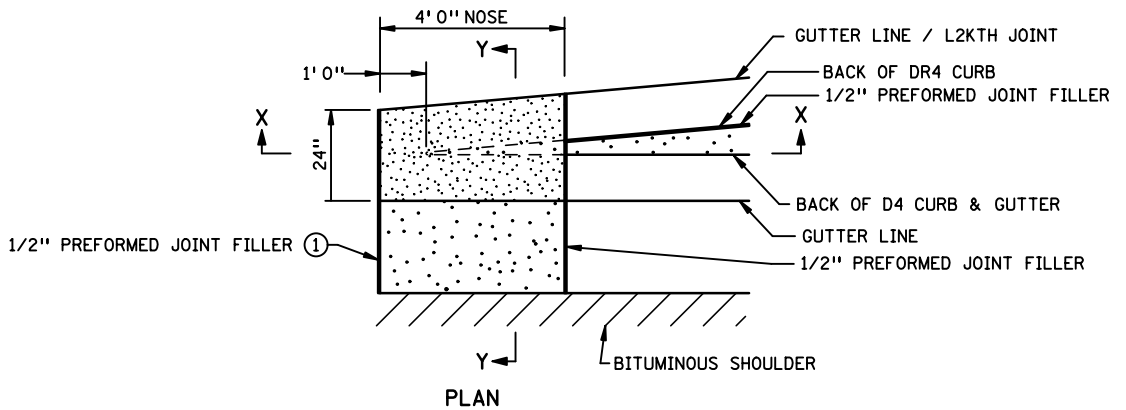
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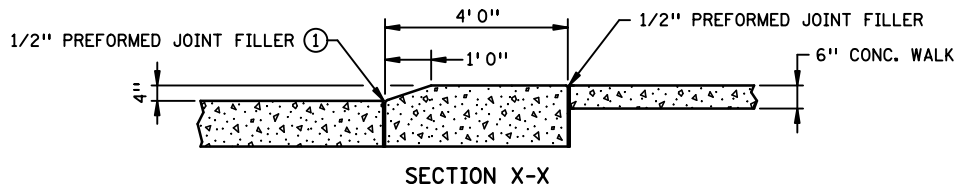
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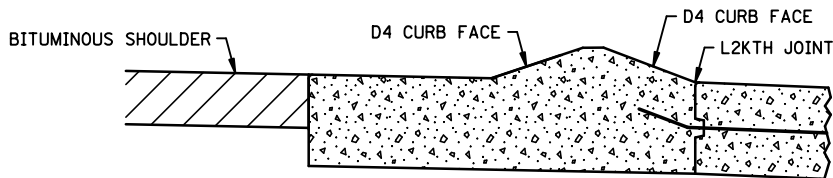
PLAN VIEW



PLAN



SECTION X-X



SECTION Y-Y
ENTRANCE NOSE DETAILS

NOTES:

- ① USE PREFORMED JOINT FILLER ONLY IF AREA IN FRONT OF NOSE IS CONCRETE.
- ② BASED ON STANDARD ENTRANCE GEOMETRY.
- ③ D424 C&G WHEN RAMP PAVEMENT IS BITUMINOUS.
- ④ D4 INTEGRANT CURB WHEN SHOULDER IS CONCRETE.

APPROVED JULY 25, 2011

[Signature]
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

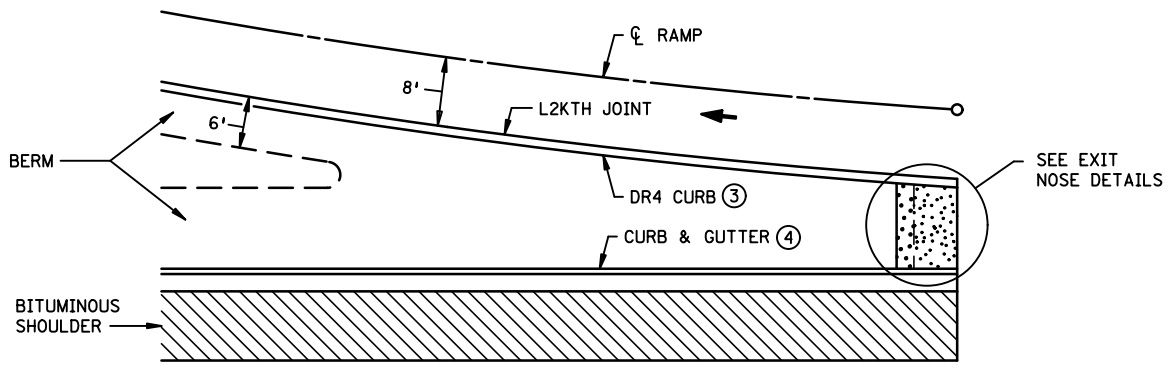
ENTRANCE NOSE
(URBAN DESIGN)

SPECIFICATION
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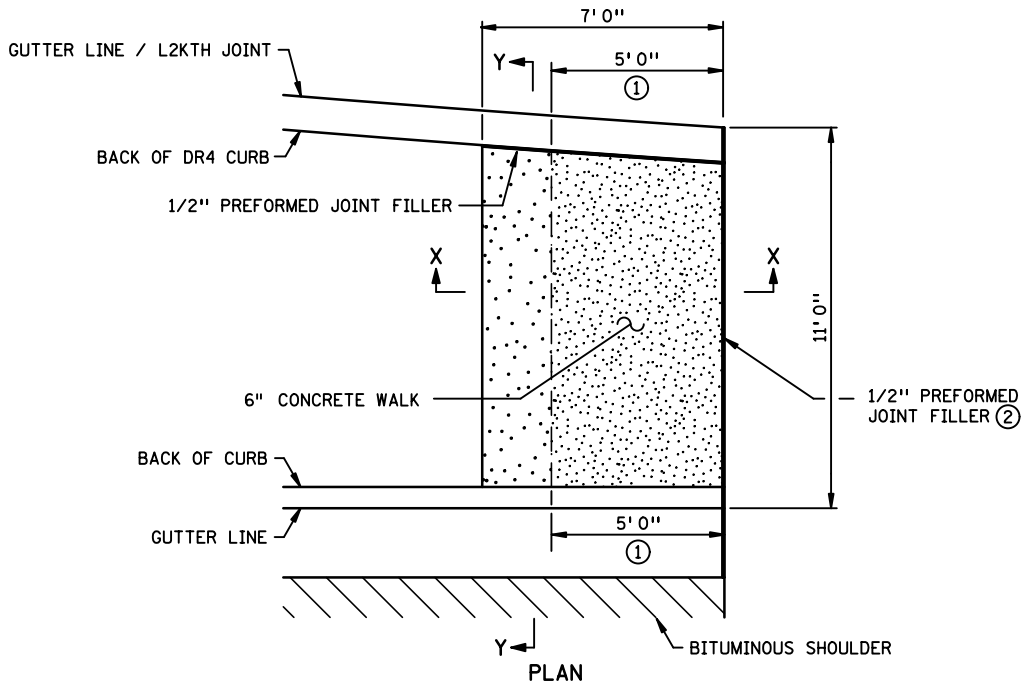
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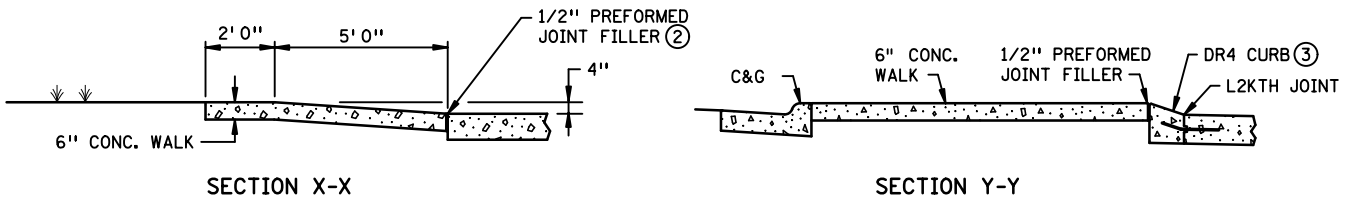
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PLAN VIEW



PLAN



SECTION X-X

SECTION Y-Y

EXIT NOSE DETAILS

NOTES:

- ① WHEN CONSTRUCTING CURB, TRANSITION FROM NOMINAL TO 0" HEIGHT.
- ② USE PREFORMED JOINT FILLER ONLY IF AREA IN FRONT OF NOSE IS CONC.
- ③ D424 C&G WHEN RAMP PAVEMENT IS BITUMINOUS.
- ④ INTEGRANT CURB WHEN SHOULDER IS CONCRETE.

APPROVED JULY 25, 2011

M. J. [Signature]
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

EXIT NOSE
(URBAN DESIGN)

SPECIFICATION
REFERENCE

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STANDARD
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