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# STANDARD DETAILS

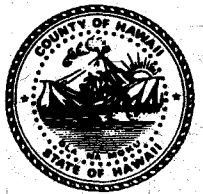
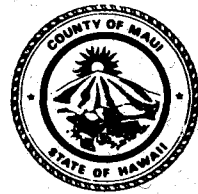
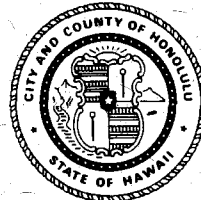
FOR PUBLIC WORKS  
CONSTRUCTION

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DEPARTMENTS OF PUBLIC WORKS  
COUNTY OF KAUAI  
CITY AND COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII  
OF THE STATE OF HAWAII



REVISED  
SEPTEMBER 2000

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SEPTEMBER 1984

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# STANDARD DETAILS

## FOR PUBLIC WORKS CONSTRUCTION

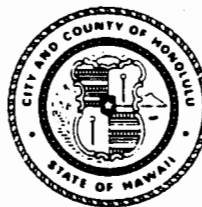
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DEPARTMENTS OF PUBLIC WORKS  
COUNTY OF KAUAI  
CITY AND COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII  
OF THE STATE OF HAWAII



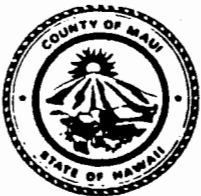
A handwritten signature in black ink, appearing to read "Lawrence Kitamura".

LAWRENCE KITAMURA  
COUNTY ENGINEER  
COUNTY OF KAUAI



A handwritten signature in black ink, appearing to read "Michael J. Chun".

MICHAEL J. CHUN  
DIRECTOR AND CHIEF ENGINEER  
CITY AND COUNTY OF HONOLULU



A handwritten signature in black ink, appearing to read "Ralph Hayashi".

RALPH HAYASHI  
DIRECTOR  
COUNTY OF MAUI



A handwritten signature in black ink, appearing to read "Edward Harada".

EDWARD HARADA  
CHIEF ENGINEER  
COUNTY OF HAWAII

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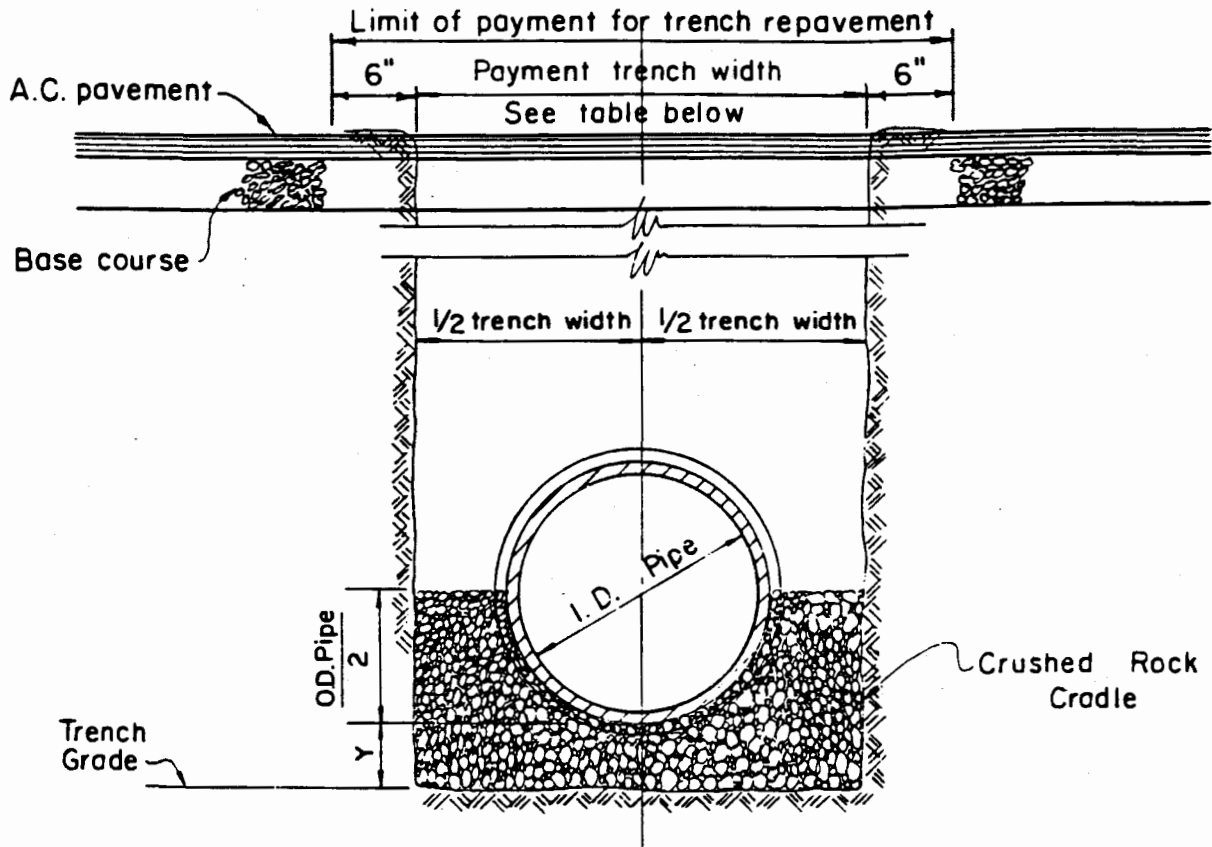
**Sewers**

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**PART**

**3**

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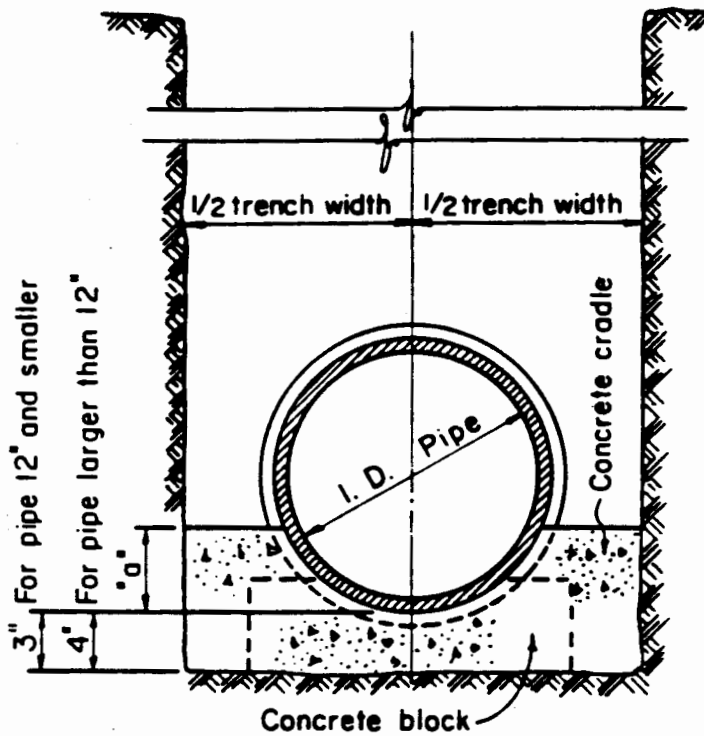


**NOTE:**

Payment width of cradle shall be payment trench width.

PIPE SIZE	PAYMENT TRENCH WIDTH	CRUSHED ROCK CRADLE	
		"Y" Min.	CY/LF
6"	24"	4"	.042
8"	24"	4"	.045
10"	24"	4"	.047
12"	30"	5"	.073
15"	38"	6"	.114
18"	41"	6"	.130
21"	45"	7"	.163
24"	50"	8"	.204
27"	53"	9"	.238
30"	57"	10"	.280
36"	69"	11"	.390
42"	76"	12"	.457
48"	84"	12"	.546
54"	91"	12"	.615

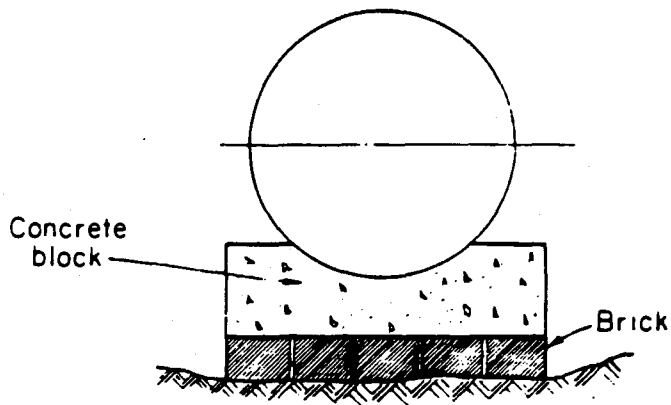
**ROCK CRADLE FOR SEWER PIPE**



**NOTE:**

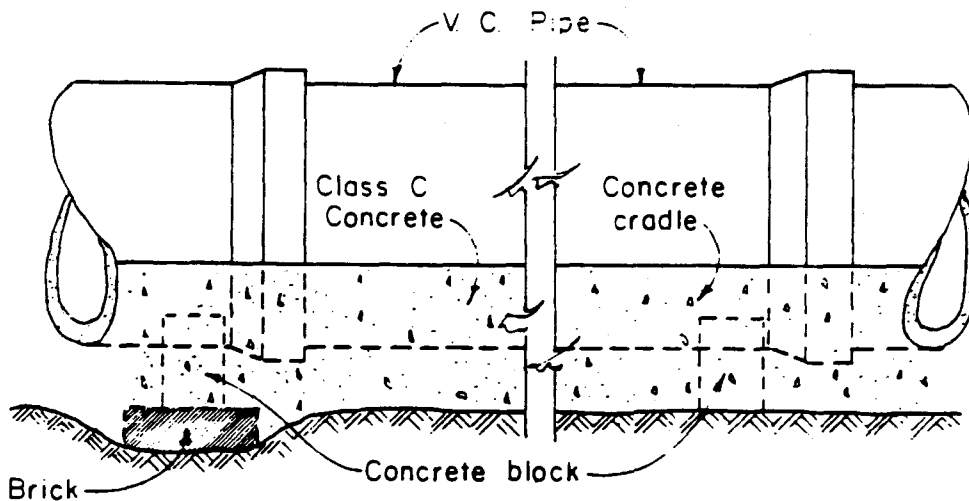
Payment width of cradle shall be payment trench width.

DIMENSIONS OF CONCRETE CRADLE		
Pipe Size	"a"	Width
6"	3"	24"
8"	3"	24"
10"	3"	24"
12"	3"	30"
15"	4"	38"
18"	5"	41"
21"	5"	45"
24"	6"	50"
27"	7"	53"
30"	7"	57"



**METHOD OF USING BRICKS  
UNDER CONCRETE BLOCKS**

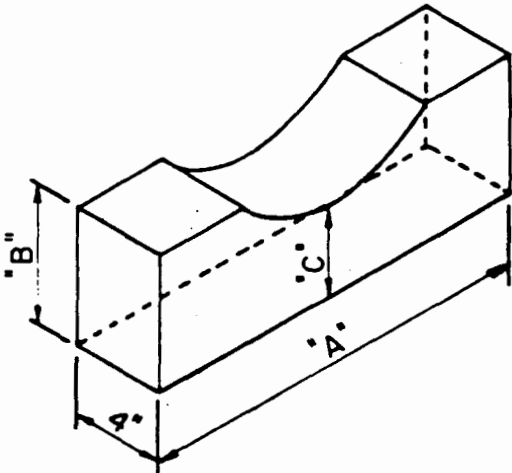
Not to Scale



**ELEVATION SHOWING  
METHOD OF LAYING PIPE**

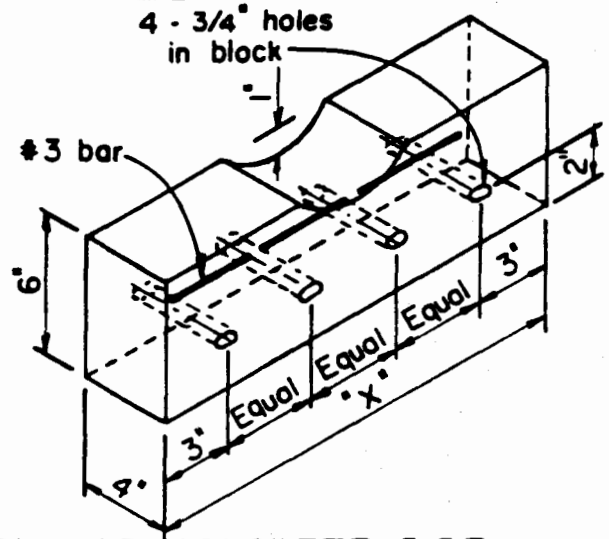
Not to Scale

Contractor shall set Concrete Blocks on undisturbed ground. Where ground is too low, the contractor shall not heap up dirt under the Concrete Block but use Concrete Bricks to take up the deficiency, scraping away beneath Concrete Block to give sufficient room for Brick.



**DETAIL OF PRECAST  
CONCRETE PIPE BLOCK**

Not to Scale

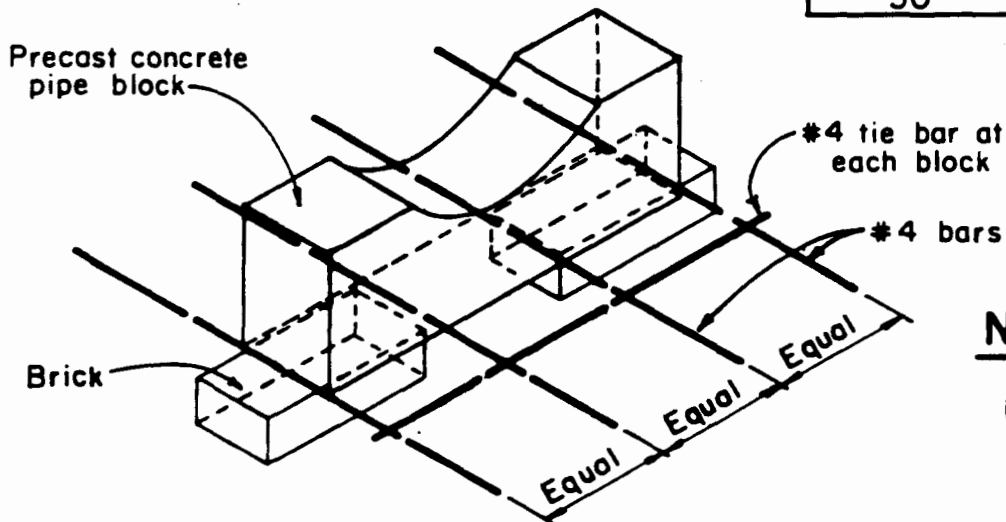


**DETAIL OF CONCRETE PIPE  
BLOCK FOR REINF. CRADLE**

Not to Scale

CONCRETE BLOCK DIMENSIONS			
Pipe Size	"A"	"B"	"C"
6"	1' - 2"	6"	3"
8"	1' - 5"	6"	3"
10"	1' - 7"	6"	3"
12"	1' - 7"	6"	3"
15"	1' - 8"	6"	4"
18"	1' - 9"	6"	4"
21"	1' - 10"	6"	4"
24"	1' - 11"	6"	4"
27"	2' - 0"	6"	4"
30"	2' - 3"	6"	4"

DIM. OF REINF. CONCRETE BLOCK	
Pipe Size	"X"
6"	1' - 6"
8"	1' - 6"
10"	1' - 8"
12"	1' - 8"
15"	1' - 10"
18"	1' - 10"
21"	1' - 10"
24"	2' - 0"
27"	2' - 0"
30"	2' - 0"



**ALTERNATE DETAIL OF CONG.  
PIPE BLOCK FOR REINF. CRADLE**

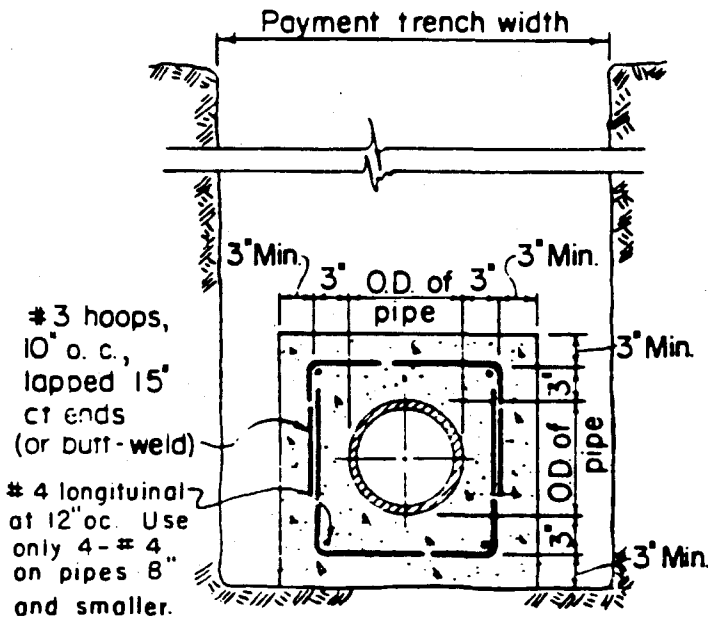
Not to Scale

**NOTE:**

Add brick for larger size pipe

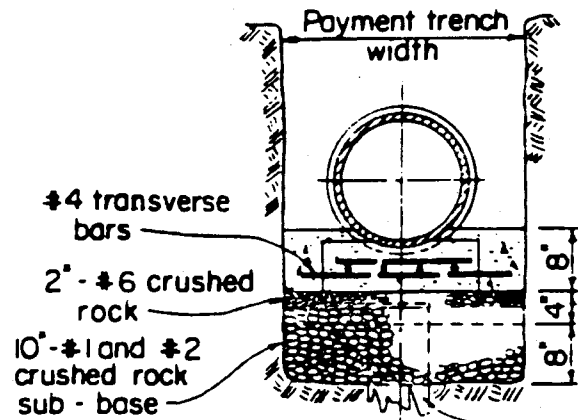
**NOTE:**

Reinforcing bars of laterals shall be lapped 40 dia. to reinforcing bars of mains.



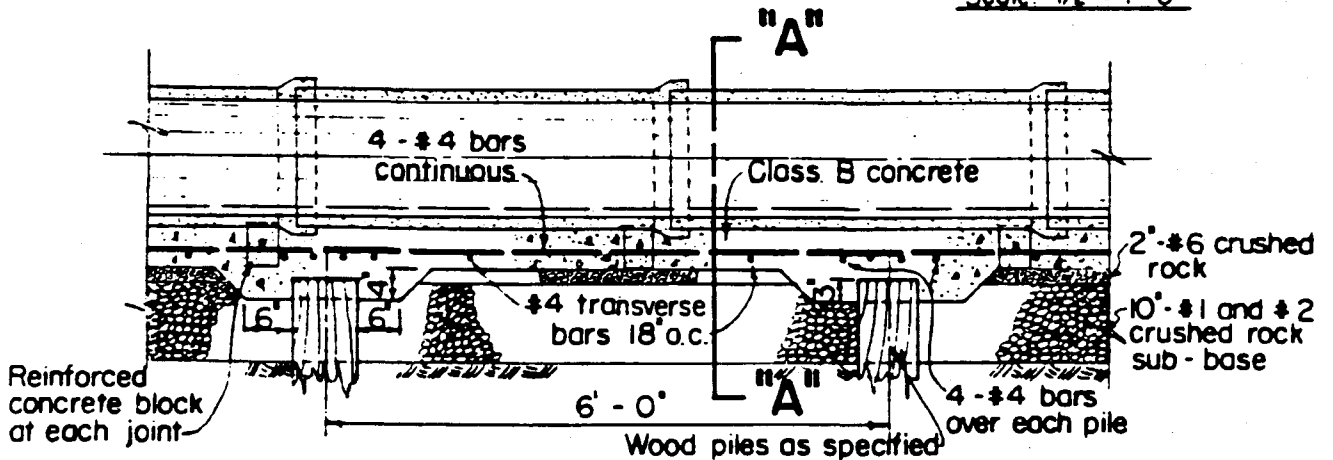
**DETAIL OF CONCRETE JACKET FOR PIPES 12" AND SMALLER**

Scale: 3/4" = 1'-0"



**SECTION "A-A"**

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



**DETAIL OF REINFORCED CONCRETE CRADLE ON WOOD PILES**

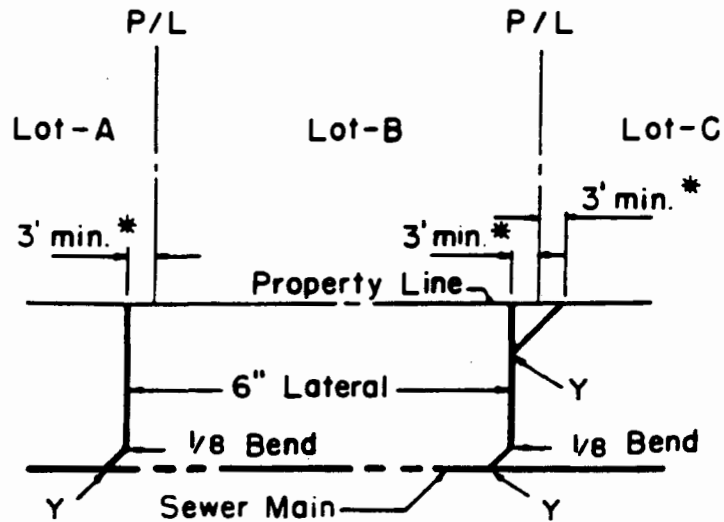
(FOR 6, 8, 10, AND 12 IN. V. C. PIPE)

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

DETAIL OF REINFORCED CONCRETE CRADLE WITHOUT PILES SIMILAR EXCEPT FOR WOOD PILES AND PILE CAPS

COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII	CONCRETE JACKET, REINFORCED CONCRETE CRADLE SCALE: AS NOTED	STANDARD DETAILS	S-5
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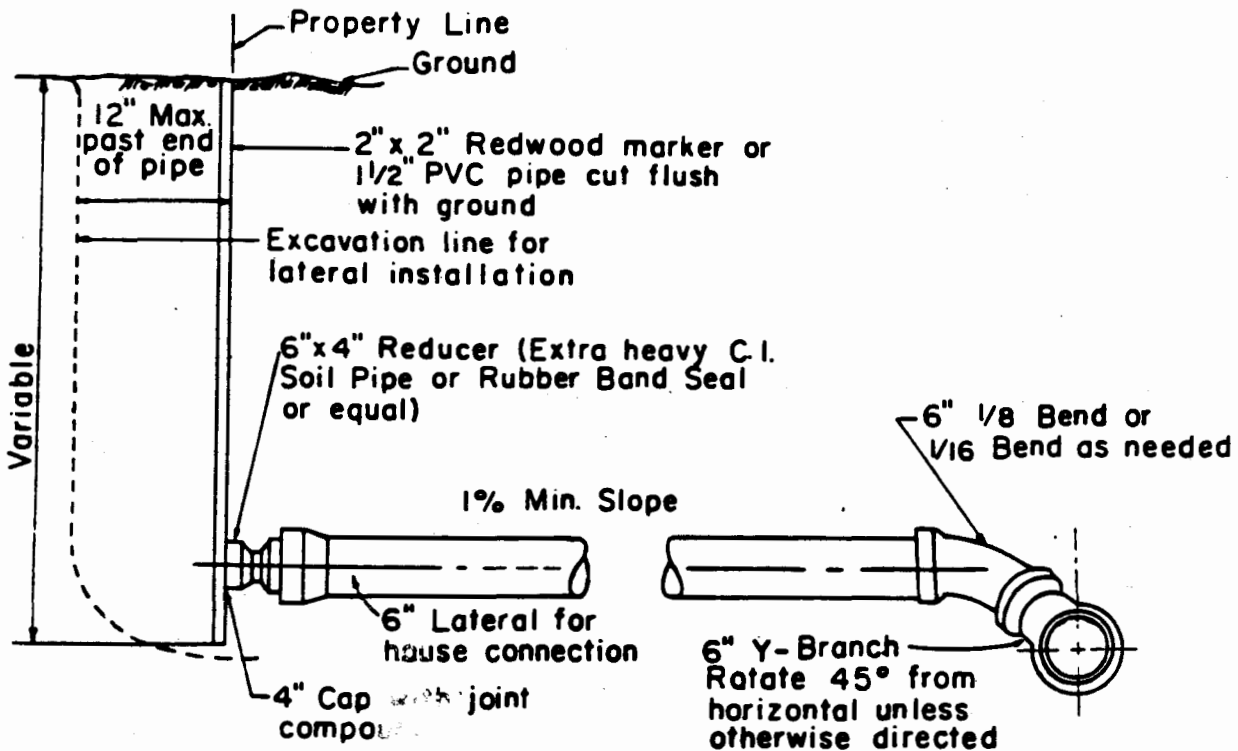


**LAYOUT**

**NOTE :**

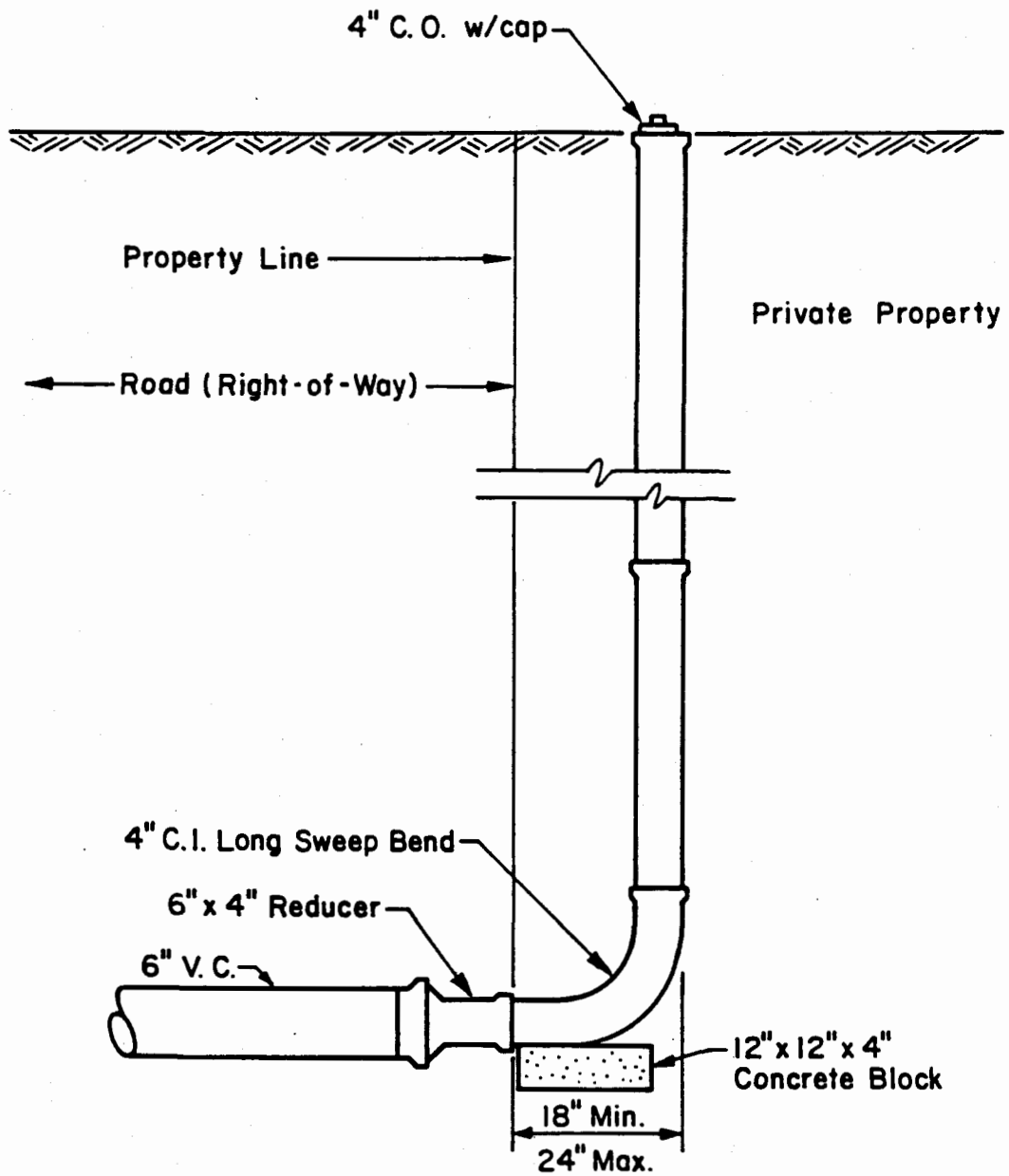
Permission is to be secured from property owner before construction at property line is started.

\* 4' for Maui only



**DETAIL AT PROPERTY LINE AND AT MAIN LINE**

S-6	STANDARD DETAILS	LATERALS	COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII
SEPTEMBER 1984		NOT TO SCALE	



**ADVANCE RISER CONNECTION**

Not to Scale

Stone or broken pavement in street areas  
(See Specs.)

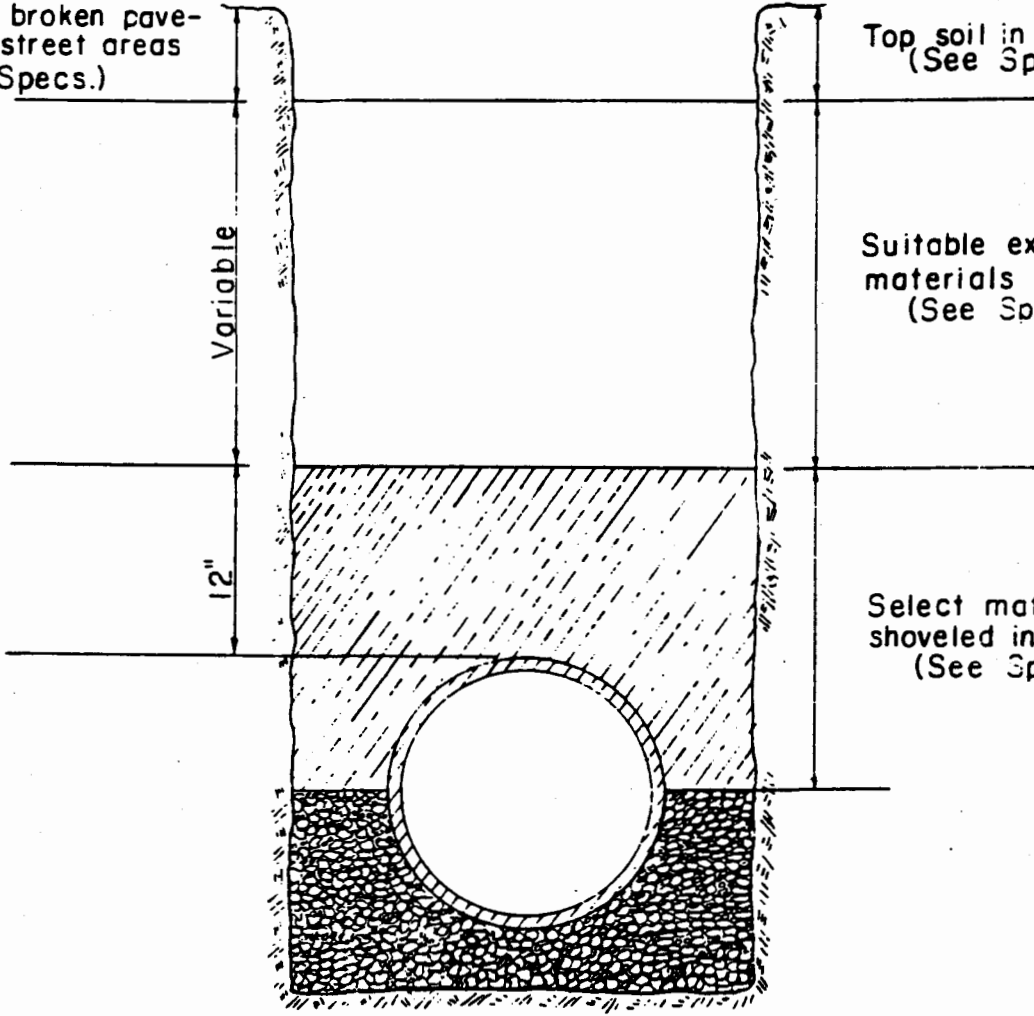
Top soil in lawn areas  
(See Specs.)

Variable

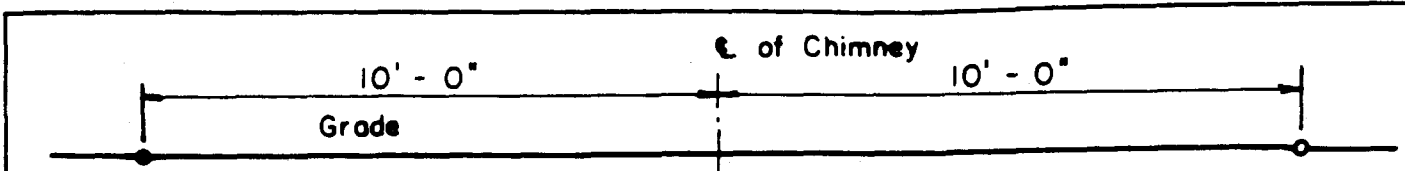
Suitable excavated materials  
(See Specs.)

12"

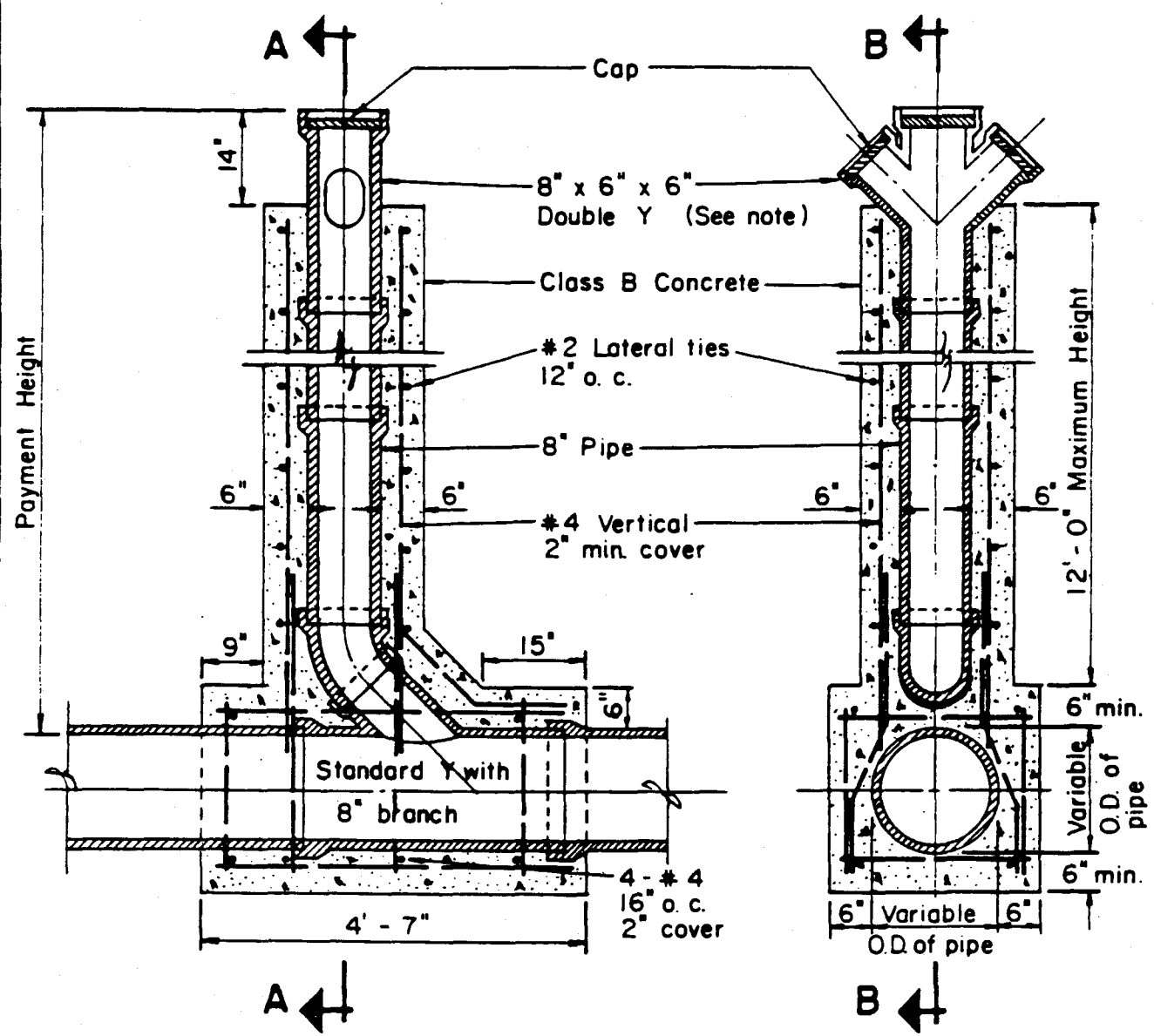
Select material hand shoveled into trench  
(See Specs.)



NOT TO SCALE



No machine backfilling between these points. Backfill to be brought up evenly on each side of chimney by hand shoveling.



**SECTION B-B**

**SECTION A-A**

**DETAILS OF CHIMNEY**

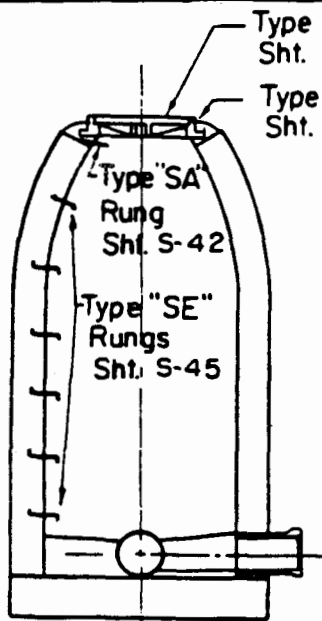
Scale: 1/2" = 1'-0"

Double "Y" may be replaced by one or two single wyes with inverts as noted on the plans.

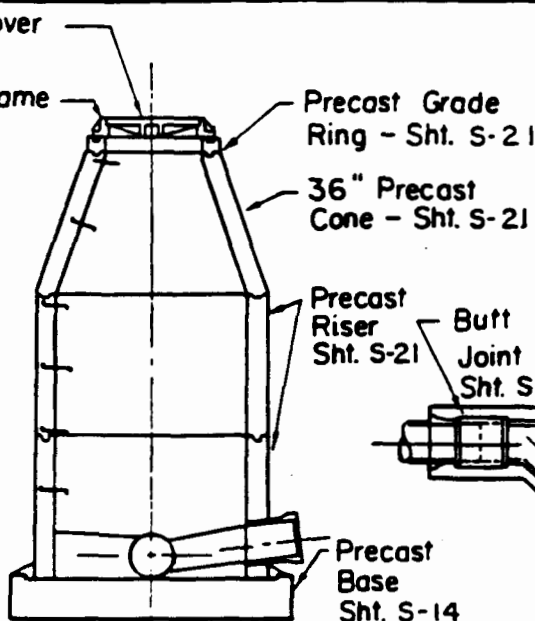
**NOTE:**

All reinforcing rods #4 except lateral ties. Laps - 40 diameters.

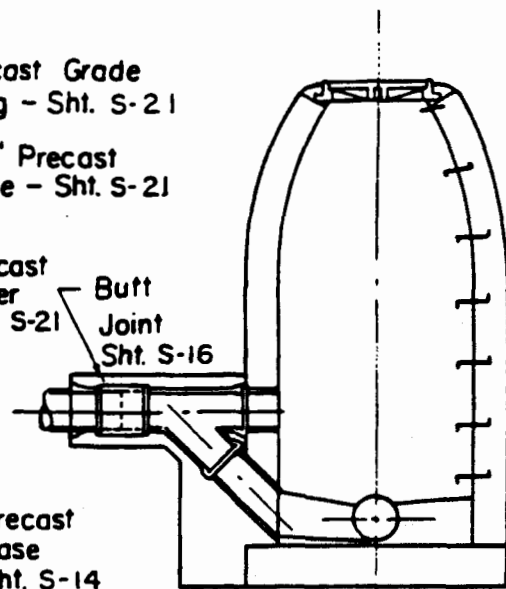
COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII	CHIMNEY  SCALE: 1/2" = 1'-0"	STANDARD DETAILS	S-9  SEPTEMBER 1984
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**PLAIN M.H.**  
(BRICK & CAST-IN-PLACE)  
SHTS. S-26, S-27

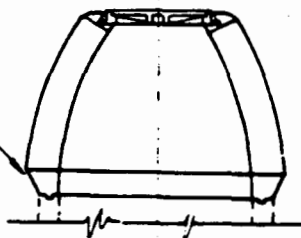


**PLAIN M.H.**  
(PRECAST) SHT. S-13

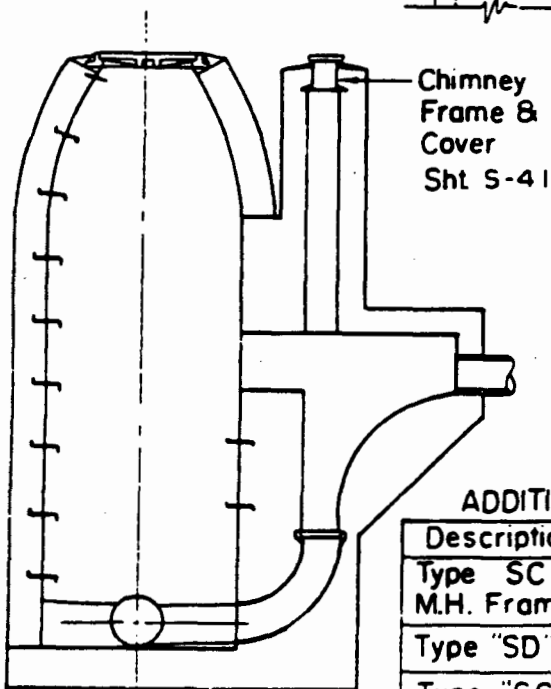
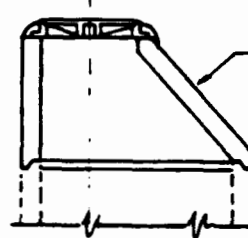


**SHALLOW DROP M.H.**  
SHTS. S-15, S-28

Precast Wall to  
Brickwall Adapter  
Ring - Sht. S-23



Precast Eccentric  
Cone - Sht. S-22



**DROP M.H.**  
SHTS. S-17, S-18,  
S-29, S-30

Brick Adjustment  
Sht. S-25

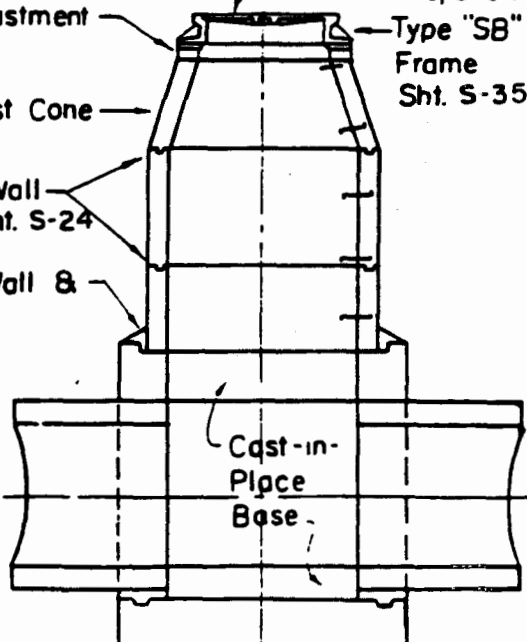
22" Precast Cone  
Sht. S-21

Precast Wall  
Joints - Sht. S-24

Precast Wall &  
Ball Joint  
Sht. S-24

Type "SB" Cover  
Shts. S-33, S-34

Type "SB"  
Frame  
Sht. S-35



**PLAIN M.H.**  
36" TO 48" DIA. PIPES  
SHTS. S-19, S-20

**ADDITIONAL DETAILS**

Description	Sht. No.
Type SC Pressure M.H. Frame & Cover	S-37 S-38 S-39
Type "SD" Frame	S-40
Type "SC" Rung	S-43
Type "SD" Rung	S-44
Modified "SB" (Press) Frame & Cover	S-36

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

## MANHOLE NOTES

### BASES

1. When precast concrete bases are used, a leveling concrete grout of 2" minimum thickness shall be placed.

### WALLS

1. When precast walls are used, the height adjustment shall be in the bottom section.
2. The precast manhole riser section shall be cast with openings whenever sewer pipes must pass thru.
3. Openings in manhole walls shall be patched with epoxy grout when required.
4. Precast cones shall not be used in easement areas unless approved by the Engineer.
5. Manhole walls of reinforced concrete shall be to a height 1' above normal ground water table.

### FRAMES AND COVERS

1. Generally type "SA" is used. Type "SD" frame is used in sidewalk or slab areas. Types "SB" and "SC" shall be used only when indicated.

### RUNGS

1. Rungs shall be placed in all manholes unless otherwise indicated.
2. One type "SA" rung is used as a grab bar at the top of the manhole.
3. Type "SE" rungs are generally used unless otherwise indicated.
4. Type "SC" rungs shall be used in corrosive conditions in lieu of "SE" when specified.
5. Rungs shall not be aligned above any flow line except in drop manholes, where two rungs are located below the drop pipe opening and level with the rungs on the opposite wall.
6. Rungs shall not be placed in manholes less than 3' high.
7. Type "SE" or designated rungs shall be evenly spaced. Maximum spacing shall be 16" on center.

DROP CONNECTIONS

- 1. Pipe shall be of vitrified clay or cast iron except PVC may be used if PVC pipeline is permitted.

MANHOLE CHIMNEYS

- 1. Pipe shall be vitrified clay except PVC may be used if PVC pipeline is permitted.

STUBS AND ENTRY PIPE

- 1. All pipes entering or leaving a manhole shall have joints within 2' of the manhole wall. Joints within 2' of the manhole wall may be omitted when approved resilient manhole connectors are used.
- 2. When providing for future alignment, the bell of the stub shall be flush with the outside of the manhole wall and capped.
- 3. Where the sewer pipe runs straight thru the manhole, the Contractor may lay the pipe thru the manhole with the manhole invert and base poured together. After the concrete has hardened, the upper portion of the pipe within the manhole shall be carefully broken out and any unevenness shall be patched with mortar.
- 4. Drop manholes shall have a bell joint flush with the exterior wall of the drop.
- 5. When not otherwise noted, manhole stubs shall be sloped as follows:

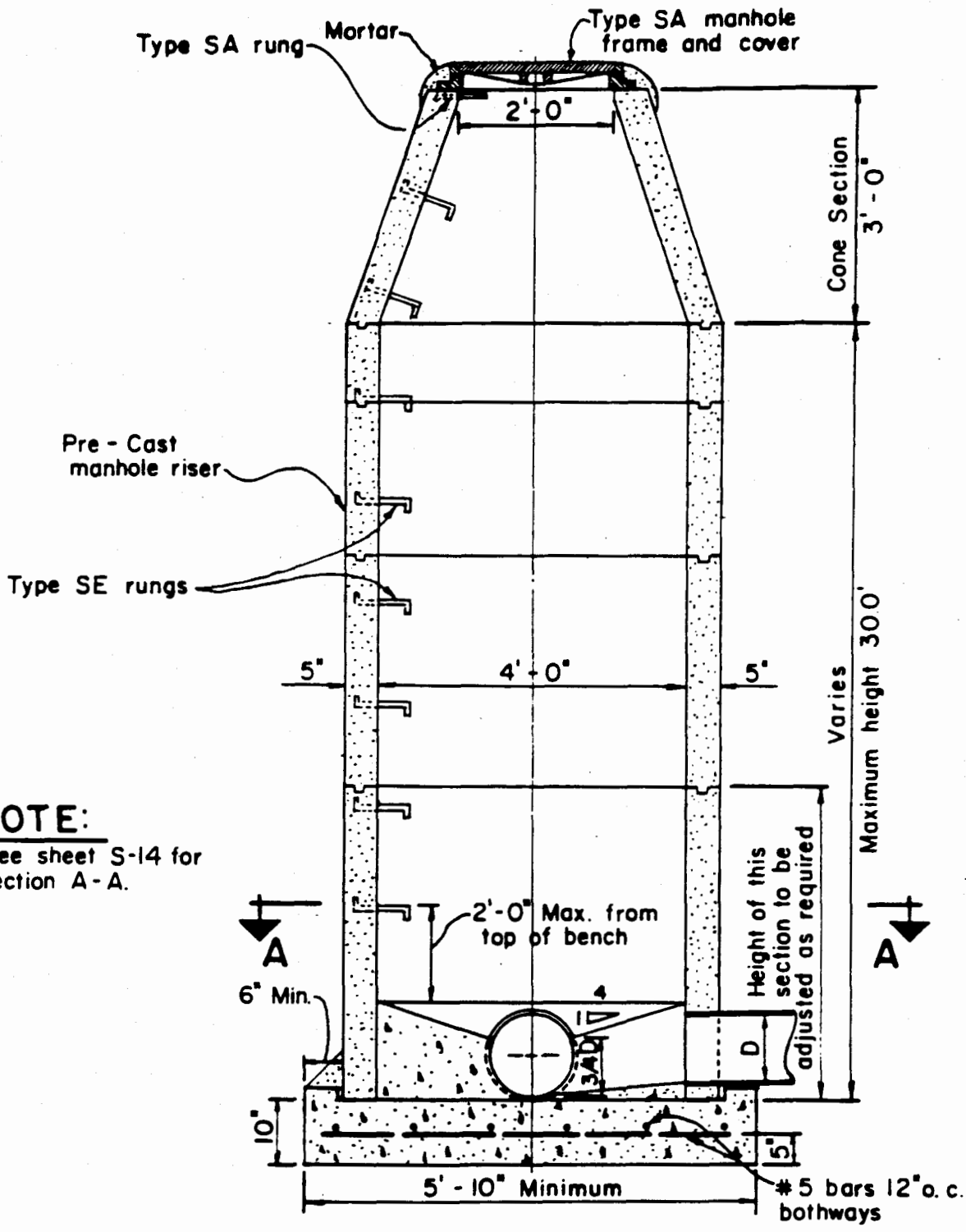
<u>Pipe Size</u>	<u>Rise Per Foot</u>
6"	1/8"
8"	3/32"
10"	1/16"
12"	1/16"

TRANSITION RING

- 1. A transition ring shall be used whenever a brick wall or cone is placed above a precast concrete wall.

REINFORCING STEEL

- 1. All reinforcing bars interfering with pipes shall be bent to clear them.



**NOTE:**  
 1. See sheet S-14 for section A-A.

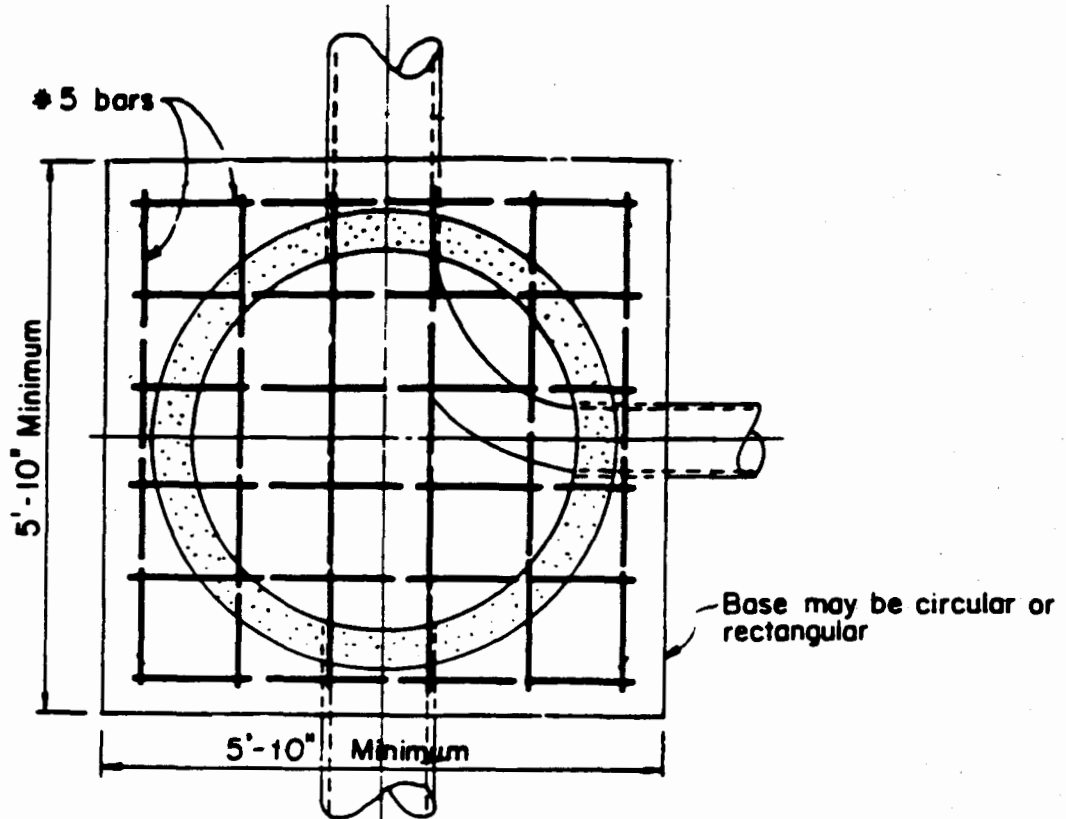
**PLAIN MANHOLE  
 PRE - CAST CONCRETE**

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

COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII	PRE-CAST CONCRETE PLAIN MANHOLE SCALE: 1/2" = 1'-0"	STANDARD DETAILS	S-13
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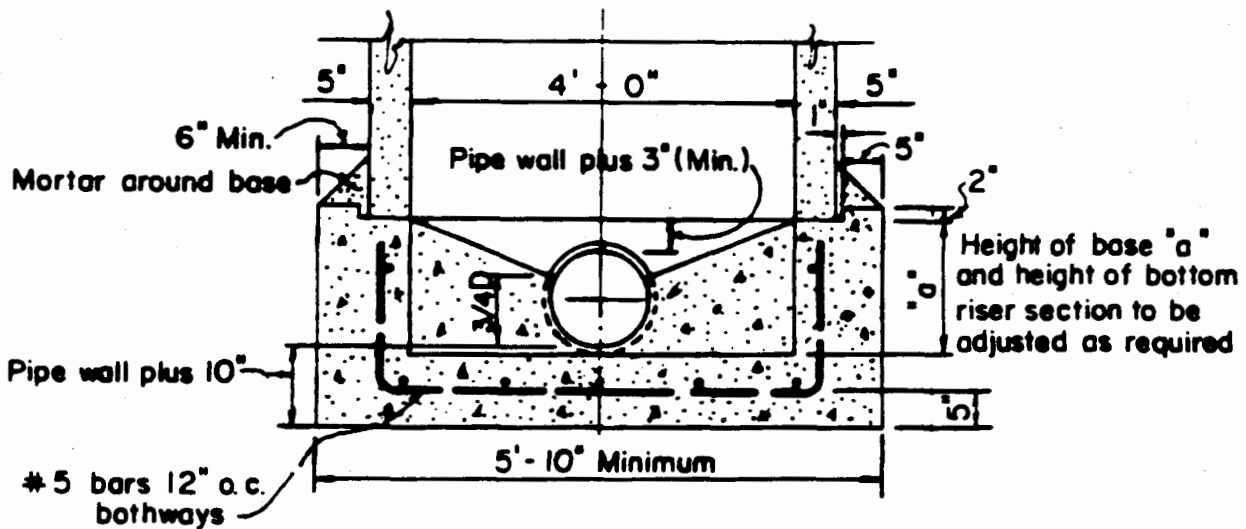
SEPTEMBER 1984





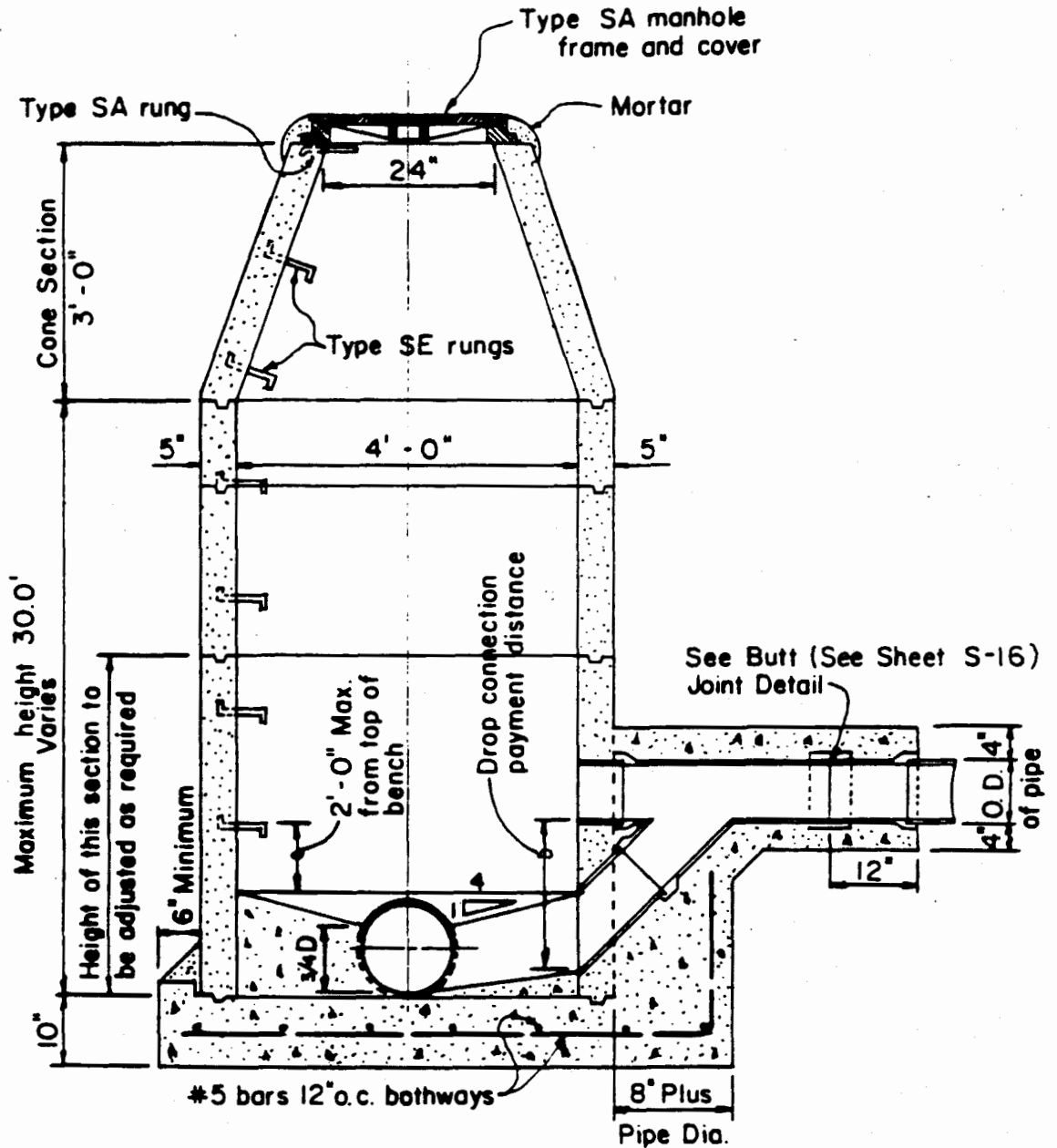
**SECTION A-A**

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



**ALTERNATE BASE**  
**PRE-CAST CONCRETE M.H.**

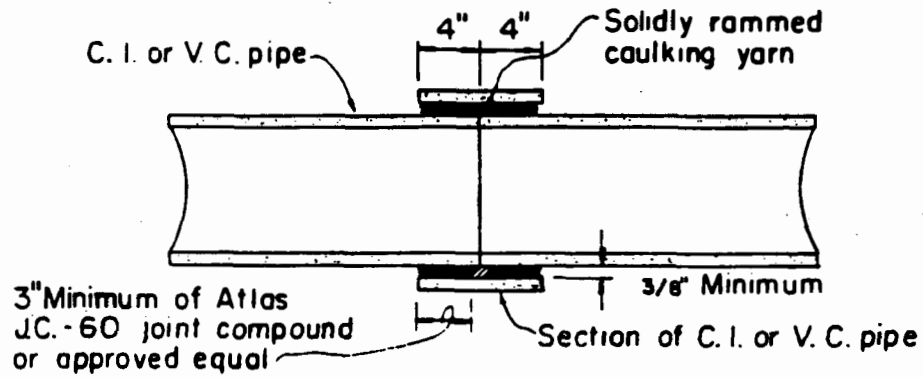
Scale: 1/2" = 1'-0"



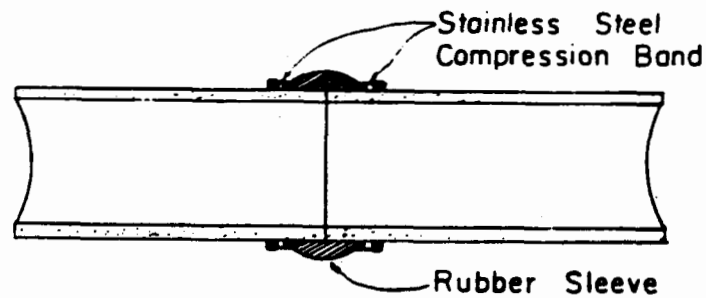
**SHALLOW DROP MANHOLE  
FOR DROP UNDER 5.0 FEET  
PRE - CAST CONCRETE**

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

COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII	PRE-CAST CONCRETE SHALLOW DROP MANHOLE SCALE: 1/2" = 1'-0"	STANDARD DETAILS	S-15 SEPTEMBER 1984
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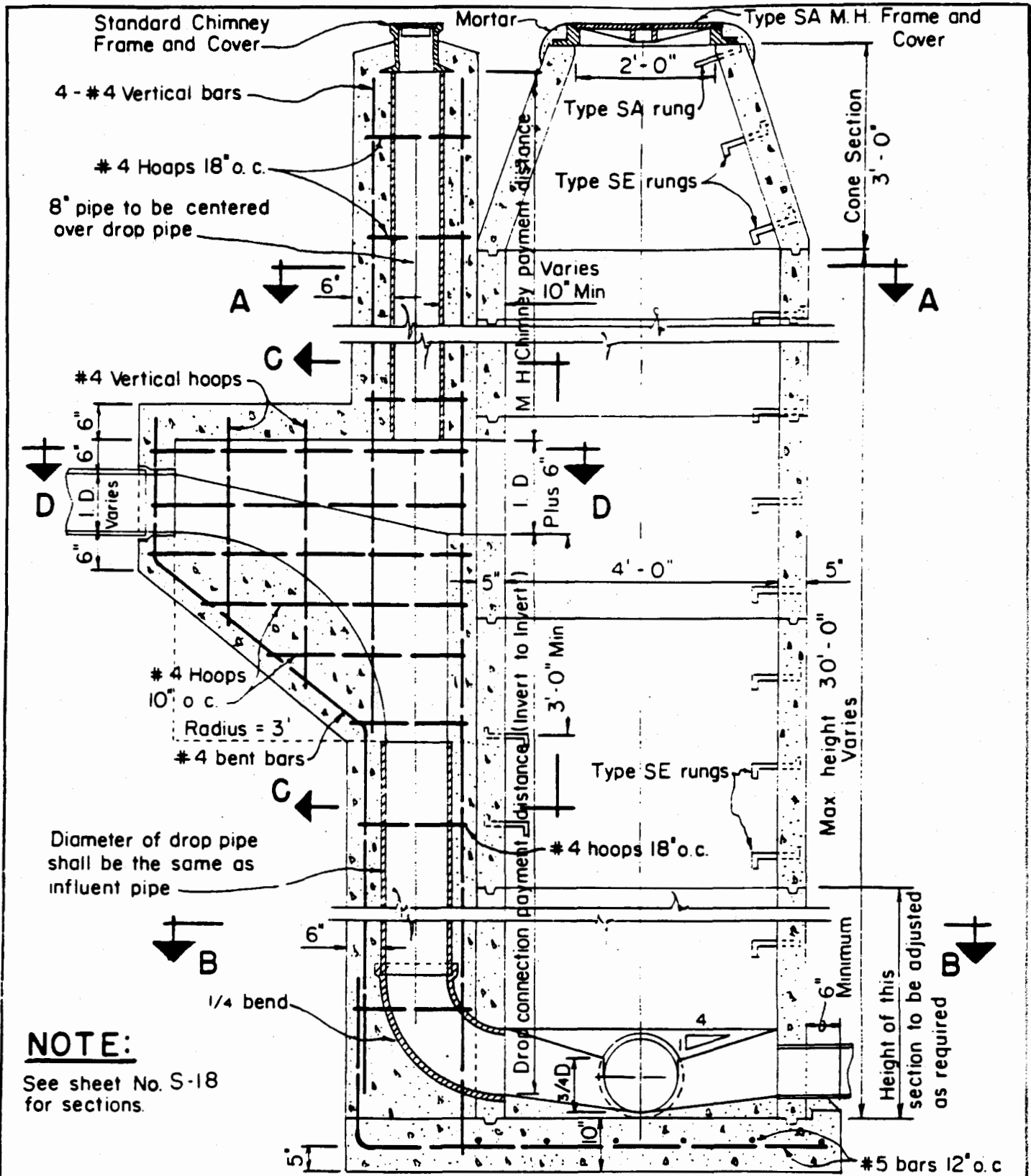
CAULKED JOINT



RUBBER COMPRESSION JOINT

BUTT JOINT DETAILS

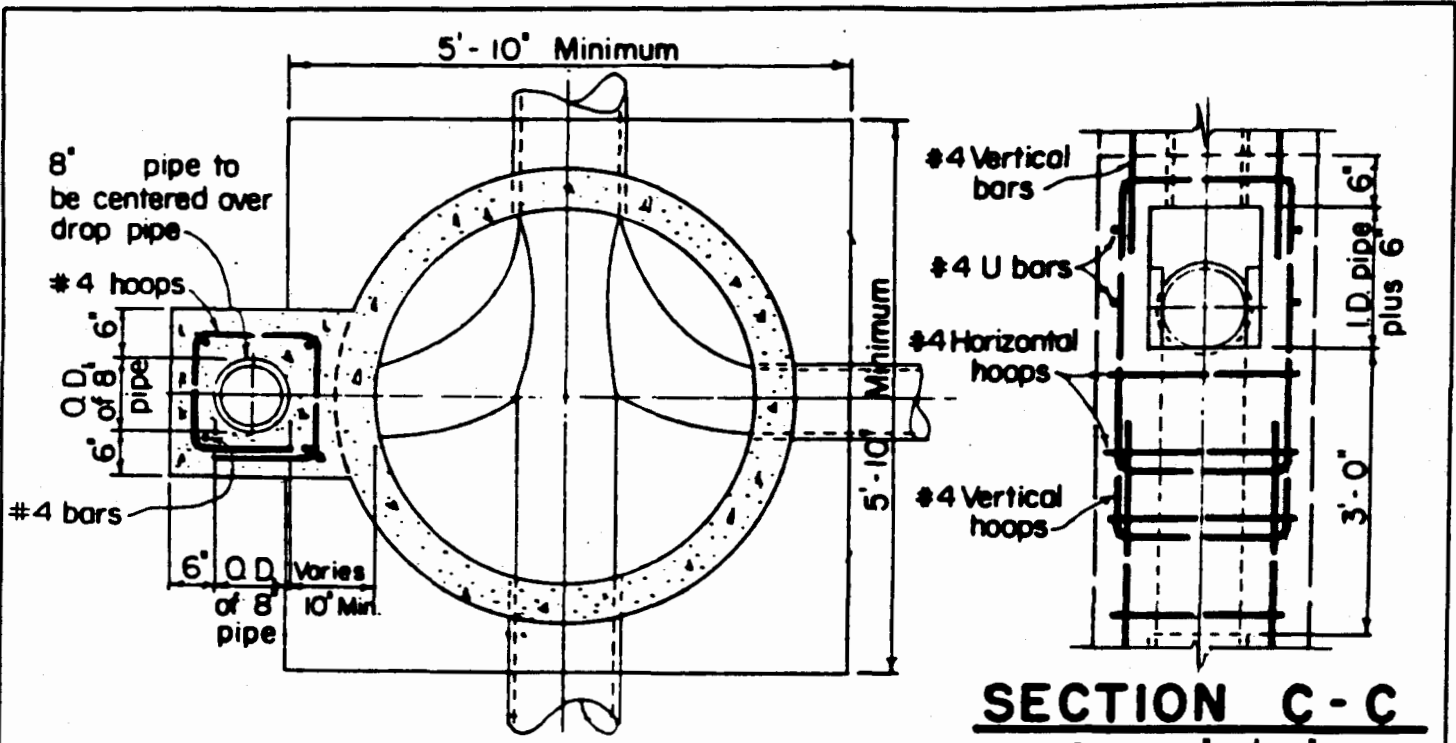
Scale: 1" = 1'-0"



**NOTE:**  
See sheet No. S-18 for sections.

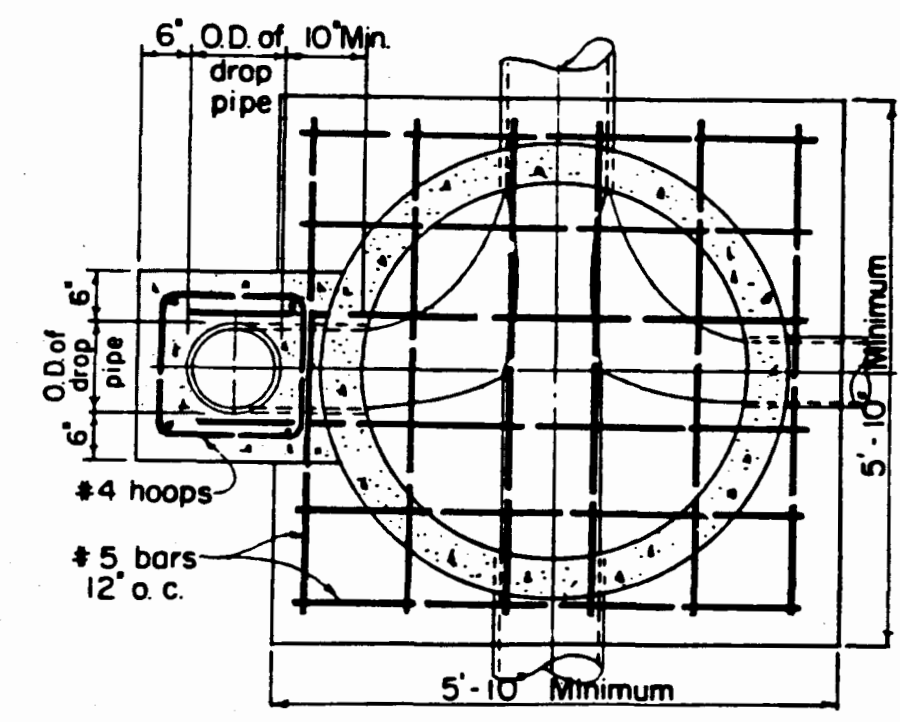
**DROP MANHOLE  
FOR DROPS OVER 5.0 FEET  
PRE - CAST CONCRETE**

COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII	PRE-CAST CONCRETE DROP MANHOLE  SCALE: 1/2" = 1'-0"  SEPTEMBER 1984	STANDARD DETAILS	S-17
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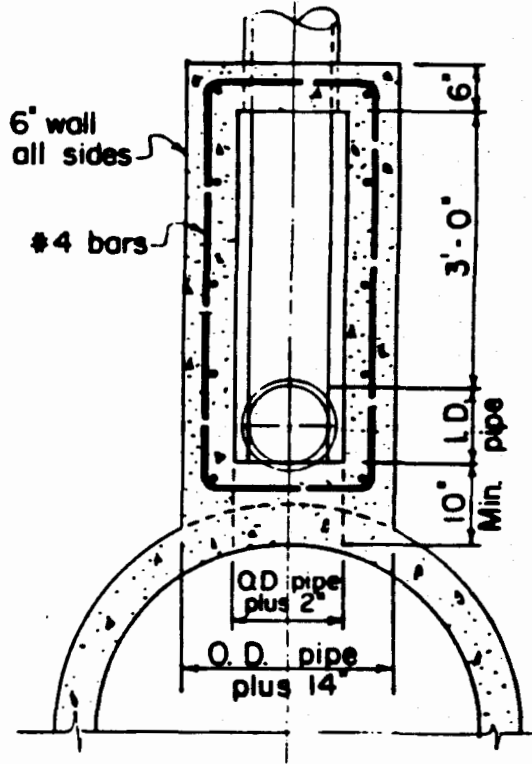


**SECTION A - A**  
Scale: 1/2" = 1'-0"

**SECTION C - C**  
Scale: 1/2" = 1'-0"

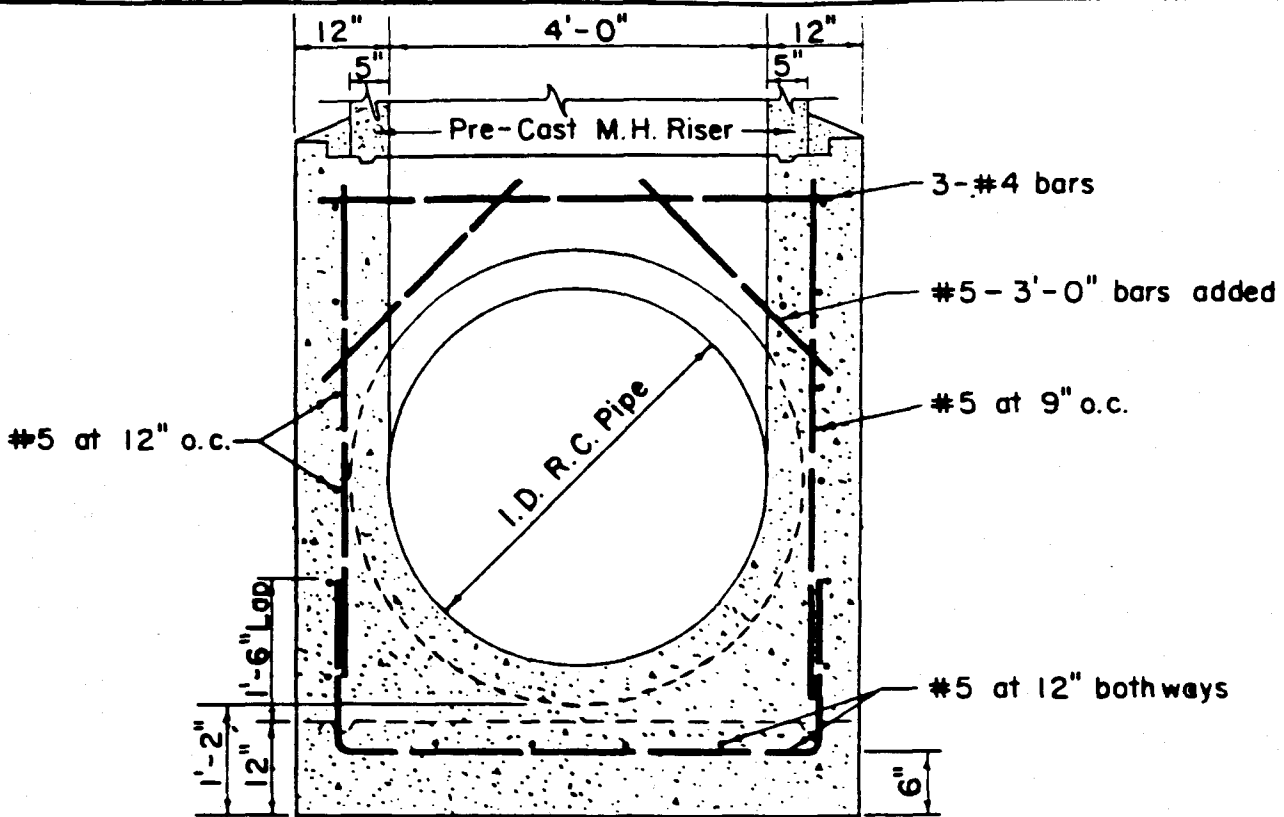


**SECTION B - B**  
Scale: 1/2" = 1'-0"

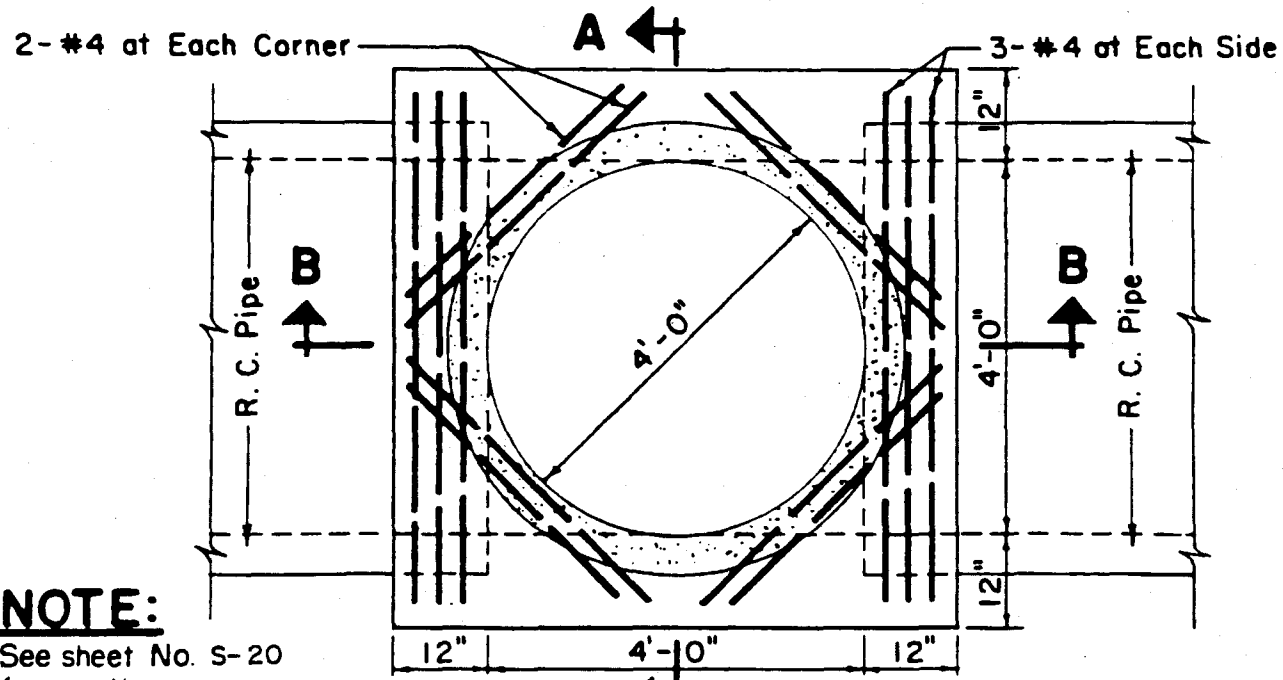


**SECTION D - D**  
Scale: 1/2" = 1'-0"

S-18	STANDARD DETAILS	PRE-CAST CONCRETE DROP MANHOLE - SECTIONS SEPTEMBER 1984	COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII SCALE: 1/2" = 1'-0"
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**SECTION A-A**  
 Scale: 1/2" = 1'-0"



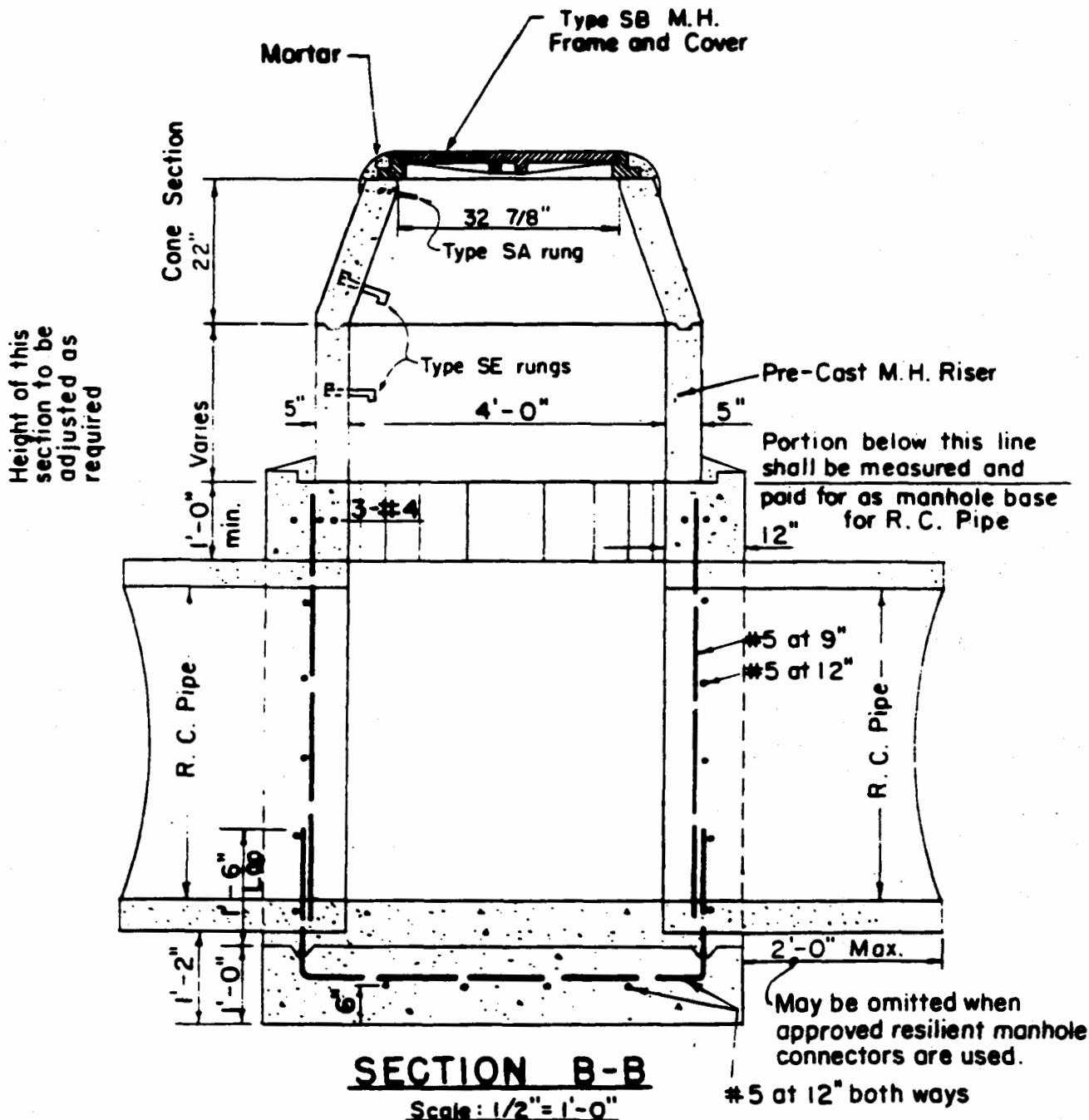
**NOTE:**  
 See sheet No. S-20  
 for section.

**PLAN**

**PLAIN MANHOLE FOR R.C. PIPE (PRE-CAST CONC.)**  
 27" TO 48"

COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII	PRE-CAST CONCRETE PLAIN MANHOLE FOR 27" TO 48" R.C. PIPE SCALE: 1/2" = 1'-0"	STANDARD DETAILS	S-19
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SEPTEMBER 1984



**PLAIN MANHOLE FOR R.C. PIPE**

(PRE-CAST CONCRETE)  
27" TO 48" DIA. INCLUSIVE

S-20

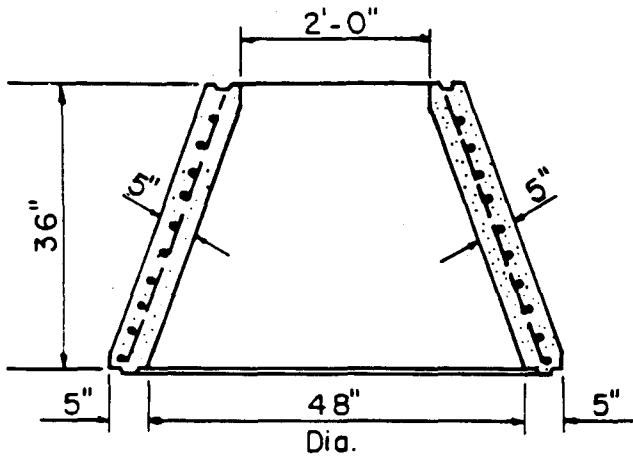
STANDARD  
DETAILS

PRE-CAST CONCRETE PLAIN MANHOLE  
FOR 27" TO 48" R.C. PIPE - SECTION

SEPTEMBER 1984

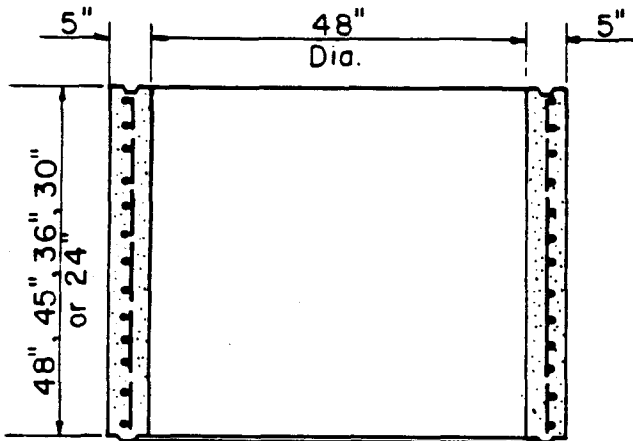
SCALE: 1/2" = 1'-0"

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII



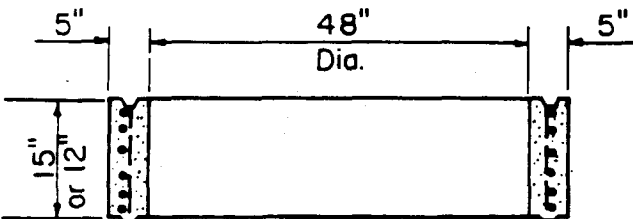
**36" CONE**

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



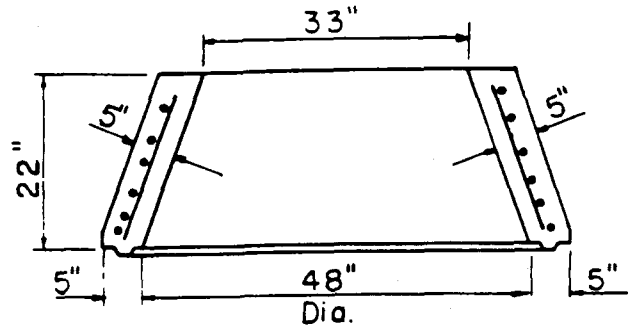
**RISER**

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



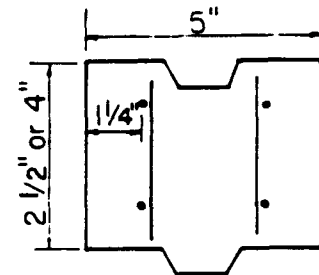
**RISER**

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



**22" CONE**

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



**GRADE RING**

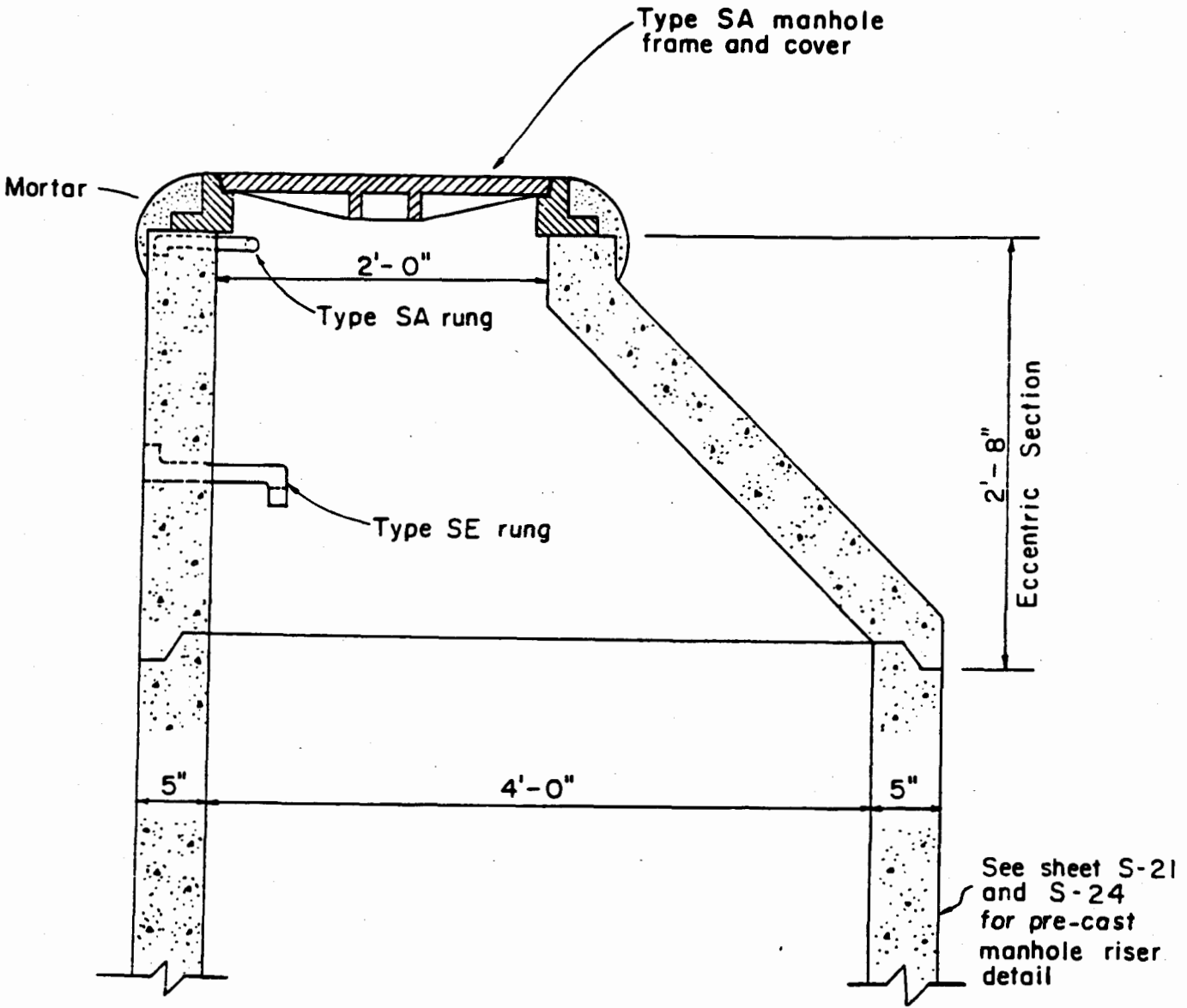
SCALE: 3" = 1' - 0"

SECTION	A <sub>s</sub> /L.F.
48" x 48" Riser	0.15
48" x 45" Riser	0.15
48" x 36" Riser	0.15
48" x 30" Riser	0.15
48" x 24" Riser	0.15
48" x 15" Riser	0.15
48" x 12" Riser	0.15
48" x 24" x 36" Cone	0.16
48" x 33" x 22" Cone	0.16
22" x 4" Grade Ring	0.12
22" x 2 1/2" Grade Ring	0.12

**NOTES**

1. Pre-cast sections shall conform to ASTM C 478
2. Manufacturers may submit to the Engineer for approval, prior to manufacturing, designs other than those shown on this sheet.





Scale: 1" = 1'-0"

S-22

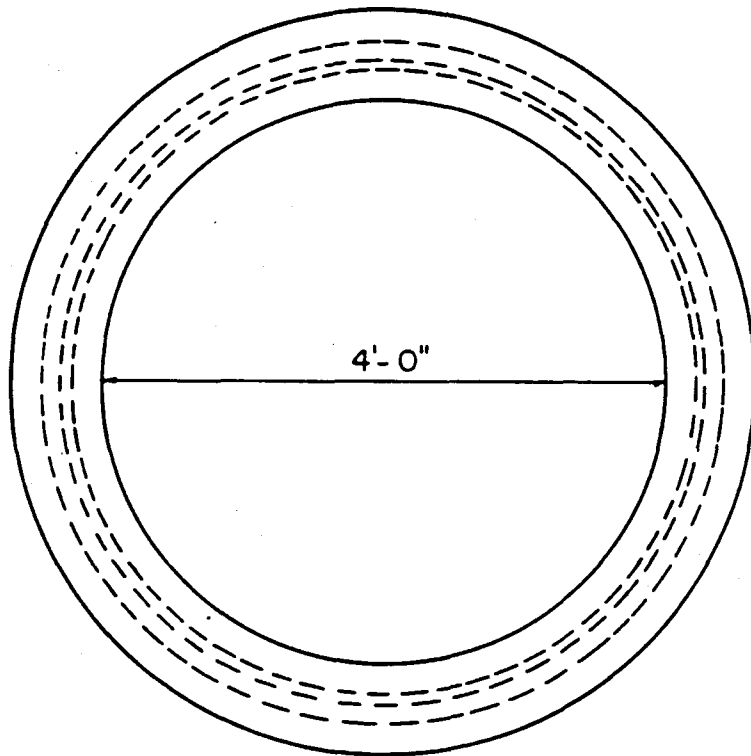
STANDARD  
DETAILS

PRE-CAST CONCRETE ECCENTRIC  
MANHOLE CONE

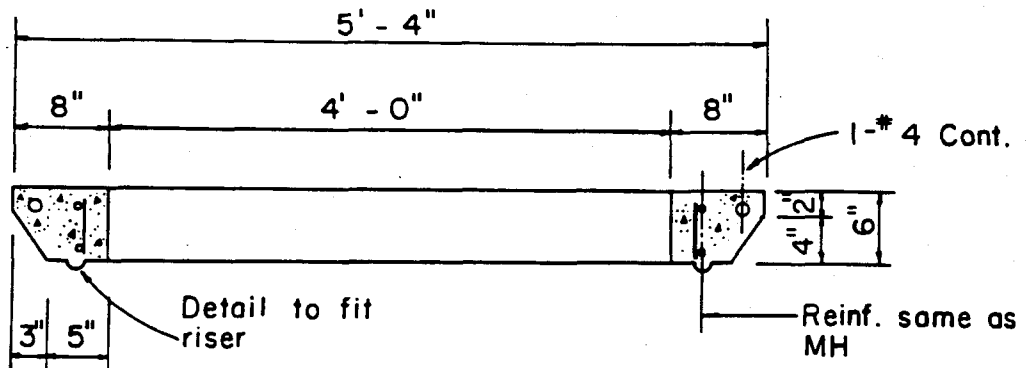
COUNTY OF KAUAI  
COUNTY OF MAUI  
COUNTY OF HAWAII

SEPTEMBER 1984

SCALE: 1" = 1'-0"

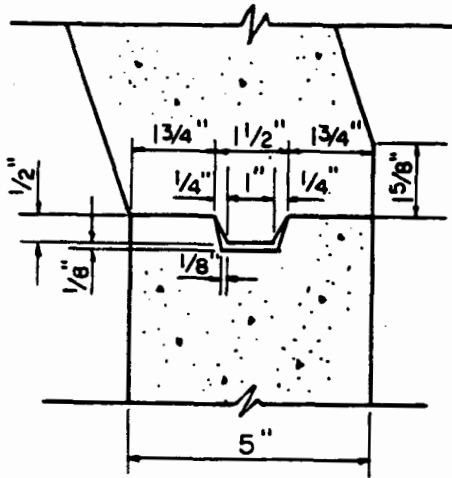


PLAN

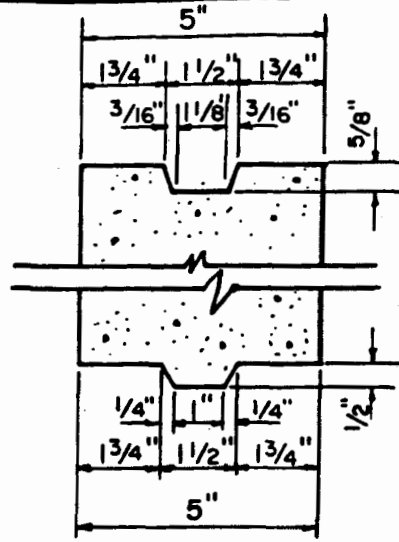


SECTION

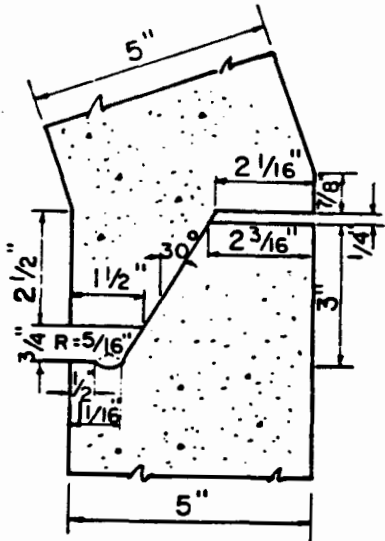
Scale:  $\frac{3}{4}'' = 1'-0''$



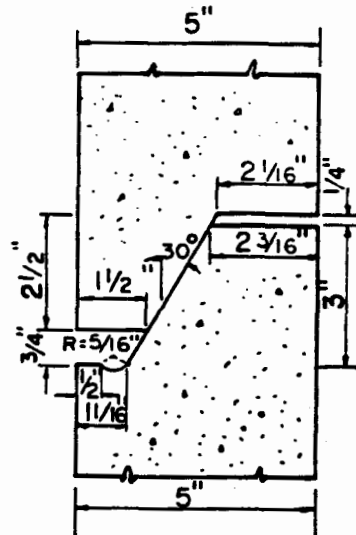
**CONE SECTION**



**RISER SECTION**

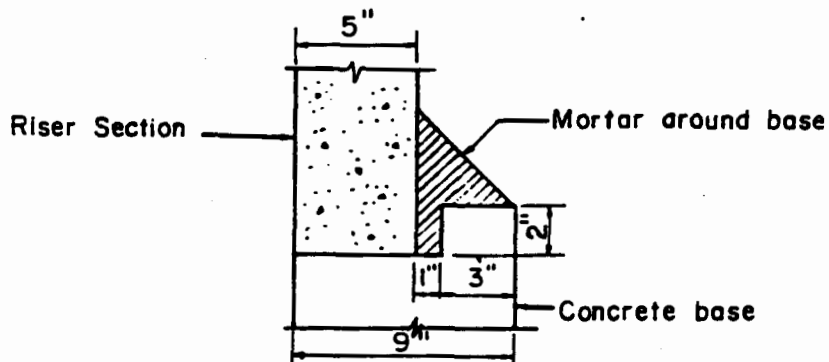


**CONE SECTION  
(Alternate Detail)**

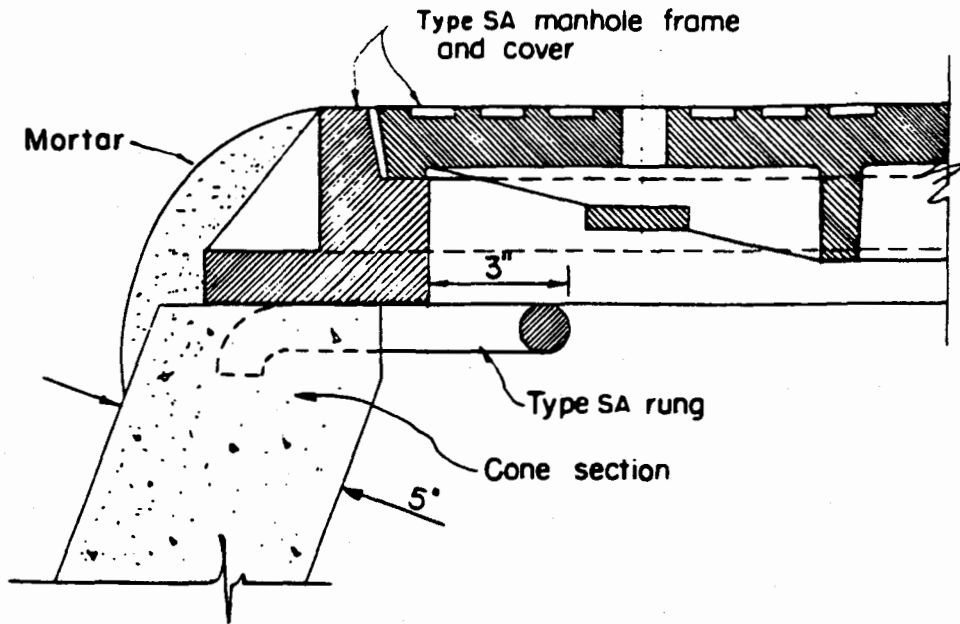


**RISER SECTION  
(Alternate Detail)**

Scale : 3" = 1'-0"

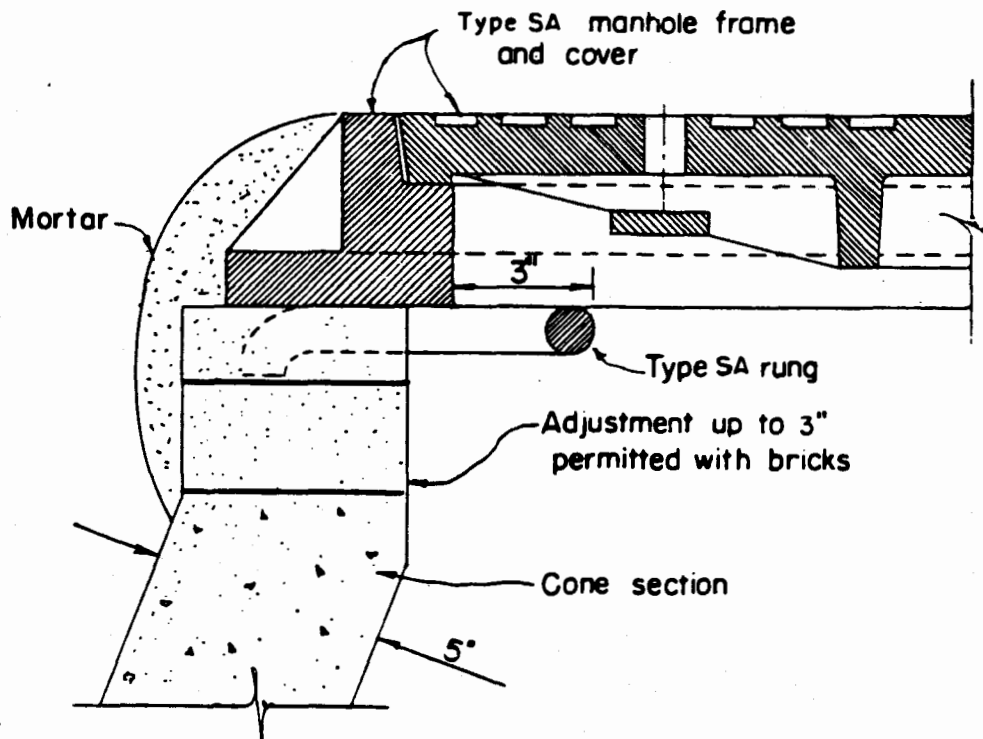


**RISER AND MANHOLE BASE JOINT SCALE: 1-1/2" = 1'-0"**



**SHOWN WITHOUT GRADE RING**

Scale: 3" = 1'-0"



**SHOWN WITH GRADE RING**  
**PRE - CAST MANHOLE**  
**DETAIL AT TOP RUNG**

COUNTY OF KAUAI  
 CITY & COUNTY OF HONOLULU  
 COUNTY OF MAUI  
 COUNTY OF HAWAII

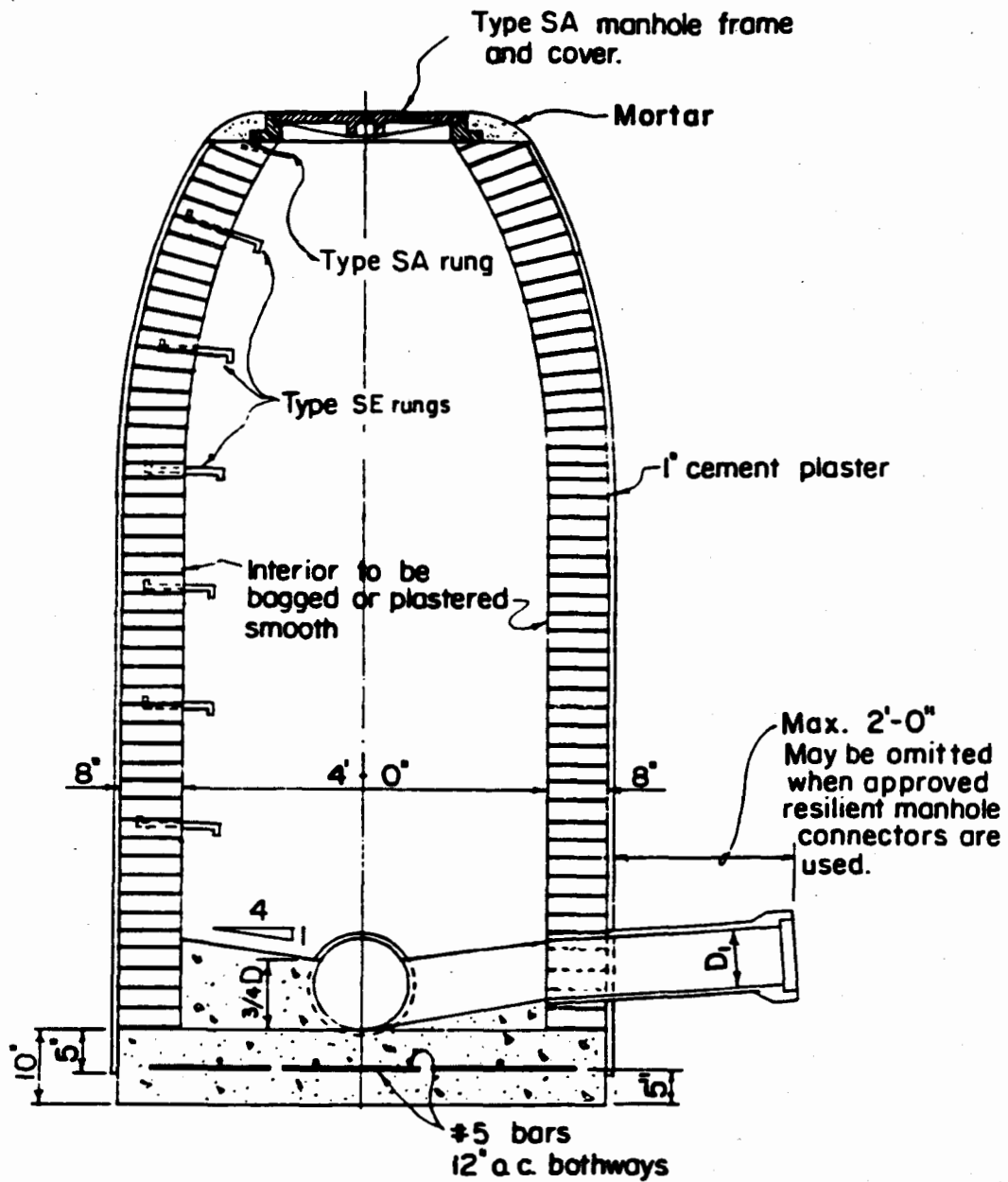
PRE-CAST CONCRETE MANHOLE -  
 DETAIL AT TOP RUNG

STANDARD  
 DETAILS

S-25

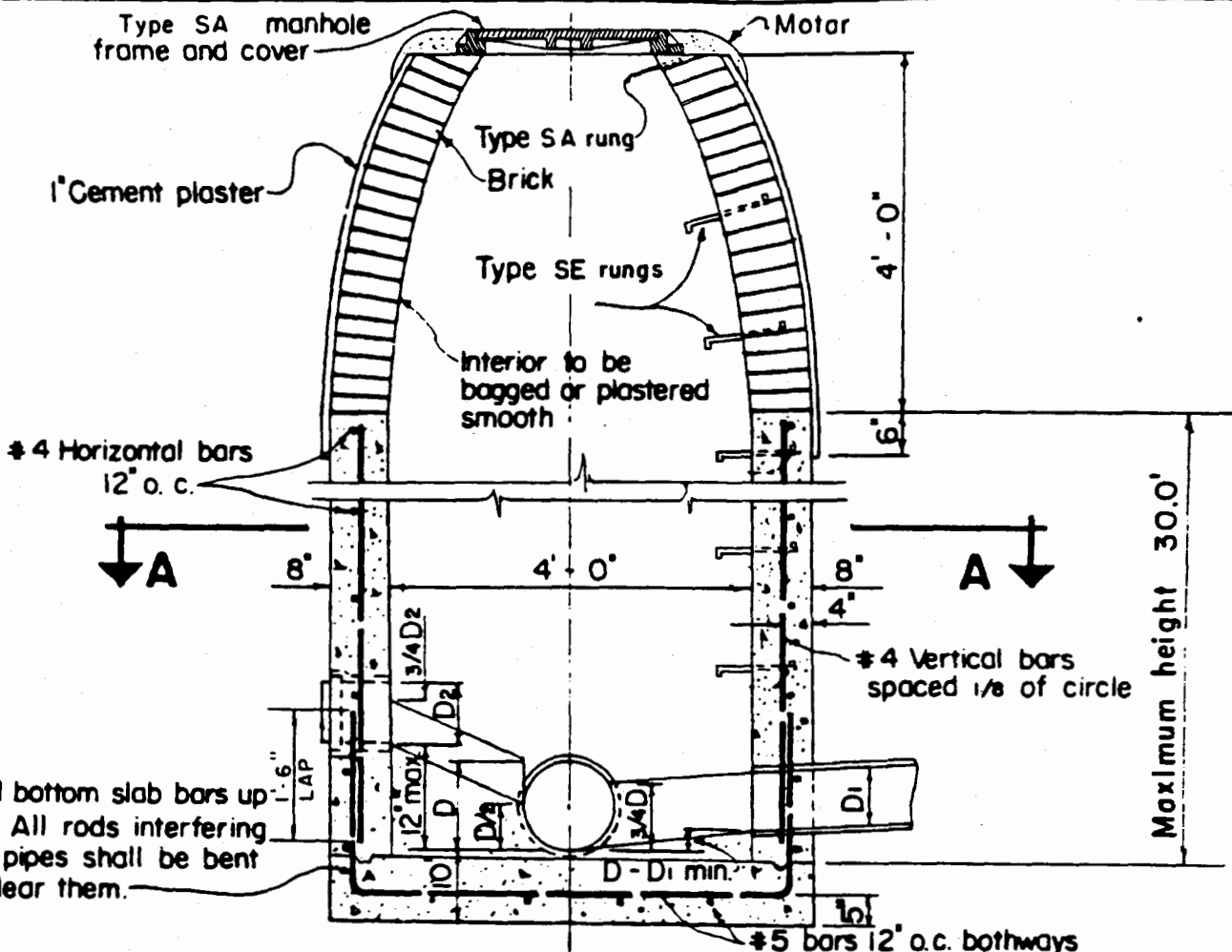
SCALE: 3" = 1'-0"

SEPTEMBER 1984



**(MAXIMUM HEIGHT - 10.0 FEET)**  
**PLAIN MANHOLE (BRICK)**

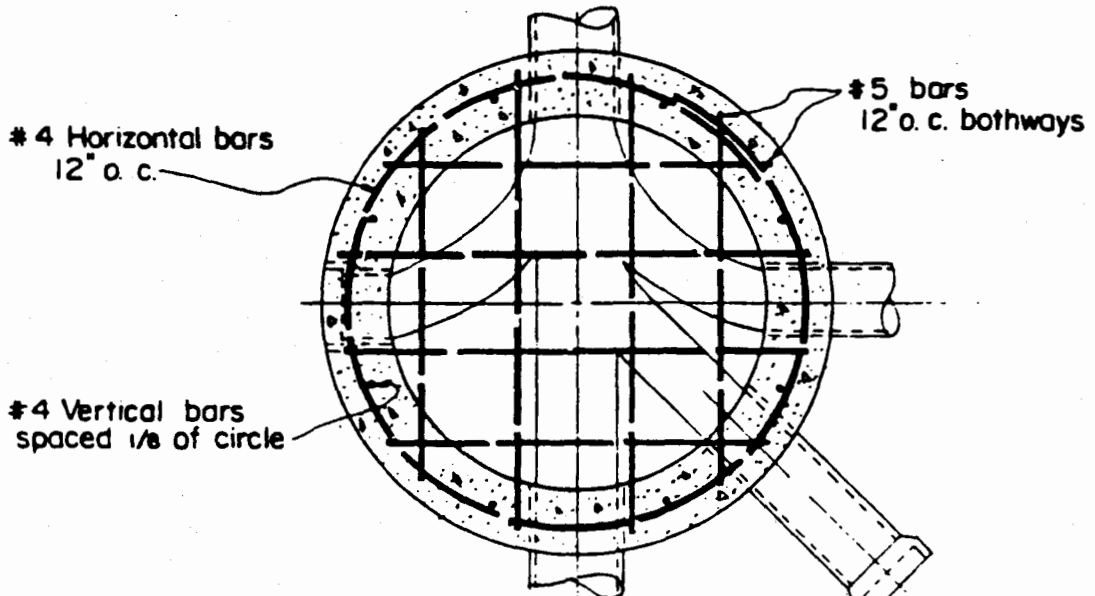
Scale:  $1/2" = 1'-0"$



Bend bottom slab bars up 24°. All rods interfering with pipes shall be bent to clear them.

**PLAIN MANHOLE (CAST-IN-PLACE)**

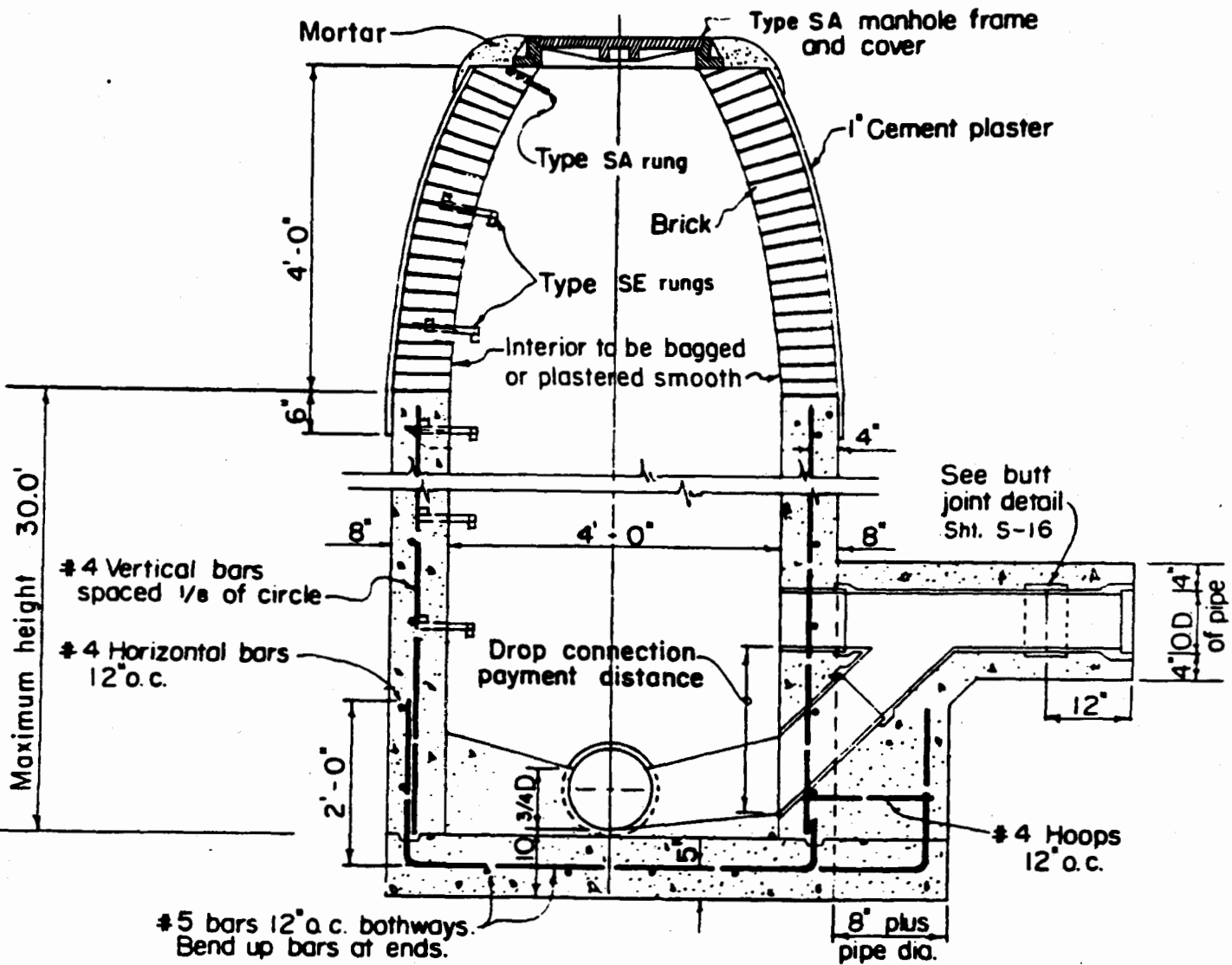
Scale: 1/2" = 1'-0"



**SECTION A-A**

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

COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII	PLAIN MANHOLE	STANDARD DETAILS	S-27
SCALE: 1/2" = 1'-0"		SEPTEMBER 1984	



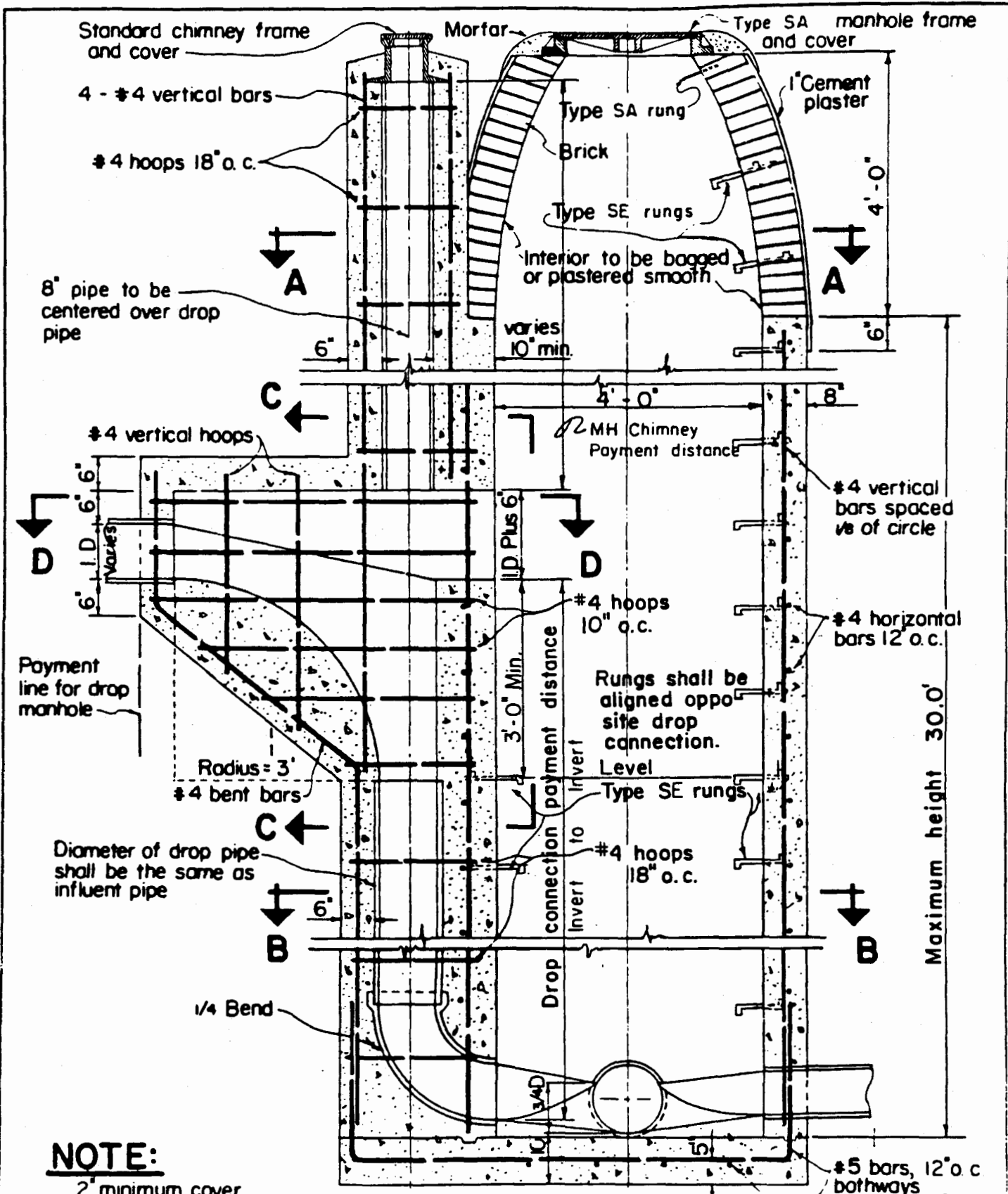
**FOR DROPS UNDER 5.0 FEET  
(SHALLOW) DROP MANHOLE (CAST-IN-PLACE)**

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

**NOTES:**

Manhole wall to be of reinforced concrete to height 1' above normal ground water table.

S-28	STANDARD DETAILS	SHALLOW DROP MANHOLE  SEPTEMBER 1984	COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII  SCALE: 1/2" = 1'-0"
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**NOTE:**

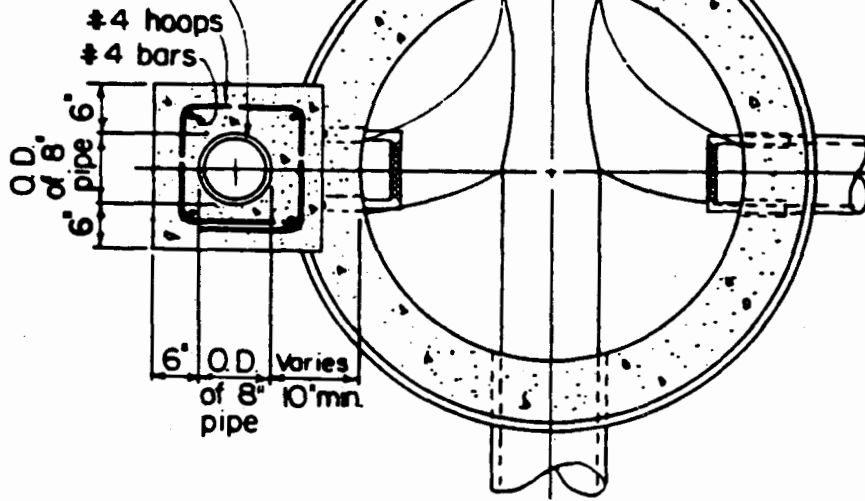
2" minimum cover on reinforcing steel  
 See sheet No. S-30 for sections.

(FOR DROPS OVER 5.0 FEET)  
**DROP MANHOLE (CAST-IN-PLACE)**

COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII	DROP MANHOLE SCALE: 1/2" = 1'-0" SEPTEMBER 1984	STANDARD DETAILS	S-29
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8" V.C. pipe to be centered over drop pipe



**SECTION A-A**

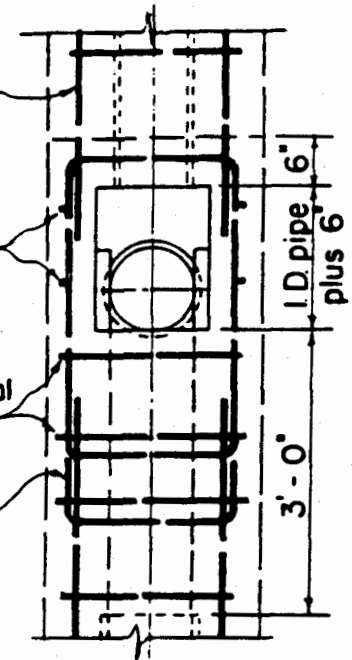
Scale: 1/2" = 1'-0"

#4 Vertical bars

#4 U bars

#4 Horizontal hoops

#4 Vertical hoops



**SECTION C-C**

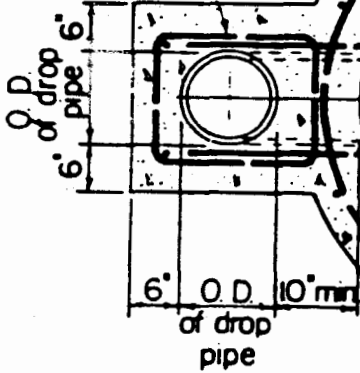
Scale: 1/2" = 1'-0"

#4 Vertical bars spaced 1/8 of circle

#4 Horizontal bars 12" o.c.

#5 bars 12" o.c. bothways

#4 hoops

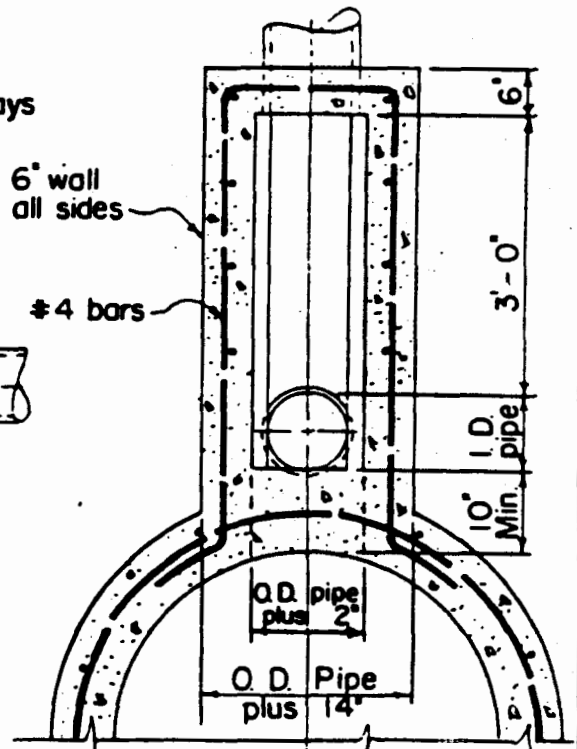


**SECTION B-B**

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

6" wall all sides

#4 bars



**SECTION D-D**

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

**DROP MANHOLE**

S-30

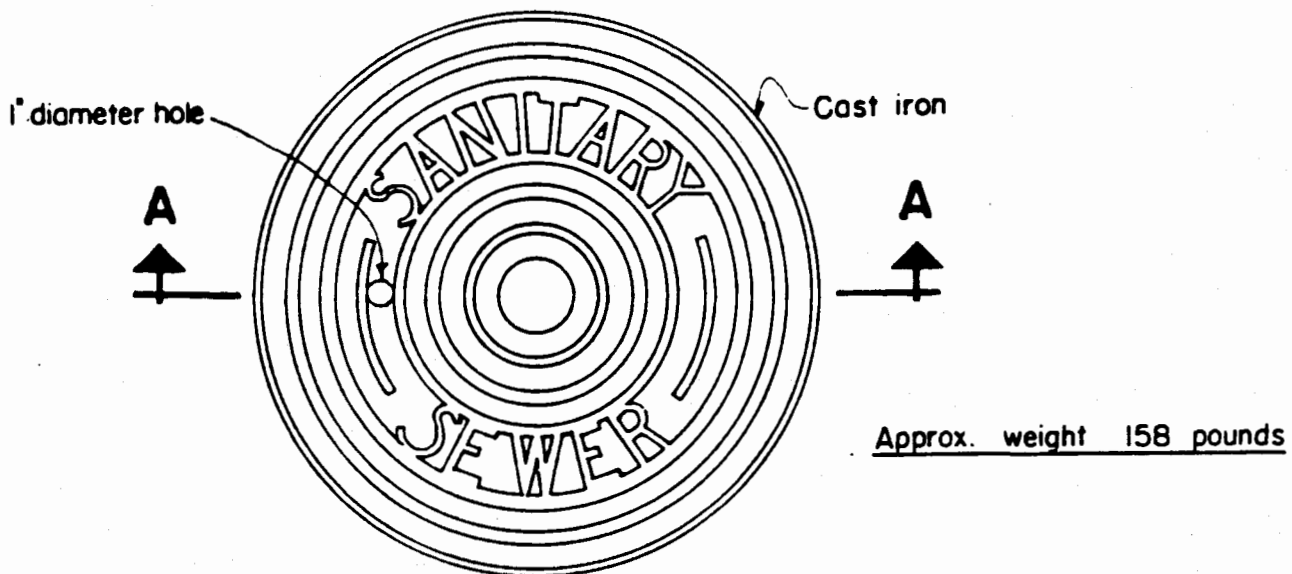
STANDARD  
DETAILS

DROP MANHOLE - SECTIONS

SEPTEMBER 1984

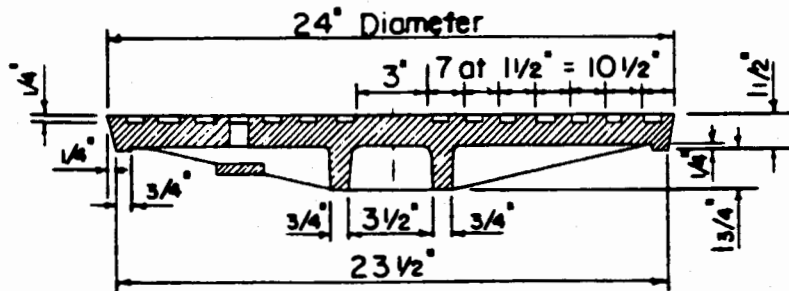
SCALE: 1/2" = 1'-0"

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII



**PLAN OF MANHOLE COVER**

Scale:  $1\frac{1}{2}'' = 1' - 0''$

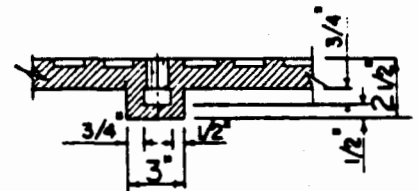
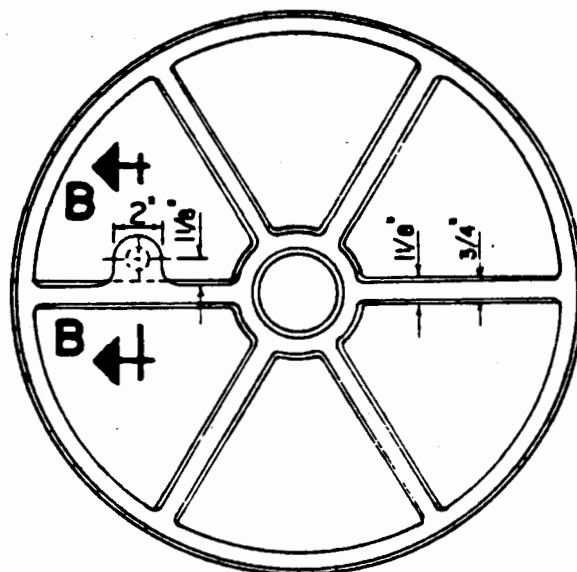


**SECTION A-A**

Scale:  $1\frac{1}{2}'' = 1' - 0''$

**NOTE:**

This cover is used with the SA or SD frame.



**SECTION B-B**

**BOTTOM VIEW OF COVER**

Scale:  $1\frac{1}{2}'' = 1' - 0''$

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII

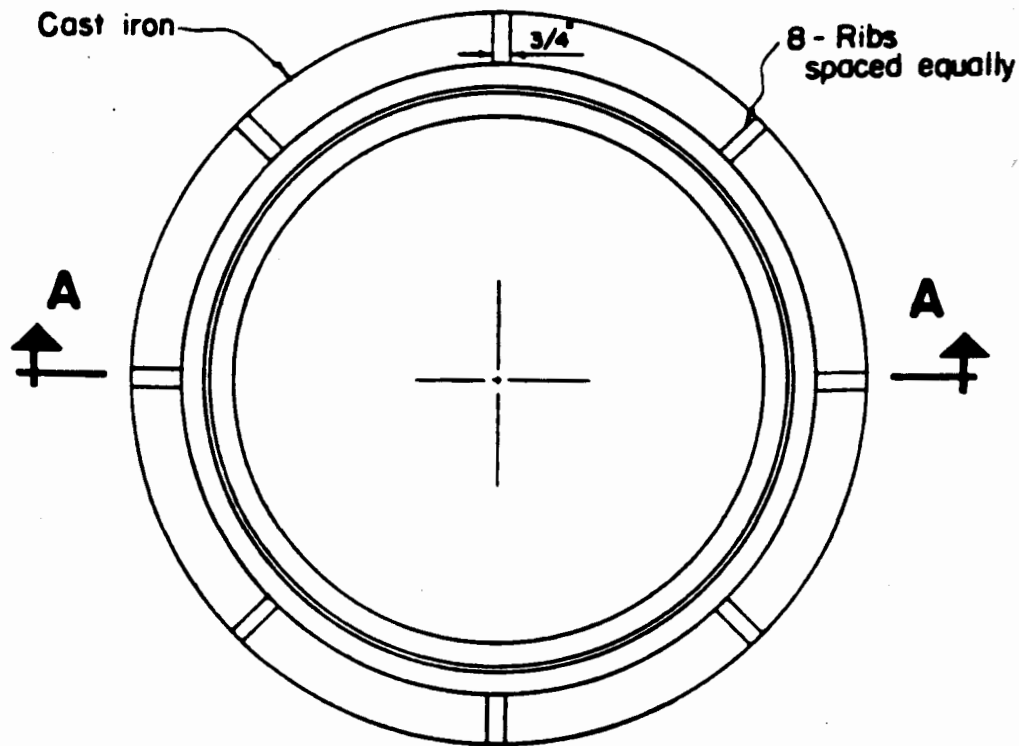
MANHOLE COVER - TYPE SA

STANDARD  
DETAILS

S-31

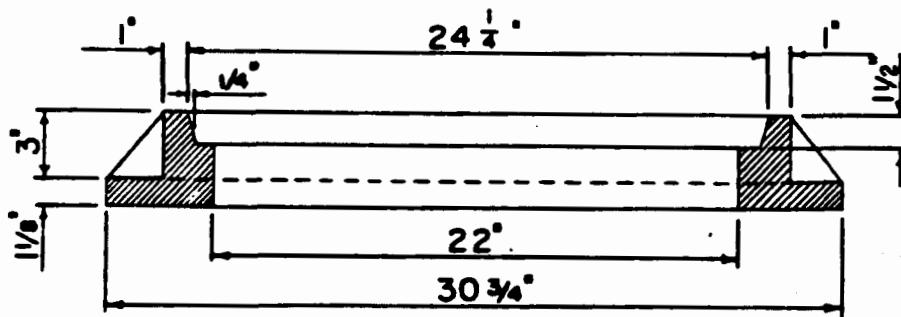
SCALE:  $1\frac{1}{2}'' = 1' - 0''$

SEPTEMBER 1984



**PLAN OF MANHOLE FRAME**

Scale:  $1\frac{1}{2}'' = 1'-0''$



**SECTION A - A**

Scale:  $1\frac{1}{2}'' = 1'-0''$

Approx. weight 156 pounds

S-32

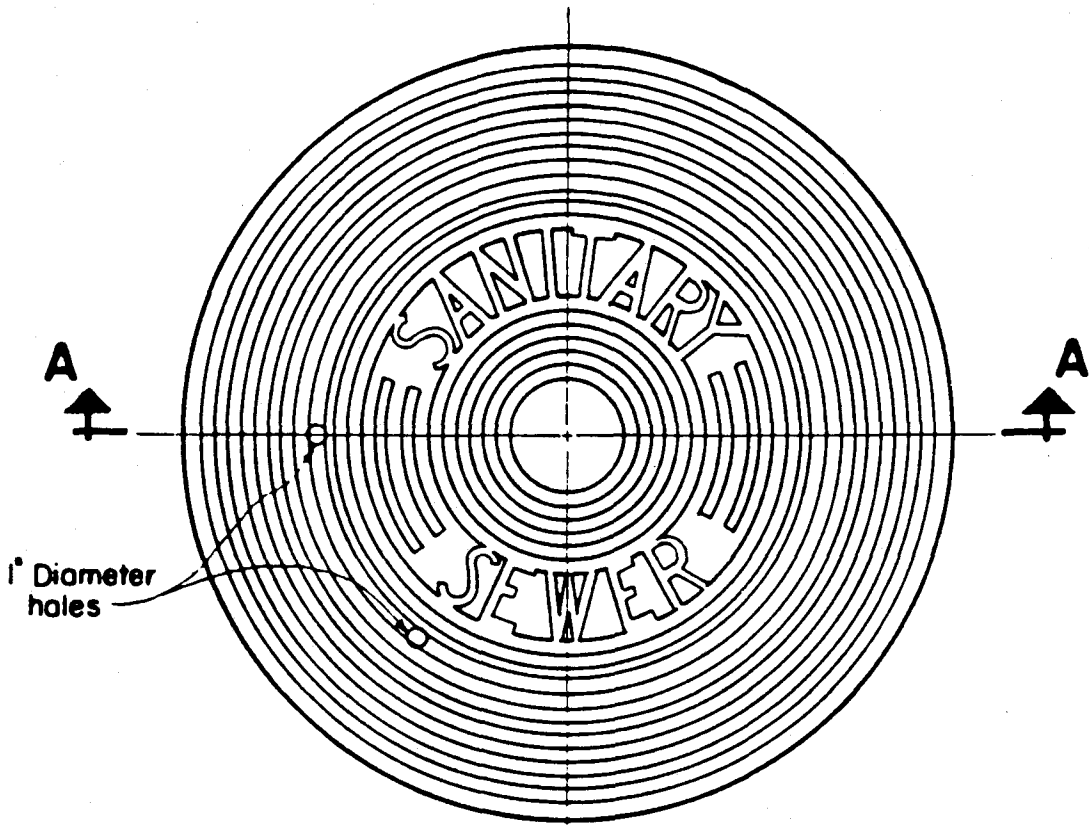
STANDARD  
DETAILS

MANHOLE FRAME - TYPE SA

SEPTEMBER 1984

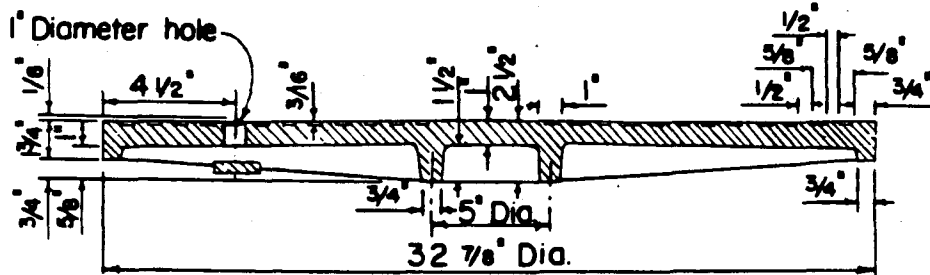
SCALE: 1-1/2" = 1'-0"

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII



**PLAN**  
**SPECIAL MANHOLE COVER**

Scale:  $1\frac{1}{2}'' = 1'-0''$



**SECTION A - A**

Scale:  $1\frac{1}{2}'' = 1'-0''$

Approx. Weight 260 Pounds

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII

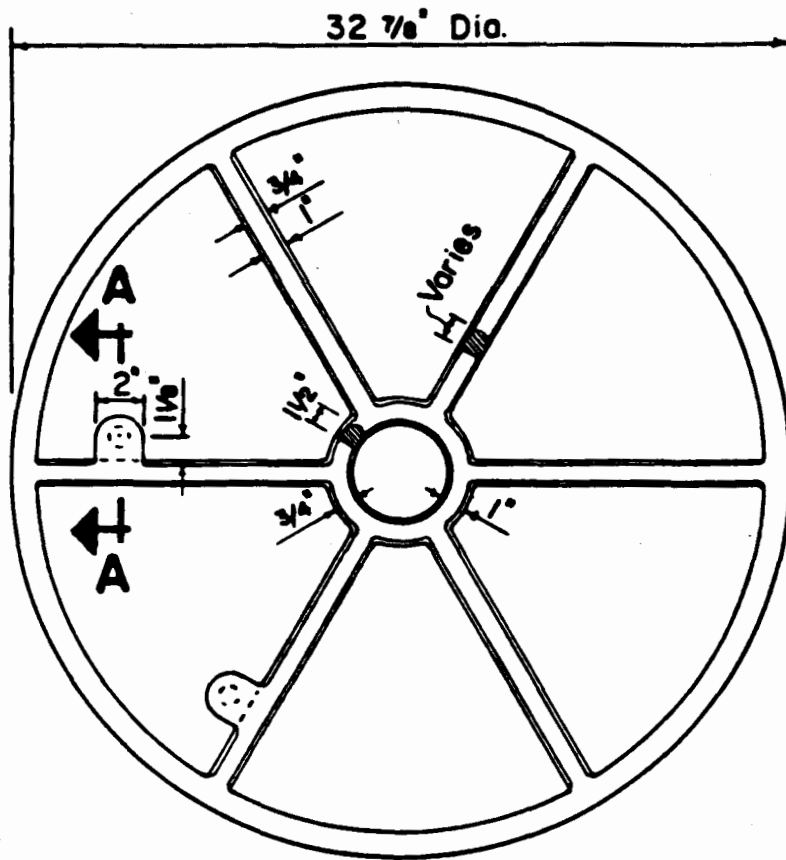
MANHOLE COVER - TYPE SB, TOP VIEW

STANDARD  
DETAILS

S-33

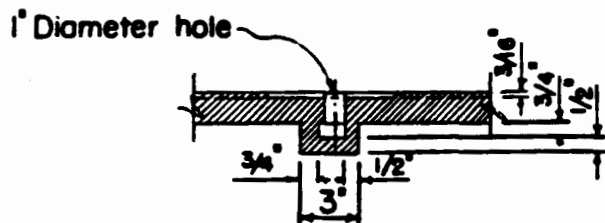
SCALE:  $1\frac{1}{2}'' = 1'-0''$

SEPTEMBER 1984



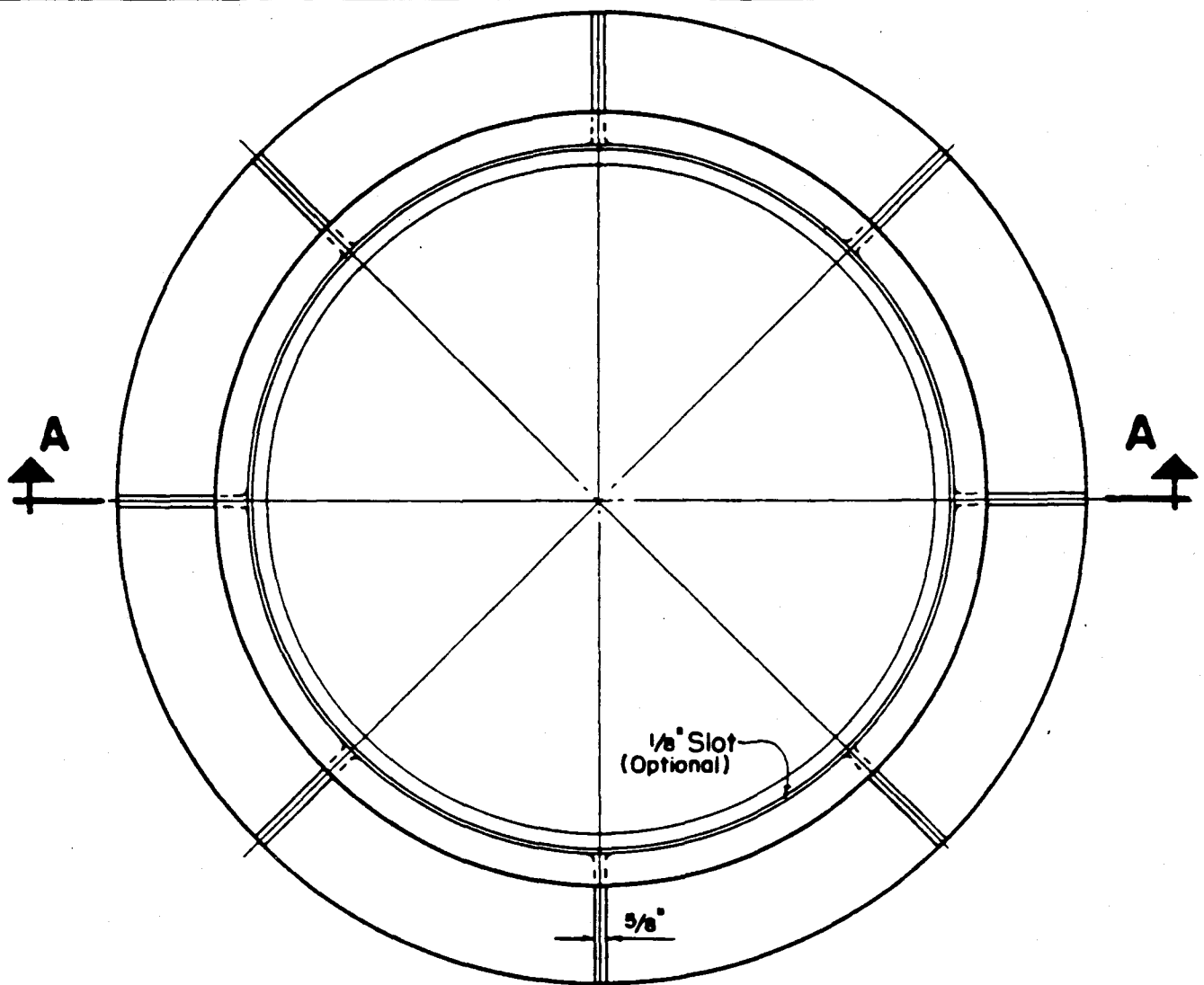
**BOTTOM VIEW OF COVER**

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



**SECTION A - A**

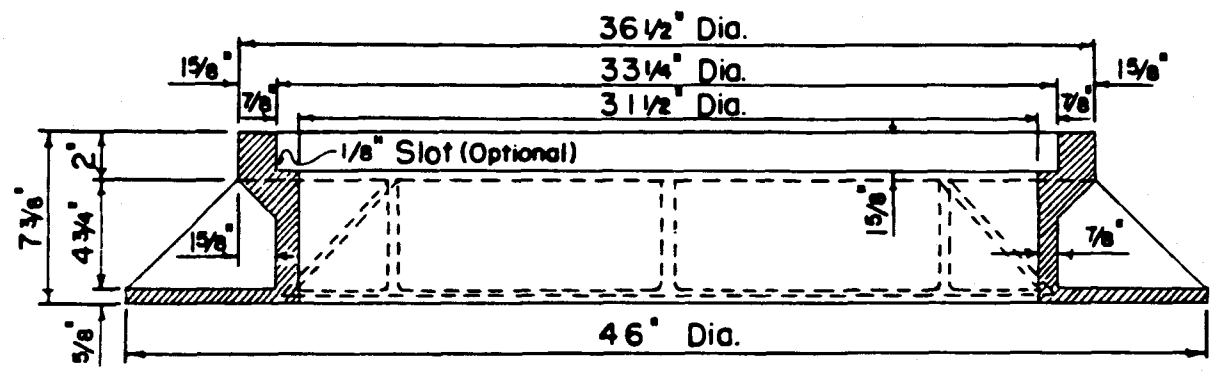
Scale: 1 1/2" = 1' - 0"



**PLAN**  
**SPECIAL MANHOLE FRAME**

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

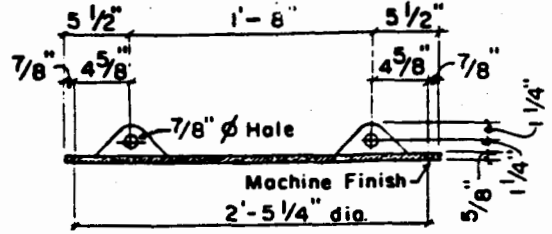
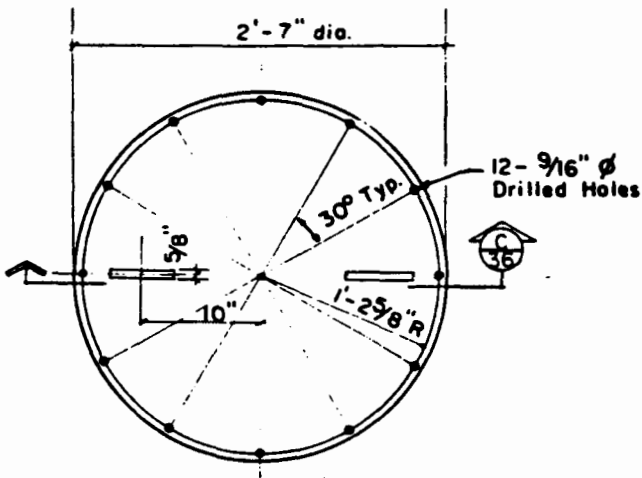
Approx. Weight 480 Pounds



**SECTION A - A**

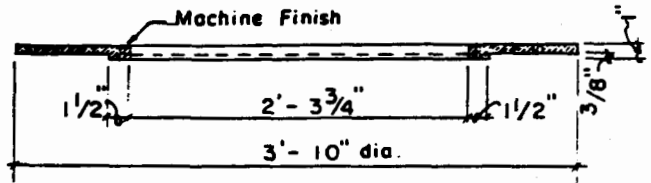
COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII	MANHOLE FRAME - TYPE SB  SCALE: 1-1/2" = 1'-0"	STANDARD DETAILS	S-35
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SEPTEMBER 1984

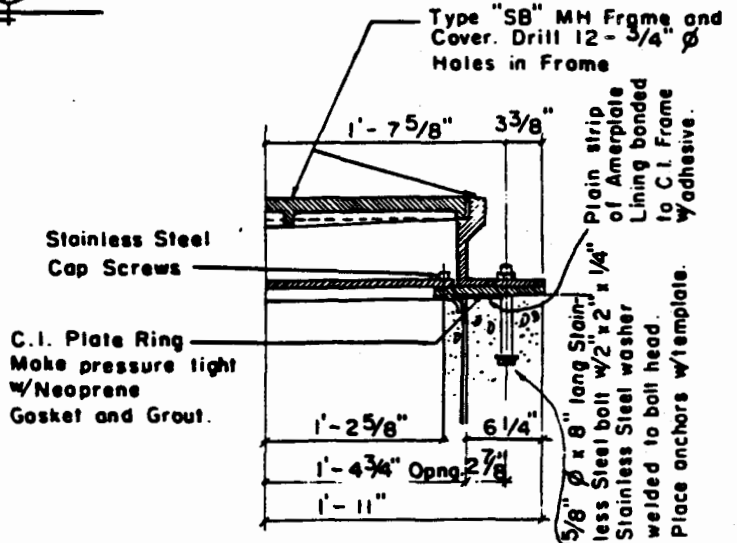
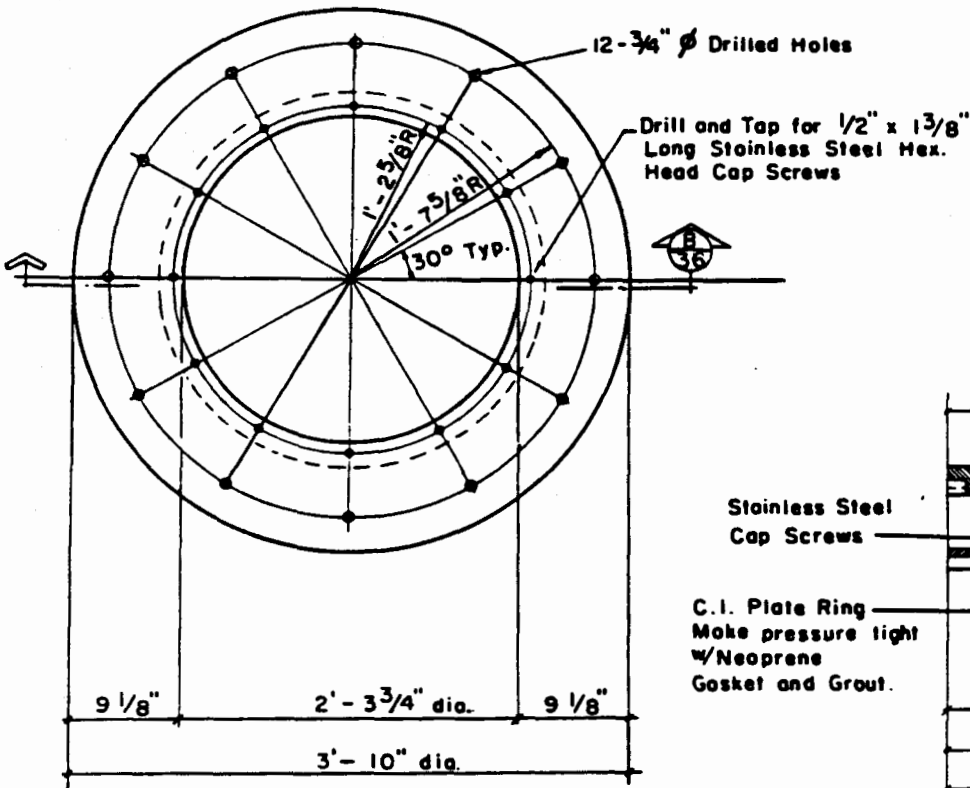


SECTION C  
36

5/8" C.I. PRESSURE PLATE COVER



SECTION B  
36



HALF SECTION-MODIFIED  
TYPE "SB" MH FRAME & COVER

C.I. PRESSURE PLATE COVER RING

S-36

STANDARD  
DETAILS

MODIFIED TYPE SB PRESSURE MANHOLE  
FRAME AND COVER

SEPTEMBER 1984

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

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII

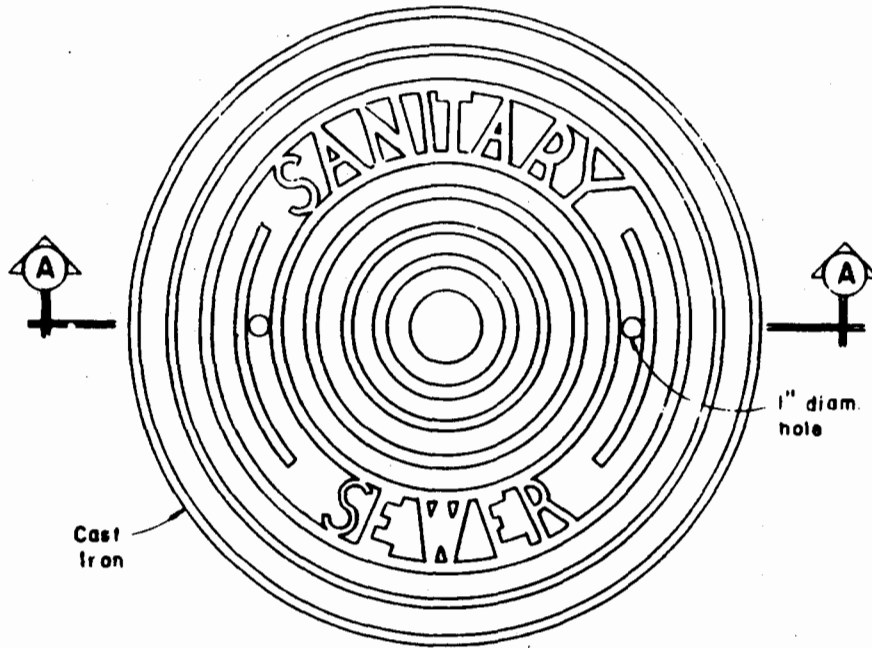
NOT TO SCALE

PRESSURE MANHOLE COVER - TYPE SC

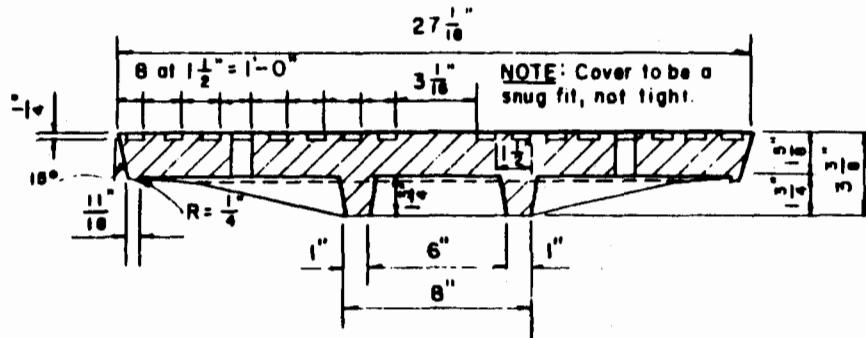
SEPTEMBER 1984

STANDARD  
DETAILS

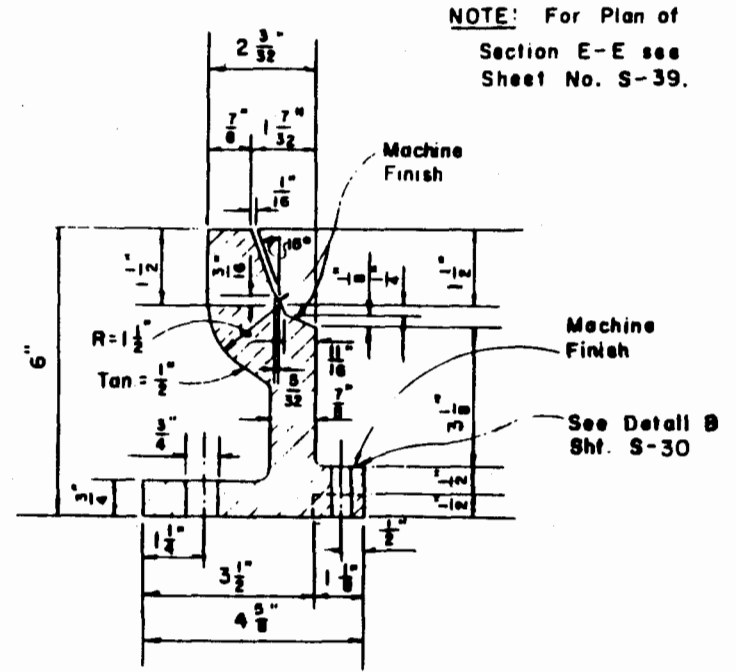
S-37



**PLAN OF PRESSURE MANHOLE COVER**



**SECTION A-A**



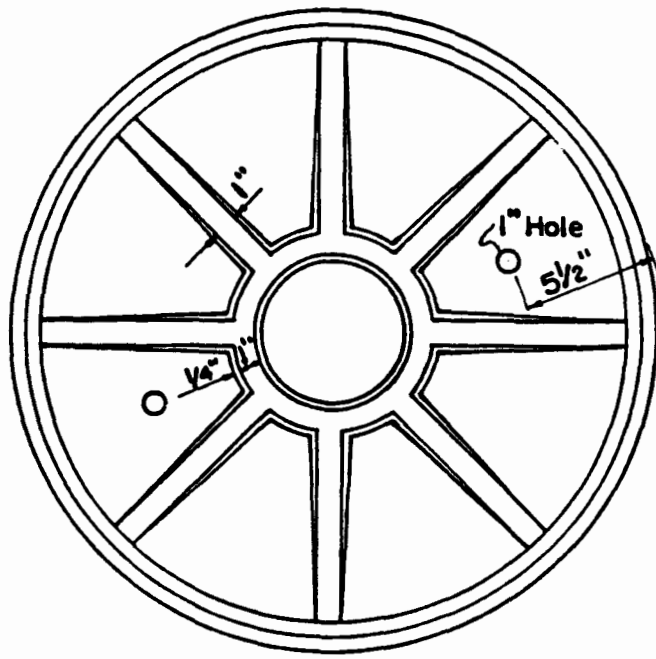
**SECTION E-E**

NOTE: For Plan of  
Section E-E see  
Sheet No. S-39.

**NOTES:**

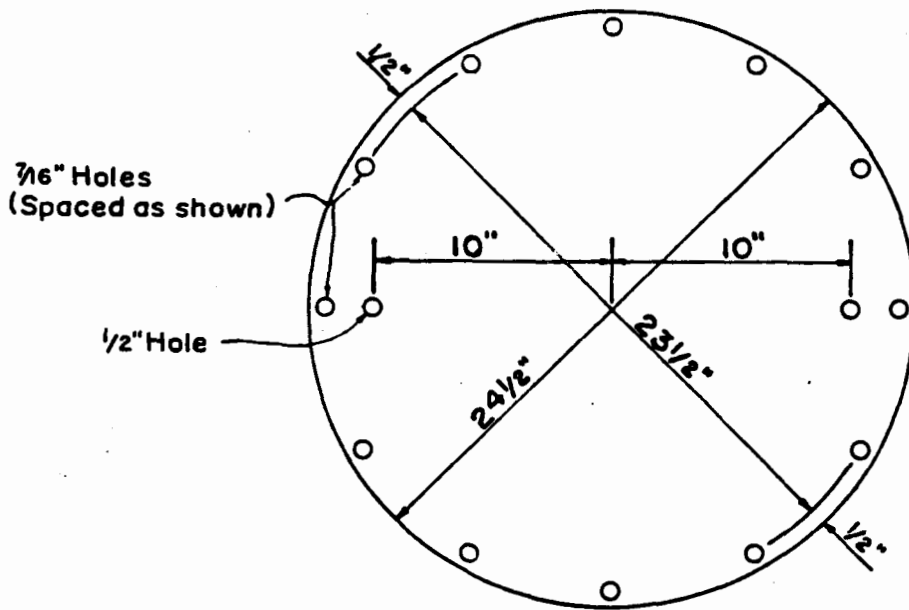
1. Gaskets shall be from  $\frac{1}{16}$  inch thick Crandall No. 1906 or Garlock No. 19.
2. The Pressure Plate and Cap Screws shall be stainless steel ASTM Designation A 240 or A 167, AISI type 318 or 321.
3. Anchor Bolts shall be Silicon Bronze ASTM Designation B 98-52.
4. All parts of the manhole frame and cover and the pressure plate shall be coated with Inertal No. 49.
5. Maximum Allowable Pressure - 25' Head of water





**BOTTOM VIEW OF PRESSURE MANHOLE COVER**

Not to Scale



**PLAN OF PRESSURE PLATE**

Not to Scale

S-38

STANDARD  
DETAILS

PRESSURE MANHOLE COVER - TYPE SC

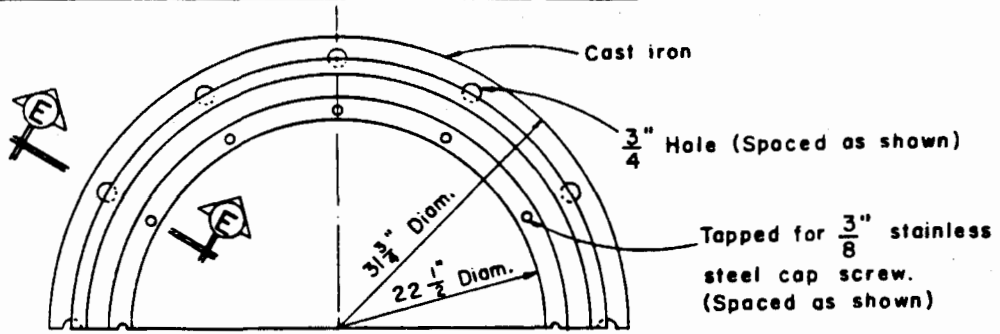
SEPTEMBER 1984

NOT TO SCALE

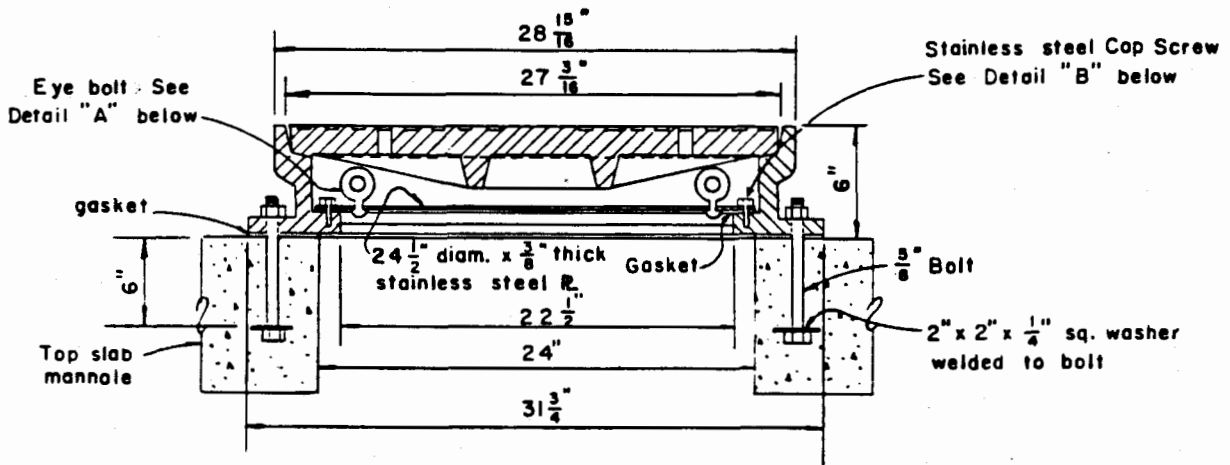
COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII

**NOTE:**

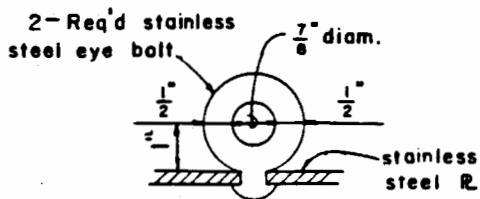
For details of  
Section E-E see  
Sheet No. S-37



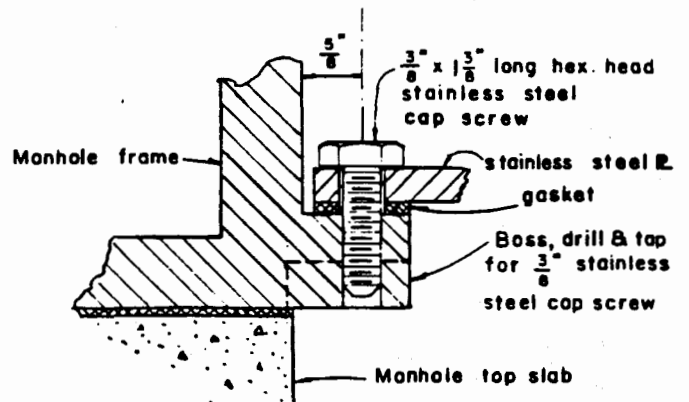
**HALF PLAN-MANHOLE FRAME**



**SECTION-MANHOLE FRAME & COVER**



**DETAIL "A"**



**DETAIL "B"**

**PRESSURE MANHOLE FRAME & COVER**

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII

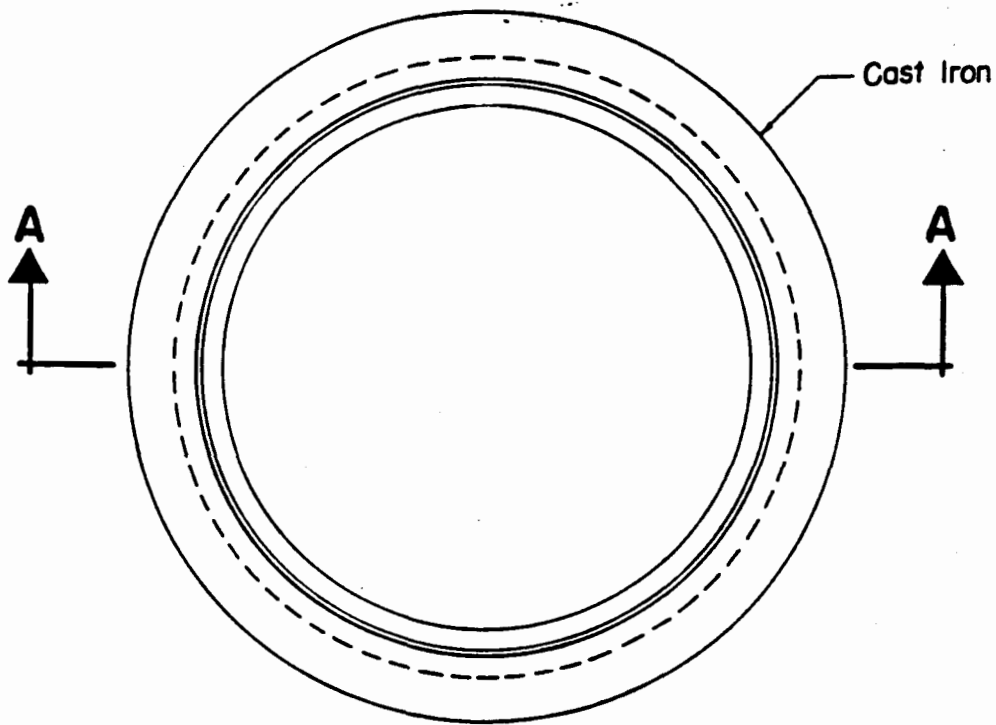
PRESSURE MANHOLE FRAME AND COVER -  
TYPE SC

STANDARD  
DETAILS

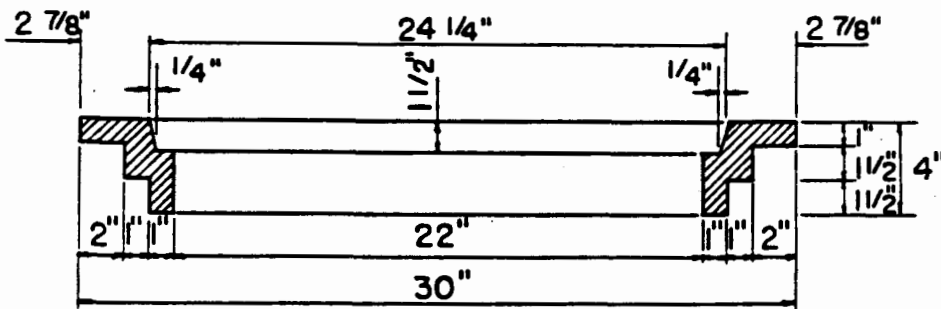
S-39

NOT TO SCALE

SEPTEMBER 1984



PLAN



SECTION A-A

**TYPE SD FRAME**

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

**NOTE:**

Type SA Cover is used with this frame.

Approx. weight 156 pounds

S-40

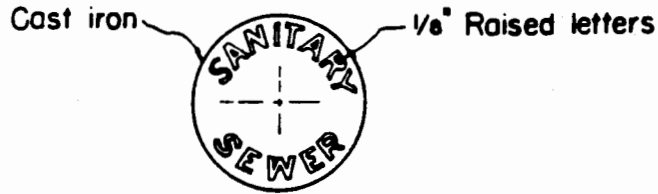
STANDARD  
DETAILS

MANHOLE FRAME - TYPE SD

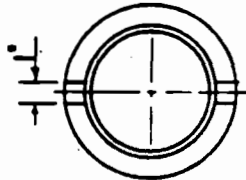
SEPTEMBER 1984

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

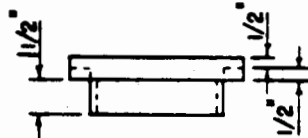
COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII



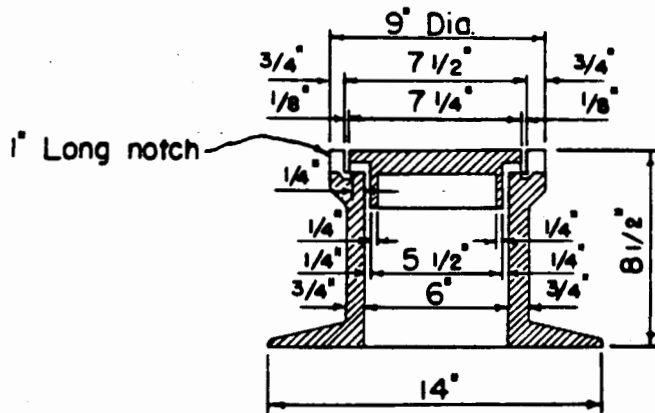
PLAN OF COVER



BOTTOM OF COVER



ELEVATION



SECTION

**DROP MANHOLE  
CHIMNEY CASTINGS**

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

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII

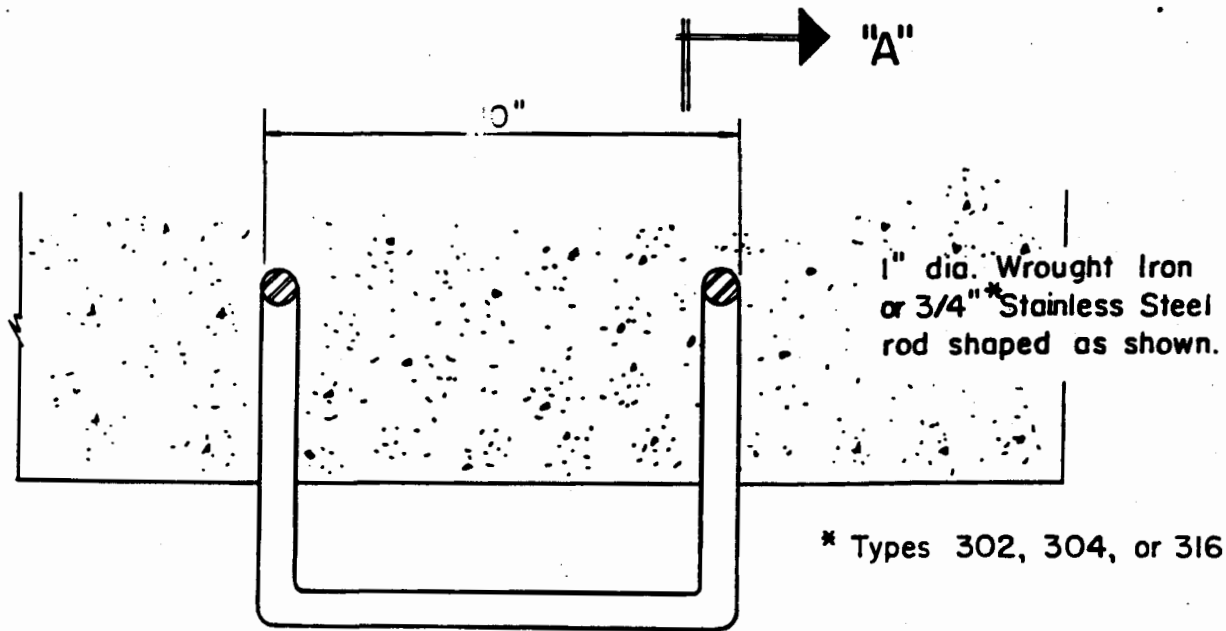
DROP MANHOLE CHIMNEY CASTING

STANDARD  
DETAILS

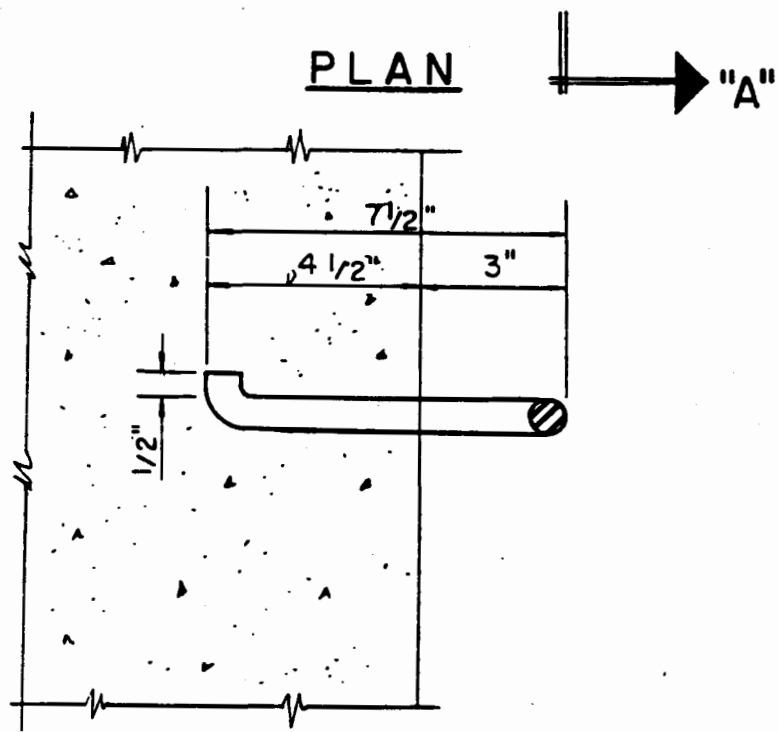
S-41

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

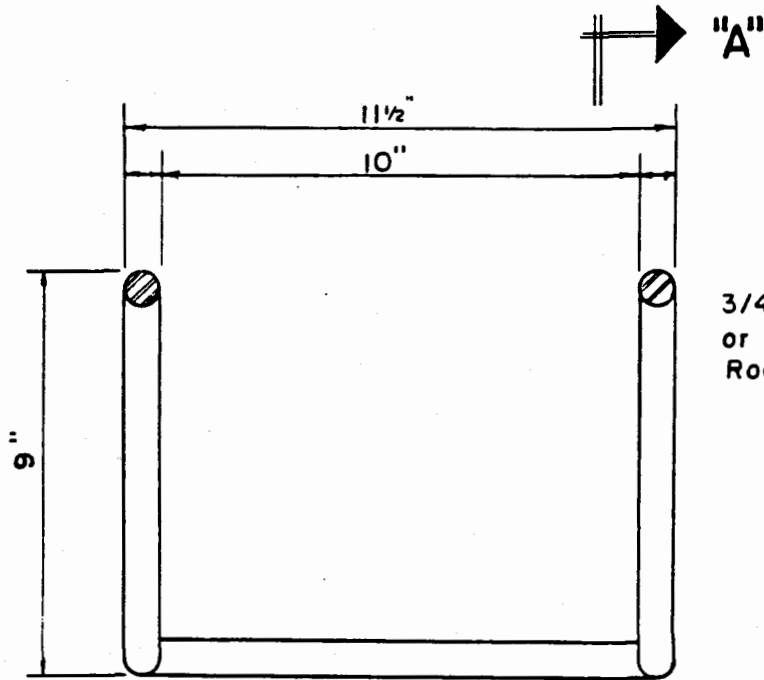
SEPTEMBER 1984



\* Types 302, 304, or 316

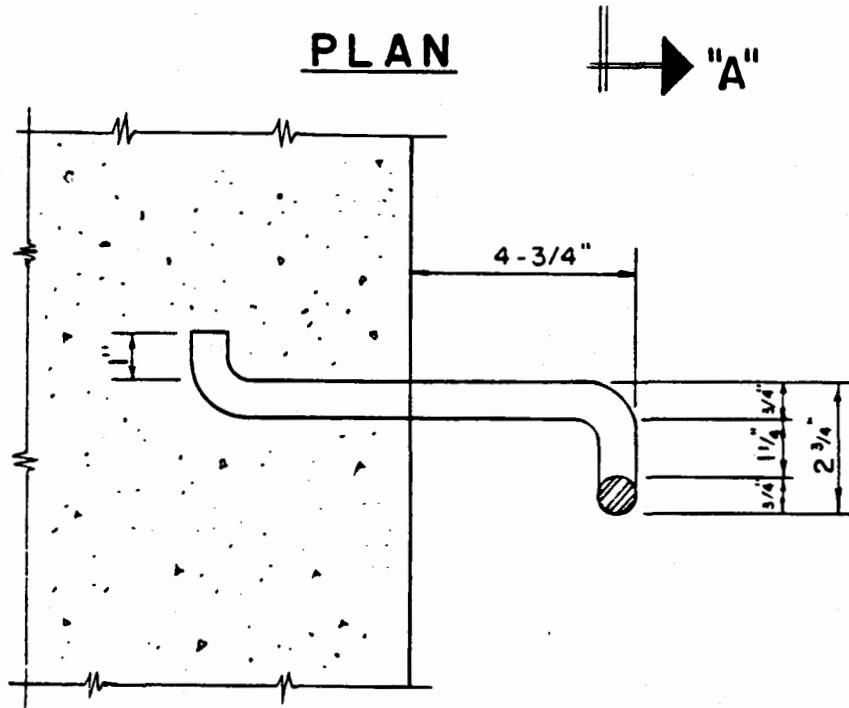


Scale: 3" = 1'-0"



3/4" Dia. Type 302, 304  
or 316 Stainless Steel.  
Rod Shaped As Shown

PLAN



SECTION "AA"

TYPE SC MANHOLE RUNG DETAILS

(STAINLESS STEEL)

Scale: 3" = 1'-0"

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII

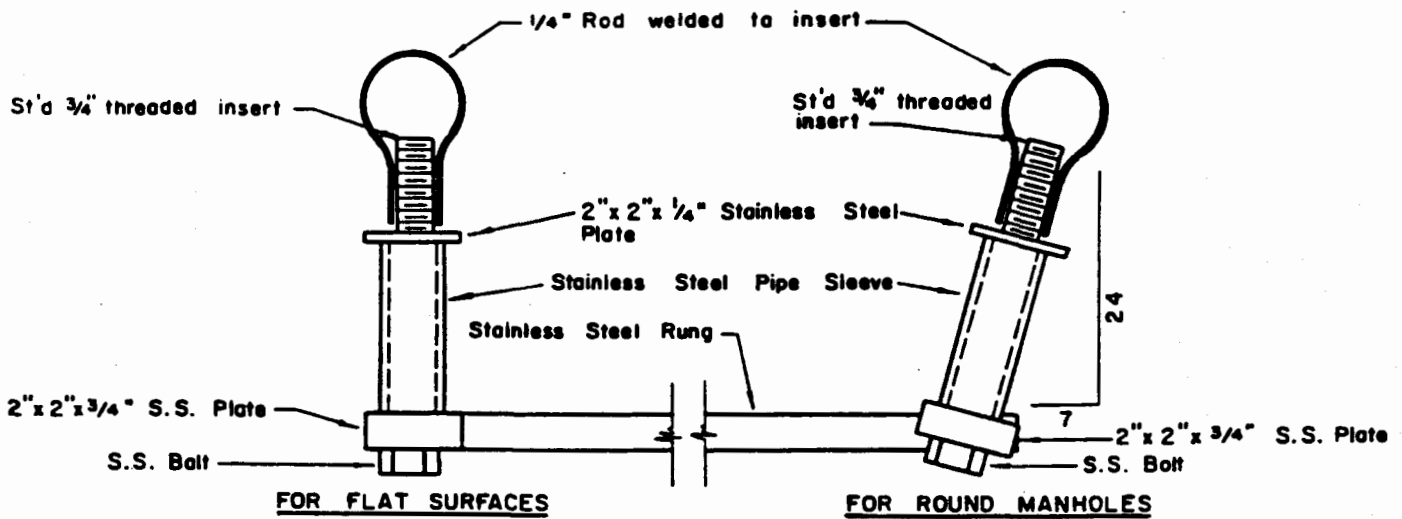
MANHOLE RUNG DETAILS - TYPE SC

STANDARD  
DETAILS

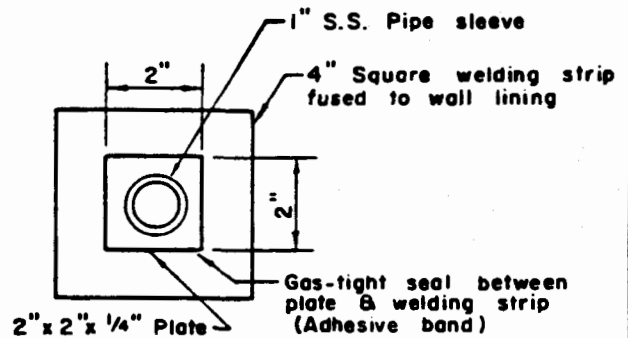
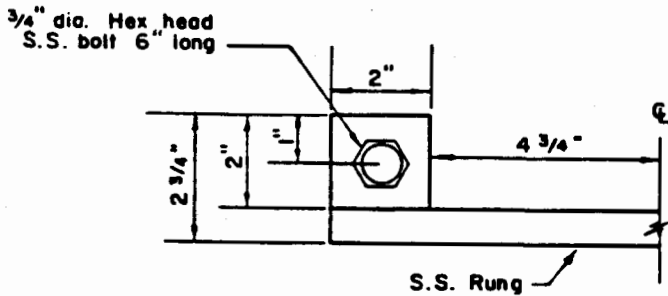
S-43

SCALE: 3" = 1'-0"

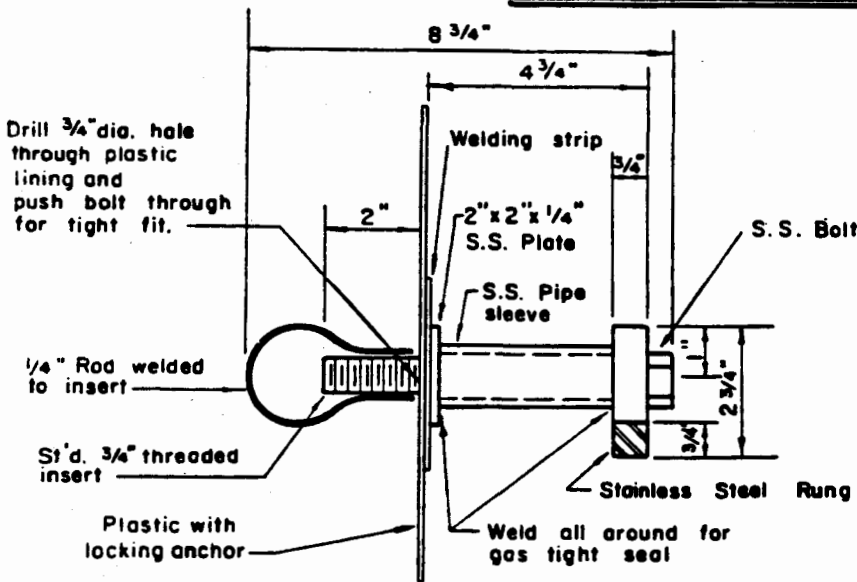
SEPTEMBER 1984



**PLAN**



**FRONT ELEVATION**



**NOTES:**

1. All items exclusive of insert to be stainless steel Type 316, 304 or equal.
2. Welding of plate & bar to fabricate rung shall result in joints with equal strength & corrosion resistance as the S.S. materials being welded.
3. Grind all sharp edges.

**SIDE ELEVATION**

**TYPE SD MANHOLE RUNG DETAILS**

S-44

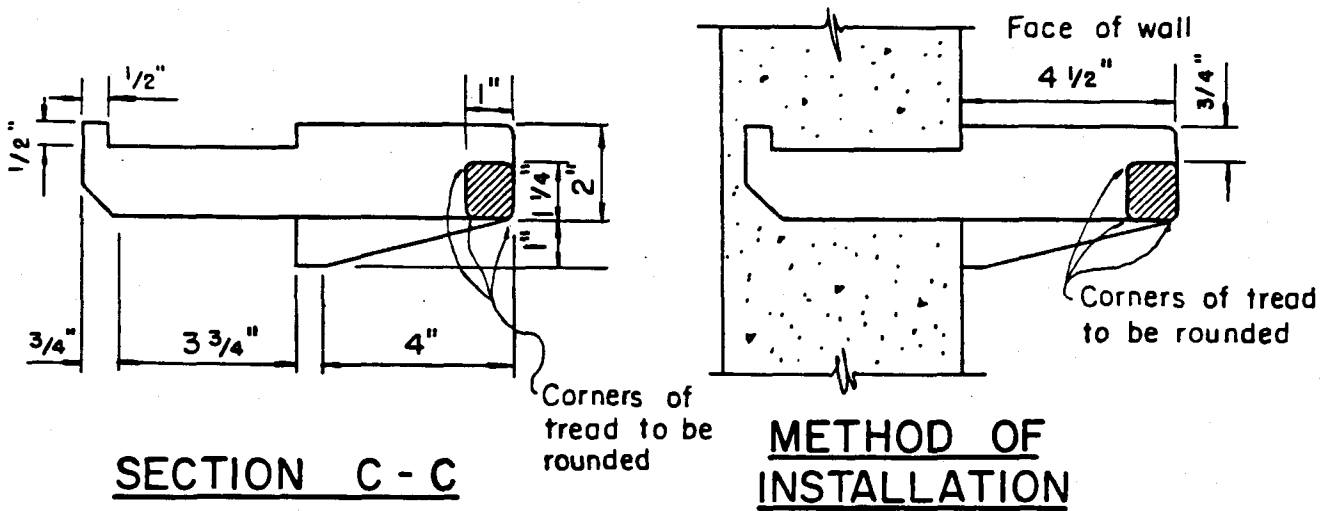
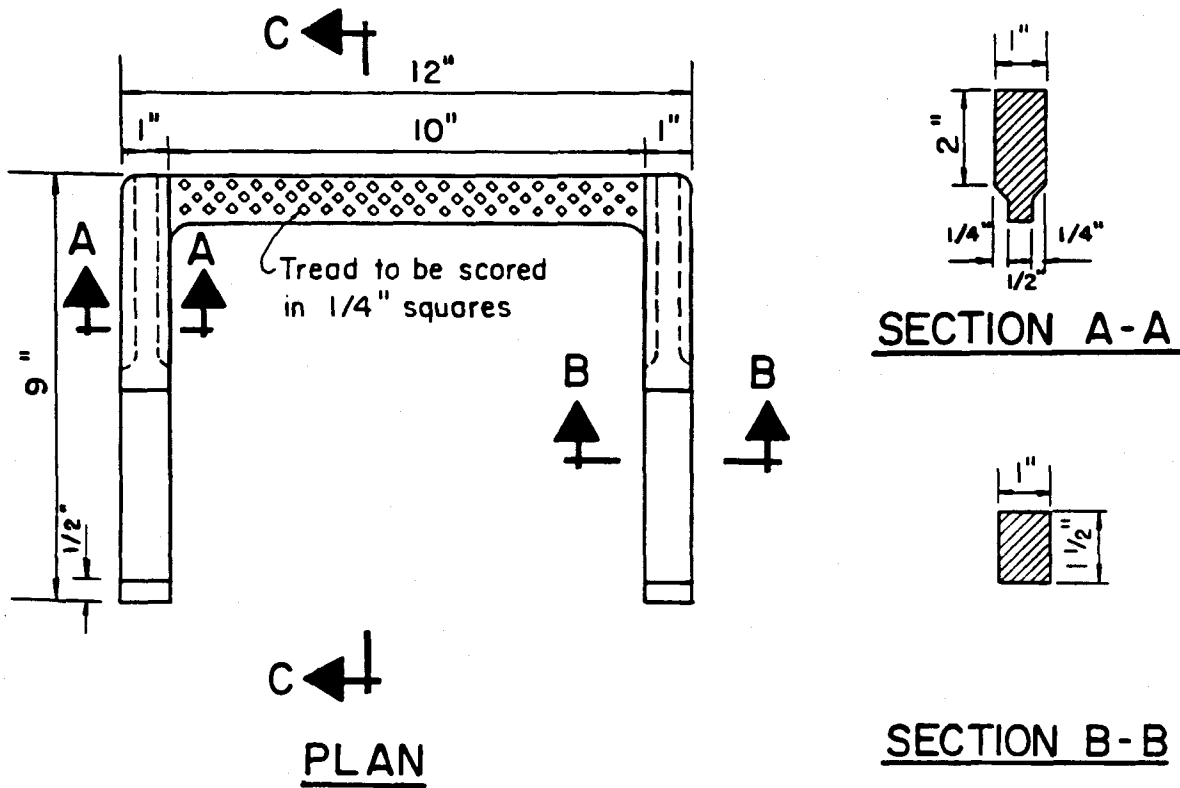
STANDARD  
DETAILS

MANHOLE RUNG DETAILS - TYPE SD

SEPTEMBER 1984

SCALE: 3" = 1'-0"

COUNTY OF KAUAI  
CITY & COUNTY OF HONOLULU  
COUNTY OF MAUI  
COUNTY OF HAWAII



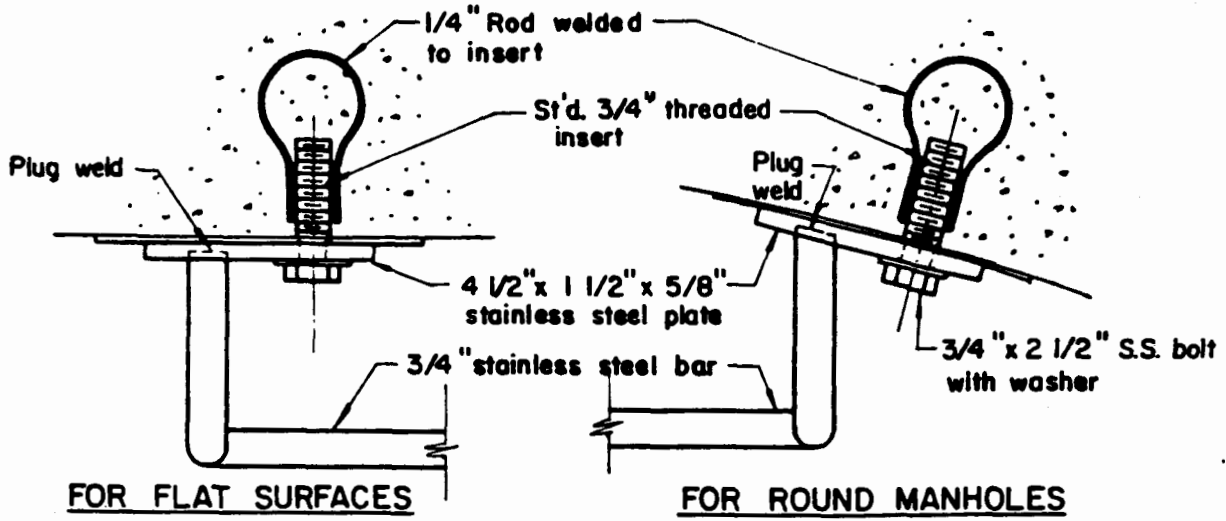
**TYPE SE MANHOLE RUNGS**  
**CAST IRON OR DUCTILE IRON**

Scale: 3" = 1'-0"

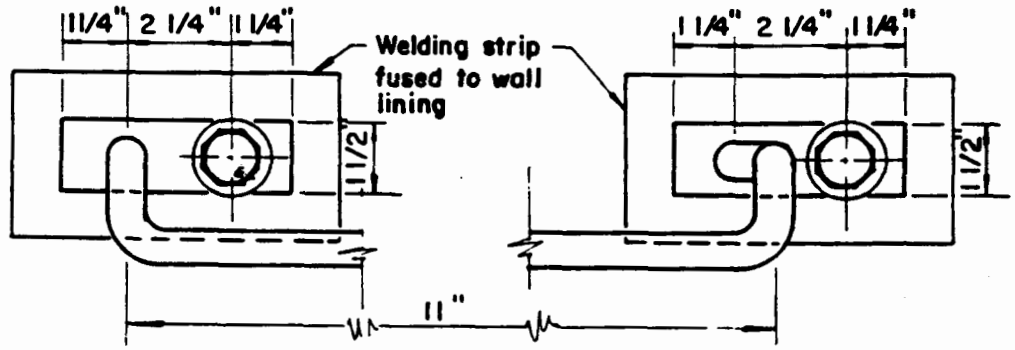
COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII	MANHOLE RUNG DETAILS - TYPE SE  SCALE: 3" = 1'-0"	STANDARD DETAILS	S-45
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SEPTEMBER 1984

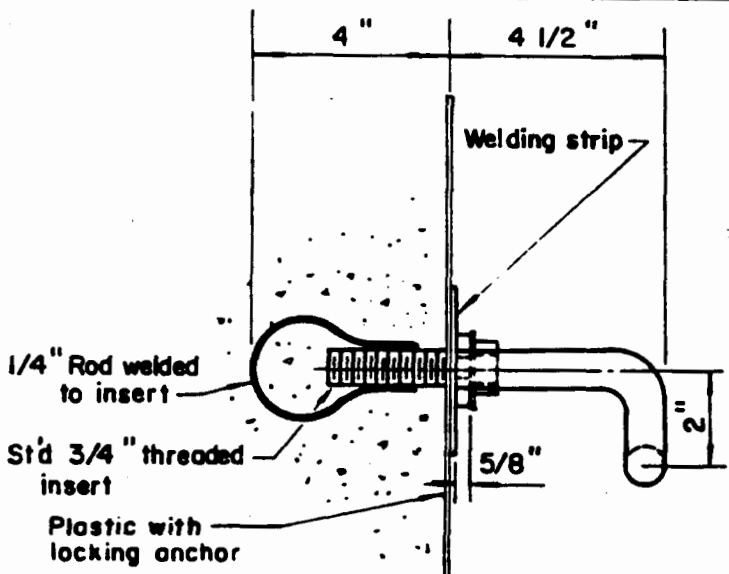




**PLAN**



**FRONT ELEVATION**



**SIDE ELEVATION**

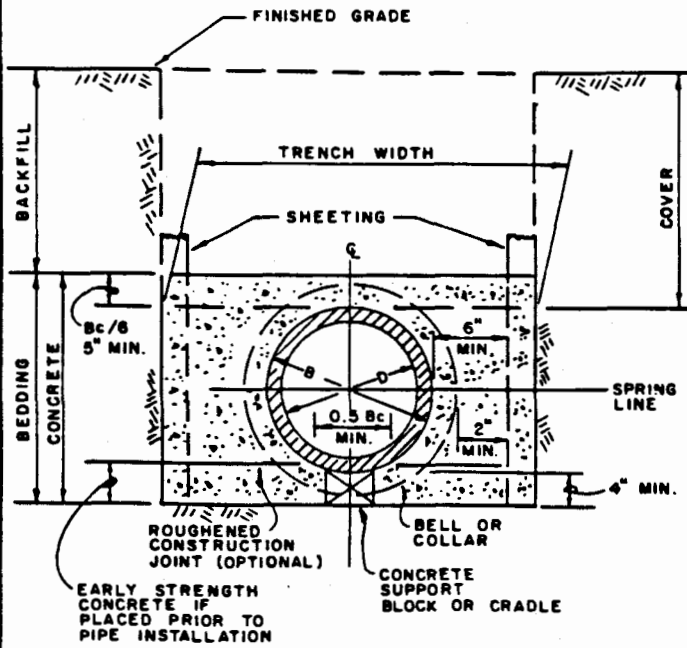
**NOTES:**

1. All items exclusive of insert to be stainless steel Type 316, 304 or equal.
2. Welding of plate and bar to fabricate rung shall result in joints with equal strength and corrosion resistance as the S.S. materials being welded.

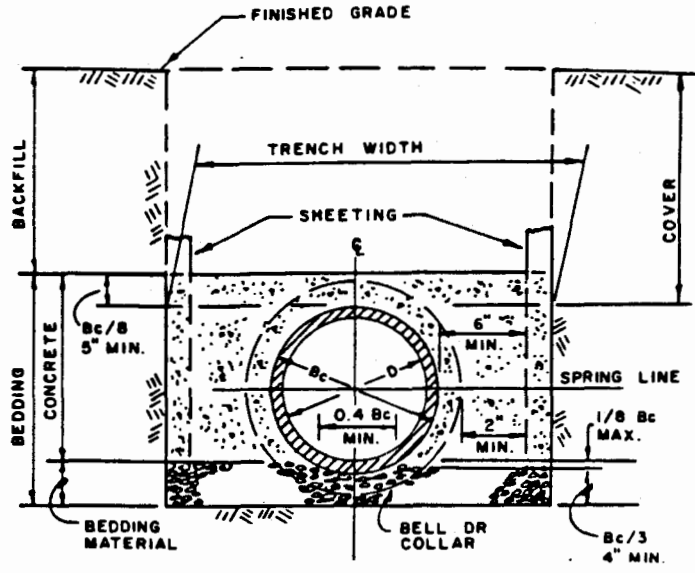
**TYPE SF MANHOLE RUNG DETAILS**

Scale: 3" = 1'-0"

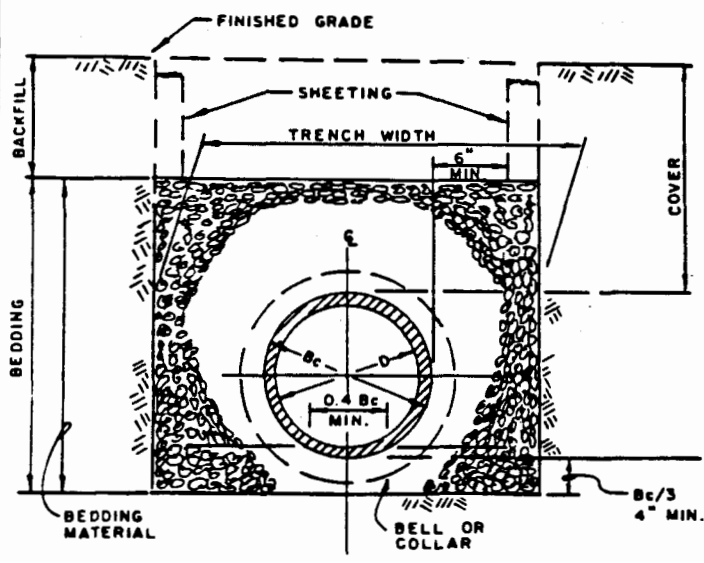
S-46	STANDARD DETAILS	MANHOLE RUNG DETAILS - TYPE SF SEPTEMBER 1984	COUNTY OF KAUAI CITY & COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII SCALE: 3" = 1'-0"
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**CLASS A BEDDING**  
NOT TO SCALE



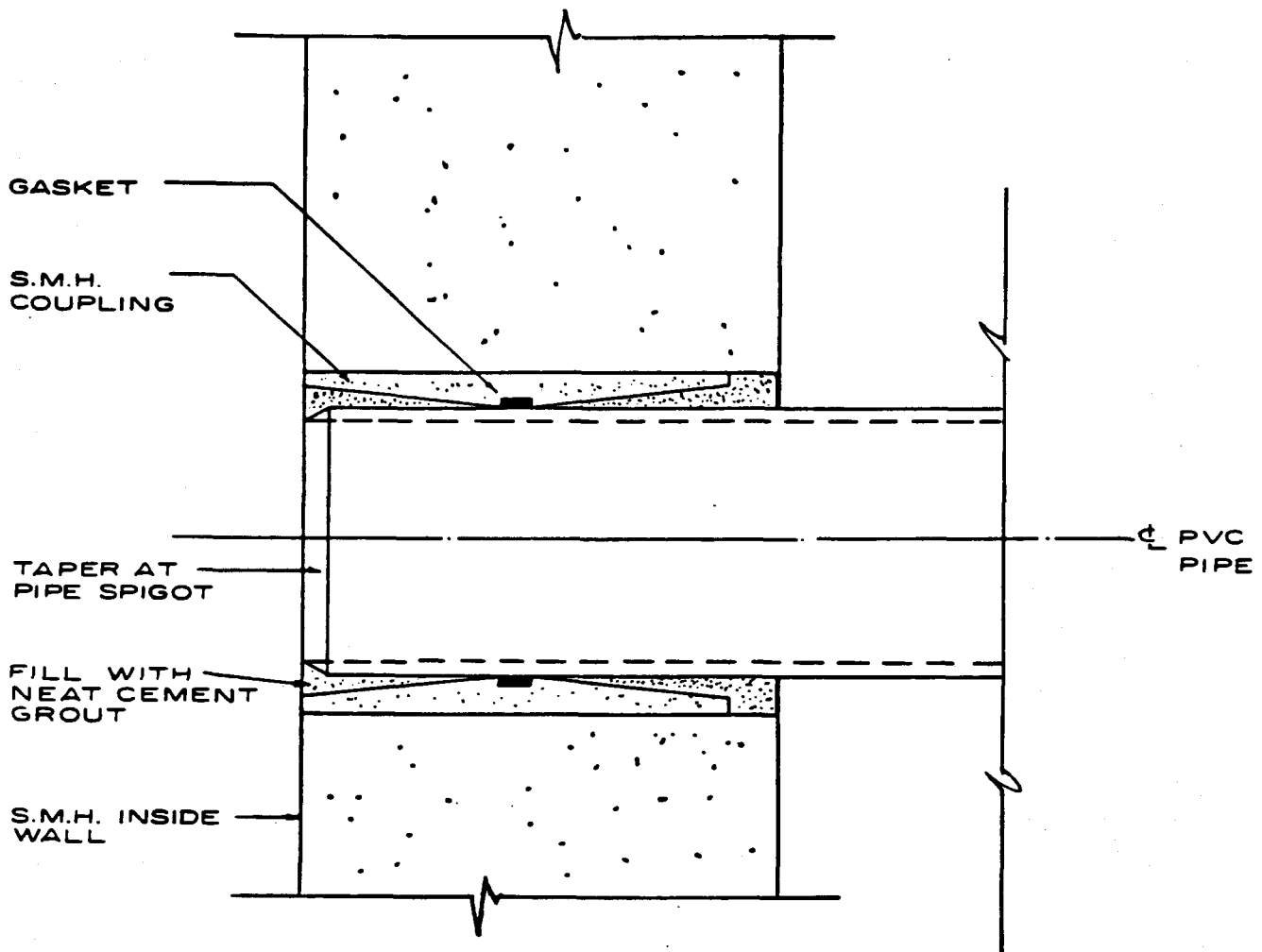
**CLASS C BEDDING**  
NOT TO SCALE



**CLASS B BEDDING**  
NOT TO SCALE

**BEDDING REQUIREMENTS**  
(6" to 12" I.D. PIPES)

<u>DEPTH OF COVER, C</u> <u>IN FEET</u>	<u>BEDDING CLASS</u>
$C \leq 4$	A
$4 < C \leq 17$	B
$17 < C \leq 30$	C
$C > 30$	Special Design



**SECTION THRU**  
**MANHOLE WALL**

<p><b>S-48</b></p>	<p><b>STANDARD DETAILS</b></p>	<p align="center"><b>PVC PIPE - RESILIENT MANHOLE CONNECTION</b></p> <p align="center">SEPTEMBER 1984 <span style="float: right;">NOT TO SCALE</span></p>	<p align="center"><b>COUNTY OF KAUAI CITY &amp; COUNTY OF HONOLULU COUNTY OF MAUI COUNTY OF HAWAII</b></p>
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