

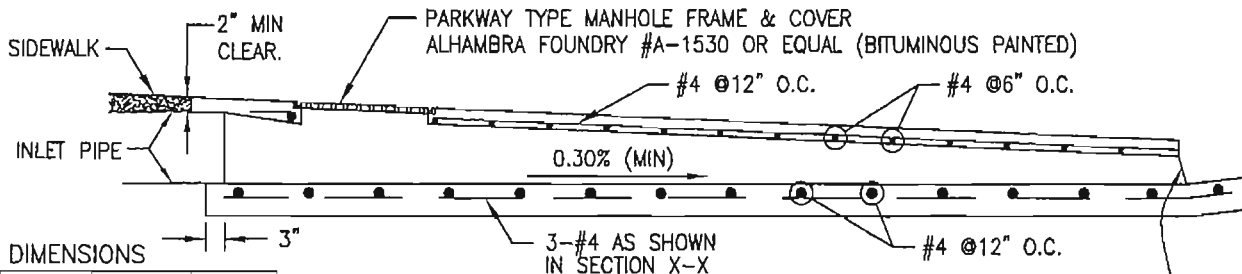
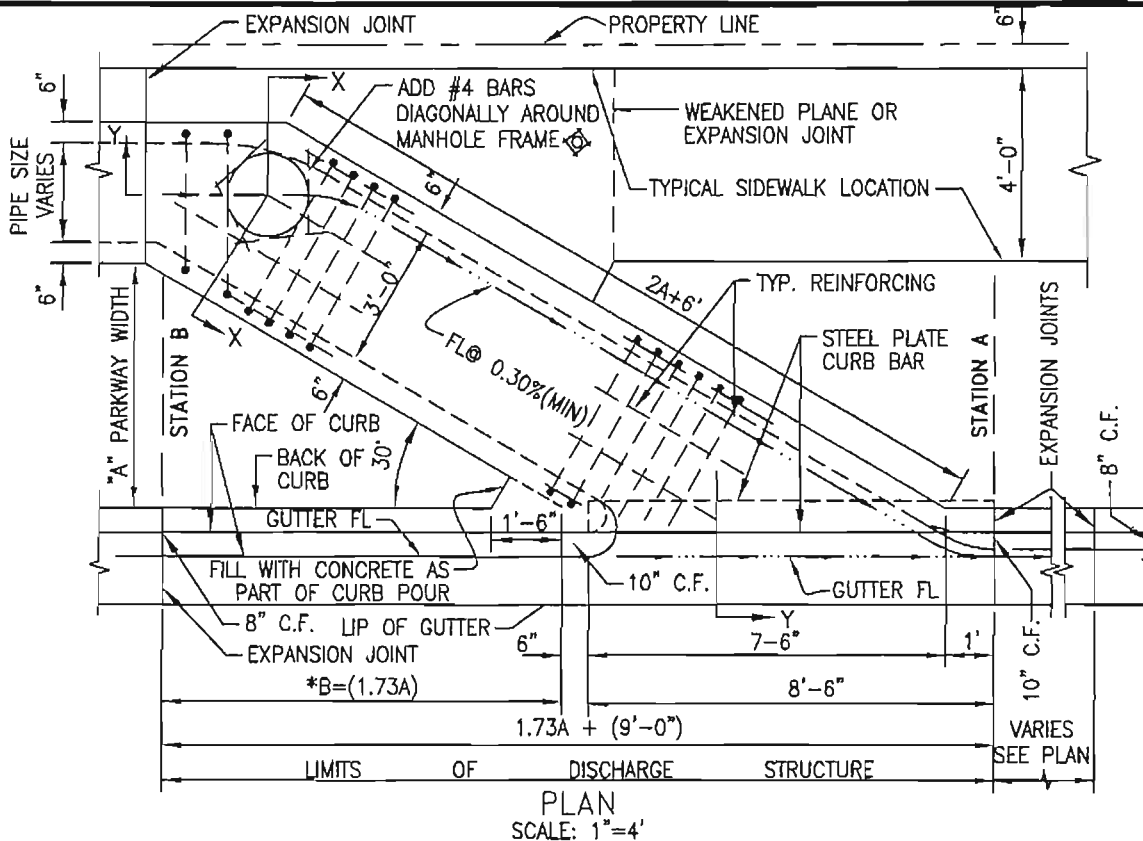


CITY OF FONTANA DESIGN STANDARDS

Link to Location on City Website:

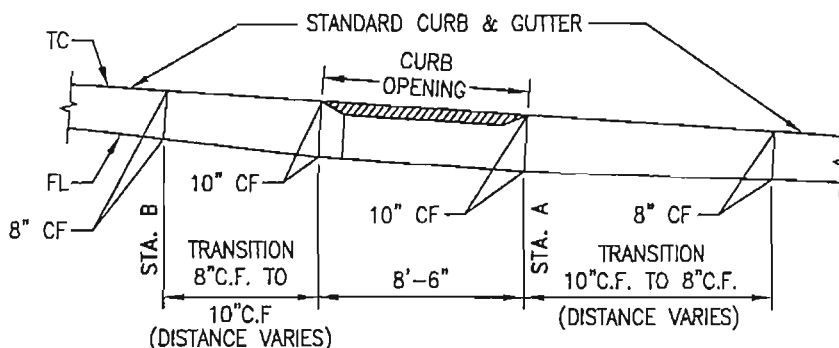
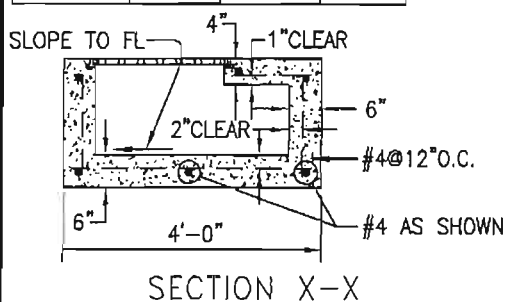
<https://www.fontanaca.gov/3483/Design-and-Construction-Standards>

STD #	SHEETS	SECTION 3000 - STORM DRAIN	DATE APPROVED
3000	1	Discharge Structure	10/18/2006
3001	1	Under Sidewalk Drain	10/18/2006
3002	1	Residential Curb Drain	10/18/2006
3003	3	Local Depressions at Catch Basins	10/18/2006
3004	2	Curb Opening Catch Basin	10/18/2006
3005	2	Monolithic Catch Basin Connection	10/18/2006
3006	2	Grate Catch Basin Reinforcement	10/18/2006
3007	6	Catch Basin Face Plate Assembly and Protection Bar	10/18/2006
3008	2	Catch Basin Manhole Frame and Cover	10/18/2006
3009	2	Junction Structure Pipe to Pipe (ID < 24")	10/18/2006
3010	2	Junction Structure Pipe to Pipe Inlet ID < 24" or OD > 1/2 Main Line ID	10/18/2006
3011	4	Manhole Pipe to Pipe (Large Side Inlet)	10/18/2006
3012	4	Manhole Pipe to Pipe (ID = 36" or Larger)	10/18/2006
3013	3	Manhole Pipe to Pipe (One or Both Main Line ID's 33" or Smaller)	10/18/2006
3014	2	Manhole Shaft with Eccentric Reducer	10/18/2006
3015	2	Manhole Shaft 36" Without Reducer	10/18/2006
3016	2	Pressure Manhole Shaft with Eccentric Reducer	10/18/2006
3017	2	Pressure Manhole Shaft and Pressure Plate Detail 36" Without Reducer	10/18/2006
3018	2	Manhole Frame & Cover Pressure Type	10/18/2006
3019	2	24" Manhole Frame and Cover	10/18/2006
3020	1	Headwall - Wing Type	10/18/2006
3021	3	Trash Rack Inclined	10/18/2006
3022	2	Concrete Collar for RCP 12" Through 72"	10/18/2006
3023	2	36" Manhole Frame and Cover	10/18/2006
3024	2	Steel Step	10/18/2006
3025	3	Pipe Connections to Existing Storm Drains	10/18/2006
3026	2	Transition Structure Pipe to Pipe	10/18/2006
3027	2	Standard Manhole Frame, Cover & Collar	8/10/2023



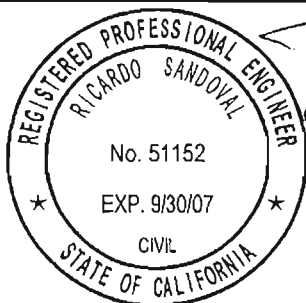
*TYP "B" DIMENSIONS

IF "A"=	5'	6'	7'
"B" =	8'-8"	10'-5"	12'-1"



NOTES:

- FLOOR OF BASIN SHALL BE GIVEN A STEEL TROWEL FINISH.
- CONCRETE SHALL BE CLASS "A" (6 SACKS PORTLAND CEMENT PER CUBIC YARD).
- TOP OF STRUCTURE SHALL SLOPE TOWARDS CURB AT 1/4" PER FT. (MEASURED PERPENDICULAR TO CURB).



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: *PL*

REVISION NUMBER: _____

DATE

10.18.06

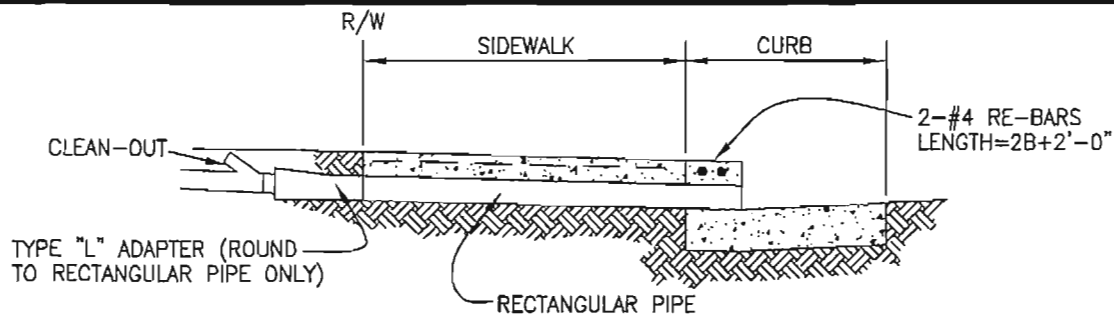
CITY OF FONTANA

DISCHARGE STRUCTURE

07/10/06

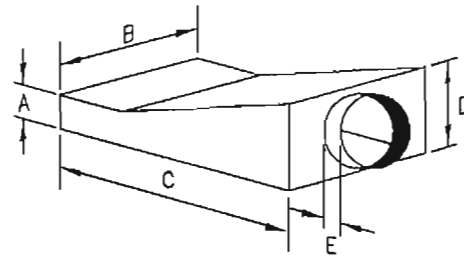
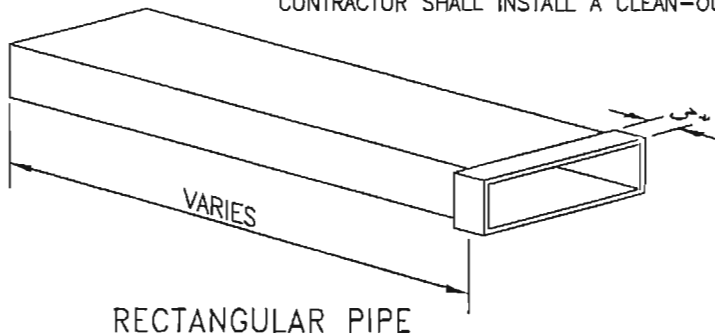
STD. PLAN NO. **3000**

SHT 1 OF 1



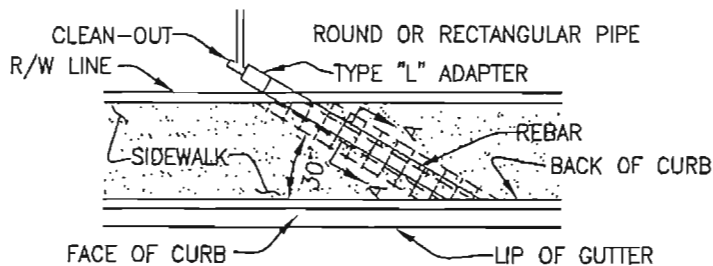
UNDER SIDEWALK DRAIN

NOTE: TYPE "L" ADAPTER WILL NOT BE INSTALLED ON PUBLIC RIGHT OF WAY. ANY CONSTRUCTION THAT CREATES ANY ANGLE POINT IN THIS STRUCTURE CONTRACTOR SHALL INSTALL A CLEAN-OUT.

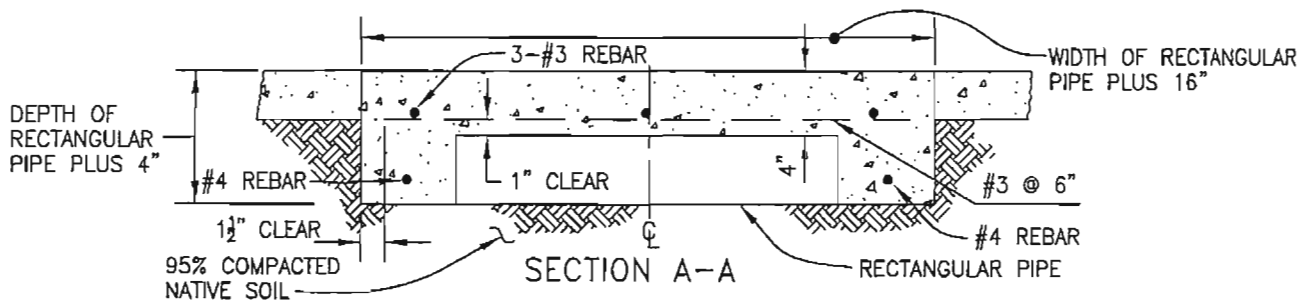


TYPE "L" ADAPTER

RECTANGULAR PIPE			TYPE "L" ADAPTER					
SIZE	OUTSIDE DIMENSION	INSIDE DIMENSION	SIZE	A	B	C	D	E
1	5 1/2" x 3 3/4"	5" x 3"	1	3 3/4"	5 1/2"	8"	6"	2"
2	8 1/2" x 4 1/4"	8" x 3 1/2"	2	4 1/4"	8 1/2"	12"	8"	2"
3	15 7/8" x 4 1/2"	15 1/8" x 3 1/2"	3	4 1/2"	15 7/8"	16 1/2"	10"	2 1/2"



ROUND PIPE	RECTANGULAR PIPE
4"	= 1
6"	= 2
8"	= 3



NOTE: SIDEWALK DRAIN TO BE MAINTAINED BY PROPERTY OWNER.



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DATE

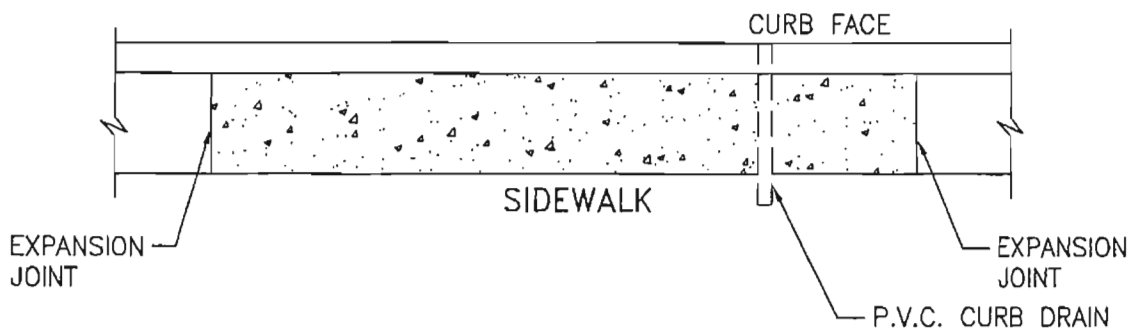
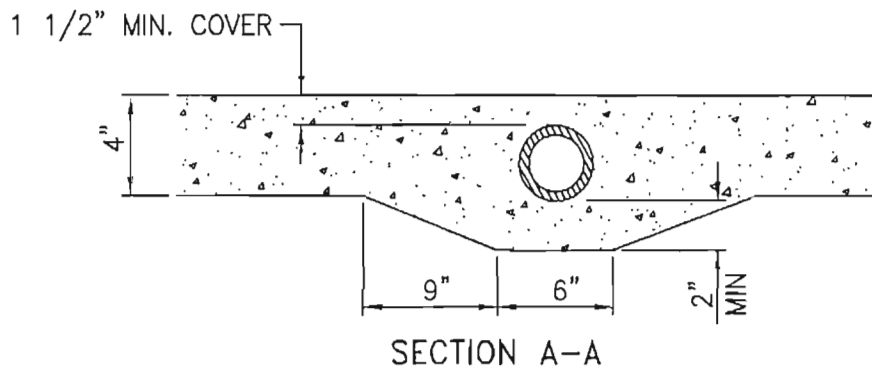
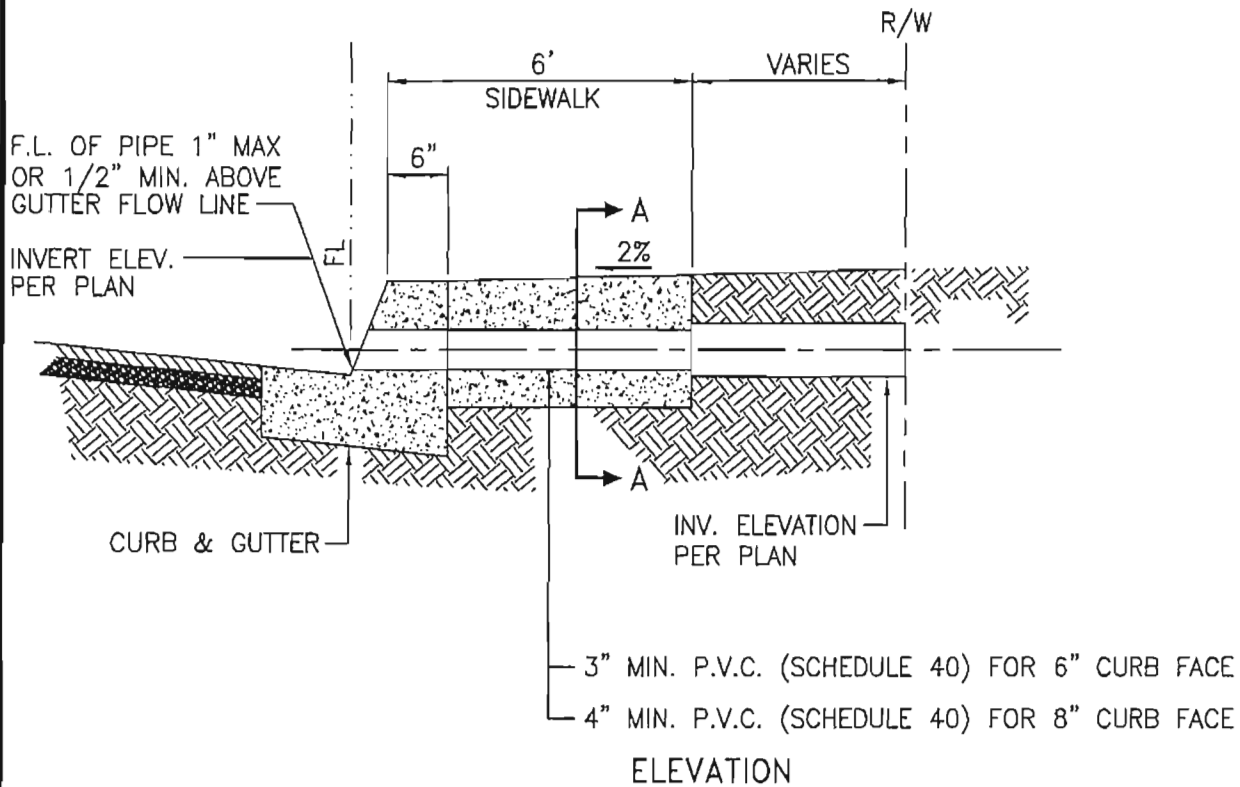
CITY OF FONTANA

UNDER
SIDEWALK DRAIN

07/10/06

STD. PLAN NO. **3001**

SHT 1 OF 1



NOTE:

* SIDEWALK TO BE REMOVED FROM EXPANSION JOINT TO EXPANSION JOINT WHERE P.V.C. DRAIN IS INSTALLED.

NOT TO SCALE



APPROVED BY: *[Signature]* 10-18-06
 CITY ENGINEER
RICARDO SANDOVAL
 REVIEWED BY: *[Signature]*
 DATE OF LAST REVISION: _____

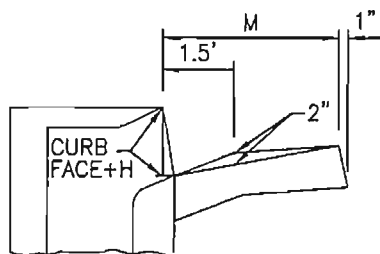
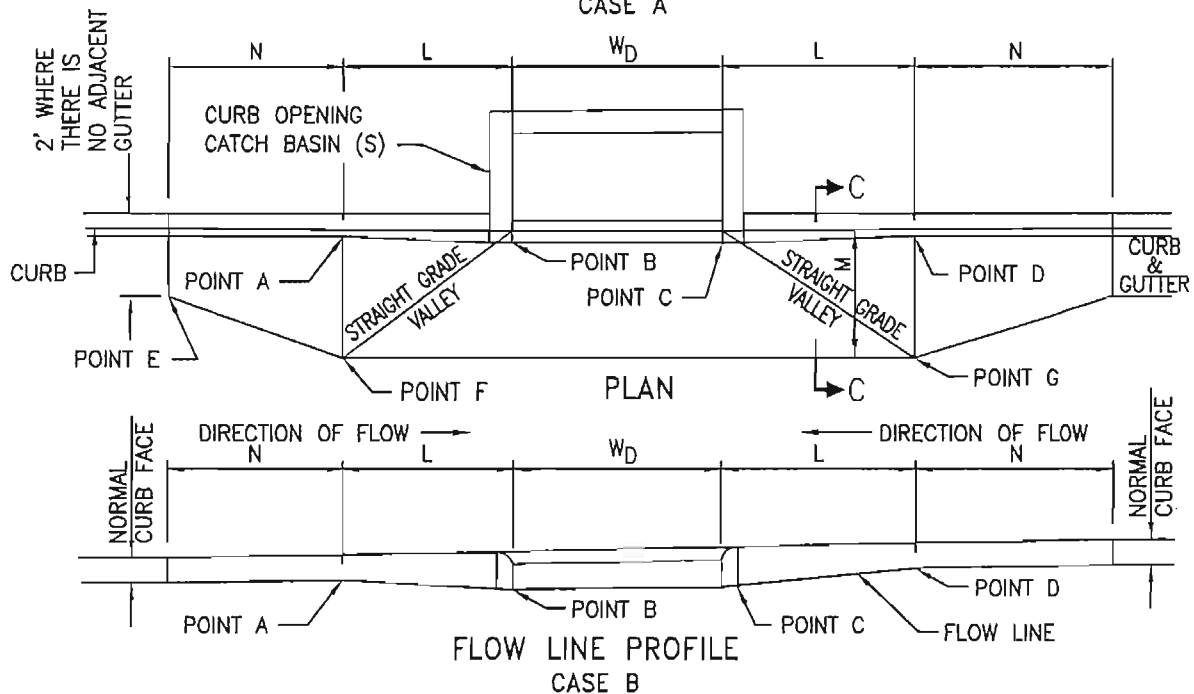
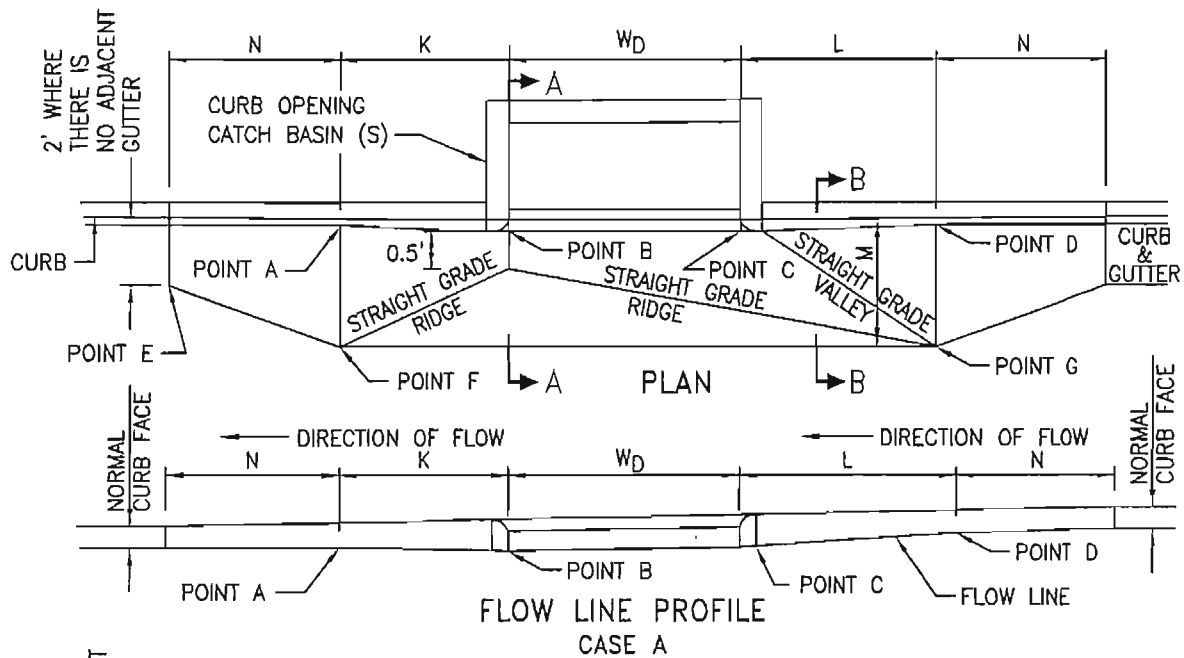
CITY OF FONTANA

RESIDENTIAL
CURB DRAIN

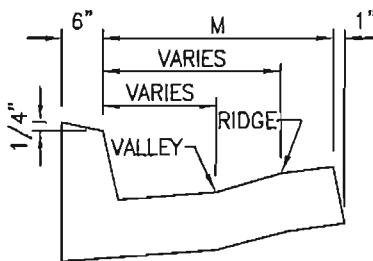
07/10/06

STD. PLAN NO. 3002

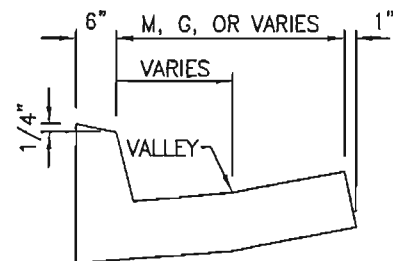
SHt 1 OF 1



SECTION A-A



SECTION B-B



SECTION C-C

NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10.18.06

CITY ENGINEER
RICARDO SANDOVAL

DATE

REVIEWED BY: *DL*

DATE OF LAST REVISION: _____

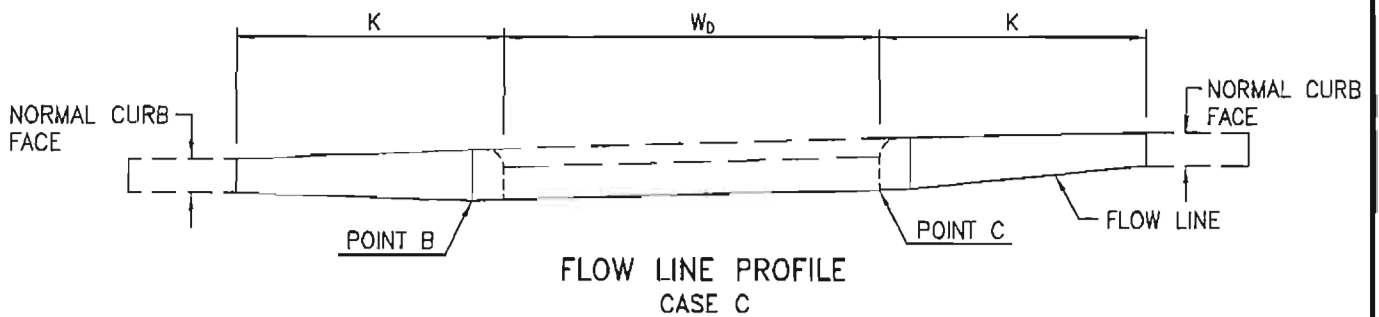
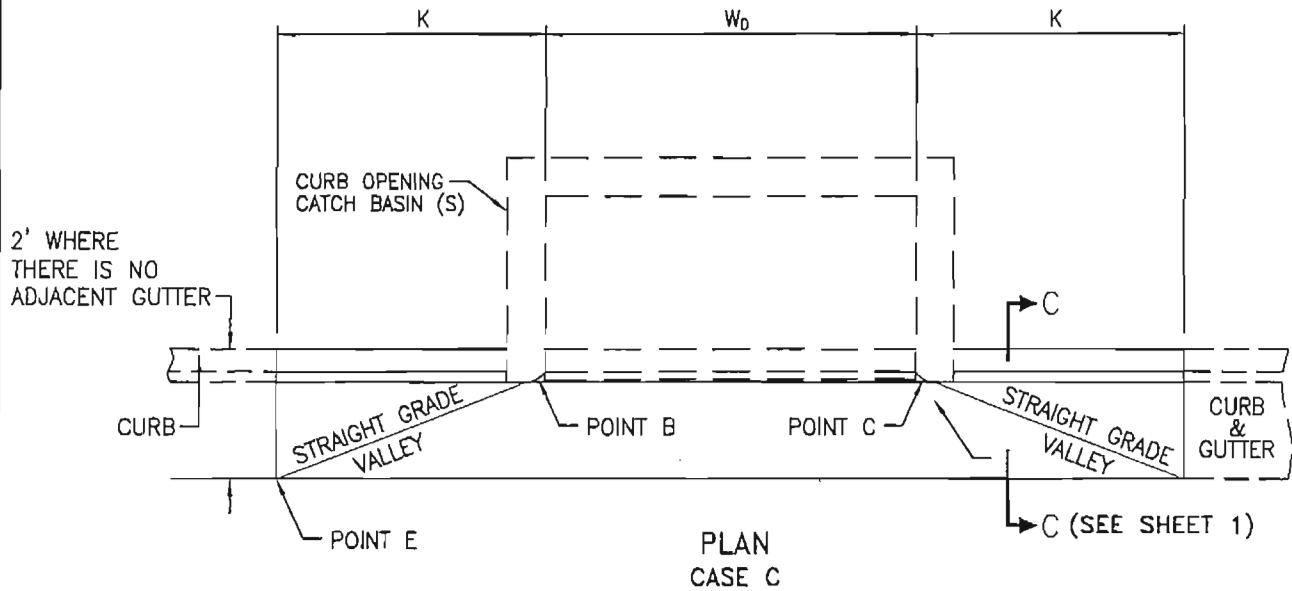
CITY OF FONTANA

**LOCAL DEPRESSIONS
AT CATCH BASINS**

07/10/06

STD. PLAN NO. **3003**

SHT 1 OF 3



NOT TO SCALE



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

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DATE OF LAST REVISION: _____

DATE

CITY OF FONTANA

LOCAL DEPRESSIONS
AT CATCH BASINS

07/10/06

STD. PLAN NO. **3003**

SHT **2** OF **3**

NOTES

1. ALL EXPOSED EDGES SHALL BE ROUNDED TO A 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 PLUS H (SEE APPLICABLE CATCH BASIN STANDARD PLAN).
3. IN EXISTING STREETS WHERE NO PAVEMENT REMODELING IS INDICATED, THE ELEVATION OF THE OUTER EDGE OF THE LOCAL DEPRESSION SHALL MEET THE FINISHED STREET SURFACE.
4. IN NEW STREETS, OR IN EXISTING STREETS WHERE PAVEMENT REMODELING 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 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

WD = 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 8 INCHES.

6. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACTLY EQUAL VALUES.



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: DC

DATE OF LAST REVISION: _____

DATE

10/18/06

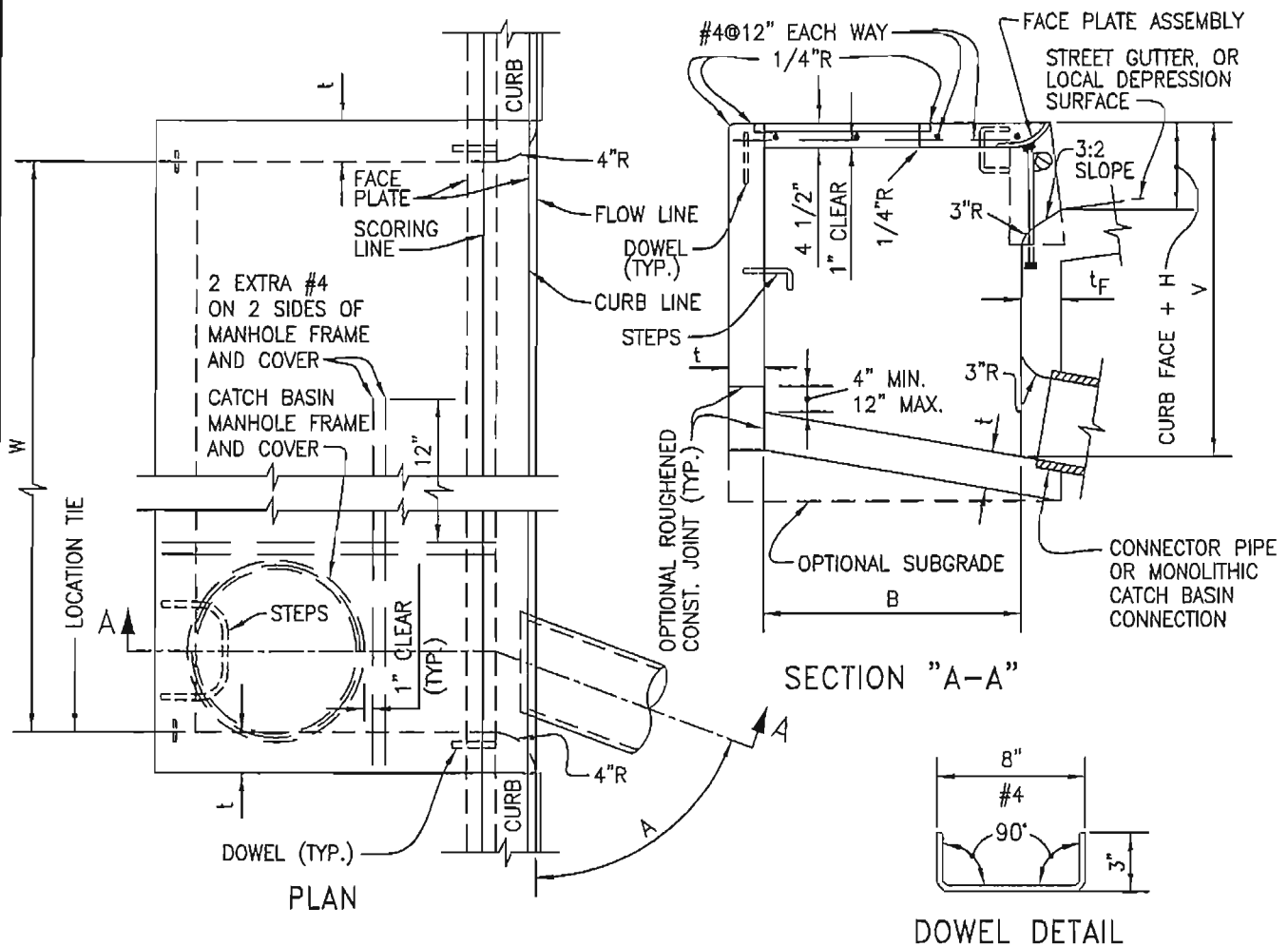
CITY OF FONTANA

LOCAL DEPRESSIONS
AT CATCH BASINS

07/10/06

STD. PLAN NO. **3003**

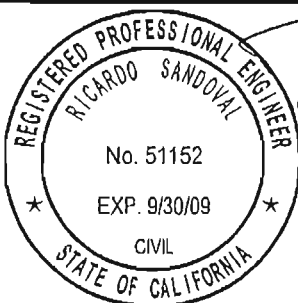
SHT **3** OF **3**



STRUCTURAL DATA							
WALL AND SLAB DIMENSIONS AND REINFORCEMENT REQUIREMENTS							
MAX W	MAX V	t	t _F	REINFORCEMENT REQUIRED IN			
				FRONT WALL	REAR WALL	BOTTOM SLAB	END WALL
3.5'	8'	6"	6"	#4 REBAR @ 12" O.C. REQUIRED			
3.5'	12'	8"	8"				
7'	6'	6"	6"				
7'	12'	8"	8"				
14'	4'	6"	6"	REINFORCEMENT REQUIRED	PER STANDARD NO. 3012		
	8'	6"	8"				
14'	12'	8"	10"				
21' AND 28'	4'	6"	6"				
	6'	6"	8"				
	8'	8"	8"				
	10'	8"	10"				
	12'	8"	10"				

FOR W > 28', V > 12' OR B > 4' SEE PROJECT PLANS

NOT TO SCALE



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

DRAWN BY: DG

REVISION NUMBER: _____

DATE

CITY OF FONTANA

**CURB OPENING
CATCH BASIN**

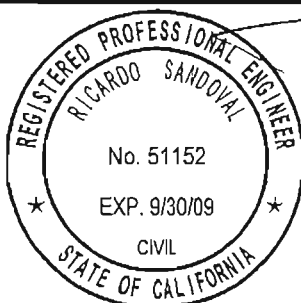
STD. PLAN NO. **3004**

SHT 1 OF 2

07/10/06

NOTES:

1. WHERE THE BASIN IS TO BE CONSTRUCTED WITHIN THE LIMITS OF EXISTING OR PROPOSED SIDEWALK OR IS CONTIGUOUS TO SUCH SIDEWALK. THE TOP SLAB OF THE BASIN MAY BE POURED EITHER MONOLITHIC WITH THE SIDEWALK OR SEPARATELY, USING THE SAME CLASS OF CONCRETE AS IN THE BASIN. WHEN POURED MONOLITHICALLY, THE SIDEWALK SHALL BE PROVIDED WITH A WEAKENED PLANE OR A 1" DEEP SAWCUT CONTINUOUSLY AROUND THE EXTERNAL PERIMETER OF THE CATCH BASIN WALLS, INCLUDING ACROSS THE FULL WIDTH OF THE SIDEWALK. SURFACE OF ALL EXPOSED CONCRETE SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH AND SCORING TO EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN.
2. ALL CURVED CONCRETE SURFACES SHALL BE FORMED BY CURVED FORMS AND SHALL NOT BE SHAPED BY PLASTERING.
3. FLOOR OF BASIN SHALL BE GIVEN A STEEL TROWEL FINISH AND SHALL HAVE A LONGITUDINAL AND LATERAL SLOPE OF 1:12 MINIMUM AND 1:3 MAXIMUM, EXCEPT WHERE THE GUTTER GRADE EXCEEDS 8 PERCENT, IN WHICH CASE THE LONGITUDINAL SLOPE OF THE FLOOR SHALL BE THE SAME AS THE GUTTER GRADE. SLOPE FLOOR FROM ALL DIRECTIONS TO THE OUTLET.
4. DIMENSIONS:
B = 3'-2"
V = THE DIFFERENCE IN ELEVATION BETWEEN THE TOP OF THE CURB AND THE INVERT OF THE CATCH BASIN AT THE OUTLET = 4.5'
VU = THE DIFFERENCE IN ELEVATION BETWEEN THE TOP OF THE CURB AND THE INVERT AT THE UPSTREAM END OF THE BASIN, AND SHALL BE DETERMINED BY THE REQUIREMENTS OF NOTE 3. BUT SHALL NOT BE LESS THAN CURB FACE PLUS 12".
VI = THE DIFFERENCE IN ELEVATION BETWEEN THE TOP OF THE CURB AND THE INVERT OF THE INLET. NOTED ON THE PROJECT PLANS.
H = NOTED ON THE PROJECT PLANS.
W = NOTED ON THE PROJECT PLANS.
A = THE ANGLE, IN DEGREES, INTERCEPTED BY THE CENTERLINE OF THE CONNECTOR PIPE AND THE CATCH BASIN WALL TO WHICH THE CONNECTOR PIPE IS ATTACHED.
5. PLACE CONNECTOR PIPES AS INDICATED ON THE PROJECT PLANS. UNLESS OTHERWISE SPECIFIED. THE CONNECTOR PIPE SHALL BE LOCATED AT THE DOWNSTREAM END OF THE BASIN. WHERE THE CONNECTOR PIPE IS SHOWN AT THE CORNER. THE CENTERLINE OF THE PIPE SHALL INTERSECT THE INSIDE CORNER OF THE BASIN. THE PIPE MAY BE CUT AND TRIMMED AT A SKEW NECESSARY TO INSURE MINIMUM 3" PIPE EMBEDMENT, ALL AROUND WITHIN THE CATCH BASIN WALL, AND 3" RADIUS OF ROUNDING OF STRUCTURE CONCRETE, ALL AROUND. ADJACENT TO PIPE ENDS, A MONOLITHIC CATCH BASIN CONNECTION SHALL BE USED TO JOIN THE CONNECTOR PIPE TO THE CATCH BASIN WHENEVER ANGLE "A" IS LESS THAN 70 DEGREES OR GREATER THAN 110 DEGREES, OR WHENEVER THE CONNECTOR PIPE IS LOCATED IN A CORNER. THE OPTIONAL USE OF A MONOLITHIC CATCH BASIN CONNECTION IN ANY CASE IS PERMITTED. MONOLITHIC CATCH BASIN CONNECTIONS MAY BE CONSTRUCTED TO AVOID CUTTING STANDARD LENGTHS OF PIPE.
6. STEPS SHALL BE LOCATED AS SHOWN. IF THE CONNECTOR PIPE INTERFERES WITH THE STEPS, THEY SHALL BE LOCATED AT THE CENTERLINE OF THE DOWNSTREAM END WALL. STEPS SHALL BE SPACED 12" APART. THE TOP STEP SHALL BE 7" BELOW THE TOP TO THE MANHOLE AND PROJECT 2-1/2". ALL OTHER STEPS SHALL PROJECT 5".
7. DOWELS ARE REQUIRED AT EACH CORNER AND AT 7' ON CENTER (MAXIMUM) ALONG THE BACKWALL.
8. THE FOLLOWING STANDARD PLANS ARE INCORPORATED HEREIN:
3005 - MONOLITHIC CATCH BASIN CONNECTION
3006 - CATCH BASIN REINFORCEMENT
3007 - CATCH BASIN FACE PLATE ASSEMBLY AND PROTECTION BAR
3008 - CATCH BASIN MANHOLE FRAME AND COVER
3024 - STEEL STEP
9. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.



APPROVED BY:

Ricardo Sandoval 10.18.06
CITY ENGINEER DATE
RICARDO SANDOVAL

DRAWN BY: *DL*

DATE OF LAST REVISION: _____

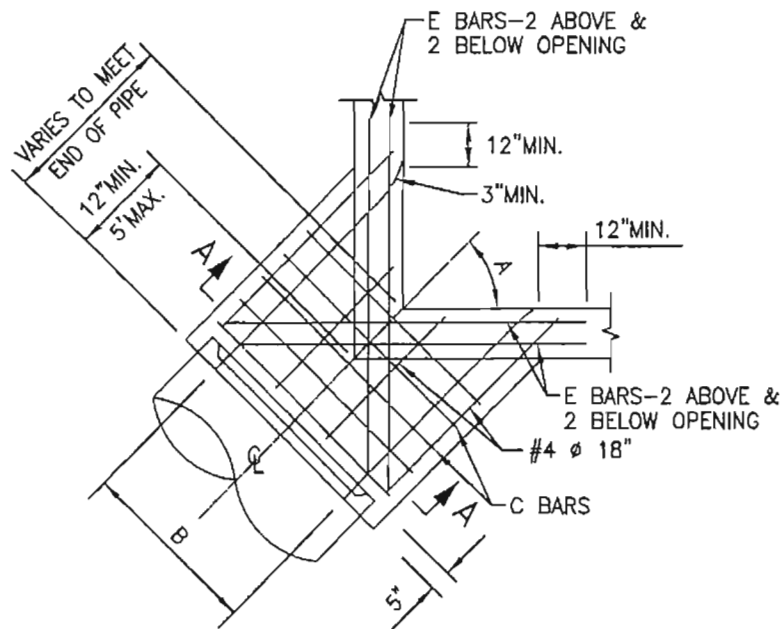
CITY OF FONTANA

**CURB OPENING
CATCH BASIN**

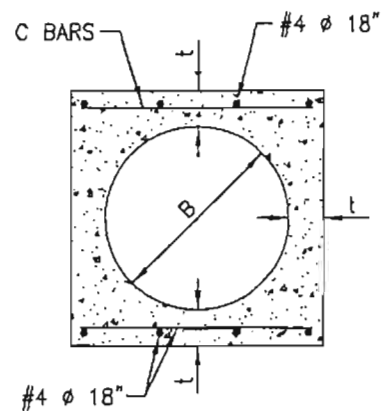
07/10/06

STD. PLAN NO. **3004**

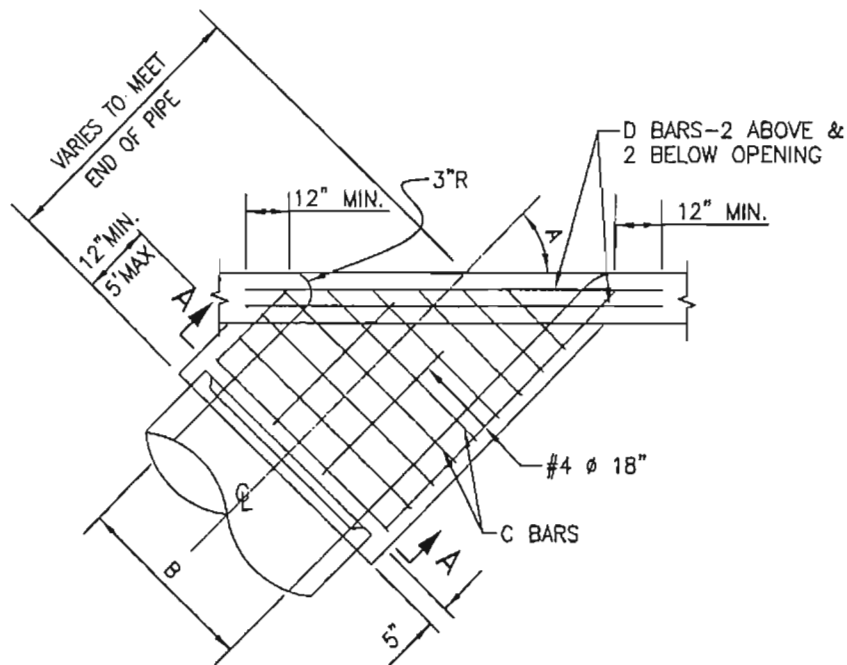
SHT **2 OF 2**



PLAN
CORNER CONNECTION



SECTION "A-A"



PLAN
SIDE CONNECTION

NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10-18-06
CITY ENGINEER DATE

RICARDO SANDOVAL

REVIEWED BY: *DL*

DATE OF LAST REVISION: _____

CITY OF FONTANA

**MONOLITHIC CATCH
BASIN CONNECTION**

07/10/06

STD. PLAN NO. **3005**

SHT 1 OF 2

STRUCTURAL DATE							
B	t	C BARS	D & E BARS	B	t	C BARS	D & E BARS
12"	4"	#4 @ 6"	#5	42"	7 1/2"	#5 @ 6"	#6
15"	4 1/4"			45"	7 3/4"		
18"	4 1/2"			48"	8"		
21"	5"			51"	8 1/2"		
24"	5 1/4"			54"	9"		
27"	5 1/2"			57"	9 1/4"		
30"	6"			60"	9 1/2"		
33"	6 1/4"			63"	10"		
36"	6 1/2"			66"	10 1/4"		
39"	7"			69"	10 3/4"		
				72"	11"		
FOR B GREATER THAN 72" SEE PROJECT PLAN							

NOTES

1. REINFORCING STEEL SHALL BE 1-1/2" CLEAR FROM FACE OF CONCRETE UNLESS OTHERWISE SHOWN.
2. REINFORCING STEEL FOR INSIDE FACE OF CATCH BASIN SHALL BE CUT AT CENTER OF OPENING AND BENT INTO WALLS OF MONOLITHIC CATCH BASIN CONNECTION. REINFORCING STEEL FOR OUTSIDE FACE OF CATCH BASIN SHALL BE CUT 2" CLEAR OF OPENING.
3. CONNECTION SHALL BE PLACED MONOLITHIC WITH CATCH BASIN. THE ROUNDED EDGE OF OUTLET SHALL BE CONSTRUCTED BY PLACING CONCRETE WITH THE SAME CLASS OF CONCRETE AS THE CATCH BASIN AGAINST A CURVED FORM WITH A RADIUS OF 3".
4. CONNECTIONS SHALL BE CONSTRUCTED WHEN:
 - (A) PIPES INLET OR OULET THROUGH CORNER OF CATCH BASIN
 - (B) ANGLE A FOR PIPE THROUGH 30" IN DIAMETER IS LESS THAN 70° OR GREATER THAN 110°
5. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: PL

DATE OF LAST REVISION: _____

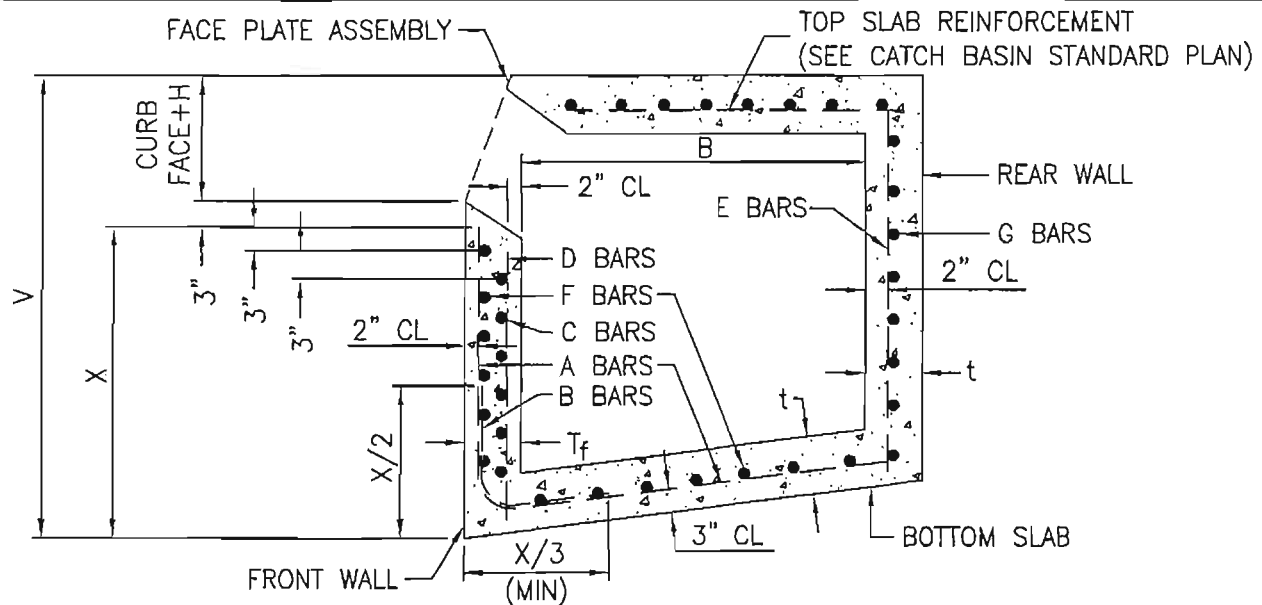
CITY OF FONTANA

MONOLITHIC CATCH
BASIN CONNECTION

07/10/06

STD. PLAN NO. **3005**

SHT **2** OF **2**



TYPICAL REINFORCEMENT DETAILS

MAX W	MAX V	t	T _f	A&B BARS	C BARS	D BARS	E BARS	F BARS	G BARS
3.5'	8'	6"	6"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"
3.5'	12'	8"	8"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"
7'	6'	6"	6"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"
7'	12'	8"	8"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"
14'	4'	6"	6"	#4 @ 12"	#4 @ 12"	#4 @ 18"	#4 @ 12"	#4 @ 12"	#4 @ 12"
14'	8'	6"	8"	#4 @ 12"	#4 @ 12"	#4 @ 18"	#4 @ 12"	#4 @ 12"	#4 @ 12"
14'	12'	8"	10"	#4 @ 12"	#4 @ 6"	#4 @ 18"	#4 @ 12"	#4 @ 12"	#4 @ 12"
28'	4'	6"	6"	#4 @ 24"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 18"	#4 @ 12"
28'	5'	6"	8"	#4 @ 24"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 18"	#4 @ 12"
28'	6'	6"	8"	#4 @ 18"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 18"	#4 @ 12"
28'	7'	8"	8"	#4 @ 17"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 18"	#4 @ 12"
28'	8'	8"	8"	#4 @ 13"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 18"	#4 @ 12"
28'	9'	8"	10"	#4 @ 15"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 18"	#4 @ 12"
28'	10'	8"	10"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 12"	#4 @ 18"	#4 @ 12"
28'	11'	8"	10"	#5 @ 15"	#4 @ 12"	#4 @ 12"	#4 @ 10"	#4 @ 18"	#4 @ 18"
28'	12'	8"	10"	#6 @ 18"	#4 @ 12"	#4 @ 12"	#4 @ 9"	#4 @ 18"	#4 @ 18"

FOR W > 28' OR B > 4' SEE PROJECT PLANS

CURB OPENING CATCH BASIN REINFORCEMENT

NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10-18-06
CITY ENGINEER DATE

REVIEWED BY: *JS*

DATE OF LAST REVISION: _____

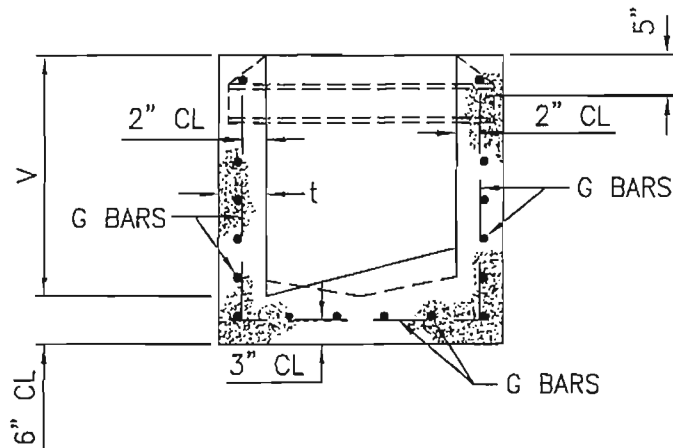
CITY OF FONTANA

GRATE CATCH BASIN
REINFORCEMENT

07/10/06

STD. PLAN NO. 3006

SHT 1 OF 2



TYPICAL REINFORCEMENT DETAILS

V	t	SIDE AND END WALL STEEL
MAX		G BARS
4'	6"	#4 @ 10"
8'	8"	#4 @ 6"
12'	10"	#5 @ 6"
FOR V > 12' SEE PROJECT PLANS		

GRATE CATCH BASIN REINFORCEMENT

NOTES

1. UNLESS OTHERWISE SPECIFIED, REINFORCEMENT FOR CURB OPENING AND GRATING, CATCH BASIN SHALL TERMINATE 2" FROM FACE OF CONCRETE.
2. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.

NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10.18.06
CITY ENGINEER DATE

RICARDO SANDOVAL

REVIEWED BY: *76*

DATE OF LAST REVISION: _____

CITY OF FONTANA

**GRATE CATCH BASIN
REINFORCEMENT**

07/10/06

STD. PLAN NO. **3006**

SHT **2** OF **2**

Technical drawing of a catch basin end wall. The drawing shows a cross-section of the wall with various dimensions and components labeled. The dimensions are: 3 1/2" (height of the wall), 2" (width of the wall), 3" (width of the opening for concrete placement), 12" (width of the basin), 3/8" (width of the end anchor), 3/4" DIA. HOLE (TYP.) (hole in the wall), 5/16"x10" FACE PLATE (plate on the wall), and 3/4" DIA. SQUARE HOLE (hole in the wall). The components are: OPENING FOR CONC. PLACEMENT (TYP.), INTERIOR FACE OF CATCH BASIN END WALL, 5/16"x10" FACE PLATE, 3/4" DIA. HOLE (TYP.), 3/4" DIA. SQUARE HOLE, and END ANCHOR (TYP.).

Technical drawing of a splice plate for a steel beam, showing dimensions and components. The drawing includes a side view on the left and a top view on the right.

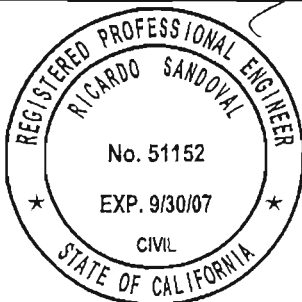
Labels and Dimensions:

- 5/16"x10" FACE PLATE**: Points to the top and bottom plates of the splice.
- LOCATE WELDS IN LONGER SPAN SEGMENT**: Points to the 1/4" V(2) weld lines.
- 3/4" DIA. SQUARE HOLE**: Points to the hole in the side view.
- 5/8"x1 1/2" CARRIAGE BOLTS AND HEX NUTS**: Points to the bolts connecting the plates.
- ANCHOR**: Points to the anchor bolts at the ends of the splice.
- 6"x3/8"x8" SPLICE PLATE**: Points to the central splice plate.
- JOINT**: Points to the connection between the beam segments.

Dimensions:

- Top View:**
 - Overall width: 10" (2" + 4" + 2" + 2")
 - Overall height: 3 1/2" (1 3/8" + 1" + 1 3/8")
 - Central square area: 4" x 4"
 - Distance from center to edge: 2"
 - Weld lines: 1/4" V(2)
- Side View:**
 - Overall length: 10" (1 1/2" + 3 3/8" + 1" + 3 3/8" + 1 1/2")
 - Central section: 3 3/8"
 - End sections: 1 1/2"

NOT TO SCALE



DATE _____

CATCH BASIN FACE PLATE ASSEMBLY AND PROTECTION BAR

07/10/06

STD. PLAN NO. 3007

SHT 1 OF 6

CURB LINE
 5/16" X 13 11/16" FACE PLATE
 65' 30' 11/16" R
 CURB FACE
 3:12 BATTER UNLESS OTHERWISE SPECIFIED
 10 1/2"
 6"
 1 1/4"
 3"
 10 13/16"
 1/4" R
 3/4"
 3-#4 BARS X (W+6") IN ADDITION TO REINFORCING STEEL PER APPLICABLE CATCH BASIN STANDARD PLAN
 SURFACE COURSE TO BE IDENTICAL WITH ADJOINING SPECIAL SIDEWALK AS SHOWN ON PLANS
 6 1/16"
 1 1/4"
 1 1/8" HOLE IN PLATE
 NOTE:
 FOR DETAILS NOT SHOWN, SEE FACE PLATE (4-1/2" TOP SLAB) SHEET 1.

OPENING FOR CONC.
PLACEMENT (TYP.)

Technical drawing of a catch basin end wall. The drawing includes a front view and a side view.

Front View Dimensions:

- Overall width: 12"
- Distance from left edge to center of end anchor: 3"
- Distance from bottom edge to center of end anchor: 7 3/16"
- End anchor diameter: 1 1/2"
- Overall height: 6 1/2"
- Distance from top edge to center of end anchor: 1 1/2"
- Distance from bottom edge to base of end anchor: 1 3/8"

Labels:

- INTERIOR FACE OF CATCH BASIN END WALL
- 5/16" X 13 11/16" FACE PLATE
- 3/4" DIA. HOLE (TYP.)
- END ANCHOR (TYP.)

Side View Dimensions:

- Overall height: 9"
- Three 3/4" square holes are shown.
- 5/8" cap bolt hex is shown at the bottom.

SECTION

11/16"

5/16" x 13 11/16"
FACE PLATE

5/8" x 1-1/2"
CARRIAGE
BOLTS AND
HEX NUTS

9" x 3/8" x 8"
SPLICE PLATE

ANCHOR

SEGMENT

1/4" x 1/2"

1/2"

1"

1-3/8"

5"

3 1/2"

2"

4"

2"

1/4" x 1/2"

JOINT

SPLICE DETAIL

NOT TO SCALE



Pinto 10.18.06
CITY ENGINEER DATE

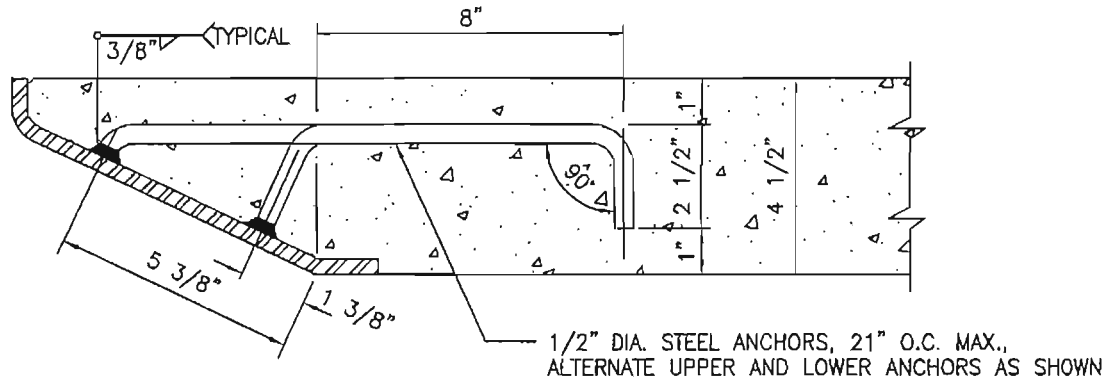
DATE OF LAST REVISION:

CATCH BASIN FACE PLATE ASSEMBLY AND PROTECTION BAR

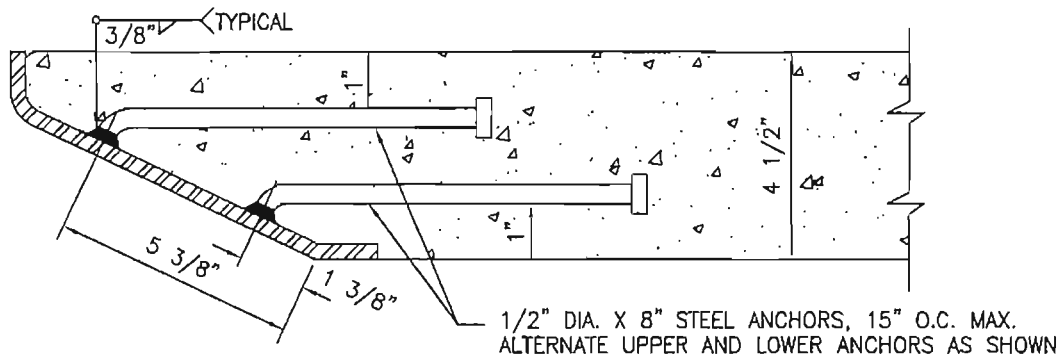
07/10/06

STD. PLAN NO. 3007	SHT 2 OF 6
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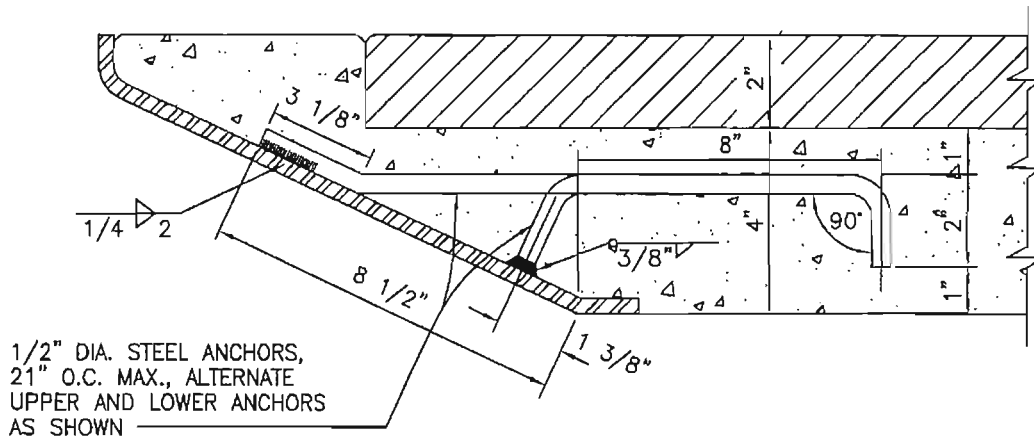
FACE PLATE ANCHORS



HOOK ANCHOR - 4 1/2" TOP SLAB



ROUND HEAD ANCHOR - 4 1/2" TOP SLAB



HOOK ANCHOR - 6" TOP SLAB

NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10.18.06
CITY ENGINEER DATE
RICARDO SANDOVAL

REVIEWED BY: *dx*

DATE OF LAST REVISION: _____

CITY OF FONTANA

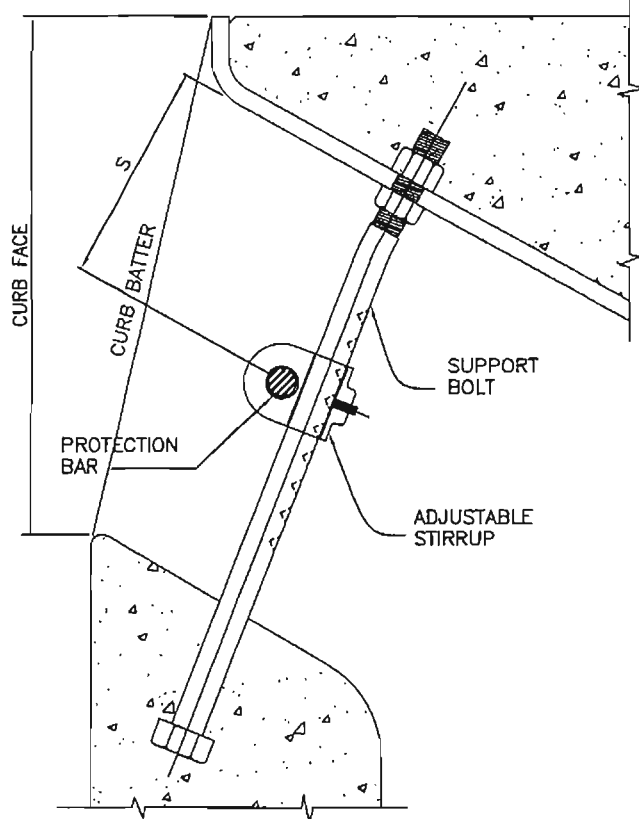
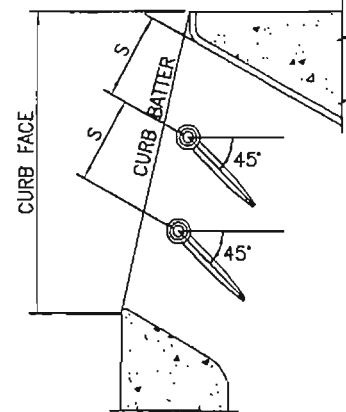
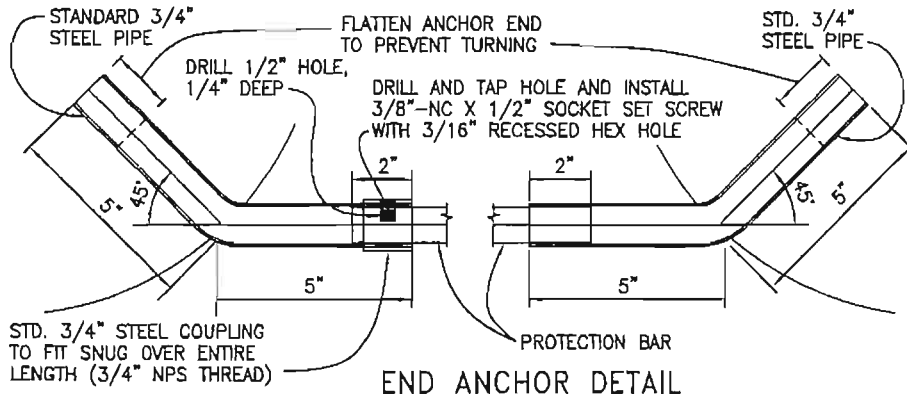
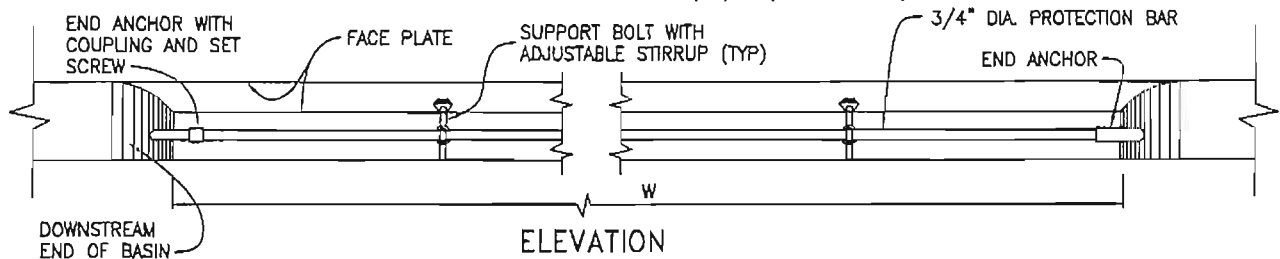
**CATCH BASIN
FACE PLATE ASSEMBLY
AND PROTECTION BAR**

07/10/06

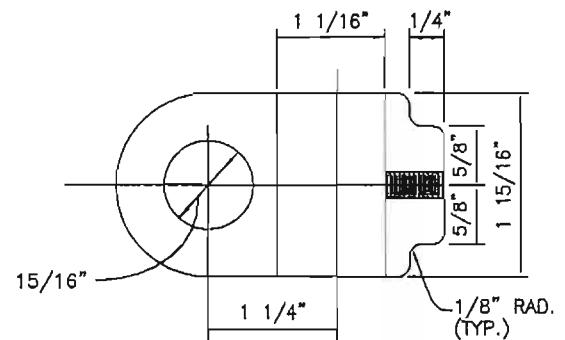
STD. PLAN NO. **3007**

SHT **3** OF **6**

PROTECTION BAR AND SUPPORT BOLT(S) WITH ADJUSTABLE STIRRUP(S)-(TYPE A)



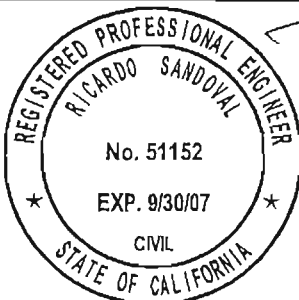
DOUBLE PROTECTION BAR DETAIL



PROTECTION BAR & STIRRUP LOCATION

STIRRUP DETAIL

NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10/18/06

CITY ENGINEER
RICARDO SANDOVAL

DATE

REVIEWED BY: *DL*

DATE OF LAST REVISION: _____

CITY OF FONTANA

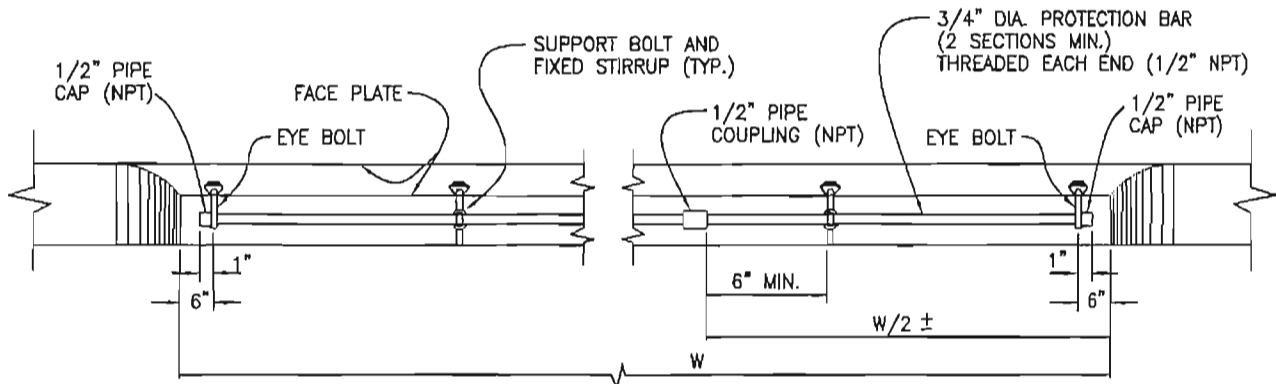
CATCH BASIN
FACE PLATE ASSEMBLY
AND PROTECTION BAR

07/10/06

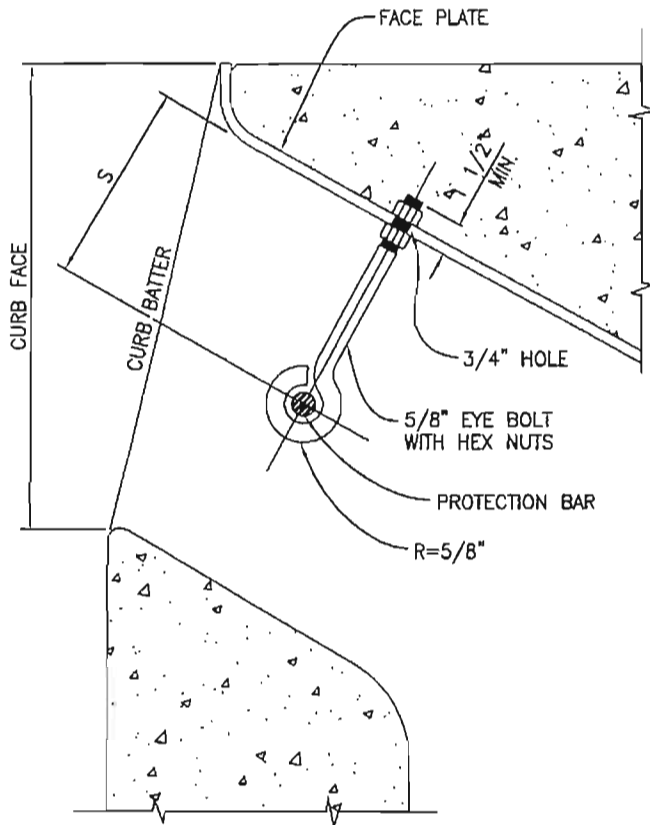
STD. PLAN NO. 3007

SHT 4 OF 6

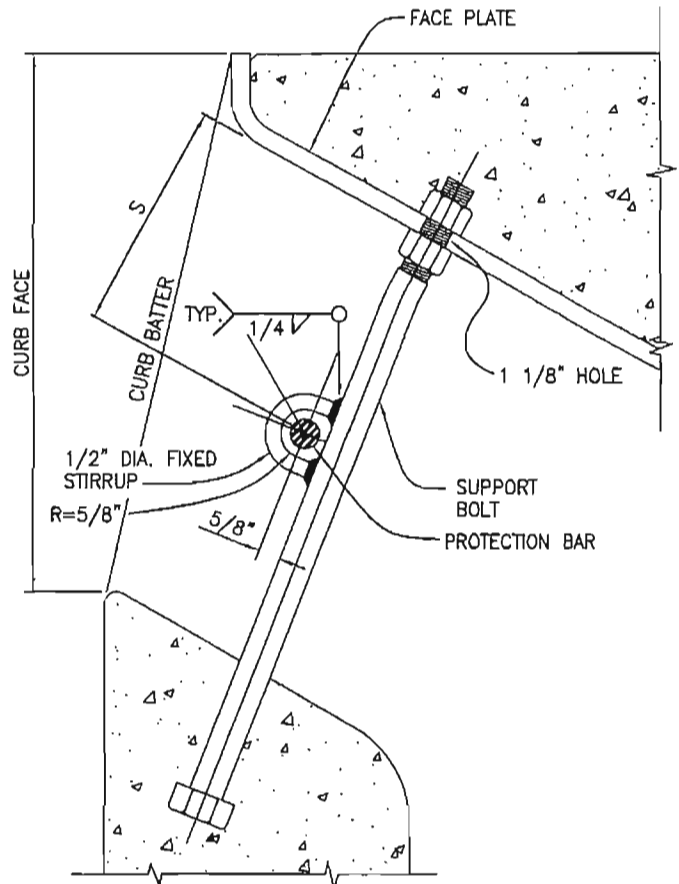
PROTECTION BAR AND SUPPORT BOLT(S) WITH FIXED STIRRUP(S)-(TYPE B)



ELEVATION

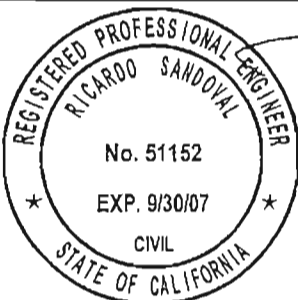


EYE BOLT DETAIL



STIRRUP DETAIL

NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10.18.06

CITY ENGINEER
RICARDO SANDOVAL

DATE

REVIEWED BY: *JK*

DATE OF LAST REVISION: _____

CITY OF FONTANA

CATCH BASIN
FACE PLATE ASSEMBLY
AND PROTECTION BAR

07/10/06

STD. PLAN NO. 3007

SHT 5 OF 6

NOTES

GENERAL

1. ALL PARTS SHALL BE STEEL, EXCEPT SET SCREWS, WHICH SHALL BE STAINLESS STEEL OR BRASS.
2. EXCLUDING SET SCREWS, ALL EXPOSED METAL PARTS SHALL BE GALVANIZED AFTER FABRICATION.
3. CURB FACE SHALL BE NOTED ON THE PROJECT PLANS.
4. CURB BATTER SHALL BE 3:12 UNLESS OTHERWISE SPECIFIED.
5. DIMENSIONS SHOWN ON THIS PLANS ARE NOT EXACT EQUAL VALUES.

FACE PLATE

6. FACE PLATE LENGTHS SHALL BE CATCH BASIN W PLUS 12" EXCEPT AS MODIFIED FOR A "CURB OPENING CATCH BASIN AT DRIVEWAY".
7. WHEN THE LENGTH OF THE FACE PLATE IS BETWEEN 22' AND 43', TWO SECTIONS MAY BE USED. WHEN THE LENGTH EXCEEDS 43', THREE SECTIONS MAY BE USED. SECTIONS SHALL BE SPLICED ACCORDING TO THE APPLICABLE SPLICE DETAIL. SPLICE SHALL BE PLACED 1' FROM A SUPPORT BOLT.
8. WHERE CATCH BASINS ARE TO BE CONSTRUCTED ON CURVES, THE MAXIMUM CHORD LENGTH FOR THE FACE PLATE SHALL BE SUCH THAT THE MAXIMUM PERPENDICULAR DISTANCE TO THE TRUE CURVE SHALL NOT EXCEED 1". WHERE MORE THAN ONE CHORD IS REQUIRED, CHORD LENGTHS SHALL BE EQUAL. CHORD SECTIONS SHALL BE SPLICED ACCORDING TO THE APPLICABLE SPLICE DETAIL (MODIFIED TO FIT THE CHORD DEFLECTION) AND A SUPPORT BOLT SHALL BE PLACED 1' FROM THE SPLICE.
9. ROUND HEAD ANCHORS FOR THE FACE PLATE SHALL BE NELSON H-4F SHEAR CONNECTOR, KSN WELDING SYSTEMS DIVISION SHEAR CONNECTOR OR EQUAL.

SUPPORT BOLT

10. SUPPORT BOLTS ARE REQUIRED WHEN THE LENGTH OF THE CATCH BASIN OPENING IS 7' OR GREATER, AND SHALL BE EVENLY SPACED ACROSS THE OPENING. SPACING SHALL NOT BE LESS THAN 3'-6" ON CENTER NOR GREATER THAN 5' ON CENTER.

STIRRUP

11. FOR TYPE A, MATERIAL SHALL BE CAST STEEL.

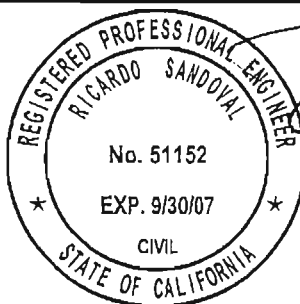
PROTECTION BAR

12. TYPE A SHALL BE USED UNLESS OTHERWISE SPECIFIED.
13. FOR TYPE A, THE BAR SHALL BE CUT TO FIT IN THE FIELD. WHEN "W" IS OVER 21', THE PROTECTION BAR SHALL CONSIST OF 2 OR MORE SECTIONS. A SPECIAL CONNECTOR BETWEEN THE PROTECTION BAR PIECES SHALL CONSIST OF A 5" LENGTH OF STANDARD 3/4" PIPE WITH STANDARD COUPLINGS FULLY THREADED ONTO EACH END DRILLED AND TAPPED FOR A SOCKET SET SCREW AS DETAILED FOR THE DOWNSTREAM AND END ANCHOR.
14. FOR TYPE B, THE BAR SHALL BE TWO PIECES. TWO EYE BOLTS AND A WELDED STIRRUP ON EACH SUPPORT BOLT ARE REQUIRED.
15. NUMBER OF PROTECTION BARS AND LOCATION(S) ARE AS FOLLOWS:

		MAXIMUM CURB FACE													S DIMENSION	
		6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"		
CURB BATTER	0:12	0	0	3.5"	3.5"	3.5"	4.5"	4.5"	5.5"	3.5"	3.5"	4.5"	4.5"	4.5"		
	1:12	0	0	3.5"	3.5"	3.5"	4.5"	4.5"	5.5"	3.5"	3.5"	4.5"	4.5"	5.5"		
	2:12	0	0	3.5"	3.5"	4.5"	4.5"	5.5"	3.5"	3.5"	4.5"	4.5"	5.5"	5.5"		
	3:12	0	0	3.5"	3.5"	4.5"	4.5"	5.5"	3.5"	4.5"	4.5"	5.5"	5.5"	4.5"		
	4:12	0	3.5"	3.5"	4.5"	4.5"	5.5"	3.5"	3.5"	4.5"	4.5"	5.5"	4.5"	4.5"		
		0	1					2*					3*			
		NUMBER OF PROTECTION BAR														

FOR OTHER CURB FACE OR BATTER SEE PROJECT PLANS

*TYPE A PROTECTION BAR ONLY



APPROVED BY:

Ricardo Sandoval
CITY ENGINEER
RICARDO SANDOVAL

DATE

REVIEWED BY: *DL*

DATE OF LAST REVISION: _____

CITY OF FONTANA

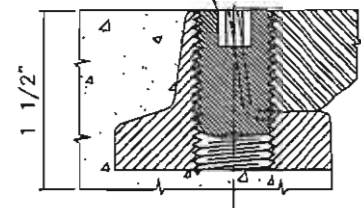
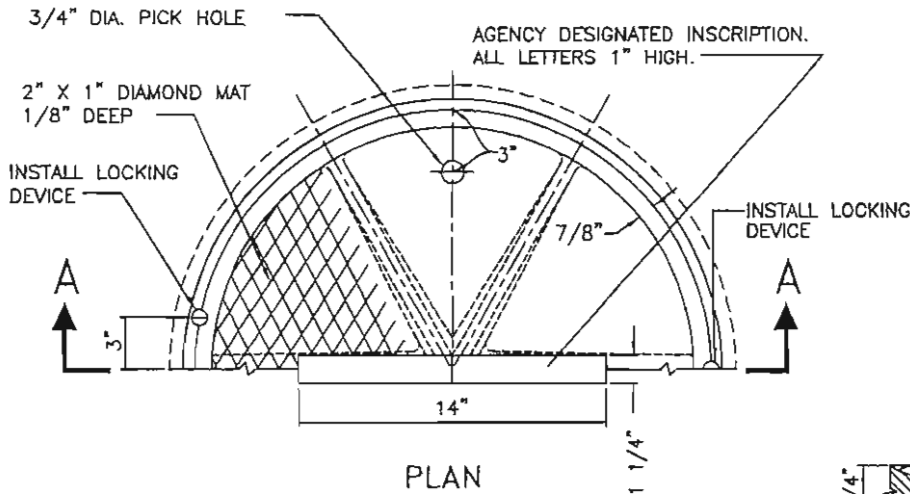
CATCH BASIN
FACE PLATE ASSEMBLY
AND PROTECTION BAR

07/10/06

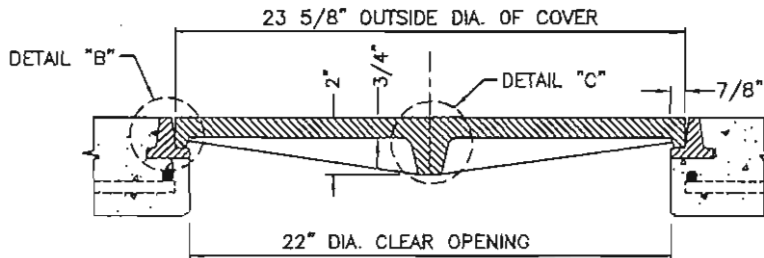
STD. PLAN NO. 3007

SHT 6 OF 6

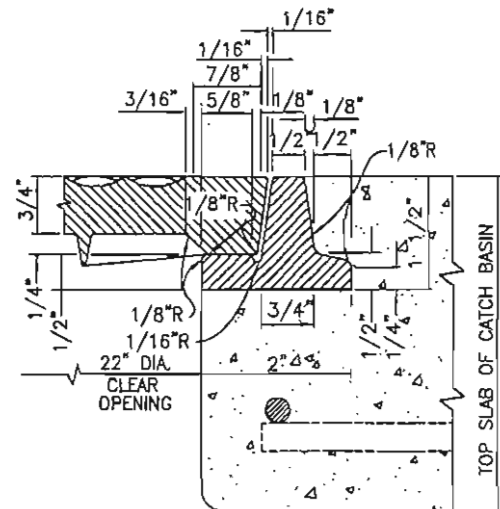
DRILL AND TAP HOLE AND INSTALL 3/4" X 1 1/4" STAINLESS STEEL SOCKET SET SCREW WITH 3/8" RECESSED HEX HOLE. ALL THREADS TO BE NC.



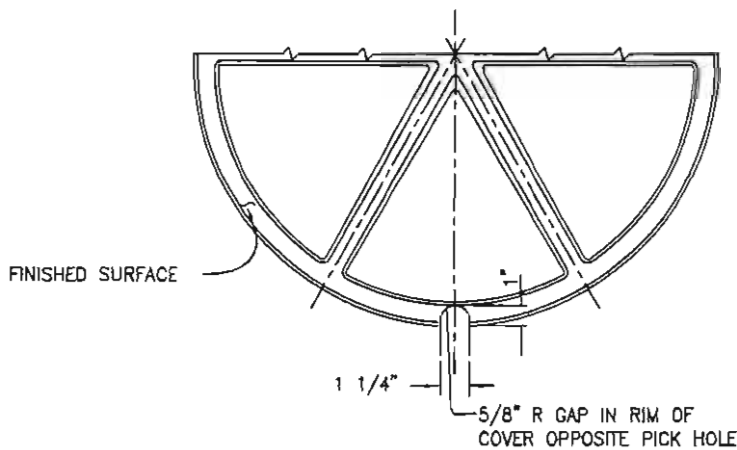
LOCKING DEVICE



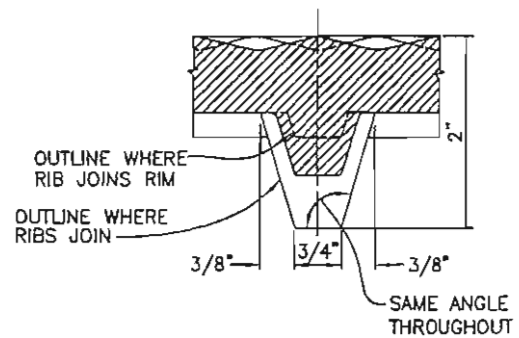
SECTION A-A



DETAIL "B"



BOTTOM OF MANHOLE COVER



DETAIL "C"

NOT TO SCALE



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: *DR*

DATE OF LAST REVISION: _____

10.18.06
DATE

CITY OF FONTANA

CATCH BASIN
MANHOLE FRAME AND COVER

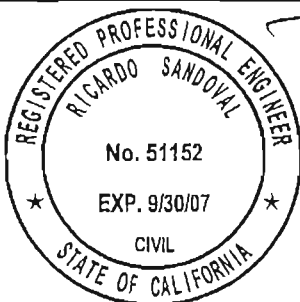
07/10/06

STD. PLAN NO. 3008

SHT 1 OF 2

NOTES:

1. THE CAST IRON USED SHALL CONFORM WITH ASTM A-48M CLASS 35B.
2. THE FRAME AND COVER SHALL BE COATED WITH ASPHALTUM OR BITAMINOUS PAINT AFTER TESTING AND INSPECTION.
3. FOUNDRY IDENTIFYING MARK, HEAT AND DATE SHALL BE CAST ON THE BOTTOM OF THE COVER AND ON THE INSIDE OF THE FRAME.
4. IMPORTED COVERS AND FRAMES SHALL HAVE THE COUNTRY OF ORIGIN MARKING IN COMPLIANCE WITH FEDERAL REGULATIONS.
5. WEIGHT OF FRAME SHALL BE 30 POUNDS. WEIGHT OF COVER SHALL BE 85 POUNDS. ACTUAL WEIGHTS SHALL BE WITHIN A RANGE OF 95% TO 110%.
6. THE MANHOLE FRAME AND COVER SHALL BE INSPECTED BY THE ENGINEER PRIOR TO SHIPMENT TO THE JOB SITE. ACCEPTANCE WILL BE INDICATED BY THE AGENCY'S MARK.
7. THE PROOF-LOAD FOR TEST METHOD B OF THE STANDARD SPECIFICATIONS IS 28,600 POUNDS.
8. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.



APPROVED BY:

Ricardo Sandoval 10.18.06
CITY ENGINEER DATE

RICARDO SANDOVAL

REVIEWED BY: *DX*

DATE OF LAST REVISION: _____

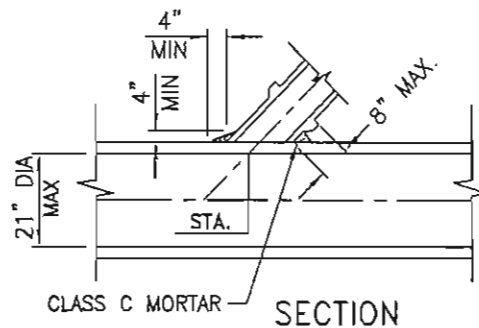
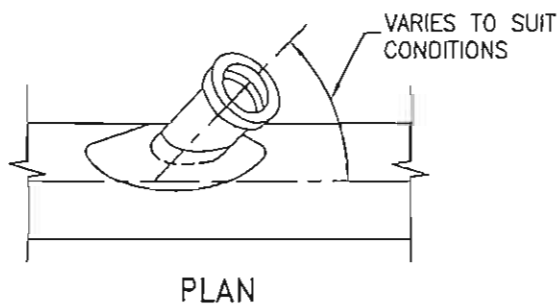
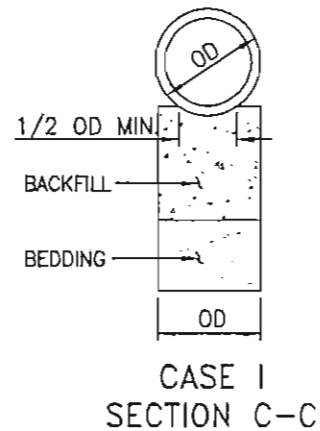
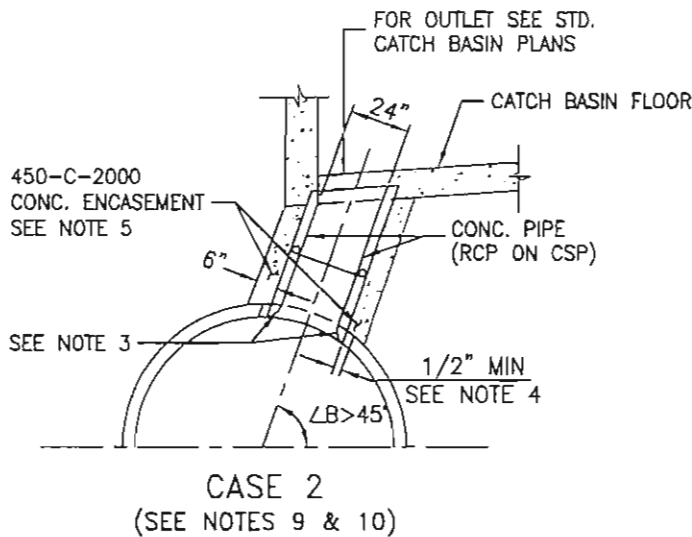
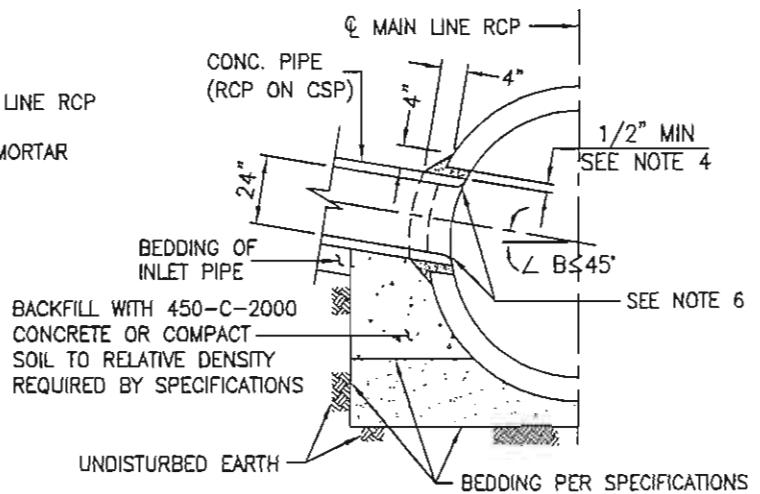
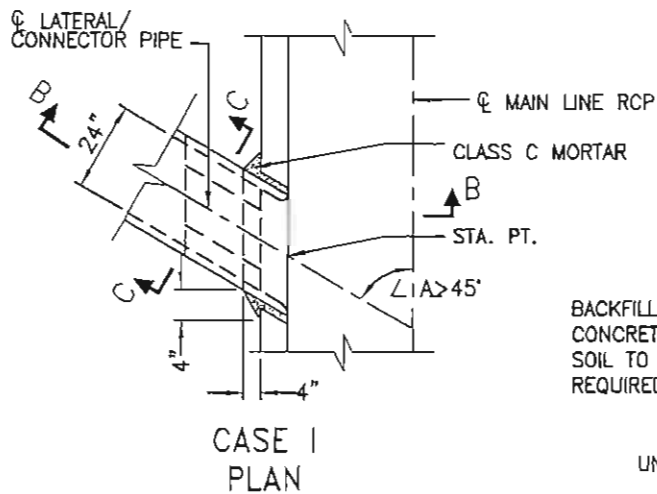
CITY OF FONTANA

CATCH BASIN
MANHOLE FRAME AND COVER

04/07/06

STD. PLAN NO. **3008**

SHT **2** OF **2**



CASE 3
SADDLE CONNECTION

NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10-18-06
CITY ENGINEER DATE
RICARDO SANDOVAL

REVIEWED BY: *PL*

DATE OF LAST REVISION: _____

CITY OF FONTANA

JUNCTION STRUCTURE
PIPE TO PIPE (ID ≤ 24")

07/10/06

STD. PLAN NO. **3009** SHT 1 OF 2

GENERAL NOTE

1. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.

NOTES

CASE 1 AND CASE 2

1. IF ANGLE A IS LESS THAN 45° OR IF D IS LARGER THAN 24", THEN ANOTHER STANDARD STRUCTURE SHALL BE SPECIFIED.
2. THE OUTSIDE DIAMETER OF THE INLET PIPE SHALL NOT EXCEED ONE-HALF THE INSIDE DIAMETER OF THE MAIN LINE.
3. THE INLET PIPE SHALL ENTER THE MAIN LINE RADially. IF THE INLET PIPE CANNOT ENTER RADially, THEN ANOTHER STANDARD STRUCTURE SHALL BE SPECIFIED.
4. THE SIZE OF THE OPENING INTO THE MAIN LINE SHALL BE THE OUTSIDE DIAMETER OF THE INLET PIPE PLUS 1" MINIMUM TO 3" MAXIMUM.
5. ALL CONNECTOR PIPES FOR CASE 2 SHALL BE ENCASED IN CONCRETE IF LAID WITHIN THE MAIN LINE EXCAVATED TRENCH OR IF LAID ON FILL WHICH HAS NOT BEEN DENSIFIED.
6. BURN OR CHIP END OF CONNECTOR PIPE FLUSH WITH INNER SURFACE OF MAIN LINE. ROUND EDGE OF CONCRETE PIPE OR RCP.
7. ALL CSP AND FITTINGS SHALL BE GALVANIZED.
8. STATION SPECIFIED ON THE PROJECT DRAWINGS APPLIES AT THE INTERSECTION OF THE INSIDE WALL OF MAIN LINE AND THE CENTER LINE OF INLET PIPE.
9. CASE 2 SHALL NOT BE USED TO CONNECT TO THE FLOOR OF A GRATING CATCH BASIN WHERE THE GRATE WILL BE SUBJECT TO VEHICLE TRAFFIC.
10. FOR CASE 2, NOT MORE THAN 12' OF INLET PIPE SHALL BE LOCATED WITHIN THE MAIN LINE EXCAVATED TRENCH.

CASE 3

11. CONNECTIONS TO PIPES 21" OR LESS IN DIAMETER WITHOUT JUNCTION STRUCTURES OR PRECAST Y BRANCHES SHALL BE MADE WITH SADDLES.
12. THE OUTSIDE DIAMETER OF THE INLET PIPE SHALL NOT EXCEED ONE-HALF THE INSIDE DIAMETER OF THE MAIN LINE.
13. TRIM OR CUT SADDLE TO FIT SNUGLY OVER THE OUTSIDE OF THE MAIN LINE SO ITS AXIS WILL BE ON THE LINE AND GRADE OF THE CONNECTOR PIPE.
14. THE OPENING INTO THE PIPE SHALL BE CUT AND TRIMMED TO FIT THE SADDLE SO THAT NO PART WILL PROJECT WITHIN THE BORE OF THE SADDLE PIPE.
15. THE CONNECTOR PIPE SHALL BE SUPPORTED AS SHOWN IN CASES 1 AND 2.



APPROVED BY:

Ricardo Sandoval 10-18-06
CITY ENGINEER DATE

RICARDO SANDOVAL

REVIEWED BY: *PC*

DATE OF LAST REVISION: _____

CITY OF FONTANA

**JUNCTION STRUCTURE
PIPE TO PIPE (ID ≤ 24")**

03/08/06

STD. PLAN NO. **3009**

SHT **2** OF **2**

© MAIN LINE RCP OR
REINFORCED MONOLITHIC
ARCH, SEE NOTE 2

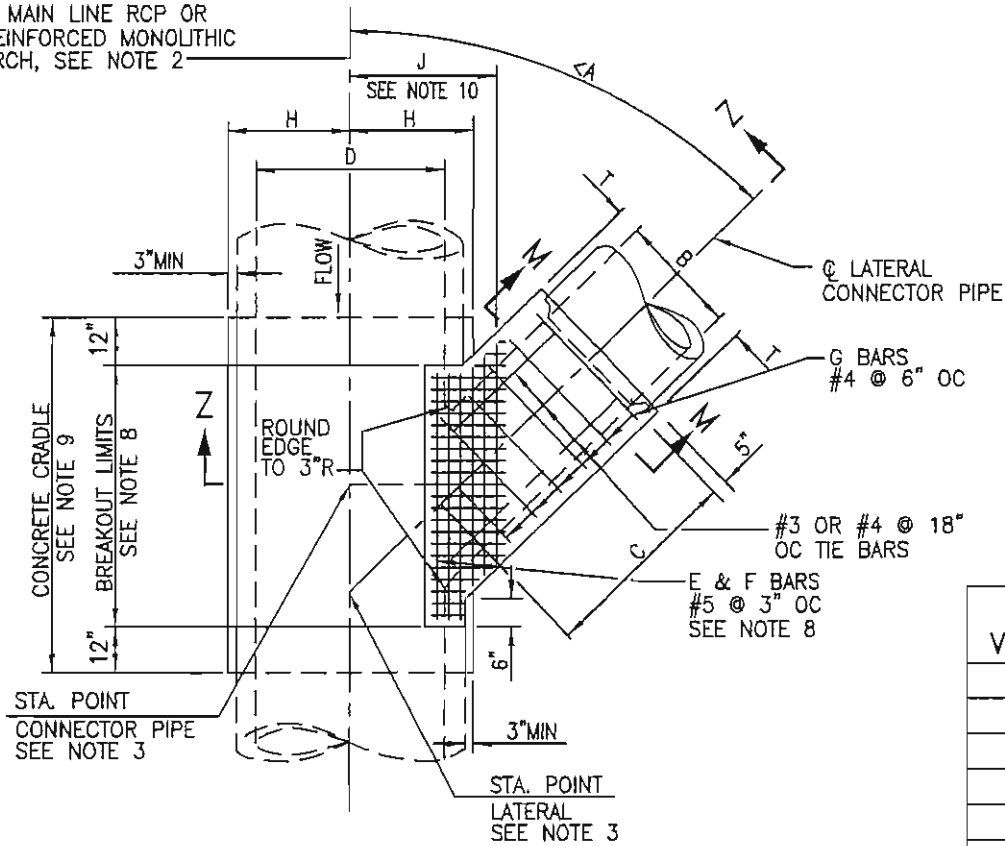
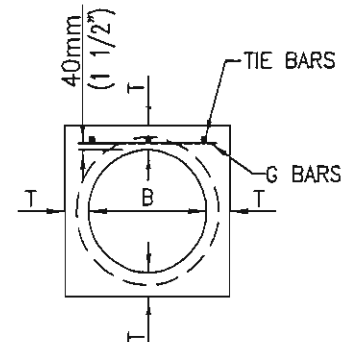
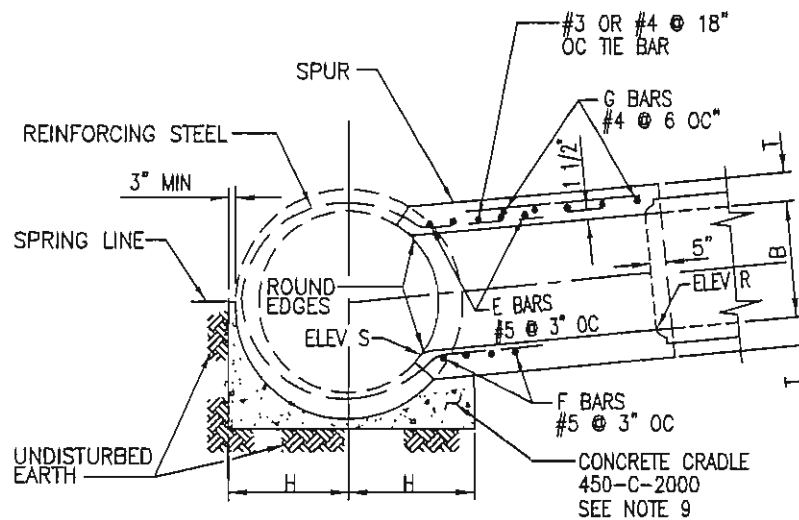
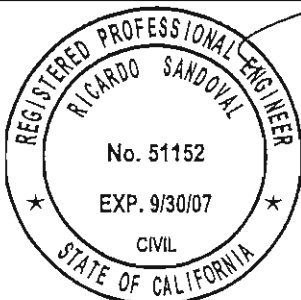


TABLE OF
VALUES FOR T

B	T
12"	5"
15"	5"
18"	5"
21"	5"
24"	5 1/2"
27"	5 1/2"
30"	6"
33"	6 1/2"
36"	6 1/2"
39"	7"



NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10-18-06
CITY ENGINEER DATE

REVIEWED BY: *PC*

DATE OF LAST REVISION: _____

CITY OF FONTANA

JUNCTION STRUCTURE
PIPE TO PIPE INLET
ID ≥ 24" OR OD > 1/2
MAIN LINE ID

07/10/06

STD. PLAN NO. 3010

SHT 1 OF 2

NOTES

1. THIS JUNCTION STRUCTURE SHALL BE USED WHEN THE OUTSIDE DIAMETER OF THE LATERAL IS GREATER THAN $1/2$ THE INSIDE DIAMETER D OF THE MAIN LINE: OR WHEN THE INSIDE DIAMETER B OF THE LATERAL IS GREATER THAN 24". B SHALL NOT EXCEED $.75 D$ OR 39".
2. IF THE MAIN LINE IS REINFORCED MONOLITHIC ARCH STORM DRAIN, D SHALL REFER TO THE CLEAR SPAN OF THE ARCH. REINFORCING STEEL SHALL BE CUT AND BENT INTO THE JUNCTION STRUCTURE IN THE SAME MANNER AS FOR A PIPE. A CONCRETE CRADLE IS NOT REQUIRED FOR A REINFORCED MONOLITHIC ARCH.
3. STATIONS SHOWN ON THE PROJECT DRAWINGS FOR LATERALS APPLY AT THE INTERSECTIONS OF CENTER LINES OF MAIN LINE AND LATERAL. STATIONS SHOWN ON PROJECT DRAWINGS FOR CATCH BASIN CONNECTOR PIPES APPLY AT THE INTERSECTION OF THE INSIDE WALL OF THE MAIN LINE WITH THE CONNECTOR PIPE CENTER LINE.
4. VALUES FOR A, B, C AND D SHALL BE SHOWN ON THE PROJECT DRAWINGS. ELEVATION R AND ELEVATION S SHALL BE SHOWN ONLY WHEN REQUIRED PER NOTE 5.
5.
 - a. ELEVATIONS R AND S NEED NOT BE SHOWN ON THE PROJECT DRAWINGS IF THE INLET PIPE IS TO ENTER THE MAIN LINE RADIALLY.
 - b. ELEVATION R SHALL BE SHOWN ON THE PROJECT DRAWINGS ONLY IF A STUB IS TO BE PROVIDED IN THE MAIN LINE FOR FUTURE CONNECTION OF AN INLET PIPE.
 - c. ELEVATION S SHALL BE SHOWN ON THE PROJECT DRAWINGS IF AN INLET PIPE IS TO ENTER THE MAIN LINE OTHER THAN RADIALLY. INLET PIPE SHALL BE LAID ON A STRAIGHT GRADE FROM ELEVATION S TO THE CATCH BASIN OR GRADE BREAK IN LINE.
6. THE INLET PIPE SHALL ENTER THE MAIN LINE RADIALLY UNLESS OTHERWISE INDICATED. THE INLET PIPE MAY ENTER THE MAIN LINE OTHER THAN RADIALLY IF ANGLE A IS GREATER THAN 45° , B IS LESS THAN OR EQUAL TO 24" AND THE OUTSIDE DIAMETER OF THE INLET PIPE IS LESS THAN $.5D$.
7. NO MORE THAN ONE OPENING SHALL BE MADE IN ANY ONE SECTION OF PIPE.
8. THE OPENING FOR THE BREAKOUT SHALL BE RECTANGULAR AND CUT NORMAL TO THE PIPE SURFACE WITHOUT DAMAGING THE REINFORCING STEEL. THE TRANSVERSE REINFORCEMENT OF THE MAIN LINE SHALL BE CUT AT THE CENTER OF THE OPENING AND BENT INTO THE TOP AND BOTTOM SLABS OF THE SPUR.
9. THE MAIN LINE SHALL BE REINFORCED WITH CONCRETE CRADLE AND ENCASEMENT (AS APPLICABLE). A CONCRETE ENCASEMENT IS REQUIRED IF A JOINT IN THE MAIN LINE FALLS WITHIN THE LIMITS OF THE CRADLE. THE CONCRETE ENCASEMENT SHALL EXTEND 12" ABOVE THE TOP OF THE MAIN LINE AND TO THE LIMITS OF THE CRADLE. IF CONNECTING TO AN EXISTING STORM DRAIN, PORTION OF CRADLE OPPOSITE INLET MAY BE OMITTED.
10. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 40 AND BE PLACED $1\frac{1}{2}$ " CLEAR FROM CONCRETE SURFACES. UNLESS OTHERWISE SHOWN F BARS SHALL BE CARRIED TO A POINT NOT LESS THAN J DISTANCE FROM CENTER LINE WITH $J=7D/12+6"$.
11. FLOOR OF THE SPUR SHALL BE STEEL-TROWELED TO THE SPRING LINE OF THE SPUR.
12. DIMENSIONS SHOWN ON THE PLANS ARE NOT EXACT EQUAL VALUES.



APPROVED BY:

[Signature] 10-18-06
CITY ENGINEER DATE

RICARDO SANDOVAL

REVIEWED BY: *[Signature]*

DATE OF LAST REVISION: _____

CITY OF FONTANA

**JUNCTION STRUCTURE
PIPE TO PIPE INLET
ID \geq 24" OR OD $>$ $1/2$
MAIN LINE ID**

07/10/06

STD. PLAN NO. **3010**

SHT **2** OF **2**

3-#4 J BARS,
4'-8" LONG, 3" OC
CONTINUE ADDITIONAL
BARS 6" OC TO INSIDE
EDGE OF MANHOLE

STATION

5"x2" PIPE SEAT

3-D BARS, 3" OC
CONTINUE 6" OC

4-#6 E BARS
SEE NOTE 3

#3 OR #4 @ 18"
OC TIE BARS

A & B BARS

STATION PT.
STATION

ROUND TO 3" R

OPTIONAL FILLET

OPTIONAL OUTSIDE
EDGE OF CONCRETE

C

DETAIL "N"

(RINGS AND COVER
NOT SHOWN)
SEE NOTE 2

PLAN

(SHAFT NOT SHOWN)

F BARS

TIE BARS

SECTION G-G

MANHOLE SHAFT PER
STD. PLAN 3025

STEPS
TIE BARS

5"x2"
PIPE SEAT
ELEV S

STREET GRADE

MANHOLE FRAME & COVER
PER STD. PLAN 3031

SEE TABLE

D BARS

F BARS

TIE BARS

A BARS

ELEV R

B BARS

#4 @ 18" OC BOTH WAYS, TO BE
USED WHEN B IS 60" OR MORE

SECTION N-M-P-O

CONCRETE RINGS PER
STD. PLAN 3025

STREET GRADE

5"x1" RING SEAT

SEE TABLE

18" M

6" H BAR

6" TIE BARS

6" E BARS

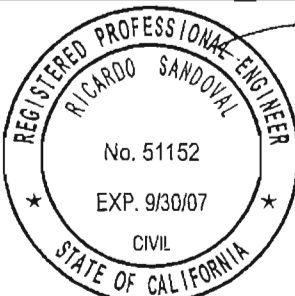
6" TIE BARS

6" J BARS

ROUND EDGES TO 3" R

SECTION C-C

NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10.18.06

CITY ENGINEER

RICARDO SANDOVAL

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CITY OF FONTANA

MANHOLE PIPE TO PIPE
(LARGE SIDE INLET)

07/10/06

STD. PLAN NO. **3011**

SHT **1** OF **4**

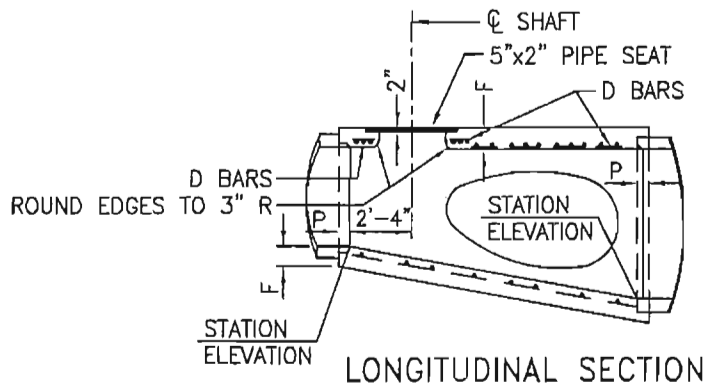


TABLE OF BARS SIZES		
D2 OR B	A & B	D OR F
12"-39"	#5 @ 3"	#4 @ 6"
42"-84"	#6 @ 3"	#5 @ 6"
90"-144"	#7 @ 3"	#6 @ 6"

TABLE OF VALUES FOR M (SEE NOTE 2)				
SECTION	PAVED STREET		UNPAVED STREET	
	MAX	MIN.	MAX	MIN.
N-M-P-O		2'-10 1/2"		3'-6"
C-C	11"	8 1/2"	16"	15"

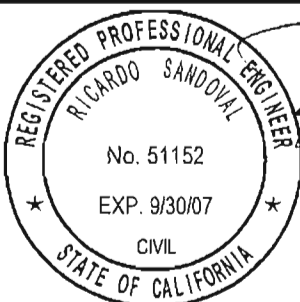
TABLE OF VALUES FOR F	
D2	F
36"	6 1/2"
39"	7"
42"	7 1/2"
45"	7 3/4"
48"	8"
51"	8 1/2"
54"	9"
57"	9 1/4"
60"	9 1/2"
63"	10"
66"	10 1/4"
69"	10 3/4"
72"	11"

TABLE OF VALUES FOR F	
D2	F
78"	11 3/4"
84"	12 1/2"
90"	13 1/4"
96"	14"
102"	15 1/2"
108"	16"
114"	16 1/2"
120"	17"
126"	17"
132"	17 1/2"
138"	17 1/2"
144"	18"

TABLE OF VALUES FOR T	
B	T
12"	4"
15"	4 1/4"
18"	4 1/2"
21"	5"
24"	5 1/4"
27"	5 1/2"
30"	6"
33"	6 1/4"
36"	6 1/2"
39"	7"
42"	7 1/2"
45"	7 3/4"
48"	8"
51"	8 1/2"
54"	9"
57"	9 1/4"
60"	9 1/2"

TABLE OF VALUES FOR T	
B	T
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"
102"	15 1/2"
108"	16"
114"	16 1/2"
120"	17"
126"	17"
132"	17 1/2"
138"	17 1/2"
144"	18"

NOT TO SCALE



APPROVED BY: *[Signature]* 10.18.06
 CITY ENGINEER
RICARDO SANDOVAL
 REVIEWED BY: *[Signature]*
 DATE OF LAST REVISION: _____

CITY OF FONTANA

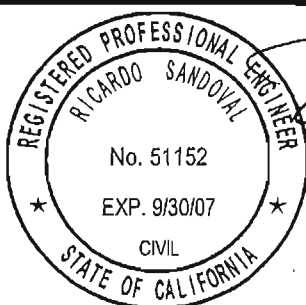
MANHOLE PIPE TO PIPE
 (LARGE SIDE INLET)

07/10/06

STD. PLAN NO. **3011** SHT **2** OF **4**

NOTES

1. VALUES FOR A, B, C, D₁, D₂, ELEVATION R AND ELEVATION S ARE SHOWN ON THE PROJECT DRAWINGS. ELEVATION S APPLIES AT INSIDE WALL OF STRUCTURE.
2. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'-10 1/2" FOR PAVED STREETS OR 3'-6" FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION C-C AND DETAIL "N". SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED PER SECTION C-C. WHEN DIAMETER D₁ IS 48" OR LESS, CENTER OF SHAFT MAY BE LOCATED PER NOTE 3.
3. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTER LINE OF STORM DRAIN WHEN DIAMETER D₁ IS 48" OR LESS, IN WHICH CASE PLACE E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTER LINE.
4. LENGTH OF MANHOLE MAY BE INCREASED AT OPTION TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION OF SPUR MUST BE APPROVED BY THE ENGINEER.
5. P SHALL BE 5" FOR D₂=96" OR LESS AND 8" FOR D₂ OVER 96".
6. REINFORCEMENT SHALL CONFORM TO ASTM A 615, GRADE 40, AND SHALL TERMINATE 1 1/2" CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
7. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
8. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
9. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN THE TABULAR VALUES OF F SHOWN ON TABLE, SH. 1.
10. IF LATERALS ENTER BOTH SIDES OF MANHOLE, SHAFT SHALL BE LOCATED ON SIDE RECEIVING THE SMALLER LATERAL.
11. STEPS SHALL CONFORM TO STANDARD PLAN 3024. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" TO 15" OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" ABOVE THE INVERT.
12. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
 - A. THIS STANDARD PLAN IS USED WHEN STANDARD PLAN 3012 INADEQUATE. MAIN LINE = 36" INSIDE DIAMETER OR LARGER.
 - B. LATERAL = 12" TO 144" INSIDE DIAMETER; HOWEVER THE INSIDE DIAMETER SHALL NOT EXCEED THE INSIDE DIAMETER OF THE MAIN LINE.
13. MANHOLE FRAME AND COVER SHALL CONFORM TO STANDARD PLAN 3018 UNLESS OTHERWISE SHOWN.
14. MANHOLE SHAFT SHALL CONFORM TO STANDARD PLAN 3014 UNLESS OTHERWISE SHOWN.
15. WHERE A MANHOLE SHAFT - 36" WITHOUT REDUCER IS SPECIFIED REFER TO STANDARD PLAN 3015.
16. WHERE A PRESSURE MANHOLE SHAFT - WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO STANDARD PLAN 3016.



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: *DL*

DATE OF LAST REVISION: _____

10.18.06

DATE

CITY OF FONTANA

**MANHOLE PIPE TO PIPE
(LARGE SIDE INLET)**

07/10/06

STD. PLAN NO. **3011**

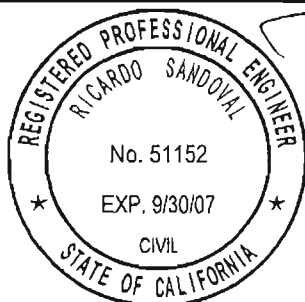
SHT **3** OF **4**

17. WHERE A PRESSURE MANHOLE SHAFT - 36" WITHOUT REDUCER IS SPECIFIED REFER TO STANDARD PLAN 3017.

18. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.

THE FOLLOWING STANDARD PLANS ARE INCORPORATED HEREIN:

- 3014 MANHOLE SHAFT - WITH ECCENTRIC REDUCER
- 3015 MANHOLE SHAFT - 36" WITHOUT REDUCER
- 3016 PRESSURE MANHOLE SHAFT - WITH ECCENTRIC REDUCER
- 3017 PRESSURE MANHOLE SHAFT - 36" WITHOUT REDUCER
- 3019 24" MANHOLE FRAME AND COVER
- 3023 36" MANHOLE FRAME AND COVER
- 3024 STEEL STEP



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: *RS*

DATE OF LAST REVISION: _____

DATE

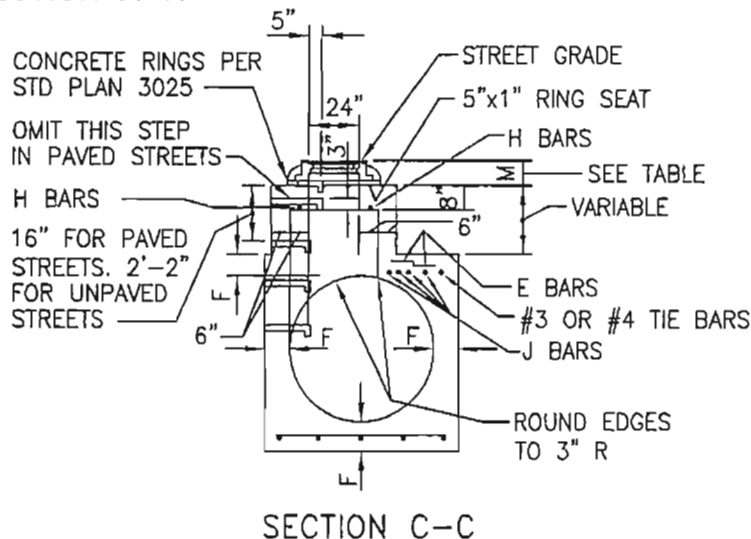
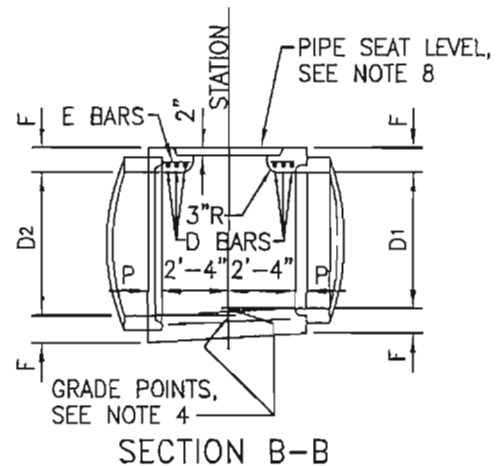
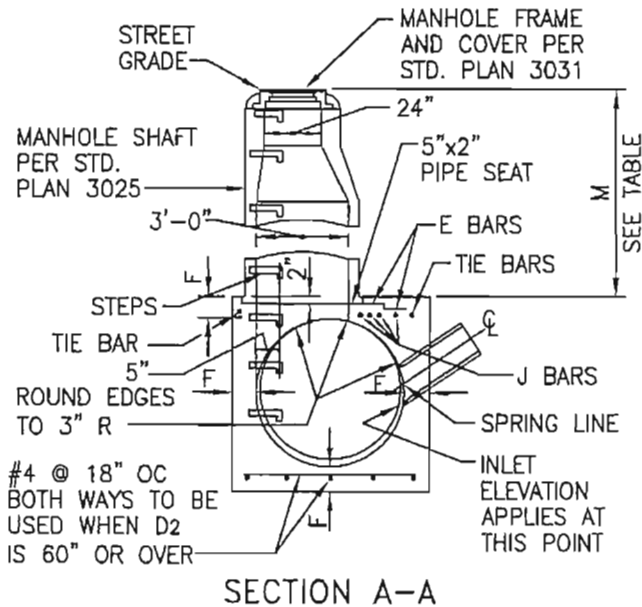
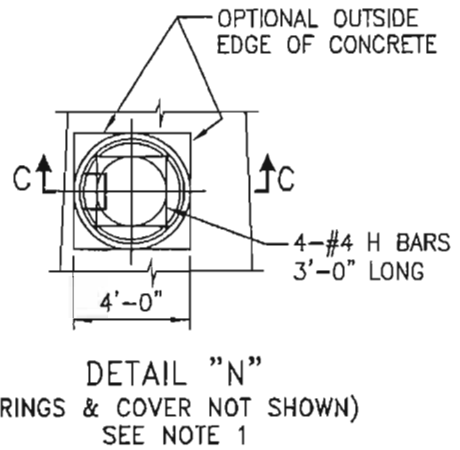
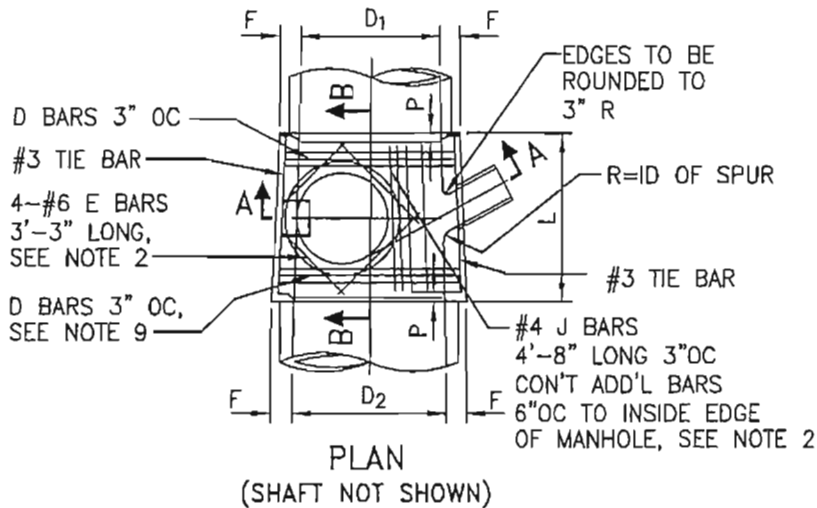
CITY OF FONTANA

**MANHOLE PIPE TO PIPE
(LARGE SIDE INLET)**

07/10/06

STD. PLAN NO. **3011**

SHT **4** OF **4**



NOT TO SCALE



APPROVED BY:

Ricardo Sandoval 10-18-06
CITY ENGINEER DATE

RICARDO SANDOVAL

REVIEWED BY: *JL*

DATE OF LAST REVISION: _____

CITY OF FONTANA

**MANHOLE PIPE
TO PIPE MAINLINE
(ID = 36" OR LARGER)**

07/10/06

STD. PLAN NO. **3012**

SHT **1** OF **4**

TABLE OF VALUES
FOR F

D2	F
36"	6 1/2"
39"	7"
42"	7 1/2"
45"	7 3/4"
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"
102"	15 1/2"
108"	16"
114"	16 1/2"
120"	17"
126"	17"
132"	17 1/2"
138"	17 1/2"
144"	18"

TABLE OF VALUES FOR M (SEE NOTE 1)

SECTION	PAVED STREET		UNPAVED STREET	
	MAX.	MIN.	MAX.	MIN.
A-A		2'-10 1/2"		3'-6"
C-C	11"	8 1/2"	16"	15"



APPROVED BY:

[Signature] 10-18-06
CITY ENGINEER DATE

RICARDO SANDOVAL

REVIEWED BY: *[Signature]*

DATE OF LAST REVISION: _____

CITY OF FONTANA

MANHOLE PIPE
TO PIPE MAINLINE
(ID = 36" OR LARGER)

07/10/06

STD. PLAN NO. 3012

SHT 2 OF 4

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'-10 1/2" FOR PAVED STREETS OR 3'-6" FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION C-C AND DETAIL "N". SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED PER SECTION C-C. WHEN DIAMETER D₁ IS 48" OR LESS, CENTER OF SHAFT MAY BE LOCATED PER NOTE 2.
2. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTER LINE OF STORM DRAIN WHEN DIAMETER D₁ IS 48" OR LESS, IN WHICH CASE PLACE E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTER LINE AND OMIT J BARS.
3. L AND P SHALL HAVE THE FOLLOWING VALUES UNLESS OTHERWISE SHOWN ON THE PROJECT DRAWINGS:
 - A. D₂ = 96" OR LESS, L=5'-6", P=5"
 - B. D₂ OVER 96", L=6'-0", P=8"

L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS. WHEN L GREATER THAN THAT SHOWN ABOVE IS SPECIFIED, D BARS SHALL BE CONTINUED 6" OC.
4. STATIONS OF MANHOLES SHOWN ON THIS PROJECT DRAWINGS APPLY AT CENTER LINE OF SHAFT. ELEVATIONS ARE SHOWN AT CENTER LINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES.
5. REINFORCEMENT SHALL CONFORM TO ASTM A 615, GRADE 40, AND SHALL TERMINATE 1 1/2" CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
6. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
7. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY WAY BE PLACED AT THE SPRING LINE.
8. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN THE TABULAR VALUES FOR F SHOWN ON TABLE SHT. 2.
9. D BARS SHALL BE #4 FOR D₂ = 39" OR LESS, #5 FOR D₂ = 42" TO 84" INCLUSIVE AND #6 FOR D₂ = 90" OR OVER.
10. CENTER LINE OF INLET PIPE SHALL INTERSECT INSIDE FACE OF CONE AT SPRING LINE UNLESS OTHERWISE SHOWN.
11. STEPS SHALL CONFORM TO STANDARD PLAN 3024. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" TO 15" OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" ABOVE THE INVERT.
12. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
 - A. MAINLINE = 36" INSIDE DIAMETER OR LARGER, EXCEPT IF THE MAIN LINE RCP DOWNSTREAM OF MANHOLE IS 36" TO 42" INSIDE DIAMETER AND THE MAIN LINE RCP UPSTREAM IS 33" OR LESS STANDARD PLAN 3014 SHALL BE USED.
 - B. THE OUTSIDE DIAMETER OF THE LATERAL MUST BE LESS THAN OR EQUAL TO 1/2 THE INSIDE DIAMETER OF THE MAIN LINE. IF THE UPSTREAM AND DOWNSTREAM DIAMETERS OF THE MANHOLE ARE NOT THE SAME, THE GOVERNING INSIDE DIAMETER OF THE MAIN LINE SHALL BE CONSIDERED TO BE THAT WHERE THE EXTENDED CENTER LINE OF THE LATERAL ENTERS THE MANHOLE.
 - C. IN NO INSTANCE SHALL THE INSIDE DIAMETER OF THE LATERAL TO THE MANHOLE BE GREATER THAN 30".



APPROVED BY:

Ricardo Sandoval 10.18.06

CITY ENGINEER
RICARDO SANDOVAL

DATE

REVIEWED BY: *DL*

DATE OF LAST REVISION: _____

CITY OF FONTANA

**MANHOLE PIPE
TO PIPE MAINLINE
(ID = 36" OR LARGER)**

07/10/06

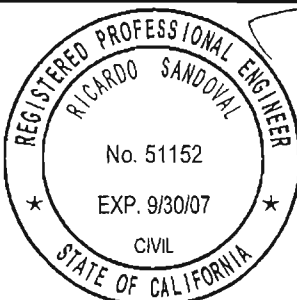
STD. PLAN NO. **3012**

SHT **3 OF 4**

13. MANHOLE FRAME AND COVER SHALL CONFORM TO STANDARD PLAN 3019 UNLESS OTHERWISE SHOWN.
14. MANHOLE SHAFT SHALL CONFORM TO STANDARD PLAN 3014 UNLESS OTHERWISE SHOWN.
15. WHERE A MANHOLE SHAFT – 36" WITHOUT REDUCER IS SPECIFIED REFER TO STANDARD PLAN 3015.
16. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO STANDARD PLAN 3016.
17. WHERE A PRESSURE MANHOLE SHAFT – 36" WITHOUT REDUCER IS SPECIFIED REFER TO STANDARD PLAN 3017.
18. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.

THE FOLLOWING STANDARD PLANS ARE INCORPORATED HEREIN:

- 3014 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
- 3015 MANHOLE SHAFT – 36" WITHOUT REDUCER
- 3016 PRESSURE MANHOLE SHAFT – WITH ECCENTRIC
- 3017 PRESSURE MANHOLE SHAFT 36" WITHOUT REDUCER
- 3019 24" MANHOLE FRAME AND COVER
- 3023 36" MANHOLE FRAME AND COVER
- 3024 STEEL STEP



APPROVED BY:

[Signature] 10-18-06
CITY ENGINEER DATE

RICARDO SANDOVAL

REVIEWED BY: *[Signature]*

DATE OF LAST REVISION: _____

CITY OF FONTANA

**MANHOLE PIPE
TO PIPE MAINLINE
(ID = 36" OR LARGER)**

07/10/06

STD. PLAN NO. **3012**

SHT **4** OF **4**

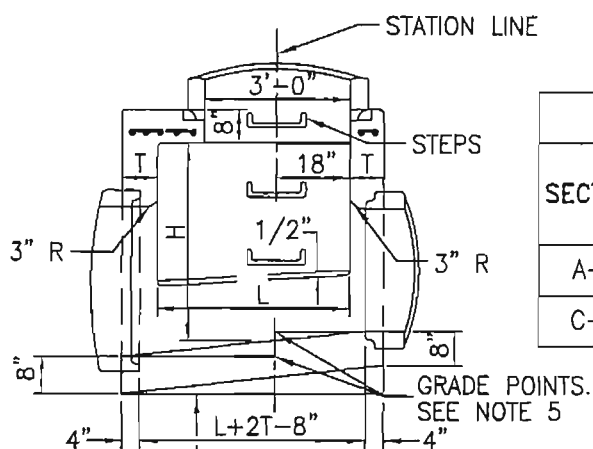
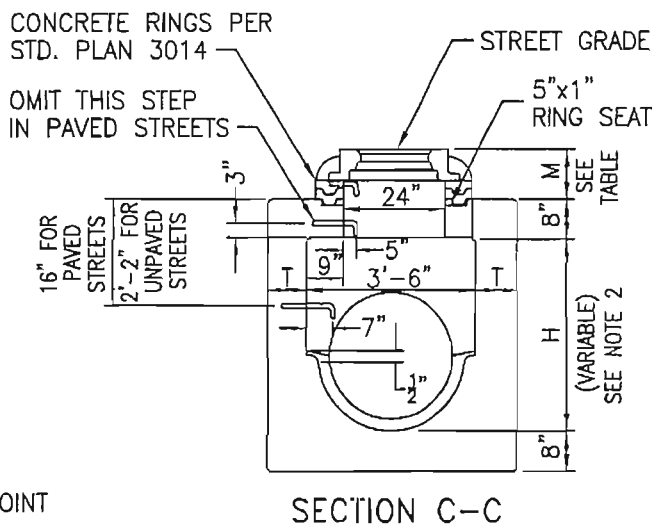
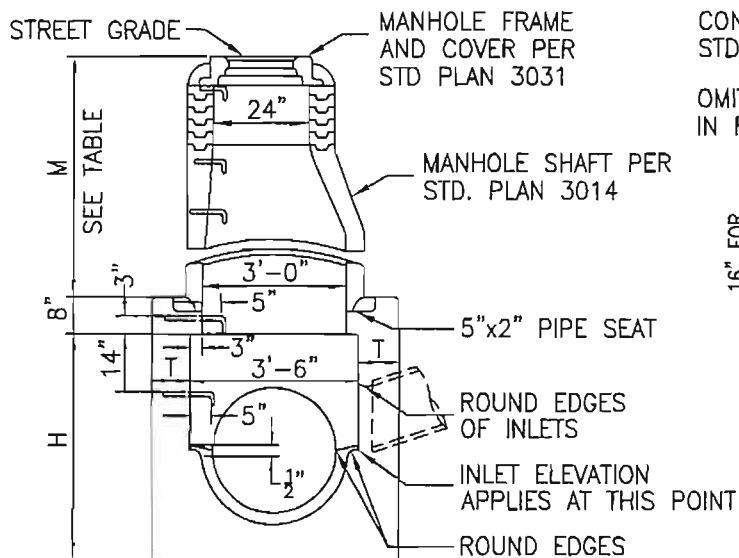
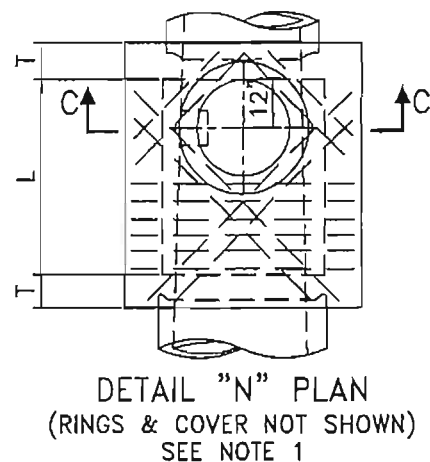
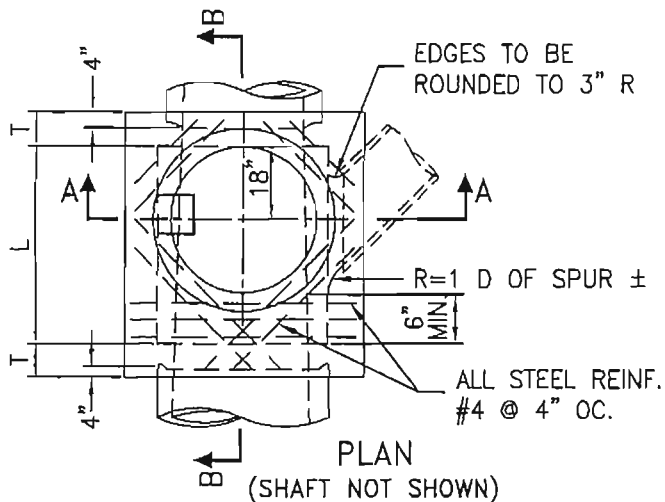


TABLE OF VALUES FOR M (SEE NOTE 1)				
SECTION	PAVED STREET		UNPAVED STREET	
	MAX.	MIN.	MAX.	MIN.
A-A		2'-10 1/2"		3'-6"
C-C	11"	8 1/2"	16"	15"

NOT TO SCALE



APPROVED BY: *Ricardo Sandoval* 10.18.06
 CITY ENGINEER
RICARDO SANDOVAL
 REVIEWED BY: *DL*
 DATE OF LAST REVISION: _____

CITY OF FONTANA

MANHOLE PIPE TO PIPE
 (ONE OR BOTH MAIN LINE
 ID'S 33" OR SMALLER)

07/10/06

STD. PLAN NO. 3013

SHT 1 OF 3

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'-10 1/2" FOR PAVED STREETS OR 3'-6" FOR UNPAVED STREETS, CONSTRUCT SHAFT PER SECTION C-C AND DETAIL "N". DEPTH M MAY BE REDUCED TO AN ABSOLUTE LIMIT OF 6" WHEN LARGER VALUES OF M WOULD REDUCE H IN SECTION C-C TO 3'-6" OR LESS.
2. H (IN SECTION A-A AND B-B) SHALL NOT BE LESS THAN 4'-0", BUT MAY BE INCREASED PROVIDED THAT THE VALUE OF M SHALL NOT BE LESS THAN THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED. FOR H (IN SECTION C-C) SEE NOTE 1.
3. L SHALL BE 4'-0" UNLESS OTHERWISE SHOWN. L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION OF THE SPUR MUST BE APPROVED BY THE ENGINEER.
4. T SHALL BE 8" FOR VALUES OF H UP TO AND INCLUDING 8'-0" AND 10" FOR VALUES OF H OVER 8'-0".
5. STATIONS OF MANHOLES SHOWN ON PROJECT DRAWINGS APPLY AT CENTER LINE OF SHAFT. ELEVATIONS ARE SHOWN AT THE CENTER LINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES. SEE NOTE 3.
6. REINFORCEMENT SHALL CONFORM TO ASTM A 615, GRADE 40 AND SHALL TERMINATE 1 1/2" CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
7. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
8. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT THE SPRING LINE.
9. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN 8".
10. STEPS SHALL CONFORM TO STANDARD PLAN 3042. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" TO 15" OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" ABOVE THE LEDGE AT THE SIDE OF THE MANHOLE.
11. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
 - A. MAIN LINE = 33" INSIDE DIAMETER OR LESS. (EXCEPTION - IF THE MAIN LINE RCP DOWNSTREAM OF THE MANHOLE IS 36" TO 42" INSIDE DIAMETER AND THE MAIN LINE RCP UPSTREAM IS 33" OR LESS.
 - B. SEE SECTION A-A. THE MAXIMUM SIZE LATERAL THAT MAY BE CONNECTED TO THIS MANHOLE IS SUCH THAT THE DISTANCE FROM THE OUTSIDE (TOP) OF THE LATERAL TO THE BOTTOM OF THE 8" THICK TOP OF THE MANHOLE CHAMBER, MEASURED VERTICALLY FROM THE END OF THE RCP, SHALL BE A MINIMUM OF 6".
 - C. IF THE SIZE OF THE LATERAL IS SUCH THAT THE ABOVE-SPECIFIED MINIMUM DISTANCES CANNOT BE MAINTAINED. THEN ONE OF THE FOLLOWING ALTERNATE SOLUTIONS MUST BE USED:
 1. PROVIDE A SPECIAL STRUCTURE.
 2. PROVIDE TWO STANDARD STRUCTURES, CONSISTING OF THIS MANHOLE PLACED UPSTREAM OR DOWNSTREAM FROM THE APPLICABLE JUNCTION STRUCTURE OR TRANSITION STRUCTURE.



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: *PLG*

DATE OF LAST REVISION: _____

DATE

CITY OF FONTANA

**MANHOLE PIPE TO PIPE
(ONE OR BOTH MAIN LINE
ID'S 33" OR SMALLER)**

07/10/06

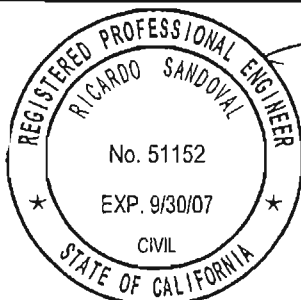
STD. PLAN NO. **3013**

SHT **2** OF **3**

12. MANHOLE FRAME AND COVER SHALL CONFORM TO STANDARD PLAN 3018 UNLESS OTHERWISE SHOWN.
13. MANHOLE SHAFT SHALL CONFORM TO STANDARD PLAN 3014 UNLESS OTHERWISE SHOWN.
14. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO STANDARD PLAN 3016.
15. WHERE A PRESSURE MANHOLE SHAFT – 36" WITHOUT REDUCER IS SPECIFIED REFER TO STANDARD PLAN 3017 AND 3018.
16. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.

THE FOLLOWING STANDARD PLANS ARE INCORPORATED HEREIN:

- 3014 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
- 3015 MANHOLE SHAFT – 36" WITHOUT REDUCER
- 3016 PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER
- 3017 PRESSURE MANHOLE SHAFT – 36" WITHOUT REDUCER
- 3018 MANHOLE FRAME AND COVER
- 3023 36" MANHOLE FRAME AND COVER
- 3024 STEEL STEP



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

DATE

REVIEWED BY: DG

DATE OF LAST REVISION: _____

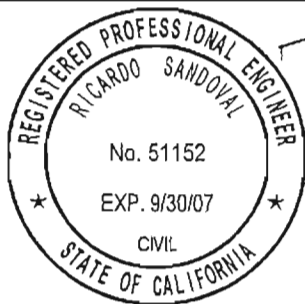
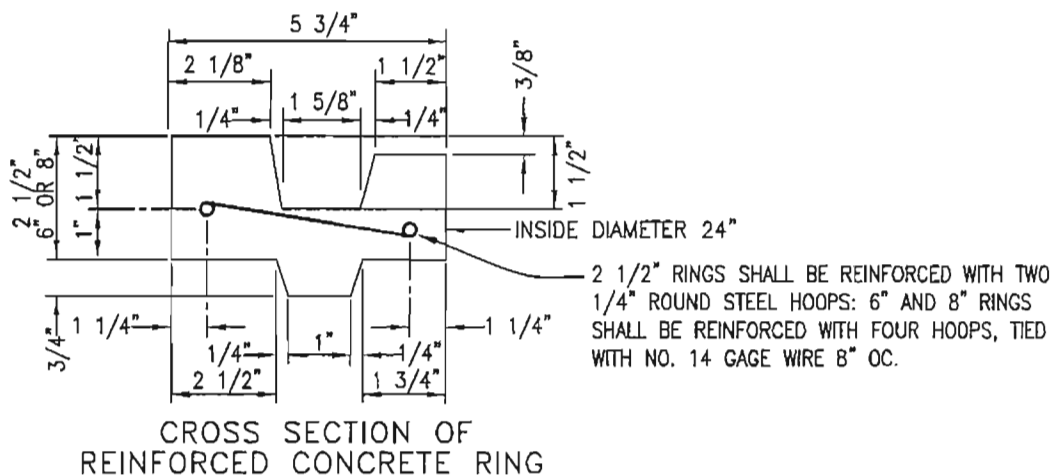
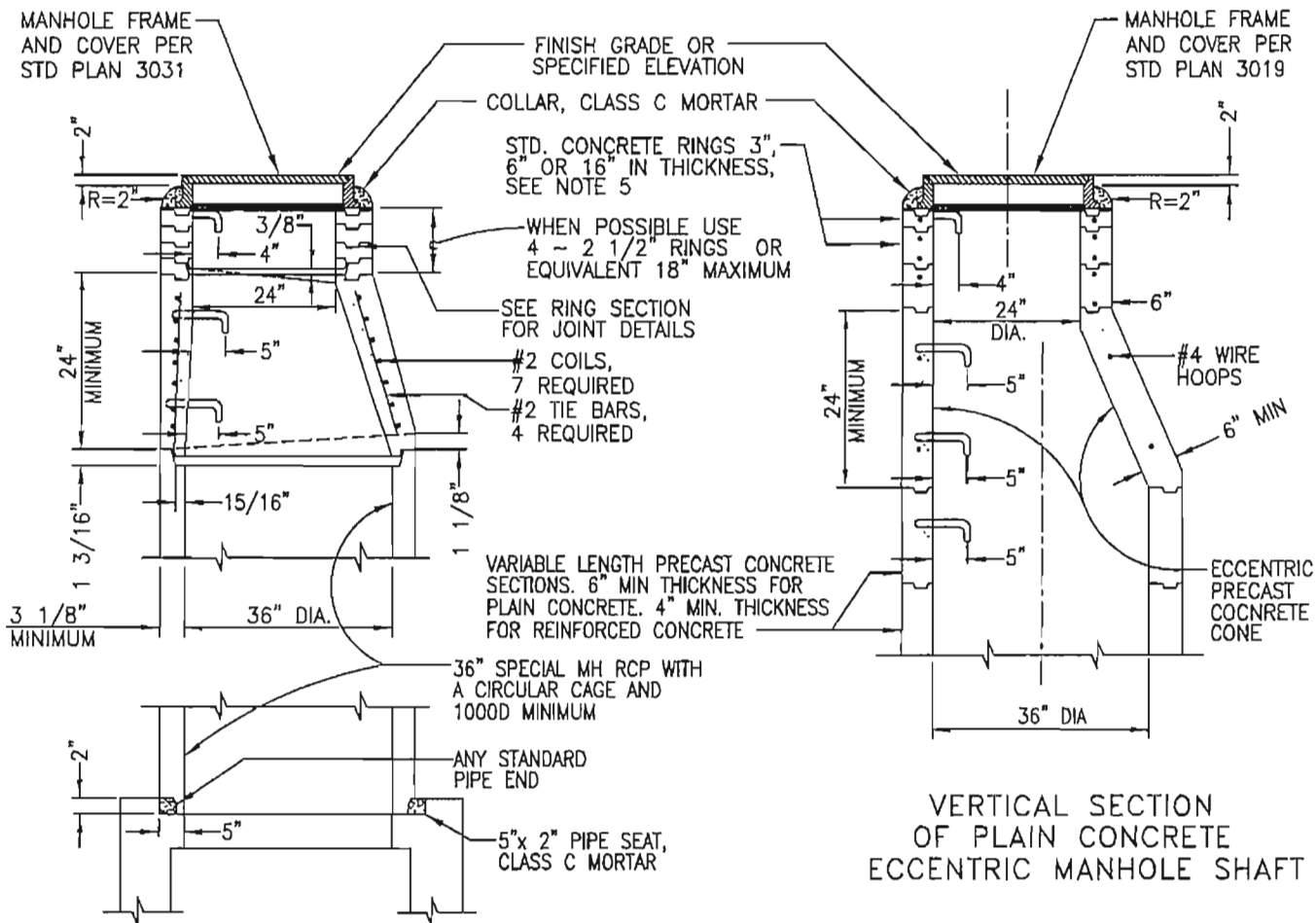
CITY OF FONTANA

MANHOLE PIPE TO PIPE
(ONE OR BOTH MAIN LINE
ID'S 33" OR SMALLER)

07/10/06

STD. PLAN NO. **3013**

SHT **3** OF **3**



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CITY ENGINEER **RICARDO SANDOVAL** DATE

REVIEWED BY: *[Signature]*

REVISION NUMBER: _____

CITY OF FONTANA

MANHOLE SHAFT WITH
ECCENTRIC REDUCER

07/10/06

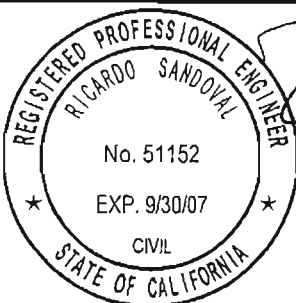
STD. PLAN NO. **3014**

SHT 1 OF 2

NOTES

1. UNLESS OTHERWISE INDICATED THIS STRUCTURE SHALL CONFORM TO ASTM C 478 AND ALL CONCRETE SHALL BE PER SSPWC.
2. MANHOLE FRAME AND COVER SHALL CONFORM TO STANDARD PLAN 3019.
3. ALL JOINTS SHALL BE SEALED BY FILLING THE ANNULAR SPACES WITH CLASS C MORTAR. WITH CLASS C MORTAR. THE INSIDE OF THE SHAFT AT EACH JOINT SHALL BE WIPED CLEAN OF EXCESS MORTAR.
4. PROTECTIVE PLASTIC LINER (T LOCK) OR ENGINEER-APPROVED COATINGS WHERE REQUIRED BY THE PROJECT DRAWINGS SHALL BE IN ACCORDANCE WITH SSPWC AND THE MANUFACTURER'S DIRECTIONS.
5. STEPS SHALL CONFORM TO STANDARD PLAN 3024. THE TOP STEP SHALL BE PLACED DIRECTLY BENEATH THE MANHOLE FRAME. UNLESS OTHERWISE SHOWN. STEPS SHALL BE SPACED 14" TO 15" OC.
6. THE ECCENTRIC MANHOLE SHAFT REDUCER AND RINGS MAY BE PLAIN CONCRTE. FOR PLAIN CONCRETE SECTIONS THE MINIMUM THICKNESS SHALL BE 6".
7. THE PRECAST CONCRETE MANHOLE STRUCTURES WILL BE INSPECTED BY THE ENGINEER WHO WILL INDICATE ACCEPTANCE FOR SHIPMENT TO THE JOB BY MARKING THE STRUCTURE WITH THE AGENCY'S STAMP.
8. THE VERTICAL SIDES OF THE MANHOLE SHAFT AND THE ECCENTRIC REDUCER SHALL BE LOCATED ABOVE AND IN LINE WITH THE SIDE OF THE STORM DRAIN CONDUIT.
9. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.

THE FOLLOWING STANDARD PLANS ARE INCORPORATED HEREIN:
3019 24" MANHOLE FRAME AND COVER
3024 STEEL STEP



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: *JK*

REVISION NUMBER: _____

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10-18-06

CITY OF FONTANA

**MANHOLE SHAFT WITH
ECCENTRIC REDUCER**

07/10/06

STD. PLAN NO. **3014**

SHT **2** OF **2**

36" MANHOLE FRAME AND COVER PER STD. PLAN 3041

COLLAR CLASS C MORTAR

FINISHED GRADE OR SPECIFIED ELEVATION

36" MANHOLE FRAME AND COVER PER STD. PLAN 3023

COLLAR CLASS C MORTAR

VARIABLE LENGTH PRE-CAST CONCRETE SECTIONS:
6", 8", 15", 30", 45".
SEE NOTE 3

5"
SEE NOTE 3

36" DIA.

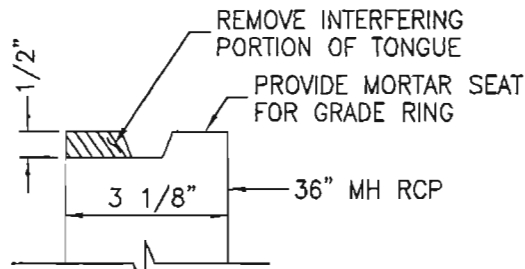
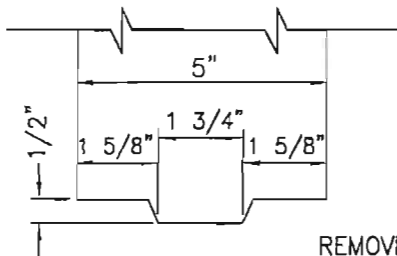
DETAIL "A"

VERTICAL SECTION OF
SPECIAL MANHOLE SHAFT
WITH GRADE RING RISERS

5" TYP
36" DIA.
5"
3 1/8"
SEE NOTE 3

36" SPECIAL MH PIPE
3 1/8"
ANY STANDARD PIPE END
5"x2" PIPE SEAT
CLASS C MORTAR
5"

VERTICAL SECTION OF
SPECIAL MANHOLE SHAFT
WITH REINFORCED CONCRETE RISERS



DETAIL "A"

NOT TO SCALE



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RICARDO SANDOVAL

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CITY OF FONTANA

MANHOLE SHAFT 36"
WITHOUT REDUCER

07/10/06

STD. PLAN NO. 3015

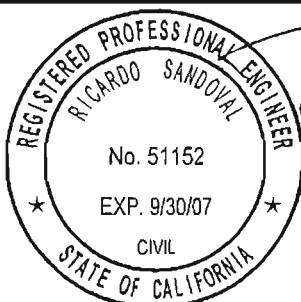
SHT 1 OF 2

NOTES

1. UNLESS OTHERWISE INDICATED, THIS STRUCTURE SHALL CONFORM TO ASTM C 478. ALL STEEL SHALL TERMINATE 1 1/2" CLEAR OF CONCRETE SURFACES AND ALL CONCRETE SHALL BE PER SSPWC.
2. WHERE A 36" MANHOLE IS CONSTRUCTED WITH 36" MANHOLE RCP, THE RCP SECTION SHALL CONTAIN A CIRCULAR CAGE AND HAVE A LOAD CARRYING CAPACITY OF AT LEAST 1000D. SPECIAL MANHOLE SHAFT SHALL BE PER THIS STANDARD AND 36" MANHOLE FRAME AND COVER SHALL BE PER STANDARD PLAN 3041.
3. THE MANHOLE SHAFT AND RINGS MAY BE PLAIN CONCRETE. FOR PLAIN CONCRETE SECTIONS THE MINIMUM THICKNESS SHALL BE 6".
4. ALL JOINTS SHALL BE SEALED BY FILLING THE ANNULAR SPACED WITH CLASS C MORTAR. THE INSIDE OF THE SHAFT AT EACH JOINT SHALL BE WIPED CLEAN OF EXCESS MORTAR.
5. PROTECTIVE PLASTIC LINER (T LOCK) OR ENGINEER-APPROVED COATINGS WHERE REQUIRED BY THE PROJECT DRAWINGS SHALL BE IN ACCORDANCE WITH SSPWC AND THE MANUFACTURER'S DIRECTIONS.
6. STEPS SHALL CONFORM TO STANDARD PLAN 3024. THE TOP STEP SHALL BE PLACED 6" BENEATH THE MANHOLE COVER FRAME. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" TO 15" OC.
7. THE PRECAST CONCRETE MANHOLE STRUCTURES WILL BE INSPECTED BY THE ENGINEER WHO WILL INDICATE ACCEPTANCE FOR SHIPMENT TO THE JOB BY MARKING THE STRUCTURES WITH THE AGENCY'S STAMP.
8. THE VERTICAL SIDES OF THE MANHOLE SHAFT SHALL BE LOCATED ABOVE AND IN LINE WITH THE SIDE OF THE STORM DRAIN CONDUIT.
9. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.

THE FOLLOWING STANDARD PLANS ARE INCORPORATED HEREIN:

3023 36" MANHOLE FRAME AND COVER
3024 STEEL STEP



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: *RS*

DATE OF LAST REVISION: _____

DATE

10.18.06

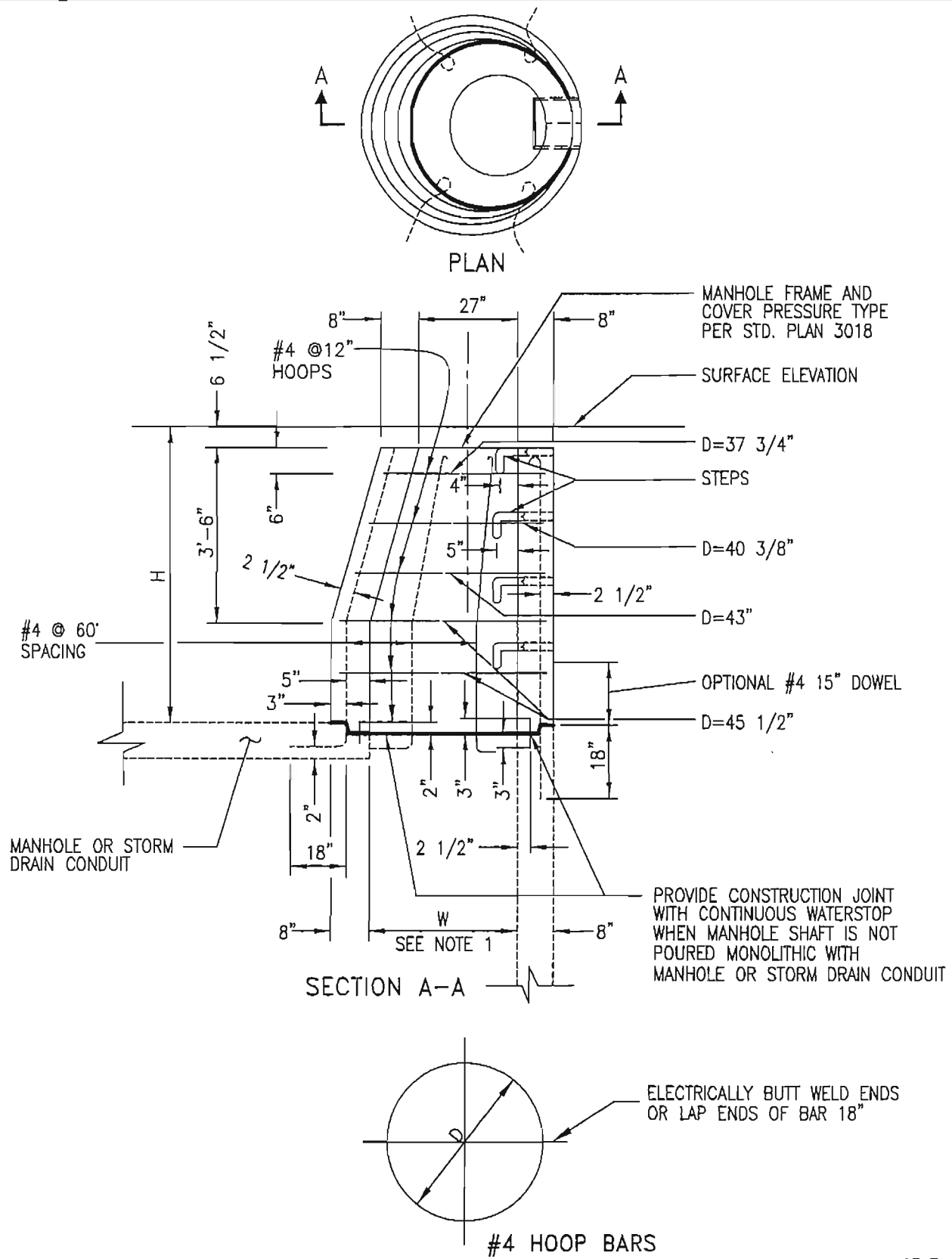
CITY OF FONTANA

**MANHOLE SHAFT 36"
WITHOUT REDUCER**

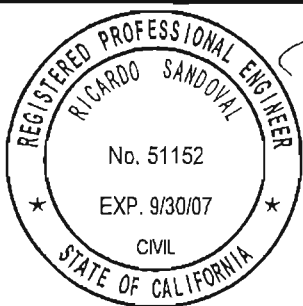
07/10/06

STD. PLAN NO. **3015**

SHT **2** OF **2**



NOT TO SCALE



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RICARDO SANDOVAL
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CITY OF FONTANA	
PRESSURE MANHOLE SHAFT WITH ECCENTRIC REDUCER	
07/10/06	
STD. PLAN NO. 3016	SHT 1 OF 2

NOTES

1. IF H IS LESS THAN 18", W=27"
IF H IS BETWEEN 18" AND 2'-6", W=2'-6"
IF H IS 2'-6" OR MORE, W=3'-0"
IF H IS MORE THAN 4'-0 1/2", BRING WALL VERTICALLY TO 4'-0 1/2" BELOW SURFACE AND TAPER FROM 3'-0" TO 27" AS SHOWN.
2. THIS STRUCTURE SHALL BE USED WITH MANHOLE FRAME AND COVER PRESSURE TYPE, STANDARD PLAN 3030. IT MAY BE USED FOR HYDROSTATIC HEADS UP TO 25' ABOVE THE STEEL PLATE.
3. THE VERTICAL SIDE OF THE MANHOLE AND THE ECCENTRIC REDUCER SHALL BE LOCATED ABOVE AND IN LINE WITH THE SIDE OF THE STORM DRAIN CONDUIT.
4. REINFORCEMENT SHALL CONFORM TO ASTM A 615, GRADE 40, AND SHALL TERMINATE 1 1/2" CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
5. STEPS SHALL CONFORM TO STANDARD PLAN 3024. THE TOP STEP SHALL BE PLACED DIRECTLY BENEATH THE MANHOLE FRAME. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" TO 15" OC.
6. SEE CONTRACT SPECIFICATIONS FOR PHYSICAL REQUIREMENTS OF WATERSTOP.
7. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT VALUES.
8. THE FOLLOWING STANDARD PLANS ARE INCORPORATED HEREIN:
3018 MANHOLE FRAME AND COVER PRESSURE TYPE
3024 STEEP STEP



APPROVED BY:

Ricardo Sandoval 10.18.06
CITY ENGINEER DATE

RICARDO SANDOVAL

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CITY OF FONTANA

**PRESSURE MANHOLE
SHAFT WITH
ECCENTRIC REDUCER**

07/10/06

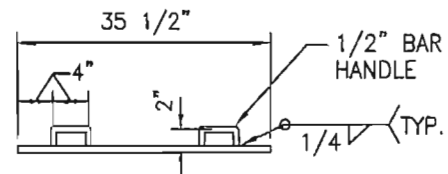
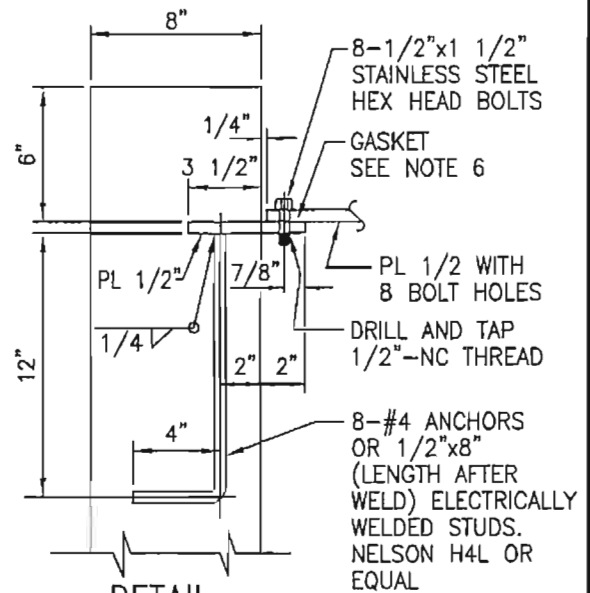
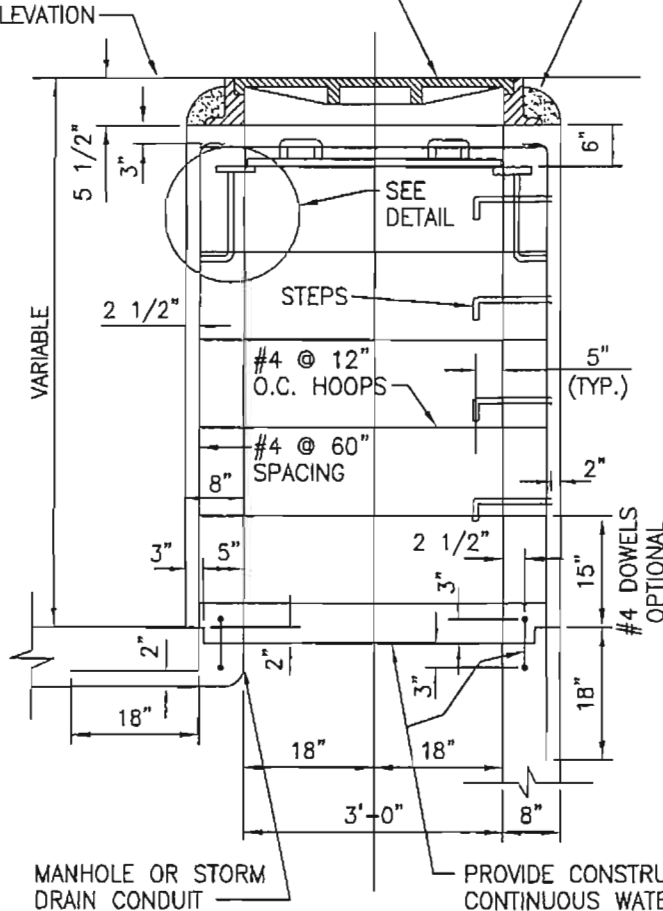
STD. PLAN NO. **3016**

SHT **2** OF **2**

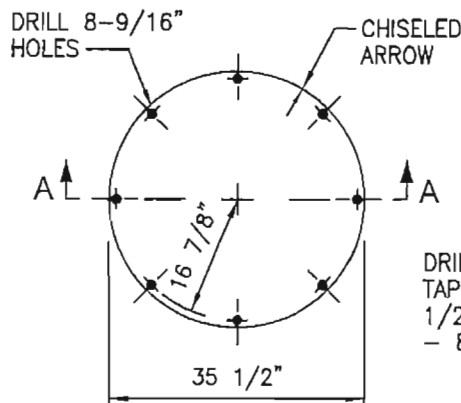
MANHOLE FRAME AND COVER
PER STANDARD PLAN 3023

COLLAR, CLASS C MORTAR

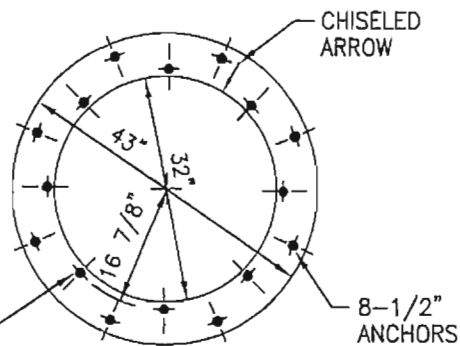
SURFACE
ELEVATION



VERTICAL SECTION OF SPECIAL PRESSURE MANHOLE SHAFT



DRILL AND
TAP STD.
1/2" THREAD
- 8 HOLES



NOT TO SCALE



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Ricardo Sandoval 10.18.06
CITY ENGINEER DATE

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CITY OF FONTANA

PRESSURE MANHOLE SHAFT
AND PRESSURE PLATE DETAIL
36" WITHOUT REDUCER

07/10/06

STD. PLAN NO. 3017

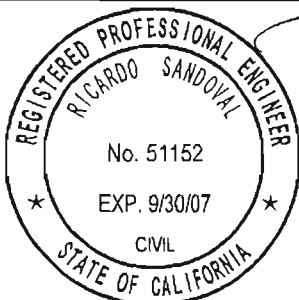
SHT 1 OF 2

NOTES

1. THIS STRUCTURE MAY BE USED FOR HYDROSTATIC HEADS UP TO 25' ABOVE THE PRESSURE PLATE.
2. 36" MANHOLE FRAME AND COVER PER STANDARD PLAN 3023 SHALL BE USED.
3. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 40 AND SHALL TERMINATE 1 1/2" CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN. HOOPS MAY BE ELECTRICALLY BUTT WELDED OR THE ENDS LAPPED 18".
4. THE MANHOLE SHAFT SHALL BE LOCATED ABOVE AND IN LINE WITH THE SIDE OF THE CONDUIT BELOW.
5. STEPS SHALL CONFORM TO STANDARD PLAN 3024. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" TO 15" OC.
6. GASKET MATERIAL SHALL BE NEOPRENE (OR EQUAL) 1/16" THICK BY 1 1/4" WIDE.
7. BOLTS SHALL BE STAINLESS STEEL CONFORMING TO ASTM A 320, GRADE B8.
8. PRESSURE PLATE AND PRESSURE PLATE RING SHALL BE STEEL CONFORMING TO ASTM A 36 AND SHALL BE GALVANIZED. PLATES SHALL BE MARKED IN SETS AND A CHISELED ARROW STAMPED ON BOTH PLATES, AFTER DRILLING AND TAPPING, TO FACILITATE FIELD ASSEMBLY.
9. SEE CONTRACT SPECIFICATIONS FOR PHYSICAL REQUIREMENTS OF WATERSTOP.
10. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.

THE FOLLOWING STANDARD PLANS ARE INCORPORATED HEREIN:

3023 36" MANHOLE FRAME AND COVER
3024 STEEP STEP



APPROVED BY:

CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: *JS*

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DATE

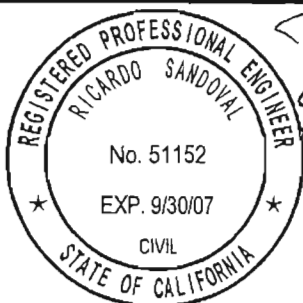
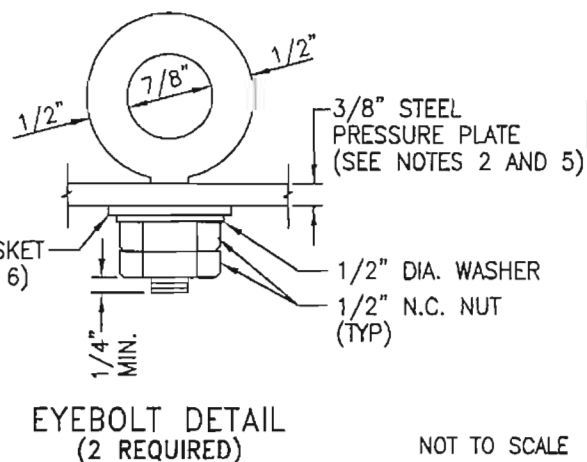
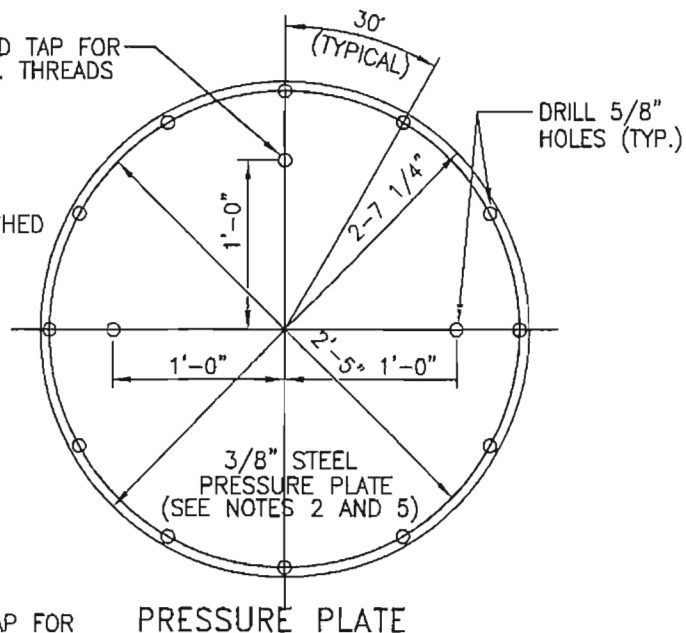
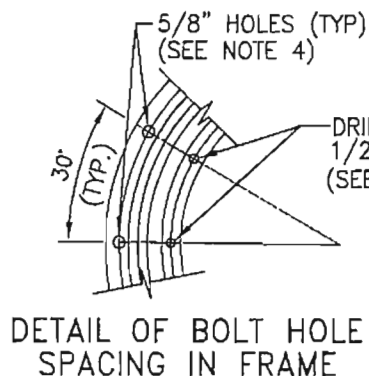
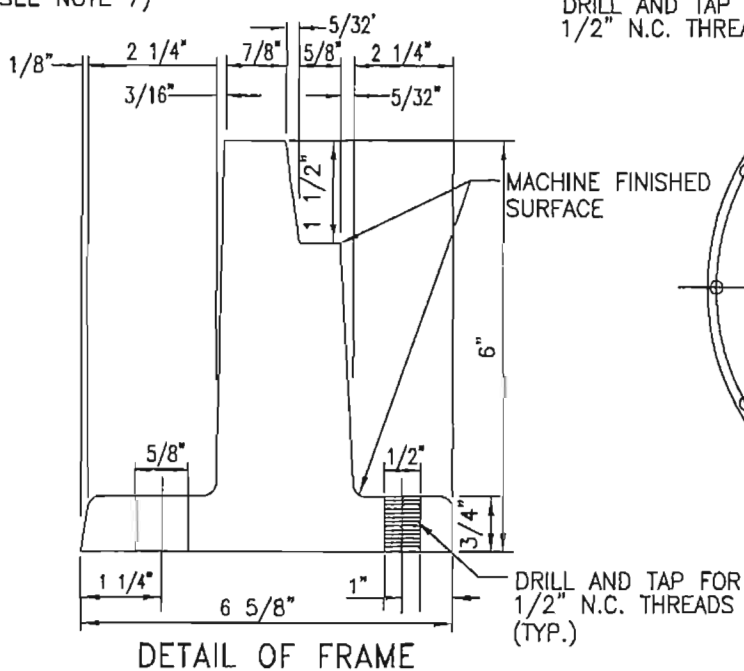
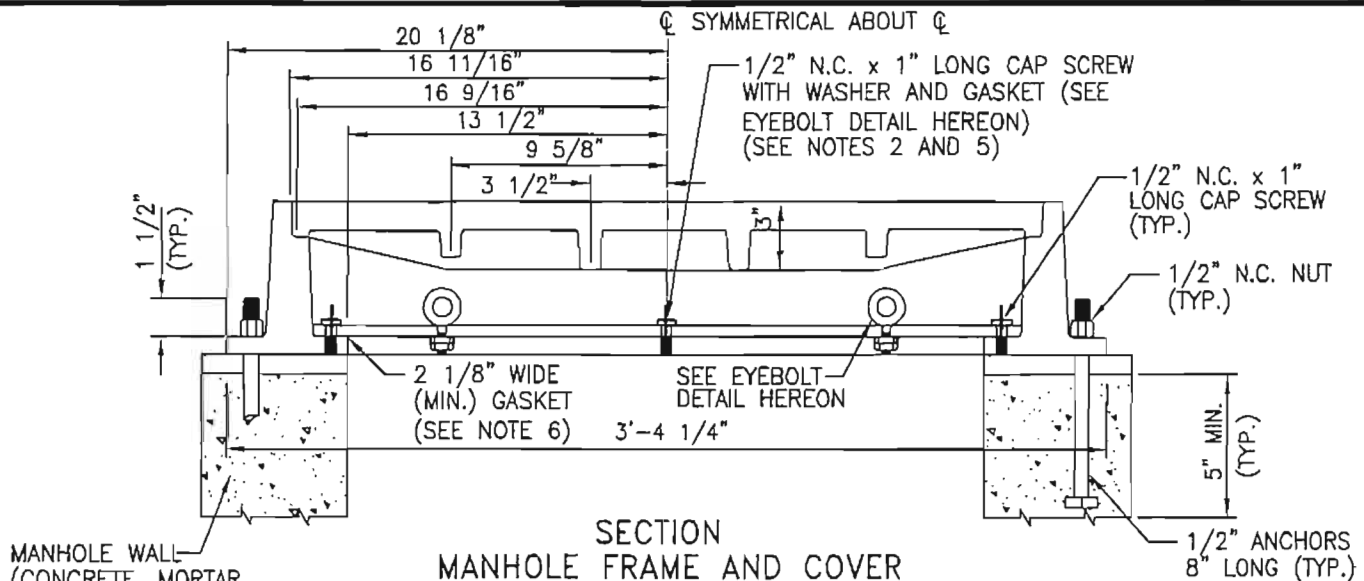
CITY OF FONTANA

**PRESSURE MANHOLE SHAFT
AND PRESSURE PLATE DETAIL
36" WITHOUT REDUCER**

07/10/06

STD. PLAN NO. **3017**

SHT **2** OF **2**



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CITY OF FONTANA

MANHOLE FRAME
AND COVER
PRESSURE TYPE

STD. PLAN NO. 3018

SHT 1 OF 2

07/10/06

NOTES

1. THE PRESSURE PLATE SHALL BE STEEL CONFORMING TO A 36, AND SHALL BE GALVANIZED AFTER FABRICATION, BUT BEFORE INSTALLATION OF SCREWS AND BOLTS.
2. CAP SCREWS AND EYEBOLTS, INCLUDING WASHERS AND NUTS ATTACHED THERETO, SHALL BE FABRICATED FROM ANY SERIES 300 STAINLESS STEEL.
3. ALL HOLES IN CAST IRON SHALL BE DRILLED AFTER CASTING, OR PLUGGED PRIOR TO CASTING. THEY SHALL NOT BE PUNCHED.
4. ALL IRON CASTING SHALL RECEIVE AN ASPHALTIC COATING AFTER FABRICATION.
5. GASKET MATERIAL SHALL BE 1/16" THICK NEOPRENE RUBBER. PRESSURE PLATE GASKET SHALL BE 2'-7 1/4" O.D.
6. ALL NUTS AND BOLTS SHALL BE TIGHTENED TO A MINIMUM TORQUE OF 25 FOOT-POUNDS.
7. FRAME SHALL BE SET ON 1/2" THICK MINIMUM WET MORTAR BASE, CLASS "B" MORTAR.
8. MANHOLE FRAME AND COVER AND PRESSURE PLATE ASSEMBLY SHALL BE TESTED FOR ACCURATE FIT PRIOR TO DELIVERY TO JOBSITE AND MARKED IN SETS.
9. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.



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RICARDO SANDOVAL

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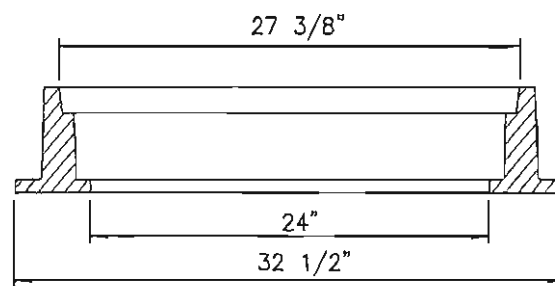
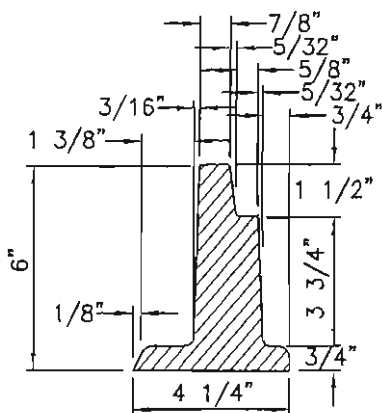
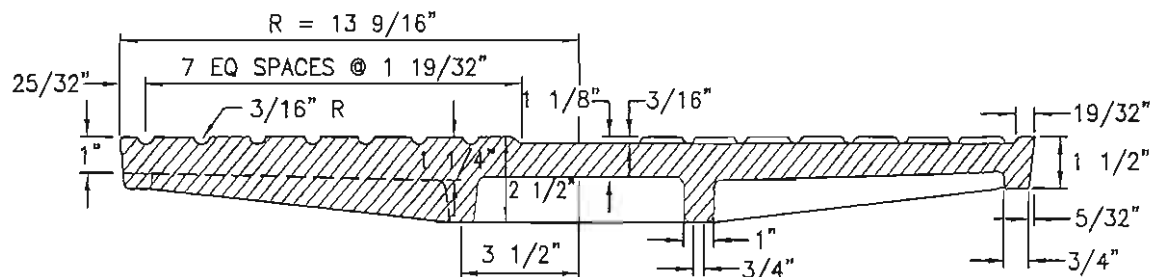
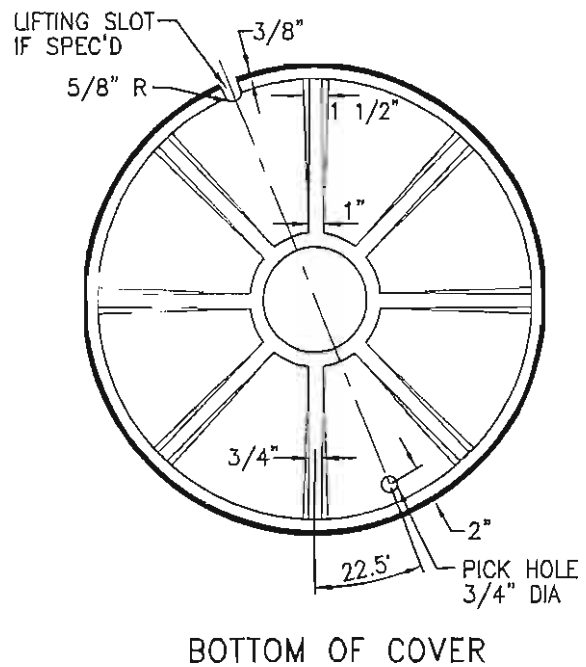
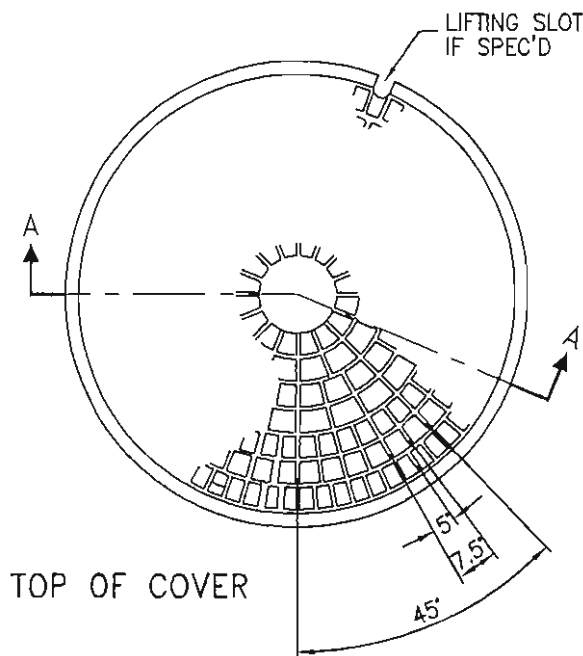
CITY OF FONTANA

**MANHOLE FRAME
AND COVER
PRESSURE TYPE**

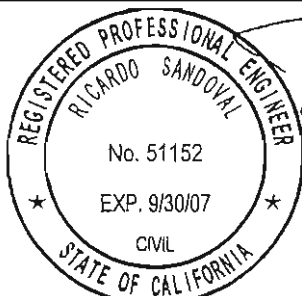
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STD. PLAN NO. **3018**

SHT **2** OF **2**



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 CITY ENGINEER
RICARDO SANDOVAL
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CITY OF FONTANA

24" MANHOLE FRAME
 AND COVER

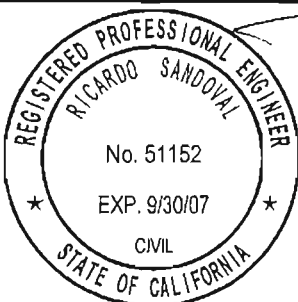
07/10/06

STD. PLAN NO. **3019**

SHT 1 OF 2

NOTES

1. THE CAST IRON USED SHALL CONFORM TO ASTM A-48 CLASS 35B.
2. COVERS SHALL BE CAST WITH THE LETTER "D" FOR STORM DRAINS AND "S" FOR SEWERS, AND THE AGENCY'S IDENTIFICATION IN ACCORDANCE WITH INSTRUCTIONS FURNISHED BY THE AGENCY. THE LETTER "D" OR "S" SHALL BE APPROXIMATELY 2 1/2" HIGH WITH 1/2" LINE WIDTH, AND PLACED IN THE CENTER OF THE COVER.
ALL LETTERS SHALL BE FLUSH WITH THE FINISHED SURFACE OF THE COVER.
3. FOUNDRY IDENTIFYING MARK, HEAT AND DATE SHALL BE CAST ON THE BOTTOM OF THE COVER AND ON THE INSIDE OF THE FRAME.
4. IMPORTED COVERS AND FRAMES SHALL HAVE THE COUNTRY OF ORIGIN MARKING IN COMPLIANCE WITH FEDERAL REGULATIONS.
5. WEIGHT OF FRAME SHALL BE 260 LBS. WEIGHT OF COVER SHALL BE 175 LBS. ACTUAL WEIGHTS SHALL BE WITHIN A RANGE OF 95% TO 110%.
6. THE MANHOLE FRAME AND COVER SHALL BE INSPECTED BY THE ENGINEER PRIOR TO SHIPMENT TO THE JOB SITE. ACCEPTANCE WILL BE INDICATED BY THE AGENCY'S MARK.
7. THE PROOF-LOAD FOR TEST METHOD B OF THE STANDARD SPECIFICATIONS IS 40,700 LBS.
8. COVERS FOR MANHOLES LOCATED IN EASEMENTS, ALLEYS, PARKWAYS AND ALL PLACES OTHER THAN PAVED STREETS SHALL BE PROVIDED WITH SOCKET-SET SCREW LOCKING DEVICES. DRILL AND TAP TWO HOLES TO A DEPTH OF ONE INCH AT 90 DEGREES TO PICK HOLE AND INSTALL 3/4" x 3/4" STAINLESS STEEL SOCKET-SET SCREWS WITH 3/8" RECESSED HEX HEAD. ALL THREADS SHALL BE N.C.
9. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACTLY EQUAL VALUES.



APPROVED BY:

[Signature] 10.18.06

CITY ENGINEER
RICARDO SANDOVAL

DATE

REVIEWED BY: *DG*

DATE OF LAST REVISION: _____

CITY OF FONTANA

**24" MANHOLE FRAME
AND COVER**

07/10/06

STD. PLAN NO. **3019**

SHT **2** OF **2**

Diagram of a trapezoidal headwall structure. The structure is shown in perspective, with a top horizontal edge of length E and a bottom horizontal edge of length F . The height of the structure is L . The slanted sides are labeled with a length L and an angle θ relative to the horizontal. The top edge is labeled A with an arrow pointing left. The bottom edge is labeled A with an arrow pointing left. The right side is labeled L and θ . The text "HEADWALL STRUCTURE" is written above the diagram, and "LAP ALL BARS 8 IN." is written to the right of the diagram.

2 #4 OR #5
SEE NOTE 2

#4 OR #5 12"
O.C. EA. WAY
SEE NOTE 2

Technical drawing showing a square-to-round transition. The top view shows a square with a circular hole. Dimensions include a width W for the top flange, a $12''$ radius for the hole, and a $6''$ thickness for the flange. The side view shows a $3''$ MIN. thickness for the vertical walls.

Diagram illustrating the reinforcement details for a continuous bar 90' bend. The drawing shows a cross-section of the structure with various dimensions and reinforcement specifications:

- Reinforcement:**
 - 2-#5 (Two #5 bars)
 - #4 OR #5 12" O.C. EA. WAY (Number 4 or Number 5 bars at 12 inches on center, each way)
 - 2-#4 OR #5 (Two #4 or #5 bars)
 - CONTINUOUS BAR 90' BEND
 - #4 OR #5 12" O.C. EA. WAY (Number 4 or Number 5 bars at 12 inches on center, each way)
- Dimensions:**
 - 8" (Horizontal dimension)
 - 4" (Horizontal dimension)
 - 8" (Horizontal dimension)
 - 12" (Horizontal dimension)
 - 4" (Horizontal dimension)
 - 4" (Horizontal dimension)
 - 8" (Horizontal dimension)
 - 2'-0" (Vertical dimension)
 - 2'-6" (Vertical dimension)
 - D+6" (Vertical dimension)
- Other Labels:**
 - GROUND LINE

DIMENSIONS				
PIPE DIAM.	L	E	F	W
24"	4'-9"	2'-8"	4'-0"	2'-6"
30"	5'-5"	3'-0"	4'-6"	3'-0"
36"	6'-0"	3'-4"	5'-0"	3'-8"
42"	6'-7"	3'-8"	5'-6"	4'-2"
48"	7'-3"	4'-0"	6'-0"	4'-10"
54"	8'-2"	4'-6"	6'-9"	5'-4"

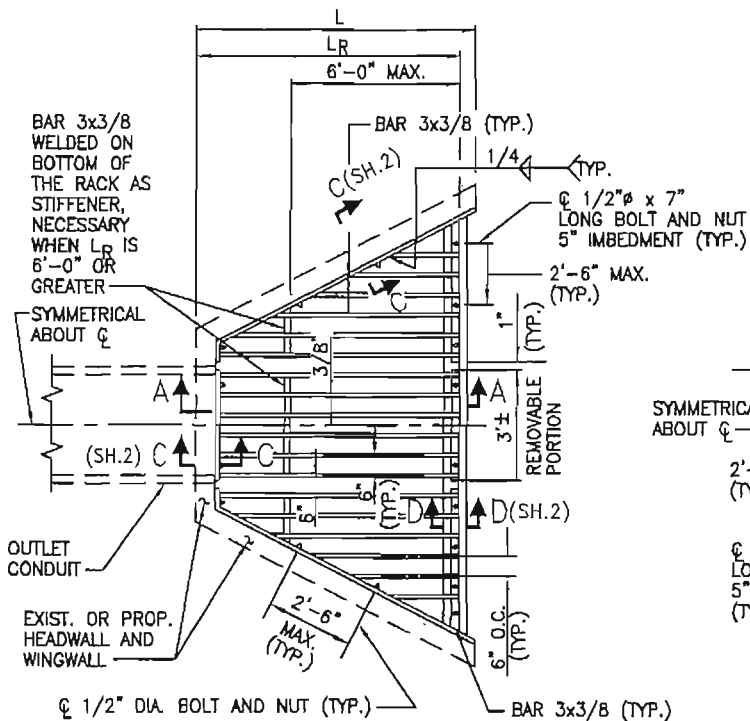
1. HEADWALL SHALL BE CONSTRUCTED OF CLASS A CONCRETE.
2. REINFORCING STEEL SHALL BE NO. 4 BARS FOR "W" UP TO 60". ABOVE "W"=60" NO. 5 BARS SHALL BE USED . 2" MIN CLEARANCE, 30 DIAMETER LAP, ALL STEEL.
3. ADJACENT SLOPES SHALL BE 1 1/2 TO 1 OR FLATTER.
4. MULTIPLE PIPES TO BE SET WITH LONGITUDINAL CENTERS 1 2/3 DIAMETERS APART.
5. ALL EXPOSED CORNERS TO BE ROUNDED 3/4" RADIUS.
6. W SHALL BE INCREASED WHEN MULTIPLE PIPE OR PIPES ON SKEW ARE USED.

REGISTERED PROFESSIONAL ENGINEER
RICARDO SANDOVAL
No. 51152
EXP. 9/30/07
CIVIL
STATE OF CALIFORNIA

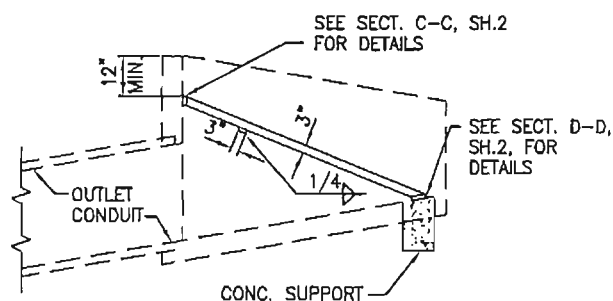
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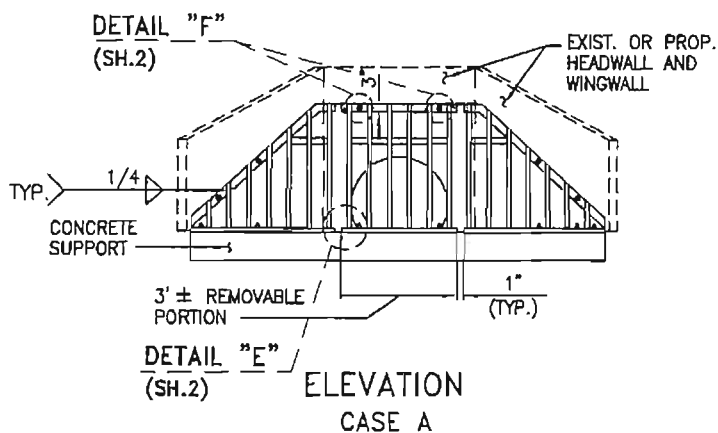
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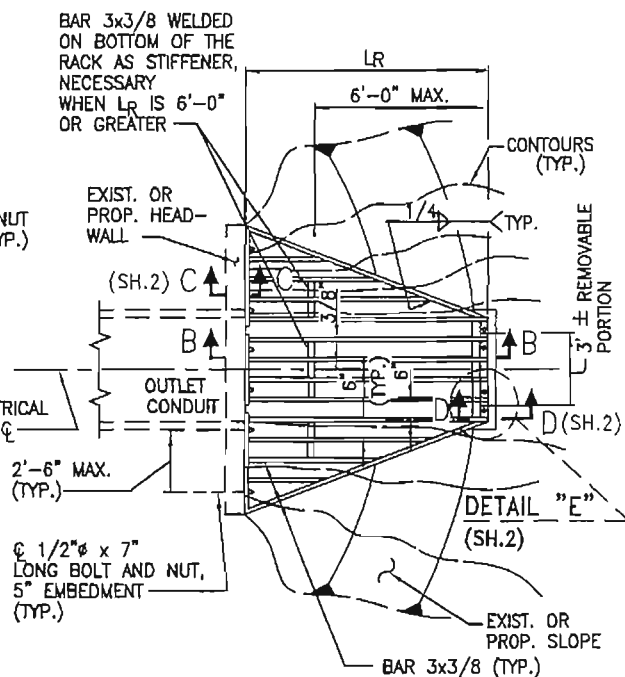
PLAN
CASE A



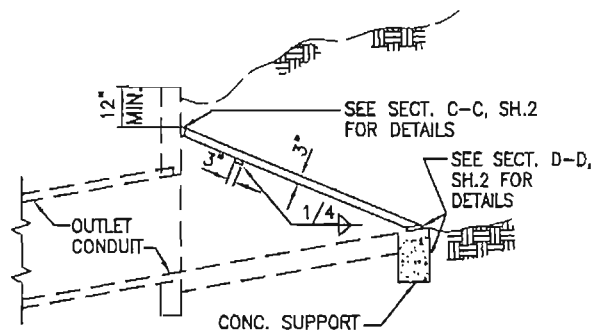
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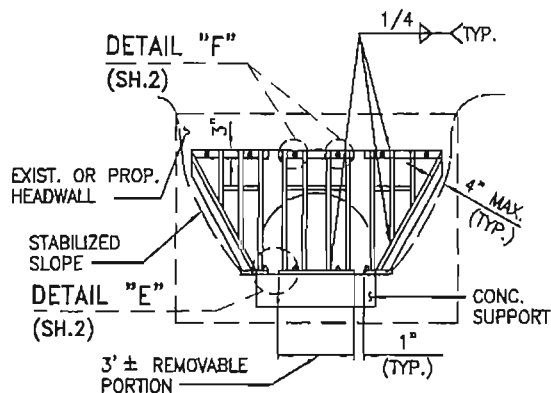
ELEVATION
CASE A



PLAN
CASE B

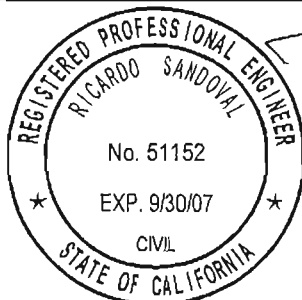


SECTION B-B



ELEVATION
CASE B

NOT TO SCALE



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RICARDO SANDOVAL

DATE

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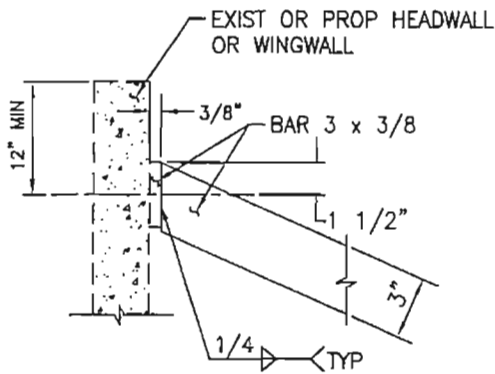
CITY OF FONTANA

TRASH RACK INCLINED

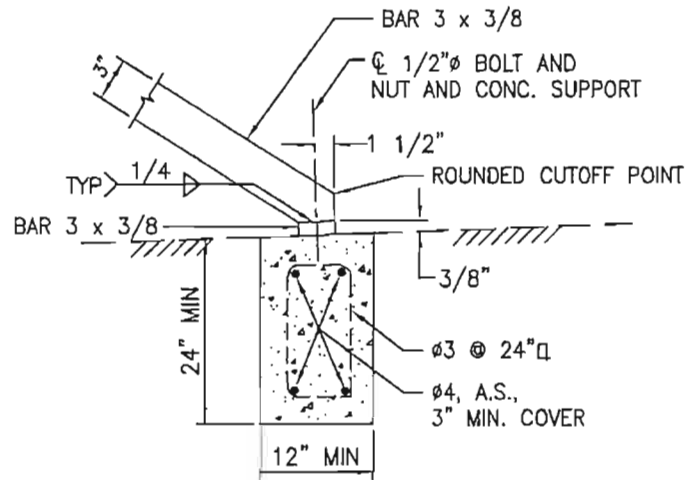
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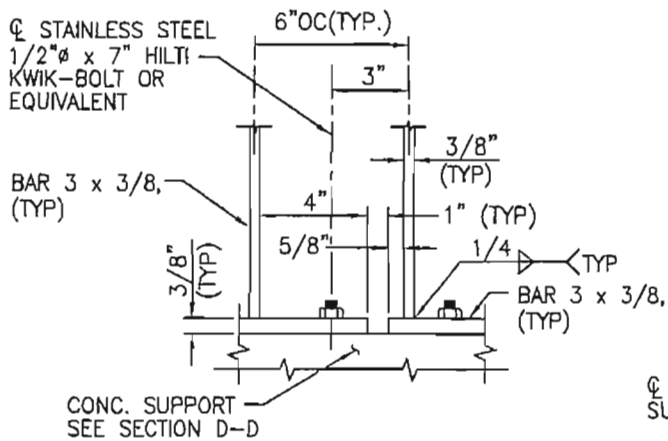
SHT 1 OF 3



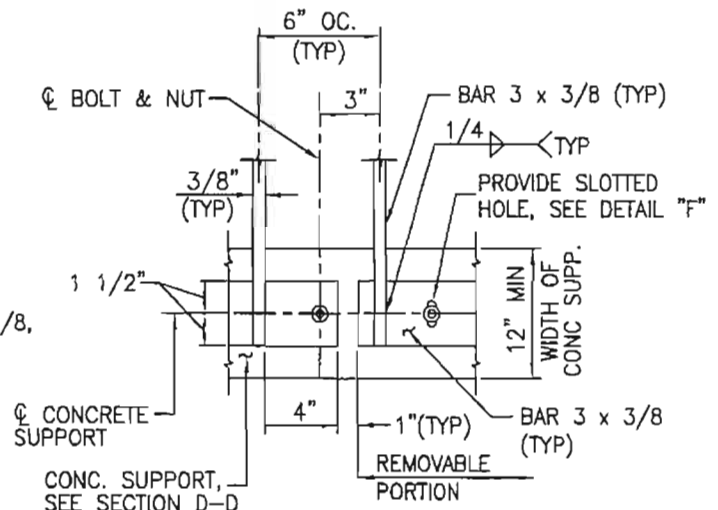
SECTION C-C (SH.1)



SECTION D-D (SH.1)

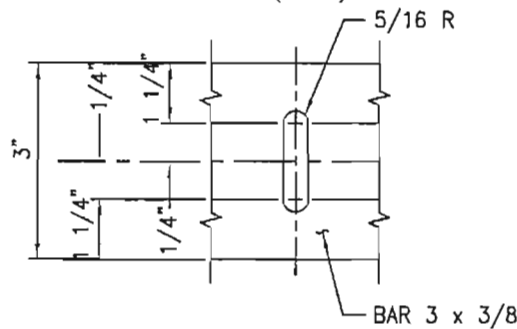


ELEVATION



PLAN

DETAIL "E" (SH.1)



DETAIL "F" (SH. 1)

APPLIES TO THE TOP & BOTTOM BARS
OF THE REMOVABLE PORTION ONLY

NOT TO SCALE



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Ricardo Sandoval 10.18.06
CITY ENGINEER DATE

RICARDO SANDOVAL

REVIEWED BY: *JD*

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TRASH RACK INCLINED

07/10/06

STD. PLAN NO. **3021**

SHT **2** OF **3**

NOTES

1. MAXIMUM SIZE OF OUTLET TO BE USED WITH THIS RACK IS 48" PIPE OR 48" WIDE RCB.
MAXIMUM LENGTH OF RACK L_R IS 10'-0".
2. L_R CAN BE ADJUSTED SO THAT THE SLOPE OF THE RACK IS APPROXIMATELY 2 HORIZONTAL
TO 1 VERTICAL.
3. THE CONCRETE SUPPORT IS NOT NECESSARY IF EXISTING OR PROPOSED INLET STRUCTURE
HAS ADEQUATE SUPPORT CUTOFF WALL. IT DOES NOT ELIMINATE THE NEED FOR A CUTOFF
WALL BUT CAN BE INTEGRATED WITH ONE WHEN REQUIRED AT A PARTICULAR INSTALLATION.
4. GALVANIZE ALL EXPOSED FERROUS PARTS AFTER FABRICATION.
5. IF FIELD WELDS ARE NECESSARY, USE GALVICON, GALVALLOY OR AGENCY APPROVED EQUAL
FOR COATING.
6. ALL BOLTS SHALL BE 1/2" IN DIAMETER AND 7" IN LENGTH. ON REMOVABLE PORTION OF
THE RACK, USE 300 SERIES STAINLESS STEEL BOLTS AND NUTS. FOR WINGWALL BOLTS FOR
CASE A, AND WHERE HEADWALL AND WINGWALL ARE EXISTING, HILTI KWIK-BOLT OR EQUIVALENT
CAN BE USED.

NOT TO SCALE



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CITY ENGINEER
RICARDO SANDOVAL

REVIEWED BY: *DL*

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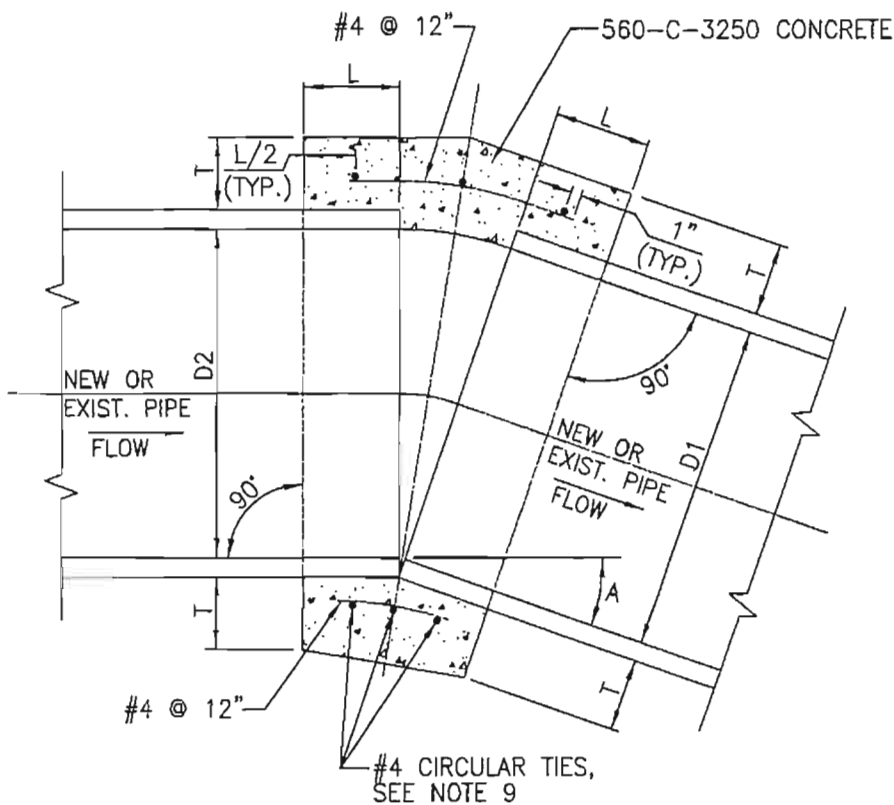
CITY OF FONTANA

TRASH RACK INCLINED

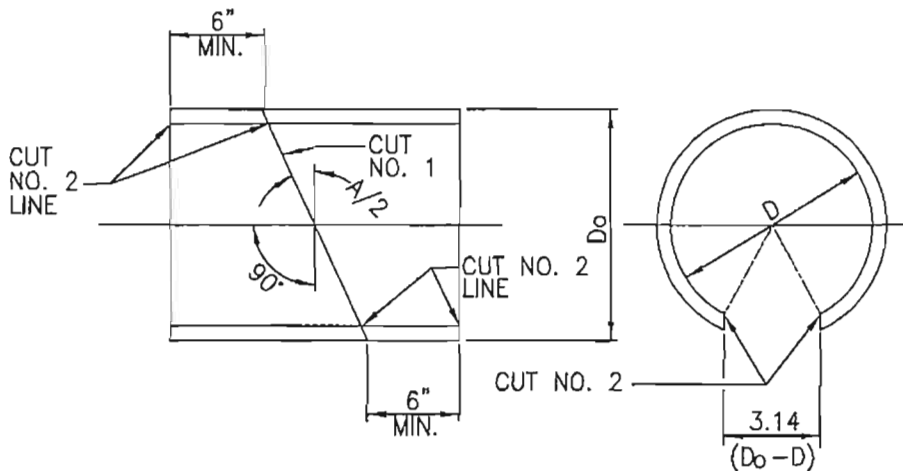
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STD. PLAN NO. **3021**

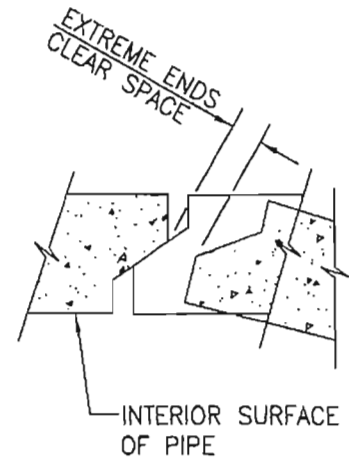
SHT **3** OF **3**



D	L	T
12"	12"	4"
18"	12"	5"
24"	12"	6"
30"	18"	7"
36"	18"	9"
42"	18"	9"
48"	18"	10"
57"	18"	10"
60"	21"	11"
66"	21"	11"
72"	24"	12"



DETAIL "A"
(SEE NOTE 10)
SONO-TUBE, OR EQUAL, INTERIOR FORM



DETAIL "B"
TYPICAL JOINT FOR
REINFORCED CONCRETE PIPE

- CUT NO. 1: SAW THE TUBE AT AN ANGLE OF $A/2$ WITH THE TRANSVERSE PLANE. REVERSE ONE SECTION AND TAPE BOTH SECTIONS TOGETHER FORMING THE DEFLECTION ANGLE A.
- CUT NO. 2: SAW THE TUBE LONGITUDINALLY REMOVING A STRIP $3.14 (D_o - D)$ WIDE ON THE SIDE OPPOSITE THE OPEN JOINT. BEND THE ENDS OF THE CUT TOGETHER AND INSERT THE TUBE IN THE PIPE.

NOT TO SCALE



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CITY OF FONTANA

CONCRETE COLLAR FOR RCP
12" THROUGH 72"

07/10/06

STD. PLAN NO. 3022

SHT 1 OF 2

NOTES

1. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN GRADE EXCEEDS 10 PERCENT.
2. FOR CURVE JOINTS (SEE DETAIL B. SHEET 1)
IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS GREATER THAN 1", BUT IS LESS THAN 3", A CONCRETE COVER IS REQUIRED IN ACCORDANCE WITH SUBSECTION 306-1.2.4 OF THE SSPWC.

IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS EQUAL TO OR GREATER THAN 3", BUT LESS THAN 6", A CONCRETE COLLAR IS REQUIRED. IF THE CLEAR SPACE IS 6" OR GREATER, A TRANSITION STRUCTURE IS REQUIRED.
3. A CONCRETE COLLAR SHALL NOT BE USED FOR A SIZE CHANGE ON THE MAIN LINE.
4. CONNECTOR PIPES
 - A. 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.
 - B. WHEN D_1 IS EQUAL TO OR LESS THAN D_2 , JOIN INVERTS AND WHEN D_1 IS GREATER THAN D_2 , JOIN SOFFITS.
5. FOR PIPE LARGER THAN 72" SPECIAL COLLAR DETAILS ARE REQUIRED.
6. FOR PIPE SIZE NOT LISTED, USE NEXT SIZE LARGER.
7. REINFORCEMENT SHALL CONFORM TO ASTM A 615 GRADE 40.
8. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE $D+(2 \times \text{WALL THICKNESS}) + T$.
9. REINFORCING SHALL BE USED WHERE THE PIPE DIAMETER IS GREATER THAN 21" AND ON ALL PIPES WHERE THE SPACES BETWEEN THE EXTREME OUTER ENDS IS 3" OR LARGER.

CIRCULAR TIES:

PIPE DIAMETER	NO. OF CIRCULAR TIES
21" OR LESS	3
24" TO 30"	3
33" TO 57"	4
60" TO 72"	5

WHERE THE SPACE BETWEEN PIPE ENDS EXCEEDS 3", THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN AN APPROXIMATE SPACING OF 6" O.C.

10. WHERE THE PIPE IS 21" OR LESS IN DIAMETER AN INTERIOR FORM OF UNSEALED SONO-TUBE OR EQUAL SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. THE PAPER FORM MAY BE LEFT IN PLACE (SEE DETAIL A). WHEN THE PIPE IS 24" OR LARGER A REMOVABLE INTERIOR FORM SHALL BE USED OR THE INTERIOR JOINT SHALL BE COMPLETELY FILLED WITH MORTAR AND NEATLY POINTED.
11. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.



APPROVED BY:

Ricardo Sandoval 10/18/06
CITY ENGINEER DATE

RICARDO SANDOVAL

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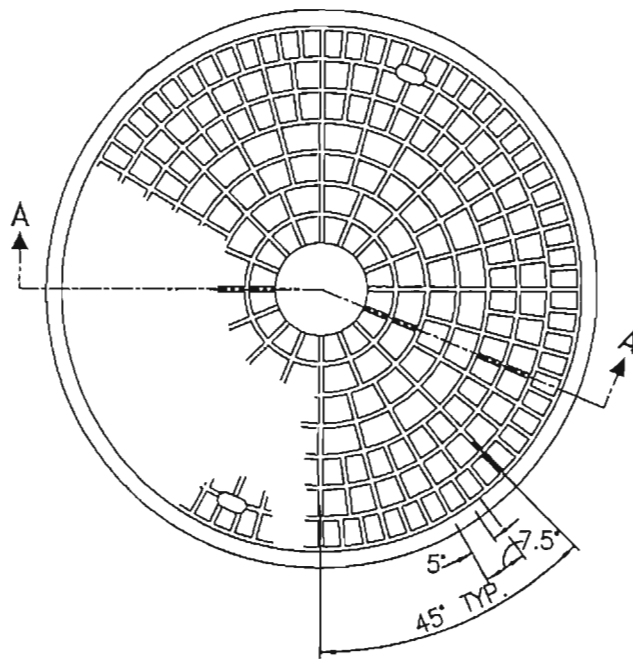
CITY OF FONTANA

**CONCRETE COLLAR FOR RCP
12" THROUGH 72"**

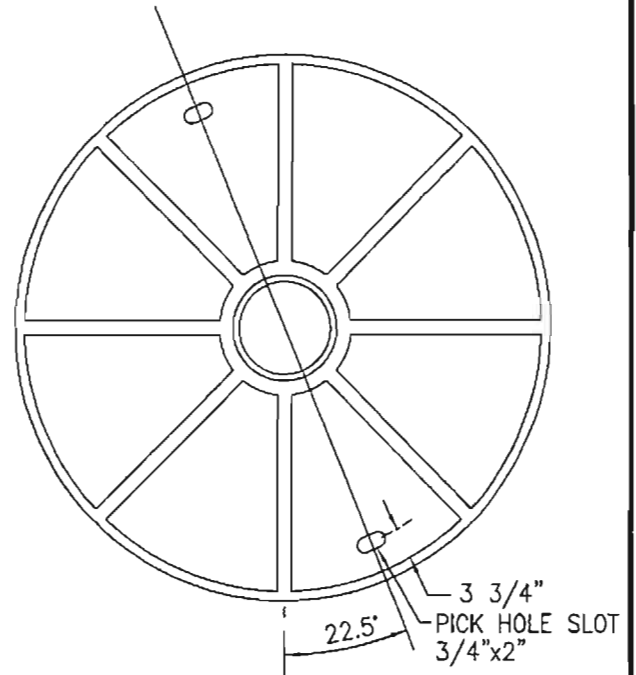
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STD. PLAN NO. **3022**

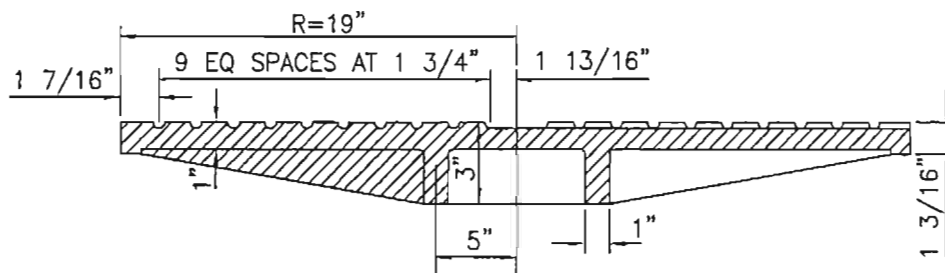
SHT 2 OF 2



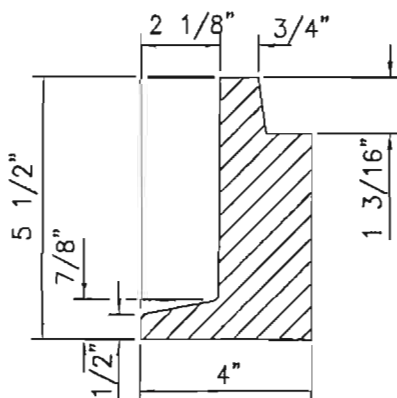
TOP OF COVER



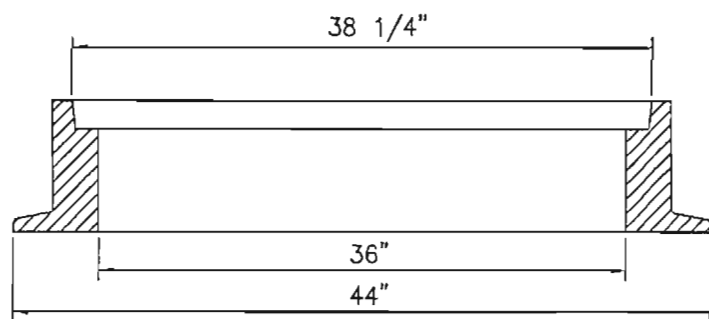
BOTTOM OF COVER



SECTION A-A



FRAME DETAIL



SECTION THRU FRAME

NOT TO SCALE



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CITY ENGINEER
RICARDO SANDOVAL

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CITY OF FONTANA

36" MANHOLE
FRAME AND COVER

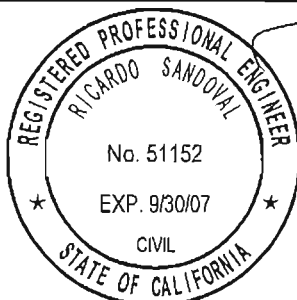
07/10/06

STD. PLAN NO. 3023

SHT 1 OF 2

NOTES

1. THE CAST IRON USED SHALL CONFORM TO ASTM A-48 CLASS 35B.
2. COVERS SHALL BE CAST WITH THE LETTER "D" FOR STORM DRAINS AND "S" FOR SEWERS, AND THE AGENCY'S IDENTIFICATION IN ACCORDANCE WITH INSTRUCTIONS FURNISHED BY THE AGENCY. THE LETTER "D" OR "S" SHALL BE APPROXIMATELY 2-1/2" HIGH WITH 1/2" LINE WIDTH, AND PLACED IN THE CENTER OF THE COVER. ALL LETTERS SHALL BE FLUSH WITH THE FINISHED SURFACE OF THE COVER.
3. FOUNDRY IDENTIFYING MARK, HEAT AND DATE SHALL BE CAST ON THE BOTTOM OF THE COVER AND ON THE INSIDE OF THE FRAME.
4. IMPORTED COVERS AND FRAMES SHALL HAVE THE COUNTRY OF ORIGIN MARKING IN COMPLIANCE WITH FEDERAL REGULATIONS.
5. WEIGHT OF FRAME SHALL BE 335 LBS. WEIGHT OF COVER SHALL BE 340 LBS. ACTUAL WEIGHTS SHALL BE WITHIN A RANGE OF 95% TO 110%.
6. THE MANHOLE FRAME AND COVER SHALL BE INSPECTED BY THE ENGINEER PRIOR TO SHIPMENT TO THE JOB SITE. ACCEPTANCE WILL BE INDICATED BY THE AGENCY'S MARK.
7. THE PROOF-LOAD FOR TEST METHOD B OF THE STANDARD SPECIFICATIONS IS 41,300 LBS.
8. COVERS FOR MANHOLES LOCATED IN EASEMENTS, ALLEYS, PARKWAYS AND ALL PLACES OTHER THAN PAVED STREETS SHALL BE PROVIDED WITH SOCKET-SET SCREW LOCKING DEVICES. DRILL AND TAP TWO HOLES TO A DEPTH OF ONE INCH AT 90 DEGREES TO PICK HOLE AND INSTALL 3/4"x3/4" STAINLESS STEEL SOCKET-SET SCREWS WITH 3/8" RECESSED HEX HEAD. ALL THREADS SHALL BE N.C.
9. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACTLY EQUAL VALUES.



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Ricardo Sandoval 10.18.06

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RICARDO SANDOVAL

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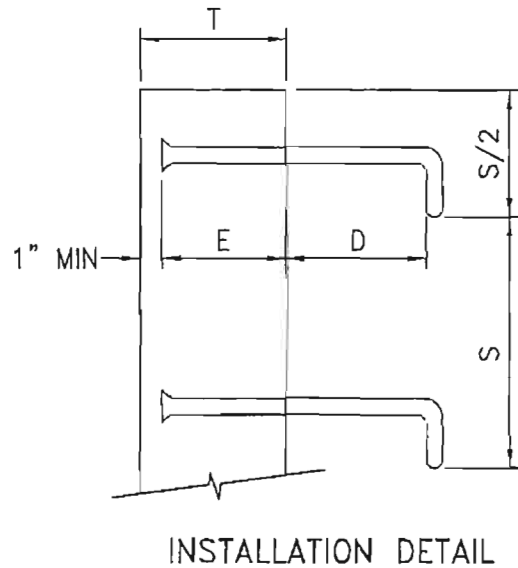
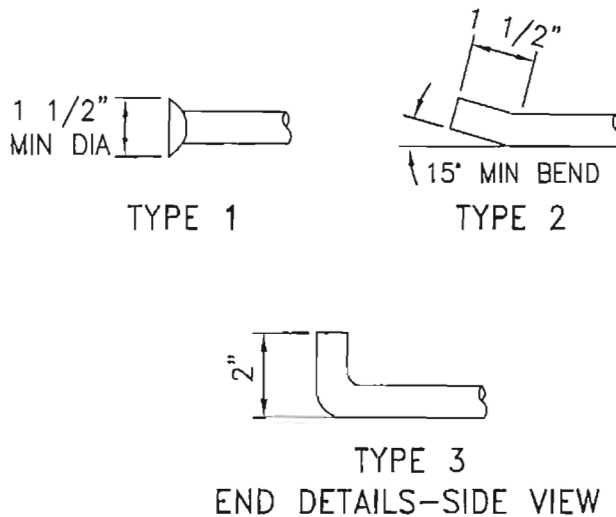
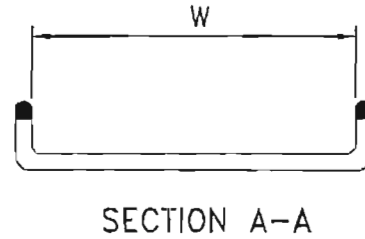
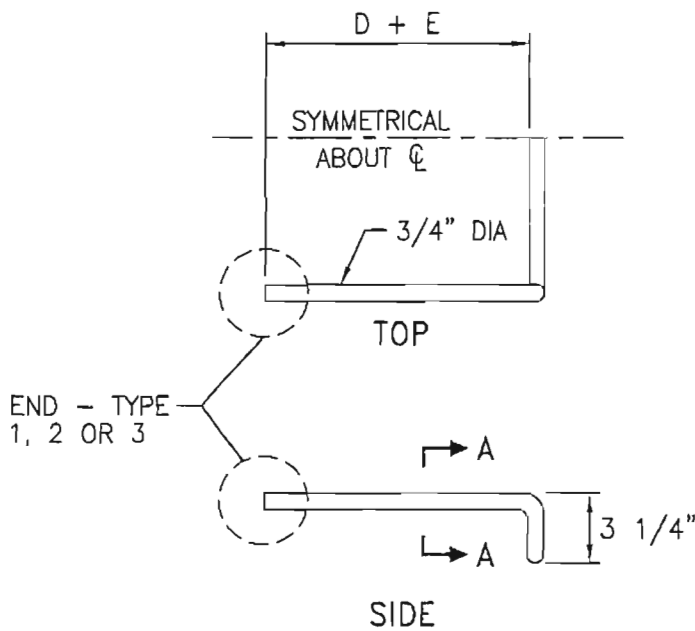
CITY OF FONTANA

**36" MANHOLE
FRAME AND COVER**

07/10/06

STD. PLAN NO. **3023**

SHT **2** OF **2**



UNLESS OTHERWISE NOTED:

D = 7"
 E = 6" OR T - 1", WHICHEVER IS LESS
 MINIMUM E IS 3"
 S = 12" MAX, EVENLY SPACED
 W = 16" MIN

FOR MANHOLES AND UNDERGROUND VAULTS:
 S = 16" MAX, EVENLY SPACED
 W = 14" MIN

NOT TO SCALE



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RICARDO SANDOVAL

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CITY OF FONTANA

STEEL STEP

07/10/06

STD. PLAN NO. **3024**

SHT 1 OF 2

NOTES

1. STEPS SHALL BE STEEL CONFORMING TO ASTM A307 AND SHALL BE GALVANIZED AFTER FABRICATION..
2. IF STAINLESS STEEL STEPS ARE REQUIRED, THE MATERIAL SHALL CONFORM TO ASTM A276, 300 SERIES.
3. STEPS ENDS MAY BE TYPE 1, 2 OR 3, AS SHOWN.
4. BOTTOM STEP SHALL BE MAXIMUM OF 2' ABOVE FLOOR OR SHELF.
5. STEPS WITH TYPE 1 OR 2 ENDS MAY BE CAST IN PLACE, OR PLACED IN THE CENTER OF 1 1/2" MIN DIA DRILLED OR FORMED HOLES AND SET WITH HIGH STRENGTH NON-SHRINK GROUT, 6000 PSI MIN. STEPS WITH TYPE 3 ENDS SHALL BE CAST IN PLACE.
6. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACTLY EQUAL VALUES.



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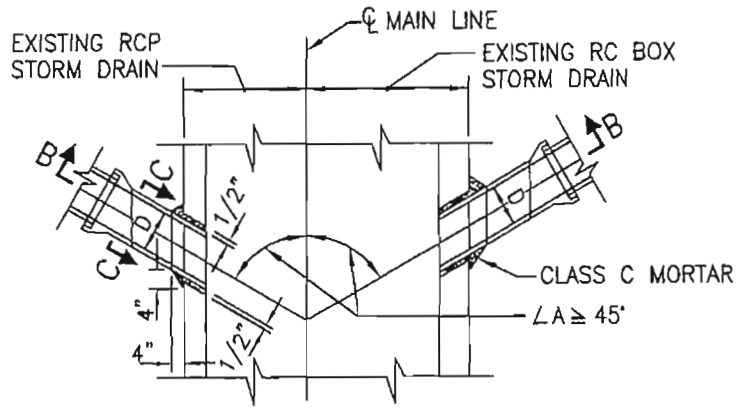
CITY OF FONTANA

STEEL STEP

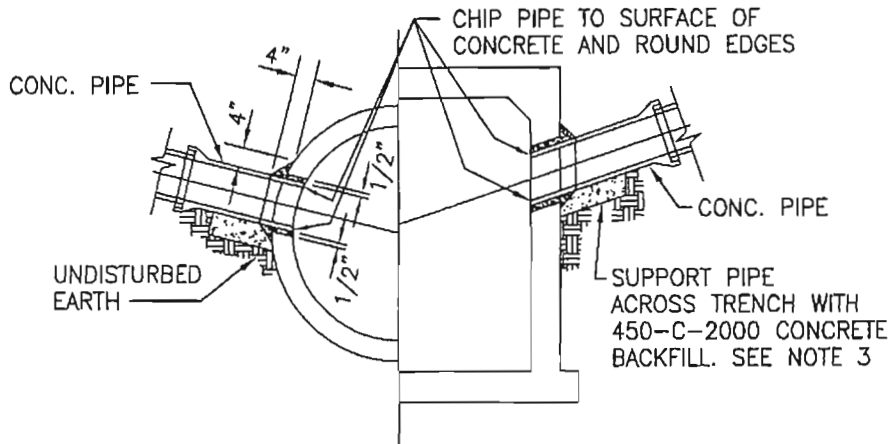
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STD. PLAN NO. **3024**

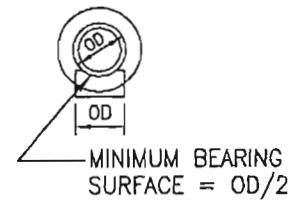
SHT **2** OF **2**



PLAN

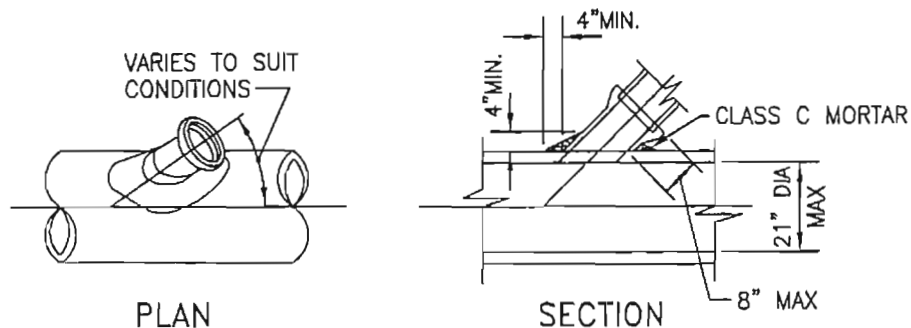


SECTION B-B



SECTION C-C

CASE 1
PLAIN CONCRETE PIPE
D = 24" MAX



CASE 2
SADDLE CONNECTION

NOT TO SCALE



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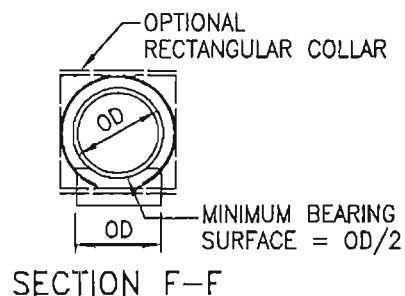
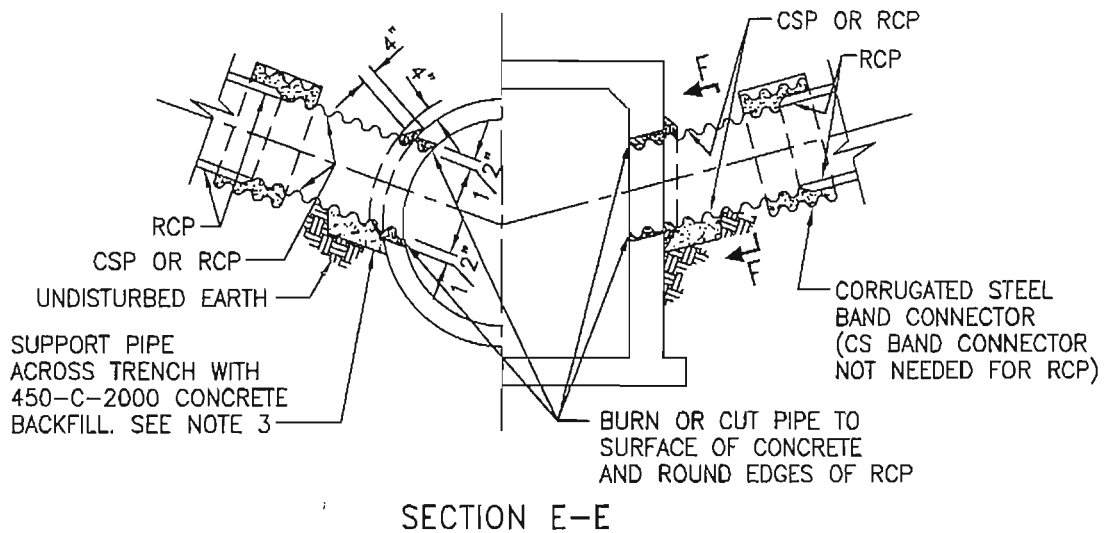
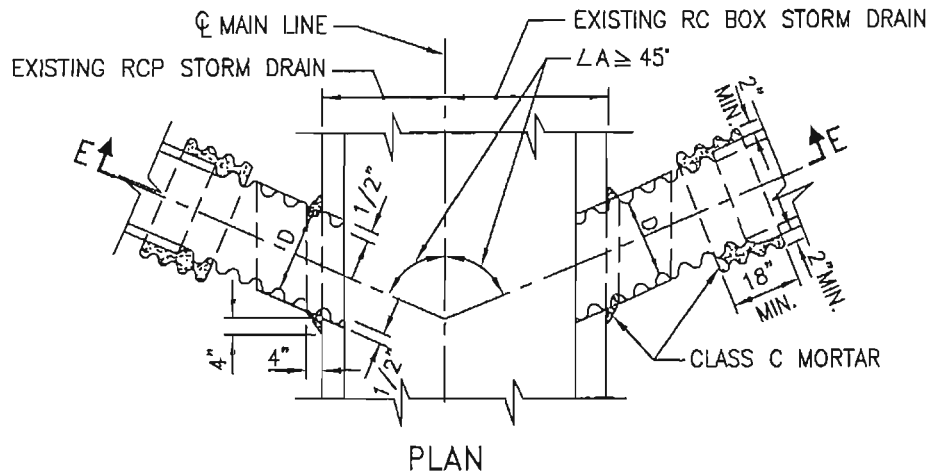
CITY OF FONTANA

PIPE CONNECTIONS TO
EXISTING STORM DRAINS

07/10/06

STD. PLAN NO. 3025

SHT 1 OF 3



DIA. OF CSP	MIN. GAGE
15" - 21"	16
24"	14

CASE 3
RCP OR CSP
D = 24" MAX



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RICARDO SANDOVAL

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PIPE CONNECTIONS TO
EXISTING STORM DRAINS

07/10/06

STD. PLAN NO. 3025

SHT 2 OF 3

GENERAL NOTE

1. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.

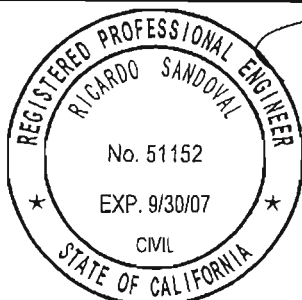
NOTES

CASE 1 AND CASE 3

1. OUTSIDE DIAMETER OF THE CONNECTOR PIPE SHALL NOT BE GREATER THAN $1/2$ THE INSIDE DIAMETER OF THE RCP MAIN LINE.
2. INSIDE DIAMETER D OF THE CONNECTOR PIPE SHALL NOT BE GREATER THAN 24".
3. THE MINIMUM OPENING INTO THE EXISTING STORM DRAIN SHALL BE THE OUTSIDE DIAMETER OF THE CONNECTING PIPE PLUS 1". THE CONCRETE BACKFILL SUPPORTING THE CONNECTING PIPE MAY BE OMITTED IF THE PIPE IS LAID ON UNDISTURBED EARTH TO STORM DRAIN WALL.
4. ALL CSP AND FITTINGS SHALL BE GALVANIZED. BAND CONNECTORS MAY BE 2 GAGES LIGHTER THAN THE PIPE, BUT WITH A MINIMUM GAGE OF 16. THEY SHALL BE CONNECTED AT THE ENDS BY ANGLES HAVING MINIMUM DIMENSIONS OF 2"x2"x3/16" AND 5 1/2" BOLTS.
5. WHEN JOINING A RCP CONNECTOR PIPE TO A CSP CONNECTOR PIPE, THE INSIDE DIAMETER D OF THE CSP SHALL BE AT LEAST EQUAL TO BUT NOT MORE THAN 3" GREATER THAN THAT OF THE RCP.
6. CONNECTOR PIPES SHALL BE NOT MORE THAN 5' ABOVE THE INVERT.
7. CONNECTOR PIPES SHALL ENTER MAIN LINE RCP RADIALLY.

CASE 2

8. SADDLE CONNECTIONS SHALL BE USED WHEN CONNECTING TO PIPES 21" OR LESS IN DIAMETER WITHOUT THE USE OF JUNCTION STRUCTURES OR PRECAST Y BRANCHES.
9. TRIM OR CUT SADDLE TO FIT SNUGLY OVER THE OUTSIDE OF THE MAIN PIPE SO ITS AXIS WILL BE ON THE LINE AND GRADE OF THE CONNECTING PIPE.
10. THE OPENING INTO THE PIPE SHALL BE CUT AND TRIMMED TO FIT THE SADDLE SO THAT NO PART WILL PROJECT WITHIN THE BORE OF THE SADDLE PIPE.
11. THE CONNECTOR PIPE SHALL BE SUPPORTED AS SHOWN IN CASE 1 AND CASE 3.



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**PIPE CONNECTIONS TO
EXISTING STORM DRAINS**

07/10/06

STD. PLAN NO. **3025**

SHT **3** OF **3**

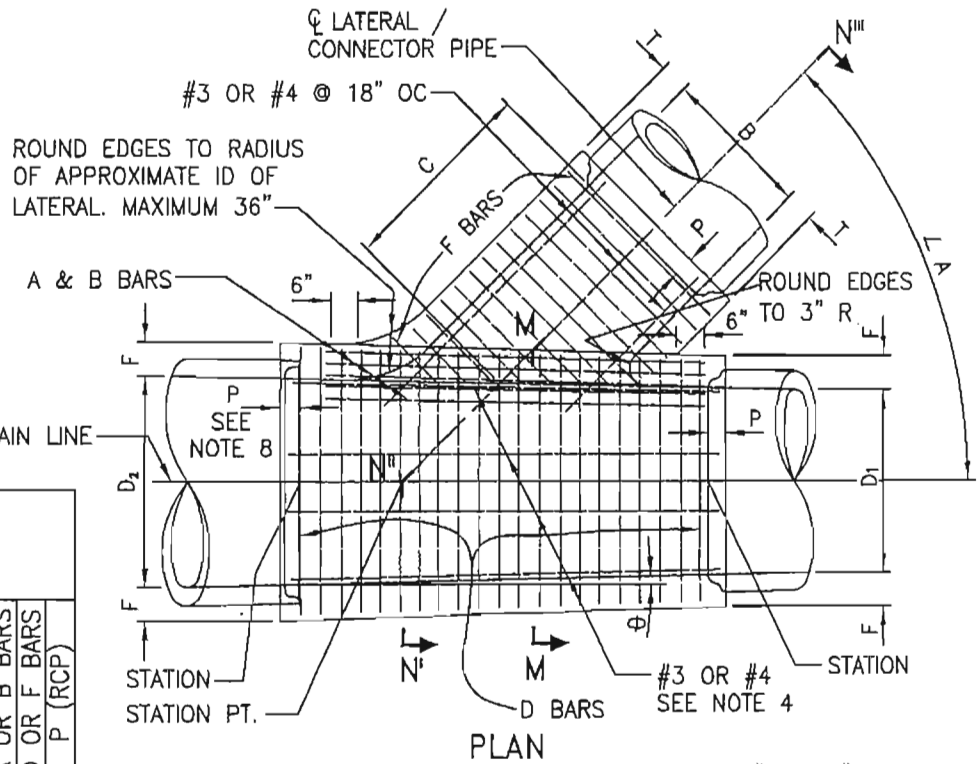
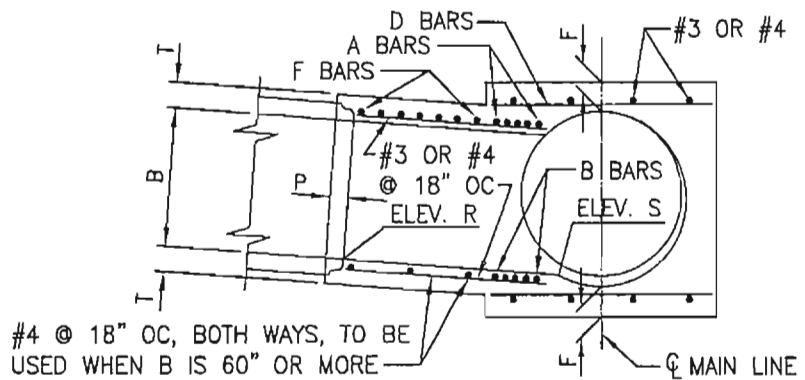
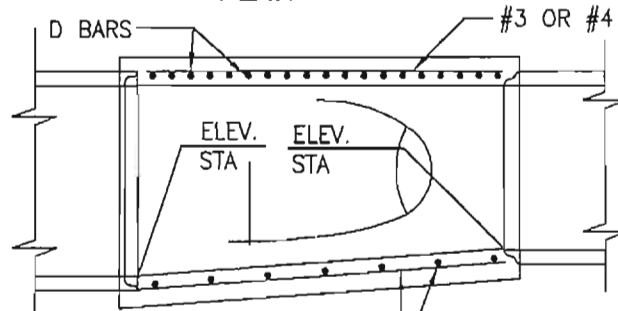


TABLE FOR DIMENSIONS AND BAR SIZES				
D ₂ OR B (INCHES)	F OR T (INCHES)	A OR B BARS	D OR F BARS	P (RCP)
12	4			
15	4 1/4			
18	4 1/2			
21	5			
24	5 1/4			
27	5 1/2			
30	6			
33	6 1/4			
36	6 1/2			
39	7			
42	7 1/2			
45	7 3/4			
48	8			
51	8 1/2			
54	9			
57	9 1/4			
60	9 1/2			
63	10			
66	10 1/4			
69	10 3/4			
72	11			
78	11 3/4			
84	12 1/2			
90	13 1/4			
96	14			
102	15 1/2			
108	16			
114	16 1/2			
120	17			
126	17			
132	17 1/2			
138	17 1/2			
144	18			



NOT TO SCALE



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CITY OF FONTANA

TRANSITION STRUCTURE
PIPE TO PIPE

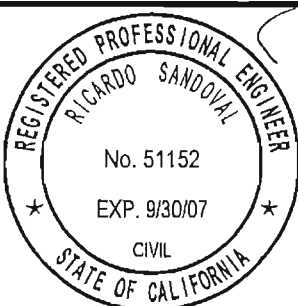
07/10/06

STD. PLAN NO. 3026

SHT 1 OF 2

NOTES

1. THE HORIZONTAL ANGLE OF CONVERGENCE OR DIVERGENCE, θ , SHALL NOT EXCEED $5^{\circ} 45'$.
2. VALUES FOR A, B, C, D₁ AND D₂ ARE SHOWN ON THE PROJECT DRAWINGS. ELEVATION R AND ELEVATION S ARE SHOWN WHEN REQUIRED BY NOTE 10.
3. FLOOR OF STRUCTURE SHALL BE STEEL TROWELED TO SPRING LINE.
4. REINFORCEMENT STEEL SHALL CONFORM TO ASTM A 615, GRADE 40, AND SHALL TERMINATE $1\frac{1}{2}"$ CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN. LONGITUDINAL BARS SHALL BE #3 OR #4 @ 18" OC OR LESS.
5. ELEVATION S APPLIES AT INSIDE WALL OF STRUCTURE.
6. TRANSITION STRUCTURE SHALL BE POURED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING AT THE SPRING LINE A CONSTRUCTION JOINT LONGITUDINAL KEYWAY.
7. THE LENGTH OF THE STRUCTURE MAY BE INCREASED AT THE OPTION OF THE CONTRACTOR TO MEET RCP ENDS, USING D BARS, LONGITUDINAL AND BOTTOM REINFORCEMENT IN EXTENDED PORTION OF SAME DIAMETER AND SPACING AS SPECIFIED IN THE TABLE, BUT ANY CHANGE IN THE LOCATION OF THE SPUR MUST BE APPROVED BY THE ENGINEER.
8. EMBEDMENT P SHALL BE AS SPECIFIED IN THE TABLE, UNLESS OTHERWISE SHOWN ON THE PROJECT DRAWINGS.
9. WHEN THERE IS NO SPUR REQUIRED, A & B BARS SHALL BE OMITTED.
10. WHEN ELEVATION R AND ELEVATION S ARE NOT SHOWN ON PROJECT DRAWINGS, INLET PIPE SHALL ENTER MAIN LINE RADially. WHEN INLET PIPE ENTERS MAIN LINE OTHER THAN RADially, ELEVATION S SHALL BE SHOWN ON THE PROJECT DRAWINGS, AND INLET PIPE SHALL BE LAID ON A STRAIGHT GRADE FROM ELEVATION S TO CATCH BASIN OR GRADE BREAK IN INLET LINE. ELEVATION R SHALL BE SHOWN ON PROJECT DRAWINGS ONLY WHEN STUB IS TO BE PROVIDED IN MAIN LINE FOR FUTURE CONSTRUCTION OF INLET PIPE.
11. THE MAXIMUM COVER ABOVE THIS STRUCTURE SHALL BE 25'. IF THE COVER EXCEEDS 25' A SPECIAL STRUCTURE SHALL BE DESIGNED FOR THE COVER AND DETAILED ON THE PROJECT DRAWINGS.
12. DIMENSIONS SHOWN ON THIS PLAN ARE NOT EXACT EQUAL VALUES.



APPROVED BY:

[Signature] 10/18/06

CITY ENGINEER

DATE

RICARDO SANDOVAL

REVIEWED BY: *[Signature]*

DATE OF LAST REVISION: _____

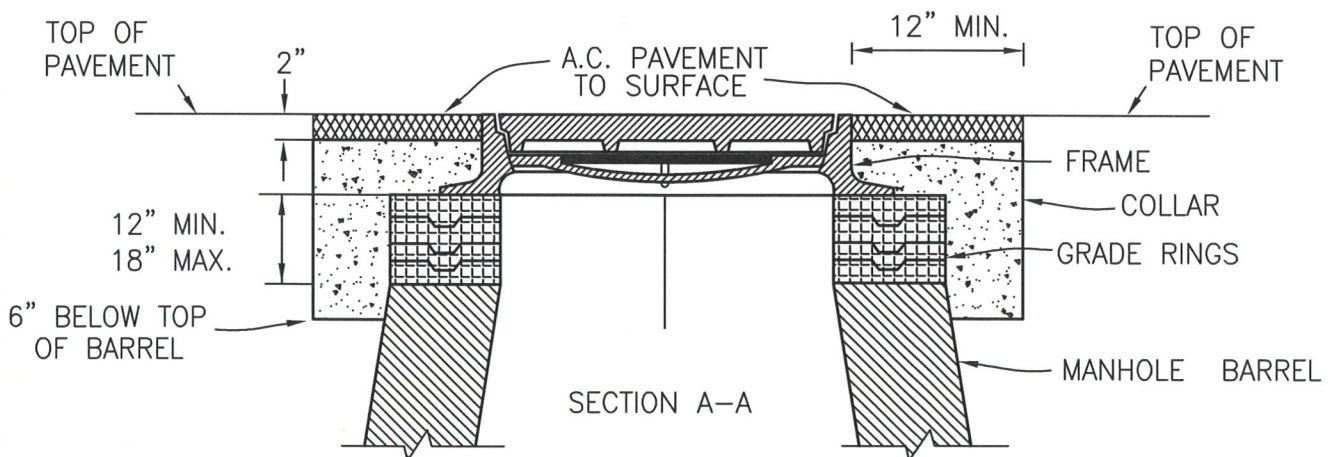
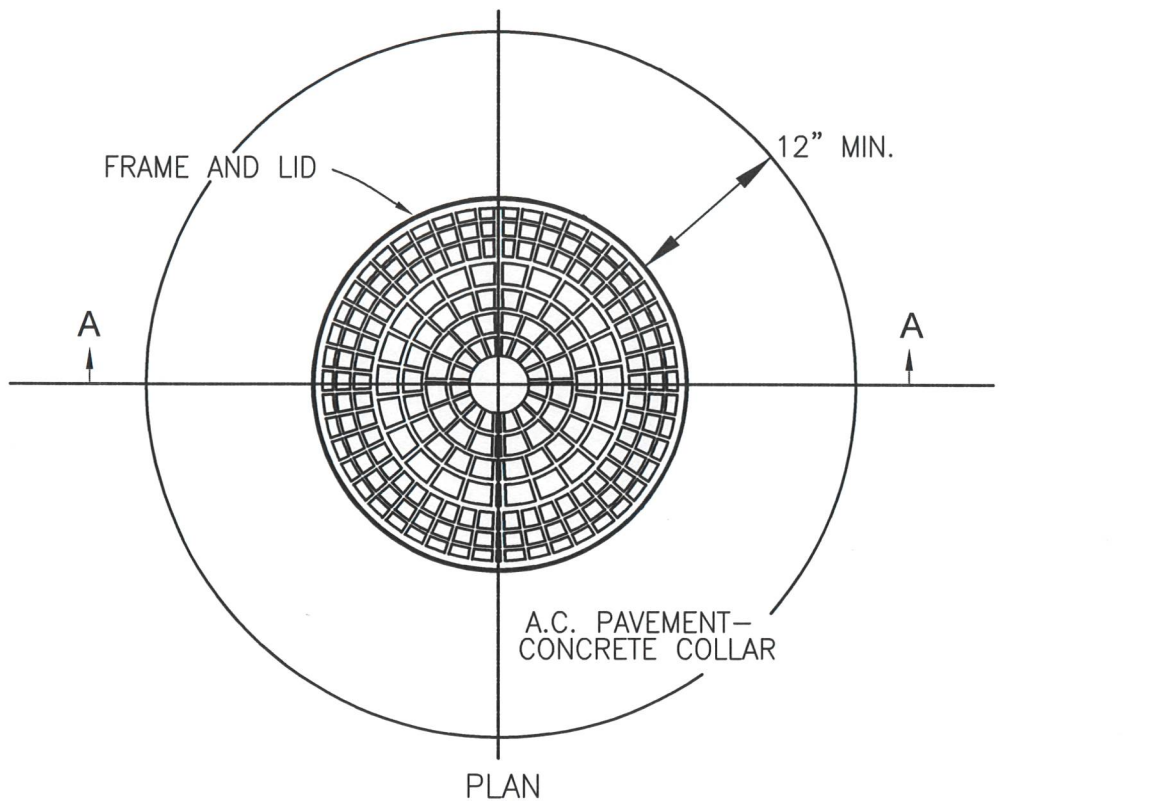
CITY OF FONTANA

**TRANSITION STRUCTURE
PIPE TO PIPE**

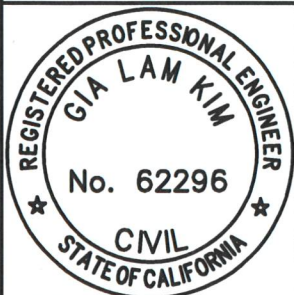
07/10/06

STD. PLAN NO. **3026**

SHT **2** OF **2**



NOT TO SCALE



APPROVED BY:

[Signature]

CITY ENGINEER

DATE

GIA LAM KIM

DRAWN BY:

DT

REVISION NO.

CITY OF FONTANA

STANDARD MANHOLE
FRAME, COVER AND
CONCRETE COLLAR

STD. PLAN NO. 3027 DWG. 1/2

NOTES:

1. MANHOLE FRAME AND COVER SHALL BE LONG BEACH IRON WORKS, LB 1170A OR APPROVED EQUAL
2. ASPHALT SURROUNDING THE FRAME SHALL BE PLACED TO A DEPTH OF 2" BELOW FINISHED SURFACE AND 12" MINIMUM WIDTH.
3. GRADE RINGS ARE ALLOWED FOR A MINIMUM OF 12" AND A MAXIMUM OF 18" FROM TOP OF MANHOLE BARREL.
4. CONCRETE COLLAR SHALL BE PLACED FROM 2" BELOW TOP OF MANHOLE FRAME TO 6" BELOW TOP OF BARREL. COLLAR SHALL COMPLETELY ENCAPSULATE ALL GRADE RINGS. CONCRETE SHALL BE 560-C-3250.
5. ACCELERATING ADMIXTURES MAY BE USED AT THE REQUEST OF THE CONTRACTOR OR CITY. ACCELERATING ADMIXTURES SHALL BE DURASET 4, POLARSET, OR APPROVED EQUAL AND SHALL CONFORM TO ASTM C494 OR ASTM D98 PER GREENBOOK SECTION 201-1.2.4 ITEM B.



APPROVED BY:

[Signature]
CITY ENGINEER _____ DATE _____
GIA LAM KIM

DRAWN BY: _____ DT _____

REVISION NO. _____

CITY OF FONTANA

STANDARD MANHOLE
FRAME, COVER AND
CONCRETE COLLAR

STD. PLAN NO. 3027 | DWG. 2/2