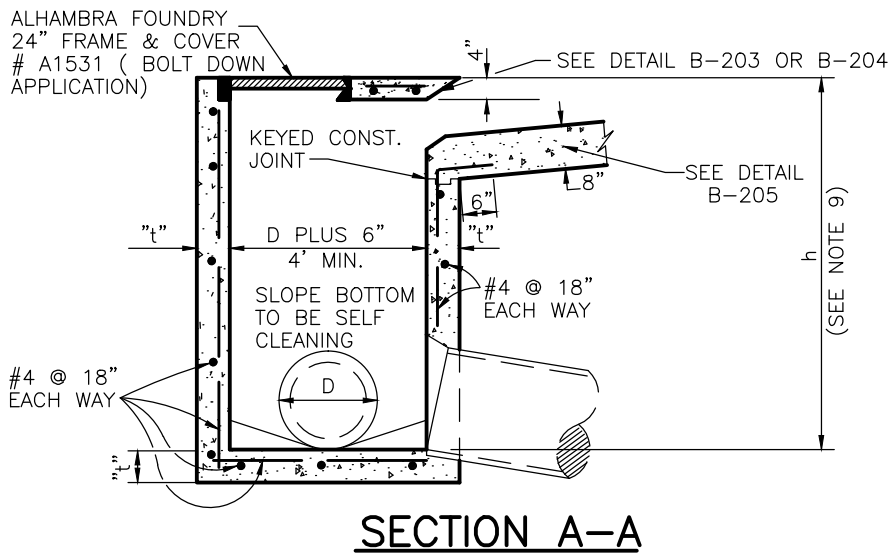
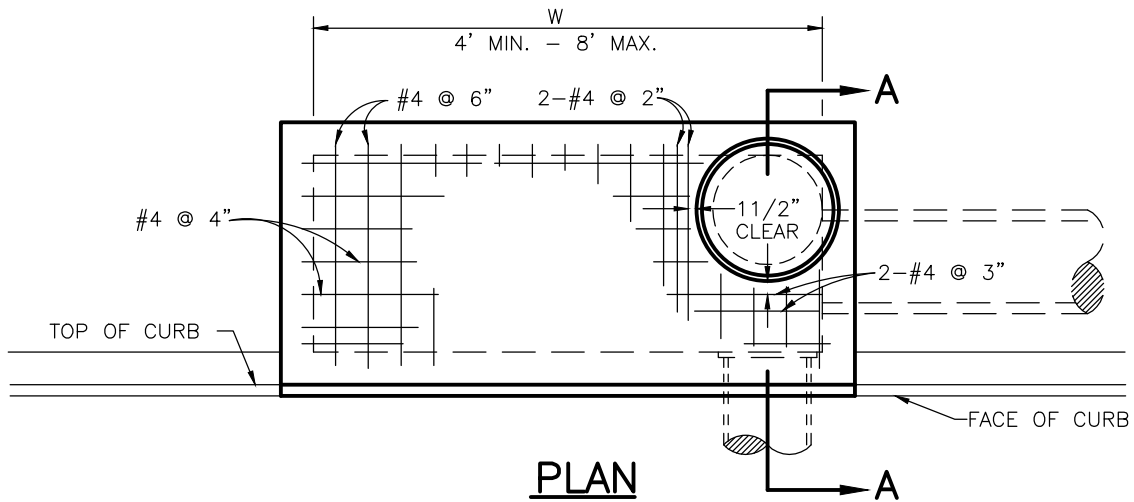




CITY OF GARDEN GROVE PUBLIC WORKS STANDARD PLANS

SERIES B-200 STORM DRAIN

- B-201 CATCH BASIN – TYPE OS (CURB OPENING – SMALL)
- B-202 CATCH BASIN – TYPE OL (CURB OPENING – LARGE)
- B-203 MISCELLANEOUS CATCH BASIN DETAILS
- B-204 MISCELLANEOUS CATCH BASIN DETAILS
- B-205A LOCAL DEPRESSION (SUMP CONDITION)
- B-205B LOCAL DEPRESSION (FLOW-BY CONDITION)
- B-206 STORM DRAIN MANHOLE
- B-207 STORM DRAIN MANHOLE (SHALLOW DEPTH)
- B-208 CONCRETE COLLAR FOR PIPES 18”–66” DIAMETER
- B-209 PARKWAY DRAIN



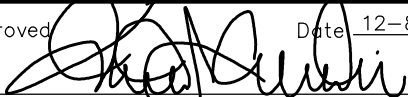
NOTES:

1. HORIZONTAL PROTECTION BAR SHALL BE USED WHEN INLET OPENING IS MORE THAN 8 INCHES. SEE STD. PLAN B-203 OR B-204 FOR DETAILS.
2. STEPS REQUIRED WHEN "h" IS GREATER THAN 3'-0". SEE STD. B-203.
3. OUTLET MAY BE MADE IN ANY DIRECTION.
4. PIPE INLETS AND OUTLETS SHALL BE AT BOTTOM OF BASIN UNLESS OTHERWISE SPECIFIED.
5. ALL EXPOSED CONCRETE SURFACES SHALL CONFORM IN GRADE, COLOR AND FINISH TO ALL ADJOINING CURB AND WALK.
6. ALL WALL AND BASE REINFORCING STEEL SHALL BE 1 1/2 INCHES CLEAR FROM INSIDE OR OUTSIDE FACE OF STRUCTURE.
7. WHEN "W" EXCEEDS 8 FEET, USE STD. PLAN B-202.
8. ALL CONCRETE SHALL BE CLASS 560-C-3250.
9. "h" SHALL BE 4' MIN. FOR MAINTENANCE PURPOSES IF POSSIBLE.
10. SLOPE BOTTOM OF CATCH BASIN TOWARDS OUTLET A MIN. OF 1" PER FOOT FROM ALL SIDES.



City of
Garden Grove
California

**CATCH BASIN – TYPE OS
(CURB OPENING – SMALL)**

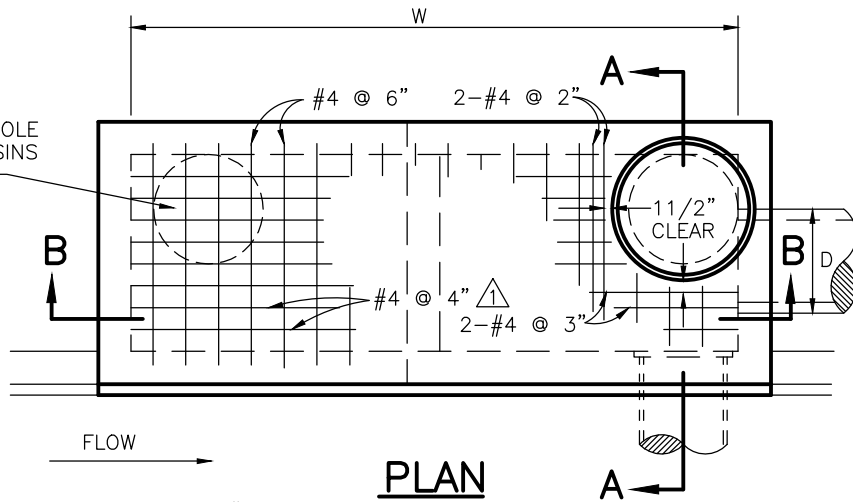
Approved  Date 12-8-15
City Engineer R.C.E. 52125 Exp.12-31-16

REVISIONS	BY	DATE

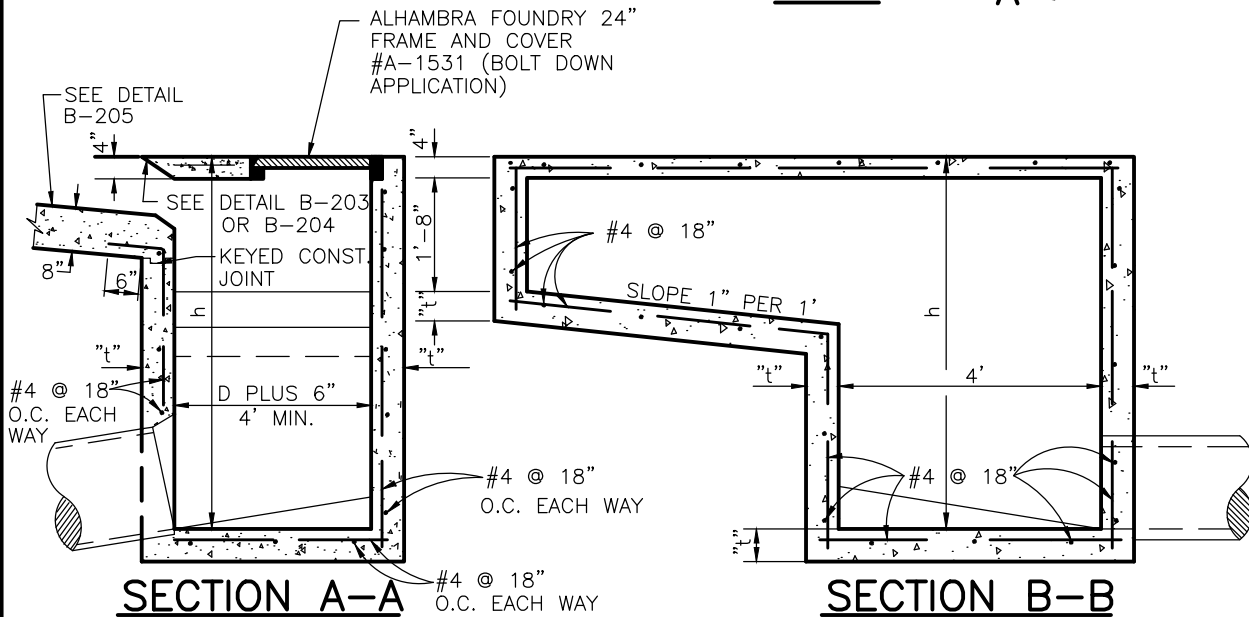
STD. PLAN NUMBER
B-201

INSTALL 2ND MANHOLE
ON ALL CATCH BASINS
14' AND LONGER

h	"t"
UP TO 8'-0"	6"
UP TO 16'-0"	8"



PLAN



SECTION A-A

SECTION B-B

NOTES:

1. HORIZONTAL PROTECTION BAR SHALL BE USED WHEN INLET OPENING IS MORE THAN 8 INCHES. SEE STD. PLAN B-203 OR B-204 FOR DETAILS.
2. STEPS REQUIRED WHEN "h" IS GREATER THAN 3'-0". SEE STD. PLAN B-203.
3. OUTLET MAY BE MADE IN ANY DIRECTION.
4. PIPE INLETS AND OUTLETS SHALL BE AT BOTTOM OF BASIN UNLESS OTHERWISE SPECIFIED.
5. ALL EXPOSED CONCRETE SURFACES SHALL CONFORM IN GRADE, COLOR AND FINISH TO ALL ADJOINING CURB AND WALK.
6. ALL WALL AND BASE REINFORCING STEEL SHALL BE 1 1/2 INCHES CLEAR FROM INSIDE OR OUTSIDE FACE OF STRUCTURE.
7. WHEN "W" IS LESS THAN 8 FEET, USE STD. PLAN B-201.
9. ALL CONCRETE SHALL BE CLASS 560-C-3250.
10. SLOPE BOTTOM OF CATCH BASIN TOWARDS OUTLET A MIN. OF 1" PER FOOT FROM ALL SIDES.



City of
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California

**CATCH BASIN – TYPE 01
(CURB OPENING – LARGE)**

Approved

Date 12-8-15

REVISIONS

BY

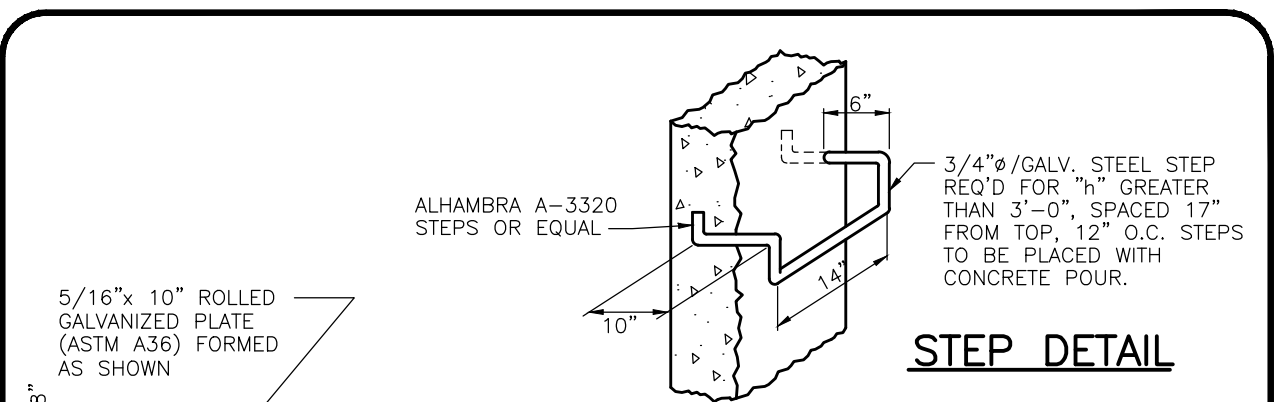
DATE

STD. PLAN NUMBER

City Engineer

R.C.E. 52125 Exp.12-31-16

B-202



STEP DETAIL

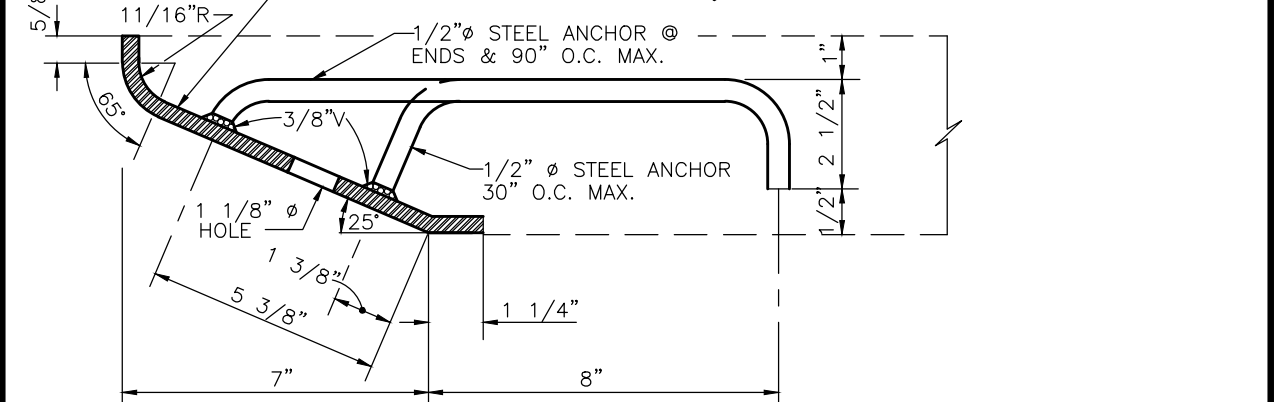
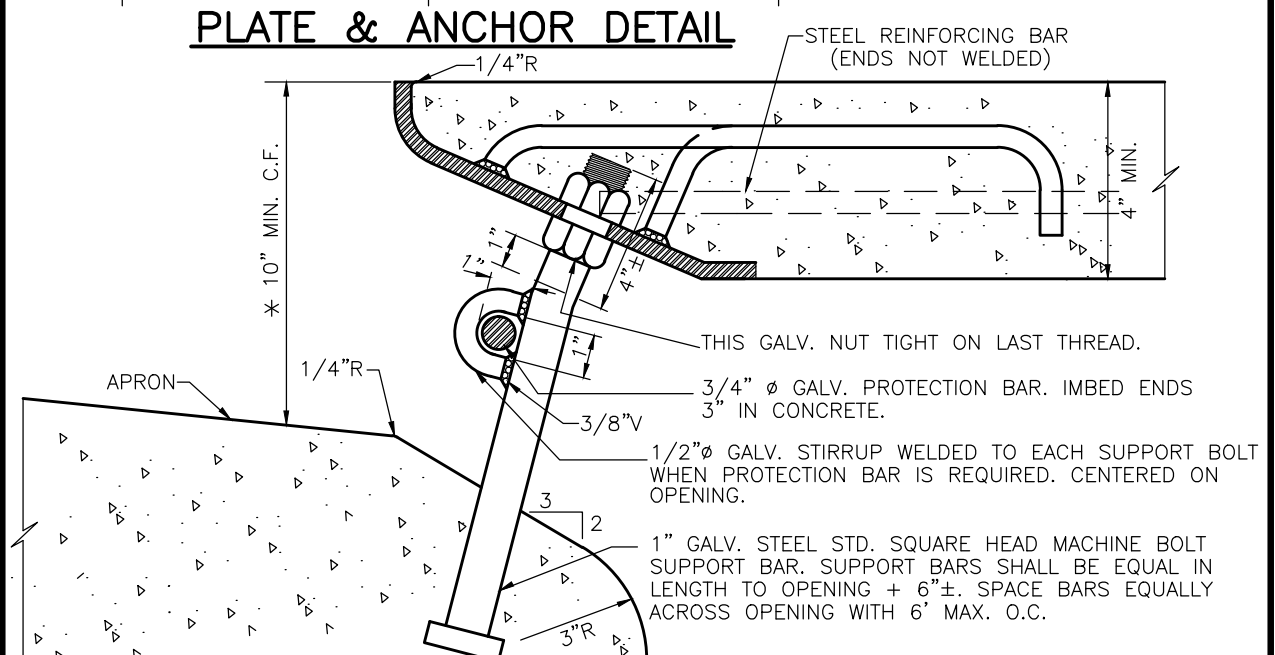




PLATE & ANCHOR DETAIL



CURB SUPPORT & OPENING DETAIL

FOR TANGENTS AND CURVES GREATER THAN 100' RADIUS

* - USE 8" C.F. FOR CURB LANES 14' OR LESS.

 <p>City of Garden Grove California</p>	<p>MISCELLANEOUS CATCH BASIN DETAILS</p>										
	<p>Approved  Date 12-8-15</p> <p>City Engineer R.C.E. 52125 Exp.12-31-16</p>	<table border="1"> <thead> <tr> <th>REVISIONS</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	BY	DATE						
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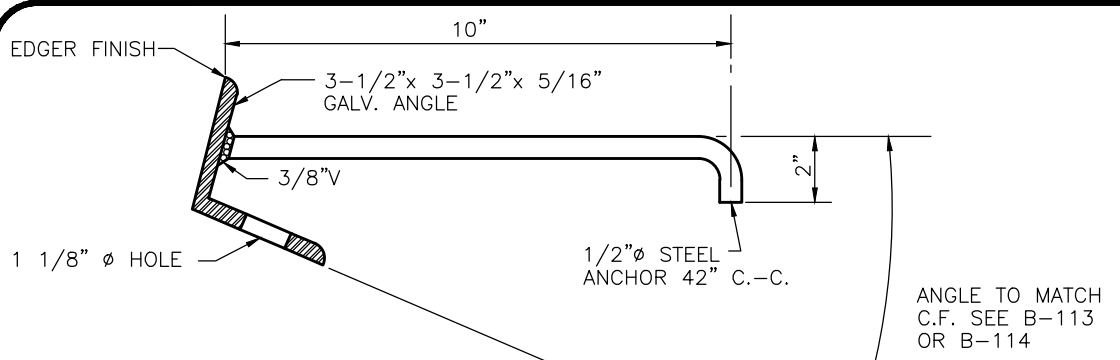
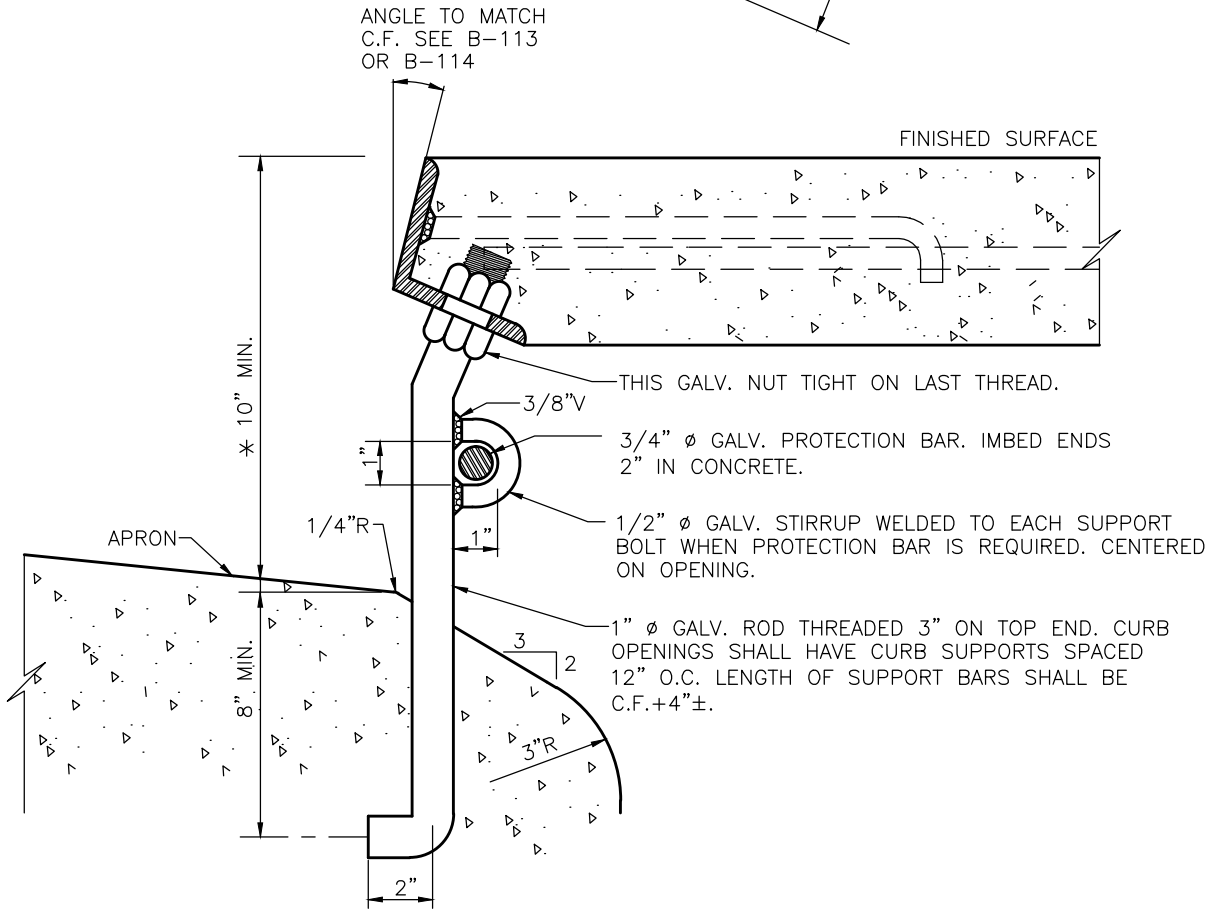


PLATE ANCHOR DETAIL



CURB SUPPORT AND OPENING DETAIL REQUIRED FOR INDUSTRIAL AREAS, IN ADVANCE OF CURB RETURNS, AND FOR CURVES OF RADIUS 100' OR LESS

* - USE 8" C.F. FOR CURB LANES 14' OR LESS.

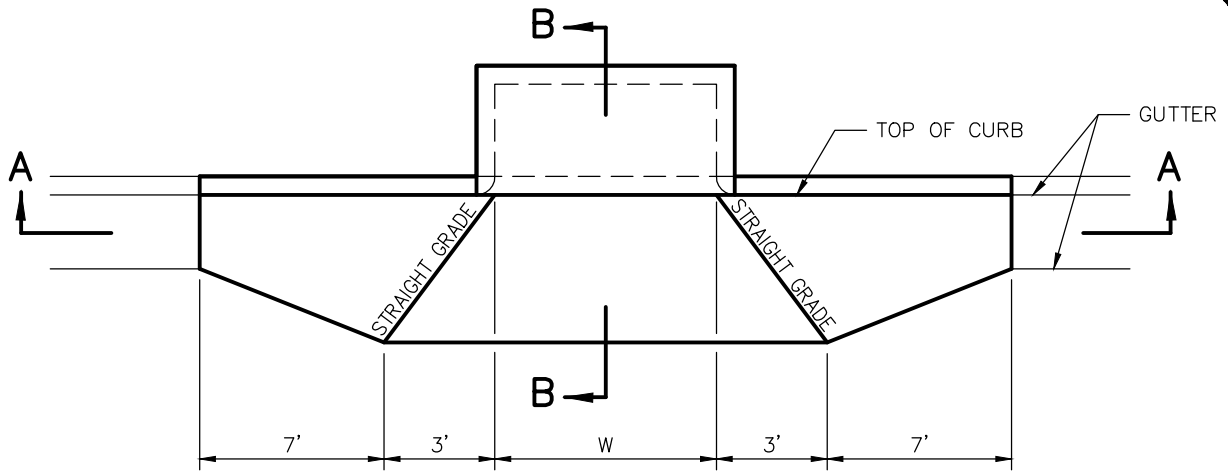


MISCELLANEOUS CATCH BASIN DETAILS

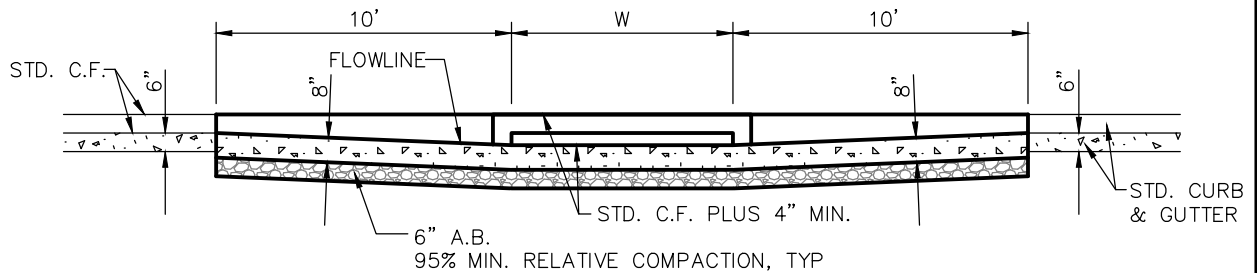
Approved: *[Signature]* Date: 12-8-15
 City Engineer R.C.E. 52125 Exp. 12-31-16

REVISIONS	BY	DATE

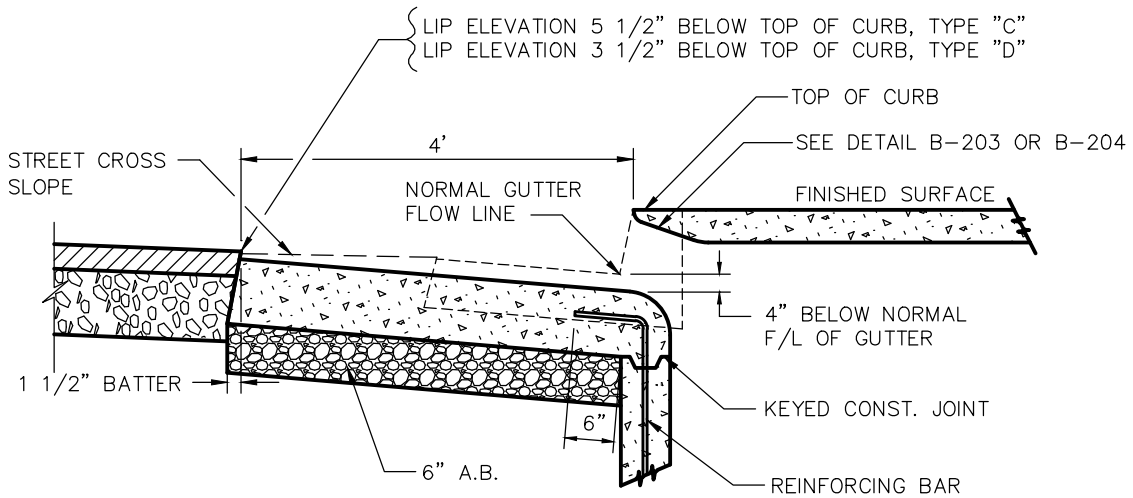
STD. PLAN NUMBER
B-204



PLAN



SECTION A-A



SECTION B-B



City of
Garden Grove
California

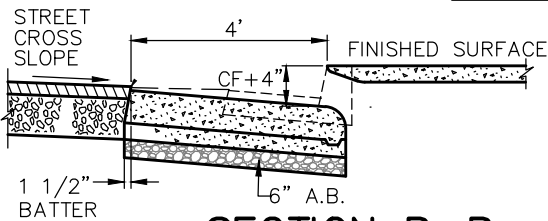
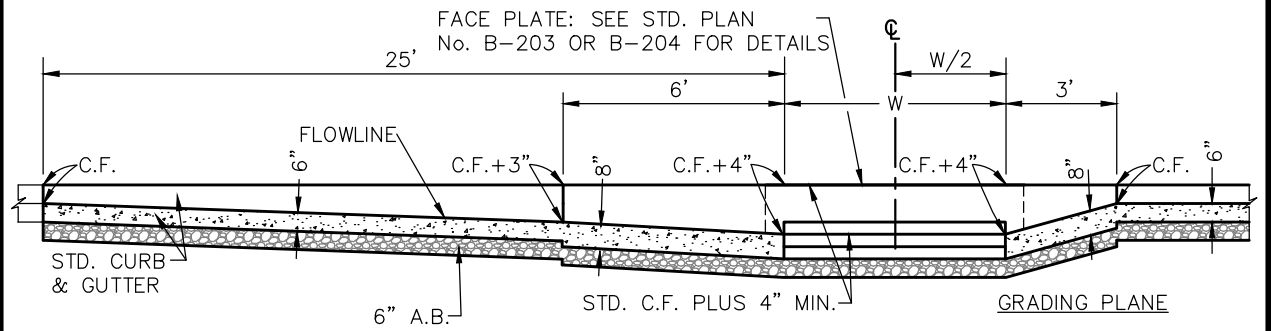
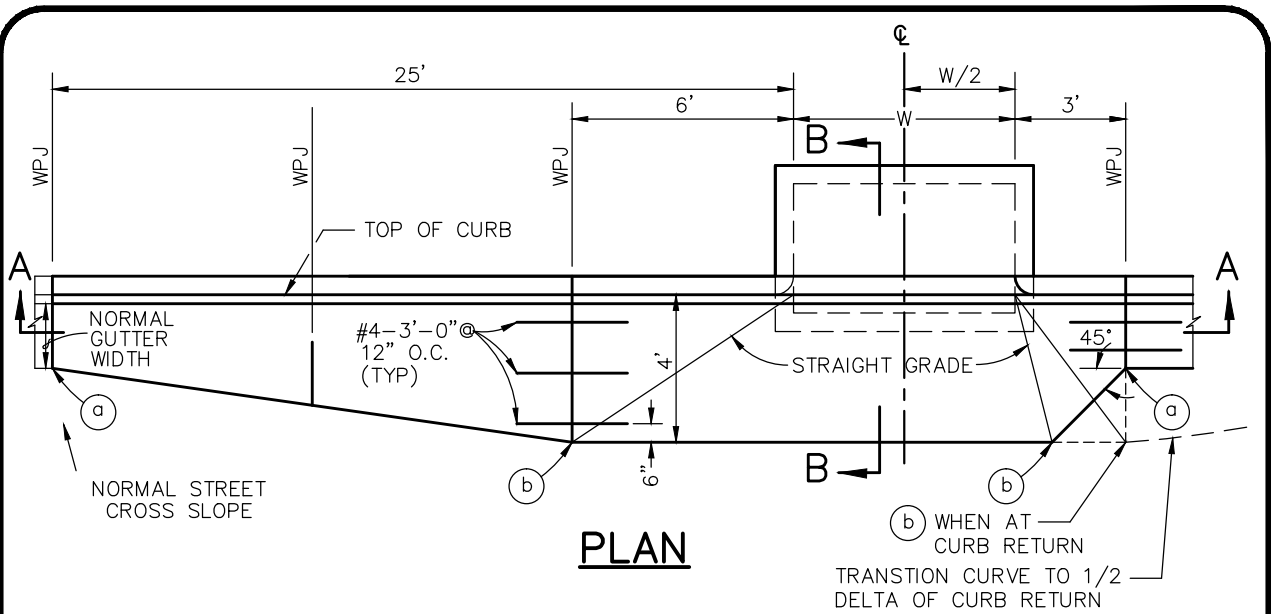
**LOCAL DEPRESSION
(SUMP CONDITION)**

Approved  Date 12-8-15
City Engineer R.C.E. 52125 Exp.12-31-16

REVISIONS	BY	DATE

STD. PLAN NUMBER

B-205A




POINT	6" TO 10" CF TRANS DISTANCE BELOW TC	8" TO 12" CF TRANS DISTANCE BELOW TC
a	0.39'	0.51'
b	0.35'	0.48'

NOTES :

1. LOCAL DEPRESSION SHALL NOT BE CONSTRUCTED UNTIL CONNECTING CURB AND GUTTER HAS BEEN COMPLETED OR SHALL BE CONSTRUCTED MONOLITHICALLY WITH CONNECTING CURB AND GUTTER, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. LOCAL DEPRESSION SHALL CONFORM TO SAME SHAPE WHETHER GRATE INLET OR CURB OPENING, OR BOTH, ARE USED.
3. LENGTH OF OPENING "W" SHALL BE SPECIFIED ON PLANS.
4. SEE STANDARD PLANS B-203 OR B-204, FOR CURB OPENING DETAIL.
5. 95% MIN. RELATIVE COMPACTION FOR UPPER 6" OF SUBGRADE.

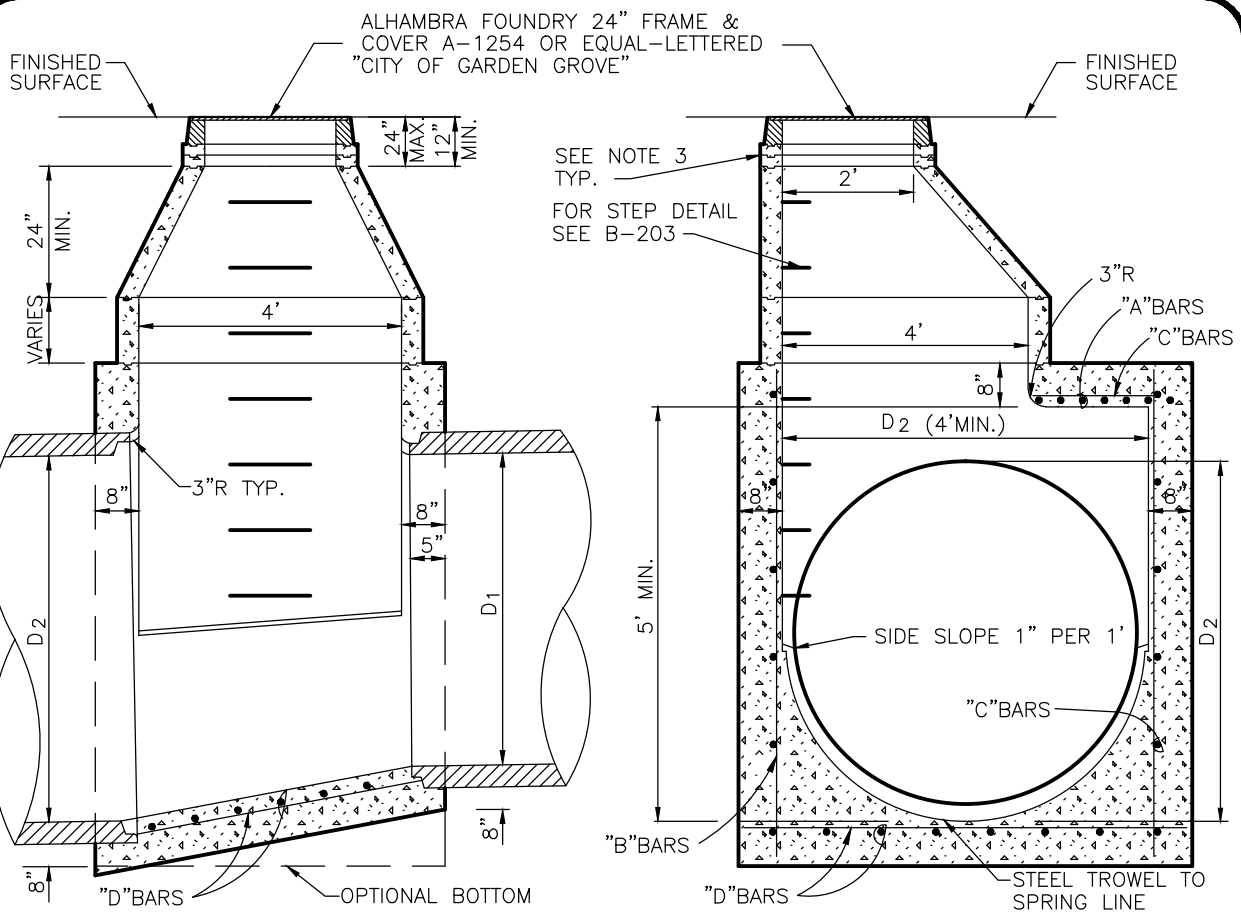


LOCAL DEPRESSION (FLOW BY CONDITION)

Approved:  Date: 12-8-15
 City Engineer R.C.E. 52125 Exp. 12-31-16

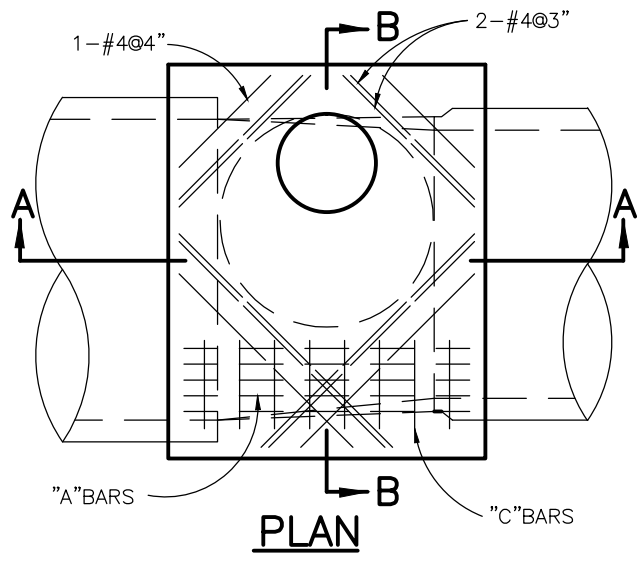
REVISIONS	BY	DATE

STD. PLAN NUMBER
B-205B



SECTION A-A

SECTION B-B



PLAN

REINFORCING SCHEDULE		
BARS	D ₂ UP TO 60"	D ₂ 63" UP TO 84"
"A" BARS	#5@4"	#5@4"
"B" BARS	#4@7"	#5@6"
"C" BARS	#4@18"	#4@18"
"D" BARS	#5@8"	#6@6"

NOTES:

1. ROUND EDGES OF OUTLET TO 3" RADIUS
2. ALL REINFORCING STEEL IN BASE STRUCTURE SHALL BE 1-1/2" CLEAR FROM INSIDE FACE OF CONCRETE.
3. CONCRETE RINGS FOR ACCESS SHAFT SHALL BE CEMENTED IN PLACE WITH 1:2 MIX CEMENT MORTAR.
4. CONCRETE SHALL BE CLASS 560-C-3250.

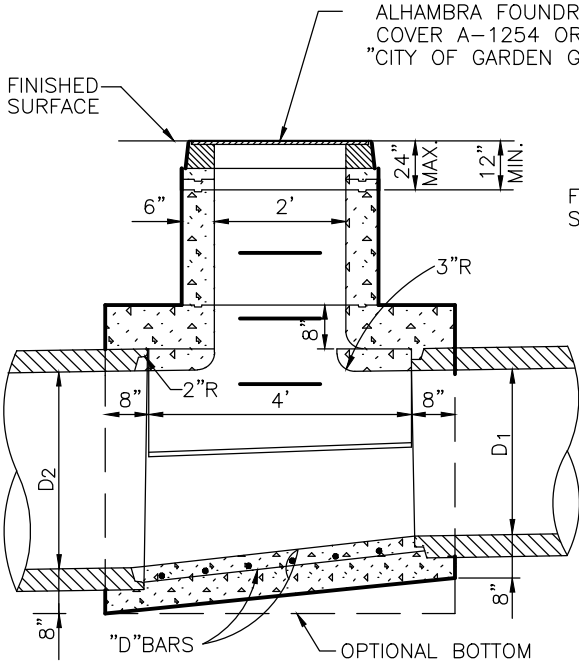


STORM DRAIN MANHOLE

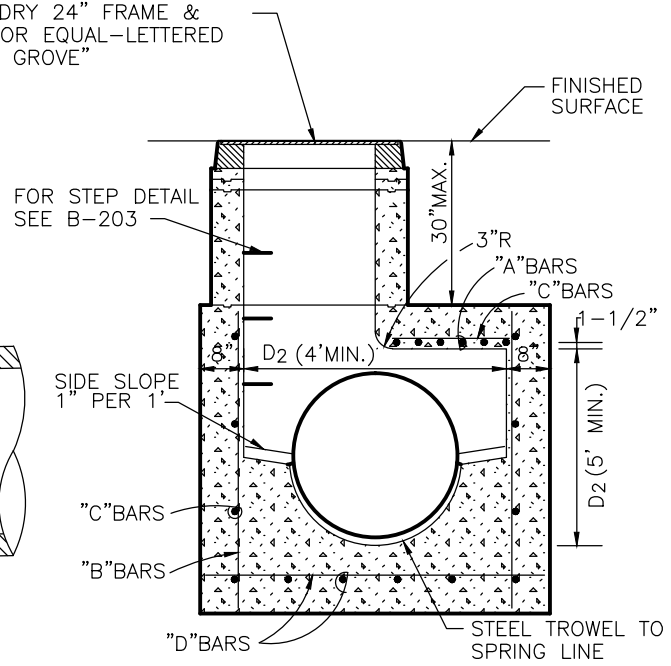
Approved:  Date: 12-8-15
 City Engineer R.C.E. 52125 Exp. 12-31-16

REVISIONS	BY	DATE

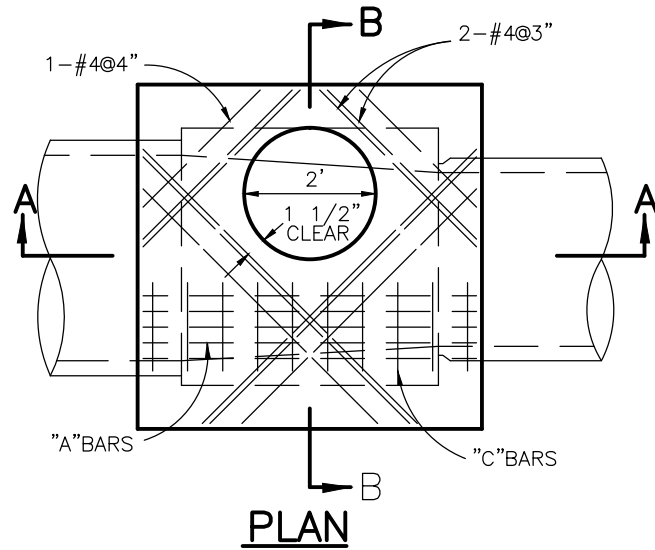
STD. PLAN NUMBER
B-206



SECTION A-A



SECTION B-B



PLAN

REINFORCING SCHEDULE		
BARS	D ₂ UP TO 60"	D ₂ 63" UP TO 84"
"A" BARS	#5@4"	#5@4"
"B" BARS	#4@7"	#5@6"
"C" BARS	#4@18"	#4@18"
"D" BARS	#5@8"	#6@6"

NOTES:

1. ROUND EDGES OF OUTLET TO 3" RADIUS
2. ALL REINFORCING STEEL IN BASE STRUCTURE SHALL BE 1-1/2" CLEAR FROM INSIDE FACE OF CONCRETE.
3. CONCRETE RINGS FOR ACCESS SHAFT SHALL BE CEMENTED IN PLACE WITH 1:2 MIX CEMENT MORTAR.
4. CONCRETE SHALL BE CLASS 560-C-3250.

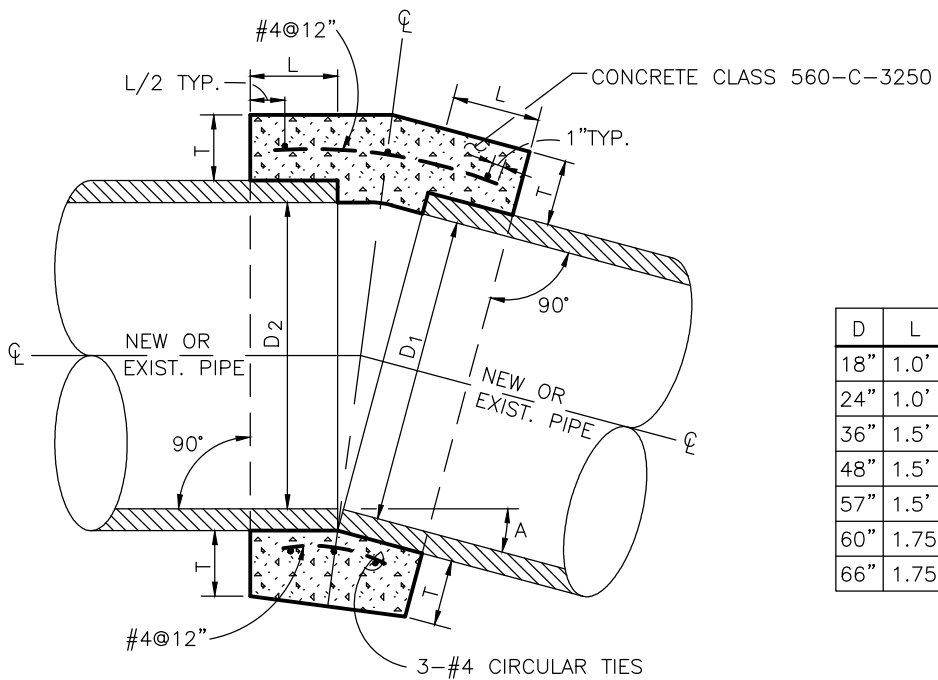


**STORM DRAIN MANHOLE
(SHALLOW DEPTH)**

Approved: *[Signature]* Date: 12-8-15
 City Engineer R.C.E. 52125 Exp. 12-31-16

REVISIONS	BY	DATE

STD. PLAN NUMBER
B-207



D	L	T
18"	1.0'	6"
24"	1.0'	6"
36"	1.5'	8"
48"	1.5'	10"
57"	1.5'	10"
60"	1.75'	12"
66"	1.75'	12"

SECTION

NOTES:

1. 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.
2. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGER.
3. OMIT REINFORCING ON PIPES 24" AND LESS IN DIAMETER AND ON ALL PIPES WHERE ANGLE A IS LESS THAN 10°.
4. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE $D + (2 \times \text{WALL THICKNESS}) + 6"$.
5. WHEN D_1 IS EQUAL TO OR LESS THAN D_2 , JOIN INVERTS AND WHEN D_1 IS GREATER THAN D_2 , JOIN SOFFITS.
6. PIPE MAY BE CORRUGATED METAL, CONCRETE OR REINFORCED CONCRETE PIPE.



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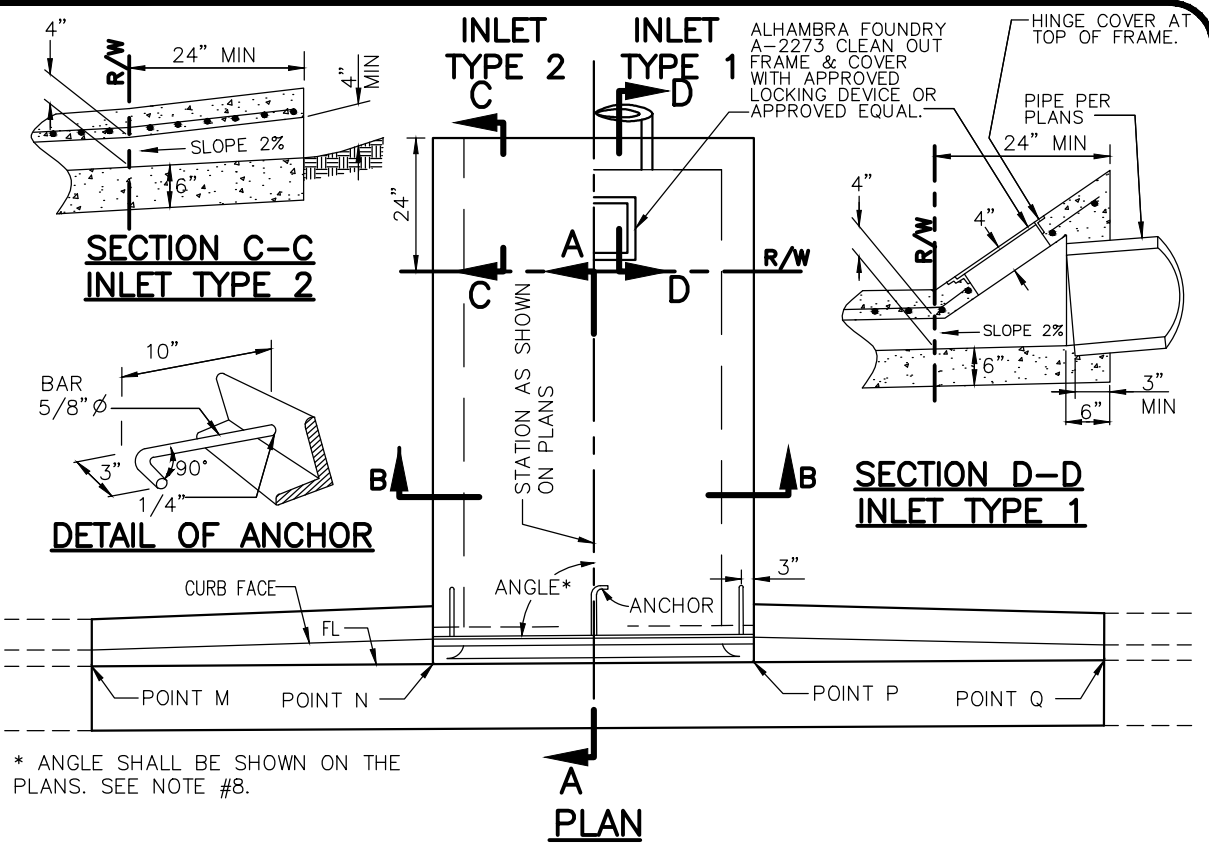
**CONCRETE COLLAR FOR
PIPE 18"–66" DIAMETER**

Approved  Date 12-8-15
City Engineer R.C.E. 52125 Exp.12-31-16

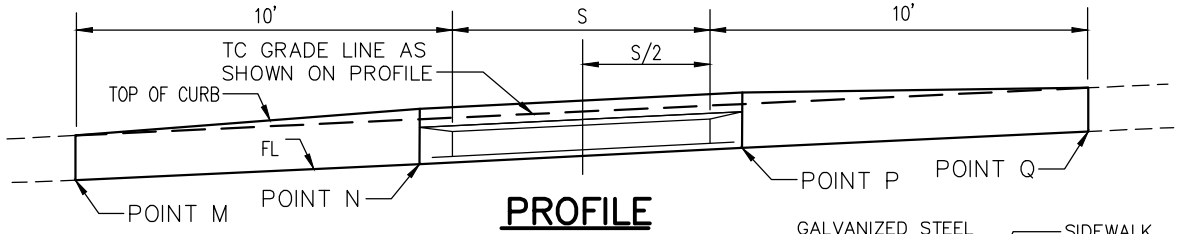
REVISIONS	BY	DATE

STD. PLAN NUMBER

B-208



* ANGLE SHALL BE SHOWN ON THE PLANS. SEE NOTE #8.



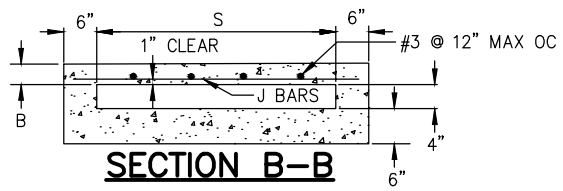
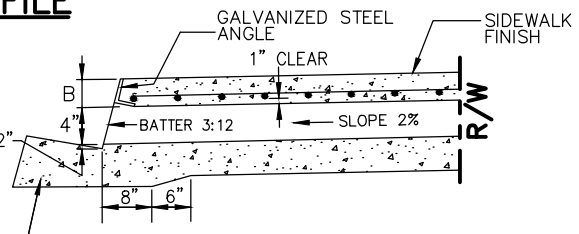
S, INCHES	J BAR SPACING
12"	7"
18"	7"
24"	7"
30"	7"
36"	7"
42"	6"
48"	5"
54"	6-1/2"
60"	5"
66"	4"
72"	3-1/2"

FOR S=30" AND LESS, USE 2 ANCHORS. OTHERWISE, USE 3 ANCHORS.

FOR S=48" AND LESS, B=3" AND 2-1/2"x2"x3/8" GALVANIZED STEEL ANGLE SHALL BE USED.

OTHERWISE, B=4" AND 3-1/2"x3"x1/2" GALVANIZED STEEL ANGLE SHALL BE USED.

J BARS ARE #3.



PARKWAY DRAIN

Approved: *[Signature]* Date: 12-8-15

City Engineer R.C.E. 52125 Exp. 12-31-16

REVISIONS	BY	DATE

STD. PLAN NUMBER

B-209

SHEET 1 OF 2


NOTES:

1. FLOOR OF BOX SHALL BE TROWELED SMOOTH.
2. IF THE TOE OF SLOPE IS ALLOWED WITHIN THE R/W, INLET TYPE 1 BEGINS AT THE TOE RATHER THAN AT THE R/W LINE.
3. FOR OPEN DITCH (TYPE 2), THE 24" EXTENSION BEYOND THE R/W LINE IS NOT REQUIRED WHEN BACK OF WALK IS 24" OR MORE FROM THE R/W LINE; HOWEVER, THE PIPE SHALL EXTEND TO THE R/W LINE IN ANY EVENT.
4. TOP OF INLET STRUCTURE (TYPE 1 & 2) SHALL BE FLUSH WITH ADJACENT SURFACE WHERE PRACTICAL.
5. A HEADED STEED STUD 5/8" x 6-3/8" WITH A 1" HEAD ATTACHED BY A FULL PENETRATION BUTT WELD MAY BE USED AS AN ALTERNATE ANCHOR.
6. NORMAL CURB FACE AT POINT M AND Q. CURB FACE IS B + 5" AT POINTI N AND P.
7. THE 3" LEG OF THE 5/8" DIA ANCHORS SHALL BE PARALLEL TO THE TOP OF SIDEWALK.
8. THE ANGLE OF THE PARKWAY DRAIN SHALL BE 90° WHEN OUTLET VELOCITIES ARE LESS THAN 5 FEET PER SECOND, 60° WHEN OUTLET VELOCITIES ARE LESS THAN 10 FEET PER SECOND, OR 45° WHEN OUTLET VELOCITIES ARE MORE THAN 10 FEET PER SECOND.
9. REINFORCING STEEL SHALL BE 1" CLEAR TO INSIDE OF DRAIN.



City of
Garden Grove
California

PARKWAY DRAIN

Approved  Date 12-8-15
City Engineer R.C.E. 52125 Exp.12-31-16

REVISIONS	BY	DATE

STD. PLAN NUMBER
B-209
SHEET 2 OF 2