

DIVISION III STANDARD DRAWINGS

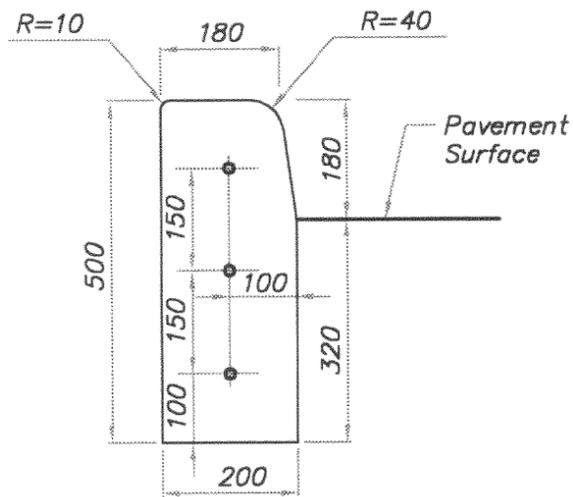


***AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METROPOLITAN CHAPTER***

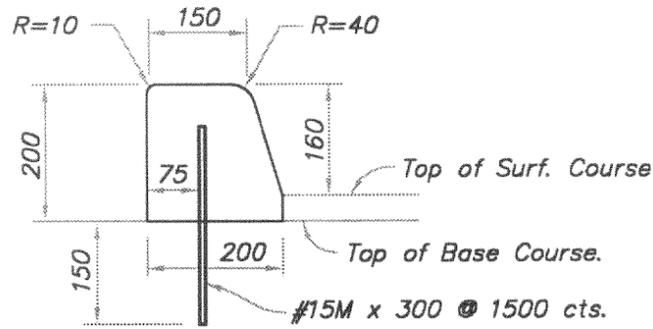
TABLE OF CONTENTS

<u>DRAWING NUMBER*</u>	<u>DESCRIPTION</u>	<u>LATEST REVISION</u>
C-1	CURB DETAILS	APRIL 17, 1996
D-1	CONCRETE DRIVEWAY DETAILS	APRIL 17, 1996
D-2	CONCRETE DRIVEWAY DETAILS	APRIL 17, 1996
CI-1	CURB INLET - TYPE 1 DETAILS	APRIL 17, 1996
CI-2	CURB INLET - TYPE 2 DETAILS	APRIL 17, 1996
CI-3	CURB INLET - TYPE 3 DETAILS	APRIL 17, 1996
FI-1	FIELD INLET DETAILS	APRIL 17, 1996
GI-1	GRATE INLET DETAILS	APRIL 17, 1996
JB-1	JUNCTION BOX DETAILS	APRIL 17, 1996
MH-1	MANHOLE DETAILS	APRIL 17, 1996
ST-1	STREET SECTION DETAILS	DECEMBER 18, 2002
ST-2	STREET SECTION DETAILS	DECEMBER 18, 2002
SW-1	SIDEWALK DETAILS	DECEMBER 18, 2002
UD-1	UNDERDRAIN DETAILS	MAY 23, 2001

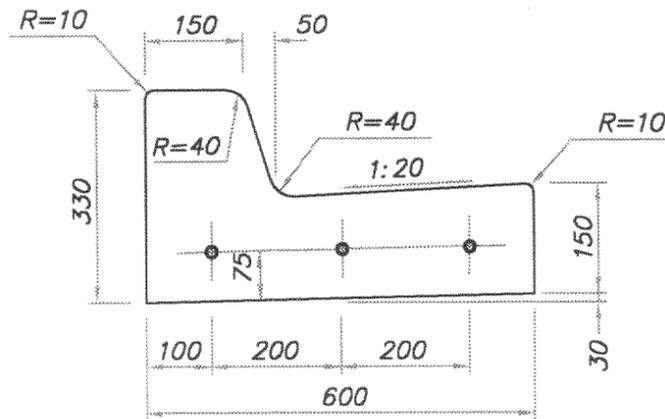
* METRIC DRAWINGS ARE DESIGNATED WITH AN (M) EXTENSION



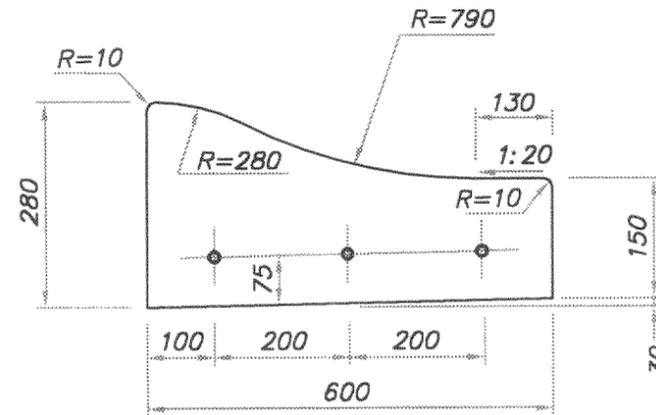
STRAIGHT CURB
(TYPE C-1)



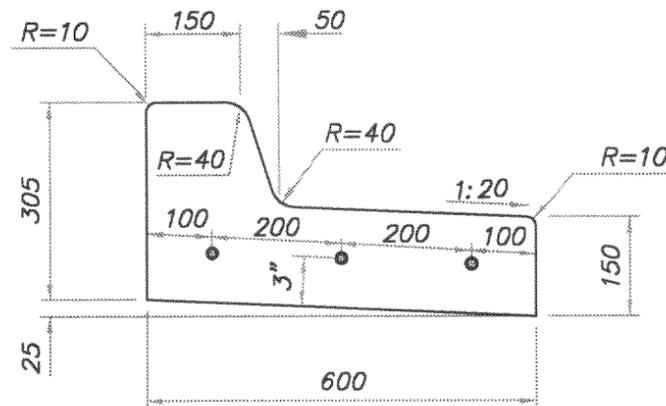
DOWELLED CURB
(TYPE DC)



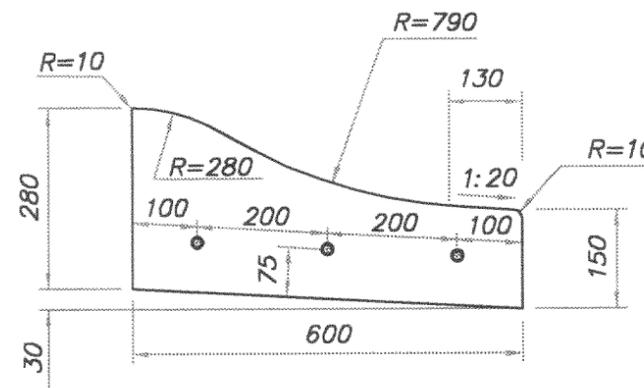
STRAIGHT BACK CURB & GUTTER
(TYPE CG-1)



ROLL BACK CURB & GUTTER
(TYPE CG-2)



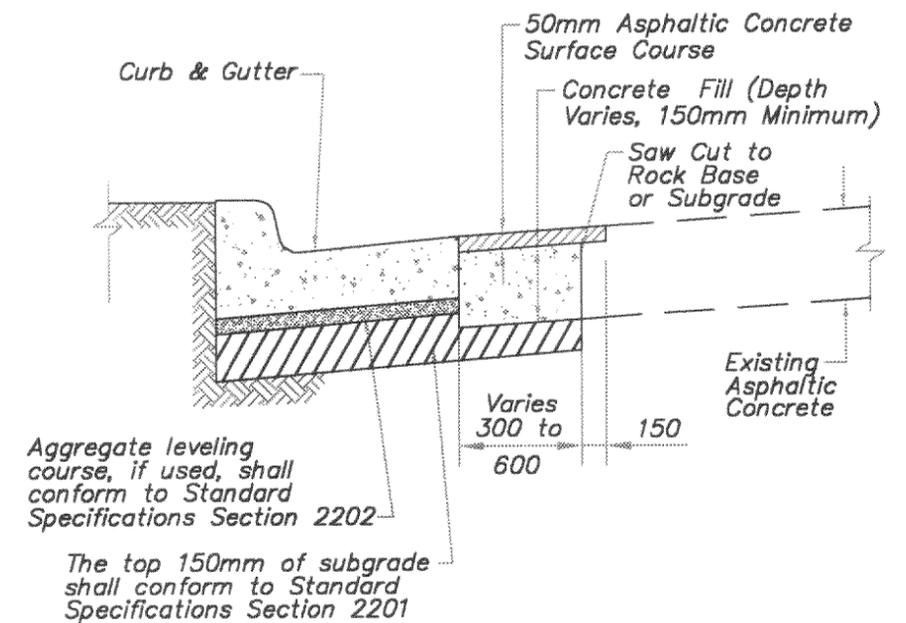
STRAIGHT BACK DRY CURB & GUTTER
(TYPE CG-1 DRY)



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

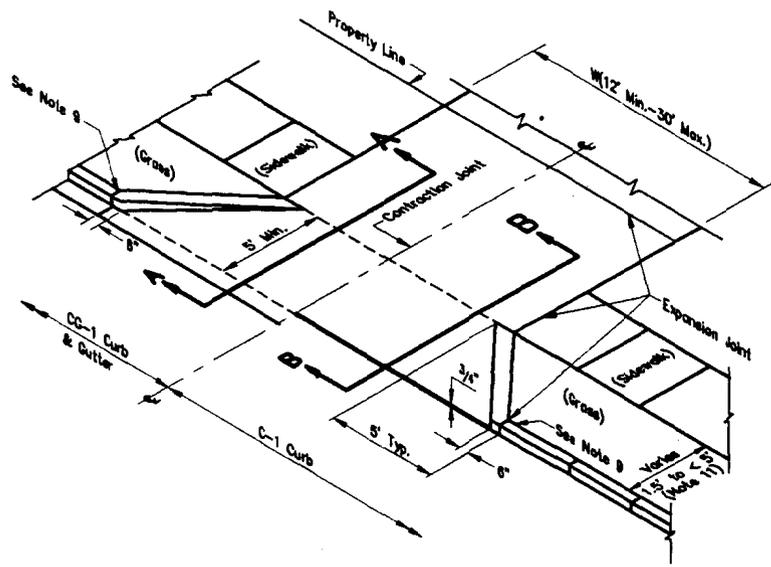
GENERAL NOTES:

- 20mm Isolation Joints with 16mm dia. x 600mm smooth dowels shall be placed at radius points and at 45M intervals. These dowel bars shall be greased and wrapped on one end with expansion tubes.
- 25mm deep Contraction Joints shall be installed at approximately 3M intervals. These joints shall pass across the entire curb section.
- Fix dowel bars with bar supports.
- Depth of curb shall be a minimum of 220mm through the handicap access ramp.
- Concrete shall conform to Standard Specifications Section 2208.2.B
- Asphaltic concrete surface course shall conform to Standard Specifications Section 2205.2

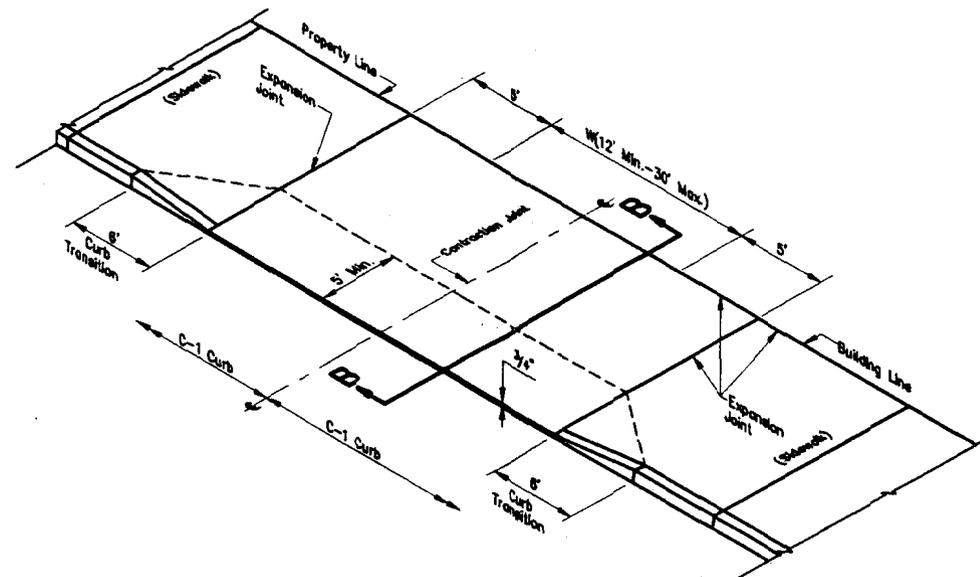


CURB REPLACEMENT DETAIL

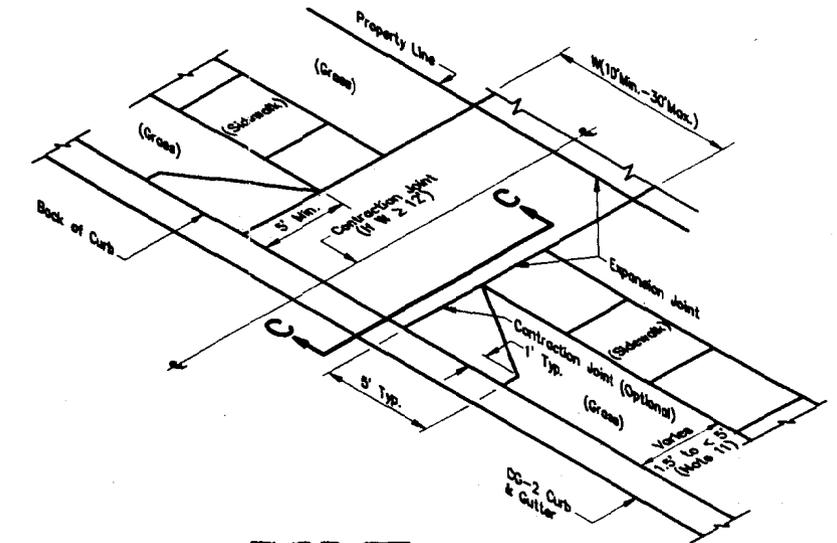
AMERICAN PUBLIC WORKS ASSOCIATION	
APWA	
KANSAS CITY METROPOLITAN CHAPTER	
CURB DETAILS (METRIC)	STANDARD DRAWING NUMBER C - 1(M) ADOPTED: MAY 23, 2001



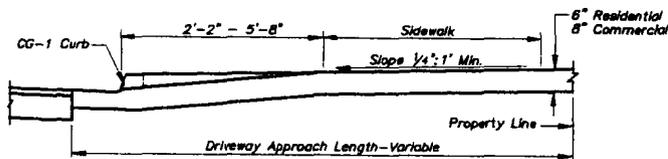
TYPE I
(Parkway 1.5' to < 5')



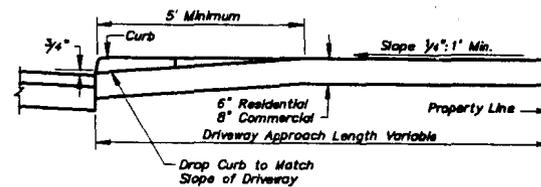
TYPE II



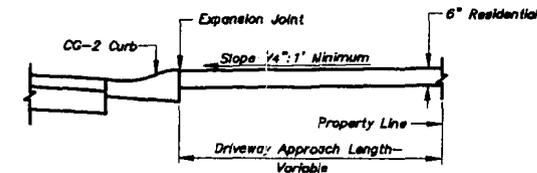
TYPE III
(Parkway 1.5' to < 5')



SECTION A-A (CG-1 CURB SHOWN)



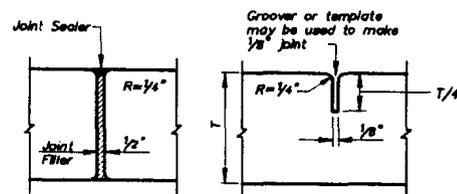
SECTION B-B (C-1 CURB)



SECTION C-C (CG-2 CURB)

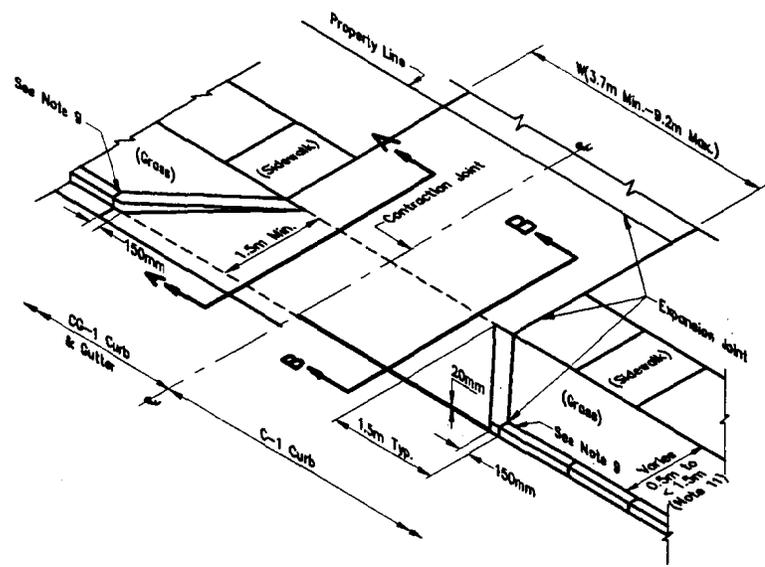
NOTES:

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"Ø 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.

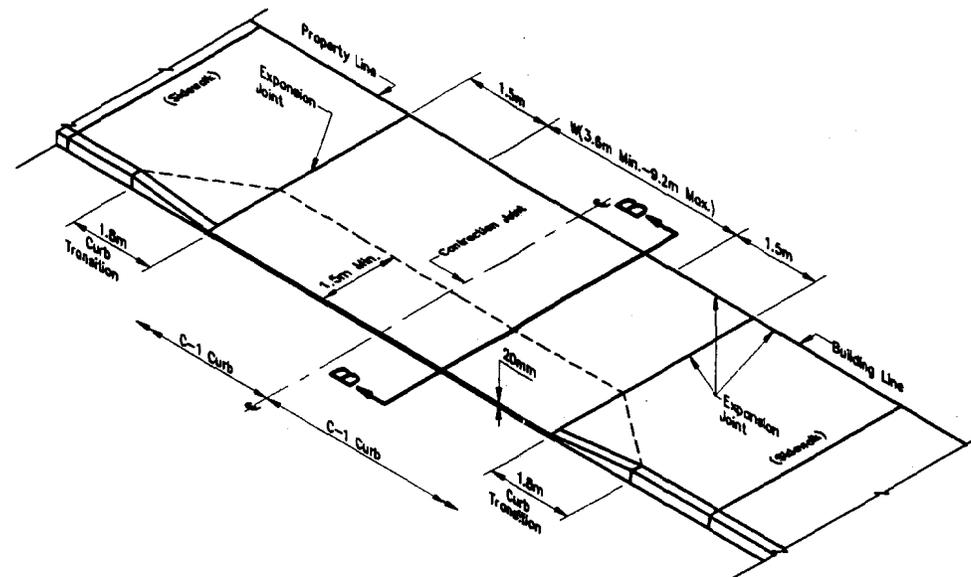


EXPANSION JOINT
CONTRACTION JOINT
JOINT DETAILS

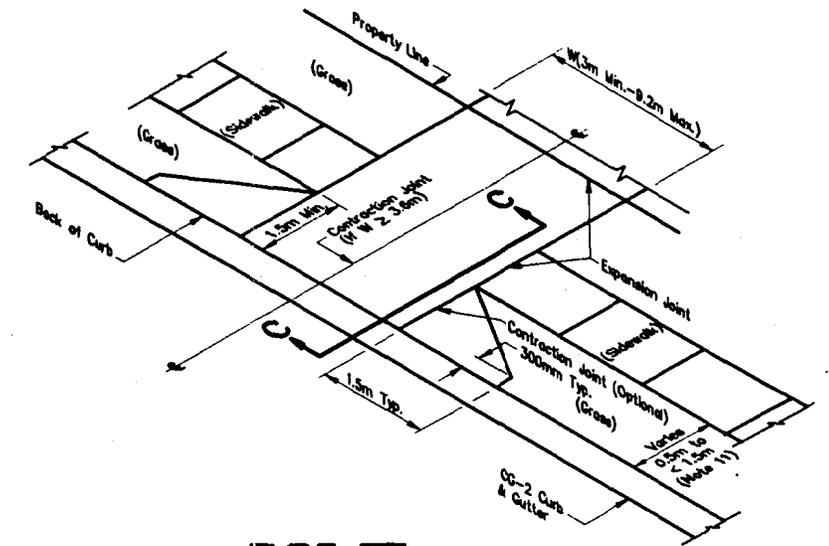
AMERICAN PUBLIC WORKS ASSOCIATION	
APWA	KANSAS CITY METROPOLITAN CHAPTER
CONCRETE DRIVEWAY DETAILS	STANDARD DRAWING NUMBER D - 1 ADOPTED: APRIL 17, 1996



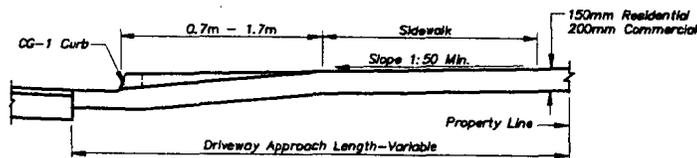
TYPE I
(Parkway 0.5m to < 1.5M)



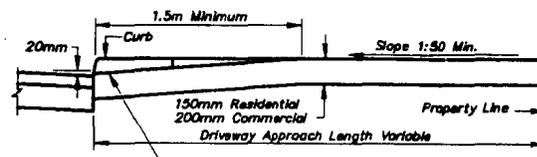
TYPE II



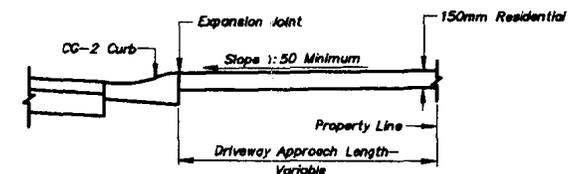
TYPE III
(Parkway 0.5m to < 1.5M)



SECTION A-A (CG-1 CURB SHOWN)



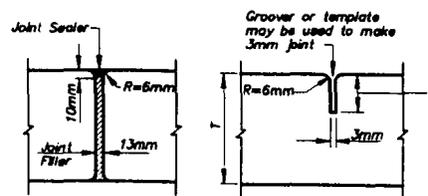
SECTION B-B (C-1 CURB)



SECTION C-C (CG-2 CURB)

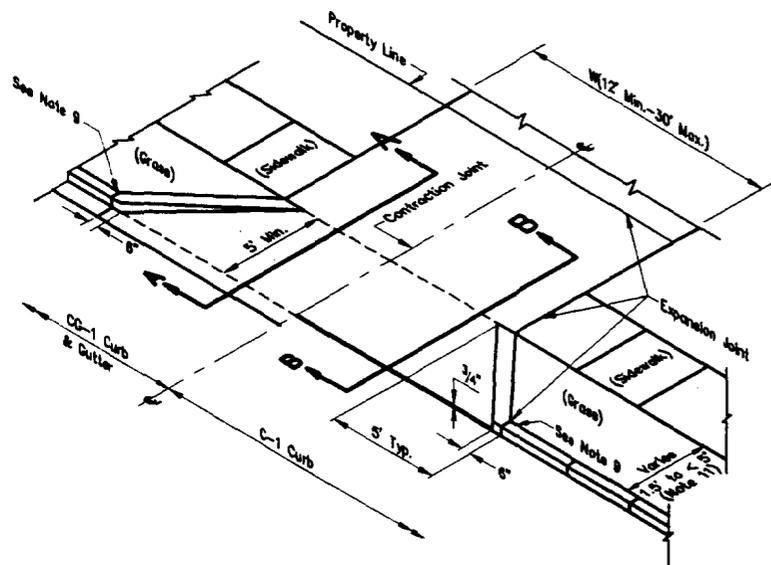
NOTES:

1. The top 150mm 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, 150 x 150 MW20 x MW20 reinforcing shall be placed in center of slab thickness.
7. On Park Department Property place 150 x 150 MW10 x MW10 reinforcing in center of slab thickness and use radius instead of flare.
8. Contraction Joints shall be spaced at 3.6m max., both directions.
9. Two #15M \emptyset x 0.6m smooth dowels (one for C-1 Curb). See curb standards for placement.
10. Form 20mm lip at pavement line on drives in C-1 & CS Curbs.
11. If parkway is < 0.5m, fill with concrete as part of the sidewalk.

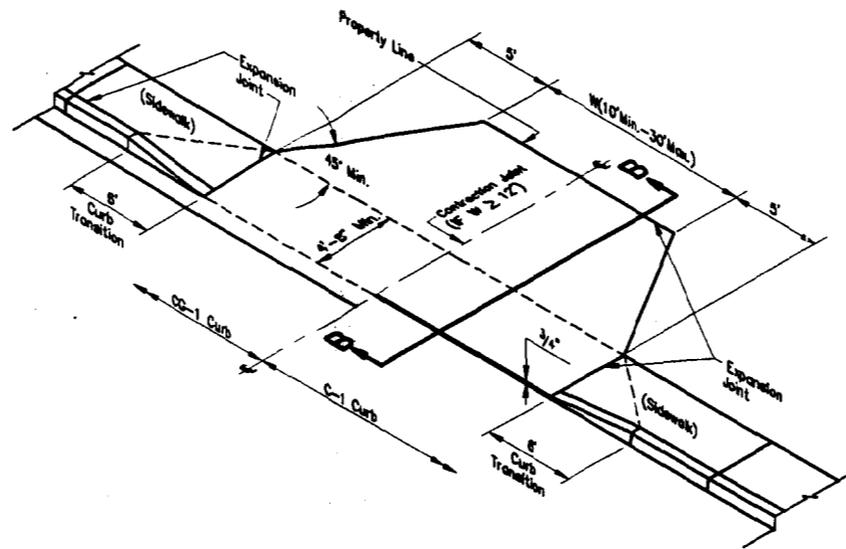


EXPANSION JOINT
CONTRACTION JOINT
JOINT DETAILS

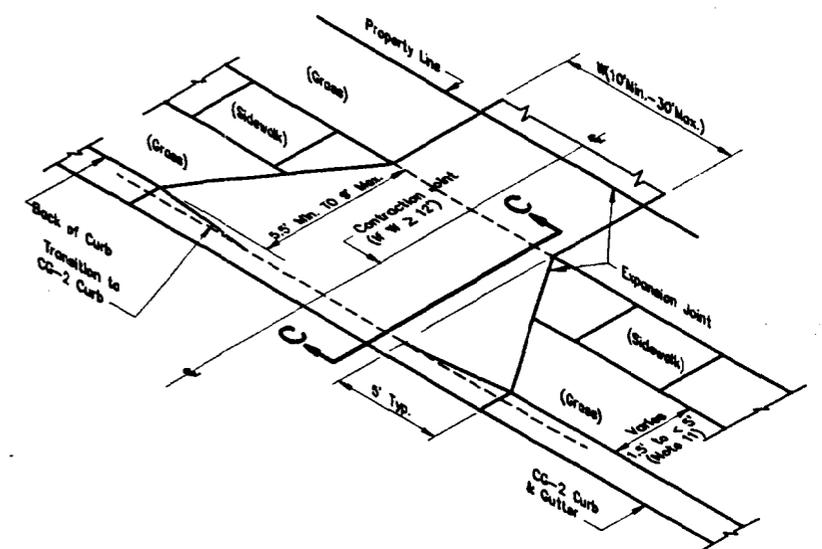
AMERICAN PUBLIC WORKS ASSOCIATION	
	KANSAS CITY METROPOLITAN CHAPTER
CONCRETE DRIVEWAY DETAILS (METRIC)	STANDARD DRAWING NUMBER D - 1(M)
	ADOPTED: APRIL 17, 1996



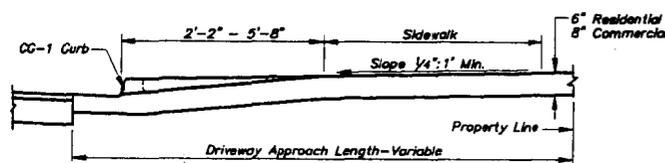
TYPE I
(Parkway 1.5' to < 5')



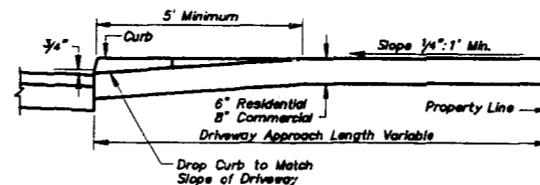
TYPE II



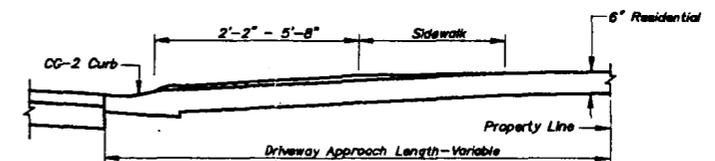
TYPE III
(Parkway 1.5' to < 5')



SECTION A-A (CG-1 CURB SHOWN)



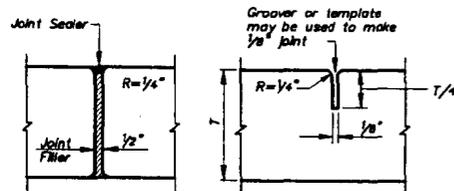
SECTION B-B (C-1 CURB)



SECTION C-C (CG-2 CURB)

NOTES:

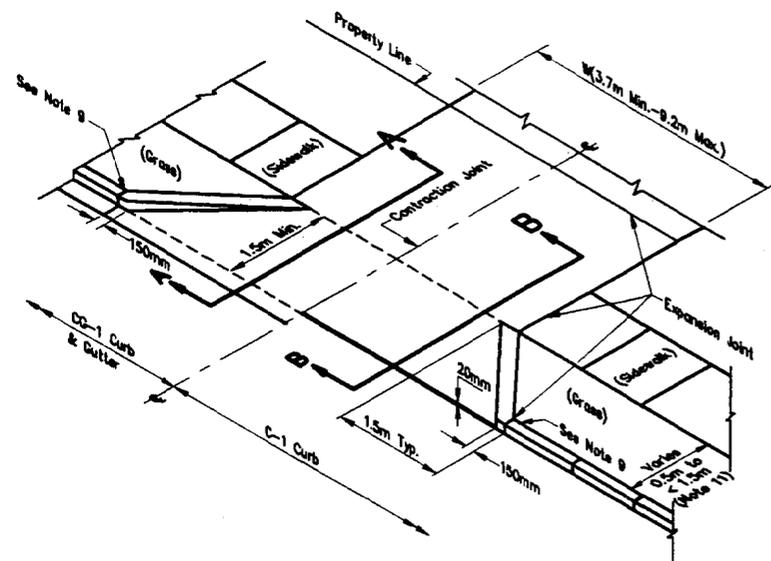
1. The top 6" of driveway subgrade shall be compacted to 95% of standard maximum density.
2. Concrete shall conform to MCIB Mix No. WA610-1-4, except in CBD where WA610-1-4 with Trap Rock Aggregate is required, Section 2209.2.A.
3. Expansion joint filler and joint sealing compound shall conform to Standard 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" 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.



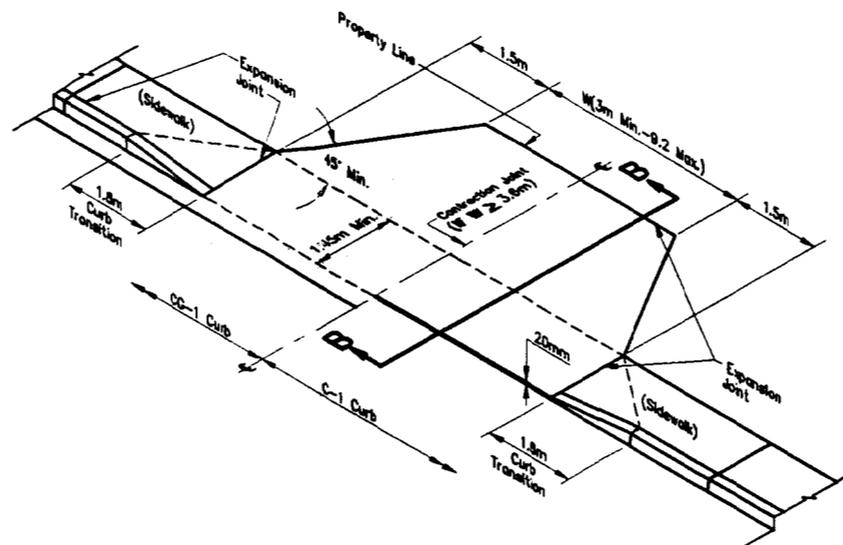
EXPANSION JOINT **CONTRACTION JOINT**

JOINT DETAILS

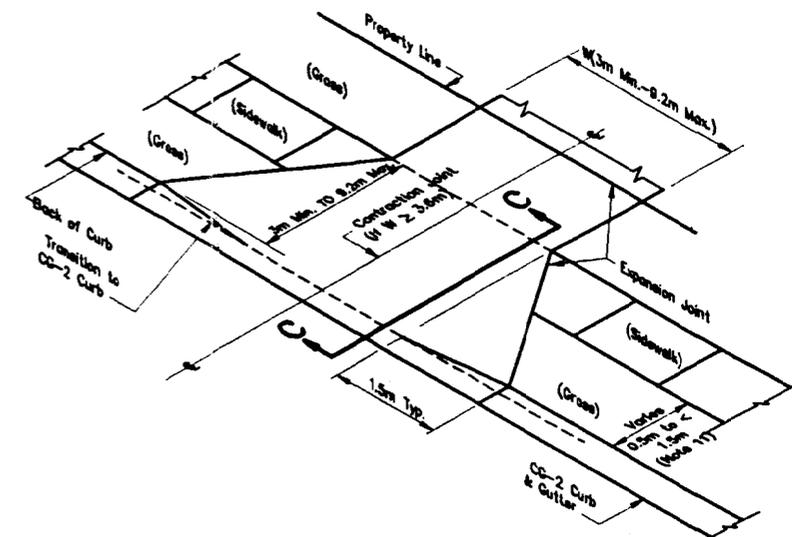
AMERICAN PUBLIC WORKS ASSOCIATION	
	KANSAS CITY METROPOLITAN CHAPTER
CONCRETE DRIVEWAY DETAILS	STANDARD DRAWING NUMBER D - 2
	ADOPTED: APRIL 17, 1996



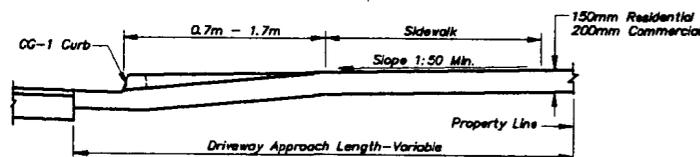
TYPE I
(Parkway 0.5m to < 1.5M)



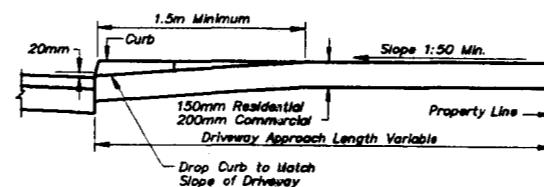
TYPE II



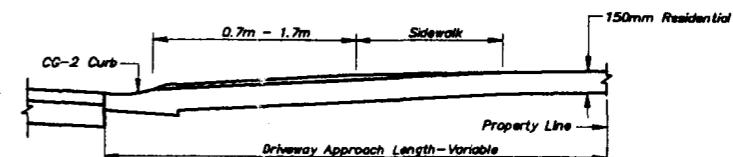
TYPE III
(Parkway 0.5m to < 1.5M)



SECTION A-A (CG-1 CURB SHOWN)



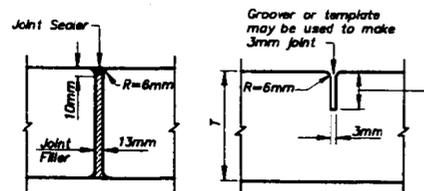
SECTION B-B (C-1 CURB)



SECTION C-C (CG-2 CURB)

NOTES:

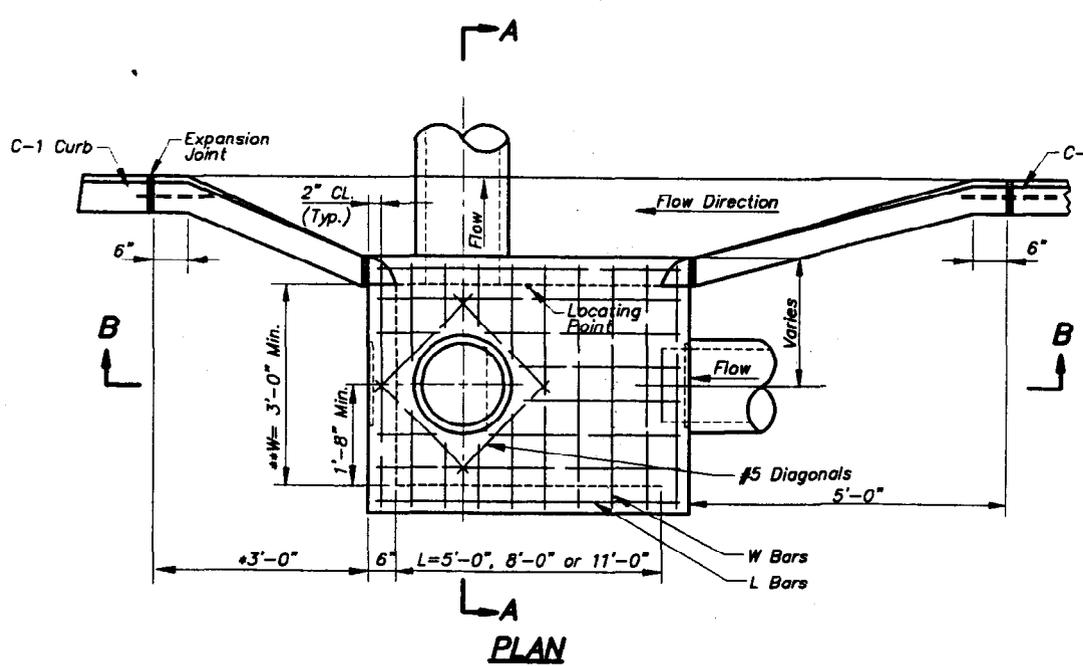
1. The top 150mm of driveway subgrade shall be compacted to 95% of standard maximum density.
2. Concrete shall conform to MCIB Mix No. WA610-1-4, except in CBD where WA610-1-4 with Trap Rock Aggregate is required, Section 2209.2.A.
3. Expansion joint filler and joint sealing compound shall conform to 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, 150 x 150 MW20 x MW20 reinforcing shall be placed in center of slab thickness.
7. On Park Department Property place 150 x 150 MW10 x MW10 reinforcing in center of slab thickness and use radius instead of flare.
8. Contraction Joints shall be spaced at 3.6m max., both directions.
9. Two #15M ϕ x 0.6m smooth dowels (one for C-1 Curb). See curb standards for placement.
10. Form 20mm lip at pavement line on drives in C-1 & CS Curbs.
11. If parkway is < 0.5m, fill with concrete as part of the sidewalk.



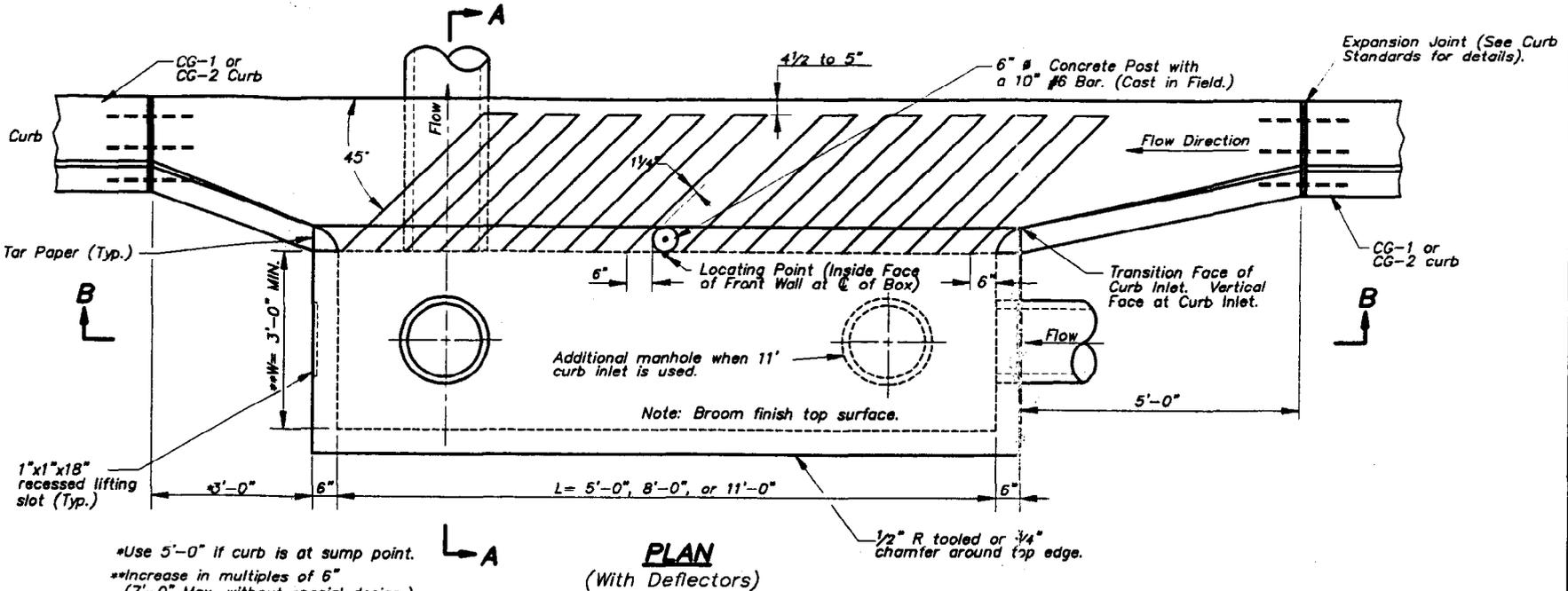
EXPANSION JOINT **CONTRACTION JOINT**

JOINT DETAILS

AMERICAN PUBLIC WORKS ASSOCIATION	
	KANSAS CITY METROPOLITAN CHAPTER
CONCRETE DRIVEWAY DETAILS (METRIC)	STANDARD DRAWING NUMBER D - 2(M)
	ADOPTED: APRIL 17, 1996

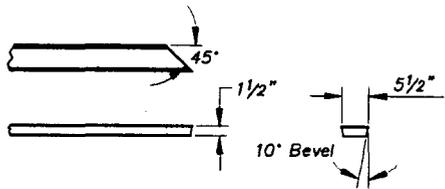


PLAN



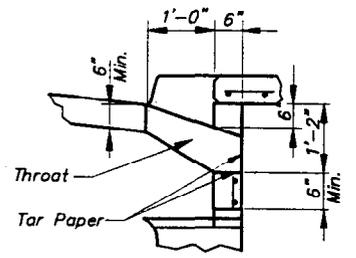
PLAN
(With Deflectors)

*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.)

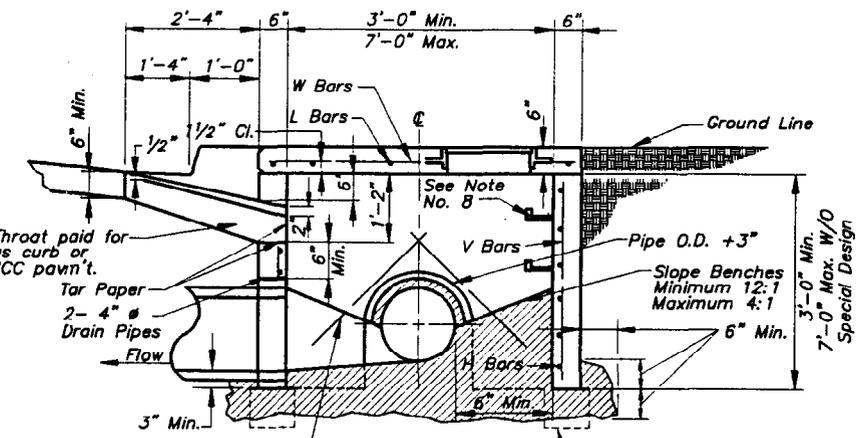


DEFLECTOR CHANNEL FORM DETAIL

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

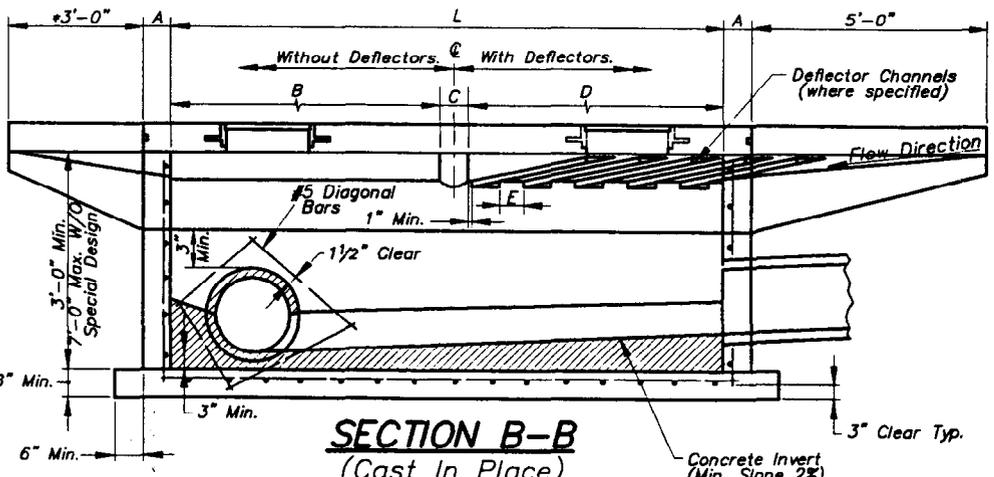


THROAT DETAIL FOR C-1 CURB
(Deflectors Not Specified)



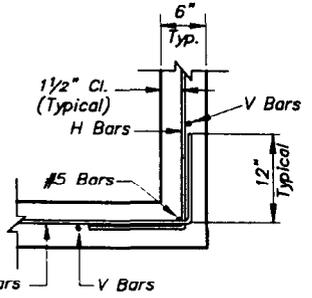
SECTION A-A
(Precast)

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



SECTION B-B
(Cast In Place)

Concrete Invert (Min. Slope 2%)



WALL CORNER DETAIL

GENERAL NOTES:

1. 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.
2. All work and materials shall conform to APWA Sect. 2600.
3. 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.
4. 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.
5. Locate manhole ring and cover over outlet.
6. Use 3/4" chamfer strip on bottom edge of lid front.
7. 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.
8. Steps required at 16" O.C. when depth from top of casting to invert exceeds 4'.
9. Walls of structures may be cast in multiple sections.
10. Asphaltic joint mat'l shall comply with APWA 2505.
11. Minimum clearance between pipe boxouts and joints is 8", without special design.
12. 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.)
13. 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.
14. Elevations shown on Construction Plans are top of inlet side of structure.

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

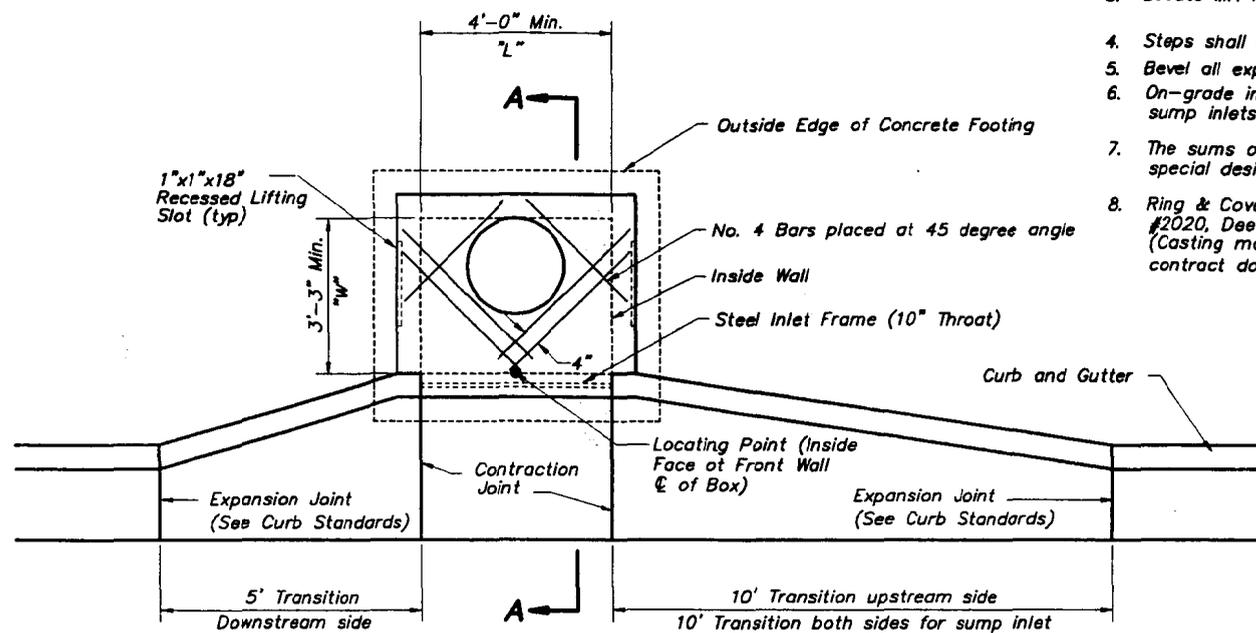
CURB INLET - TYPE 1 DETAILS

STANDARD DRAWING NUMBER CI - 1

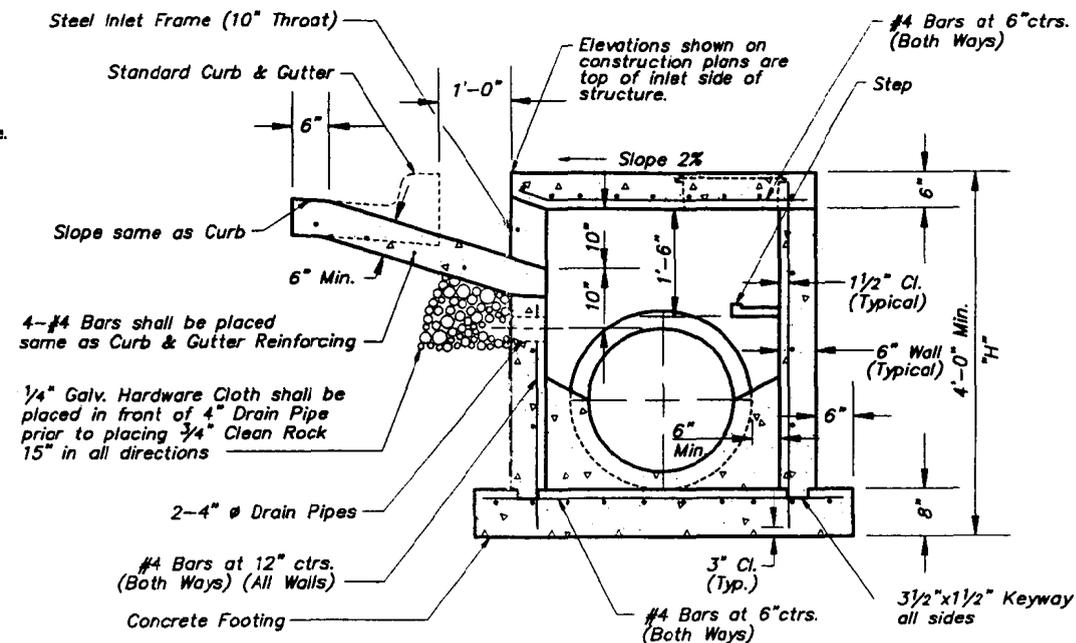
ADOPTED: APRIL 17, 1996

GENERAL NOTES:

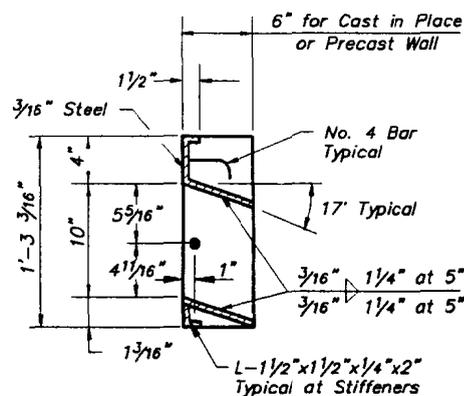
1. The first dimension listed in the Construction Notes is the "L" dimension. The second dimension is the "W" dimension. L's listed on the project plans are listed at the inside face of the wall.
2. Floor of Inlet shall be shaped with invert to provide smooth flow.
3. Locate MH ring and cover over outlet.
4. Steps shall be spaced at 1'-4" O.C. vertically.
5. Bevel all exposed edges with 3/4" chamfer or 1/2" tool 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.)



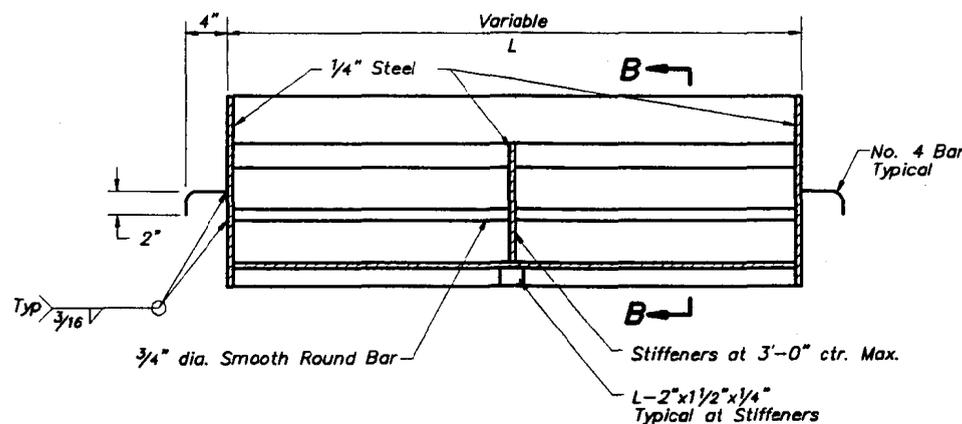
PLAN



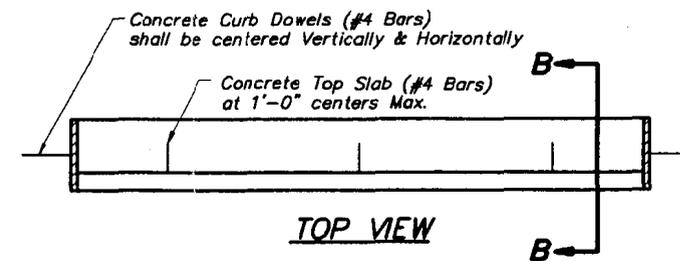
SECTION A-A



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 painted a single coat of CHEM-PRIME #37-77 primer (Red) or equal.

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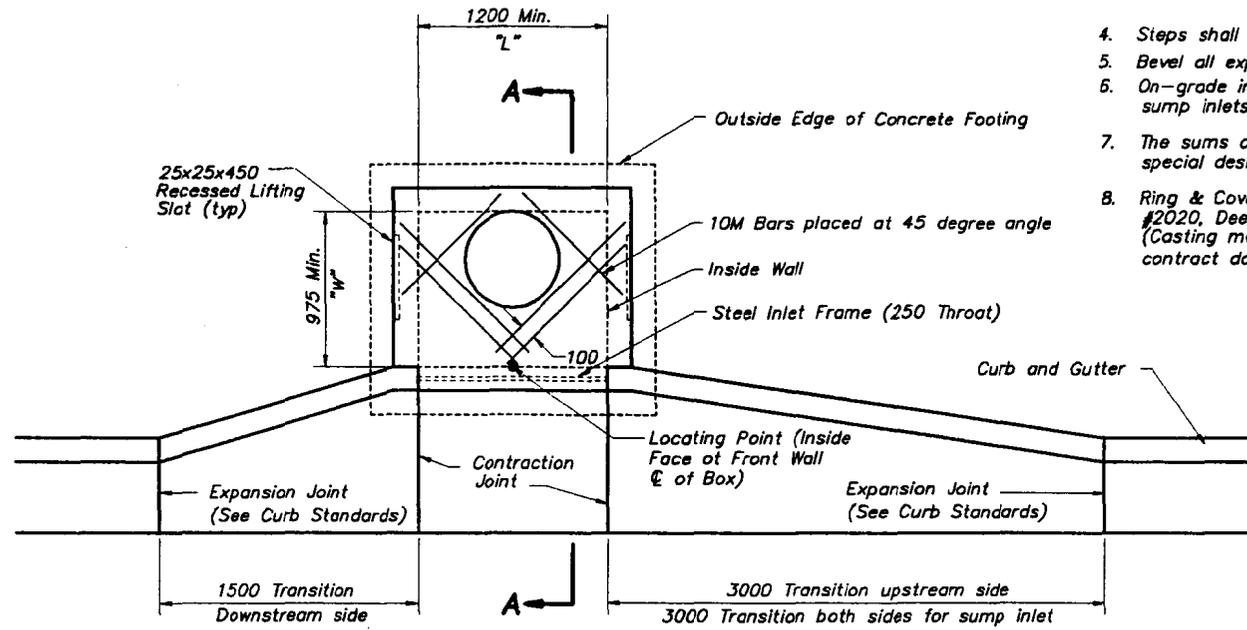
KANSAS CITY
METROPOLITAN CHAPTER

CURB INLET - TYPE 2
DETAILS

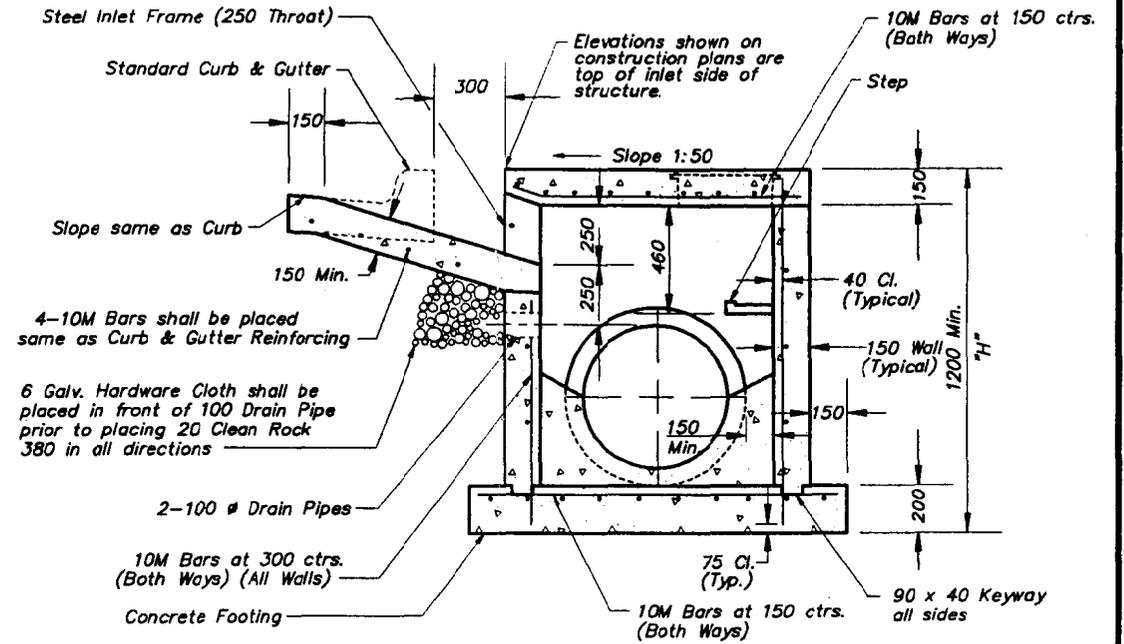
STANDARD DRAWING
NUMBER CI - 2
ADOPTED:
APRIL 17, 1996

GENERAL NOTES:

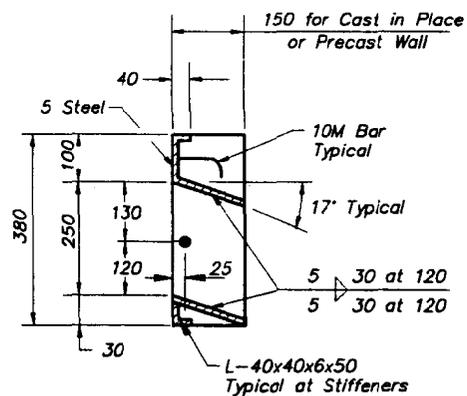
1. The first dimension listed in the Construction Notes is the "L" dimension. The second dimension is the "W" dimension. L's listed on the project plans are listed at the inside face of the wall.
2. Floor of Inlet shall be shaped with invert to provide smooth flow.
3. Locate MH ring and cover over outlet.
4. Steps shall be spaced at 400 O.C. vertically.
5. Bevel all exposed edges with 20 chamfer or 10 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 4200 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.)



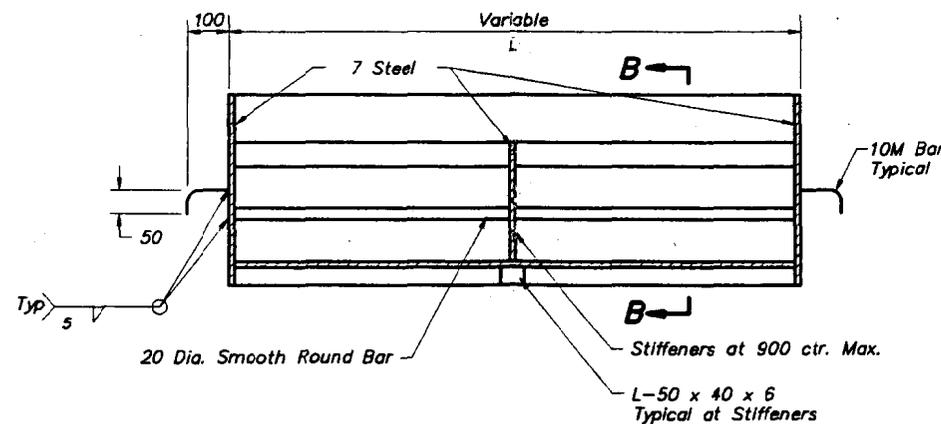
PLAN



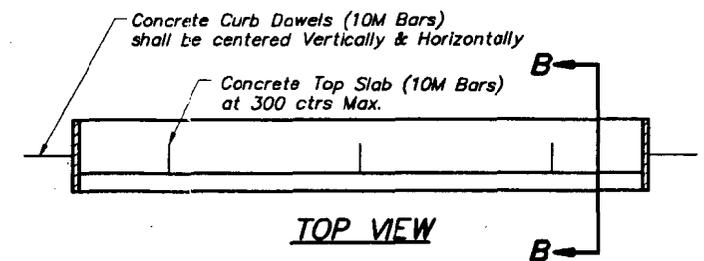
SECTION A-A



SECTION B-B



FRONT VIEW



TOP VIEW

Notes:

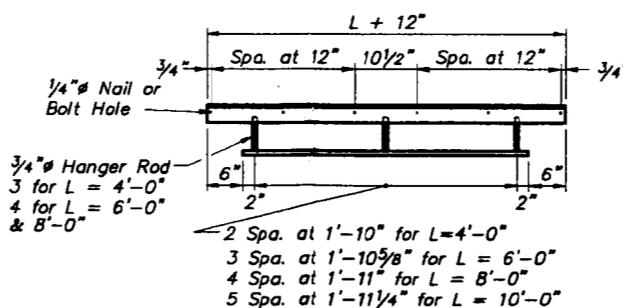
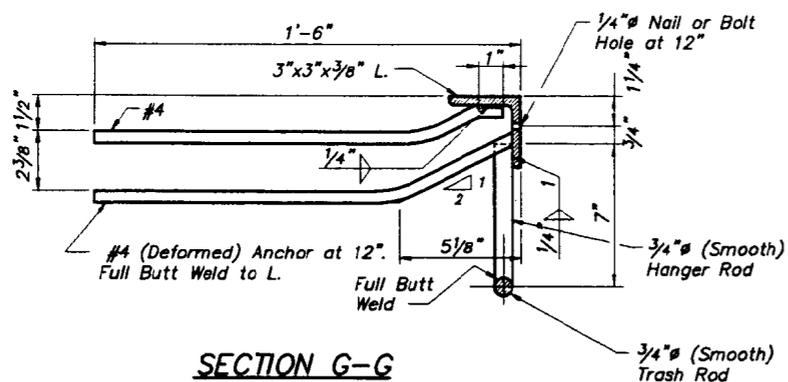
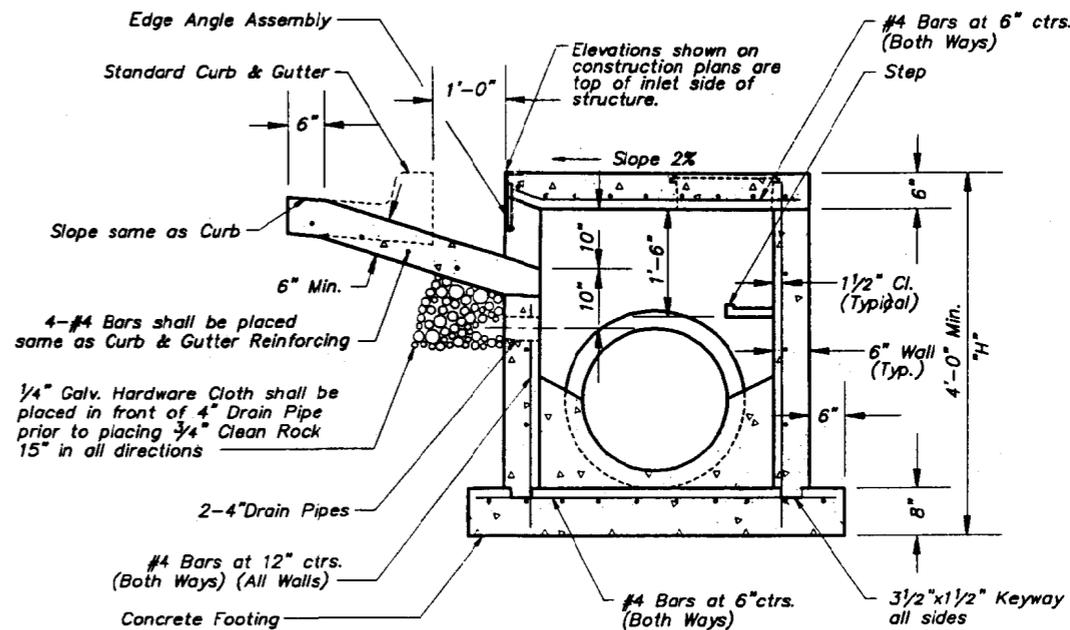
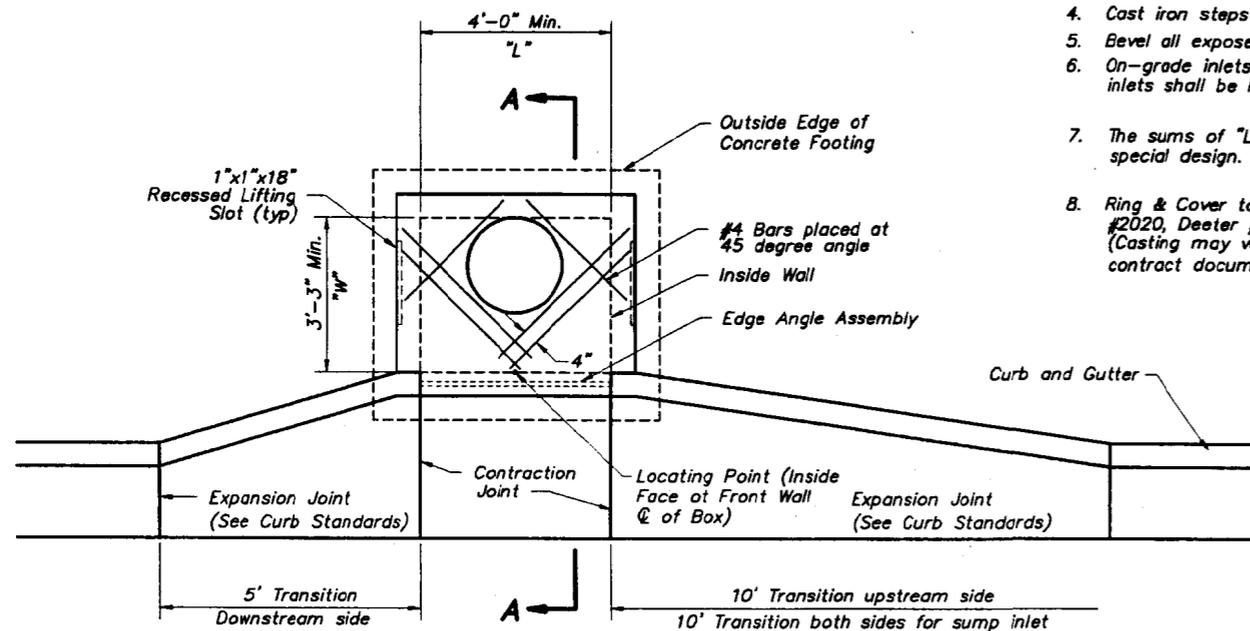
1. All welds shall be performed in accordance with appropriate AWS Specifications & Procedures.
2. All welds on exposed surfaces shall be dressed so as to provide a pleasing finished appearance.
3. The entire frame shall be painted a single coat of CHEM-PRIME #37-77 primer (Red) or equal.

NOTE: All dimensions in millimeters.

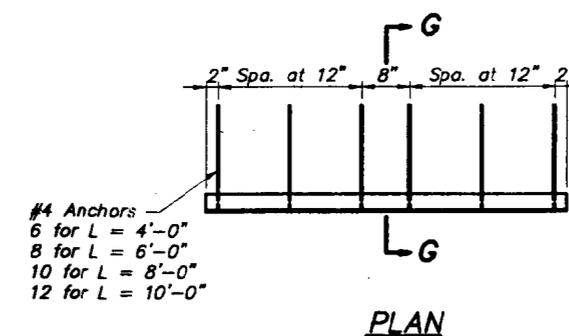
AMERICAN PUBLIC WORKS ASSOCIATION	
APWA	KANSAS CITY METROPOLITAN CHAPTER
CURE INLET - TYPE 2 DETAILS (METRIC)	STANDARD DRAWING NUMBER CI - 2(M) ADOPTED: APRIL 17, 1996

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. Cast iron steps shall be spaced at 1'-4" O.C. vertically.
5. Bevel all exposed edges with 3/4" chamfer or 1/2" tool 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.)



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

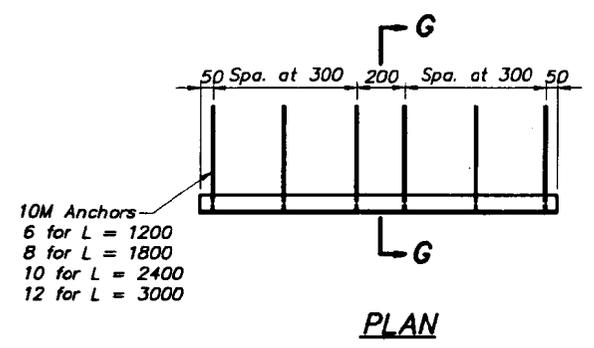
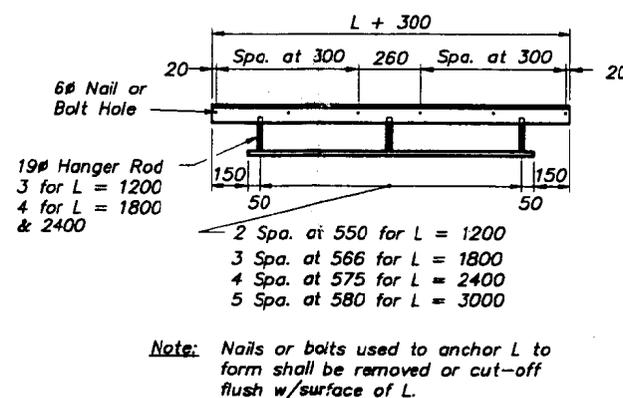
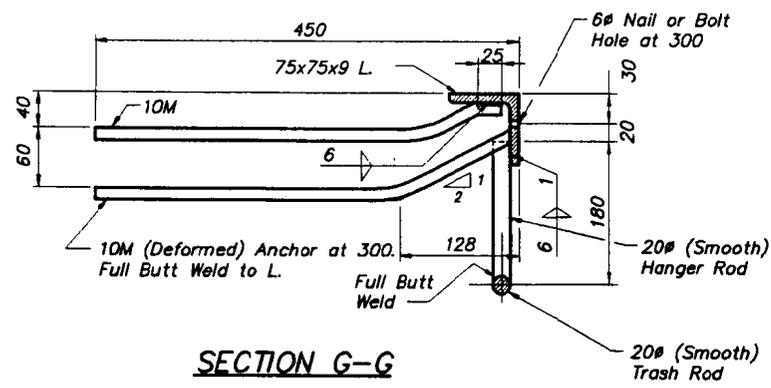
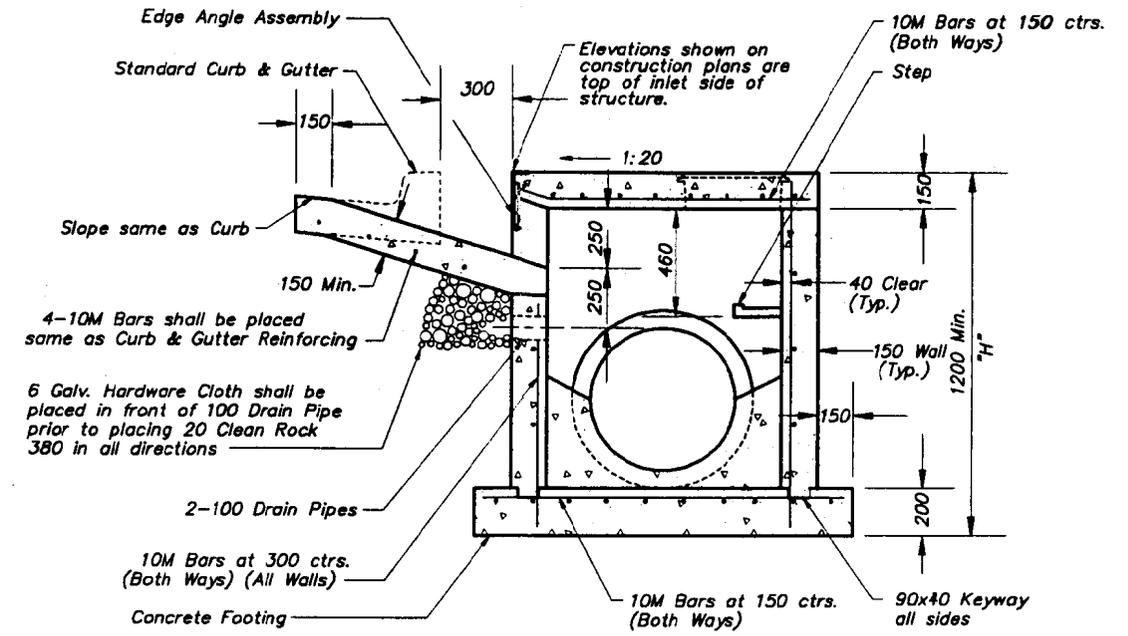
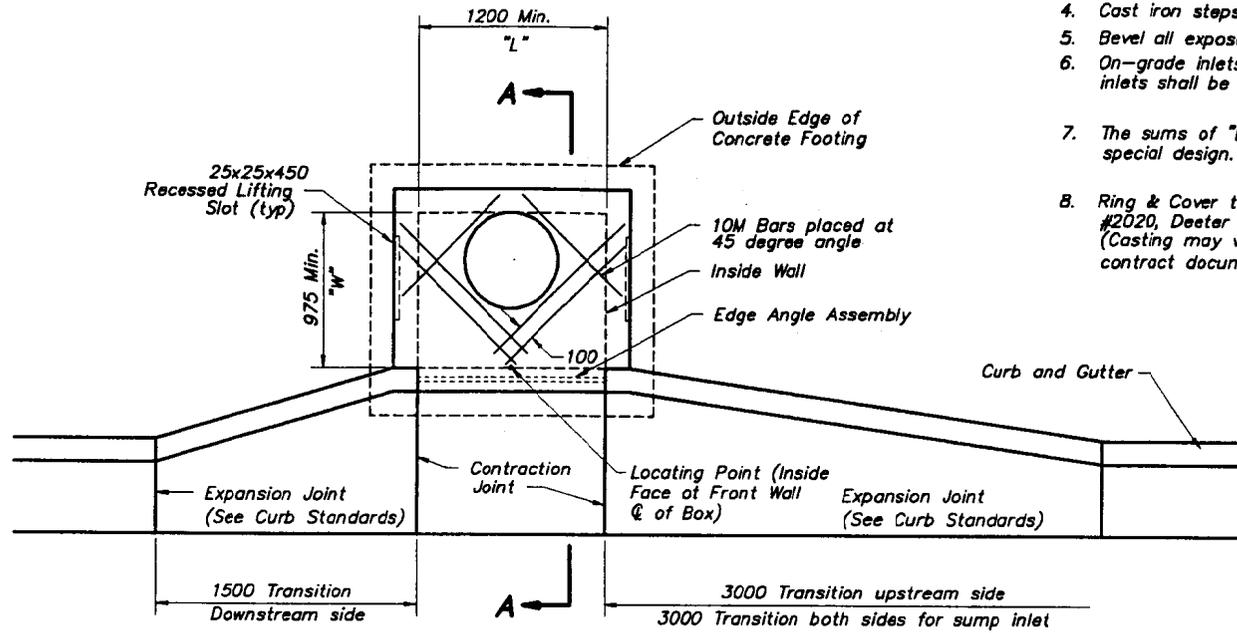


DETAIL OF EDGE ANGLE ASSEMBLY

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

GENERAL NOTES:

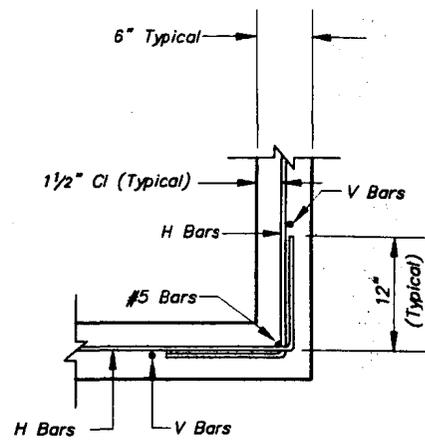
1. The first dimension listed in the Construction Notes is the "L" dimension. The second dimension is the "W" dimension. L's listed on the project plans are listed at the inside face of the wall.
2. Floor of Inlet shall be shaped with invert to provide smooth flow.
3. Locate MH ring and cover over outlet.
4. Cast iron steps shall be spaced at 400 O.C. vertically.
5. Bevel all exposed edges with 20 chamfer.
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 4200 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.)



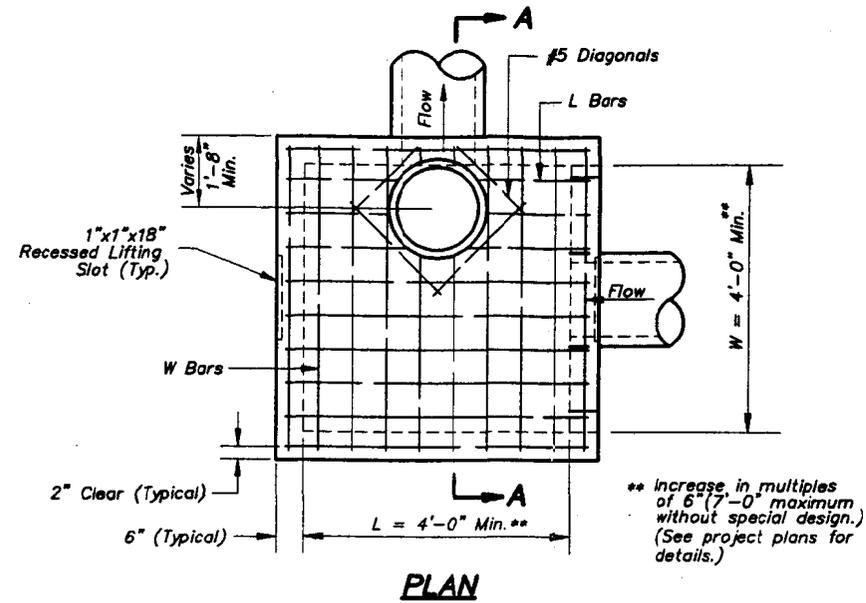
DETAIL OF EDGE ANGLE ASSEMBLY

NOTE: All dimensions in millimeters.

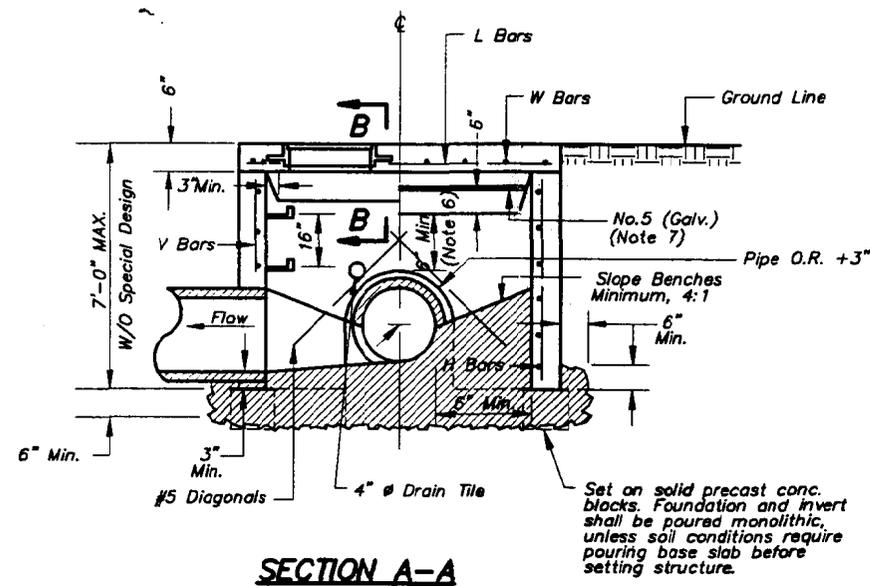
AMERICAN PUBLIC WORKS ASSOCIATION	
	KANSAS CITY METROPOLITAN CHAPTER
CURB INLET - TYPE 3 DETAILS (METRIC)	STANDARD DRAWING NUMBER CI - 3 (M)
	ADOPTED: APRIL 17, 1996



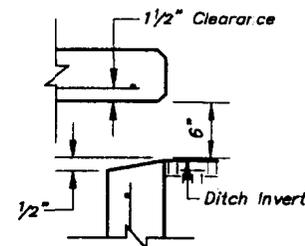
CORNER DETAIL



PLAN



SECTION A-A



SECTION B-B

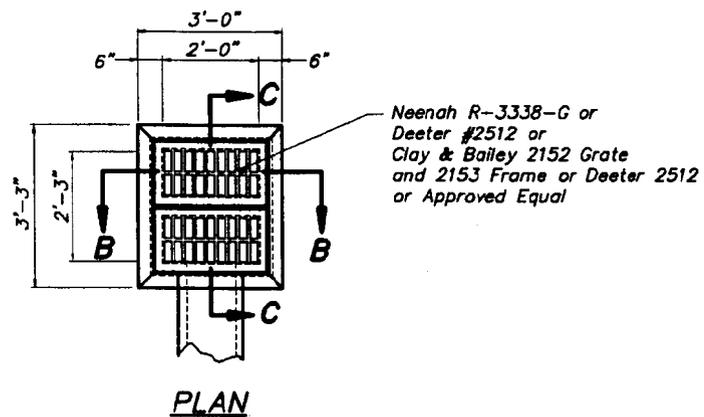
REINFORCING

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

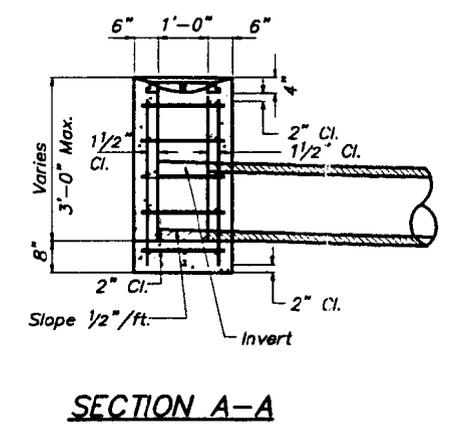
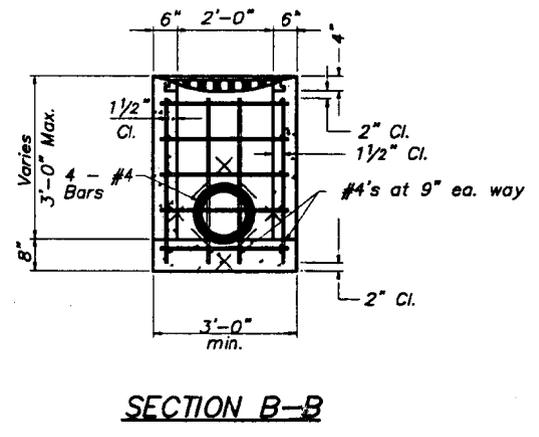
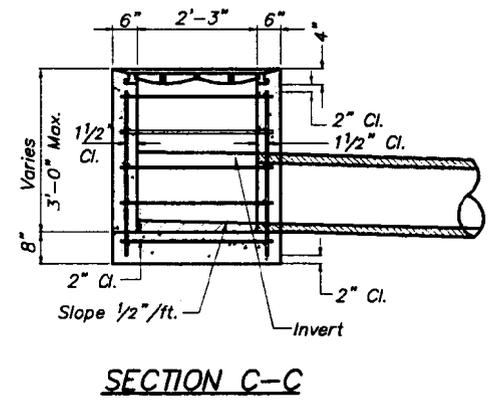
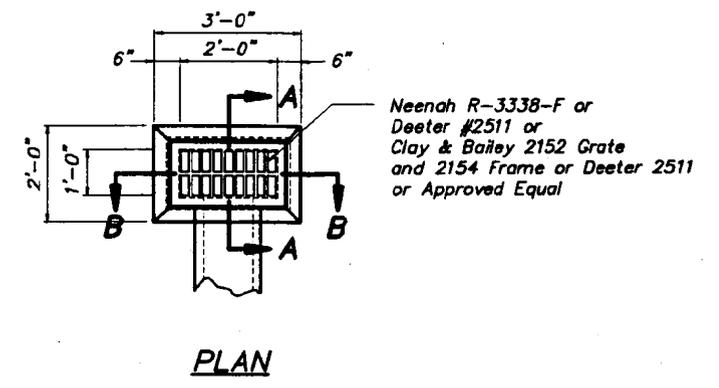
GENERAL NOTES:

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 site 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.

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



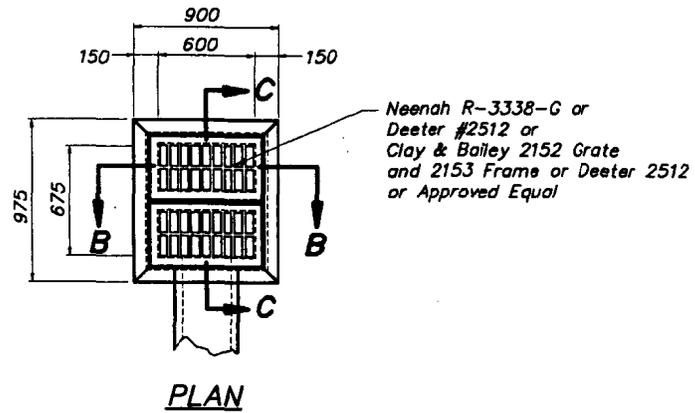
- NOTE:**
1. Location point at center of inlet.
 2. A separate top slab may be utilized.
 3. Not recommended for use in areas with bicycle traffic.



DOUBLE GRATE INLET DETAILS

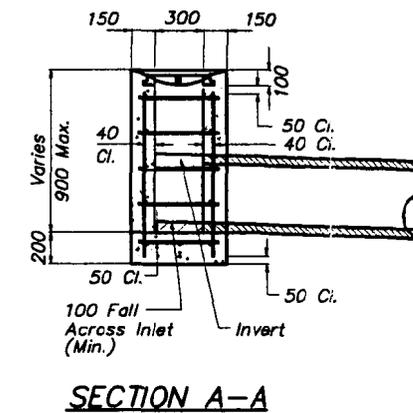
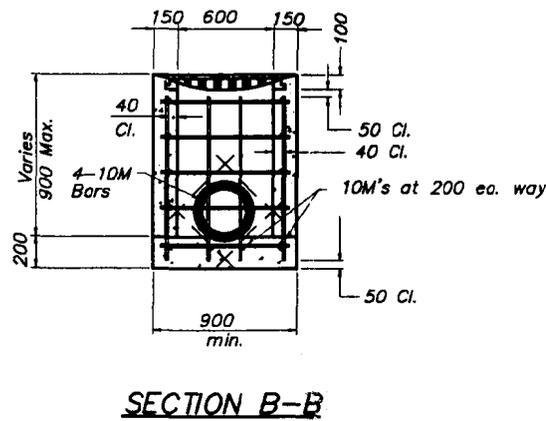
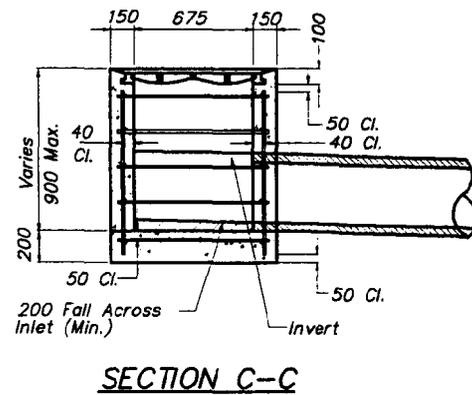
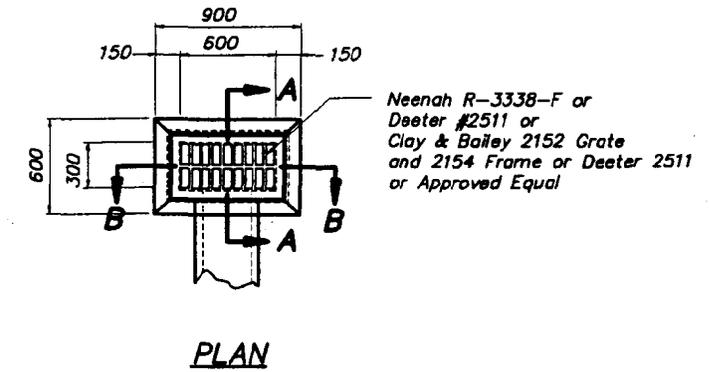
SINGLE GRATE INLET DETAILS

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



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.

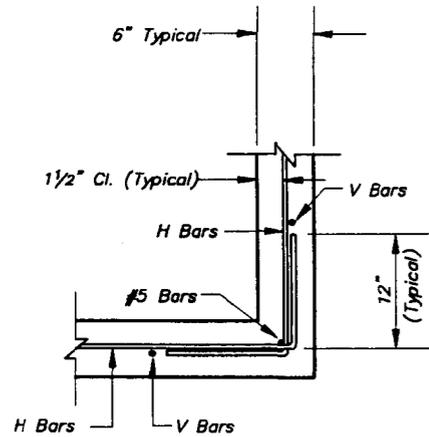


DOUBLE GRATE INLET DETAILS

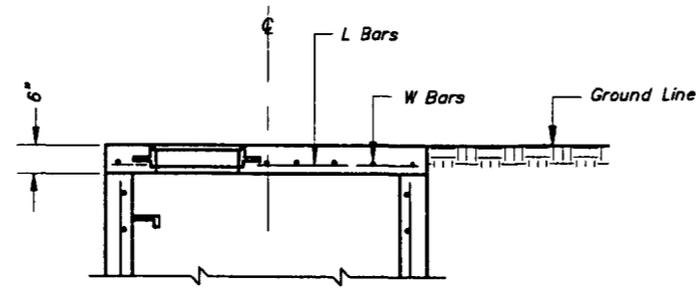
SINGLE GRATE INLET DETAILS

Note: All units are in millimeters.

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

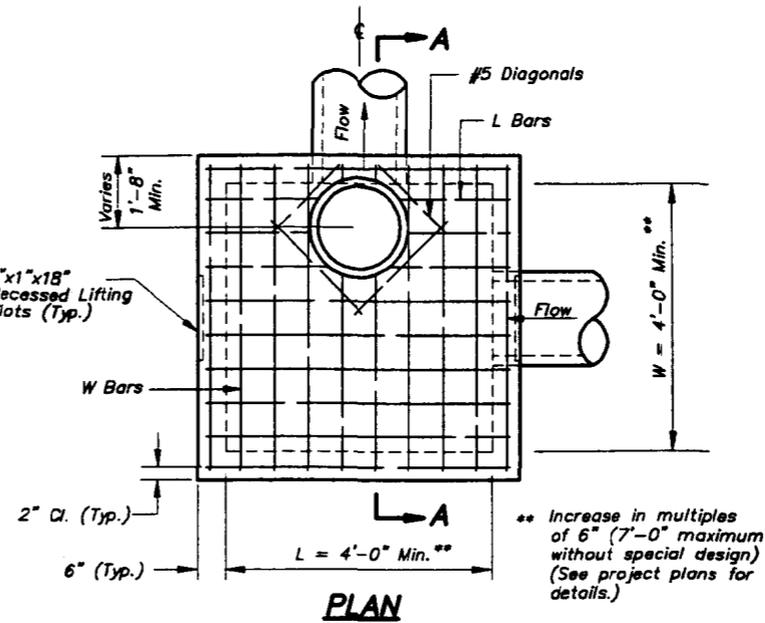


CORNER DETAIL



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.)

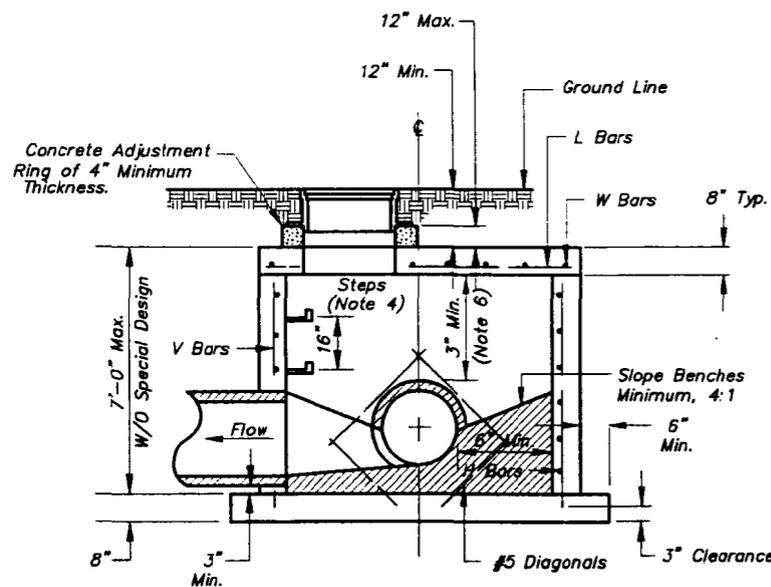


PLAN

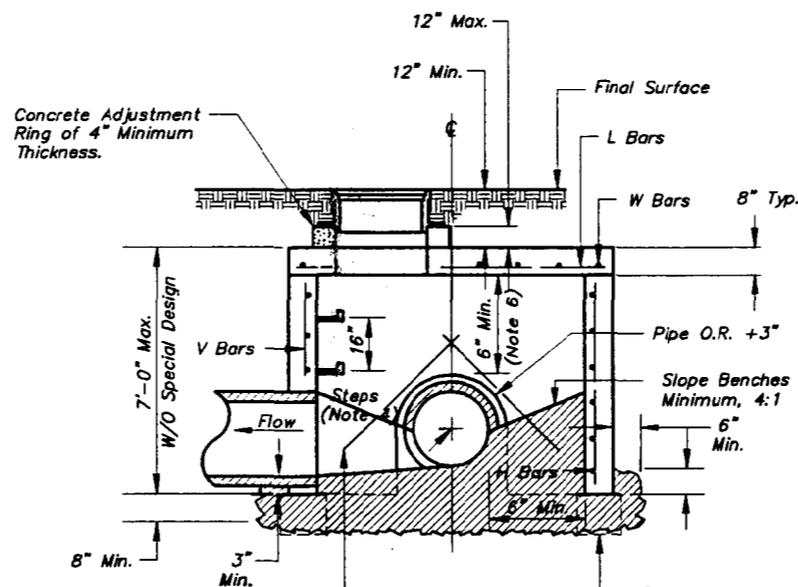
** Increase in multiples of 6" (7'-0" maximum without special design) (See project plans for details.)

GENERAL NOTES:

1. Locate ring and cover over outlet.
2. All work and materials shall conform to Section 2600 APWA.
3. Use 3/4" Chamfer strip or 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.)



SECTION A-A (Cast In Place)



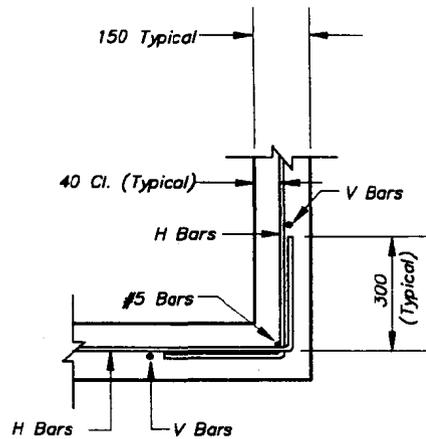
SECTION A-A (Precast)

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

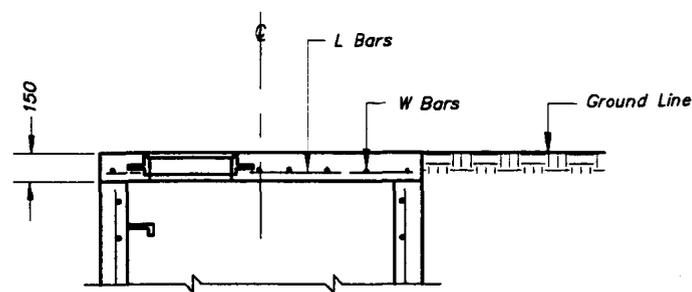
REINFORCING

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

AMERICAN PUBLIC WORKS ASSOCIATION	
APWA	
KANSAS CITY METROPOLITAN CHAPTER	
JUNCTION BOX DETAILS	STANDARD DRAWING NUMBER JB - 1
	ADOPTED: APRIL 17, 1996

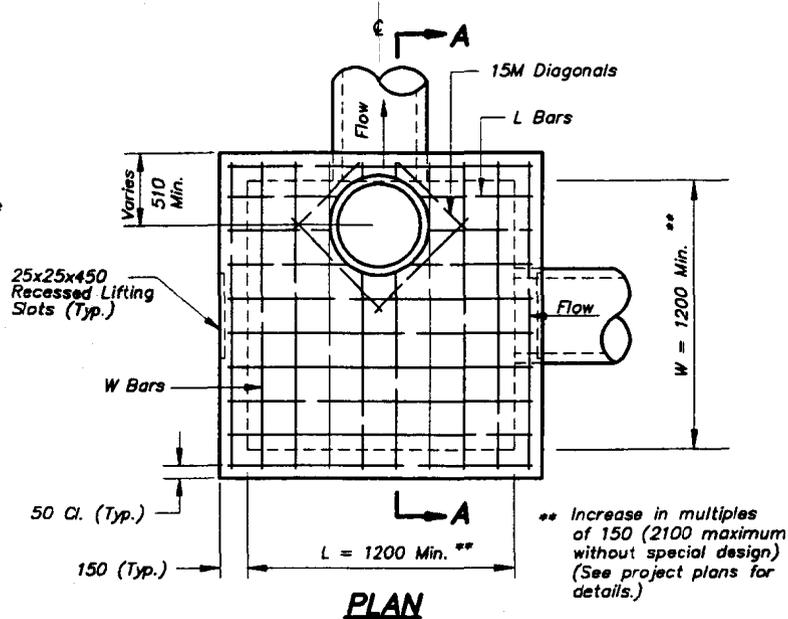


CORNER DETAIL



SLAB TOP ALTERNATE FOR JUNCTION BOX (SHALLOW)

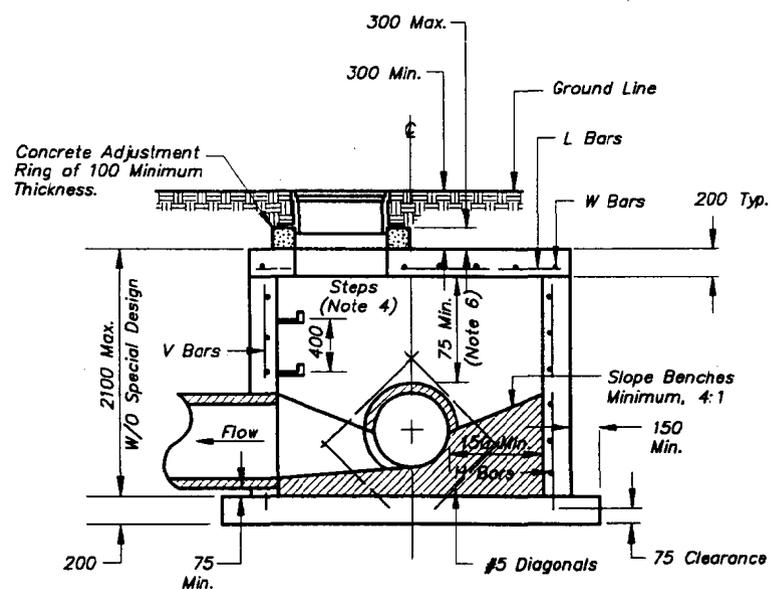
NOTE: Ring & Cover to be Neenah R-1537, Clay & Bailey #2020, Deeter #2016, or approved equal. (Casting may vary by municipality, refer to plans & contract documents.)



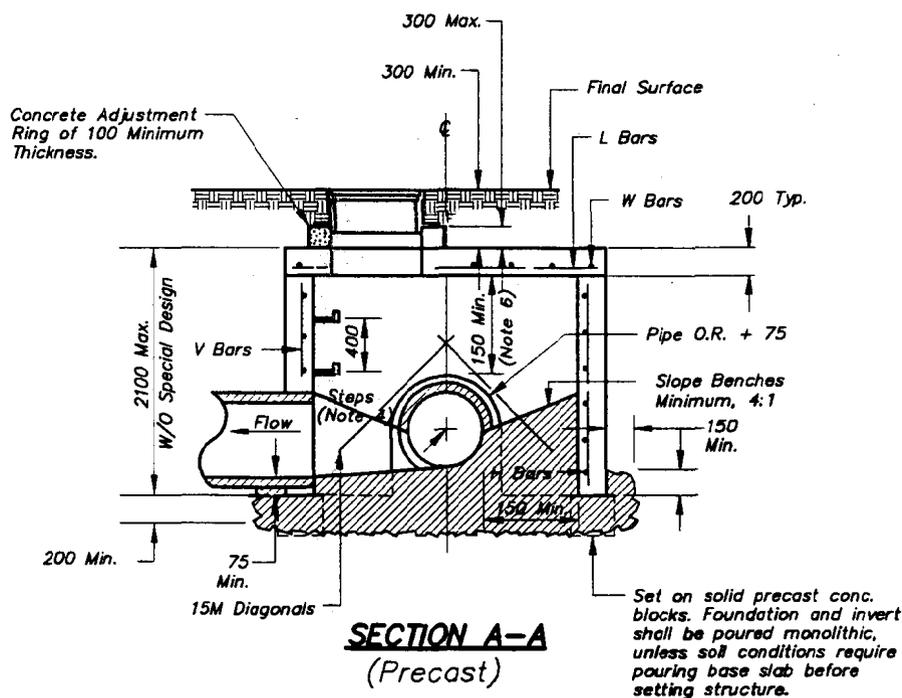
PLAN

GENERAL NOTES:

1. Locate ring and cover over outlet.
2. All work and materials shall conform to Section 2600 APWA.
3. Use 20 Chamfer strip on all exposed concrete corners.
4. Steps required at 400 O.C. when depth from top of casting to invert exceeds 1200.
5. Boxouts will not be allowed to project through the Corners of the structure and the minimum distance between boxouts is 150 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 150 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.)



SECTION A-A
(Cast In Place)



SECTION A-A
(Precast)

REINFORCING

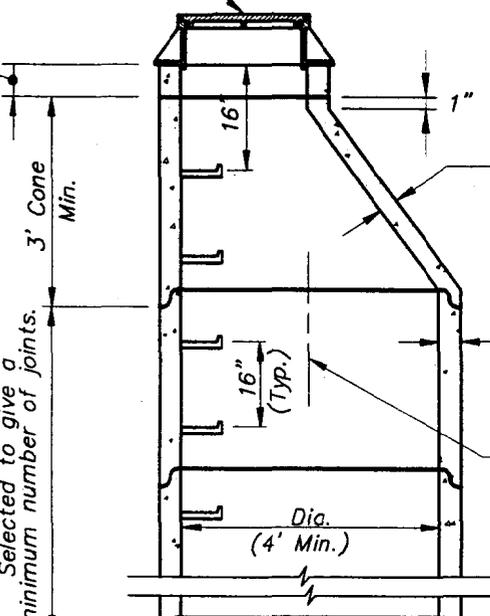
BARS	BAR SIZE	SPACING (mm)
H	10M	300
V	10M	300
L	15M	150
W	15M	150

NOTE: All dimensions in millimeters.

AMERICAN PUBLIC WORKS ASSOCIATION	
KANSAS CITY METROPOLITAN CHAPTER	
JUNCTION BOX DETAILS (METRIC)	STANDARD DRAWING NUMBER JB - 1(M)
	ADOPTED: APRIL 17, 1996

Top Elevations Shown on Const. Plans are Top of Ring & Lid

4" Min.
12" Max.



1/12 of inside diameter (inches) for depths to 16',
1/12 of inside diameter (inches) +1" for depths of 16' and greater.

Locations Shown on Construction Plans are to Center of Structure

Top of highest pipe

6" Min.

8" Min.

Invert depth = D/2

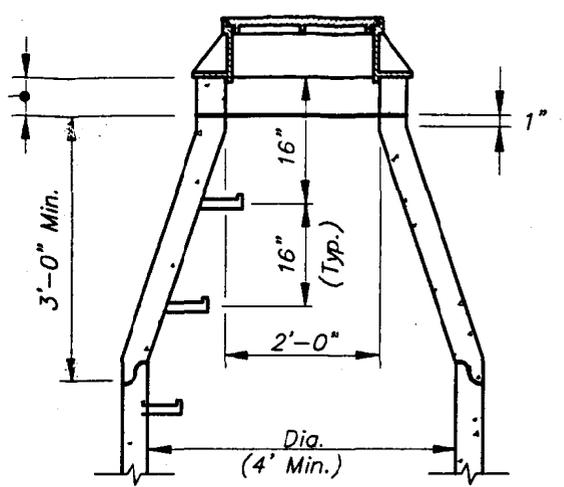
3" or monolithic

Invert of outlet pipe shall be a min. of 3" above the top surface of the base.

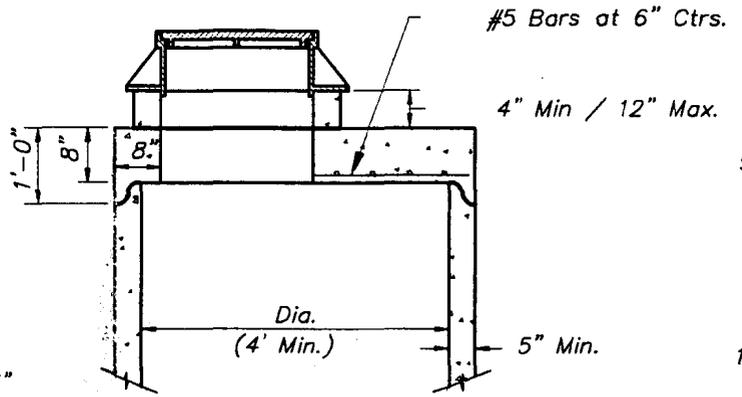
No. 4 Bars at 6" Ctrs. (Both Ways)

STANDARD PRECAST MANHOLE (ECCENTRIC CONE)

4" Min / 12" Max.



STANDARD PRECAST MANHOLE (CONCENTRIC CONE)
(See Eccentric Cone For Other Details)



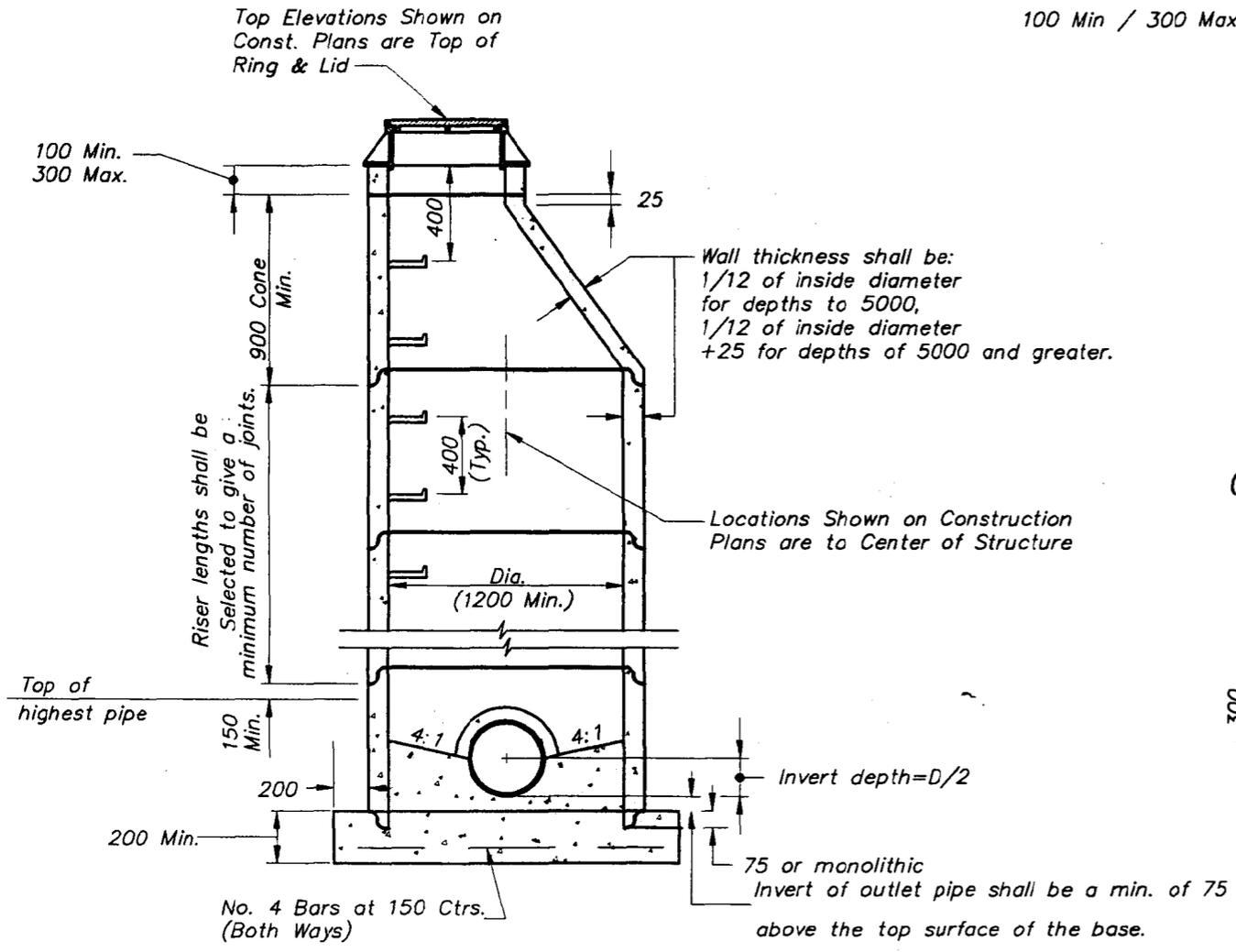
STANDARD PRECAST MANHOLE (SHALLOW TYPE)

(See Eccentric Cone For Other Details)

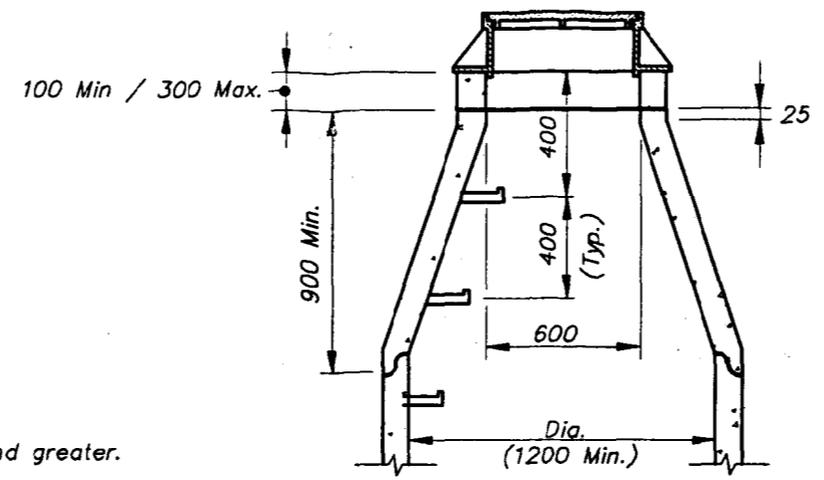
GENERAL NOTES:

- All manholes are to be precast concrete and of Eccentric Cone type unless otherwise specified.
- Manhole top adjustments shall be accomplished by the use of concrete adjustment rings.
- Top of manhole casting shall be set flush and on same slope as finished surface or as directed by the Engineer.
- Reinforcement in all sections shall equal or exceed A.S.T.M. C-478 specifications.
- The engineer shall designate modifications for manholes with special designs.
- The inside diameter of the manhole shall be 4'-0" for pipe diameters from 12" thru 24", 5'-0" for pipe diameters from 27" thru 36", and 6'-0" for pipe diameters 42" thru 48".
- Clearance Tolerance of Pipe Openings: The Maximum Allowable Pipe Opening on a Horizontal Axis Shall be the Outside Diameter of the Pipe Plus 12". The Maximum Allowable Pipe Opening on Vertical Axis Shall be the Outside Diameter Plus 8". The Minimum Clearance Between the Outside Surface of an Installed pipe and the Concrete of the Manhole Shall be 2".
- Installation of Pipe Openings: All required pipe openings shall be plant cast in manhole units. Field alterations of openings will be permitted provided walls are scored with a masonry saw to a depth sufficient to sever reinforcing steel. A chipping hammer may then be used to remove the concrete. Minimum distance between any two adjacent pipes shall be 4".
- No direct payment for shaping floor or connecting pipes as shown on plans.
- Ring & Cover to be Neenah R-1736, Clay & Bailey #2008, Deeter #1316, or approved equal. (Casting may vary by municipality, refer to plans & contract documents.)
- Sanitary Sewers shall be coated and conform to Section 2600.

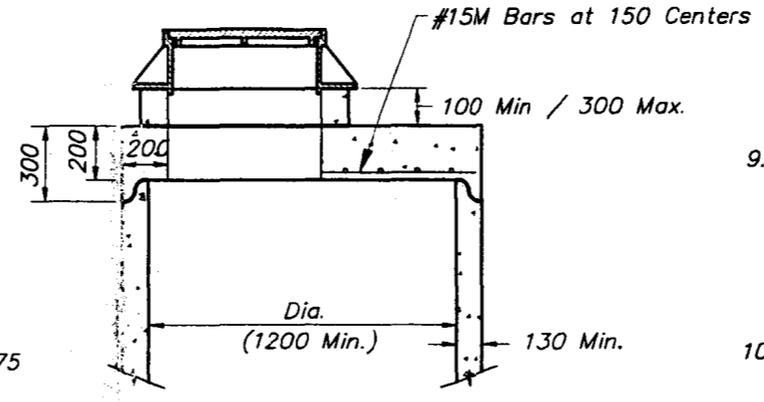
AMERICAN PUBLIC WORKS ASSOCIATION	
	KANSAS CITY METROPOLITAN CHAPTER
MANHOLE DETAILS	STANDARD DRAWING NUMBER MH - 1
	ADOPTED: APRIL 17, 1996



STANDARD PRECAST MANHOLE (ECCENTRIC CONE)



STANDARD PRECAST MANHOLE (CONCENTRIC CONE)
(See Eccentric Cone For Other Details)



STANDARD PRECAST MANHOLE (SHALLOW TYPE)
(See Eccentric Cone For Other Details)

GENERAL NOTES:

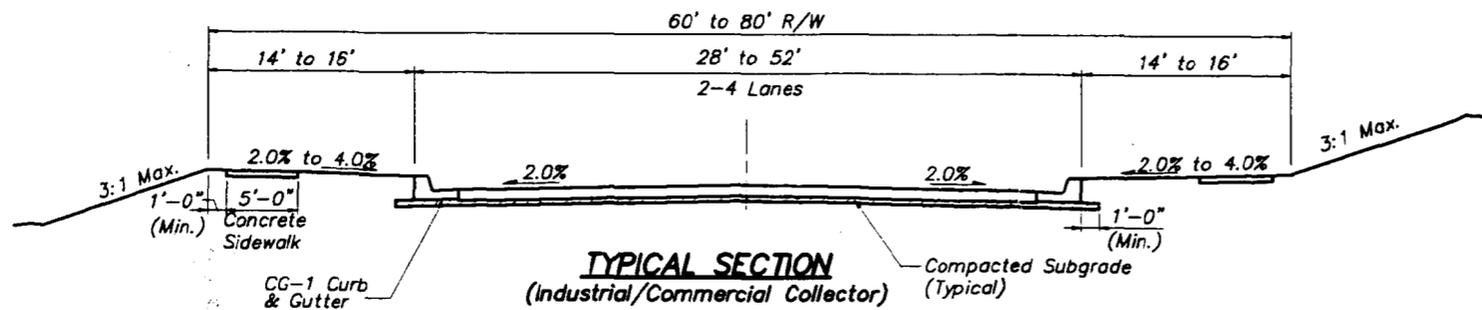
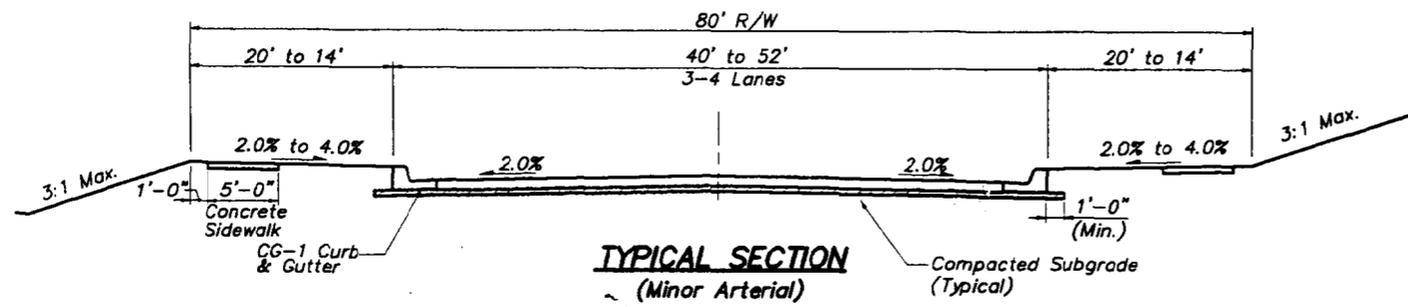
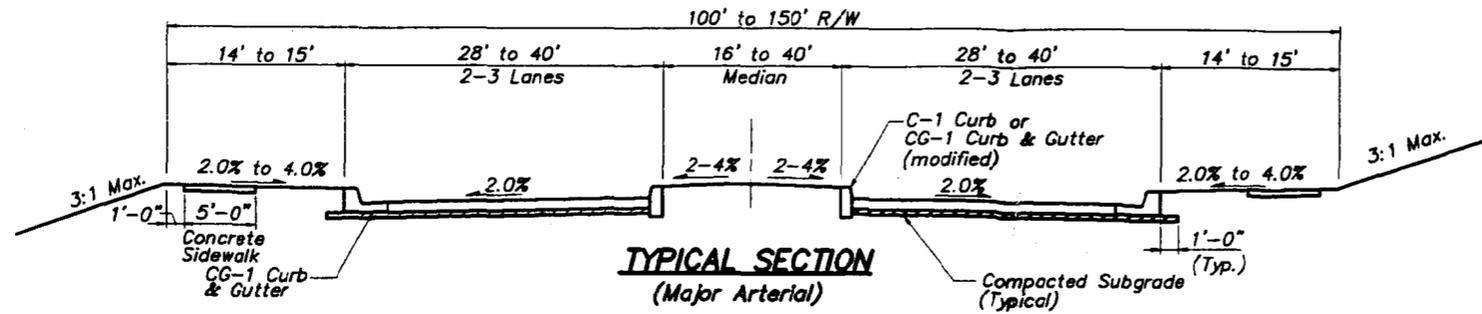
1. All manholes are to be precast concrete and of Eccentric Cone type unless otherwise specified.
2. Manhole top adjustments shall be accomplished by the use of concrete adjustment rings.
3. Top of manhole casting shall be set flush and on same slope as finished surface or as directed by the Engineer.
4. Reinforcement in all sections shall equal or exceed A.S.T.M. C-478 specifications.
5. The engineer shall designate modifications for manholes with special designs.
6. The inside diameter of the manhole shall be 1200 for pipe diameters from 300 thru 600, 1500 for pipe diameters from 675 thru 900, and 1800 for pipe diameters 1050 thru 1200.
8. Clearance Tolerance of Pipe Openings: The Maximum Allowable Pipe Opening on a Horizontal Axis Shall be the Outside Diameter of the Pipe Plus 300. The Maximum Allowable Pipe Opening on Vertical Axis Shall be the Outside Diameter Plus 200. The Minimum Clearance Between the Outside Surface of an Installed pipe and the Concrete of the Manhole Shall be 50.
9. Installation of Pipe Openings: All required pipe openings shall be placed cast in manhole units. Field alterations of openings will be permitted provided walls are scored with a masonry saw to a depth sufficient to sever reinforcing steel. A chipping hammer may then be used to remove the concrete. Minimum distance between any two adjacent pipes shall be 400.
10. No direct payment for shaping floor or connecting pipes as shown on plans.
11. Ring & Cover to be Neenah R-1736, Clay & Bailey #2008, Deeter #1316, or approved equal. (Casting may vary by municipality, refer to plans & contract documents.)
12. Sanitary Sewers shall be coated and conform to Section 2600.

Note: All dimensions are in mm.

AMERICAN PUBLIC WORKS ASSOCIATION	
APWA	
KANSAS CITY METROPOLITAN CHAPTER	
MANHOLE DETAILS (METRIC)	STANDARD DRAWING NUMBER MH - 1 (M) ADOPTED: APRIL 17, 1996

GENERAL NOTES:

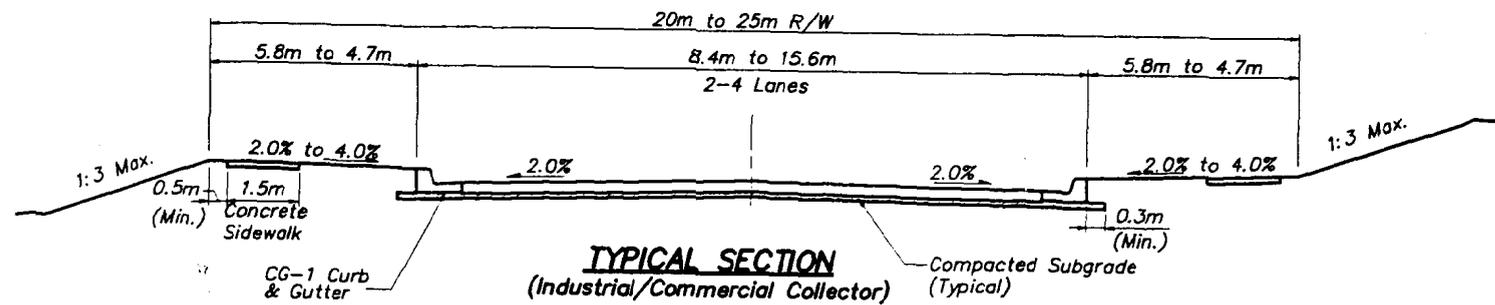
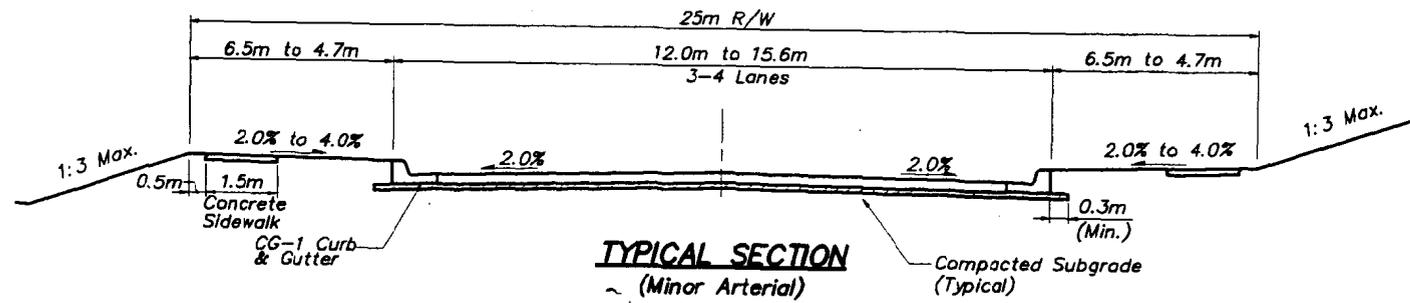
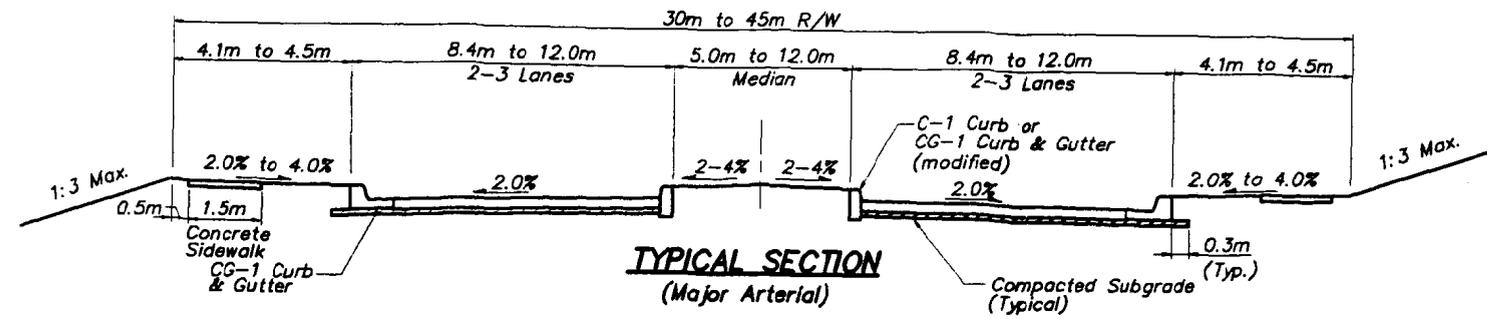
1. See Table 1 for Pavement Type.
2. The Median (including median curb) is optional for the Major Arterial; modify shoulder width accordingly.



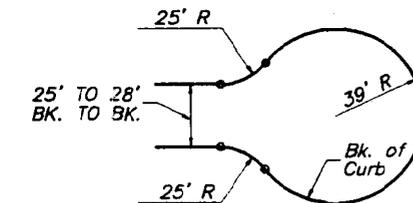
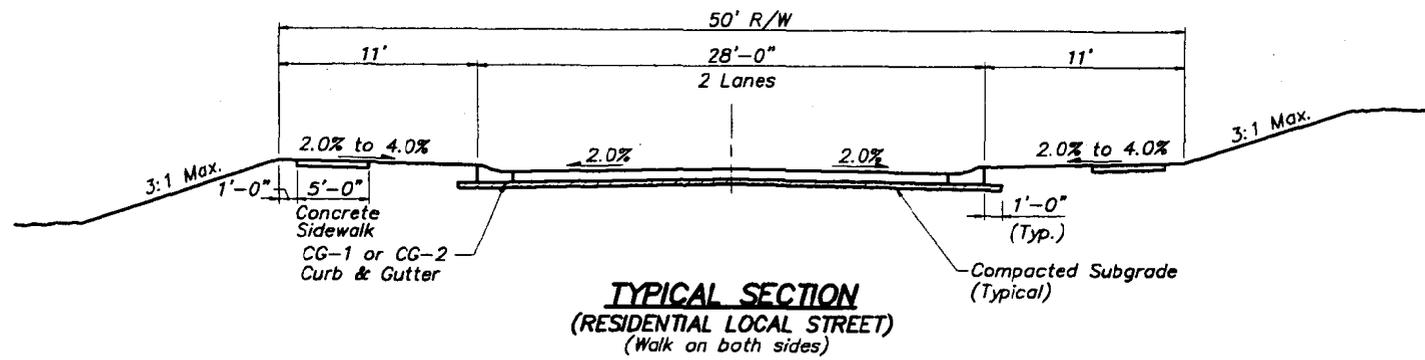
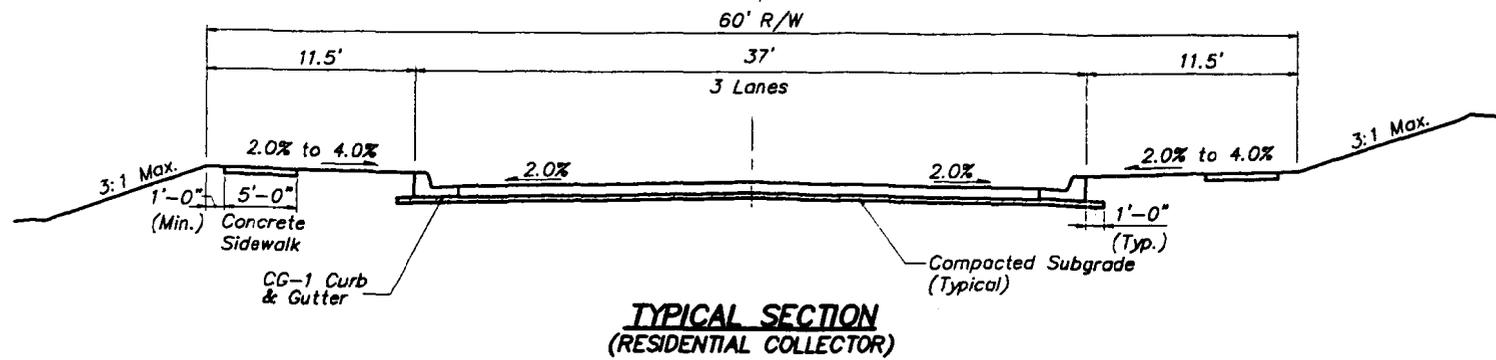
AMERICAN PUBLIC WORKS ASSOCIATION	
APWA	
KANSAS CITY METROPOLITAN CHAPTER	
STREET SECTION DETAILS	STANDARD DRAWING NUMBER ST - 1
	ADOPTED: APRIL 17, 1996

GENERAL NOTES:

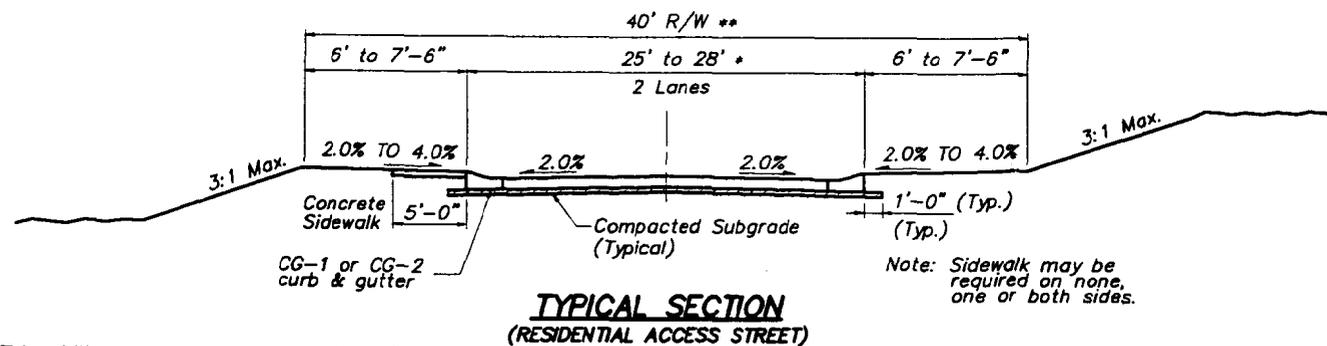
1. See Table 1(M) for Pavement Type.
2. The Median (including median curb) is optional for the Major Arterial; modify shoulder width accordingly.



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



**PLAN VIEW
OF CUL-DE-SAC**



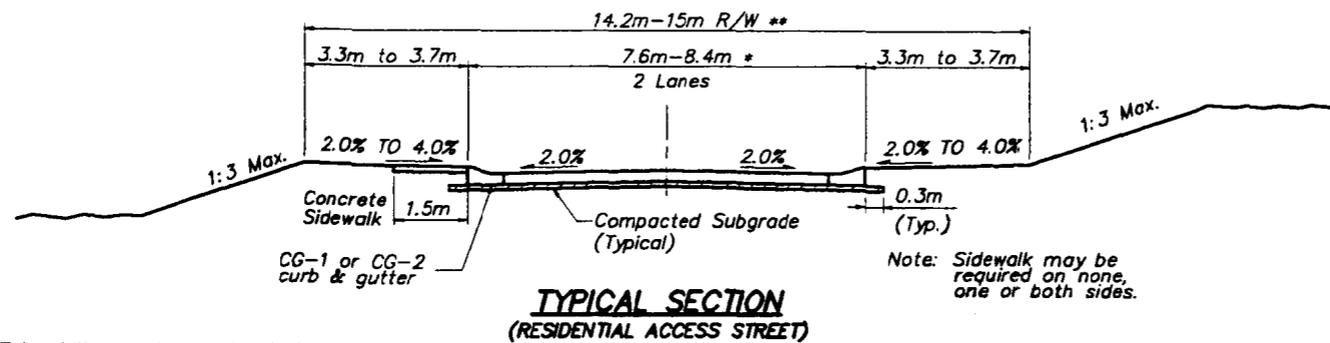
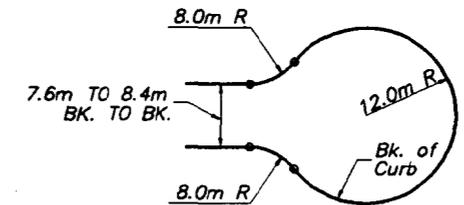
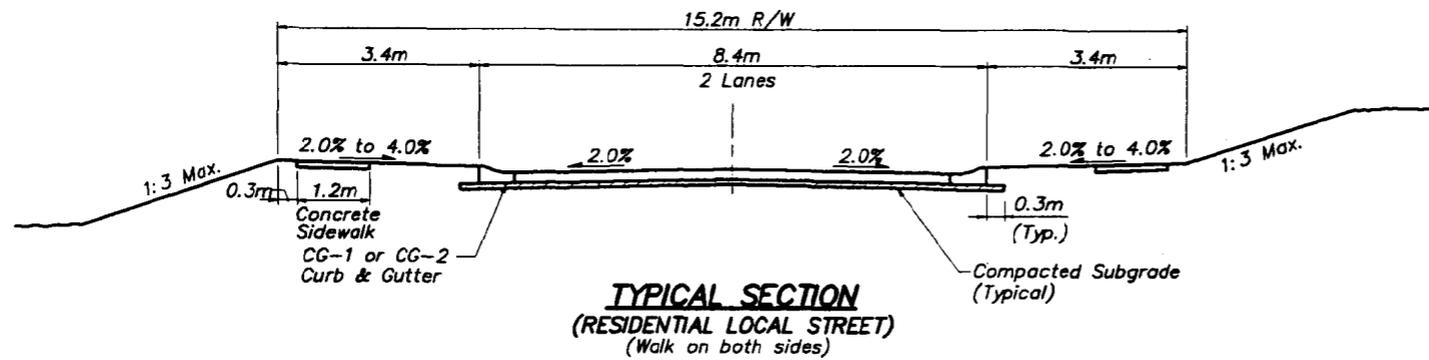
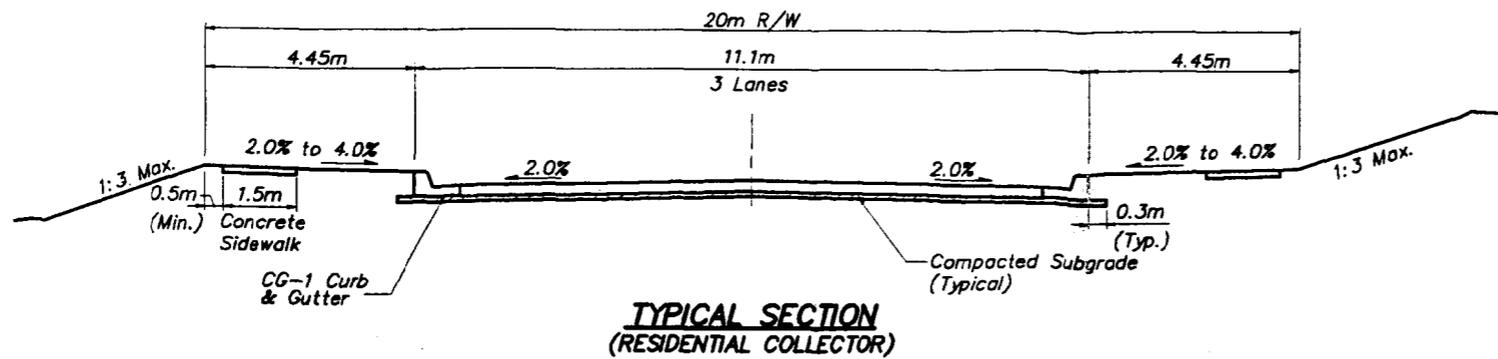
* This width may be used only in planned development where a minimum of 4' off street parking spaces are provided for each dwelling unit.

** 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.

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.

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



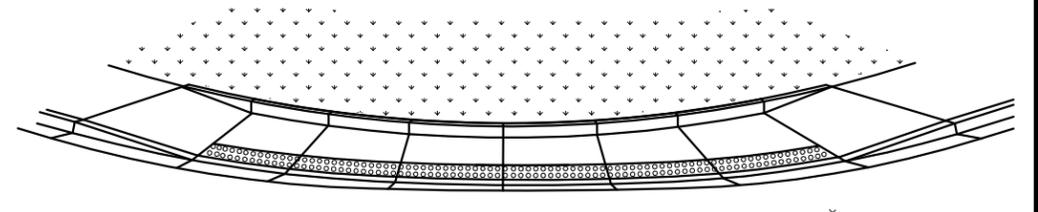
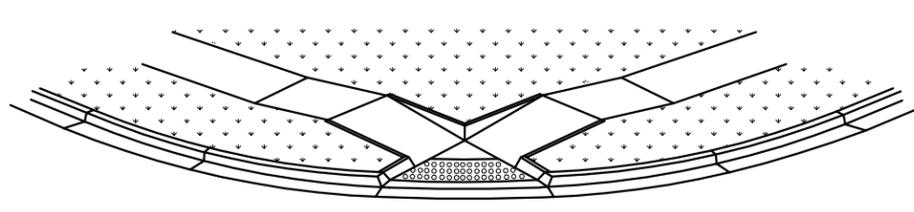
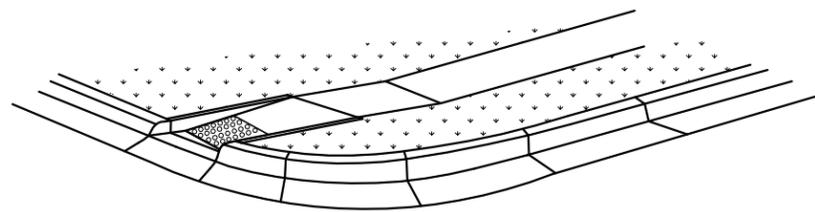
General Notes:

1. Where the local authority requires 1.2m 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, ST-4(M).
2. See Table 1(M) 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.

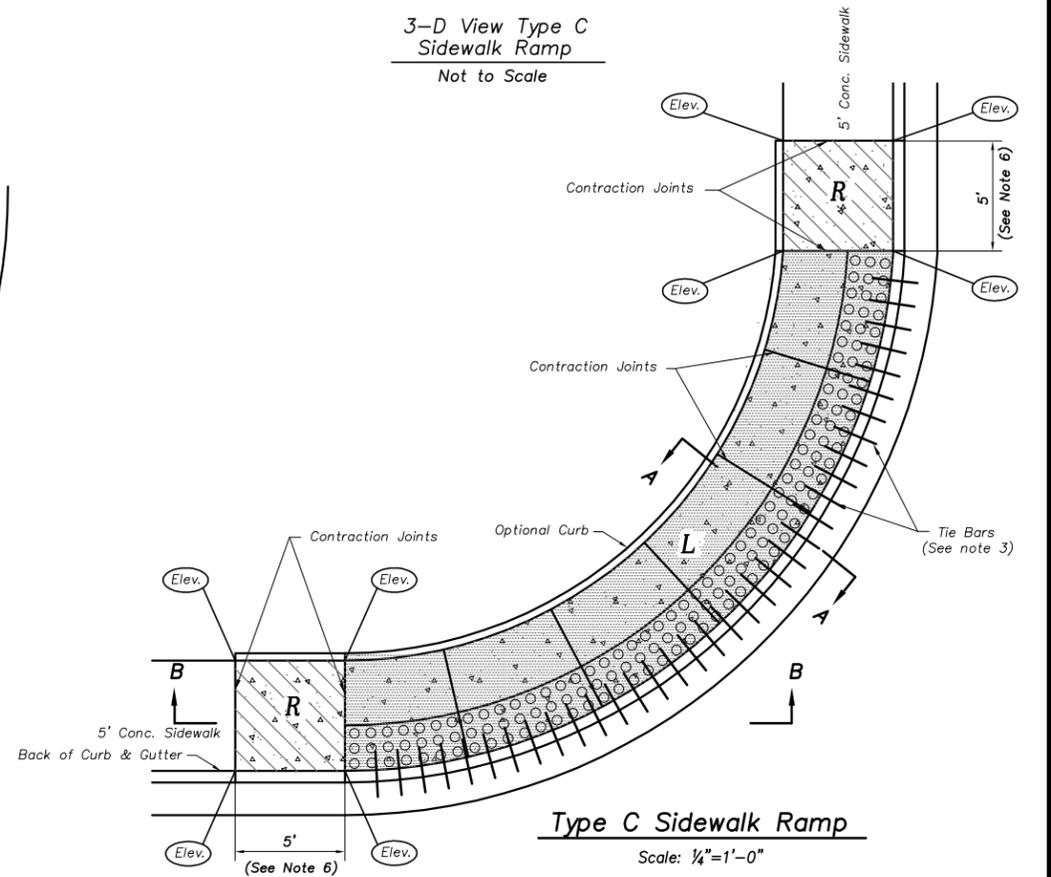
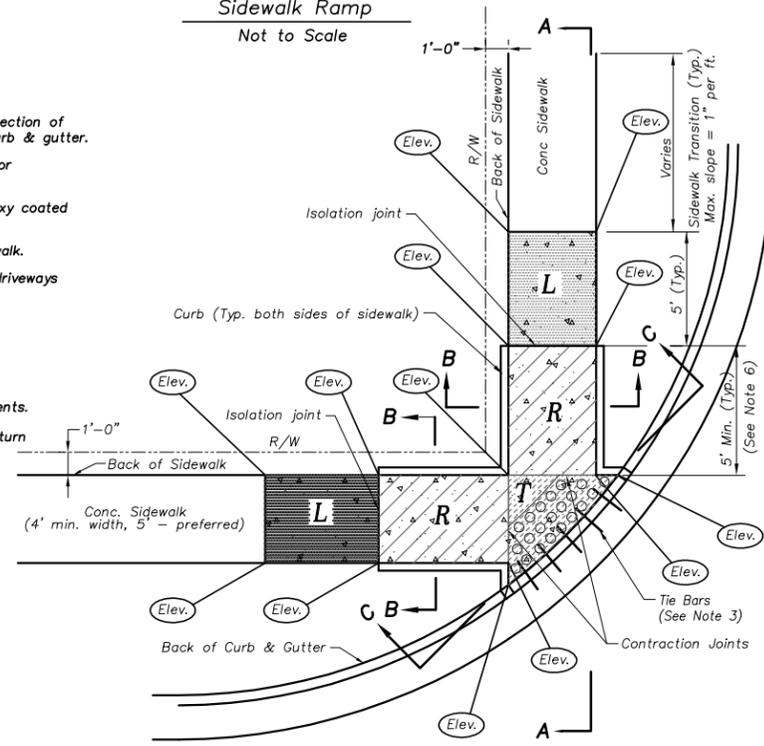
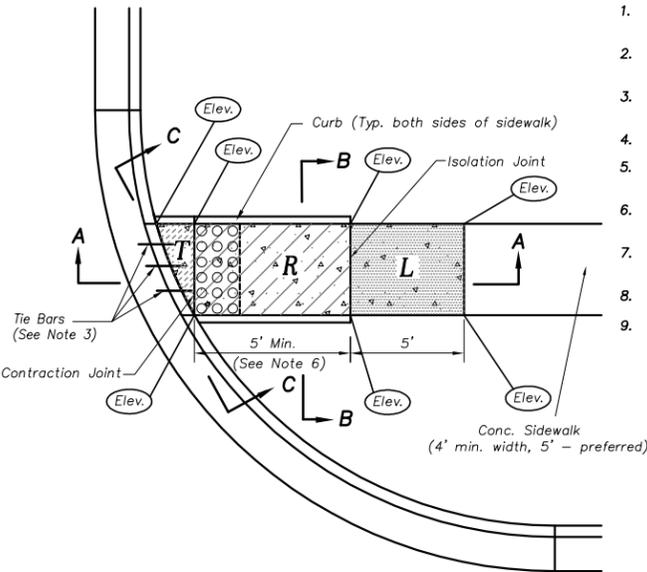
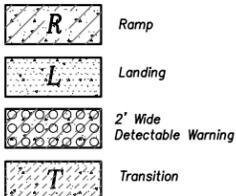
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	KANSAS CITY METROPOLITAN CHAPTER
STREET SECTION DETAILS (METRIC)	
STANDARD DRAWING NUMBER ST - 2(M) ADOPTED: APRIL 17, 1996	



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 labeled 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.

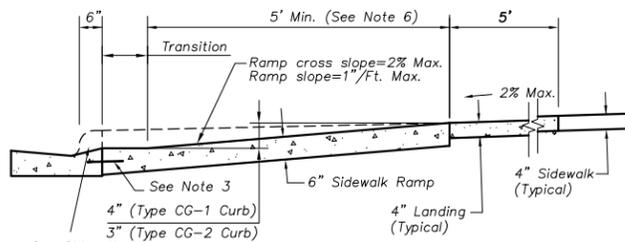
Legend:



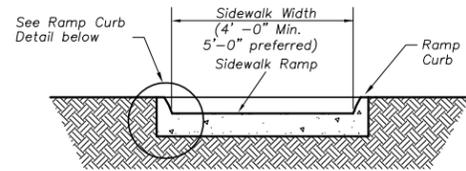
Type A Sidewalk Ramp
Scale: 1/4"=1'-0"

Type B Sidewalk Ramp
Scale: 1/4"=1'-0"

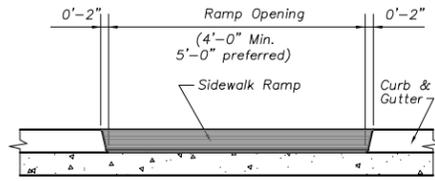
Type C Sidewalk Ramp
Scale: 1/4"=1'-0"



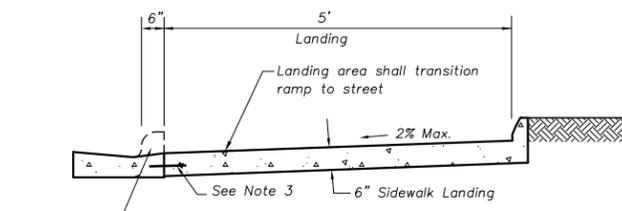
Section A-A Type A & B Sidewalk Ramp
Scale: 1/2"=1'-0"



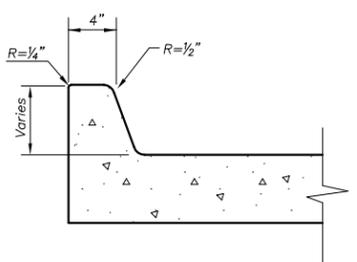
Section B-B Type A & B Sidewalk Ramp
Scale: 1/2"=1'-0"



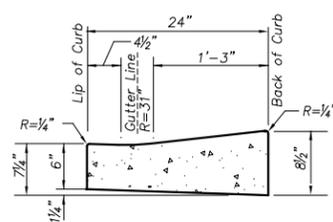
Section C-C Type A & B Sidewalk Ramp
Scale: 1/2"=1'-0"



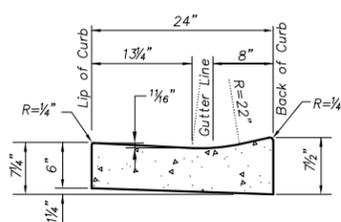
Section A-A Type C Sidewalk Ramp
Scale: 1/2"=1'-0"



Ramp Curb Detail
Scale: 1 1/2" = 1'-0"

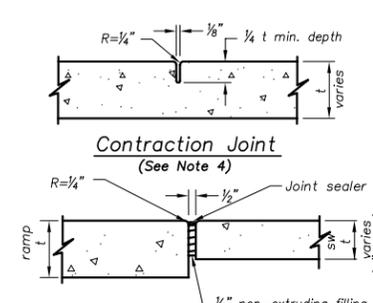


Use With Type CG-2 Curb
Scale: 1"=1'-0"

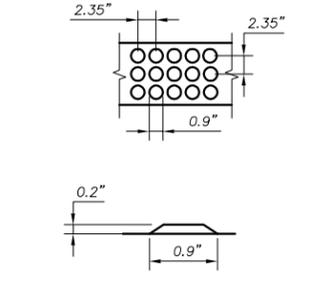


Use With Type CG-1 Curb
Scale: 1"=1'-0"

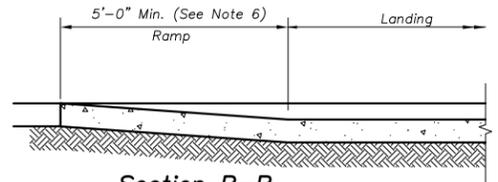
Street Curb Detail at Ramp



Isolation Joint
(See Note 5)

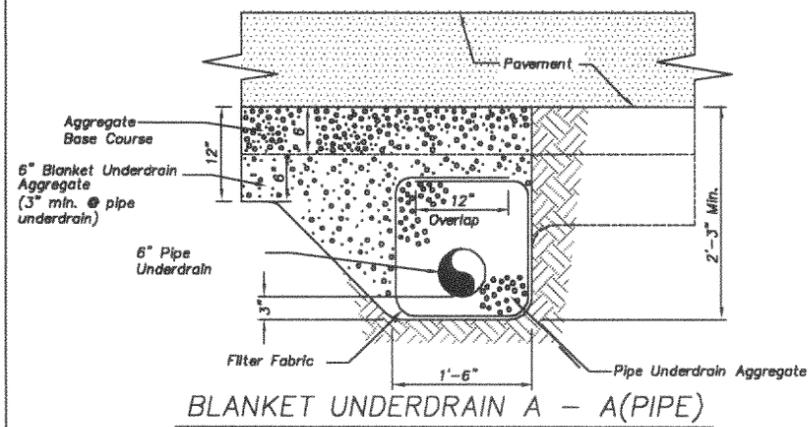


Detectable Warning Dome Spacing and Section
Not to Scale



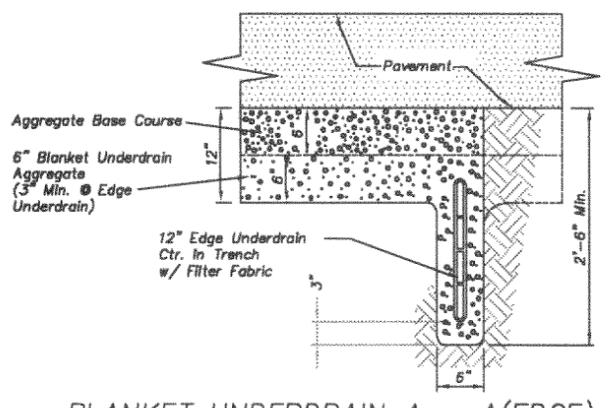
Section B-B Type C Sidewalk Ramp
Scale: 1/2"=1'-0"

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	KANSAS CITY METROPOLITAN CHAPTER
SIDEWALK RAMP DETAILS	STANDARD DRAWING NUMBER SW - 1 ADOPTED: DECEMBER 18, 2002



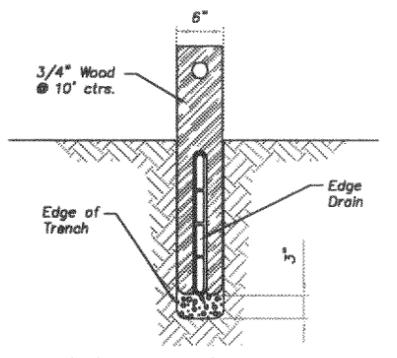
BLANKET UNDERDRAIN A - A (PIPE)

SCALE: 1" = 1'-0"



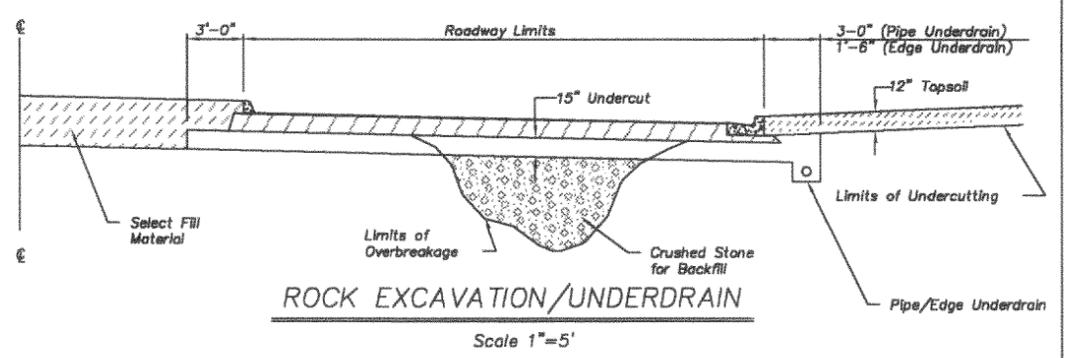
BLANKET UNDERDRAIN A - A (EDGE)

SCALE: 1" = 1'-0"



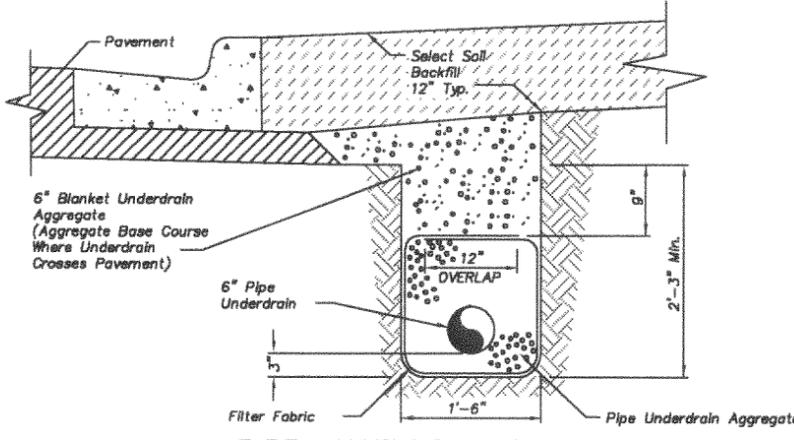
EDGE UNDERDRAIN TEMPORARY SUPPORT DETAIL

SCALE: 1" = 1'-0"



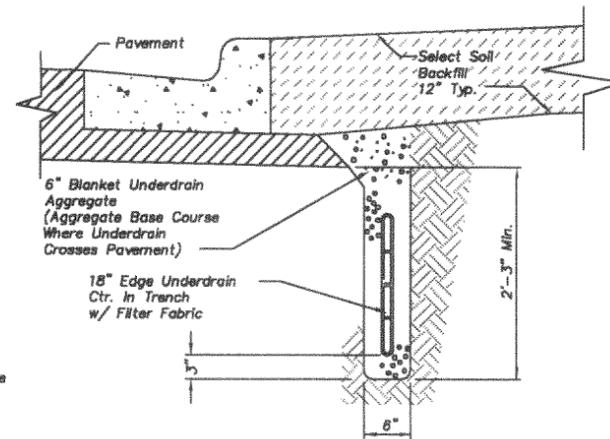
ROCK EXCAVATION/UNDERDRAIN

Scale 1"=5'



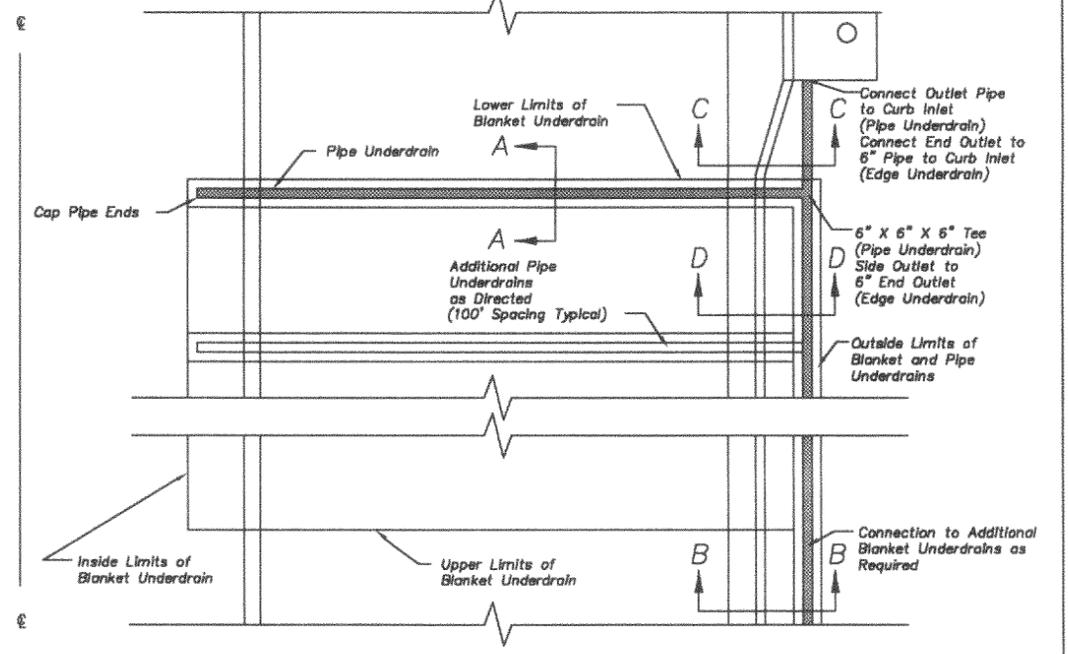
PIPE UNDERDRAIN B - B

SCALE: 1" = 1'-0"



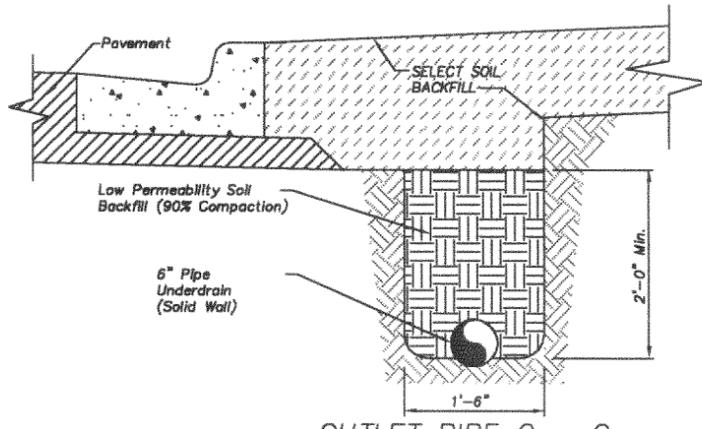
EDGE UNDERDRAIN B - B

SCALE: 1" = 1'-0"



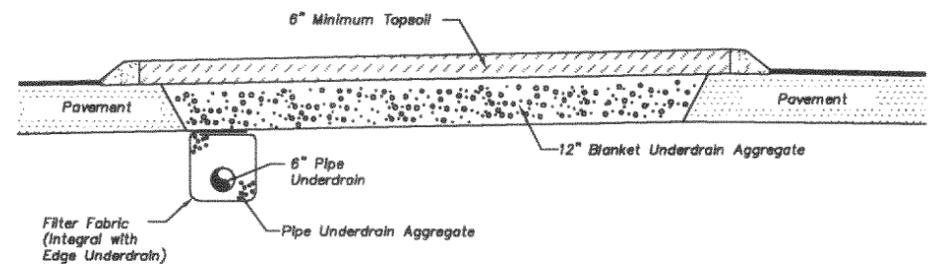
UNDERDRAIN LAYOUT

Scale 1"=5'



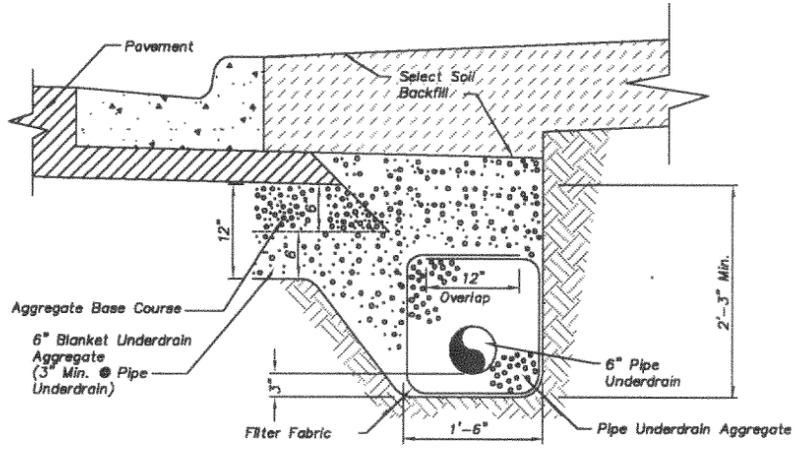
OUTLET PIPE C - C

SCALE: 1" = 1'-0"



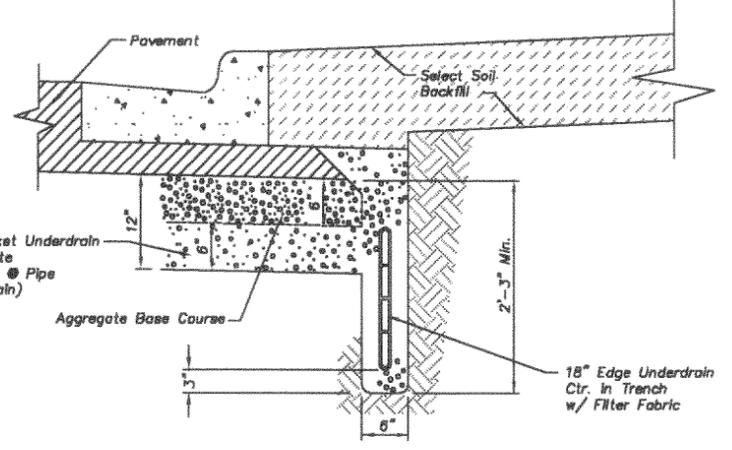
UNDERDRAIN AT MEDIAN NOSE

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



PIPE UNDERDRAIN BEHIND CURB D - D

SCALE: 1" = 1'-0"



EDGE UNDERDRAIN BEHIND CURB D - D

SCALE: 1" = 1'-0"

Underdrain Notes:

- All roadway excavation in rock will be undercut no less than 15" for the full width of the roadway as shown.
- 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.
- Layers of earth or shale shall not be permitted for backfill up to the bottom of the crushed stone.
- 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.
- Proposed underdrain pipe layout, flowing elevations, inlet connection points, and details shall be approved prior to construction by the City Engineer.
- 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.
- All underdrain pipes shall be installed at a minimum slope of 1%. Underdrain pipe shall be installed with the perforations placed down.
- 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.
- All filter fabric used for pipe underdrain construction shall conform to Standard Specifications Section 2203.6.
- The Contractor may, at his option, use either pipe underdrain or edge underdrain, but shall not mix underdrain types within any underdrain system.
- 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.
- 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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APWA	
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METROPOLITAN CHAPTER	
UNDERDRAIN DETAILS	STANDARD DRAWING
	UD-1
	ADOPTED:
	MAY 23, 2001