

Revised: 12-6-68

THIS SHEET IS NOT PART OF CONTRACT PLANS

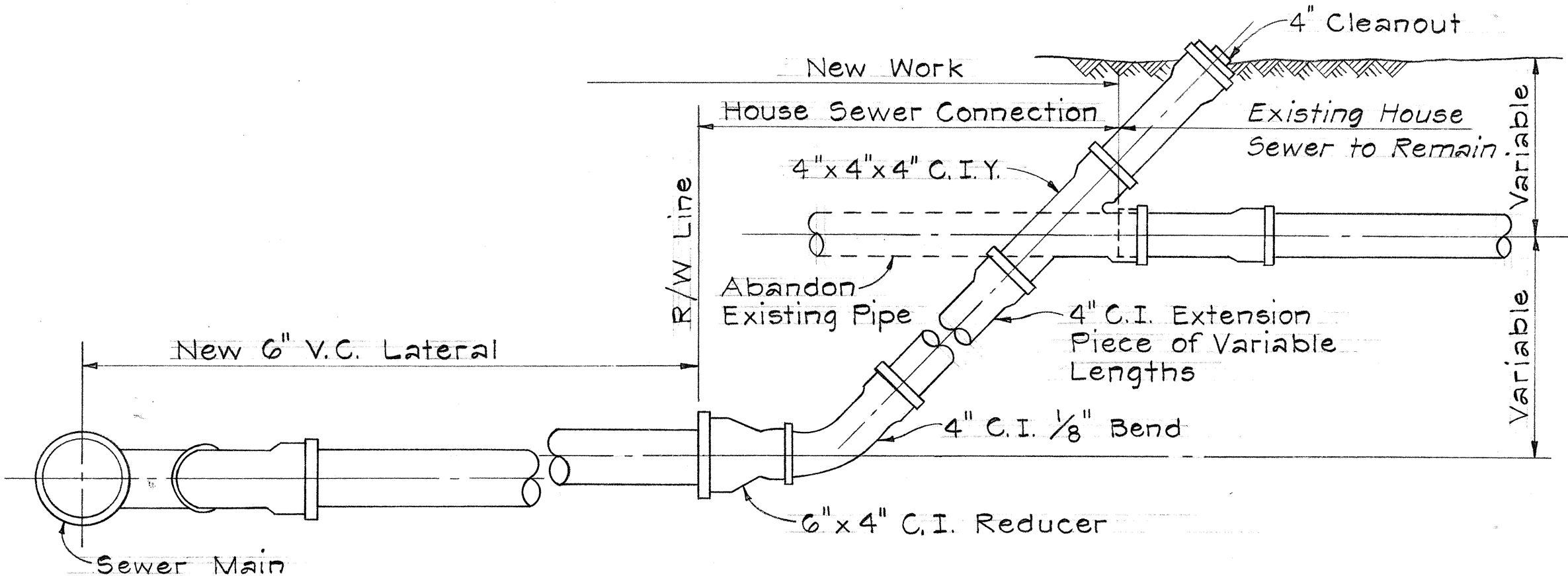
ORIGINAL PLAN	SURVEY PLOTTED BY _____	DATE _____
	DRAWN BY _____	_____
NOTE BOOK	TRACED BY _____	_____
	DESIGNED BY _____	_____
	QUANTITIES BY _____	_____
No. _____	CHECKED BY _____	_____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(3)21, Unit 3	1968	16	47

Revised: 12-6-68

WATER - GENERAL NOTES

- The Contractor shall notify the Board of Water Supply in writing one week prior to commencing work on the water system.
- The Contractor shall arrange with the Board of Water Supply to cut off existing unused service laterals and remove meter boxes and appurtenances prior to commencement of clearing and grading operations. Contractor to provide all necessary excavation.
- Items indicated as "salvage" on the plans shall be removed, cleaned, and returned to B.W.S. Kalihi Store Yard by the Contractor.
- Items indicated as "relocate" on the plans shall be removed, cleaned, painted and reinstalled at the new location by the Contractor unless otherwise specified.
- All excavation and backfill shall be done by the Contractor, including excavation for the relocation and lowering of existing main and excavation for meter to consumer service pipe.
- Wherever a corporation stop shown tapping into a new main is larger than that allowed by the B.W.S. Standards, a double hub fitting with boss tapped for appropriate size corporation shall be used.
- The minimum clearance between fire hydrants and utility poles or light standards shall be 3.0 feet.
- The locations of existing water main and appurtenances shown on the plans are approximate only. Any adjustment to the water mains and appurtenances whether shown on the construction plans or not shall be made and paid for by the project.
- The Contractor shall plug the ends of abandoned water mains with class "C-1" concrete. Payment for class "C-1" concrete used as plugs shall be considered incidental to the various contract items for the water system.
- Prior to final inspection, all fire hydrants shall be cleaned of all oil, grease, dirt or other loose material and given one coat of an approved red lead and one coat of an approved aluminum hydrant paint.



TYPICAL DETAIL OF HOUSE SEWER CONNECTION

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

SEWER, WATER, & GAS UTILITIES

- S — Existing Sewer Line to remain.
- S — New Sewer Line.
- W — Existing Water Line to remain.
- W — New Water Line.
- G — Existing Gas Line to remain.
- G — New Gas Line.
- / — Cut/ Plug or Plug Existing Utility Line
- X — Existing Abandoned Utility Line
- ⊙ S.M.H. Existing (Sewer, Water, Gas) Manhole
- ⊙ S.M.H. New (Sewer, Water, Gas) Manhole
- [] WM — Existing Water Meter
- [] WM — New Water Meter
- ○ F.H. Existing Fire Hydrant
- ○ F.H. New Fire Hydrant
- // A.P. — Cut and Abandon in Place Existing Utility Line
- // Remove — Existing Utility Line to be removed

GAS - GENERAL NOTES

- On this project the relocation of the gas system will be done by the utility company's forces or its Contractor. The State's Contractor and the utility company shall mutually coordinate the work to minimize conflicts and delays to either party.
- The existing gas lines shown on the plans are approximate only. The State Contractor shall use precaution when working in the vicinity of the gas lines.
- Cutting, plugging and reconnecting of live gas lines will be done by the Honolulu Gas Company, Ltd.
- There shall be at least 6" Clearance between any gas line and any underground structure not used in conjunction with the gas line. If this clearance cannot be attained, the gas line shall be protected with a Honolulu Gas Co., Ltd., approved insulating material.

SEWER - GENERAL NOTES

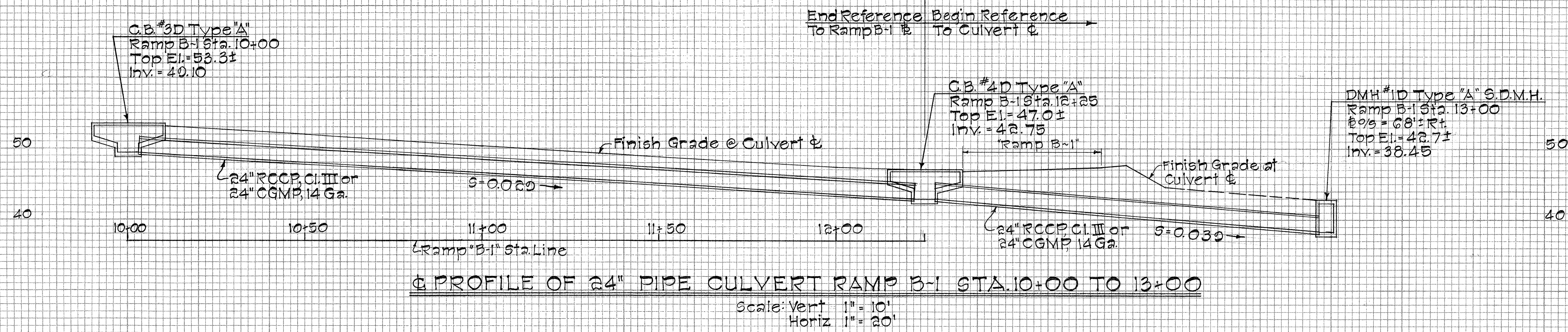
- The Contractor shall notify the Division of Sewers in writing 2 working day prior to commencing work on the sewer system.
- Existing Sewer Lines shown on the plans are approximate only. The Contractor shall verify their actual locations and shall make adjustments to any new, or existing sewer facility as directed by the Engineer.
- If existing laterals other than those shown on the plans are exposed during construction, they shall be cut and plugged or extended and reconnected as directed by the Engineer.
- All services from existing sewer mains which are to be abandoned or removed shall be connected to new sewer mains if services are required.
- Location of laterals and wyes on new sewer lines shall be as designated by the Engineer.
- Concrete jackets shall be constructed a minimum of 2 1/2 ft. beyond the edges of footings, piers box culverts, etc., or as directed by the Engineer.
- Payment for all work not listed in the Proposal Schedule, but noted on the plans shall be considered as incidental to the various items of work.

APPROVED:		
<i>[Signature]</i>		8/9/68
CHIEF, ENGINEERING DIVISION B.W.S.		DATE
HONOLULU GAS CO., LTD.		DATE
<i>[Signature]</i>		8/22/68
DIVISION OF SEWERS		DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
UTILITY DETAIL	
INTERSTATE ROUTE H-1	
Pele Street to Victoria Street	
F.A.I. Proj. No. I-HI-1(3)21, Unit 3	
Scale: As Shown	Date: Aug. 1968
SHEET NO. 1 OF 15 SHEETS	

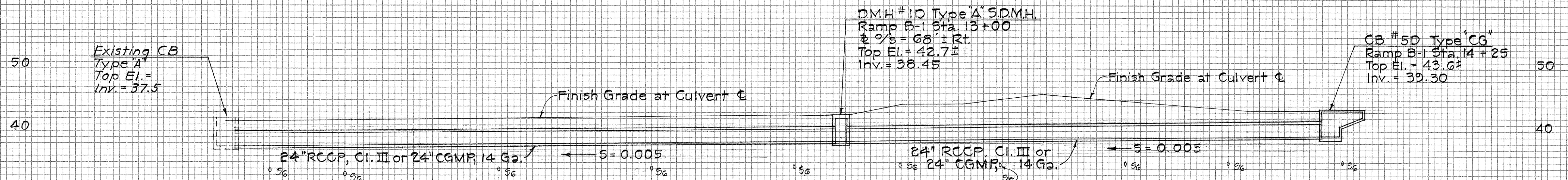
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31):21, Unit 3	1968	18	47

Revised: 12-6-68



PROFILE OF 24" PIPE CULVERT RAMP B-1 STA. 10+00 TO 13+00

Scale: Vert. 1" = 10'
Horiz. 1" = 20'

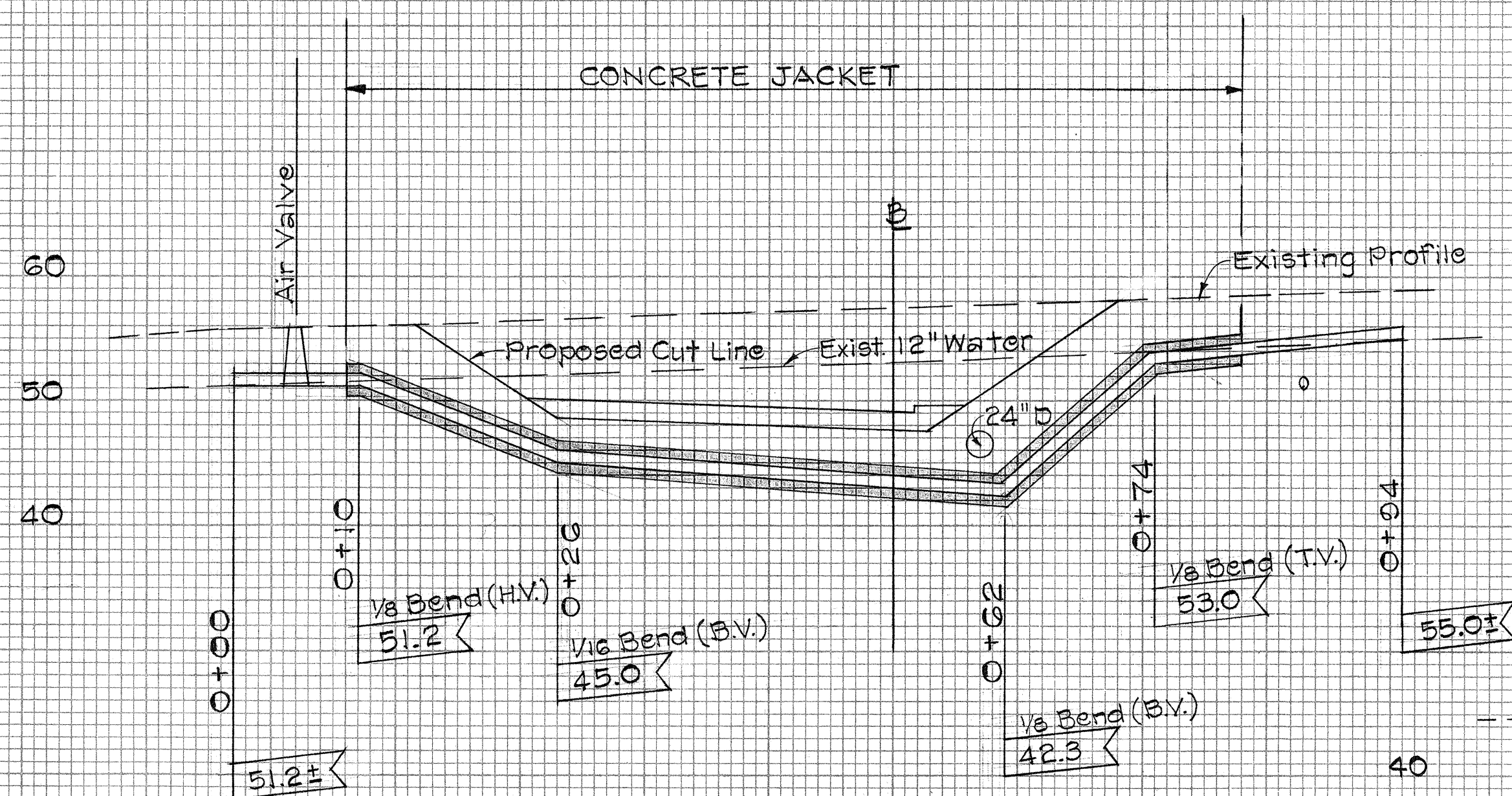


PROFILE OF 24" CULVERT ALONG KINAU ST.

Scale: Vert. 1" = 10'
Horiz. 1" = 20'

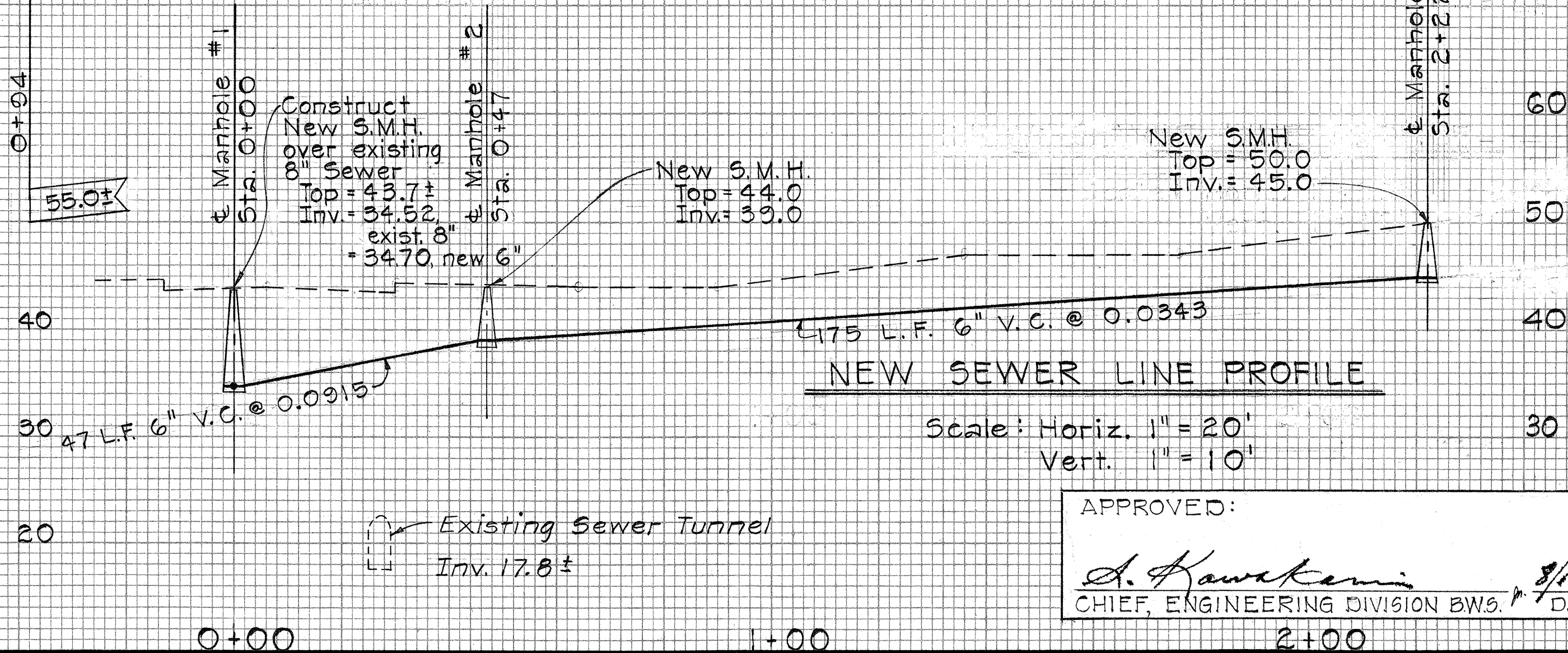
APPROVED:

W. J. [Signature] 8/22/68
DIVISION OF SEWERS DATE



PROFILE OF 12" WATER MAIN

Scale: Horiz. 1" = 10'
Vert. 1" = 10'



NEW SEWER LINE PROFILE

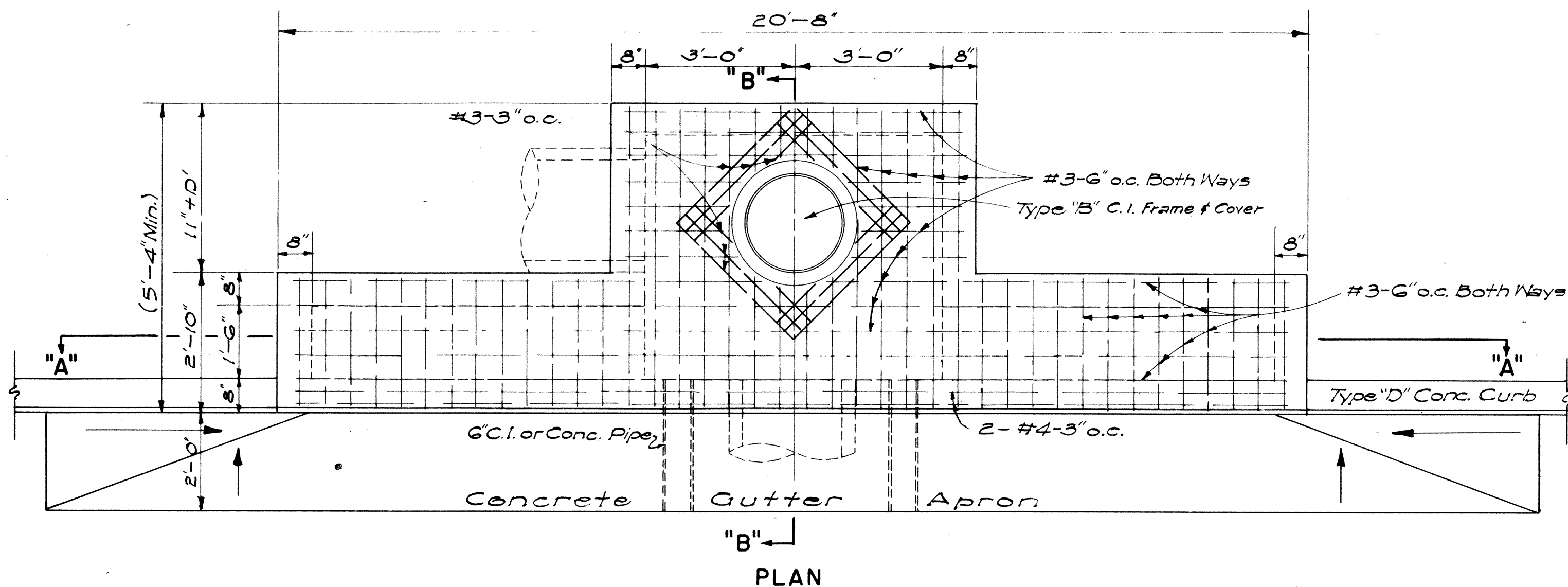
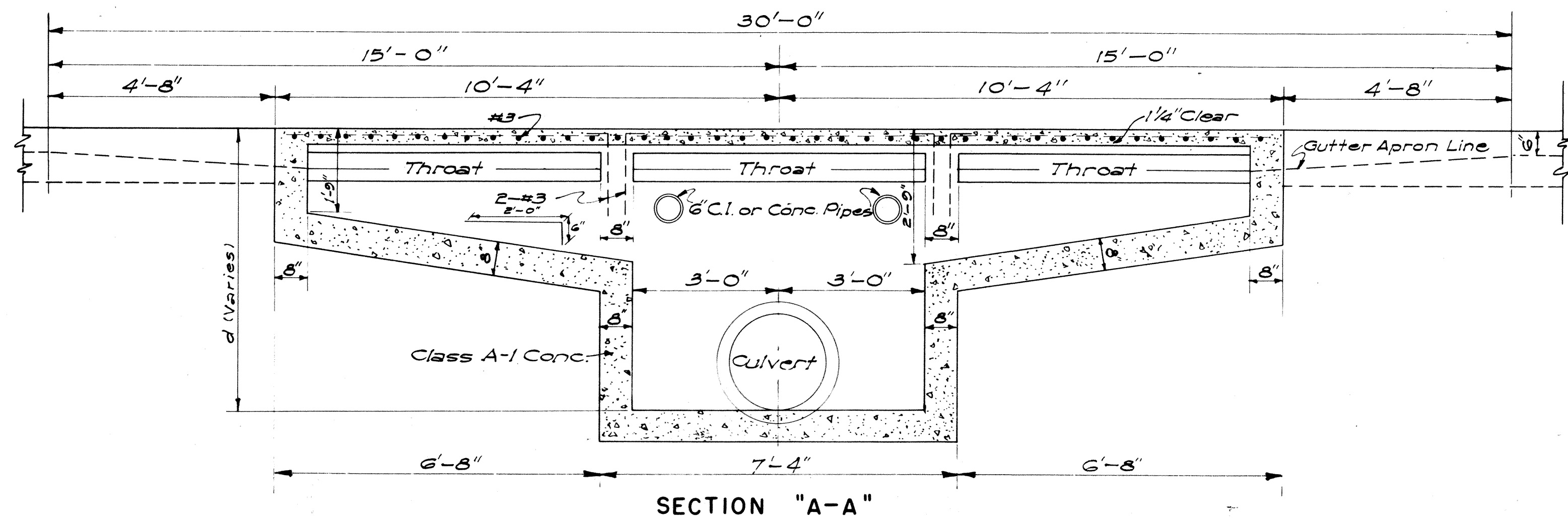
Scale: Horiz. 1" = 20'
Vert. 1" = 10'

APPROVED:

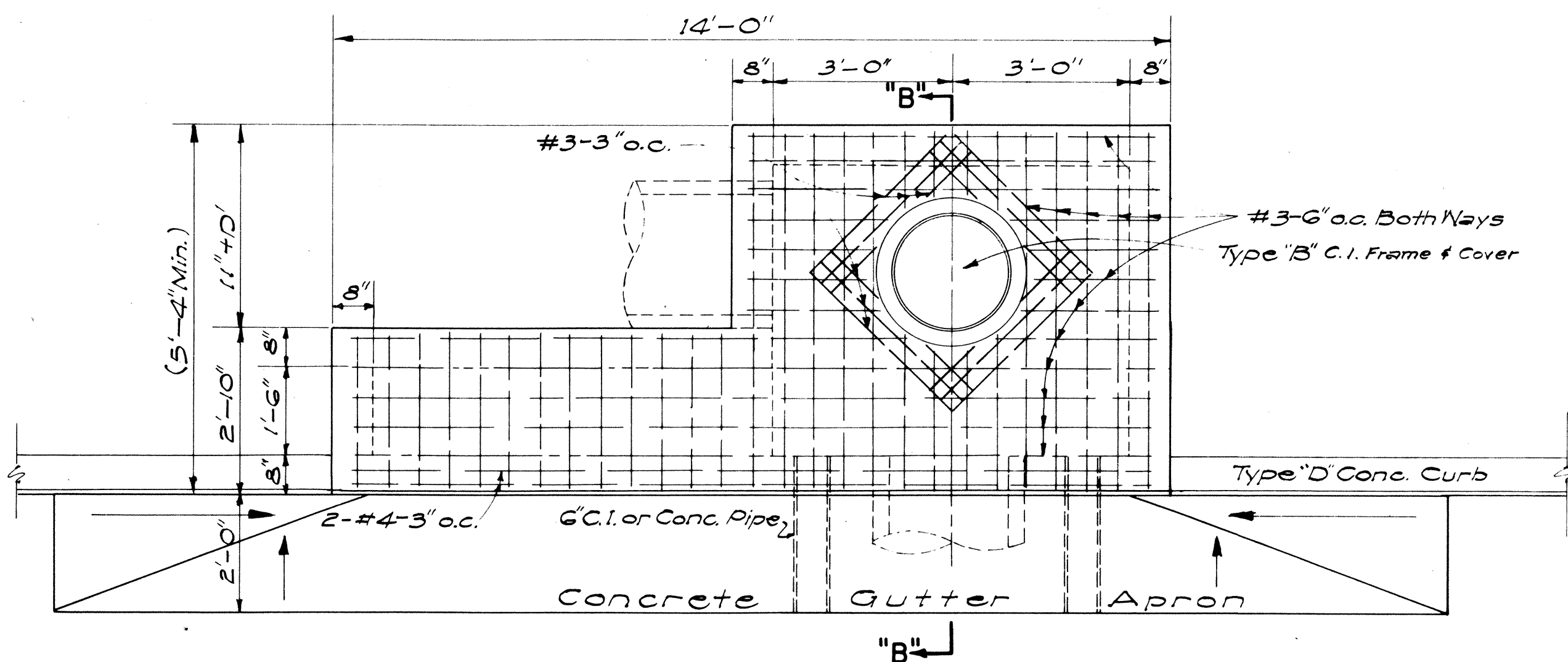
A. Kawakami 8/18/68
CHIEF, ENGINEERING DIVISION DWS. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**DRAINAGE AND WATER
PROFILE - RAMP B-1**
INTERSTATE ROUTE H-1
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31):21 Unit 3
Scale: As Shown Date: Aug. 1968
SHEET No. 3 OF 15 SHEETS

2/17/50

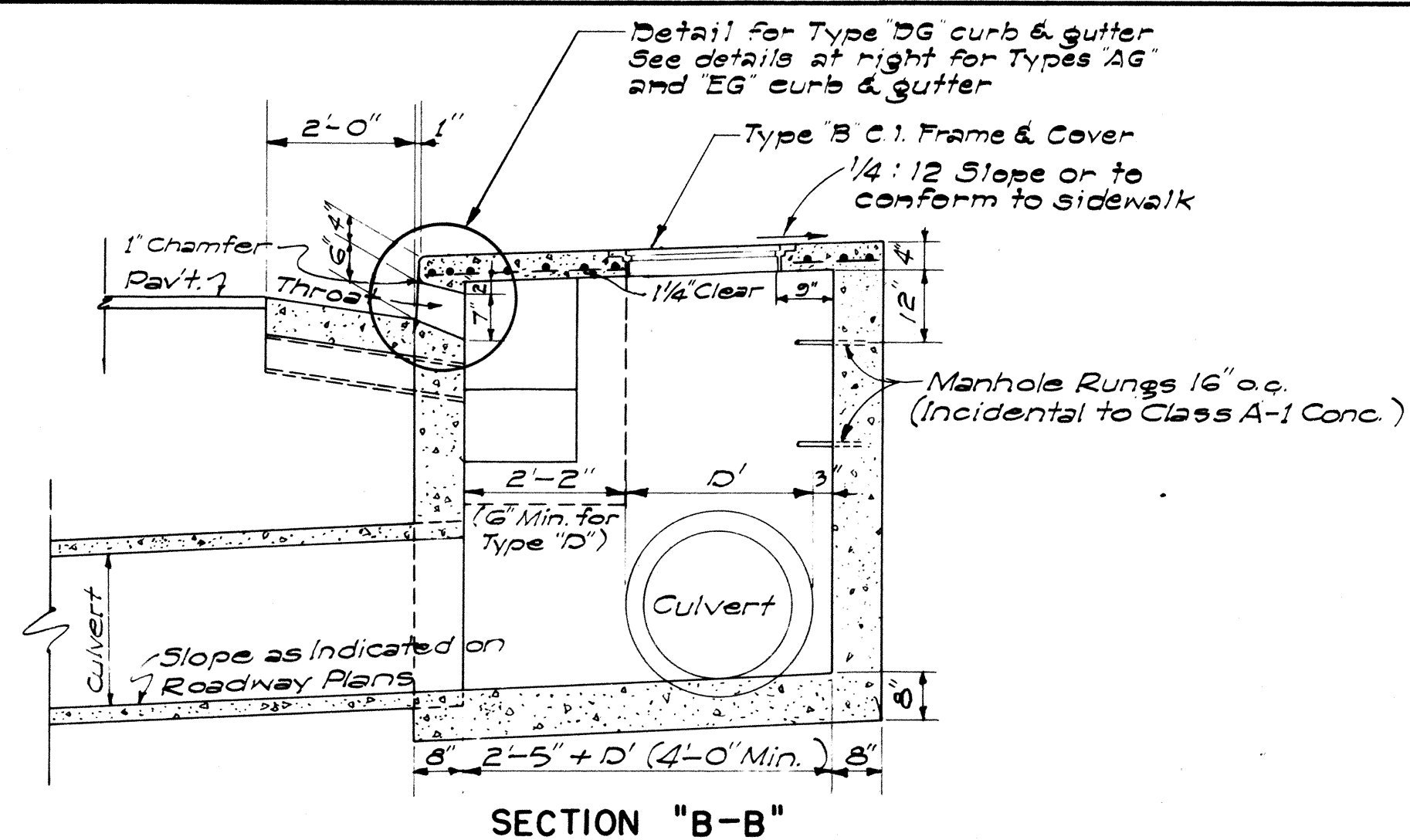


DETAIL OF TYPE "A" CATCH BASIN
SCALE: 1/2" = 1'-0"

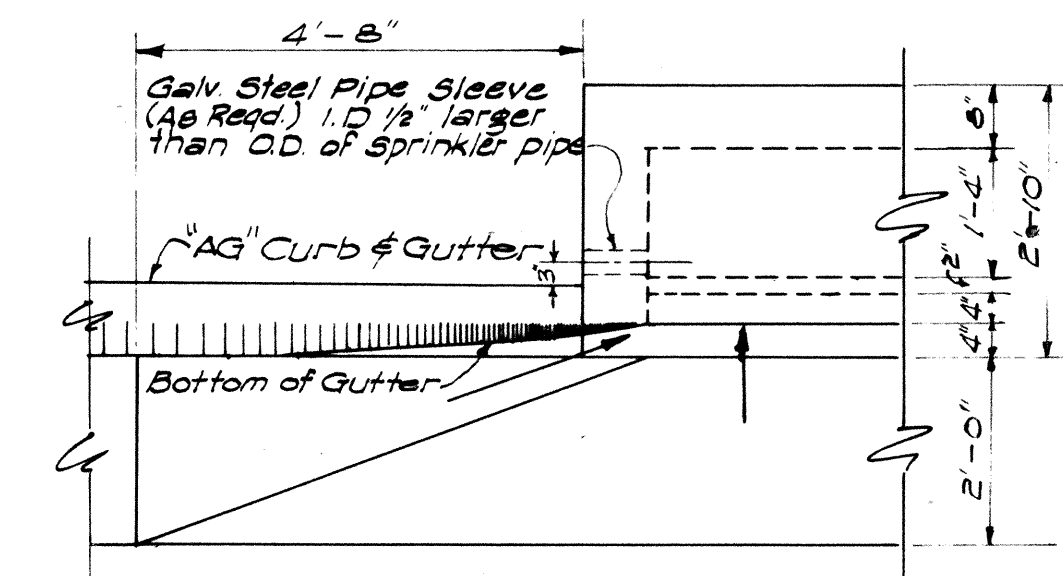


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SCALE: 1/2" = 1'-0"

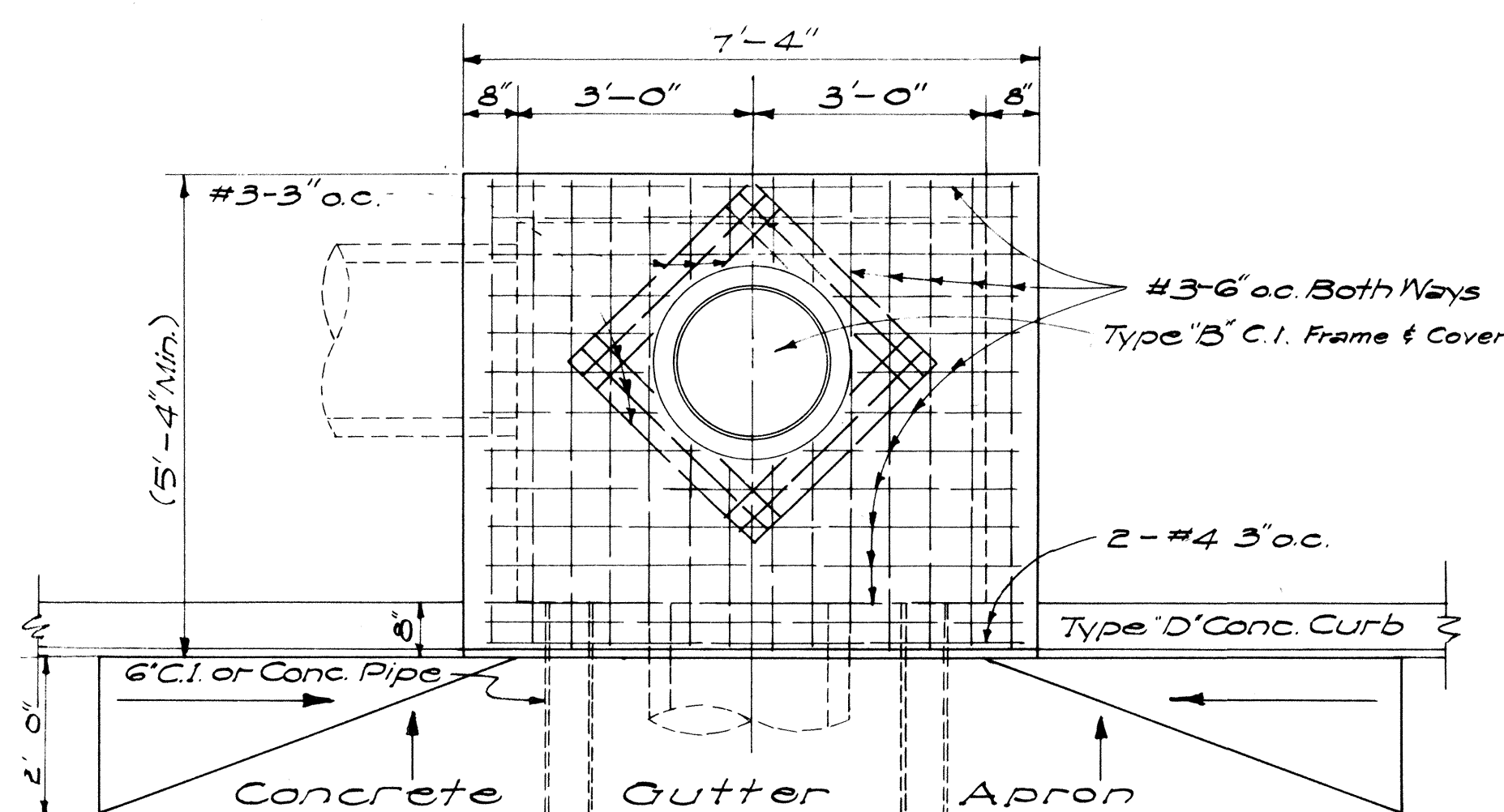
NOTE: TYPE "C" C.B. SIMILAR BUT OPPOSITE HAND



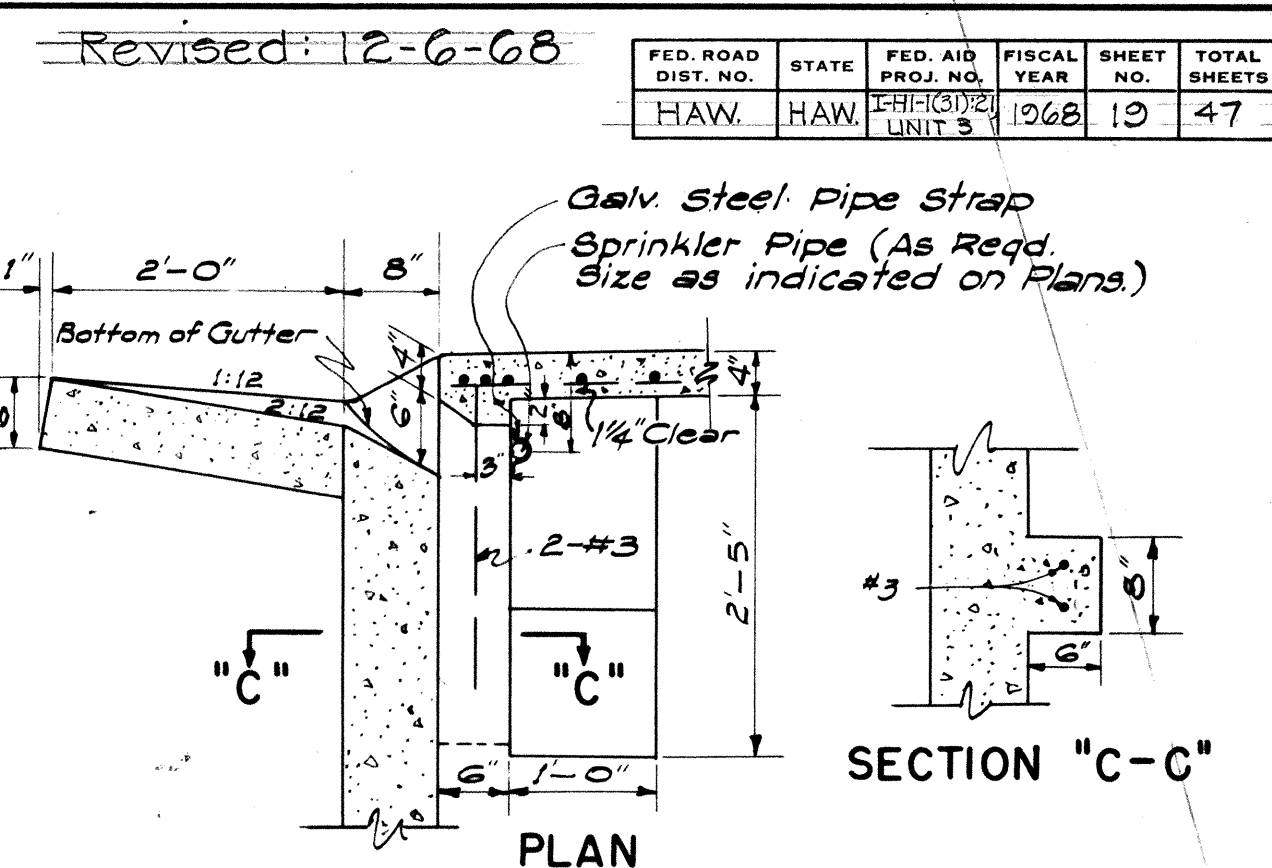
DETAIL OF CATCH BASIN
WITH TYPE "EG" CURB & GUTTER



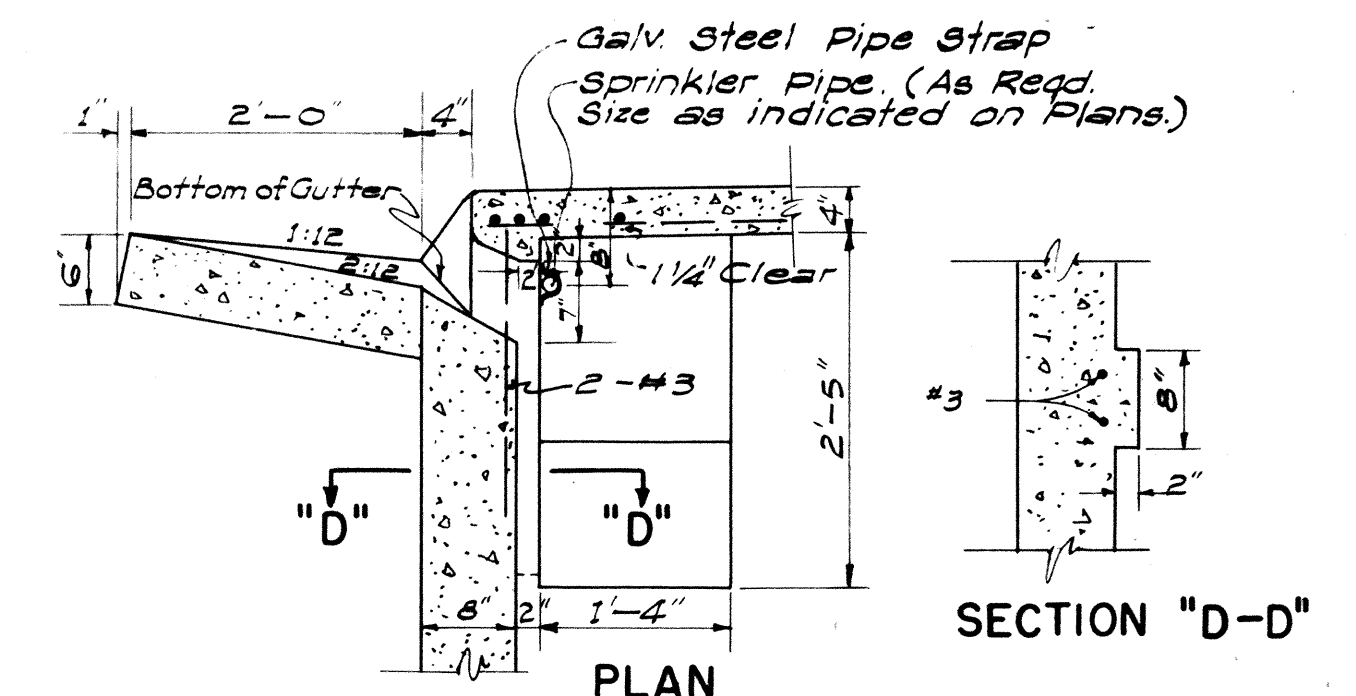
DETAIL OF CATCH BASIN
WITH TYPE "AG" CURB & GUTTER
SCALE: 1/2" = 1'-0"



DETAIL OF TYPE "D" CATCH BASIN
SCALE: 1/2" = 1'-0"



THROAT DETAIL FOR
TYPE "EG" CURB & GUTTER
SCALE: 3/4" = 1'-0"



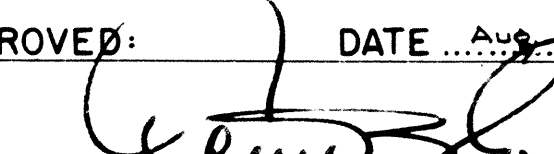
THROAT DETAIL FOR
TYPE "AG" CURB & GUTTER
SCALE: 3/4" = 1'-0"

ESTIMATED QUANTITIES

Type	Class A-1 Conc.	Struct. Exc.	Reinf. Steel	Gutter Length
"A"	7.5 c.y.	24.7 c.y.	145 lb.	30'-0"
"B"	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"C"	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"D"	4.9 c.y.	16.5 c.y.	77 lb.	16'-8"

NOTES:

- Quantities based on $d = 5.75'$ and $D = 30'$
- Quantities do not include concrete for Gutter Apron.
- The Contractor shall install two 6" Cast Iron or Concrete Pipes as incidental to Class A-1 Concrete for Construction Drainage.
- Culvert shall leave C.B. from any position and any direction indicated by plans or ordered by the Engineer. Culvert may both enter and leave C.B. so that C.B. will also act as Manhole.
- The Contractor shall install Galvanized Steel Pipe Sleeves and Straps as incidental to Sprinkler System.

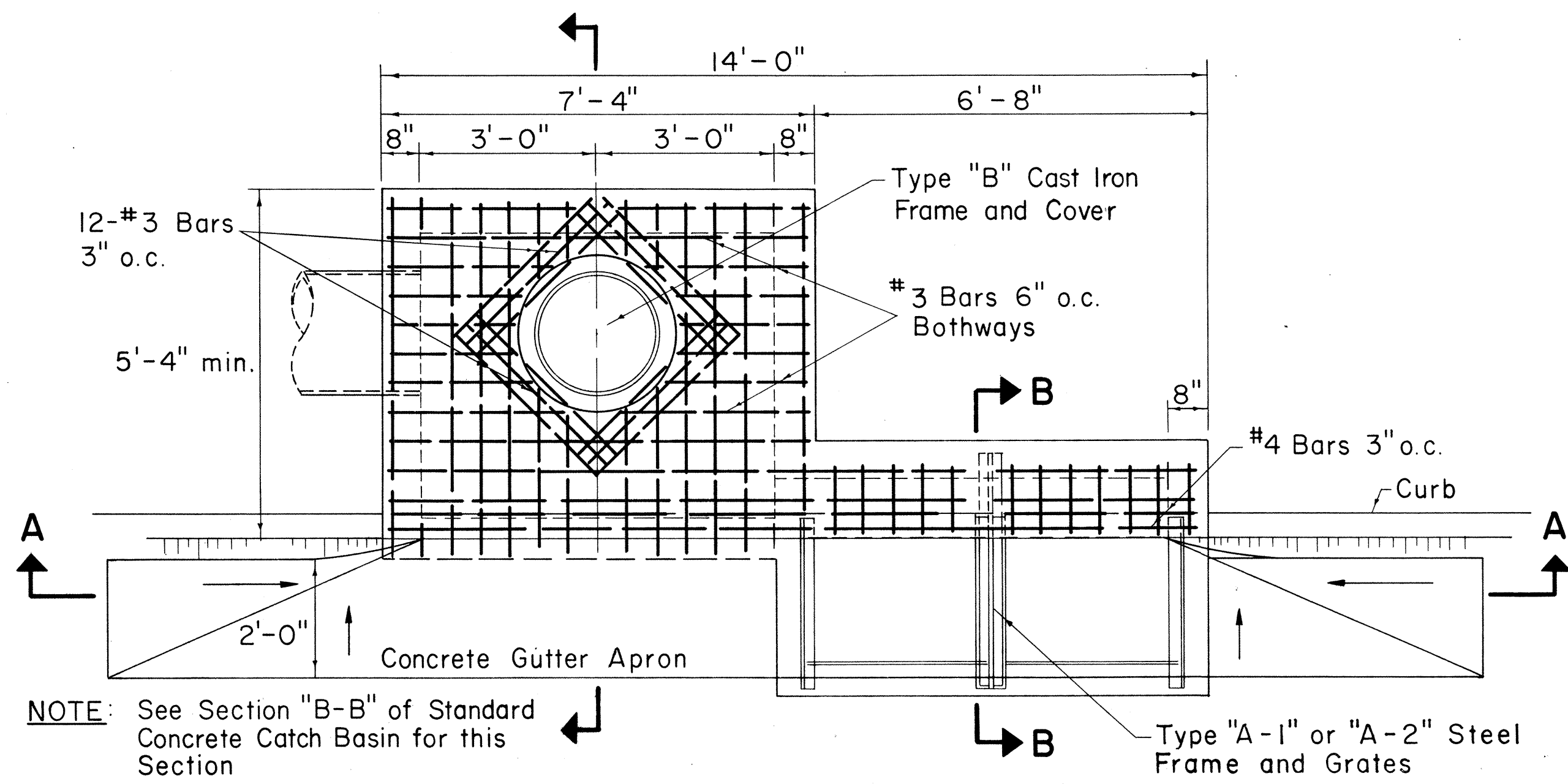
APPROVED:  DATE: Aug. 26, 1950
STATE HIGHWAY ENGINEER

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CATCH BASINS

SCALES AS NOTED
SHEET No. 4 OF 15 SHEETS

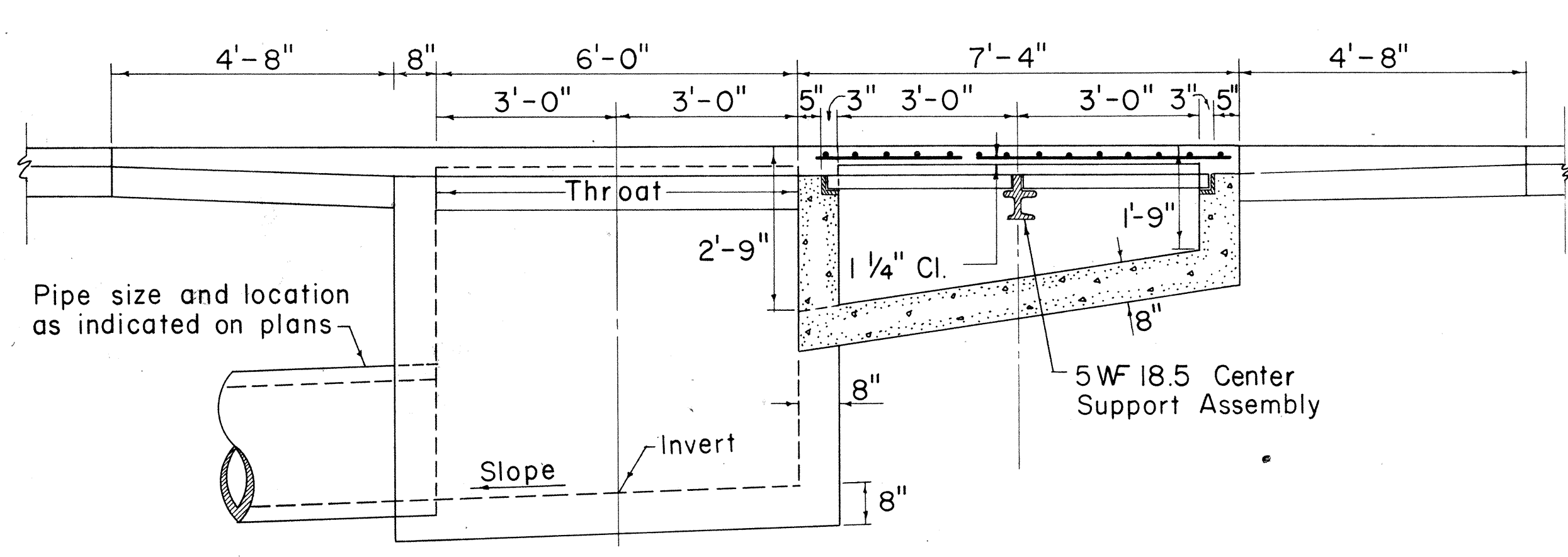
Revised: 12-6-68	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	HAWAII	HAWAII	HH(30)21, UNIT 5	1968	20	47

Revised: Jan. 25, 1967

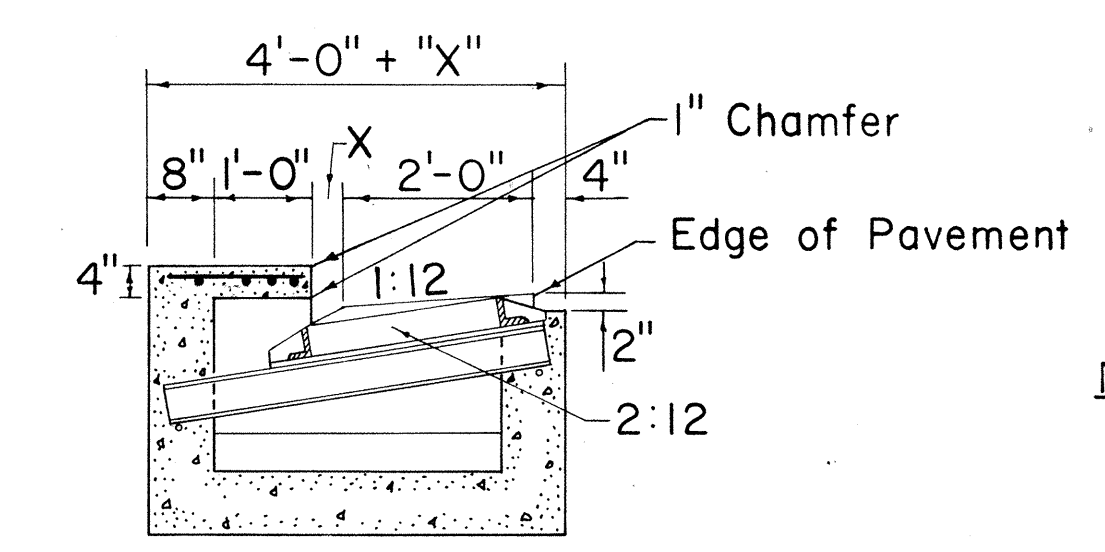


NOTE: See Section "B-B" of Standard Concrete Catch Basin for this Section

PLAN



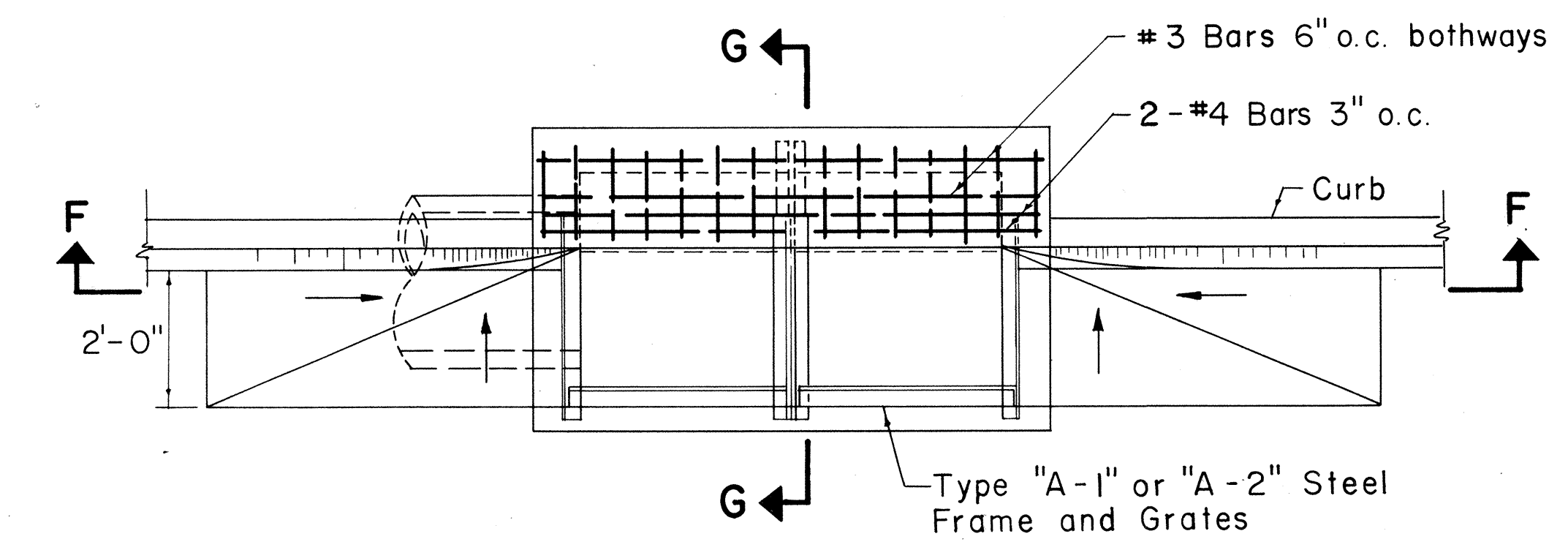
SECTION A-A



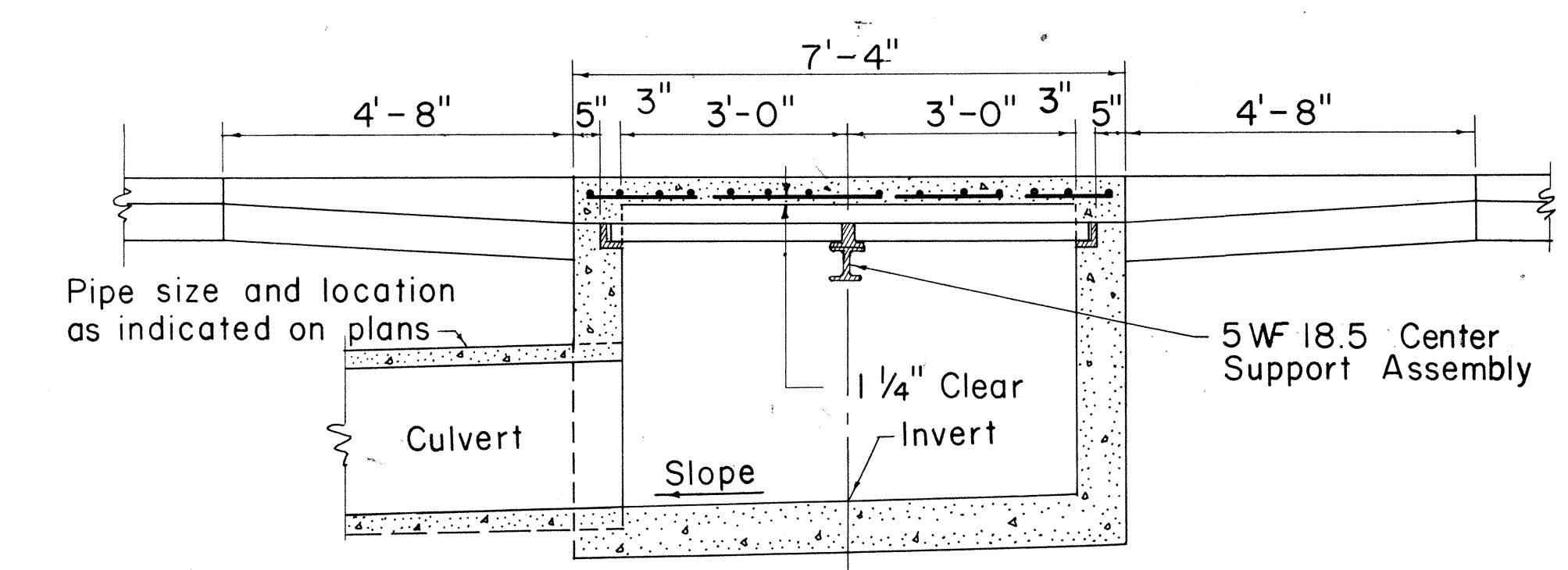
SECTION B-B

DETAIL OF TYPE "CG" CATCH BASIN

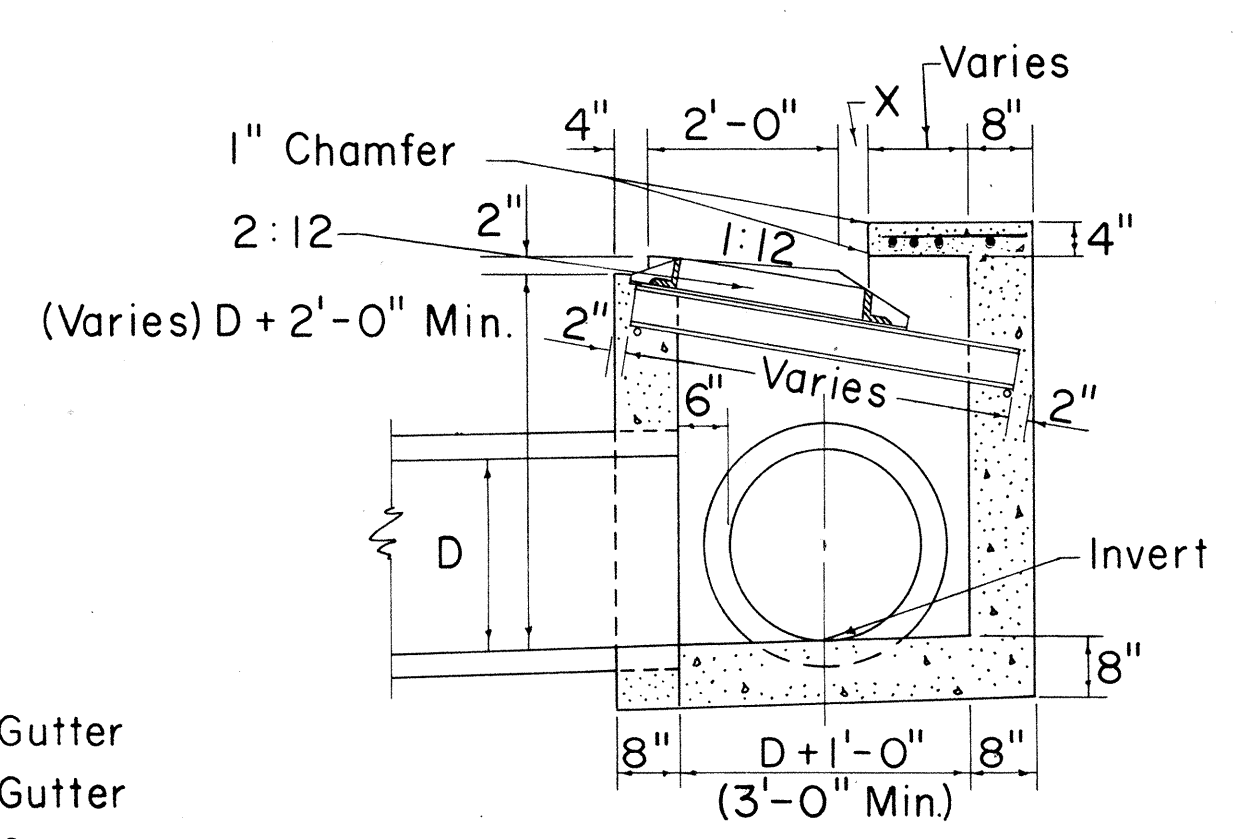
Scale: 1/2" = 1'-0"



PLAN



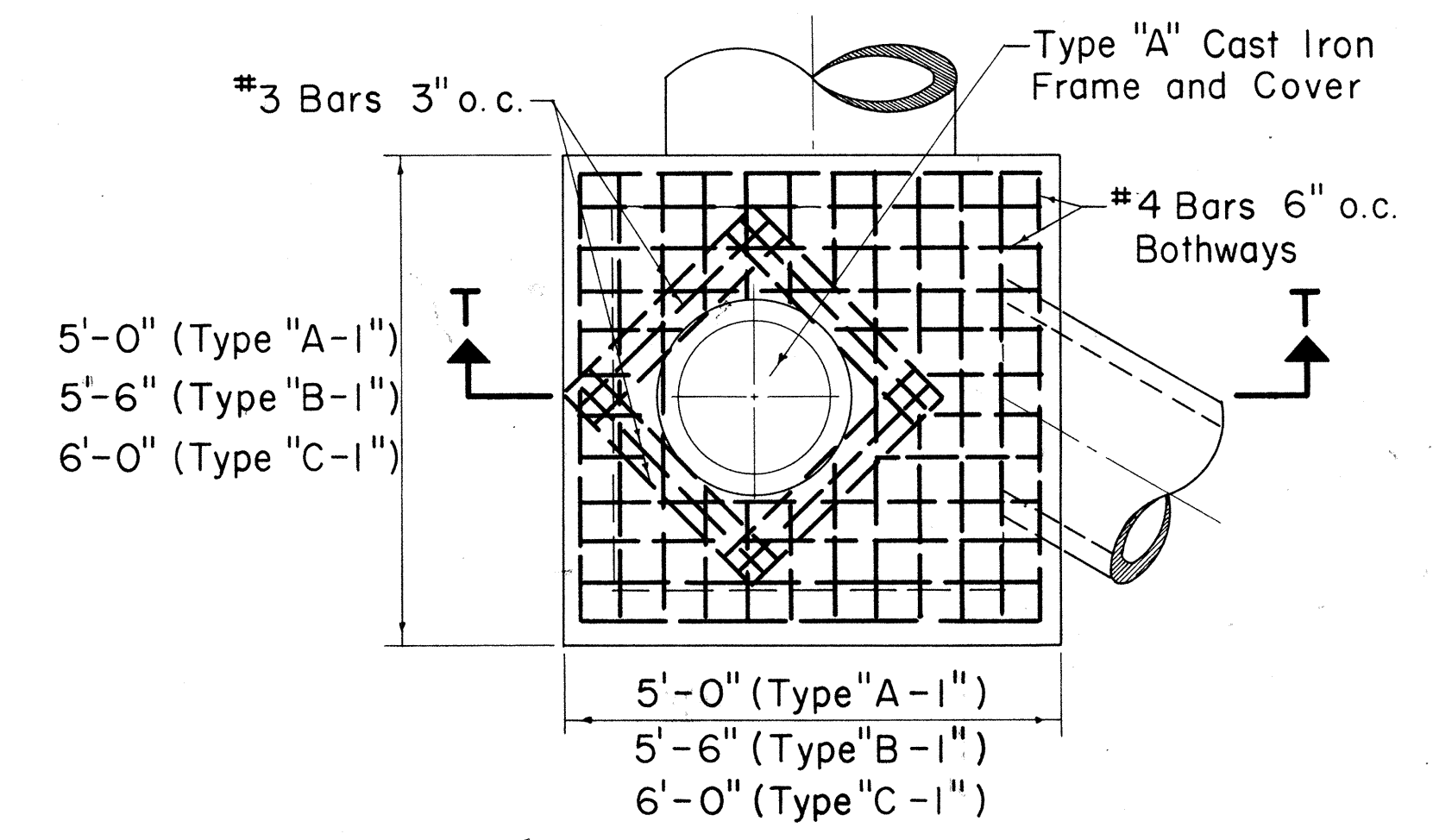
SECTION F-F



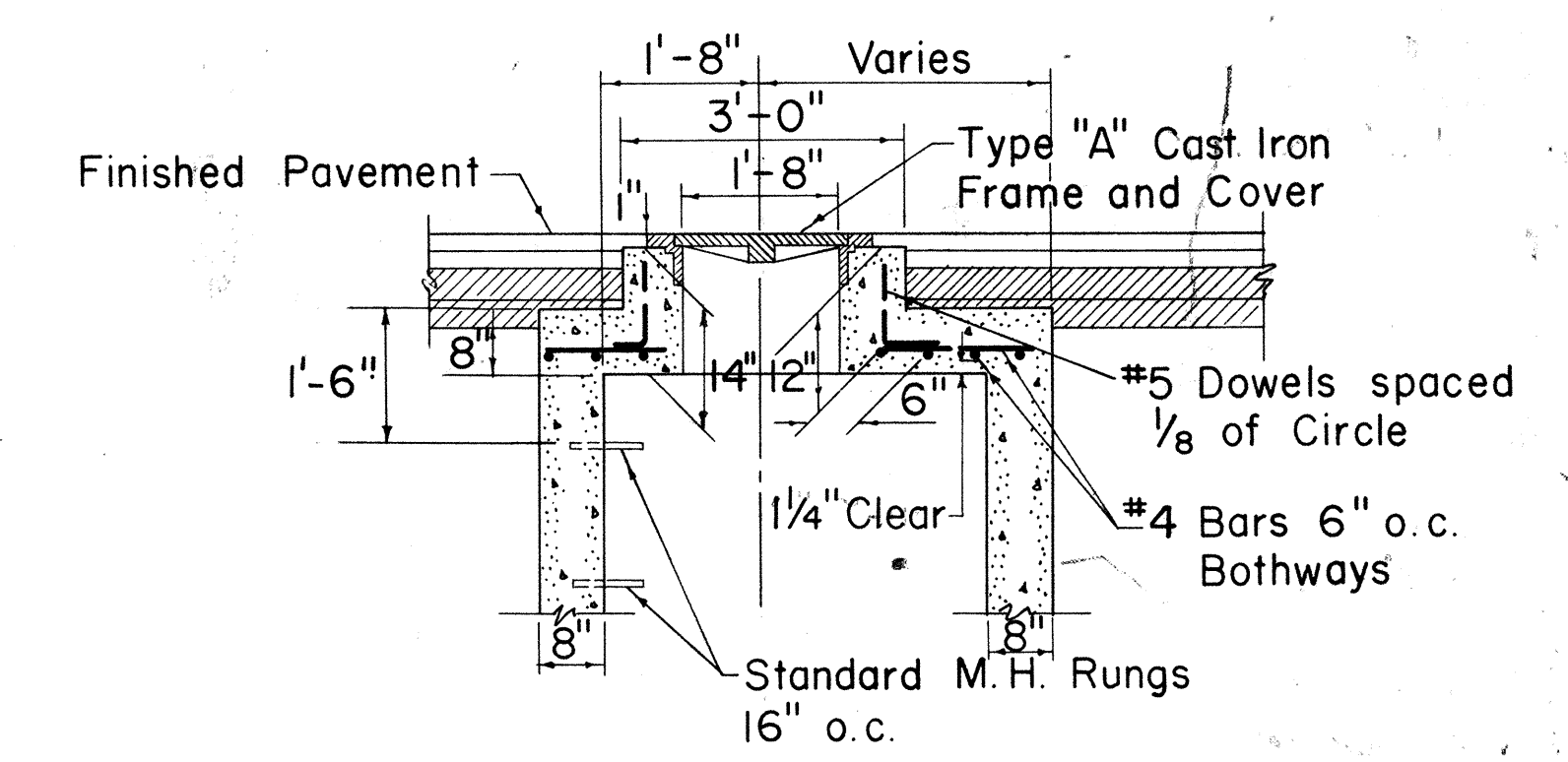
SECTION G-G

DETAIL OF TYPE "DG" CATCH BASIN

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



PLAN



SECTION T-T

TYPE "A-1", "B-1", & "C-1"
STORM DRAIN MANHOLE
TOP DETAIL UNDER PAVEMENT
(BOTTOM DETAIL SIMILAR TO TYPE "A", "B", & "C")
Scale: 1/2" = 1'-0"

APPROVED:

DIRECTOR OF TRANSPORTATION DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

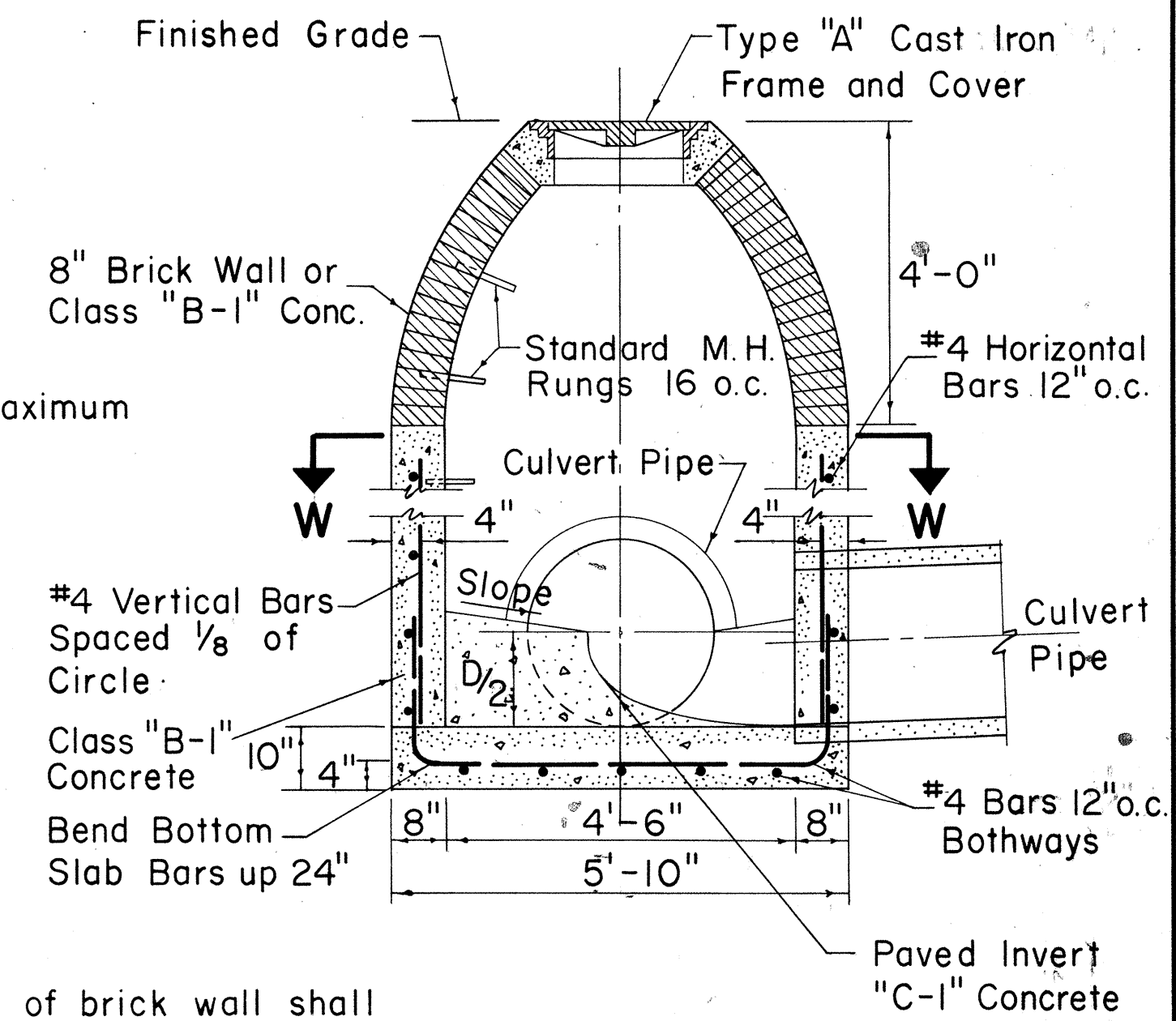
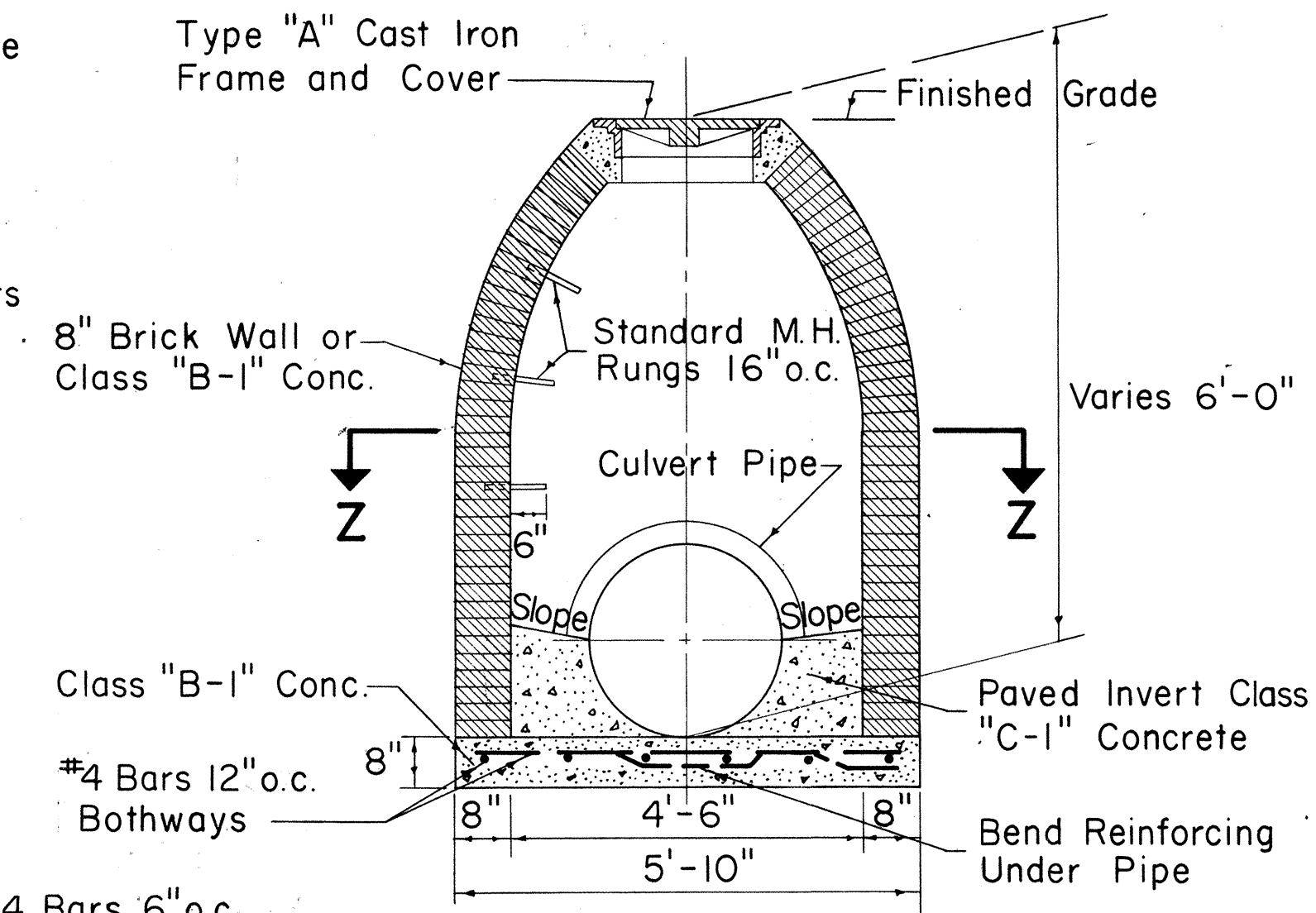
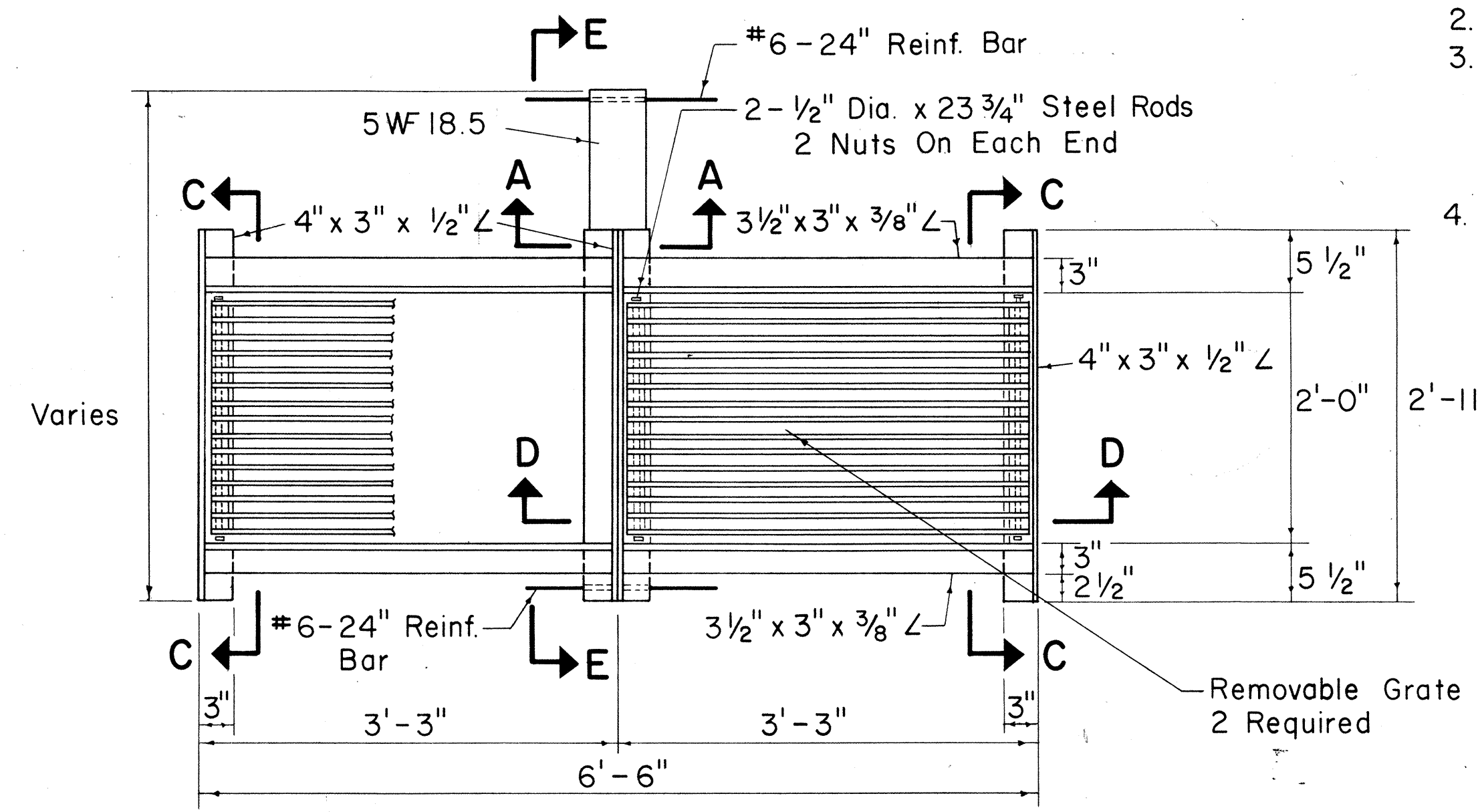
STANDARD DETAILS

CATCH BASINS AND
STORM DRAIN MANHOLES

Scales: As Noted Date: Aug., 1968

SHEET NO. 5 OF 15 SHEETS

- NOTE:
- All welds $\frac{3}{8}$ " unless otherwise noted.
 - All steel shall be structural grade.
 - Grates and Frame shall be hot dip galvanized after fabrication in accordance with Section 44(H) of the Standard Specifications.
 - Detail of Types "A-1" and "A-2" Steel Frame and Grates are identical except for the thickness of end spacers and number of grate bars. See Table of End Spacer Thickness.



- NOTE:
- Exterior surface of brick wall shall be plastered with 1" thickness of 1:2 Cement Mortar.
 - Number size and direction of culvert pipes at manhole to be as shown on plans.
 - Paved invert not required at drop manholes.
 - All Class "C-1" Concrete to be incidental to Class "B-1" Concrete.

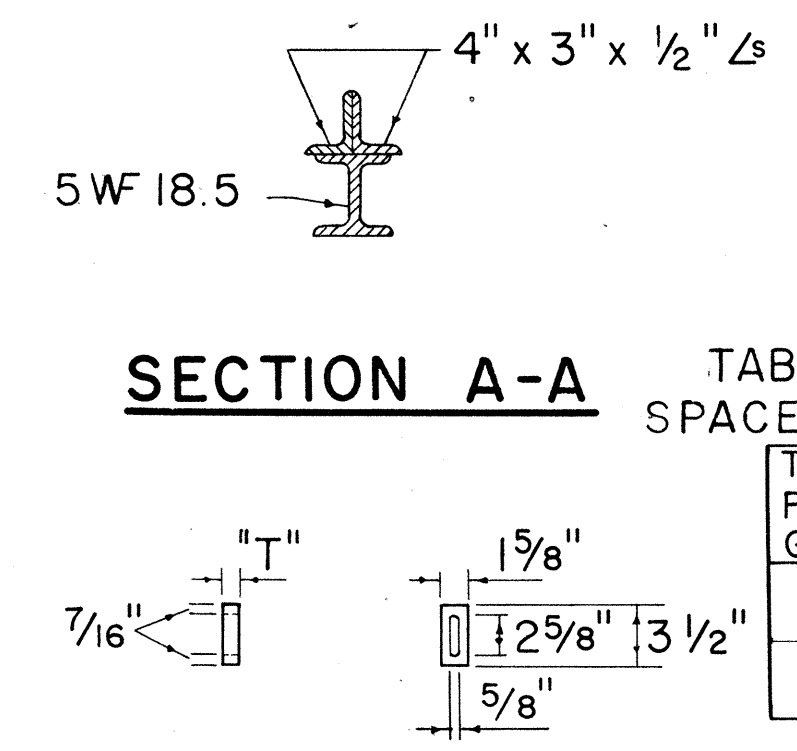
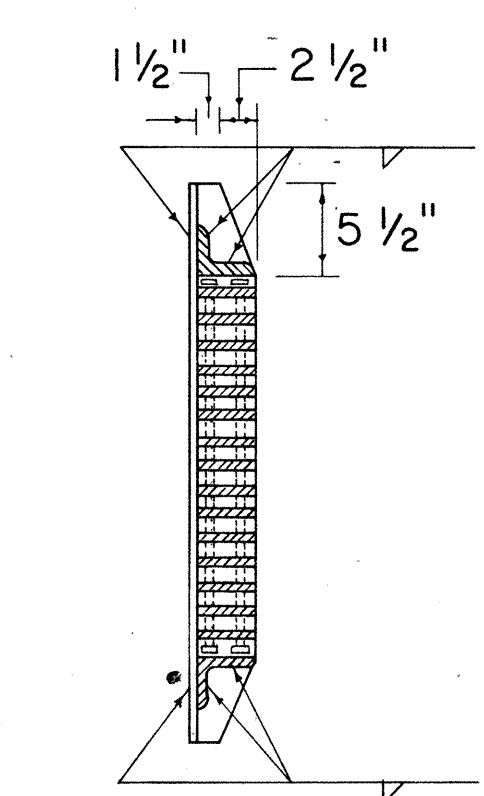
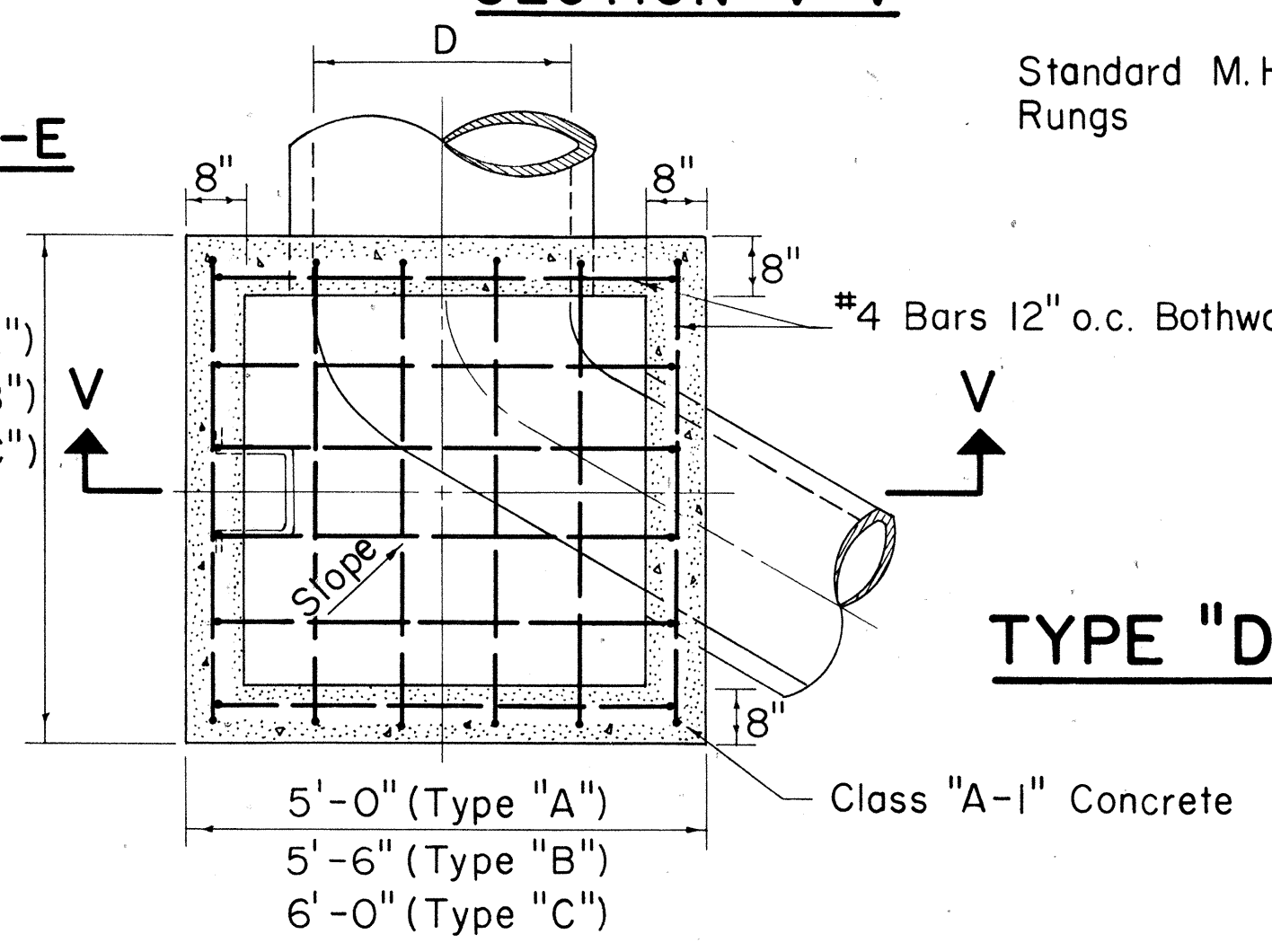
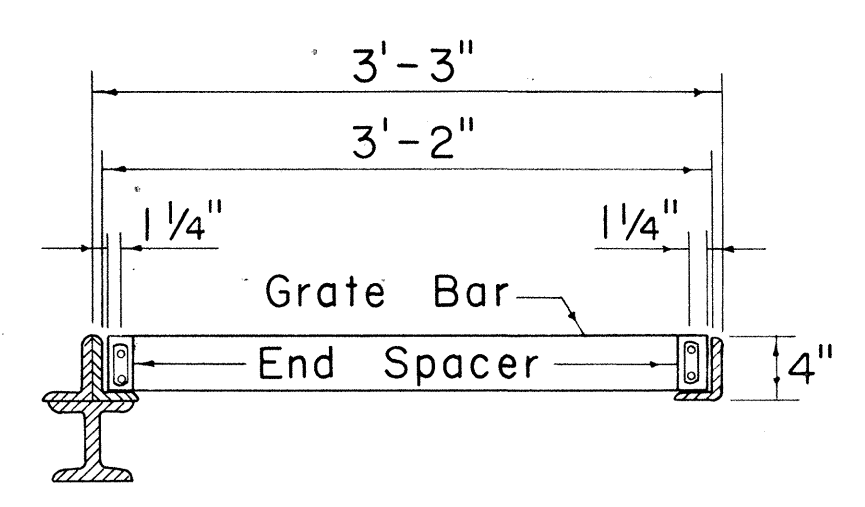
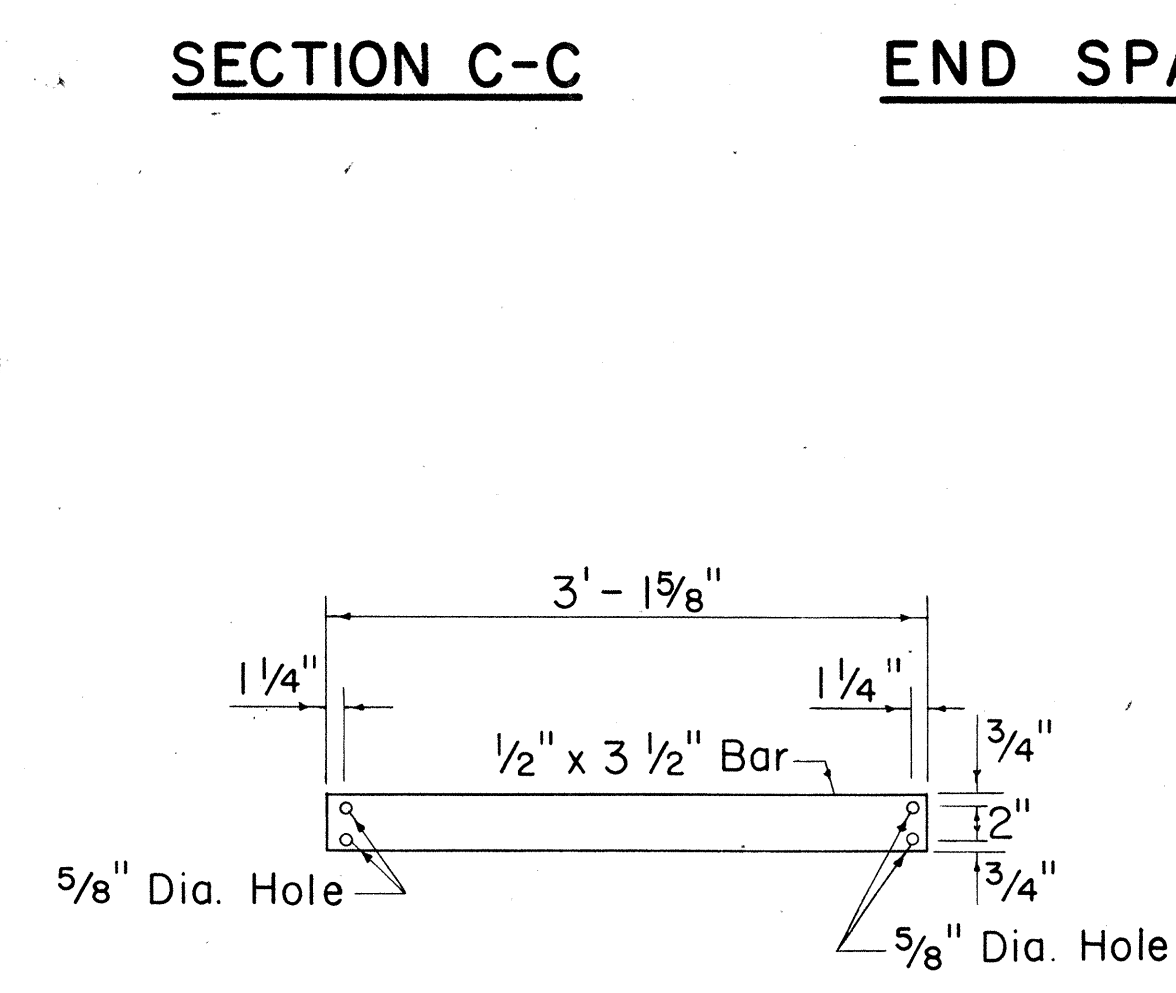
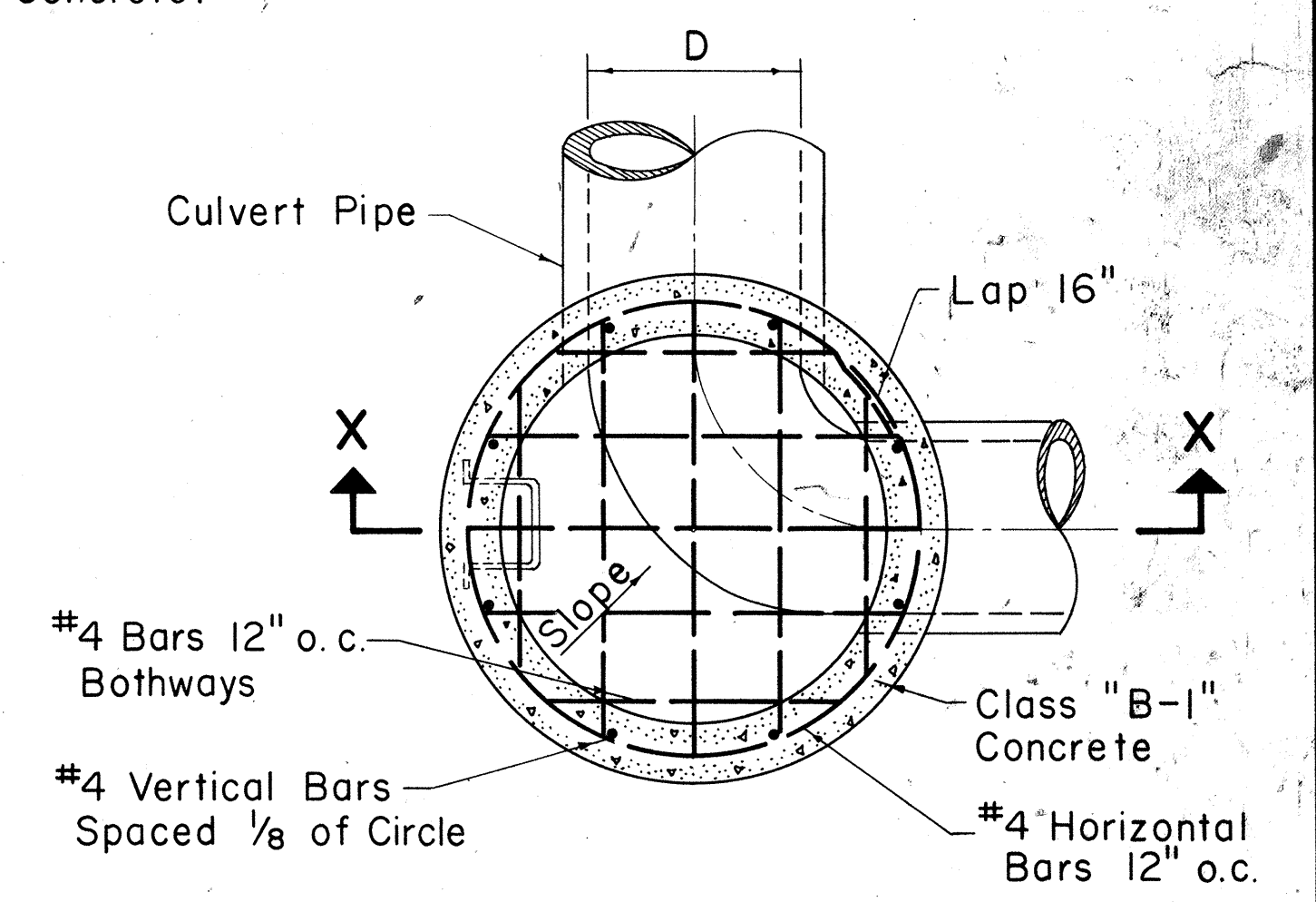
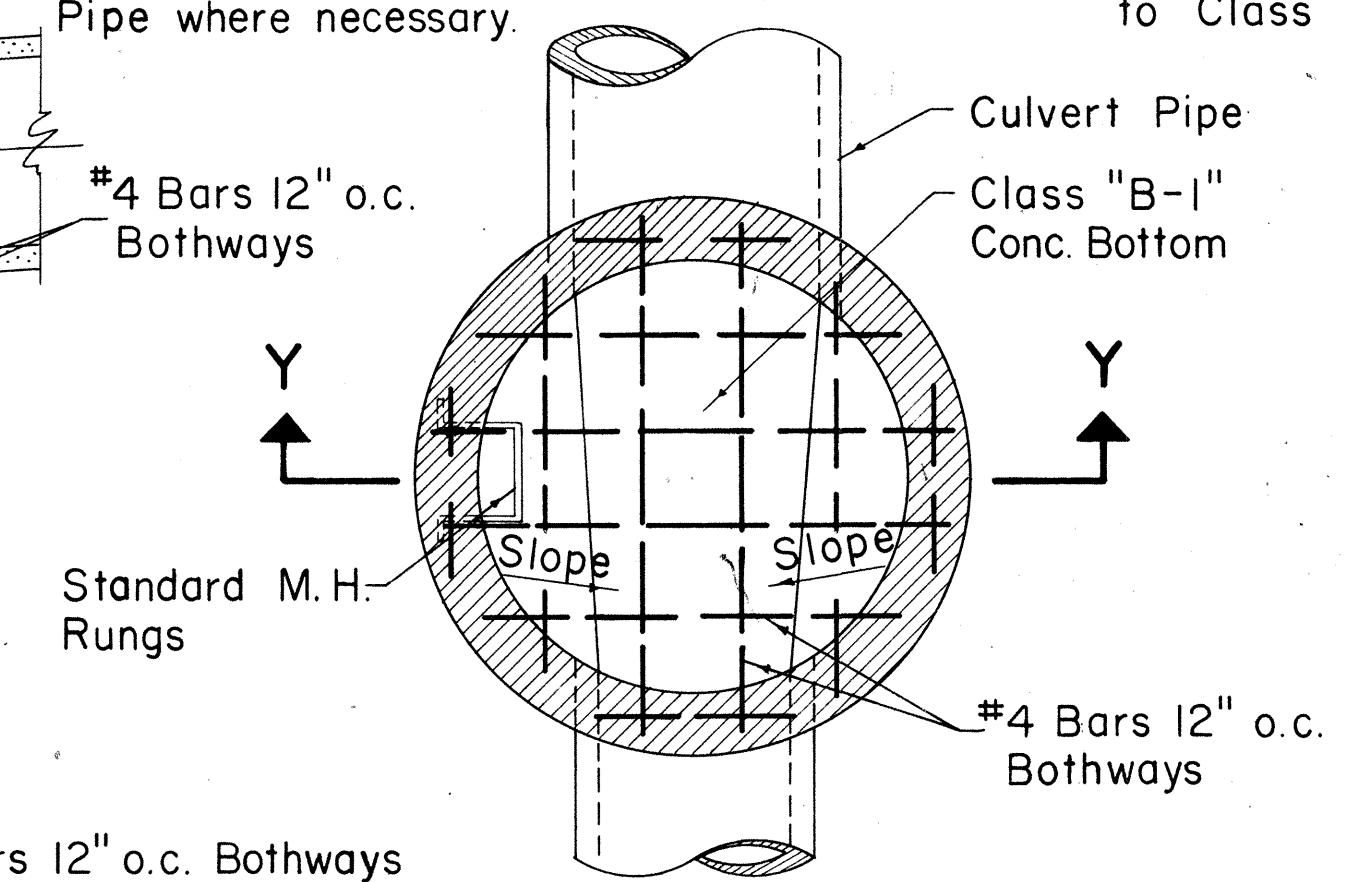
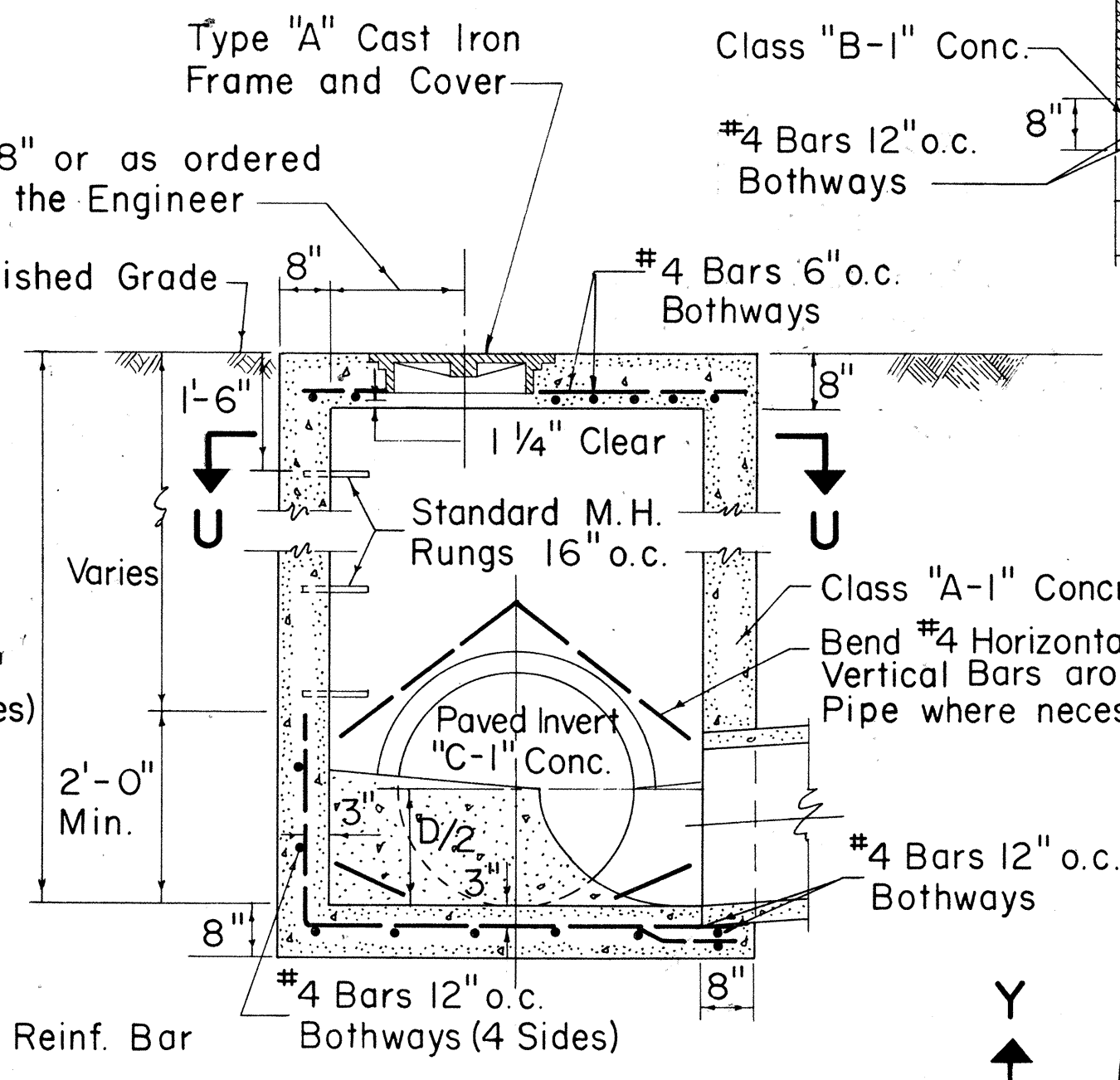
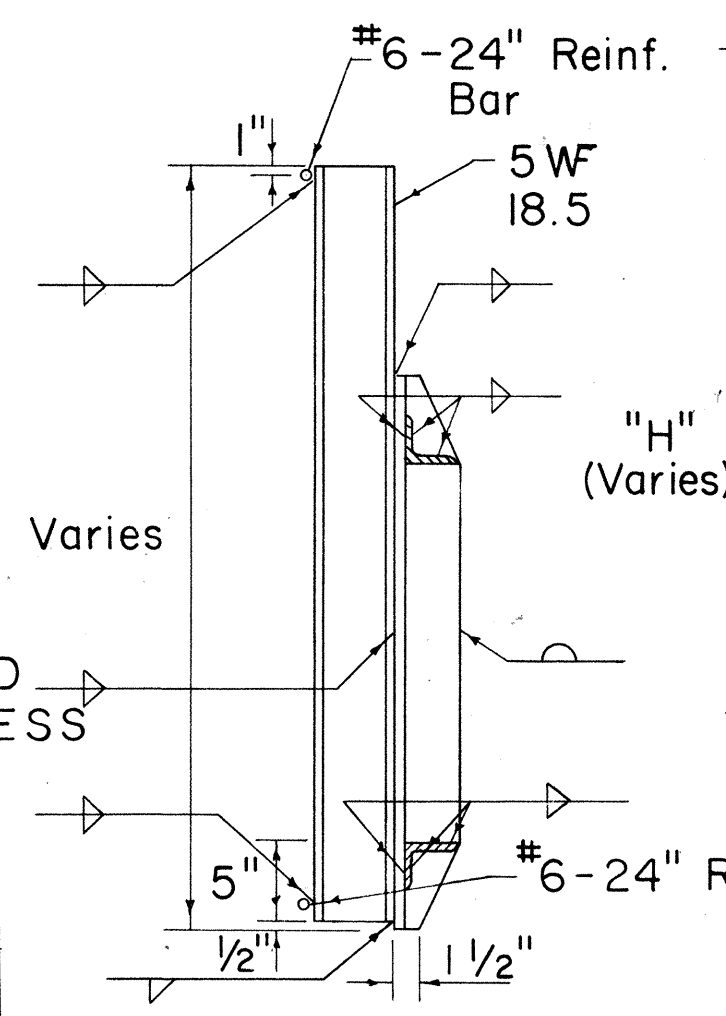


TABLE OF END SPACER THICKNESS

TYPE FRAME & GRATES	"T" (in.)
A-1	1
A-2	1 3/8



TYPE "D" STORM DRAIN MANHOLE
 Scale: 1/2" = 1'-0"

TYPE "E" STORM DRAIN MANHOLE
 Scale: 1/2" = 1'-0"

SECTION U-U
 TYPE "A", "B", & "C"
 S.D.M.H.
 Scale: 1/2" = 1'-0"

DETAIL OF TYPE "A-1" & "A-2" STEEL FRAME AND GRATES
 Scale: 1" = 1'-0"

APPROVED:

 DIRECTOR OF TRANSPORTATION DATE

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

STANDARD DETAILS

STEEL FRAME AND GRATES

AND STORM DRAIN MANHOLES

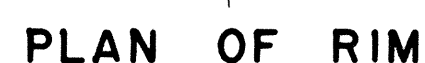
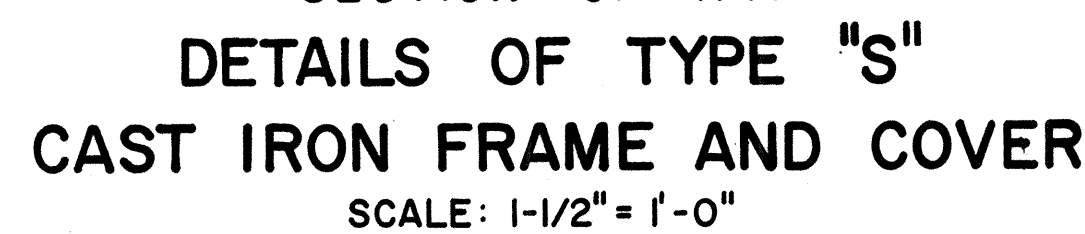
Scales: As Noted

Date: Aug., 1968

ORIGINAL PLAN	SURVEY PLOTTED BY.....	DATE.....
NOTE BOOK	DESIGNED BY.....	" "
	DRAWN BY.....	" "
	TRACED BY.....	" "
	QUANTITIES BY.....	" "
No.	CHECKED BY.....	" "

August 1957

Revised: 12-6-68



DETAILS OF TYPE "B"
CAST IRON FRAME AND COVER
SCALE: 1-1/2" = 1'-0"



DETAILS OF TYPE "A"
CAST IRON FRAME AND COVER
SCALE: 1-1/2"= 1'-0"

NOTE: Stock Pattern From Novelty Foundry ~ Honolulu

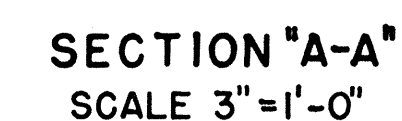


TOP VIEW

TOP VIEW

TYPE C C.I. FRAME AND GRATING

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



DETAILS OF TYPE "W"
CAST IRON FRAME AND COVER
SCALE: 1-1/2" = 1'-0"

NOTE:

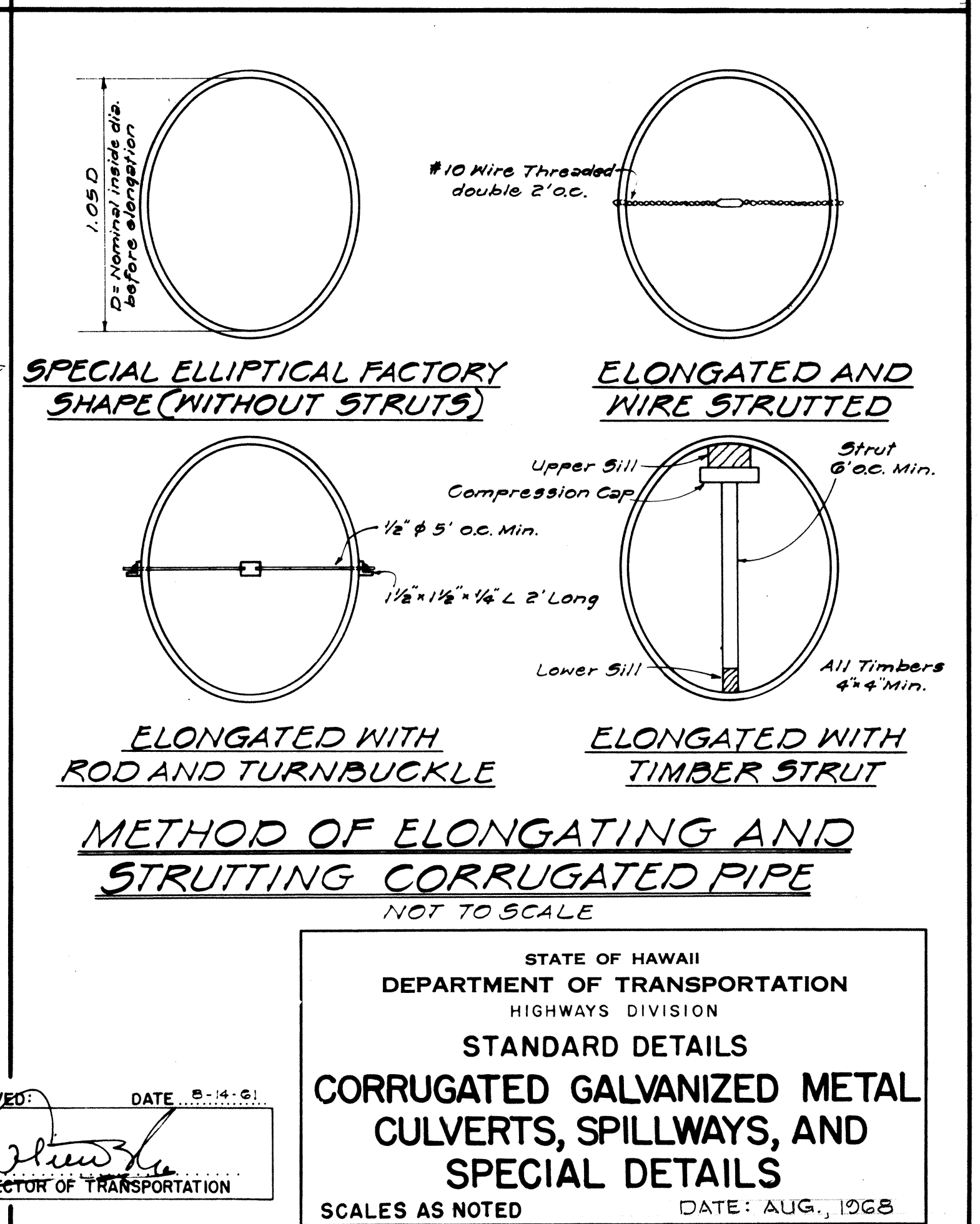
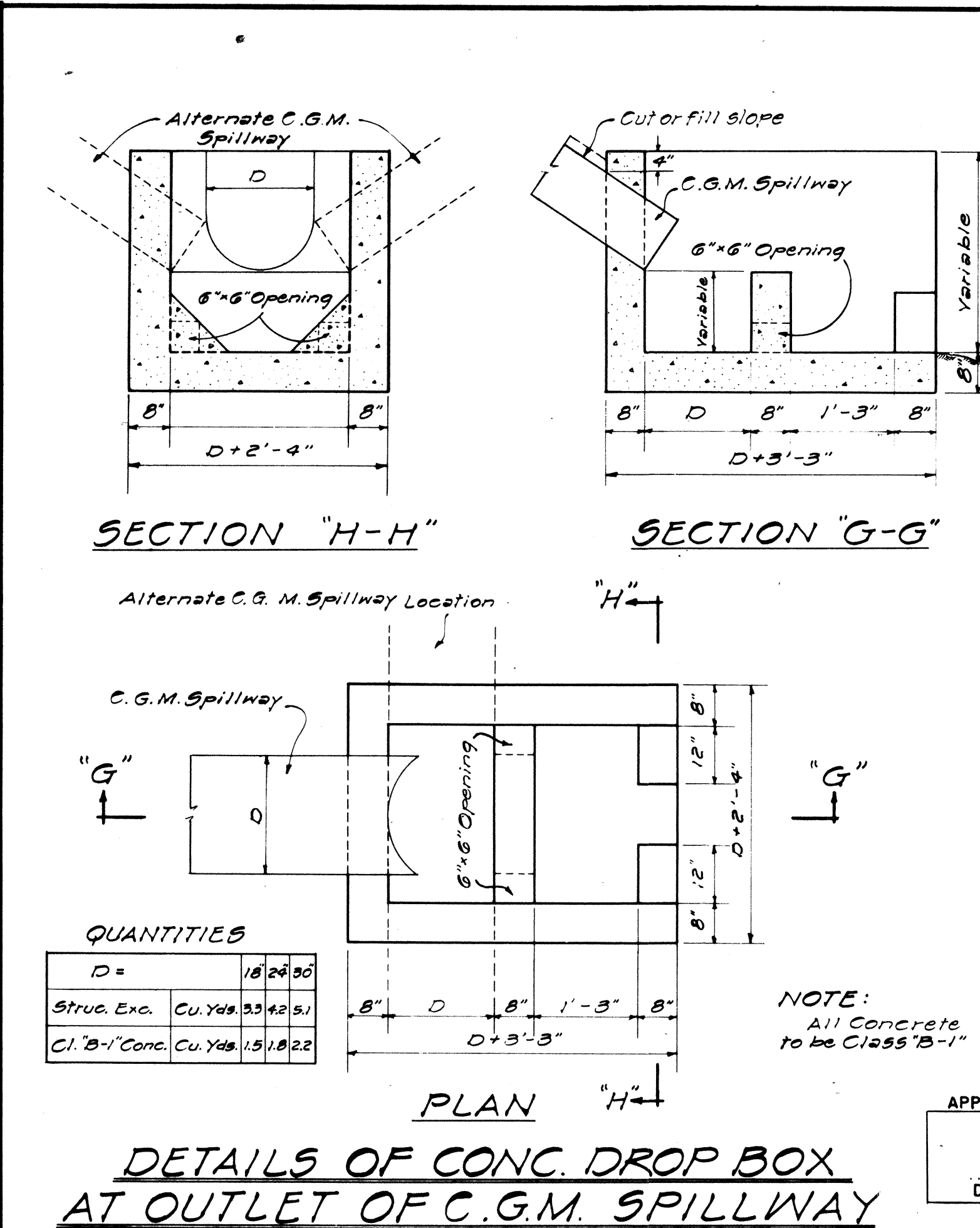
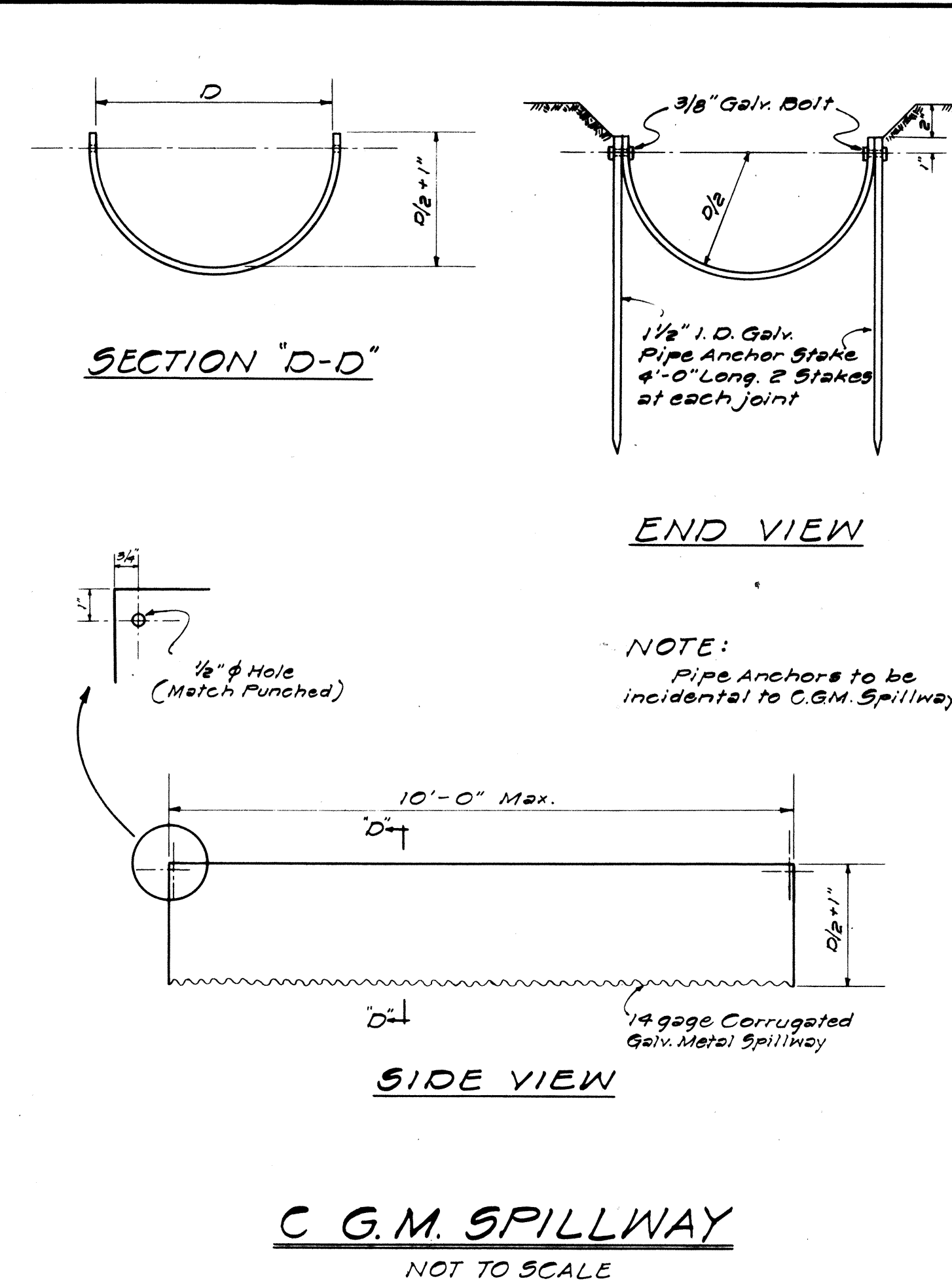
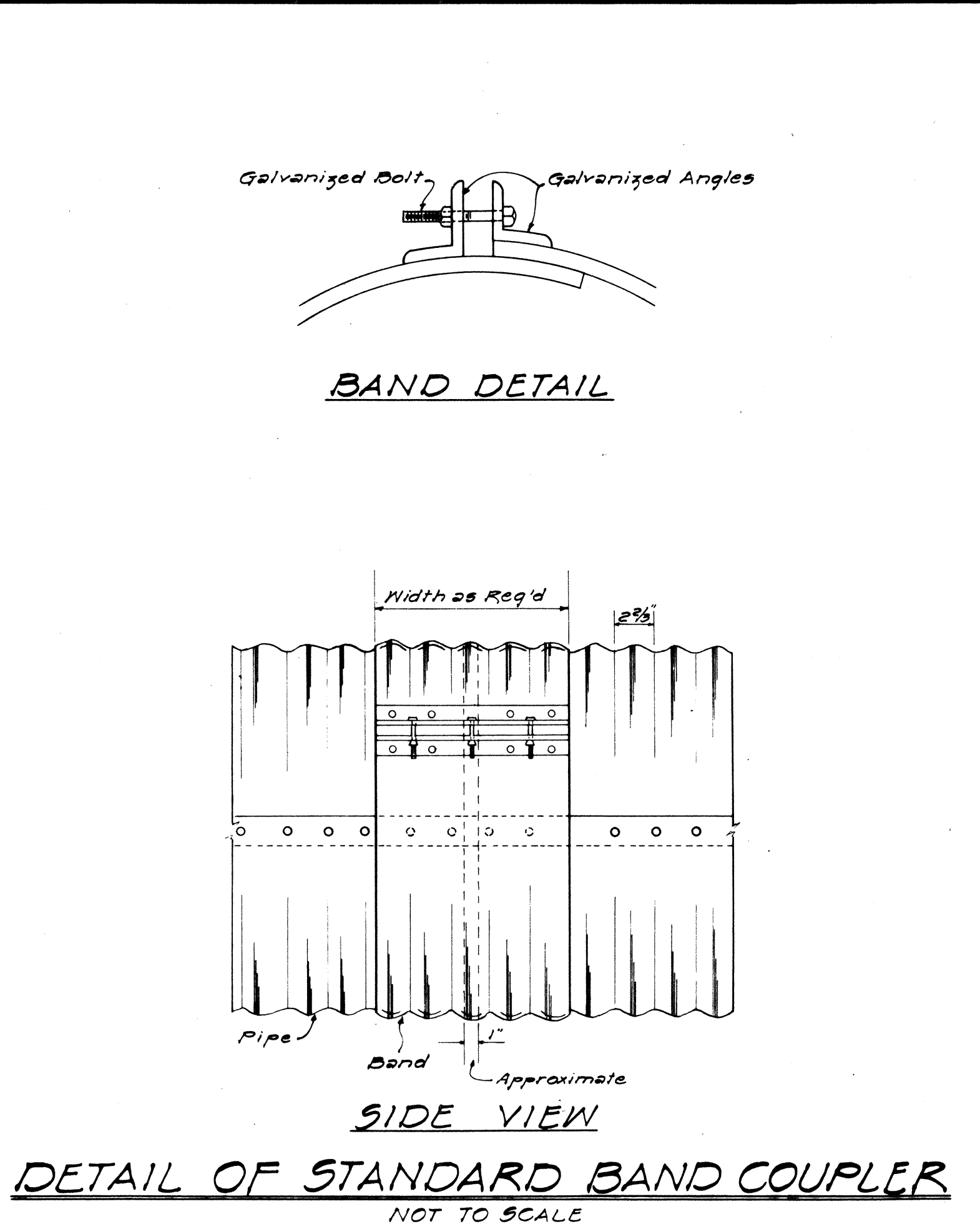
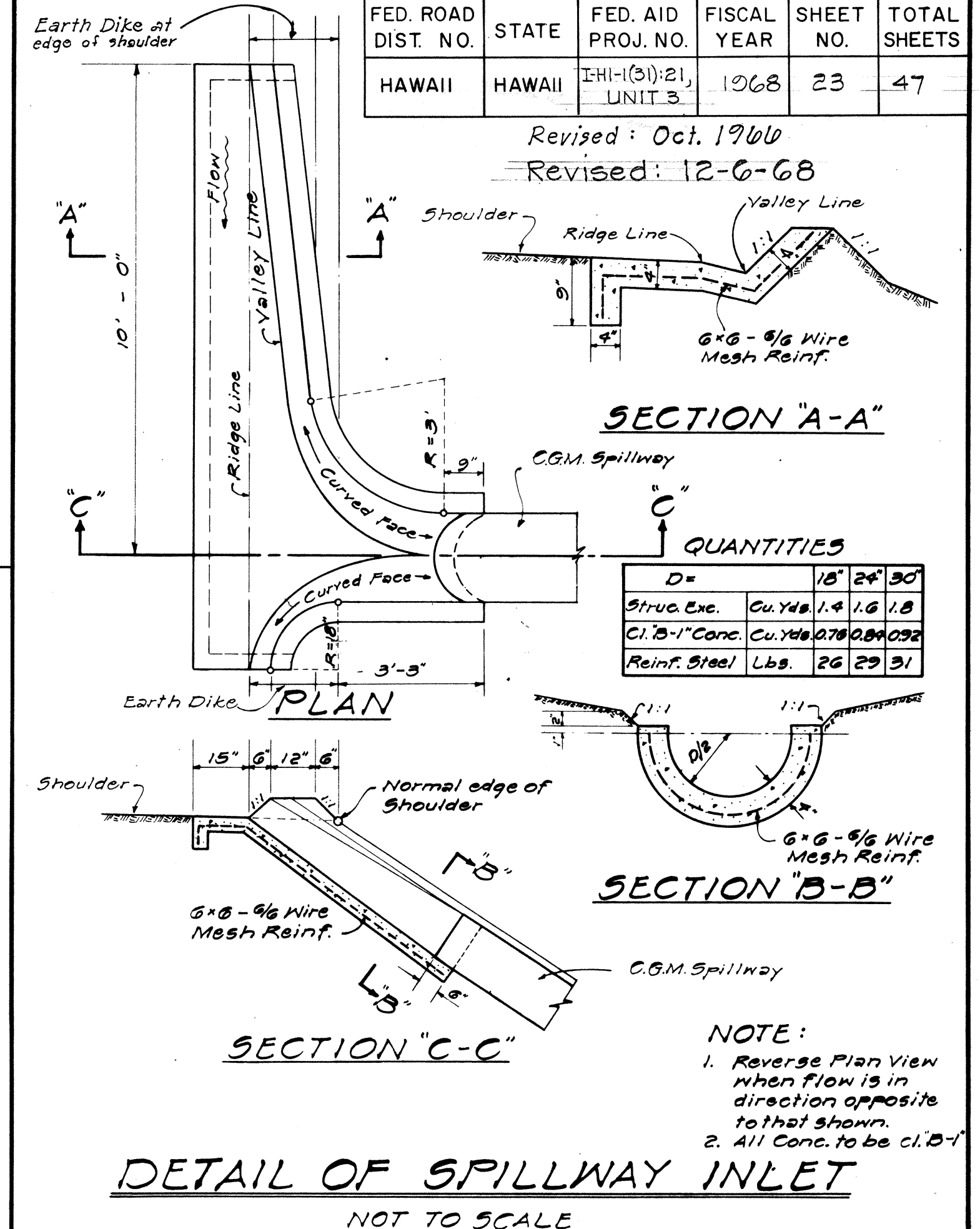
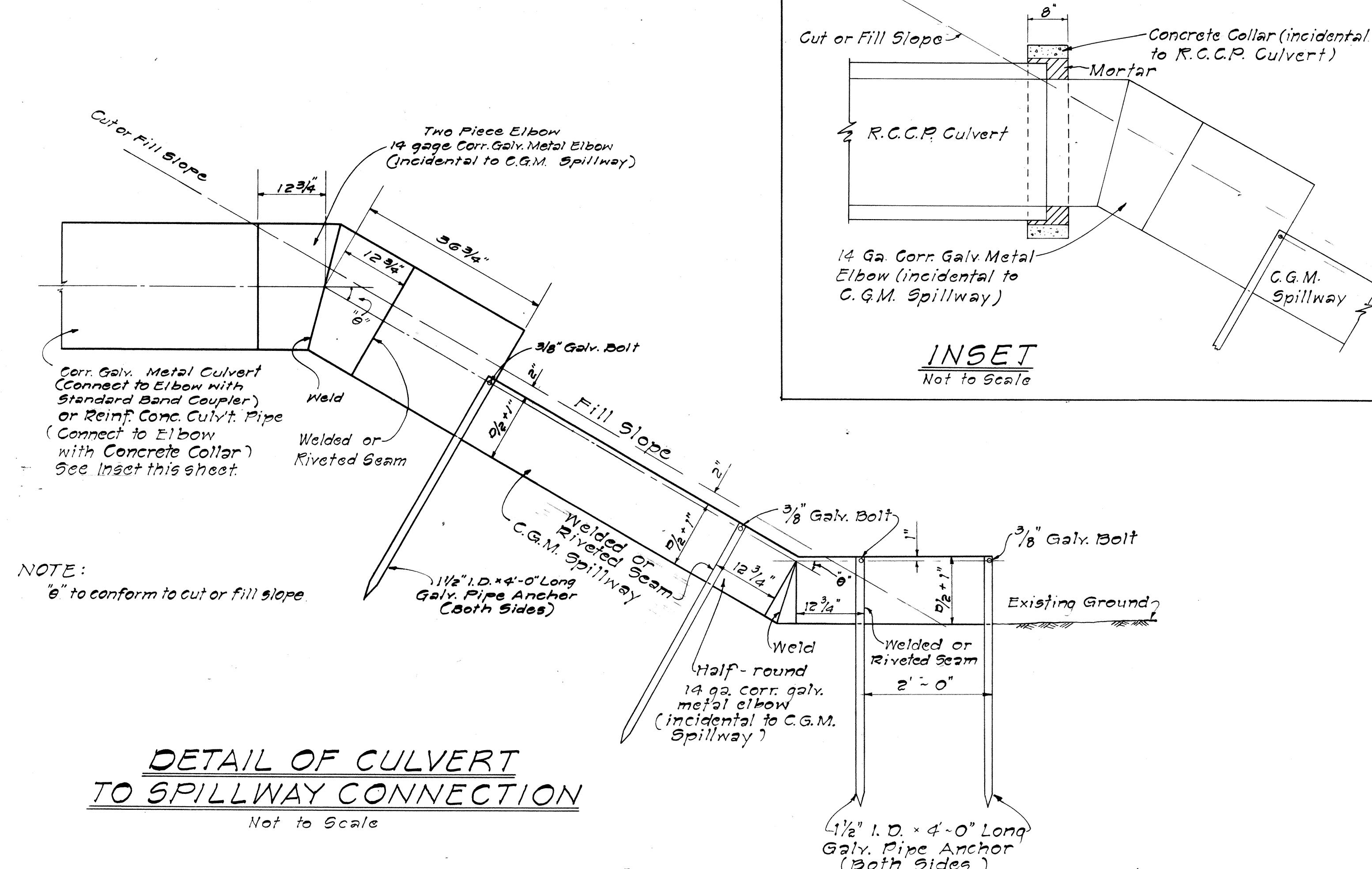
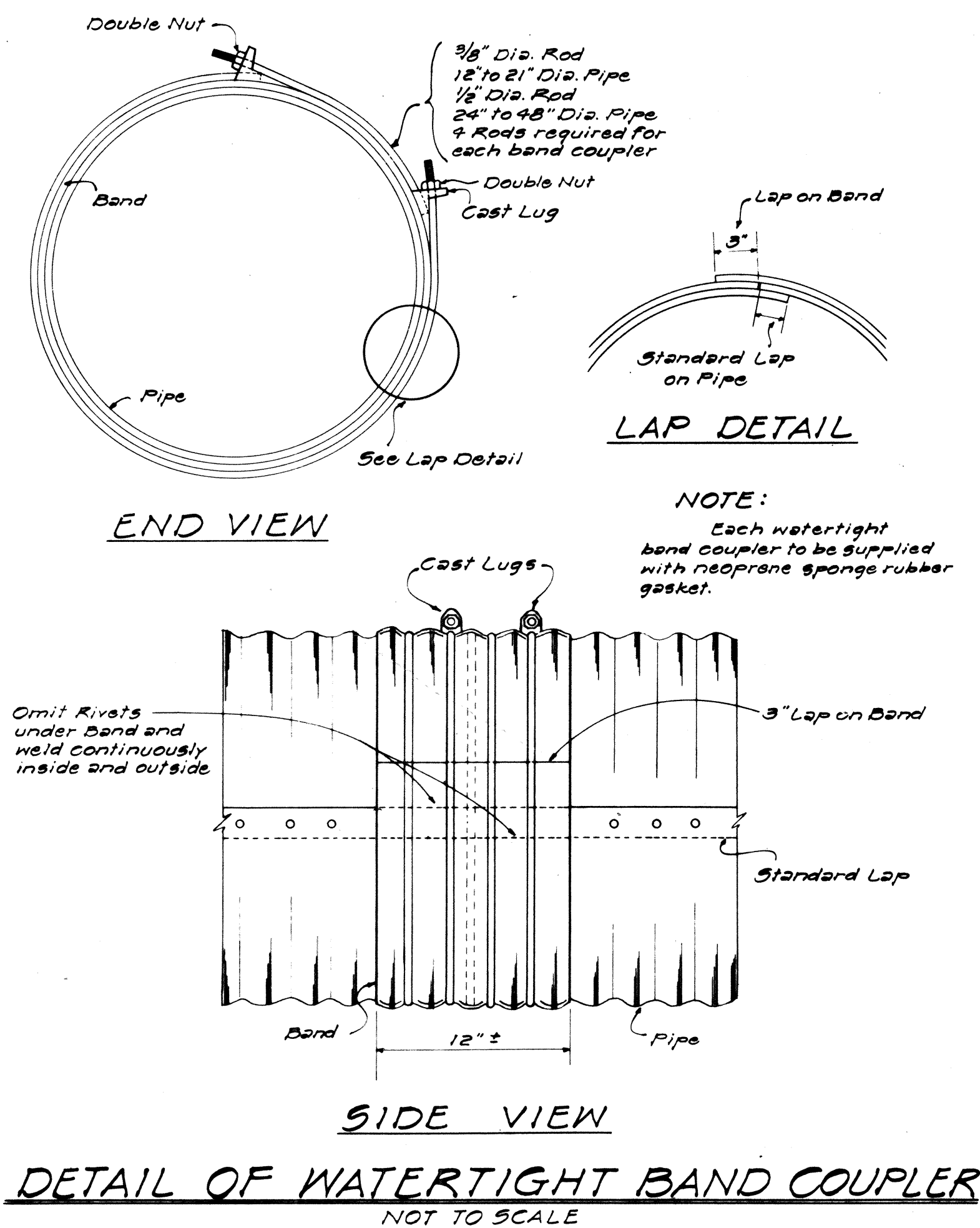
THE TYPE "S" CAST IRON FRAME AND COVER SHOWN
ON THIS SHEET IS EQUIVALENT TO THE CITY AND
COUNTY OF HONOLULU, DIVISION OF SEWERS' TYPE
"SA" CAST IRON MANHOLE FRAME AND COVER.

THE TYPE "W" CAST IRON FRAME AND COVER
SHOWN ON THIS SHEET IS EQUIVALENT TO THE
CITY AND COUNTY OF HONOLULU, BOARD OF
WATER SUPPLY'S CAST IRON MANHOLE FRAME
AND COVER, 20" SIZE.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**STANDARD DETAILS
CATCH BASIN AND
MANHOLE CASTINGS
SCALES AS NOTED**

SHEET No 7 OF 15 SHEETS

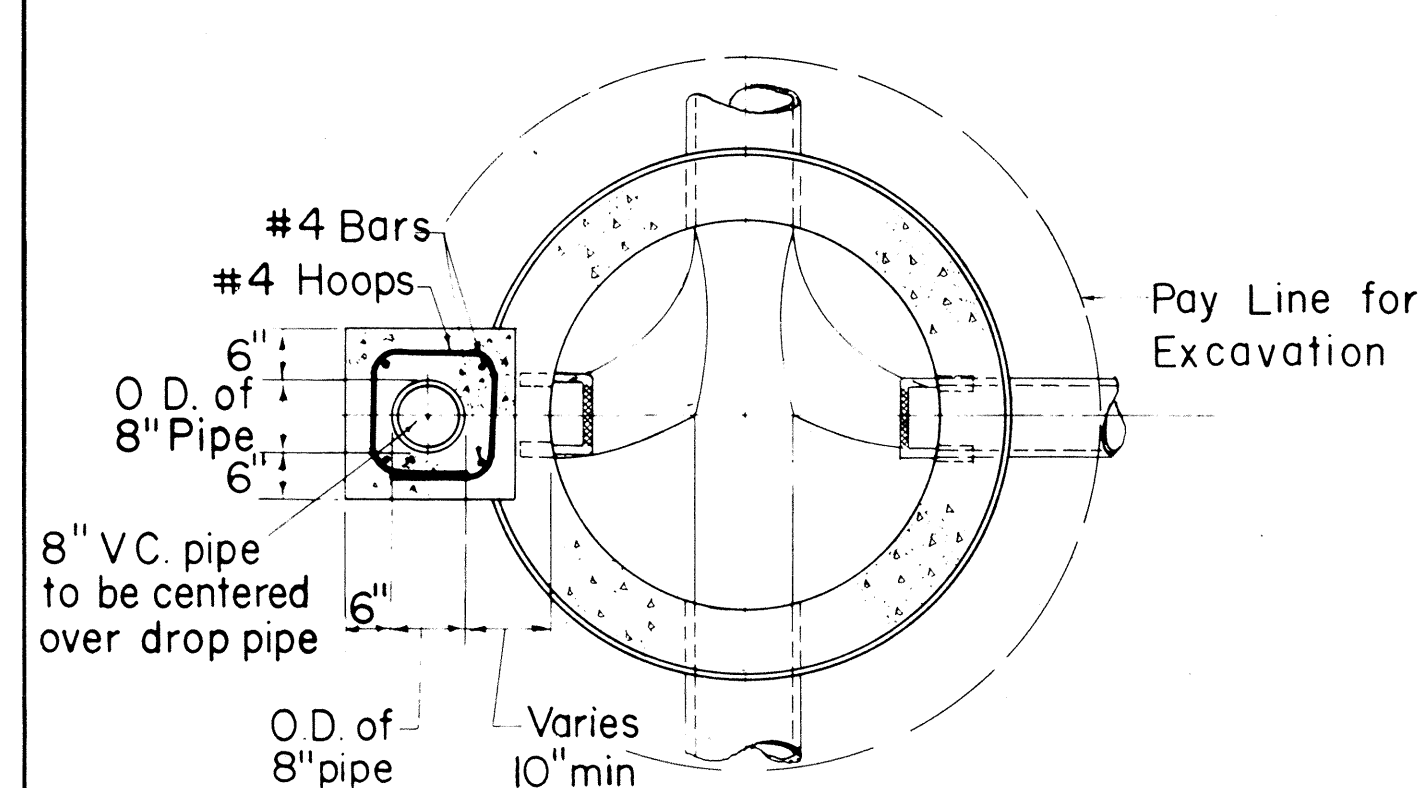


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CORRUGATED GALVANIZED METAL
CULVERTS, SPILLWAYS, AND
SPECIAL DETAILS
SCALES AS NOTED
DATE: AUG, 1968
SHEET NO 8 OF 15 SHEETS

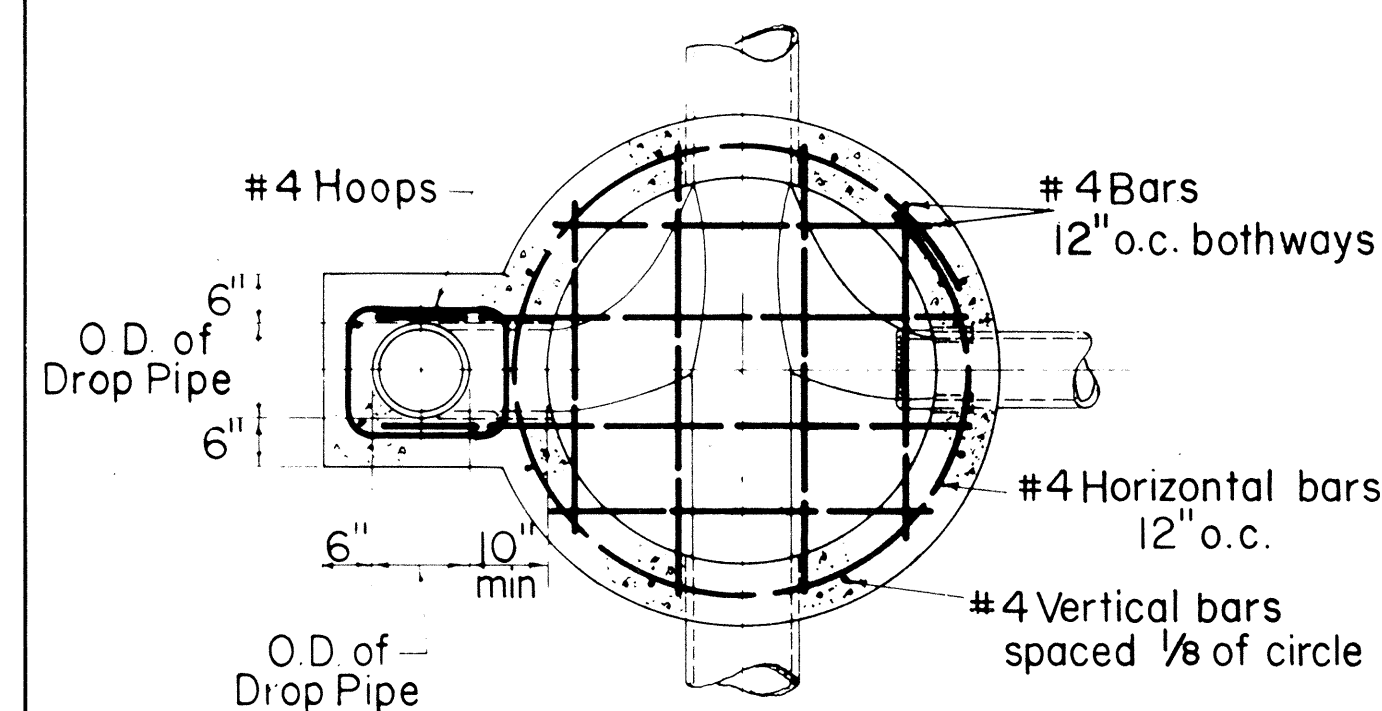
DATE: 5-24-64
SURVEY PLOTTED BY: R.Y.
DESIGNED BY: O.M.
NOTE BOOK: 5-24-64
QUANTITIES BY: O.M.
CHECKED BY: No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(81)-2 Unit 3	1968	24	47

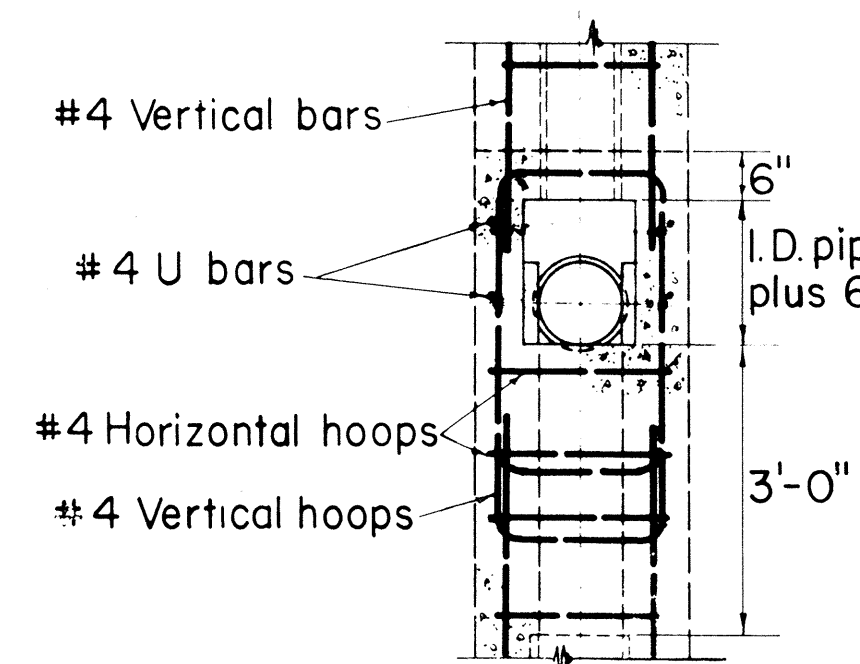
Revised 12-6-68



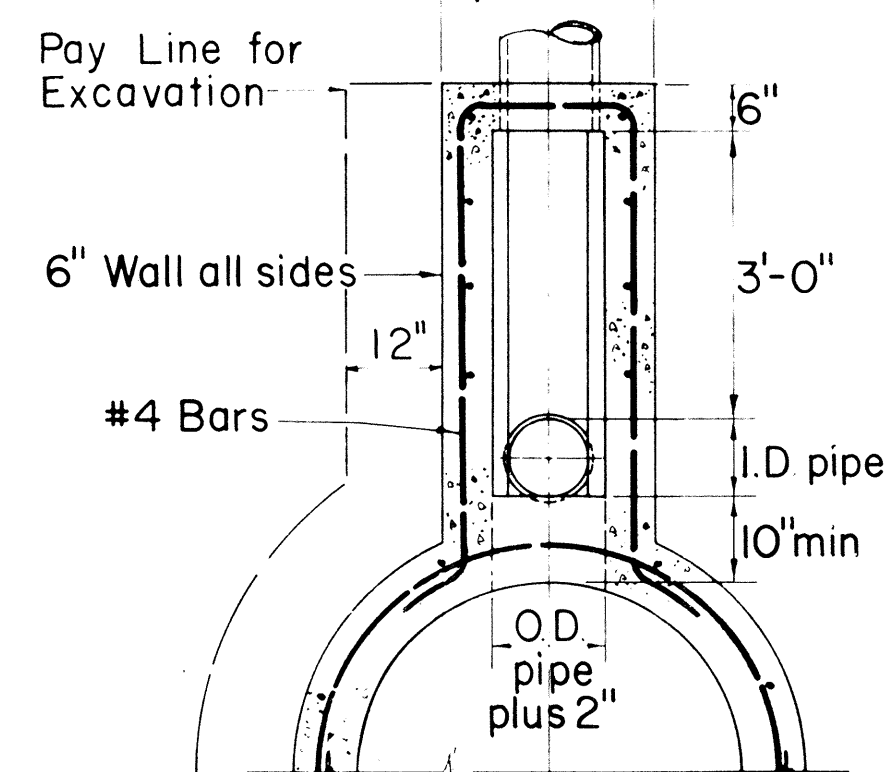
SECTION A-A
Scale: 1/2" = 1'-0"



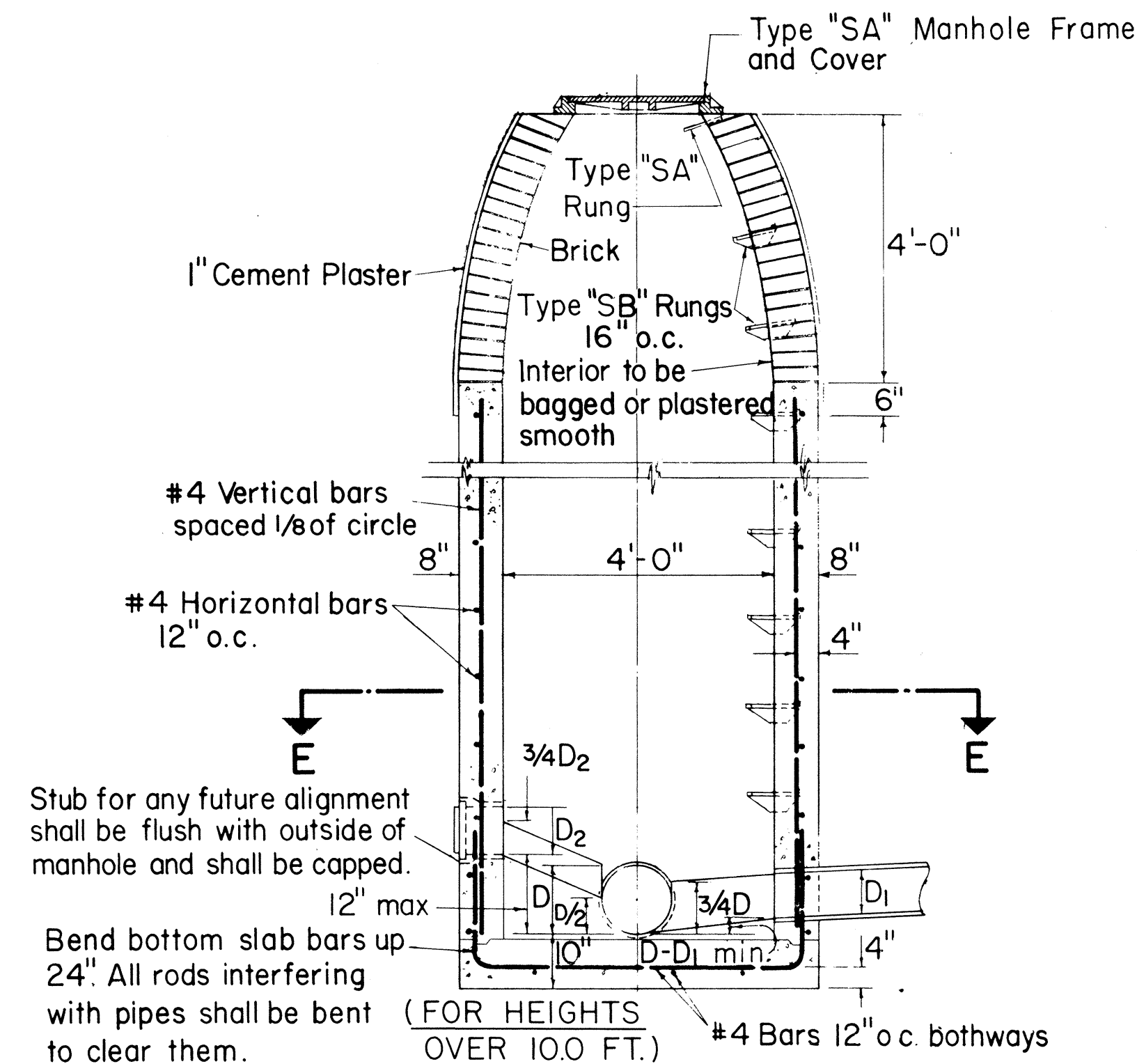
SECTION B-B
Scale: 1/2" = 1'-0"



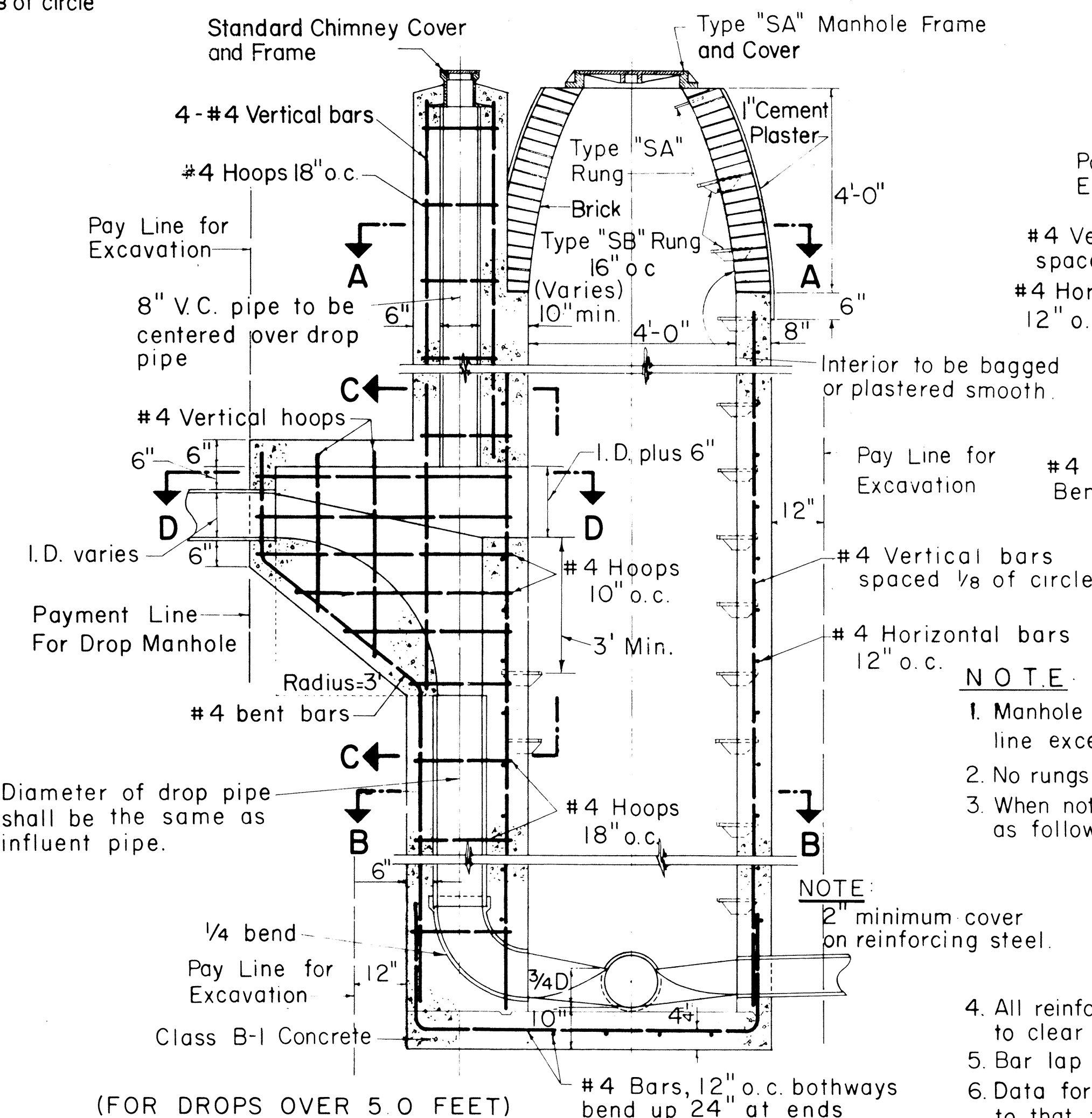
SECTION C-C
Scale: 1/2" = 1'-0"



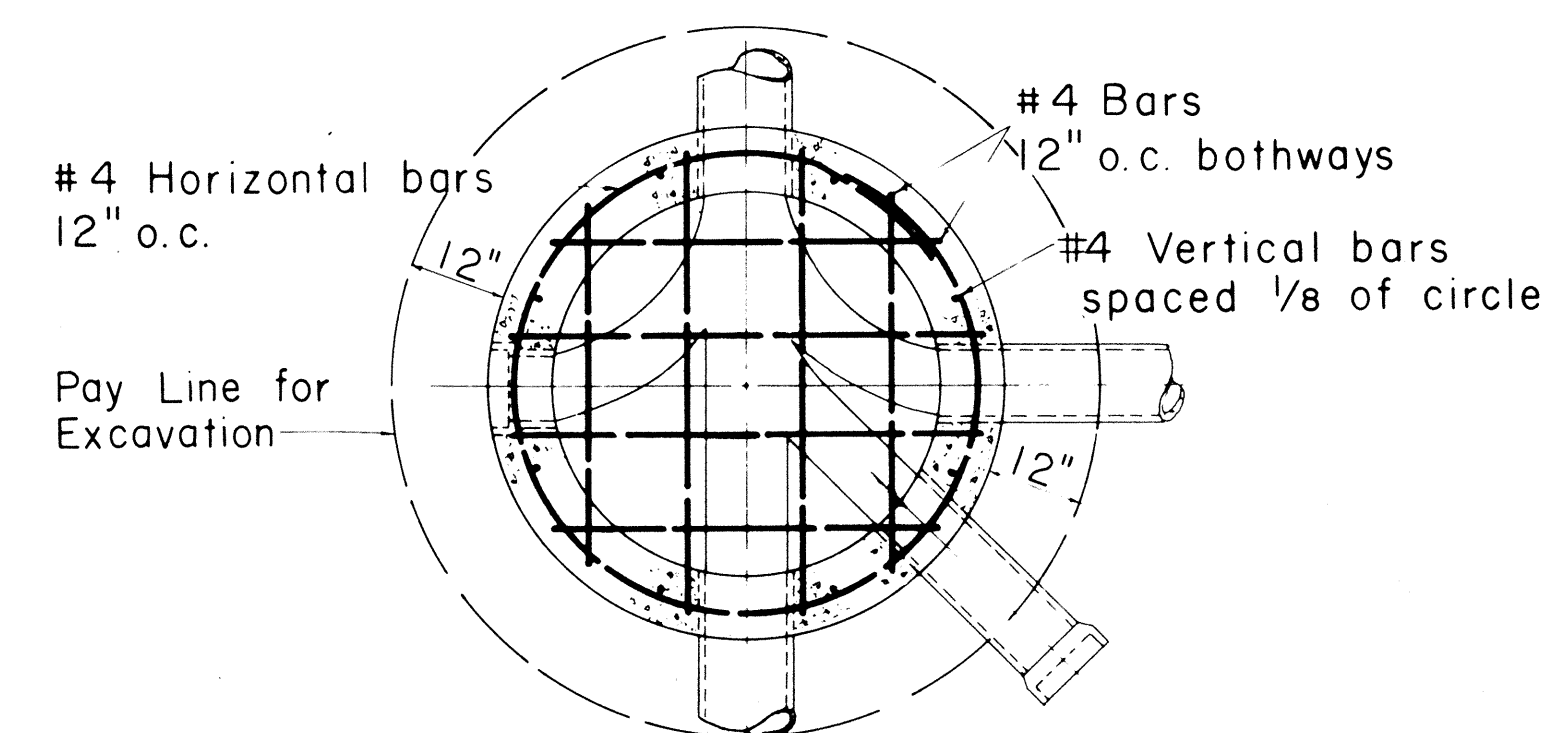
SECTION D-D
Scale: 1/2" = 1'-0"



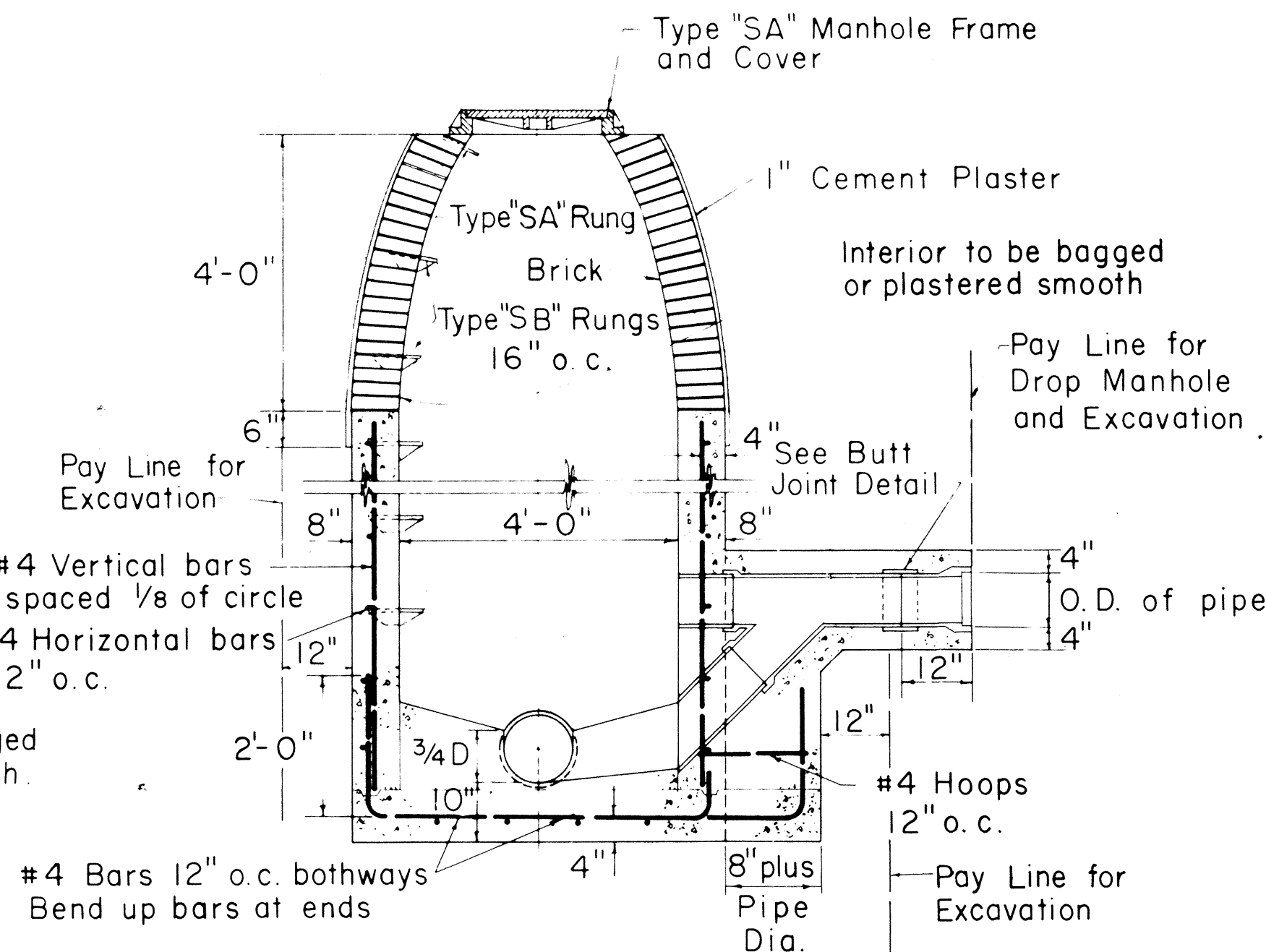
PLAIN MANHOLE
Scale: 1/2" = 1'-0"



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



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



SHALLOW DROP MANHOLE
Scale: 1/2" = 1'-0"

NOTE:

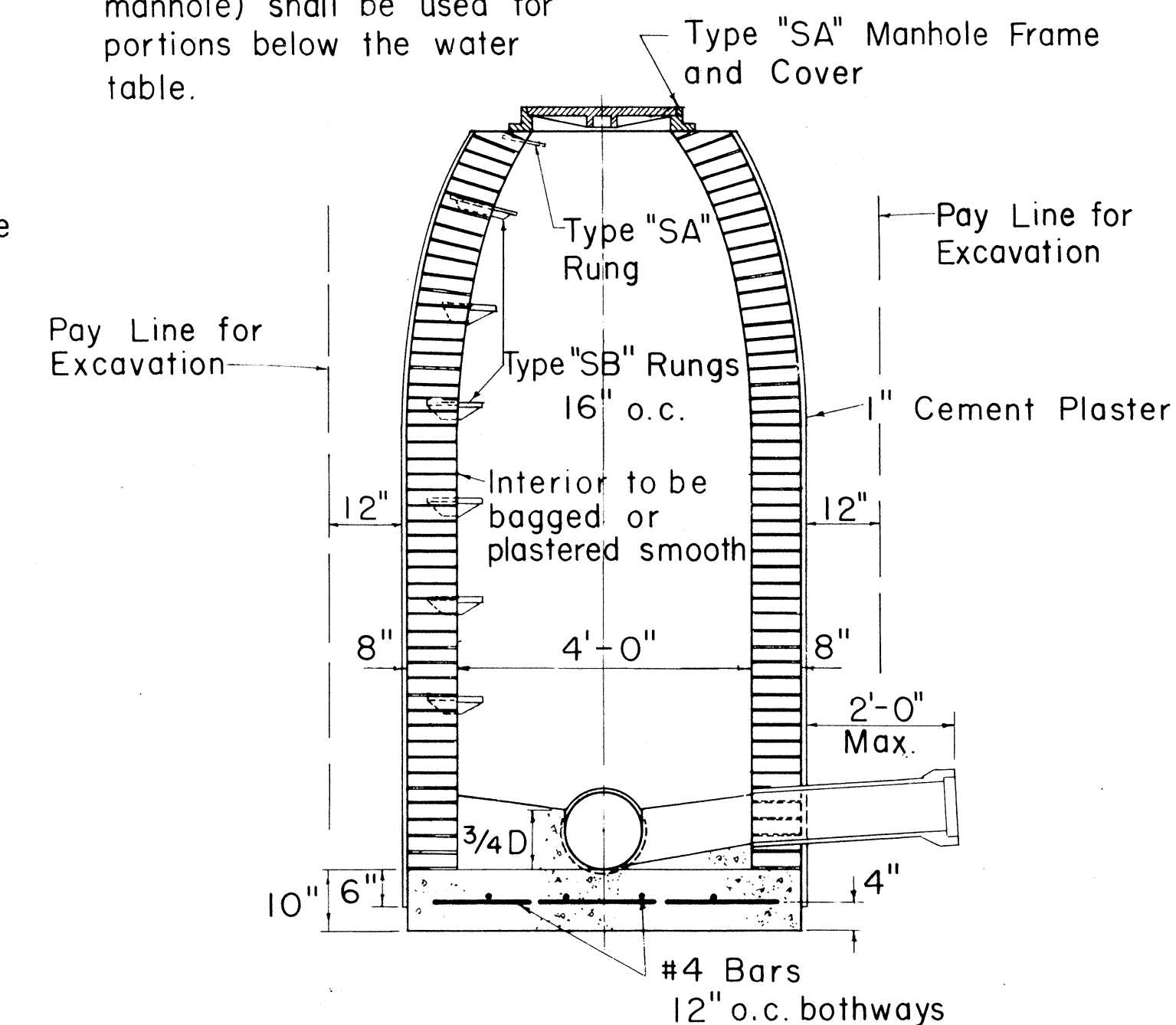
1. Manhole rungs shall not be aligned above any flow line except in drop manhole.
2. No rungs shall be installed in manholes less than 3' high.
3. When not otherwise noted, manhole stubs shall be sloped as follows:

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

4. All reinforcing rods interfering with pipes shall be bent to clear them.
5. Bar lap to be 40 diameters in length.
6. Data for special manholes not shown shall be similar to that for plain manholes.
7. Size of drop pipe in all Drop Manholes shall be same as influent line.

NOTE:

Reinforced concrete manhole walls (See detail of plain manhole) shall be used for portions below the water table.



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

Payment for excavation for manholes shall be made under unit price for trench excavation and shall be measured to one foot outside of walls from original ground elevation to authorized bottom elevation.
Payment for manhole walls (brick, or cast-in-place concrete) shall include brick, mortar, concrete, reinforcing steel, cast-iron steps, galvanized wrought iron rungs, and plastering.

APPROVED:

SEWER SYSTEM DIRECTOR,
DIVISION OF SEWERS

DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DIVISION OF SEWERS
CITY & COUNTY OF HONOLULU

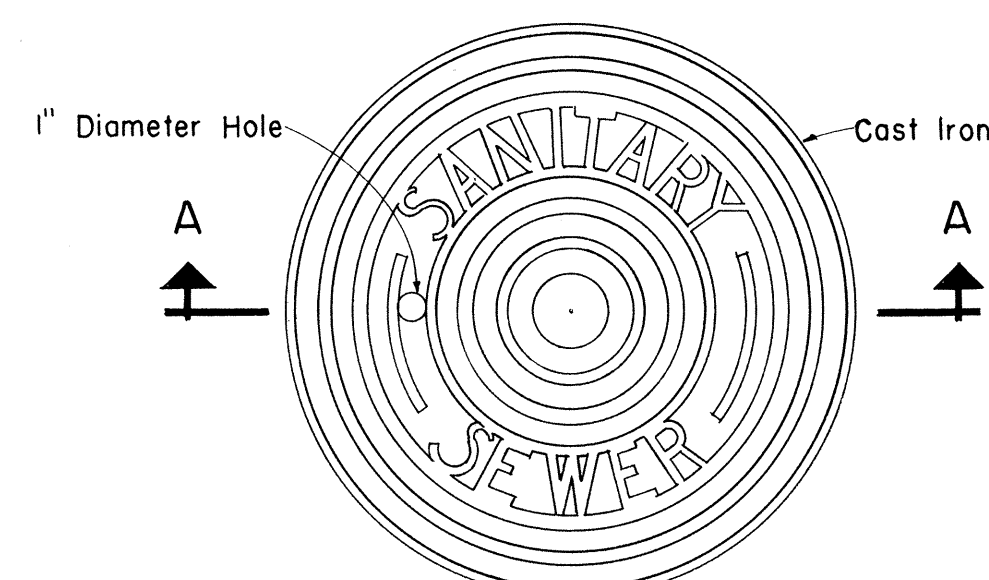
STANDARD DETAILS
SEWERS - DROP MANHOLE AND
BRICK MANHOLE DETAILS

Scales: As Noted Date: Aug., 1968

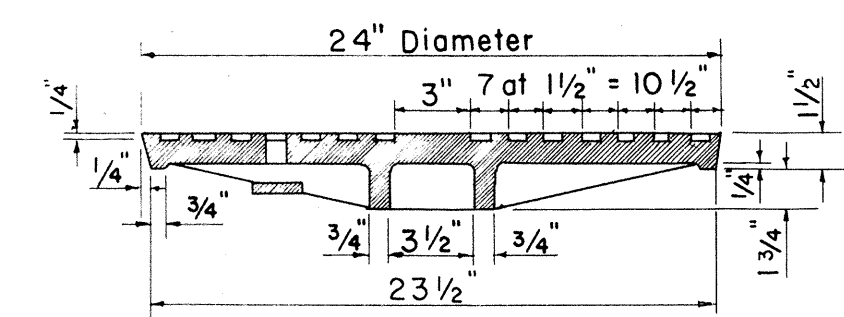
SHEET NO. 24 OF 15 SHEETS

Revised: 12-6-68

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-H-1(31):21 Unit 3	1968	25	47

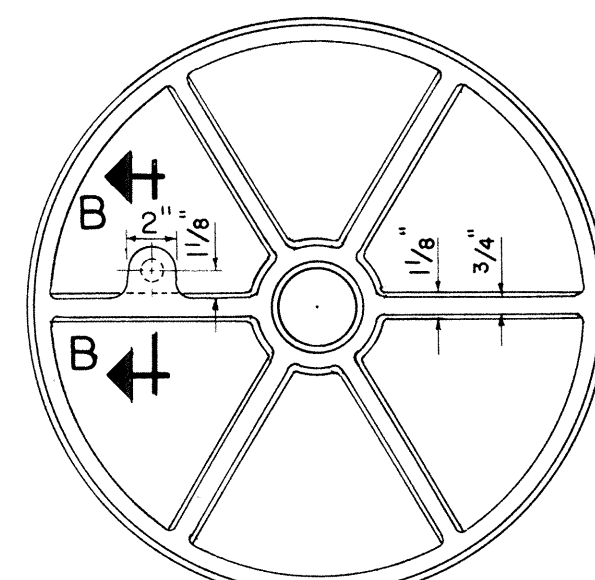


PLAN OF MANHOLE COVER
Scale: 1 1/2" = 1'-0"

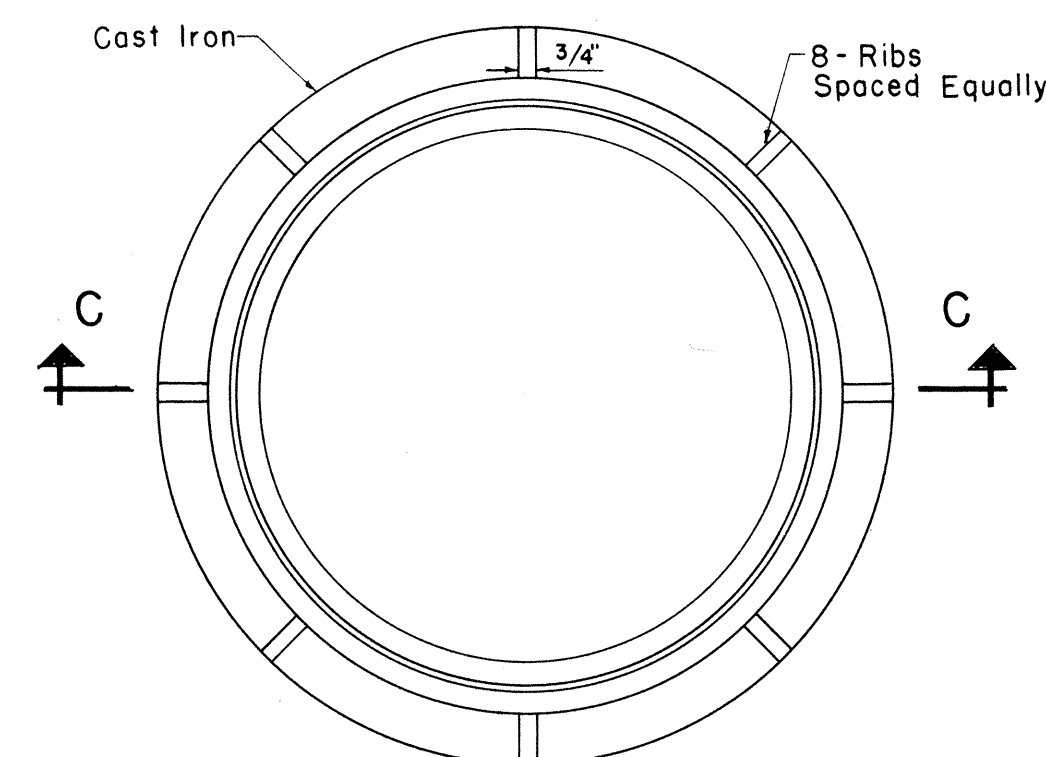


SECTION A-A
Scale: 1 1/2" = 1'-0"

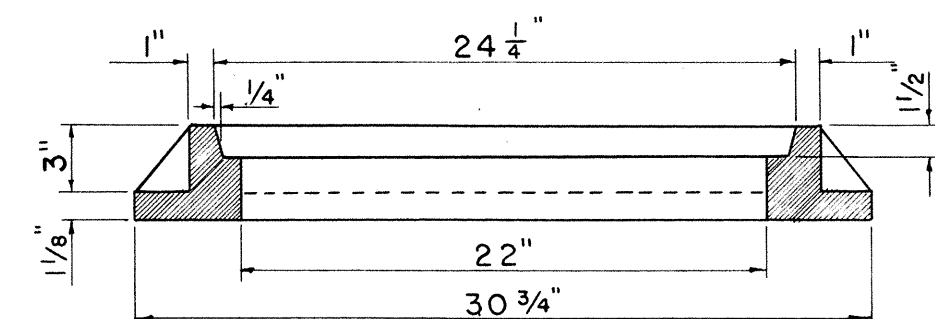
NOTE:
This cover is used with the "SA" or "SD" frame



BOTTOM VIEW OF COVER
Scale: 1 1/2" = 1'-0"



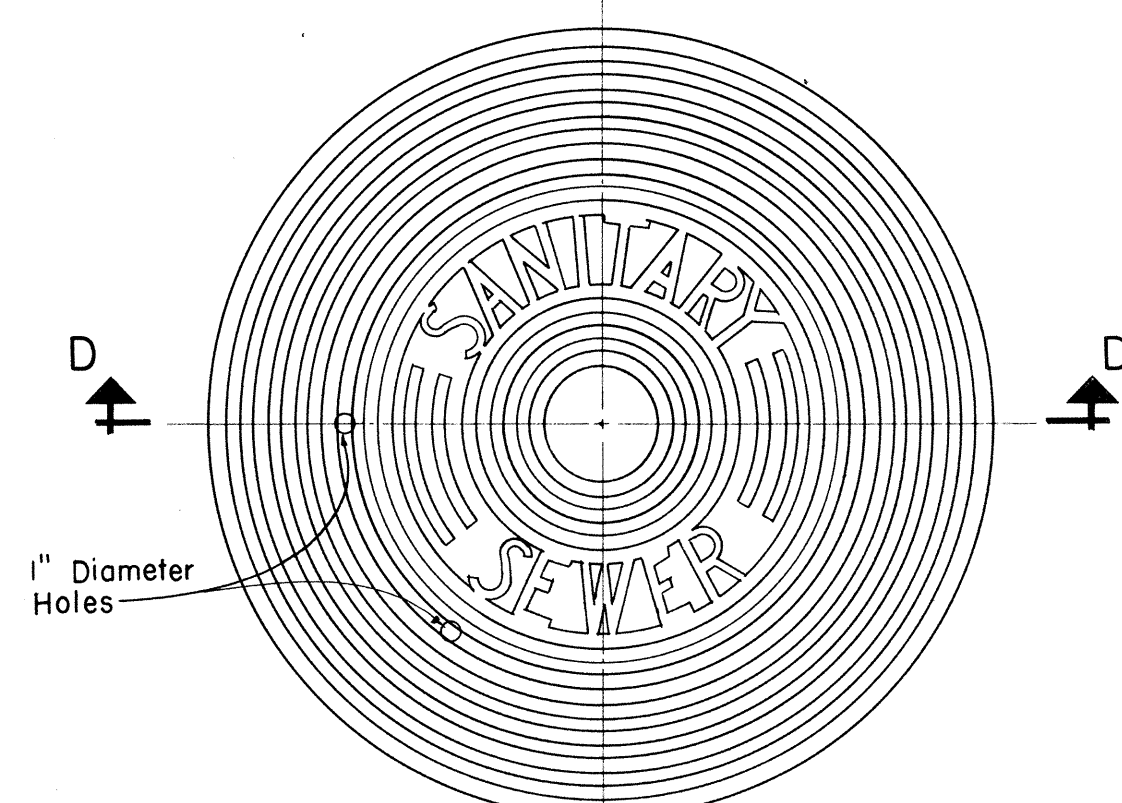
PLAN OF MANHOLE FRAME
Scale: 1 1/2" = 1'-0"



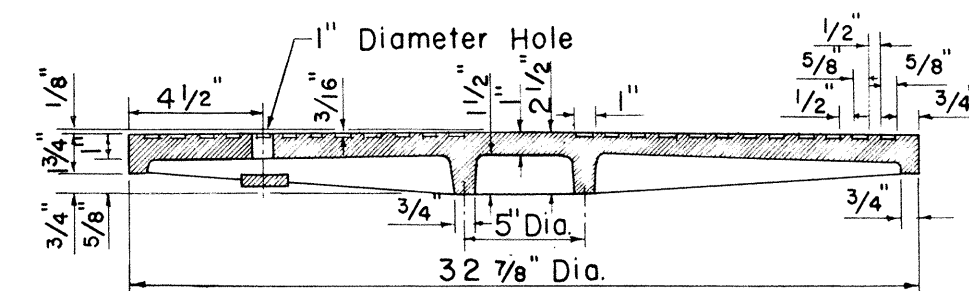
SECTION C-C
Scale: 1 1/2" = 1'-0"

TYPE "SA" SEWER MANHOLE FRAME AND COVER

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

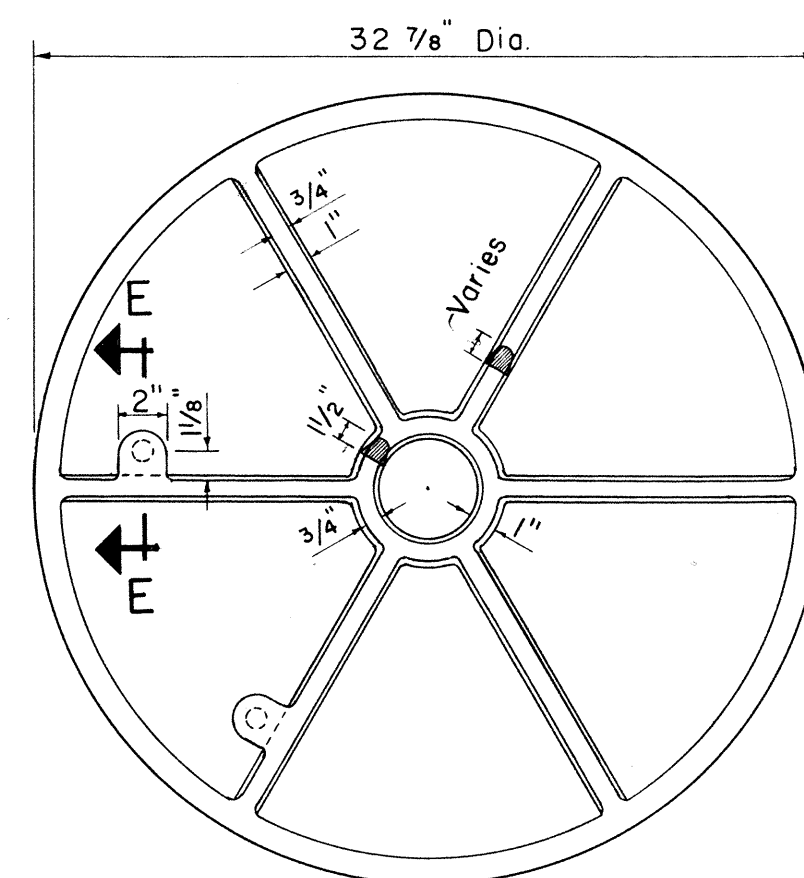


PLAN
SPECIAL MANHOLE COVER
Scale: 1 1/2" = 1'-0"

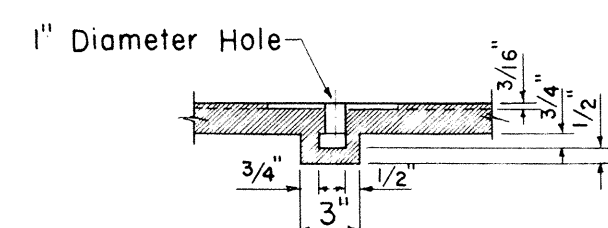


SECTION D-D
Scale: 1 1/2" = 1'-0"

Approx. Weight 260 Pounds



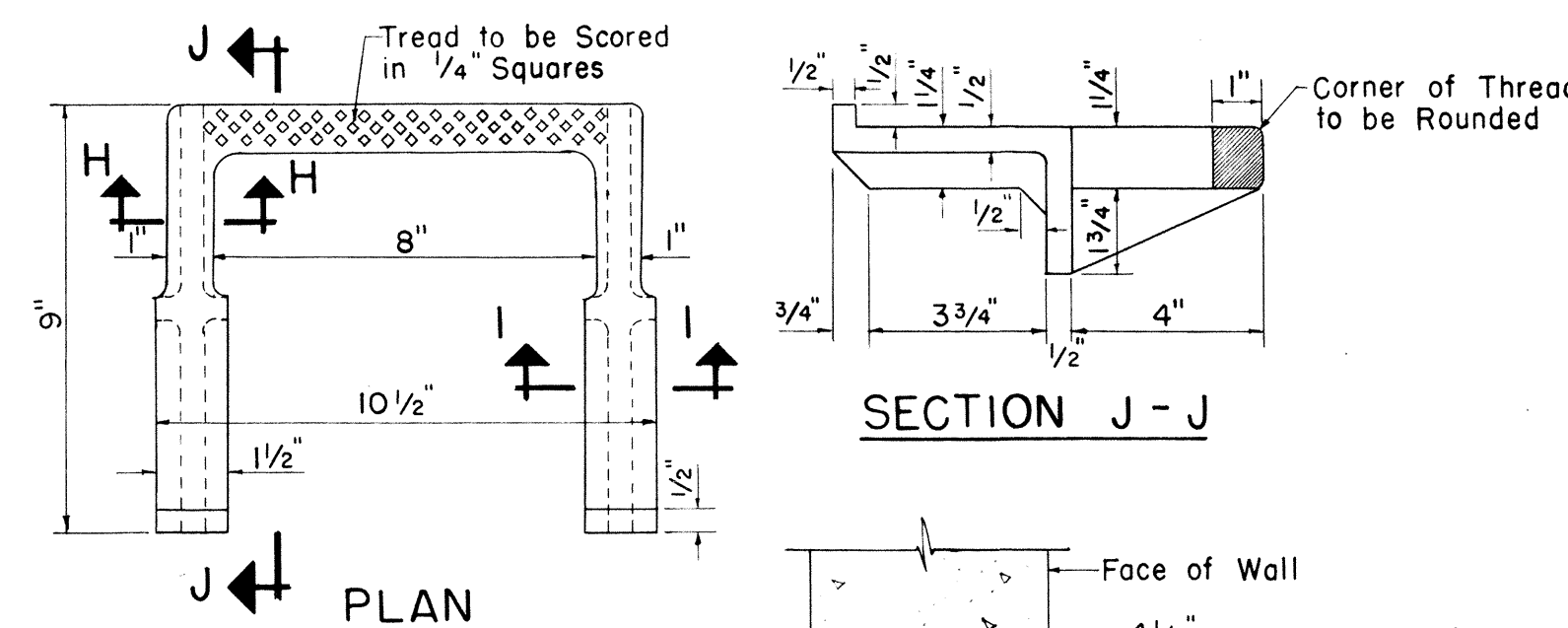
BOTTOM VIEW OF COVER
Scale: 1 1/2" = 1'-0"



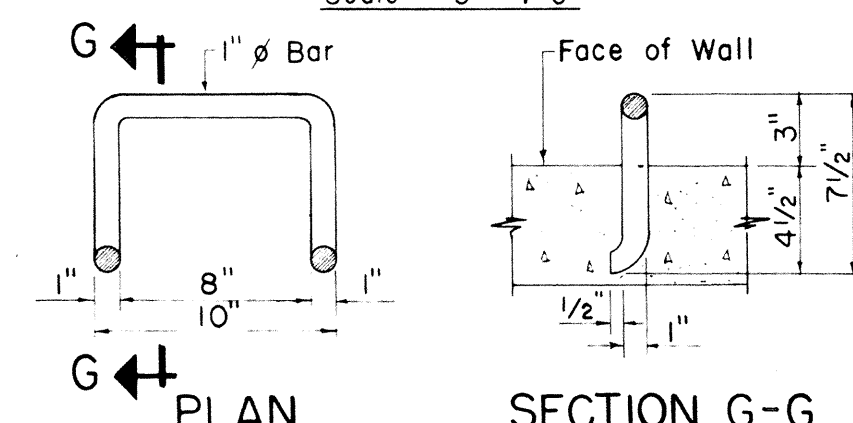
SECTION E-E
Scale: 1 1/2" = 1'-0"

TYPE "SB" SEWER MANHOLE FRAME AND COVER

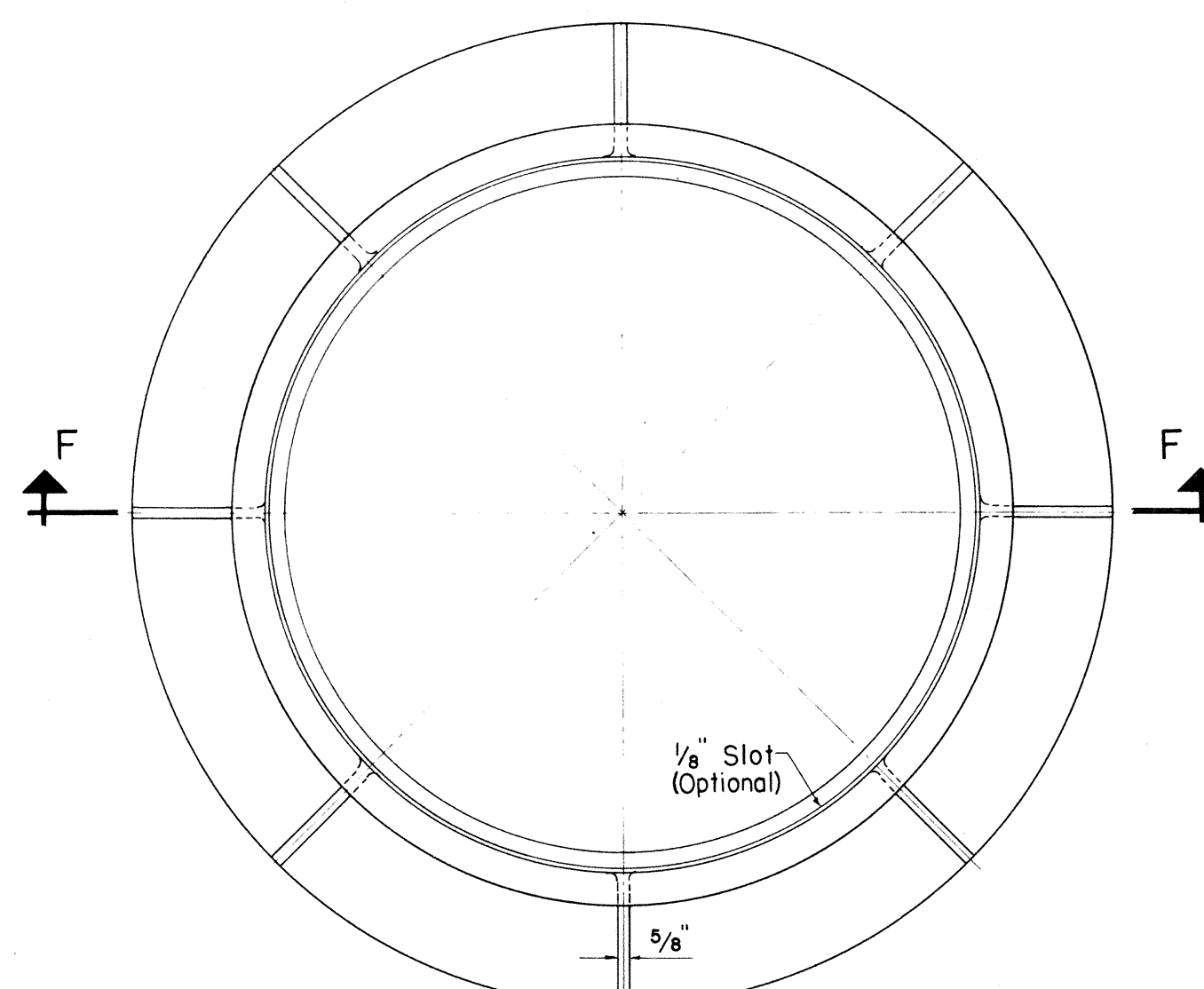
Scale: 1 1/2" = 1'-0"



PLAN
SECTION J-J
TYPE "SB" MANHOLE RUNGS (CAST IRON)
Scale: 3" = 1'-0"

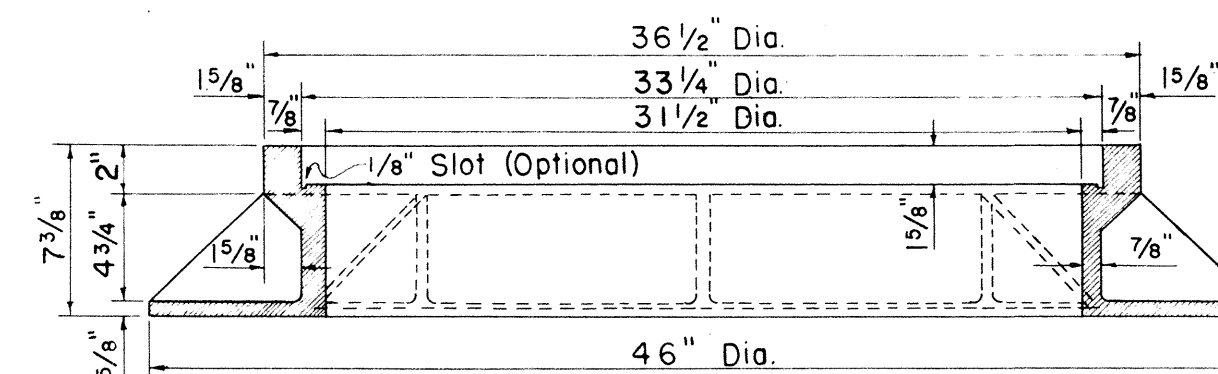


PLAN
SECTION G-G
TYPE "SA" MANHOLE RUNGS (WROUGHT IRON)
Scale: 1 1/2" = 1'-0"

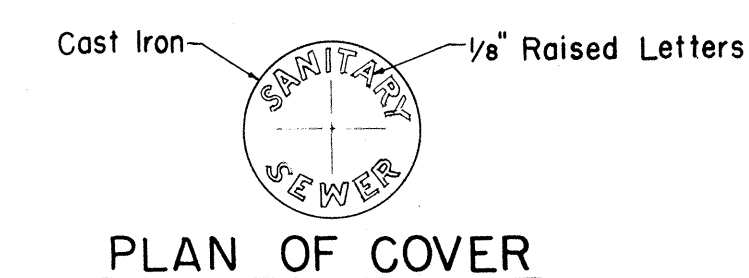


PLAN
SPECIAL MANHOLE FRAME
Scale: 1 1/2" = 1'-0"

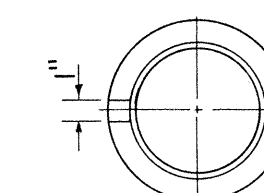
Approx. Weight 437 Pounds



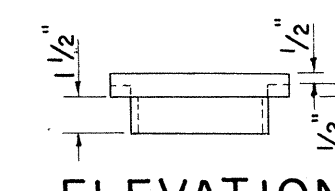
SECTION F-F
Scale: 1 1/2" = 1'-0"



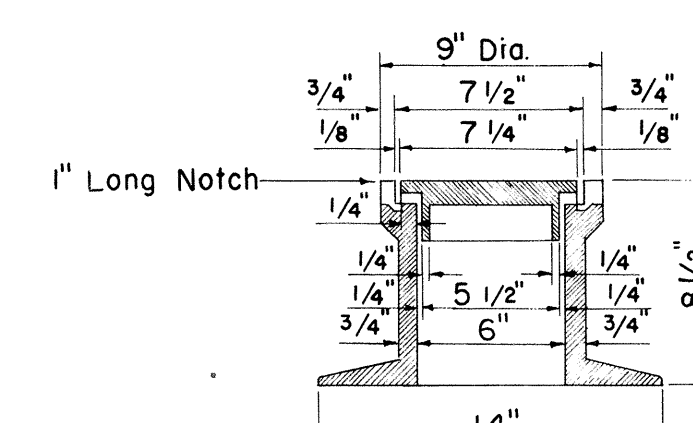
PLAN OF COVER



BOTTOM OF COVER



ELEVATION



SECTION

DROP MANHOLE CHIMNEY CASTINGS

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

APPROVED:

SEWER SYSTEM DIRECTOR,
DIVISION OF SEWERS
DATE 8/22/68

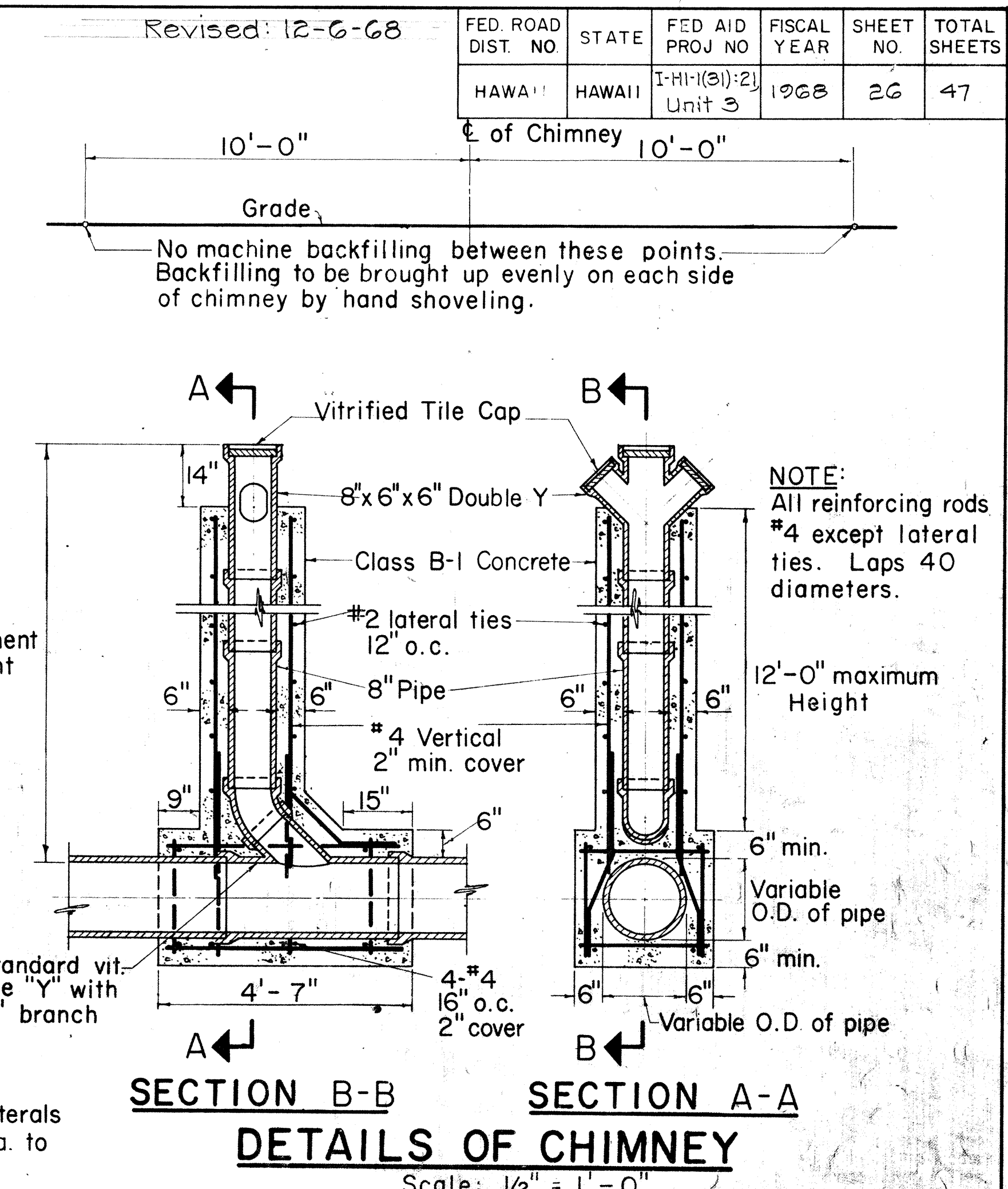
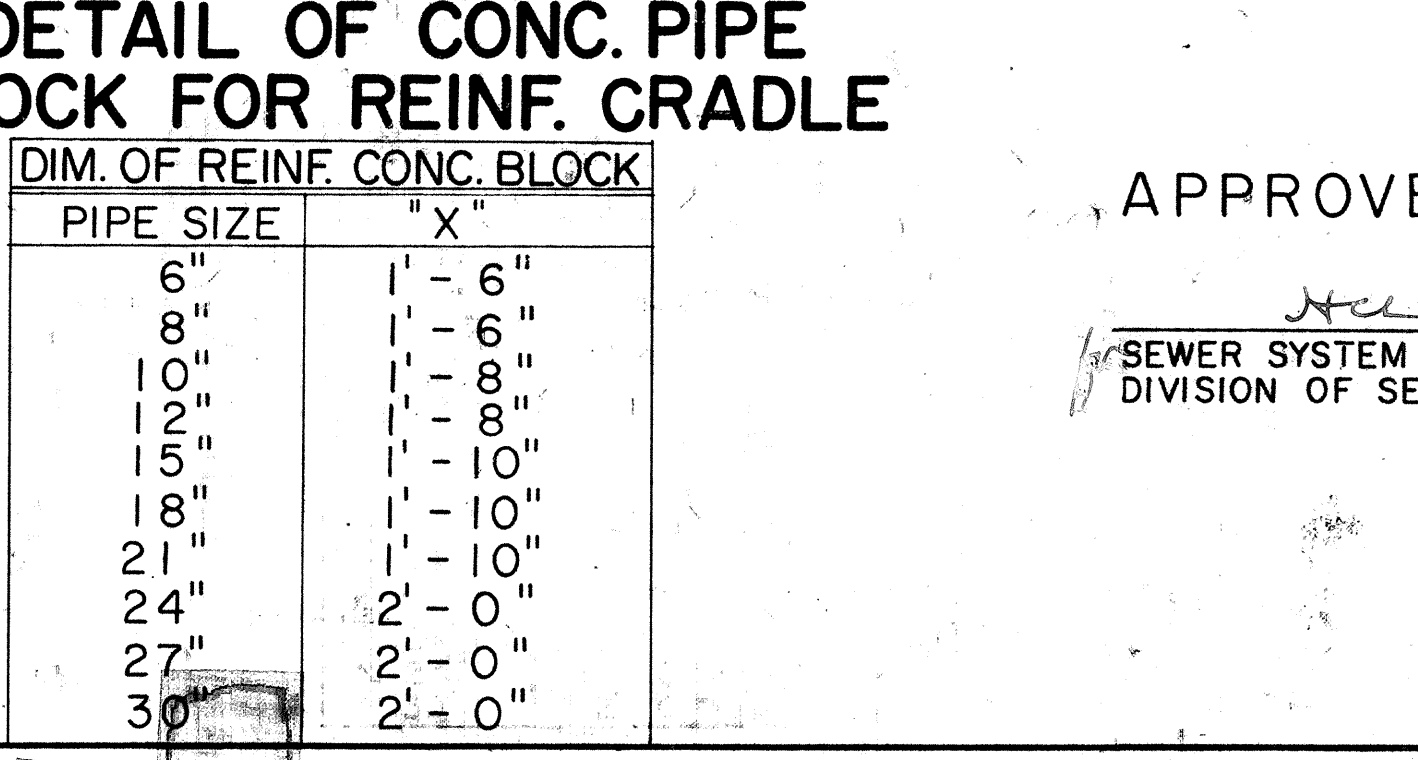
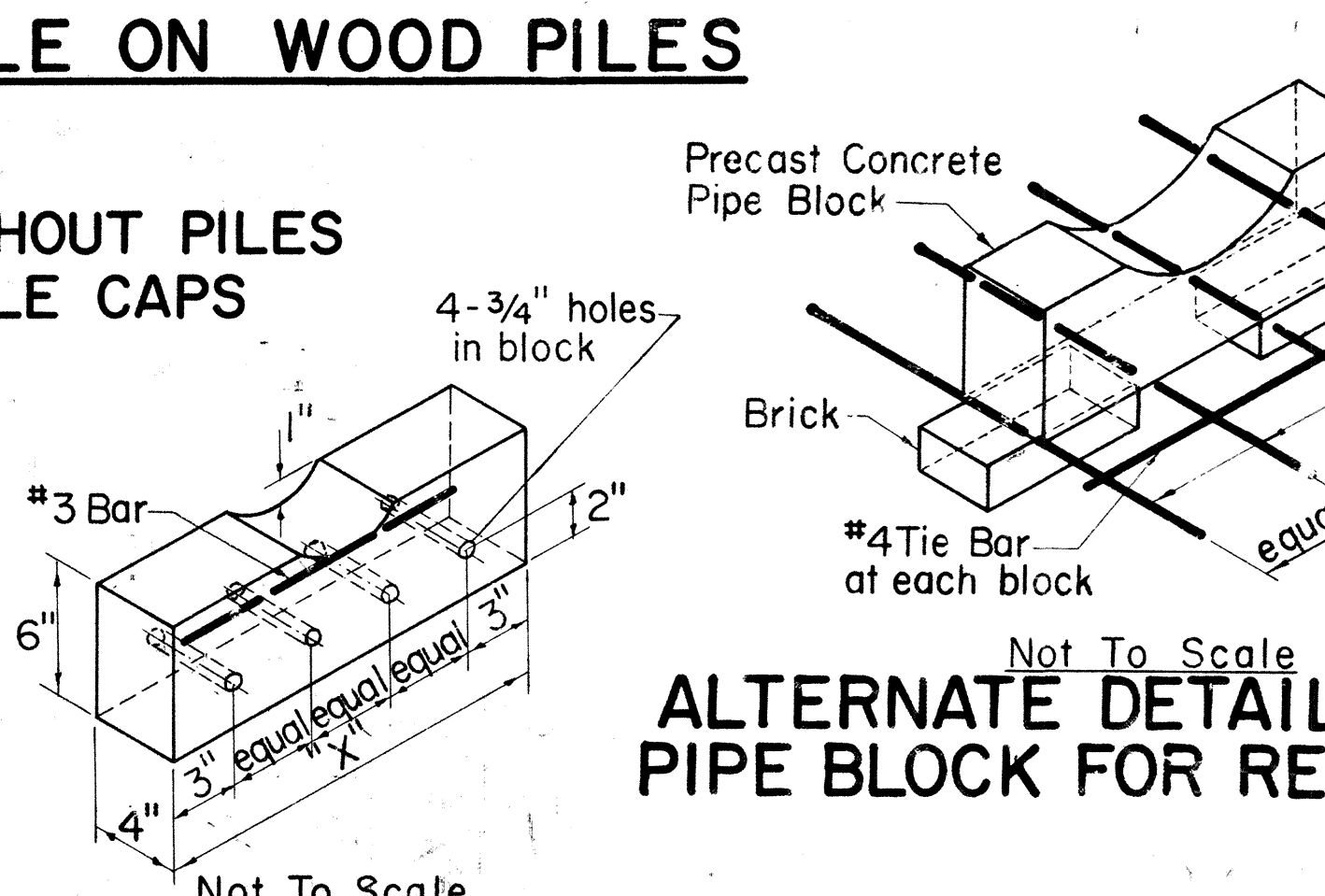
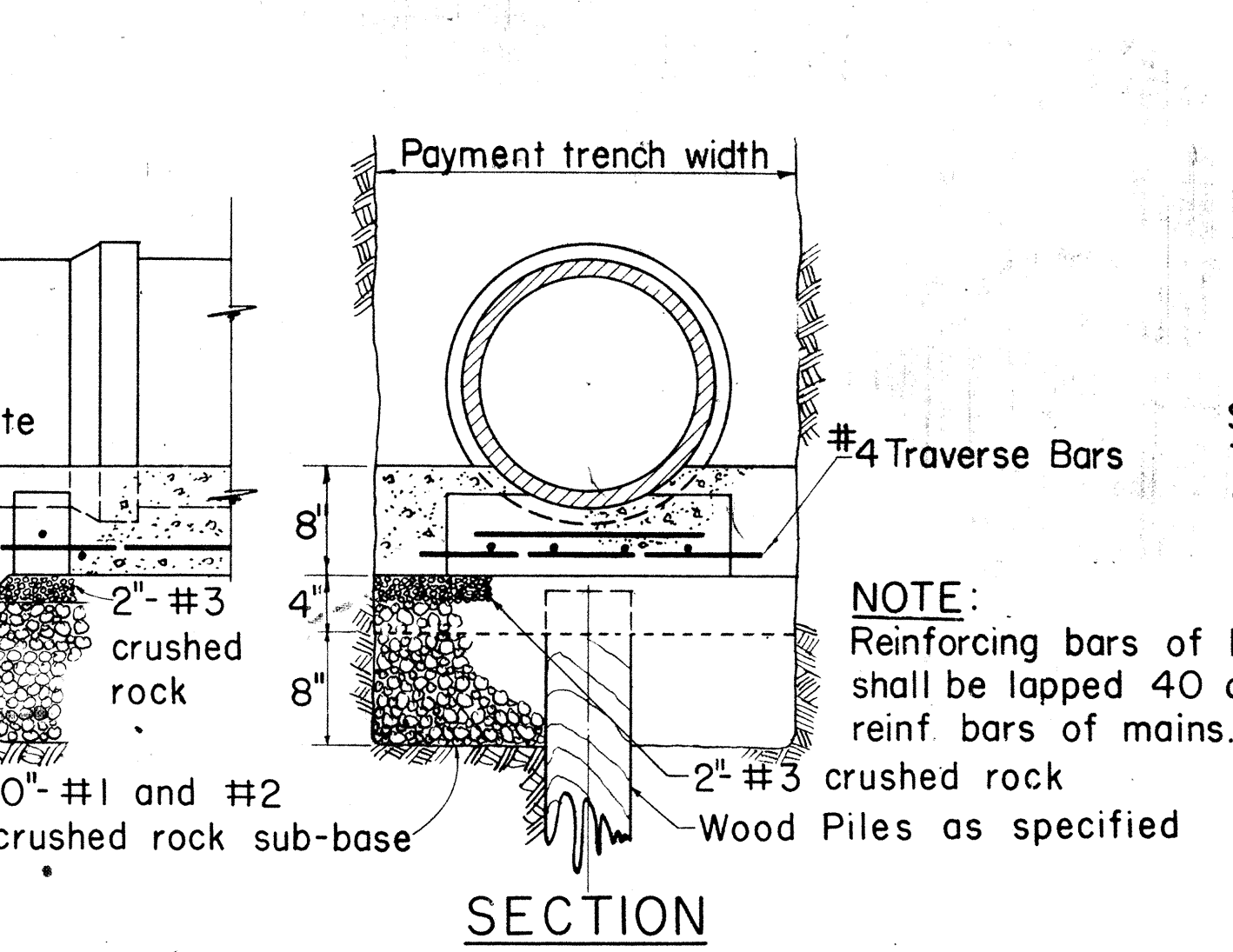
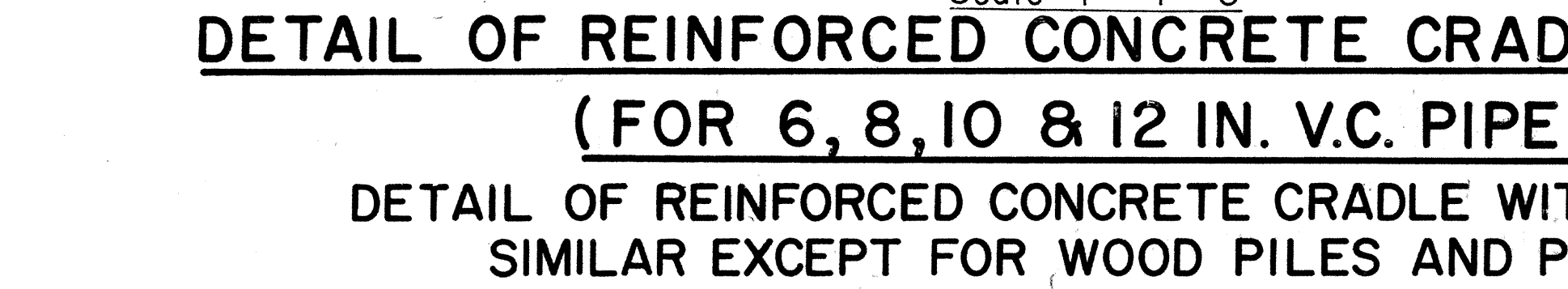
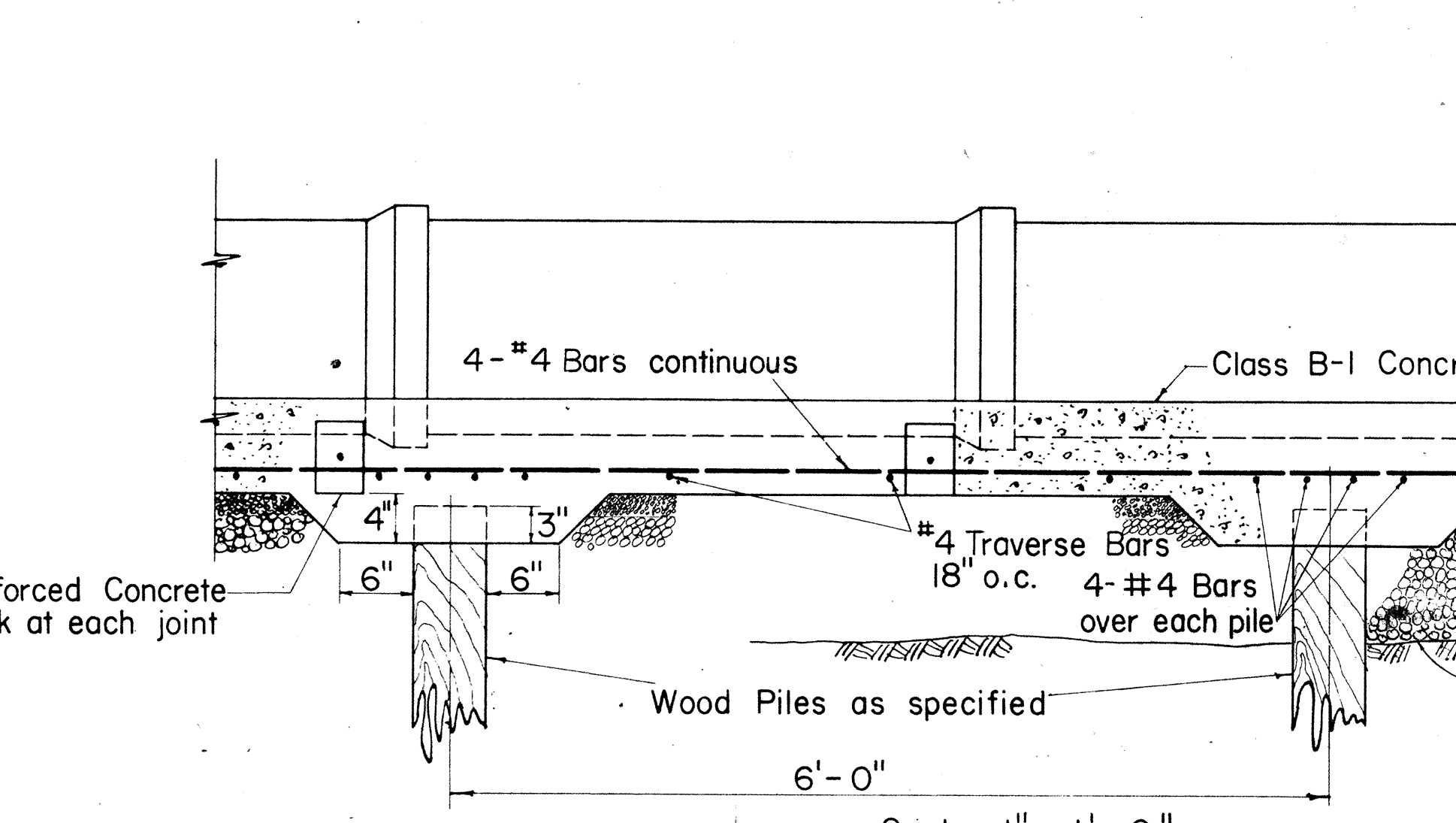
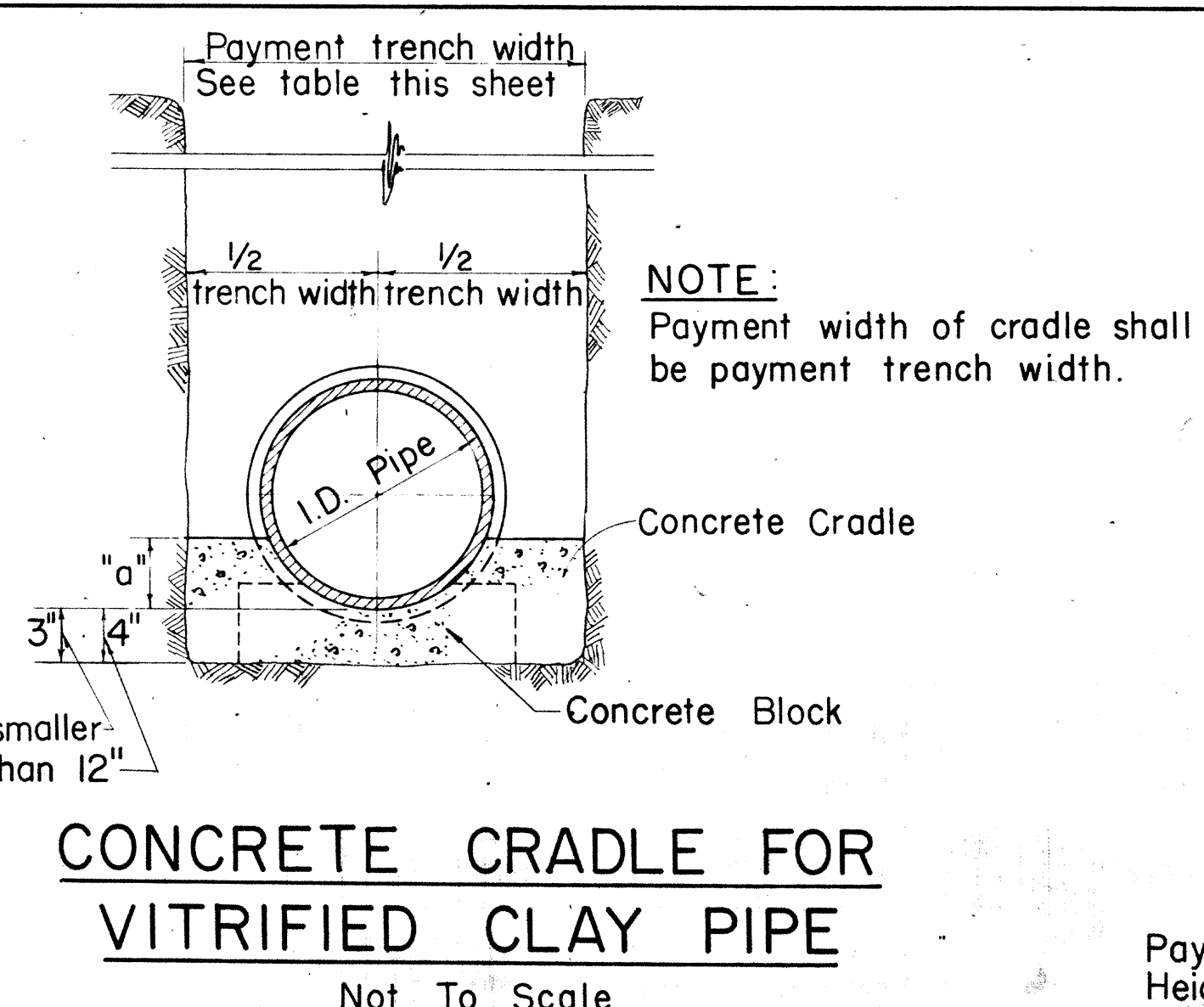
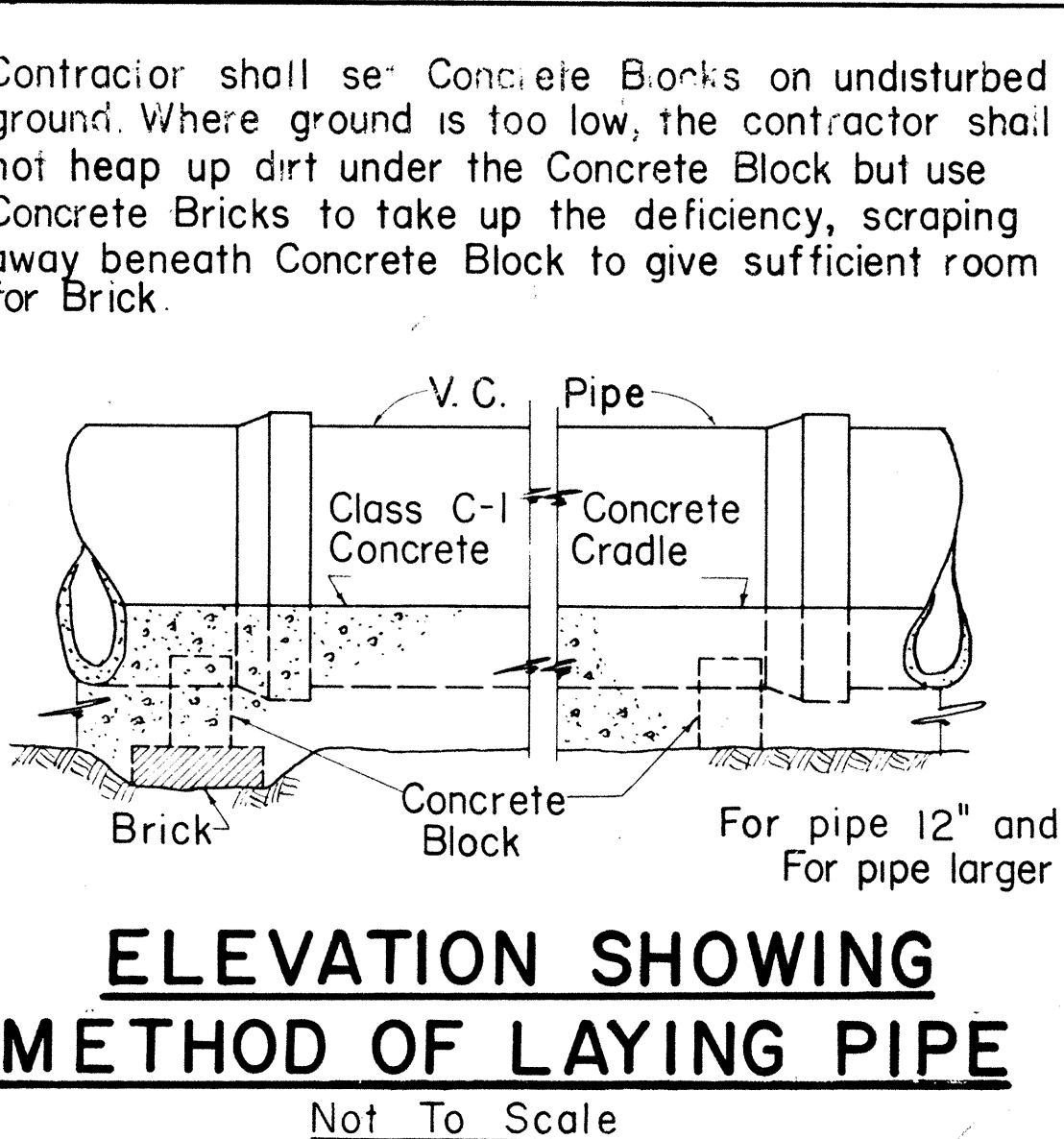
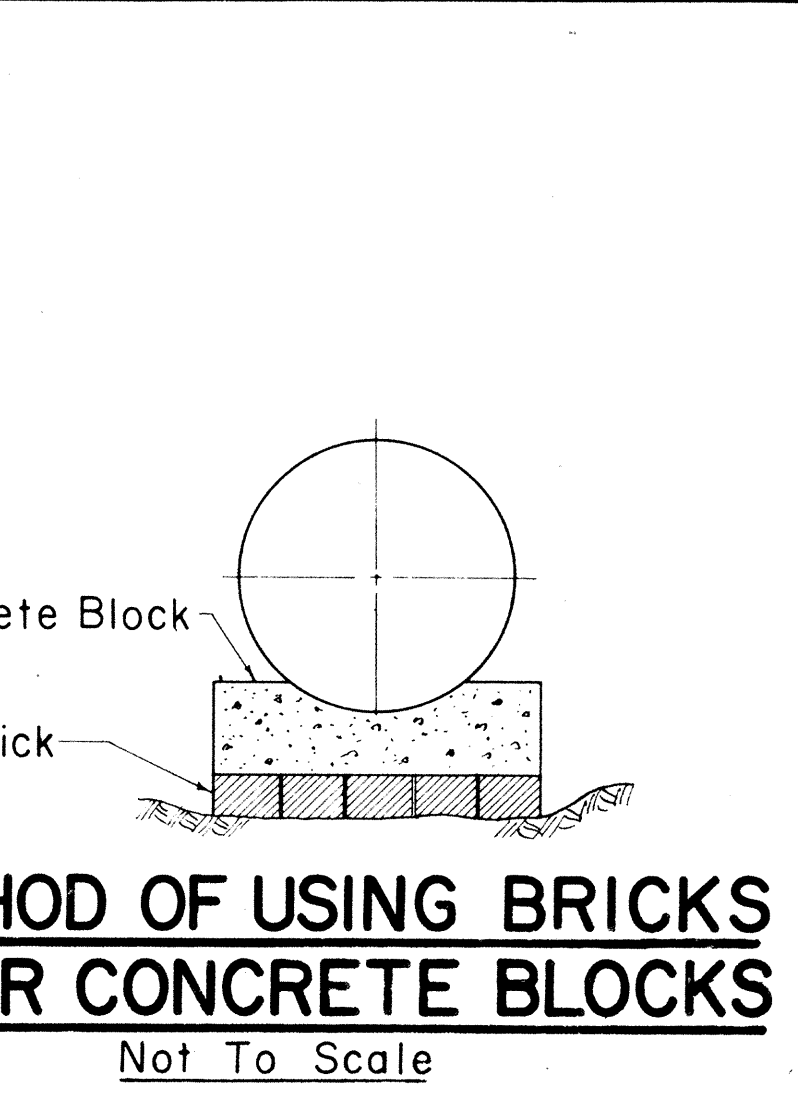
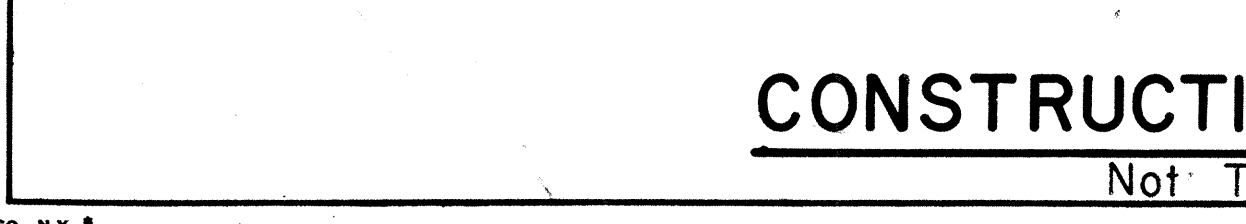
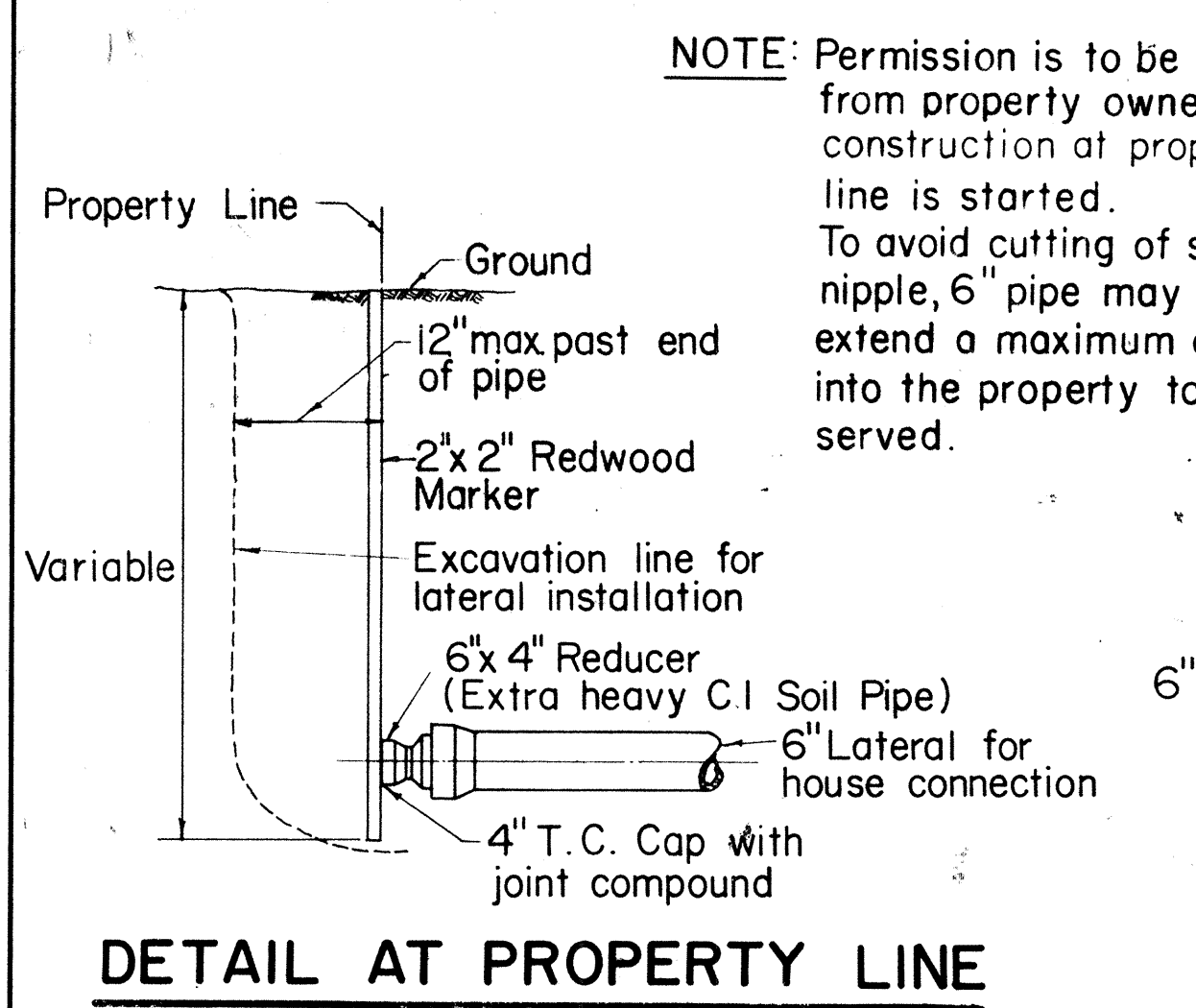
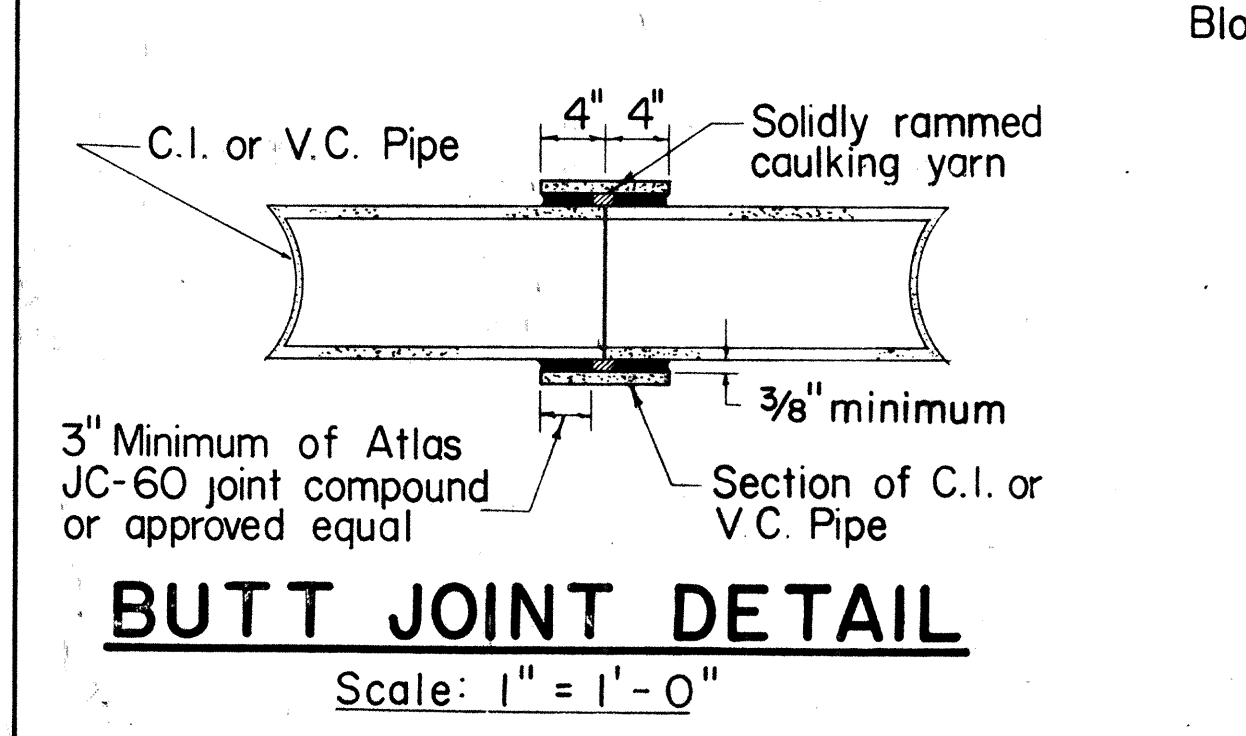
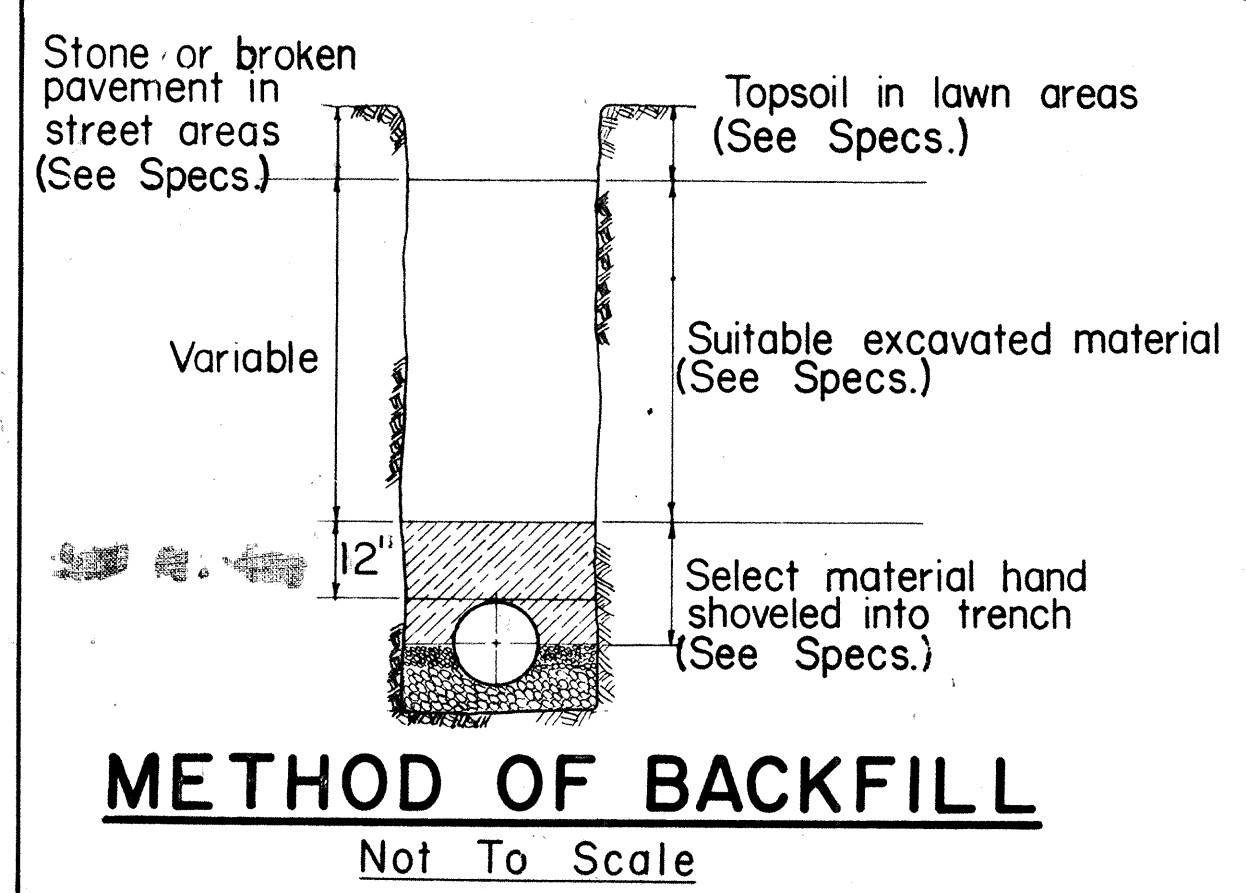
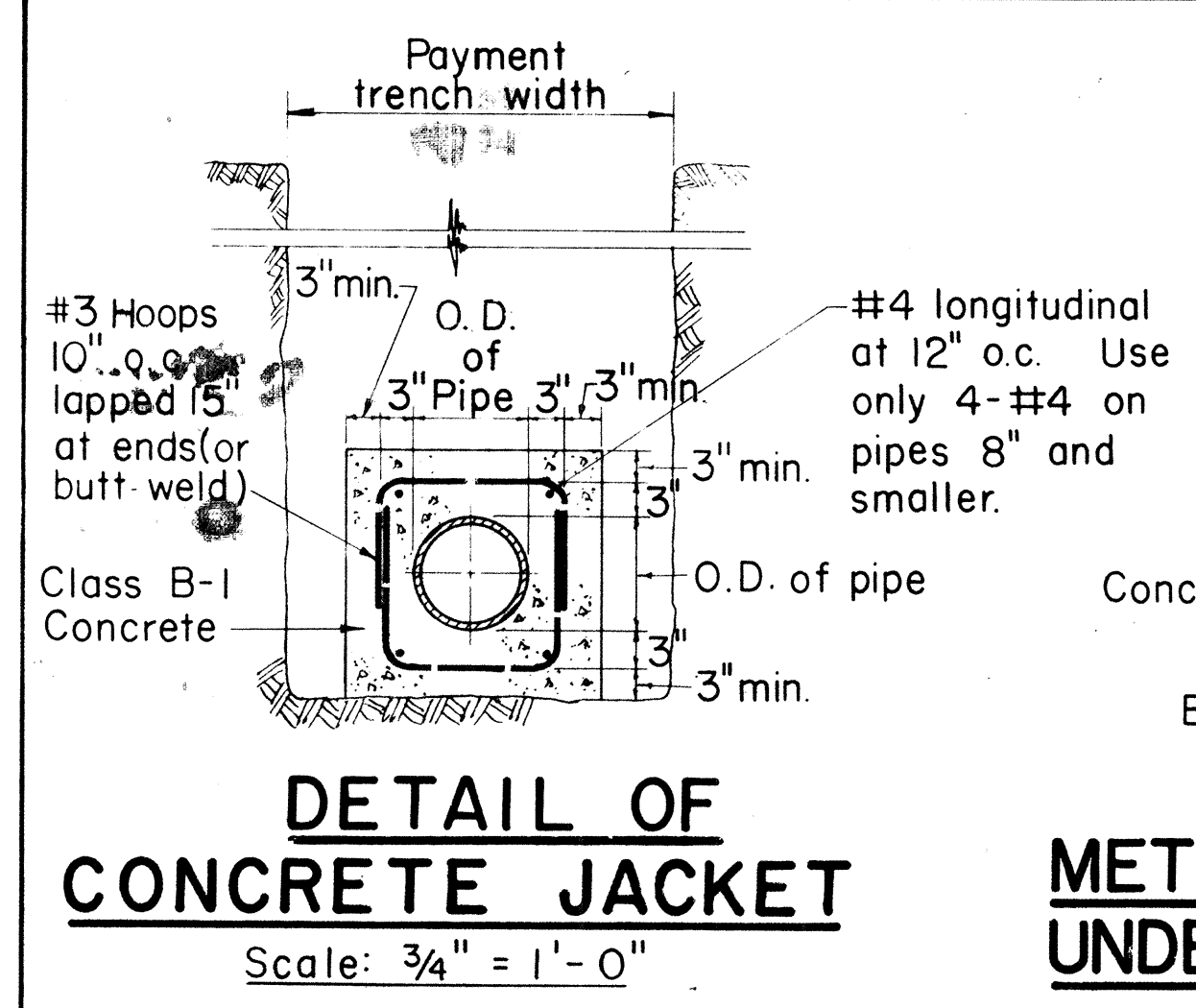
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DIVISION OF SEWERS
CITY & COUNTY OF HONOLULU
STANDARD DETAILS
SEWERS-MANHOLE RUNGS,
CHIMNEY CASTINGS AND
FRAME AND COVER DETAILS

Scales: As Noted

Date: Aug., 1968

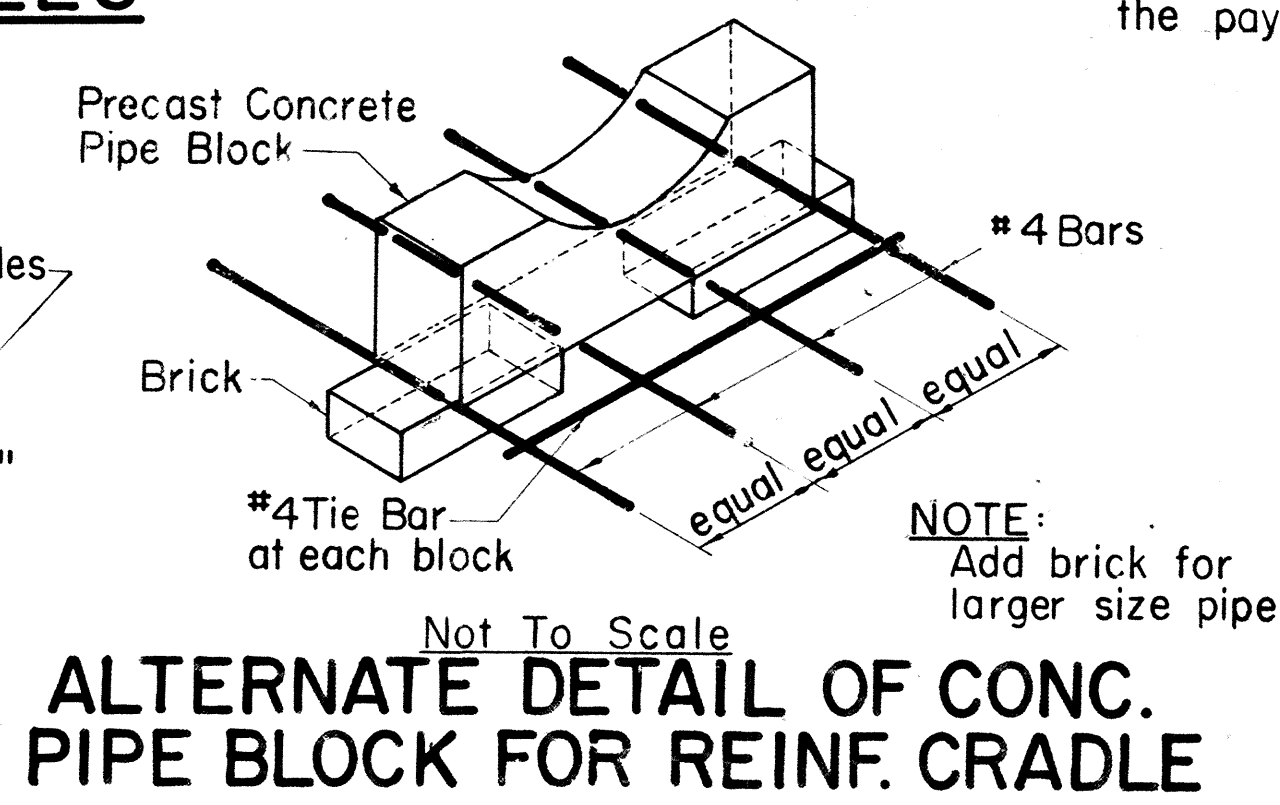
SHEET NO. 10 OF 15 SHEETS

25



Payment quantities for trench excavation, crushed rock fill, crushed rock cradle, and crushed rock sub-base shall be computed using payment trench widths as shown in the table of "Trench Widths". No payment shall be made for excess quantities resulting from trench widths greater than the payment trench widths shown.

VITRIFIED CLAY PIPE TABLE				
TRENCH WIDTHS		DIM. OF CONC. CRADLE		
PIPE SIZE	PAY. WIDTH	PIPE SIZE	"a"	WIDTH
6"	24"	6"	3"	24"
8"	24"	8"	3"	24"
10"	24"	10"	3"	24"
12"	30"	12"	3"	30"
15"	38"	15"	4"	38"
18"	41"	18"	5"	41"
21"	45"	21"	5"	45"
24"	50"	24"	6"	50"
27"	53"	27"	7"	53"
30"	57"	30"	7"	57"



APPROVED: _____
SEWER SYSTEM DIRECTOR,
DIVISION OF SEWERS
DATE: 8/22/68

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 DIVISION OF SEWERS
 CITY & COUNTY OF HONOLULU

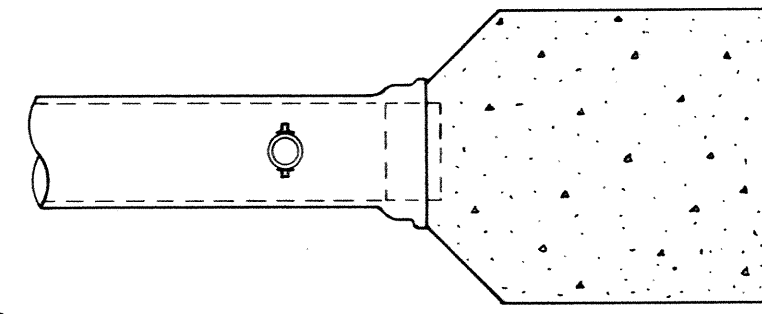
STANDARD DETAILS
 SEWERS - CONCRETE JACKET
 & MISCELLANEOUS DETAILS

Scales: As Noted
 Date: Aug., 1968
 SHEET NO. 11 OF 15 SHEETS

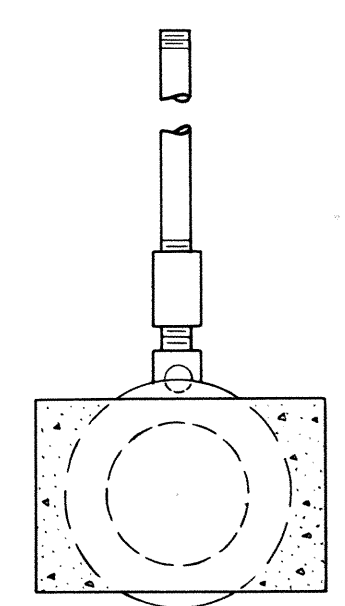
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-(31)-21 Unit 3	1968	27	47

Revised: 12-6-68

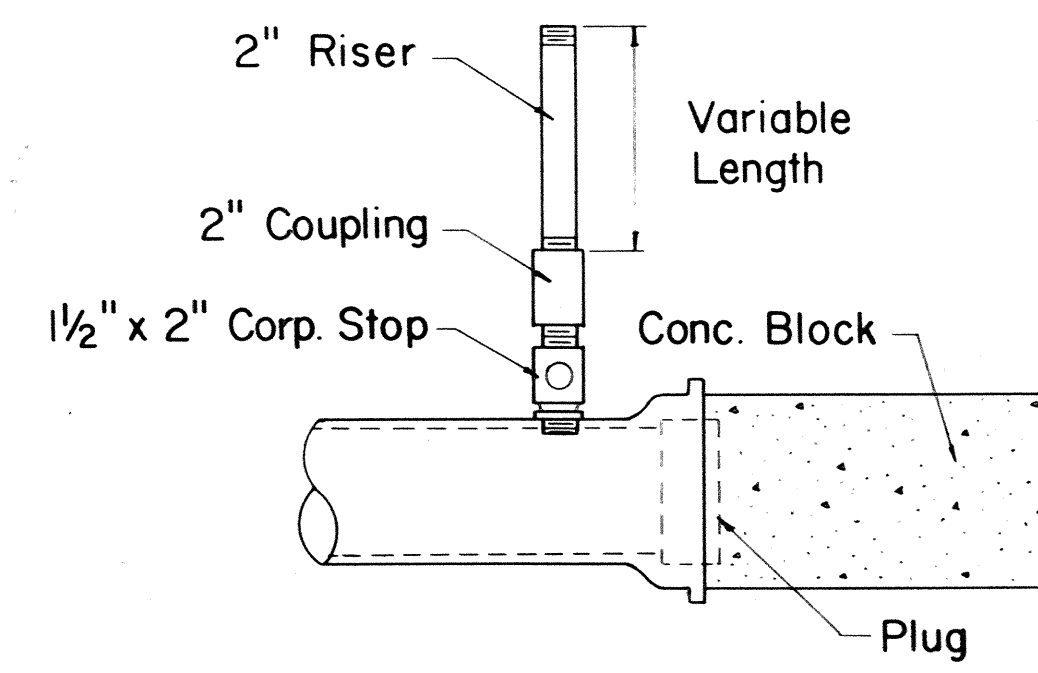
NOTE:
Contractor to furnish 1 1/2" brass plug (Tapered thread) to replace corporation stop upon completion of chlorination.



TOP VIEW

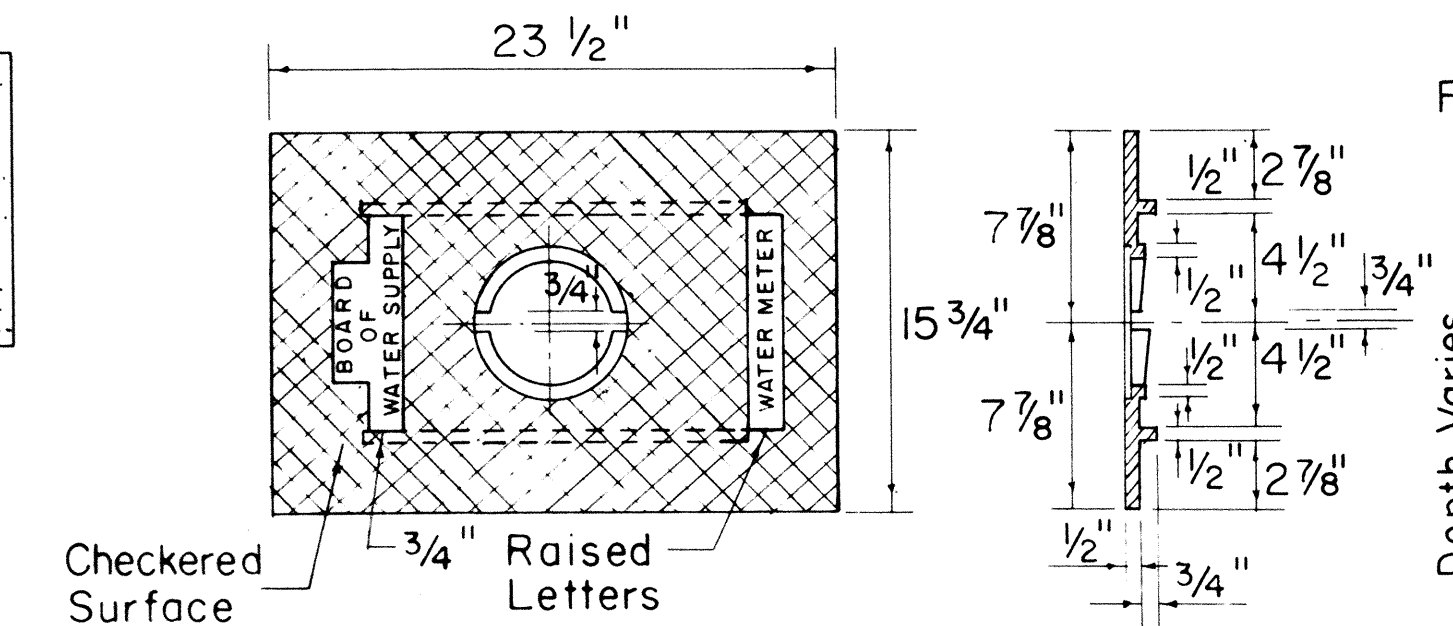


END VIEW

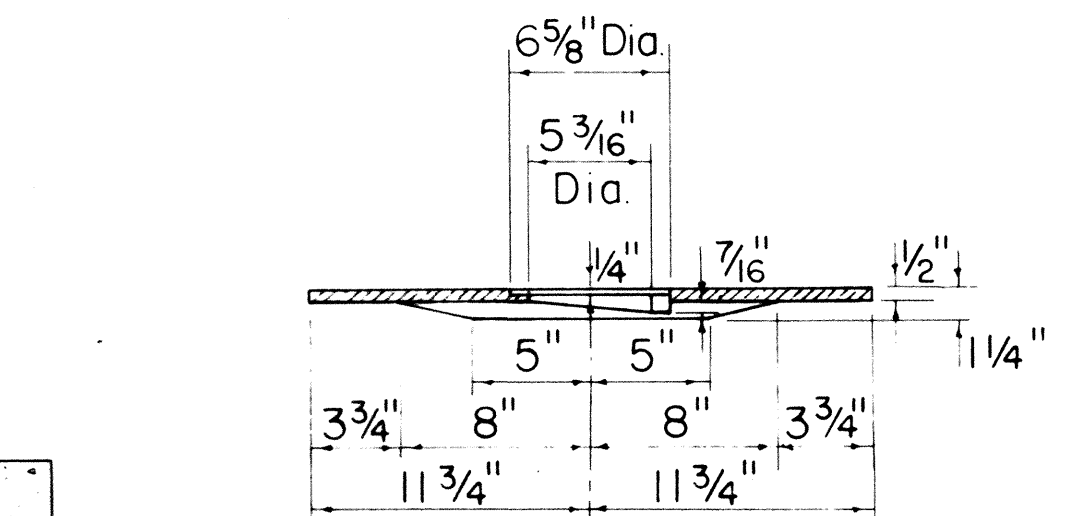


SIDE VIEW

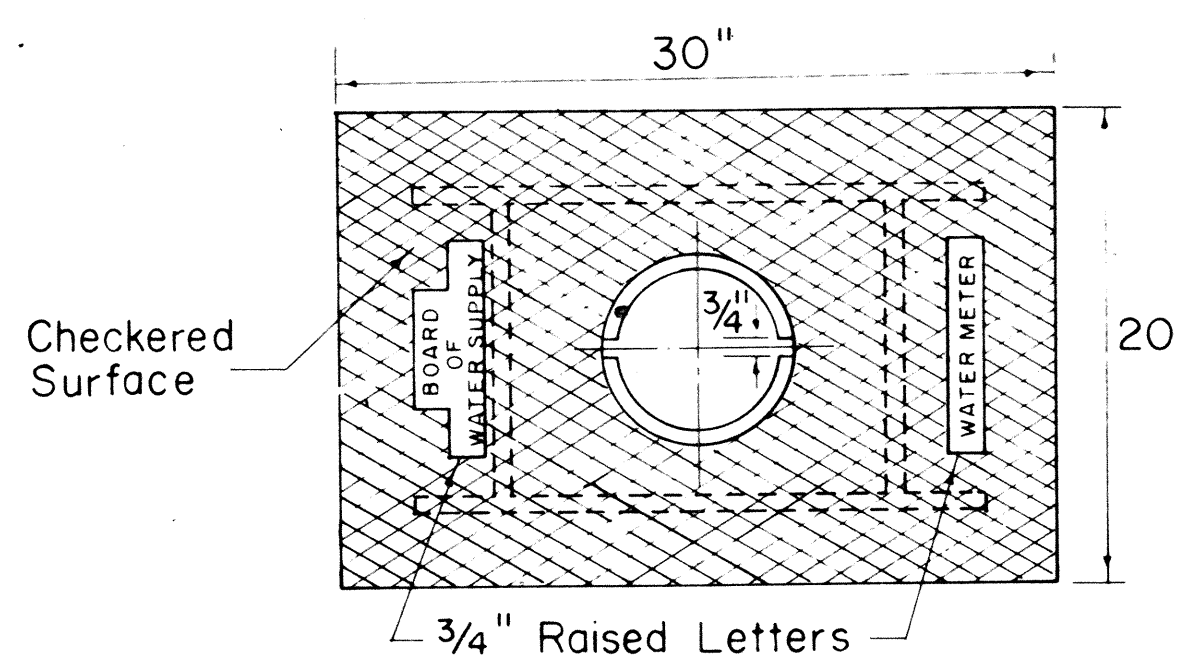
DETAIL OF TEMPORARY 2" CLEANOUT
Not to Scale



COVER PLATE

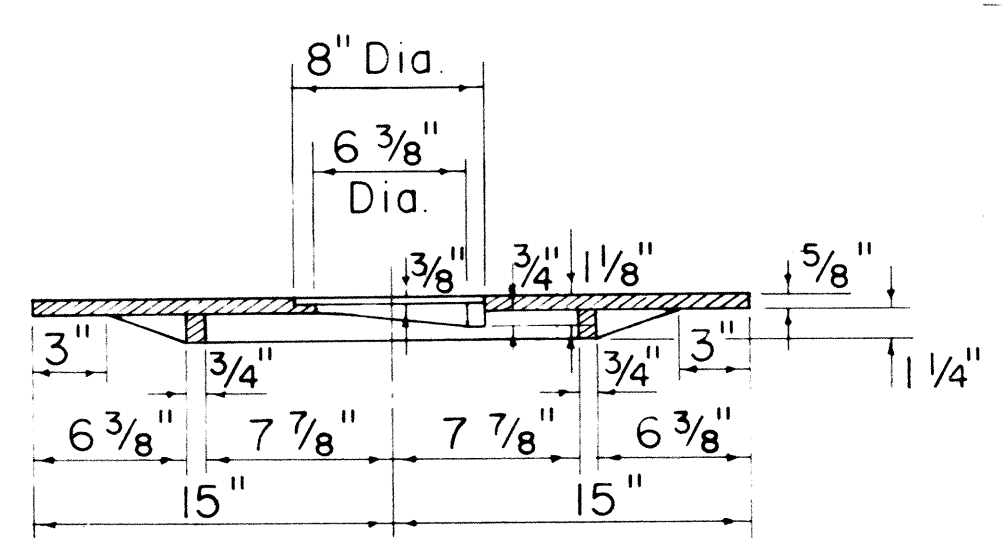


CAST IRON FRAME AND PLATE TYPE II
Scale: 1 1/2" = 1'-0"

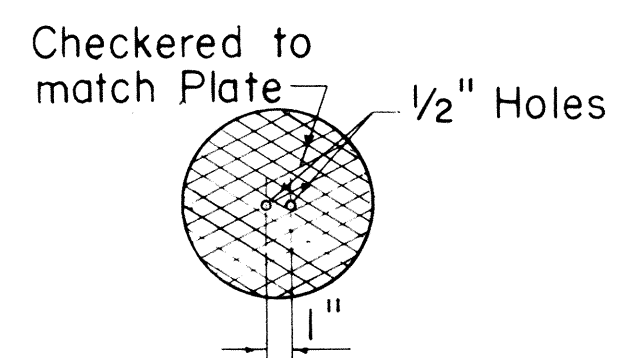


COVER PLATE

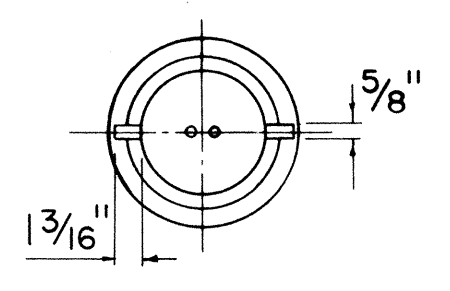
CAST IRON FRAME, PLATE AND COVER TYPE III
Scale: 1 1/2" = 1'-0"



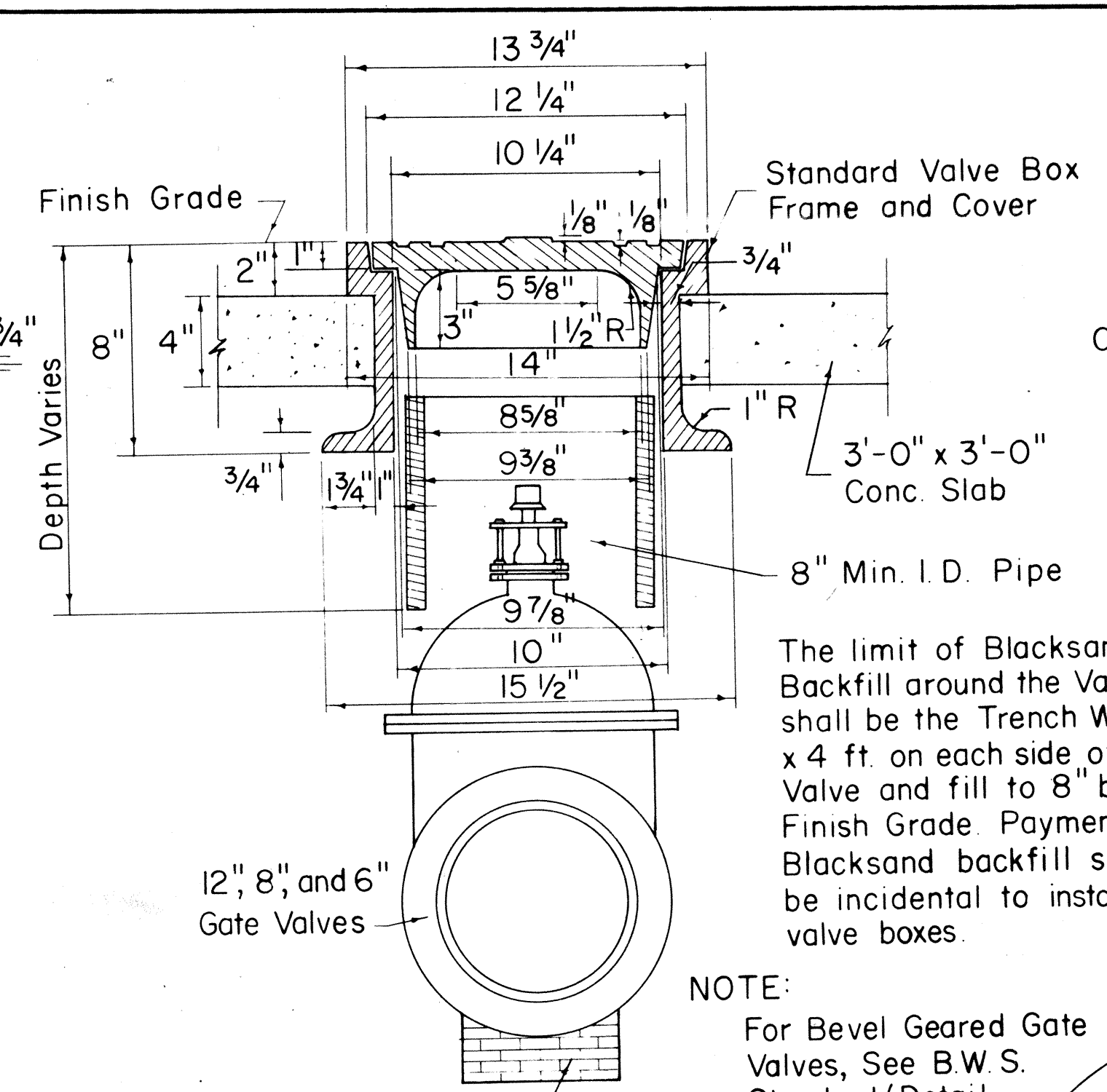
FRAME



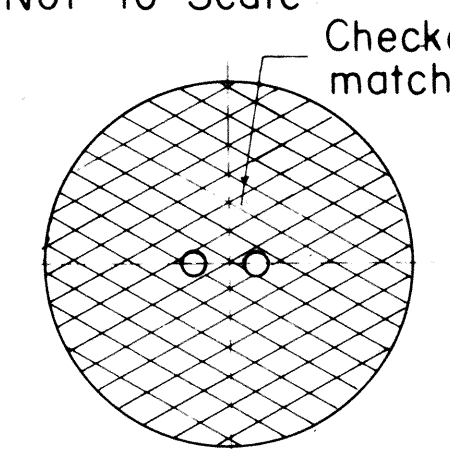
READING COVER



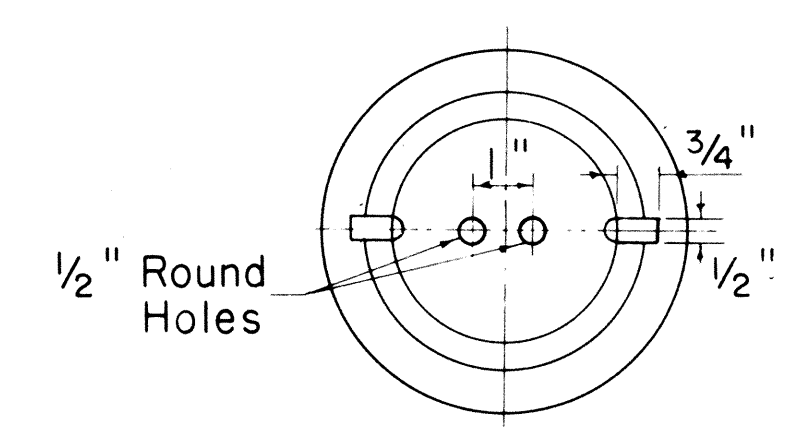
CAST IRON COVER FOR TYPE II FRAME
Not to Scale



INSTALLATION OF VALVE BOX FOR GATE VALVES
Not to Scale

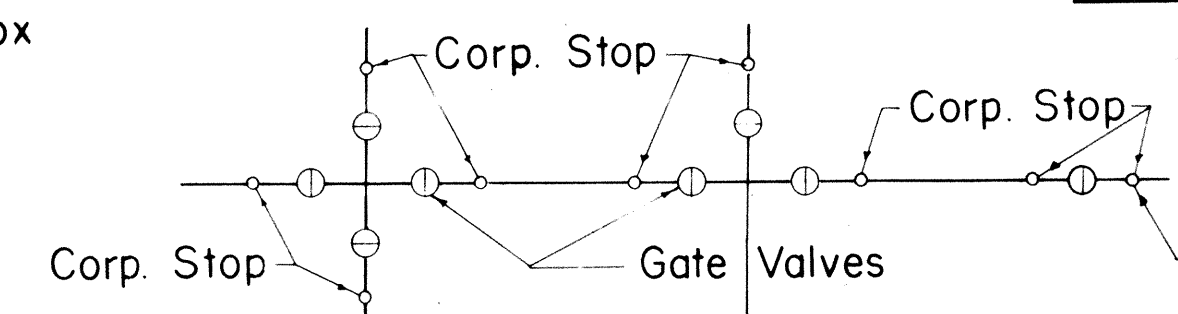


CAST IRON FRAME AND COVER
Scale: 3" = 1'-0"

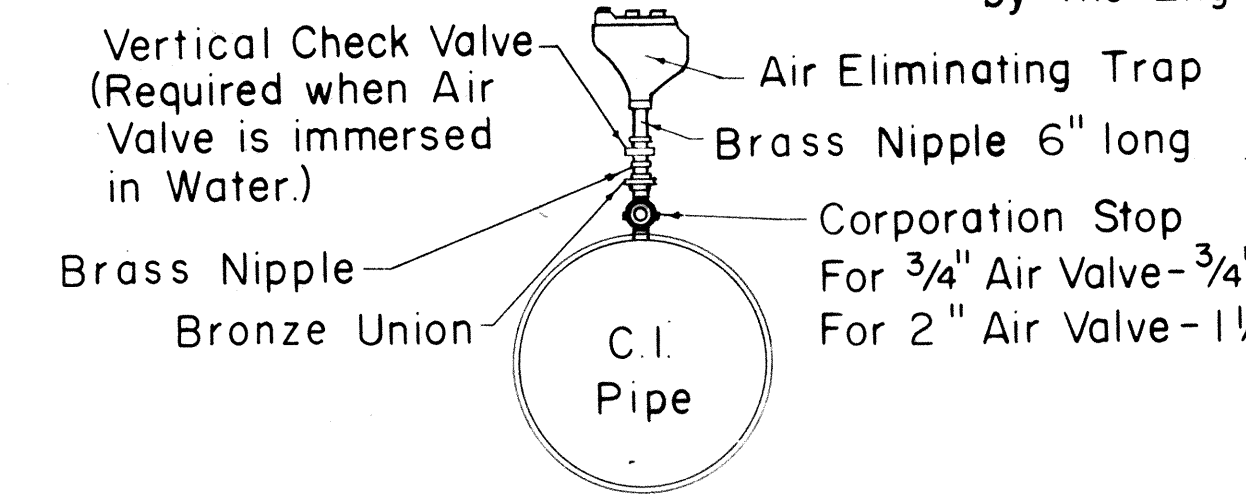


READING COVER

CHECKERED PATTERN



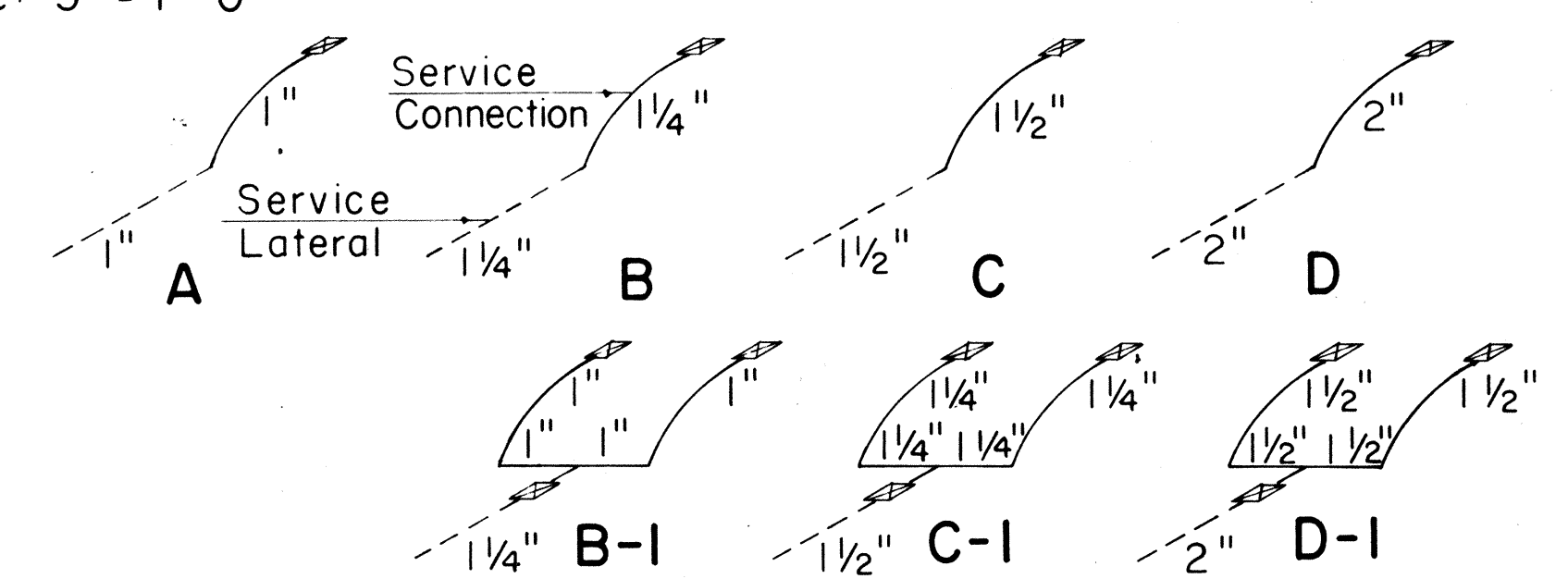
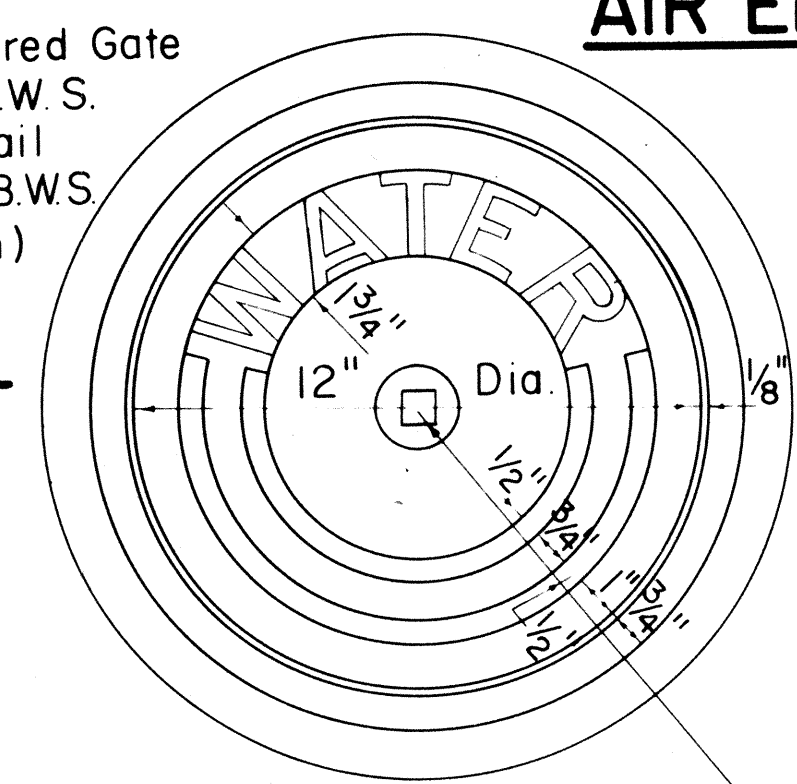
CORP. STOP LAYOUT
Not to Scale



DETAIL OF CONNECTION FOR AIR ELIMINATING TRAP
Not to Scale

Offset word "WATER" 1 3/4" high, 1/8" deep

NOTE:
All castings shall be made accurately to the dimensions shown. Seat and Cover shall be ground where necessary to secure flat and true surfaces. The Cover shall not rattle in any position.
Minor changes in dimensions may be made to suit foundry conditions provided such changes are approved by the Board of Water Supply.

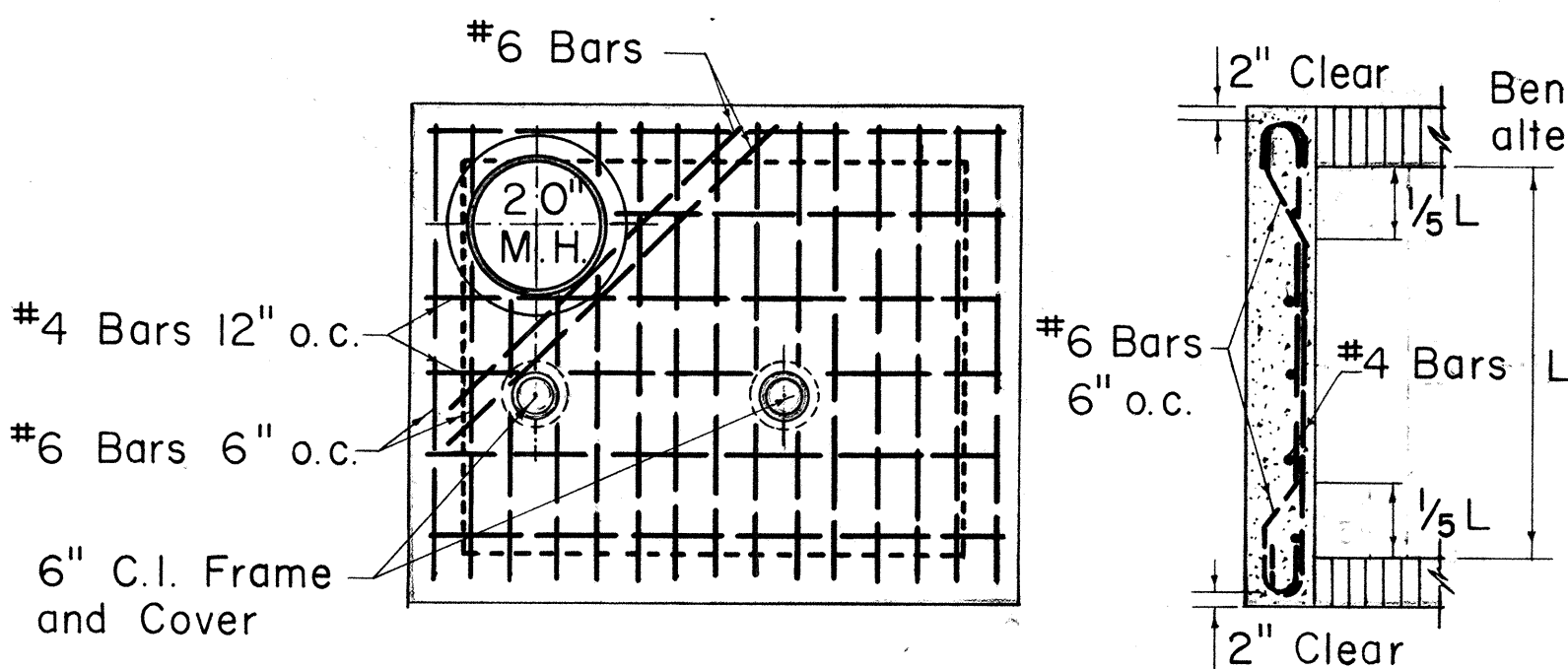


TYPICAL LAYOUT OF SERVICE LATERALS AND CONNECTIONS
Not to Scale

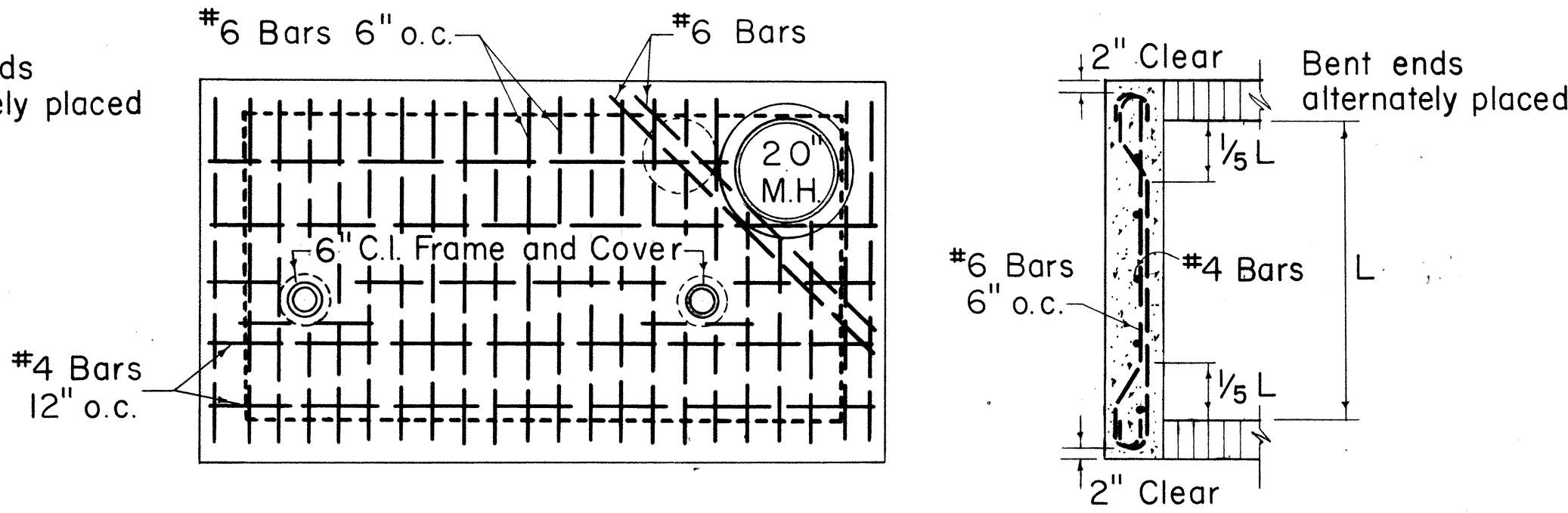
APPROVED:
[Signature]
CHIEF, ENGINEERING DIVISION
BOARD OF WATER SUPPLY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU
Scale: As Noted
Date Aug., 1968

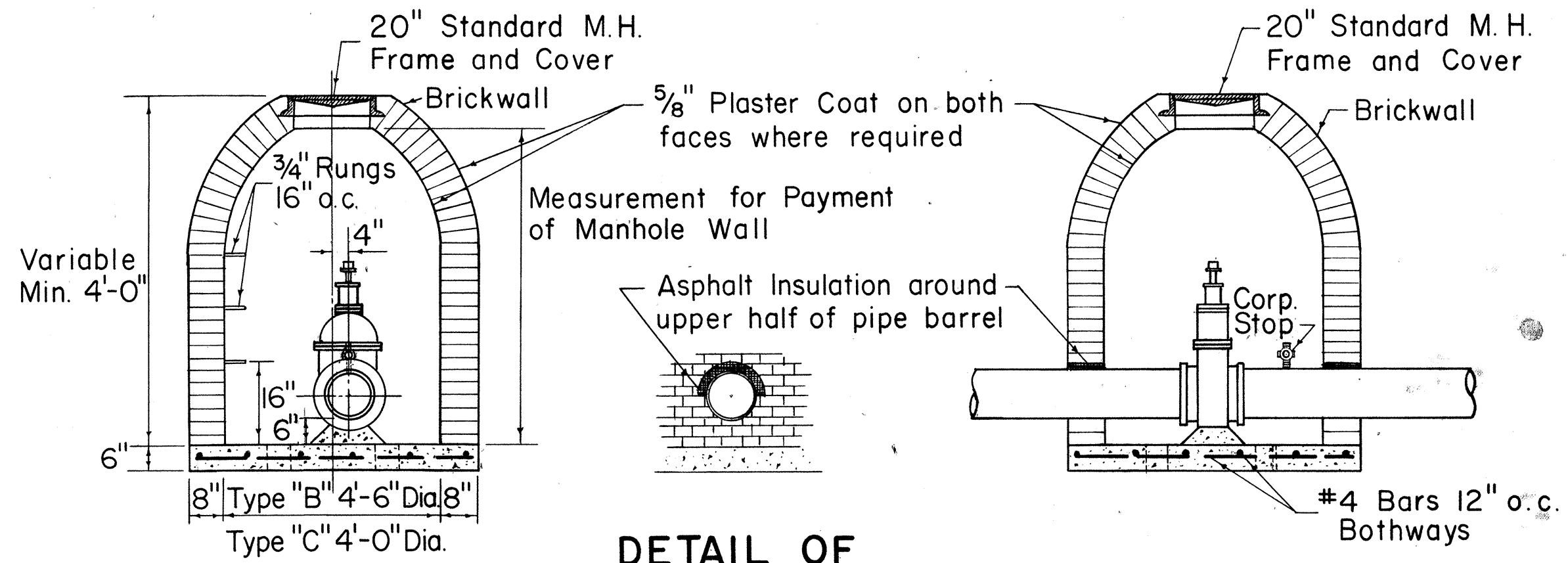
Revised: 12-6-68



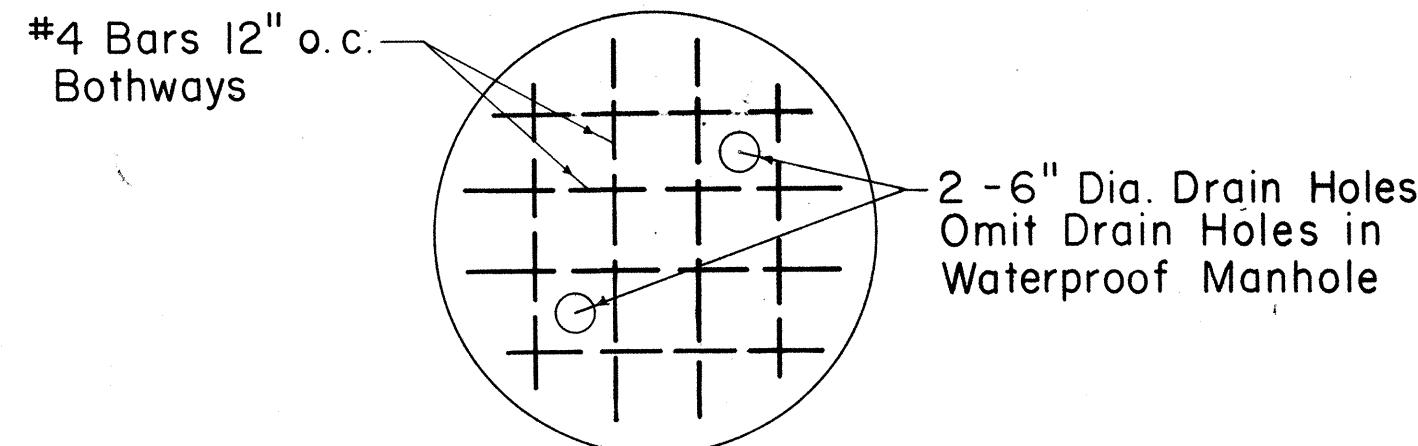
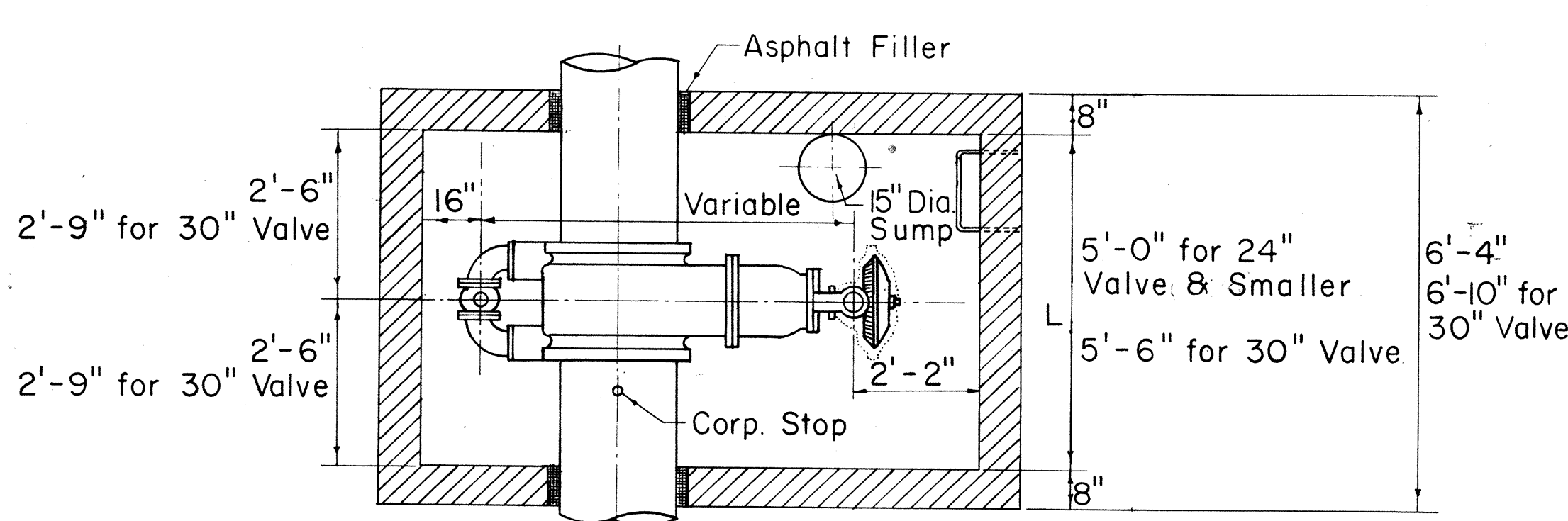
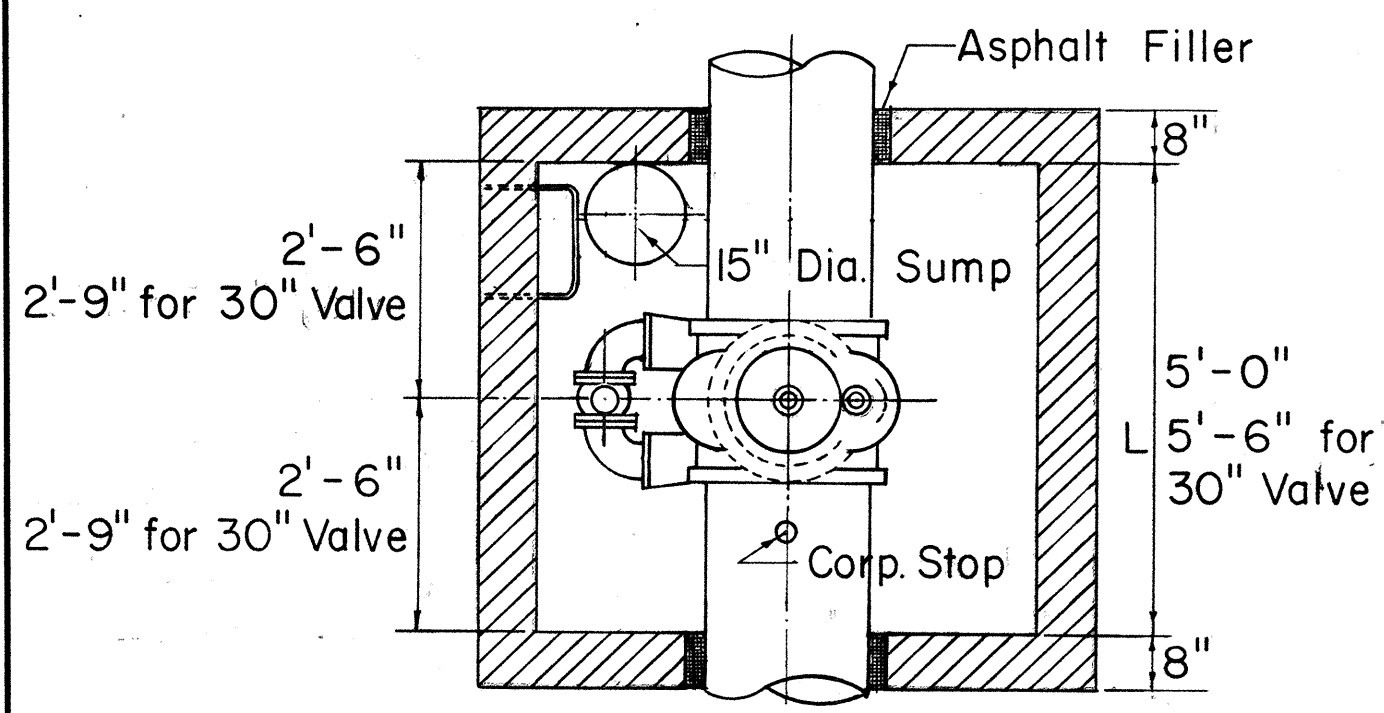
PLAN OF TOP SLAB



PLAN OF TOP SLAB



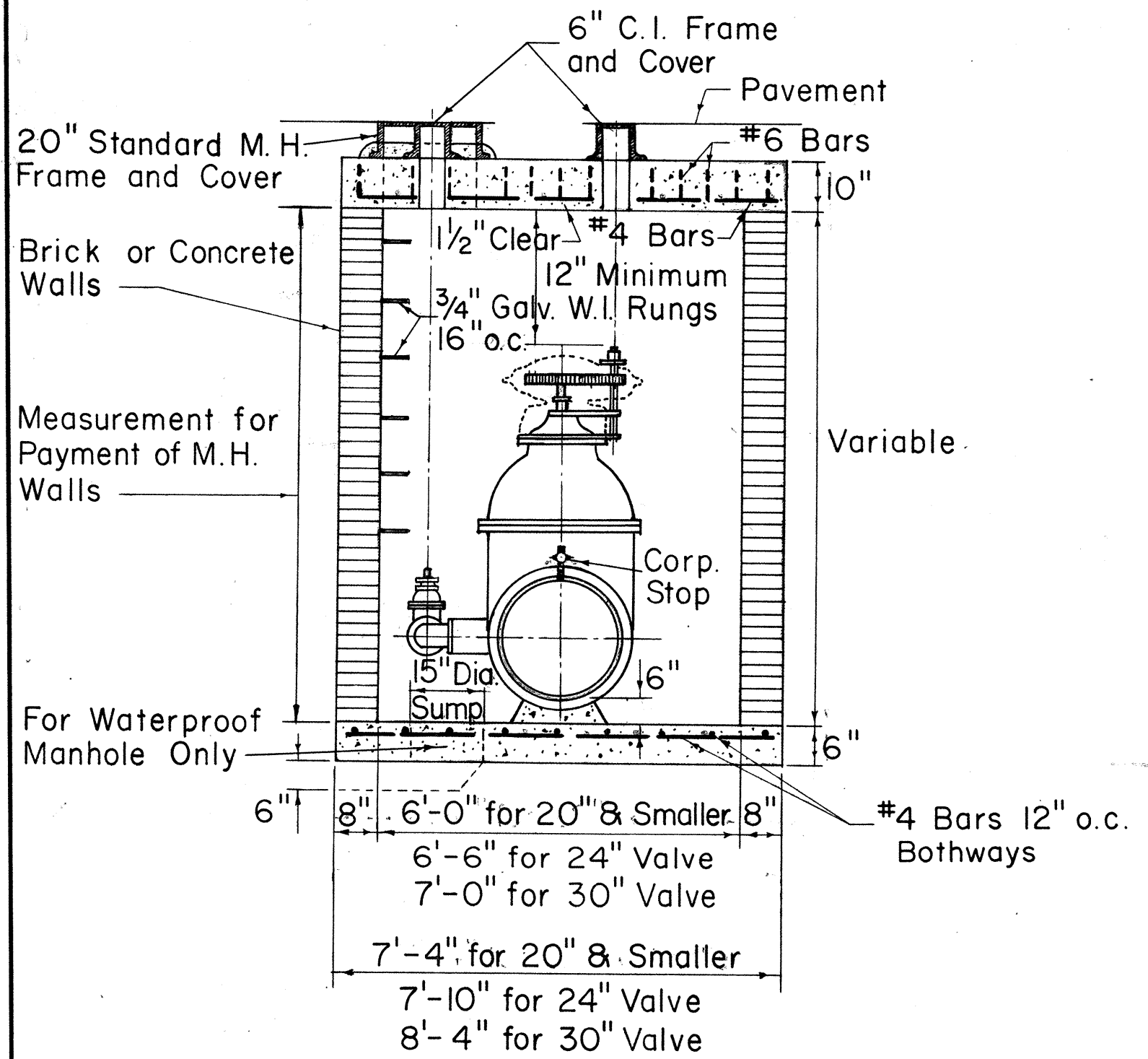
DETAIL OF ASPHALT FILLER



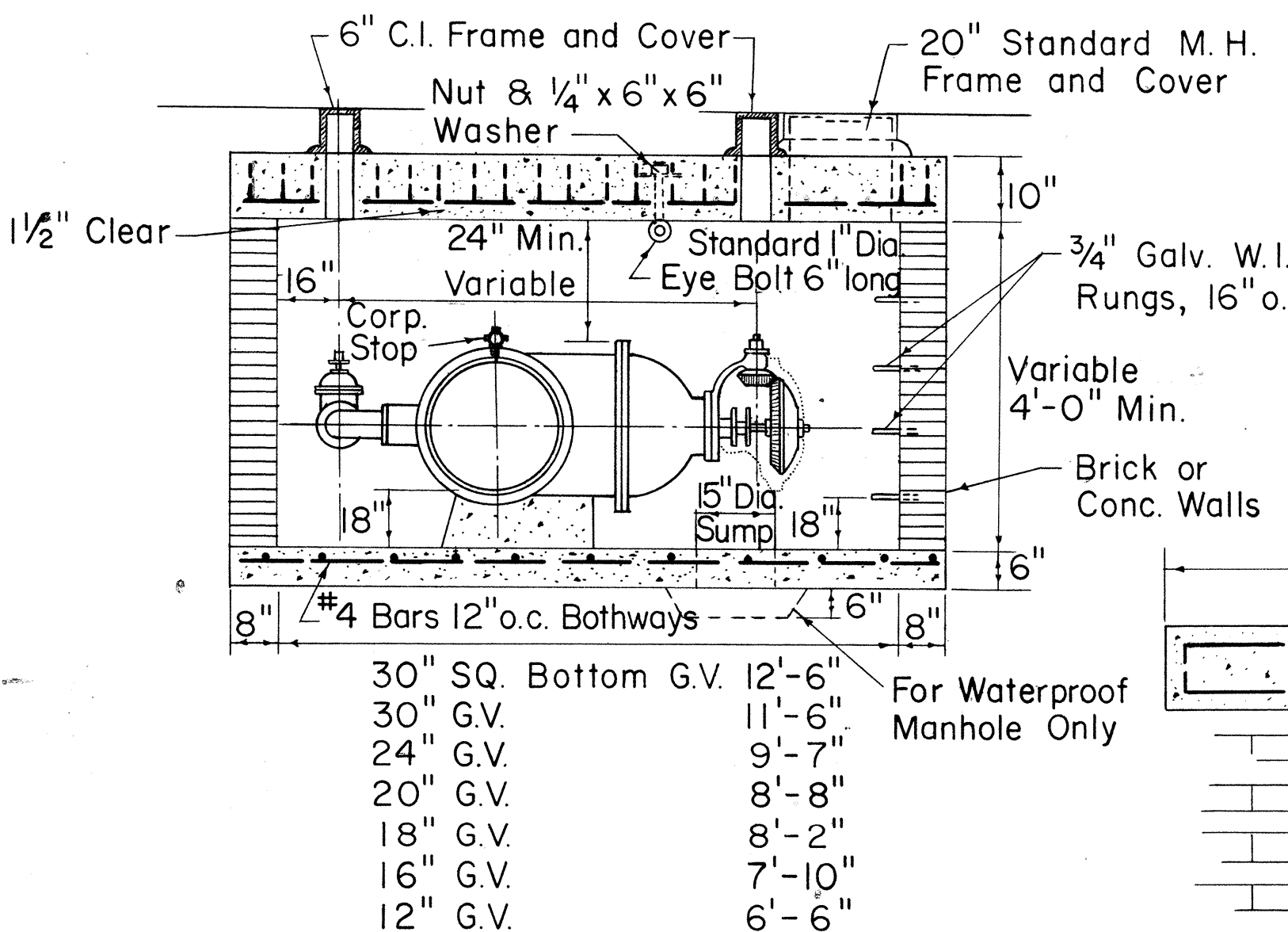
STEEL DETAIL IN BOTTOM SLAB

TABLE "A"
REQUIRED CORPORATION STOP SIZES AT GATE VALVE

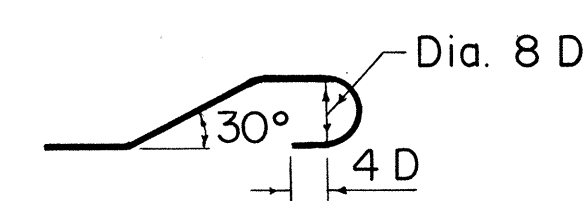
DIA. OF MAIN INCHES	SIZE OF CORP. STOP
4	1" x 1/4"
6	1" x 1/4"
8	1" x 1/4"
12	1" x 1/4"
16	1" x 1/4"
20	1" x 1/4"
24	1 1/2" x 2"
36	1 1/2" x 2"
42	1 1/2" x 2"



SECTION TYPE "A" MANHOLE FOR SPUR GEARED GATE VALVES

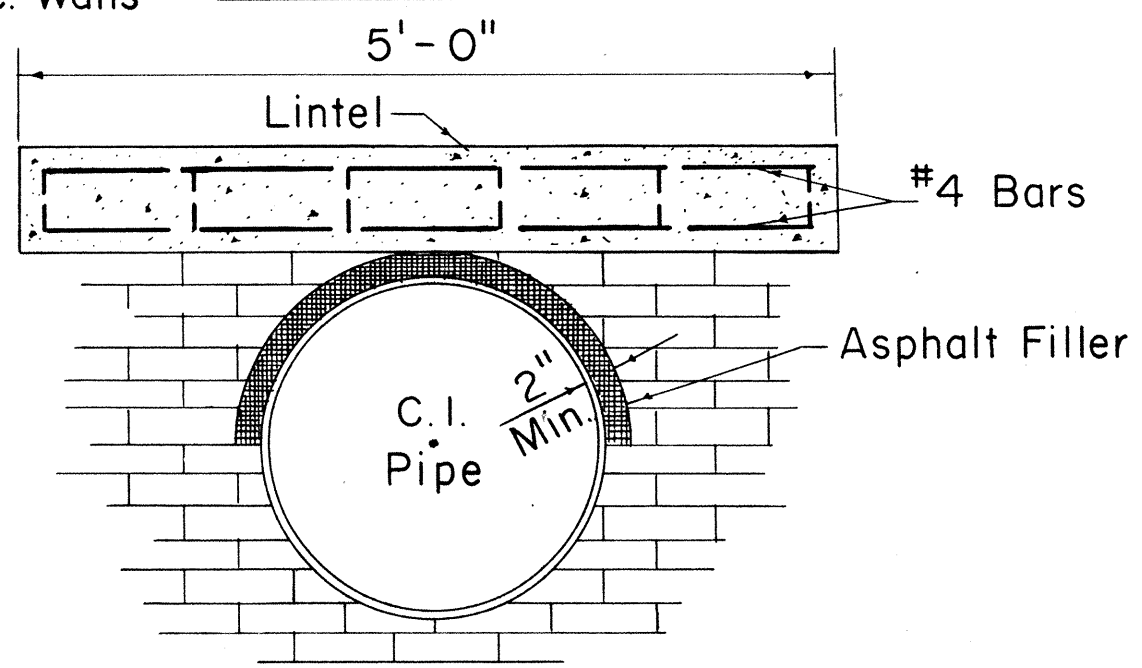


SECTION TYPE "A" MANHOLE FOR BEVEL GEARED GATE VALVES

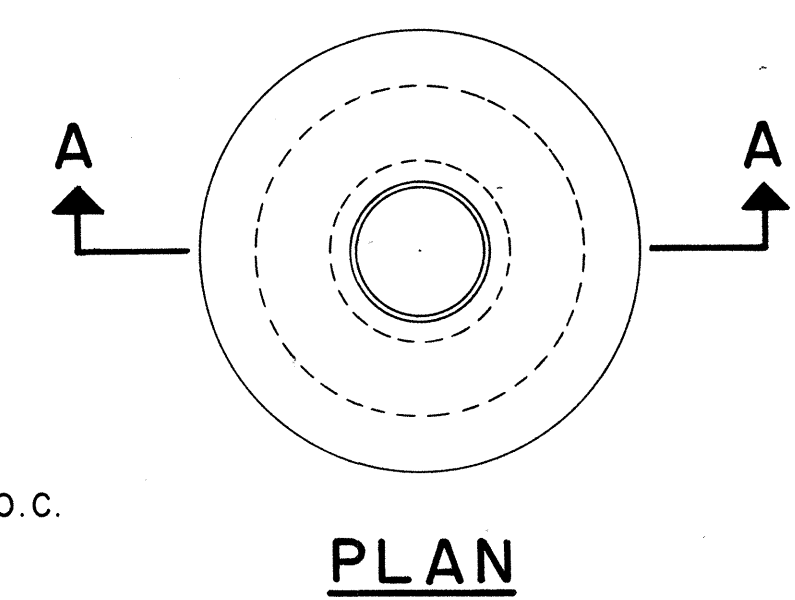


BAR BENDING DETAIL

SECTION THRU LINTEL

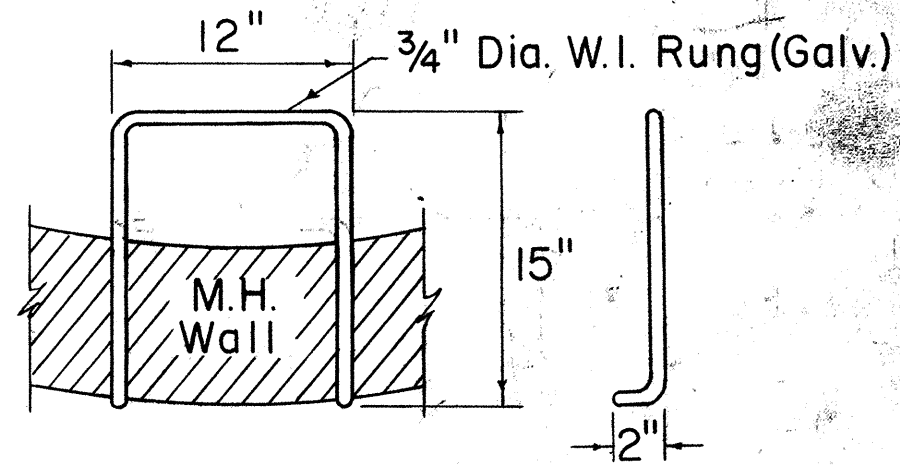


DETAIL OF LINTEL AND ASPHALT FILLER



PLAN

TYPE "B" AND "C" MANHOLES
TYPE "B" 4'-6" DIA. (FOR 12" G.V.)
TYPE "C" 4'-0" DIA. (FOR 6" & 8" G.V.)



DETAIL OF RUNG

APPROVED:

[Signature]
CHIEF, ENGINEERING DIVISION
BOARD OF WATER SUPPLY

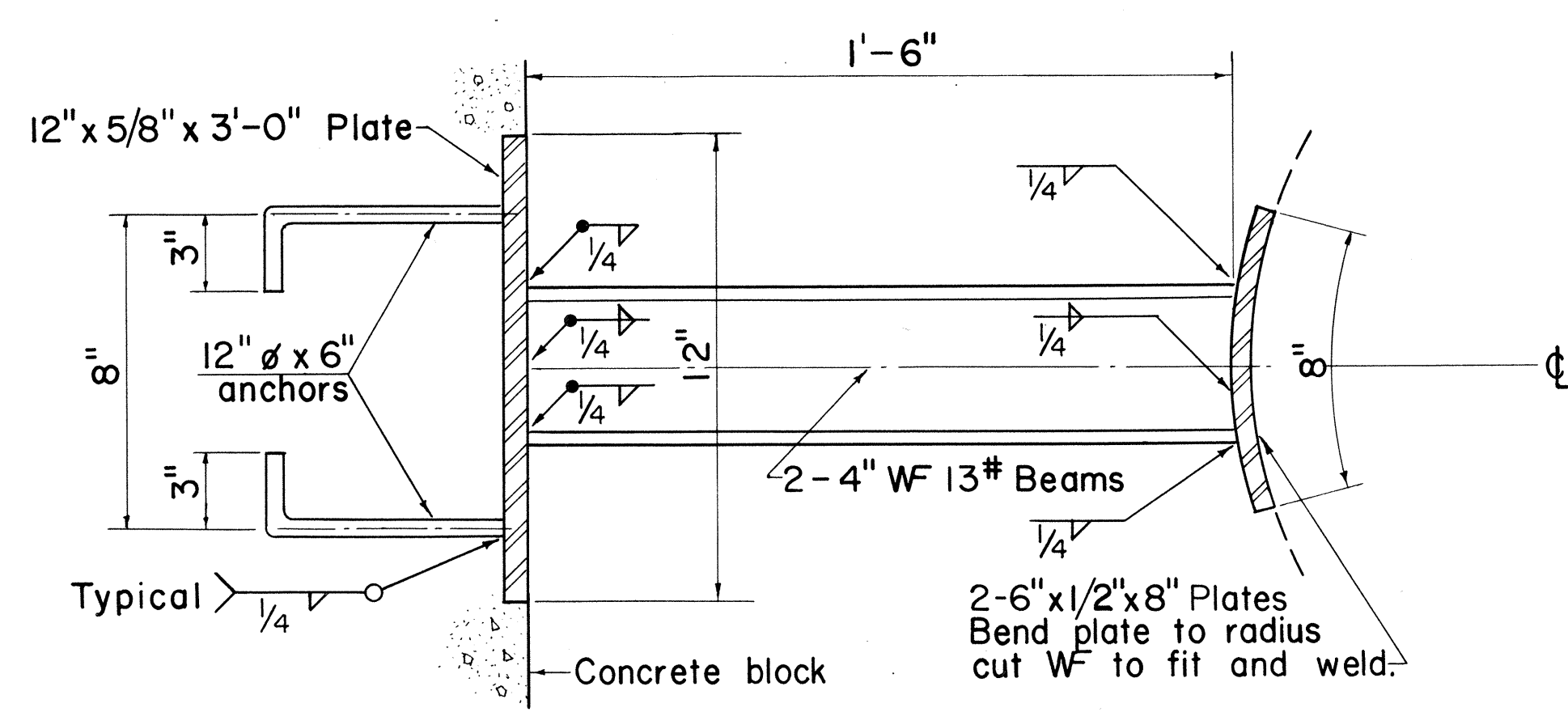
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

Not to Scale Date Aug. 1968

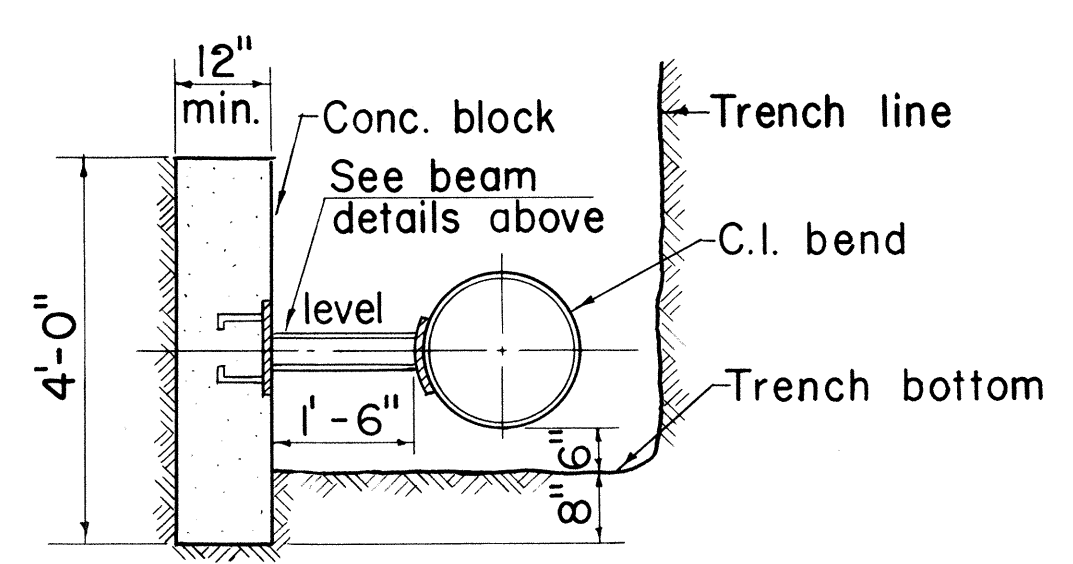
SHEET NO. 13 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(3)-21, Unit 3	1968	29	47

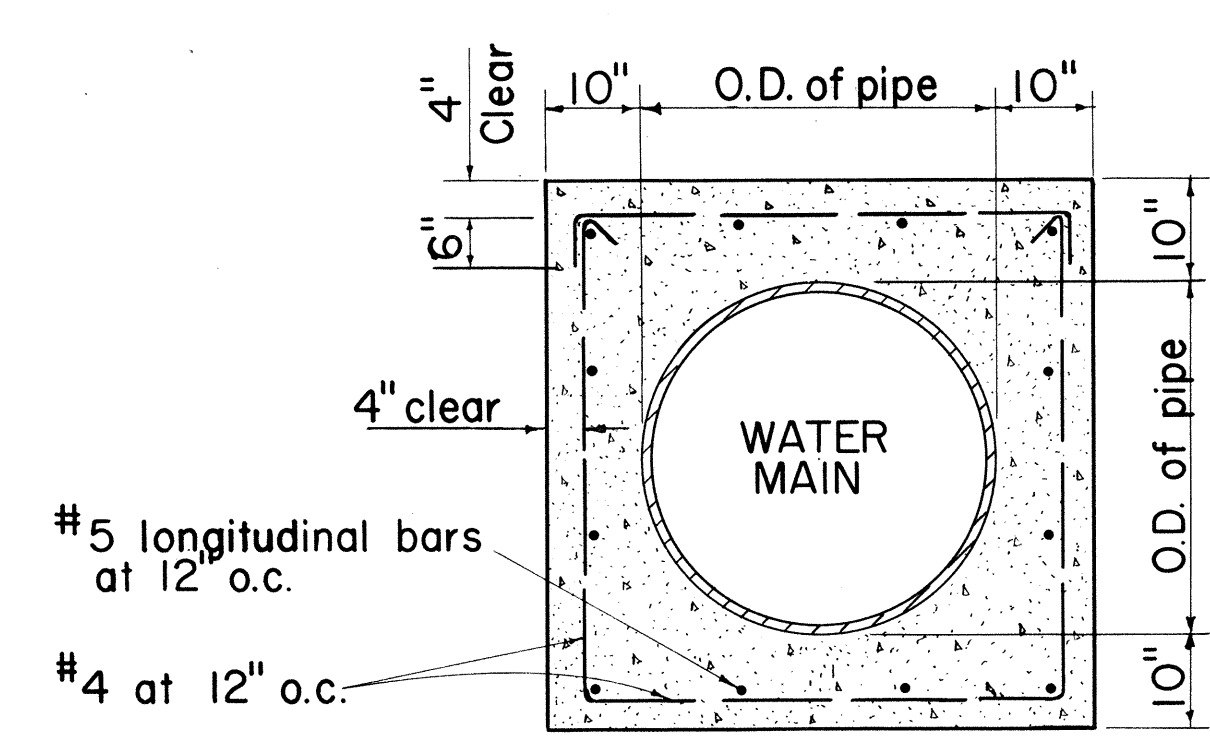
Revised: 12-6-68



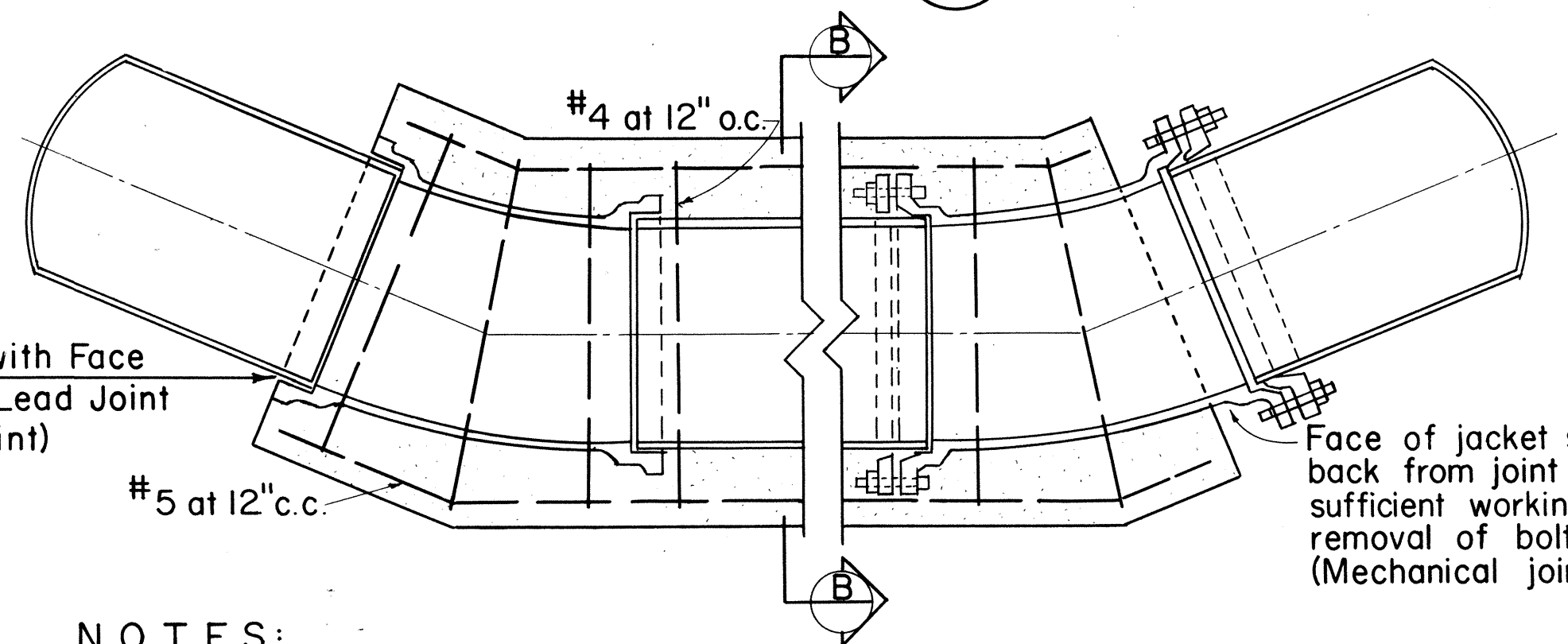
BEAM DETAIL
Scale: 3" = 1'-0"



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



SECTION B

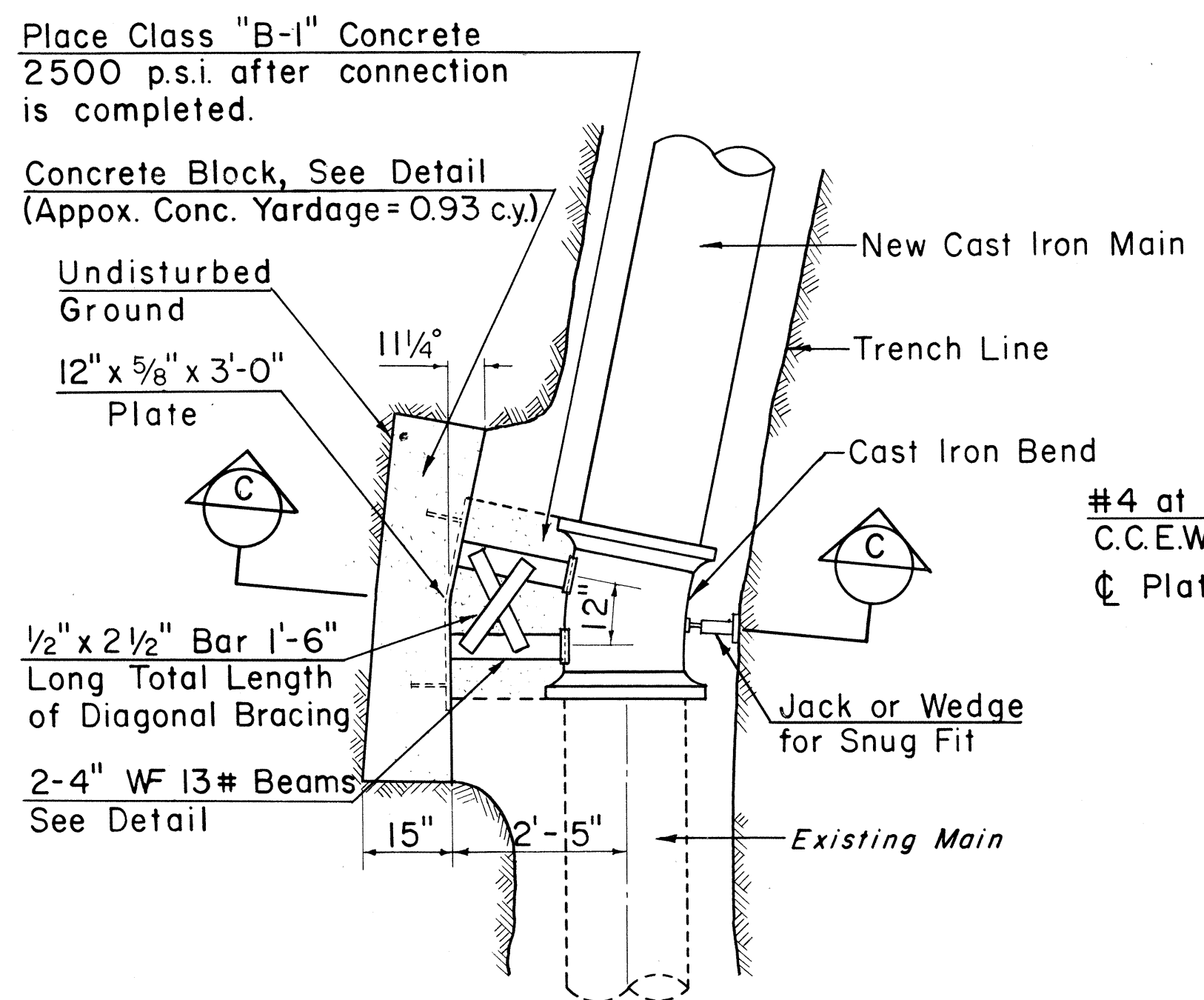


NOTES:

- Jacket to be poured after completion of test.
- 2 1/2" depth of lead for lead joint pipe required at all embedded joints.
- Wherever construction joints are required, 6" rubber or neoprene waterstops shall be installed. Waterstops shall be of the type specified and manufactured by the Serviced Products Corporation, Gate Rubber Company or approved equal.

REINFORCED CONCRETE JACKET

Scale: Not to Scale

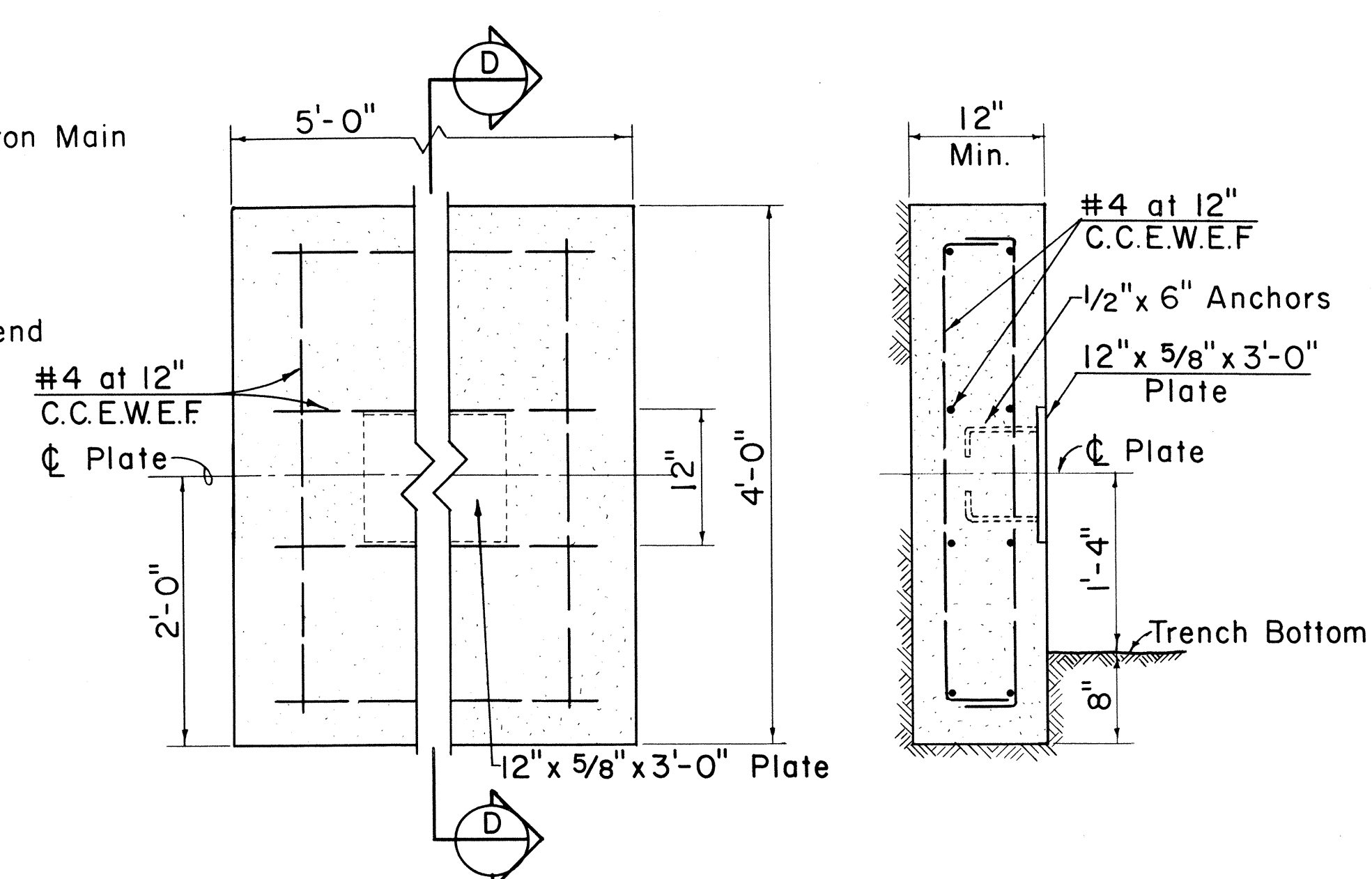


PLAN

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

NOTE:

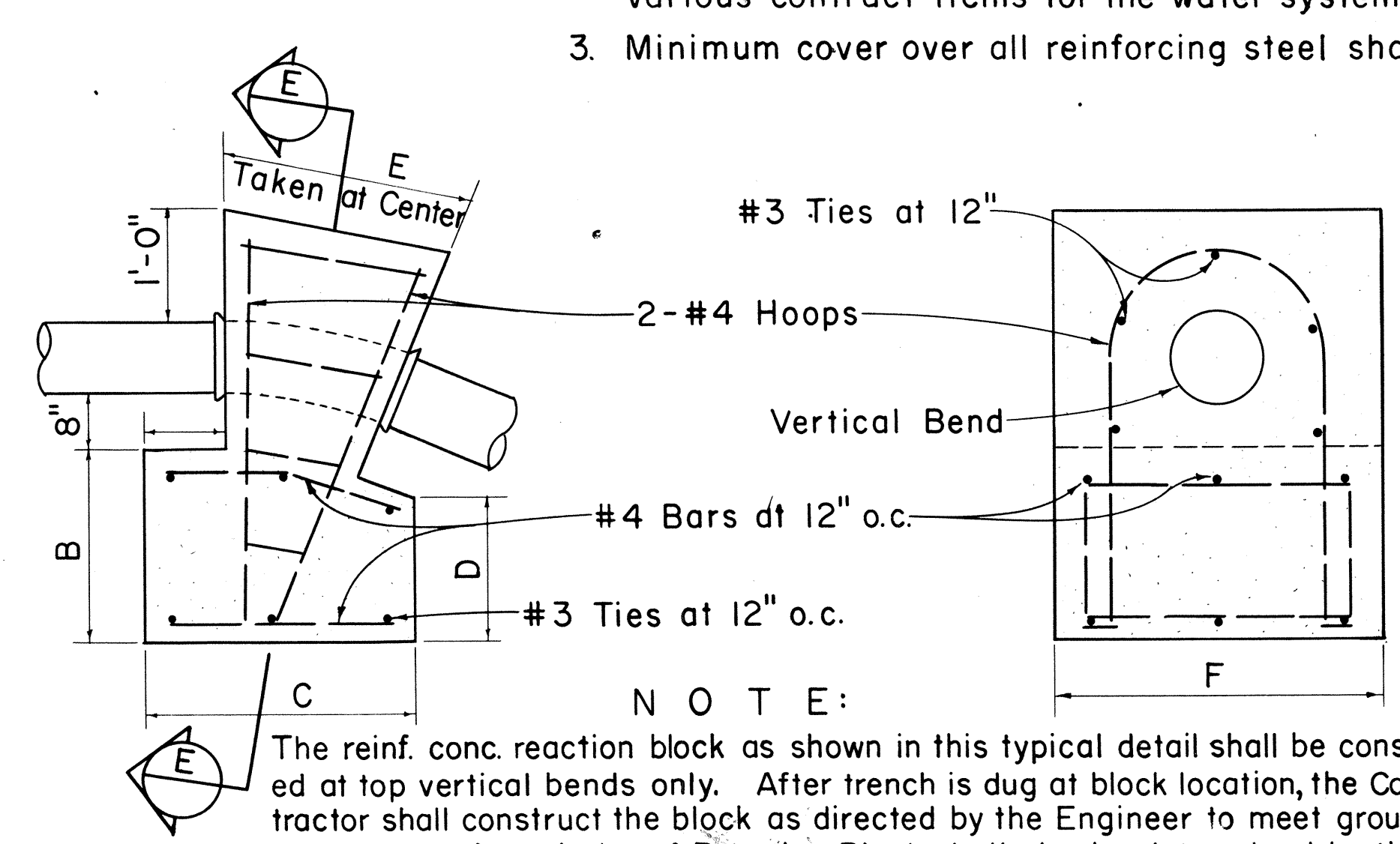
Concrete Block with structural strut shall be used for bends at connections or for tee connections.



ELEVATION

DETAILS OF CONCRETE BLOCK

Scale: 1" = 1'-0"

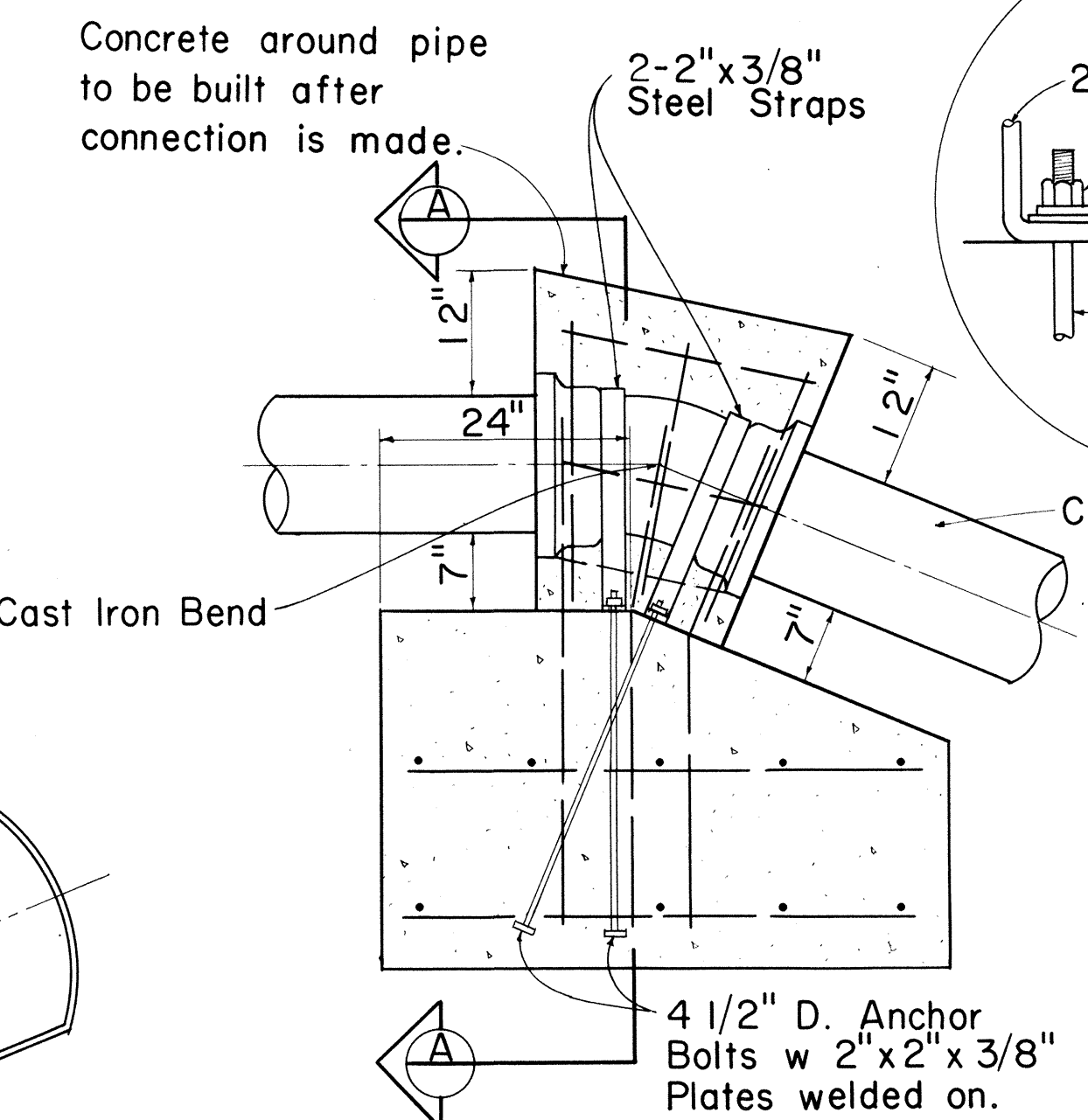


ELEVATION

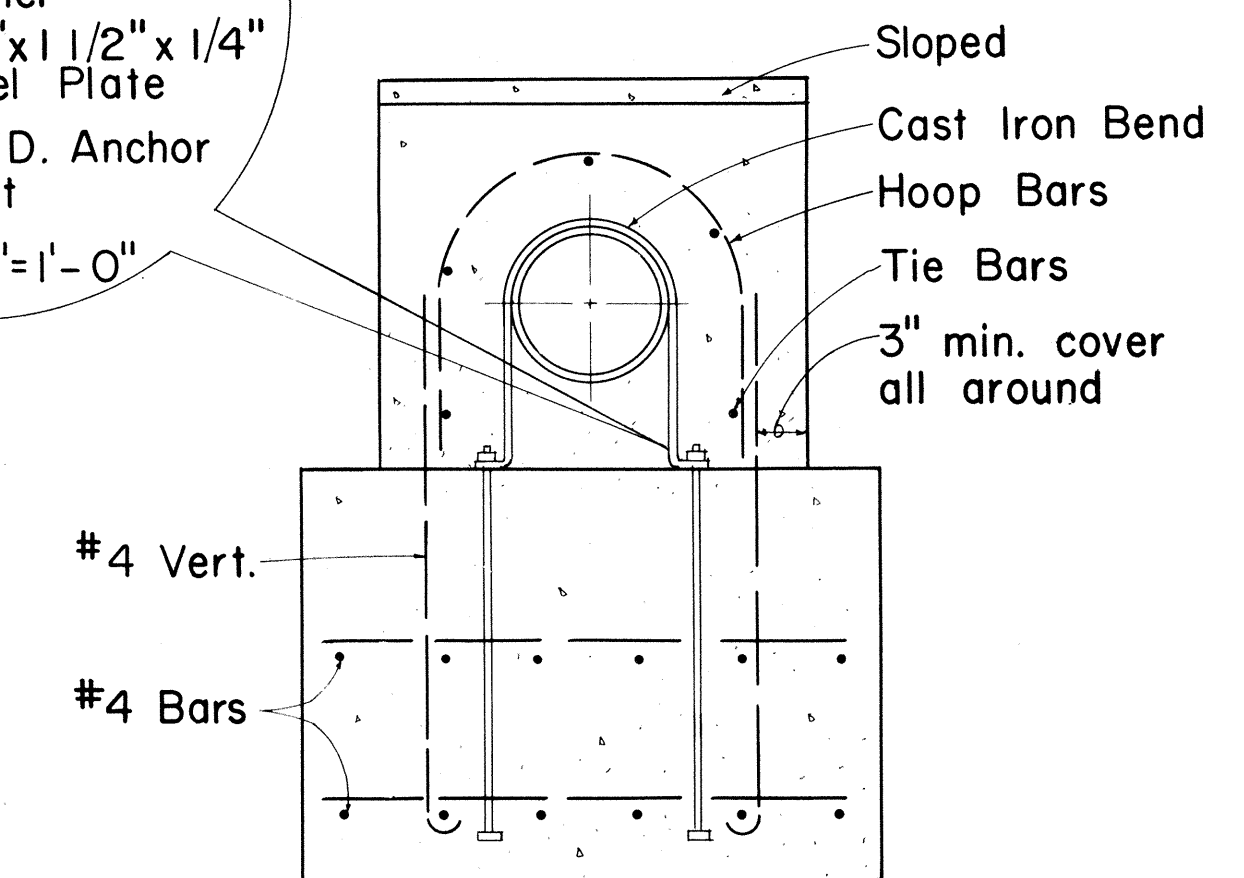
TYPICAL DETAIL OF REINFORCED CONCRETE REACTION BLOCK FOR TOP VERTICAL BENDS

Scale: Not to Scale

NOTE:
The reinf. conc. reaction block as shown in this typical detail shall be constructed at top vertical bends only. After trench is dug at block location, the Contractor shall construct the block as directed by the Engineer to meet ground conditions. Actual size of Reaction Block shall also be determined by the Engineer.



ELEVATION



SECTION A

TYPICAL DETAIL OF CONCRETE REACTION BLOCK WITH STRAPS

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

GENERAL NOTES:

- Detail drawings of actual precast blocks and other reaction blocks (not precast) to be used, shall be furnished during construction by B.W.S. and or State.
- Steel straps, anchor bolts, nuts, washers, etc., furnished and installed by the Contractor will not be paid for directly, but shall be considered incidental to the various contract items for the water system.
- Minimum cover over all reinforcing steel shall be 3 inches.

1/16 VERTICAL BENDS, A.W.A.A. 250 p.s.i.							
PIPE SIZE	DIMENSIONS						CU. YDS.
	A	B	C	D	E	F	
8	1'-0"	2'-0"	3'-0"	1'-6"	1'-6"	4'-0"	1 1/4
6	0'-9"	1'-9"	2'-6"	1'-4"	1'-6"	3'-0"	3/4

APPROVED:

J. Kawakawa
CHIEF, ENGINEERING DIVISION
BOARD OF WATER SUPPLY
DATE: 8/27/68

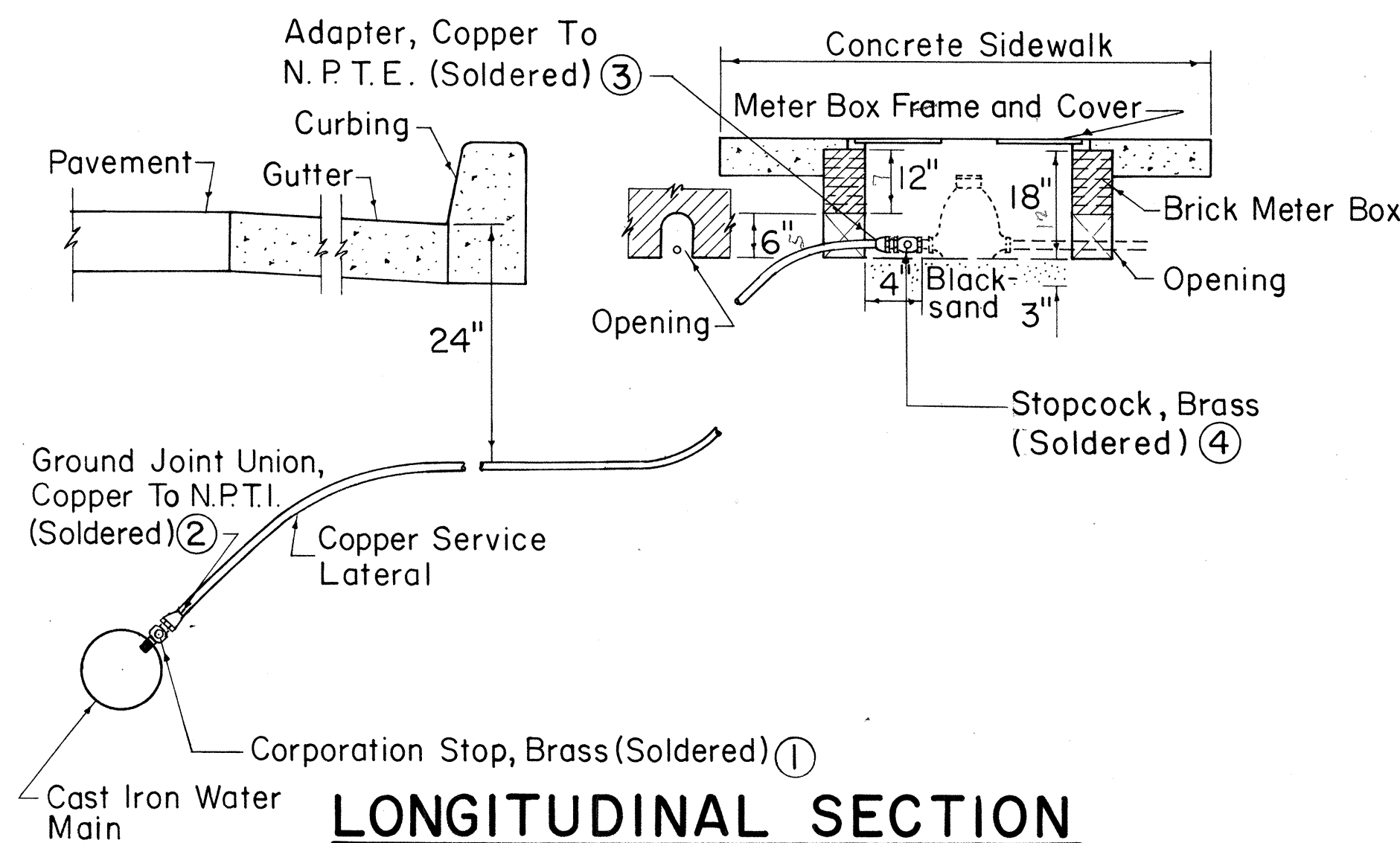
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU
STANDARD DETAILS

TYPICAL DETAIL OF CONCRETE BLOCK WITH STRUCTURAL STRUT

SCHEDULE OF COPPER FITTINGS
(SOLDERED JOINT)

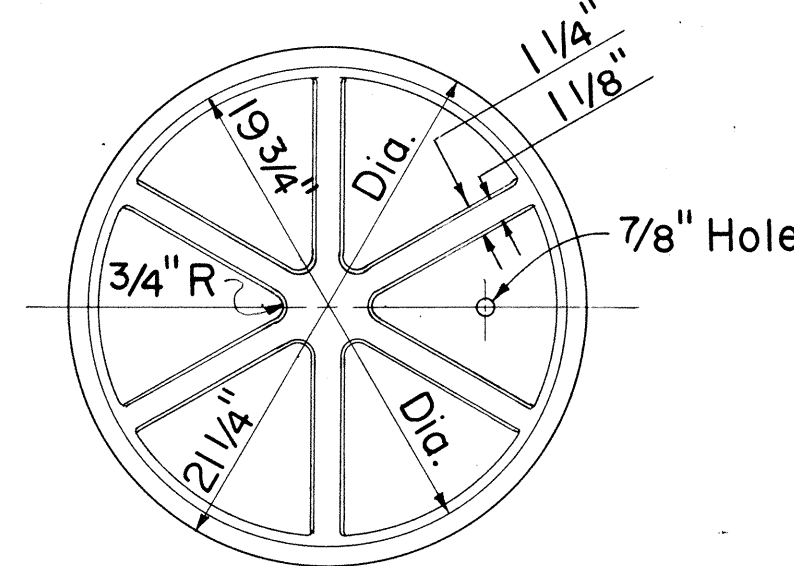
ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	MULTIPLE TWO SERVICES	SERV. CONN. THREE SERVICES
1	Corporation Stop Brass (H-10003)	1	1	1
2	Ground Joint Union (Style Copper To N.P.T.E. No. C-109)	1	1	1
3	Adapter, Copper To N.P.T.E. (Style No. C-101)	2	1	1
4	Stopcock Brass (BWS Standard)	1	1	1
5	Fitting Adapter, (Style Fitting To N.P.T.E. No. C-104)	—	1	1
6	Tee, Copper To Copper To Copper (Style No. T-300)	—	1	1
7	Bushings, Fitting To Copper (Style No. C-103)	—	2	2
8	90° Elbow, Copper To Copper (Style No. C-200)	—	2	2
9	Adapter, Copper To N.P.T.E. (Style No. C-101)	1	2	3
10	Stopcock Brass (BWS Standard)	1	2	3
11	Reducing Tee, Copper To Copper To Copper (Substitute For Items Number 6 and 7). (Style No. T-300)	—	1	1
12	Tee, Copper To Copper To Copper (Style No. T-300)	—	—	1
13	Bushing, Fitting To Copper (Style No. C-103)	—	—	1
14	Reducing Tee, Copper To Copper To Copper (Substitute For Items Number 12 and 13 (Style No. T-300)	—	—	1

NOTE:
Reference Numbers shown thus (H-10003) are from Mueller Co. Catalog "H" and (Style No. T-300) are from Mueller Brass Co. "Streamline" Catalog S-354. Approved Equal may be used.

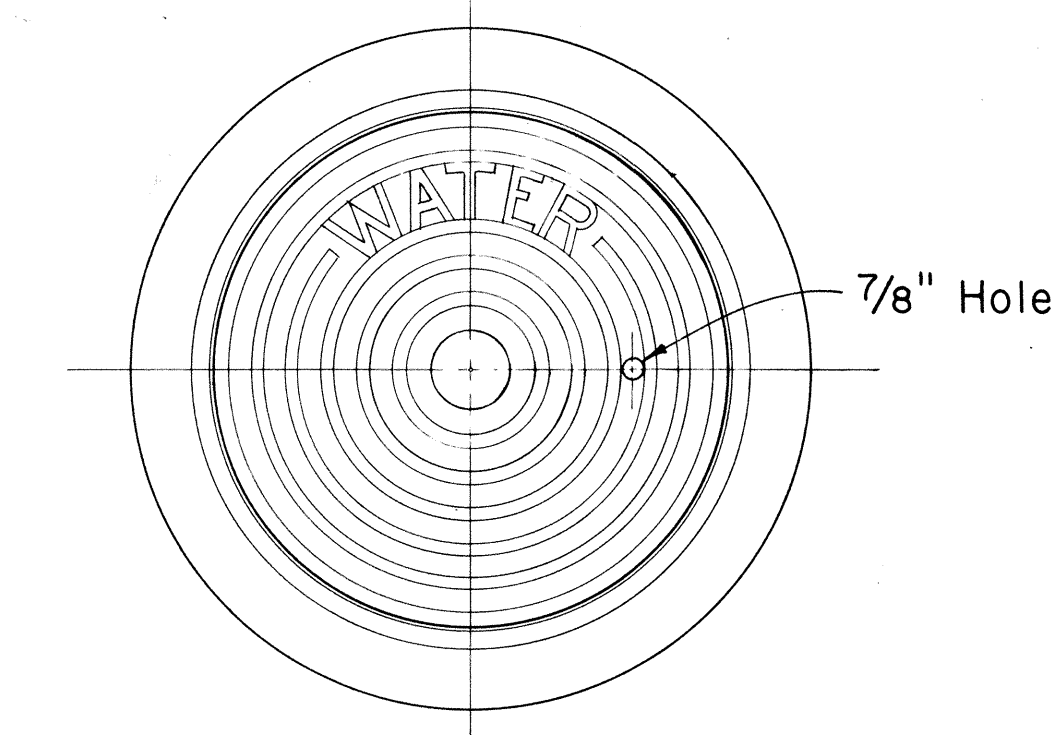


NOTE:

All castings shall be made accurately to the dimensions shown. Seat and cover shall be machined or ground where necessary to secure flat and true surfaces. The cover shall not rattle in any position.



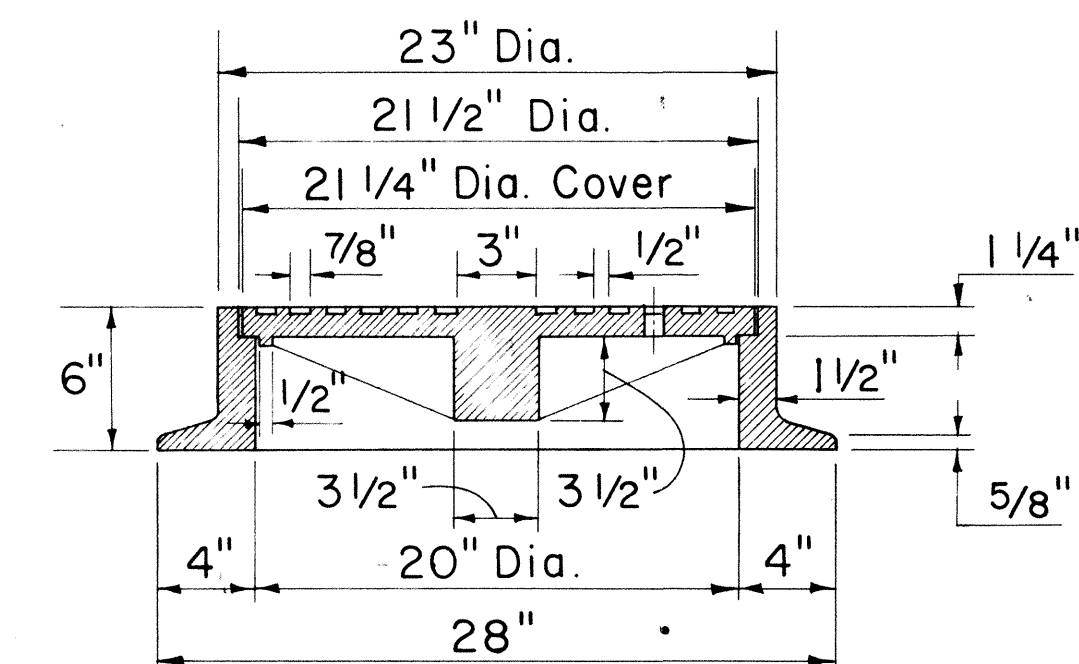
BOTTOM VIEW OF COVER



PLAN OF FRAME AND COVER

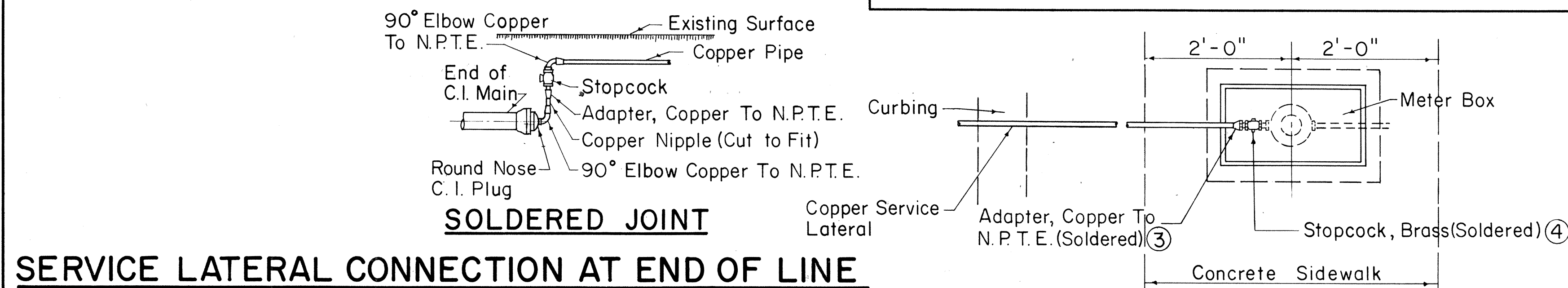
MANHOLE FRAME & COVER
CAST IRON, 20" SIZE

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

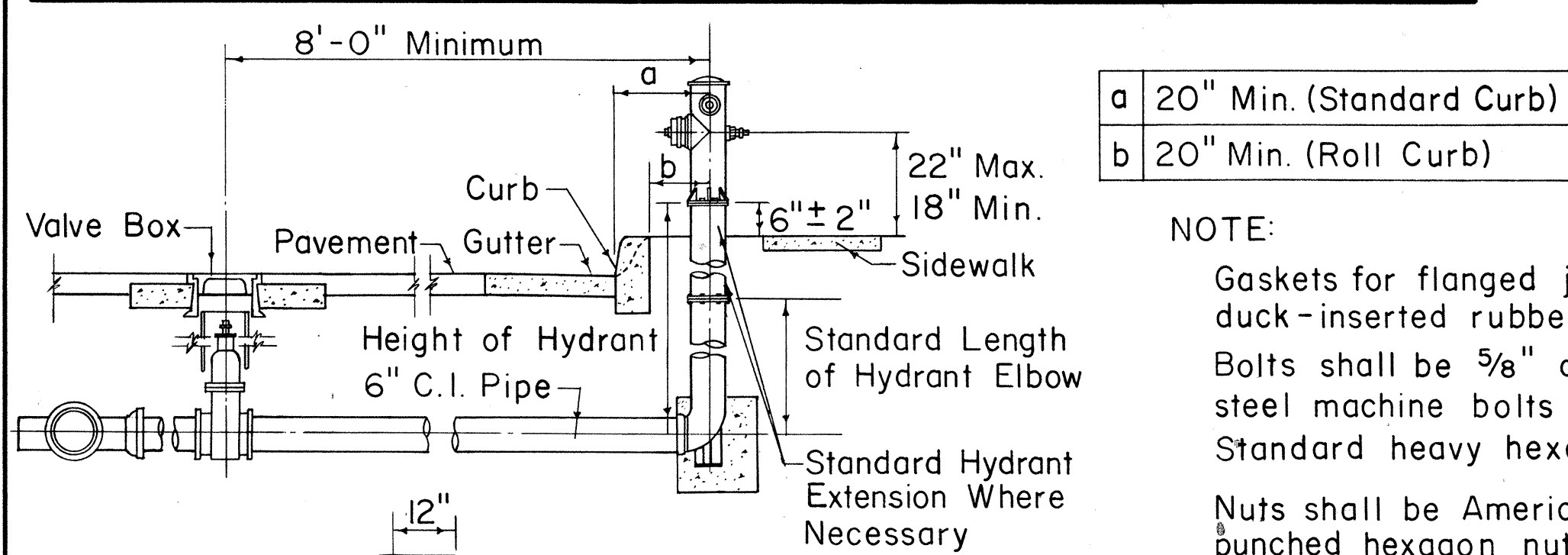


SECTION OF FRAME AND COVER

SINGLE SERVICE CONNECTION



SERVICE LATERAL CONNECTION AT END OF LINE

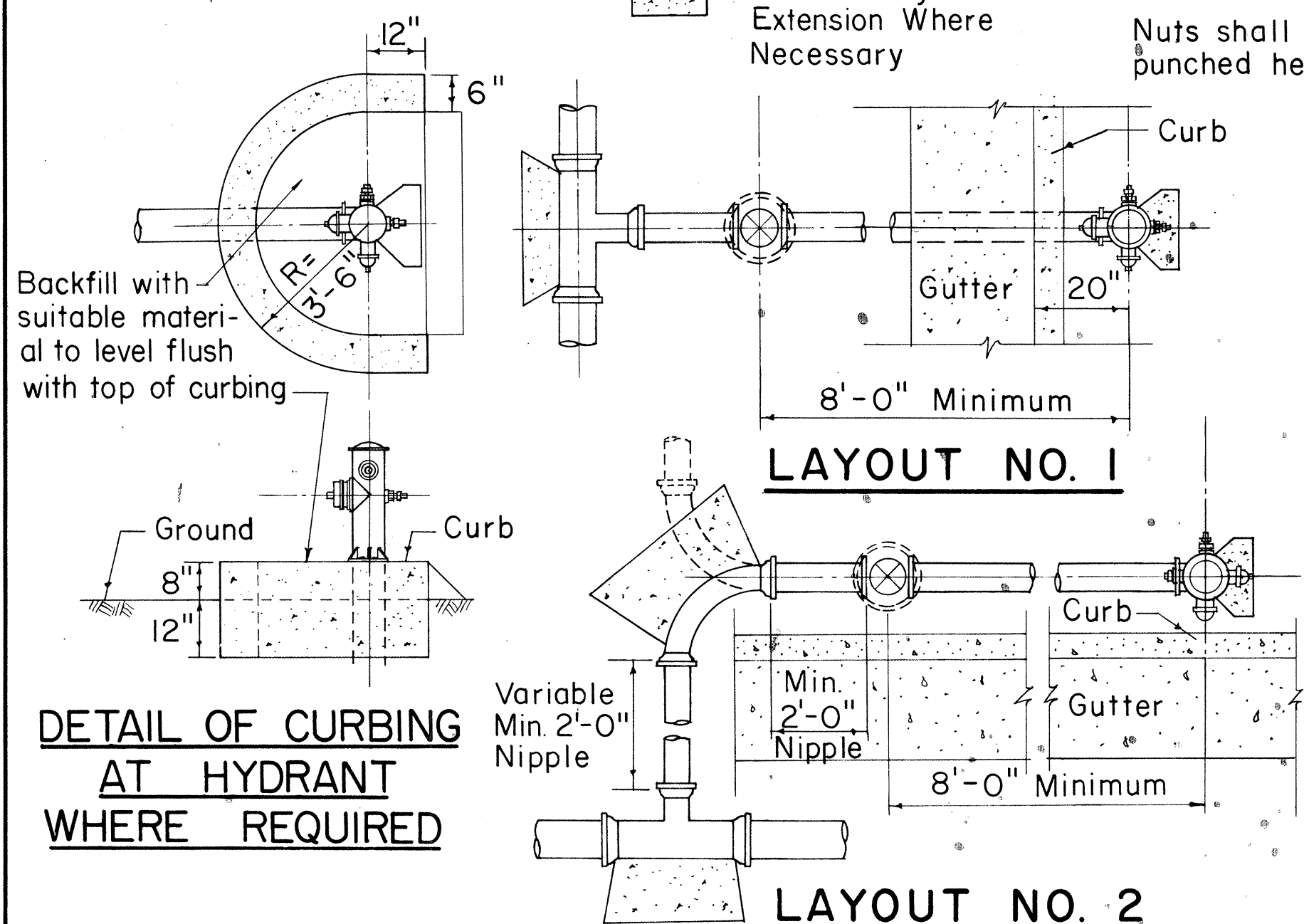


NOTE:

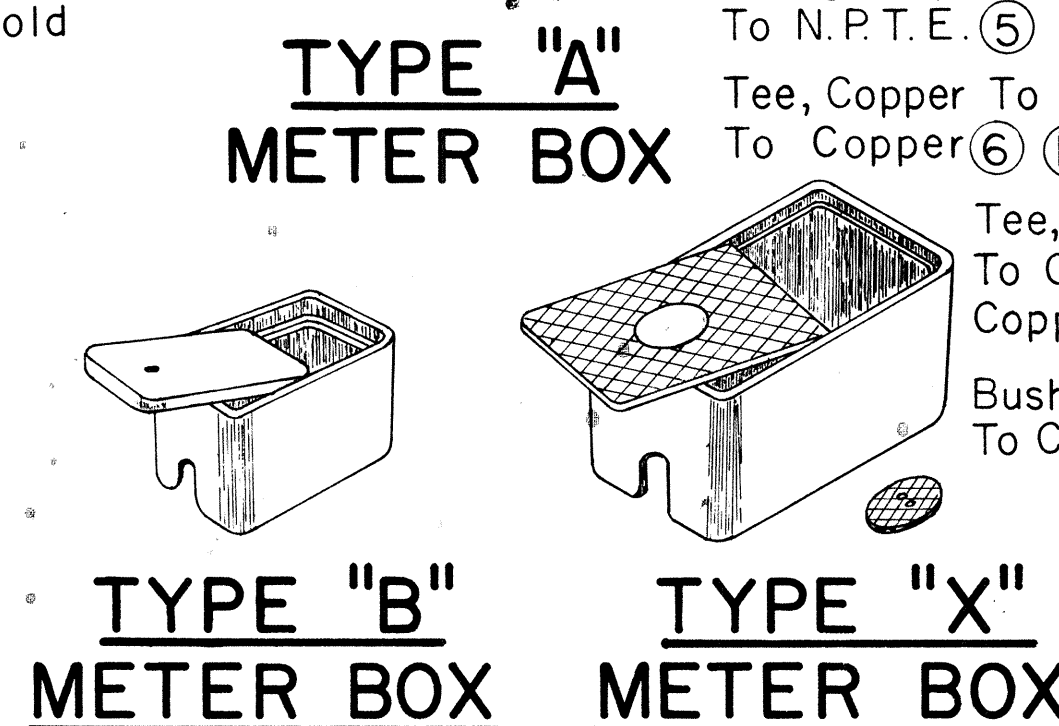
Gaskets for flanged joints shall be 1/16 inch duck-inserted rubber packing Garlock No. 19. Bolts shall be 5/8 inch diameter x 2 3/4 inch long steel machine bolts with cut threads, American Standard heavy hexagon heads, galvanized. Nuts shall be American Standard heavy cold punched hexagon nuts, galvanized.

STANDARD LENGTHS FOR HYDRANT ELBOWS
30"
36"
42"
48"

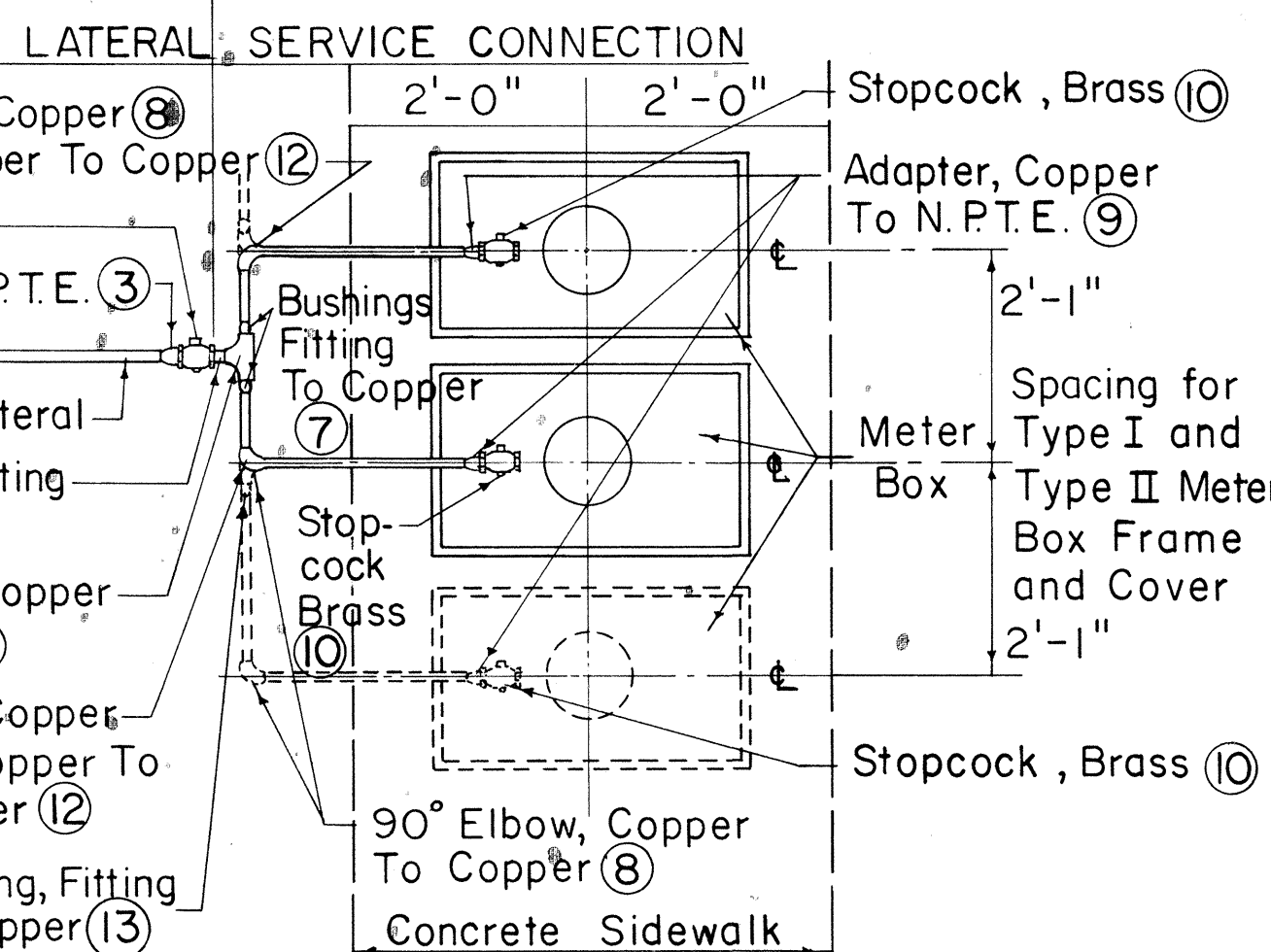
Standard Hydrant Extensions are available in the following Lengths:
6 to 30 inches long in increments of 6 inches



STANDARD FIRE HYDRANT LAYOUT



TYPE "B" METER BOX
TYPE "X" METER BOX



MULTIPLE SERVICE CONNECTION
SOLDERED JOINTS

METER BOX DATA					
TYPE METER BOX	METER SIZES	OVERALL DIMENSIONS AT BOTTOM	OVERALL DIMENSIONS AT TOP	COMPLETE WEIGHT	OVERALL DIMENSIONS OF LID
A	5/8" or 3/4" Without Valve	7 1/4" x 7 1/4"	10" x 10"	45 lbs.	7 3/8" Dia.
B	5/8" or 3/4"	9 1/2" x 16"	12 1/4" x 18 3/8"	82 lbs.	8 3/4" x 14 1/2"
X		14 1/2" x 23 1/2"	16" x 25"	143 lbs.	13 1/8" x 22 1/8"

APPROVED:

A. Kawakami 8/19/68
CHIEF, ENGINEERING DIVISION
BOARD OF WATER SUPPLY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU