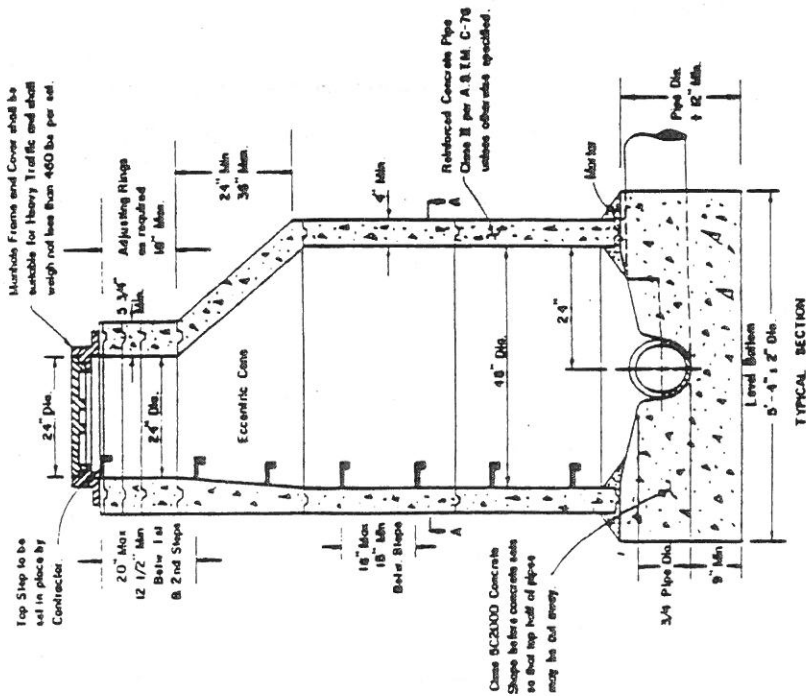
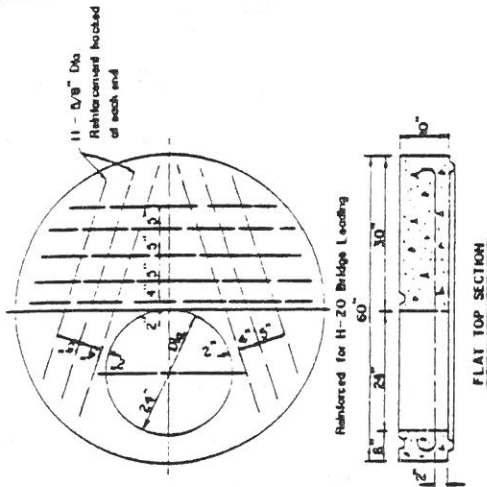


TYPE "A" MANHOLE



TYPE "B" MANHOLE



NOTE: "B" Manhole same as Type "A" Manhole except that Flat Top Section shall be used in place of Eccentric Cone Section. B Manhole walls shall be S1 d Precast Sections having 6" minimum wall thickness. Minimum reinforcement for Sections having 6" wall thickness shall be No. 4 wire hoops.

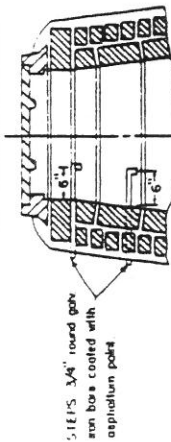
GENERAL NOTES

STANDARD MANHOLE - TYPE "A"
Type "A" Manholes shall be used in all cases, unless otherwise noted on the Plan or in the Specifications.
DROP MANHOLES
Drop Manholes shall be constructed using a Tee Branch at top invert and a 90° Bend at the bottom invert. The entire Drop Section shall be encased in concrete, having a 6 inch minimum cover, from the base of the Manhole to the center of the upper pipe section.

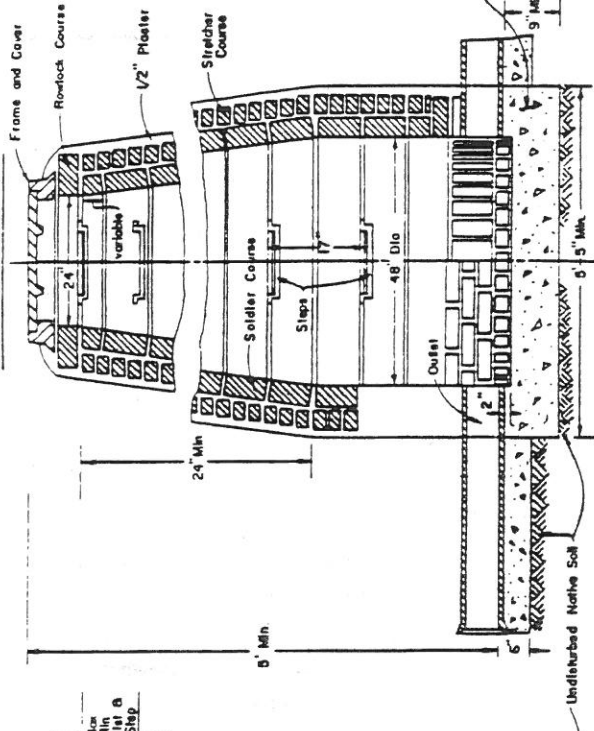
CITY OF UPLAND STANDARD DRAWING

DRAWN BY	DATE	PRECAST CONC. MANHOLES TYPE "A" & TYPE "B"
W. B.	10/21/65	
REVISION BY	DATE	SANITARY SEWER SYSTEMS
		APPROVED BY
		<i>Paul C. Colburn</i>
		CITY ENGINEER
		DRAWING NO. CU-Z-1

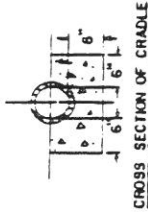
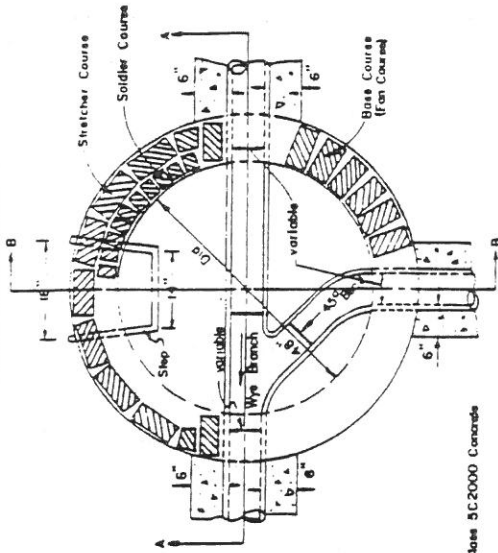
SECTIONAL ELEVATION "B-B"



SECTIONAL ELEVATION "A-A"



SECTIONAL PLAN OF BASE



GENERAL NOTES

CONCRETE BASE:

During construction, all pipes shall be rigidly supported by brick piers one foot deep, located just outside the structure. Construct top of concrete base 2 inches below invert of lowest pipe. Fill space beneath pipe with mortar and shove from both sides with base course brick to form a water tight joint.

BASE OR FAN COURSE:

Lay brick flat on radial lines with tops to same level.

ARCHES:

Lay spalled brick on edge to form a true radial arch with full mortar joint around all pipe openings. Turn arch of two such courses over pipes 15 inches or more in diameter.

SOLDIER COURSES:

Lay inside brick on radial lines with first four courses vertical. Lay succeeding courses with a uniform batter to obtain an inside diameter of 24 inches at top of last or fractional soldier course. Use split brick to close soldier courses.

STRETCHER COURSES:

Lay outside brick flat in a deep bed of mortar. Shove brick hard together against adjacent soldier course.

ROWLOCK COURSE:

Lay last course of brick on edge across soldier and stretcher courses, on radial lines.

STEPS:

Set lower step on top of third soldier course and notch brick above. Place upper step immediately below rowlock course and project 6 inches. Steps shall be spaced not more than 17 inches apart.

JOINTS:

Inside joints shall be neatly stuck and pointed and shall not exceed 3/8 inch in thickness.

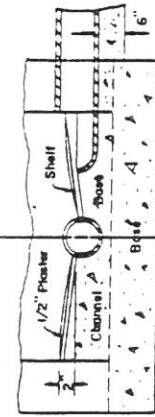
CHANNEL BASE:

The depth of channel in channel base shall be 3/4 of pipe diameter for pipes 15 inches or less, and shall equal the pipe diameter for pipes 18 inches or larger. For special channels in trap or gauging manholes see special plans.

CRADLE:

Grade first length of pipe at all inlets and outlets with concrete per detail.

CROSS SECTION OF CRADLE



SECTIONAL ELEVATION "B-B"

CHANNEL BASE

CITY OF UPLAND
STANDARD DRAWINGBRICK MANHOLE
TYPE "C"FOR
SANITARY SEWER SYSTEMS

APPROVED BY

CITY ENGINEER

DRAWING NO. CU-Z-2

DRAWN BY

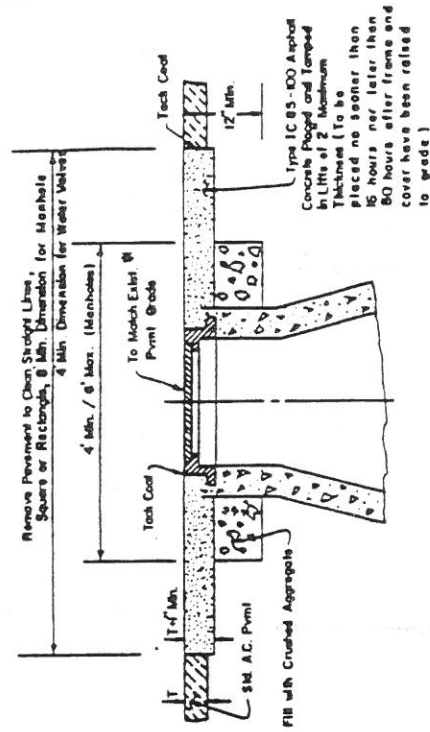
DATE

REVISION

BY

DATE

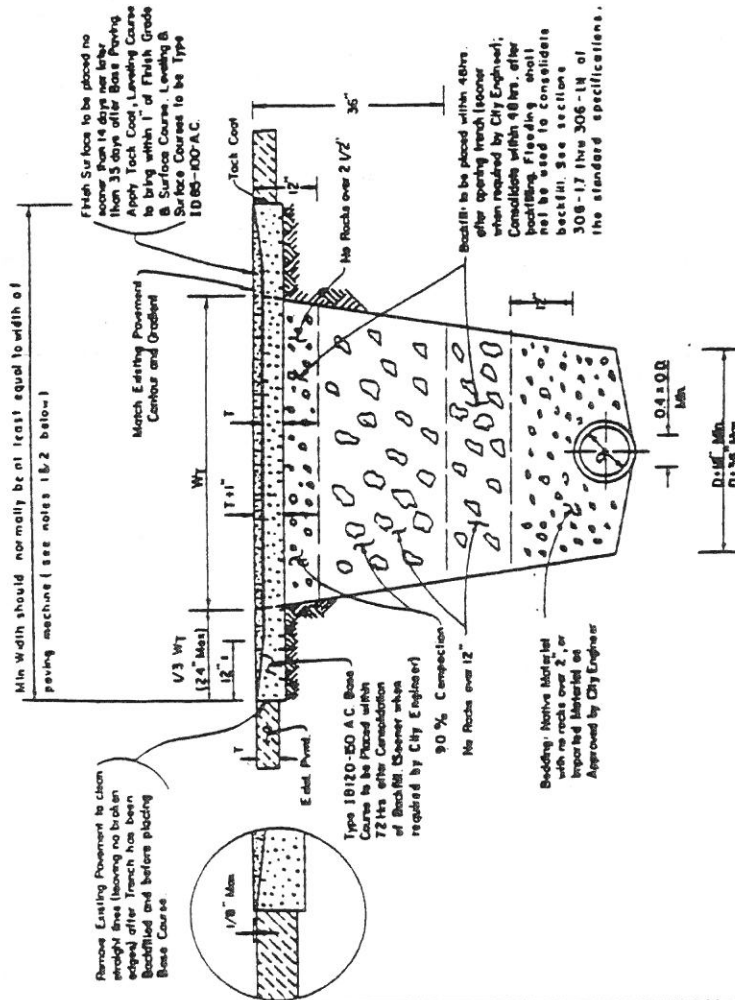
DETAIL FOR ADJUSTING MANHOLES & WATER VALVES TO GRADE



GENERAL NOTES

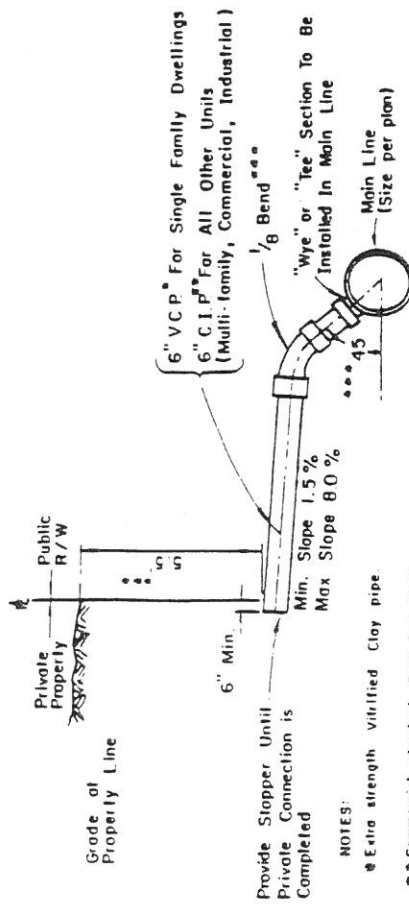
1. * Frame and Cover to be set 3" to 6" below Subgrade before A.C. Pavement is Placed.
2. Frame and Cover to be adjusted to Grade after A.C. Paving. Pavement Repairs to be made per the Detail after Raising to Grade.
3. Reset Top Step in Month of the Year Frame and Cover are raised to Grade; add additional step when necessary to maintain proper spacing between Steps (see Drawg. CU-Z-1 & CU-Z-2 for Correct Spacing of Steps).

DETAIL FOR TRENCHING, BACKFILL & A.C. PAVEMENT REPAIR



GENERAL NOTES

1. Spreader Boxes may be employed for ditch paving jobs less than 500 lin. ft..
2. All joints shall be vertical butt joints. Lap or feathered joints are not allowed.
3. Unless otherwise instructed by city Engineer, trench patch should be straight grade across width, and should not be crowned at center.



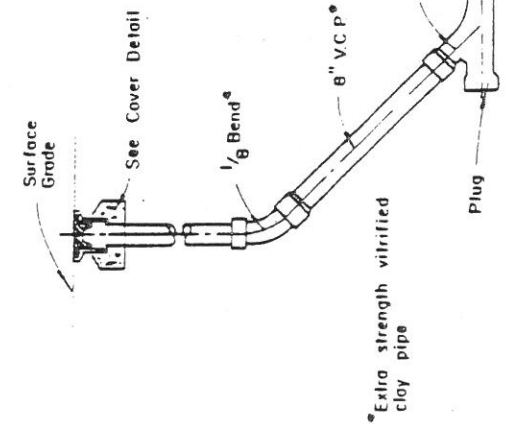
NOTES:

- Extra strength vitrified clay pipe.
- Commercial standard Cast Iron Pipe (C.S. No. 188, U.S. Dept. of Commerce)

SANITARY SEWER LATERAL LINE

• Normal, unless otherwise noted on plan

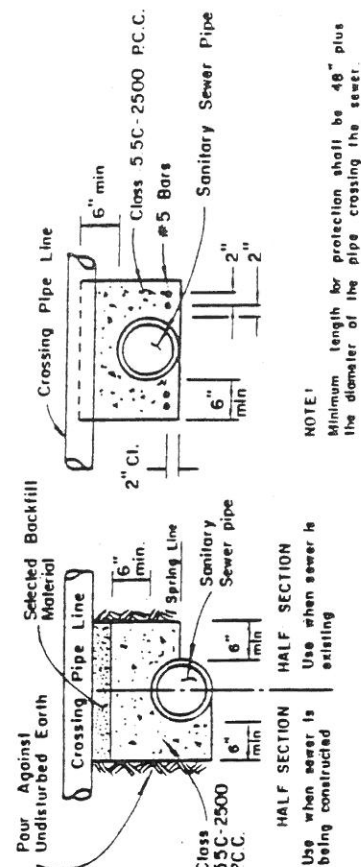
SANITARY SEWER ON HORIZONTAL CURVE
 Will only be permitted when concentric with the street E, and shall conform to the following Manning requirements
 Minimum Radius: 200 LF
 Minimum Grade in % $\cdot 0.4 + \frac{90}{R}$
 Maximum Spacing of sloping 25 ft.
 MH locations Req'd at both ends of curve with Max. spacing of 250 ft.



NOTE:

Terminal Cleanouts shall not be used more than 100 ft. from a manhole or wherever 4 or more connections are located on the terminal section of the sewer main line.

SANITARY SEWER TERMINAL CLEANOUT



NOTE:

Minimum length for protection shall be 48" plus the diameter of the pipe crossing the sewer.

PROTECTION FOR SANITARY SEWERS

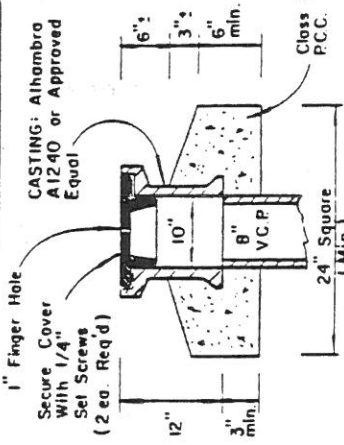
(Use When Clearance Between Sewer And Other Pipe Is 18" or Less)

GENERAL NOTES:

- The width of the trench at the top of the pipe shall not exceed 3 times the diameter of the sanitary sewer pipe.
- Grade stakes shall be set every 25 feet to insure a true gradient.
- Maximum spacing between manholes:
 $S_{max} = 35 (D + G^{1/2})$
 $S_{max} = \text{Maximum spacing}$
 $D = \text{Diameter in inches}$
 $G = \text{Gradient in percent}$

• Minimum Slope Shall Be Increased For Dead End Lines Having A Limited Number Of Connections

MAIN LINE GRADIENTS		
DIA	MIN SLOPE	MAX SLOPE
8"	0.40%	8.0%
10"	0.32%	7.0%
12"	0.24%	6.0%
15"	0.18%	4.0%
18"	0.14%	3.0%
21"	0.12%	2.5%
24"	0.10%	2.0%



COVER "DETAIL"

CITY OF UPLAND STANDARD DRAWING

Drawn By		Date	SANITARY SEWER SYSTEMS	
LWA		4-27-70	MAIN LINES	
Revisions By		Date	LATERAL LINES	
BG		12-12-73	TERMINAL CLEANOUTS	
B.F.		12-4-75		
			Approved By	
			City Engineer	
			DRAWING NO. CU-Z-4	