

CITY OF RICHMOND STANDARD PLANS

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION



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CITY OF RICHMOND STANDARD DRAWINGS

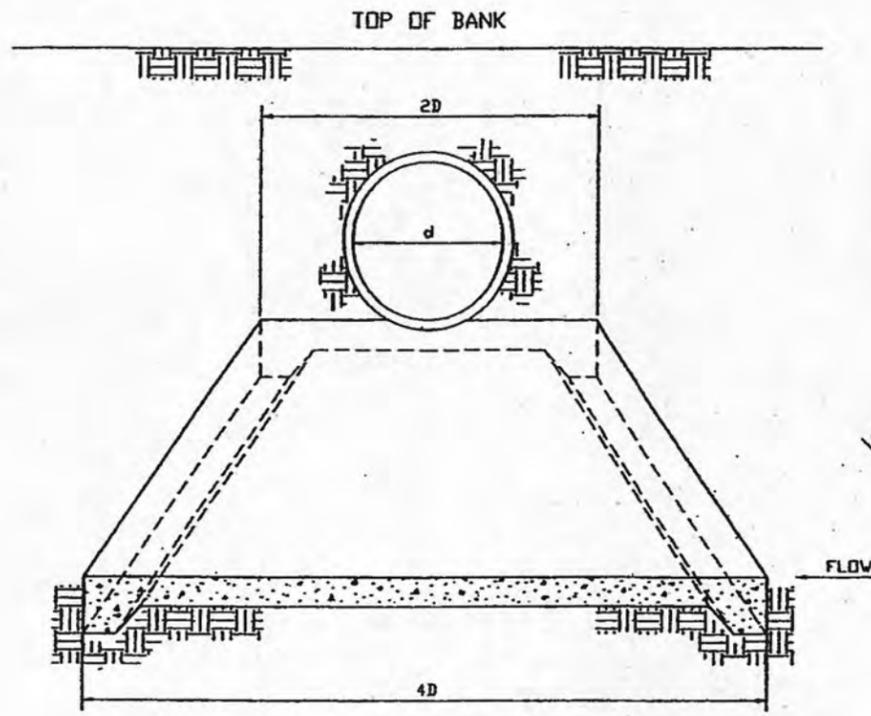
SEQUENCE NO.	SUBJECT	PLAN TITLE	PLAN NUMBER
1	APRON, CONCRETE	STANDARD DETAILS CONCRETE APRON	6-AA-1080
2	BARRICADE & GUARD RAILS	STANDARD PLAN LAMINATED TIMBER GUARD RAIL & BARRICADE	5-AA-1113
3	CATCHBASIN, TYPE 1	STANDARD DETAILS CATCHBASIN, TYPE 1	6-AA-1032
4	CATCHBASIN, TYPE 1	STANDARD DETAILS CATCHBASIN, TYPE 1 FOR TYPE III STREETS	6-B-1038
5	SIDEWALK UNDERDRAIN	STANDARD SIDEWALK UNDERDRAIN	5-AA-1123
6	BUS STOP PAD	STANDARD DETAILS REINFORCED CONCRETE PAD	5-AA-1111
7	CATCHBASIN, TYPE 3	STANDARD DETAILS CATCHBASIN, TYPE 3	6-AA-1034
8	CATCHBASIN, TYPE 3G	STANDARD DETAILS CATCH BASIN TYPE 3G	6-AA-1120
9	CATCHBASIN, FRAME & GRATING DETAILS	STANDARD DETAILS GRATE & FRAME	5-AA-1061
10	CLEANOUT-FRAME & COVER	STANDARD CLEANOUT FRAME & COVER	6-AA-1051
11	CLEANOUT-FRAME & COVER	STANDARD DOUBLE-CLEANOUT FRAME & COVER	6-AA-1090
12	CROSS SECTION, STREET	STREET IMPROVEMENT TYPICAL CROSS SECTION	5-AA-1068
13	CROSS SECTION, STREET CLASS B	CLASS B - TYPE III STREET IMPROVEMENT TYPICAL CROSS SECTION	5-AA-1085
14A	CURB & GUTTER, SIDEWALK AND DRIVEWAY	SIDEWALK, CURB & GUTTER	ST-1A
14B		CURB AND GUTTER DETAILS	ST-1B
14C		CONCRETE DRIVEWAY WITH SIDEWALK WIDTH LESS THAN 9FT	ST-1C
14D		CONCRETE DRIVEWAY WITH SIDEWALK WIDTH GREATER THAN 9FT	ST-1D
14E		NOTES FOR SIDEWALK, CURB & GUTTER AND DRIVEWAY	ST-1E
15	CURB INLET ANGLE	STANDARD DETAILS CURB INLET ANGLE	6-AA-1079
16	DITCH, CONCRETE	STANDARD P.C.C. LINED "V" DITCH	6-AA-1135
17	(NOT USED)		
18	ENERGY DISSIPATOR FOR STORM CULVERT OUTFALL	STANDARD ENERGY DISSIPATOR FOR STORM CULVERT OUTFALL	6-B-1033
19	HEADWALLS, PIPE CULVERT	STANDARD DETAILS PIPE CULVERT HEADWALLS	6-AA-1062
20	JUNCTION BOX	STANDARD JUNCTION BOX "V" DITCH TO PIPE CONNECTION	6-AA-1073
21	LIGHTING SUBDIVISIONS	STANDARD ELECTROLIER DETAILS	4-AA-1007
22	LIGHTING, SUBDIVISIONS	STANDARD STREET LIGHTING DETAILS FOR SUBDIVISION	4-AA-1024

SEQUENCE NO.	SUBJECT	PLAN TITLE	PLAN NUMBER
23	MANHOLE, STORM SEWER	STANDARD STORM SEWER & SMALL DEFLECTION MANHOLES 12" TO 60" DIA. SEWERS	6-AA-1048
24	MANHOLE SHALLOW STORM DRAIN	STANDARD DETAILS SHALLOW STORM DRAIN MANHOLE	6-AA-1048A
25	METAL GUARD RAILING BARRICADE	METAL GUARD RAILING & BARRICADE - SUPPLEMENT TO STD. DWG. #5-AA-1113	5-AA-1148
26	MONUMENT	STANDARD DETAILS CONTROL MONUMENT & CASTING	30-AA-1045
27	MONUMENT PIN	RICHMOND STANDARD CONTROL SURVEY MONUMENT DISC	30-A-1049
28	PARKING LOT DIMENSIONS	STANDARD PARKING DIMENSIONS	30-A-1116
29	PEDESTRIAN PATH & STAIRS	STANDARD DETAILS PEDESTRIAN PATH & STAIRS	5-AA-1110
30	PIPE, CONNECTIONS	STANDARD DETAIL CONNECTION OF SMALL RCP TO LARGE RCP	6-AA-1061
31	PIPE, CRADLE & SADDLE	STANDARD CONCRETE CRADLE & SADDLE	5-AA-1074
32	SPEED CONTROL	SPEED CONTROL UNDULATIONS	8-AA-1121
33	STREET NAME SIGN	STANDARD STREET NAME SIGNS	30-B-1086
34	VALLEY GUTTERS	CONCRETE VALLEY GUTTERS STANDARD DETAILS	5-AA-1065
35	(NOT USED)		
36	COVER & FRAME MANHOLE & LAMPHOLE	STANDARD RISER FRAME & COVER STANDARD MANHOLE FRAME & COVER	10-AA-1017
37	GREASE & SAND TRAP FOR AUTO WASH RACKS	DETAILS OF STANDARD GREASE & SAND TRAP FOR AUTO WASH RACKS	10-AA-1005
38	OIL & SILT SEPARATOR	OIL & SILT SEPARATOR STANDARD DETAILS	10-B-1049
39	STREET DETAILS	STANDARD STREET DETAILS RETURNS, CUL-DE-SAC	5-AA-1071
40	STREET DIMENSIONS	STANDARD STREET DIMENSIONS	5-AA-1598
41	STREET NAME SIGN	STANDARD STREET NAME SIGN-POST & SIGNS	8-A-1145
42	STREET NAME SIGN	STANDARD STREET SIGN LOCATION	8-A-1136
43	TREE PLANTING	STANDARD TREE PLANTING DETAIL	2-AA-1138
44A	CURB RAMPS	CURB RAMP DETAILS	ST-2A
44B		CURB RAMP DETAILS AND NOTES	ST-2B
44C		CURB RAMP AND ISLAND PASSAGEWAY DETAILS	ST-3

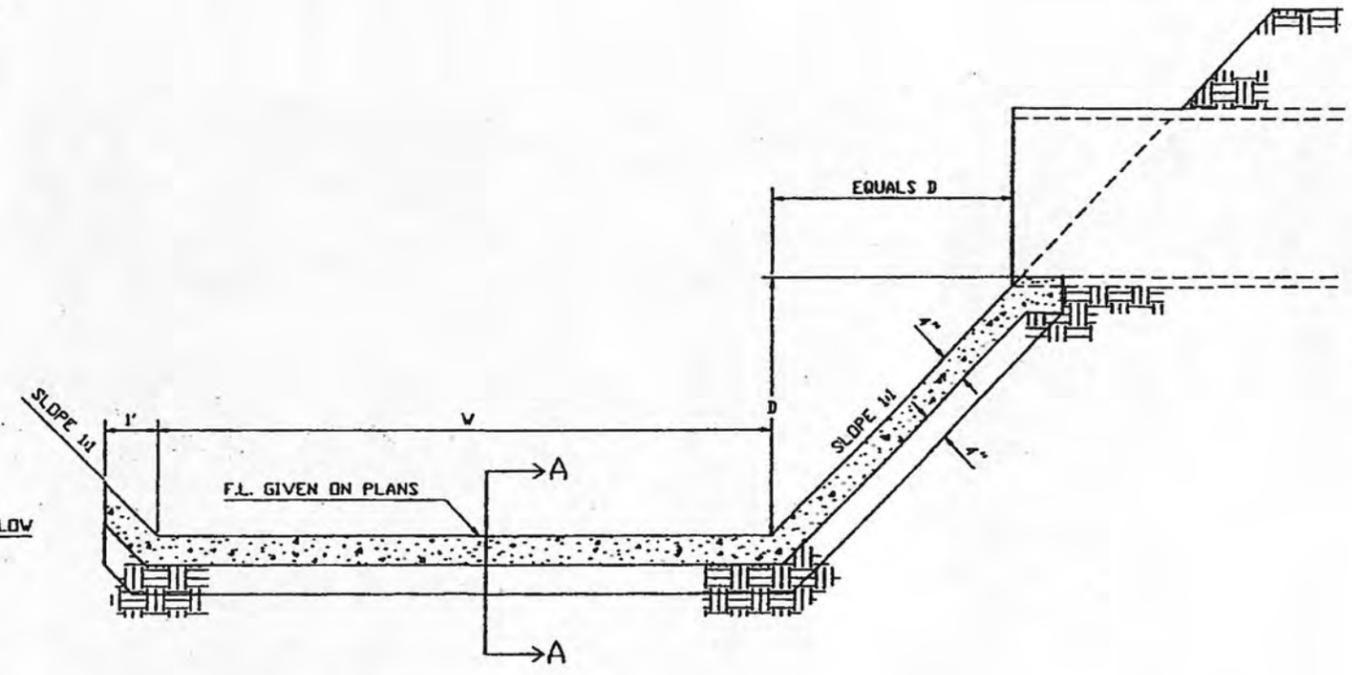
CITY OF RICHMOND STANDARD DRAWINGS

SEQUENCE NO.	SUBJECT	PLAN TITLE	PLAN NUMBER
45	SEWER	STANDARD SEWER SAMPLING STATION	10-AA-1084
46	SANITARY SEWER	STANDARD COVER MANHOLE	10-AA-1942
47	SANITARY SEWER	TYPE II TRUNK MANHOLE	10-AA-1943
48	SANITARY SEWER	STANDARD DROP MANHOLE	10-AA-1944
49	SANITARY SEWER	SPECIAL MANHOLE BASE FOR DEAD END MANHOLES IN CUL-DE-SAC	10-AA-1945
50	SANITARY SEWER	PRIVATE CONTROL MANHOLE	10-AA-1946
51	SANITARY SEWER	MANHOLE FRAME + COVER	10-AA-1947
52	SANITARY SEWER	BOLT-DOWN MANHOLE COVER	10-AA-1948
53	SANITARY SEWER	PRIVATE MANHOLE FRAME & COVER	10-AA-1949
54	SANITARY SEWER	PRIVATE CONTROL MANHOLE FRAME & COVER	10-AA-1950
55	SANITARY SEWER	36" DIAMETER MANHOLE FRAME & COVER	10-AA-1951
56	SANITARY SEWER	RISER	10-AA-1952
57	SANITARY SEWER	RISER FRAME & COVER FOR 6", 8" AND 10" DIA. PIPE	10-AA-1953
58	SANITARY SEWER	BUILDING SEWER DETAILS	10-AA-1954A
59	SANITARY SEWER	BUILDING SEWER DETAILS	10-AA-1954B
60	SANITARY SEWER	BUILDING SEWER AIR TEST DETAIL	10-AA-1955
61	SANITARY SEWER	BUILDING SEWER CLEANOUT TO GRADE	10-AA-1956
62	SANITARY SEWER	SANITARY SEWER STORM SEWER CROSSING	10-AA-1957
63	SANITARY SEWER	SANITARY SEWER WATER MAIN CROSSING	10-AA-1958
64	SANITARY SEWER	SEWER PIPE INSTALLATION COVER, SLOPE, SPECIAL BEDDING AND ENCASEMENT REQUIREMENTS	10-AA-1959A
65	SANITARY SEWER	SEWER PIPE INSTALLATION COVER, SLOPE, SPECIAL BEDDING AND ENCASEMENT REQUIREMENTS	10-AA-1059B

SEQUENCE NO.	SUBJECT	PLAN TITLE	PLAN NUMBER
66	SANITARY SEWER	TWO COMPARTMENT GREASE INTERCEPTOR	10-AA-1960
67	SANITARY SEWER	THREE COMPARTMENT GREASE INTERCEPTOR	10-AA-1961
68	SANITARY SEWER	TWO COMPARTMENT SUMP	10-AA-1962
69	SANITARY SEWER	REPAIR COUPLING FOR VITRIFIED CLAY PIPE 10" DIA. AND LARGER	10-AA-1963



SECTION AA
N.T.S.



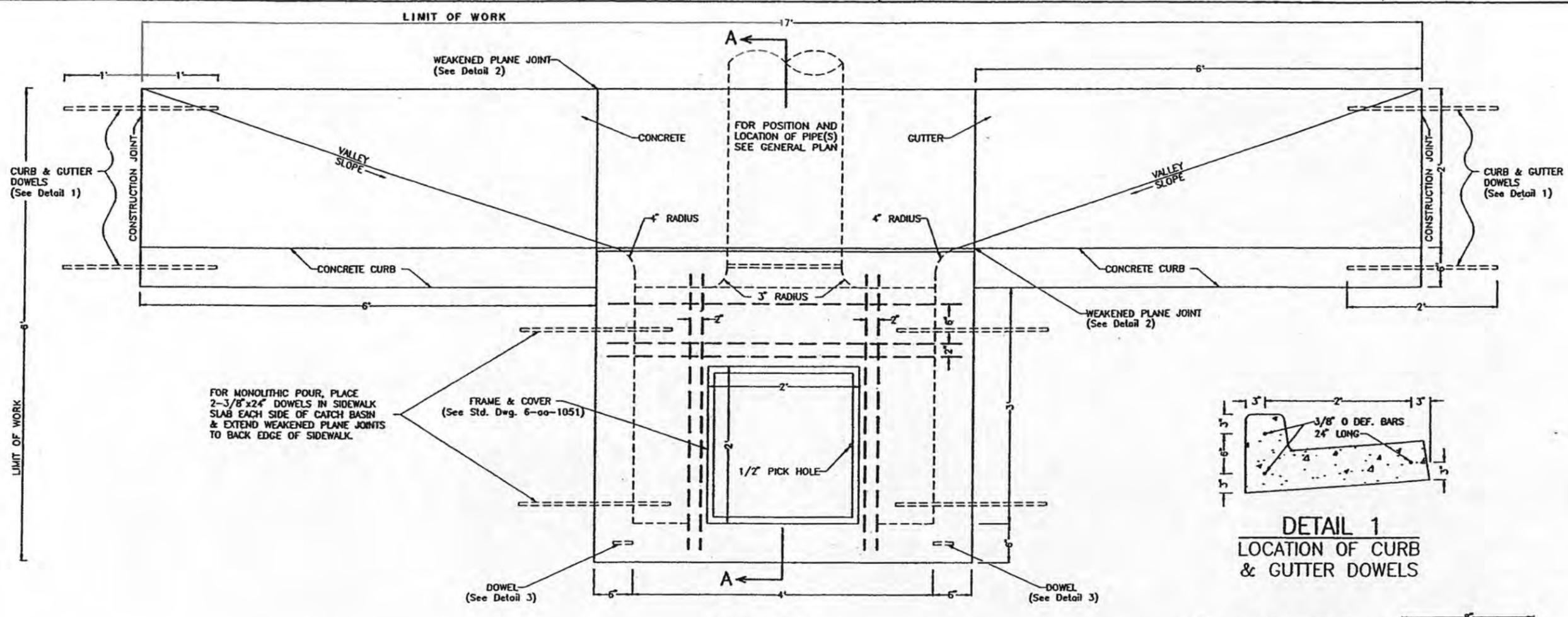
SECTION ACROSS DITCH
N.T.S.

①
FOR CULVERT SPILLWAY
INTO DITCH ABOVE GRADE

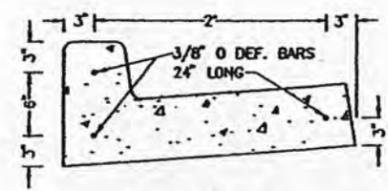
NOTE

D = DIFFERENCE IN ELEV. GIVEN IN PLANS.
W = WIDTH OF CHANNEL GIVEN IN PLANS.
d = INSIDE DIAMETER OF PIPE GIVEN IN PLANS
FILLETS = 45 DEGREES

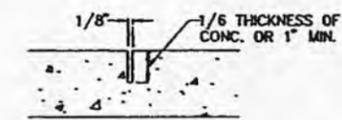
REFERENCES		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STANDARD DETAIL CONCRETE APRON	
No.	DATE	DESCRIPTION	APPR.
REVISIONS			
		DESIGN	SUBMITTED <i>Richard Davidson</i>
		DRAWN G.M.D.	APPROVED <i>[Signature]</i>
		CHECK KMH	DIRECTOR OF PUBLIC WORKS R.C.E.
			DATE 03-13-92 DRAWING NUMBER 6-AA-1060



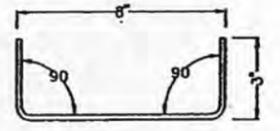
PLAN
SCALE: 3/4" = 1"



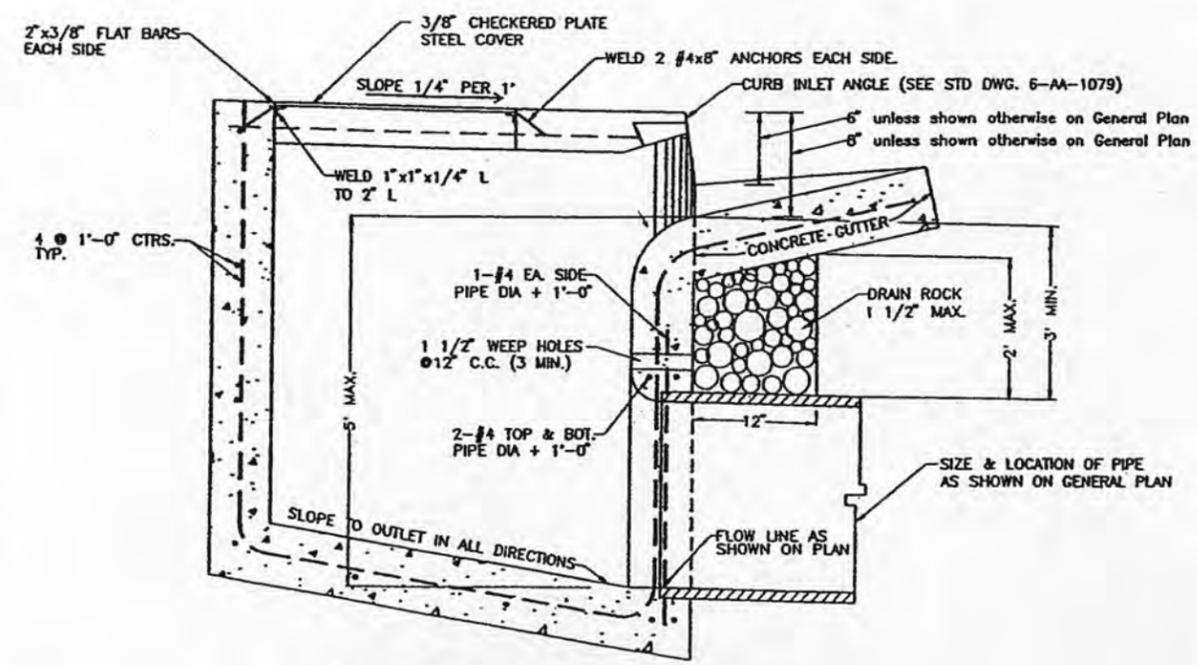
DETAIL 1
LOCATION OF CURB & GUTTER DOWELS



DETAIL 2
WEAKENED PLANE JOINT



DETAIL 3
DOWEL



SECTION A-A
SCALE: 3/4" = 1"

NOTES:

1. POSITION OF PIPE LEAVING CATCH BASIN TO BE INDICATED IN PLANS. CATCH BASIN FLOOR TO SLOPE TO END OF PIPE.
2. WHERE TWO PIPES ENTER CATCH BASIN, THE FLOOR OF THE CATCH BASIN SHALL HAVE A CHANNEL CONNECTING THE PIPES.
3. REINF. STEEL FOR C.B.'S WALLS SHALL BE 1/2" @ 12" C.C. BOTH WAYS.
4. ALL EXPOSED STEEL PARTS TO BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH A.S.T.M. DESIGNATION A-123, AS AMENDED.
5. CONCRETE SHALL BE CLASS A.
6. PRECAST CATCH BASIN MAY BE USED IN LIEU OF CAST-IN-PLACE UNIT UPON APPROVAL OF CITY ENGINEER.
7. MAX DEPTH OF BOX SHALL BE 5'-8" (TOP OF COVER TO FLOW LINE).

REFERENCES:

STANDARD CONC. CURB, GUTTER & SIDEWALK	5-AA-1059
STANDARD CONC. DRIVEWAY & SCORE LINES	5-AA-1067
STANDARD CLEANOUT FRAME & COVER	6-AA-1051
STANDARD CURB INLET ANGLE	6-AA-1079

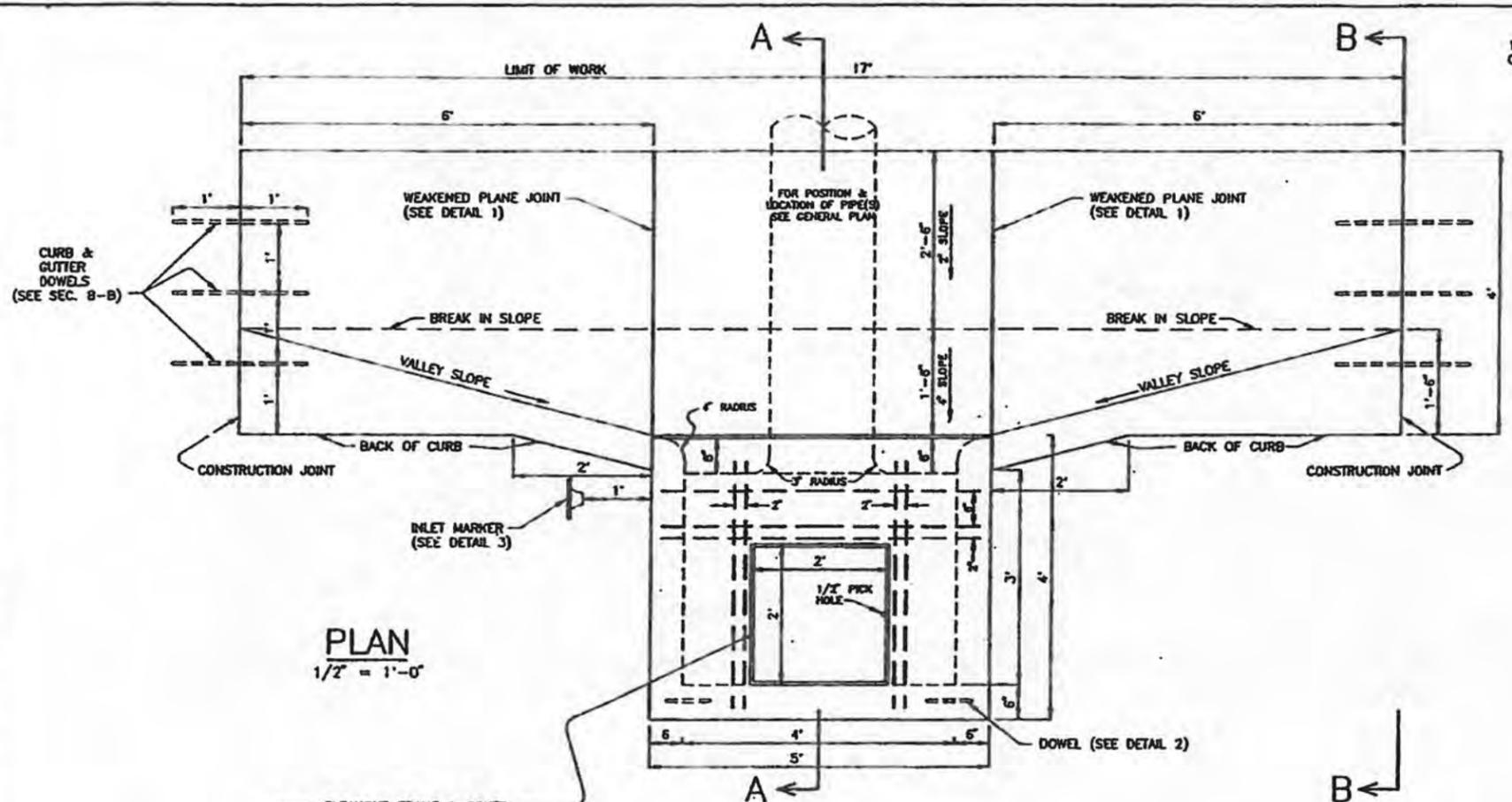
CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

STANDARD DETAILS
CATCH BASIN
TYPE I

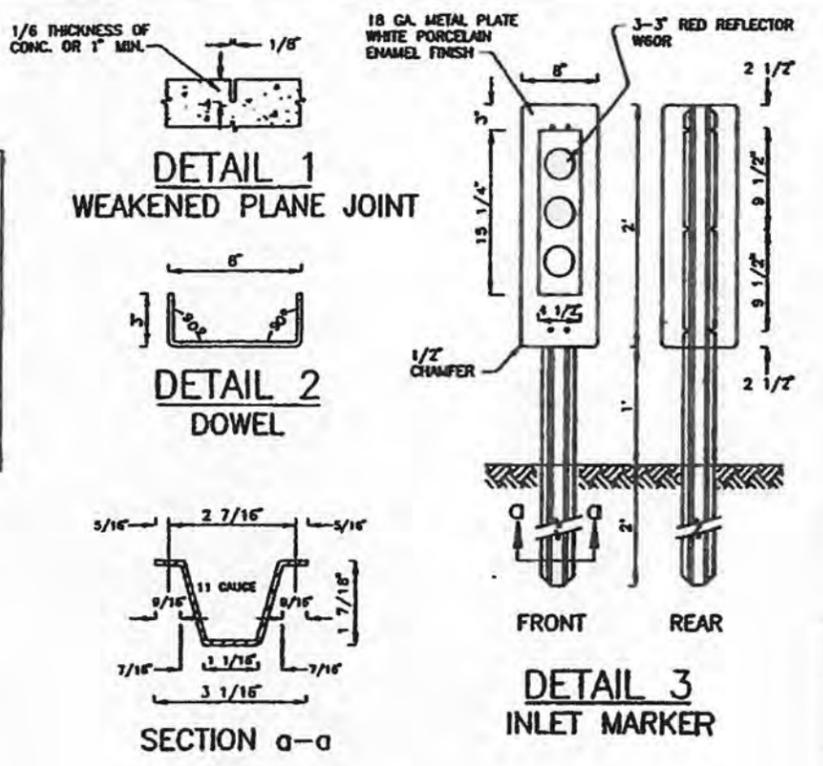
No.	DATE	DESCRIPTION	APPROV.
6	11-15-81	MAX. DEPTH & REINF STEEL	
5	12-28-77	ADD NOTE 7.	
4	4-15-68	REVISED COVER FRAME	
3	3-1-63	ADD NOTE 6.	
2	5-18-60	SIDEWALK DOWELS FOR MONOLITHIC POUR	
1	5-18-60	WEAKENED PLANE JOINT DIMENSIONS	

DESIGN	SUBMITTED	DATE
DRAWN	APPROVED	07-15-92
CHECK	DIRECTOR OF PUBLIC WORKS R.C.E.	DRAWING NUMBER
		6-AA-1032

3

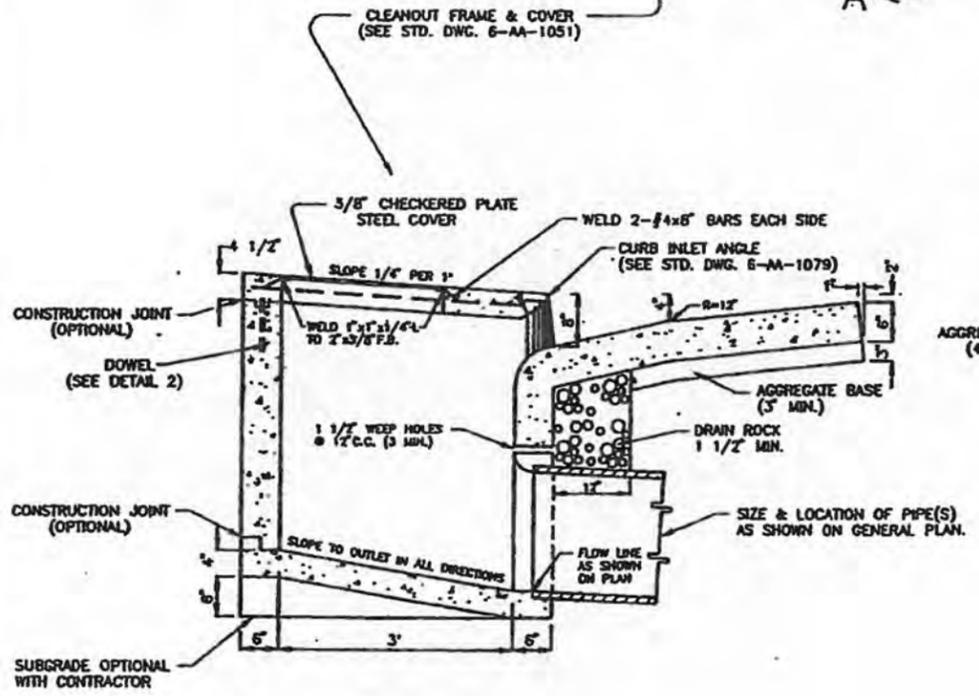


PLAN
1/2" = 1'-0"

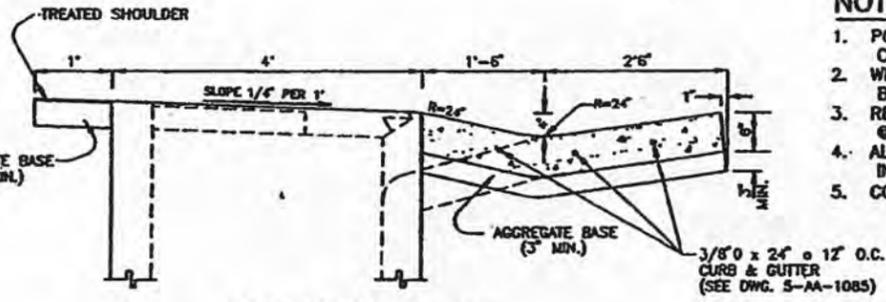


- STEEL LIST**
(DOES NOT INCLUDE REINFORCEMENT FOR C.B.'S OVER 6' IN DEPTH.)
- 4 - 3'-6" x 1/2" O
 - 3 - 4'-10" x 1/2" O
 - 1 - STANDARD CURB INLET ANGLE
 - 2 - DOWELS - C.B. STRUCTURE
 - 6 - 24" x 3/8" O CURB & GUTTER DOWELS
 - 1 - 2' x 2' STANDARD CLEANOUT FRAME & COVER
 - 1 - STANDARD INLET MARKER, COMPLETE

- NOTES:**
1. POSITION OF PIPE LEAVING CATCH BASIN TO BE INDICATED IN PLANS. CATCH BASIN FLOOR TO SLOPE TO END OF PIPE.
 2. WHERE TWO PIPES ENTER CATCH BASIN, THE FLOOR OF THE CATCH BASIN SHALL HAVE A CHANNEL CONNECTING THE PIPES.
 3. REINF. STEEL FOR CATCH BASINS OVER 6" DEEP SHALL BE 1/2" O @ 12" C.C. BOTH WAYS.
 4. ALL EXPOSED STEEL PARTS TO BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH A.S.T.M. DESIGNATION A-123, AS AMENDED.
 5. CONCRETE SHALL BE CLASS A.



SECTION A-A
1/2" = 1'-0"



SECTION B-B
1/2" = 1'-0"

REFERENCES:

STANDARD CLEANOUT FRAME & COVER	6-AA-1051
STANDARD CURB INLET ANGLE	6-AA-1079
TYPE III STREET IMPROVEMENT X-SECTION	5-AA-1085

CITY OF RICHMOND
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DIVISION OF ENGINEERING

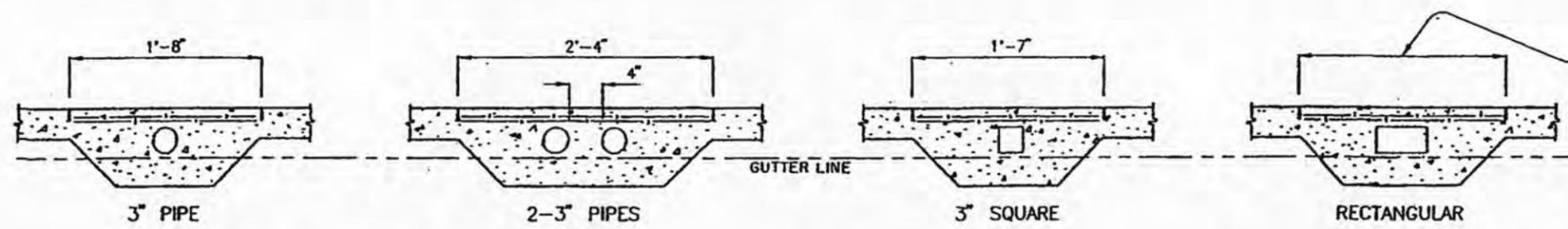
**STANDARD DETAILS
CATCH BASIN TYPE I
FOR TYPE III STREETS**

No.	DATE	DESCRIPTION	APPROV.
3	4-17-88	REVISED CLEANOUT FRAME & COVER	
2	3-1-83	ADD NOTE 5	
1	2-7-82	ANGLE BACK OF CURB	

REVISIONS

DESIGN	SUBMITTED	DATE
DRAWN G.M.D.	Richard Dawkins	04-20-93
CHECK K.M.H.	APPROVED	DRAWING NUMBER
	Director of Public Works	5-AA-1061

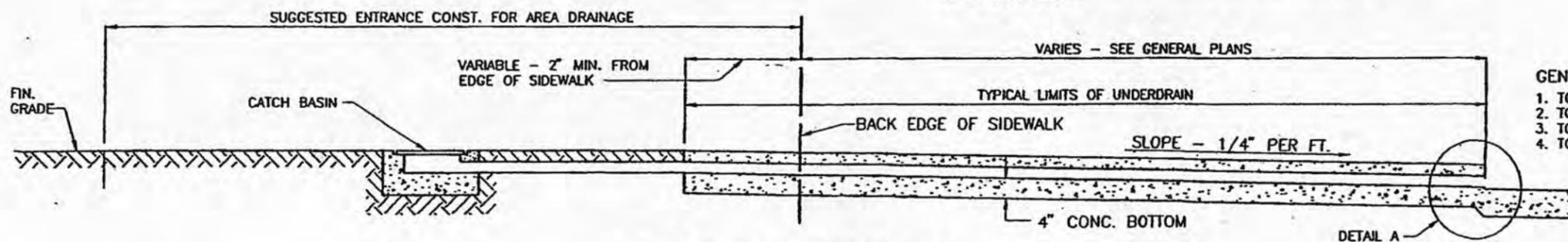
SIZE		3" PIPE	2-3" PIPES	3" SQUARE	3" x 4"	3" x 5"	3" x 6"	3" x 7"	3" x 10"	3" x 12"
□' AREA	PARKING LOT	2000	4000	4000	5000	6500	8000	10000	16200	20000
DRAINED	RESIDENTIAL	5000	10000	6200	10000	10300	16000	20000	32600	40000



- 3" x 4" - 1'-8"
- 3" x 5" - 1'-9"
- 3" x 6" - 1'-10"
- 3" x 7" - 1'-11"
- 3" x 10" - 2'-2"
- 3" x 12" - 2'-4"

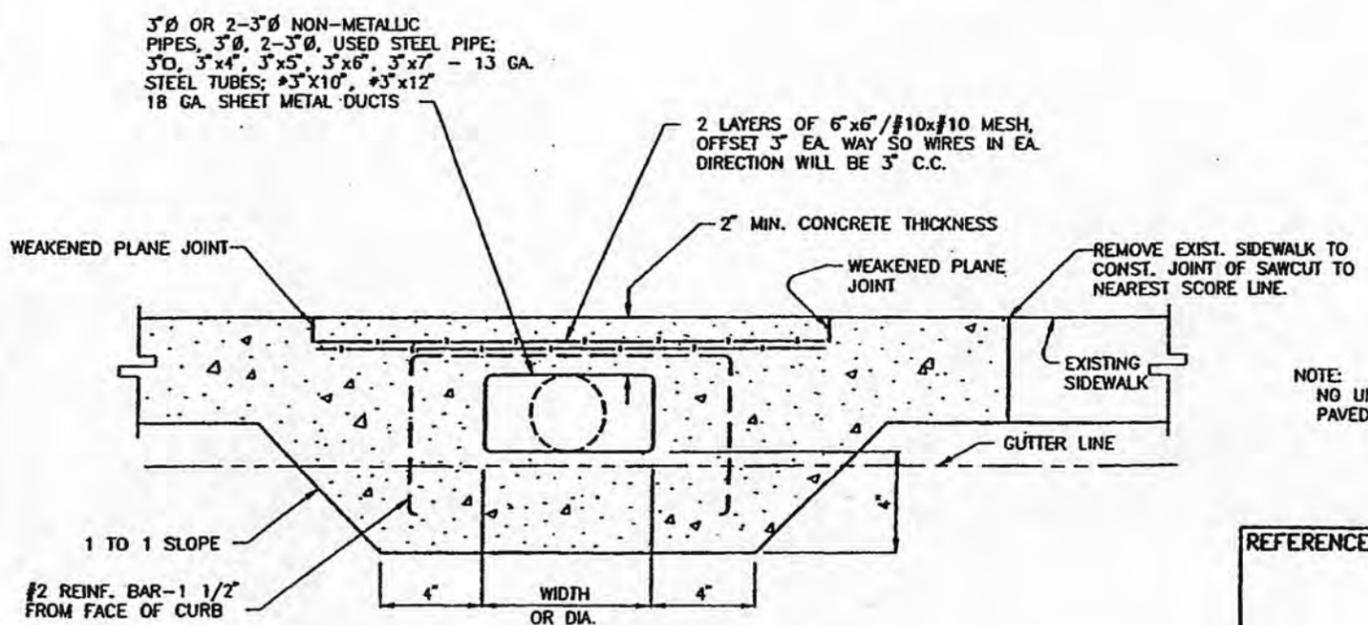
CURB HEIGHTS PERMITTING LARGER PIPES OR DUCTS MAY BE USED. TRANSITE DUCTS IF AVAILABLE MAY BE USED. CITY INSPECTORS APPROVAL REQ'D.

NOTE: FOR STEEP HILLY RESIDENTIAL AREAS DIVIDE RESIDENTIAL AREA BY 2 AND USE THIS AREA AS PARKING LOT AREA TO PICK SIZE OF PIPE OR DUCT.

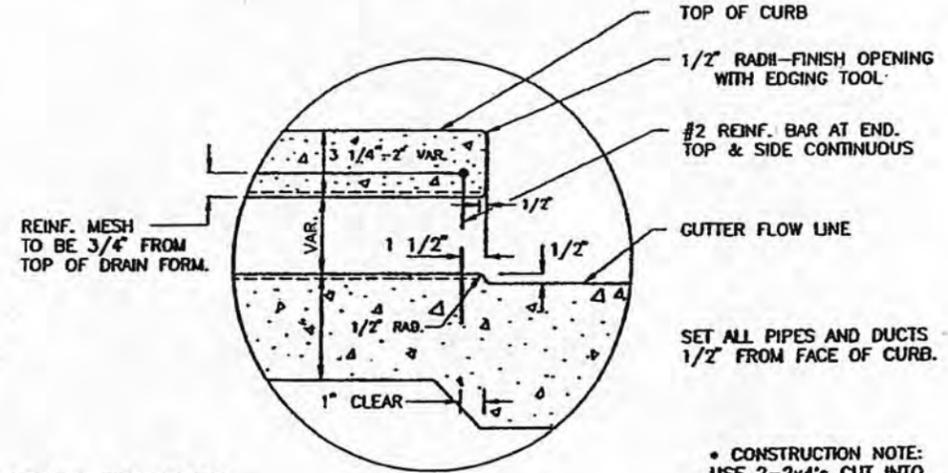


- GENERAL USES
1. TO DRAIN PARKING LOTS.
 2. TO INTERCEPT ROOF DRAINS.
 3. TO CONNECT TO V-DITCH DRAINS.
 4. TO INTERCEPT AREA DRAINS.

TYPICAL SIDEWALK DRAIN
LONGITUDINAL SECTION
N.T.S.



SECTION THRU SIDEWALK DRAIN
N.T.S.



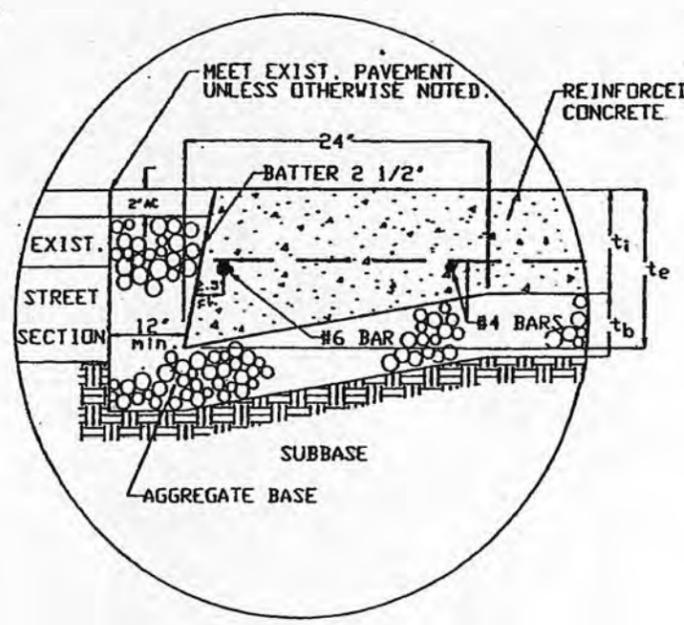
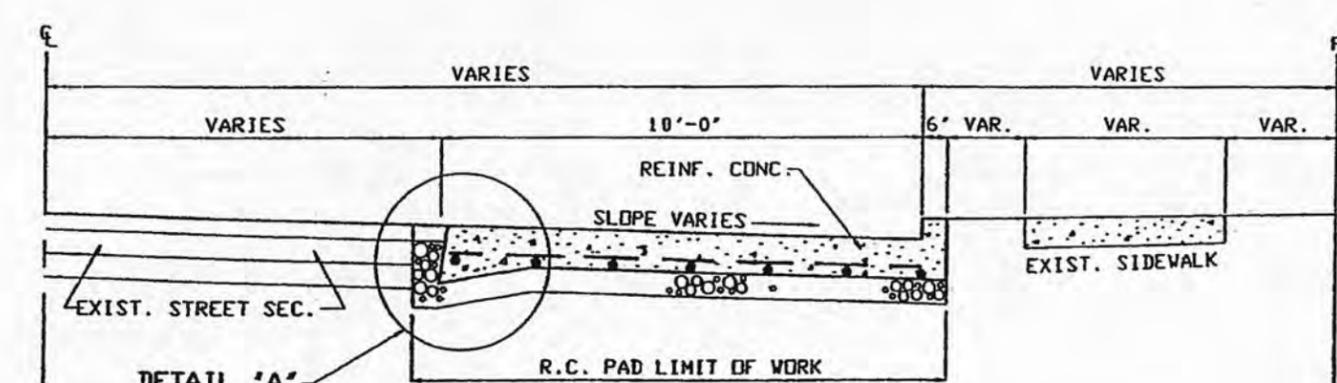
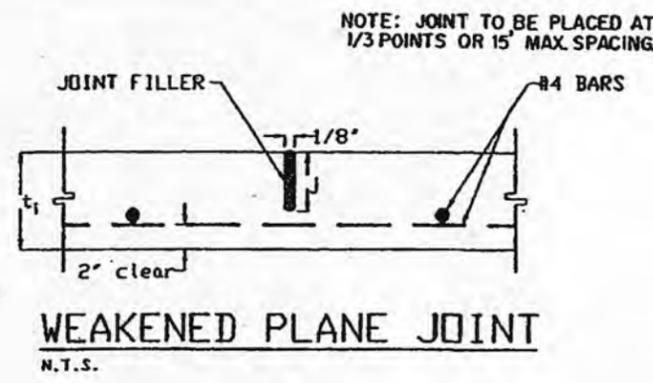
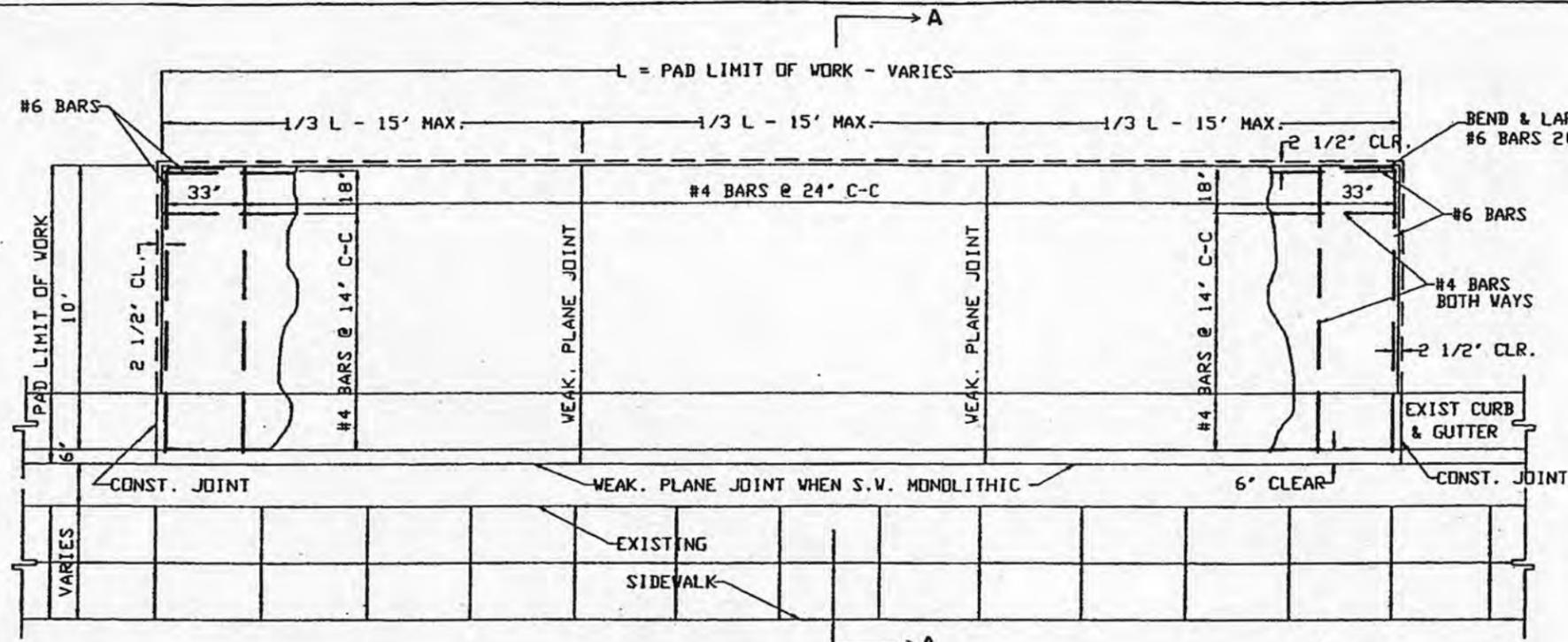
DETAIL A
N.T.S.

NOTE: NO UNDERDRAIN REQUIRED FOR PAVED AREAS UNDER 601 SQ. FT.

CONSTRUCTION NOTE:
USE 2-2x4's CUT INTO LONGITUDINAL WEDGES TO MAINTAIN SHAPE OF 18 GA. DUCTS DURING CONSTRUCTION. USE WEDGES IN PAIRS.

5

REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STANDARD SIDEWALK UNDERDRAIN	
4	3/22/67	DRAWINGS REVISED - SIZE DATA REV.	DATE
3	2/2/65	CHANGED SIZE DATA	04-05-93
2	10/8/63	ADDED ADD'L NOTES OF APPLICATION OF CONST.	DESIGN
1	10/9/62	ADDED OVAL A.C. PIPE & SAW CUTTING DIMTS.	SUBMITTED: <i>Richard Marden</i>
No.	DATE	DESCRIPTION	APPROVED: <i>[Signature]</i>
		REVISIONS	DRAWN: GMD
			CHECK: KMH
			DIRECTOR OF PUBLIC WORKS R.C.E.
			DRAWING NUMBER: 5-AA-1123



- NOTES:
1. THICKEN ALL ENDS AND OUTSIDE EDGES AND REINFORCE WITH A #6 BAR AS SHOWN IN DETAIL 'A'.
 2. SEE 'PLACEMENT DETAILS' DRAWING FOR LENGTH AND OTHER DETAILS FOR EACH PAD TO BE CONSTRUCTED.
 3. SEE JOB SPECIFICATIONS FOR DESCRIPTION OF MATERIALS.
 4. WHERE CURB & SIDEWALK ARE MONOLITHIC, SAW CUT SIDEWALK 6' BACK FROM FACE OF CURB.

SCHEDULE OF PAD DIMENSIONS

LENGTH OF PAD	J	t _i	t _e	t _b = Inches of Aggregate Base for Expansion Pressures of					
				140 psf	151 psf	162 psf	173 psf	185 psf	196 psf
40' & 80'	1 3/4" to 2"	7'	10 1/2'	4'	5'	6'	7'	8'	9'
				135 psf	146 psf	157 psf	168 psf	180 psf	191 psf
30'	1 3/4" to 2"	5'	9 1/2'	4'	5'	6'	7'	8'	9'
				135 psf	146 psf	157 psf	168 psf	180 psf	191 psf

- NOTES:
1. t_b TO BE DETERMINED BY THE ENGINEER.
 2. EXPANSION PRESSURE TO BE MEASURED UNDER NORMAL FIELD CONDITIONS; i.e., 300 psi EXUDATION PRESSURE.

REFERENCES:

No.	DATE	DESCRIPTION	APPR.
4	4-30-68	REVISED NOTE NO. 4	L.K.
3	4-12-68	REVISED TITLE	L.K.
2	6-6-61	ELIMINATE PAVING NOTCH	
1	6-6-61	WEAK PL. JNTS AT 1/3 POINTS-15' MAX.	

REVISIONS

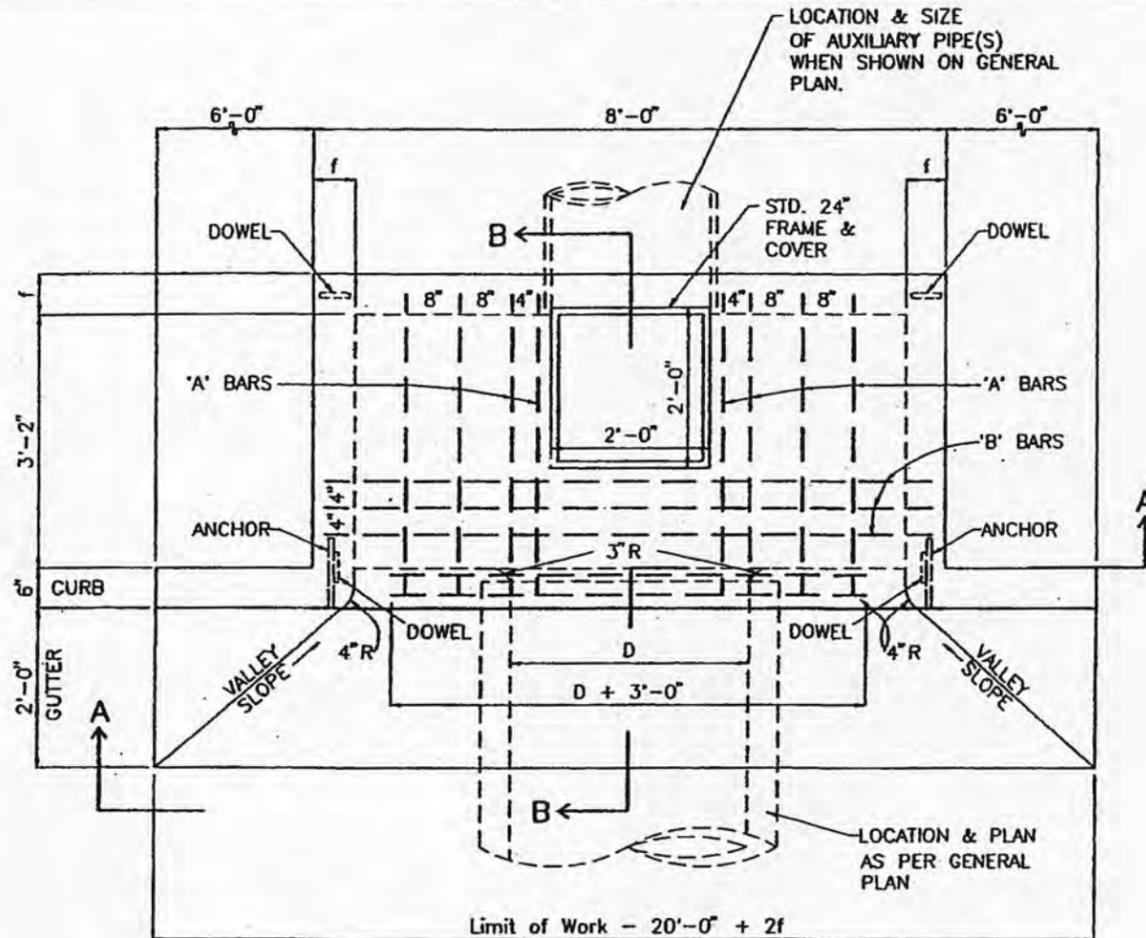
CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

STANDARD DETAILS
REINFORCED CONCRETE PAD

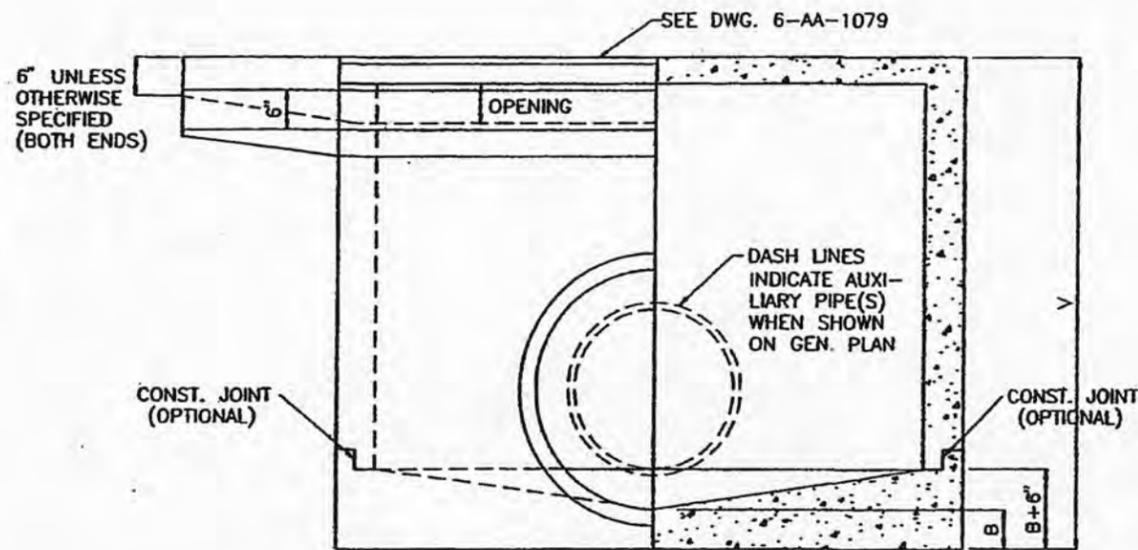
DESIGN: [Signature]
SUBMITTED: Richard Davidson
DATE: 06-18-92

DRAWN: GMD
APPROVED: [Signature]
DIRECTOR OF PUBLIC WORKS REC.

DRAWING NUMBER: 5-AA-1111



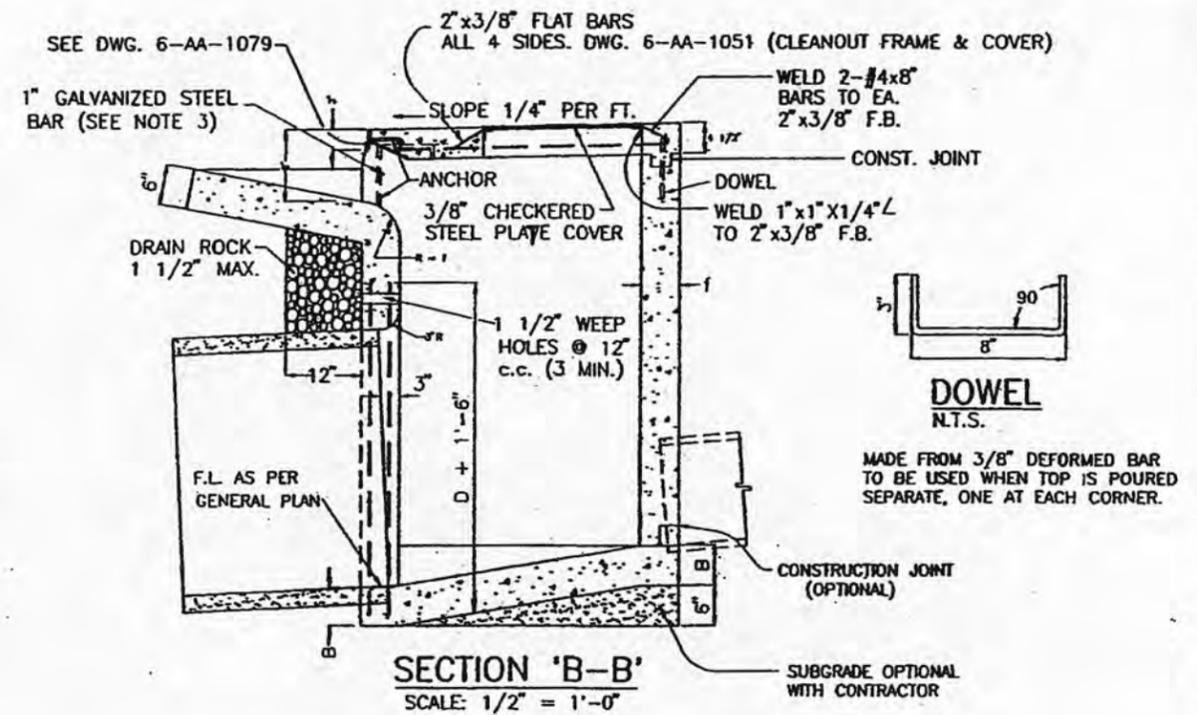
PLAN
SCALE: 1/2" = 1'-0"



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

WHEN V = 4' OR LESS, f = 6"
 V = BETWEEN 4' & 8', f = 8"
 V = MORE THAN 8', f = 10"

B = 6" WHEN OUTLET DIA. IS 24" OR SMALLER.
 B = 8" WHEN OUTLET DIA. IS LARGER THAN 24"



- NOTES:
1. ALL REINFORCING TO BE 1/2" Ø BARS.
 2. FLOOR OF CATCH BASIN SHALL BE SLOPED TO PIPE.
 3. 1" GALVANIZED STEEL BAR TO BE USED ACROSS OPENING FOR PROTECTION WHEN CURB FACE IS 15" OR MORE. BAR SHALL BE EMBEDDED 5" AT EACH END.
 4. ALL EXPOSED STEEL TO BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM DESIGNATION A-123, AS AMENDED.
 5. CONCRETE SHALL BE CLASS 'A'.

- STEEL LIST
- 'A' BARS, 8 - 4"x1/2" Ø
 - 'B' BARS, 3 - 8'-9"x1/2" Ø
 - 2 - D+3'-0"x1/2" Ø
 - 4 - D+1'-6"x1/2" Ø
 - 4 - DOWELS
 - 2 - ANCHORS
 - 1 - STANDARD INLET ANGLE
 - 1 - 2'x2' CLEANOUT FRAME & COVER

- STEEL FOR AUXILIARY PIPE(S)
- *4 - D+1'-6"
 - *2 - D+3'-0" } FOR SINGLE PIPE OR PIPE ARCH.
- *FOR MULTIPLE PIPES
 NO. OF VERTICAL 1/2" Ø BARS = 4 x NO. OF PIPES - 2
 LENGTH OF HORIZ. 1/2" Ø BARS = 5D/2 + 3'-0"
 (BENDS ENDS IF NECESSARY)

REFERENCES:

STD. DETAILS, CONC. CURB, GUTTER, SIDEWALK	5-AA-1059
STD. CONC. DRIVEWAY AND SCORING LINES	5-AA-1067
STD. CLEANOUT FRAME AND COVER	6-AA-1051

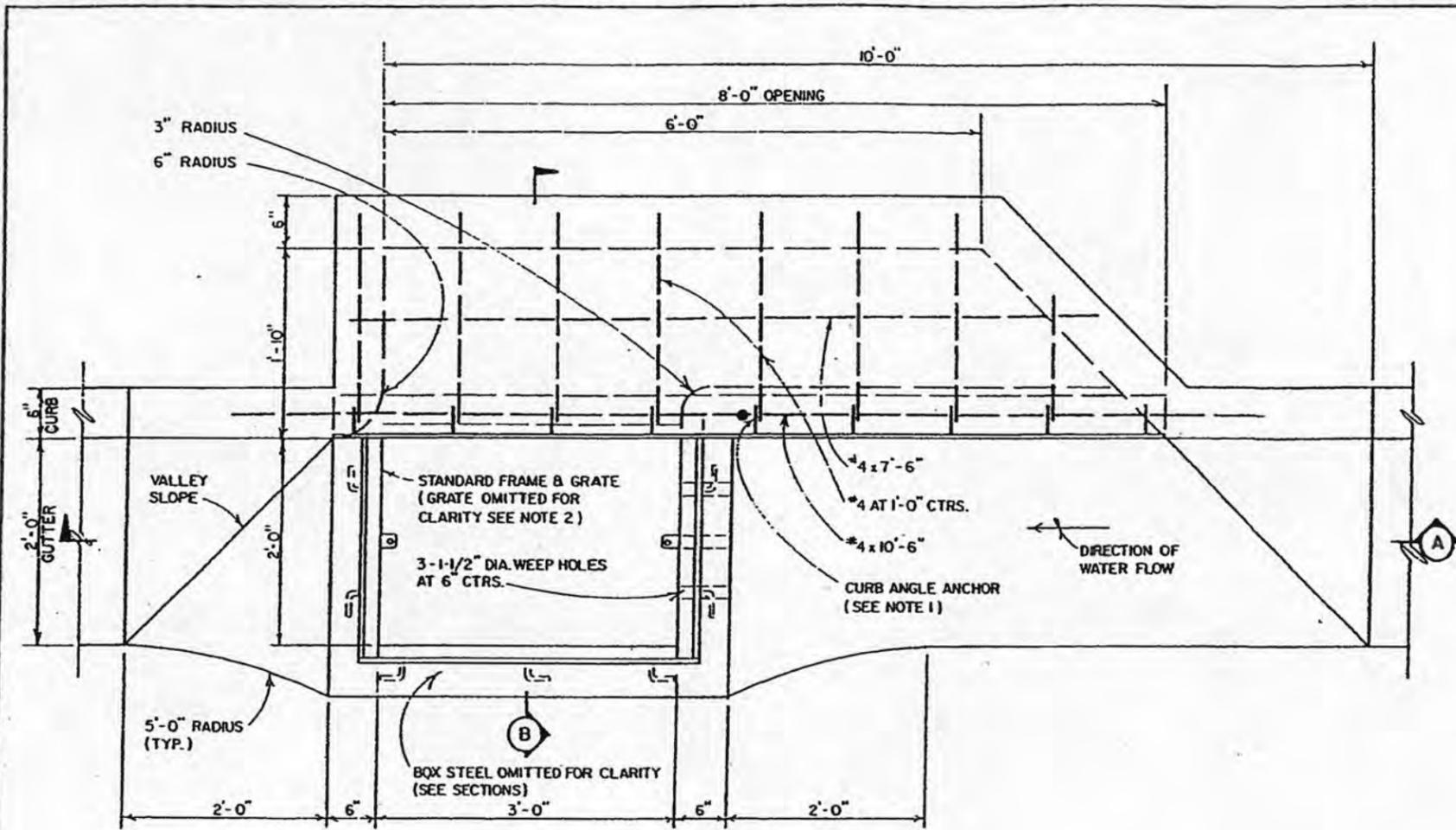
CITY OF RICHMOND
 DEPARTMENT OF PUBLIC WORKS
 DIVISION OF ENGINEERING

**STANDARD DETAILS
 CATCH BASIN
 TYPE 3**

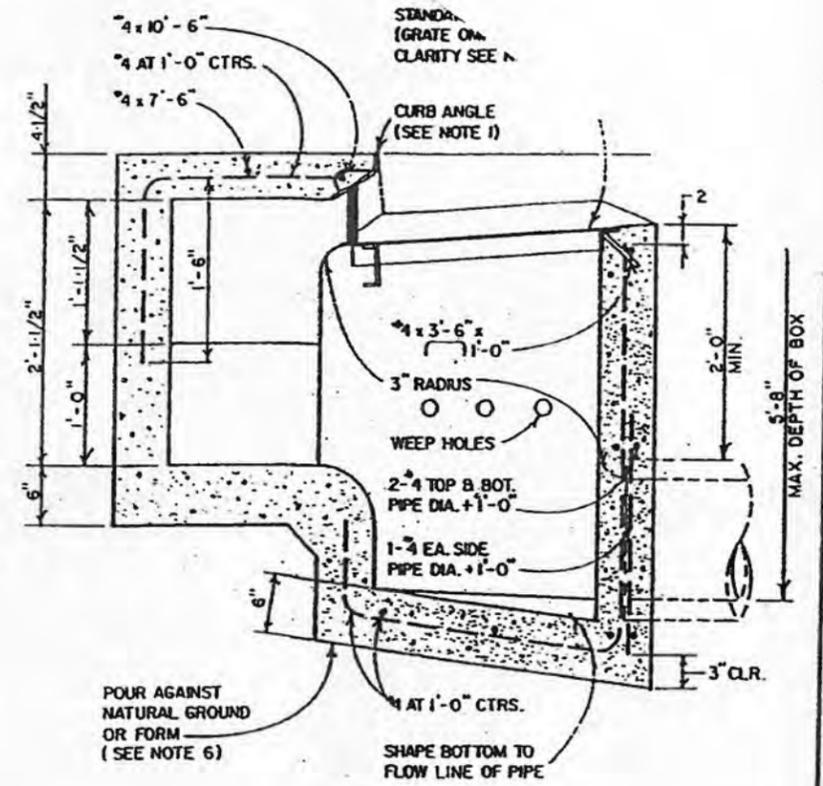
No.	DATE	DESCRIPTION	APPR.
4	4-15-68	REVISED CLEANOUT FRAME & COVER	
3	4-29-63	ADD WEEP HOLES-SECT. B-B	
2	12-10-60	CHANGE LENGTH OF GUTTER	
1	4-6-60	CHANGE TO STD.-CURB INLET ANGLE	

REVISIONS

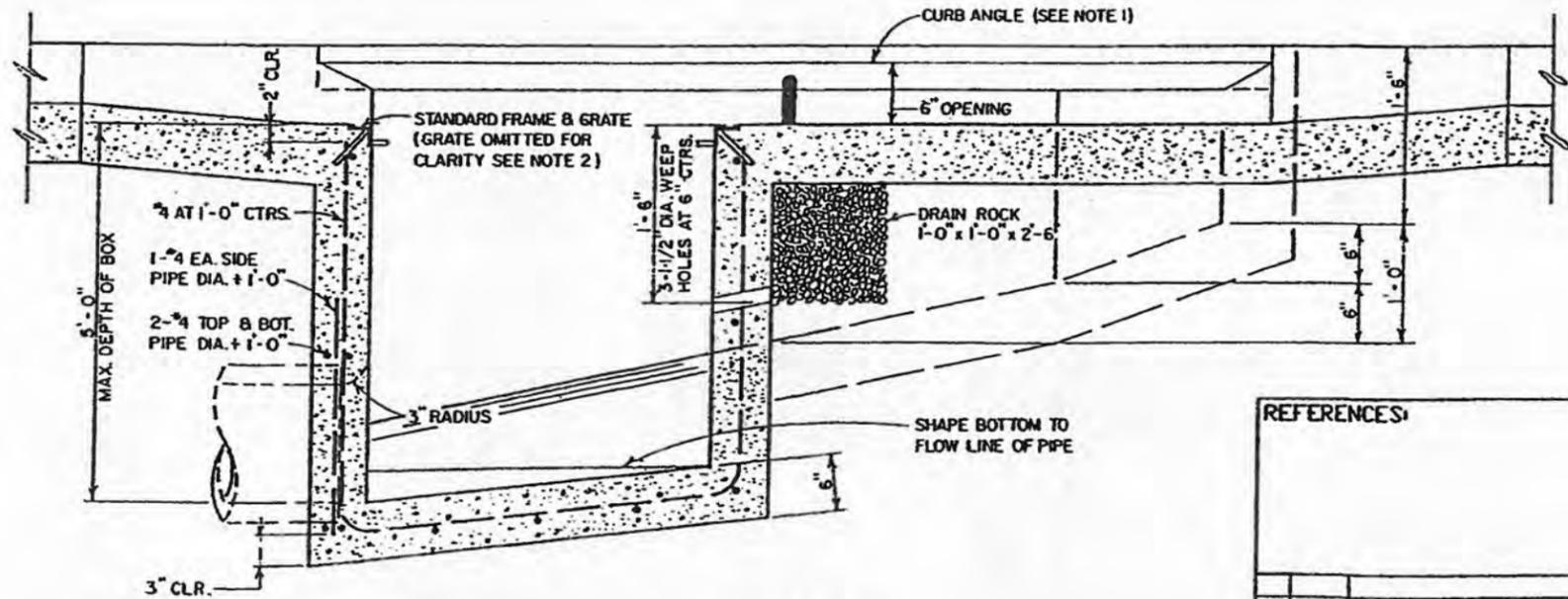
DESIGN	SUBMITTED	DATE
DRAWN	APPROVED	DRAWING NUMBER
CHECK	DIRECTOR OF PUBLIC WORKS R.C.E.	6-AA-1034



PLAN
3/4" = 1'-0"



SECTION B
3/4" = 1'-0"



SECTION A
3/4" = 1'-0"

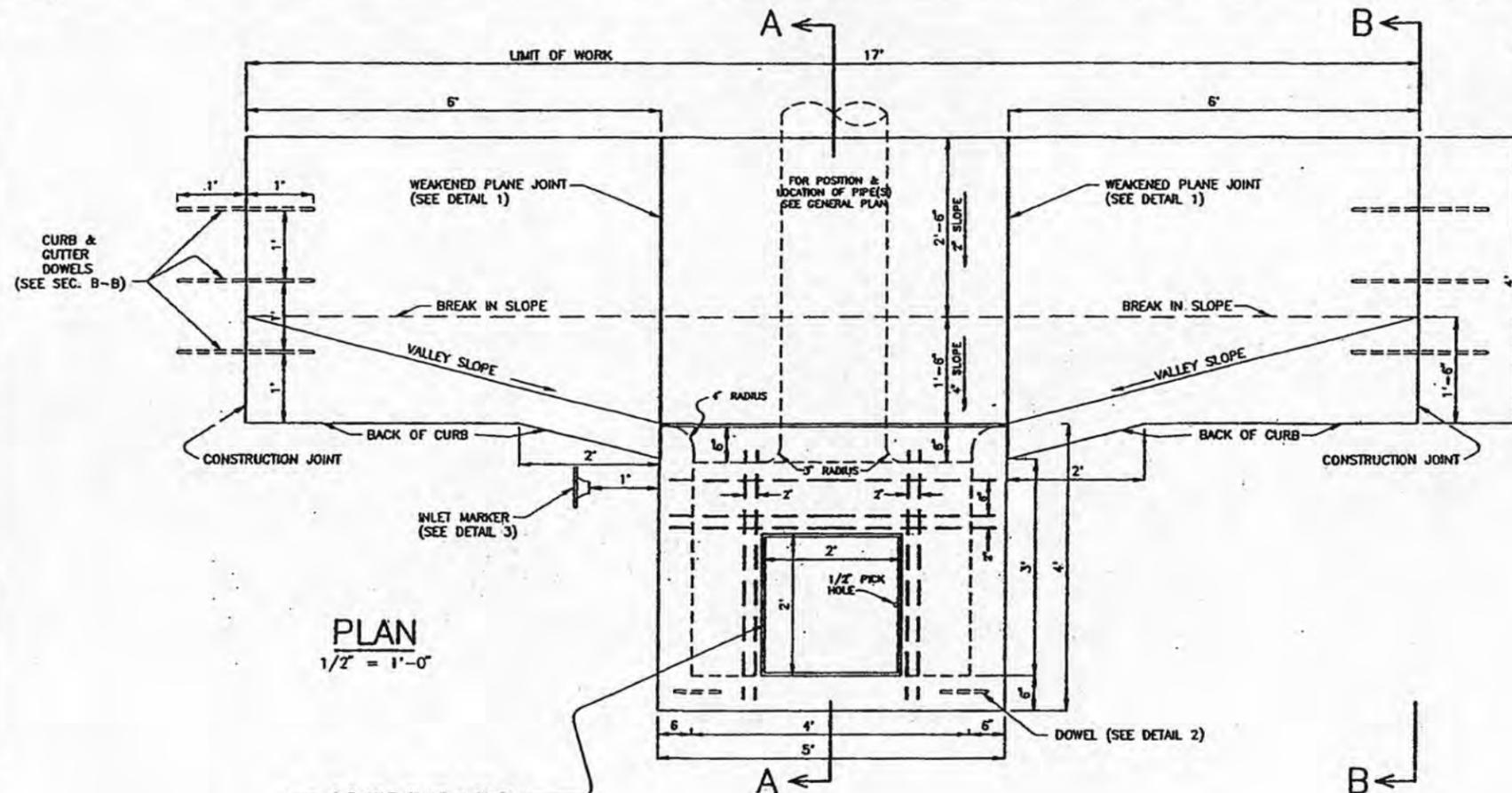
NOTES:

1. "CURB INLET ANGLE" SEE DWG. NO. 6-AA-1079.
2. "STANDARD GRATE & FRAME" SEE DWG. NO. 5-AA-1061.
3. NO CONCRETE TO BE PLACED PRIOR TO FORM & STEEL INSPECTION BY CITY ENGINEER.
4. CONCRETE SHALL BE CLASS A.
5. ALL REINFORCEMENT SHALL BE #4 DEFORMED BARS CONFORMING TO ASTM A-15 OR A-408.
6. MAX. WALL THICKNESS SHALL BE 10" IF POURED AGAINST NATURAL GROUND.
7. ALL EXPOSED STEEL TO BE GALVANIZED IN ACCORDANCE WITH ASTM A-123.

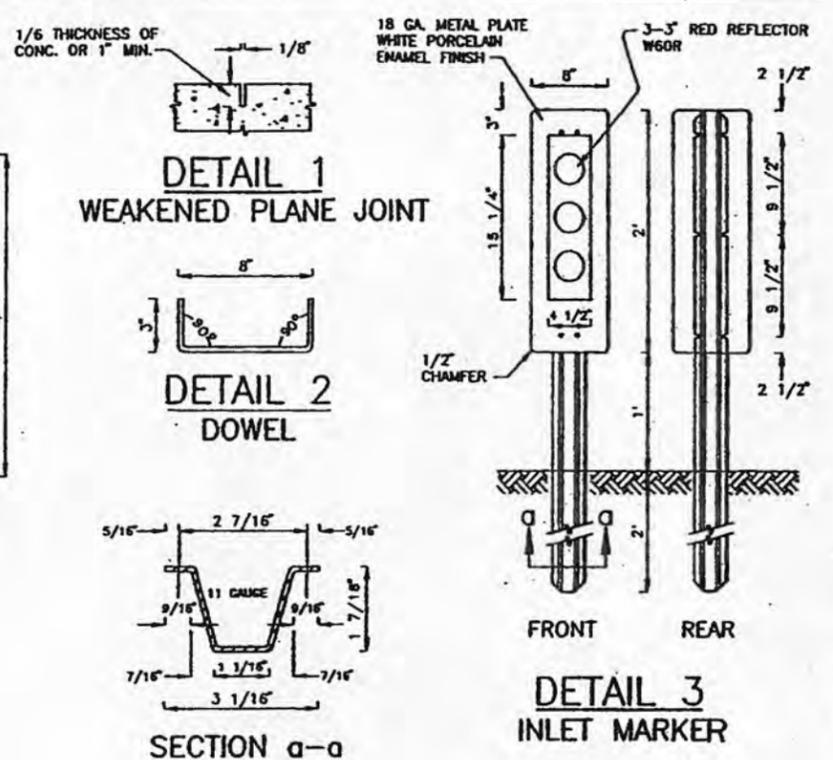
8

REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STANDARD CATCH BASIN TYPE 3G	
2	11-25-81	MAX. DEPTH OF BOX	D.P. DESIGN
1	3-5-81	ADAPT TO CURRENT GRATE	D.P. DRAWN
No.	DATE	DESCRIPTION	APPROVED
REVISIONS			APPROVED
			DIRECTOR OF PUBLIC WORKS R.C.E.
		DATE	04-09-93
		DRAWING NUMBER	6-AA-1120

8



PLAN
1/2" = 1'-0"

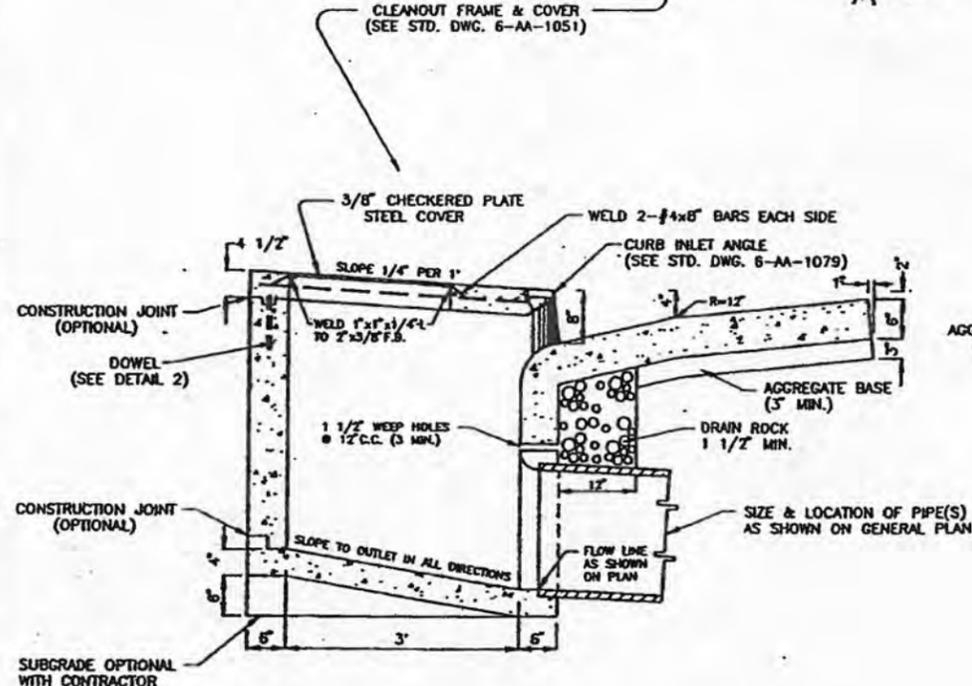


STEEL LIST

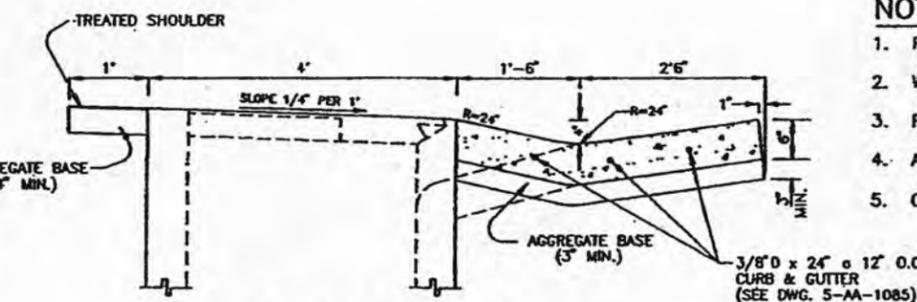
- (DOES NOT INCLUDE REINFORCEMENT FOR C.B.'S OVER 6' IN DEPTH.)
- 4 - 3'-6" x 1/2" O
 - 3 - 4'-10" x 1/2" O
 - 1 - STANDARD CURB INLET ANGLE
 - 2 - DOWELS - C.B. STRUCTURE
 - 6 - 2 1/2" x 3/8" O CURB & GUTTER DOWELS
 - 1 - 2' x 2' STANDARD CLEANOUT FRAME & COVER
 - 1 - STANDARD INLET MARKER, COMPLETE

NOTES:

1. POSITION OF PIPE LEAVING CATCH BASIN TO BE INDICATED IN PLANS. CATCH BASIN FLOOR TO SLOPE TO END OF PIPE.
2. WHERE TWO PIPES ENTER CATCH BASIN, THE FLOOR OF THE CATCH BASIN SHALL HAVE A CHANNEL CONNECTING THE PIPES.
3. REINF. STEEL FOR CATCH BASINS OVER 6' DEEP SHALL BE 1/2" O @ 12" C.C. BOTH WAYS.
4. ALL EXPOSED STEEL PARTS TO BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH A.S.T.M. DESIGNATION A-123, AS AMENDED.
5. CONCRETE SHALL BE CLASS A.



SECTION A-A
1/2" = 1'-0"



SECTION B-B
1/2" = 1'-0"

REFERENCES:

STANDARD CLEANOUT FRAME & COVER	6-AA-1051
STANDARD CURB INLET ANGLE	6-AA-1079
TYPE III STREET IMPROVEMENT X-SECTION	5-AA-1085

CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

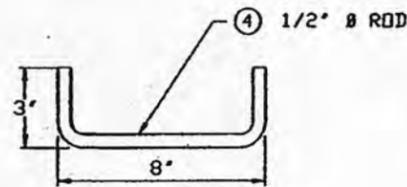
STANDARD DETAILS
CATCH BASIN TYPE I
FOR TYPE III STREETS

DESIGN	SUBMITTED <i>Richard Dwyer</i>	DATE	04-20-93
DRAWN G.M.D.	APPROVED <i>[Signature]</i>	DRAWING NUMBER	5-AA-1061
CHECK K.M.H.	DIRECTOR OF PUBLIC WORKS P.C.E.		

REVISIONS

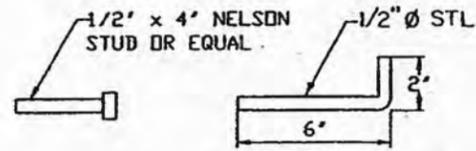
No.	DATE	DESCRIPTION	APPR.
3	8-17-88	REVISED CLEANOUT FRAME & COVER	
2	3-1-83	ADD NOTE 5	
1	2-7-83	ANGLE BACK OF CURB	

9



DETAIL A

*NELSON STUD OR ANCHOR
OPTIONAL IN PLACE OF ITEM 4.
INSTALL 2 EACH SIDE, 8 TOTAL.

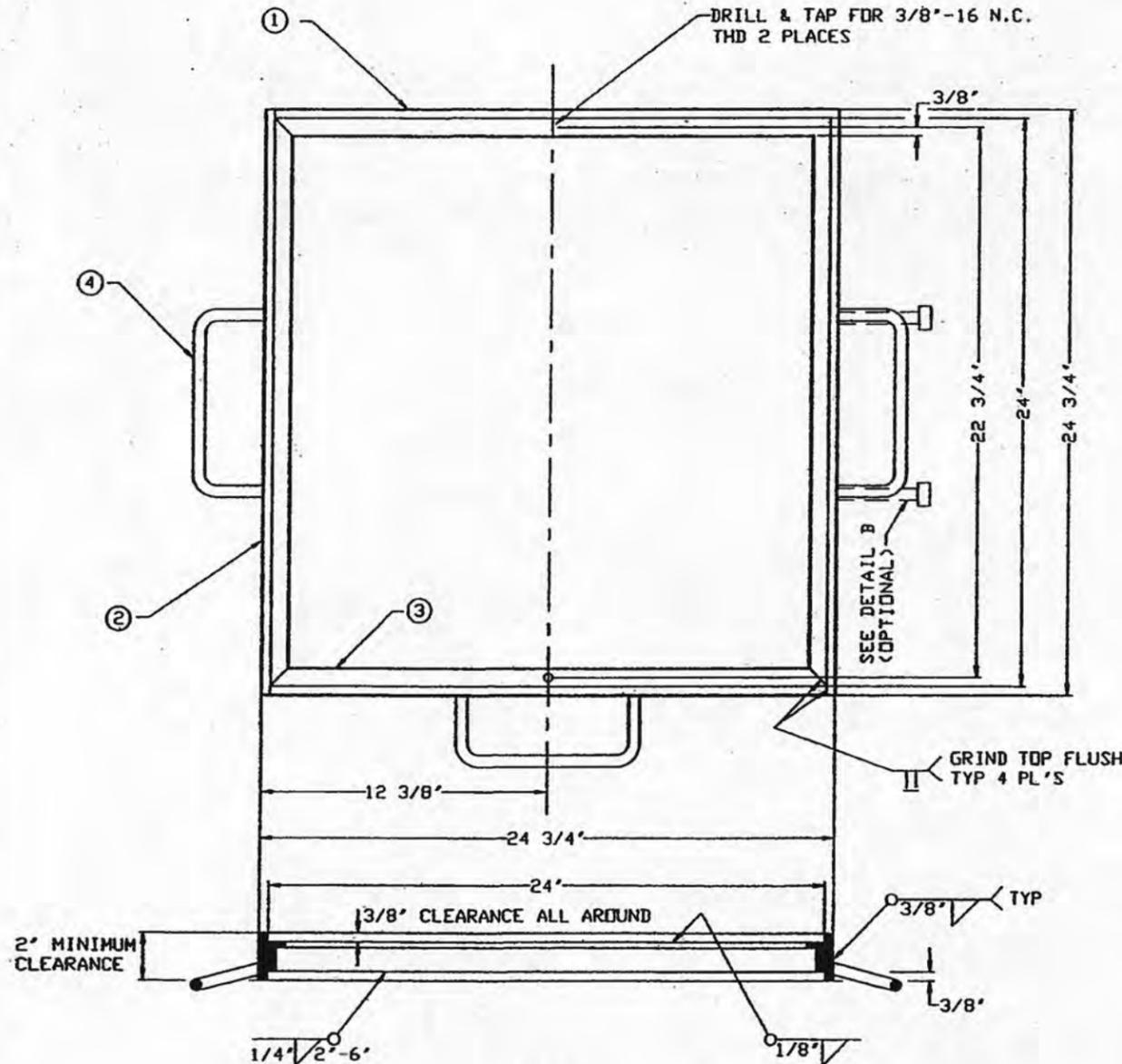


*DETAIL B

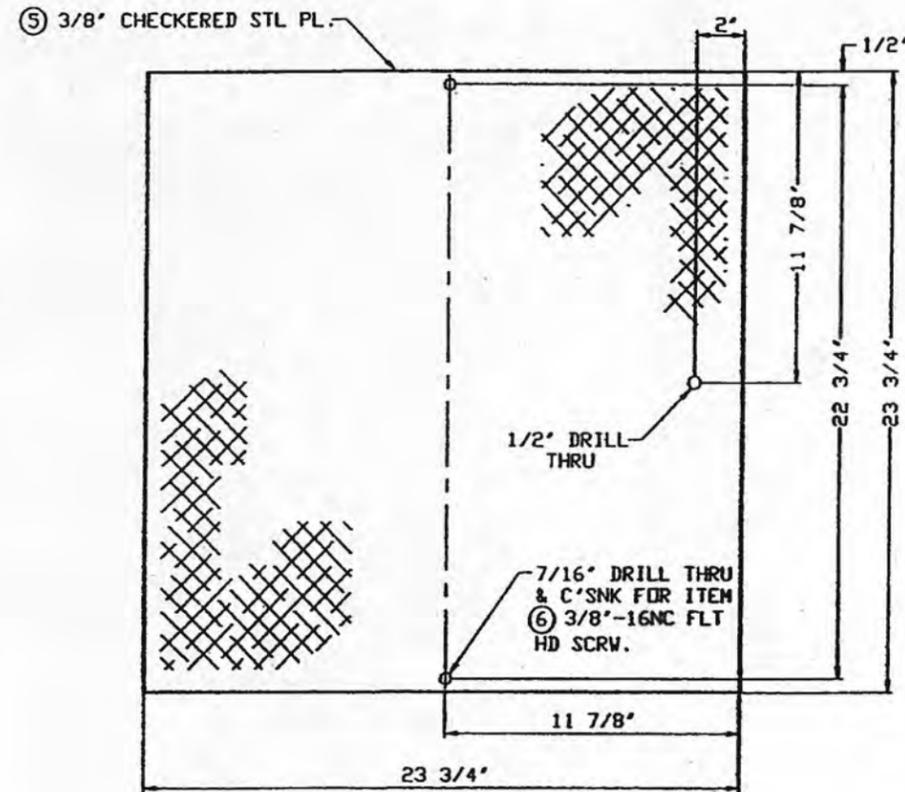
NOTES:

- TOLERANCES:
A) ALL WELDMENT $\pm 1/16"$.
B) ALL TAPPED HOLES $\pm 1/64"$.
- GALVANIZE FRAME & COVER
AFTER FABRICATION IN ACCORDANCE WITH ASTM A-123.

MATERIAL			
ITEM	DESCRIPTION	MAT'L	NO. REQ
1	BAR 2" x 3/8" x 24"	HR STL	2
2	BAR 2" x 3/8" x 24 3/4"	"	2
3	ANGLE 1" x 1" x 1/4" X 24"	"	4
4	ROD 1/2" Ø x 14"	"	4
5	3/8" CHECKERED STL PL 23 3/4" x 23 3/4"	"	1
6	FLT HD SCRWS 3/8-16 NC x 3/4"	BRASS	2
*7	ROD 1/2" Ø x 8 OR 1/2" x 4" NELSON STUD	STL	8



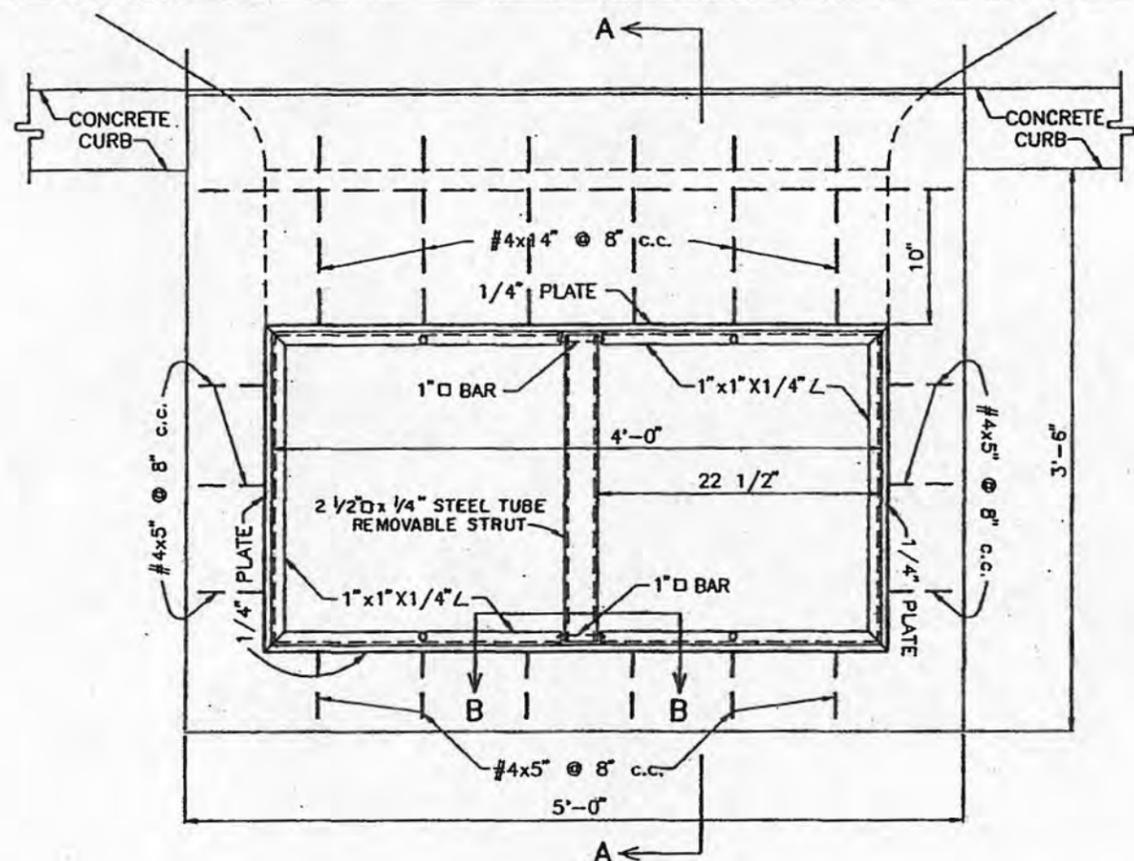
FRAME
SCALE: 2" = 1'-0"



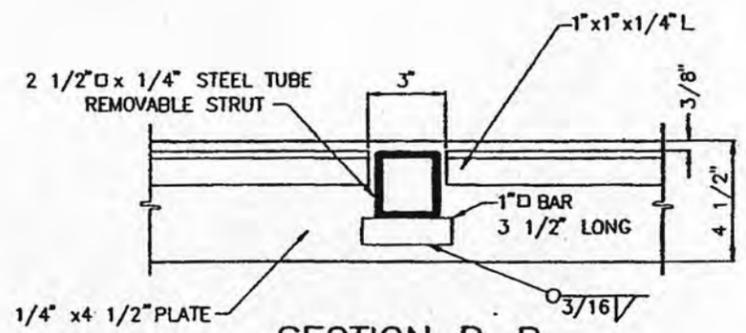
COVER
SCALE: 2" = 1'-0"

10

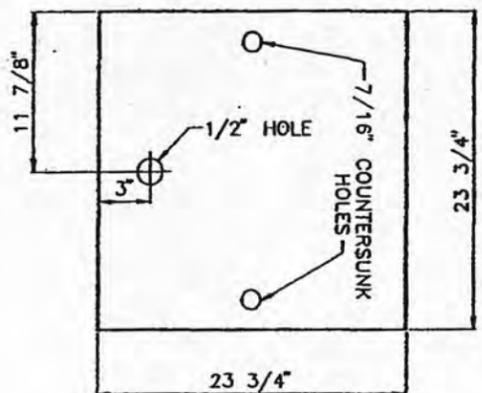
REFERENCES:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING																									
<table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>APPR.</th> </tr> <tr> <td>5</td> <td>9-26-66</td> <td>Added Anchor or Nelson Stud Action</td> <td></td> </tr> <tr> <td>4</td> <td>9-1-66</td> <td>Revised Frame.</td> <td></td> </tr> <tr> <td>3</td> <td>10-8-63</td> <td>Revise Cover Fastening.</td> <td></td> </tr> <tr> <td>2</td> <td>5-23-63</td> <td>Add Scrws & Holes.</td> <td></td> </tr> <tr> <td>1</td> <td>4-6-60</td> <td>1/2" Dia. Hole was 3/4" Dia.</td> <td></td> </tr> </table>			NO.	DATE	DESCRIPTION	APPR.	5	9-26-66	Added Anchor or Nelson Stud Action		4	9-1-66	Revised Frame.		3	10-8-63	Revise Cover Fastening.		2	5-23-63	Add Scrws & Holes.		1	4-6-60	1/2" Dia. Hole was 3/4" Dia.		<h2>STANDARD CLEANOUT FRAME & COVER</h2>	
			NO.	DATE	DESCRIPTION	APPR.																						
			5	9-26-66	Added Anchor or Nelson Stud Action																							
			4	9-1-66	Revised Frame.																							
			3	10-8-63	Revise Cover Fastening.																							
2	5-23-63	Add Scrws & Holes.																										
1	4-6-60	1/2" Dia. Hole was 3/4" Dia.																										
DESIGN		SUBMITTED: <i>Richard Davila</i>	DATE: 06-22-92																									
DRAWN: G.M.D.		APPROVED: <i>[Signature]</i>	DRAWING NUMBER: 6-AA-1051																									
CHECK: K.M.H.		DIRECTOR OF PUBLIC WORKS: R.C.E.																										



PLAN
SCALE: 1"=1'-0"



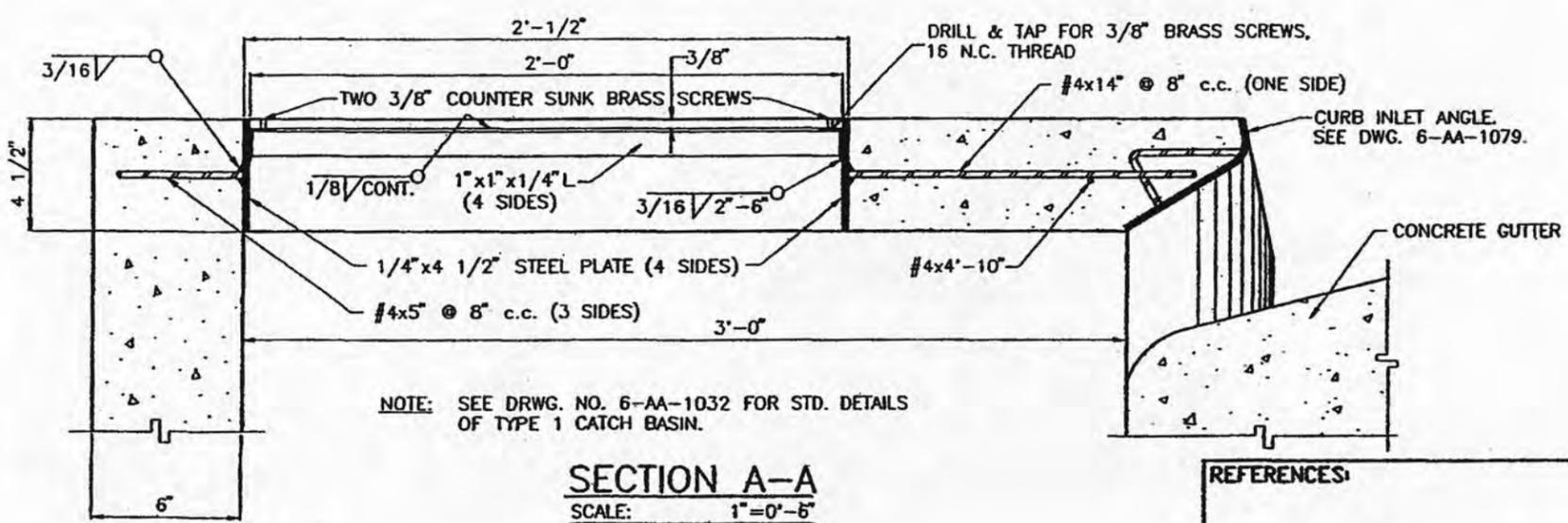
SECTION B-B
SCALE: 1"=0'-6"
(COVER NOT SHOWN)



NOTE:
COVERS MADE FROM 3/8" CHECKERED STEEL PLATE-- 2 REQUIRED. SEE DRWG. 6-AA-1051.

STANDARD CLEANOUT COVER

NOTE: ALL STEEL PARTS TO BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM DESIGNATION A-123, AS AMENDED.



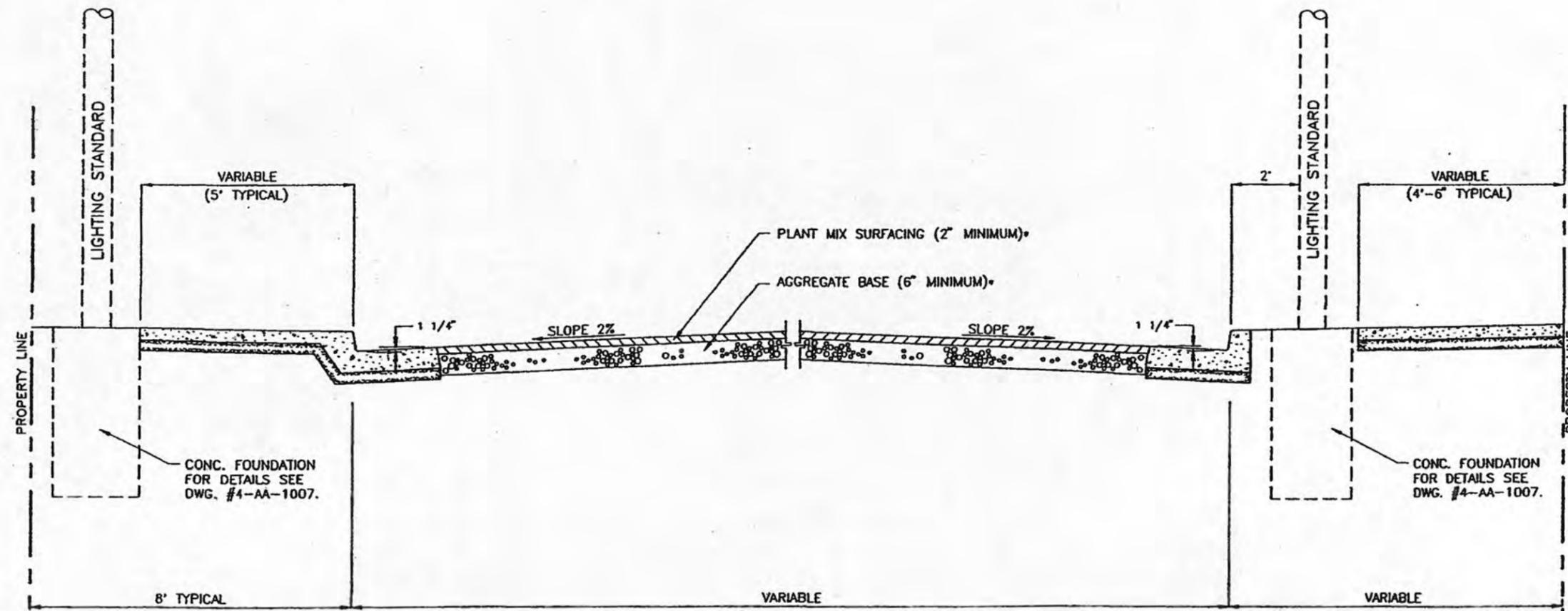
SECTION A-A
SCALE: 1"=0'-6"
(COVER NOT SHOWN)

NOTE: USE THIS FRAME & COVER WHEN INLET OR JUNCTION BOX IS LESS THAN 4'-0" IN DEPTH.

REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STANDARD DOUBLE CLEANOUT FRAME AND COVER	
		DESIGN	DATE
		BRWN GMD	11-24-92
		CHECK KMH	BRWGNG NUMBER
			6-AA-1090
		SUBMITTED: <i>Richard Dwyer</i>	
		APPROVED: <i>[Signature]</i>	
		DIRECTOR OF PUBLIC WORKS R.C.E.	

NO.	DATE	DESCRIPTION	APPR.
2	12/29/91	Revised removable strut.	
1	5/22/63	Added screws, nuts, & holes.	

REVISIONS



TYPICAL MONOLITHIC CURB, GUTTER & SIDEWALK
 SCALE: 3/8" = 1'-0"

*THESE ARE MINIMUM ALLOWABLE DIMENSIONS. ACTUAL THICKNESS OF SUB-BASE, BASE, AND SURFACING SHALL BE IN ACCORDANCE WITH THE CALTRANS HIGHWAY DESIGN MANUAL.

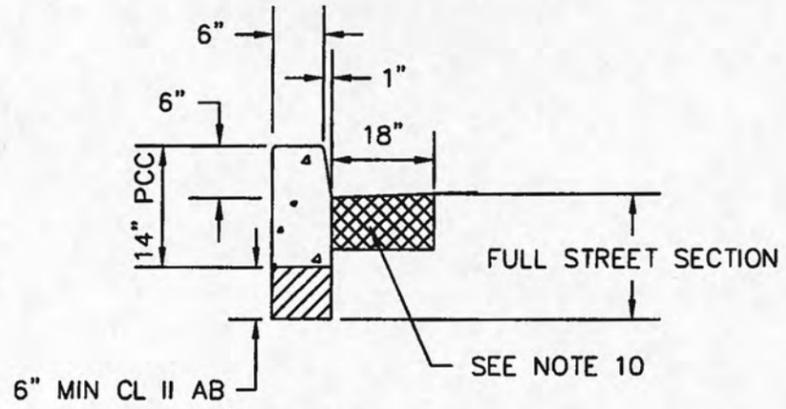
TYPICAL CURB, GUTTER & SIDEWALK
 SCALE: 3/8" = 1'-0"

NOTE:
 FOR DETAILS OF CURB, GUTTER & SIDEWALK SEE DWG. #5-AA-1059.

12

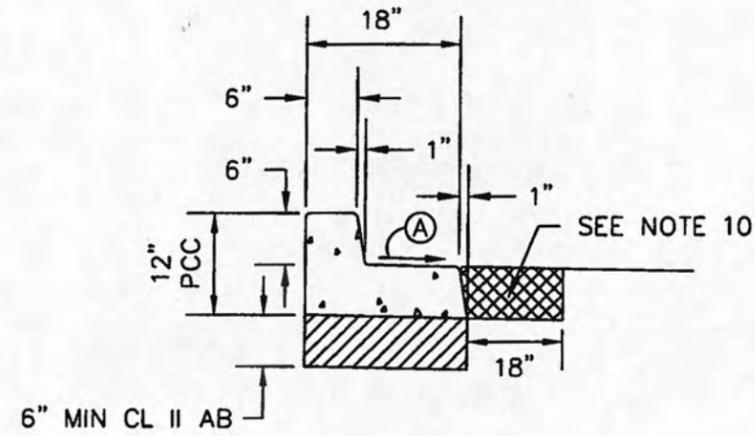
REFERENCES:		
DWG. NOS. 4-AA-1007 & 5-AA-1-59 ORD. NO. 1478		
No.	DATE	DESCRIPTION
3	10-9-80	Mix Thickness, S/W Width, Note
2	4-17-88	Revised Base- Added Notes
1	11-23-86	Revised
REVISIONS		

CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
STREET IMPROVEMENT TYPICAL CROSS SECTION	
DESIGN	DATE
DRAWN G.M.D.	04-16-93
CHECK KMH	DRAWING NUMBER
	5-AA-1066
SUBMITTED: <i>Richard Arvon</i> APPROVED: <i>[Signature]</i> DIRECTOR OF PUBLIC WORKS P.C.E.	



TYPE "C" CURB

N.T.S.



TYPE "D" CURB AND SPILL GUTTER

N.T.S.

(A) CROSS SLOPE TO MATCH
ADJACENT PAVEMENT SLOPE

(14B)



**CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT
STANDARD PLAN**

APPROVED BY:
Edric Kwan
EDRIC KWAN CITY ENGINEER

CURB AND GUTTER DETAILS

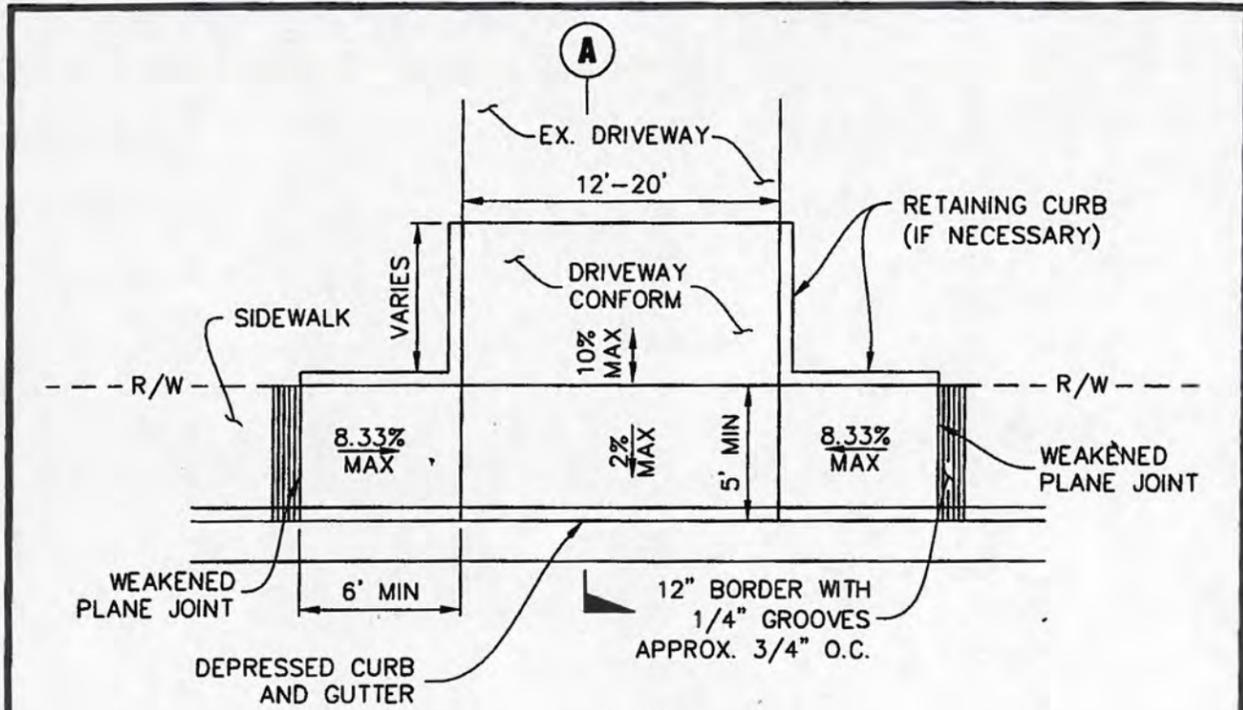
DATE: SEPTEMBER 2010
REVISED:

DRAWN: GAR

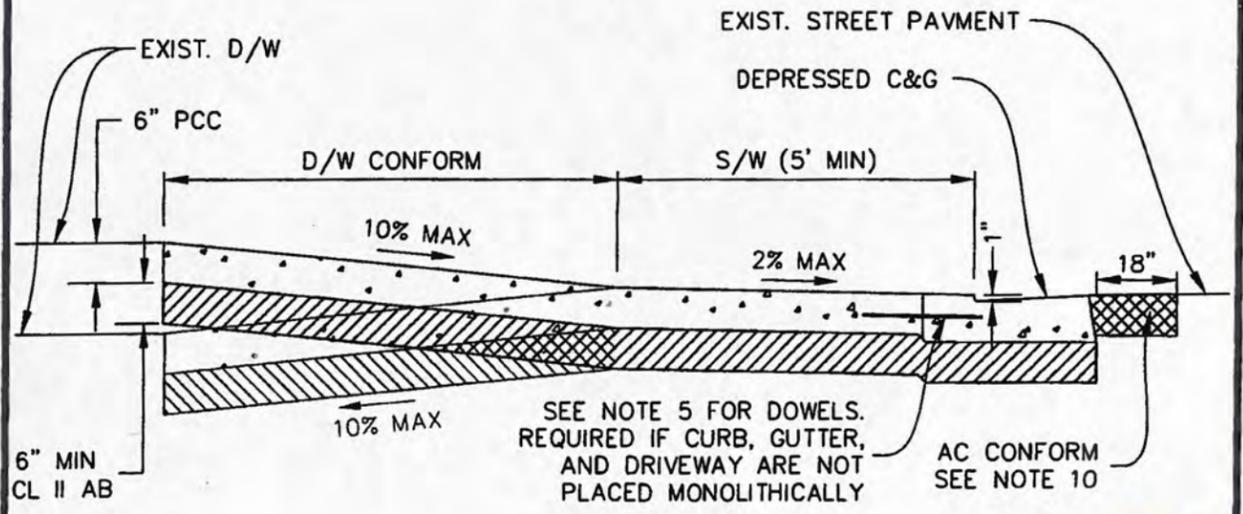
CHECK: EK

SHEET NO. 2 OF 5

DRAWING NO. ST-1B



PLAN
N.T.S.

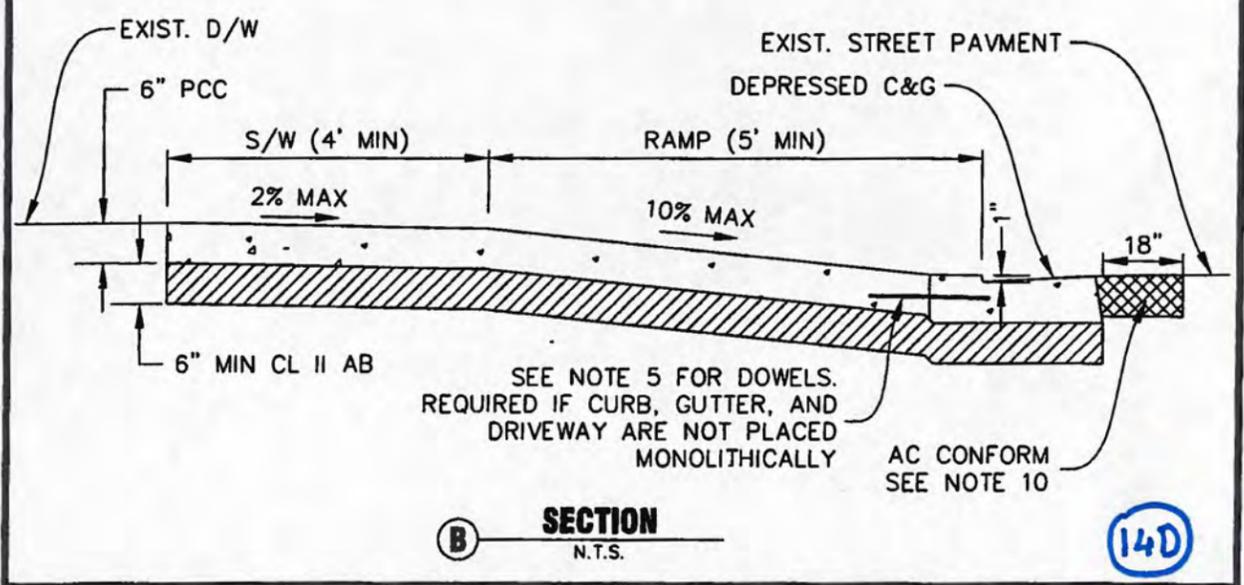
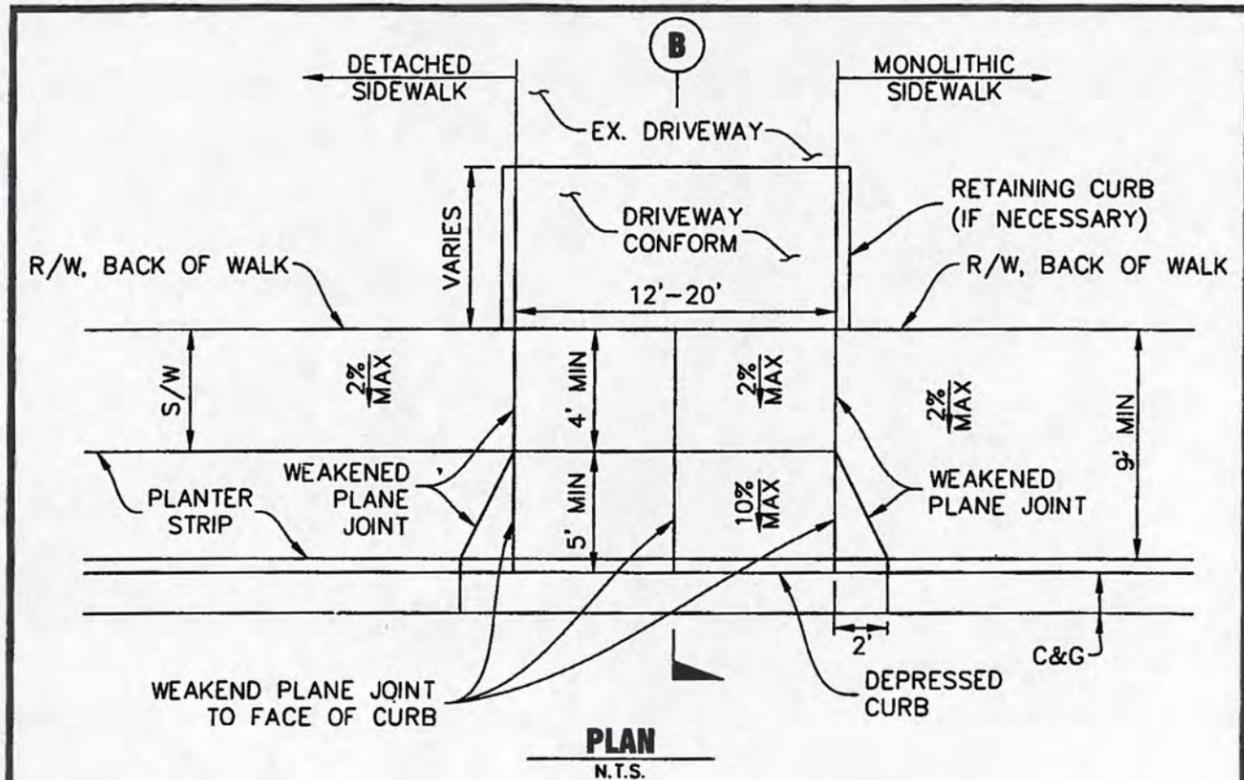


SECTION
N.T.S.

14C



CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT			
STANDARD PLAN			
APPROVED BY:		CONCRETE DRIVEWAY WITH SIDEWALK WIDTH LESS THAN 9 FEET	
 EDRIC KWAN CITY ENGINEER			
DATE:	SEPTEMBER 2010	DRAWN:	CHECK:
REVISED:		GAR	EK
		SHEET NO.	DRAWING NO.
		3 OF 5	ST-1C



	CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT			
	STANDARD PLAN			
	APPROVED BY: <i>Edric Kwan</i> EDRIC KWAN CITY ENGINEER		CONCRETE DRIVEWAY WITH SIDEWALK WIDTH GREATER THAN 9 FEET	
	DATE: SEPTEMBER 2010	DRAWN: GAR	CHECK: EK	SHEET NO. 4 OF 5
REVISED:			DRAWING NO. ST-1D	

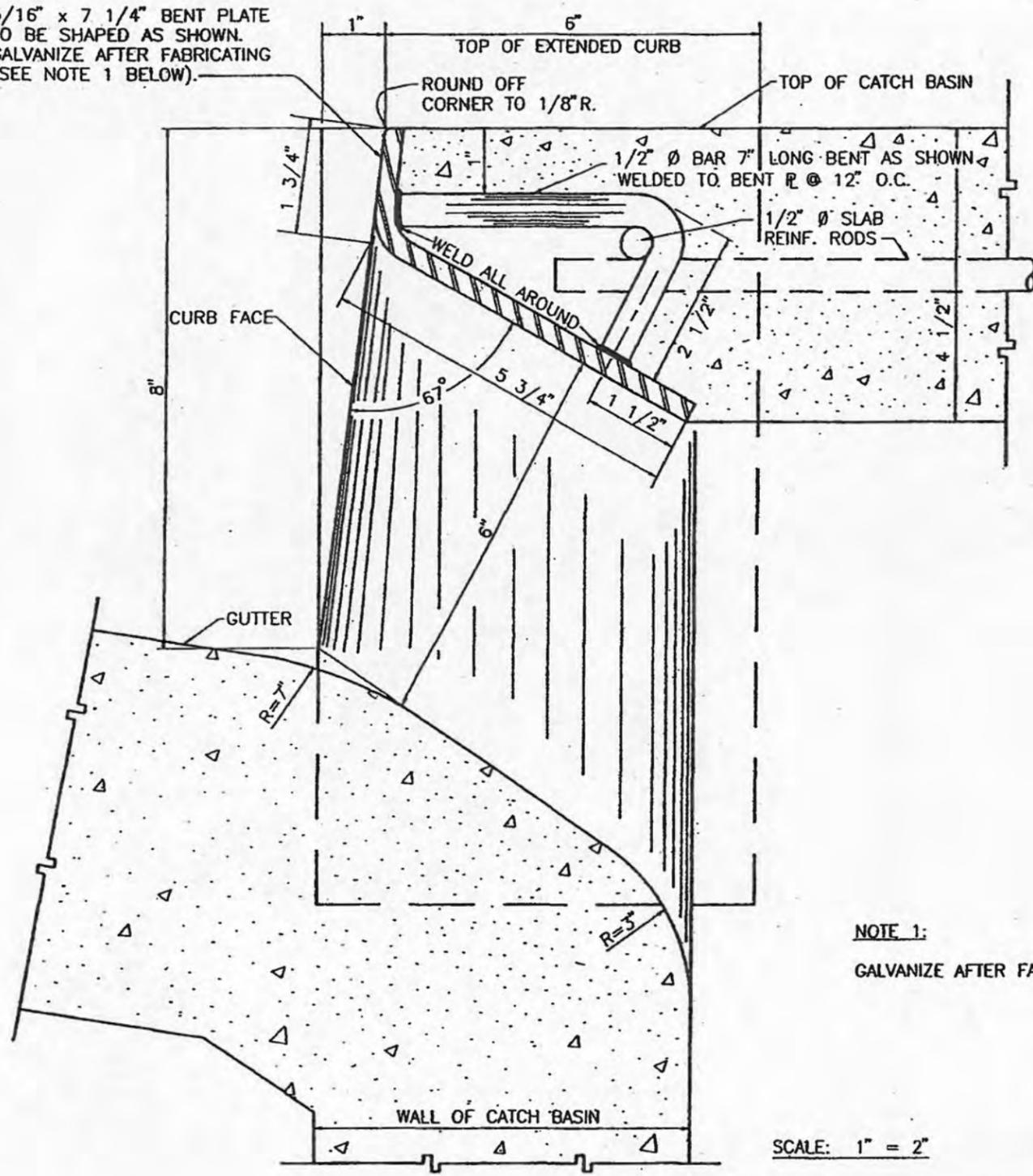
NOTES:

1. ALL CONCRETE SHALL BE MINOR CONCRETE IN CONFORMANCE WITH SECTION 90 OF THE CALTRANS STANDARD SPECIFICATIONS.
2. CURB, GUTTER, SIDEWALK, AND DRIVEWAY CONSTRUCTION SHALL BE IN CONFORMANCE WITH SECTION 73 OF THE CALTRANS STANDARD SPECIFICATIONS.
3. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED TO A DEPTH OF ONE (1) INCH WITH A SCORING TOOL, WHICH WILL LEAVE THE CORNERS ROUNDED WITH $\frac{3}{8}$ " RADIUS. WEAKENED PLANE JOINTS SPACING SHALL NOT EXCEED 20 FEET UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER. SAW CUT SCORES WILL NOT BE ACCEPTED.
4. SCORE MARKS SHALL CONFORM TO EXISTING ADJACENT PATTERNS, OR SHALL BE PLACED AS DIRECTED BY THE CITY ENGINEER. SCORE MARKS, EXPANSION JOINTS, AND WEAKENED PLANE JOINTS SHALL BE STRAIGHT AND TRUE.
5. WHERE NEW CONCRETE SHALL BE PLACED AGAINST EXISTING CONCRETE AND AT CONSTRUCTION (COLD) JOINTS IN NEW CONCRETE, THE TWO SHALL BE JOINED WITH DOWELS OF CLEAN AND DEFORMED #3 X 12" EPOXY BARS @ 24" O.C., OR AS DIRECTED BY THE CITY ENGINEER. ALL HOLES SHALL BE DRILLED INTO THE EXISTING CONCRETE WITH 6" EMBEDMENT. NO NEW CONCRETE SHALL BE PLACED AGAINST DEFECTIVE CONCRETE.
6. ALL EDGES SHALL BE TOOLED WITH A $\frac{1}{2}$ " RADIUS EDGER.
7. SIDEWALKS AND DRIVEWAYS SHALL RECEIVE A MEDIUM BROOM FINISH AND SHALL BE BROOMED TRANSVERSELY TO THE LINE OF PEDESTRIAN TRAFFIC. CURB & GUTTER AND VALLEY GUTTERS SHALL RECEIVE A LIGHT BRUSH FINISH WITH BRUSH STROKES PARALLEL TO THE LINE OF THE CURB OR GUTTER.
8. PIGMENTED SEALING COMPOUND SHALL BE USED FOR CURING CONCRETE.
9. ALL CONCRETE (EXCEPT MEDIAN CURBS AND TRAFFIC ISLANDS) SHALL BE COLORED BY ADDING TWO (2) POUNDS OF BEST QUALITY LAMPBLACK EQUIVALENT TO EACH CUBIC YARD OF CONCRETE.
10. SAW CUT AND REMOVE EXISTING PAVEMENT 18" OR AT THE DIRECTION OF THE ENGINEER FROM THE LIP OF GUTTER AND REPLACE WITH A MINIMUM OF 6" OR EXISTING FULL STREET SECTION OF HOT MIX ASPHALT, WHICHEVER IS GREATER.
11. REFER TO THE CITY OF RICHMOND MUNICIPAL CODE 12.36.161 REGARDING ALLOWABLE TREATMENTS BETWEEN THE BACK OF CURB AND THE SIDEWALK.
12. EXPANSION JOINTS SHALL BE THE BITUMINOUS FIBER TYPE, $\frac{1}{2}$ " IN THICKNESS, IN ONE PRE-MOLDED PIECE. EXPANSION JOINTS SHALL BE FILLED WITH $\frac{1}{4}$ " THICK PRE-MOLDED JOINT FILLER CONFORMING TO SECTION 73 OF CALTRANS STANDARD SPECIFICATIONS. EXPANSION JOINTS SHALL BE SPACED A MAXIMUM OF 50' APART AND SHALL BE CAST INTO FRESH CONCRETE. "CUT-IN" EXPANSION JOINTS WILL NOT BE ACCEPTED.
13. CLASS II AGGREGATE BASE SHALL CONFORM TO SECTION 26 OF THE CALTRANS STANDARD SPECIFICATIONS.
14. MINIMUM CLASS II AGGREGATE BASE SHALL BE PLACED WHERE REQUIRED BY SOIL CONDITIONS AS DIRECTED BY CITY ENGINEER.

14E

	CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT			
	STANDARD PLAN			
	APPROVED BY:  EDRIC KWAN CITY ENGINEER		NOTES FOR SIDEWALK, CURB & GUTTER AND DRIVEWAY	
	DATE: SEPTEMBER 2010	DRAWN: GAR	CHECK: EK	SHEET NO. 5 OF 5
REVISED:	DRAWING NO. ST-1E			

5/16" x 7 1/4" BENT PLATE
TO BE SHAPED AS SHOWN.
GALVANIZE AFTER FABRICATING
(SEE NOTE 1 BELOW).



NOTE 1:
GALVANIZE AFTER FABRICATION IN ACCORDANCE WITH ASTM DESIGNATION A-123.

SCALE: 1" = 2"

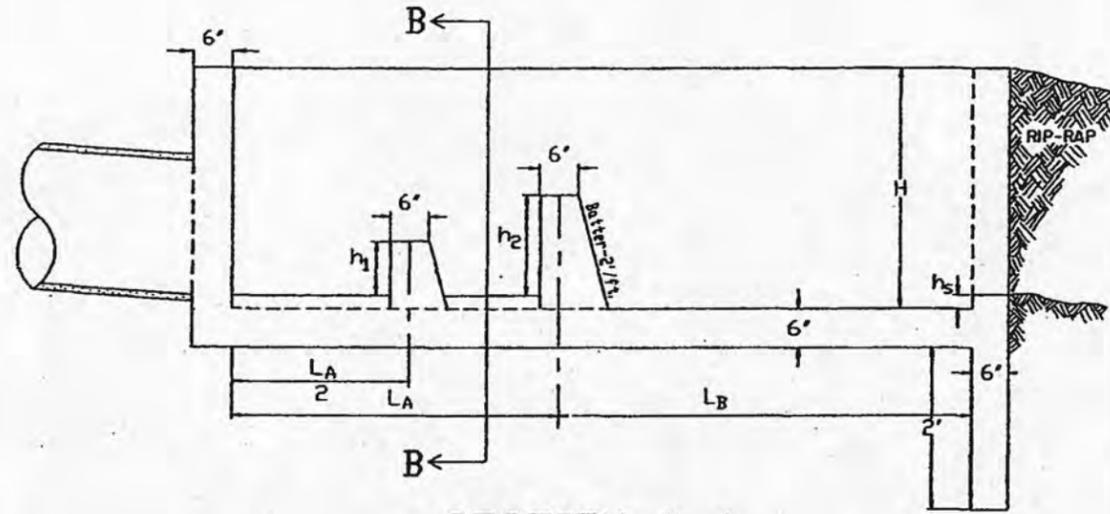
15

REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STANDARD DETAIL CURB INLET ANGLE	
2	5-67	Gov. note revised	DESIGN
1	5-67	Omitted end bevel on R.	SUBMITTED <i>Richard Danon</i> 11-12-92
No.	DATE	DESCRIPTION	APPR. DRAWN GMD APPROVED <i>[Signature]</i> 6-AA-1079
REVISIONS		CHECK KMH	INSPECTOR OF PUBLIC WORKS R.C.E.

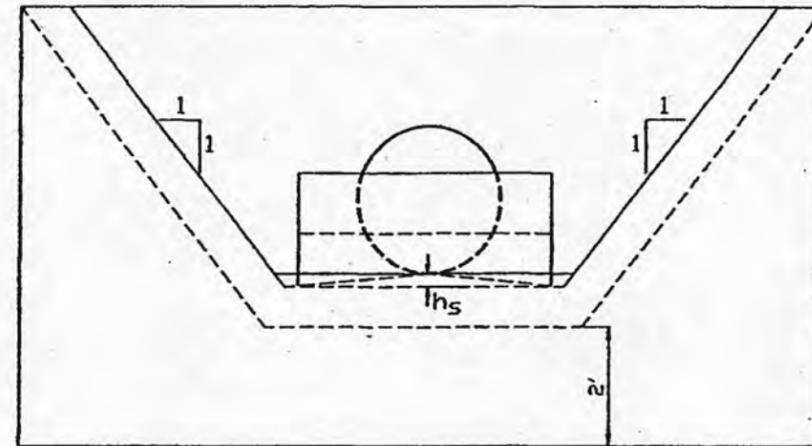
DESIGN PROCEDURE

1. DETERMINE MAXIMUM FLOW CONDITIONS EXPECTED AT CULVERT OUTFALL.
2. DETERMINE h_2 IN FT. BY FOLLOWING EQUATION: $h_2 = 0.08d_1^{0.443} V^{1.83}$
3. DETERMINE h_1 AS FOLLOWS: $h_1 = 0.5h_2$.
4. DETERMINE L_A IN FT. AS FOLLOWS: $L_A = 3.5h_2$.
5. DETERMINE L_B IN FT. AS FOLLOWS: $L_B = 1.6L_A$.
6. DETERMINE H IN FT. AS FOLLOWS: $H = 1 + 2.1h_2$ OR $H = 1.5D$, WHICHEVER IS LARGER.
7. DETERMINE h AS FOLLOWS: $h = 0.07D$.
8. STEEL REINFORCING SHALL BE DESIGNED IN ACCORDANCE WITH GOOD ENGINEERING PRACTICE.

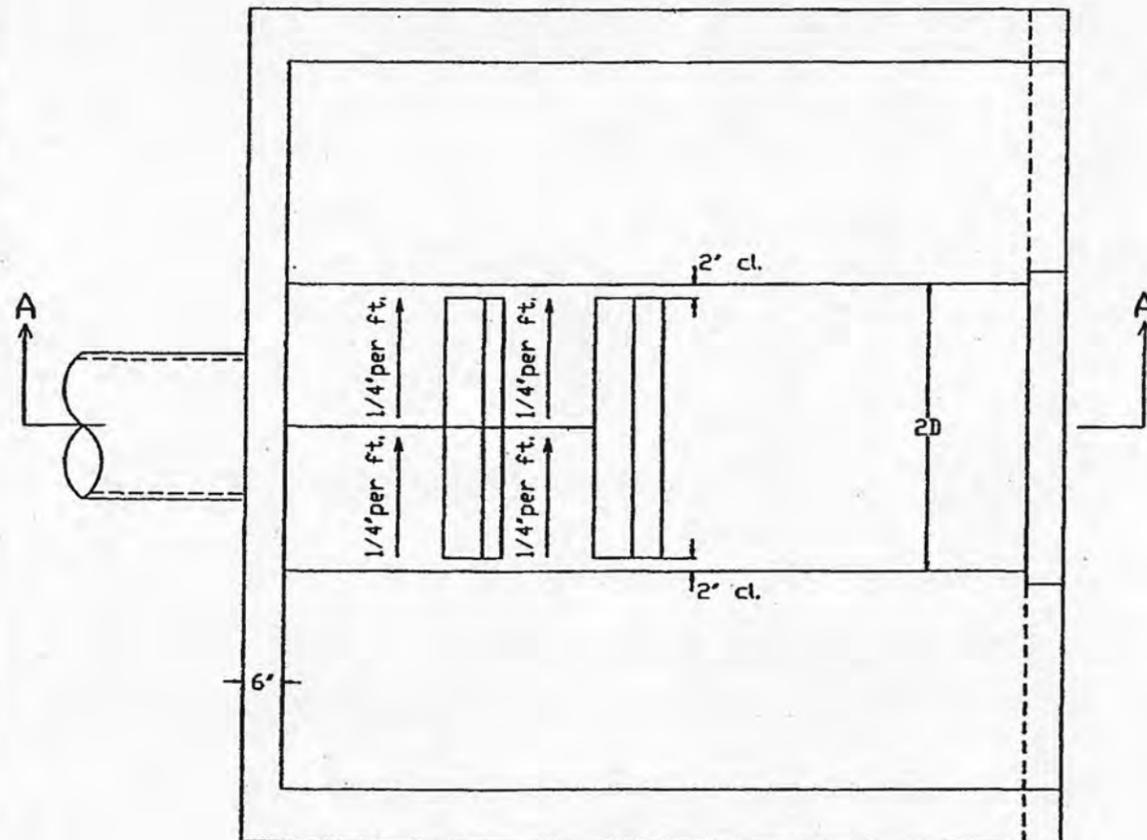
NOTE: DOWNSTREAM CHANNEL TO BE BUILT UP WITH RIP-RAP TO CONFORM WITH END DIMENSIONS OF DISSIPATOR.



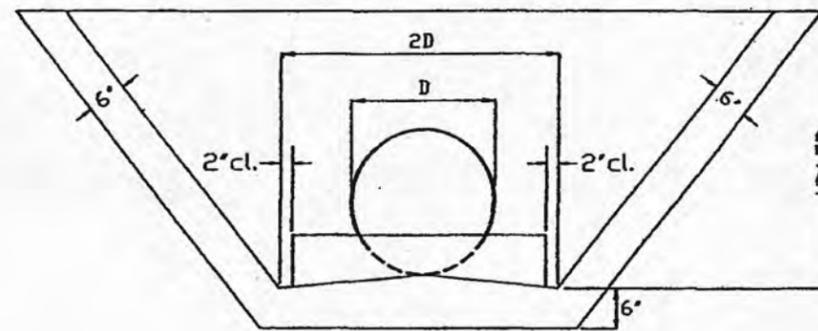
SECTION A-A



END ELEVATION



PLAN



SECTION B-B

NOTATION

- D - INSIDE DIAMETER OF CULVERT IN FEET.
- d_1 - DEPTH OF FLOW IN CULVERT AT OUTFALL IN FEET.
- d_2 - DEPTH OF UNIFORM FLOW IN DOWNSTREAM CHANNEL IN FT.
- h_1 - HEIGHT OF INTERMEDIATE BAFFLE IN FEET.
- h_2 - HEIGHT OF FINAL BAFFLE IN FEET.
- h_s - HEIGHT OF STILLING BASIN SILL IN FEET.
- L_A - LENGTH OF APPROACH BASIN IN FEET.
- L_B - LENGTH OF STILLING BASIN IN FEET.
- V - VELOCITY OF FLOW IN CULVERT AT OUTFALL IN FT./SEC.
- H - VERTICAL HEIGHT OF SIDE-WALLS ABOVE BASIN FLOOR IN FEET.

(18)

REFERENCES:

UNIV. OF CALIF. I.E.R. REPORT SERIES
ES 5795.

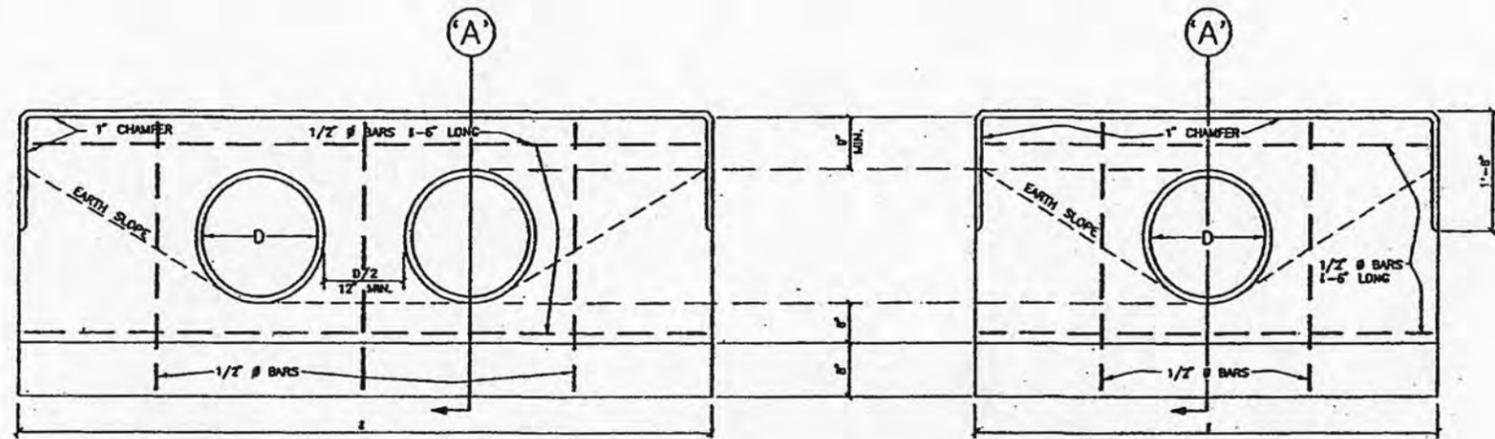
CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

**STANDARD ENERGY DISSIPATOR
FOR
STORM CULVERT OUTFALL**

No.	DATE	DESCRIPTION	APPR.

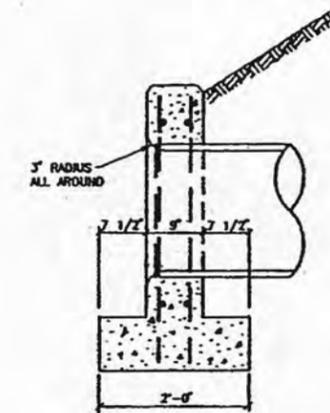
REVISIONS

DESIGN	SUBMITTED	DATE
DRAWN GMD	<i>Richard Davison</i>	03-13-92
CHECK KMH	APPROVED <i>[Signature]</i>	DRAWING NUMBER
	DIRECTOR OF PUBLIC WORKS R.C.E.	6-B-1033

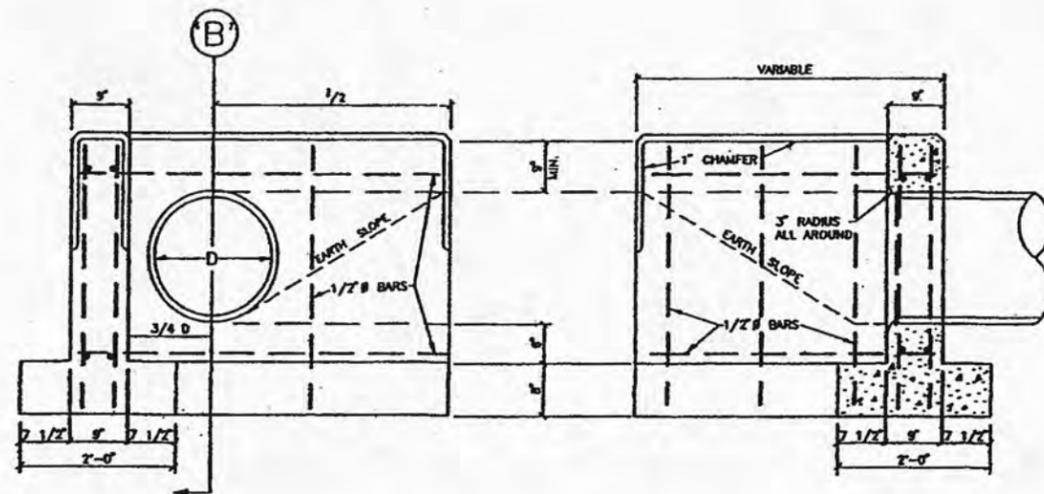


FRONT ELEV. DOUBLE HEADWALL

FRONT ELEV. SINGLE HEADWALL



SECTION 'A'



FRONT ELEV. 'L' HEADWALL

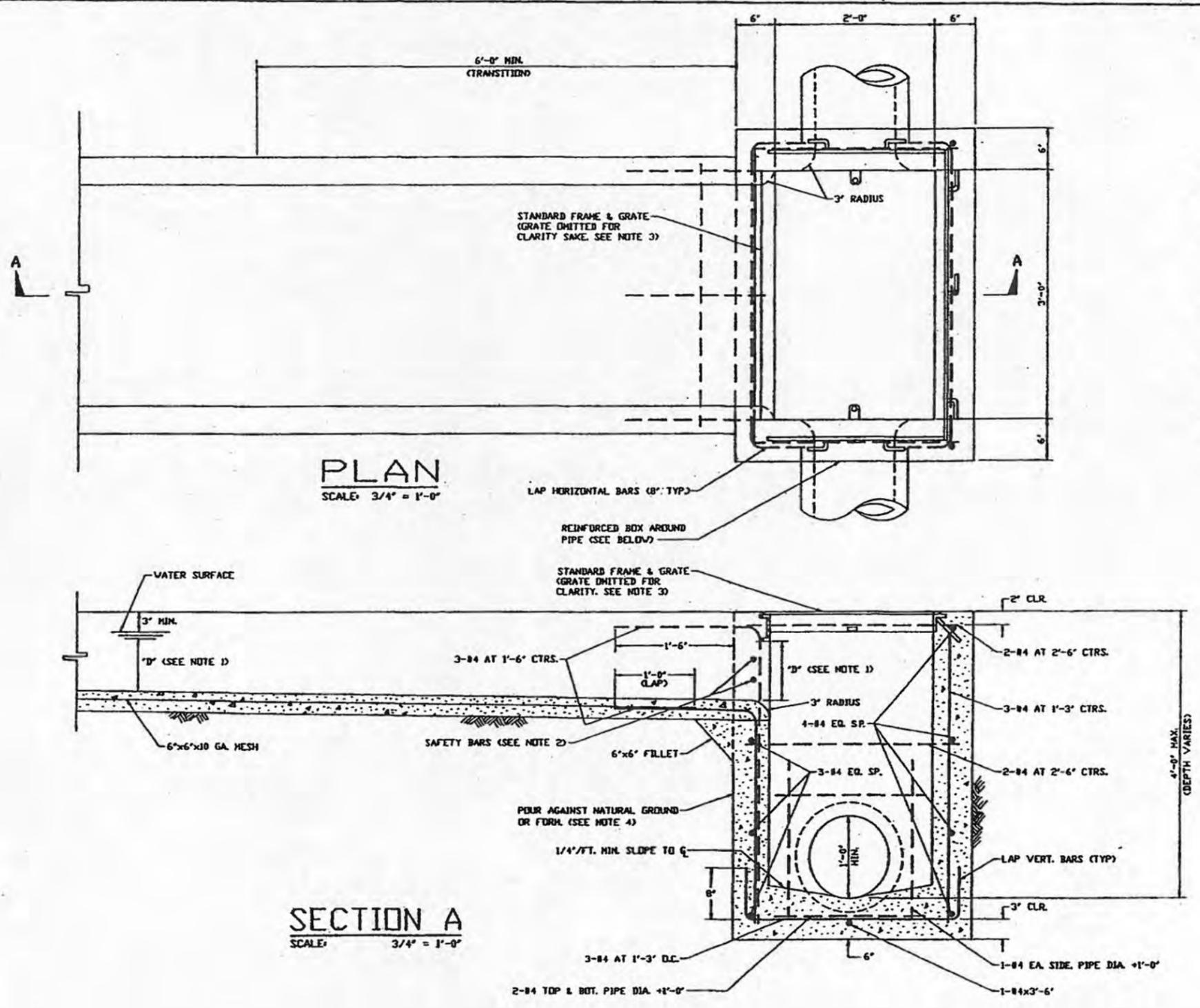
SECTION 'B'

Dia. of Pipe D	l		l/2	Steel Lbs.		Conc. C.Y.	
	Single	Double	'L'	Single	Double	Single	Double
12"	4'-0"	6'-0"	2'-0"	17	26	0.44	0.65
15"	5'-0"	7'-0"	2'-6"	20	30	0.58	0.78
18"	5'-6"	8'-0"	2'-9"	22	34	0.66	0.93
24"	7'-6"	10'-6"	3'-9"	29	43	0.98	1.33
30"	9'-0"	12'-9"	4'-6"	35	51	1.27	1.73
36"	10'-6"	15'-0"	5'-3"	40	59	1.60	2.17
42"	12'-0"	17'-3"	6'-0"	46	67	1.96	2.67
48"	14'-0"	20'-0"	7'-0"	52	77	2.43	3.27
54"	15'-6"	22'-3"	7'-9"	57	85	2.85	3.84

Note: Where D>54" use standard wingwall design
 'L' wall quantities are variable
 Quantities are based on the use of C.M.P.

- NOTE:
1. Concrete shall be Class A.
 2. Wingwalls shall be constructed where required.

REFERENCES:				CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING			
				STANDARD DETAILS PIPE CULVERT HEADWALLS			
				DESIGN	SUBMITTED: <i>Richard L. Smith</i>		DATE: 10-29-92
				DRAWN: GMD	APPROVED: <i>[Signature]</i>		DRAWING NUMBER: 6-AA-1062
				CHECK: KMH	DIRECTOR OF PUBLIC WORKS R.C.E.		
REVISIONS							
No.	DATE	DESCRIPTION	APPR.				
2	12-28-87	HEADWALL REVISED.					
1	3-1-83	ADD NOTE 1.					



PLAN
SCALE: 3/4" = 1'-0"

SECTION A
SCALE: 3/4" = 1'-0"

NOTES:

1. 'D' VARIES, SEE STANDARD P.C.C. LINED 'V' DITCH, DWG. NO. 6-AA-1135.
2. WHEN 'D'=8' OR GREATER, INSERT (2) SAFETY BARS INTO CONCRETE 3' MIN. EACH SIDE. BARS TO BE #4 MIN.
3. 'STANDARD GRATE & FRAME' SEE DWG. NO. 5-AA-1061.
4. MAXIMUM WALL THICKNESS SHALL BE 10" IF POURED AGAINST NATURAL GROUND.
5. FOR DROP INLET OMIT SIDE OPENING AND PROVIDE REINFORCING STEEL SAME AS OPPOSITE SIDE.

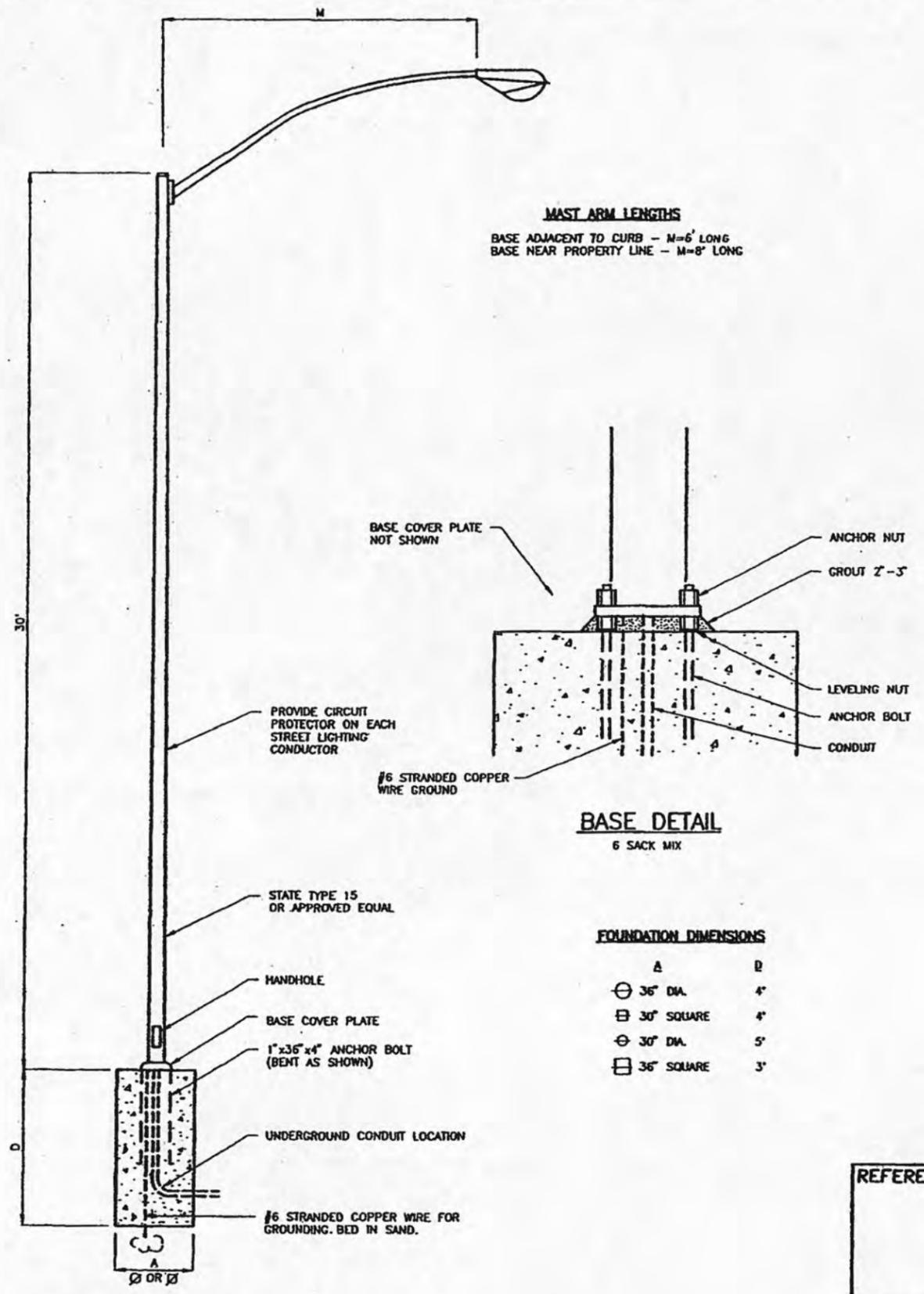
REFERENCES: 5-AA-1061

CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

**STANDARD
JUNCTION BOX
V-DITCH TO PIPE CONNECTION**

No.	DATE	DESCRIPTION	APPR.
1	1-28-81	ADAPT TO CURRENT GRATE & V-DITCH	DP

DESIGN	SUBMITTED	DATE
DRAWN	APPROVED	DRAWING NUMBER
CHECK	DIRECTOR OF PUBLIC WORKS R.C.E.	6-AA-1073



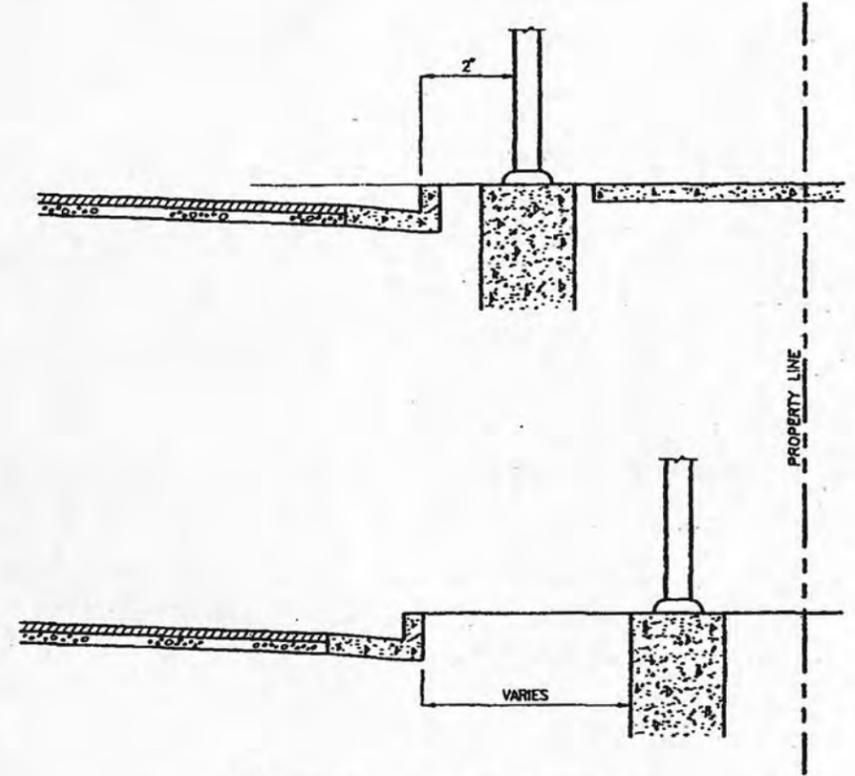
TYPICAL STANDARD

MAST ARM LENGTHS
 BASE ADJACENT TO CURB - M=6' LONG
 BASE NEAR PROPERTY LINE - M=8' LONG

BASE DETAIL
 6 SACK MIX

FOUNDATION DIMENSIONS

A	B
⊕ 36" DIA.	4"
⊕ 30" SQUARE	4"
⊕ 30" DIA.	5"
⊕ 36" SQUARE	3"



LIGHT STANDARD LOCATIONS

LUMINAIRE

FOR MINOR STREETS USE
 70 WATT HIGH PRESSURE SODIUM VAPOR, 120 VOLT
 UNLESS OTHERWISE SPECIFIED.
 LIGHT DISTRIBUTION SHALL BE M-S
 TYPE II UNLESS OTHERWISE SPECIFIED.
 FOR COLLECTOR STREETS USE
 150 WATT HIGH PRESSURE SODIUM VAPOR,
 120 VOLT UNLESS OTHERWISE SPECIFIED.
 SEE DRAWING NO. 4-AA-1024 FOR ADDITIONAL DETAILS.

#10 WIRE IN POLE
 #6 - #8 FROM POLE TO SERVICE

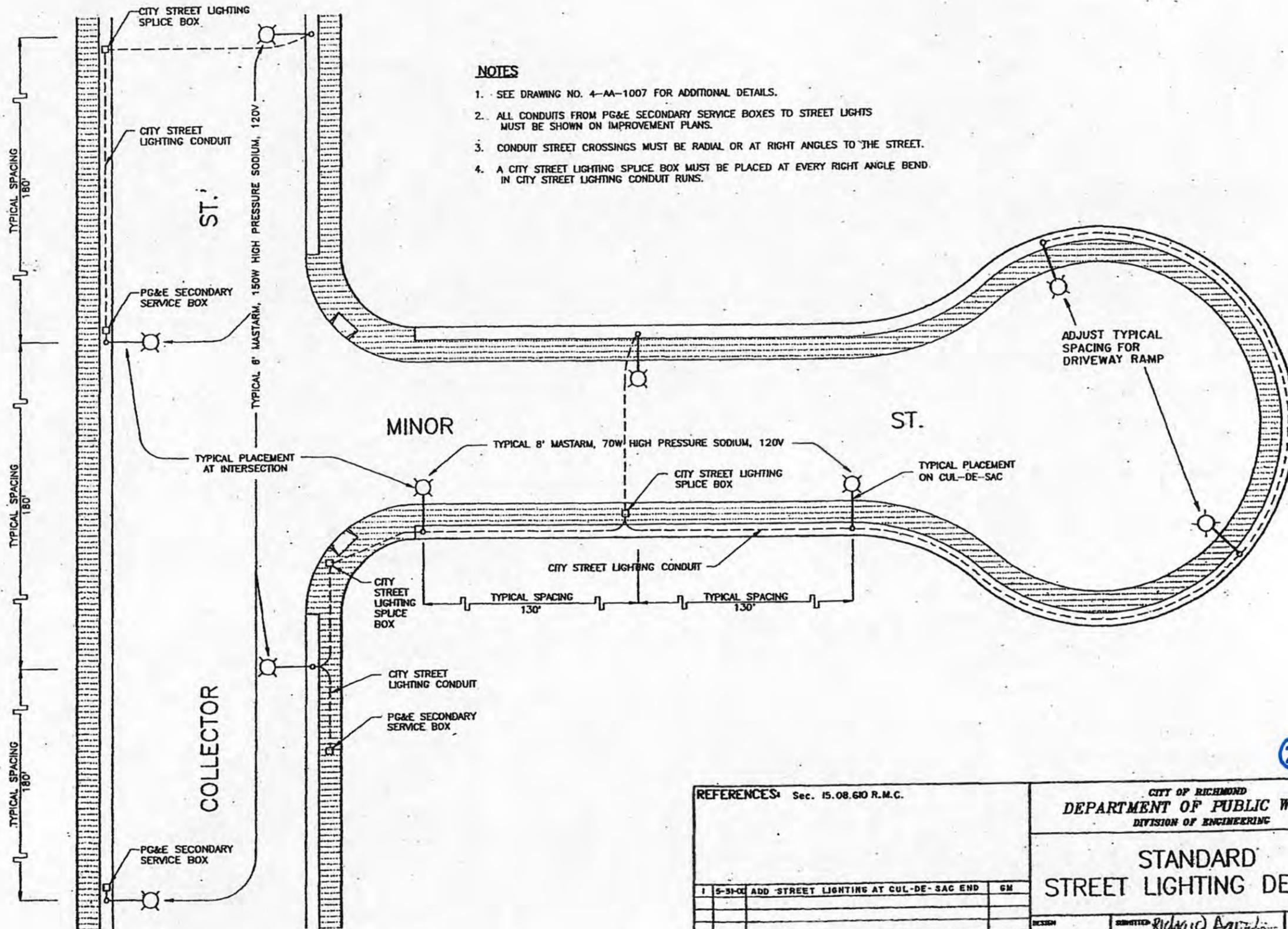
REFERENCES:

No.	DATE	DESCRIPTION	APPR.
7	4-87	Added grounding wire & note	
6	11-25-81	Add circuit protector	
5	8-28-81	70 watt, 150 watt, pole height	
4	10-0-80	120 volt	
3	3-12-76	Redrawn	

CITY OF RICHMOND
 DEPARTMENT OF PUBLIC WORKS
 DIVISION OF ENGINEERING

**STANDARD
 ELECTROLIER DETAILS**

DESIGN	SUBMITTED <i>Richard Davidson</i>	DATE 04-15-93
DRAWN G.M.D.	APPROVED <i>[Signature]</i>	DRAWING NUMBER 4-AA-1007
CHECK K.M.H.	DIRECTOR OF PUBLIC WORKS R.C.E.	



NOTES

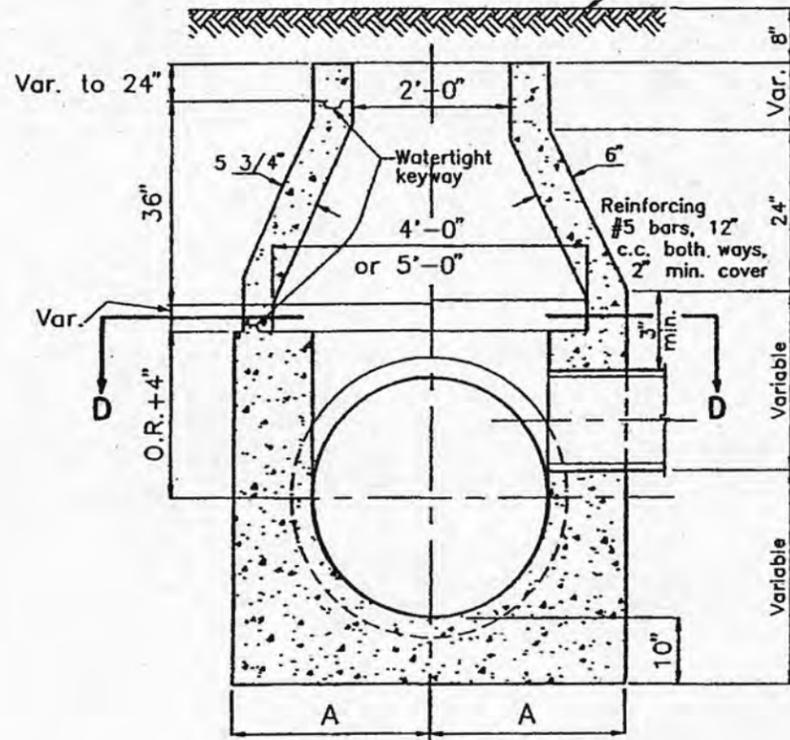
1. SEE DRAWING NO. 4-AA-1007 FOR ADDITIONAL DETAILS.
2. ALL CONDUITS FROM PG&E SECONDARY SERVICE BOXES TO STREET LIGHTS MUST BE SHOWN ON IMPROVEMENT PLANS.
3. CONDUIT STREET CROSSINGS MUST BE RADIAL OR AT RIGHT ANGLES TO THE STREET.
4. A CITY STREET LIGHTING SPLICE BOX MUST BE PLACED AT EVERY RIGHT ANGLE BEND IN CITY STREET LIGHTING CONDUIT RUNS.

22

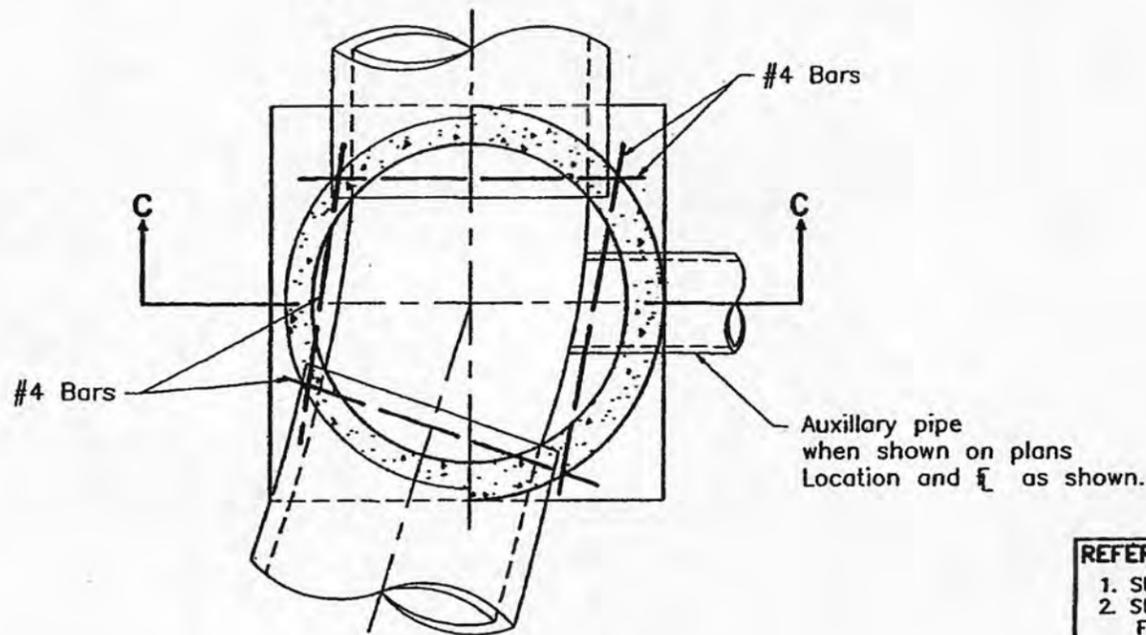
No.	DATE	DESCRIPTION	APPR.
1	5-31-00	ADD STREET LIGHTING AT CUL-DE-SAC END	GM

REFERENCES: Sec. 15.08.610 R.M.C.		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
DESIGN:		SUBMITTED: <i>Richard...</i>	
DRAWN: G.M.D.		DATE: 01-29-93	
CHECK: KMH		APPROVED: <i>[Signature]</i> DRAWING NUMBER: 4-AA-1024	
STANDARD STREET LIGHTING DETAILS			

Manhole frame to be bedded in mortar.
For Std. Manhole frame,
See Dwg. 10-AA-1017



SECTION 'C-C'



SECTION 'D-D'
CONCRETE MANHOLE

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

NOTES:

1. Top elevation of manhole to be determined in field. Top of manhole to fit Standard Cast Iron Manhole Frame and Cover. (See Dwg. 10-AA-1017). Minimum 3" grout to be used.
2. Form a smooth shaped channel with streamline junction.
3. Use 5'-0" dia. M.H. for sewers 48", 54", & 60" in diameter.
4. Outside of base to be a minimum of 5'-0" square but may assume a shape other than a square provided the standard barrel rests at all points upon the surface of the concrete base.
5. Concrete wall construction may be pre-cast or cast-in-place. Steel- #5 bars @ 12" c.c. both ways, center of wall or approved equal if precast manholes are used.
6. Wall thickness - Pour in place, 6" min.; 48" precast manhole, 4 1/8" min.
7. O.R. - Outside radius of pipe.
8. Dimensions A:

PIPE DIA.	A-CONC. M.H.
39" or less	2' - 6"
more than 39"	O.R. + 8"

9. Polypropylene rungs are required on manholes 3 feet or more in depth. Rungs to face East or West.

23

REFERENCES:				CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
1. Standard Manholes Draw. No. 10-AA-1018				STANDARD STORM SEWER & SMALL DEFLECTION MANHOLES 12" TO 60" DIA. SEWERS		
2. Std. Manhole Frame & Cover & Shallow Manhole Frame Draw. No. 10-AA-1017.						
3 3-87 Added Note 9				DESIGN	SUBMITTED <i>Richard Dardon</i>	DATE 08-12-92
2 4-68 Deleted Brick M.H.				DRAWN G.M.D.	APPROVED <i>[Signature]</i>	DRAWING NUMBER 6-AA-1044
1 10-57 Drafting Details				CHECK KMH	DIRECTOR OF PUBLIC WORKS R.C.E.	
REVISIONS						

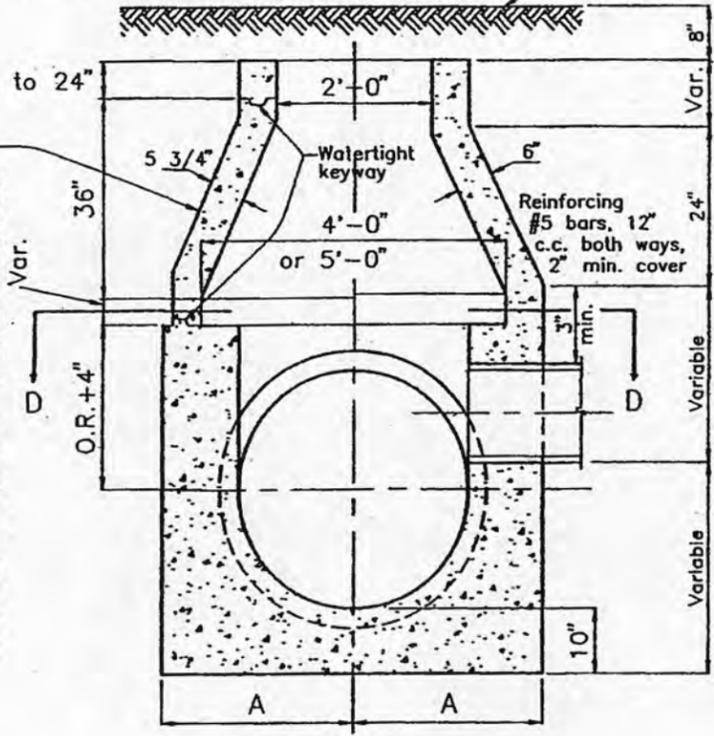
Manhole frame to be bedded in mortar.
For Std. Manhole frame,
See Dwg. 10-AA-1017

Ground or street surface

NOTE:

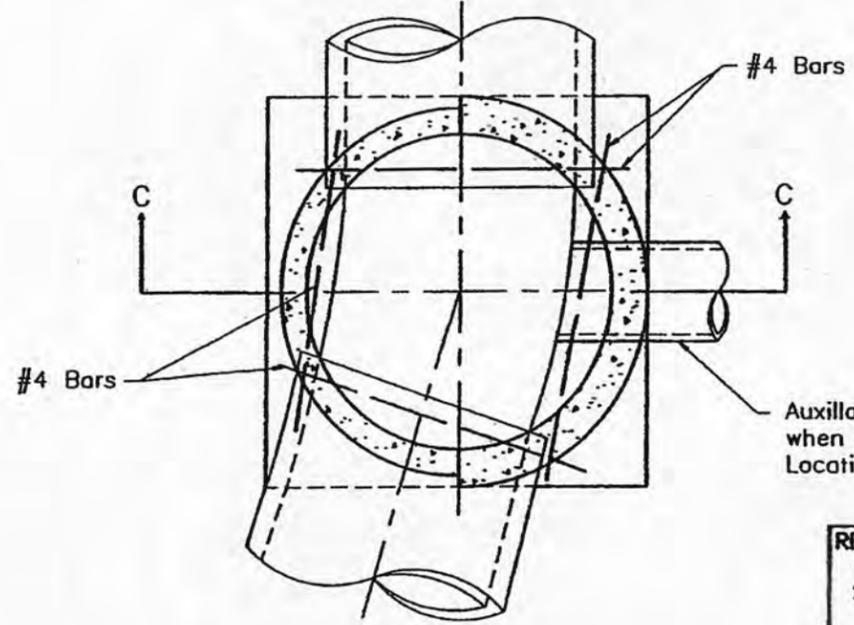
Install Pre-Cast Concrete
48"x24" Reducer Slab
Instead of Cone.

TYPICAL PRECAST CONSTRUCTION



TYPICAL CAST IN PLACE CONSTRUCTION

SECTION 'C-C'



Auxillary pipe
when shown on plans
Location and \bar{L} as shown.

SECTION 'D-D'
CONCRETE MANHOLE

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

NOTES:

1. Top elevation of manhole to be determined in field. Top of manhole to fit Standard Cast Iron Manhole Frame and Cover. (See Dwg. 10-AA-1017). Minimum 3" grout to be used.
2. Form a smooth shaped channel with streamline junction.
3. Use 5'-0" dia. M.H. for sewers 48", 54", & 60" in diameter.
4. Outside of base to be a minimum of 5'-0" square but may assume a shape other than a square provided the standard barrel rests at all points upon the surface of the concrete base.
5. Concrete wall construction may be pre-cast or cast-in-place. Steel- #5 bars @ 12" c.c. both ways, center of wall or approved equal if precast manholes are used.
6. Wall thickness - Pour in place, 6" min.; 48" precast manhole, 4 1/8" min.
7. O.R. - Outside radius of pipe.
8. Dimensions A:

PIPE DIA.	A-CONC. M.H.
39" or less	2' - 6"
more than 39"	O.R. + 8"

24

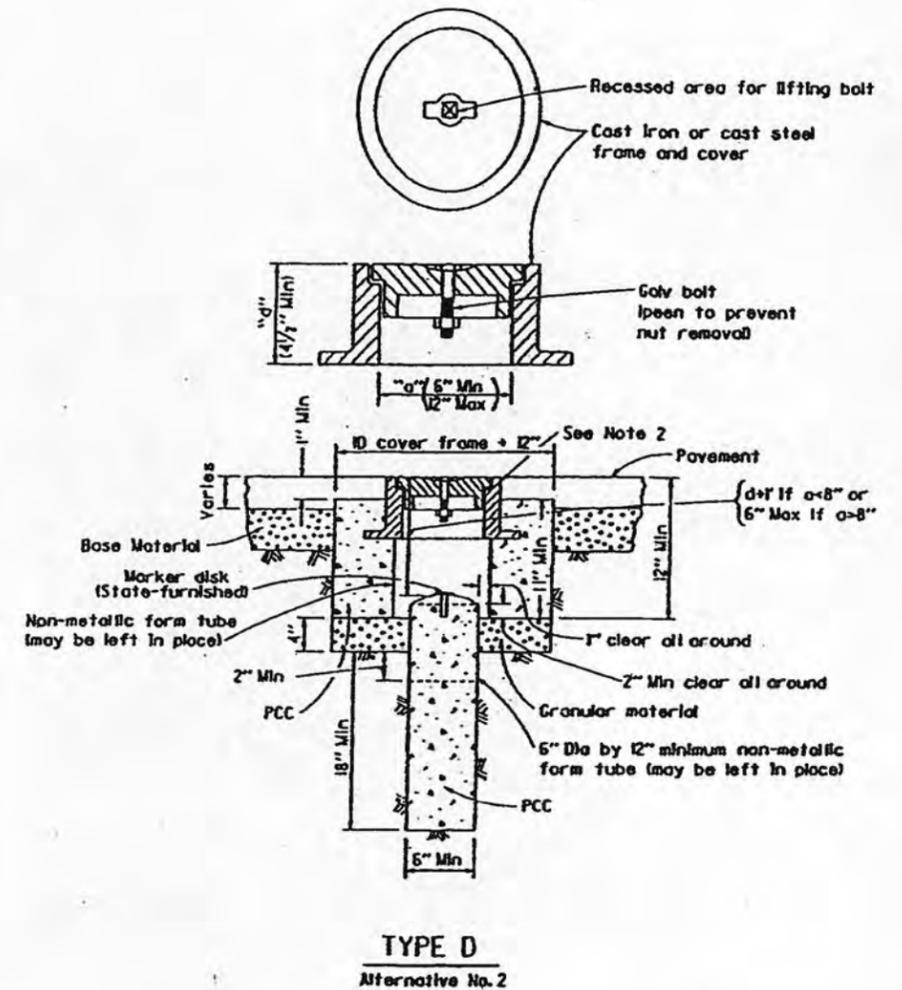
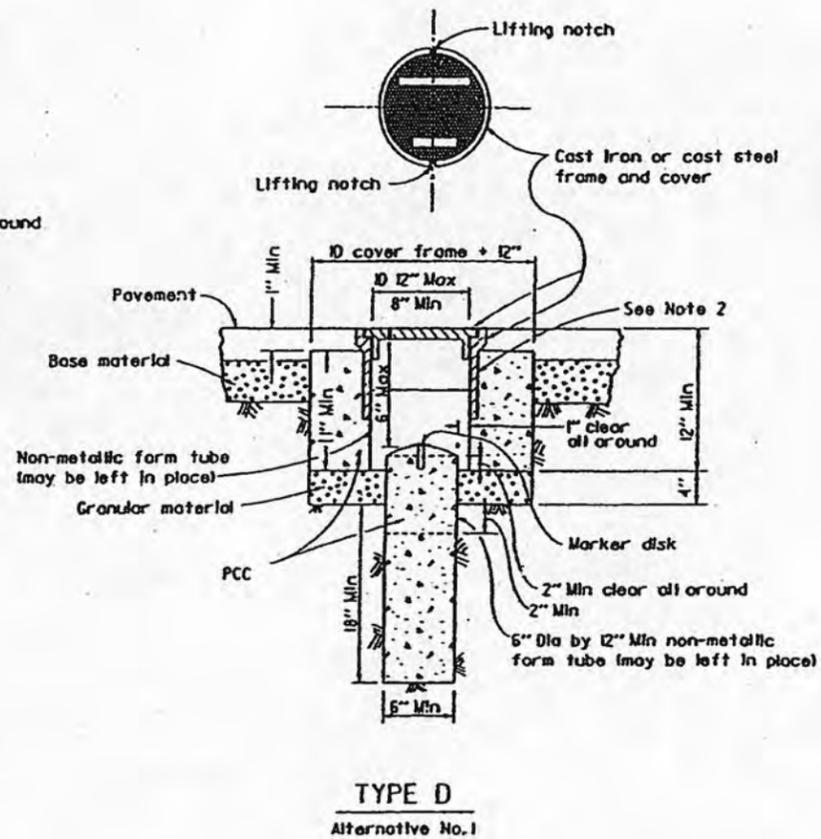
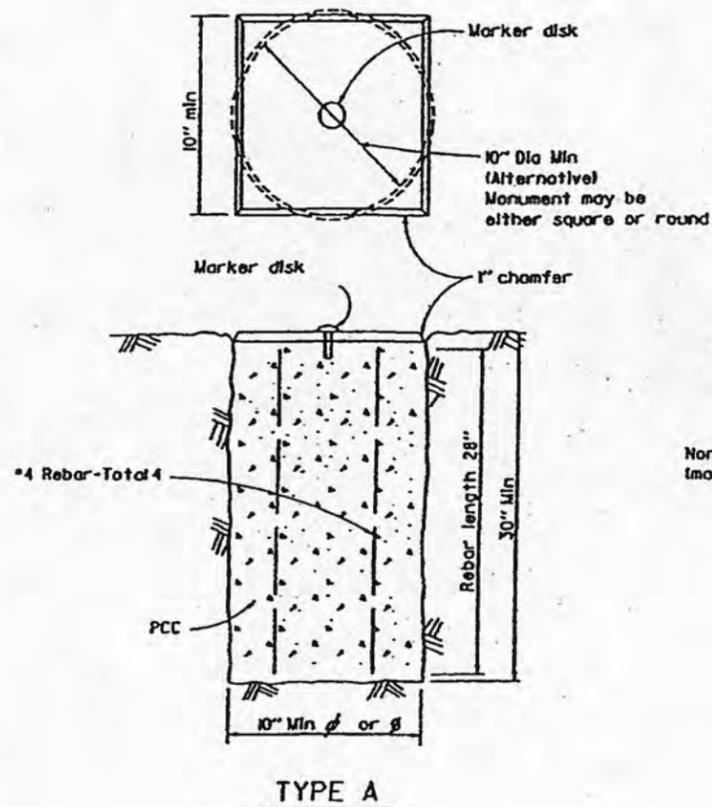
- REFERENCES:**
1. Standard Manholes Draw. No. 10-AA-1018
 2. Std. Manhole Frame & Cover & Shallow Manhole Frame Draw. No. 10-AA-1017.

CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

SHALLOW STORM
DRAIN MANHOLE

No.	DATE	DESCRIPTION	APPROVED
2	4-68	Deleted Brick M.H.	
1	10-57	Drafting Details	
REVISIONS			

DESIGN	SUBMITTED: <i>Richard Rawlin</i>	DATE: 02-01-93
DRAWN: G.M.D.	APPROVED: <i>[Signature]</i>	DRAWING NUMBER: 5-AA-1048A
CHECK: KMH	DIRECTOR OF PUBLIC WORKS: ACE	

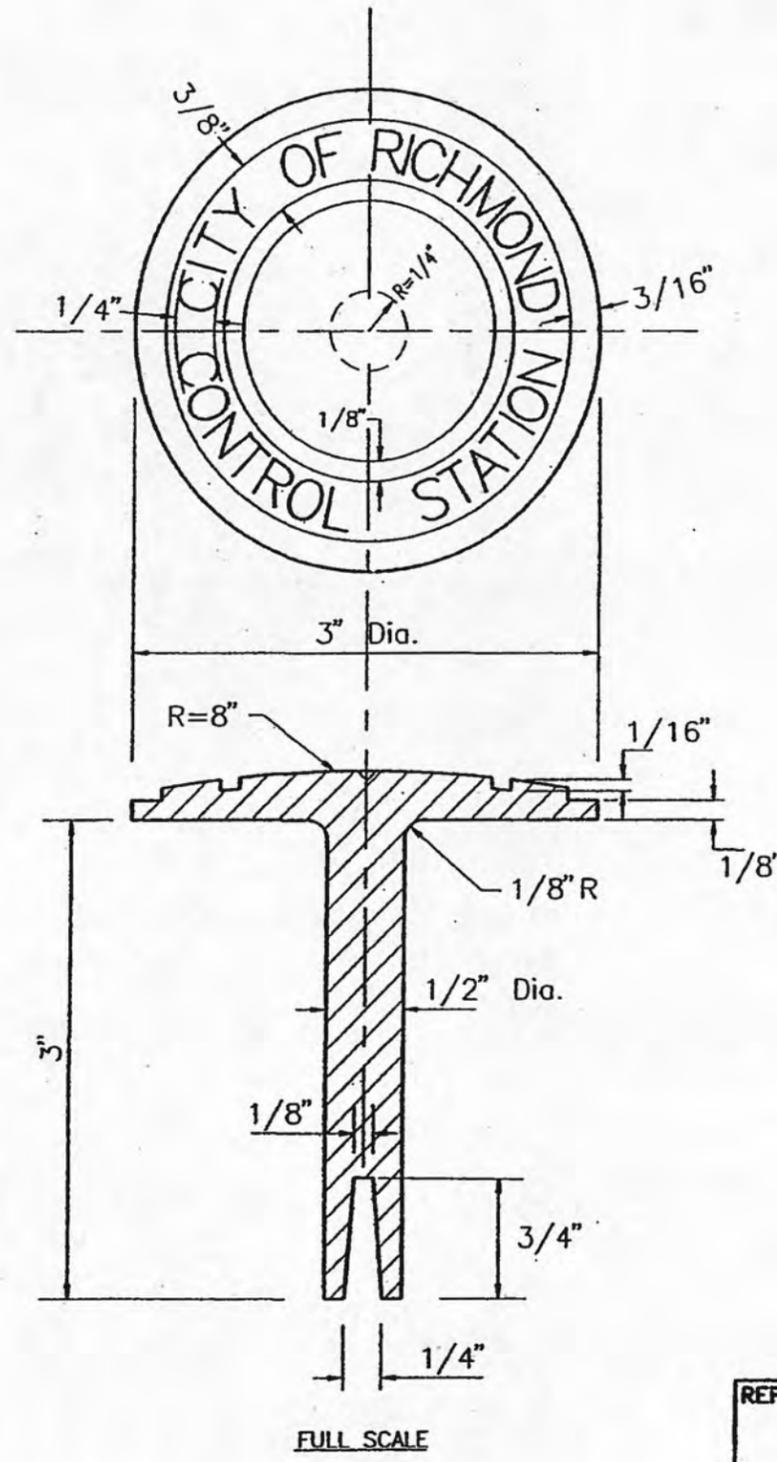


NOTES

1. The configuration of the cast iron or cast steel frame and cover may vary from that shown.
2. Frame shall be embedded in the concrete a minimum of 3".
3. Type D monument shall be either Alternative No. 1 or Alternative No. 2 at the contractor's option.
4. All portland cement concrete shall be Class B or minor concrete with 1" maximum aggregate.

26

REFERENCES: CALTRANS STD PLAN A74 DTD 7-1-92		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
STANDARD DETAILS SURVEY MONUMENTS			
DESIGN	SUBMITTED	DATE	APPROVED
	Richard Dawson	04-09-93	
DRAWN	GMD	APPROVED	DRAWING NUMBER
			30-AA-1045
CHECK	KMH	DIRECTOR OF PUBLIC WORKS P.C.E.	
REVISIONS			

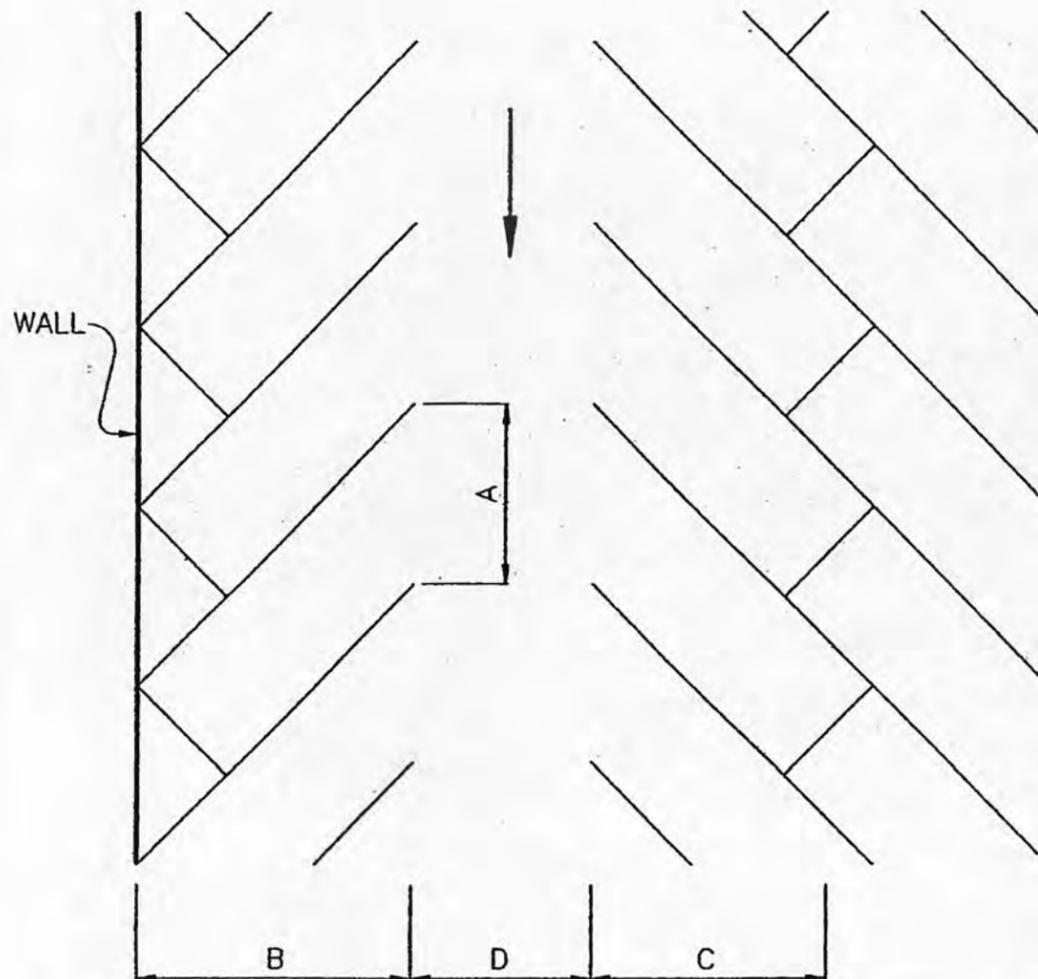


NOTE:
 CASTINGS AVAILABLE AT EAST BAY BRASS FOUNDRY, 13TH & CHESLEY STS. SAN PABLO, CALIFORNIA.
 CITY OF RICHMOND HAS PATTERN FOR CASTING.

NOTE:
 MONUMENT DISC TO BE MADE OF BRONZE.

(27)

REFERENCES: Dwg. 30-AA-1045 (Shows details of entire Monument other than disc).		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING																	
		RICHMOND STANDARD CONTROL SURVEY MONUMENT DISC																	
<table border="1"> <thead> <tr> <th>No.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>APPR.</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>10-7-57</td> <td>Added disc to title. Added note.</td> <td></td> </tr> <tr> <td>2</td> <td>1-30-56</td> <td>Changed shaft and base.</td> <td></td> </tr> <tr> <td>1</td> <td>1-25-56</td> <td>Raised lettered section.</td> <td></td> </tr> </tbody> </table>		No.	DATE	DESCRIPTION	APPR.	3	10-7-57	Added disc to title. Added note.		2	1-30-56	Changed shaft and base.		1	1-25-56	Raised lettered section.		DESIGN DRAWN G.M.D CHECK KMH	SUBMITTED <i>Richard D. Miller</i> APPROVED <i>William J. ...</i> DIRECTOR OF PUBLIC WORKS R.C.E.
No.	DATE	DESCRIPTION	APPR.																
3	10-7-57	Added disc to title. Added note.																	
2	1-30-56	Changed shaft and base.																	
1	1-25-56	Raised lettered section.																	
			DATE 09-01-92 DRAWING NUMBER 30-AA-1049																



TYPICAL PARKING DIMENSIONS IN FEET				
PARKING ANGLE	A STALL WIDTH PARALLEL TO AISLE	B STALL DEPTH TO WALL	C STALL DEPTH TO INTERLOCK	D AISLE WIDTH*
45°				
8.5-ft. stall	12.0	17.5	15.3	13.0
9.0-ft. stall	12.7	17.5	15.3	12.0
9.5-ft. stall	13.4	17.5	15.3	11.0
60°				
8.5-ft. stall	9.6	19.0	17.5	18.0
9.0-ft. stall	10.4	19.0	17.5	16.0
9.5-ft. stall	11.0	19.0	17.5	15.0
75°				
8.5-ft. stall	8.8	19.5	18.8	25.0
9.0-ft. stall	9.5	19.5	18.8	23.0
9.5-ft. stall	9.8	19.5	18.8	22.0
90°				
8.5-ft. stall	8.5	18.5	18.5	26.0
9.0-ft. stall	9.0	18.5	18.5	26.0
9.5-ft. stall	9.5	18.5	18.5	25.0
10.0-ft. stall	10.00	20.00	20.00	25.0

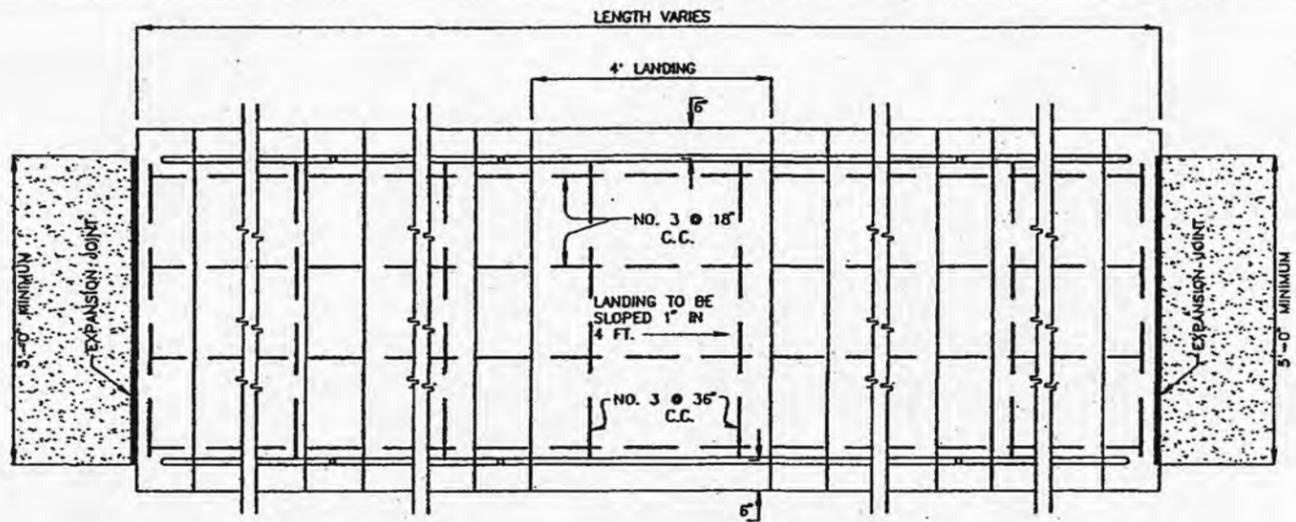
* MEASURED BETWEEN ENDS OF STALL LINES

NOTES:

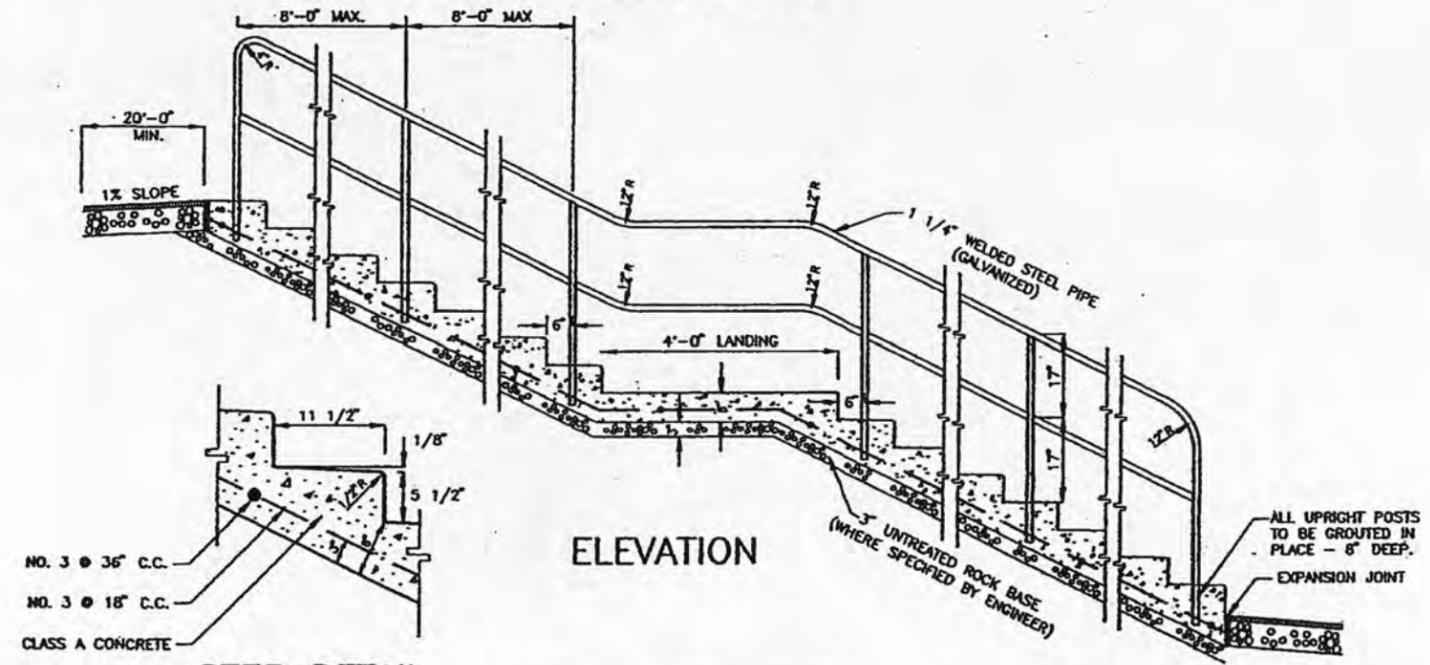
1. 8.5-FEET WIDTH STALLS TO BE USED FOR INDUSTRIAL AND COMMERCIAL EMPLOYEE PARKING ONLY.
2. 9.0-FEET WIDTH STALLS TO BE USED FOR INDUSTRIAL AND COMMERCIAL CUSTOMER PARKING ONLY.
3. 9.5-FEET WIDTH STALLS TO BE USED FOR MARKET AND SHOPPING CENTER PARKING AND MULTIPLE RESIDENTIAL PARKING.
4. 10.0-FEET WIDTH STALLS TO BE USED FOR SINGLE FAMILY RESIDENTIAL PARKING.
5. COMPACT STALLS SHALL BE 8.0-FEET WIDE BY 16.0-FEET LONG. ONLY THOSE STALLS IN EXCESS OF THE NUMBER REQUIRED BY THE ZONING ORDINANCE MAY BE COMPACT.

28

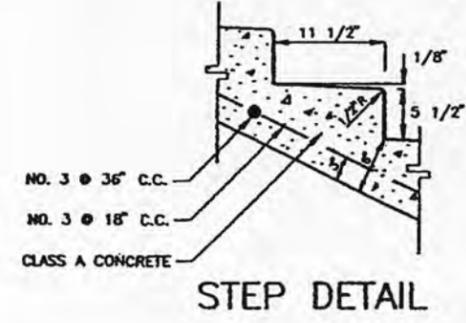
REFERENCES		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STANDARD PARKING DIMENSIONS	
No.	DATE	DESCRIPTION	APPROVED
1	11-10-83	Added Note No. 5	
		DESIGN	SUBMITTED: <i>Richard Daurda</i>
		DRAWN: GMD	DATE: 03-17-93
		CHECK: KMH	APPROVED: <i>[Signature]</i>
			DRAWING NUMBER: 30-A-1116
			DIRECTOR OF PUBLIC WORKS R.C.E.



PLAN
SCALE: 3/8" = 1'-0"

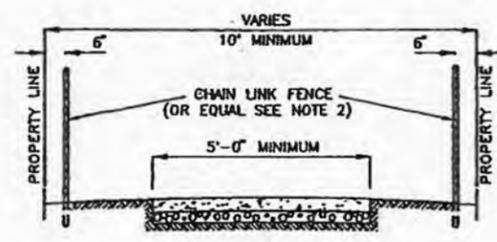


ELEVATION

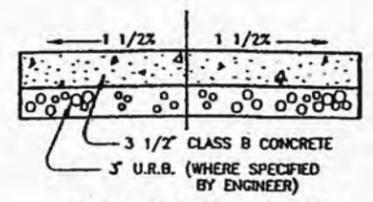


STEP DETAIL

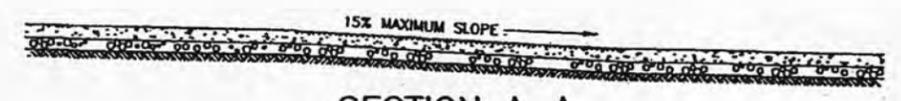
STAIR DETAILS
SCALE: 3/8" = 1'-0"



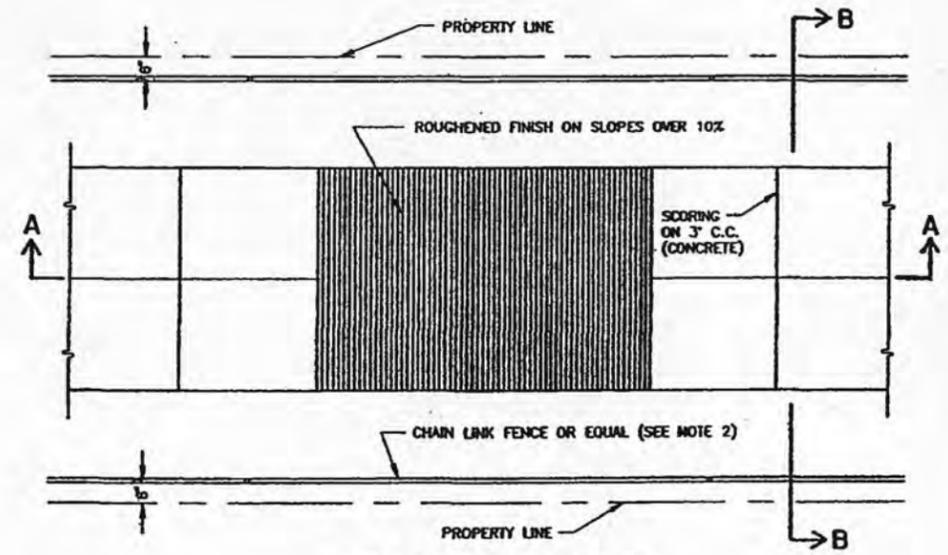
SECTION B-B



CONCRETE WALK



SECTION A-A



PATH DETAILS
N.T.S.

NOTES:

1. LIGHTING TO BE PROVIDED IN ACCORDANCE WITH SEC. 15.08.610 R.M.C.
2. PATH FENCE TO BE CHAIN LINK TYPE OR EQUAL; 3' IN HEIGHT FROM SIDEWALK TO BUILDING SET-BACK LINE, 6' IN HEIGHT BEYOND SET-BACK LINE.
3. MAXIMUM PATH SLOPE TO BE 15%. STAIRS TO BE USED WHERE SLOPE WOULD BE OVER 15%.
4. ONE 4' LANDING TO BE PROVIDED FOR EVERY 12' OF RISE. LANDING(S) TO BE EVENLY SPACED IN STAIR.
5. HANDRAILING ON STAIR TO BE OF 1 1/4" WELDED STEEL PIPE AS SHOWN OR EQUAL. UPRIGHT MEMBERS TO BE EQUALLY SPACED AT 8' C.C. MAXIMUM. PIPE TO BE GALVANIZED.
6. PLANTING TO BE AS DIRECTED BY SUPT. OF PARKS.

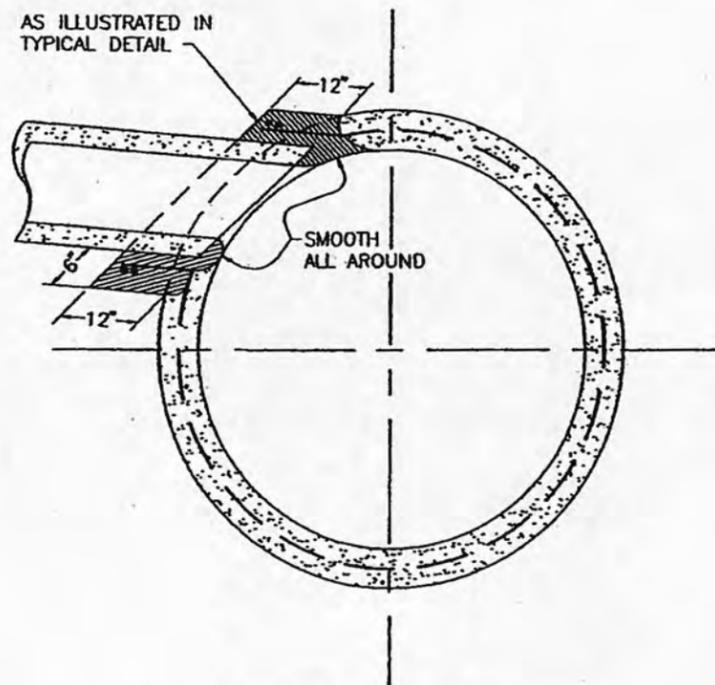
REFERENCES:

No.	DATE	DESCRIPTION	APPRD.
2	9-1-78	COMPLIANCE WITH 15.08.550 R.M.C.	
1	7-1-83	ADDED "CLASS A" NOTATION TO STEP DETAIL	
REVISIONS			

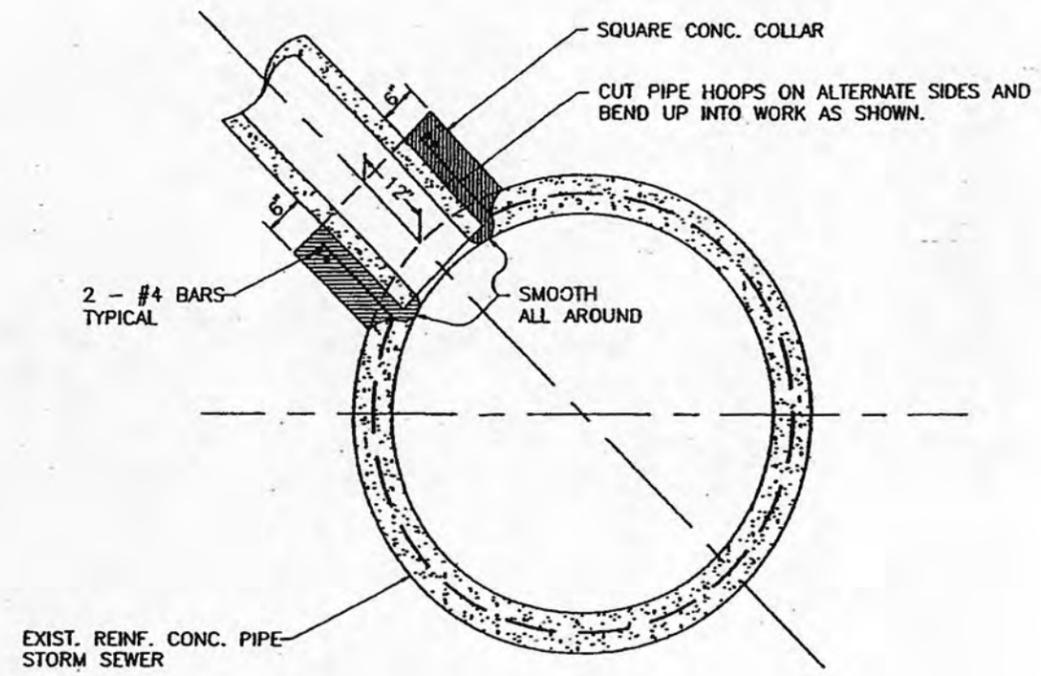
CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

STANDARD DETAILS
PEDESTRIAN PATH
AND STAIRS

DESIGN	SUBMITTED	DATE
DRAWN G.M.D.	APPROVED	04-27-93
CHECK KMH	DIRECTOR OF PUBLIC WORKS P.C.E.	DRAWING NUMBER 5-AA-1110



ALTERNATE DETAIL
TO BE USED WHEN
SPECIFIED
 SCALE: 1/2" = 1'-0"



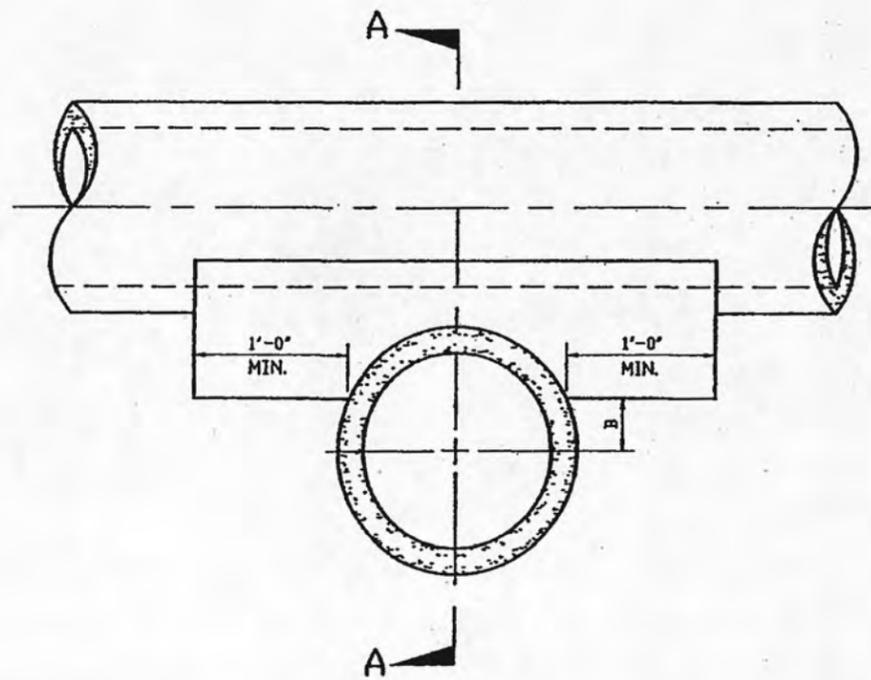
TYPICAL DETAIL
 SCALE: 1/2" = 1'-0"

NOTES:

1. Shaded Area indicates Concrete & Mortar. Fillets and Edges to be Rounded with Mortar.
2. Ratio of Small Pipe Diameter to Large Pipe; Diameter shall be 1:4 Maximum.
3. Collar shall be Class 'A' Portland Cement Concrete or better.
4. Invert of smaller pipe shall not be lower than the spring line of the larger pipe.
5. This type of connection shall only be used when approved by the City Engineer.

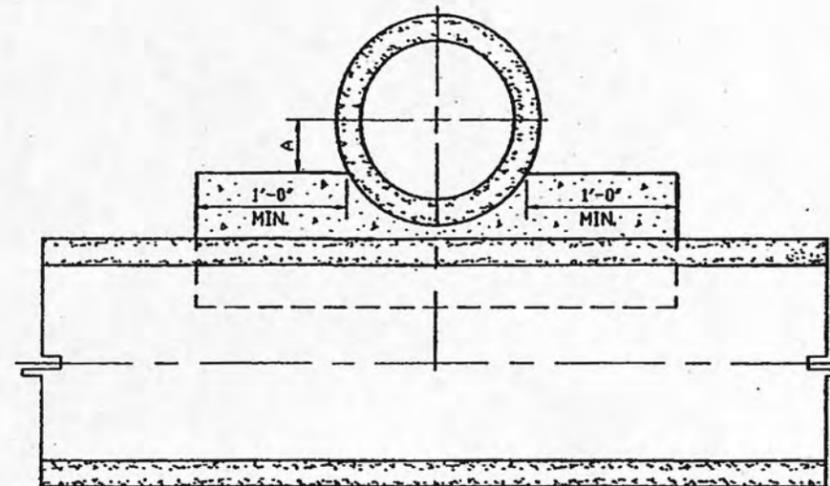
30

REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STANDARD DETAIL CONNECTION OF SMALL R.C.P. TO LARGE R.C.P.	
No.	DATE	DESCRIPTION	APPR.
1	11-2-57	Added notes and dimensions.	
		DESIGN	SUBMITTED <i>Richard M. ...</i>
		DRAWN GMD	APPROVED <i>[Signature]</i>
		CHECK KMH	DIRECTOR OF PUBLIC WORKS R.C.E.
		REVISIONS	DATE 10-05-92 DRAWING NUMBER 6-AA-1061



ELEVATION

SCALE: 1" = 1'-0"



SECTION 'A-A'

SCALE: 1" = 1'-0"

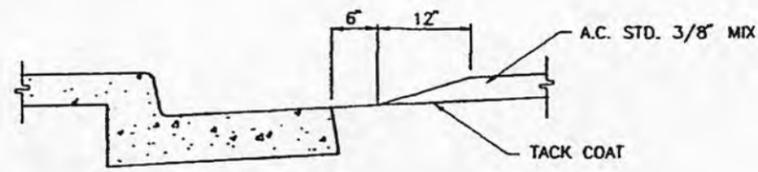
A = 1/4 OUTSIDE DIAMETER OF UPPER PIPE.
 B = 1/4 OUTSIDE DIAMETER OF LOWER PIPE.

NOTE:

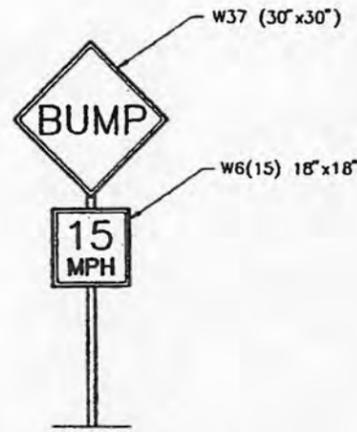
INSTALL CONCRETE CRADLE WHERE ONE PIPE (CONCRETE OR CLAY) PASSES OVER OR UNDER ANOTHER PIPE (CONCRETE OR CLAY) WITH IMPAIRED CLEARANCE.

31

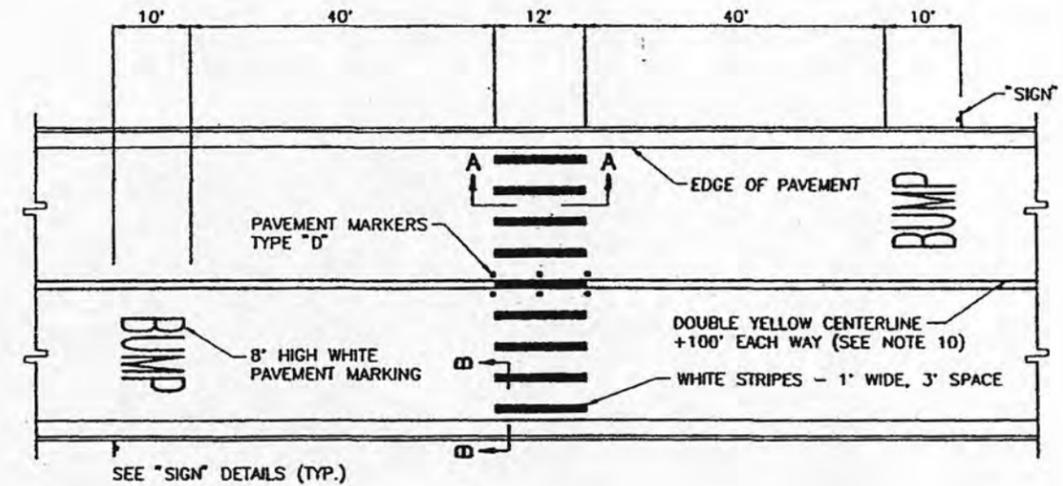
REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STANDARD CONCRETE CRADLE & SADDLE	
		DESIGN	SUBMITTED: <i>Richard [Signature]</i> DATE: 05-11-92
		DRAWN: G.M.B.	APPROVED: <i>[Signature]</i> DRAWING NUMBER: 5-AA-1074
		CHECK: K.M.H.	DIRECTOR OF PUBLIC WORKS REC.
No.	DATE	DESCRIPTION	APPROVED
REVISIONS			



SECTION B-B
NTS



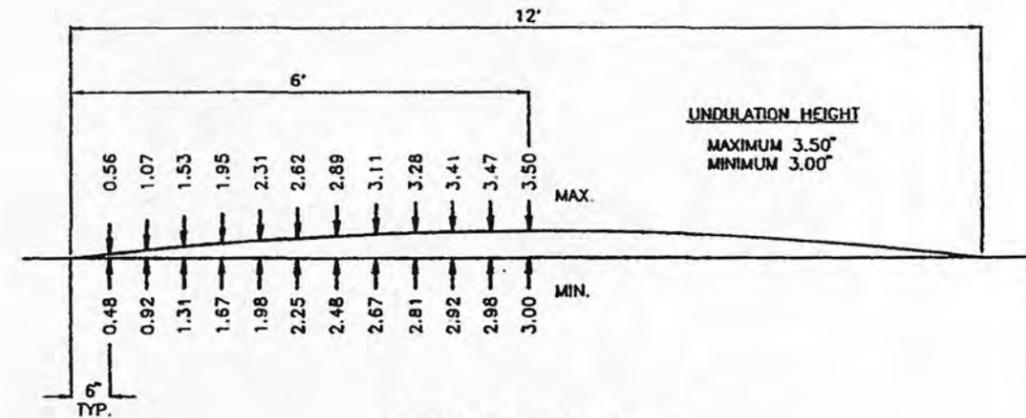
SIGN DETAILS
NTS



PLAN
NTS

GENERAL NOTES:

1. Undulations shall not be placed over manholes, watergates, etc.
2. Edge of undulations shall be at least 10' away from edge of any driveway.
3. Whenever possible undulations should be placed at property lines instead of mid-lot.
4. Whenever possible undulations should be placed adjacent to street lights.
5. All markings and signs shall be reflective.
6. Undulations must be installed with exceptional accuracy and attention to detail.
7. W37/W6 signs must be installed prior to constructing undulations.
8. Striping and pavement legends must be installed immediately after constructing humps.
9. City Traffic Engineer must approve layout prior to construction and verify installation upon completion.
10. Centerline should be used only where the resulting curb to centerline lane width would be a minimum of 18 feet where parking exists and 12 feet where there is no parking.



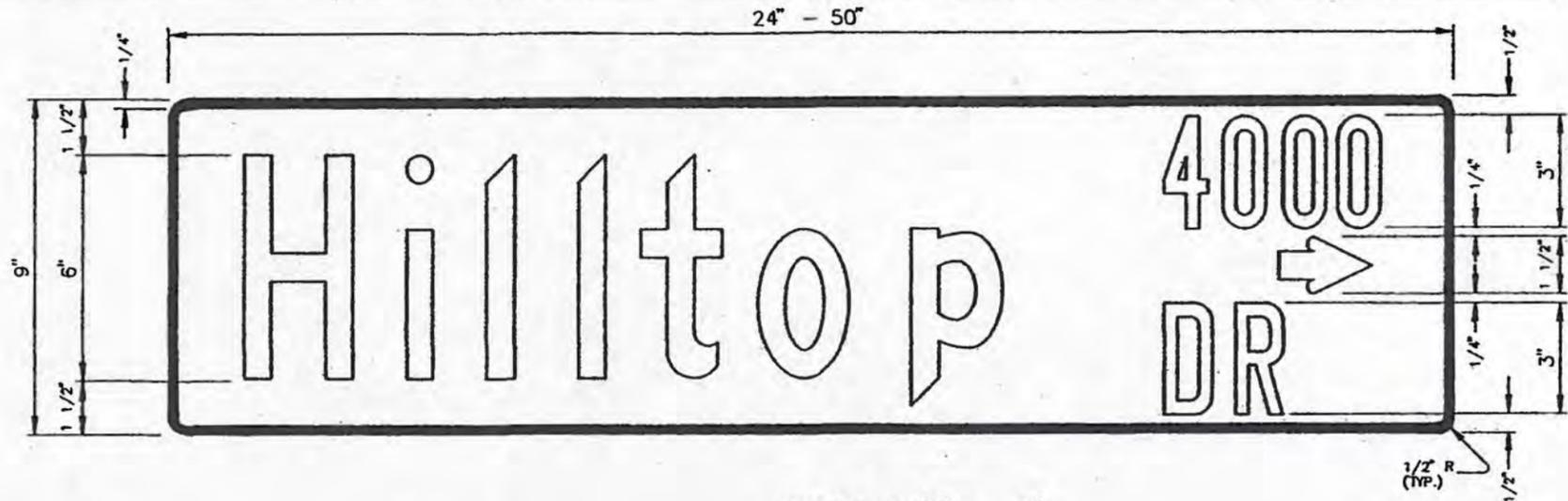
SECTION A-A
NTS

32

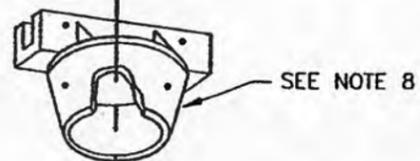
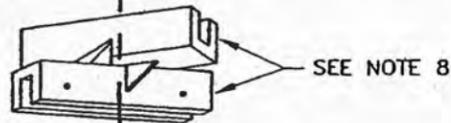
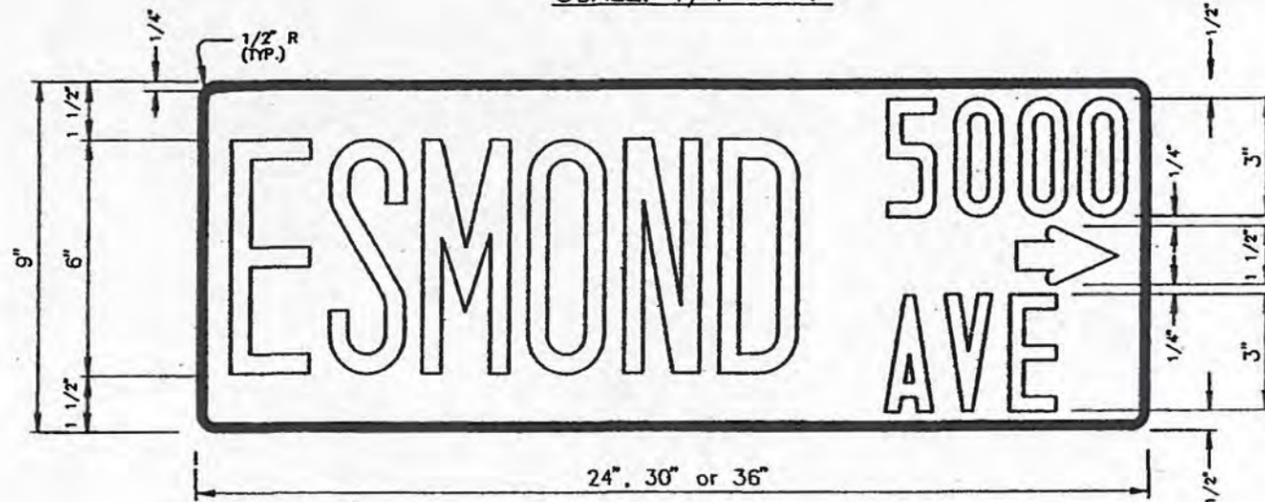
REFERENCES:		CITY OF RICHMOND OFFICE OF COMMUNITY & CULTURAL SERVICES PUBLIC WORKS-ENGINEERING	
		SPEED CONTROL UNDULATIONS	
		DESIGN	SUBMITTED <i>Mary Martin</i>
		DRAWN GONZALO	DATE 06-11-96
		CHECK GRM	APPROVED <i>[Signature]</i>
			CITY ENGINEER R.C.E. MOLIBIZA
			DRAWING NUMBER 8-AA-1121
REVISIONS			
No.	DATE	DESCRIPTION	APPR.
1	8-11-96	USE OF SINGLE BUMPS INSTEAD OF PAIRS OF BUMPS.	GRM

NOTES:

1. All street name signs shall be made from aluminum blade. The length of each blade will be dictated by the contained message with special considerations to layout. Blade thickness shall be .080 with 1/2" corners radii. Applicable items shall conform to Caltrans specifications.
2. All street name signs shall be 9" high and shall have a 1/4" border encasing the entire sign. There shall be no recession space between edge of plate and border.
3. Background shall be approved green reflective material.
4. Letters and numbers shall be approved silver reflective material.
5. Names of all major streets, shall consist of upper and lower case letters. Uppercase letter and number size shall be 6" series B or C. Lowercase letters will be 4 1/2" series B or C.



SCALE: 1/4" = 1"

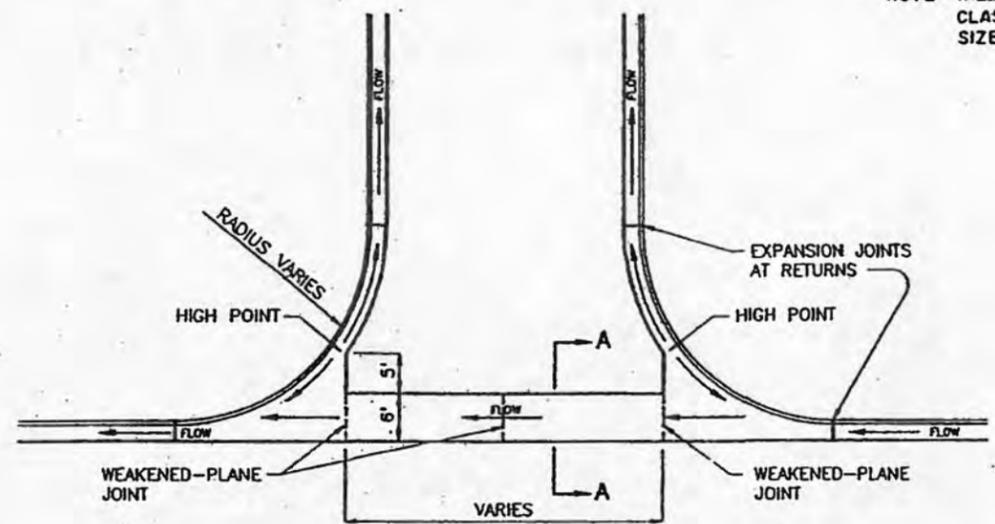


6. Names of all other streets shall consist of uppercase letters only. Letters and numbers shall be 6" series B or C.
7. All address numbers and abbreviations such as St., Ave., Blvd., Pl., Ct., Dr., Ln, Cir., Rd, and Hwy. shall be 3" B or C series. Directional arrows shall be installed on all street name signs and size and design of arrow shall be as pictured.
8. All street name signs shall be constructed of a single blade with street names on both sides. The minimum length of Blade clamp hardware shall be 5".
9. The street name shall be centered vertically on the sign plate. However, in no case shall any portion of any letter be closer than 1/4" from the sign border.

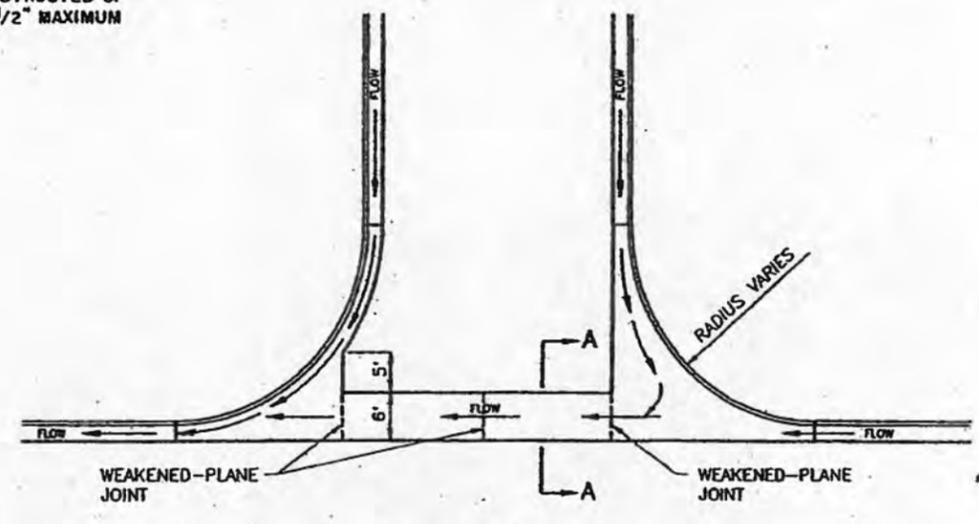
33

REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STREET NAME SIGN	
DESIGN	J.S.	SUBMITTED	Don Martin
DATE		APPROVED	[Signature]
DRWN	GMD	CHECKED	J.R.M.
REVISIONS		DATE	03-29-83
		DRAWING NUMBER	30-B-1086
		DIRECTOR OF PUBLIC WORKS R.C.L.	

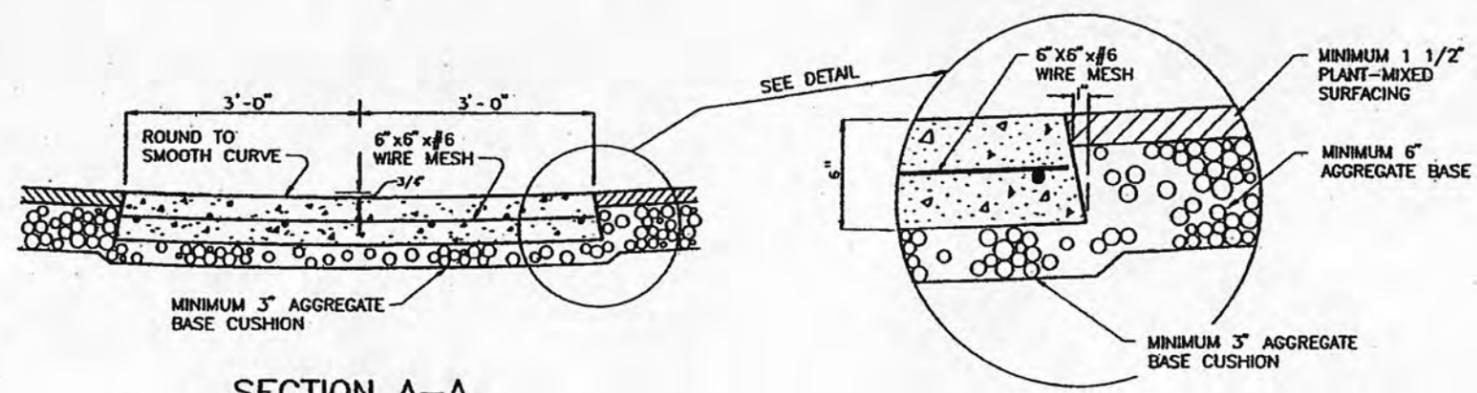
NOTE: VALLEY GUTTERS SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE HAVING 1 1/2" MAXIMUM SIZE AGGREGATE.



TYPICAL PLAN
SCALE 1" = 20'

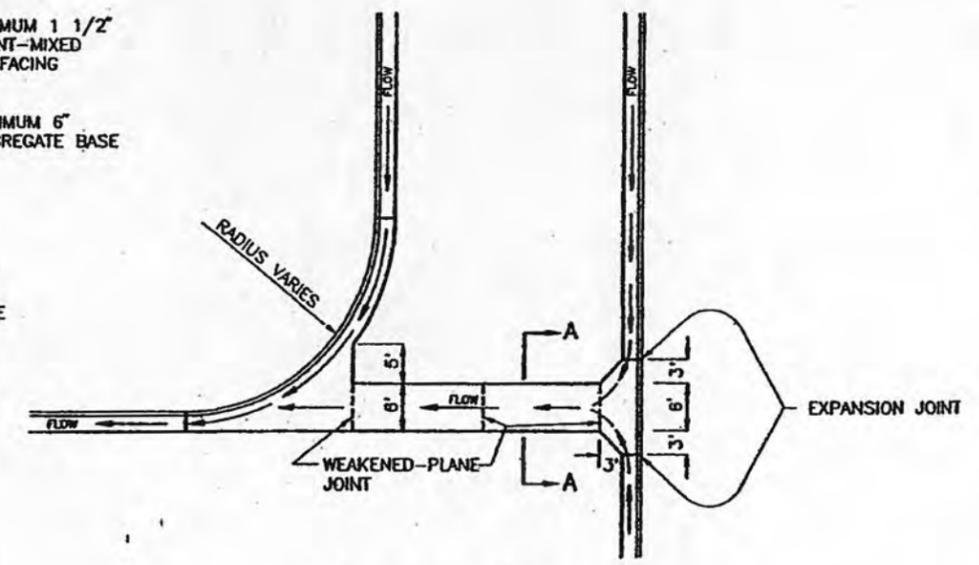


JUNCTION PLAN
SCALE 1" = 20'

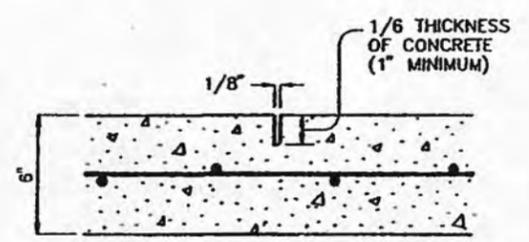


SECTION A-A
N.T.S.

DETAIL
N.T.S.



JUNCTION PLAN
SCALE 1" = 20'



WEAKENED PLANE JOINT
N.T.S.

34

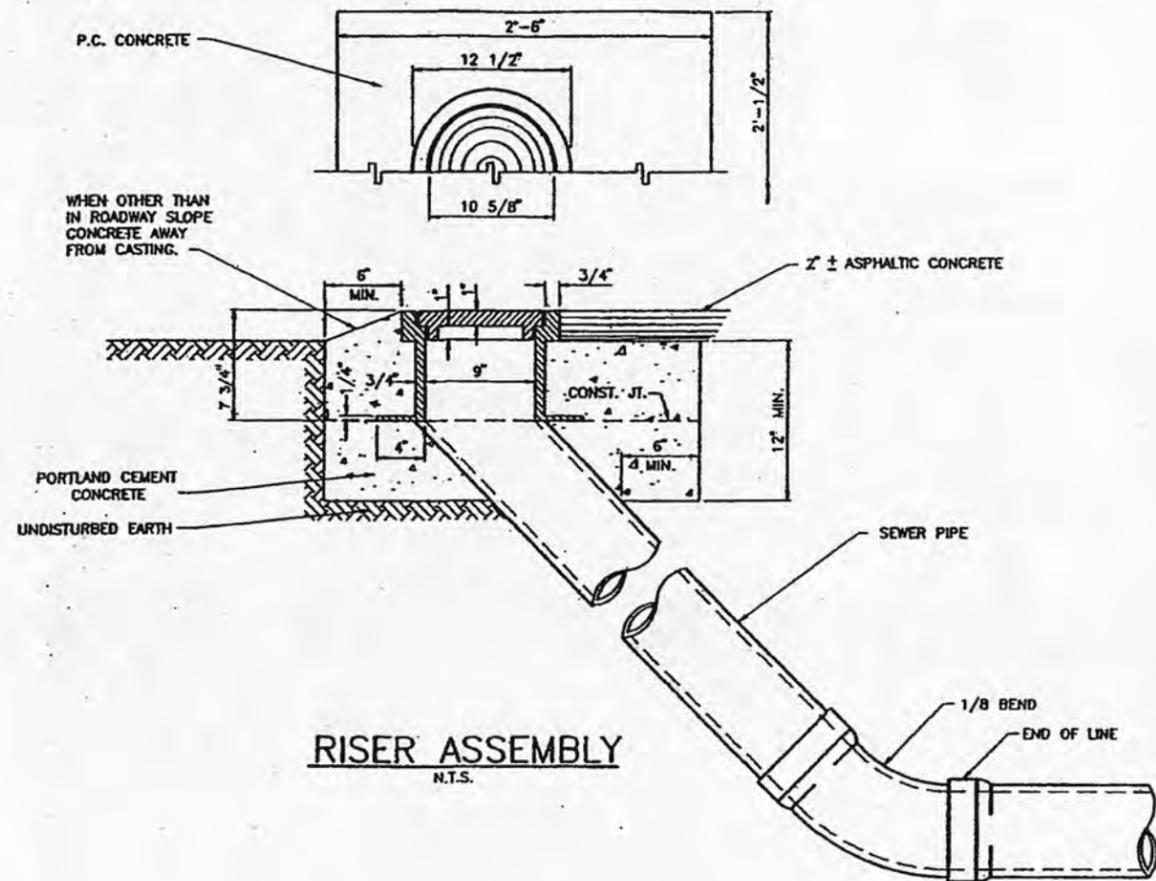
REFERENCES: Supersedes Dwg. No. 5-A-10.

CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

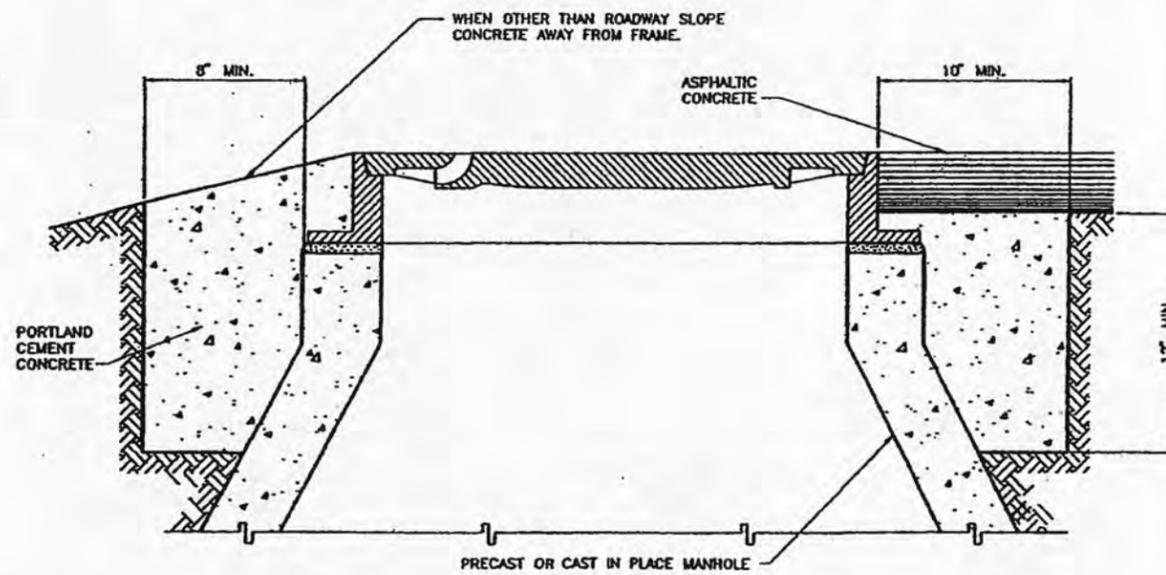
CONCRETE
VALLEY GUTTER
STANDARD DETAILS

No.	DATE	DESCRIPTION	APPR.
1	11-3-65	Added Weakened Plane-Joint on @	
REVISIONS			

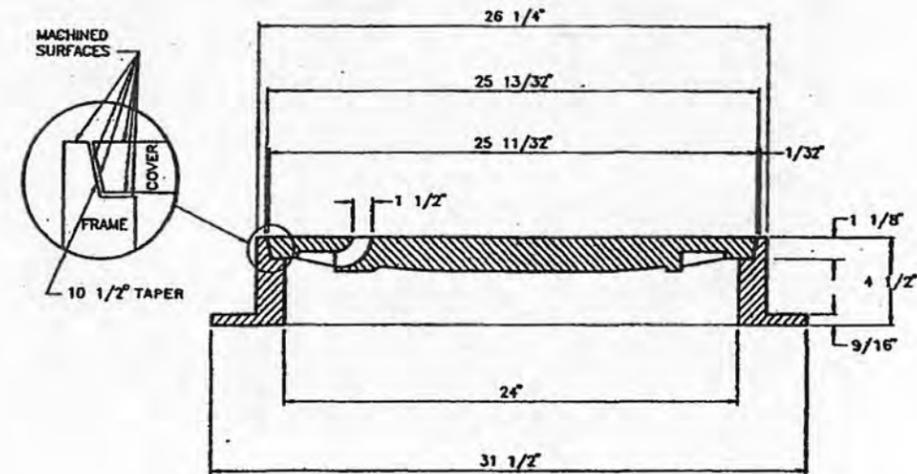
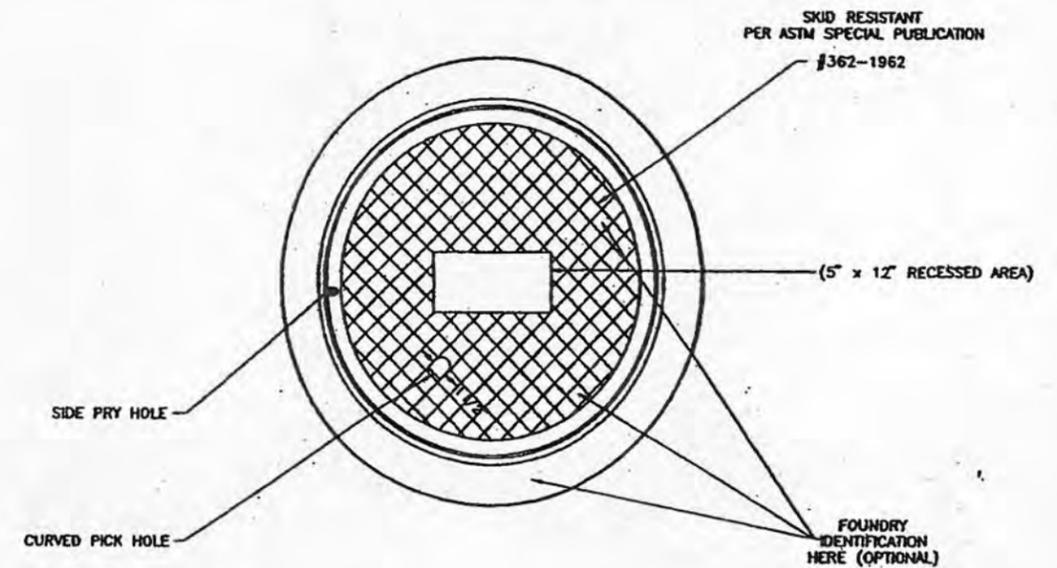
DESIGN	SUBMITTED	DATE
	<i>Richard M. ...</i>	03-16-93
DRAWN	APPROVED	DRAWING NUMBER
GMD	<i>[Signature]</i>	5-AA-1065
CHECK	DIRECTOR OF PUBLIC WORKS P.E.	
KMH		



RISER ASSEMBLY
N.T.S.



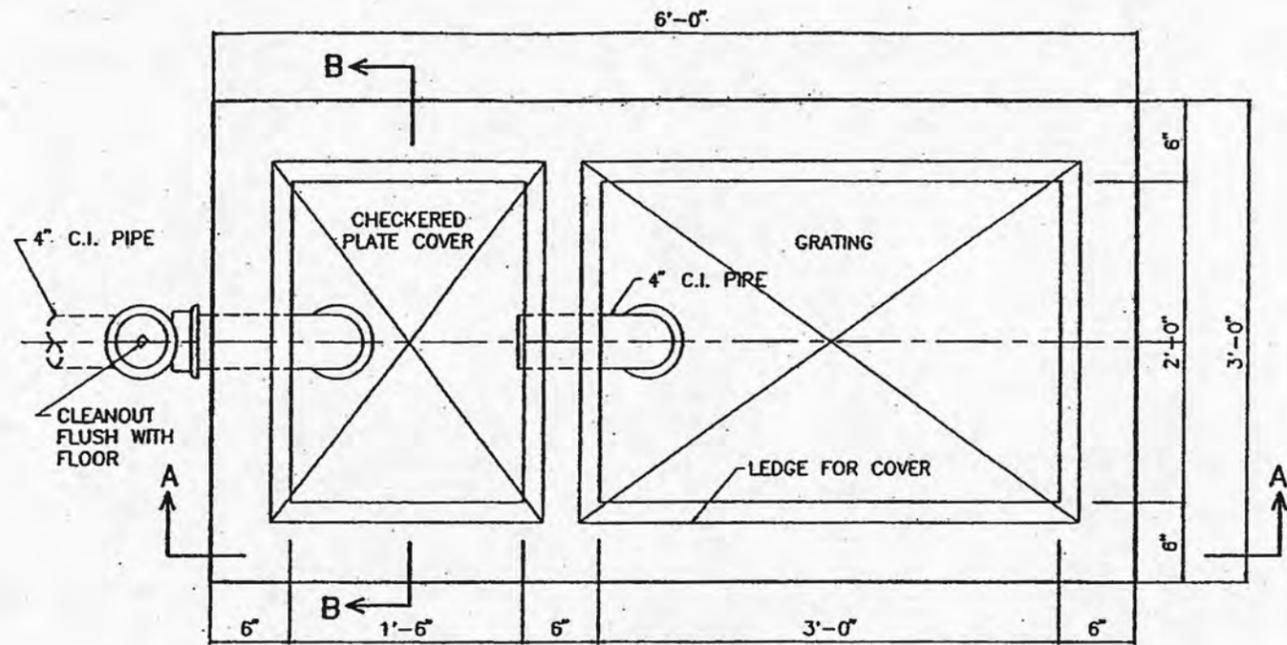
SECTION THRU MANHOLE
SCALE: 1 1/2" = 1'-0"



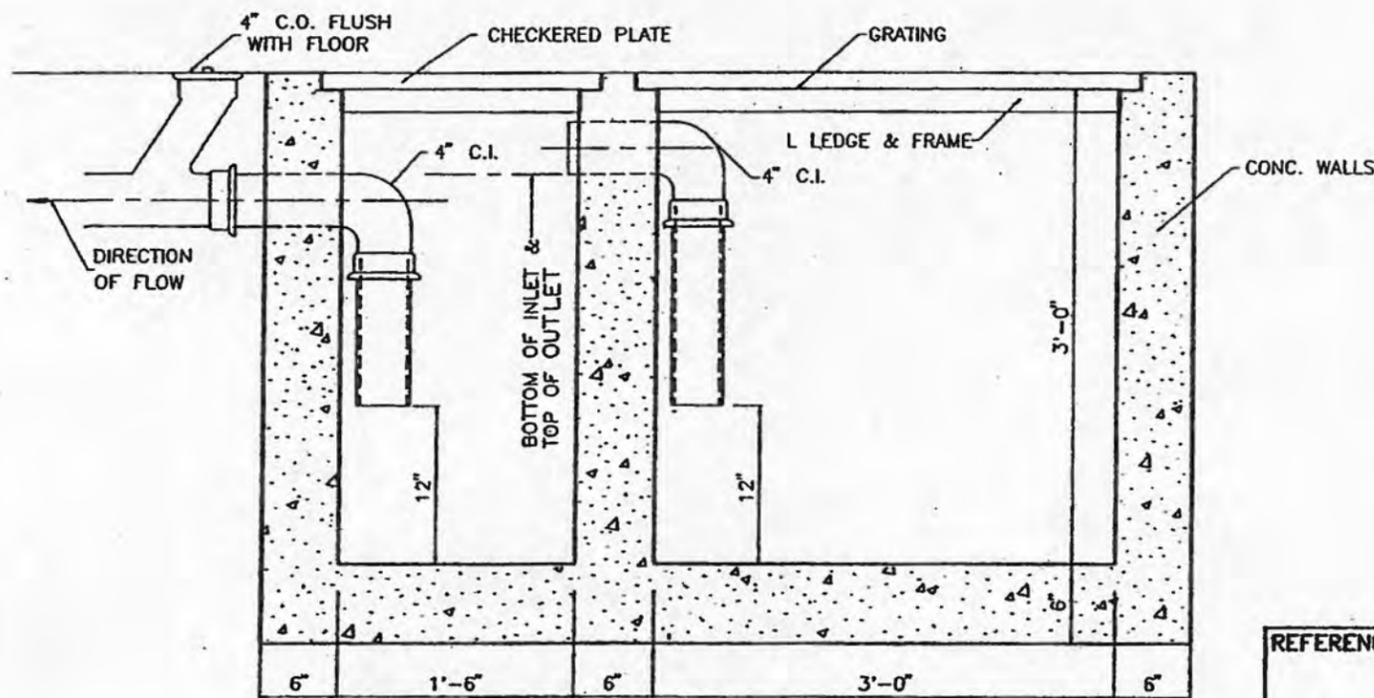
CAST IRON MANHOLE FRAME AND COVER

36

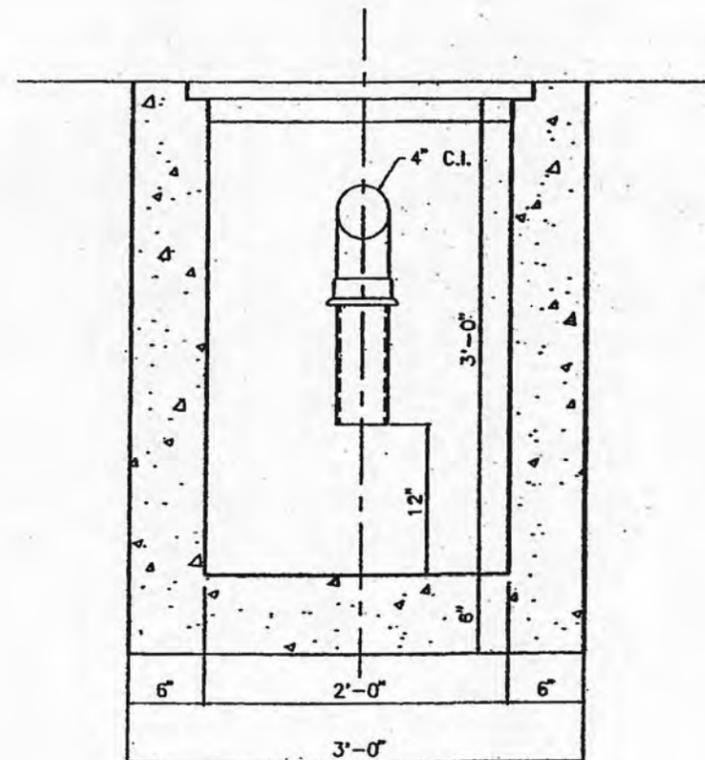
REFERENCES:				CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
				STANDARD RISER FRAME & COVER STANDARD MANHOLE FRAME & COVER		
No.	DATE	DESCRIPTION	APPR.	DESIGN	SUBMITTED	DATE
				G.M.B.	<i>Richard Lynda</i>	01-20-83
				K.M.H.	<i>W. J. [Signature]</i>	DRAWING NUMBER
					DIRECTOR OF PUBLIC WORKS P.C.E.	10-AA-1017



PLAN
SCALE: 1" = 1'-0"



SECTION A-A
SCALE 1" = 1'-0"

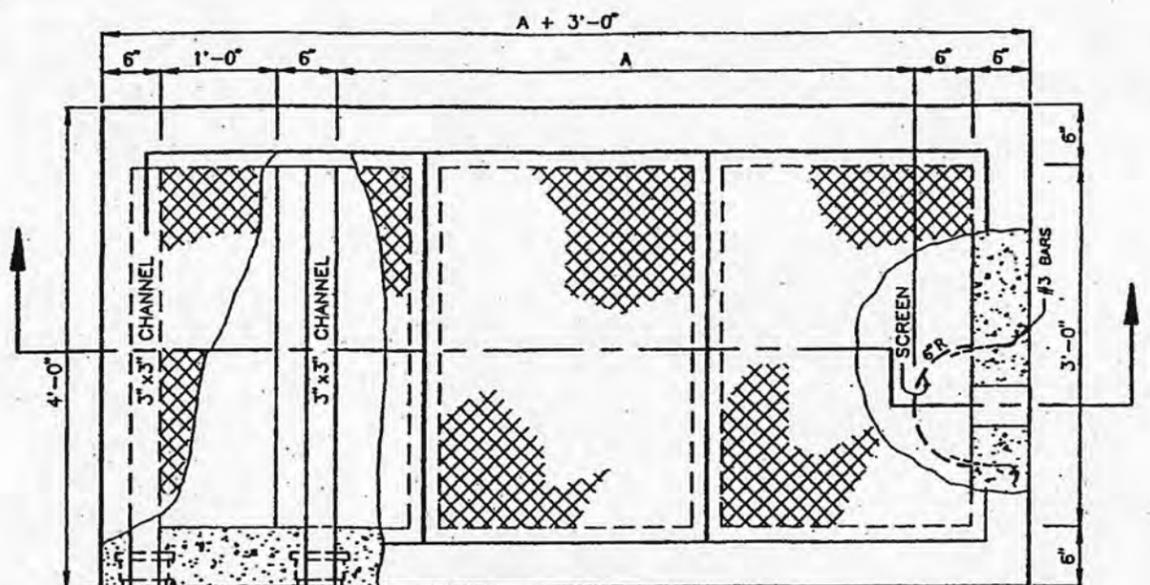


SECTION B-B
SCALE: 1" = 1'-0"

Approved By Plumbing Inspector
(Sgd.) George W. Doll

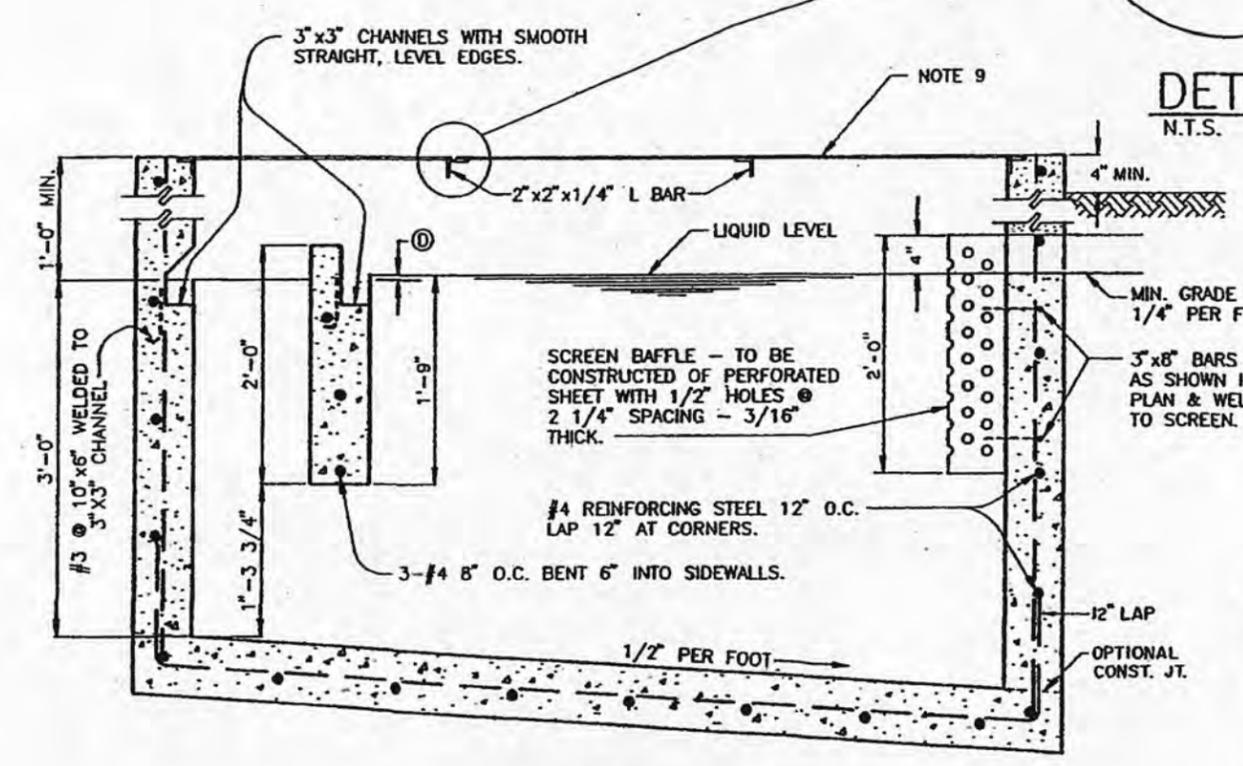
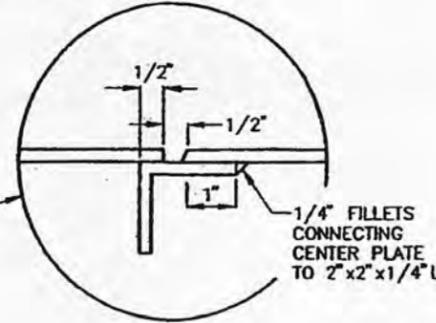
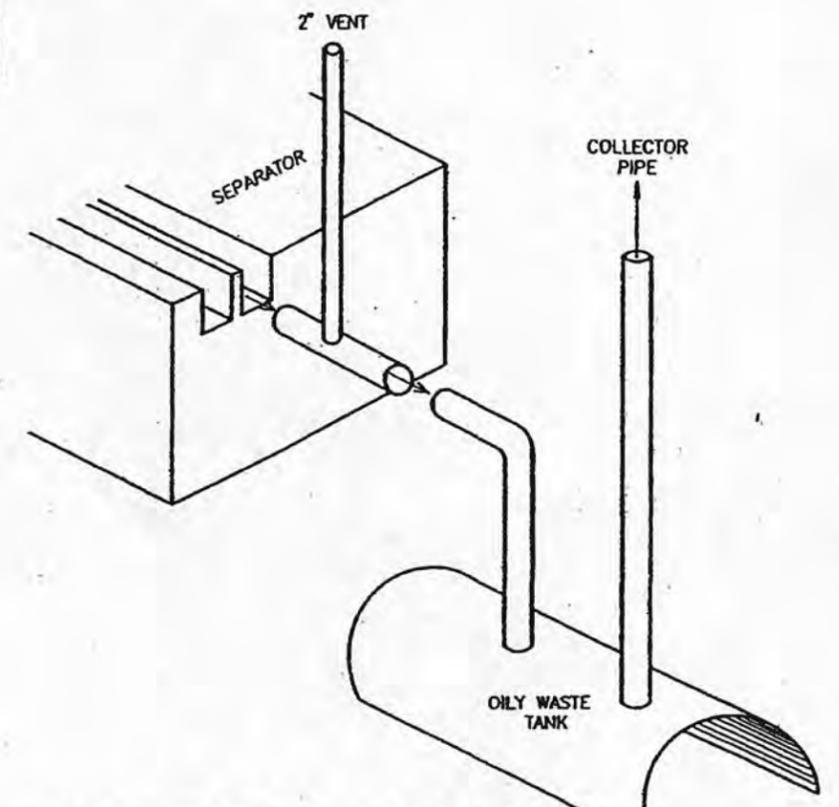
37

REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		DETAILS OF STANDARD GREASE & SAND TRAP FOR AUTO WASH RACKS	
DESIGN		SUBMITTED	Richard [Signature]
DATE		DATE	07-13-92
NO.	DATE	DESCRIPTION	APPROVED
			[Signature]
			DIRECTOR OF PUBLIC WORKS D.C.E.
			DRAWING NUMBER
			10-AA-1005
REVISIONS		CHECK	KMH



CAPACITIES	DIMENSIONS	
	A	B
10 GPM	1'-6"	3/8"
20 GPM	3'-0"	1/2"
40 GPM	6'-0"	3/4"

FOR LARGER CAPACITIES, DETAILED PLANS OF SEPARATOR SHALL BE SUBMITTED TO THE DIRECTOR OF PUBLIC WORKS.



NOTES:

- 3" x 3" CHANNEL SHALL BE 14 GA. METAL OR THICKER OR MAY BE FORMED WITH CONCRETE.
- ALL METAL PORTIONS ARE TO BE OF STEEL WHICH SHALL BE GALVANIZED AFTER FABRICATION.
- THE CENTER LINE OF INLET SHALL NOT BE CONSTRUCTED LESS THAN 12" FROM EITHER SIDE.
- THE COVER PLATE SHALL BE 1/4" CHECKERED PLATE AND THE MAXIMUM CLEAR SPAN SHALL BE 3'-0".
- WALLS AND BOTTOM SHALL BE REINFORCED CONCRETE.
- OIL & SILT SEPARATOR SHALL BE ENCLOSED AGAINST RAINS.
- VENT SHALL BE IN ACCORD WITH PLUMBING CODE SECTIONS 310, 506, 708 & 709.
- SEWAGE AND WASTE OUTLETS MAY BE ON EITHER SIDE OF SEPARATOR.
- SEPARATOR SHALL BE RAISED ABOVE GROUND TO PREVENT VEHICLES FROM CROSSING EXCEPT WHEN ALTERNATE DESIGN IS APPROVED BY DIRECTOR OF PUBLIC WORKS.

APPROVED CONTINUOUS OILY WASTE SEPARATOR MANUFACTURED BY PLUMBING FIXTURE CO. MAY BE USED IN LIEU OF THIS DESIGN.

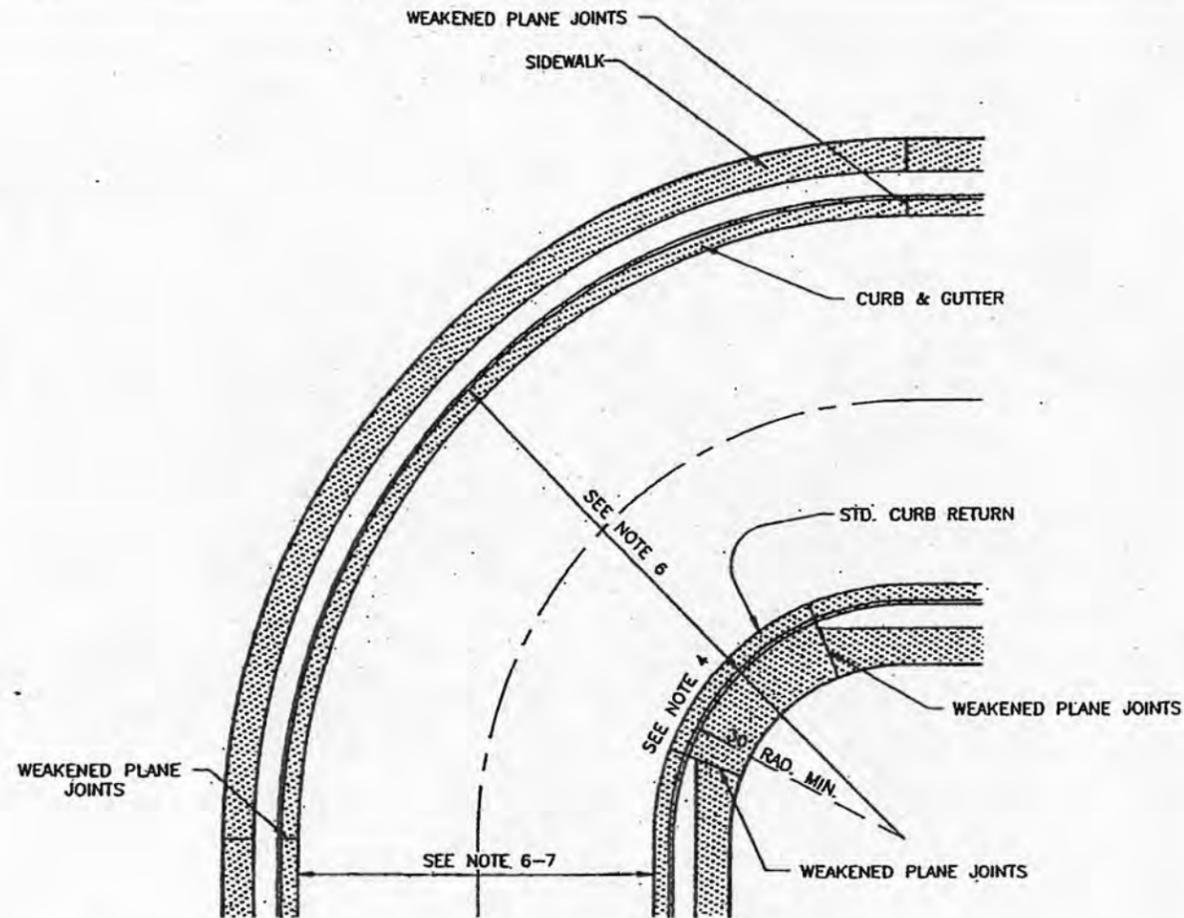
38

REFERENCES:			
No.	DATE	DESCRIPTION	APPRO.
1	1-15-68	BAR LAPS & CONST. JOINTS ADDED	
REVISIONS			

CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

**OIL & SILT SEPARATOR
STANDARD DETAILS**

DESIGN	SUBMITTED	DATE
	<i>Richard Kamin</i>	03-30-93
DRAWN	APPROVED	DRAWING NUMBER
GMD	<i>[Signature]</i>	10-B-1049
CHECK	DIRECTOR OF PUBLIC WORKS R.C.C.	
KMH		

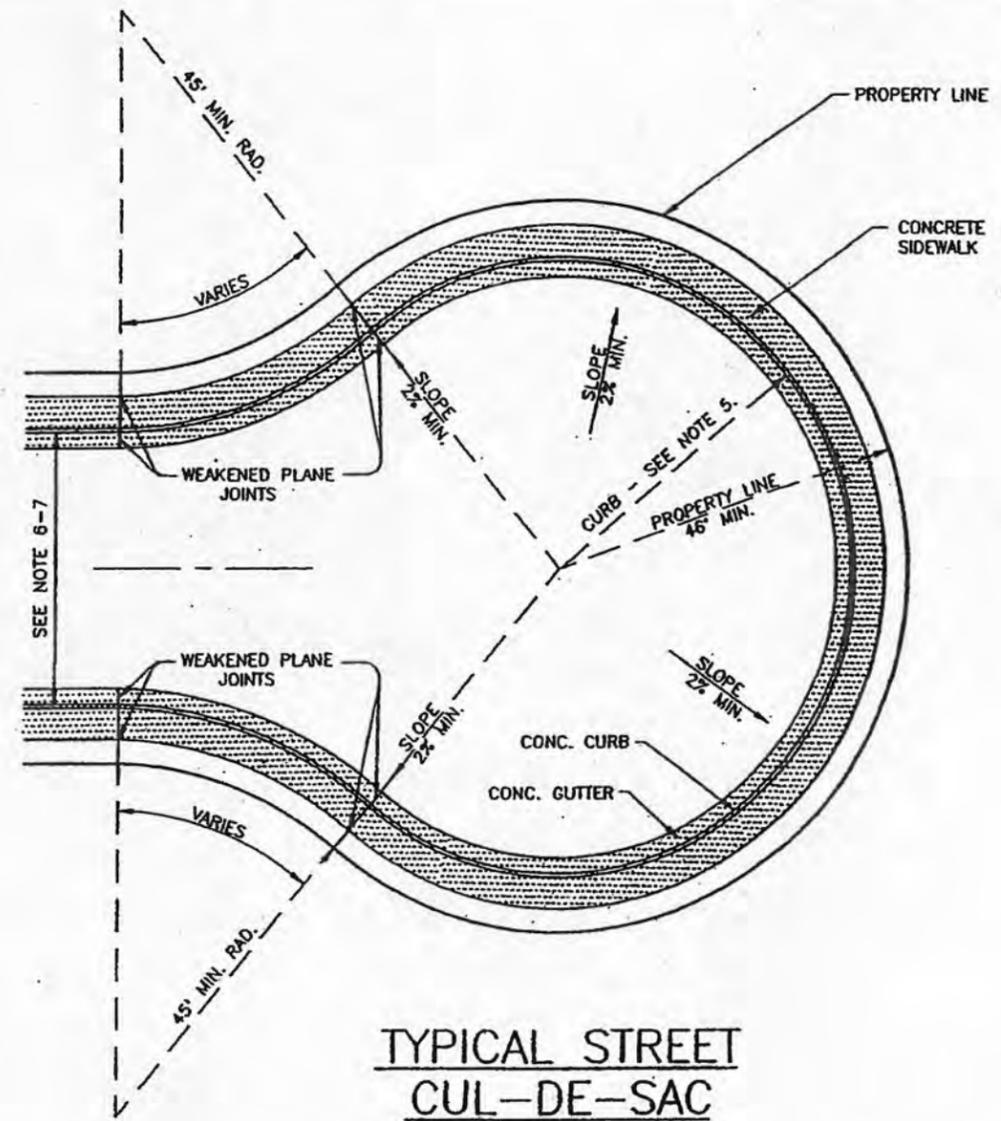


DETAIL OF CIRCULAR CORNER

SCALE: 1" = 20'-0"

ABBREVIATIONS

CONC. - CONCRETE
 RAD. - RADIUS
 PROP. - PROPERTY

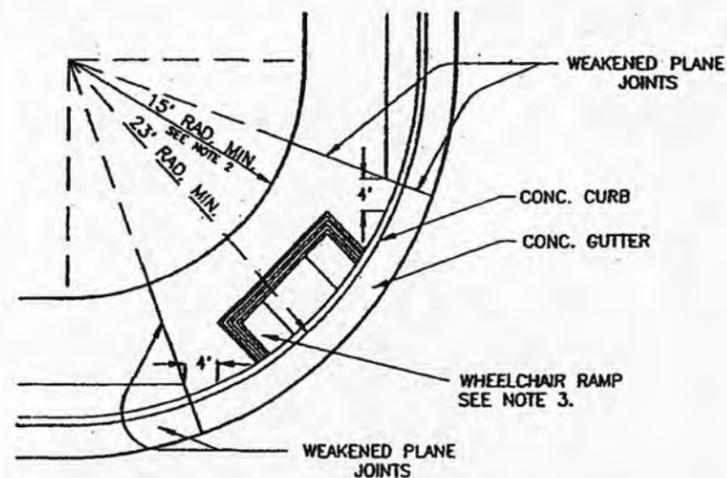


TYPICAL STREET CUL-DE-SAC

SCALE: 1" = 20'-0"

NOTES:

1. SHADING INDICATES CONCRETE CURBS, GUTTERS AND SIDEWALKS.
2. 25' MIN. PROPERTY LINE RADIUS IN INDUSTRIAL SUBDIVISIONS.
3. SEE STANDARD CONCRETE WHEELCHAIR RAMP, DRAWING NO. 5-AA-1345. TYPE OF RAMP TO BE DETERMINED BY CITY.
4. CURB ON INSIDE OF CURVE TO BE POSTED NO PARKING.
5. MINIMUM FOR MINOR STREETS = 40'; MINIMUM FOR MINOR INDUSTRIAL STREETS = 50'.
6. MINIMUM FOR MINOR STREETS = 40'; MINIMUM FOR MINOR INDUSTRIAL STREETS = 42'.
7. FOR SPECIAL CASES SEE R.M.C. SECTION 15.08.540 "DESIGN STANDARDS-STREETS-CROSS SECTION" AND ORDINANCE 110 N.S. - "STANDARDS FOR HILLSIDE SUBDIVISIONS."



STANDARD CURB RETURN

SCALE: 1" = 10'-0"

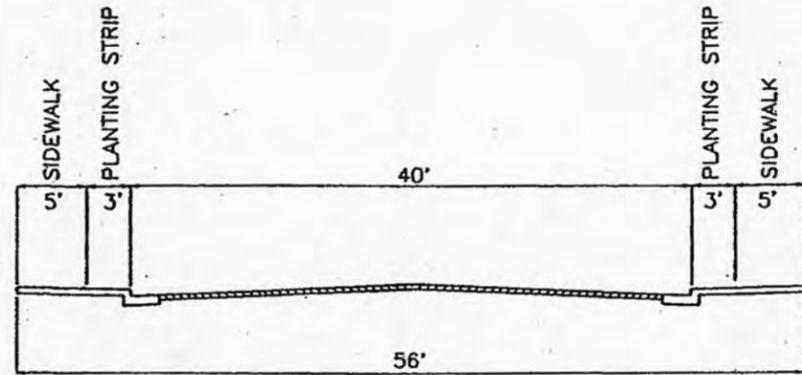
REFERENCES:

No.	DATE	DESCRIPTION	APPR.
3	10-8-80	CUL-DE-SAC, WHEELCHAIR RAMP, NOTES.	
2	11-24-82	REV. CORNER AND ADDED NOTES	
1	7-30-58	CHANGED CUL-DE-SAC.	
REVISIONS			

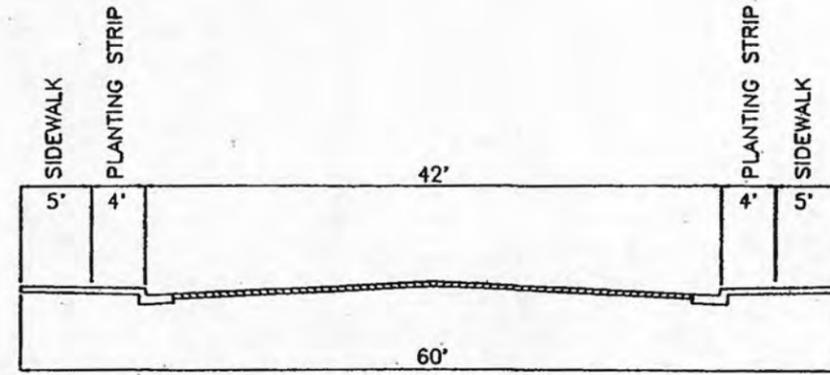
CITY OF RICHMOND
 DEPARTMENT OF PUBLIC WORKS
 DIVISION OF ENGINEERING

STANDARD STREET DETAILS

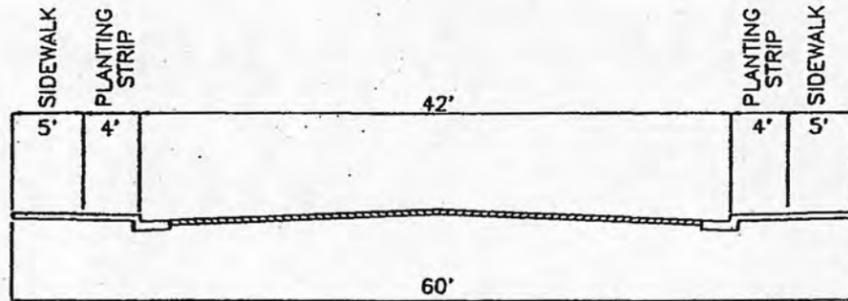
DESIGN	SUBMITTED	DATE
DRAWN G.M.D.	<i>Richard ...</i>	01-26-93
CHECK K.M.H.	APPROVED	DRAWING NUMBER
	<i>[Signature]</i>	5-AA-1071
	DIRECTOR OF PUBLIC WORKS R.E.E.	



RESIDENTIAL

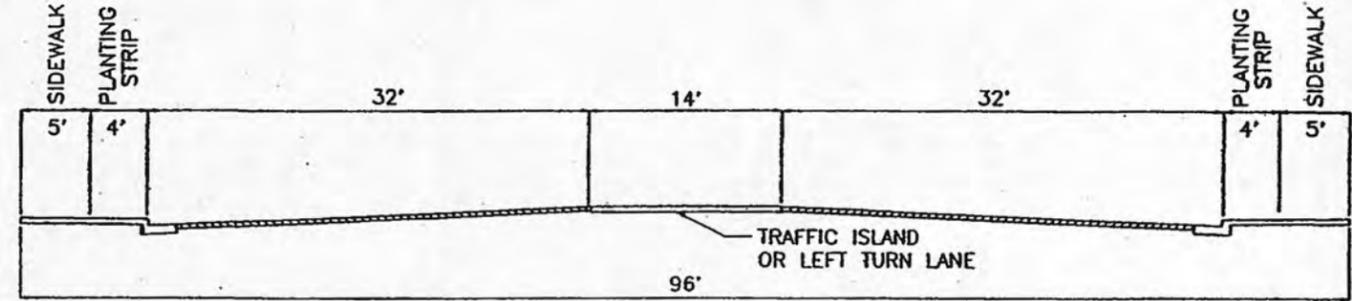


RESIDENTIAL



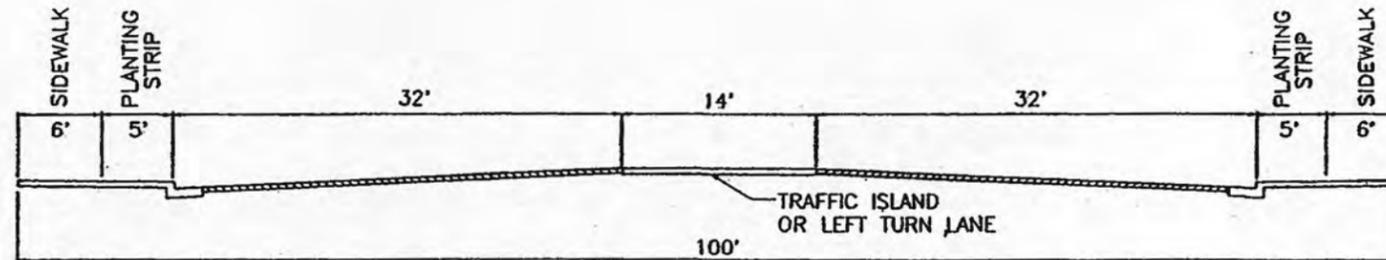
INDUSTRIAL

MINOR STREETS



INDUSTRIAL

COLLECTOR STREETS



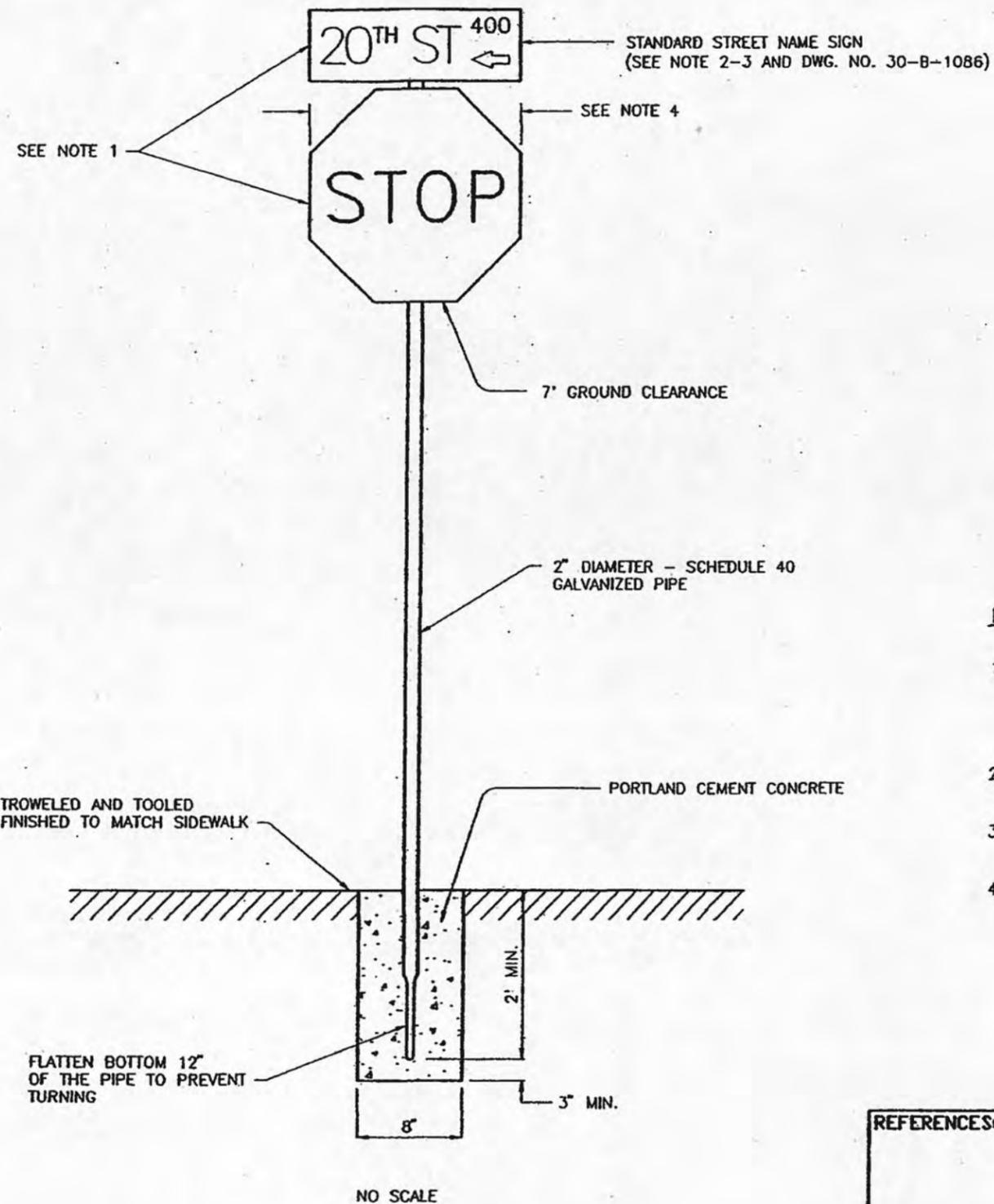
ARTERIAL STREETS

SCALE: 3/32" = 1'-0"

NOTE: FOR SPECIAL CASES SEE R.M.C. SECTION 15.08.540 "DESIGN STANDARDS-STREETS-CROSS SECTION" AND ORDINANCE 110 N.S."STANDARDS FOR HILLSIDE SUBDIVISIONS."

40

REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STANDARD STREET DIMENSIONS	
DESIGN	DATE	SUBMITTED	DATE
		<i>Richard J. ...</i>	06-27-93
DRAWN	DATE	APPROVED	DRAWING NUMBER
		<i>G.M.D.</i>	5-AA-1598
CHECK	DATE	REVISIONS	DIRECTOR OF PUBLIC WORKS P.E.E.
			KMH

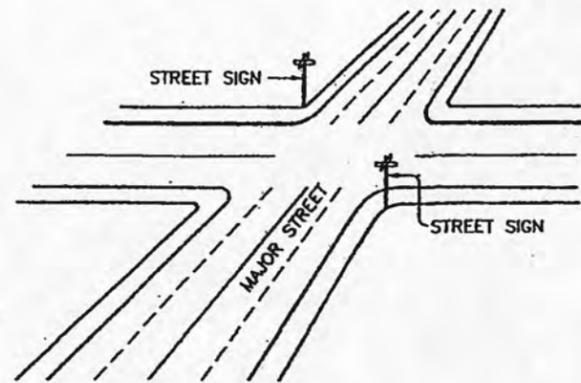


NOTES:

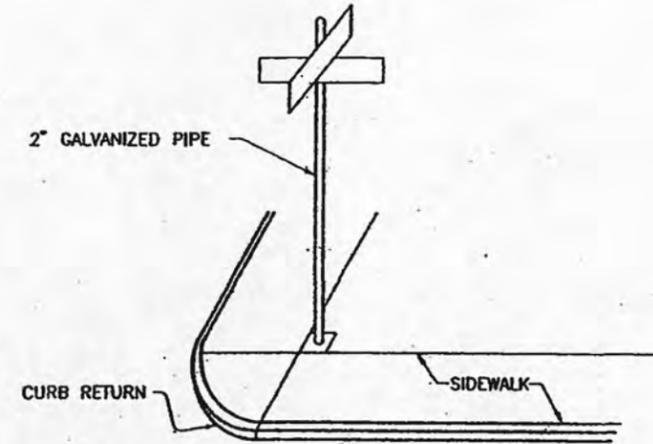
1. SIGN PANELS SHALL BE CONSTRUCTED FROM 0.080 GAUGE NEW SHEET ALUMINUM ALLOY 5052 H38 OR 6061-T6 CONFORMING TO THE REQUIREMENTS OF A.S.T.M. DESIGNATION B209. SHAPE, COLOR, LEGEND AND SIZE SHALL CONFORM TO THE CURRENT CALTRANS SIGN SPECIFICATIONS.
2. IF STREET NAME SIGNS ARE THE ONLY SIGNS ON THE POST, THEN THE GROUND CLEARANCE SHALL BE 9'-6".
3. WHERE NO STREET NAME SIGN IS SPECIFIED, USE A SLIP ON ALUMINUM CAP ON POST TOP.
4. FOR R1 (STOP SIGN) MINIMUM DIMENSION IS 30".

41

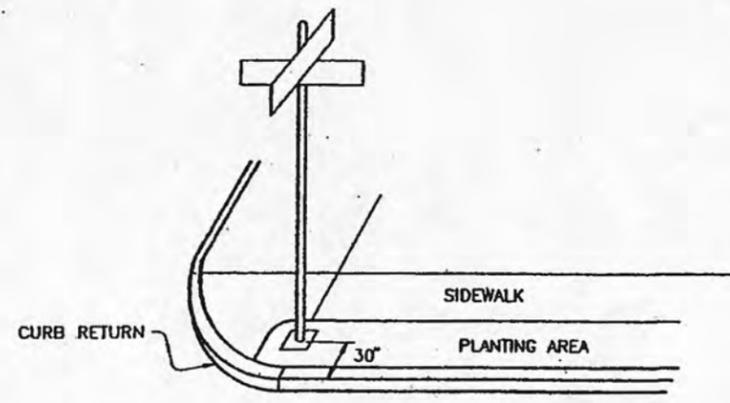
REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
DWG. # 8-A-1136. DWG. # 30-B-10-86		STANDARD STREET NAME SIGN POST & SIGNS	
		DESIGN GRM	SUBMITTED <i>John Martin</i> DATE 04-15-93
		DRAWN GHD	APPROVED <i>[Signature]</i> DRAWING NUMBER 8-A-1145
		CHECK KHH	DIRECTOR OF PUBLIC WORKS R.C.E.
REVISIONS			
No.	DATE	DESCRIPTION	APPRO.



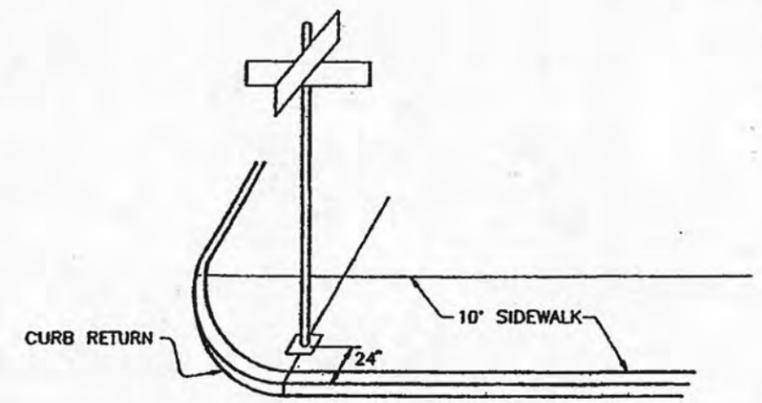
LOCATION AT INTERSECTIONS



LOCATION IN NARROW SIDEWALK
ADJACENT TO CURB



LOCATION IN PLANTING STRIP



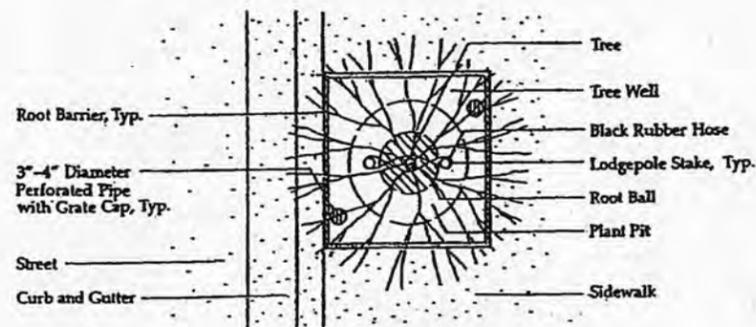
LOCATION IN 10 FT. MONOLITHIC SIDEWALK

NOTES:

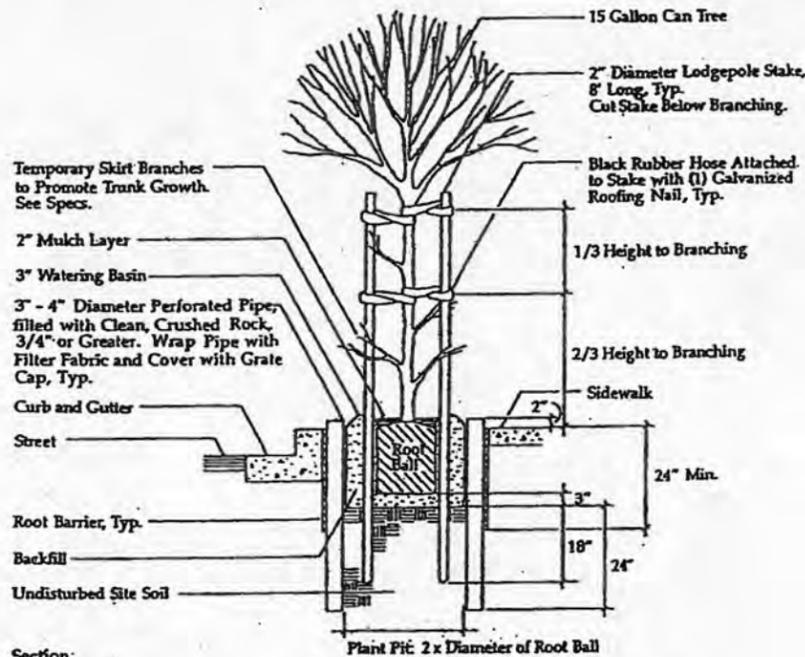
1. CORNER FOR INSTALLATION SHALL BE AS DESIGNATED BY THE CITY ENGINEER.
2. SAWCUT REQUIRED IF SIGN IS INSTALLED AFTER THE SIDEWALK IS POURED.
3. WHEN PLACED IN SIDEWALK, POLES WILL BE SET PRIOR TO SIDEWALK CONCRETE PLACEMENT
4. UTILIZE SAME PIPE FOR STOP SIGN AND STREET NAME SIGN WHERE POSSIBLE.

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REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
DWG. NO. 8-A-1145 STANDARD STREET NAME SIGN POST.		STANDARD STREET SIGN LOCATION	
DESIGN		SUBMITTED	<i>Richard L. Gaudin</i> 03-17-93
DATE		APPROVED	<i>[Signature]</i> 8-A-1136
		CHECK	KMH DIRECTOR OF PUBLIC WORKS P.C.E.
REVISIONS			

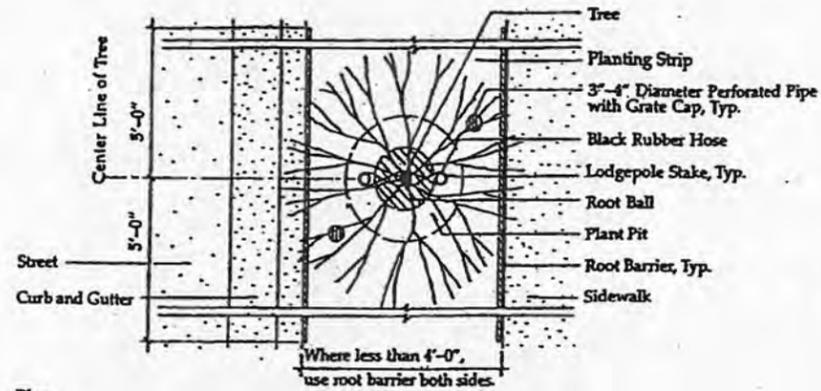


Plan

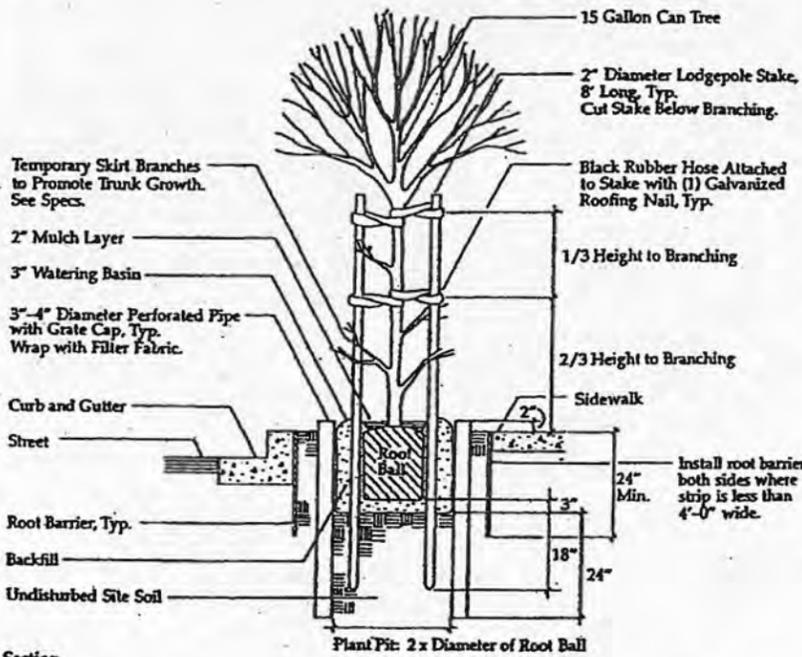


Section

TREE PLANTING DETAIL - TREE WELL

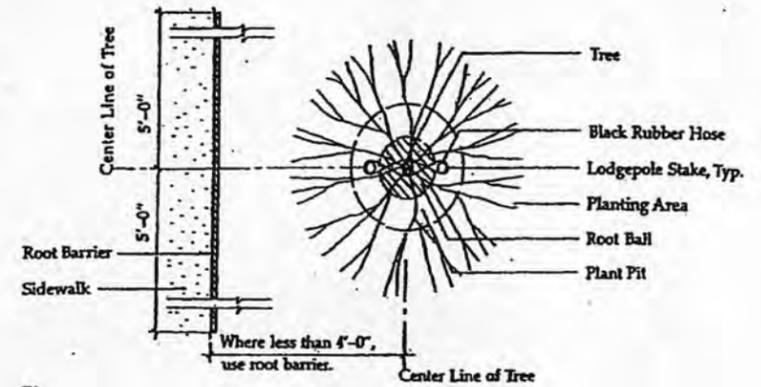


Plan

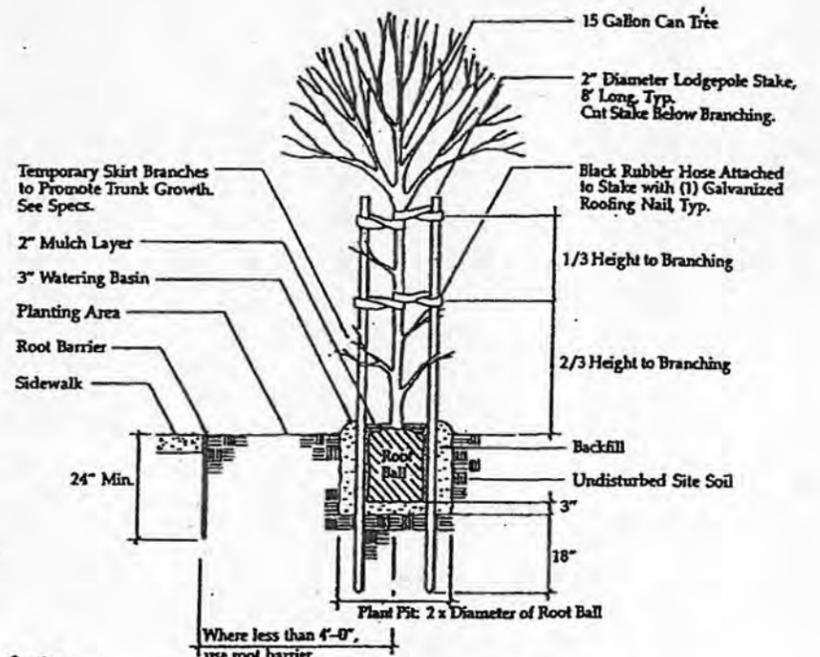


Section

TREE PLANTING DETAIL - PLANTING STRIP



Plan



Section

TREE PLANTING DETAIL - PLANTING AREA BEHIND SIDEWALK

NOTES:

1. BACKFILL MIX SHALL BE SITE SOIL REMOVED FROM PLANT PIT. INCORPORATE TWO POUNDS OF BROADLEAF P4 PER CUBIC YARD PRIOR TO PLACING BACKFILL IN PIT.
2. SCARIFY SIDES AND BOTTOM OF PLANT PIT.
3. PRIOR TO INSTALLATION, SOAK ALL PLANTS IN CONTAINERS WITH WETTING AGENT, SUCH AS AQUA-6RO. BE CERTAIN THE ENTIRE ROOT BALL IS SATURATED BEFORE REMOVING THE TREE FROM CONTAINER.
4. REMOVE ROOTBALL FROM CONTAINER CAREFULLY, SUPPORTING IT FROM BELOW. SEVER ANY CIRCLING ROOTS 3/16\"/>

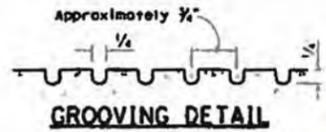
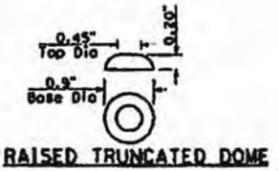
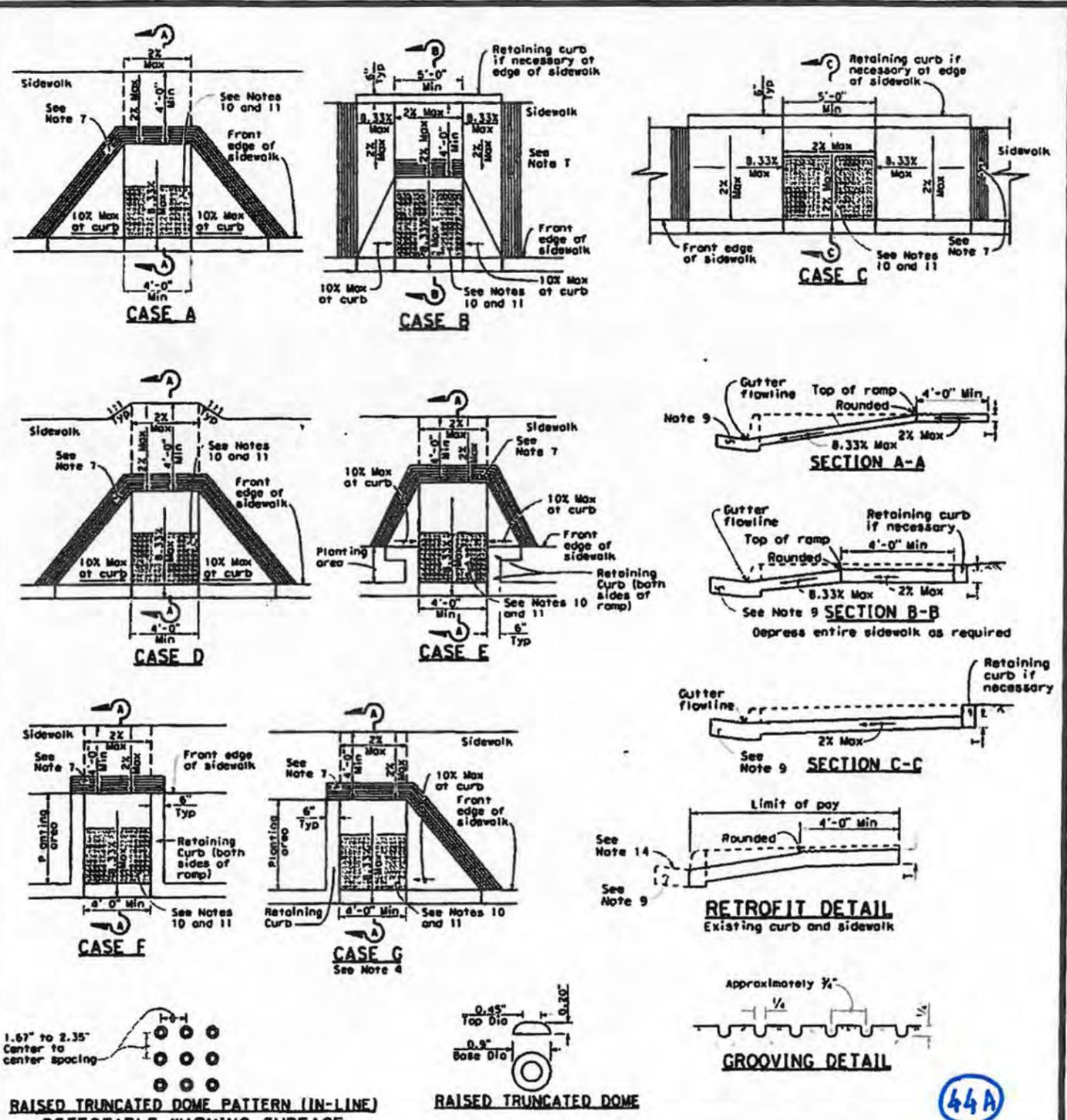
REFERENCES:

No.	DATE	DESCRIPTION	APPR.

CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

**STANDARD
TREE PLANTING
DETAIL**

DESIGN	SUBMITTED <i>Richard Dawson</i>	DATE 04-09-93
DRAWN G.M.D.	APPROVED <i>[Signature]</i>	DRAWING NUMBER 2-AA-1138
CHECK KMH	DIRECTOR OF PUBLIC WORKS A.C.E.	



REFERENCE:
CALTRANS REVISED STANDARD PLAN RSP A88A DATED 9-1-2006

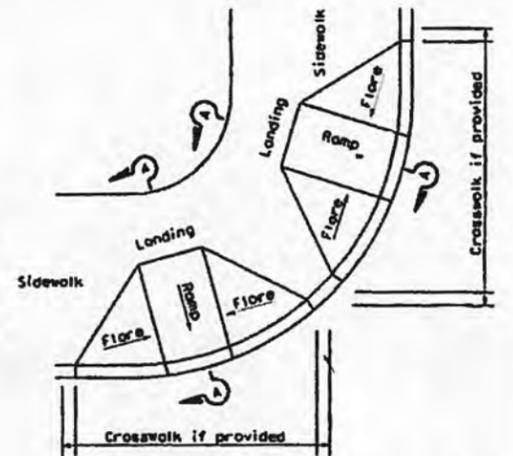


CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT			
STANDARD PLAN			
APPROVED BY:		CURB RAMP DETAILS	
 EDRIC KWAN CITY ENGINEER			
DATE: SEPTEMBER 2010	DRAWN: GAR	CHECK: EK	SHEET NO. 1 OF 2
REVISED:			DRAWING NO. ST-2A

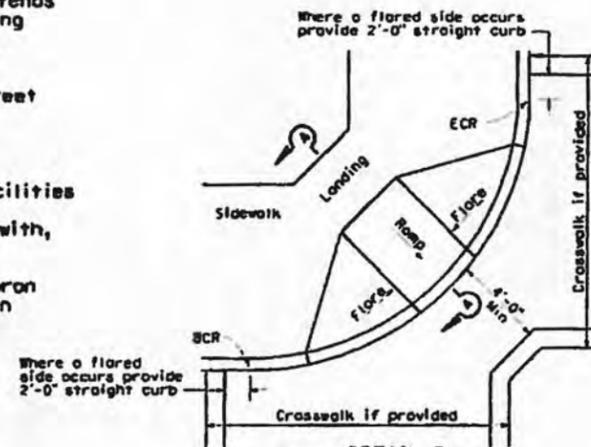
44A

NOTES:

1. As site conditions dictate, Case A through Case G curb ramps may be used for corner installations similar to those shown in Detail A and Detail B. The case of curb ramps used in Detail A do not have to be the same. Case A through Case G curb ramps also may be used at mid block locations, as site conditions dictate.
2. If distance from curb to back of sidewalk is too short to accommodate ramp and 4'-0" platform (landing) as shown in Case A, the sidewalk may be depressed longitudinally as in Case B, or C or may be widened as in Case D.
3. When ramp is located in center of curb return, crosswalk configuration must be similar to that shown for Detail B.
4. As site conditions dictate, the retaining curb side and the flared side of the Case G ramp shall be constructed in reversed position.
5. If located on a curve, the sides of the ramp need not be parallel, but the minimum width of the ramp shall be 4'-0".
6. Side slope of ramp flares vary uniformly from a maximum of 10% at curb to conform with longitudinal sidewalk slope adjacent to top of the ramp, except in Case C and Case F.
7. The curb ramp shall be outlined, as shown, with a 1'-0" wide border with 1/4" grooves approximately 1/4" on center. See grooving detail.
8. Transitions from ramps and landing to walks, gutters or streets shall be flush and free of abrupt changes.
9. Maximum slopes of adjoining gutters, the road surface immediately adjacent to the curb ramp or accessible route shall not exceed 5 percent within 4'-0" of the top and bottom of the curb ramp.
10. Curb ramps shall have a detectable warning surface that extends the full width and 3'-0" depth of the ramp. Detectable Warning Surfaces shall conform to the details on this plan and the requirements in the Special Provisions.
11. The edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flowline.
12. Sidewalk and ramp thickness, "T", shall be 3/2" minimum.
13. Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp will be relocated or adjusted to grade by the owner prior to, or in conjunction with, curb ramp construction.
14. For retrofit conditions, removal and replacement of curb apron will be at the Contractor's option, unless otherwise shown on project plans.



DETAIL A
TYPICAL TWO-RAMP CORNER INSTALLATION
See Note 1

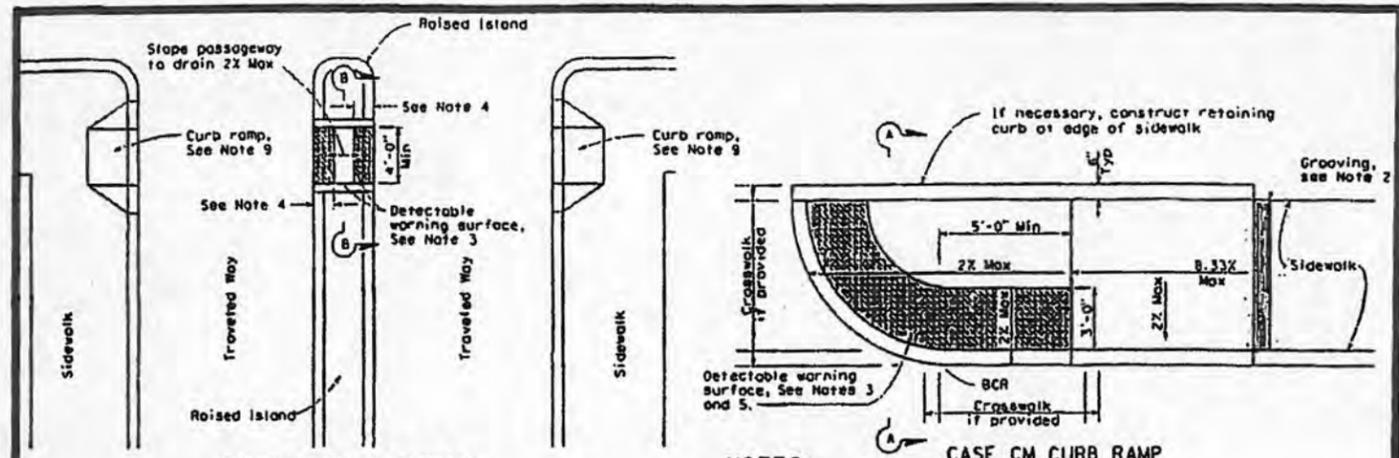


DETAIL B
TYPICAL ONE-RAMP CORNER INSTALLATION
See Notes 1 and 3

448

REFERENCE:
CALTRANS REVISED STANDARD PLAN RSP A88A DATED 9-1-2006

	CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT			
	STANDARD PLAN			
	APPROVED BY:		CURB RAMP DETAILS AND NOTES	
	 EDRIC KWAN CITY ENGINEER			
DATE: SEPTEMBER 2010	DRAWN: GAR	CHECK: EK	SHEET NO. 2 OF 2	DRAWING NO. ST-2B
REVISED:				

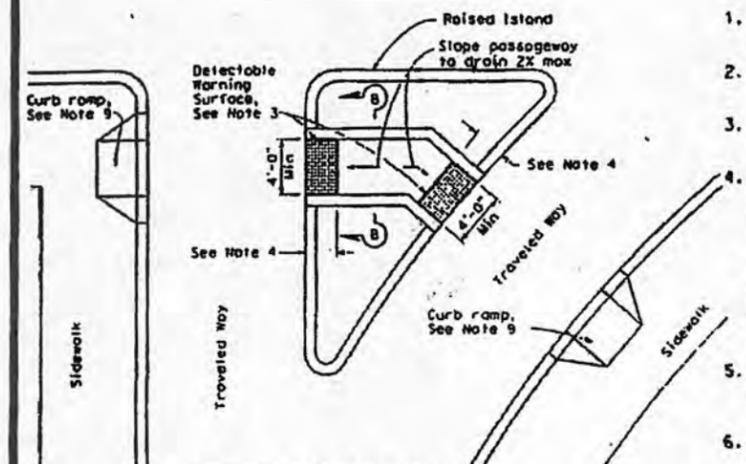


TYPE A PASSAGEWAY

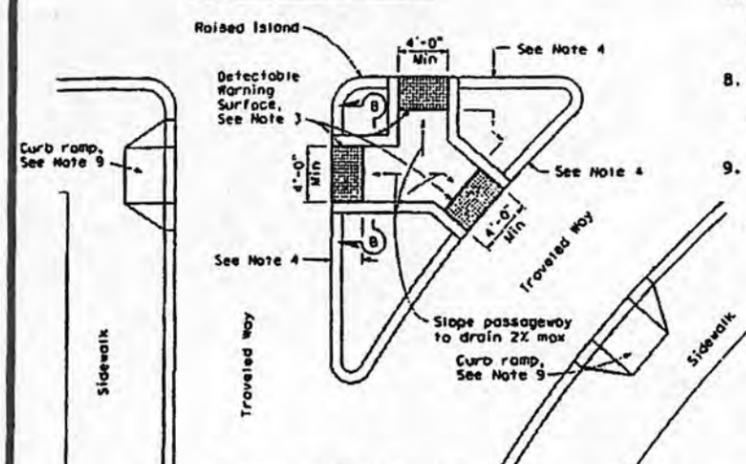
CASE CM CURB RAMP

NOTES:

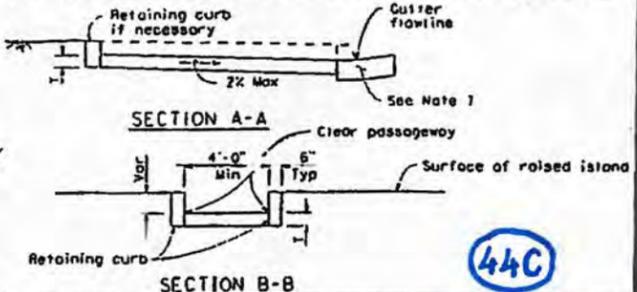
1. Sidewalk, ramp and passageway thickness, "T", shall be 3 1/2" minimum.
2. For details of grooving used with Case CM curb ramp, see Standard Plan AB8A.
3. For details of detectable warning surfaces, see Standard Plan AB8A.
4. Where an island passage way length is less than 6'-0", the detectable warning surface shall extend the full width and full depth of the passage way length. Where an island passage way length is greater than or equal to 6'-0", but less than 8'-0", each detectable warning surface shall extend the full width and 2'-0" depth of the passage way length. Where an island passage way length is greater than or equal to 8'-0", each detectable warning surface shall extend the full width and 3'-0" depth of the passage way length.
5. For Case CM curb ramp, the edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flowline.
6. Transitions from ramps to walks, gutters or streets shall be flush and free of abrupt changes.
7. Maximum slopes of adjoining gutters, the road surface immediately adjacent to the curb ramp or accessible route shall not exceed 5 percent within 4'-0" of the top and bottom of the curb ramp.
8. Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp will be relocated or adjusted to grade by the owner prior to, or in conjunction with, curb ramp construction.
9. For additional curb ramp details, see Standard Plan AB8A.



TYPE B PASSAGEWAY



TYPE C PASSAGEWAY



REFERENCE:
CALTRANS REVISED STANDARD PLAN RSP A88B DATED 5-1-2006



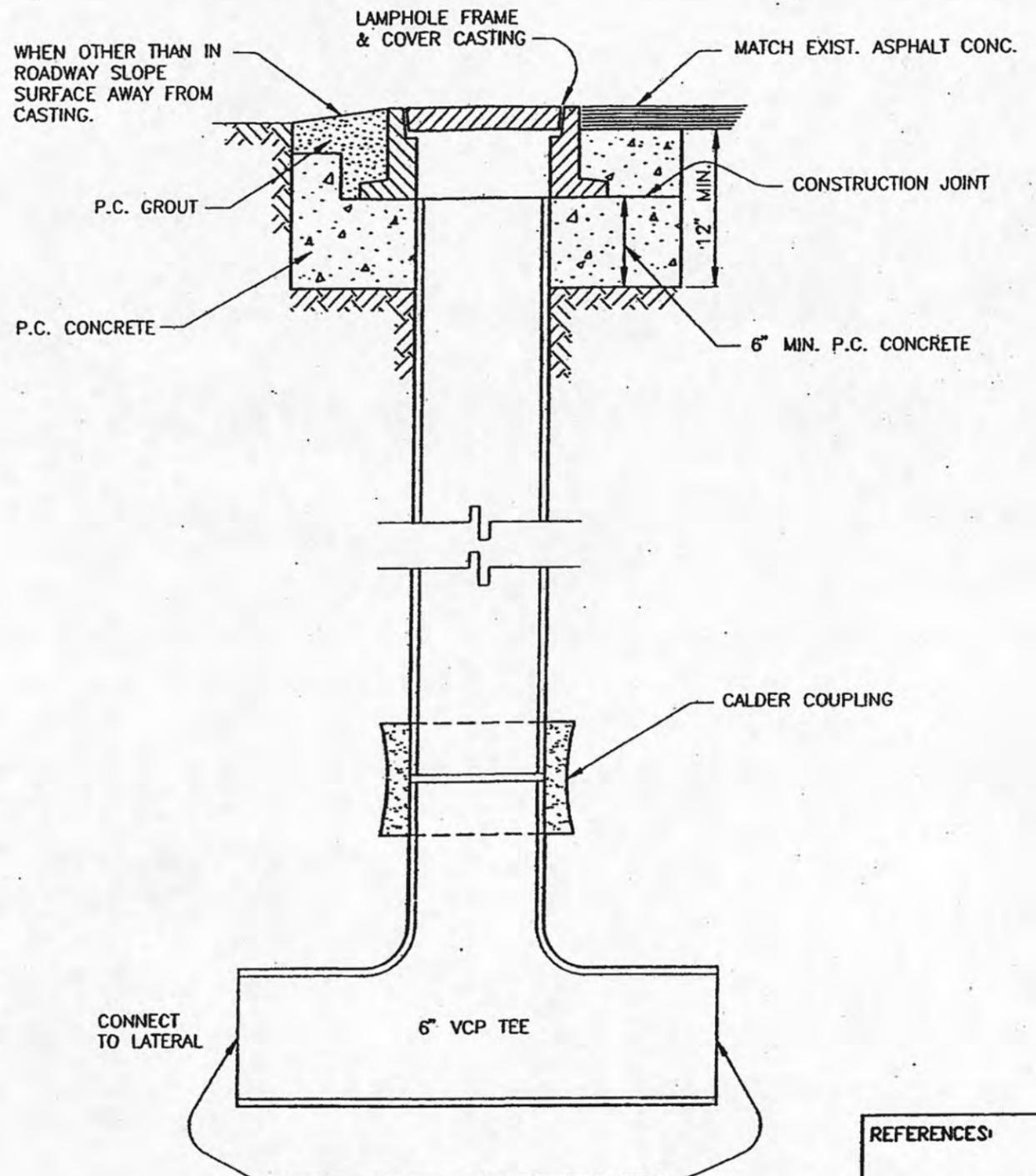
CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT
STANDARD PLAN

APPROVED BY:
[Signature]
EDRIC KWAN CITY ENGINEER

CURB RAMP AND ISLAND PASSAGEWAY DETAILS

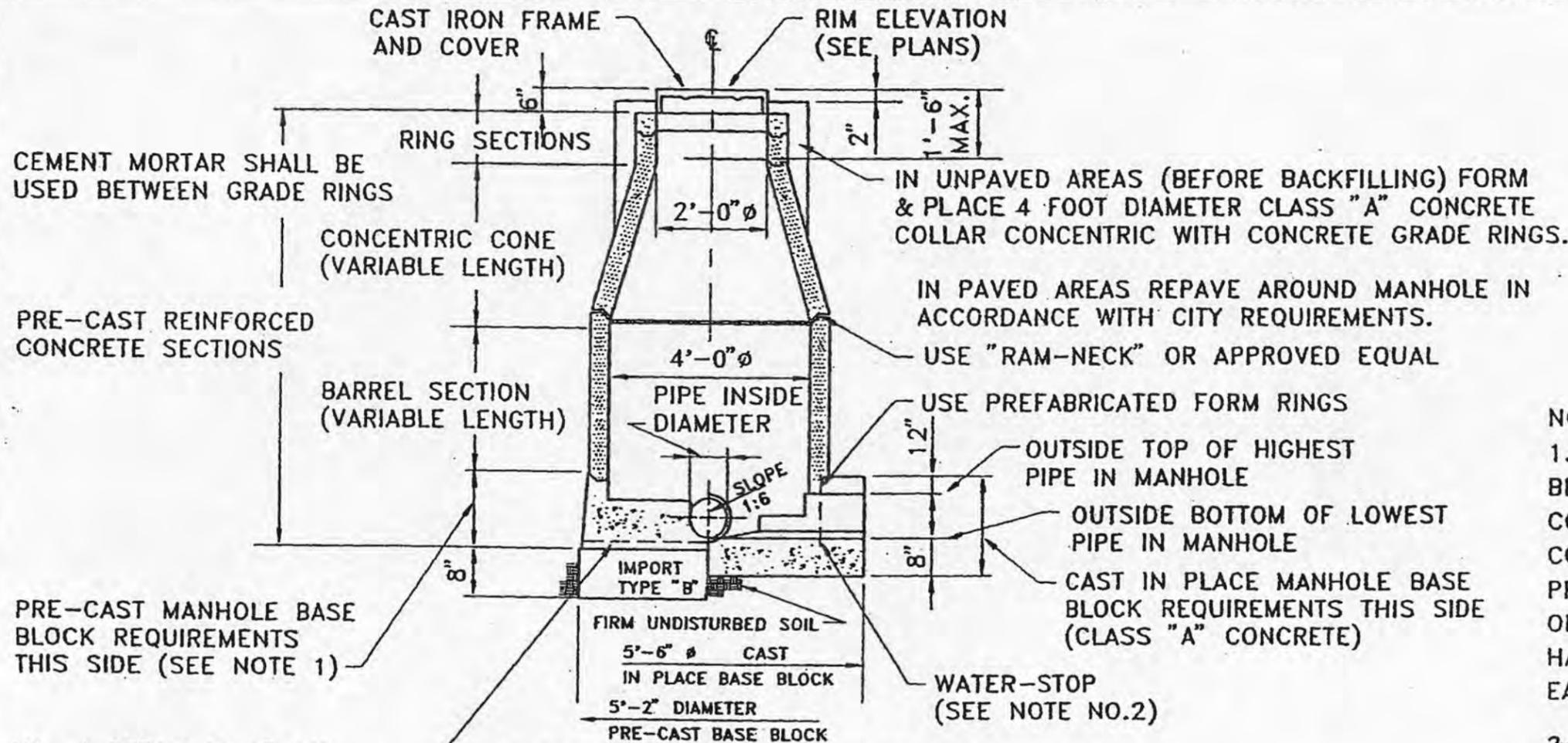
DATE: SEPTEMBER 2010	DRAWN: GAR	CHECK: EK	SHEET NO. 1 OF 1	DRAWING NO. ST-3
REVISED:				

44C

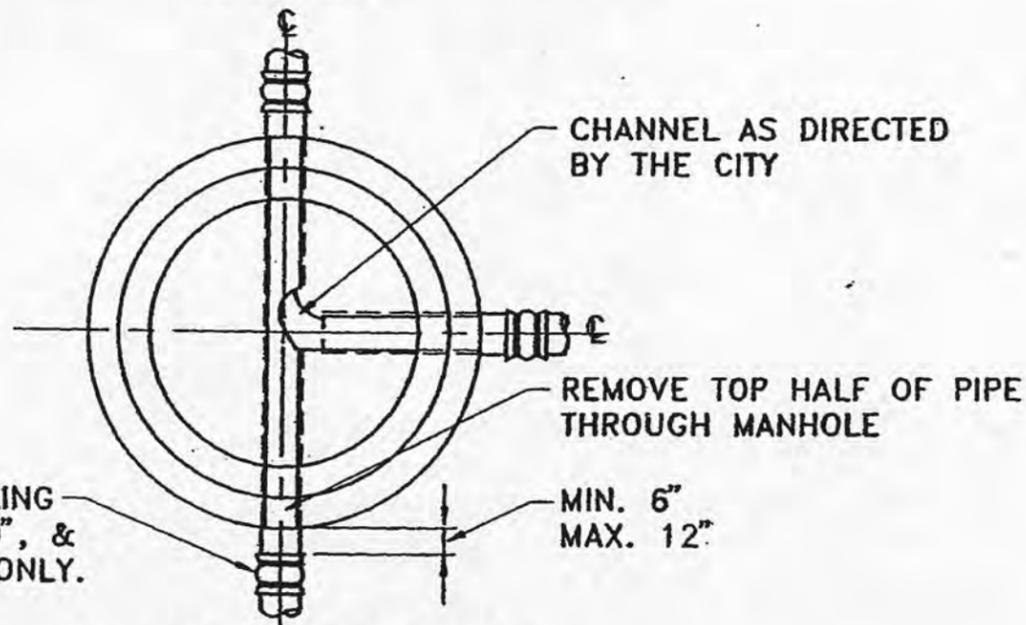


45

REFERENCES:		CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
		STANDARD SEWER SAMPLING STATION	
		DESIGN	SUBMITTED: <i>Richard David</i> DATE: 03-10-93
		DRAWN: G.M.D.	APPROVED: <i>W. J. Hunter</i> DRAWING NUMBER: 10-AA-1084
		CHECK	DIRECTOR OF PUBLIC WORKS REC.
No.	DATE	DESCRIPTION	APPROD.
REVISIONS			



ELEVATION SECTION
SCALE: NTS

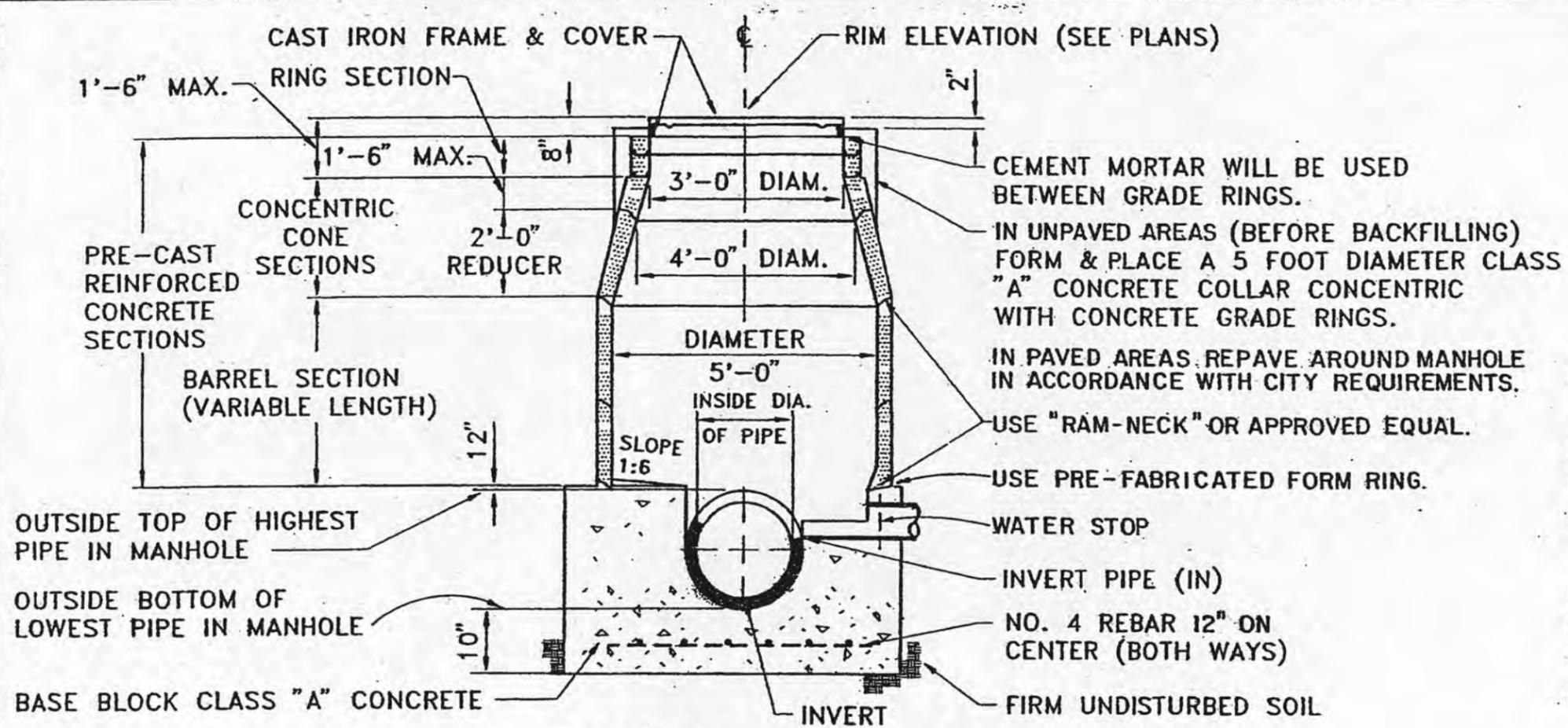


PLAN SECTION
SCALE: NTS

- NOTES:
1. PRE-CAST MANHOLE BASE BLOCKS SHALL BE AS MANUFACTURED BY HANSON CONCRETE PRODUCTS, INC. ONE HANSON COURT, MILPITAS, CA 95035 OR EQUAL PRE-CAST MANHOLE BASE BLOCKS SHALL ONLY BE USED AFTER PRIOR APPROVAL HAS BEEN RECEIVED FROM CITY FOR EACH LOCATION.
 2. FLEXIBLE PIPE ONLY - AN APPROVED WATER STOP SHALL BE INSTALLED ON ALL FLEXIBLE PIPE ENTERING OR LEAVING A MANHOLE, AND CENTERED UNDER THE MANHOLE WALL AS SHOWN.
 3. INSTALL "RAM-NECK" BETWEEN EACH JOINT OF THE CONE AND BARREL SECTIONS TO MAKE A FLEXIBLE WATER TIGHT JOINT. AFTER JOINT IS MADE, TRIM JOINT SMOOTH ON INSIDE OF MANHOLE.
 4. FLEXIBLE COUPLING NOT REQUIRED IF MANHOLE IS INSTALLED OVER EXISTING SANITARY SEWER.

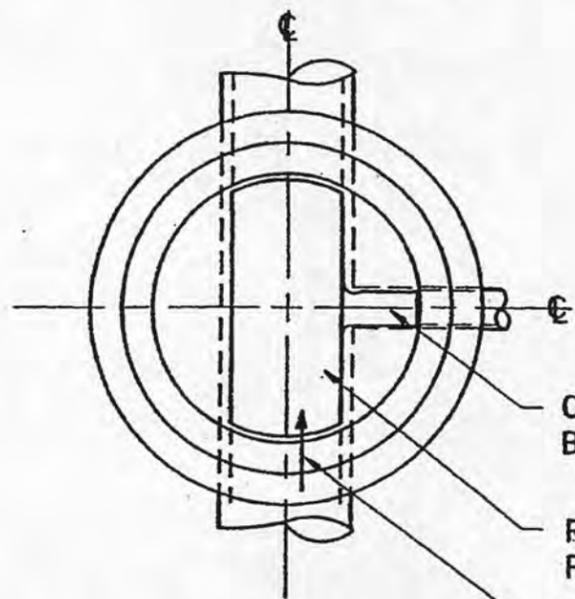
46

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			STANDARD COVER MANHOLE	
NO.	DATE	DESCRIPTION REVISION	APPRD.	
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1942



ELEVATION SECTION

SCALE: NTS



PLAN SECTION

SCALE: NTS

CEMENT MORTAR WILL BE USED BETWEEN GRADE RINGS.
 IN UNPAVED AREAS (BEFORE BACKFILLING) FORM & PLACE A 5 FOOT DIAMETER CLASS "A" CONCRETE COLLAR CONCENTRIC WITH CONCRETE GRADE RINGS.
 IN PAVED AREAS, REPAVE AROUND MANHOLE IN ACCORDANCE WITH CITY REQUIREMENTS.
 USE "RAM-NECK" OR APPROVED EQUAL.
 USE PRE-FABRICATED FORM RING.
 WATER STOP
 INVERT PIPE (IN)
 NO. 4 REBAR 12" ON CENTER (BOTH WAYS)
 FIRM UNDISTURBED SOIL

NOTES:

1. PRE-CAST MANHOLE BASE BLOCKS SHALL BE AS MANUFACTURED BY HANSON CONCRETE PRODUCTS, INC. ONE HANSON COURT, MILPITAS, CA 95035 OR EQUAL.

PRE-CAST MANHOLE BASE BLOCKS SHALL ONLY BE USED AFTER PRIOR APPROVAL HAS BEEN RECEIVED FROM CITY FOR EACH LOCATION.

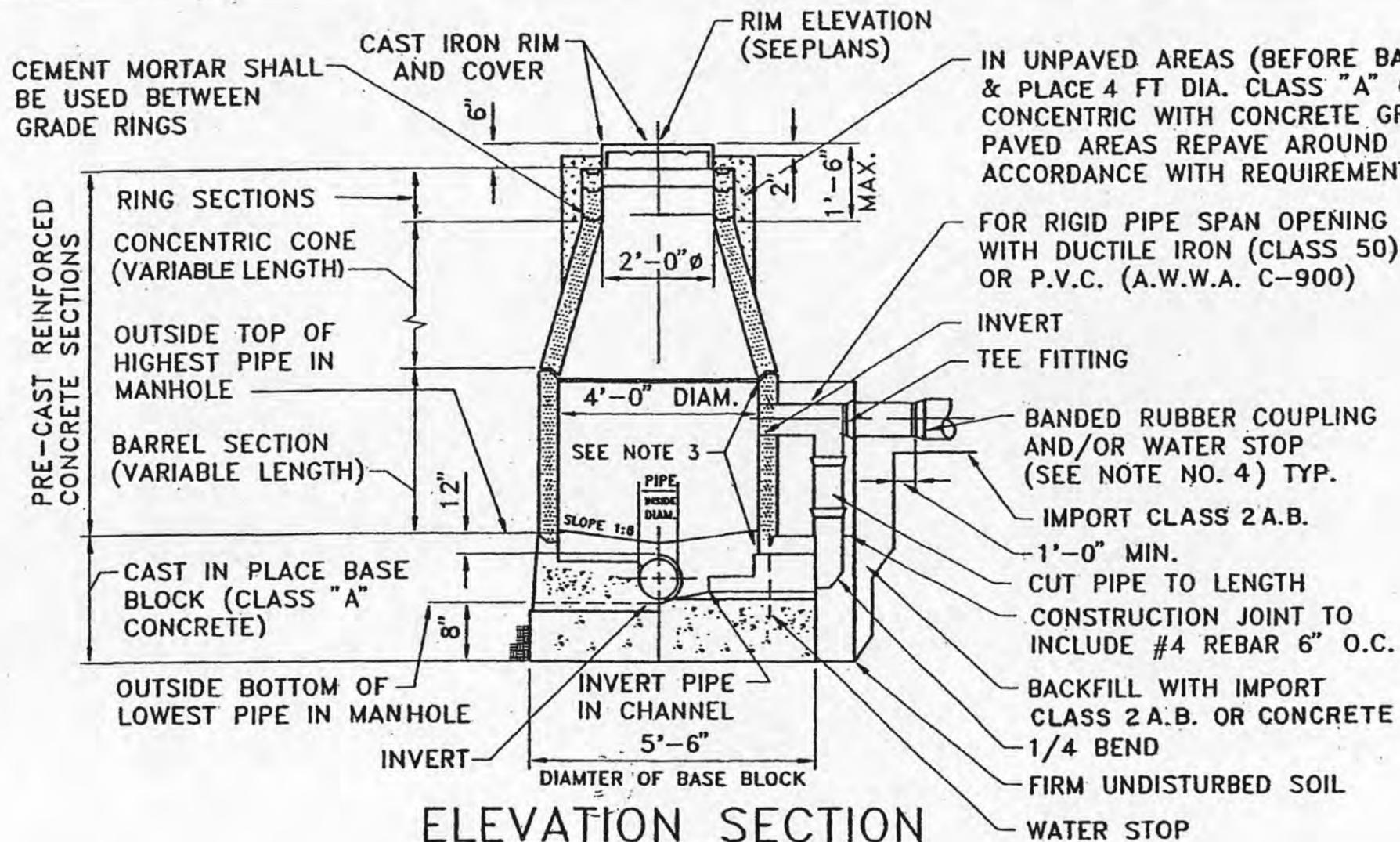
2. FLEXIBLE PIPE ONLY - AN APPROVED WATER STOP SHALL BE INSTALLED ON ALL FLEXIBLE PIPE ENTERING OR LEAVING A MANHOLE, AND CENTERED UNDER THE MANHOLE WALL AS SHOWN.

3. INSTALL "RAM-NECK" BETWEEN EACH JOINT OF THE CONE AND BARREL SECTIONS TO MAKE A FLEXIBLE WATER TIGHT JOINT. AFTER JOINT IS MADE, TRIM JOINT SMOOTH ON INSIDE OF MANHOLE.

4. TYPE II MANHOLES ARE REQUIRED FOR SEWER LINES 24" OR LARGER IN DIAMETER.

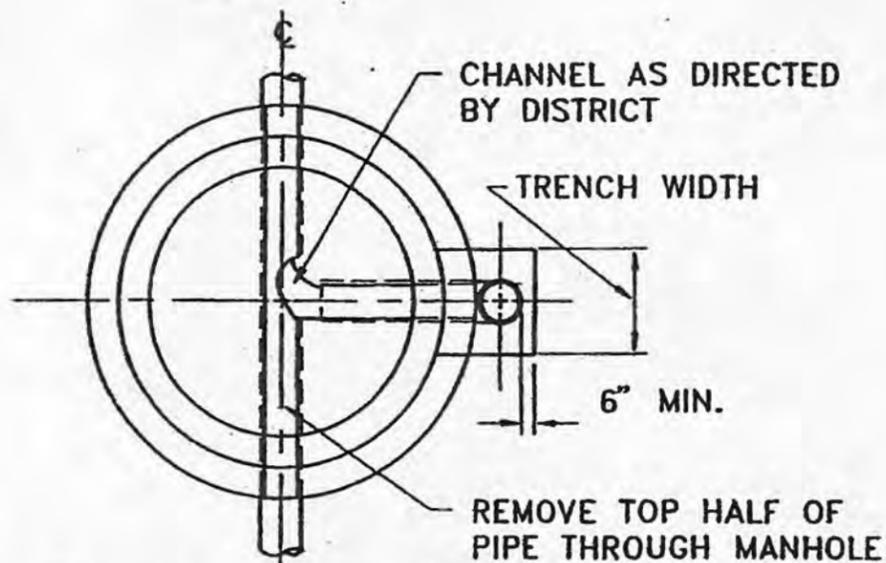
47

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			TYPE II TRUNK MANHOLE	
NO.	DATE	DESCRIPTION REVISION	APPRD.	
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91
CHECKED BY: KMH		APPROVED:		DWG. IO-AA-1943



ELEVATION SECTION

SCALE: NTS



PLAN SECTION

SCALE: NTS

IN UNPAVED AREAS (BEFORE BACKFILLING) FORM & PLACE 4 FT DIA. CLASS "A" CONCRETE COLLAR CONCENTRIC WITH CONCRETE GRADE RINGS. IN PAVED AREAS REPAVE AROUND MANHOLE IN ACCORDANCE WITH REQUIREMENTS OF THE CITY

FOR RIGID PIPE SPAN OPENING WITH DUCTILE IRON (CLASS 50) OR P.V.C. (A.W.W.A. C-900)

INVERT
TEE FITTING

BANDIED RUBBER COUPLING AND/OR WATER STOP (SEE NOTE NO. 4) TYP.

IMPORT CLASS 2 A.B.
1'-0" MIN.

CUT PIPE TO LENGTH
CONSTRUCTION JOINT TO INCLUDE #4 REBAR 6" O.C.

BACKFILL WITH IMPORT CLASS 2 A.B. OR CONCRETE
1/4 BEND

FIRM UNDISTURBED SOIL
WATER STOP

NOTES:

1. PRE-CAST MANHOLE BASE BLOCKS SHALL BE AS MANUFACTURED BY HANSON CONCRETE PRODUCTS, INC. ONE HANSON COURT, MILPITAS, CA 95035 OR EQUAL.

PRE-CAST MANHOLE BASE BLOCKS SHALL ONLY BE USED AFTER PRIOR APPROVAL HAS BEEN RECEIVED FROM CITY FOR EACH LOCATION TO BE USED.

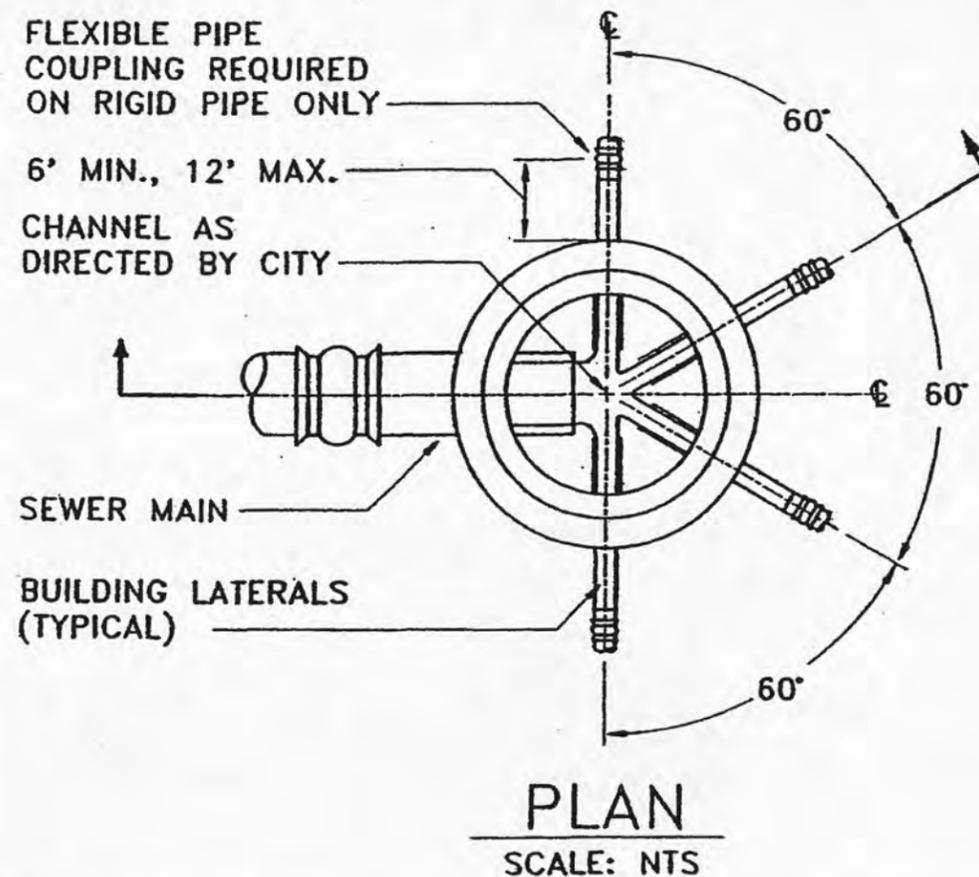
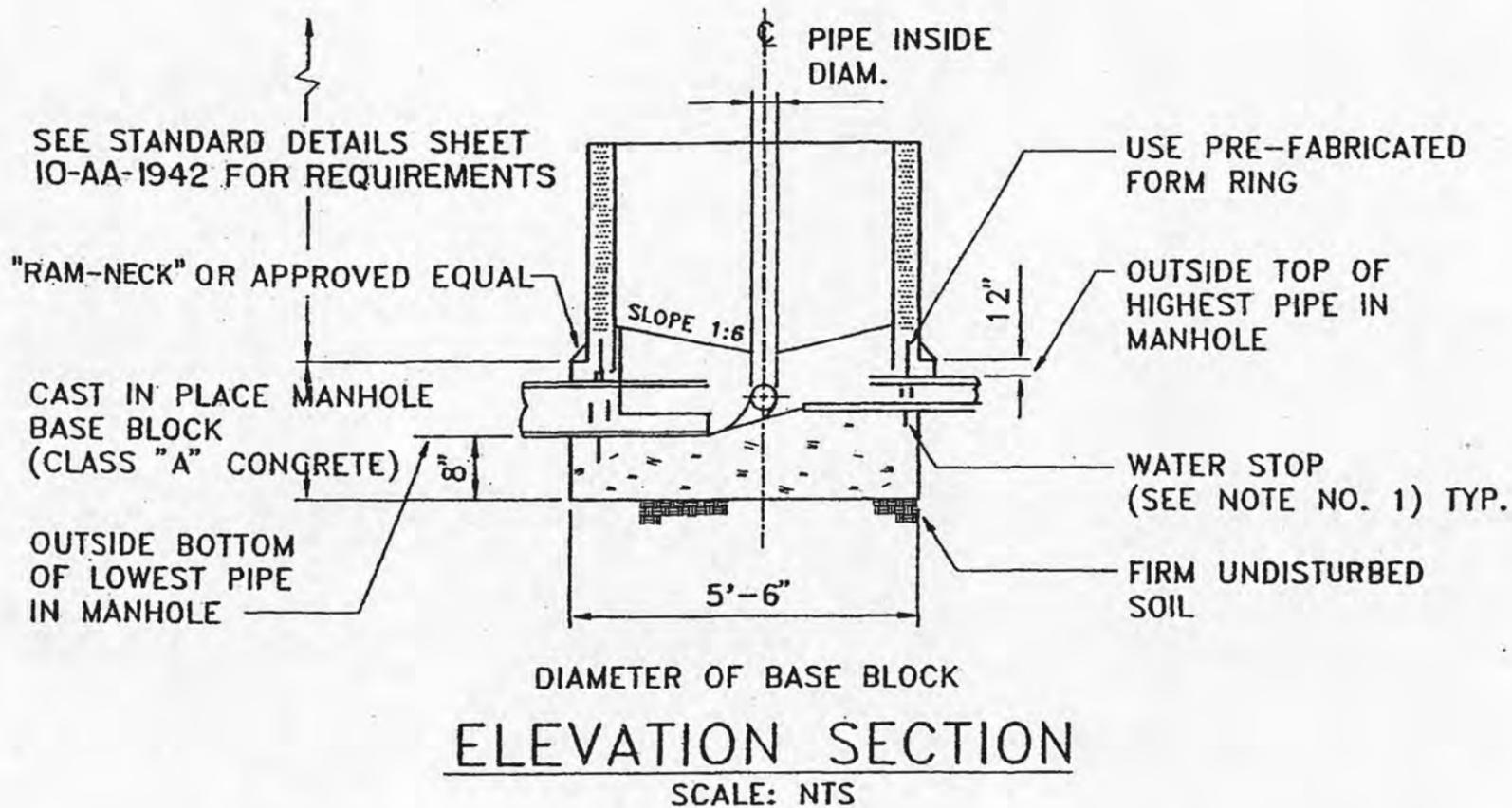
2. FLEXIBLE PIPE ONLY - AN APPROVED WATER STOP SHALL BE INSTALLED ON ALL FLEXIBLE PIPE ENTERING OR LEAVING A MANHOLE, AND CENTERED UNDER THE MANHOLE WALL AS SHOWN.

3. INSTALL "RAM-NECK" BETWEEN EACH JOINT OF THE CONE AND BARREL SECTIONS TO MAKE A FLEXIBLE WATER TIGHT JOINT. AFTER JOINT IS MADE, TRIM JOINT SMOOTH ON INSIDE OF MANHOLE.

4. FLEXIBLE COUPLING NOT REQUIRED IF MANHOLE IS INSTALLED OVER EXISTING SANITARY SEWER.

48

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			STANDARD DROP MANHOLE	
NO.	DATE	DESCRIPTION REVISION	APPRD.	
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1944

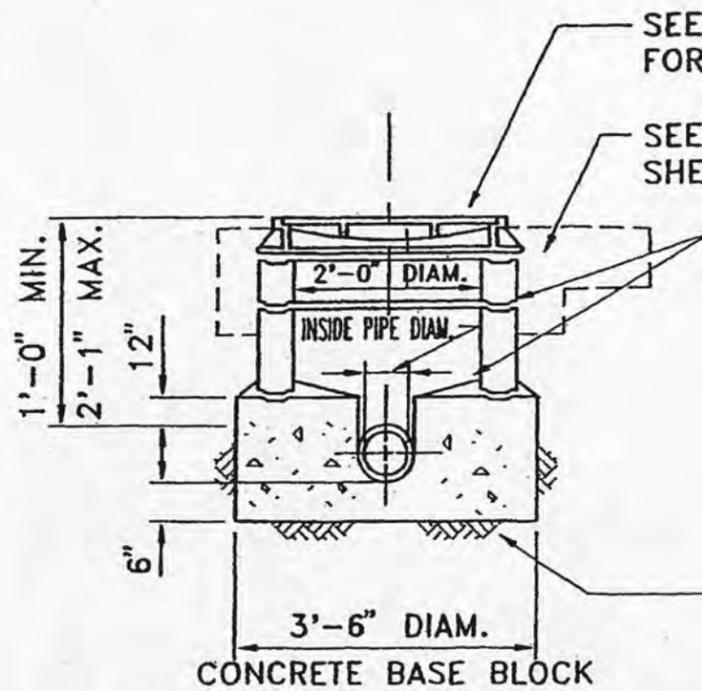


NOTES:

- 1.FLEXIBLE PIPE ONLY. AN APPROVED WATER STOP SHALL BE INSTALLED ON ALL FLEXIBLE PIPE ENTERING OR LEAVING A MANHOLE AND CENTERED UNDER THE MANHOLE WALL AS SHOWN.
- 2.ALL PIPES IN MANHOLE BASE BLOCK SHALL MATCH TOPS.
- 3.MAXIMUM NUMBER OF LATERALS TO BE CONNECTED TO A DEAD END MANHOLE IN A CUL-DE-SAC IS (4) FOUR.
- 4.INSTALL "RAM-NECK" BETWEEN EACH JOINT OF THE CONE AND BARREL SECTIONS TO MAKE A FLEXIBLE WATER TIGHT JOINT. AFTER JOINT IS MADE, TRIM JOINT SMOOTH ON INSIDE OF MANHOLE.

49

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING SPECIAL MANHOLE BASE FOR DEAD END MANHOLES IN CUL-DE-SACS		
NO.	DATE	DESCRIPTION REVISION	APPRD.		
DRAWN BY: EAS			SUBMITTED:		DATE: 11/18/91
CHECKED BY: KMH			APPROVED:		DWG. 10-AA-1945



TYPE "A" MANHOLE

SCALE: NTS

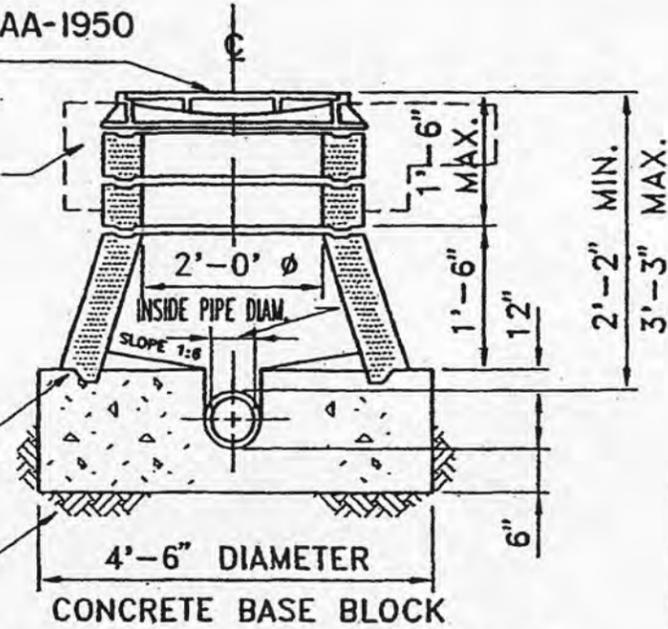
SEE STANDARD DETAIL SHEET NO. 10-AA-1950 FOR FRAME AND COVER DETAIL

SEE TYPE "C" MANHOLE DETAIL THIS SHEET FOR CONCRETE COLLAR DETAIL

CEMENT MORTAR SHALL BE USED BETWEEN GRADE RINGS (TYPICAL EACH MANHOLE SHOWN ON THIS SHEET)

USE "RAM-NECK" OR APPROVED EQUAL

FIRM UNDISTURBED SOIL



TYPE "B" MANHOLE

SCALE: NTS

NOTES:

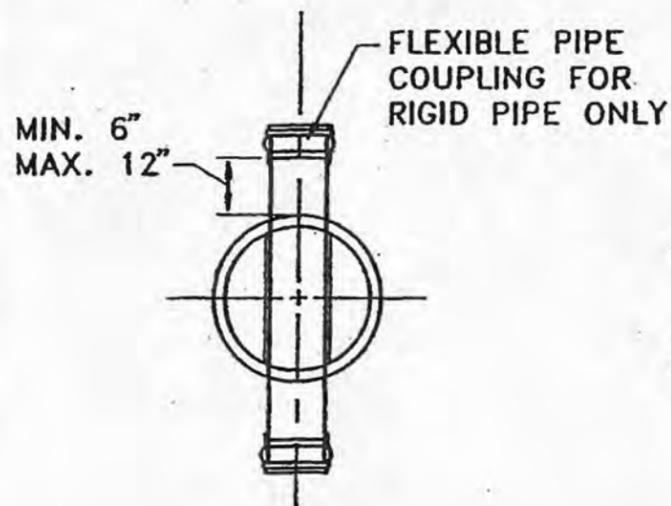
1. INSTALL "RAM-NECK" BETWEEN EACH JOINT OF THE CONE AND BARREL SECTIONS TO MAKE A FLEXIBLE WATER TIGHT JOINT. AFTER JOINT IS MADE, TRIM JOINT SMOOTH ON INSIDE OF MANHOLE.

2. COLLAR AND BASE BLOCK SHALL BE CLASS "A" CONCRETE POURED IN PLACE.

3. INSTALL PRIVATE CONTROL MANHOLE FRAME AND COVER AS SHOWN ON CITY OF RICHMOND STANDARD SPECIFICATIONS.

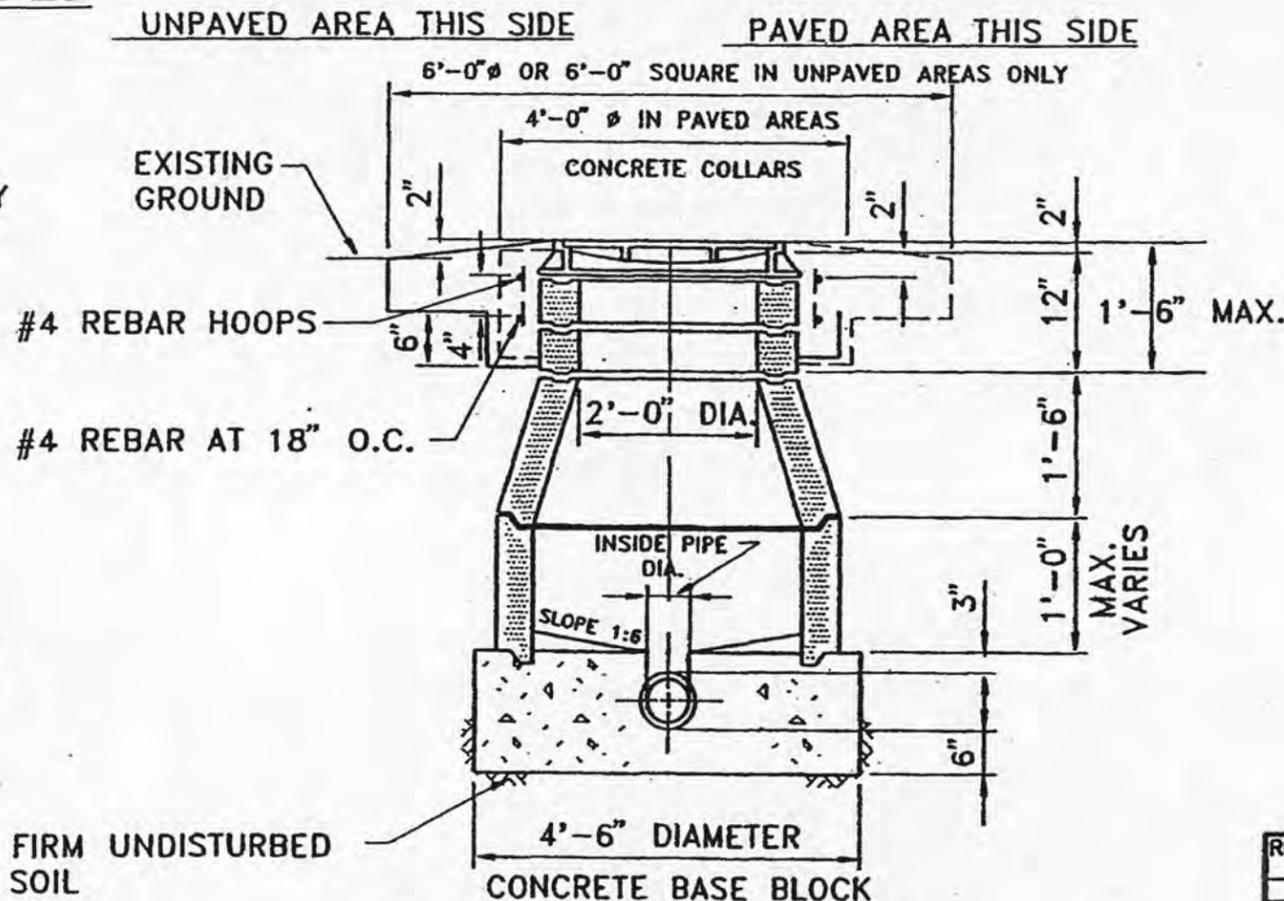
4. ALL CONCRETE GRADE RINGS, CONES AND BARREL SECTIONS SHOWN ABOVE ARE PRECAST AS MANUFACTURED BY HANSON CONCRETE PRODUCTS INC. ONE HANSON COURT, MILPITAS, CALIFORNIA OR AN APPROVED EQUAL.

5. FLEXIBLE PIPE ONLY - AN APPROVED WATER STOP SHALL BE INSTALLED ON ALL FLEXIBLE PIPE ENTERING OR LEAVING A MANHOLE AND CENTERED UNDER THE MANHOLE WALL.



TYPICAL PLAN SECTION

SCALE: NTS



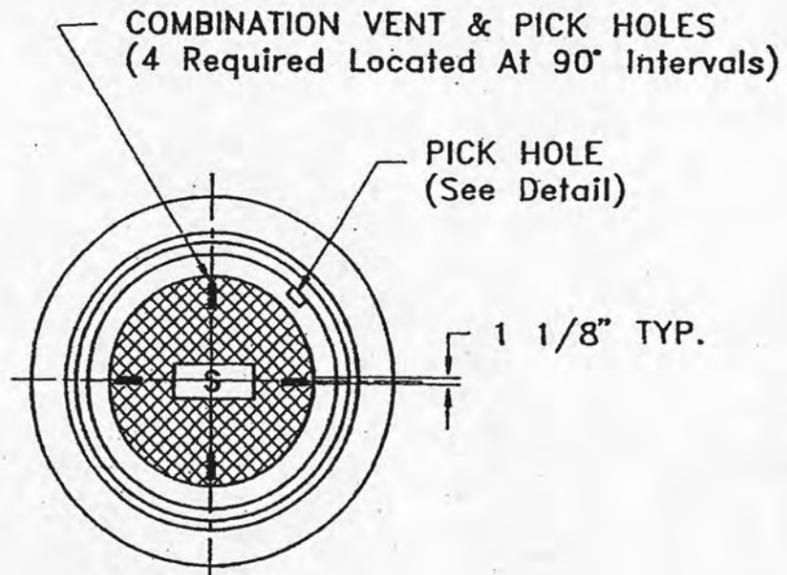
TYPE "C" MANHOLE

SCALE: NTS

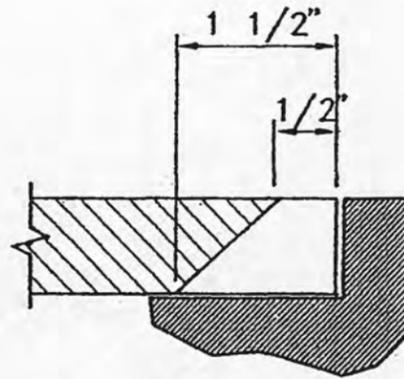
FIRM UNDISTURBED SOIL

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			PRIVATE CONTROL MANHOLE	
NO.	DATE	DESCRIPTION REVISION	APPRD.	
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1946

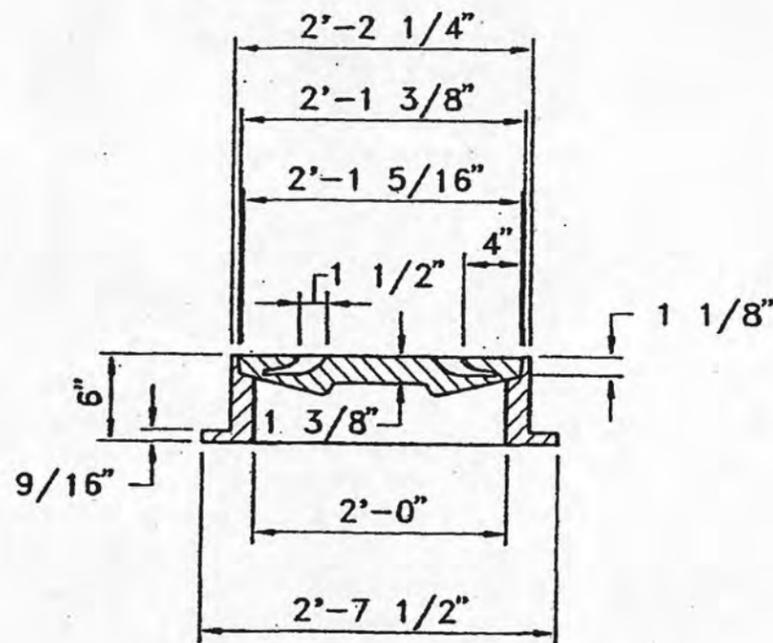
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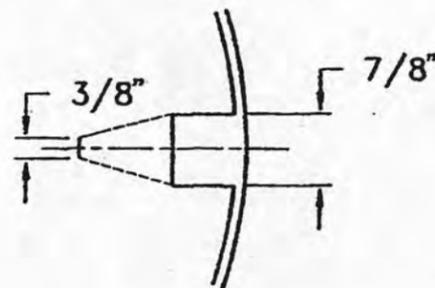
PLAN
SCALE: NTS



ELEVATION
SCALE: NTS



ELEVATION SECTION
SCALE: NTS



PLAN PICK HOLE DETAIL
SCALE: NTS

NOTES:

1. MINOR MODIFICATIONS IN ABOVE DIMENSIONS AND MANUFACTURING CONFIGURATIONS ARE PERMISSIBLE SUBJECT TO CITY APPROVAL.

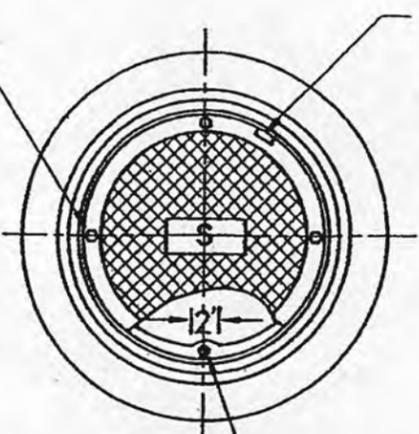
2. CAST IRON FOR FRAME AND COVER SHALL BE CLASS 30 MINIMUM AS PER A.S.T.M. A-48.

3. BEFORE LEAVING THE FOUNDRY, THE FRAME AND COVER SHALL BE PAINTED OR DIPPED IN ASPHALT PAINT.

51

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
NO.	DATE	DESCRIPTION REVISION	APPRD.	MANHOLE FRAME + COVER
DRAWN BY: EAS		SUBMITTED:	DATE: 11/18/91	
CHECKED BY: KMH		APPROVED:	DWG. 10-AA-1947	

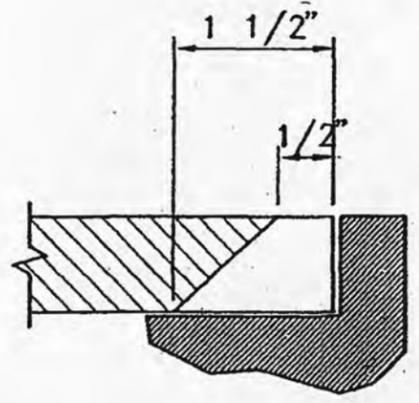
1/2" HEX-HEAD STAINLESS STEEL BOLT
WITH 1/8" THICK NEOPRENE GASKET
(4 REQUIRED LOCATED AT 90° INTERVALS)



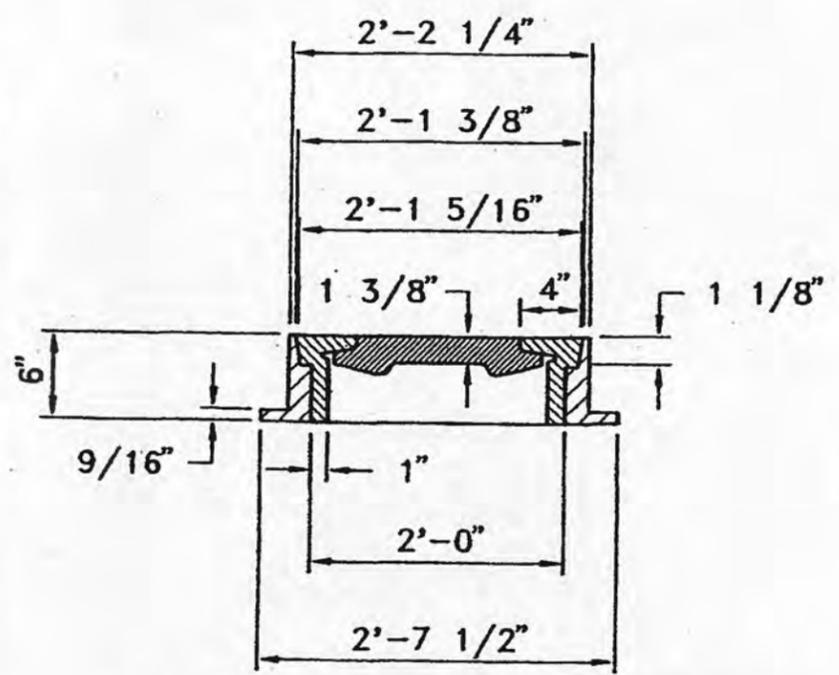
PICK HOLE
(See Detail)
BOLT HOLES IN COVER
TO BE COUNTER SUNK
FOR BOLT HEADS

BOSSSES FOR BOLTING

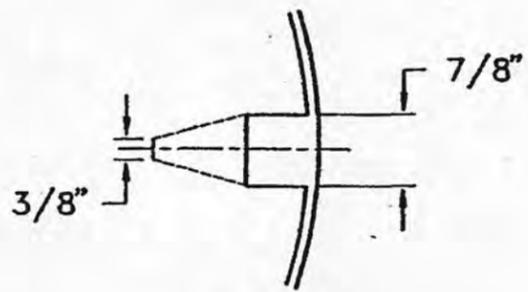
PLAN
SCALE: NTS



ELEVATION
SCALE: NTS



ELEVATION SECTION
SCALE: NTS



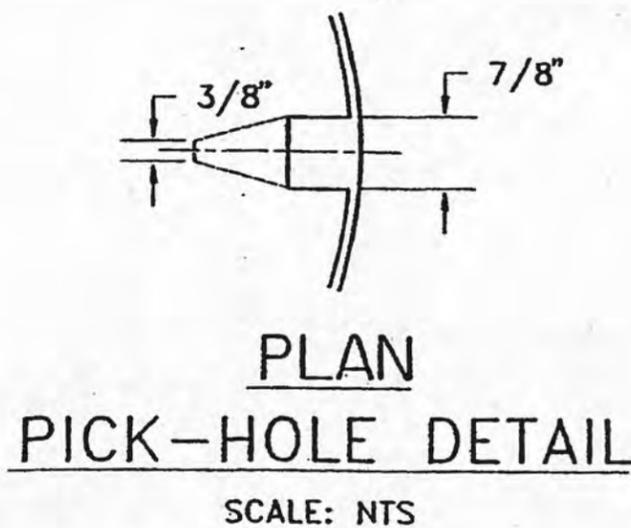
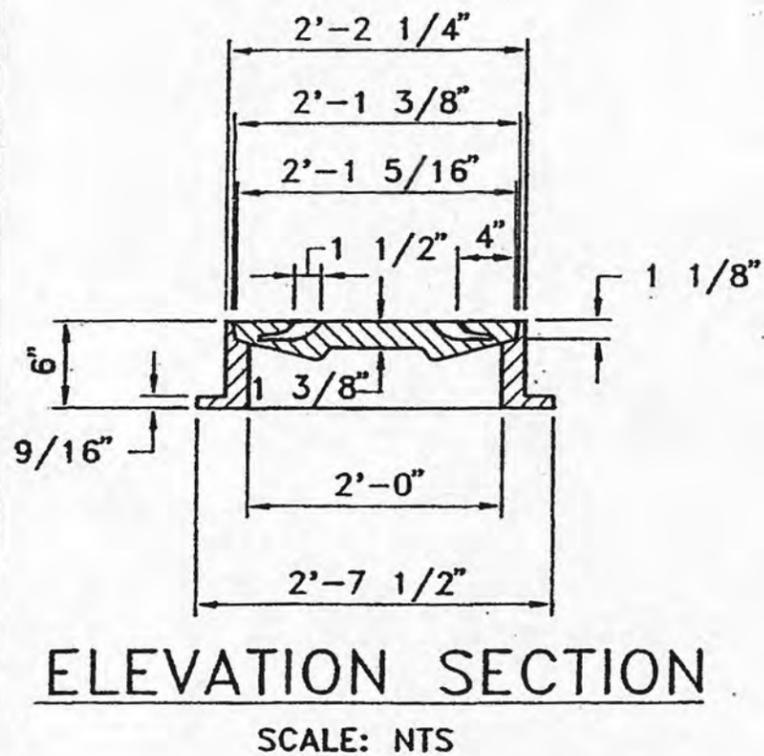
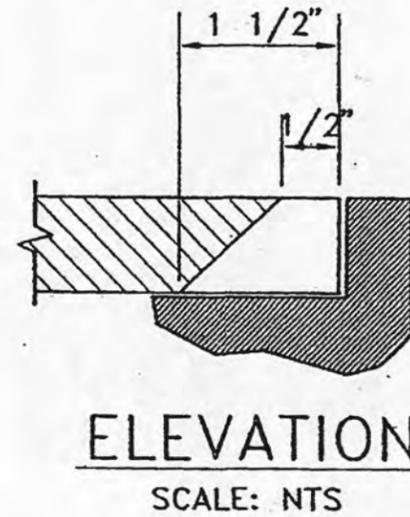
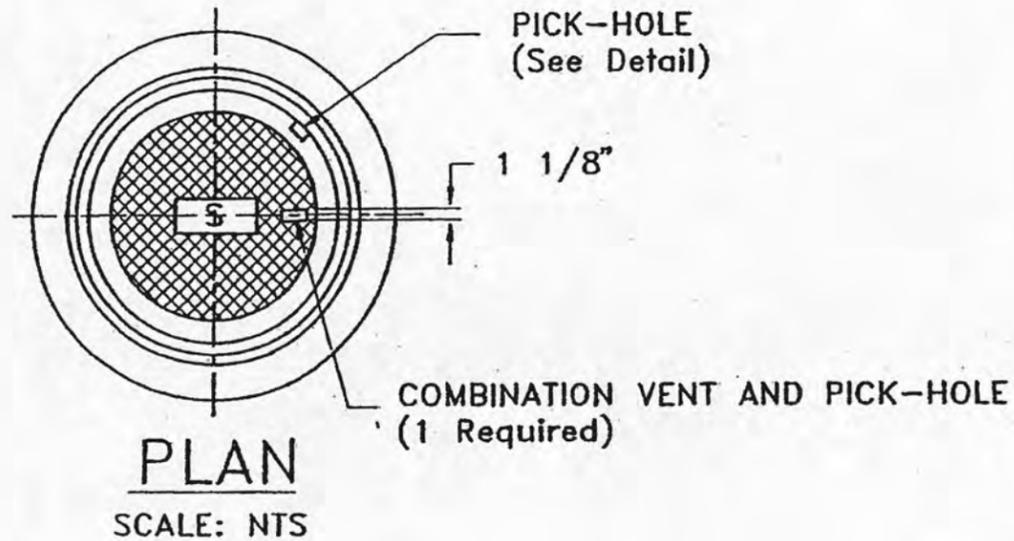
PICK HOLE DETAIL
SCALE: NTS

NOTES:

1. MINOR MODIFICATIONS IN ABOVE DIMENSIONS AND MANUFACTURING CONFIGURATIONS ARE PERMISSIBLE SUBJECT TO CITY APPROVAL.
2. CAST IRON FOR FRAME AND COVER SHALL BE CLASS 30 MINIMUM AS PER A.S.T.M. A-48.
3. WHEN VENT HOLES ARE SPECIFIED FOR THE BOLT-DOWN MANHOLE COVER ON PLANS, THEY SHALL BE DESIGNED AND SPACED AS SHOWN ON STANDARD MANHOLE COVER DETAIL SHEET NO. 10-AA-1947
4. BEFORE LEAVING THE FOUNDRY, THE FRAME AND COVER SHALL BE PAINTED OR DIPPED IN ASPHALT PAINT.

52

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			BOLT-DOWN MANHOLE COVER	
NO.	DATE	DESCRIPTION REVISION	APPRD.	
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1948



NOTES:

1. MINOR MODIFICATIONS IN ABOVE DIMENSIONS AND MANUFACTURING CONFIGURATIONS ARE PERMISSIBLE SUBJECT TO CITY APPROVAL.

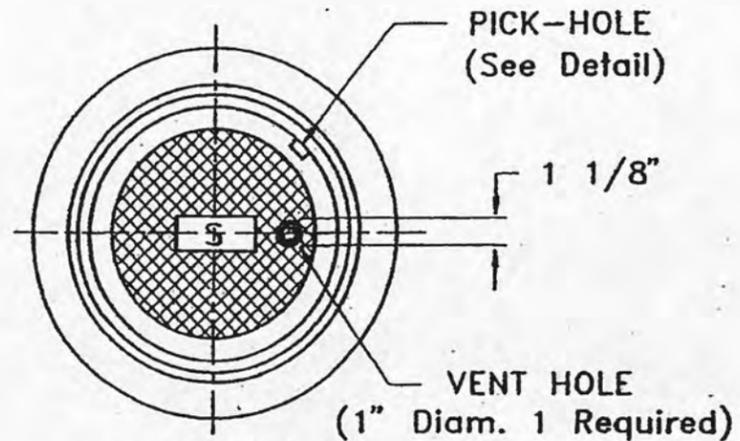
2. CAST IRON FOR FRAME AND COVER SHALL BE CLASS 30 MINIMUM AS PER A.S.T.M. A-48.

3. RAISED LETTERS 1/4" HIGH TO BE CAST IN CENTER OF MANHOLE COVER.

4. BEFORE LEAVING THE FOUNDRY, THE FRAME AND COVER SHALL BE PAINTED OR DIPPED IN ASPHALT PAINT.

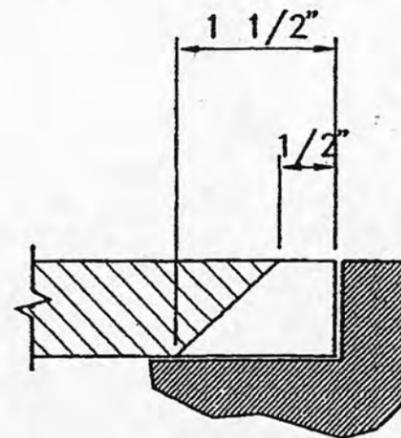
53

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
			PRIVATE MANHOLE FRAME AND COVER		
NO.	DATE	DESCRIPTION REVISION	APPRD.		
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91	
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1949	



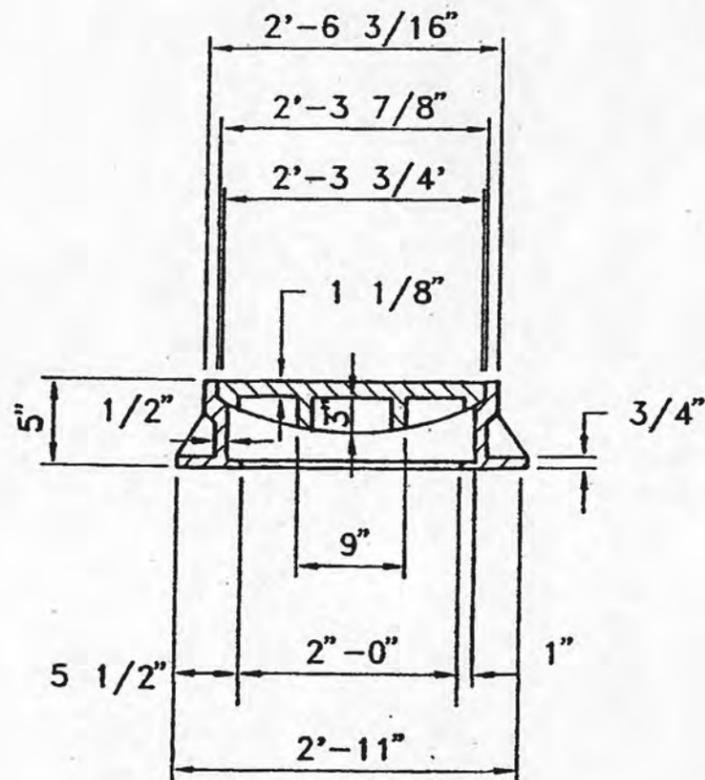
PLAN

SCALE: NTS



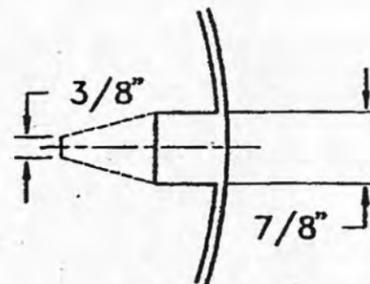
ELEVATION

SCALE: NTS



ELEVATION

SCALE: NTS



PLAN

PICK-HOLE DETAIL

SCALE: NTS

NOTES:

1. MINOR MODIFICATIONS IN ABOVE DIMENSIONS AND MANUFACTURING CONFIGURATIONS ARE PERMISSIBLE SUBJECT TO CITY APPROVAL.

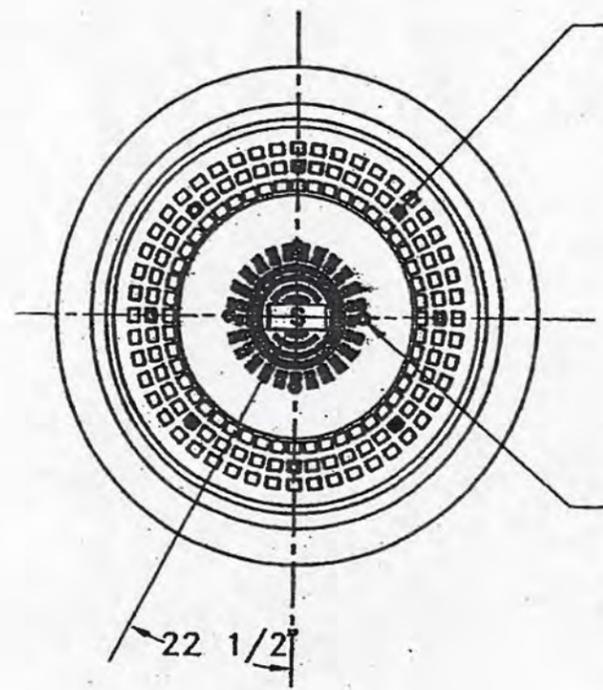
2. CAST IRON FOR FRAME AND COVER SHALL BE CLASS 30 MINIMUM AS PER A.S.T.M. A-48.

3. RAISED LETTER 1/4" HIGH TO BE CAST IN CENTER OF MANHOLE COVER.

4. BEFORE LEAVING THE FOUNDRY THE FRAME AND COVER SHALL BE PAINTED OR DIPPED IN ASPHALT PAINT.

54

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
			PRIVATE CONTROL MANHOLE FRAME AND COVER		
NO.	DATE	DESCRIPTION REVISION	APPRD.		
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91	
CHECKED BY: KMH		APPROVED:		DWG. IQ-AA-195C	

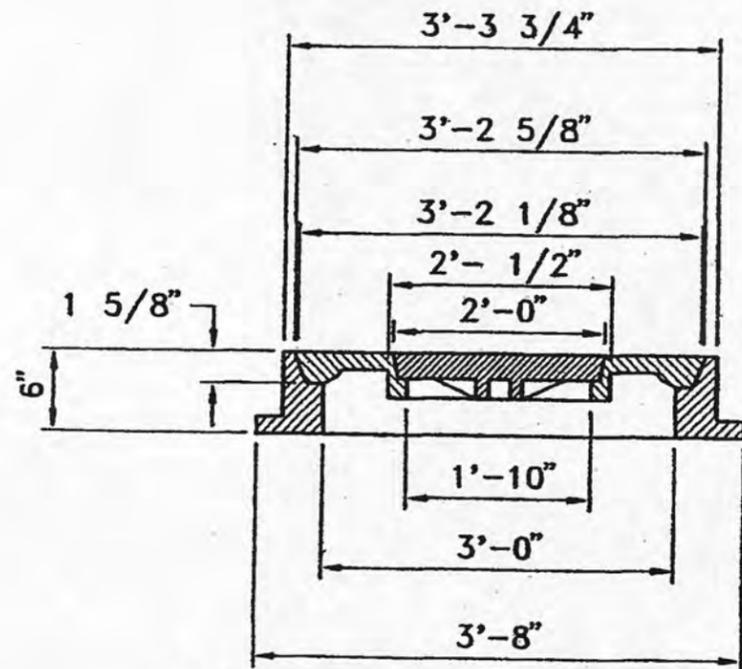


1" DIAMETER VENT HOLES IN OUTER COVER
 (8 Required. Located at 45° intervals and
 on a 31 1/4" Diameter Circle That Is Concentric
 about the Center of the Cover)

1" DIAMETER VENT HOLES IN INNER COVER
 (4 Required Located at 90° Intervals and
 on a 14 3/4" Diameter Circle That Is Concentric
 about the Center of the Cover)

PLAN

SCALE: NTS



ELEVATION SECTION

SCALE: NTS

NOTES:

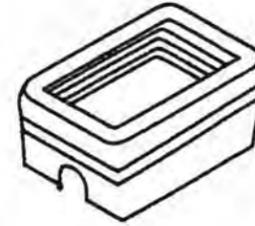
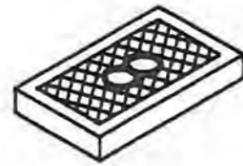
1. MINOR MODIFICATIONS IN ABOVE DIMENSIONS AND MANUFACTURING CONFIGURATIONS ARE PERMISSIBLE SUBJECT TO CITY APPROVAL.

2. CAST IRON FOR FRAME AND COVER SHALL BE CLASS 30 MINIMUM AS PER A.S.T.M. A-40.

3. BEFORE LEAVING THE FOUNDRY, THE FRAME AND COVER SHALL BE PAINTED OR DIPPED IN ASPHALT PAINT.

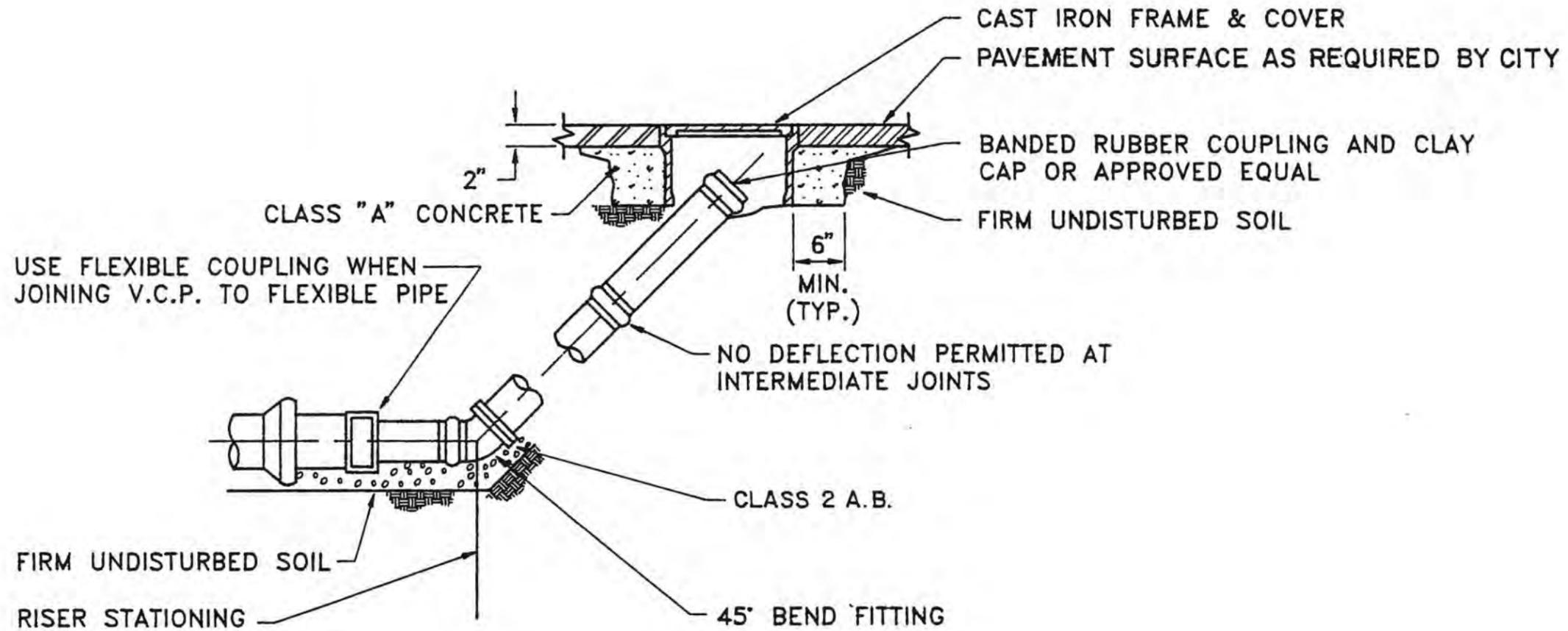
55

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
			36" DIAMETER MANHOLE FRAME AND COVER		
NO.	DATE	DESCRIPTION	APPRD.		
		REVISION			
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91	
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1951	



SEE DWG. 10-AA-1956
FOR BOX & COVER REQUIREMENTS.

CAST IRON COVER/CONCRETE BOX

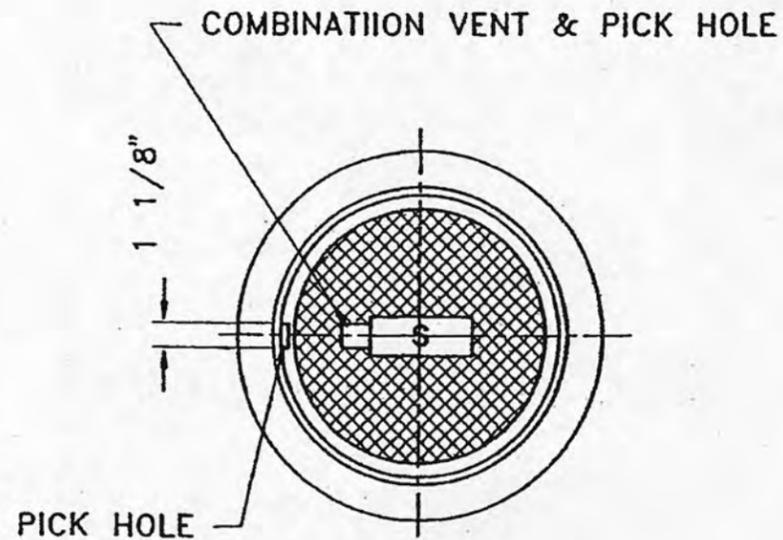


ELEVATION

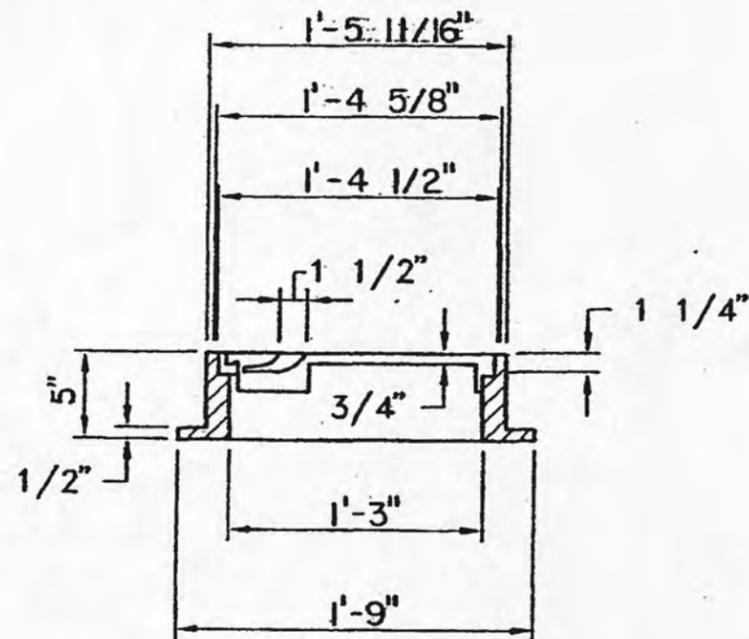
SCALE: NTS

56

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			RISER	
NO.	DATE	DESCRIPTION	APPRD.	
		REVISION		
DRAWN BY: EAS		SUBMITTED: <i>Rwd</i>		DATE: 11/18/91
CHECKED BY: KMH		APPROVED: <i>[Signature]</i>		DWG. 10-AA-1952



PLAN
SCALE: NTS



ELEVATION SECTION
SCALE: NTS

NOTES:

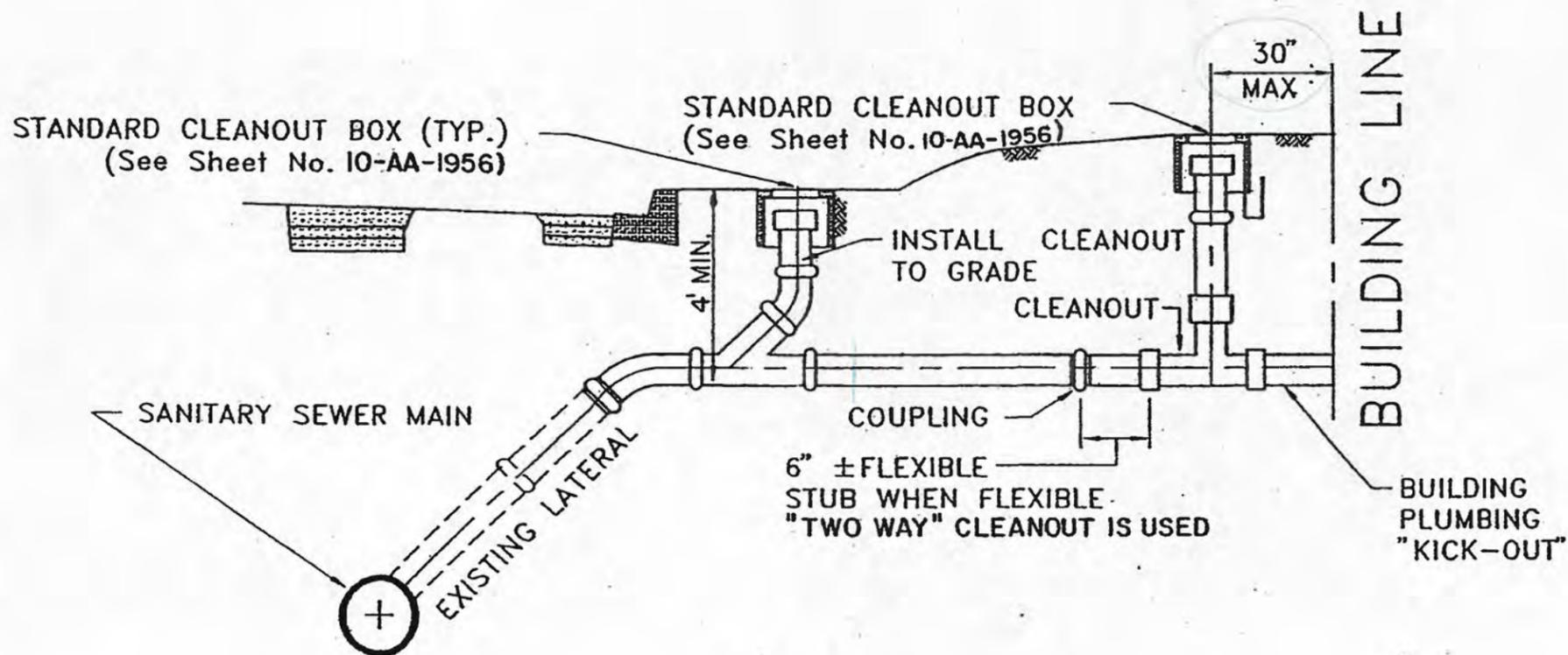
1. MINOR MODIFICATIONS IN ABOVE DIMENSIONS AND MANUFACTURING CONFIGURATIONS ARE PERMISSIBLE SUBJECT TO CITY APPROVAL.

2. CAST IRON FOR FRAME AND COVER SHALL BE CLASS 30 AS PER A.S.T.M. A-48.

3. BEFORE LEAVING THE FOUNDRY, THE FRAME AND COVER SHALL BE PAINTED OR DIPPED IN ASPHALT PAINT.

57

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
			RISER FRAME AND COVER FOR 6", 8" AND 10" DIA PIPE		
NO.	DATE	DESCRIPTION REVISION	APPRD.		
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91	
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1953	



TYPICAL CONNECTION TO BUILDING
SEWER TO EXISTING LATERAL

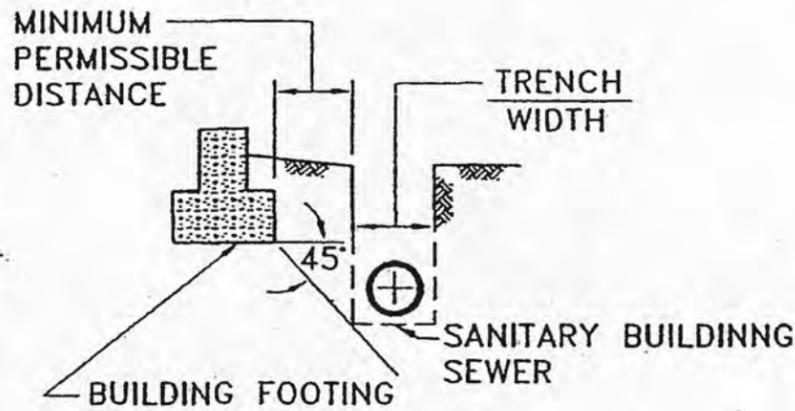
SCALE: NTS

NOTES:

1. CLEANOUT BE INSTALLED BEHIND THE FACE OF CURB.
2. THE SEWER SHALL BE LAID ON A STRAIGHT GRADE BETWEEN THE MAIN SEWER AND THE PROPERTY LINE AND BETWEEN THE PROPERTY LINE AND THE BUILDING PLUMBING.

58

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			BUILDING SEWER DETAILS	
NO.	DATE	DESCRIPTION REVISION	APPRD.	
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1954A

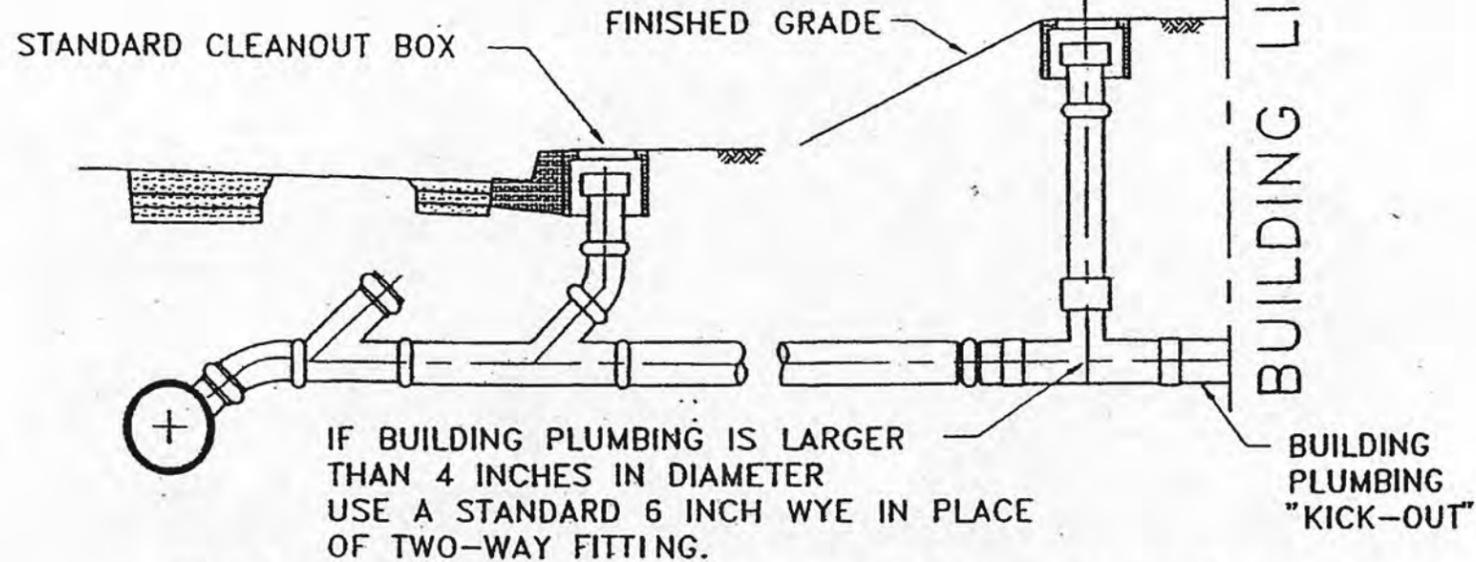


DETAIL - BUILDING SEWER ADJACENT TO BUILDING FOOTING

NOTES:

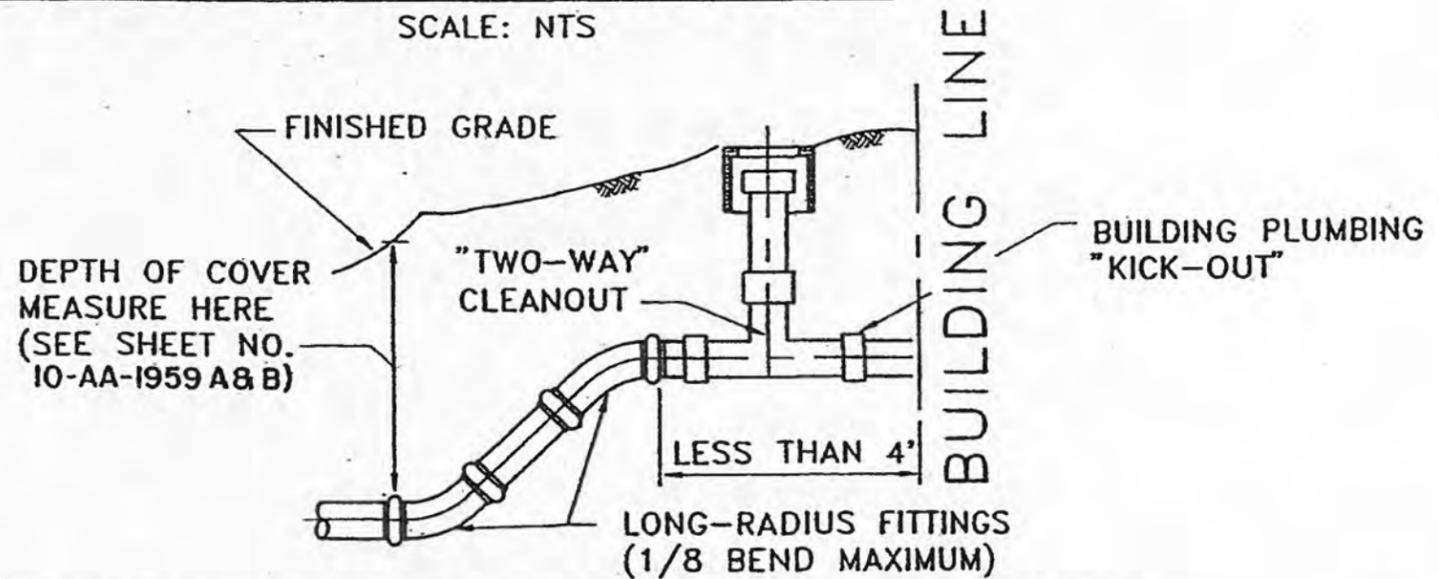
1. CLEANOUT BE INSTALLED BEHIND THE FACE OF CURB.
2. THE SEWER SHALL BE LAID ON A STRAIGHT GRADE BETWEEN THE MAIN SEWER AND THE PROPERTY LINE AND BETWEEN THE PROPERTY LINE AND THE BUILDING PLUMBING.

ALL CLEANOUT MUST BE BROUGHT TO GRADE AND PROTECTED WITH APPROVED BOX.



TYPICAL CONNECTION OF BUILDING SEWER TO EXISTING LATERAL

SCALE: NTS

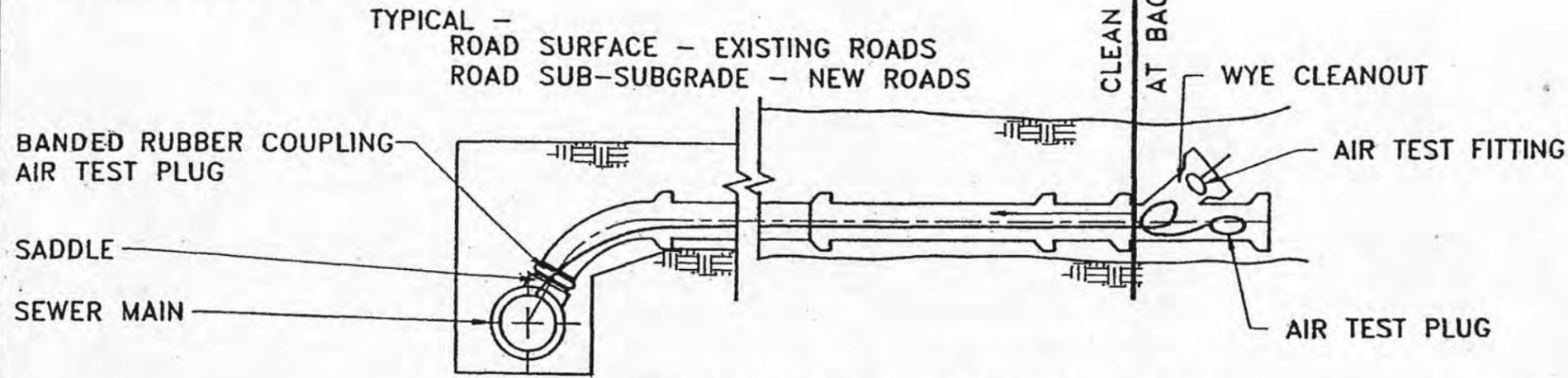


TYPICAL CONNECTION TO BUILDING SEWER FOR SHALLOW BUILDING PLUMBING "KICK-OUT"

SCALE: NTS

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			BUILDING SEWER DETAILS	
NO.	DATE	DESCRIPTION REVISION	APPRD.	
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1954E

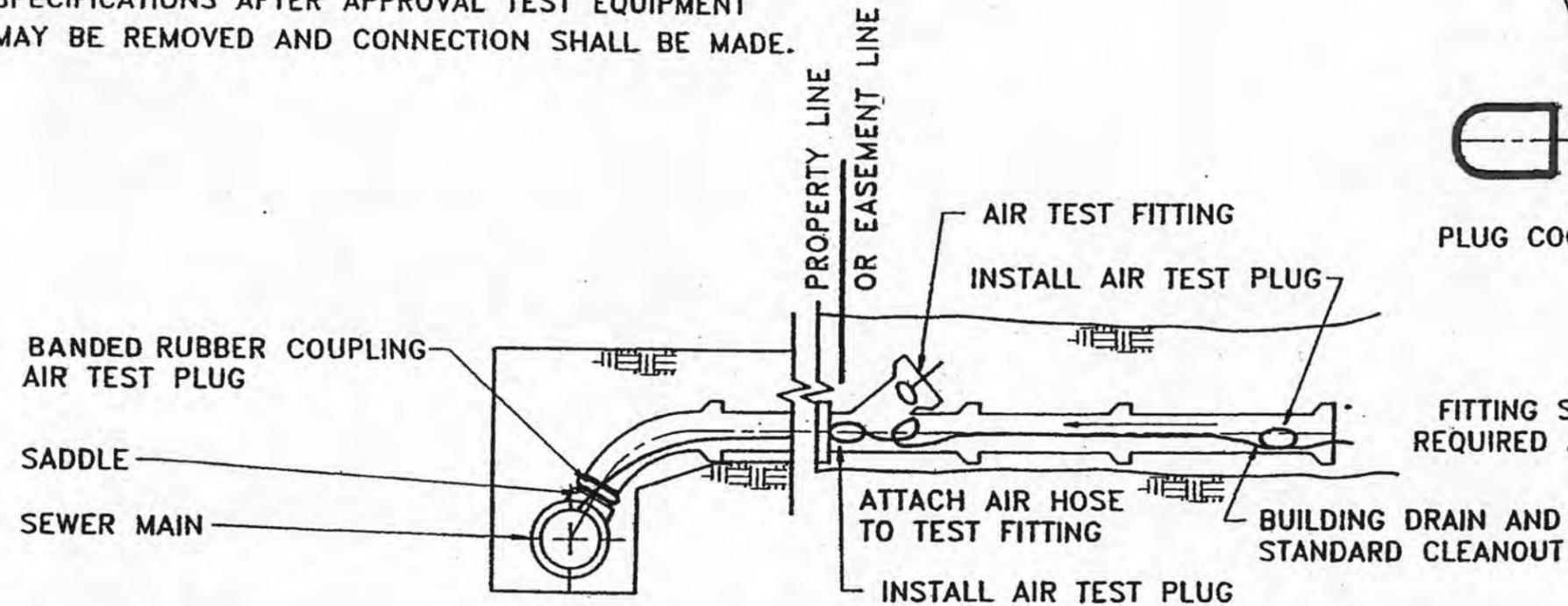
LAY PIPE FROM SADDLE TO PROPERTY LINE, INSERTING HOSE INSIDE AS IT IS BEING LAID TO THE WYE BRANCH AT CURB CLEANOUT. INSTALL TEST EQUIPMENT AND PRESSURIZE LINE IN ACCORDANCE WITH STANDARD SPECIFICATIONS. IF TEST IS SATISFACTORY REMOVE PLUGS AND CONTINUE PIPE LAYING.



LATERAL SEWER TEST

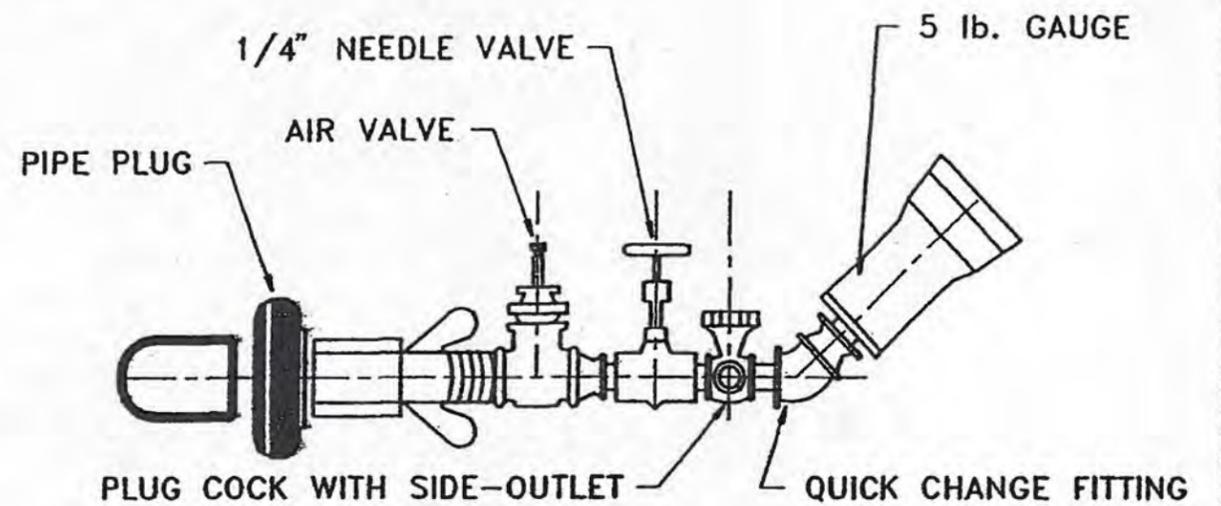
SCALE: NTS

INSTALL TEST PLUGS AND TEST FITTINGS AS SHOWN AND PRESSURIZE LINE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AFTER APPROVAL TEST EQUIPMENT MAY BE REMOVED AND CONNECTION SHALL BE MADE.



HOUSE SEWER TEST

SCALE: NTS



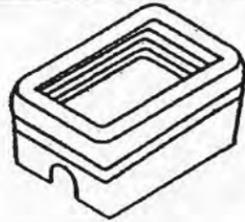
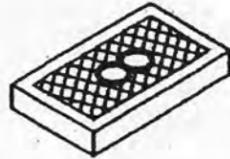
AIR TEST FITTING

SCALE: NTS

FITTING SHOWN ABOVE CONSISTS OF THE MINIMUM HARDWARE REQUIRED AND SUGGESTS A RECOMMENDED CONFIGURATION ONLY

60

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
			BUILDING SEWER AIR TEST DETAIL		
NO.	DATE	DESCRIPTION REVISION	APPRD.		
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91	
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1955	



CAST IRON COVER

CONCRETE BOX

CONCRETE COVER

IN PAVED AREAS OR TRAFFIC AREA
BOX AND COVER SHALL BE SUITABLE
FOR AASHTO H-20 LOAD

NOTE:

1.A RECTANGULAR BOX AS SHOWN ABOVE
SHALL BE USED FOR CLEANOUTS THAT
ARE CAPPED USING A BANDED RUBBER
COUPLING.

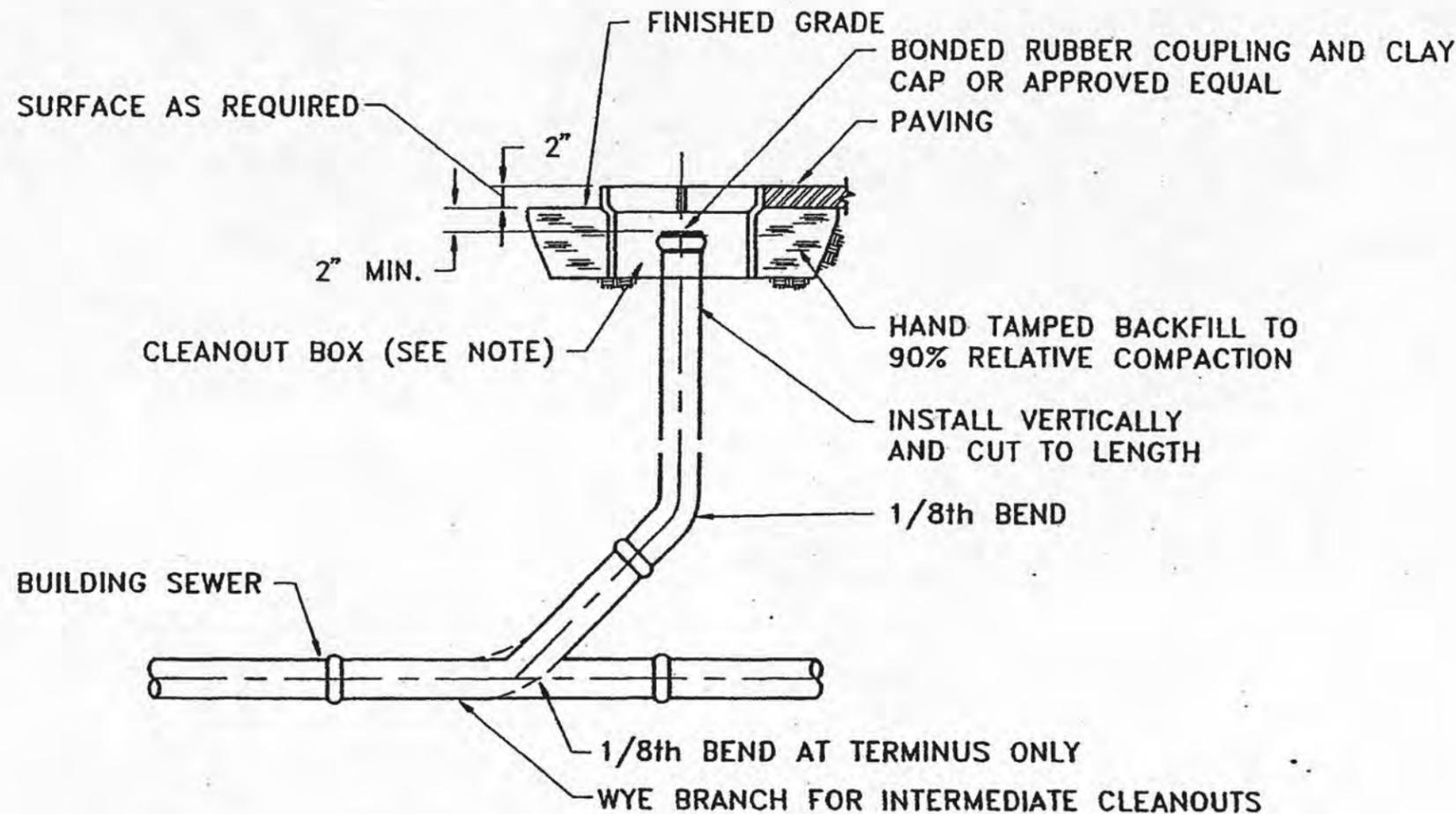
2.CIRCULAR BOXES ARE PERMITTED FOR
CLEANOUTS THAT ARE CAPPED WITH A
SCREW TYPE CAP OR THE APPROVED TOP
OPENING CAPS. TYPE AND MANUFACTURE
SUBJECT TO APPROVAL.

3.CIRCULAR BOXES INSTALLED IN SIDEWALK
AREAS SHALL HAVE A SOLID COVER
WITHOUT HOLES.

4.APPROVED RECTANGULAR BOXES ARE:
A)CHRISTY CONCRETE PRODUCTS 83
BOX WITH A 83D CONCRETE LID OR
83C METAL LID OR
B)BROOKS PRODUCTS INC. NO. 3
METER BOX WITH A NO. 3 HEAVY
DUTY CONCRETE LID OR A NO. 3
CAST IRON TRAFFIC LID OR AN
APPROVED EQUAL.

5.CONCRETE LIDS ARE ACCEPTABLE FOR
USE IN NON-VEHICULAR TRAFFIC AREAS,
WHILE METAL LIDS MUST BE USED
ELSEWHERE.

6.ALL CLEANOUT BOX LIDS SHALL BE
MARKED WITH A LETTER "S" OR THE WORD
"SEWER".



ELEVATION

SCALE:NTS

TERMINATE CLEANOUT AT CLOSEST JOINT TO SURFACE WITH
TEMPORARY PLUG. AFTER ALL BACKFILL IS COMPLETE AND
SUB-GRADE MADE IN AREAS TO BE PAVED, THE FINAL
RISER PIPE AND BOX SHALL BE INSTALLED AS SHOWN.

61

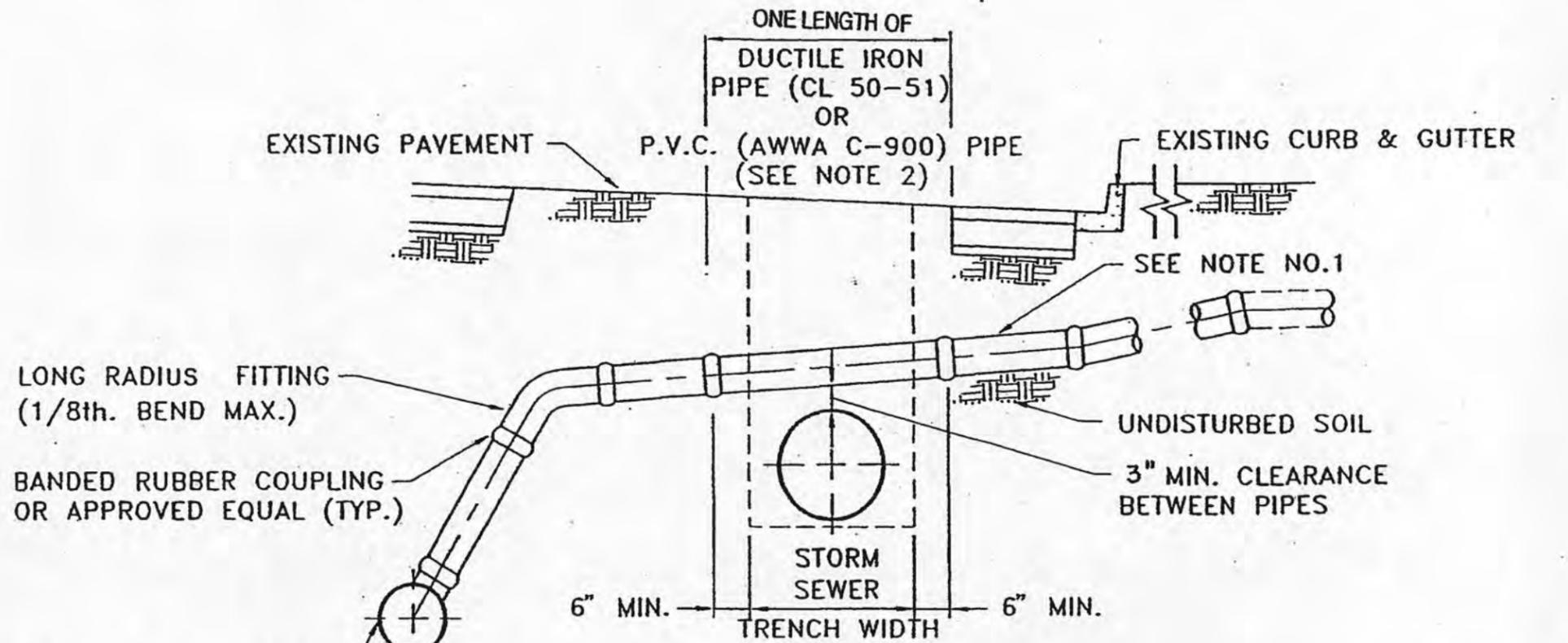
REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
			BUILDING SEWER		
			CLEANOUT TO GRADE		
NO.	DATE	DESCRIPTION REVISION	APPR.		
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91	
CHECKED BY: KMH		APPROVED:		DWG-10-AA-1956	

NOTES:

1. THE ABOVE DETAILS ARE TYPICAL FOR MAIN AND BUILDING SEWERS WHEN RIGID PIPE IS USED.

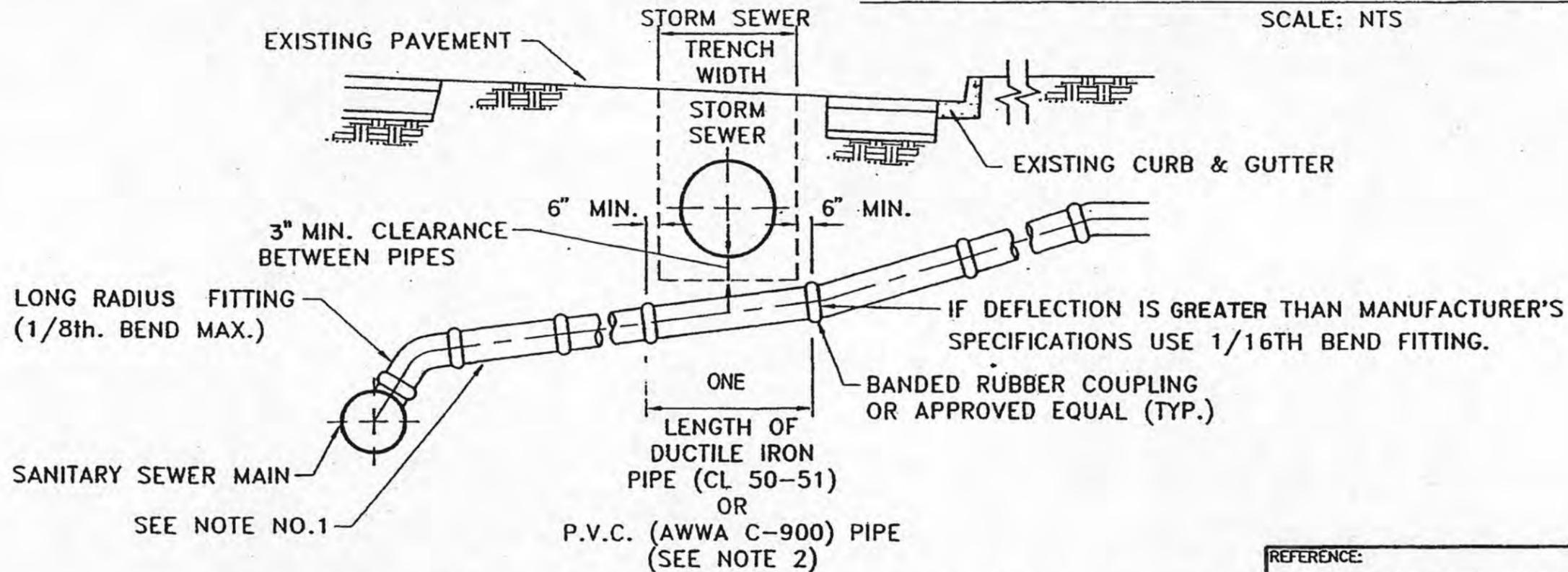
2. IF CLEARANCE BETWEEN PIPES IS LESS THAN 6" DUCTILE IRON OR PVC PIPE, OF THE TYPE SHOWN SHALL BE USED.

3. THIS TYPE OF CROSSING MAY ALSO BE REQUIRED BY THE CITY OF RICHMOND WHEN CROSSING CERTAIN OTHER UTILITIES.



TYPICAL CROSSING OVER STORM SEWER

SCALE: NTS

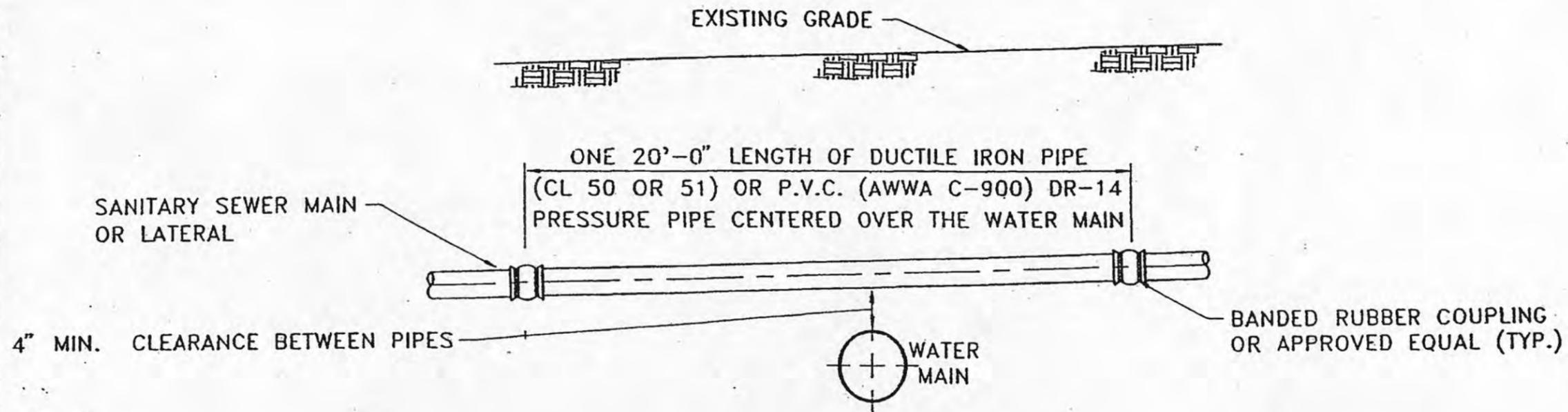


TYPICAL CROSSING UNDER STORM SEWER

SCALE: NTS

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			SANITARY SEWER	
NO.	DATE	DESCRIPTION	APPROD.	
		REVISION		
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-19

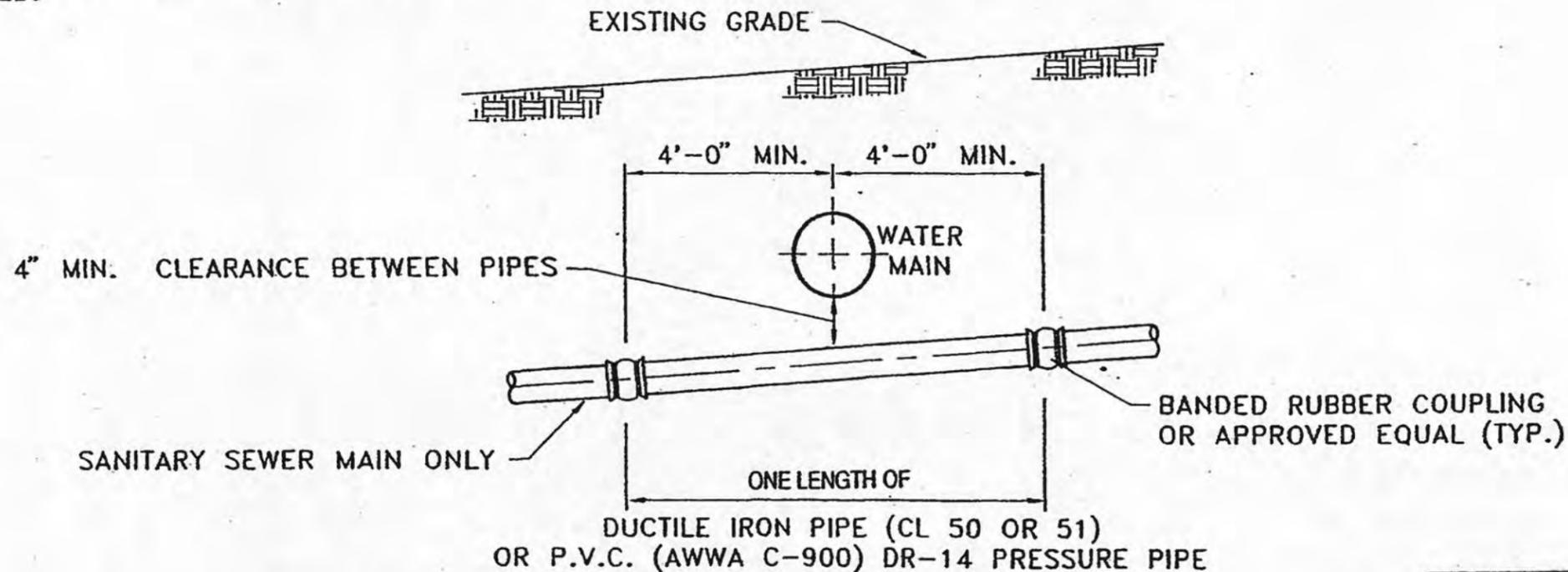
62



TYPICAL CROSSING OVER WATER MAIN

SCALE: NTS

NOTE:
IF CLEARANCE BETWEEN PIPES IS LESS THAN 1'
DUCTILE IRON OR PVC PIPE, OF THE TYPE SHOWN,
SHALL BE USED.



TYPICAL CROSSING UNDER WATER MAIN

SCALE: NTS

63

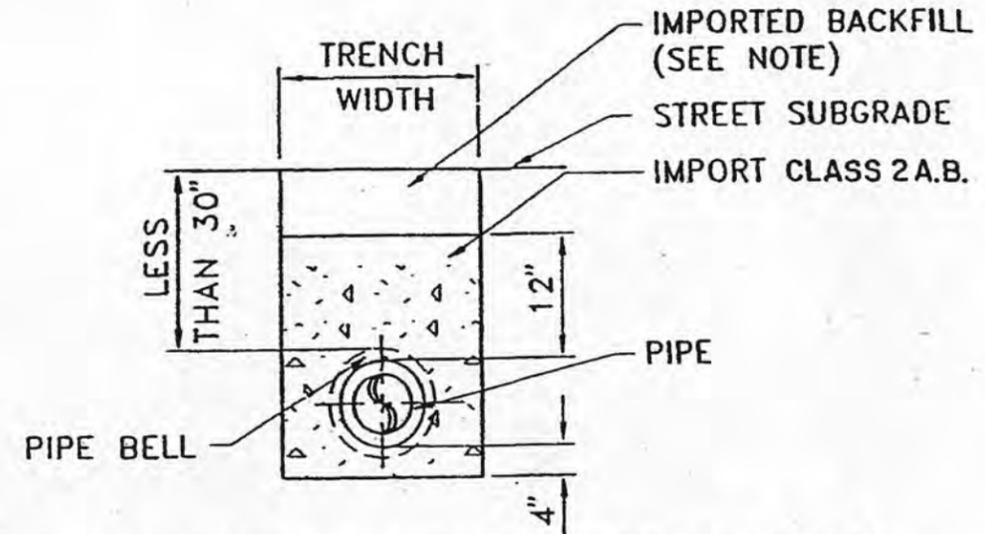
10-AA-1958

REFERENCE:			CITY OF RICHMOND	
			DEPARTMENT OF PUBLIC WORKS	
			DIVISION OF ENGINEERING	
			SANITARY SEWER	
			WATER MAIN CROSSING	
NO.	DATE	DESCRIPTION REVISION	APPRD.	
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-195

BEDDING COVER AND SLOPE REQUIREMENTS FOR SEWER INSTALLATION

PIPE COVER LIMITATION TABLE			
PIPE SPECIFICATION - SEE SEC. 5		COVER IN FEET MIN - MAX* *	
MATERIAL	TYPE AND MINIMUM CLASS	DETAIL A	DETAIL B
BUILDING SEWER FROM PROPERTY LINE TO BUILDING IN UNPAVED PRIVATE PROPERTY			
4" - 6" VCP		—	2 - 30
4" - 6" ABS	SOLID & COMPOSITE WALL	—	2 - 30
4" - 6" CIP	SOIL PIPE	—	1 - 30
4" - 6" DIP	DUCTILE (50 & 51)	—	1 - 30
4" - 6" PVC	CLASS SDR 18	—	1 - 30
MAIN & BUILDING SEWERS IN PUBLIC UTILITY AND CITY EASEMENTS STREET RIGHTS OF WAY AND PAVED PRIVATE PROPERTY			
4" - 6" VCP		2 - 19	—
8" VCP		3 - 16	—
10" - LARGER VCP		3 - 14	—
4" - LARGER CIP	SOIL PIPE	1 - 30	—
4" - LARGER DIP	DUCTILE IRON (CLASS 50 & 51)	1 - 30	—
8" - LARGER PVC	COMPOSITE WALL	3 - 30	—
4" - LARGER PVC	SOLID WALL (CLASS SDR 14)	1 - 30	—
WHEN MAXIMUM COVER IS EXCEEDED, APPROVAL BY CITY OF SPECIAL BEDDING REQUIREMENT IS NECESSARY			

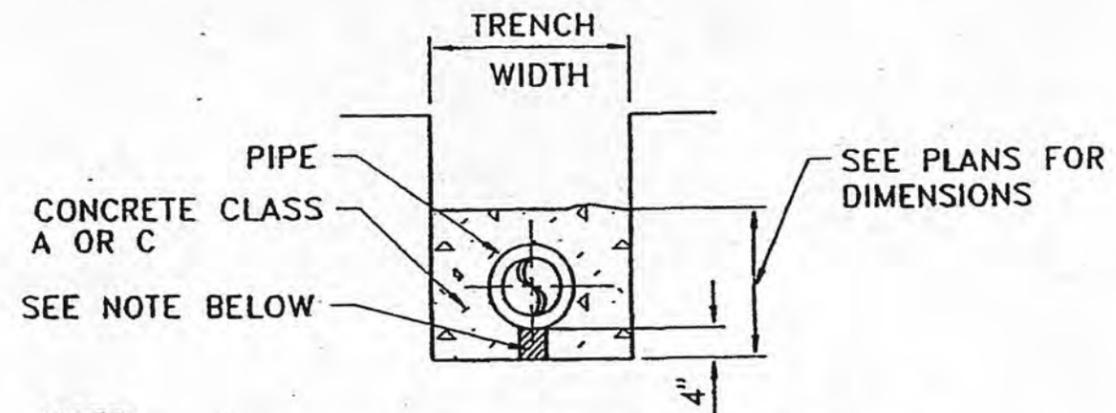
NOTE: ABS PIPE CANNOT BE USED IN PUBLIC UTILITY AND CITY EASEMENTS, STREET RIGHTS OF WAY AND PAVED PRIVATE PROPERTY.



NOTE:
REPLACE WITH IMPORTED BACKFILL AS REQUIRED BY CITY

SPECIAL BEDDING DETAIL

SCALE: NTS



NOTE:
SOLID SUPPORT ON FIRM UNDISTURBED GROUND IS
REQUIRED BEFORE CONCRETE ENCASEMENT IS POURED

CONCRETE ENCASEMENT DETAIL

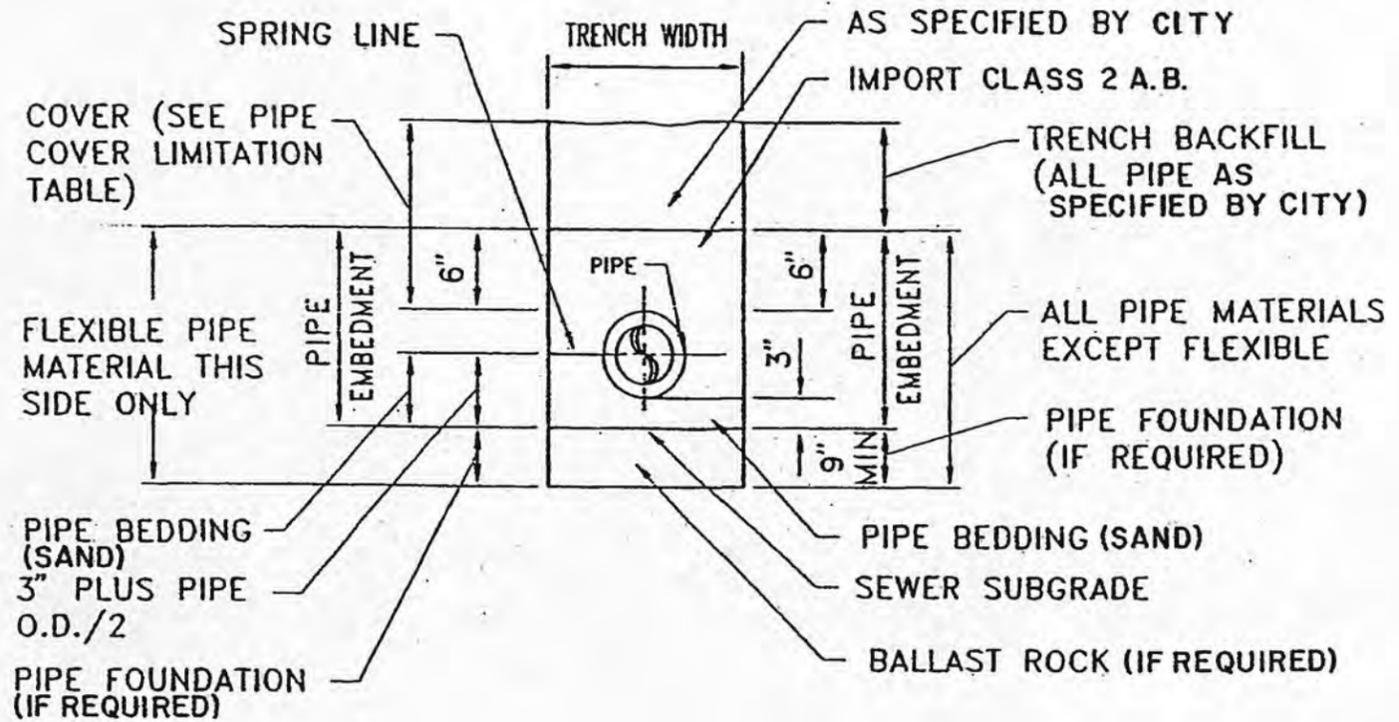
SCALE: NTS

64

10-AA-1059A

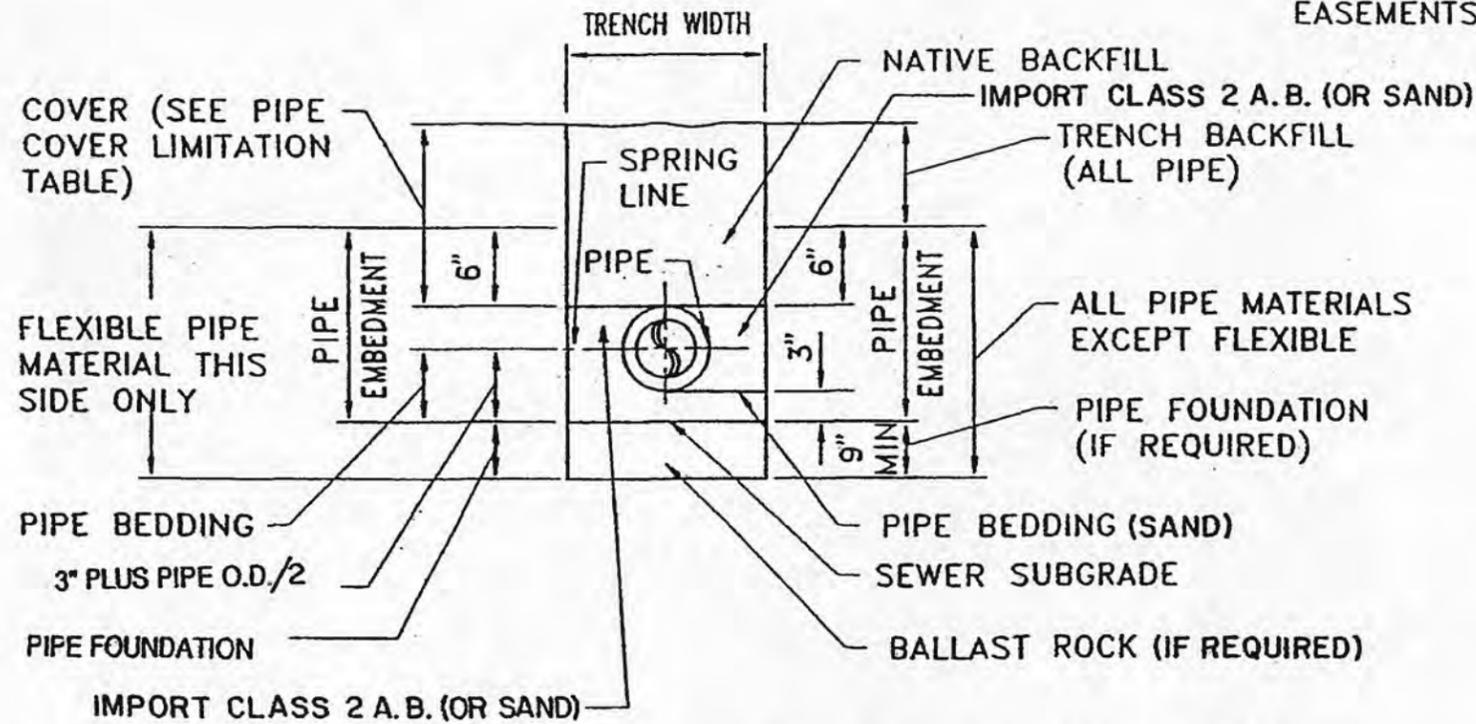
REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
			SEWER PIPE INSTALLATION COVER, SLOPE, SPECIAL BEDDING AND ENCASEMENT REQUIREMENT		
NO.	DATE	DESCRIPTION REVISION	APPRD.		
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91	
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-1959	

MINIMUM SIZE AND SLOPE LIMITATION TABLE			
SPECIFICATION - SEE SEC. 20 & 21 * *			
PIPE DIAMETER	MINIMUM SLOPE (FT/FT)	COMMENTS	MAXIMUM FIXTURE UNITS
BUILDING SEWER			
FROM SEWER MAIN TO BUILDING			
4"	0.02	IF MAIN IS NOT ADEQUATE DEPTH 0.01 FT/FT IS MINIMUM	200
6"	0.01		600
MAIN SEWERS			
8"	.003		—
10"	0.0015		—
12"	.0010		—
LARGE		PER PLANS AND ENGINEERS REQUIREMENTS	



MAIN BUILDING SEWERS IN PUBLIC UTILITY AND CITY EASEMENTS, STREET RIGHTS OF WAY AND PAVED PRIVATE PROPERTY

DETAIL A
SCALE: NTS



* UNLESS OTHERWISE REQUIRED BY CITY OF RICHMOND BUILDING SEWER IN UNPAVED PRIVATE PROPERTY FROM BACK OF CURB TO BUILDING

DETAIL B
SCALE: NTS

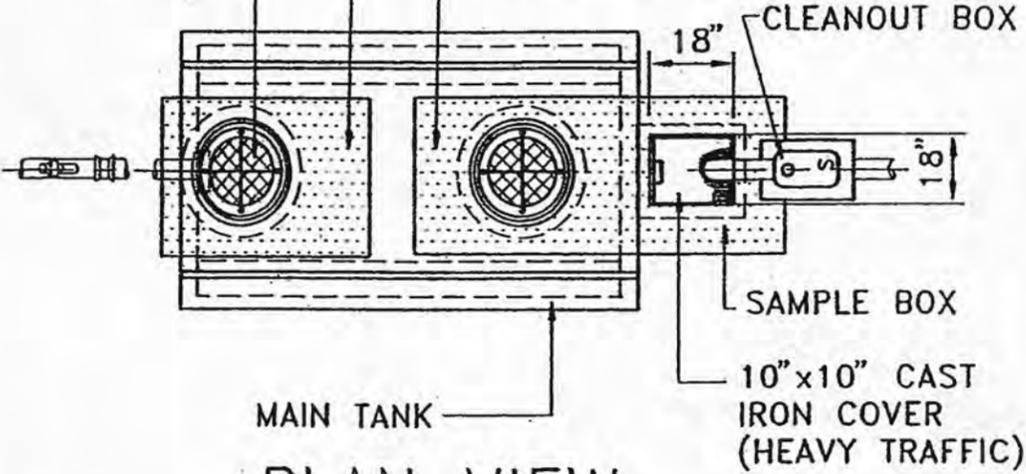
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10-AA-1059B

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
			SEWER PIPE INSTALLATION COVER, SLOPE, SPECIAL BEDDING AND ENCASUREMENT REQUIREMENT		
NO.	DATE	DESCRIPTION	APPRD.		
		REVISION			
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91	
CHECKED BY: KMH		APPROVED:		DWG. 10-AA-19591	

BOLT DOWN (TYP.)
(SEE NOTE NO.7)

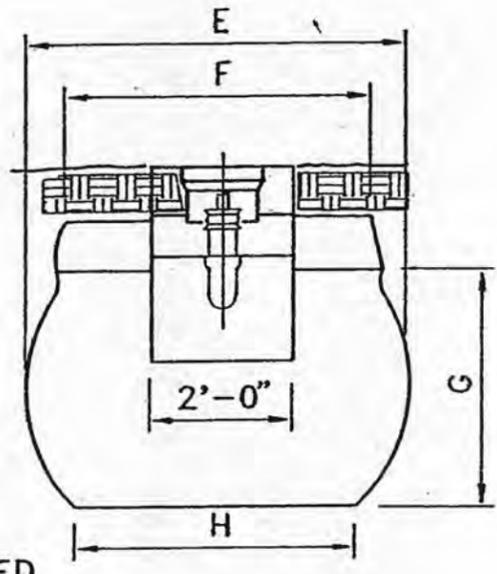
POUR CONCRETE
COLLARS AROUND
CAST IRON FRAMES



PLAN VIEW
SCALE: NTS

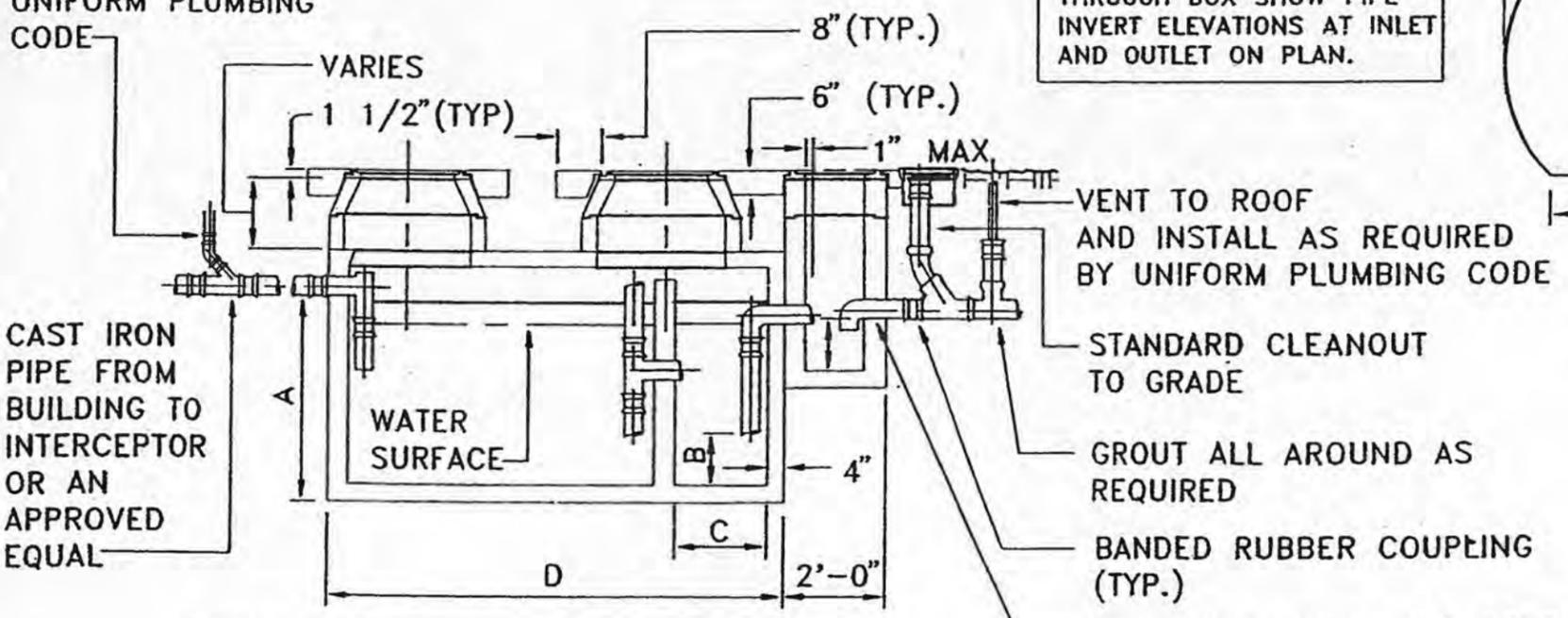
- NOTES:
1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 P.S.I. AT 28 DAYS.
 2. CIRCULAR LIDS FOR NOTTINGHAM SHALL BE SOUTHBAY FOUNDRY 1900 - BD OR APPROVED EQUAL, WITH RAISED "S" OR THE WORD "SEWER."
 3. TANK TO BE PLACED ON CLASS 2 A. B.

NOTE: TO ENGINEER OR ARCHITECT PROVIDE 4" ELEVATION DROP BETWEEN INLET AND OUTLET PIPES THROUGH BOX SHOW PIPE INVERT ELEVATIONS AT INLET AND OUTLET ON PLAN.



END VIEW
SCALE: NTS

VENT TO ROOF AND INSTALL AS REQUIRED BY UNIFORM PLUMBING CODE



ELEVATION SECTION
SCALE: NTS

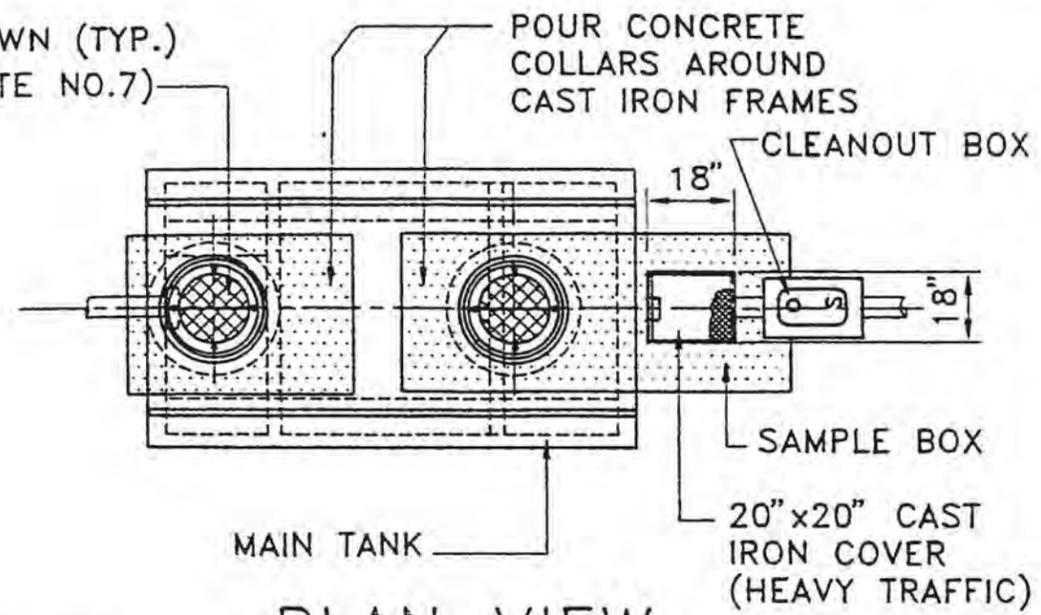
4. HEIGHT OF TANK ABOVE FITTINGS VARIABLE, 6 OR 12 INCH SECTIONS MAY BE ADDED TO REACH THE REQUIRED FINISHED GRADE MORTAR AND BAND BOTH SIDES IN FIELD.
5. ALL CONCRETE JOINTS SHALL BE CLEANED WETTED AND MORTARED PRIOR TO SETTING NEXT SECTION. THE JOINTS SHALL BE PACKED TROWELLED AND BANDED SMOOTH ON BOTH SIDES OF THE BOX.
6. ALL PIPING IN THE BOX TO BE CAST IRON OR APPROVED EQUAL.
7. BOLT EACH OF THE THREE COMPARTMENT COVERS DOWN TO FRAME WITH NOT LESS THAN TWO 7/16" HEX. HEAD STEEL BOLTS.
8. JOIN (ENTIRE SURFACE) SAMPLE BOX TO TANK WITH FACTORY INSTALLED BOLTS OR EPOXY IN FIELD.
9. UNLESS OTHERWISE APPROVED BY THE CITY OF RICHMOND A VENT WILL BE REQUIRED ON THE INLET SIDE OF THE INTERCEPTOR WHEN ITS DISTANCE FROM THE VENT SYSTEM WITHIN THE BUILDING IS GREATER THAN 10 FEET. VENT PIPES ON THE INLET SIDE AND THE OUTLET SIDE MAY BE INSTALLED SEPARATELY OR COMBINED IN CONFORMANCE WITH UNIFORM PLUMBING CODE.
10. STRUCTURE SHOWN IN PRE-CAST REINFORCED CONCRETE AS MANUFACTURED BY M.C. NOTTINGHAM OR AN APPROVED EQUAL.

66

CAPACITY	CU.FT.GREASE	EXCAVATION SPECIFICATION										
		A	B	C	D	E	F	G	H	LENGTH	WIDTH	DEPTH BELOW INLET
1000	67	4'-4"	1'-0"	2'-0"	8'-0"	5'-11"	4'-3"	5'-3"	4'-1"	9'-0"	7'-0"	4'-4"
1250	75	5'-0"	1'-0"	2'-0"	8'-0"	5'-11"	4'-3"	5'-11"	3'-11"	9'-0"	7'-0"	5'-0"
1500	83	5'-0"	1'-0"	2'-0"	8'-0"	6'-11"	5'-3"	5'-11"	4'-11"	9'-0"	6'-0"	5'-0"

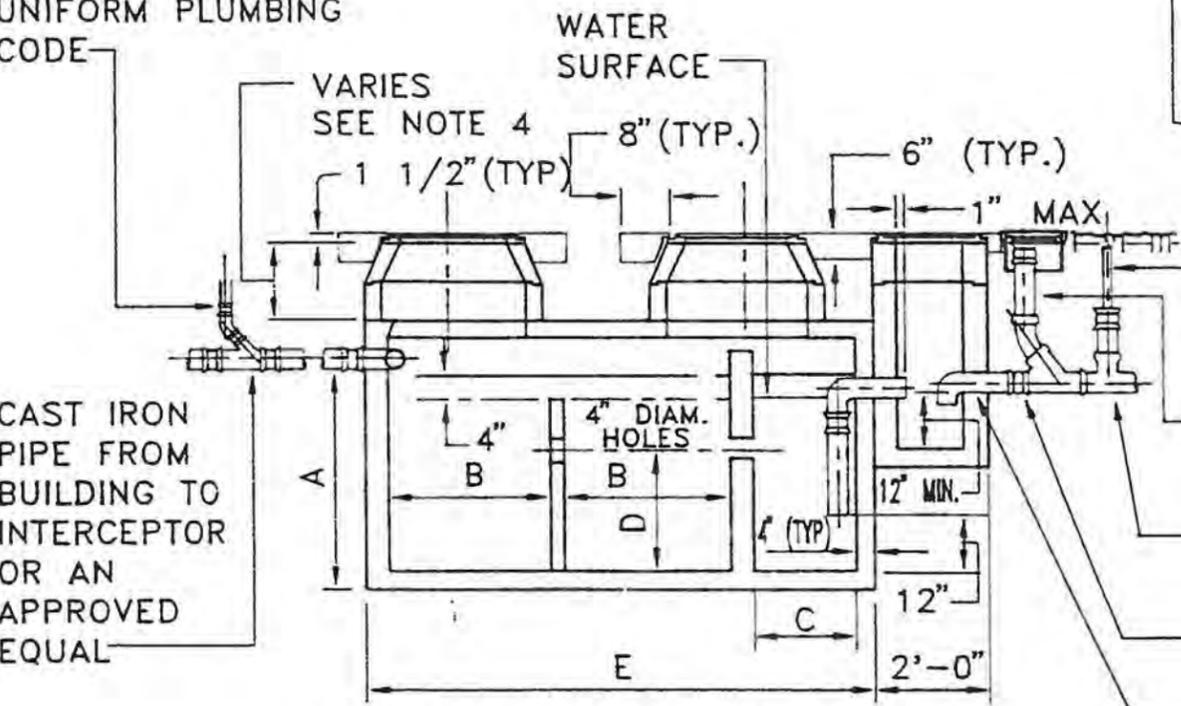
REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			TWO COMPARTMENT GREASE INTERCEPTOR	
NO.	DATE	DESCRIPTION	APPRD.	
		REVISION		
DRAWN BY: EAS		SUBMITTED:		DATE: 11/18/91

OLT DOWN (TYP.)
SEE NOTE NO.7)



PLAN VIEW
SCALE: NTS

VENT TO ROOF
AND INSTALL AS
REQUIRED BY
UNIFORM PLUMBING
CODE

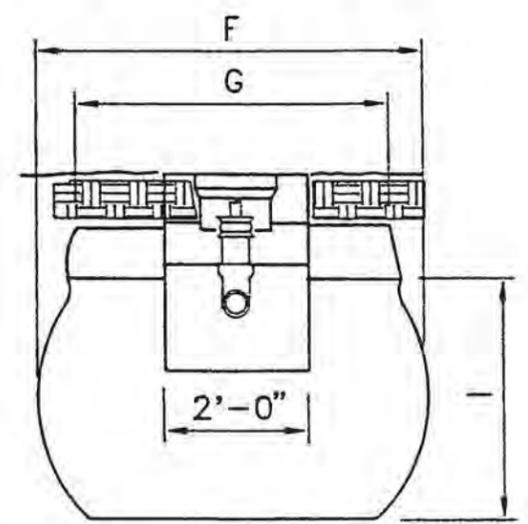


ELEVATION SECTION
SCALE: NTS

NOTES:

1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 P.S.I. AT 28 DAYS.
2. CIRCULAR LIDS FOR NOTTINGHAM SHALL BE SOUTHBAY FOUNDRY 1900 - BD OR APPROVED EQUAL, WITH RAISED "S" OR THE WORD "SEWER".
3. TANK TO BE PLACED ON TYPE "B" IMPORT.

NOTE: TO ENGINEER OR ARCHITECT: PROVIDE 4" ELEVATION DROP BETWEEN INLET AND OUTLET PIPES THROUGH BOX SHOW PIPE INVERT ELEVATIONS AT INLET AND OUTLET ON PLAN.



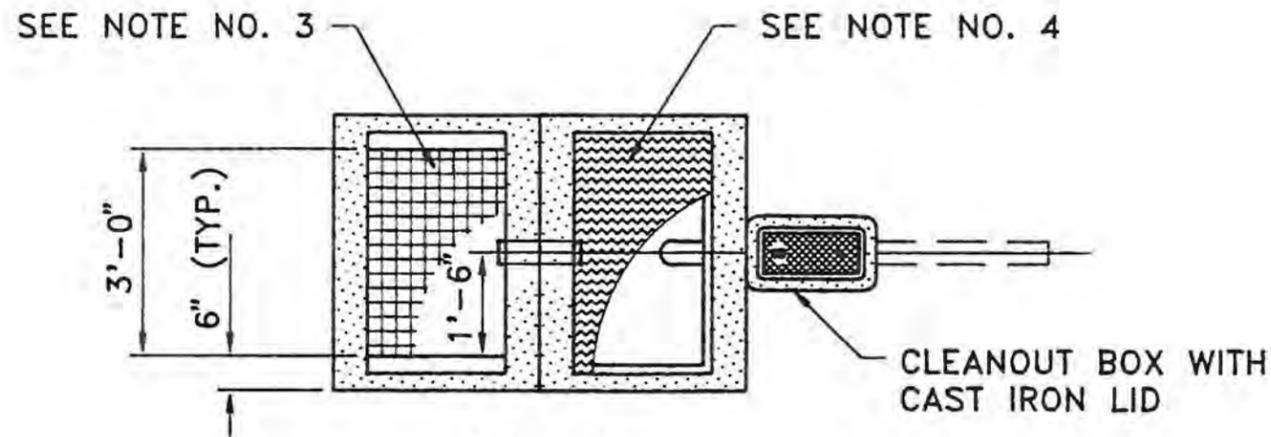
END VIEW
SCALE: NTS

4. HEIGHT OF TANK ABOVE FITTINGS VARIABLE, 6 OR 12 INCH SECTIONS MAY BE ADDED TO REACH THE REQUIRED FINISHED GRADE MORTAR AND BAND BOTH SIDES IN FIELD.
5. ALL CONCRETE JOINTS SHALL BE CLEANED WETTED AND MORTARED PRIOR TO SETTING NEXT SECTION. THE JOINTS SHALL BE PACKED TROWELLED AND BANDED SMOOTH ON BOTH SIDES OF THE BOX.
6. ALL PIPING IN THE BOX TO BE CAST IRON OR APPROVED EQUAL.
7. BOLT EACH OF THE THREE COMPARTMENT COVERS DOWN TO FRAME WITH A NOT LESS THAN TWO 7/16" HEX. HEAD STEEL BOLTS.
8. JOIN (ENTIRE SURFACE) SAMPLE BOX TO TANK WITH FACTORY INSTALLED BOLTS OR EPOXY IN FIELD.
9. UNLESS OTHERWISE APPROVED BY THE CITY OF RICHMOND A VENT WILL BE REQUIRED ON THE INLET SIDE OF THE INTERCEPTOR WHEN ITS DISTANCE FROM THE VENT SYSTEM WITHIN THE BUILDING IS GREATER THAN 10 FEET. VENT PIPES ON THE INLET SIDE AND THE OUTLET SIDE MAY BE INSTALLED SEPARATELY OR COMBINED IN CONFORMANCE WITH UNIFORM PLUMBING CODE.
10. STRUCTURE SHOWN IN PRE-CAST REINFORCED CONCRETE AS MANUFACTURED BY M.C. NOTTINGHAM OR AN APPROVED EQUAL.

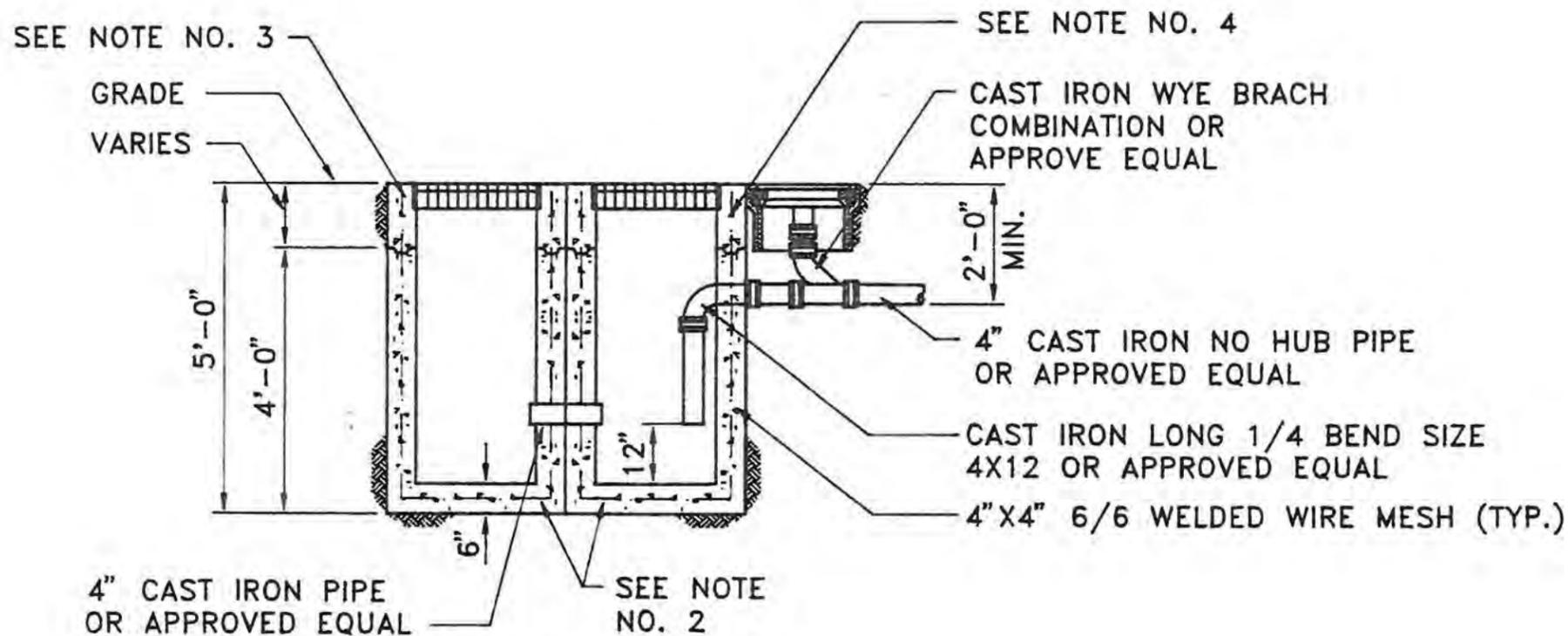
67

CAPACITY	EXCAVATION SPECIFICATION									LENGTH	WIDTH	DEPTH BELOW INLET
	A	B	C	D	E	F	G	H	I			
1000	4'-4"	2'-8"	1'-10"	1'-10"	8'-0"	5'-11"	4'-3"	4'-1"	5'-3"	9'-0"	7'-0"	4'-4"
1250	5'-0"	2'-8"	1'-10"	2'-2"	8'-0"	5'-11"	4'-3"	3'-11"	5'-11"	9'-0"	7'-0"	5'-0"
1500	5'-0"	2'-8"	1'-10"	2'-2"	8'-0"	6'-11"	5'-3"	4'-11"	5'-11"	9'-0"	8'-0"	5'-0"

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
			THREE COMPARTMENT GREASE INTERCEPTOR		
NO.	DATE	DESCRIPTION	APPRD.		
		REVISION			
DRAWN BY: EAS		SUBMITTED: <i>RWD</i>		DATE: 11/18/91	
CHECKED BY: KMH		APPROVED: <i>[Signature]</i>		DWG. 10-AA-1961	



PLAN
SCALE: NTS



SECTION
SCALE: NTS

NOTES:

1. DIMENSION AS SHOWN UNLESS OTHERWISE SPECIFIED.

2. TWO (2) U-32 CATCH BASIN BOXES AS MANUFACTURED BY CHRISTY CONCRETE PRODUCTS INC. 44100 CHRISTY STREET, FREMONT, CA. 94538 OR AN APPROVED EQUAL.

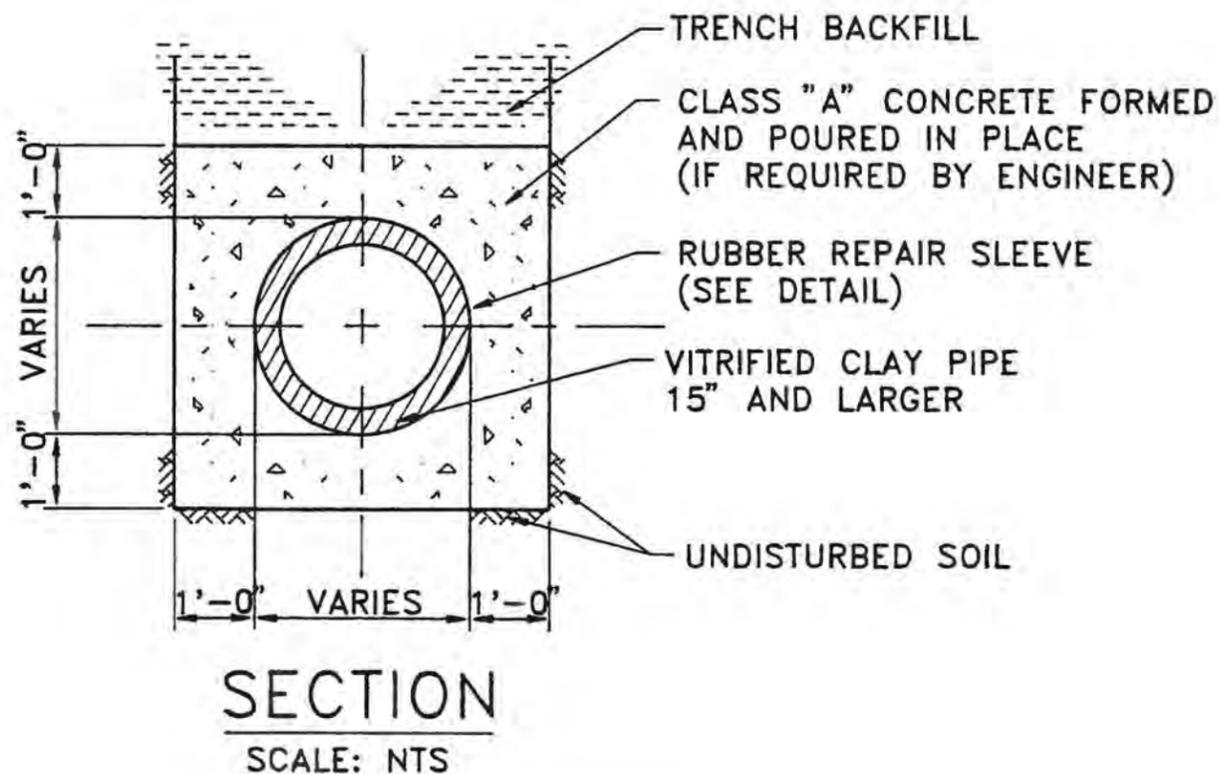
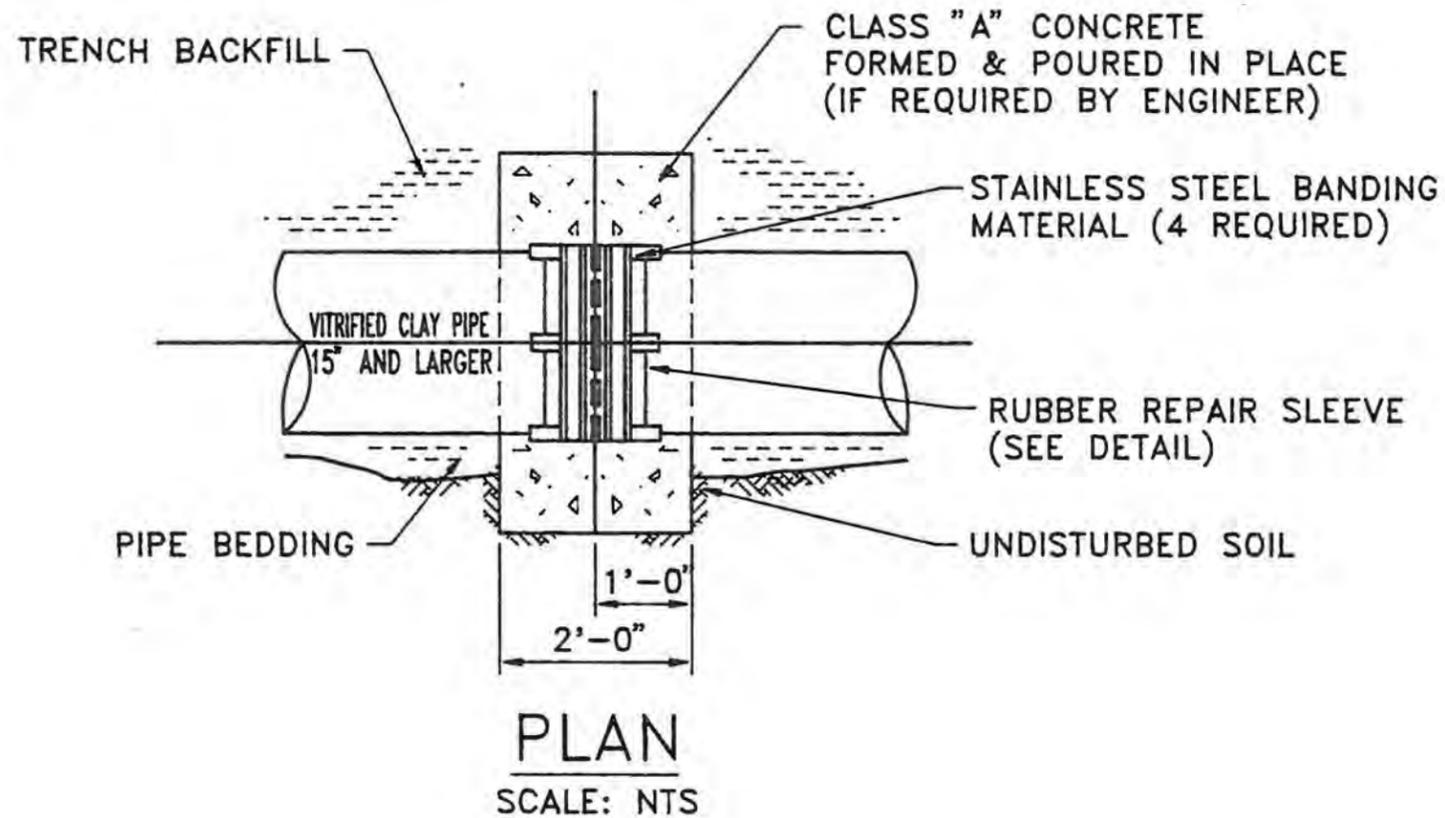
3. ONE (1) U-32 CATCH BASIN GRADE RING WITH A FRAME NO. 71W432 CAST IN PLACE WITH A WELDED STEEL GRATE NO. 71W432 AS MANUFACTURED OR SUPPLIED BY THE COMPANY IN NOTE NO. 2 OR AN APPROVED EQUAL.

4. ONE (1) U-32 CATCH BASIN GRADE RING WITH A FRAME NO. T32-51JF CAST IN PLACE AND A STEEL LID NO. T32-51JF (H-20) BOTH WITH BOLT DOWN PROVISIONS AS MANUFACTURED OR SUPPLIED BY THE COMPANY IN NOTE NO. 2 OR AN APPROVED EQUAL.

5. EPOXY BOTH BOXES TOGETHER IN THE FIELD WITH "THORO BOND" CONCRETE EPOXY AS MANUFACTURED BY THORO SYSTEMS OF NORTHERN CALIFORNIA, 36403 CHERRY STREET, NEWARK, CA. OR AN APPROVED EQUAL.

68

REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
			TWO COMPARTMENT SUMP	
NO.	DATE	DESCRIPTION REVISION	APPRD.	
DRAWN BY:	EAS	SUBMITTED:	<i>RWD</i>	DATE: 11/18/91
CHECKED BY:	KMH	APPROVED:	<i>[Signature]</i>	DWG. 10-AA-1962

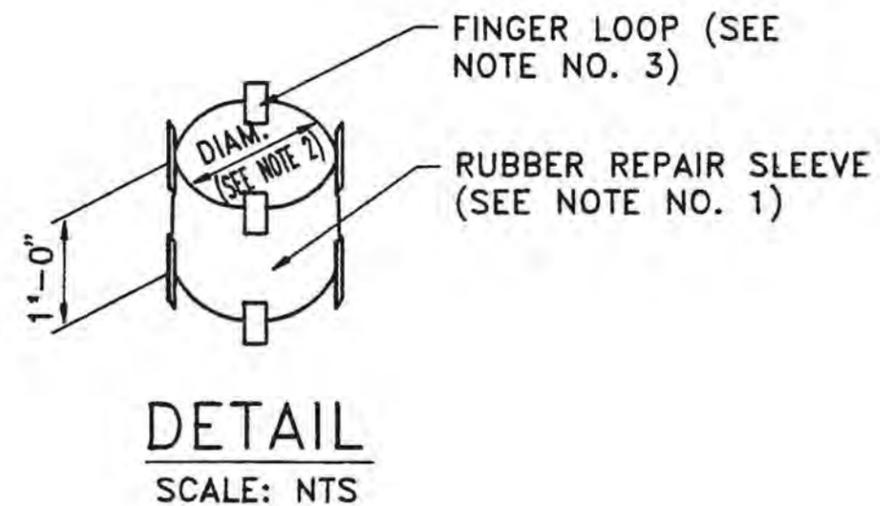


NOTES:

1. REPAIR SLEEVE SHALL BE MADE OF RUBBER, REINFORCED WITH ONE OR TWO PLYS OF TIRE CORD AS MANUFACTURED BY VANDERLANS & SONS, PO BOX 758, 320 SOUTH SACRAMENTO STREET, LODI, CA 95241, OR APPROVED EQUAL.

2. THE INSIDE DIAMETER OF THE RUBBER REPAIR SLEEVE SHALL BE 1/8" LARGER THAN THE OUTSIDE DIAMETER OF THE VITRIFIED CLAY PIPE.

3. FINGER LOOPS SHALL BE 1 1/2" WIDE RUBBER, REINFORCED WITH ONE PLY OR TIRE CORD AND THE FINGER LOOPS SHALL BE VULCANIZED TO THE RUBBER REPAIR SLEEVE (4 REQUIRED EACH END AND EQUALLY SPACED AROUND THE CIRCUMFERENCE OF THE REPAIR SLEEVE)



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REFERENCE:			CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING		
			REPAIR COUPLING FOR VITRIFIED CLAY PIPE 10" DIAMETER AND LARGER		
NO.	DATE	DESCRIPTION	APPRD.		
REVISION					
DRAWN BY: EAS		SUBMITTED: <i>RWD</i>		DATE: 11/18/91	
CHECKED BY: KMH		APPROVED: <i>KMH</i>		DWG. 10-AA-1963	