

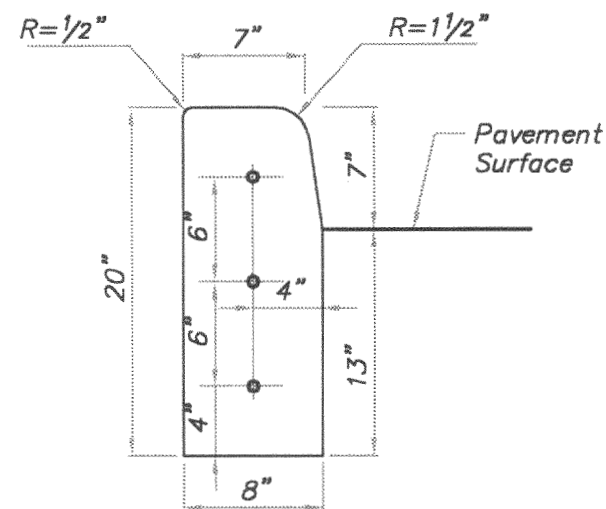
DIVISION III
STANDARD DRAWINGS



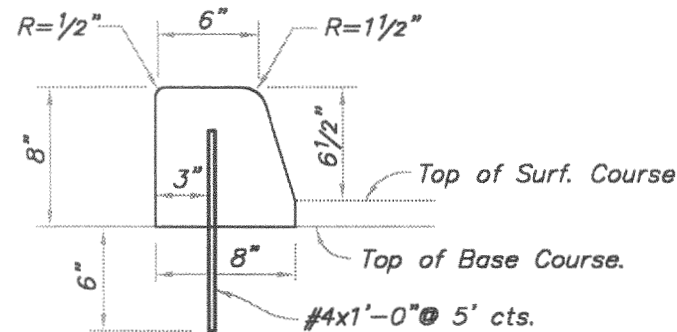
AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METROPOLITAN CHAPTER

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* ALL METRIC VERSIONS REMOVED – APRIL 19, 2019.



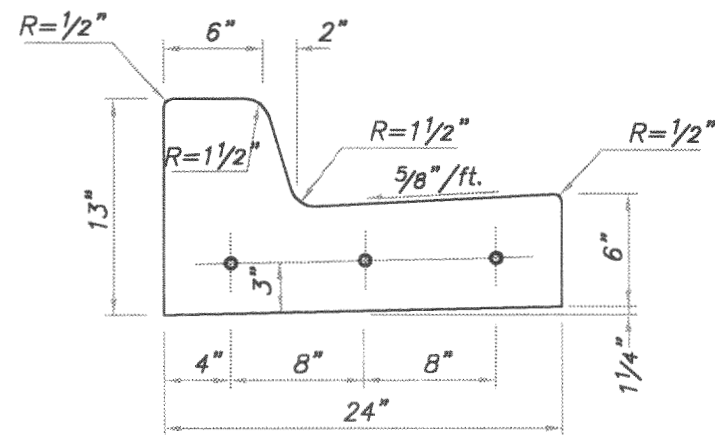
STRAIGHT CURB
(TYPE C-1)



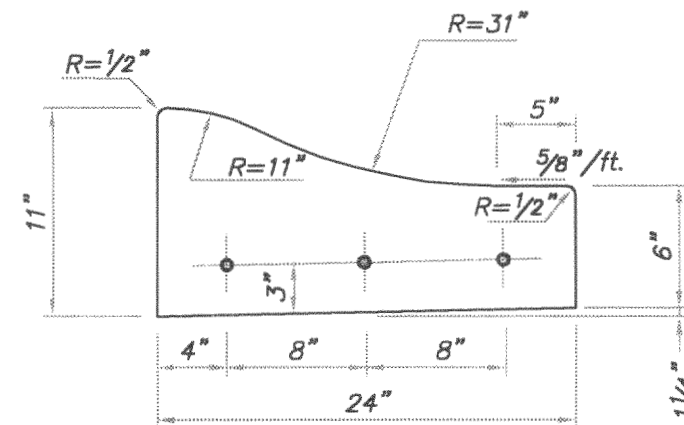
DOWELLED CURB
(TYPE DC)

GENERAL NOTES:

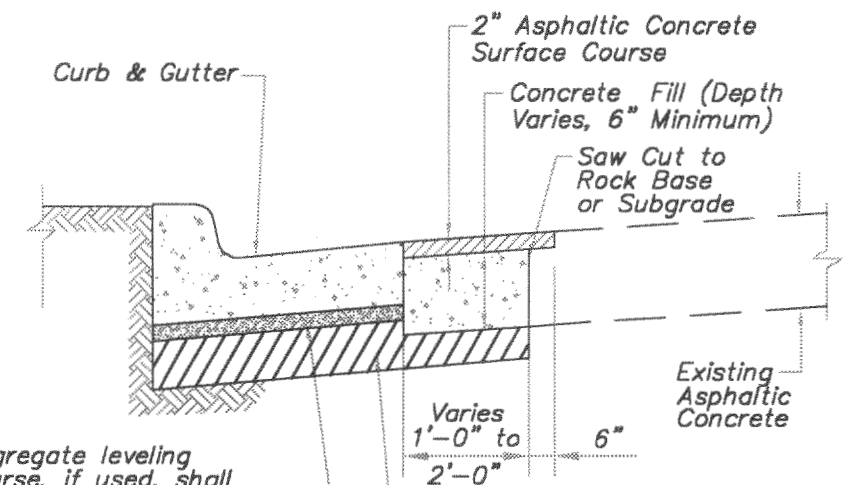
1. $\frac{3}{4}$ " Isolation Joints with $\frac{5}{8}$ " dia. x 2' smooth dowels shall be placed at radius points and at 150' intervals. These dowel bars shall be greased and wrapped on one end with expansion tubes.
2. 1" deep Contraction Joints shall be installed at approximately 10' intervals. These joints shall pass across the entire curb section.
3. Fix dowel bars with bar supports.
4. Depth of curb shall be a minimum of 8" through the handicap access ramp.
5. Concrete shall conform to Standard Specifications Section 2208.2.B.
6. Asphaltic concrete surface course shall conform to Standard Specifications Section 2205.2.



STRAIGHT BACK CURB & GUTTER
(TYPE CG-1)



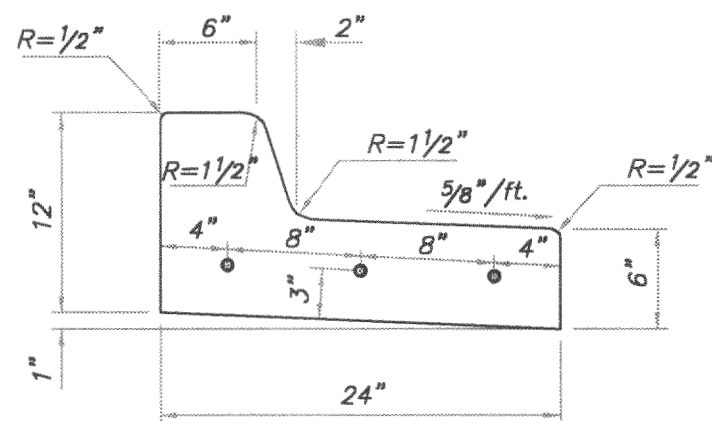
ROLL BACK CURB & GUTTER
(TYPE CG-2)



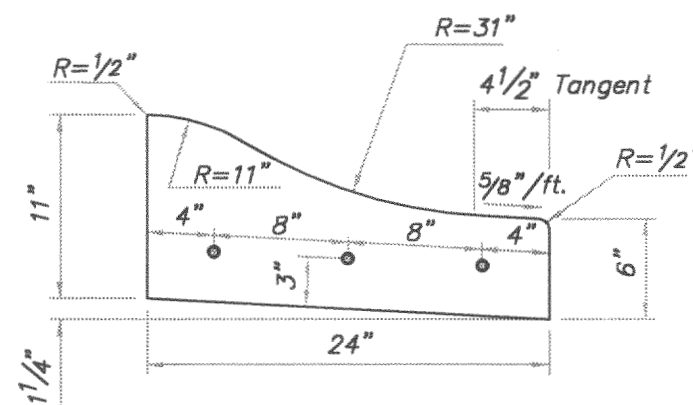
Aggregate leveling course, if used, shall conform to Standard Specifications Section 2202.

The top 6" of subgrade shall conform to Standard Specifications Section 2201.

CURB REPLACEMENT DETAIL

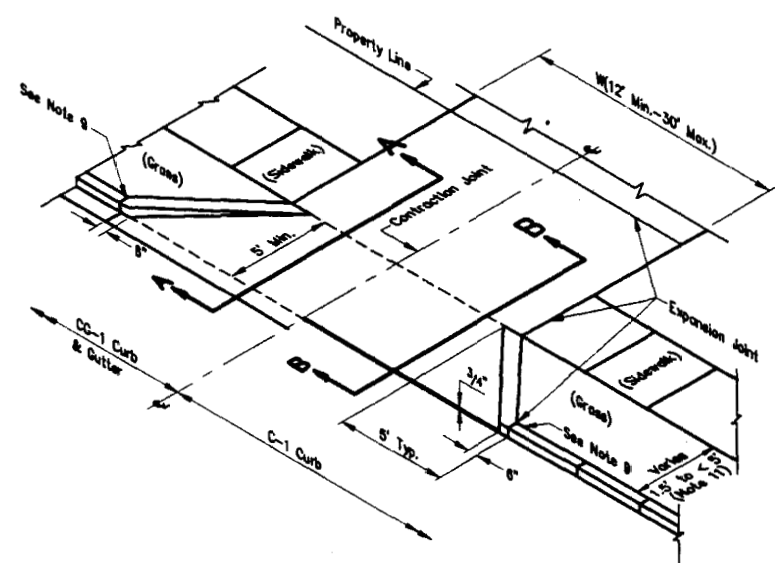


STRAIGHT BACK DRY CURB & GUTTER
(TYPE CG-1 DRY)

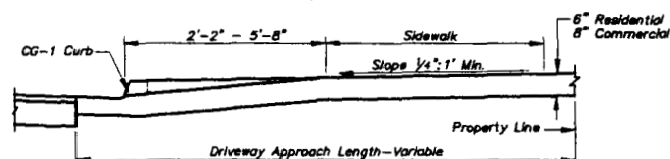


ROLL BACK DRY CURB & GUTTER
(TYPE CG-2 DRY)

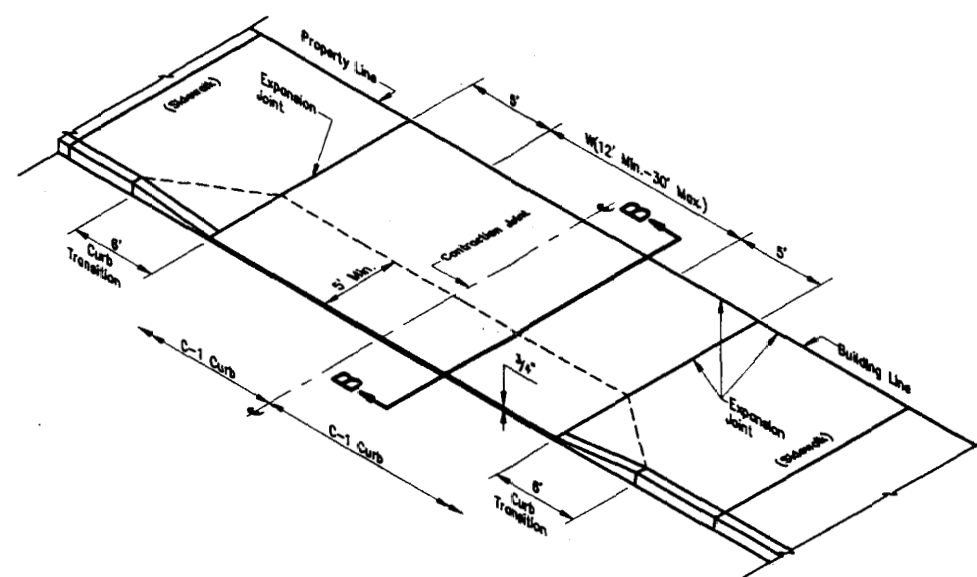
AMERICAN PUBLIC WORKS ASSOCIATION	
APWA	
KANSAS CITY METROPOLITAN CHAPTER	
CURB DETAILS	STANDARD DRAWING NUMBER C - 1
ADOPTED: MAY 23, 2001	



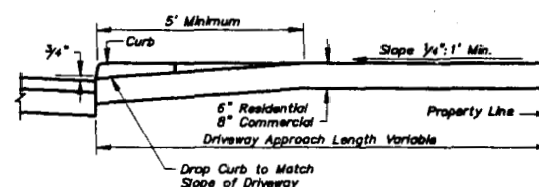
TYPE I
(Parkway 1.5' to < 5')



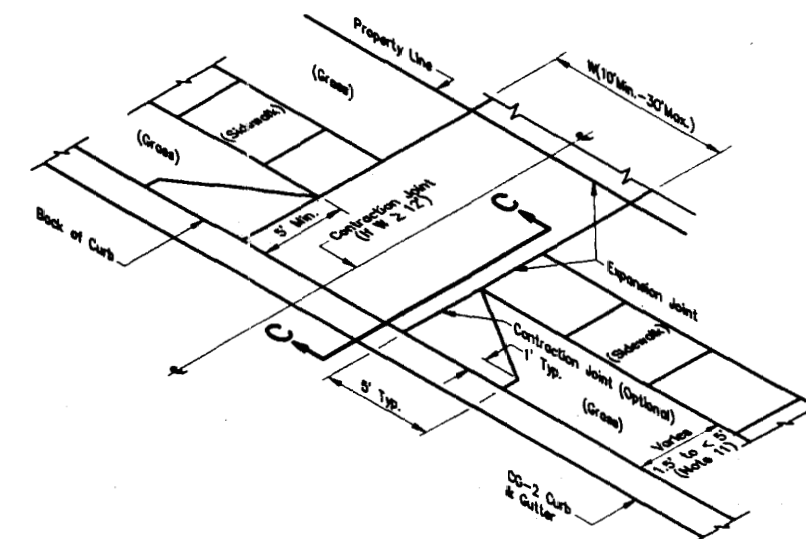
SECTION A-A (CG-1 CURB SHOWN)



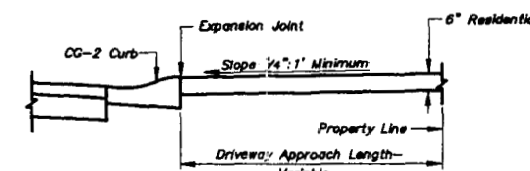
TYPE II



SECTION B-B (C-1 CURB)



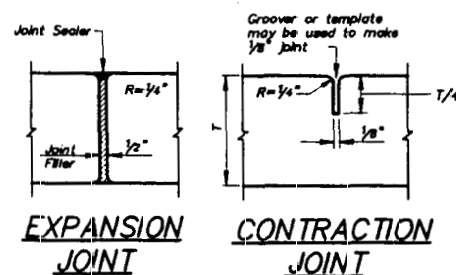
TYPE III
(Parkway 1.5' to < 5')



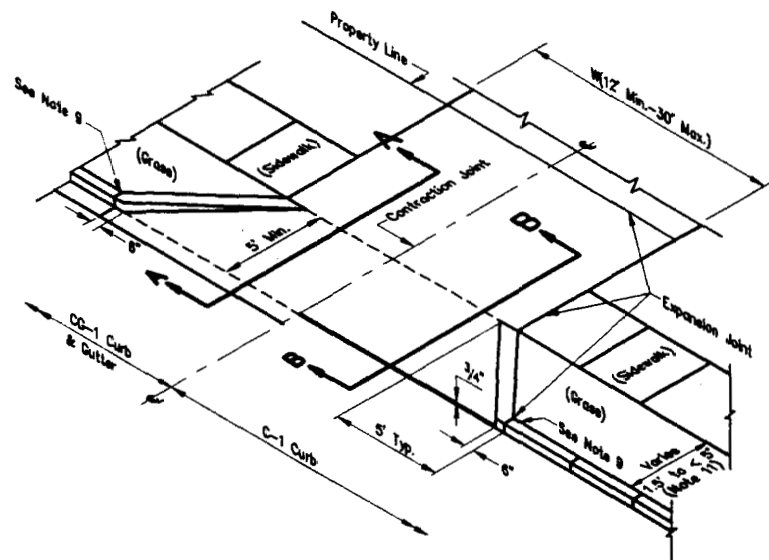
SECTION C-C (CG-2 CURB)

NOTES:

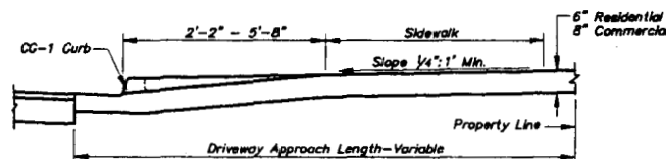
1. The top 6" of driveway subgrade shall be compacted to 95% of standard maximum density.
2. Concrete shall conform to MCIB Mix No. WA610-1-4, except in CBD where WA610-1-4 with Trap Rock Aggregate is required, Section 2209.2.A.
3. Expansion joint filler and joint sealing compound shall conform to Standard Specifications Section 2209.2.
4. Curing membranes shall conform to Standard Specifications Section 2208.2F.
5. Curb transitions on driveway flares are considered part of driveway.
6. In CBD, 6 x 6-W2.9 x W2.9 reinforcing shall be placed in center of slab thickness.
7. On Park Department Property place 6 x 6-W1.4 x W.4 reinforcing in center of slab thickness and use radius instead of flare.
8. Contraction Joints shall be spaced at 12' max., both directions.
9. Two 5/8" x 2' smooth dowels (one for C-1 Curb). See curb standards for placement.
10. Form 3/4" lip at pavement line on drives in C-1 & C/S Curbs.
11. If parkway is < 1.5' fill with concrete as part of the sidewalk.



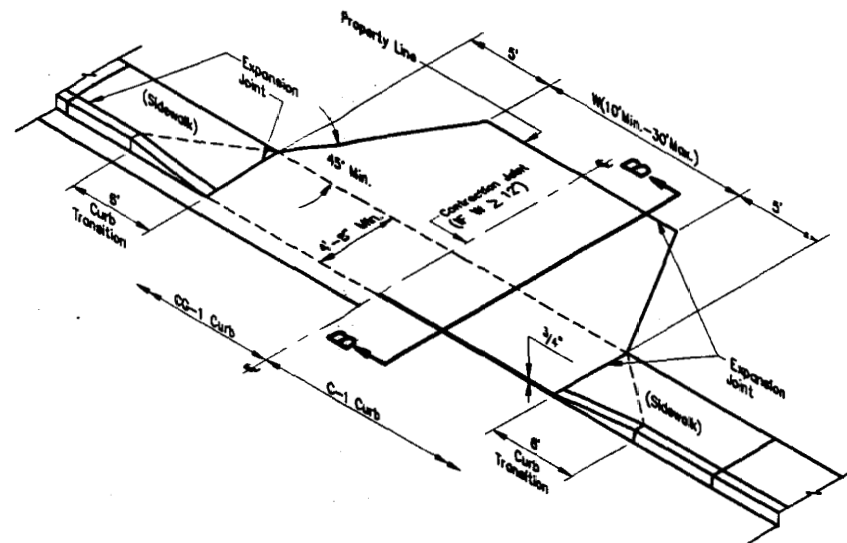
EXPANSION JOINT
CONTRACTION JOINT
JOINT DETAILS



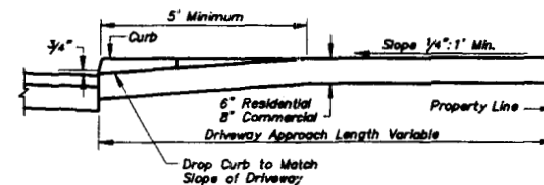
TYPE I
(Parkway 1.5' to < 5')



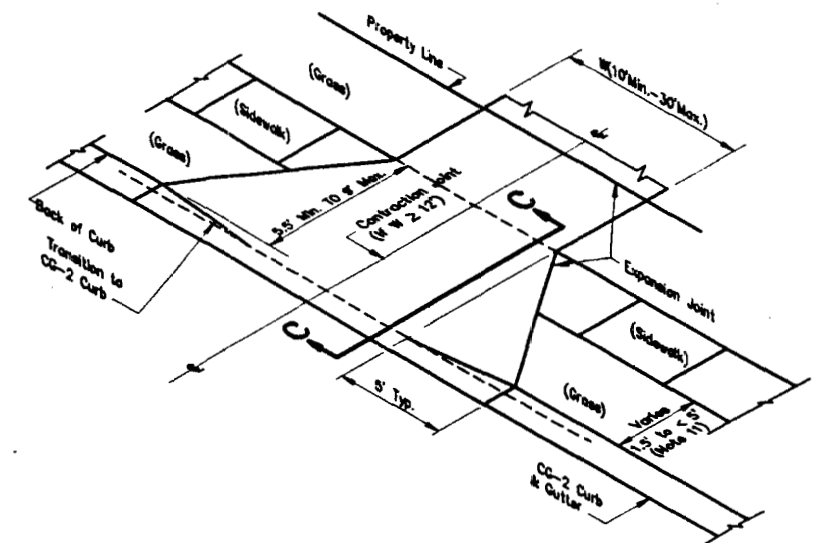
SECTION A-A (CG-1 CURB SHOWN)



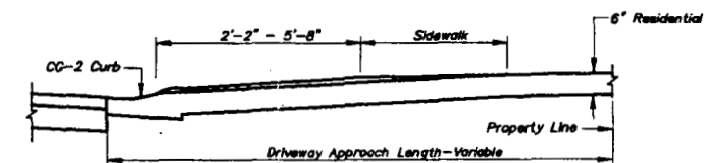
TYPE II



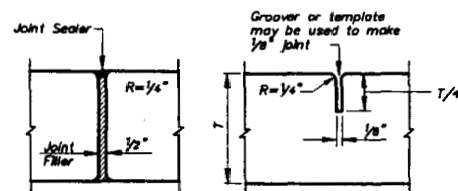
SECTION B-B (C-1 CURB)



TYPE III
(Parkway 1.5' to < 5')



SECTION C-C (CG-2 CURB)

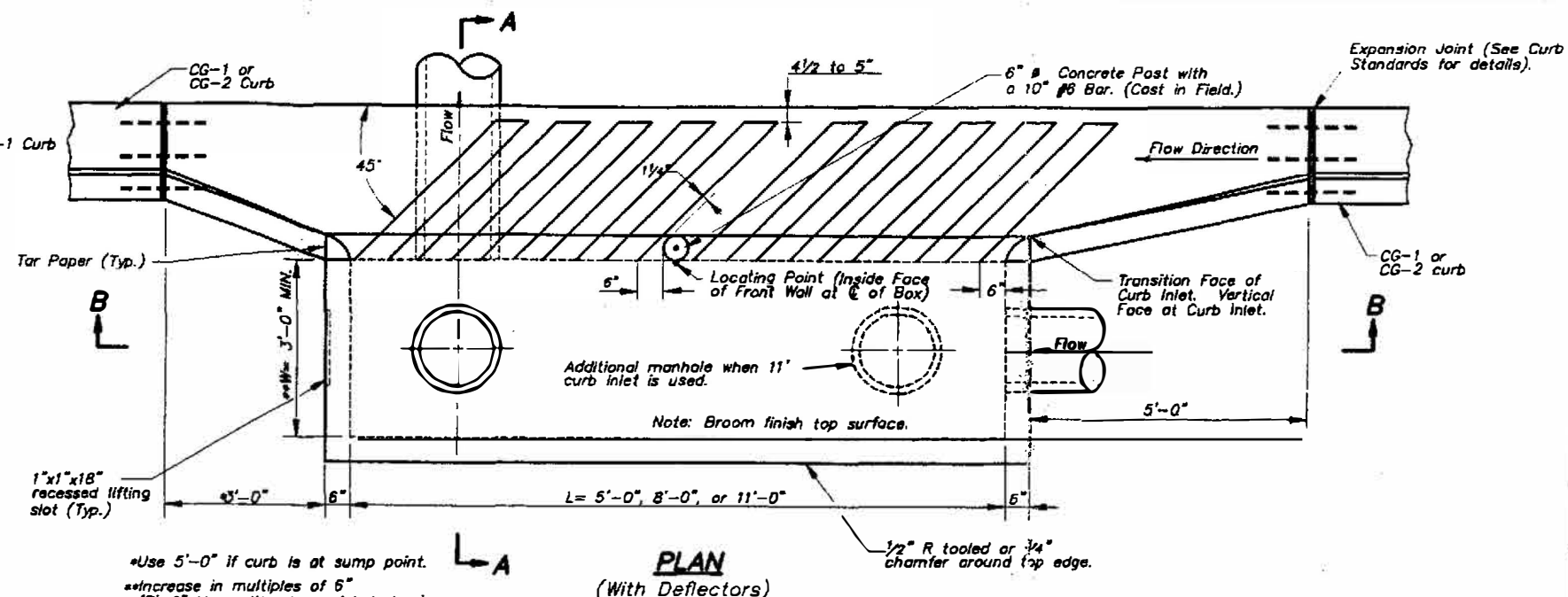
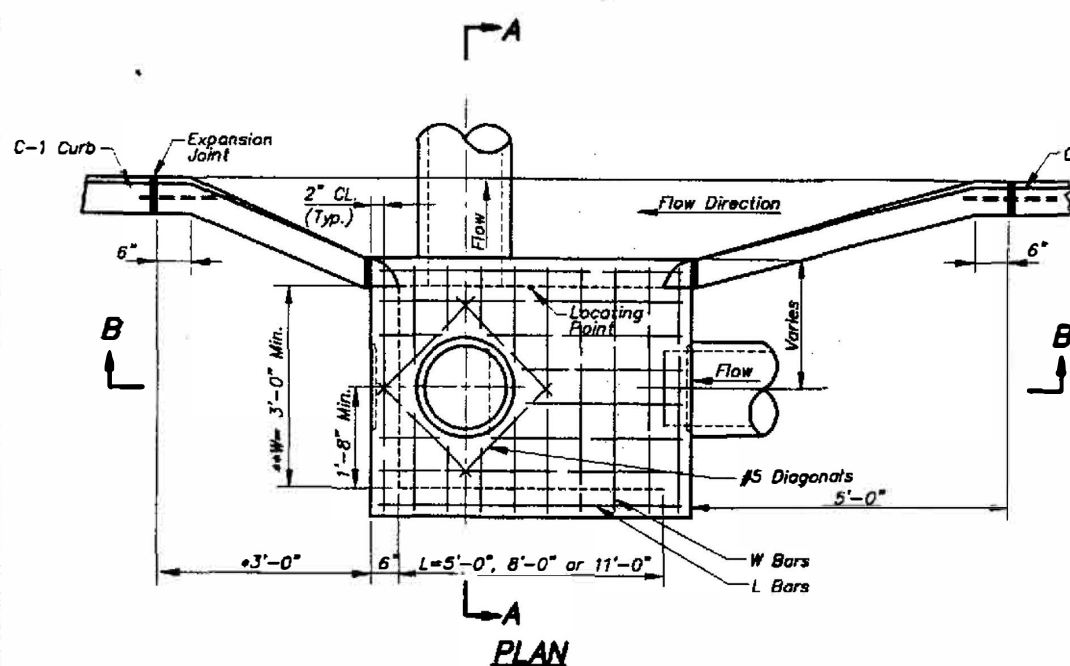


EXPANSION JOINT **CONTRACTION JOINT**

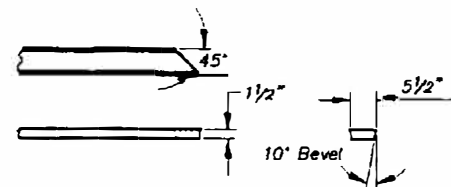
JOINT DETAILS

NOTES:

1. The top 6" of driveway subgrade shall be compacted to 95% of standard maximum density.
2. Concrete shall conform to MCIB Mix No. WA610-1-4, except in CBD where WA610-1-4 with Trap Rock Aggregate is required, Section 2209.2.A.
3. Expansion joint filler and joint sealing compound shall conform to Standard Specifications Section 2209.2.
4. Curing membranes shall conform to Standard Specifications Section 2208.2F.
5. Curb transitions on driveway flares are considered part of driveway.
6. In CBD, 6 x 6-W2.9 x W2.9 reinforcing shall be placed in center of slab thickness.
7. On Park Department Property place 6 x 6-W1.4 x W.4 reinforcing in center of slab thickness and use radius instead of flare.
8. Contraction Joints shall be spaced at 12' max., both directions.
9. Two 5/8" ϕ x 2' smooth dowels (one for C-1 Curb). See curb standards for placement.
10. Form 3/4" lip at pavement line on drives in C-1 & CS Curbs.
11. If parkway is < 1.5', fill with concrete as part of the sidewalk.

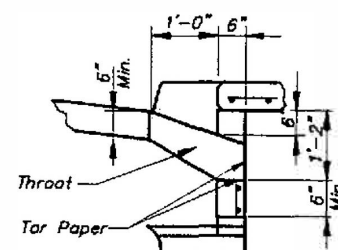


Use 5'-0" if curb is at sump point.
Increase in multiples of 6"
(7'-0" Max. without special design.)
(See project plans for details.)

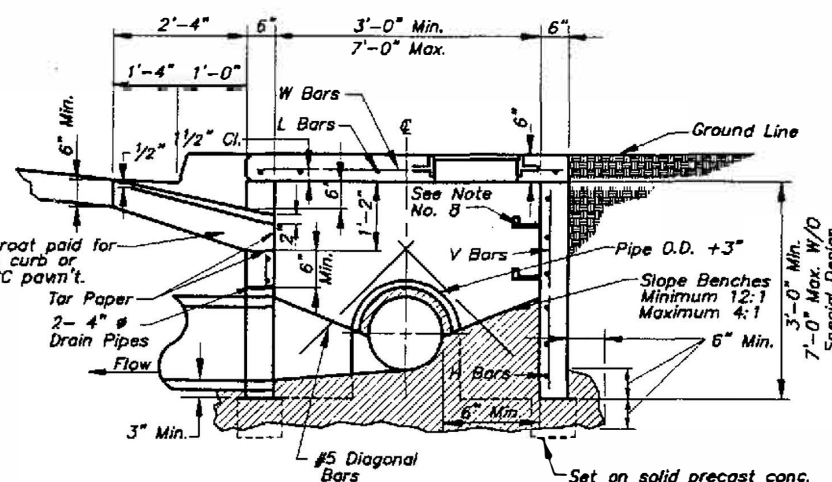


DEFLECTOR CHANNEL FORM DETAIL

NOTE: Forms shall be well oiled and hand placed at time of pour. After initial set, remove forms and finish surface of concrete.



THROAT DETAIL FOR C-1 CURB (Deflectors Not Specified)



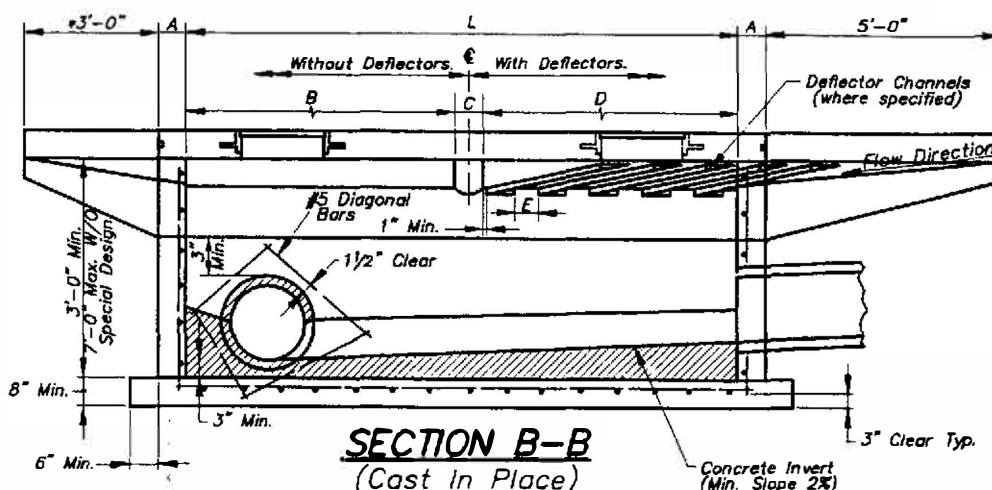
SECTION A-A (Precast)

Set on solid precast conc. blocks. Foundation and invert shall be poured monolithic, unless soil conditions require pouring base slab before setting structure.

GENERAL NOTES:

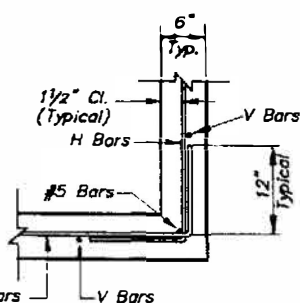
- Minimum distance from top of curb inlet to top of entering or leaving pipe shall be 2'-6" in front and 2'-0" in back or on sides.
- All work and materials shall conform to APWA Sect. 2600.
- Reinforcing shall be ASTM A615 with 1 1/2" clear cover unless shown otherwise.
L & W Bars are #5 at 6" O.C.
H & V Bars are #4 at 12" O.C.
1 H-Bar minimum over a cast-in place pipe & 2 H-Bars over a precast boxout.
- Boxouts shall not project through the structure corners. Reinforcing shall be bent around pipe openings when possible. When reinforcing is cut, a diagonal bar shall be used to tie all cut ends together.
- Locate manhole ring and cover over outlet.
- Use 3/4" chamfer strip on bottom edge of lid front.
- 4" field tile or precast hole shall be located at entering pipe and in the front face sump points. These tiles or openings shall be capped with 1/4" galvanized wire mesh on the outside of the inlet and clear the invert and base concrete.
- Steps required at 16" O.C. when depth from top of casting to invert exceeds 4'.
- Walls of structures may be cast in multiple sections.
- Asphaltic joint mat'l shall comply with APWA 2505.
- Minimum clearance between pipe boxouts and joints is 8", without special design.
- Ring and cover to be Neenah R-1537, Clay & Bailey #2020, Deeter #2016, or approved equal. (Castings may vary by municipality, refer to plans & contract documents.)
- The first dimension listed in the Construction Notes is the "L" dimension. The second dimension is the "W" dimension. L's listed on the project plans are at the inside face of the wall.
- Elevations shown on Construction Plans are top of inlet side of structure.

* East Jordan is an approved manufacturer for castings.



SECTION B-B (Cast in Place)

Concrete Invert (Min. Slope 2%)



WALL CORNER DETAIL

CURB INLET LENGTH	A	B	C	D	E	NO. OF DEFLECTORS
L = 5'-0"	6"	5'-0"	—	—	3"	5
L = 8'-0"	6"	5'-9"	6"	3'-9"	6"	6
L = 11'-0"	6"	5'-3"	6"	5'-3"	4"	10

(Table Dimensions good to depth of 7'-0".)

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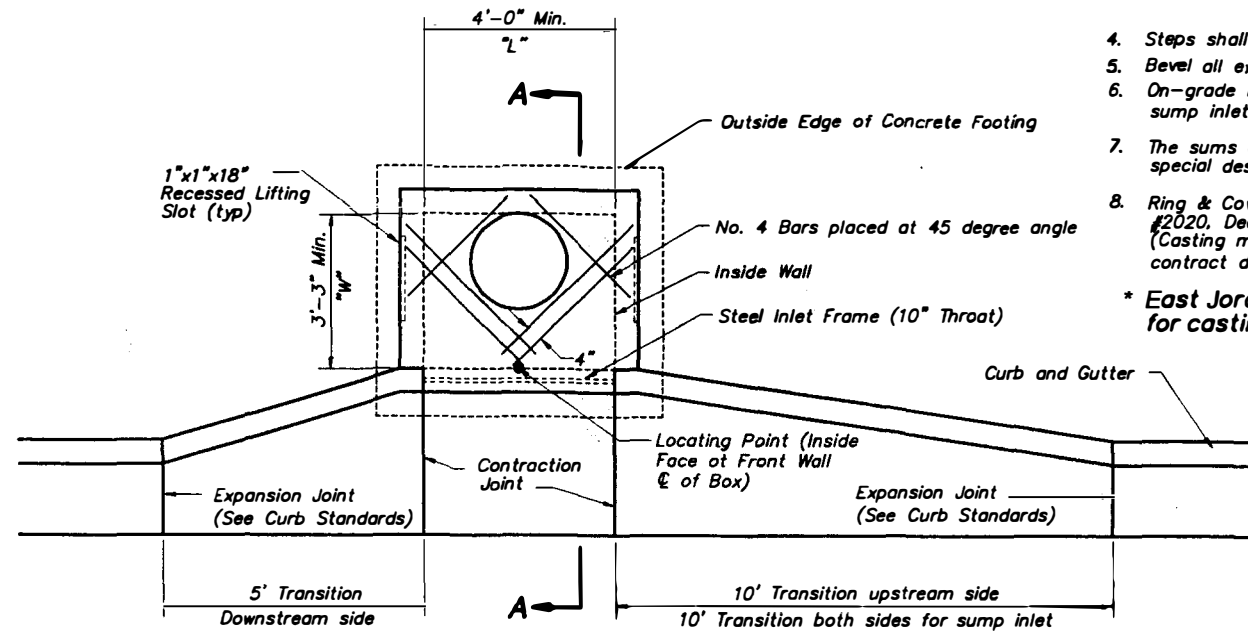
KANSAS CITY
METROPOLITAN CHAPTER

CURE INLET - TYPE 1
DETAILS

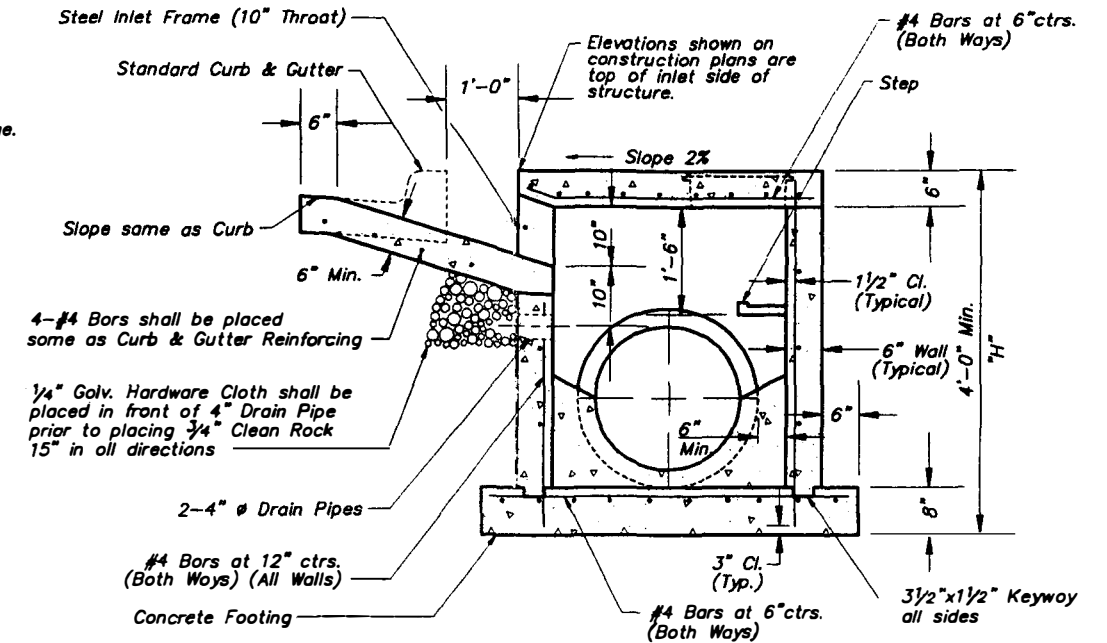
STANDARD DRAWING
NUMBER CI - 1
ADOPTED:
APRIL 17, 1996

GENERAL NOTES:

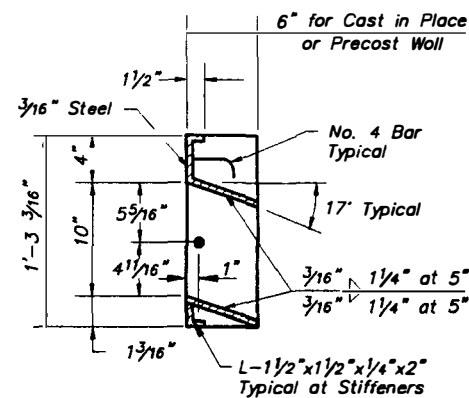
1. The first dimension listed in the Construction Notes is the "L" dimension. The second dimension is the "W" dimension. L's listed on the project plans are listed at the inside face of the wall.
 2. Floor of Inlet shall be shaped with invert to provide smooth flow.
 3. Locate MH ring and cover over outlet.
 4. Steps shall be spaced at 1'-4" O.C. vertically.
 5. Bevel all exposed edges with $\frac{3}{4}$ " chamfer or $\frac{1}{2}$ " tooled edge.
 6. On-grade inlets shall conform to the street grade and sump inlets shall be level.
 7. The sums of "L" & "W" shall not exceed 14' without special design. (See project plans for details.)
 8. Ring & Cover to be Neenah R-1537, Clay & Bailey #2020, Deeter #2016, or approved equal. (Casting may vary by municipality, refer to plans & contract documents.)
- * East Jordan is an approved manufacturer for castings.



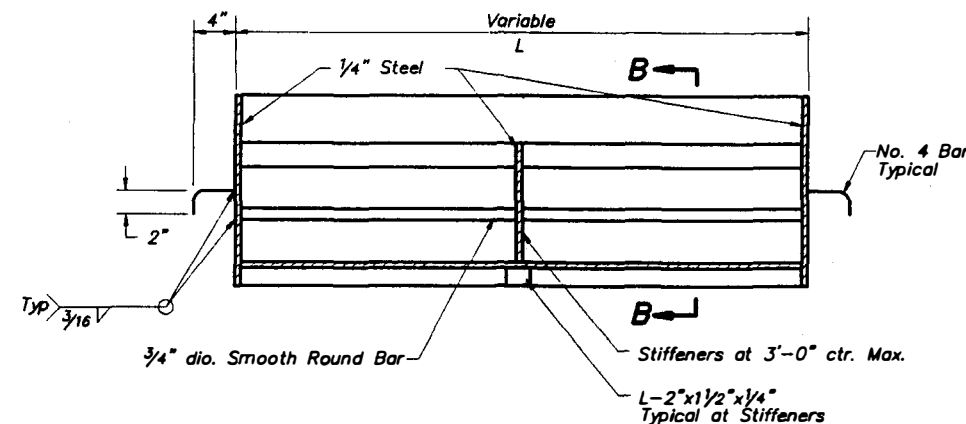
PLAN



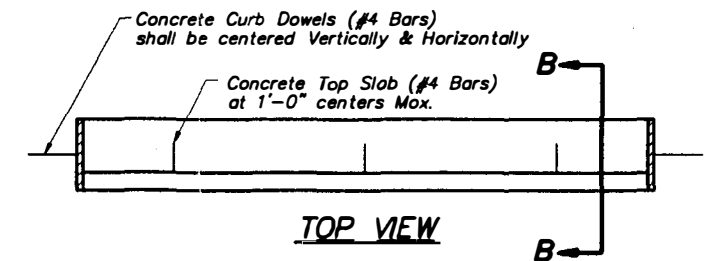
SECTION A-A



SECTION B-B



FRONT VIEW



TOP VIEW

Notes:

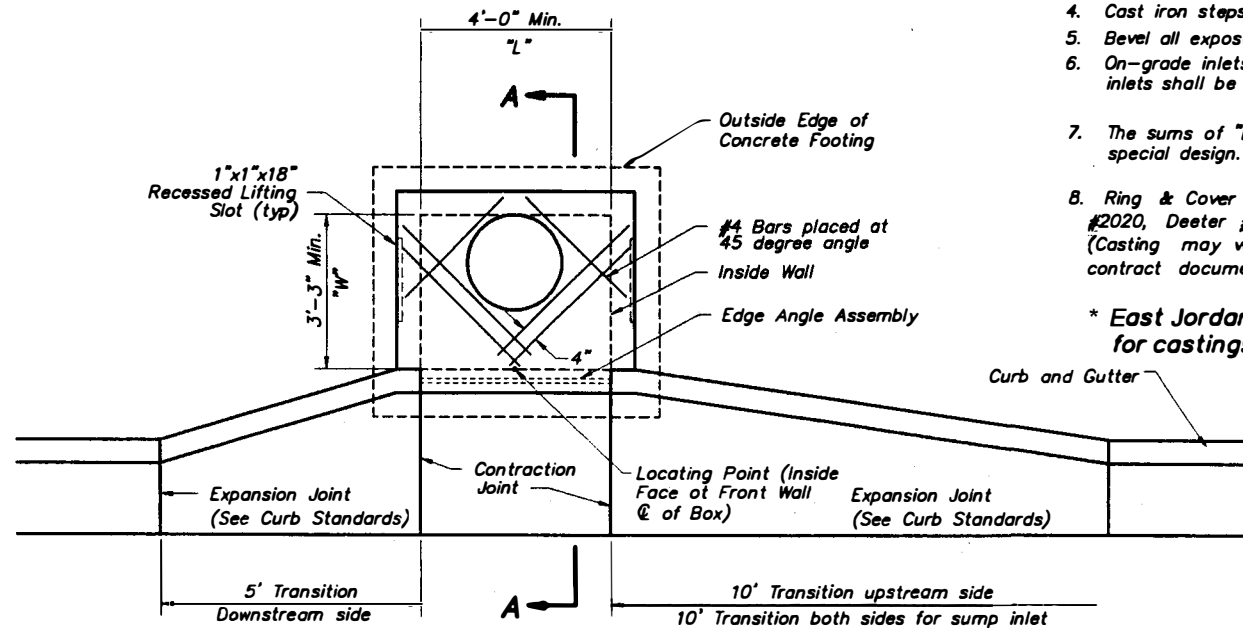
1. All welds shall be performed in accordance with appropriate AWS Specifications & Procedures.
2. All welds on exposed surfaces shall be dressed so as to provide a pleasing finished appearance.
3. The entire frame shall be pointed a single coat of CHEM-PRIME #37-77 primer (Red) or equal.

AMERICAN PUBLIC WORKS ASSOCIATION	
APWA	KANSAS CITY METROPOLITAN CHAPTER
CURB INLET - TYPE 2 DETAILS	
STANDARD DRAWING NUMBER CI - 2 ADOPTED: APRIL 17, 1996	

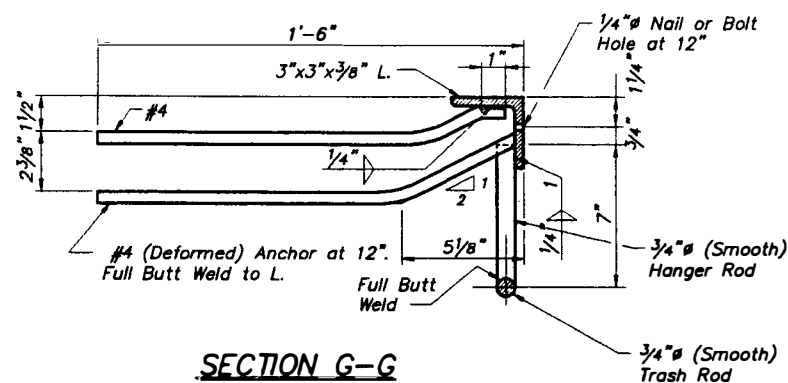
GENERAL NOTES:

1. The first dimension listed in the Construction Notes is the "L" dimension. The second dimension is the "W" dimension. E's listed on the project plans are listed at the inside face of the wall.
2. Floor of Inlet shall be shaped with invert to provide smooth flow.
3. Locate MH ring and cover over outlet.
4. Cast iron steps shall be spaced at 1'-4" O.C. vertically.
5. Bevel all exposed edges with $\frac{3}{4}$ " chamfer or $\frac{1}{2}$ " tooled edge.
6. On-grade inlets shall conform to the street grade and sump inlets shall be level.
7. The sums of "L" & "W" shall not exceed 14' without special design. (See project plans for details.)
8. Ring & Cover to be Neenah R-1537, Clay & Bailey #2020, Deeter #2016, or approved equal. (Casting may vary by municipality, refer to plans & contract documents.)

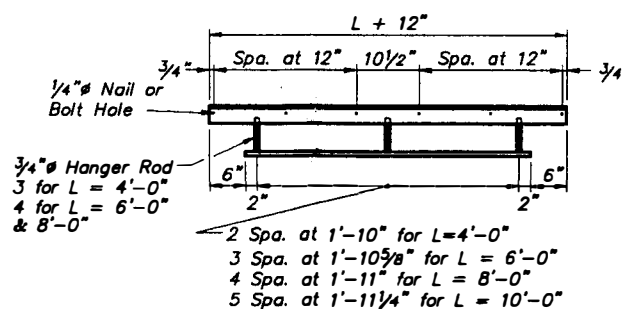
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PLAN

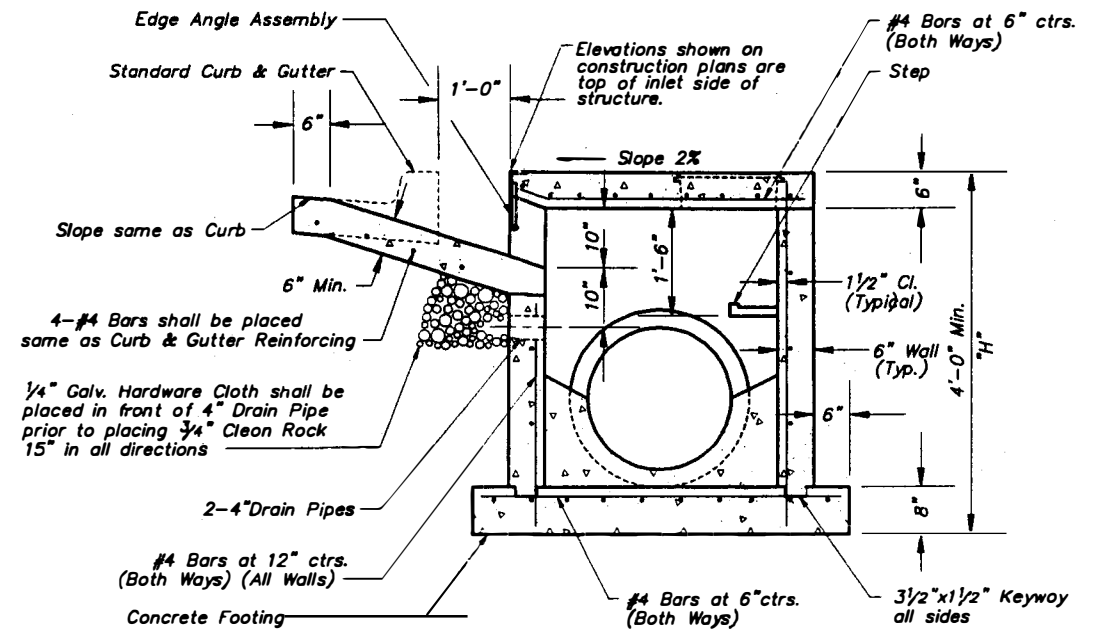


SECTION G-G

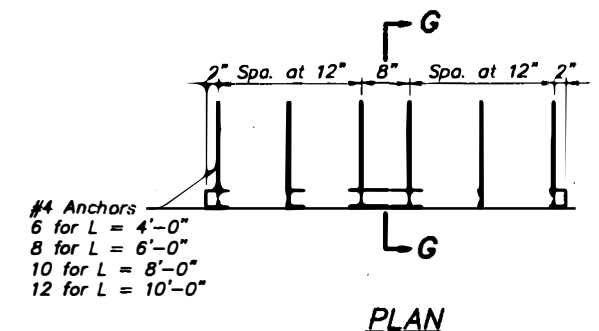


Note: Nails or bolts used to anchor L to form shall be removed or cut-off flush w/surface of L.

FRONT ELEV.



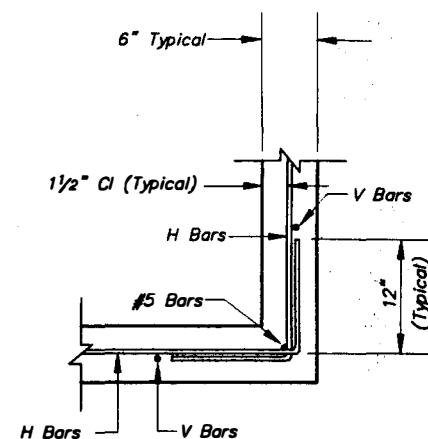
SECTION A-A



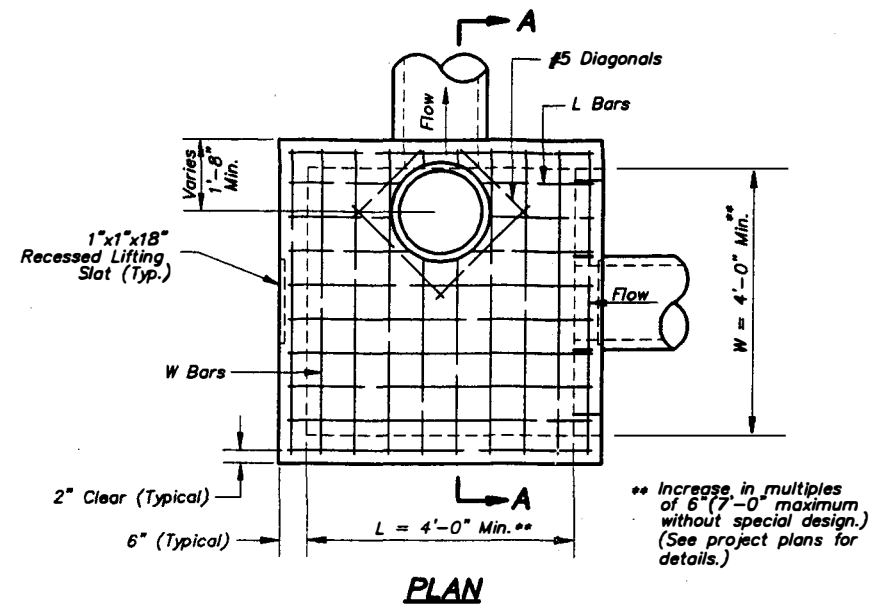
PLAN

DETAIL OF EDGE ANGLE ASSEMBLY

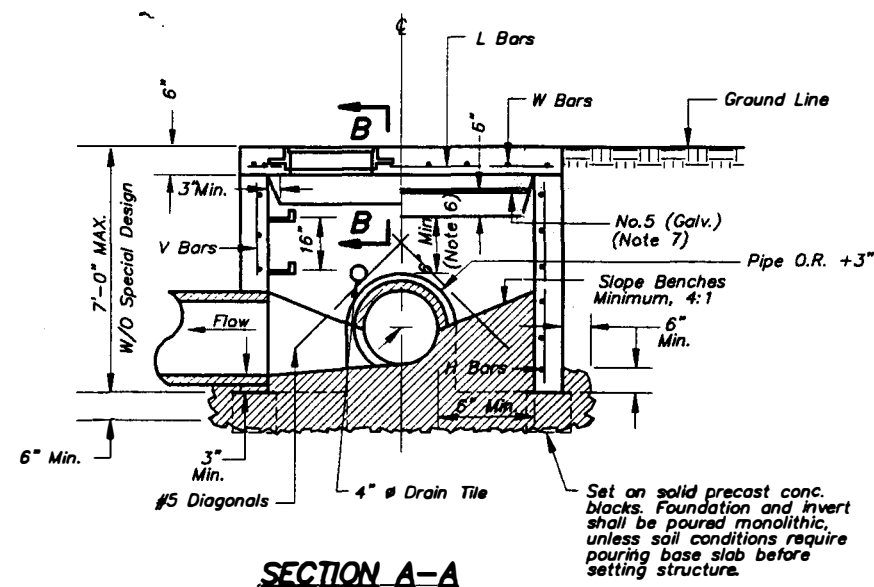
AMERICAN PUBLIC WORKS ASSOCIATION	
APWA	KANSAS CITY METROPOLITAN CHAPTER
CURB INLET - TYPE 3 DETAILS	
STANDARD DRAWING NUMBER CI - 3 ADOPTED: APRIL 17, 1996	



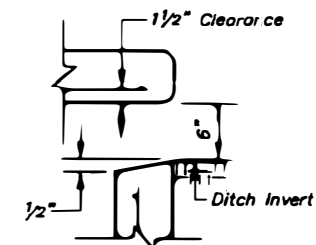
CORNER DETAIL



PLAN



SECTION A-A



SECTION B-B

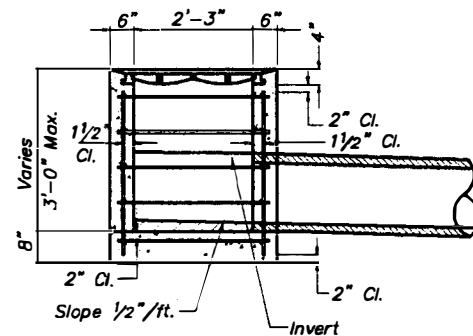
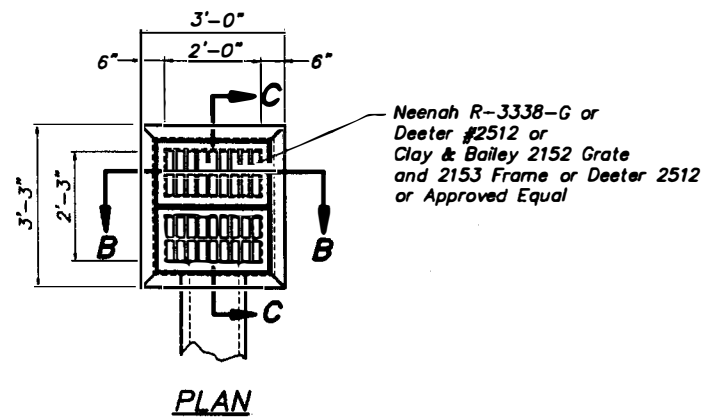
REINFORCING

BARS	BAR SIZE	SPACING (IN.)
H	4	12
V	4	12
L	5	6
W	5	6

GENERAL NOTES:

1. Locate ring and cover over outlet.
2. All work and materials shall conform to APWA Sect. 2600.
3. Use 3/8" chamfer strip on all exposed concrete corners.
4. Steps required at 16" O.C. when depth from top of casting to invert exceeds 4'.
5. Boxouts will not be allowed to project through the corners of the structure.
6. The minimum reinforcing shall be 1 H-bar over a cast-in place pipe and 2 H-bars over a precast boxout.
7. Limit opening height to 6" with No. 5 galvanized bars extending to corner rebars.
8. Show field inlet orientation on plans plus number and size of openings.
9. O.R. = outside pipe radius
10. Ring & Cover to be Neenah R-1537, Clay & Bailey #2020, Deeter #2016, or approved equal. (Casting may vary by municipality, refer to plans & contract documents.)
11. 4" # field tile or precast hole shall be located at entering pipe and in the front face sump points. These tiles or openings shall be capped with 1/4" galvanized wire mesh on the outside of the inlet and clear the invert and base concrete.

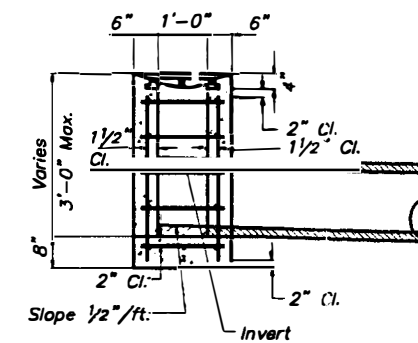
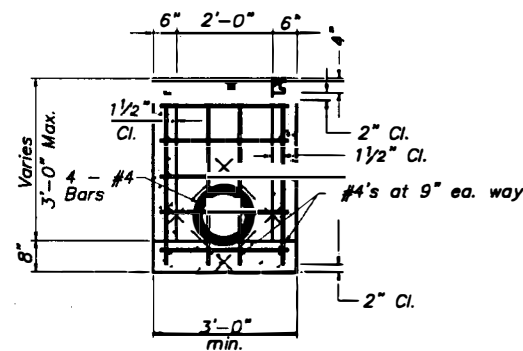
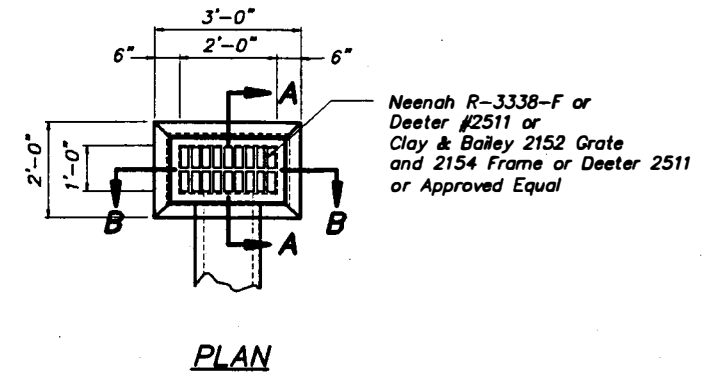
* East Jordan is an approved manufacturer for castings.




DOUBLE GRATE INLET DETAILS

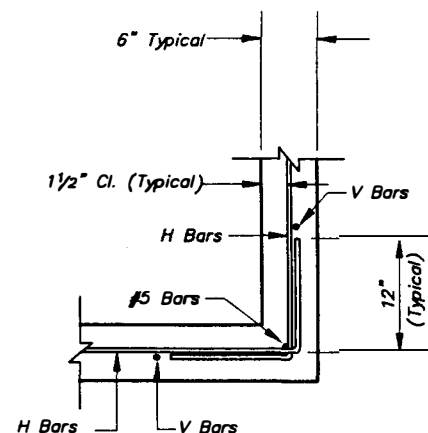
NOTE:

1. Location point at center of inlet.
 2. A separate top slab may be utilized.
 3. Not recommended for use in areas with bicycle traffic.
- * East Jordan is an approved manufacturer for castings.

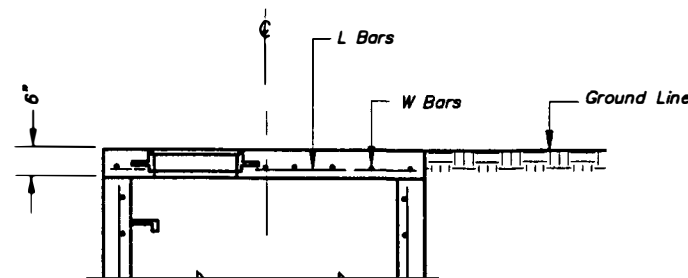


SINGLE GRATE INLET DETAILS

AMERICAN PUBLIC WORKS ASSOCIATION	
	KANSAS CITY
	METROPOLITAN CHAPTER
GRATE INLET DETAILS	STANDARD DRAWING NUMBER GI-1
	ADOPTED: APRIL 17, 1996

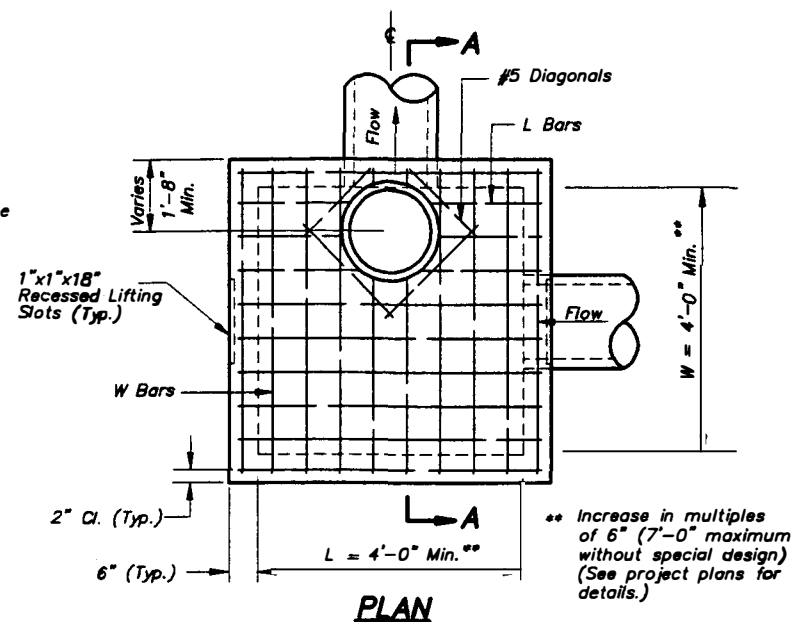


CORNER DETAIL



SLAB TOP ALTERNATE FOR JUNCTION BOX (SHALLOW)

NOTE: Ring & Cover to be Neenah R-1537, Clay & Bailey #2020, Deeter #2016, or approved equal. (Casting may vary by municipality, refer to plans & contract documents.)

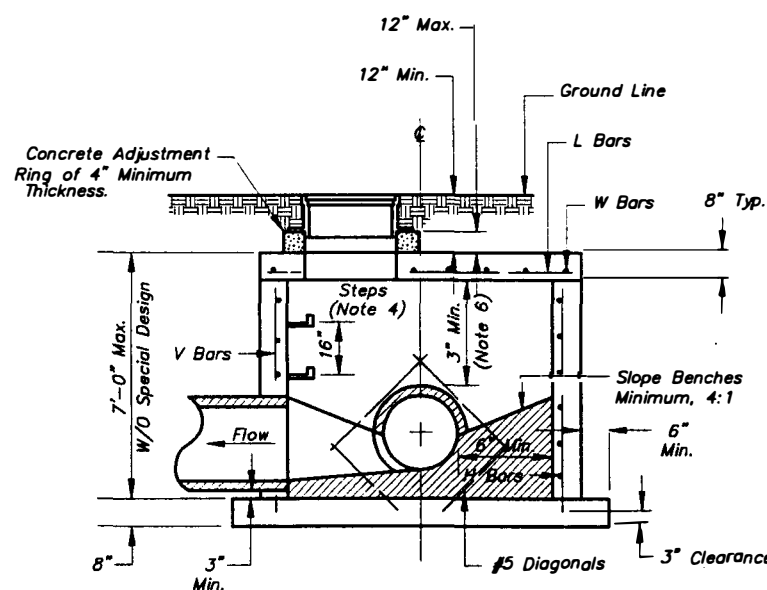


PLAN

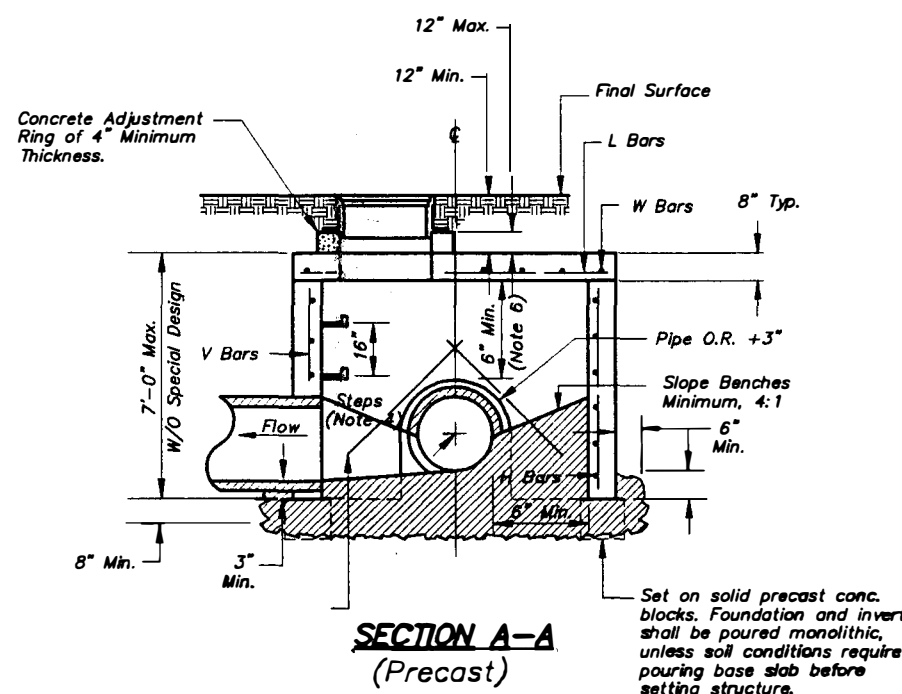
GENERAL NOTES:

1. Locate ring and cover over outlet.
2. All work and materials shall conform to Section 2600 APWA.
3. Use $\frac{3}{4}$ " Chamfer strip or $\frac{1}{2}$ " R edger tool on all exposed concrete corners.
4. Steps required at 16" O.C. when depth from top of casting to invert exceeds 4'.
5. Boxouts will not be allowed to project through the Corners of the structure and the minimum distance between boxouts is 6" with 1 corner bar.
6. The minimum reinforcing shall be 1 H-Bar over a cast-in place pipe and 2 H-Bars over a precast boxout.
7. Limit opening height to 6" with No. 5 galvanized bars extending to corner rebars.
8. Show field inlet orientation on plans plus number and size of openings locating point at center of structure.
9. O.R. = one half outside pipe diameter (O.D.).
10. Reinforcing of covers in streets require special design.
11. Ring & Cover to be Neenah R-1736, Clay & Bailey #2008, Deeter #1315, or approved equal. (Casting may vary by municipality, refer to plans & contract documents.)

* East Jordan is an approved manufacturer for castings.



SECTION A-A
(Cast In Place)



SECTION A-A
(Precast)

REINFORCING

BARS	BAR SIZE	SPACING (IN.)
H	4	12
V	4	12
L	5	6
W	5	6

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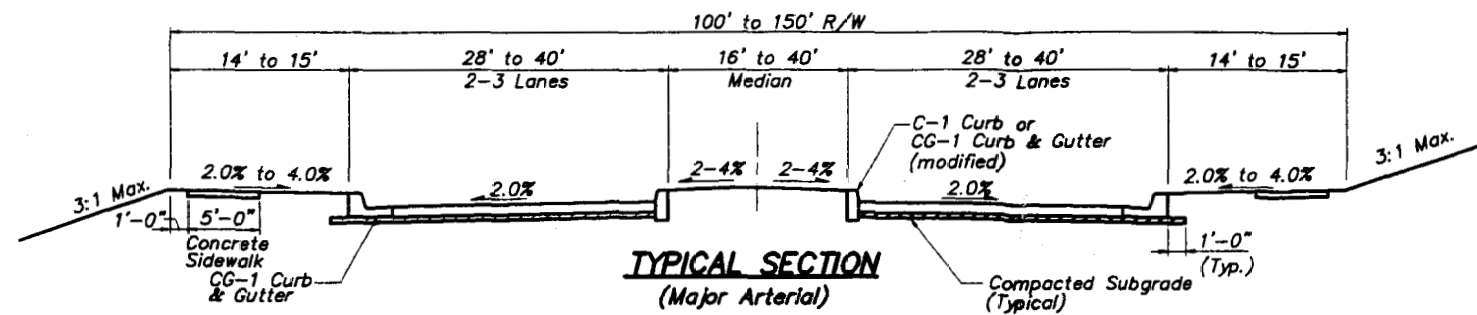


**KANSAS CITY
METROPOLITAN CHAPTER**

**JUNCTION BOX
DETAILS**

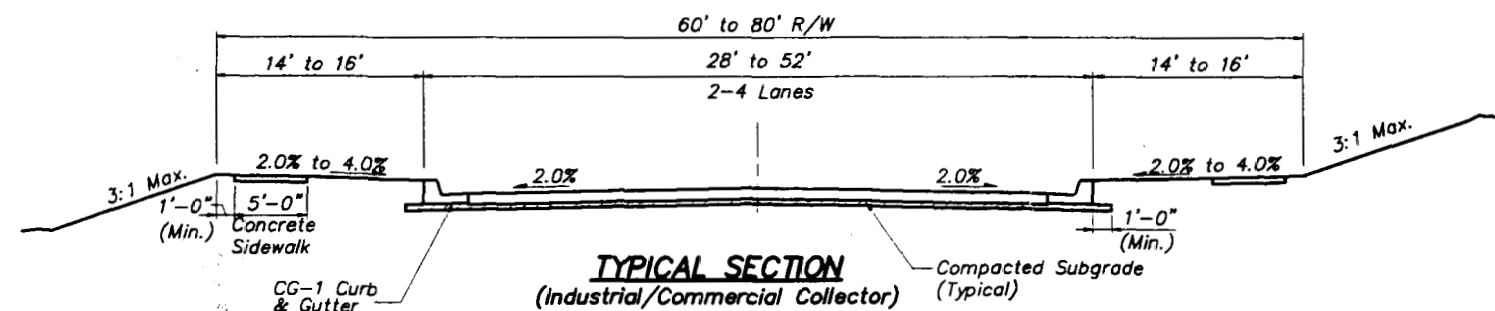
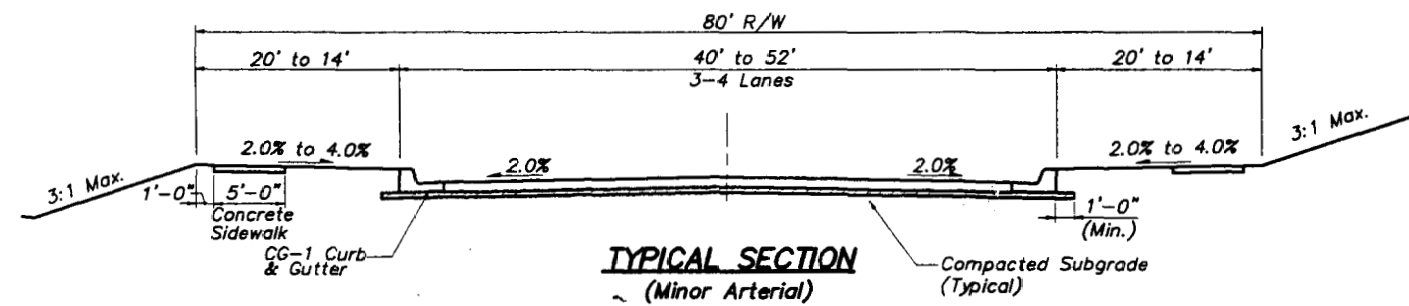
**STANDARD DRAWING
NUMBER JB - 1**


**ADOPTED:
APRIL 17, 1996**

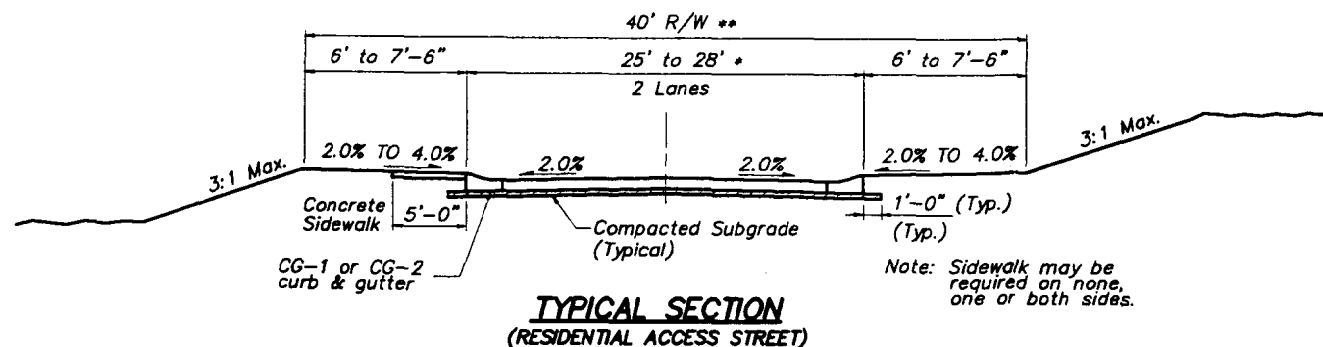
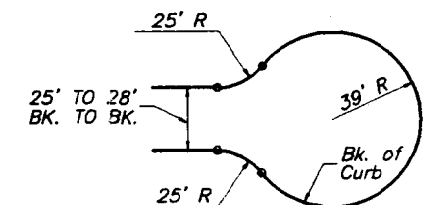
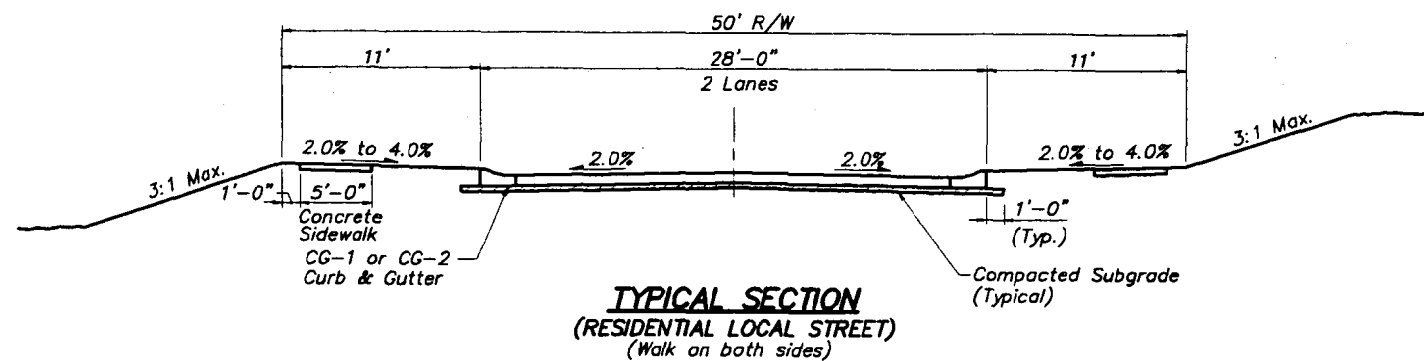
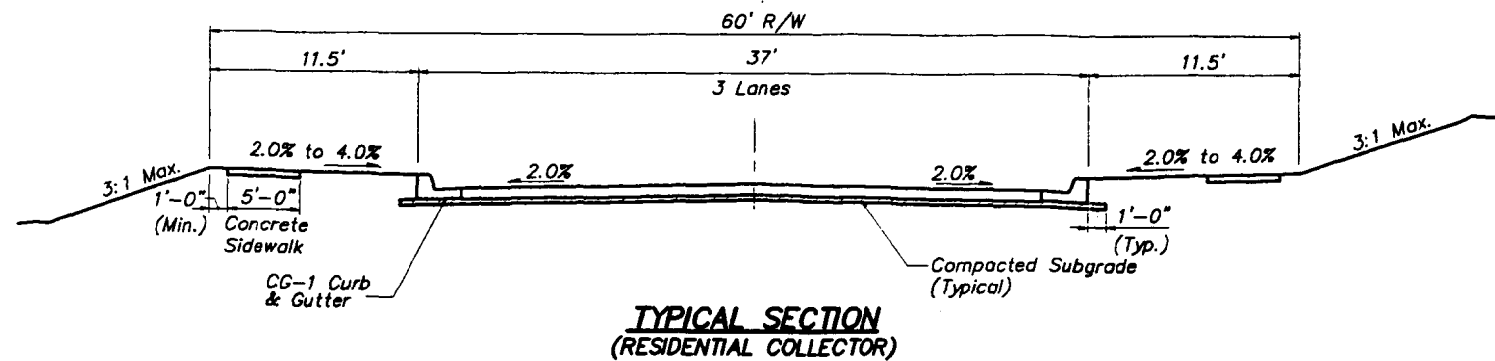


GENERAL NOTES:

1. See Table 1 for Pavement Type.
2. The Median (including median curb) is optional for the Major Arterial; modify shoulder width accordingly.



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KANSAS CITY METROPOLITAN CHAPTER	
STREET SECTION DETAILS	STANDARD DRAWING NUMBER ST - 1
ADOPTED: APRIL 17, 1996	

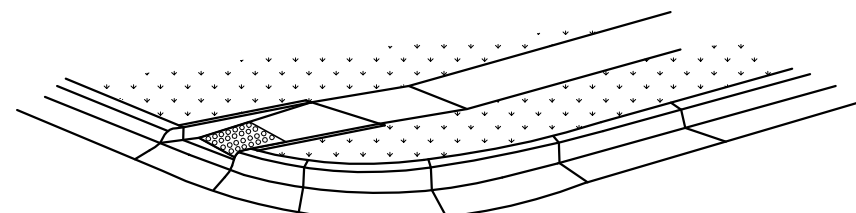


- General Notes:**
1. Where the local authority requires 4' from the curb to the sidewalk on one or both sides of the street and there are no special conditions, use residential local street typical section.
 2. See Table 1 for Pavement Type.

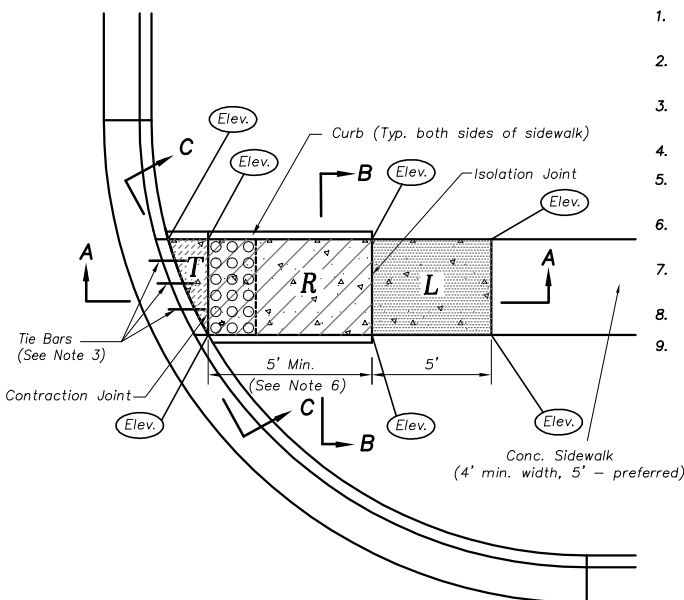
* This width may be used only in planned development where a minimum of 4' off street parking spaces are provided for each dwelling unit.

** Must be approved by the local authority during the preliminary planned development stage under special conditions such as extremely hilly topography, preserving existing trees or other site conditions.

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APWA	
KANSAS CITY METROPOLITAN CHAPTER	
STREET SECTION DETAILS	STANDARD DRAWING NUMBER ST - 2 ADOPTED: APRIL 17, 1996



3-D View Type A
Sidewalk Ramp
Not to Scale



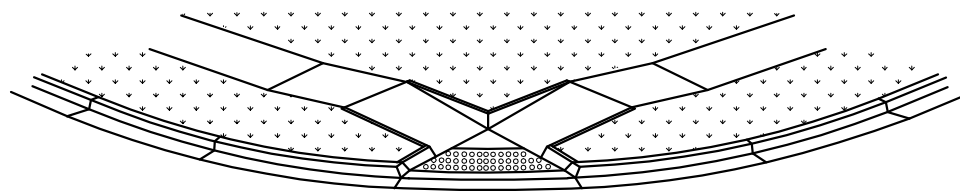
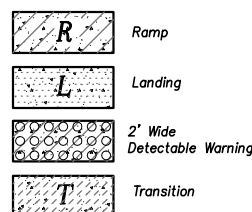
Type A Sidewalk Ramp

Scale: $\frac{1}{4}"=1'-0"$

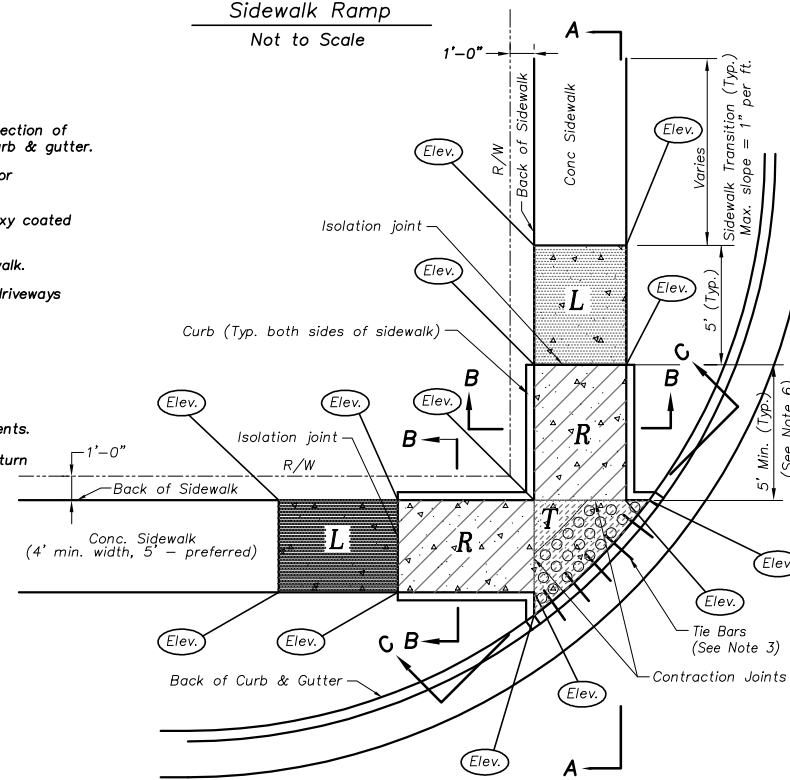
Sidewalk Ramp Notes:

1. Sidewalk ramp location determined from the intersection of the extension of back of sidewalk and back of curb & gutter.
2. Plan drawings shall include a table of elevations for all points labelled as **Elev.**
3. Key all construction joints or use tie bars #4 epoxy coated @ 12" o.c.
4. Longitudinal joint spacing to match width of sidewalk.
5. Isolation joints shall be placed where walk abuts driveways and similar structures, and 250' centers max.
6. Sidewalk Ramp shall be lengthened to provide ADA compliance slope but need not exceed 15'.
7. ADA maximum ramp slope = 1"/ft.
ADA maximum cross slope = 2%.
8. Detectable warnings to comply with ADA requirements.
9. Landing for Type C ramp along the entire curb return is preferred, but may be shortened to minimum ADA compliant dimension.

Legend:

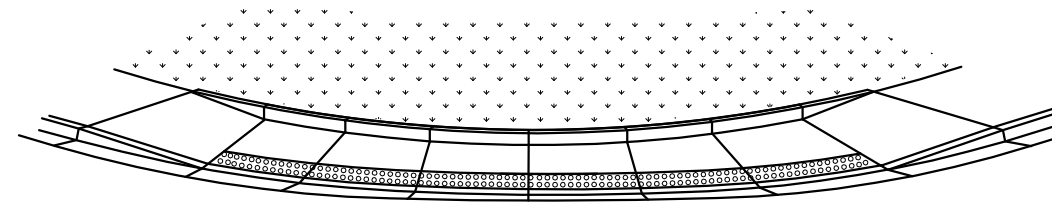


3-D View Type B
Sidewalk Ramp
Not to Scale

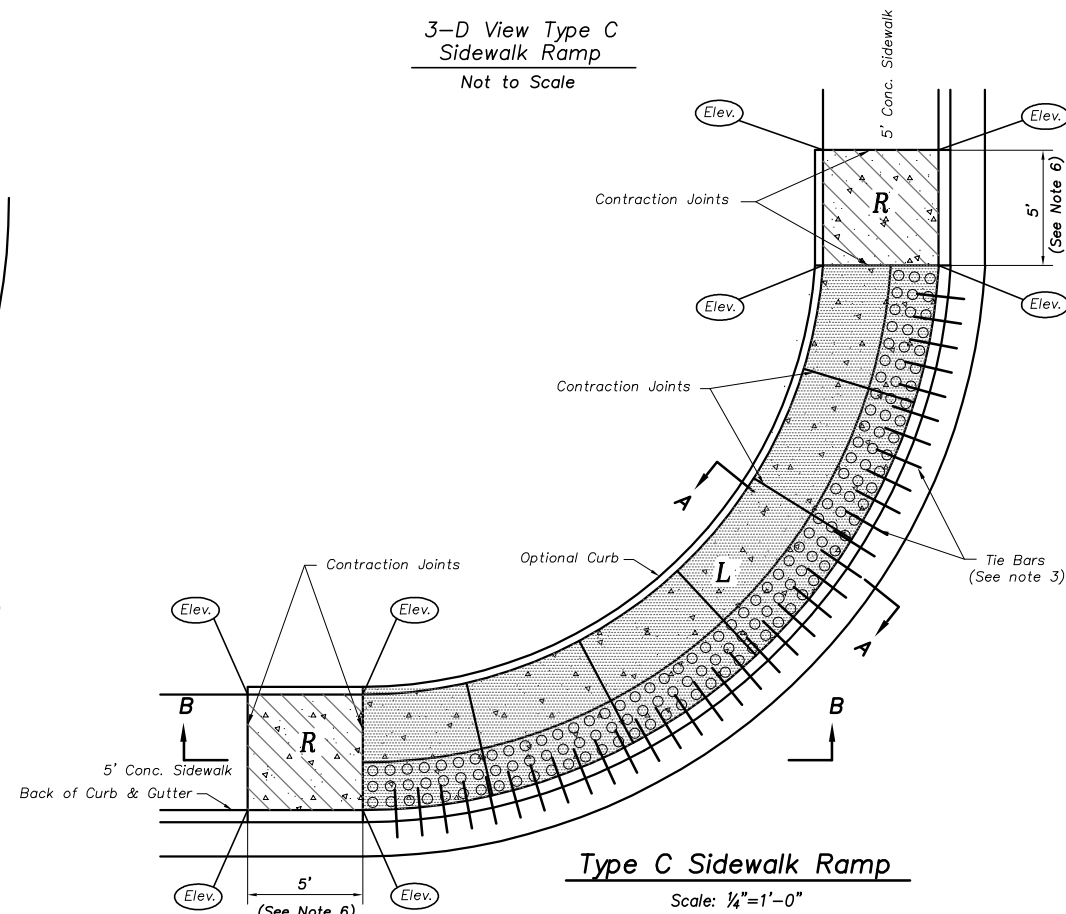


Type B Sidewalk Ramp

Scale: $\frac{1}{4}"=1'-0"$

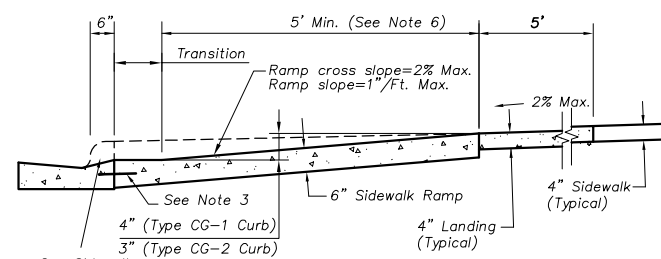


3-D View Type C
Sidewalk Ramp
Not to Scale



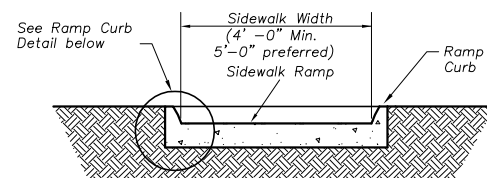
Type C Sidewalk Ramp

Scale: $\frac{1}{4}"=1'-0"$



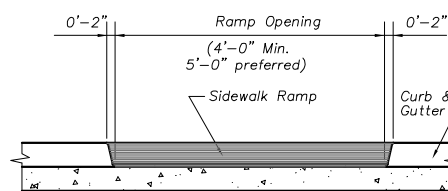
Section A-A
Type A & B Sidewalk Ramp

Scale: $\frac{1}{2}"=1'-0"$



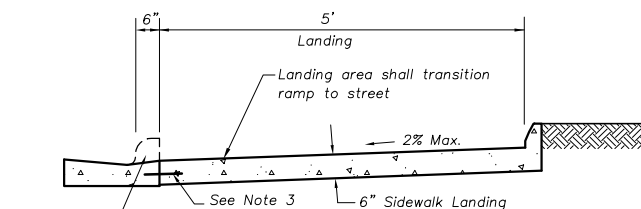
Section B-B
Type A & B Sidewalk Ramp

Scale: $\frac{1}{2}"=1'-0"$



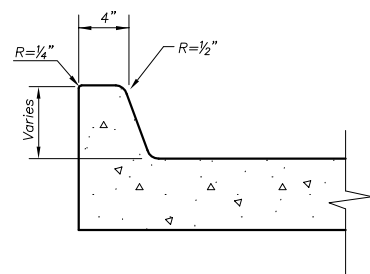
Section C-C
Type A & B Sidewalk Ramp

Scale: $\frac{1}{2}"=1'-0"$



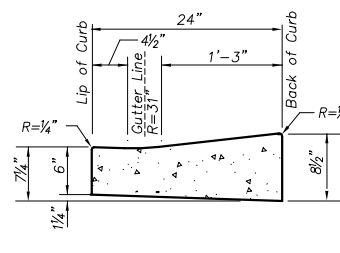
Section A-A
Type C Sidewalk Ramp

Scale: $\frac{1}{2}"=1'-0"$



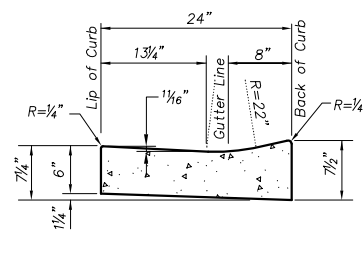
Ramp Curb Detail

Scale: $1 \frac{1}{2}"=1'-0"$



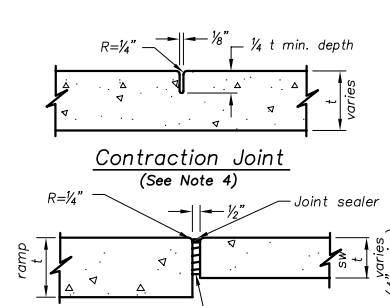
Use With Type CG-2 Curb

Scale: $1"=1'-0"$

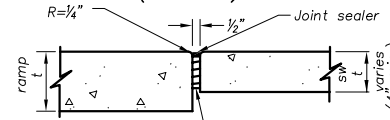


Use With Type CG-1 Curb

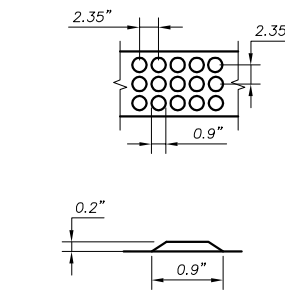
Scale: $1"=1'-0"$



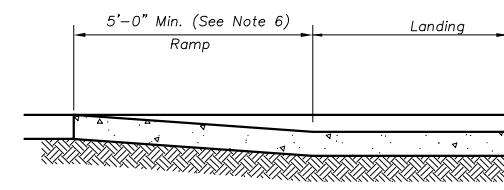
Contraction Joint
(See Note 4)



Isolation Joint
(See Note 5)



Detectable Warning
Dome Spacing and Section
Not to Scale



Section B-B
Type C Sidewalk Ramp

Scale: $\frac{1}{2}"=1'-0"$

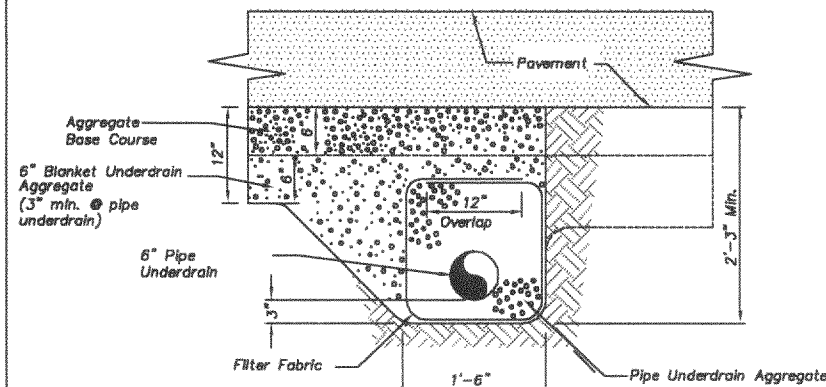
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KANSAS CITY
METROPOLITAN CHAPTER

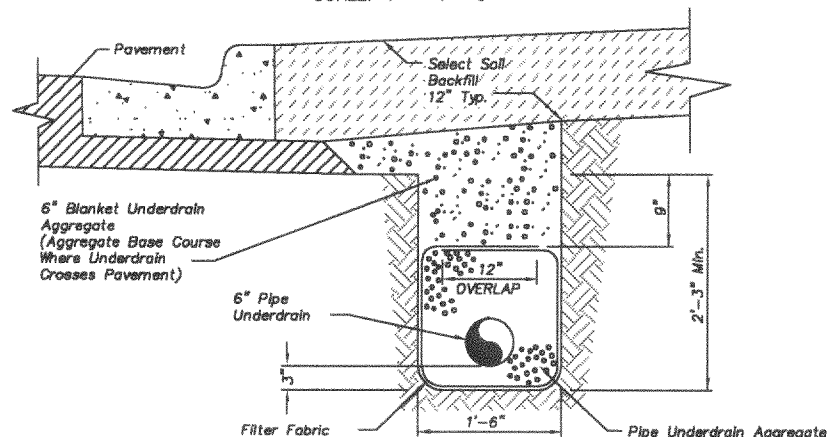
SIDEWALK RAMP DETAILS

STANDARD DRAWING
NUMBER SW - 1
ADOPTED:
DECEMBER 18, 2002



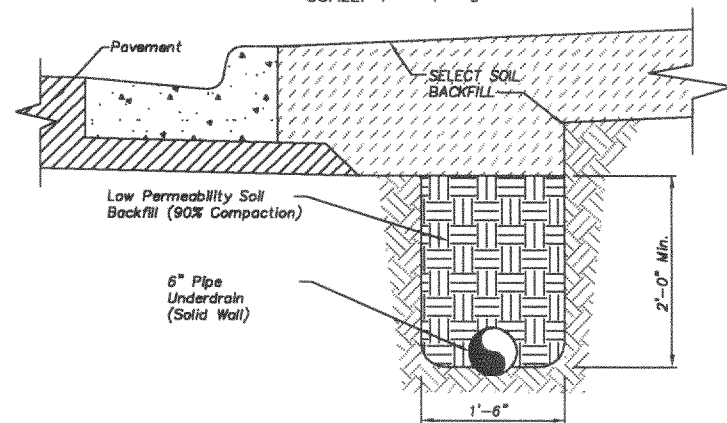
BLANKET UNDERDRAIN A - A (PIPE)

SCALE: 1" = 1'- 0"



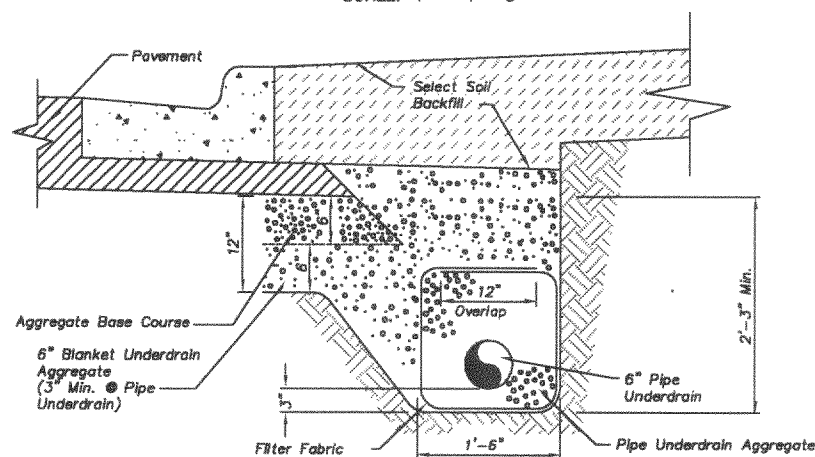
PIPE UNDERDRAIN B - B

SCALE: 1" = 1'- 0"



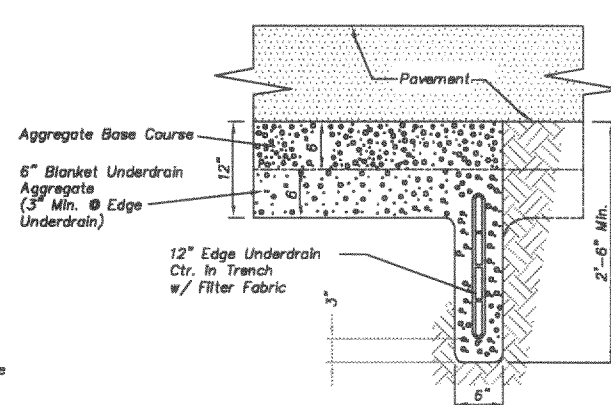
OUTLET PIPE C - C

SCALE: 1" = 1'- 0"



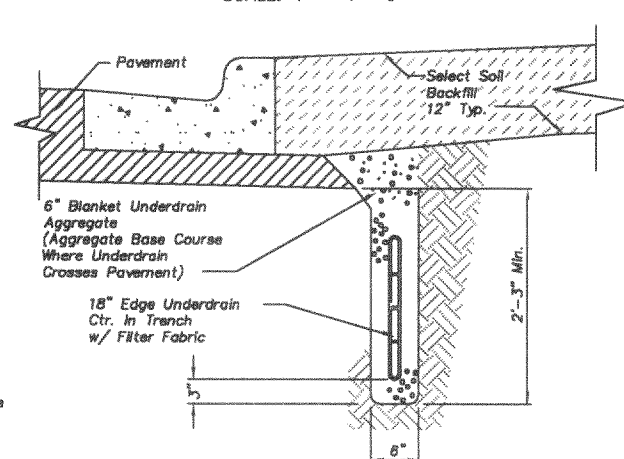
PIPE UNDERDRAIN BEHIND CURB D - D

SCALE: 1" = 1'- 0"



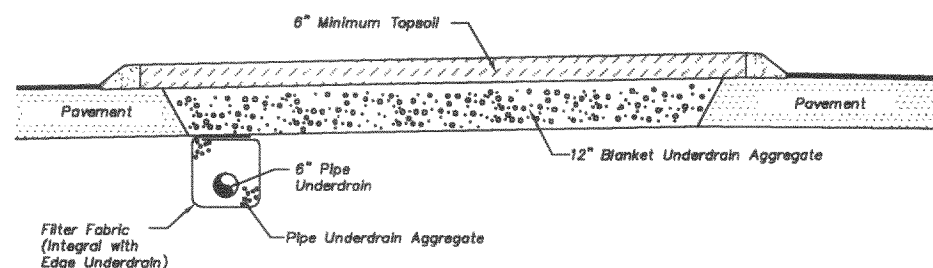
BLANKET UNDERDRAIN A - A (EDGE)

SCALE: 1" = 1'- 0"



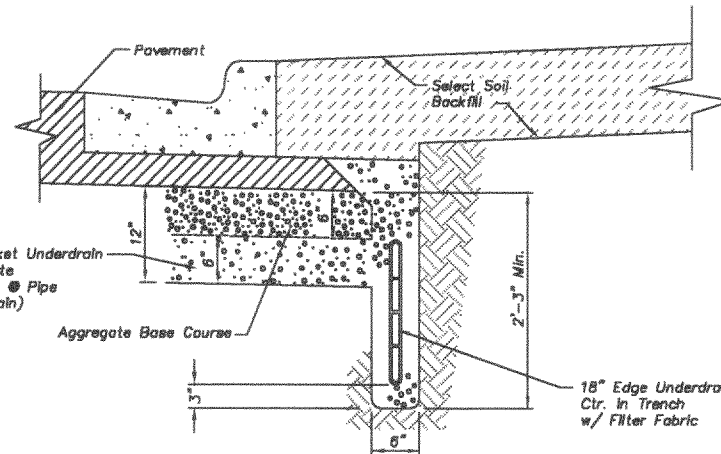
EDGE UNDERDRAIN B - B

SCALE: 1" = 1'- 0"



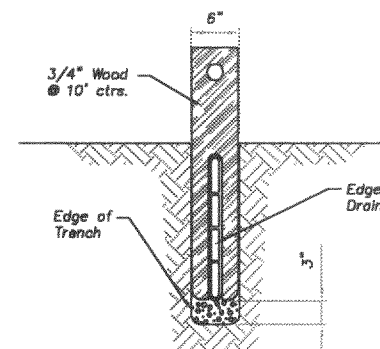
UNDERDRAIN AT MEDIAN NOSE

SCALE: 1/2" = 1'- 0"



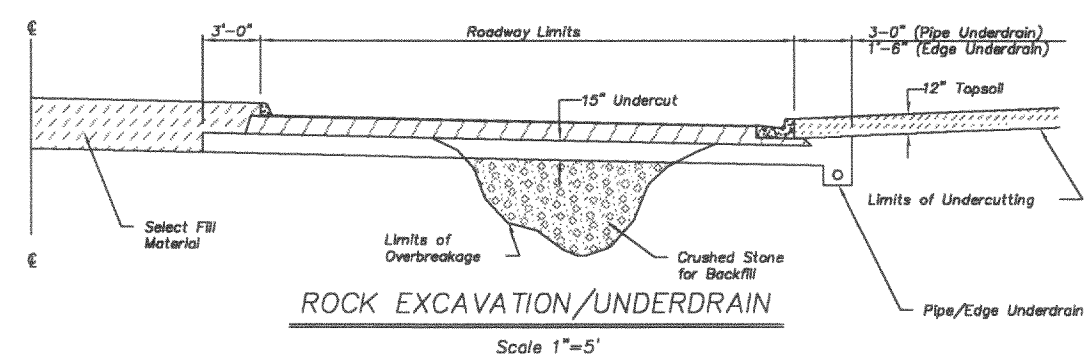
EDGE UNDERDRAIN BEHIND CURB D - D

SCALE: 1" = 1'- 0"



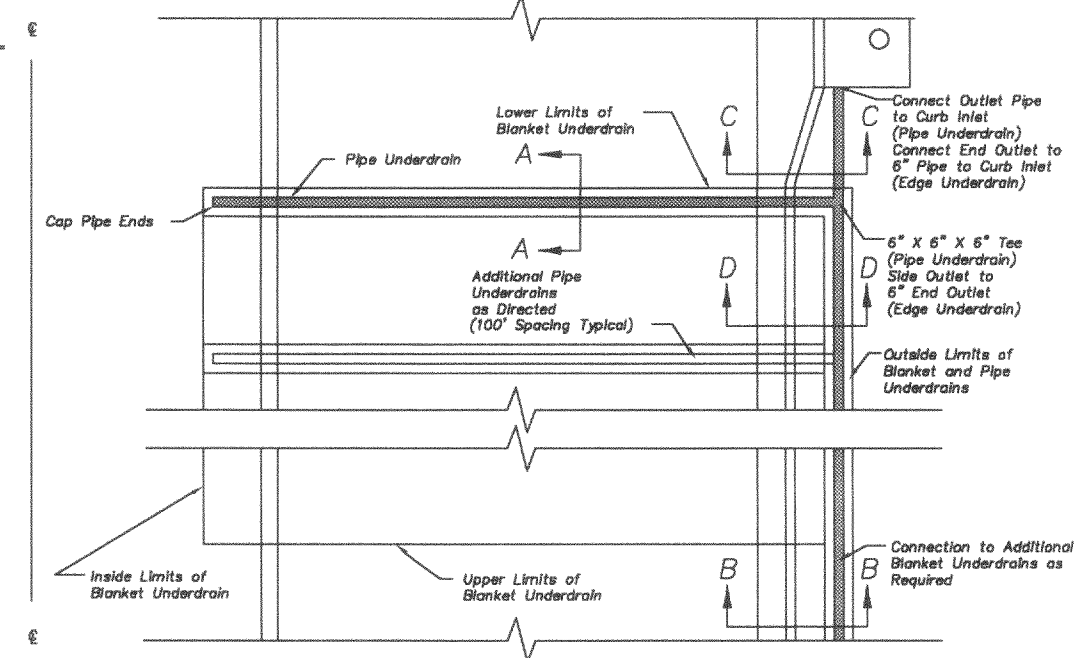
EDGE UNDERDRAIN
TEMPORARY SUPPORT DETAIL

SCALE: 1" = 1'- 0"



ROCK EXCAVATION/UNDERDRAIN

Scale 1"=5'



UNDERDRAIN LAYOUT

Scale 1"=5'

Underdrain Notes:

1. All roadway excavation in rock will be undercut no less than 15" for the full width of the roadway as shown.
2. In areas where underdrains are not required, undercut and overbreakage in limestone and shale shall be brought to within 6" of the subgrade line with properly compacted crushed stone, shot rock, and/or rock rubble. The remaining 6" shall conform to Standard Specifications Section 2202.
3. Layers of earth or shale shall not be permitted for backfill up to the bottom of the crushed stone.
4. A minimum of 12" of select soil (topsoil) shall be placed on exposed rock cut or fill slopes outside the limits of the roadway. All rock and shale slopes shall be benched @ maximum 2' vertical intervals prior to placement of select soil.
5. Proposed underdrain pipe layout, flowline elevations, inlet connection points, and details shall be approved prior to construction by the City Engineer.
6. Where pipe underdrains are used, all underdrain outlet pipes shall be solid wall with watertight joints. All outlet pipes shall be tied into the nearest storm sewer inlet as approved. Where edge underdrains are used, all underdrain outlet pipes shall be solid wall with manufacturer joints approved by the City Engineer. All connections between pipes and edge connectors or curb inlets shall be made with 2' minimum length of pipe.
7. All underdrain pipes shall be installed at a minimum slope of 1%. Underdrain pipe shall be installed with the perforations placed down.
8. Blanket underdrains shall be placed on bedrock unless otherwise directed by the City Engineer. Undercut and overbreakage in limestone and shale shall be brought to within 12" of the subgrade line with properly compacted crushed stone, shot rock and/or rock rubble.
9. All filter fabric used for pipe underdrain construction shall conform to Standard Specifications Section 2203.6.
10. The Contractor may, at his option, use either pipe underdrain or edge underdrain, but shall not mix underdrain types within any underdrain system.
11. All edge underdrain shall be held in the center of the trench by mechanical methods while placing granular backfill. See detail this sheet. Alternate methods may be used with prior approval by the City Engineer.
12. Blanket underdrain aggregate, pipe underdrain aggregate, pipe underdrain, edge underdrain and outlet pipe shall conform to Standard Specifications Section 2203.6.

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KANSAS CITY

METROPOLITAN CHAPTER

UNDERDRAIN DETAILS

STANDARD DRAWING
UD-1

ADOPTED:
MAY 23, 2001