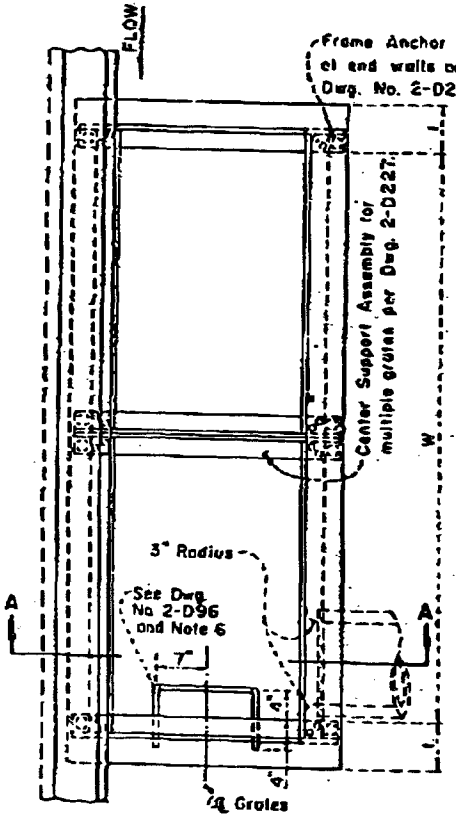
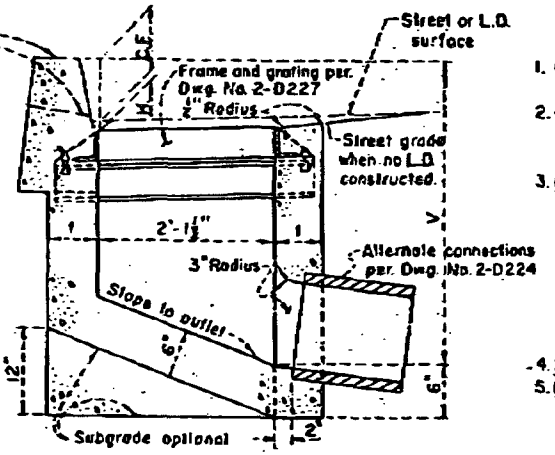
STORM DRAIN STANDARDS

2-1-89

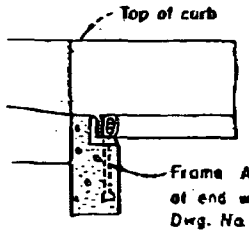
New No.	Title	Old No.	Prev. No.	Orig. No.
SD-01	CB #& Side Opening & Grating	SD-01	CB #3 SS-40	LACFCD 2-D170
SD-02	CB #4 Grating Only	SD-02	CB #4 SS-37	LACFCD 2-D101
SD-03.1	CB #1 Side Opening Only	SD-03	SS-59	LACFCD 2-D160
SD-03.2	CB #2 Side Opening Only	SD-03	SS-59	LACFCD 2-D162
SD-03.3	CB #3 Side Opening Only	SD-03	SS-59	LACFCD 2-D163
SD-03.4	Detail of C.B.Opening - Bent Plate	SD-03.1	SD-04.1	LACFCD 2-D232
SD-03.5	Side Opening C.B. Capacity Table	SD-03.2	OS-05	
SD-04	Std. Loc. Dep. for Grating Basin	SR-05	SS-41	LACFCD 2-D248
SD-04.1	Std. Loc. Dep. for Grating & Side Opening Basin	SR-06	SS-43 Old #5	
SD-04.3	Std. Loc. Dep. for Side opening Basin	SR-09	SS-52 Old #8	LACFCD 2-D88
SD-05.1	Std. St. Dr. M.H. #1	SD-05.1		LACFCD 2-D102
SD-05.2	Std. St. Dr. M.H. #2	SD-05	SS-48	LACFCD 2-D184
SD-06	C.B. Reinforcement	SD-06		LACFCD 2-D172
SD-07	C.B. #5 Alley Basin	SD-07		LACFCD 2-D164
SD-08	Pipe Conn. to Exist. ST. DR.	SD-08		
SD-09.1	Pipe Support Across Trenches	SD-09	SD-09.1	LACFCD 2-D173.1
SD-09.2	Pipe Support Across Trenches	SD-09.2	SD-09.3	LACFCD 2-D173.2
SD-09.3	Pipe Support Across Trenches	SD-09.3	SD-09.4	LACFCD 2-D173.3
SD-10.1	Junction Structure #4	SD-10.1		LACFCD 2-D193
SD-10.2	Junction Structure #2	SD-10.2		LACFCD 2-D112
SD-11	Std. Pressure M.H. Shaft	SD-11		LACFCD 2-D210
SD-12	Depressed Gutter			LACFCD 2-D415
SD-13	Std. Sect. - Reinforced Conc. Culv.	SD-13		
SD-14	Automatic Flap Gate inlet to St.DRAIN	SD-14		LACFCD 2-D192
SD-15	Concrete Collar for Conn. Pipe	SD-15		LACFCD 2-D393
SD-16	CMP Flared Inlet Plan & Section	SD-16		LACFCD 2-D265
SD-17.1	Provisions-Conn. Drain to Channel wall			
SD-17.2	Junct. Str. "A" - Corps of Eng.			
SD-17.3	Junct. Str. "D" - Corps of Eng.			
SD-18.1	Sect. Details Stand. Arch. Sect. "A"			
SD-18.2	Reinfor. Detail Stand. Arch. Sect. "A"			
SD-19	Pipe Bedding in Trenches			LACFCD 2-D177
SD-20.1	St. Drain Data Sheet	OS-08		
SD-20.3	St. Drain Design Sheet	OS-09		



STRUCTURAL PLAN



SECTION A-A

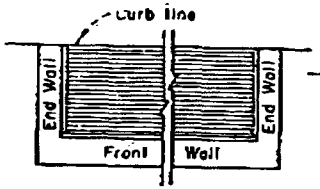


DETAIL OF END WALL

NOTES

1. GRATING: One grating required unless otherwise shown on general plan. Position gratings as required by Std. Dwg. No. 2-D246.
2. CONNECTOR PIPE: Locate at downstream end of basin unless specifically noted otherwise. Pipe shall be trimmed to the final shape and length before the placement of concrete.
3. CONCRETE: Design f'_c = 3000 psi at 28 days. Floor of basin shall slope from all walls to the outlet and shall be given a steel-troweled finish. Street-side walls of the basin shall be poured to the elevation of the L.D. or adjacent street surface. Curb wall of the basin and curb shall be poured monolithically, and the curb surface shall conform in slope, grade, color, and finish to the adjacent curbing.
4. REINFORCEMENT: As required by Std Dwgs. Nos. 2-D171 and 2-D172.
5. DIMENSIONS:
   V = 3'-6", unless otherwise shown.
   W = 2'-11⅛" for one grating; add 3'-5⅜" for each additional grating.
   T = 6 inches if V is 4'-0" or less.
   T = 8 inches if V is 4'-0" to 8'-0"
   T = 10 inches if V is 8'-0" or more.
   H = 0 inches at depressed driveway curb or when no L.D. is constructed. See Std. Dwg. No. 2-D248.
6. STEPS: V to 3'-0" (incl.), place one step 12 inches above the floor of the basin.
   V over 3'-0", place steps at 12-inch intervals from floor of the basin to a minimum of 12 inches below top of the grating.
   Construct steps on front wall when connector pipe is aligned to downstream end wall.

SUPERSEDES DRAWING OF THE SAME NUMBER DATED OCTOBER, 1958



BASIN AND GRATING ALIGNMENT PLAN

REVISIONS			
MARK	DATE	DESCRIPTION	
A.S.H.			
D.W.H.			
G.J.P.			
C.W.H.			

O. J. Rasson
R.C.E. NO. 11480 CITY ENGR.

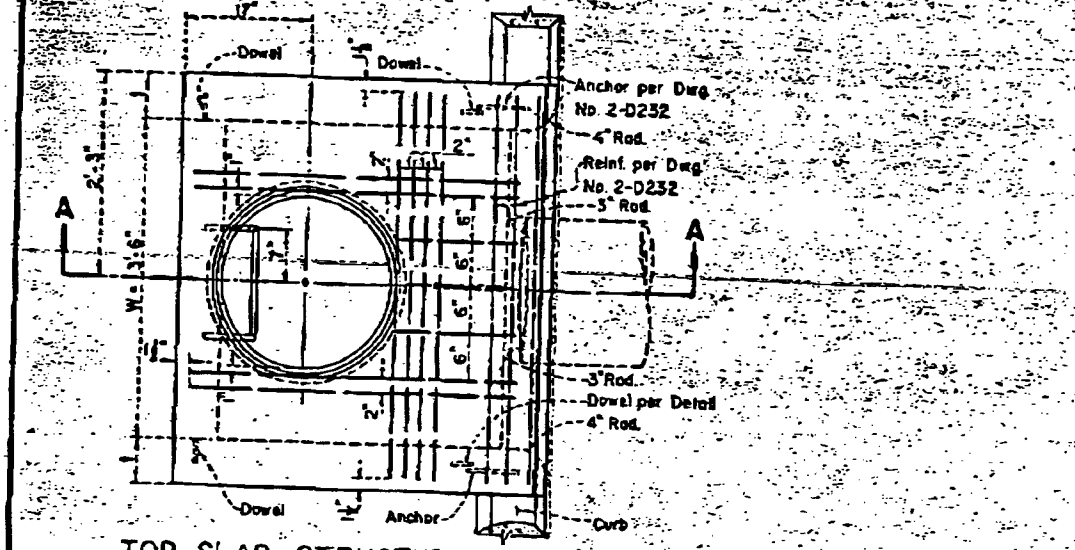
DATE: 9/10/69
SCALE: NONE

CITY OF ALHAMBRA
DEPARTMENT OF PUBLIC WORKS

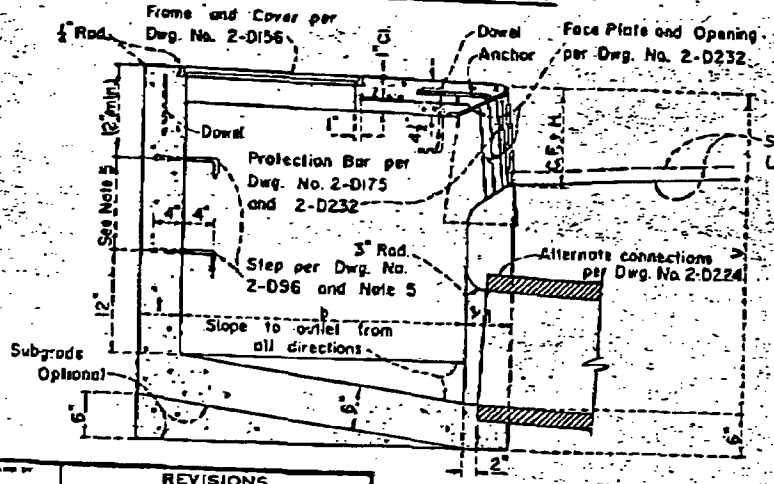
CATCH BASIN NO. 4
PLAN, SECTION AND DETAILS

DRWG. NO. SD-02
SHT. 1 OF 1 SHT.

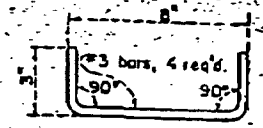
L.A.C.F.C.D. NO. 2-D101



TOP SLAB - STRUCTURAL PLAN



SECTION A-A



DETAIL OF DOWEL

NOTES

1. CONNECTOR PIPE:
   Locate pipe on any alignment around the walls of the basin as shown on the general plan.
   Pipe shall be trimmed to the final shape and length before the placement of concrete.
2. CONCRETE:
   Design; f'_c = 3,000 psi compressive strength at 28 days.
   Floor of the basin shall slope from all walls to the outlet and shall be given a steel-troweled surface finish.
   Curvature of the sill and side walls at the gutter opening shall be formed by curved forms.
   Surface of all exposed concrete shall conform in slope, grade, color, and finish to the existing, or proposed, curb and walk adjacent to the basin.
3. REINFORCEMENT: (Std. Dwg. No. 2-D171)
   Top Slab - No.3 bars required as spaced on the Structural Plan.
   Walls and Floor - As required by Standard Drawing No. 2-D172.
4. DIMENSIONS:
   Curb face at catch basin opening (Exist. C.F.+H) shall be as required by Standard Drawings Nos. 2-D88, 2-D45, or as shown on the general plan.
   V = 3'-6", H = 6 inches, and b = 3'-2" unless otherwise shown.
5. STEPS: (Std. Dwg. No. 2-D96)
   V to 3'-0" (incl.), place one step 12 inches above the floor of the basin.
   V over 3'-0", place steps at 12-inch intervals from the floor of the basin with the top step at 12 inches (minimum) below the top surface of the top slab.

DESIGNED BY	REVISIONS		
S.Y.H.	MARK	DATE	DESCRIPTION
DRAWN BY D.W.H.			
CHECKED BY G.J.P.			
QUANTITIES BY C.W.H.			

SUPERSEDES DRAWING NO. SD-03 DATED 2/17/64

O. H. Ronsse
R.C.E. NO. 11460 CITY ENGR.

DATE: 9/15/69

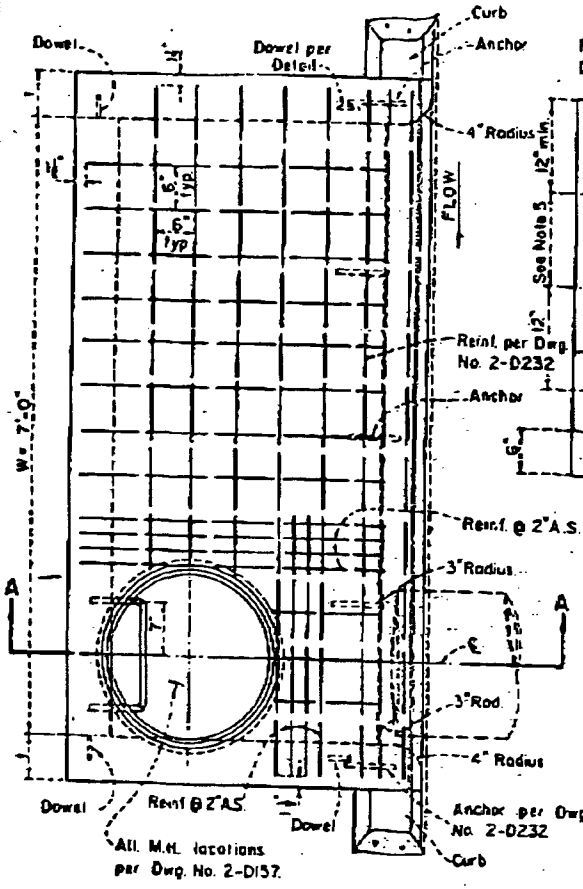
SCALE: NONE

CITY OF ALHAMBRA
DEPARTMENT OF PUBLIC WORKS
CATCH BASIN NO. 1
PLAN, SECTION AND DETAILS

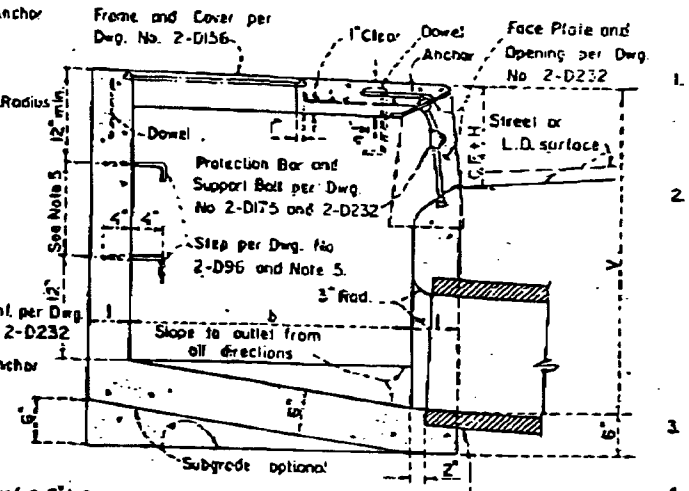
DRWG. NO. SD-03.1

SHT. 1 OF 1 SHT.

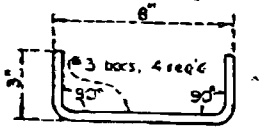
L.A.C.F.C.D. NO. 2-D160



TOP SLAB - STRUCTURAL PLAN



SECTION A-A



DETAIL OF DOWEL

NOTES

1. CONNECTOR PIPE:
Locate pipe at the downstream end of the basin unless specifically noted otherwise on the general plan.
Pipe shall be trimmed to the final shape and length before the placement of concrete.
2. CONCRETE:
Design, f'_c = 3,000 psi compressive strength at 28 days
Floor of the basin shall slope from all walls to the outlet and shall be given a steel-troweled surface finish
Curvature of the sill and side wall at the gutter opening shall be formed by curved forms; and all exposed edges, or corners, and concrete to metal frame edges shall be given $\frac{1}{2}$" radius edger finish.
Surface of all exposed concrete shall conform in grade, slope, color and finish to the existing, or proposed, curb and walk adjacent to the basin.
3. REINFORCEMENT: (Standard Dwg. No. Z-D171)
Top slab - No. 3 bars as required on the Top Slab Structural Plan.
Walls and Floor - As required by Standard Dwg. No. 2-D172.
4. DIMENSIONS:
Curb Face of the catch basin opening (Exist C.F.+H.) shall be as required by Std. Dwg. Nos. 2-D88, 2-D415, or as shown on the general plan.
B = 3'-2", unless otherwise shown.
t = 6 inches if V = 4'-0" or less.
t = 8 inches if V = 4'-1" to 8'-0".
t = 10 inches if V = 8'-1" or more.
V = 4'-0" unless otherwise shown on the general plan.
5. STEPS: (Std. Dwg. No. 2-D96)
V to 3'-0" (incl.), place one step 12 inches above the floor of the basin.
V over 3'-0", place steps at 12-inch intervals from the floor of the basin with the top step at 12 inches (minimum) below the top of the manhole.

Supersedes drawing of the same number dated August 1950.

DRAWN BY	REVISIONS		
SYH	MARK	DATE	DESCRIPTION
ENGINEER IN CHARGE: D.W.H			
DESIGNED BY: G.J.P.			
SUBMITTED: C.W.H.			

SUPERSEDES DRAWING NO. SD-03 DATED 2/17/64

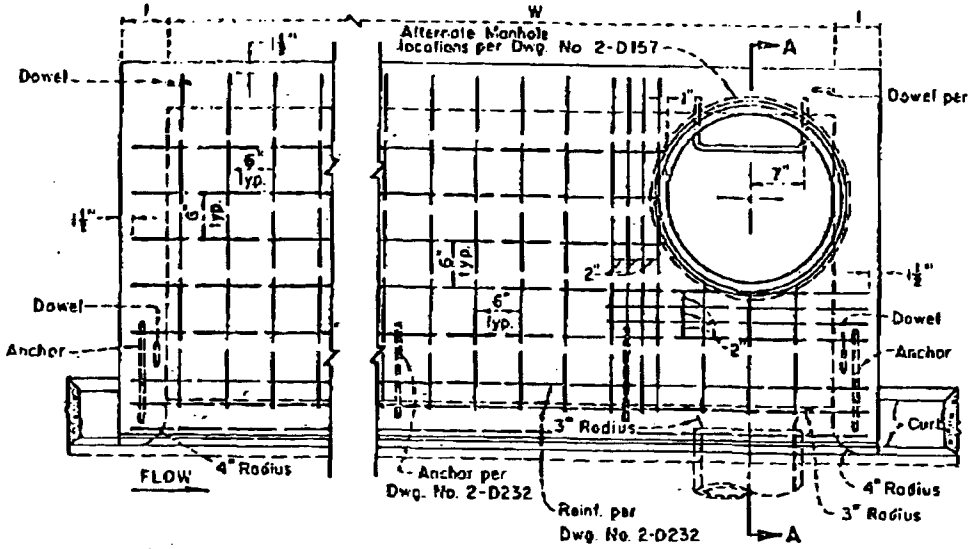
O.H. Rouse
R.C.E. NO. 11460 CITY ENGR.

DATE: 9/15/69
SCALE: NONE

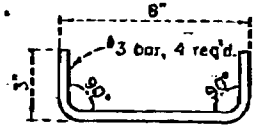
CITY OF ALHAMBRA
DEPARTMENT OF PUBLIC WORKS
CATCH BASIN NO. 2
PLAN, SECTION AND DETAILS

DRWG. NO.
SD-03.2
SHT. 1 OF 1 SHT.

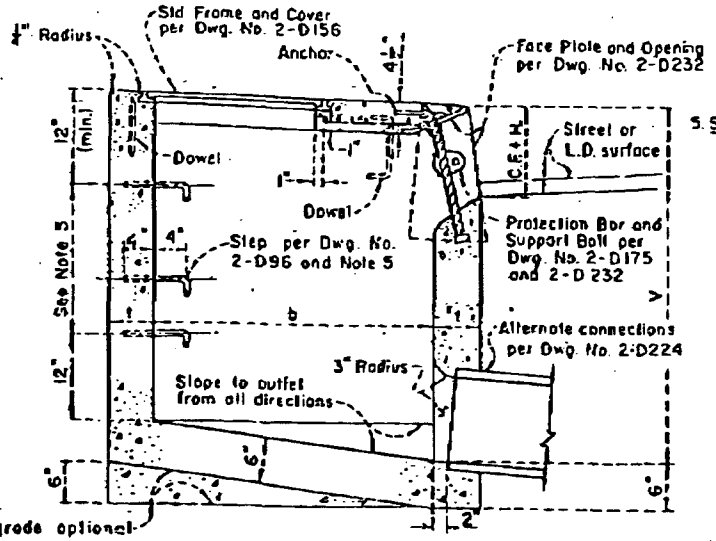
LACFCD NO. 2-D1[illegible]



TOP SLAB – STRUCTURAL PLAN



DETAIL OF DOWEL



SECTION A-A

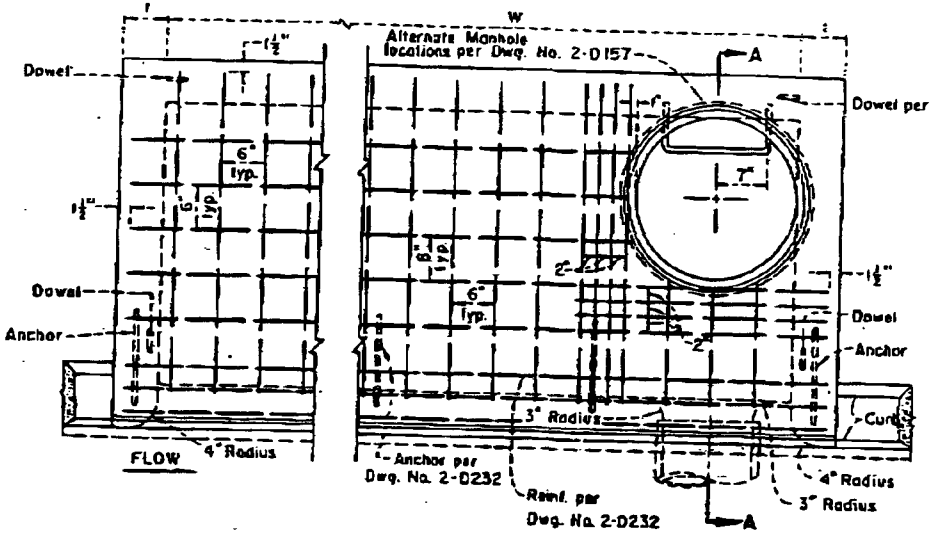
NOTES

1. CONNECTOR PIPE:
   Locate pipe at the downstream end of the basin unless specifically noted otherwise on the general plan.
   Pipe shall be trimmed to the final shape and length before the placement of the concrete.
2. CONCRETE:
   Design, f'_c = 3,000psi compressive strength at 28 days.
   Floor of the basin shall slope from all walls to the outlet and shall be given a steel-troweled surface finish.
   Curvature of the sill and the side walls at the gutter opening shall be formed by curved forms.
   Surface of all exposed concrete shall conform in grade, slope, color, and finish to the existing, or proposed, curb and walk adjacent to the basin.
3. REINFORCEMENT: (Std. Dwg No. 2-D171)
   Top Slab - No. 3 bars spaced as required on the Structural Plan.
   Walls and Floor – As required by Std. Dwg. No. 2-D172.
4. DIMENSIONS:
   Curb face of catch basin opening (Exist C.F.+H.) shall be as required by Std. Dwgs. Nos. 2-D 88, 2-D415 or as shown on the general plan.
   Catch basins for W = 10 feet or more shall have a "V" depth at the upstream end equal to the curb face of the catch basin plus 12 inches.
   W = 14'-0"; and b = 3'-2", unless otherwise shown.
   V = 4'-0", unless otherwise shown.
   t = 6" if V = 4'-1" or less.
   t = 8" if V = 4'-1" to 8'-0".
   t = 10" if V = 8'-1" or more.
5. STEPS: (Std. Dwg. No. 2-D 96)
   V to 3'-0" (incl.), place one step 12 inches above the floor of the basin.
   V over 3'-0", place steps at 12-inch intervals from the floor of the basin with the top step at 12 inches (minimum) below the top surface of the top slab.

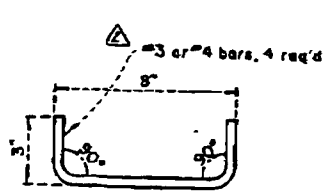
SUPERSEDES DRAWING NO. 30-03 DATED 2/17/64

R.C.E. NO. 11460 CITY ENGR.

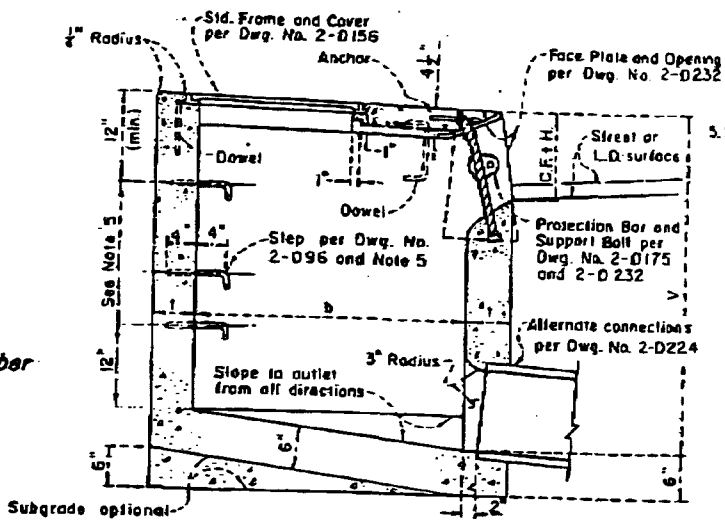
CITY OF ALHAMBRA	DATE: 9/15/69
DEPT. OF PUBLIC WORKS	SCALE: NONE
CATCH BASIN NO. 3 PLAN, SECTION AND DETAILS	DRWG. NO. 30-03.3
	CHK. [illegible] CHT.



TOP SLAB - STRUCTURAL PLAN



DETAIL OF DOWEL



SECTION A-A

NOTES

1. CONNECTOR PIPE:
   Locate pipe at the downstream end of the basin unless specifically noted otherwise on the general plan.
   Pipe shall be trimmed to the final shape and length before the placement of the concrete.
2. CONCRETE:
   Design, f'_c = 3,000psi compressive strength at 28 days.
   Floor of the basin shall slope from all walls to the outlet and shall be given a steel-troweled surface finish.
   Curvature of the sill and the side walls at the gutter opening shall be formed by curved forms.
   Surface of all exposed concrete shall conform in grade, slope, color, and finish to the existing, or proposed, curb and walk adjacent to the basin.
3. REINFORCEMENT: (Std. Dwg. No. 2-0171)
   Δ Top Slab - No. 3 or No. 4 bars spaced as required on the Structural Plan.
   Walls and Floor - As required by Std. Dwg. No. 2-0172.
4. DIMENSIONS:
   Curb face at catch basin opening (Exist. C.F.+H.) shall be as required by Std. Dwgs. Nos. 2-0.88, 2-0415 or as shown on the general plan.
   Catch basins for W=10 feet or more shall have a "V" depth at the upstream end equal to the curb face at the catch basin plus 12 inches, Δ but in no case shall the slope of the floor exceed 3:1
   W= 14'-0", and b=3'-2", unless otherwise shown.
   V = 4'-0", unless otherwise shown.
   l = 6" if V = 4'-0" or less.
   l = 8" if V = 4'-1" to 8'-0".
   l = 10" if V = 8'-1" or more.
5. STEPS: (Std. Dwg. No. 2-096)
   V to 3'-0" (incl.), place one step 12 inches above the floor of the basin.
   V over 3'-0", place steps at 12-inch intervals from the floor of the basin with the top step at 12 inches (minimum) below the top surface of the top slab.

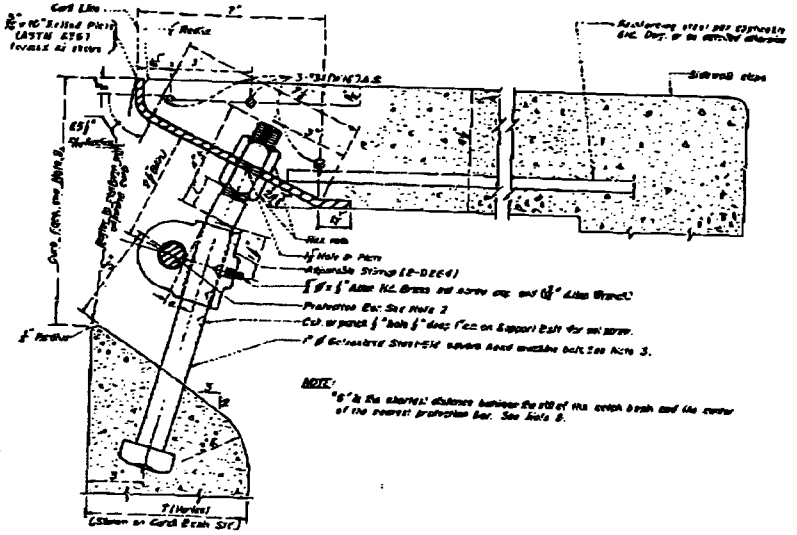
Supersedes drawing of the same number dated Aug. '50

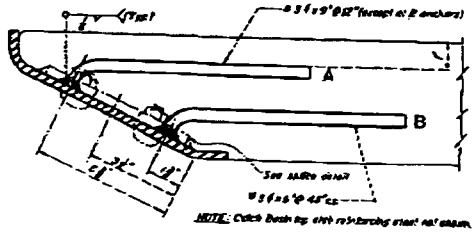
	REVISIONS		
	MARK	DATE	DESCRIPTION
S.H.	Δ	2-1-71	Addition to Note 4
W.H.	Δ	2-1-74	As per alternate
J.P.			
W.M.			

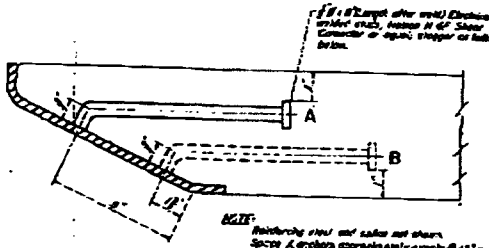
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

CATCH BASIN NO. 3
PLAN, SECTION, AND DETAILS

SCALE	DATE	DWG. NO. 2-0163
NONE	5-15-'68	SHEET 1 OF 1



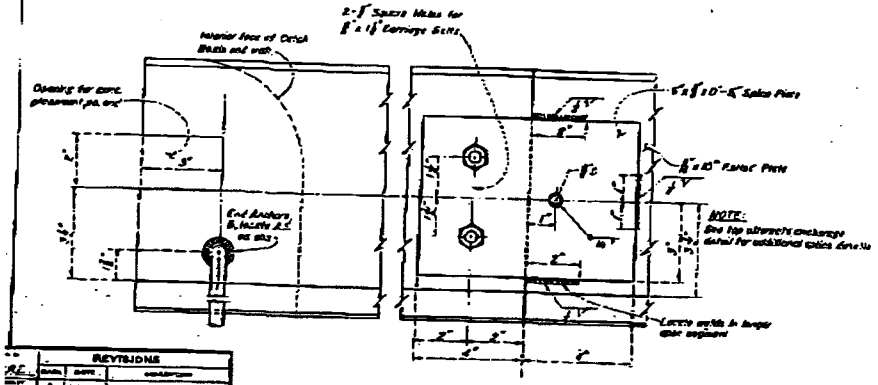




ALTERNATE METHODS FOR FACE PLATE ANCHORAGE

NOTES

1. Support bolt angle "a" shall vary to conform with batter of adjoining curb.
2. Protection bar shall be installed, and support bolts spaced, according to Standard Drawing S-D173.
3. Support bolts shall be equal in length to Curb Face +4"± for all curb batters.
4. All exposed metal parts shall be galvanized after fabrication.
5. Protective Bar Spacing. Protective bar(s) shall be installed when the minimum clear opening of the catch basin exceeds 6". Bar(s) shall be placed such that the maximum clear opening dimension is 6".
   (A) When one bar is required, "S" shall be 6"; however, this shall be reduced, if necessary, so that the center of the protective bar is not less than 2" from the rolled pitch.
   (B) When two or more bars are required "S" shall be 6" with remaining bars spaced @ 6" c.c. The spacing of the top bar shall be reduced, if necessary, so that the center of the bar is not less than 2" from the rolled plate.
6. Where catch basins are to be constructed on curves, the minimum chord length for face plate shall be such that the maximum dimension from said chord (measured perpendicular thereto) to the true curve will not exceed one inch. Where more than one chord is required, chord lengths shall be equal.
7. When height of Face Plate is between 22" and 43" two sections may be used. When length exceeds 43" three sections may be used. Sections shall be spliced according to the Splice Detail. Splices shall be placed one foot from support bolt(see Std. Dwg. No. S-D178).
8. Length of Face Plate is 9'-0" for all curb inlets except the driveway Catch Basin No.8 (See Dwg.No. S-D245.1 as S-.2 for details).
9. Curb Vent shall be as required by Dwgs. Nos. S-D88, S-D248, S-D413, or as shown on the general plan.
10. SPACING OF ALL ANCHORAGE:
    a. Slot and anchor 3" from ends of face plate.
    b. Place one L anchor at each side of any and all splice joints and other 6" Bars at



⚠ FACE PLATE END-8 SPLICE DETAILS ⚠

SUPERSEDES DRAWING NUMBER SD-03.1 DATED 2/17/84

REVISIONS			
	Date	Description	
⚠	4-25-07	Revised Detail	
⚠	7-19-06	Revised Detail	

R.C.E. NO. 11460 CITY ENGR.

CITY OF ALHAMBRA	DATE: 3/8/85
DEPARTMENT OF PUBLIC WORKS	SCALE: NONE
DETAIL OF CATCH BASIN OPENING	DRWG. NO. SD 03.4
	SHT. 1 OF 1 SHT.

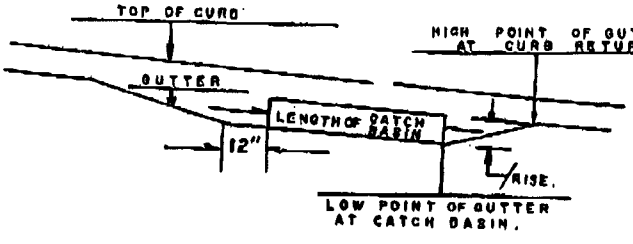
L.A.C.F.C.D. NO. 2-D232

SLOPE OF STREET IN FEET PER FOOT	LENGTH OF CATCH BASIN	CUBIC FEET PER SECOND RISE GIVEN BOTH IN INCHES & IN FEET. 0" 0"	3.5" 0.30'	6" 0.50'	8" 0.67'	2' 1.00'
.005	3.5	0.5	1.8	2.7	3.8	4.9
.005	7.0	1.8	3.4	4.6	5.6	7.5
.005	10.0	3.0	4.7	6.0	7.0	9.0
.005	14.0	4.6	6.4	7.7	8.8	10.9
.005	21.0	7.4	9.4	10.8	11.7	13.9
.005	28.0	10.2	12.1	13.3	14.6	16.8
.01	3.5	0.5	1.7	2.7	3.4	4.8
.01	7.0	2.0	3.6	4.8	5.8	7.6
.01	10.0	3.2	4.9	6.2	7.3	9.3
.01	14.0	3.9	6.8	8.2	9.3	11.5
.01	21.0	7.8	9.8	11.3	12.3	14.5
.01	28.0	10.7	12.7	14.1	15.3	17.5
.02	3.5	0.4	1.5	2.8	4.0	6.4
.02	7.0	1.9	3.0	4.0	6.3	9.5
.02	10.0	3.1	4.4	8.1	7.7	10.9
.02	14.0	4.8	6.2	8.1	9.6	12.8
.02	21.0	7.7	9.4	11.2	12.4	15.1
.02	28.0	10.6	12.6	14.0	15.2	17.4

SLOPE OF STREET IN FEET PER FOOT	LENGTH OF CATCH BASIN	CUBIC FEET PER SECOND RISE GIVEN BOTH IN INCHES & IN FEET. 0" 0"	3.5" 0.30'	6" 0.50'	8" 0.67'	2" 1.00'
0.4	3.5	0.2	1.3	2.3	3.3	5.3
0.4	7.0	1.6	2.5	4.0	5.3	8.0
0.4	10.0	2.7	3.6	5.2	5.2	9.4
.04	14.0	4.1	5.1	6.6	7.9	10.7
.04	21.0	6.6	7.7	9.1	10.1	12.5
.04	28.0	9.1	10.3	11.2	12.3	14.3
.06	3.5	0.0	0.9	1.8	2.7	4.5
.06	7.0	0.8	1.7	3.0	4.3	0.9
.06	10.0	1.6	2.4	3.8	5.3	7.9
.06	14.0	2.6	3.4	4.7	6.8	9.4
.06	21.0	4.4	5.1	6.0	8.2	10.7
.06	29.0	6.2	6.8	7.2	9.6	2.0

NOTE

1. THIS TABLE WAS CONSTRUCTED BY MAKING ARBITRARY ASSUMPTIONS BASED ON EXPERIMENTAL OBSERVATIONS MADE ON A MINIATURE APPARATUS, AND ON A FEW MEASUREMENTS OF CAPACITIES OF ACTUAL EXISTING INLETS IN STREETS.
2. IT IS ADVISABLE TO ALLOW A SMALL OVERFLOW, HEREBY INTERCEPTING A LARGER AMOUNT OF WATER, FOR EXAMPLE: MEASUREMENTS OF FLOW INTO AN INLET 3.5 FEET IN LENGTH ON A FLAT SLOPE SHOWED:
   CAPACITY WITH NO OVERFLOW..2.0 SEC.FT
   CAPACITY WITH 44 SEC. FT.
   FLOWING PAST THE INLET...5.0 SEC. FT
   THE PROPORTIONATE INCREASE IN CAPACITY DECREASES WITH INCREASE IN LENGTH OF INLET, AND WITH INCREASE IN SLOPE OF STREET, BUT UNTIL FURTHER INVESTIGATION IS MADE, NO DEFINITE DATA ON CAPACITY WITH OVERFLOW CAN BE GIVEN.
3. TABULAR VALUES ARE FOR CAPACITIES WITH NO OVERFLOW.



RECOMMENDED FOR APPROVAL

TRAFFIC ENGR. (DATE)

ASSN'T CITY ENGR. (R.C.E. No. 11460) 4-7-64

Rev. No.	Date	By/App.	ITEM
2			
1			

CITY OF ALHAMBRA

ENGINEERING AND STREET DEPARTMENT

(R.C.E. No. 9925) CITY ENGR.

DATE: 4-7-64.

SCALE: NONE.

	BY	DATE	REFERENCES:
DESIGN			F. B. NO.
DRAWN	B.D.K.	4-7-64	DRWG. NO.
CHECKED			

DRWG. NO. SD-032

SHT. OF SHTS.

TABLE OF SIDE OPENING CATCH BASIN CAPACITY