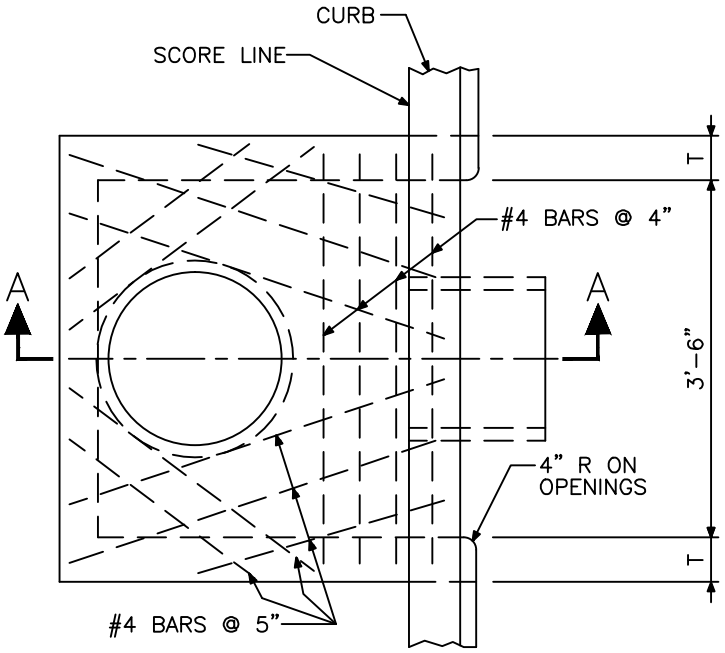
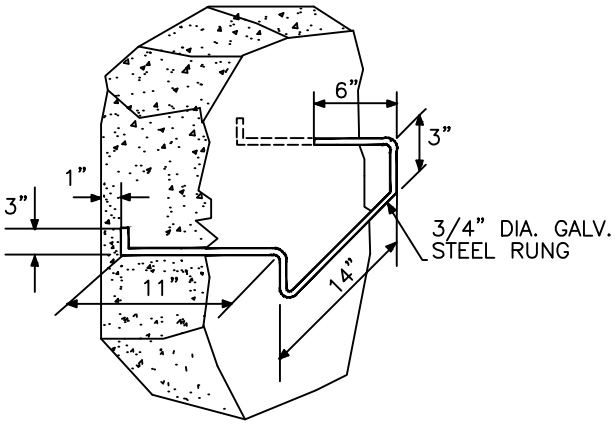
SECTION 300
STORM DRAIN & FLOOD CONTROL

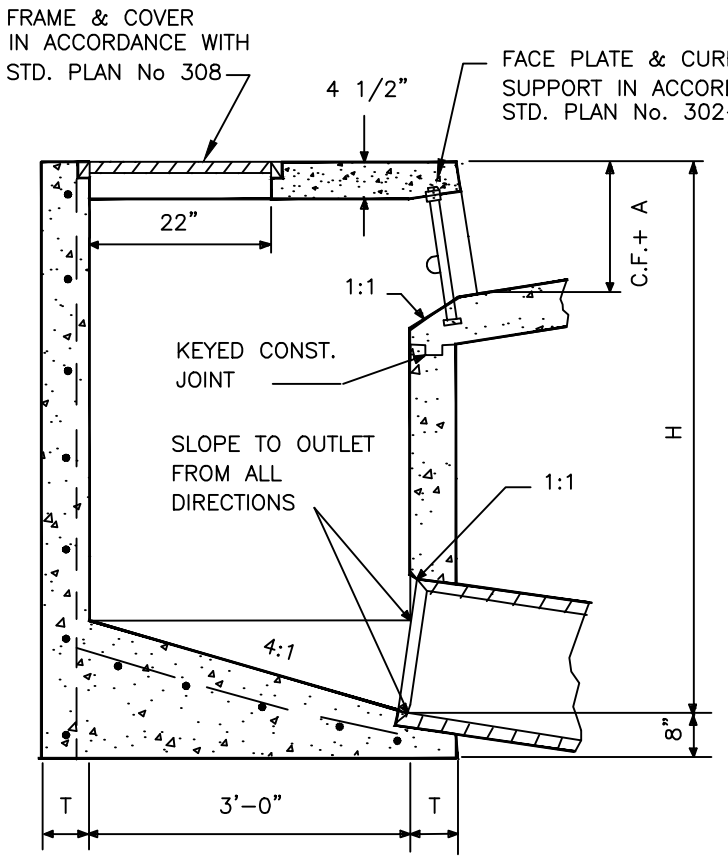
PLAN NO.	DESCRIPTION
300-1	CATCH BASIN TYPE 1
300-2	NOTES FOR STANDARD PLAN 300
301-1	CATCH BASIN TYPE 2
301-2	NOTES FOR STANDARD PLAN 301
302-1	CATCH BASIN DETAILS FOR STREETS WITH TYPE A-2 CURB AND GUTTER
302-2	CATCH BASIN DETAILS FOR STREETS WITH TYPE D CURB AND GUTTER
302-3	CATCH BASIN SCREENS
303-1	LOCAL DEPRESSION
303-2	LOCAL DEPRESSION
303-3	LOCAL DEPRESSION
304	CORRUGATED STEEL PIPE DROP INLET
305-1	JUNCTION STRUCTURE NO. 1
305-2	JUNCTION STRUCTURE NO. 1
306-1	JUNCTION STRUCTURE NO. 2
306-2	JUNCTION STRUCTURE NO. 2
306-3	JUNCTION STRUCTURE NO. 3
306-4	JUNCTION STRUCTURE NO. 3
306-5	JUNCTION STRUCTURE NO. 4
306-6	JUNCTION STRUCTURE NO. 4
307	CONCRETE COLLAR
308	MANHOLE FRAME AND COVER
309-1	36 INCH REINFORCED CONCRETE MANHOLE
309-2	48 INCH REINFORCED CONCRETE MANHOLE
309-3	24 INCH REINFORCED CONCRETE GRADE RINGS
310	STORM DRAIN BEDDING DETAIL



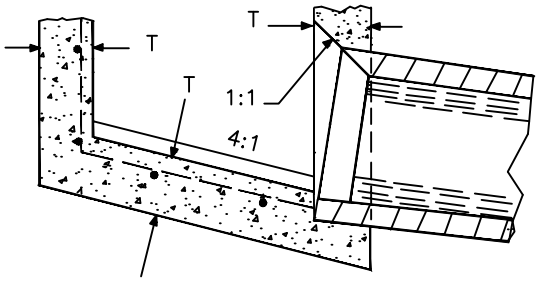
PLAN



STEP DETAIL



SECTION A-A



ALTERNATE FLOOR

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	CATCH BASIN TYPE I	300-1
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 1 OF 2

NOTES:

1. CURB OPENING SHALL CONFORM TO ADJACENT CURB ALIGNMENT.

2. REINFORCING STEEL FOR WALLS AND FLOOR SHALL BE #4 BARS @ 18 INCHES O.C. BOTH WAYS, PLACED 1–1/2 INCHES CLEAR TO INSIDE OF CATCH BASIN.

3. STEPS:
   a. NONE REQUIRED WHERE 'H' IS 3 FEET– 6 INCHES OR LESS.
   b. INSTALL LOWEST STEP 16 INCHES ABOVE FLOOR AND OTHER STEP(S) AT 12"–16" INTERVALS TO WITHIN 12" OF THE TOP OF THE BOX.
   c. WHERE 'H' IS MORE THAN 5 FEET– 0 INCHES, STEPS SHALL BE EVENLY SPACED AT 16 INCH INTERVALS FROM 16 INCHES ABOVE THE FLOOR TO WITHIN 12 INCHES OF THE TOP OF THE BOX.
   d. PLACE STEPS IN WALL WITHOUT PIPE PENETRATION.

4. PIPES MAY BE PLACED IN ANY WALL.

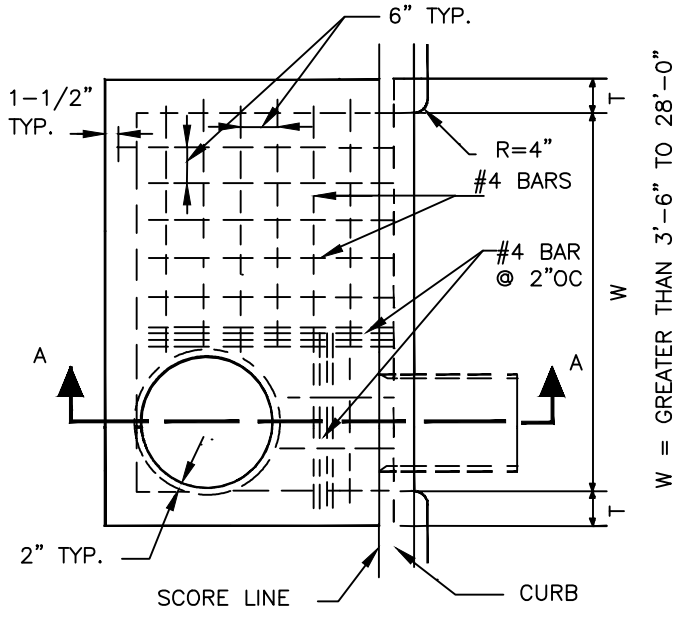
5. CATCH BASIN FLOORS SHALL BE SLOPED FROM ALL DIRECTIONS TOWARD OUTLET PIPE AND SHALL HAVE A WOOD TROWEL FINISH.

6. DIMENSIONS:
   H = 4 FEET– 0 INCHES UNLESS OTHERWISE SHOWN.
   T = 6 INCHES FOR H = 8 FEET– 0 INCHES OR LESS.
   T = 8 INCHES FOR H = 8 FEET– 1 INCH TO 20 FEET– 0 INCHES.

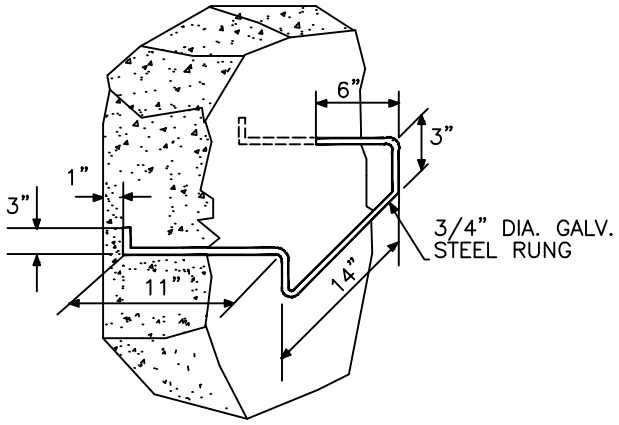
7. CURB FACE AT CATCH BASIN OPENING SHALL BE EQUAL TO EXISTING C.F. + DEPTH OF LOCAL DEPRESSION (A), SEE STD. PLAN No. 303–1.

8. CONCRETE: f'c = 3250 psi AT 28 DAYS.

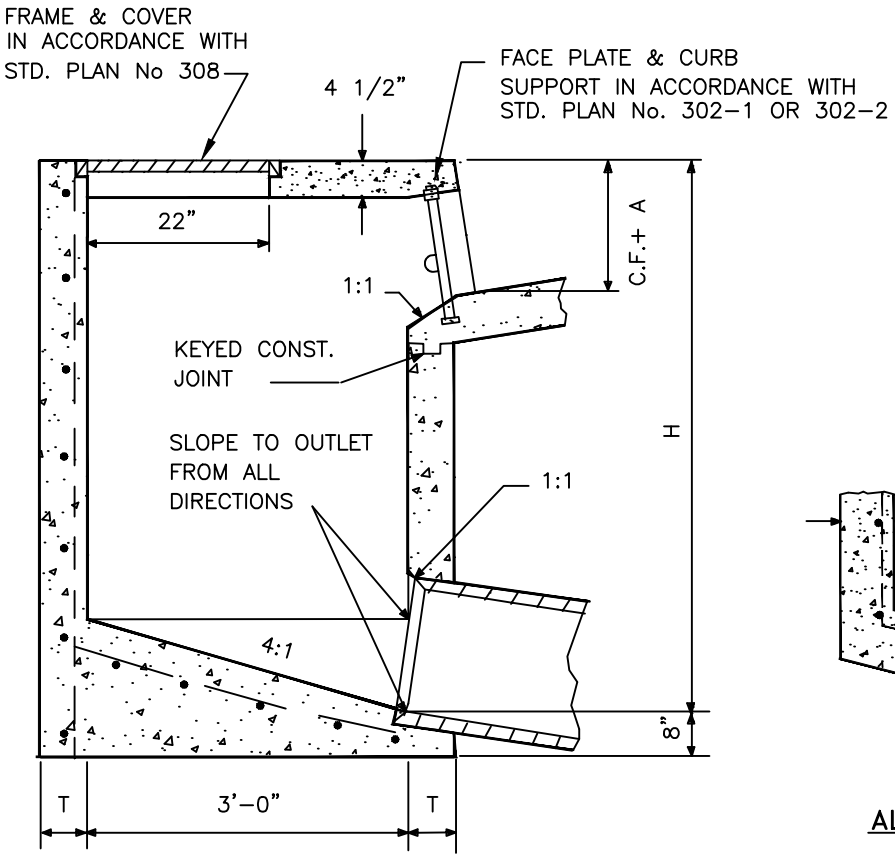
REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	NOTES FOR STANDARD PLAN 300	300-2
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 2 OF 2



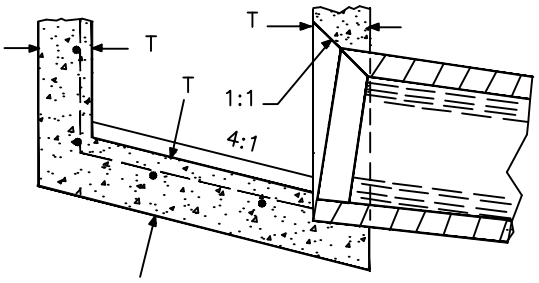
PLAN



STEP DETAIL



SECTION A-A



ALTERNATE FLOOR

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	CATCH BASIN TYPE II	301-1
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 1 OF 2

NOTES:

1. CURB OPENING SHALL CONFORM TO ADJACENT CURB ALIGNMENT.

2. REINFORCING STEEL FOR WALLS AND FLOOR SHALL BE #4 BARS @ 18 INCHES O.C. BOTH WAYS, PLACED 1–1/2 INCHES CLEAR TO INSIDE OF CATCH BASIN.

3. STEPS:
   a. NONE REQUIRED WHERE 'H' IS 3 FEET– 6 INCHES OR LESS.
   b. INSTALL ONE STEP 16 INCHES ABOVE FLOOR WHEN 'H' IS MORE THAN 3 FEET–6 INCHES AND LESS THAN 5 FEET– 0 INCHES.
   c. WHERE 'H' IS MORE THAN 5 FEET– 0 INCHES, STEPS SHALL BE EVENLY SPACED AT 16 INCH INTERVALS FROM 16 INCHES ABOVE THE FLOOR TO WITHIN 12 INCHES OF THE TOP OF THE BOX.
   d. PLACE STEPS IN WALL WITHOUT PIPE PENETRATION.

4. PIPES MAY BE PLACED IN ANY WALL.

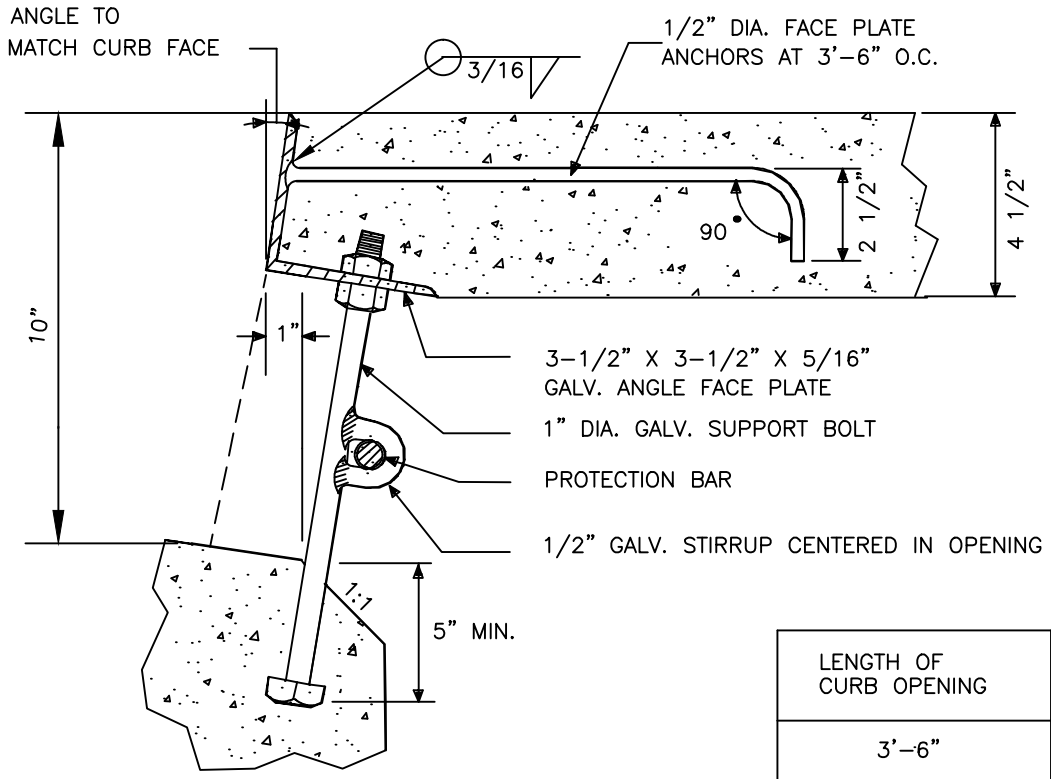
5. CATCH BASIN FLOORS SHALL BE SLOPED FROM ALL DIRECTIONS TOWARD OUTLET PIPE AND SHALL HAVE A WOOD TROWEL FINISH.

6. DIMENSIONS:
   H = 4 FEET– 0 INCHES UNLESS OTHERWISE SHOWN.
   T = 6 INCHES FOR H = 8 FEET– 0 INCHES OR LESS.
   T = 8 INCHES FOR H = 8 FEET– 1 INCH TO 20 FEET– 0 INCHES.

7. CURB FACE AT CATCH BASIN OPENING SHALL BE EQUAL TO EXISTING C.F. + DEPTH OF LOCAL DEPRESSION (A), SEE STD. PLAN No. 303–1.

8. CONCRETE: f'c = 3250 psi AT 28 DAYS.

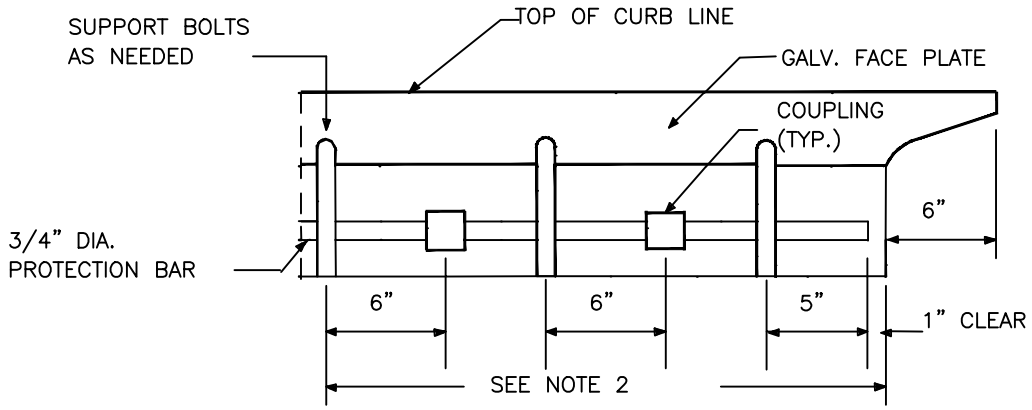
REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	NOTES FOR STANDARD PLAN 301-1	301-2
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 2 OF 2



FACE PLATE ANCHORAGE

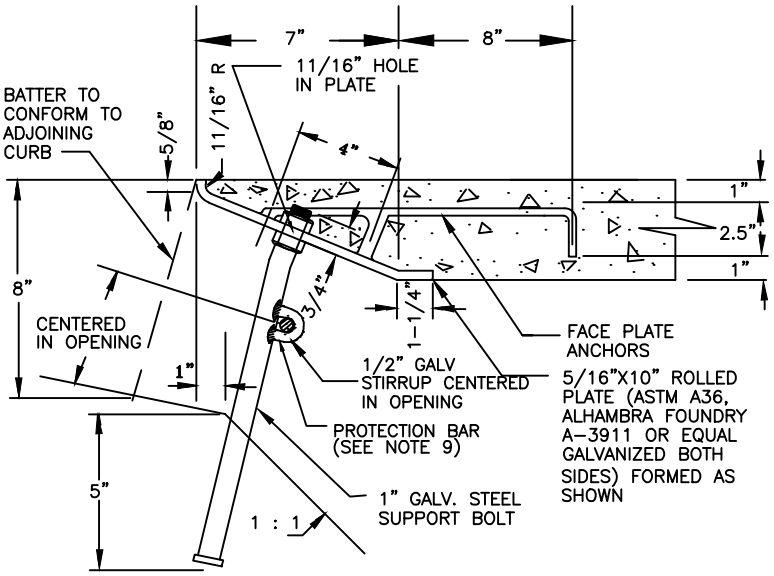
AND CURB SUPPORT DETAIL

LENGTH OF CURB OPENING	# OF ANCHORS
3'-6"	2
7'-0"	3
10'-0"	4
14'-0"	5
21'-0"	7



PROTECTION BAR DETAIL

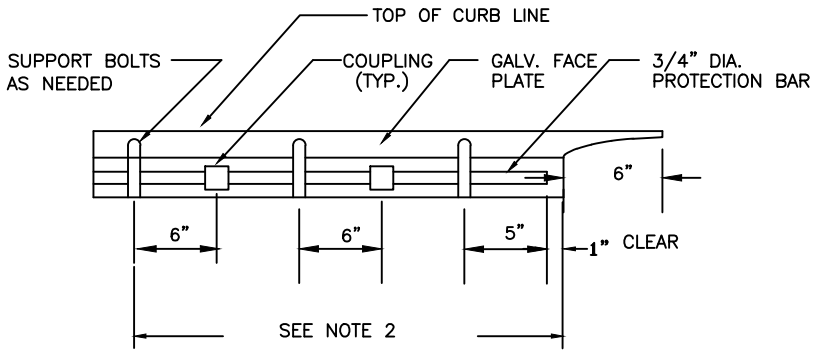
REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	CATCH BASIN DETAILS FOR STREETS WITH TYPE "A-2" CURB AND GUTTER	302-1
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 1 OF 2



BOLT AND ANCHOR
DETAIL FOR FACE PLATE

NOTES:

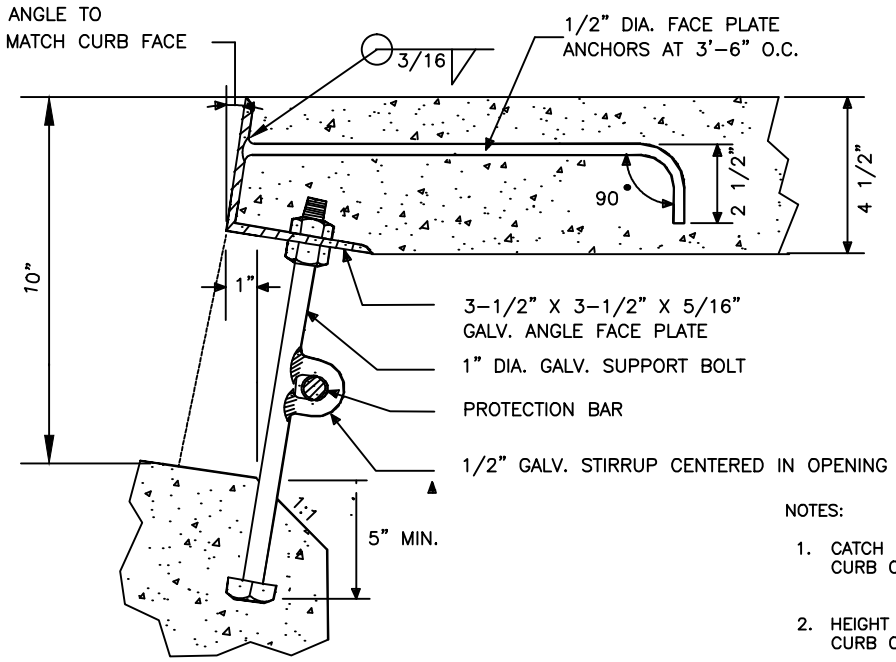
1. ONE SUPPORT BOLT SHALL BE PLACED 12 INCHES FROM EACH END OF FACE PLATE.
2. SUPPORT BOLTS SHALL BE SYMMETRICALLY SPACED IN THE CURB OPENING SO THAT THE UNSUPPORTED SPAN IS NOT MORE THAN 4 FEET.
3. ONE COUPLING SHALL BE PLACED 6 INCHES TO THE RIGHT OR LEFT OF EACH SUPPORT BOLT WITH THE EXCEPTION OF THE LAST SUPPORT BOLT. COUPLINGS SHALL BE THREADED TO FACILITATE REMOVAL OF PROTECTION BAR.
4. SUPPORT BOLTS SHALL BE INSTALLED IN ALL CATCH BASINS AND SPACED AS SHOWN IN THE PROTECTION BAR DETAIL.
5. FACE PLATE ANCHORS SHALL BE UNIFORMLY SPACED NOT TO EXCEED 4 FEET– 0 INCHES O.C. AND SHALL BE PLACED 4 1/2 INCHES FROM EACH END OF THE FACE PLATE.
6. A COUPLING MAY BE OMITTED PROVIDED THE PROTECTION BAR IS REMOVABLE AFTER INSTALLATION.
7. ALL METAL SHALL BE GALVANIZED AFTER FABRICATION.
8. SUPPORT BOLTS AND ANCHORS MAY BE ATTACHED BY A FULL PENETRATION BUTT WELD AS AN ALTERNATE SOLUTION.
9. PLACE 3/4 INCH DIAMETER PROTECTION BAR (ALHAMBRA FOUNDRY A–1564 OR EQUAL) HORIZONTALLY ACROSS THE ENTIRE LENGTH OF THE CURB OPENING. ONE PROTECTION BAR REQUIRED FOR 9 INCHES OR LESS OPENING AND TWO BARS FOR OPENINGS IN EXCESS OF 9 INCHES.
10. HEIGHT OF OPENING WILL VARY AS SHOWN ON STANDARD PLAN NO. 303–1.
11. THE WORDS "NO DUMPING, DRAINS TO OCEAN" SHALL BE STENCILED ON TOP OF THE CATCH BASIN INLET WITH 2 INCH LETTERS USING BLACK EPOXY PAINT. ANY VARIATIONS MUST BE APPROVED BY THE CITY ENGINEER.



PROTECTION BAR DETAIL

LENGTH OF CURB OPENING	# OF ANCHORS
3'–6"	2
7'–0"	3
10'–0"	4
14'–0"	5
21'–0"	7

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	CATCH BASIN DETAILS FOR STREETS WITH TYPE "D" CURB AND GUTTER	302-2
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 2 OF 2

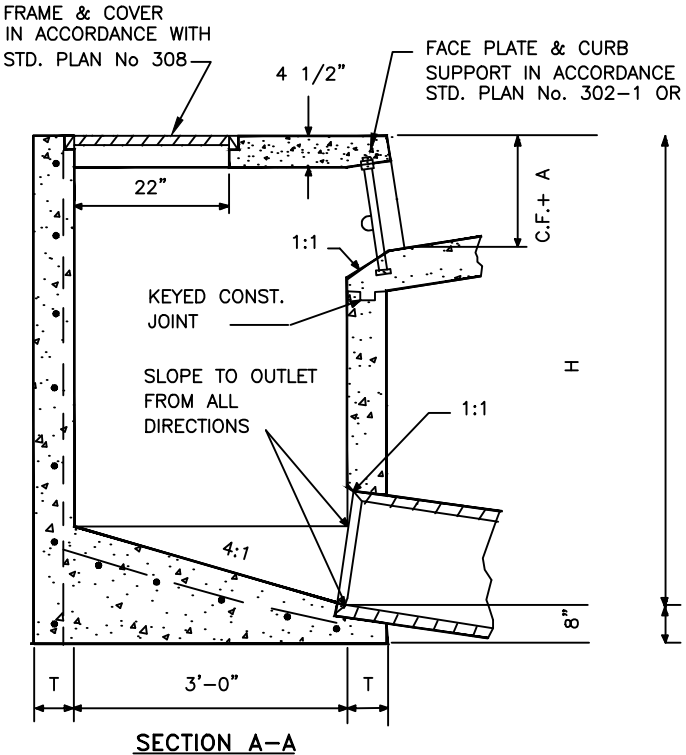


FACE PLATE ANCHORAGE

AND CURB SUPPORT DETAIL

NOTES:

1. CATCH BASIN SCREEN SHALL BE THE FULL LENGTH OF CURB OPENING.
2. HEIGHT OF SCREEN SHALL VARY ACCORDING TO HEIGHT OF CURB OPENING AS SHOWN ON STANDARD PLAN NO.303-1.
3. HEIGHT OF 2 INCHES OR MORE SHALL BE DESIGNATED FOR SCREEN OVERFLOW CLEARANCE, UNLESS OTHERWISE SPECIFIED BY THE CITY.
4. SCREEN INSTALLATION SHALL BE PARALLEL TO CURB FACE WITH A DEPRESSION DEPTH GREATER THAN 1 INCH.
5. SCREEN PATTERN DESIGN SHALL BE SQUARE-SHAPED WITH A WIDTH AND HEIGHT OF 3/4 INCH TO 1 INCH.
6. SUPPORT CLAMPS MOUNTING THE SCREEN TO THE PROTECTION BAR SHALL BE SYMMETRICALLY SPACED WITH NO FEWER THAN 2 CLAMPS PER 2 TO 6 FEET LENGTH OF CURB OPENING. UNSUPPORTED SCREEN SPAN SHALL NOT EXCEED 4 FEET.
7. MATERIALS SHALL INCLUDE GALVANIZED METAL, STAINLESS STEEL, POST-CONSUMER RECYCLED UV STABILIZED HDPE, OR FIBERGLASS COMPOSITE, UNLESS OTHERWISE SPECIFIED BY THE CITY.



SECTION A-A

LENGTH OF CURB OPENING	# OF SUPPORT CLAMPS
3'-6"	2
7'-0"	3
10'-0"	4
14'-0"	5
21'-0"	7

REVISIONS

CITY OF FOUNTAIN VALLEY

CATCH BASIN SCREENS

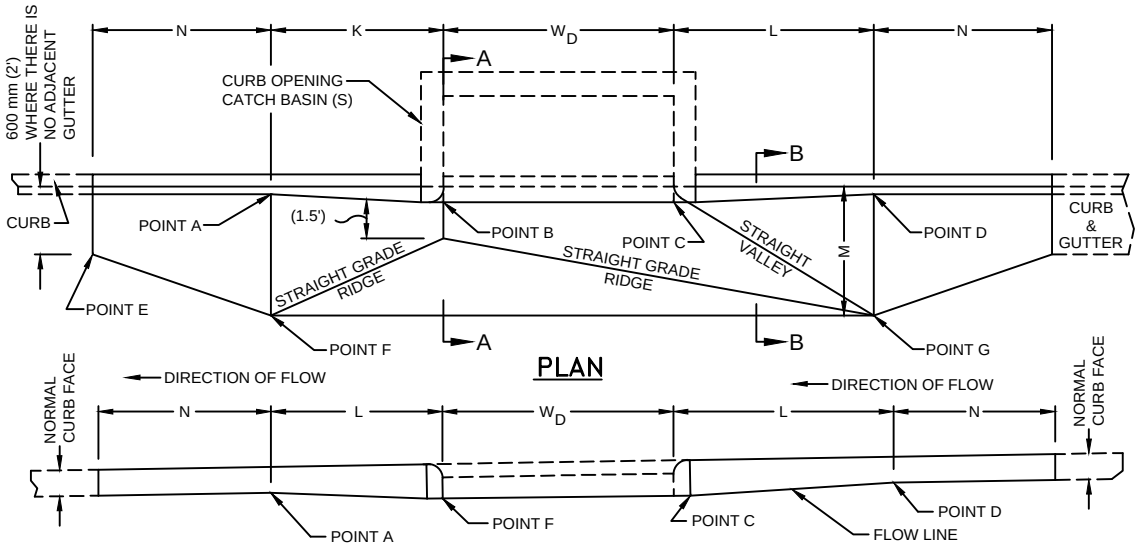
STANDARD PLAN NO.

302-3

APPROVED BY: MARK LEWIS R.C.E. 49335
CITY ENGINEER

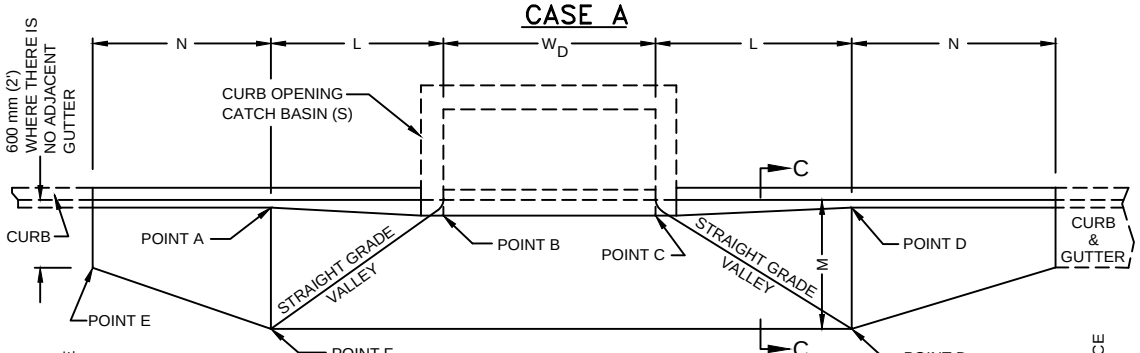
DATE: 04/01/15

SHEET: 3 OF 3

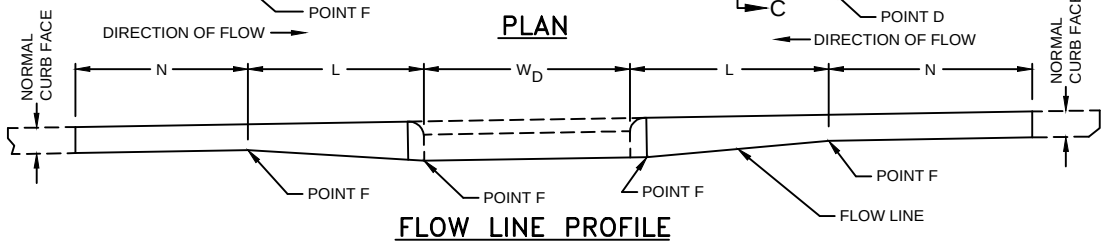


PLAN

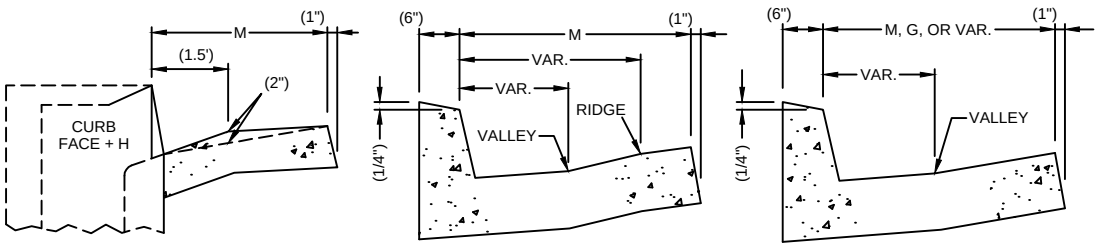
FLOW LINE PROFILE
CASE A



PLAN

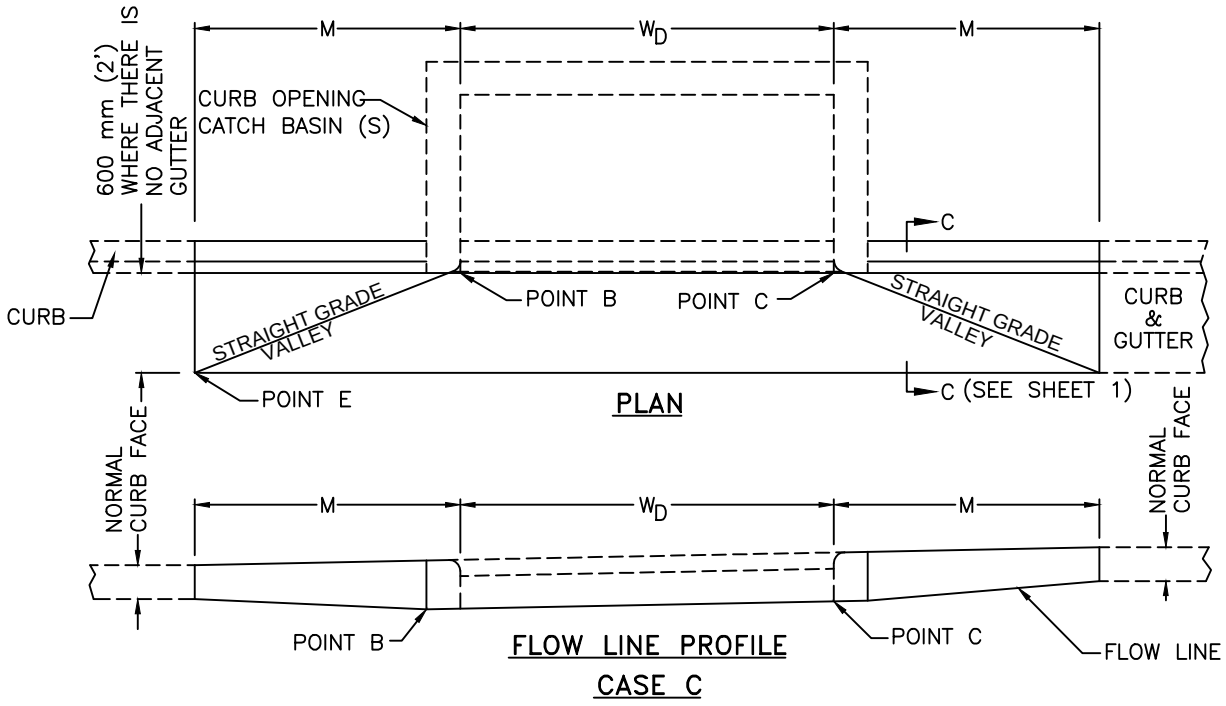


FLOW LINE PROFILE
CASE B



SECTION A–A SECTION B–B SECTION C–C

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	LOCAL DEPRESSIONS	303-1
APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER	DATE: 04/01/15	SHEET: 1 OF 3



NOTE:

1. ALL EXPOSED EDGES SHALL BE ROUNDED TO A 15 mm (HALF INCH) RADIUS.
2. THE CURB FACE AT POINTS A AND D SHALL BE THE NORMAL CURB FACE OF THE ADJACENT CURB. THE CURB FACE AT POINTS B AND C SHALL BE THE NORMAL CURB FACE OF THE ADJACENT CURB
3. PLUS H (SEE APPLICABLE CATCH BASIN STANDARD PLAN).
4. IN EXISTING STREETS WHERE NO PAVEMENT REHABILITATION IS INDICATED, THE ELEVATION OF THE OUTER EDGE OF THE LOCAL DEPRESSION SHALL MEET THE FINISHED STREET SURFACE.
   IN NEW STREETS, OR IN EXISTING STREETS WHERE PAVEMENT REHABILITATION IS INDICATED:
   THE ELEVATIONS OF POINTS F AND G SHALL BE SET H1 HIGHER THAN THE GUTTER FLOW LINE ELEVATIONS AT POINTS A AND D, RESPECTIVELY.
   THE ELEVATIONS OF POINTS P AND R SHALL BE SET H2 HIGHER THAN THE GUTTER FLOW LINE ELEVATIONS AT POINTS B AND C, RESPECTIVELY.
   THE ELEVATION OF POINT S2 SHALL BE SET H HIGHER THAN THE ELEVATION AT THE NEAREST GUTTER FLOW LINE.
   WHERE THERE IS NO GUTTER ADJACENT TO THE LOCAL DEPRESSION, THE ELEVATION OF POINT E SHALL BE SET H3 HIGHER THAN THE ELEVATION AT THE NEAREST TOE OF CURB.
5. DIMENSIONS:

H	=	NOTED ON THE PROJECT PLANS.
H1	=	NOTED ON THE PROJECT PLANS.
H2	=	NOTED ON THE PROJECT PLANS.
H3	=	NOTED ON THE PROJECT PLANS.
G	=	2 FEET.
K	=	5 FEET.
L	=	6 FEET.
M	=	4 FEET.
N	=	5 FEET.

W_D = CATCH BASIN W FOR ONE CATCH BASIN OR DISTANCE BETWEEN EXTREME END WALLS FOR MULTIPLE CATCH BASINS.
THE THICKNESS OF THE LOCAL DEPRESSION SHALL BE 200 mm (8 INCHES).

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	LOCAL DEPRESSION	303-2
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 2 OF 3

NOTE:

1. ALL EXPOSED EDGES SHALL BE ROUNDED TO A 15 mm (HALF INCH) RADIUS.

2. THE CURB FACE AT POINTS A AND D SHALL BE THE NORMAL CURB FACE OF THE ADJACENT CURB. THE CURB FACE AT POINTS B AND C SHALL BE THE NORMAL CURB FACE OF THE ADJACENT CURB

3. PLUS H (SEE APPLICABLE CATCH BASIN STANDARD PLAN).

4. IN EXISTING STREETS WHERE NO PAVEMENT REHABILITATION IS INDICATED, THE ELEVATION OF THE OUTER EDGE OF THE LOCAL DEPRESSION SHALL MEET THE FINISHED STREET SURFACE.

   IN NEW STREETS, OR IN EXISTING STREETS WHERE PAVEMENT REHABILITATION IS INDICATED:

   THE ELEVATIONS OF POINTS F AND G SHALL BE SET H1 HIGHER THAN THE GUTTER FLOW LINE ELEVATIONS AT POINTS A AND D, RESPECTIVELY.

   THE ELEVATIONS OF POINTS P AND R SHALL BE SET H2 HIGHER THAN THE GUTTER FLOW LINE ELEVATIONS AT POINTS B AND C, RESPECTIVELY.

   THE ELEVATION OF POINT S SHALL BE SET H2 HIGHER THAN THE ELEVATION AT THE NEAREST GUTTER FLOW LINE.

   WHERE THERE IS NO GUTTER ADJACENT TO THE LOCAL DEPRESSION, THE ELEVATION OF POINT E SHALL BE SET H3 HIGHER THAN THE ELEVATION AT THE NEAREST TOE OF CURB.

5. DIMENSIONS:

   H = NOTED ON THE PROJECT PLANS.

   H1 = NOTED ON THE PROJECT PLANS.

   H2 = NOTED ON THE PROJECT PLANS.

   H3 = NOTED ON THE PROJECT PLANS.

   G = 2 FEET.

   K = 5 FEET.

   L = 6 FEET.

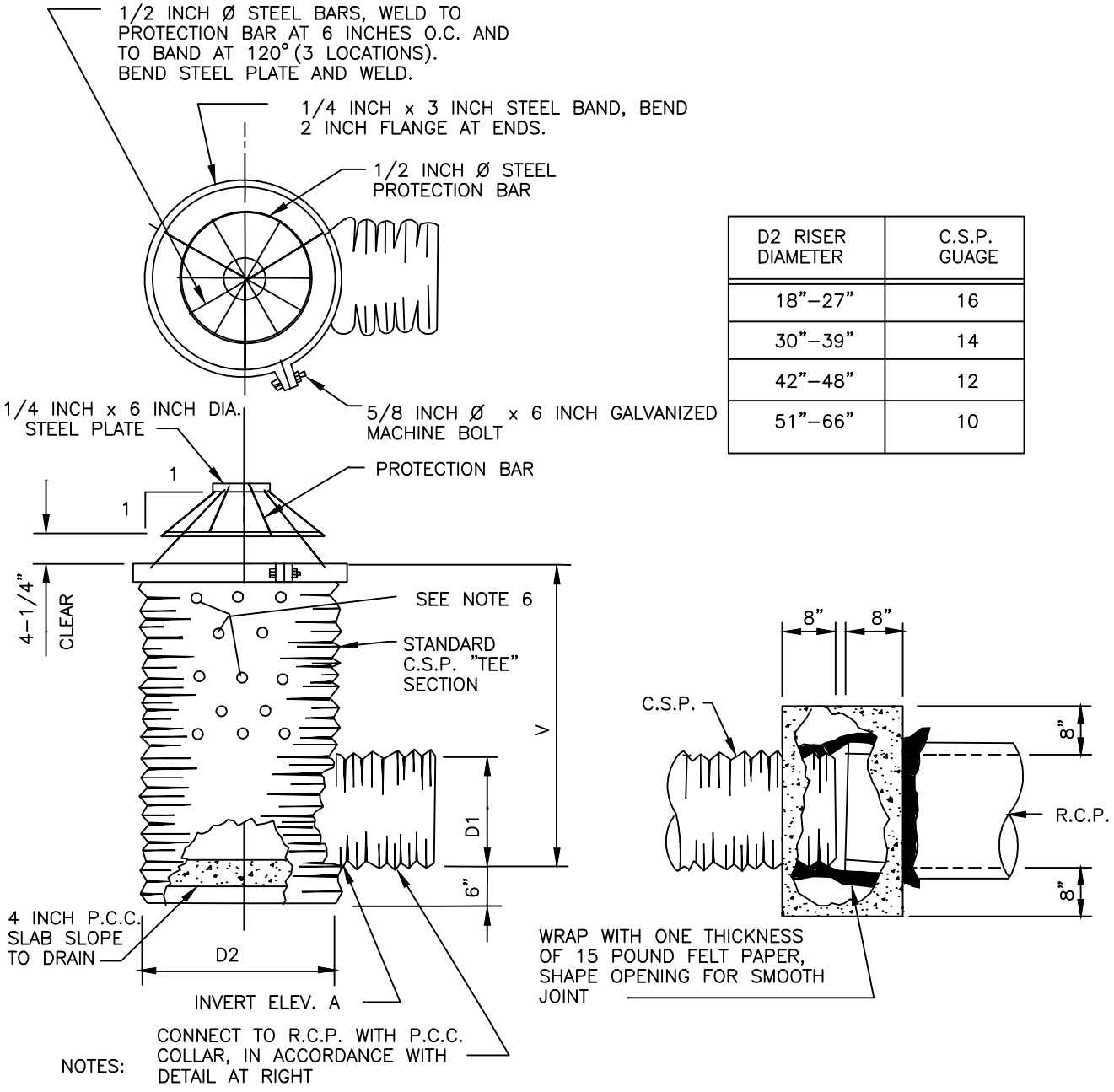
   M = 4 FEET.

   N = 5 FEET.

   W_D = CATCH BASIN W FOR ONE CATCH BASIN OR DISTANCE BETWEEN EXTREME END WALLS

FOR MULTIPLE CATCH BASINS.
THE THICKNESS OF THE LOCAL DEPRESSION SHALL BE 200 mm (8 INCHES).

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	LOCAL DEPRESSION	303-3
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 3 OF 3

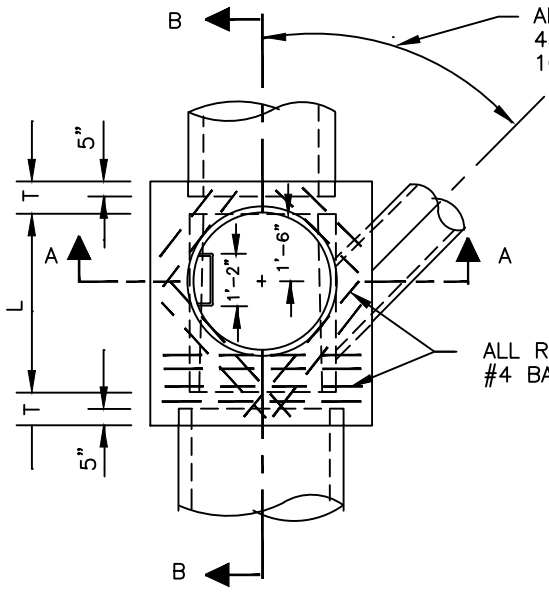


D2 RISER DIAMETER	C.S.P. GUAGE
18"–27"	16
30"–39"	14
42"–48"	12
51"–66"	10

NOTES:

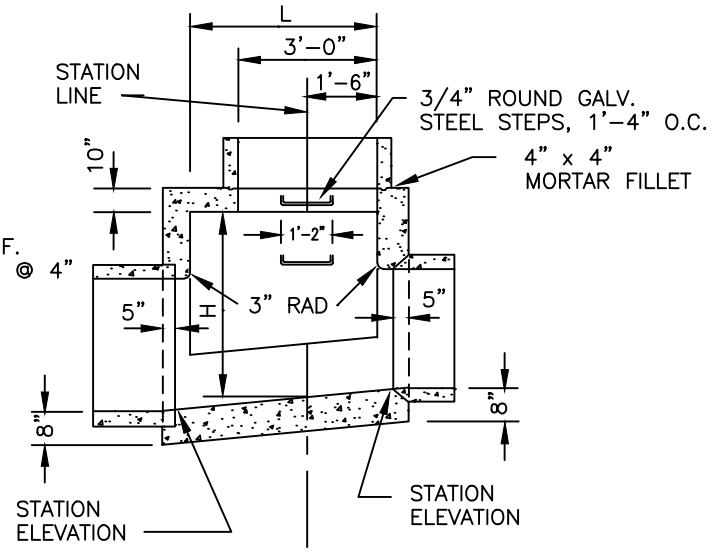
1. V, D1, D2 AND ELEVATION A SHALL BE SHOWN ON THE CONSTRUCTION PLANS.
2. GRATE ASSEMBLY SHALL BE FABRICATED TO FIT C.S.P. OF SIZE D2.
3. GRATE ASSEMBLY SHALL BE GALVANIZED AFTER FABRICATION.
4. R.C.P. SHALL BE SIZED TO FIT FUTURE CATCH BASIN DESIGN.
5. GRATE ASSEMBLY SHALL BE FABRICATED TO FIT THE OUTSIDE DIAMETER OF STANDARD JUNCTION STRUCTURE SHAFT IF INDICATED ON CONSTRUCTION PLANS.
6. 1/2 INCH WIDE SLOTS OR 1/2 INCH TO 1 INCH Ø HOLES.
7. D1 GAUGE SHALL BE SAME AS D2.

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	CORRUGATED STEEL PIPE DROP INLET	304
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 1 OF 1

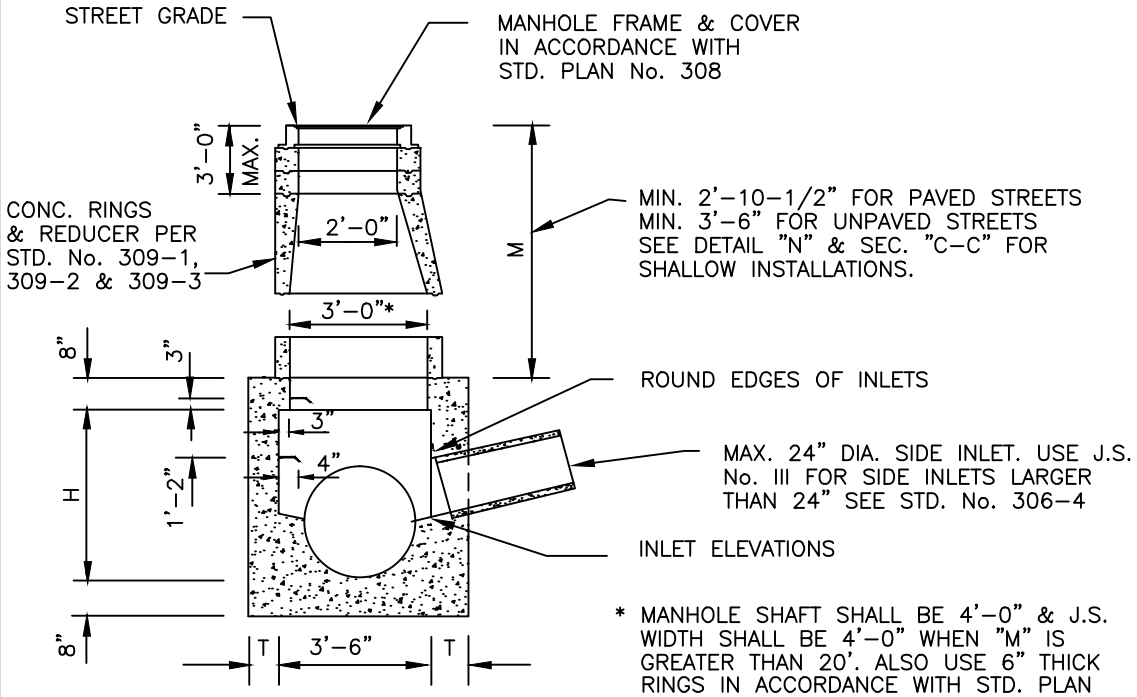


PLAN

(SHAFT NOT SHOWN)



SECTION B–B



SECTION A–A

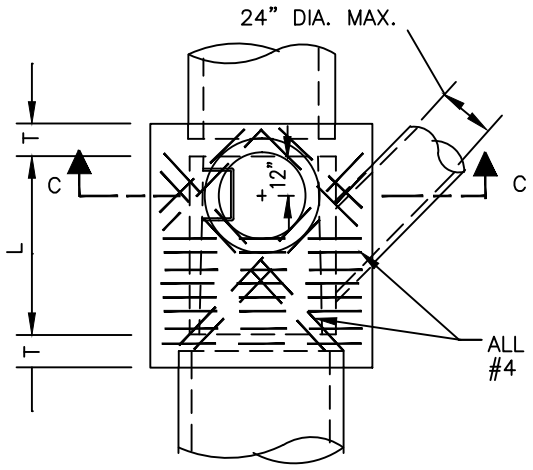
NOTES:

1. USE JUNCTION STRUCTURE NO. 1 FOR MAINLINE PIPES 39 INCH DIA. OR LESS.
2. SEE SHEET 2 Of 2 FOR NOTES AND OTHER DETAILS.

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	JUNCTION STRUCTURE NO. 1	305-1
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 1 OF 2

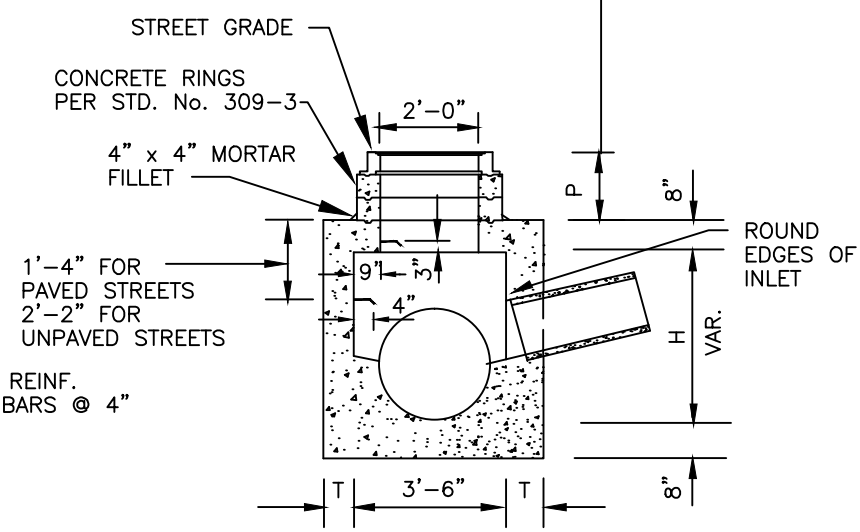
	MAX.	MIN.
PAVED STREETS	11"	8-1/2"
UNPAVED STREETS	16"	15"

SEE NOTE 4



DETAIL N

SHAFT NOT SHOWN
SEE NOTE 4

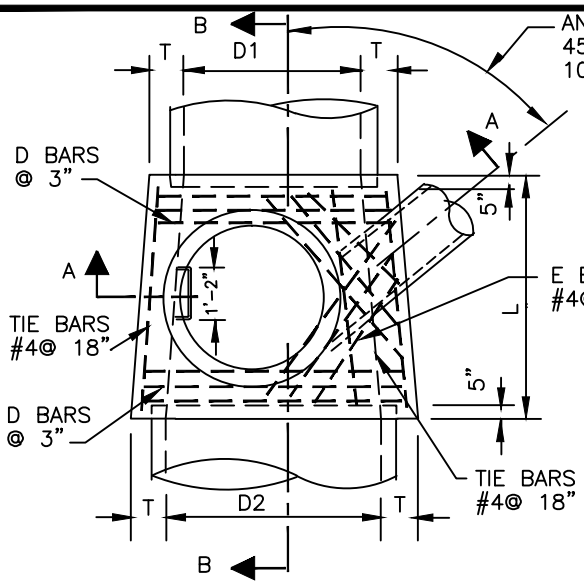


SECTION C-C

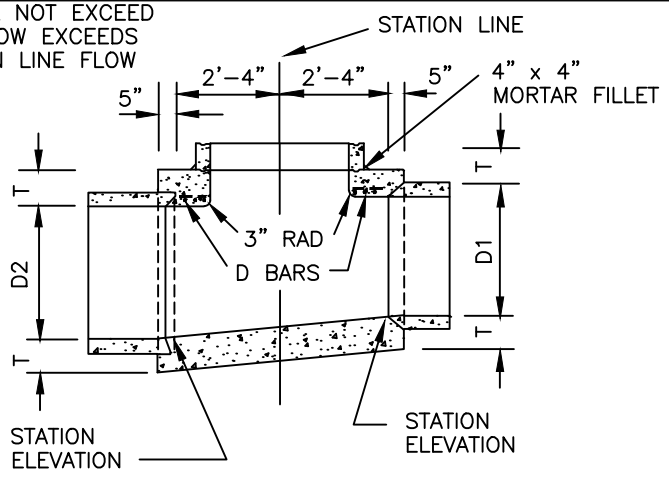
NOTES:

1. HEIGHT "H", IN SECTION A-A & SECTION B-B, SHALL NOT BE LESS THAN 4'-0", BUT MAY BE INCREASED AT THE OPTION OF THE ENGINEER, PROVIDED THAT THE VALUE OF "M" (SEE STD. PLAN No. 305-1) SHALL BE NOT LESS THAN THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED. FOR "H", IN SECTION C-C, SEE NOTE 4.
2. LENGTH "L" SHALL BE 4 FEET UNLESS OTHERWISE SHOWN ON THE PLANS.
3. THE SHAFT SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION C-C & DETAIL "N" WHEN DEPTH "M" FROM STREET GRADE TO TOP OF BOX IS LESS THAN 2'-10-1/2" FOR PAVED STREETS OR 3'-6" FOR UNPAVED STREETS (SEE STD. No. 305-1).
4. DEPTH "P" MAY BE REDUCED TO AN ABSOLUTE LIMIT OF 6 INCHES WHEN LARGER VALUE OF "P" WOULD REDUCE "H", IN SECTION C-C, TO 3 FEET- 6 INCHES OR LESS.
5. STEPS SHALL BE 3/4 INCH ROUND GALVANIZED STEEL AND ANCHORED NOT LESS THAN 6 INCHES IN THE WALLS OF STRUCTURE. UNLESS OTHERWISE SHOWN, STEPS SHALL BE PLACED 1'-4" ON CENTER. THE LAST STEP SHALL BE NOT MORE THAN 2' ABOVE THE LEDGE AT THE SIDE OF THE MANHOLE FLOOR.
6. "T" SHALL BE 8 INCHES FOR VALUES OF "H" TO 8 FEET. "T" SHALL BE 10 INCHES FOR VALUE OF "H" OVER 8 FEET.
7. ALL REINFORCING STEEL SHALL HAVE 1-1/2 INCHES CLEAR FROM FACE OF CONCRETE.
8. FLOOR OF MANHOLE SHALL BE STEEL TROWELED.
9. RINGS, REDUCER AND PIPE FOR ACCESS SHAFT SHALL BE SEATED IN 1:2 MORTAR AND NEATLY POINTED OR WIPED INSIDE THE SHAFT.
10. LEDGE SHALL BE SLOPED AT 2 INCHES PER FOOT.
11. CONCRETE : f'c = 3250 p.s.i. AT 28 DAYS.

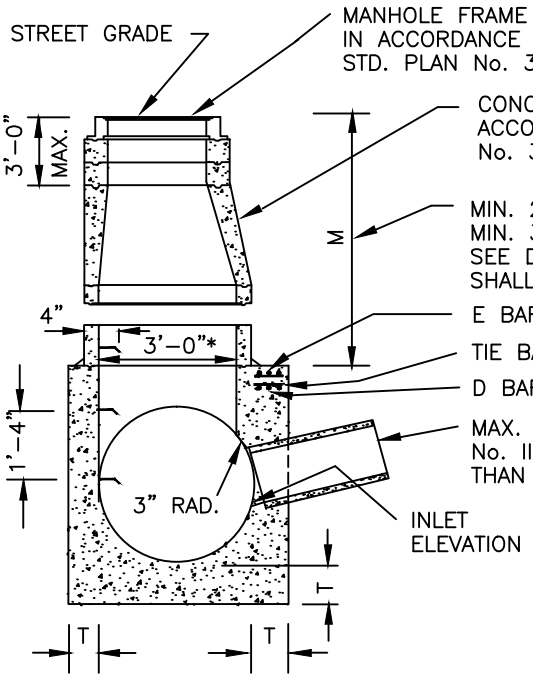
REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	JUNCTION STRUCTURE NO. 1	305-2
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 2 OF 2



PLAN
(SHAFT NOT SHOWN)



SECTION B-B



SECTION A-A

TABLE OF VALUES FOR T	
D2	T
42"	8"
45"	8"
48"	8"
51"	8"-1/2"
54"	9"
57"	9-1/4"
60"	9-1/2"
63"	10"
66"	10-1/4"
69"	10-3/4"
72"	11"
78"	11-3/4"
84"	12-1/2"
90"	13-1/4"
96"	14"

* MANHOLE SHAFT SHALL BE 4'-0" & J.S. WIDTH SHALL BE 4'-0" WHEN "M" IS GREATER THAN 20'. ALSO USE 6" THICK RINGS IN ACCORDANCE WITH STD. PLAN No. 309-2 & 309-3

NOTES:

1. SEE SHEET 2 OF 2 FOR NOTES AND OTHER DETAILS.
2. USE JUNCTION STRUCTURE No. II FOR MAINLINE PIPE 42 INCH DIA. OR LARGER.

REINF. STEEL TABLE FOR JUNCTION STRUCTURE No. II						
D BARS				E BARS		
DIAM. D2	MIN. NO. REQ'D	SIZE	LENGTH	MIN. NO. REQ'D	SIZE	LENGTH
42"*	6	#5	4'-6"	4	#4	3'-2"
45"*	6	#5	4'-10"	4	#4	3'-5"
48"	6	#5	5'-1"	4	#4	3'-7"
51"	6	#5	5'-5"	6	#4	4'-9"
54"	6	#5	5'-9"	6	#4	5'-1"
57"	6	#5	6'-1"	6	#4	5'-6"
60"	6	#5	6'-4"	6	#4	5'-11"
63"	6	#5	6'-8"	6	#4	6'-3"
66"	6	#5	7'-0"	8	#4	6'-8"
69"	6	#5	7'-4"	8	#4	6'-8"
72"	6	#5	7'-7"	8	#4	6'-8"
78"	6	#5	8'-3"	8	#4	6'-8"
84"	6	#5	8'-10"	10	#4	6'-8"
90"	6	#6	9'-6"	10	#4	6'-8"
96"	6	#6	10'-1"	10	#4	6'-8"

REVISIONS

CITY OF FOUNTAIN VALLEY

JUNCTION STRUCTURE NO. 2

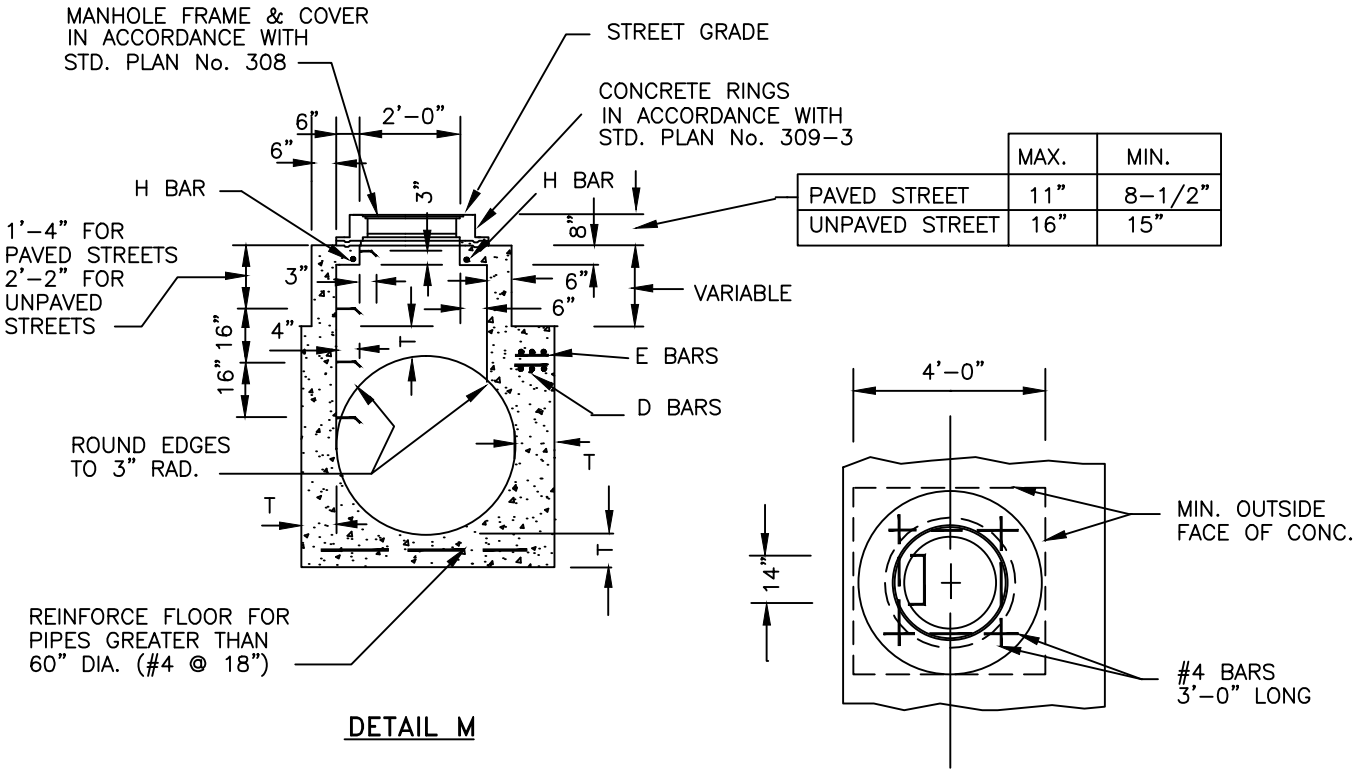
STANDARD PLAN NO.

306-1

APPROVED BY: MARK LEWIS R.C.E. 49335
CITY ENGINEER

DATE: 04/01/15

SHEET: 1 OF 6



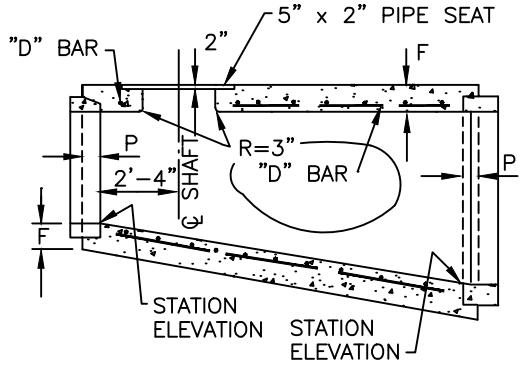
	MAX.	MIN.
PAVED STREET	11"	8-1/2"
UNPAVED STREET	16"	15"

DETAIL M

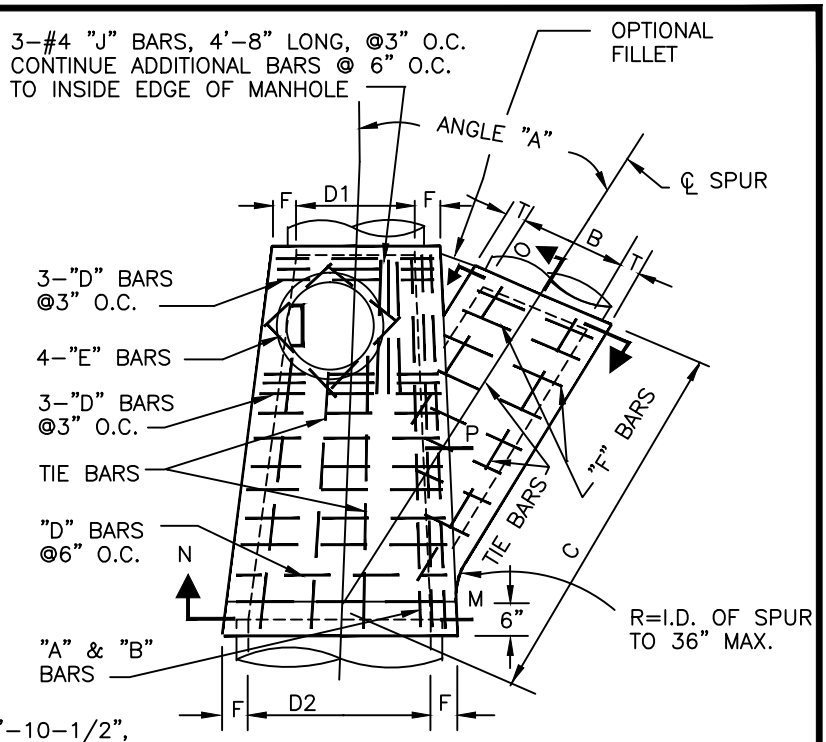
NOTES:

1. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTERLINE OF STORM DRAIN WHEN DIAMETER D1 IS 48 INCHES OR LESS, IN WHICH CASE PLACE "E" BAR SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE.
2. LENGTH "L" SHALL BE 5'-6" UNLESS OTHERWISE SHOWN ON PLANS. WHEN "L" IS SPECIFIED ON PLANS TO BE GREATER THAN 5'-6" CONTINUE "D" BARS AT 6 INCHES O.C.
3. LENGTHS SHOWN IN STEEL TABLE ARE FOR THE LONGEST BARS. WHERE SHORTER BARS ARE REQUIRED, BEND OR CUT BARS AS REQUIRED.
4. USE DETAIL "M" WHEN DEPTH OF MANHOLE FROM STREET GRADE TO TOP OF BOX IS LESS THAN SHOWN ON SECTION A-A BY CONSTRUCTING MONOLITHIC SHAFT AS SHOWN IN DETAIL. WHEN D1 IS LESS THAN 48 INCHES SEE NOTE No. 1 .
5. THICKNESS OF DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL PIPE SEAT, BUT SHALL NOT BE LESS THAN VALUES FOR "T" SHOWN IN TABLE.
6. REINFORCING STEEL SHALL HAVE 1-1/2 INCHES CLEAR FROM FACE OF CONCRETE.
7. STEPS SHALL BE 3/4 INCH ROUND GALVANIZED STEEL AND ANCHORED NOT LESS THAN 6 INCHES IN THE WALLS OF THE STRUCTURE. SPACING SHALL BE 1-4 INCHES ON CENTER. THE LOWEST STEP SHALL BE NOT MORE THAN 2'-0" ABOVE THE INVERT.
8. RINGS, REDUCER AND PIPE FOR ACCESS SHAFT SHALL BE SEATED IN 1:2 MORTAR AND NEATLY POINTED OR WIPED INSIDE THE SHAFT.
9. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
10. BODY OF MANHOLE SHALL BE CONSTRUCTED IN ONE CONTINUOUS OPERATION, EXCEPT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY AT THE SPRING LINE.
11. CONCRETE: f'c = 3250 p.s.i. AT 28 DAYS.

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	JUNCTION STRUCTURE NO. 2	306-2
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 2 OF 6

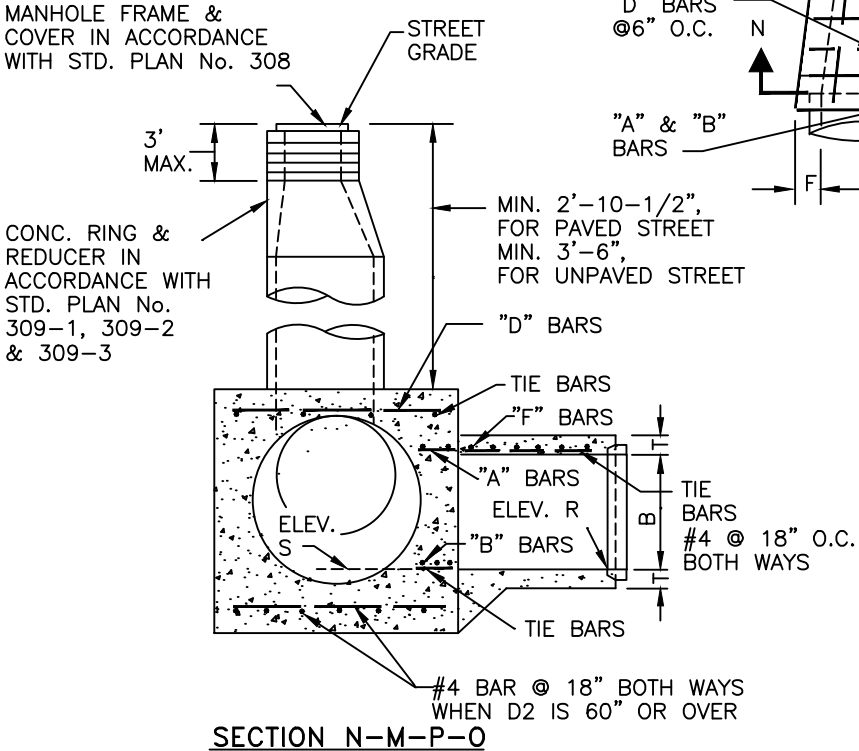


LONGITUDINAL SECTION



PLAN

SHAFT NOT SHOWN



SECTION N-M-P-O

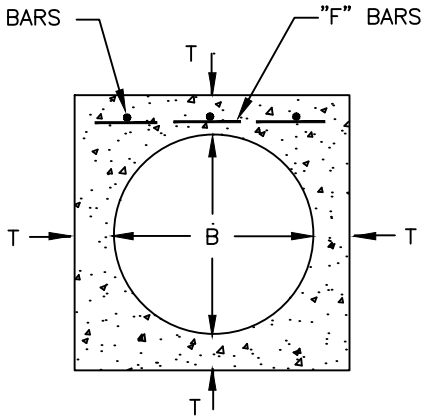
TABLE OF BAR SIZES PROJECTED ON N-M-P-O		
D2 OR B	A & B BARS	D & F BARS
24"-39'	#5 @ 3"	#4 @ 6"
42"-84"	#6 @ 3"	#5 @ 6"
90"-96"	#7 @ 3"	#6 @ 6"

TABLE OF VALUE FOR F AND T			
D2	F	B	T
36"	8"	24"	5-1/4"
39"	8"	27"	5-1/2"
42"	8"	30"	6"
45"	8"	33"	6-1/4"
48"	8"	36"	6-1/2"
51"	8-1/2"	39"	7"
54"	9"	42"	7-1/2"
57"	9-1/4"	45"	7-3/4"
60"	9-1/2"	48"	8"
63"	10"	51"	8-1/2"
66"	10-1/4"	54"	9"
69"	10-3/4"	57"	9-1/4"
72"	11"	60"	9-1/2"
78"	11-3/4"	63"	10"
84"	12-1/2"	66"	10-1/2"
90"	13-1/4"	69"	10-3/4"
96"	14"	72"	11"

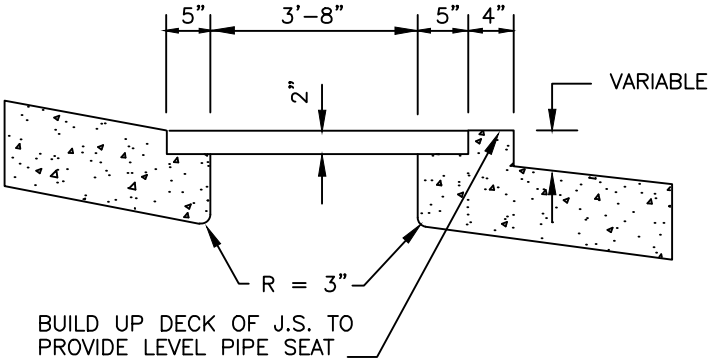
NOTES:

1. USE JUNCTION STRUCTURE No. III FOR INLET PIPES LARGER THAN 24 INCHES.
2. SEE SHEET 2 OF 2 FOR NOTES AND OTHER DETAILS.

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	JUNCTION STRUCTURE NO. 3	306-3
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 3 OF 6



SECTION G–G

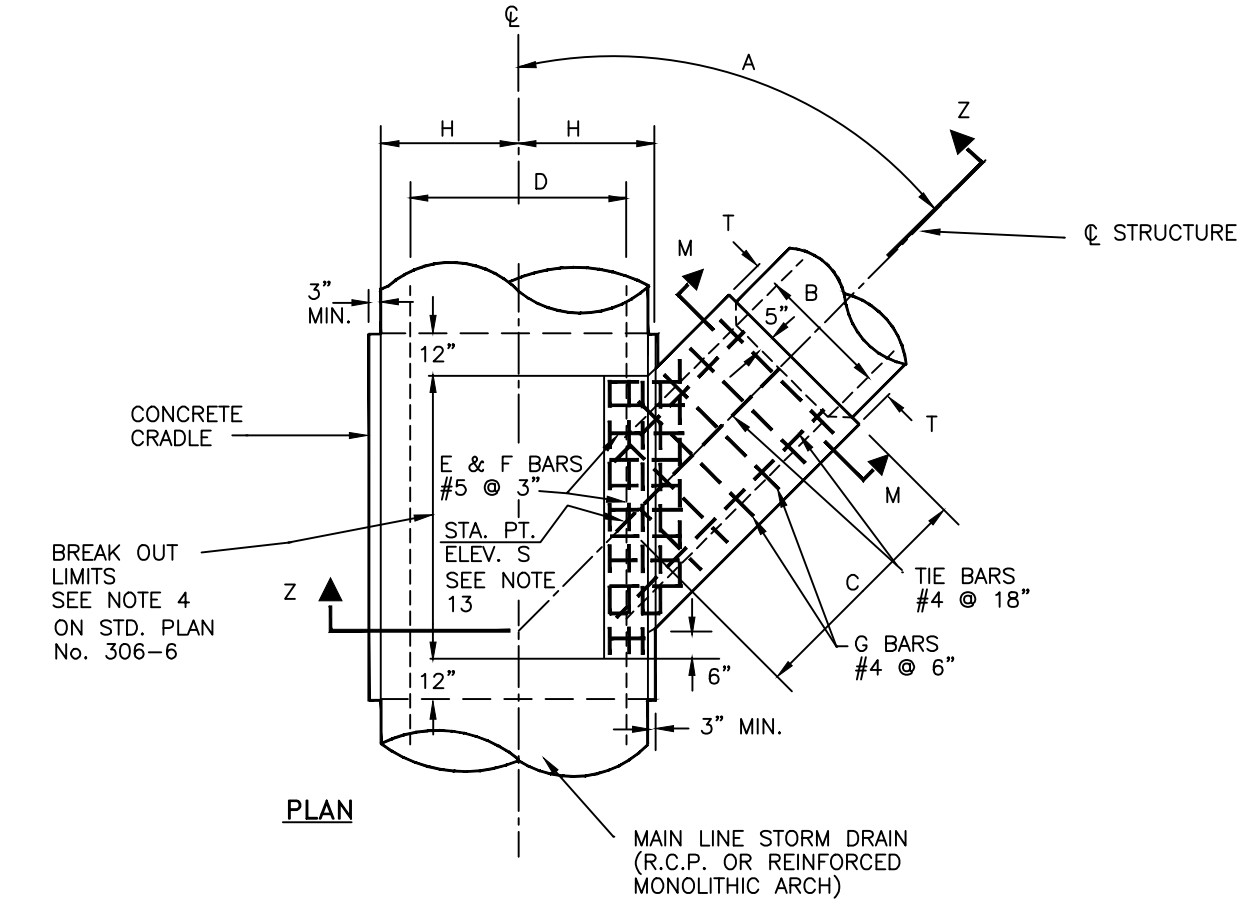


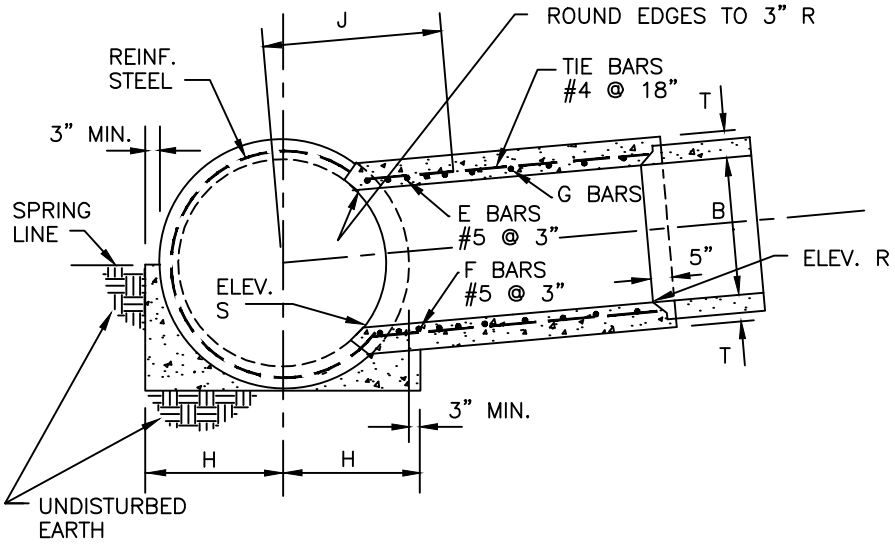
SHAFT SEAT DETAIL

NOTES:

1. VALUE FOR "A", "B', "C", "D1", "D2", ELEVATION "R" AND ELEVATION "S" ARE SHOWN ON PLANS.
2. IF LATERALS ENTER BOTH SIDES OF JUNCTION STRUCTURE, THE ACCESS SHAFT SHALL BE LOCATED ON THE SIDE RECEIVING THE SMALLER LATERAL.
3. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER THE CENTERLINE OF THE STORM DRAIN WHEN D1 IS 48 INCHES OR LESS, IN THIS CASE PLACE 4–"E" BARS (#4) SYMMETRICALLY AROUND THE SHAFT AT 45° WITH THE CENTERLINE.
4. LENGTH OF JUNCTION STRUCTURE CAN BE INCREASED AT CONTRACTOR'S OPTION TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION OF THE SPUR MUST BE APPROVED BY THE CITY ENGINEER.
5. THE STATION POINT, AS SHOWN ON THE PLANS, IS DEFINED AS THE INTERSECTION OF THE CENTERLINE OF THE MAIN LINE AND THE CENTERLINE OF THE SPUR.
6. USE DETAIL "M" OF STANDARD No. 306–2 WHEN DEPTH OF THE SHAFT FROM STREET GRADE TO THE TOP OF THE JUNCTION STRUCTURE IS LESS THAN 2'–10–1/2" FOR PAVED STREETS OR 3'–6" FOR UNPAVED STREETS. CONSTRUCT MONOLITHIC SHAFT AS SHOWN ON DETAIL "M". CONSTRUCTION OF MANHOLE SHAFT PER DETAIL "M" FOR ANY DEPTH OF MANHOLE IS OPTIONAL. WHEN D1 IS 48 INCHES OR LESS SEE NOTE 3.
7. REINFORCING STEEL SHALL BE 1–1/2 INCHES CLEAR FROM FACE OF CONCRETE. TIE BARS SHALL BE #4 @ 18 INCHES MAX.
8. EMBEDMENT "P" SHALL BE 5 INCHES FOR D2 TO 96 INCHES OR LESS AND 8 INCHES FOR D2 OVER 96 INCHES.
9. STEP SHALL BE 3/4 INCH Ø GALVANIZED STEEL, AND ANCHORED NOT LESS THAN 6 INCHES IN THE WALLS OF THE STRUCTURE. STEP SPACING SHALL BE 1'–4" WITH THE LOWEST STEP NOT MORE THAN 2 FEET ABOVE THE INVERT.
10. RING, REDUCER AND PIPE FOR ACCESS SHAFT SHALL BE SEATED IN 1:2 MIX MORTAR AND NEATLY POINTED OR WIPED INSIDE THE SHAFT.
11. FLOOR OF JUNCTION STRUCTURE SHALL BE STEEL TROWELED TO THE SPRING LINE.
12. BODY OF JUNCTION STRUCTURE, INCLUDING SPUR, SHALL BE CONSTRUCTED IN ONE, CONTINUOUS OPERATION, EXCEPT THAT A CONSTRUCTION JOINT AT THE SPRING LINE, WITH A LONGITUDINAL KEYWAY, IS OPTIONAL.
13. ELEVATION "S" APPLIES AT THE CENTERLINE OF THE MAIN LINE ON THE PROLONGATION OF THE INVERT OF THE SPUR.
14. CONCRETE: f'c = 3250 PSI AT 28 DAYS.

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	JUNCTION STRUCTURE NO. 3	306-4
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 4 OF 6





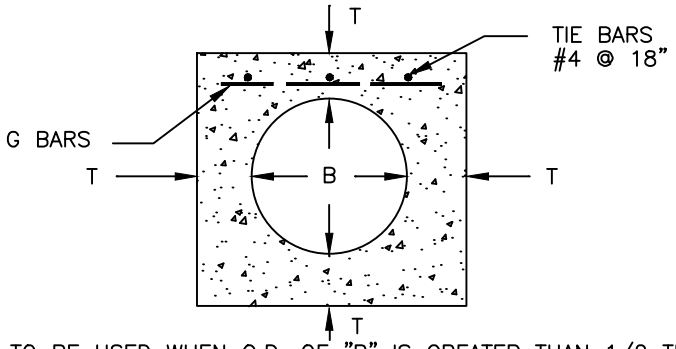
SECTION Z-Z

TABLE OF VALUE FOR T	
B	T
12"	6"
15"	6"
18"	6"
21"	6"
24"	7"
27"	7"
30"	7"
33"	7"
36"	7"
39"	7"

NOTES:

1. SEE SHEET 2 OF 2 FOR NOTES AND OTHER DETAILS.
2. USE JUNCTION STRUCTURE No. IV WHEN O.D. OF "B" > 1/2 THE I.D. OF "D", MAXIMUM "B" = 39 INCHES.

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	JUNCTION STRUCTURE NO. 4	306-5
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 5 OF 6



SECTION M–M

NOTES:

1. JUNCTION STRUCTURE No. IV IS TO BE USED WHEN O.D. OF "B" IS GREATER THAN 1/2 THE I.D. OF "D", OR "B" IS GREATER THAN 24 INCHES. "B" SHALL NOT EXCEED 3/4 "D" OR 39 INCHES. NO MORE THAN ONE OPENING SHALL BE MADE IN ONE SECTION OF PIPE.

2. VALUE OF A,B,C, AND D ARE SHOWN ON PROJECT DRAWINGS. ELEVATION "R" AND ELEVATION "S" ARE SHOWN WHEN REQUIRED PER NOTE 12.

3. ELEVATION "S" APPLIES AT INSIDE WALL OF STRUCTURE.

4. BREAKOUT LIMITS SHALL BE DETERMINED AS FOLLOWS:
   UPSTREAM LIMIT – THE INTERSECTION OF THE OUTSIDE OF THE SPUR WALL WITH THE MAIN LINE PIPE WALL.
   DOWNSTREAM LIMIT – 6 INCHES DOWNSTREAM OF THE INTERSECTION OF THE OUTSIDE OF THE SPUR WALL WITH THE MAIN LINE PIPE WALL.
   THE OPENING SHALL BE RECTANGULAR AND CUT NORMAL TO THE PIPE SURFACE WITHOUT DAMAGING REINFORCING STEEL. PROVIDE A CONCRETE ENCASEMENT 1' ABOVE THE TOP OF THE MAIN LINE PIPE TO THE LIMITS OF THE CONCRETE CRADLE, IF A JOINT IN THE MAIN LINE PIPE FALLS WITHIN THE LIMITS OF THE CRADLE.

5. THE TRANSVERSE REINFORCEMENT IN PIPE SHALL BE CUT AT CENTER OF OPENING AND BENT INTO TOP AND BOTTOM SLABS OF SPUR.

6. THE MAIN LINE PIPE SHALL BE CRADLED AND ENCASED IN CONCRETE IN ACCORDANCE WITH STANDARD PLAN No. 310, EXTENDING LONGITUDINALLY 12 INCHES BEYOND THE LIMITS OF BREAKOUT (SEE NOTE 4). CRADLE MAY BE OMITTED ON SIDE OPPOSITE LATERAL INLET WHEN CONSTRUCTED IN CONNECTION WITH EXISTING STORM DRAIN.

7. REINFORCING STEEL SHALL BE PLACED 1–1/2 INCHES CLEAR FROM FACE OF CONCRETE, UNLESS OTHERWISE SHOWN.

8. E AND F BARS SHALL BE CARRIED TO A POINT NOT LESS THAN J DISTANCE FROM CENTERLINE. $J = 7/12\ D + 6$ INCHES.

9. CONCRETE f'c = 3250 PSI AT 28 DAYS.

10. FLOOR OF STRUCTURE SHALL BE STEEL TROWELED TO SPRING LINE.

11. WHEN JUNCTION STRUCTURE No. IV IS SPECIFIED WITH REINFORCED MONOLITHIC ARCH STORM DRAIN, VALUE D SHALL REFER TO THE CLEAR SPAN OF THE ARCH. REINFORCING STEEL SHALL BE CUT AND BENT INTO JUNCTION STRUCTURE IN THE SAME MANNER AS FOR PIPE. CONCRETE CRADLE UNDER REINFORCED MONOLITHIC ARCH IS NOT REQUIRED.

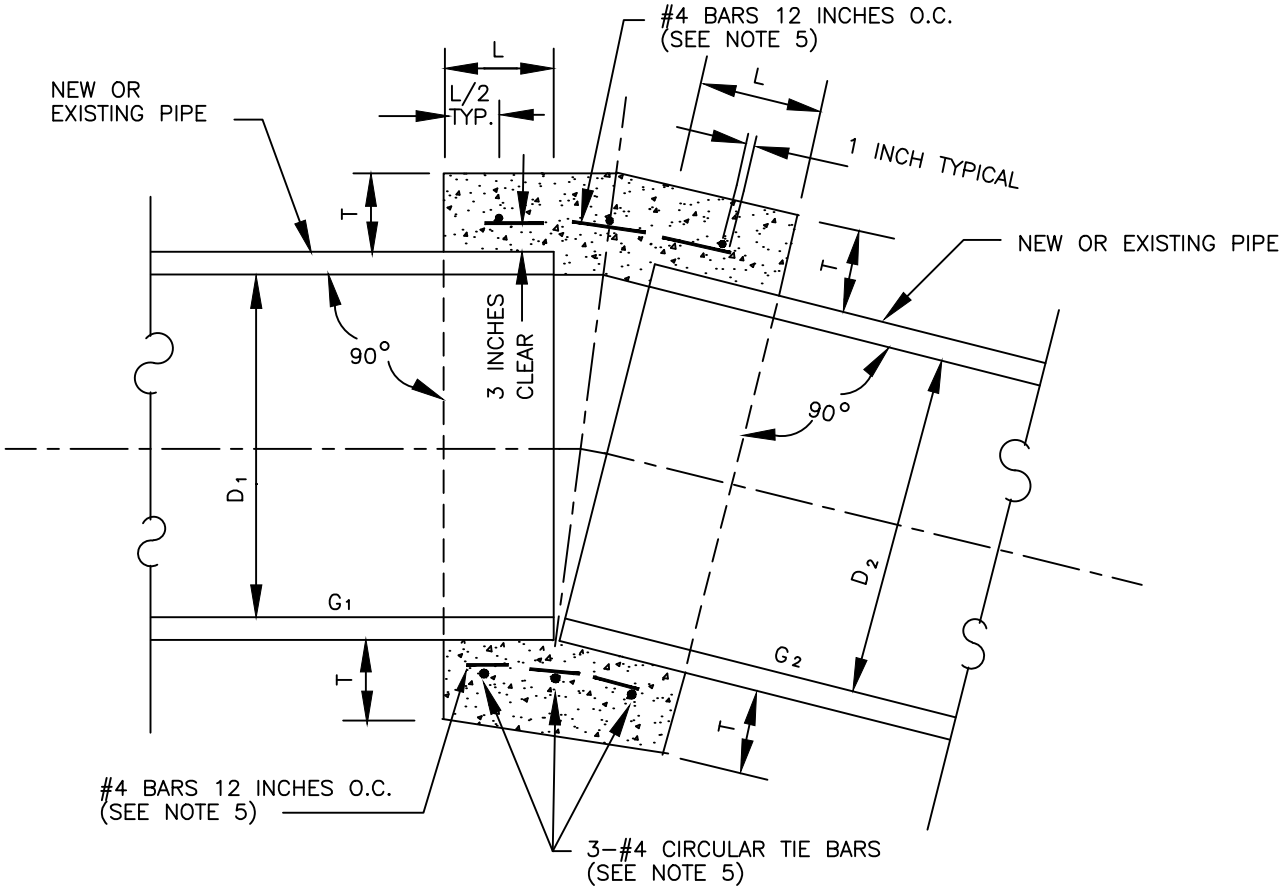
12. INLET PIPE SHALL ENTER MAIN LINE RADIALLY WHEN ELEVATIONS "R" AND "S" ARE NOT SHOWN ON PROJECT DRAWINGS, AND INLET PIPE SHALL BE LAID ON A STRAIGHT GRADE FROM ELEVATION "S" TO CATCH BASIN OR GRADE BREAK IN LINE. ELEVATION "R" SHALL BE SHOWN ON PROJECT DRAWINGS ONLY WHEN STUB IS TO BE PROVIDED IN MAIN LINE FOR FUTURE INLET PIPE.

13. STATIONS SPECIFIED ON DRAWINGS APPLY AT THE INTERSECTION OF CENTERLINES OF MAIN LINE AND LATERALS, EXCEPT THAT STATIONS FOR CATCH BASIN CONNECTOR PIPE APPLY AT INSIDE OF STRUCTURE.

14. JUNCTION STRUCTURE No. IV SHALL NOT BE USED WHEN ASBESTOS CEMENT PIPE IS USED FOR MAIN LINE.

15. JUNCTION STRUCTURE No. IV SHALL BE USED ONLY WHEN SUFFICIENT MEANS OF ACCESS IS AVAILABLE FOR STORM DRAIN MAINTENANCE.

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	JUNCTION STRUCTURE NO. 4	306-6
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 6 OF 6



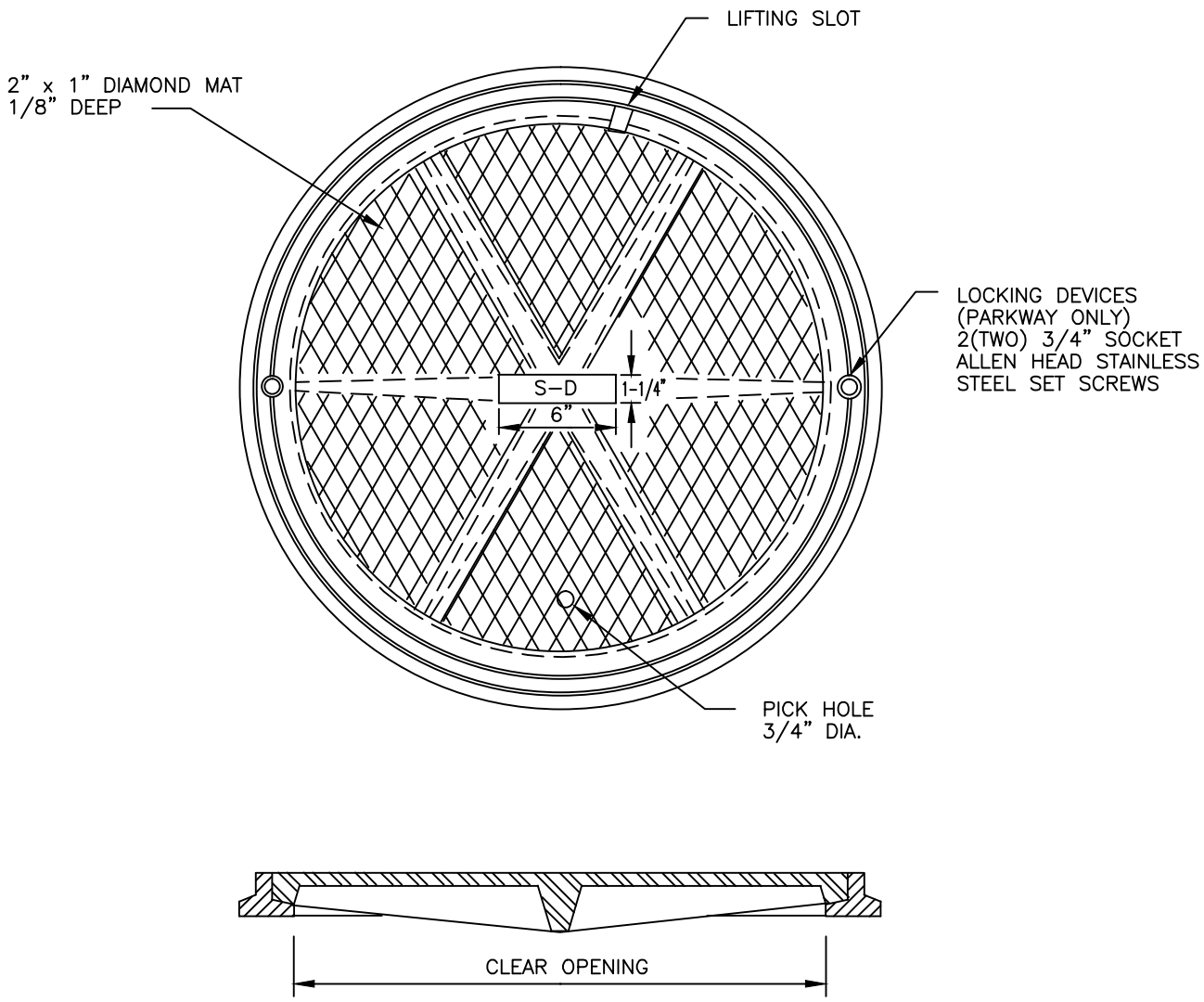
D	12"	18"	24"	30"	36"	42"	48"	54"	60"	66"
L	1.0'	1.0'	1.0'	1.25'	1,5'	1.5'	1.5'	1.75'	1.75'	1.75'
T	4"	5"	6"	7"	8"	9"	10"	10"	11"	11"
A	.08	.067	.052	.042	.036	.040	.036	.032	.028	.026

G = SLOPE OF PIPE FT./FT.

NOTES:

1. A CONCRETE COLLAR IS REQUIRED WHERE $G_2 - G_1 > A$
2. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHALL BE THOSE OF THE LARGER PIPE D = D_1 OR D_2 , WHICHEVER IS GREATER.
3. FOR PIPE LARGER THAN 66 INCHES A SPECIAL COLLAR DETAIL IS REQUIRED.
4. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGER.
5. OMIT REINFORCING ON PIPES 24 INCHES AND LESS IN DIAMETER AND ON ALL PIPES WHERE $G2 - G1 < 3 \times A$.
6. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE D+(2 x WALL THICKNESS)+T.
7. WHEN D_2 IS EQUAL TO OR LESS THAN D_1, JOIN INVERTS AND WHEN D_2 IS GREATER THAN D_1, JOIN SOFFITS.
8. BEVELED PIPE MAY BE USED IN LIEU OF CONCRETE COLLAR.
9. THIS CONCRETE COLLAR DETAIL SHALL NOT BE USED WHEN $G_2 - G_1 > 10\%$.

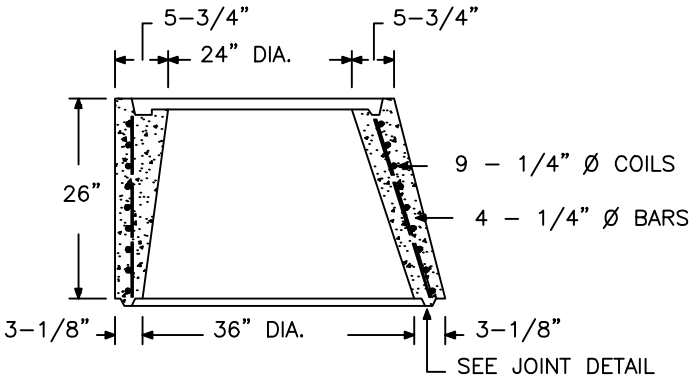
REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	CONCRETE COLLAR	307
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 1 OF 1



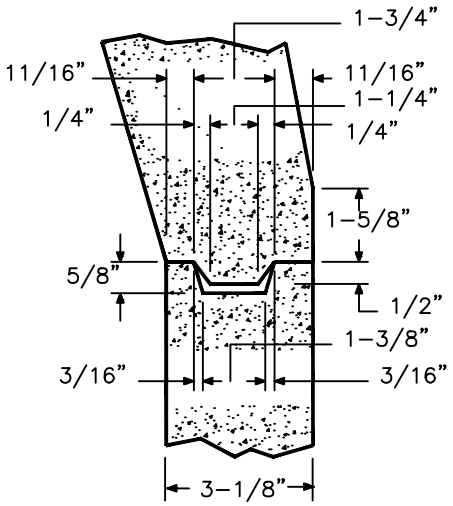
NOTES:

1. FOR 22 INCH PARKWAY MANHOLE OPENING USE ALHAMBRA FOUNDRY A-1530B (GALVANIZED) OR APPROVED EQUAL WITH LOCKING DEVICE. APPROXIMATE SHIPPING WEIGHT = 130#.
2. FOR 36 INCH PARKWAY MANHOLE OPENING USE ALHAMBRA FOUNDRY A-1261-4 (GALVANIZED) OR APPROVED EQUAL WITH LOCKING DEVICE. APPROXIMATE SHIPPING WEIGHT = 520#.
3. FOR 24 INCH TRAFFIC MANHOLE OPENING USE ALHAMBRA FOUNDRY A-1254 OR APPROVED EQUAL. APPROXIMATE SHIPPING WEIGHT = 320#.
4. FOR 36 INCH TRAFFIC MANHOLE OPENING USE ALHAMBRA FOUNDRY A-1251-4 OR APPROVED EQUAL. APPROXIMATE SHIPPING WEIGHT = 520#.

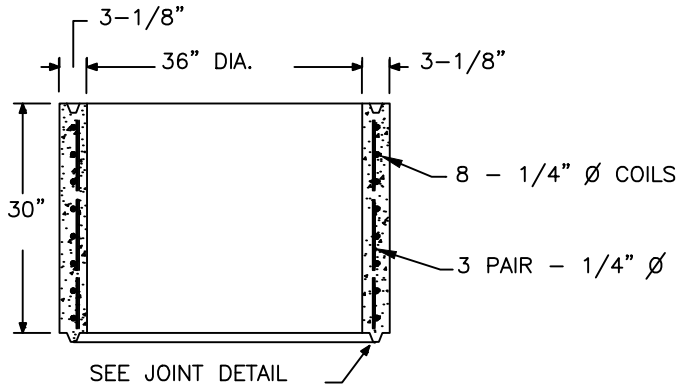
REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	MANHOLE FRAME AND COVER	308
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 1 OF 1



36" TO 24" ECCENTRIC CONE



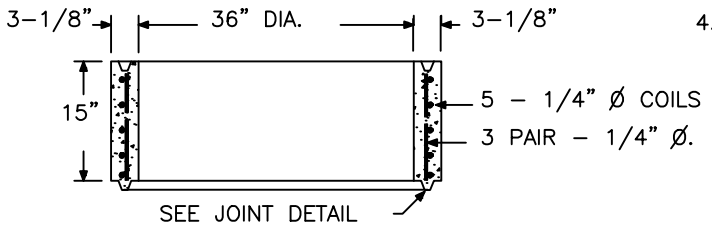
JOINT DETAIL



36" X 30" MANHOLE PIPE

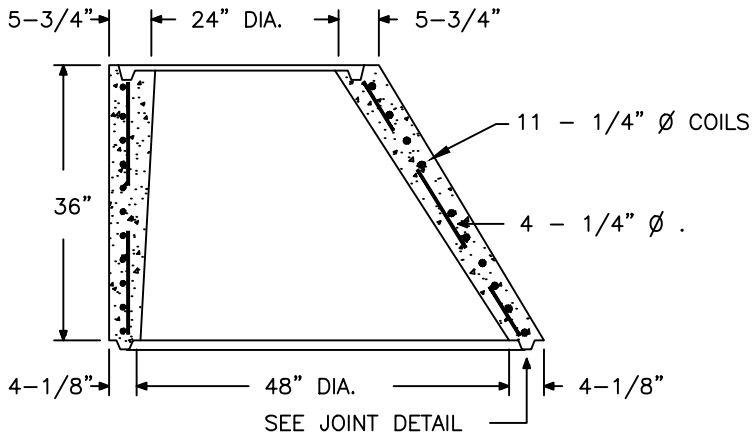
NOTES:

1. SEE STD. PLAN No. 308 FOR FRAME & COVER.
2. SEE STD. PLAN No's. 305–1, 305–2 ,306–3 & 306–4 FOR MANHOLE INSTALLATION DETAILS INCLUDING STEPS.
3. THE MANHOLE PIPES & GRADE RINGS SHALL BE ARRANGED IN ORDER OF LONGER TO SHORTER LENGTHS FROM BOTTOM TO TOP.
4. SEE STD. PLAN No. 309–3 FOR GRADE RING DETAILS.

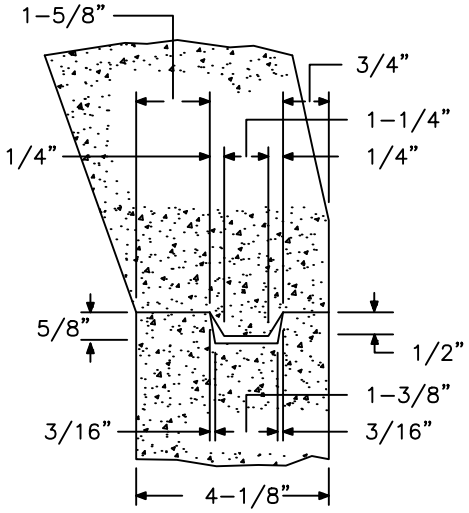


36" X 15" MANHOLE PIPE

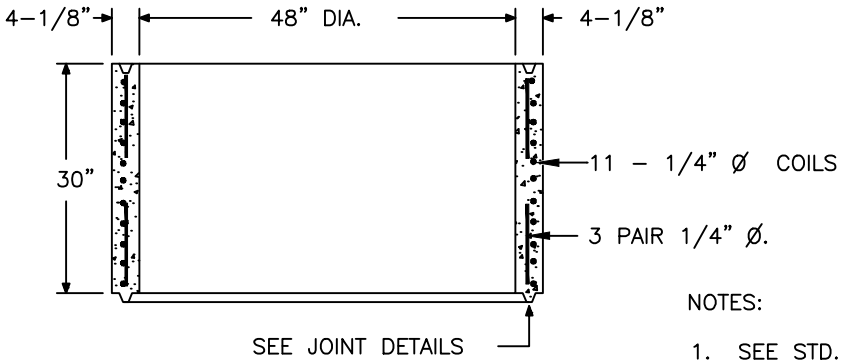
REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	36 INCH REINFORCED CONCRETE MANHOLE	309-1
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 1 OF 3



48" TO 24" ECCENTRIC CONE



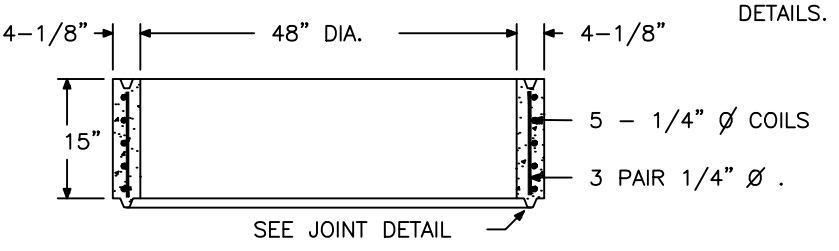
JOINT DETAIL



48" X 30" MANHOLE PIPE

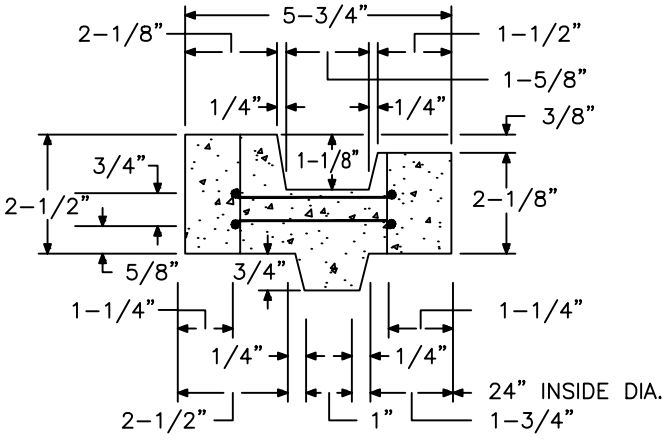
NOTES:

1. SEE STD. PLAN No. 308 FOR FRAME & COVER.
2. SEE STD. PLAN No's. 30305–1, 305–2 306–3 & 306–4 FOR MANHOLE INSTALLATION DETAILS INCLUDING STEPS.
3. THE MANHOLE PIPES & GRADE RINGS SHALL BE ARRANGED IN ORDER OF LONGER TO SHORTER LENGTHS FROM BOTTOM TO TOP.
4. SEE STD. PLAN No. 319–3 FOR GRADE RING DETAILS.

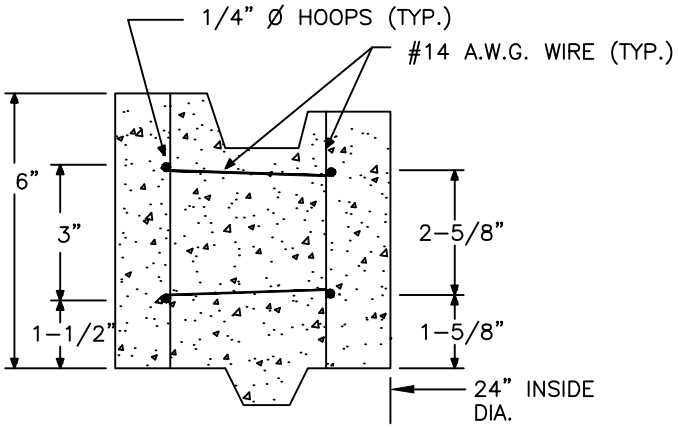


48" X 15" MANHOLE PIPE

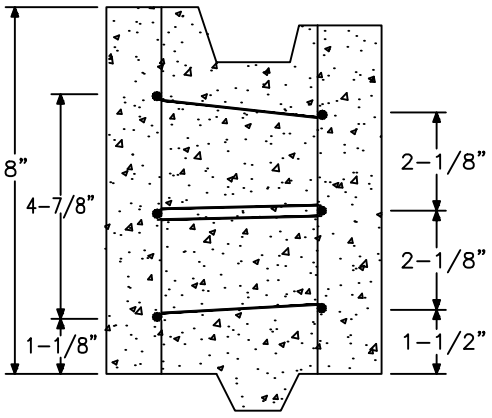
REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	48 INCH REINFORCED CONCRETE MANHOLE	309-2
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 2 OF 3



24" X 2 1/2" GRADE RING



24" X 6" GRADE RING

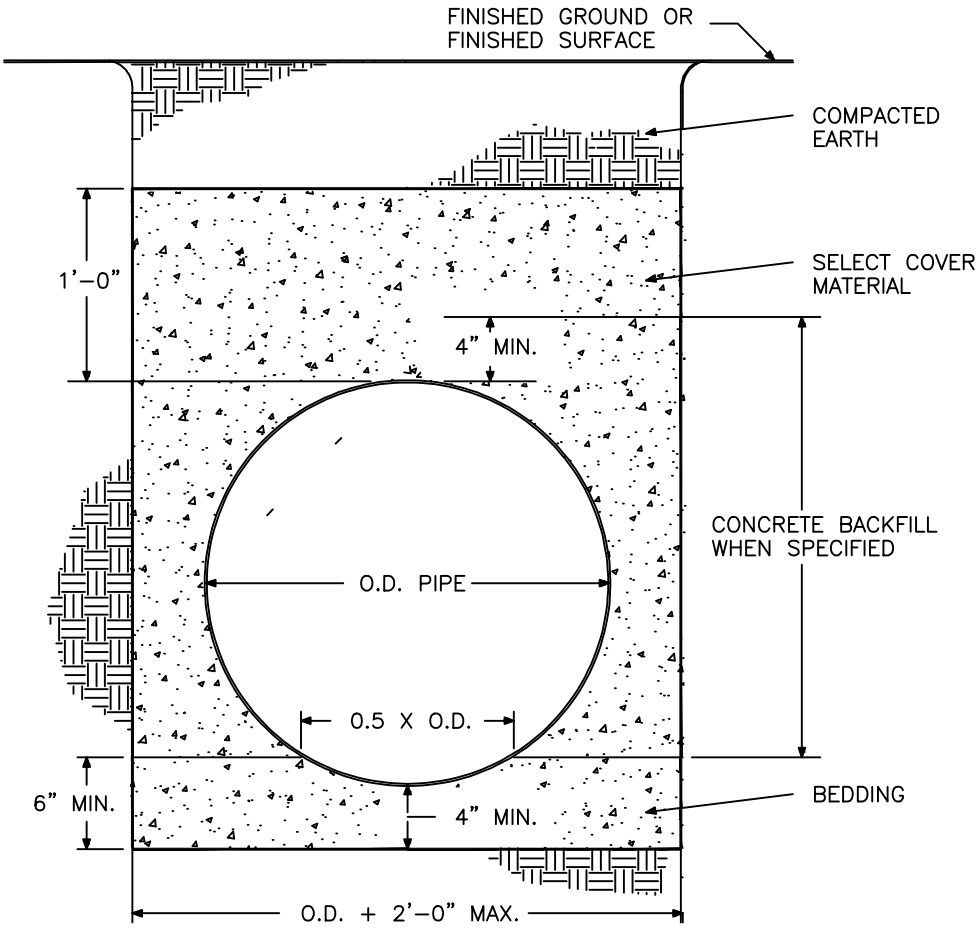


24" X 8" GRADE RING

NOTES:

1. SEE STD. PLAN No. 308 FOR FRAME & COVER.
2. SEE STD. PLAN No'S. 305–1, 305–2, 306–2 & 306–3 FOR MANHOLE INSTALLATION DETAILS INCLUDING STEPS.
3. THE MANHOLE PIPES & GRADE RINGS SHALL BE ARRANGED IN ORDER OF LONGER TO SHORTER LENGTHS FROM BOTTOM TO TOP.
4. SEE STD. PLAN No. 309–1 FOR 36 INCH DIA. MANHOLE & STD. PLAN NO. 309–2 FOR 48 INCH DIA. MANHOLE.

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	24 INCH REINFORCED CONCRETE GRADE RINGS	309-3
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 3 OF 3



NOTES :

1. ALL MATERIAL MUST MEET THE APPROVAL OF THE FIELD INSPECTOR.
2. BEDDING SHALL CONSIST OF SAND OR OTHER GRANULAR MATERIAL WITH A MIN. SAND EQUIVALENT OF 25 UNLESS GROUND WATER IS PRESENT, IN WHICH CASE BEDDING MATERIAL OF #3 ROCK IS REQUIRED.
3. BEDDING AND BACKFILL SHALL BE COMPACTED TO A RELATIVE COMPACTION OF NOT LESS THAN 90%, EXCEPT FINAL 2 FEET WHICH WILL BE NOT LESS THAN 95%.

REVISIONS	CITY OF FOUNTAIN VALLEY	STANDARD PLAN NO.
	STORM DRAIN BEDDING DETAIL	310
	APPROVED BY: MARK LEWIS R.C.E. 49335 CITY ENGINEER DATE: 04/01/15	SHEET: 1 OF 1