

UTILITY LEGEND

	Existing Electric or Telephone Pole		Existing Water Line
	Existing Electric or Telephone Pole to be removed		New Water Line
	New Electric or Telephone Pole		Existing Gas Line
	Existing Electric or Telephone Pole with existing Anchor		New Gas Line
	Existing Electric or Telephone Pole with New Anchor		Existing Sewer Line
	New Electric or Telephone Pole with New Anchor		New Sewer Line
	Existing Pull Box or Service Box		Cut existing Sewer, Water or Gas Line
	New Pull Box or Service Box		Cut and Abandon in Place existing Sewer, Water or Gas Lines
	Existing Handhole or Manhole		Existing (Water, Sewer, Gas) Manhole
	New Handhole or Manhole		Existing (Water, Sewer, Gas) Manhole to be Adjusted
	Reinforced or nonreinforced concrete encased ducts		New (Water, Sewer, Gas) Manhole
	Existing Signal Corps Cable		Existing Water Meter
			New Water Meter
			Existing Fire Hydrant
			New Fire Hydrant

GENERAL WATER 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, remove meter boxes and appurtenances, prior to commencement of clearing and grading operations. Contractor to provide all necessary excavation.
- Asterisk (*) indicates work to be performed by BWS. Materials to be furnished by the Contractor unless specified as "reuse".
- 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 house service connections.
- Wherever a corporation stop shown tapping into a new main is larger than that allowed by the BWS Standards, a double hub fitting with boss tapped for appropriate size corporation shall be used.
- The locations of existing water mains 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.
- Concrete in reaction and test blocks and reinforced concrete jacket shall be Class B-1.
- Existing 30" Main is of Southern Pipe manufacture. The Contractor shall be held responsible to furnish all necessary materials, including adapters if required, to facilitate connections into existing mains. Cost of adapters shall be incidental to Pipeline Work.
- H.E.Co. and H.T.Co. utility poles, handholes, manholes and ductlines to have minimum of three (3) feet clearance from water mains and other water system appurtenances. Ductlines crossing water mains to have minimum 6" vertical clearances.
- Extra precaution shall be taken when rolling over new or existing concrete cylinder pipes. Any damage to pipes and appurtenances shall be the responsibility of the Contractor.
- Any excavation work around existing water main shall be by hand only.
- All 30" concrete cylinder pipe shall be class 125 and manufactured in accordance with the requirements of Section 100, the Special Provisions and the Manufacturer's Detail Drawings all approved by BWS.
- All gate valves specified as "salvage" on the plans shall be removed, cleaned, and returned to B.W.S. Kalia Store Yard, by the Contractor.
- Degree of concrete cylinder bend, or length of adjacent pipes required at points of connection to the existing main shall be verified after exposure of the existing main prior to the start of construction work. Any resulting revisions required shall be done by the Contractor at his own cost. Degree of conc. cylinder 2 piece elbows specified on plan at connection points are for bidding purposes only.
- "Salvage" materials shall be returned to BWS KALIA Store Yard by the Contractor.
- Temporary cleanouts shall be installed by the Contractor wherever necessary and the cost thereof shall be incidental to pipeline work.
- In fill areas where the cover (from the existing ground) over the new main is less than three (3) feet, the Contractor shall first fill and compact the area (to provide a minimum of three (3) feet cover) prior to trenching for the new main.

GENERAL ELECTRIC & TELEPHONE NOTES

- Existing electric and telephone systems shown on these plans are located from the best sources available. The Contractor shall check and verify the exact location and depth of same.
- Contractor to stake out proposed ductlines, pole and anchor locations; H.E.Co. to check locations before Contractor undertakes excavation.
- Minimum depth of duct lines from finish grade to top of concrete jacket where ducts are concrete encased = 2'-0" unless otherwise shown.
- Ducts encased in concrete jackets:
 - Normal distance from face of jacket to all ducts to be 3" minimum.
 - Clear distance of 1 1/2" minimum between ducts of same utility company.
 - Clear distances of 3" minimum between H.E. Co. ducts and H.T. Co. ducts.
- All ducts and conduits called for installation in concrete jacket shall be inspected and approved by the respective Engineer of H.E.Co. or H.T.Co. before concrete placing. 24 hr. (min.) notice shall be given before placing concrete.
- Depth of all pullboxes, service boxes and H.E.Co. handholes and manholes to be determined in the field.
- Poles and anchors for H.E.Co. unless otherwise noted.
- Depth of poles and anchor holes are taken from finish grade.
- For pole setting depth data, see sht. No. 47.
- Installation of, and backfill for poles by H.E.Co. or H.T.Co.
- Backfill of anchor holes by the Contractor.

APPROVED:

PRINCP. ELECTRICAL ENGR., H.E. CO., INC.	DATE
<i>Manicah Kan</i>	10/13/64
PRINCP. DISTRIBUTION ENGR., H.E. CO., INC.	DATE
<i>R. M. for F. H. Gidd</i>	10/14/64
OUTSIDE PLANT ENGINEER, H.T. CO. LTD.	DATE
<i>J. Hawatani</i>	10/6/64
ASSISTANT CHIEF ENGINEER B.W.S.	DATE
<i>P. C. Jones</i>	10/13/64
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD.	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY GENERAL NOTES

WATER-ELECTRIC-TELEPHONE-GAS

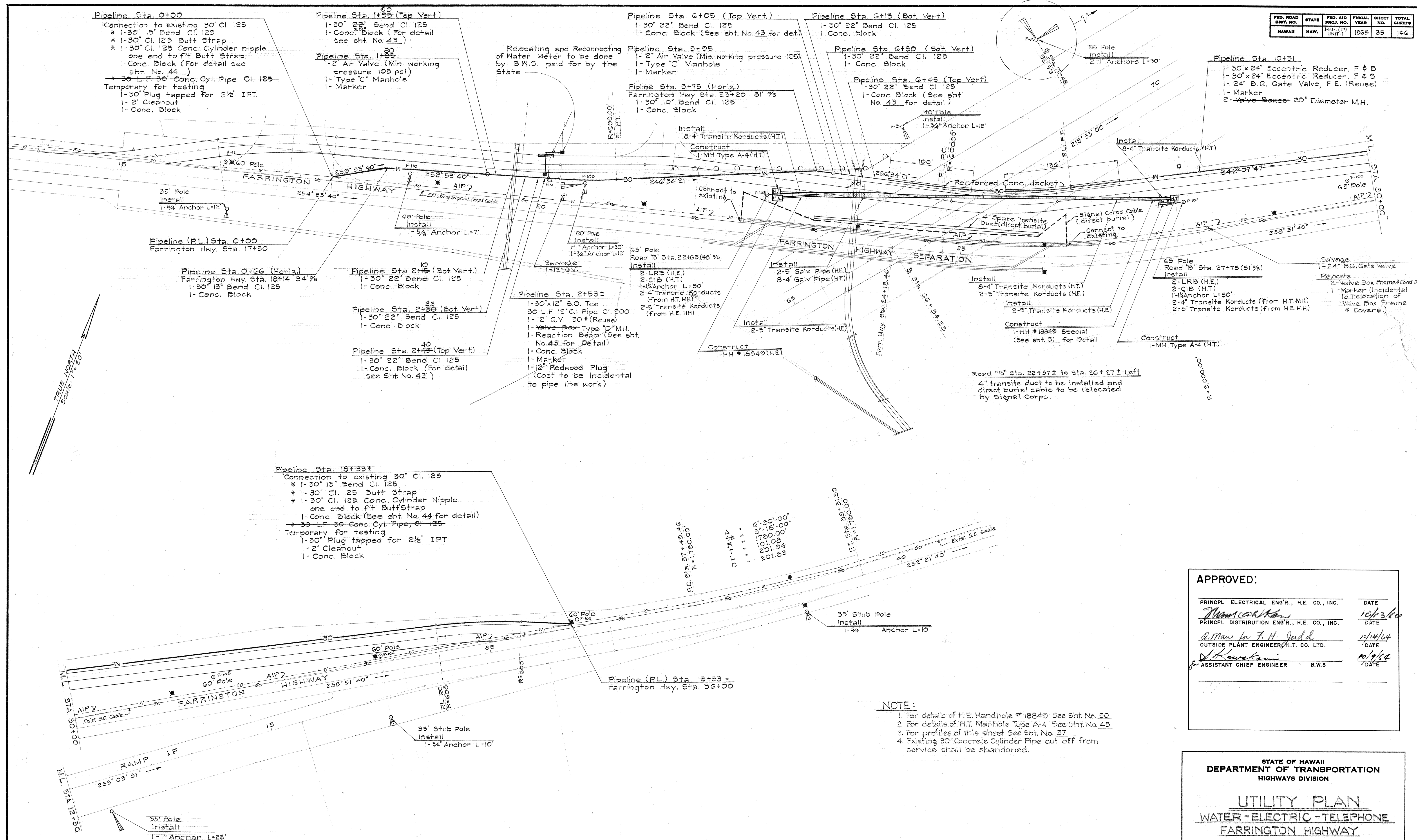
INTERSTATE ROUTE H-1
F.A.I. Proj. No. I-H-1(17), UNIT 1

Date: Oct. 1963

SHEET No. 1 OF 18 SHEETS

ORIGINAL PLAN	DATE
DESIGNED BY	
NOTED BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1 (17) UNIT 1	1965	35	140



NOTE:

1. For details of H.E. Handhole # 18840 See Sht. No. 50
2. For details of H.T. Manhole Type A-4 See Sht. No. 45
3. For profiles of this sheet See Sht. No. 37
4. Existing 30" Concrete Cylinder Pipe cut off from service shall be abandoned.

APPROVED:	
<u>PRINCPL ELECTRICAL ENGR., H.E. CO., INC.</u> <i>Thomas C. H. Jones</i>	<u>DATE</u> <i>10/13/64</i>
<u>PRINCPL DISTRIBUTION ENGR., H.E. CO., INC.</u> <i>W. M. Jones for F. H. Jones</i>	<u>DATE</u> <i>10/14/64</i>
<u>OUTSIDE PLANT ENGINEER, H.T. CO. LTD.</u> <i>J. H. Jones</i>	<u>DATE</u> <i>10/9/64</i>
<i>J. H. Jones</i> ASSISTANT CHIEF ENGINEER	B.W.S. <u>DATE</u>

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PLAN
WATER-ELECTRIC-TELEPHONE
FARRINGTON HIGHWAY
INTERSTATE ROUTE H-1
F.A.I. Proj. No. I-H-1 (17), UNIT 1

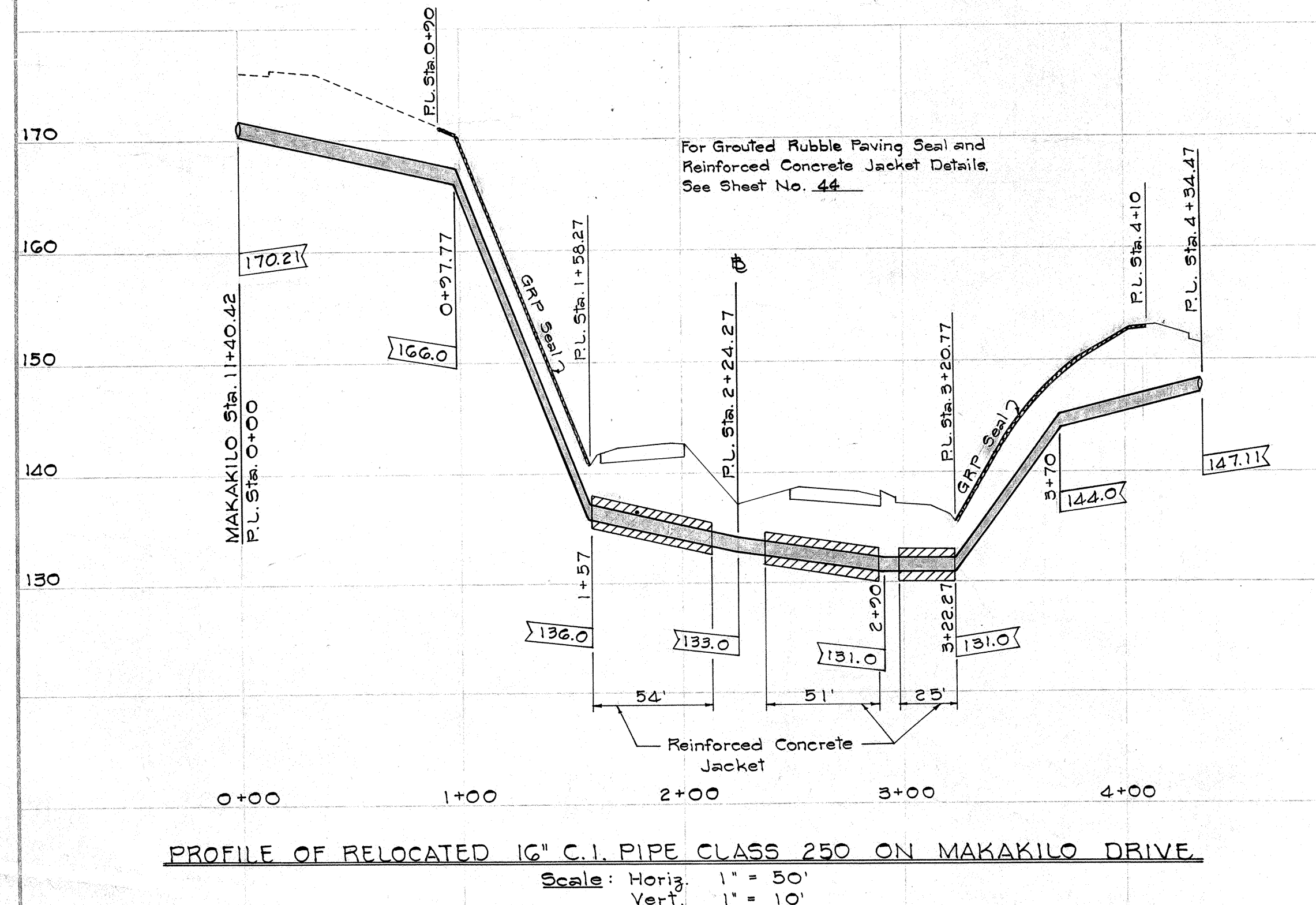
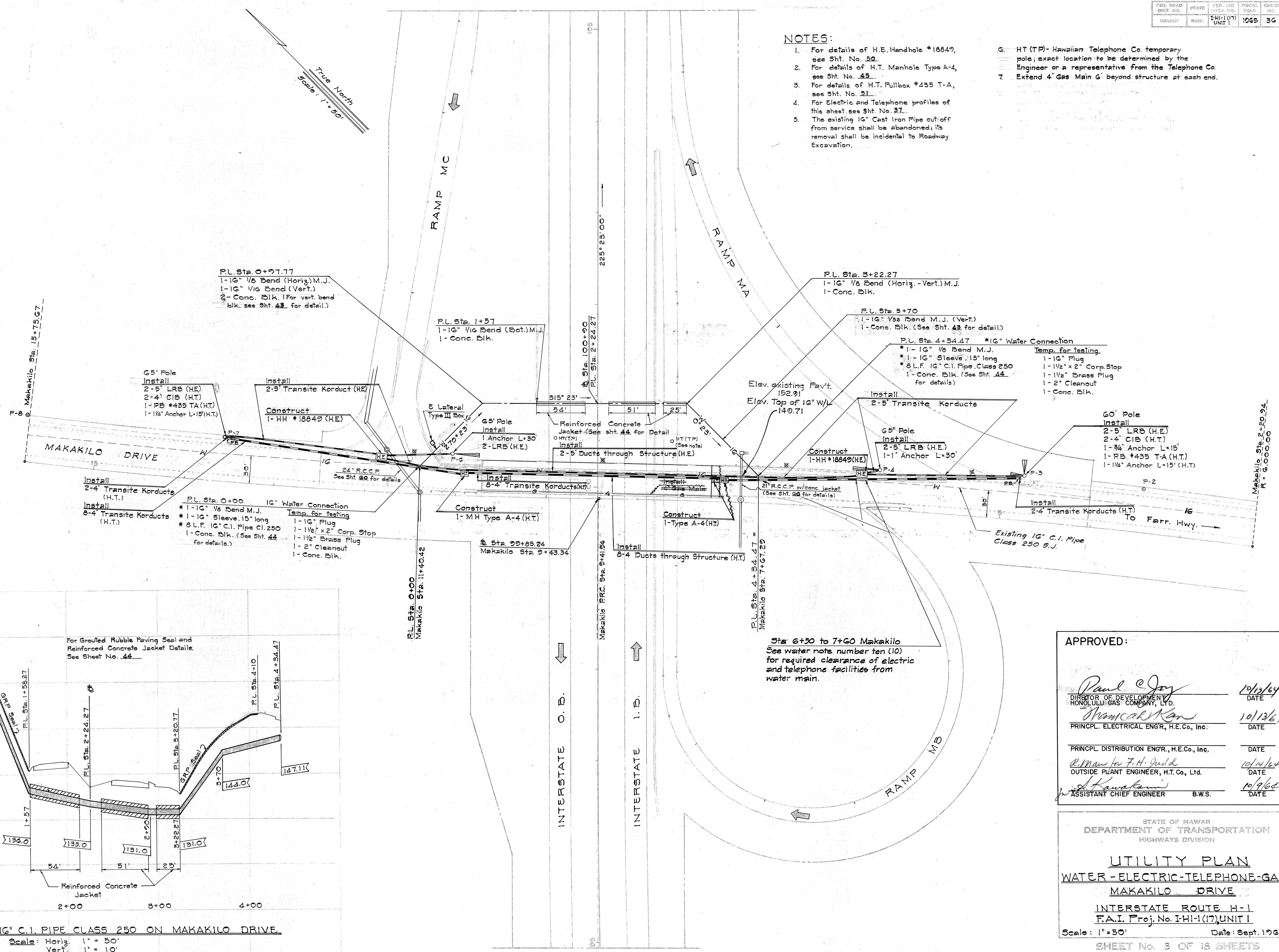
Scale: 1"=50' Date: Oct. 1964

SHEET No. 2 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1065	1965	36	146

NOTES:

- For details of H.E. Handhole #18849, see Sht. No. 32.
- For details of H.T. Manhole Type A-4, see Sht. No. 45.
- For details of H.T. Pullbox #435 T-A, see Sht. No. 51.
- For Electric and Telephone profiles of this sheet, see Sht. No. 37.
- The existing 16" Cast Iron Pipe cut off from service shall be abandoned; its removal shall be incidental to Roadway Excavation.
- HT (TP) - Hawaiian Telephone Co. temporary pole; exact location to be determined by the Engineer or a representative from the Telephone Co.
- Extend 4" Gas Main G' beyond structure at each end.



APPROVED:

Paul C. Jay 10/13/64
DIRECTOR OF DEVELOPMENT
HONOLULU GAS COMPANY, LTD. DATE

Shirley A. Kan 10/13/64
PRINCPL. ELECTRICAL ENGR., H.E. Co., Inc. DATE

R. M. Law for F. H. Gidd 10/14/64
PRINCPL. DISTRIBUTION ENGR., H.E. Co., Inc. DATE

A. Kawakami 10/9/64
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. DATE

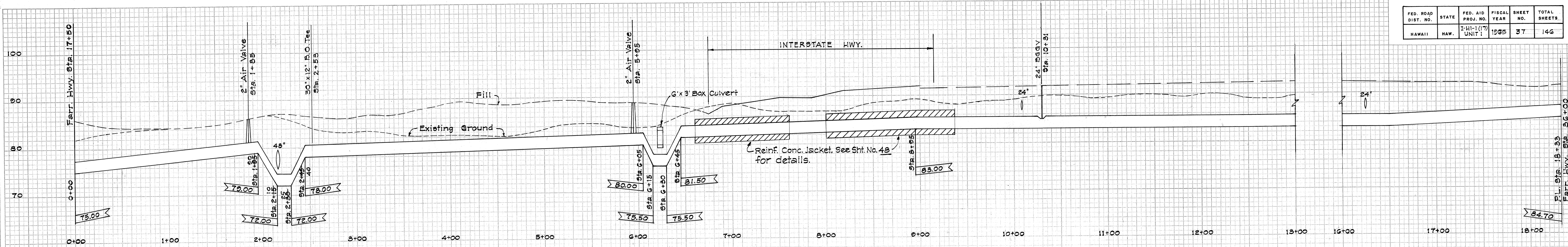
A. Kawakami B.W.S. 10/9/64
ASSISTANT CHIEF ENGINEER DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PLAN
WATER-ELECTRIC-TELEPHONE-GAS
MAKAKILO DRIVE
INTERSTATE ROUTE H-1
F.A.I. Proj. No. IHI-1(17)UNIT I
Scale: 1"=50' Date: Sept. 1964.
SHEET No. 3 OF 18 SHEETS

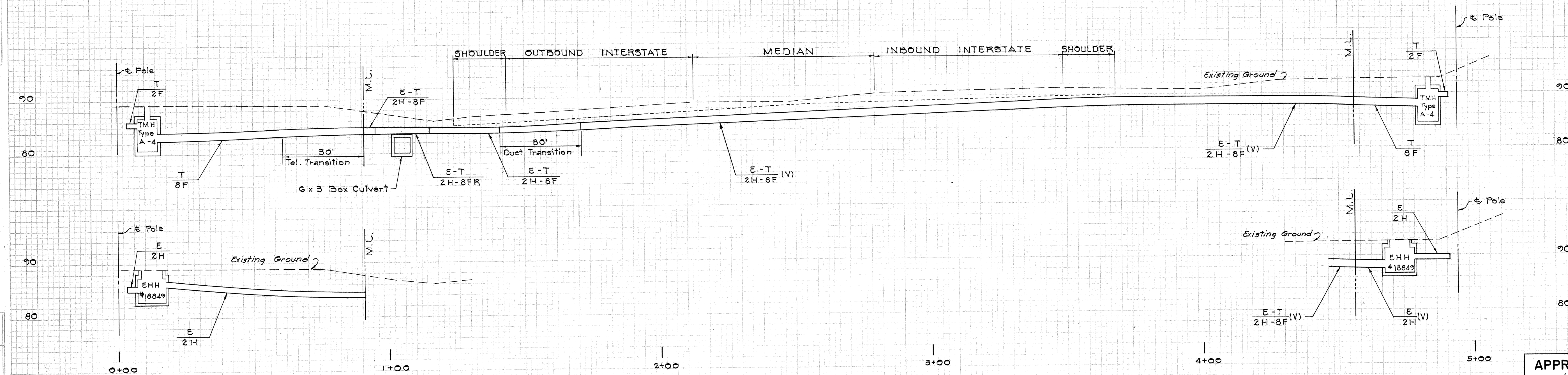
ORIGINAL	DATE
PLAN	
DESIGNED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(17) UNIT 1	1965	37	146



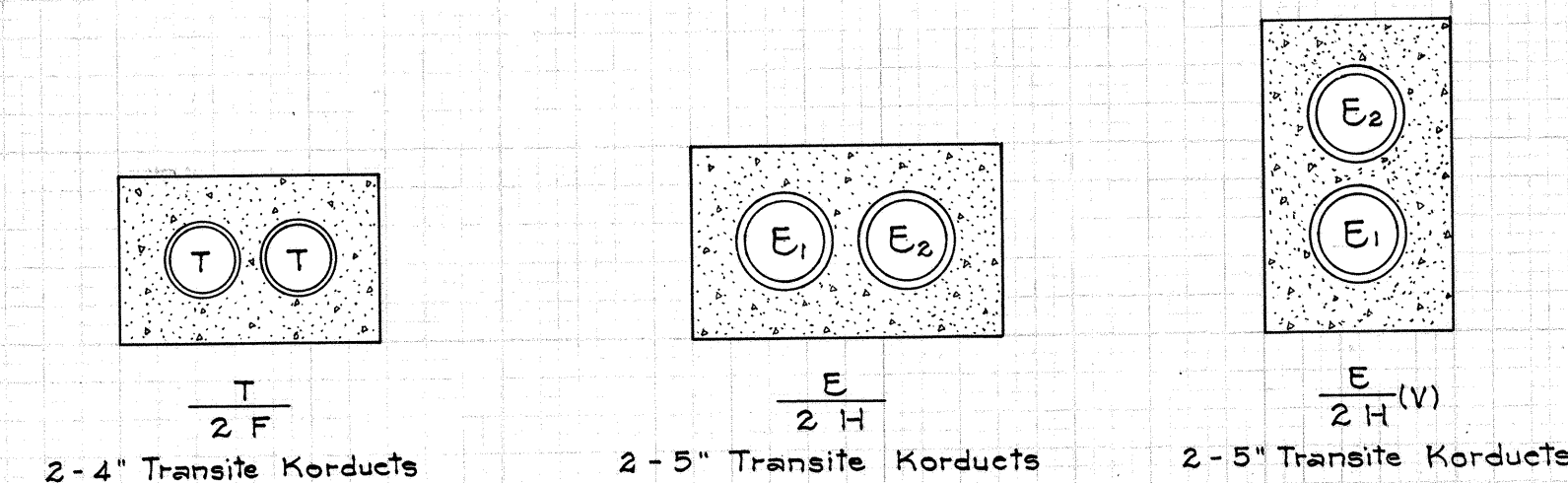
PROFILE 30" CONC. WATER PIPE RELOCATION ALONG FARRINGTON HIGHWAY

PROFILE SCALE: Hor. 1" = 50'
Ver. 1" = 10'

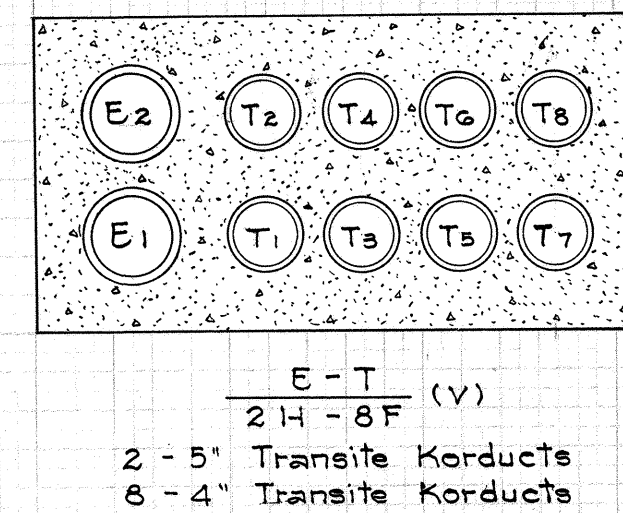
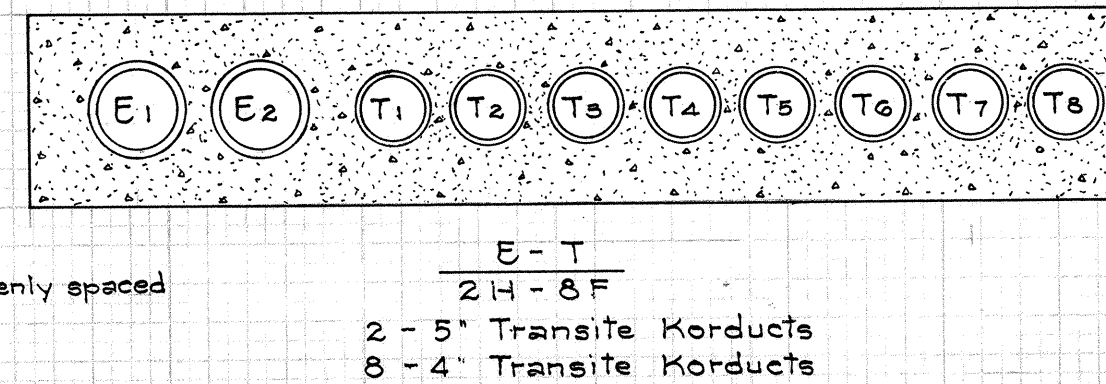
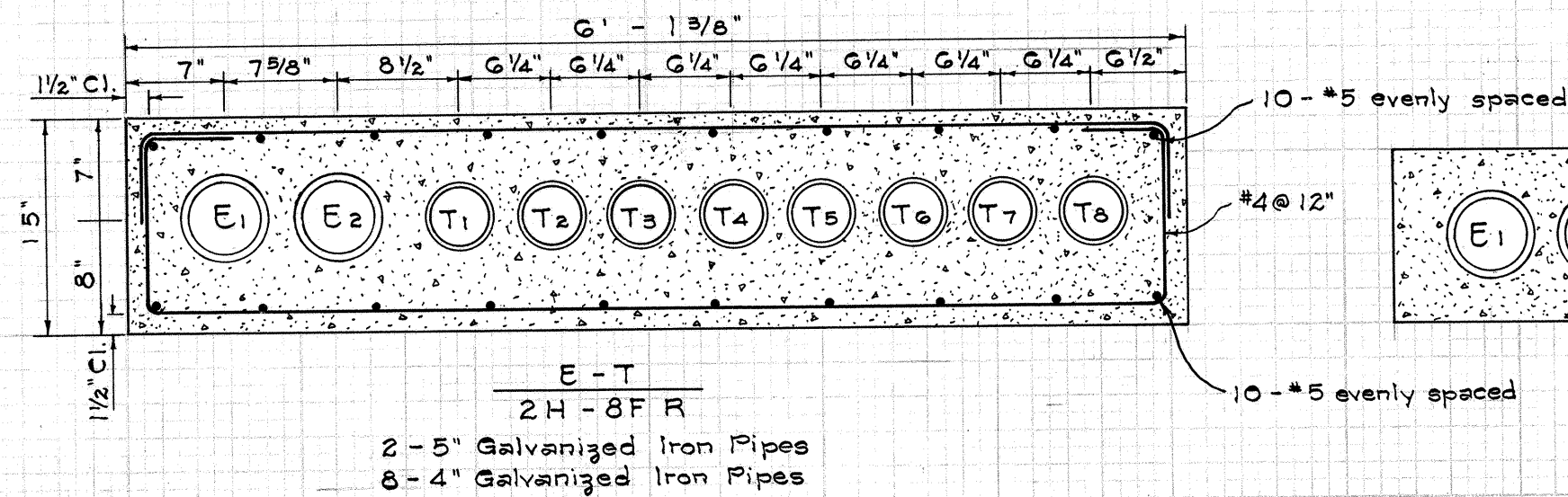
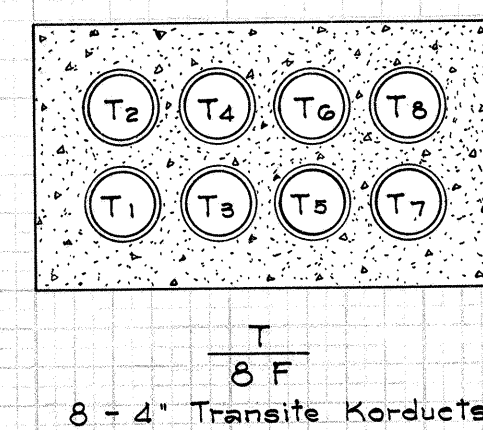


PROFILE OF TELEPHONE AND ELECTRIC DUCT LINES ALONG FARRINGTON HIGHWAY

PROFILE SCALE: Hor. 1" = 20'
Ver. 1" = 10'



CONDUIT SIZE	SYMBOL
3/4"	A
1"	B
2"	C
3"	D
3 1/2"	E
4"	F
4 1/2"	G
5"	H



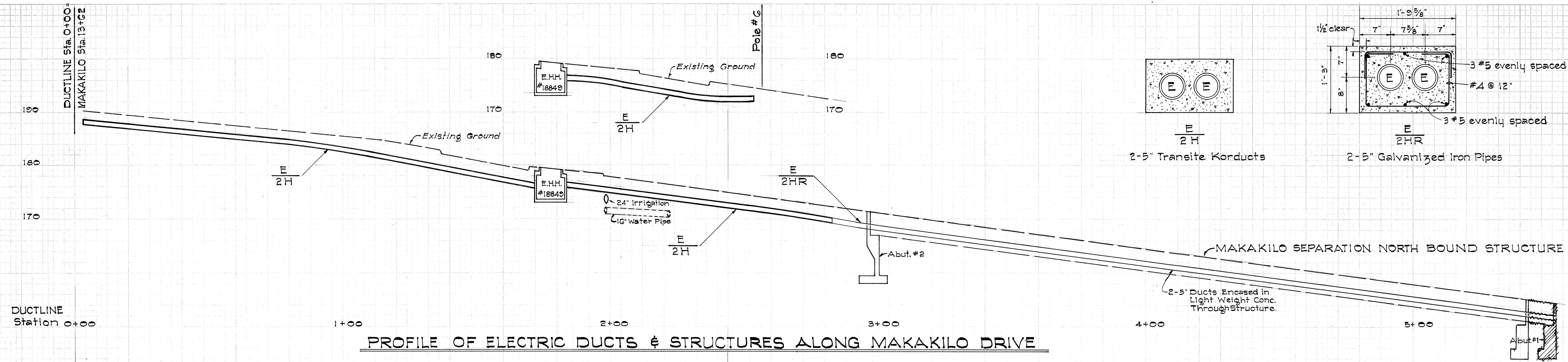
APPROVED:		
<i>[Signature]</i>	ASSISTANT CHIEF ENGINEER	10/9/64
<i>[Signature]</i>	OUTSIDE PLANT ENGINEER/H.T. Co., Ltd.	10/14/64
<i>[Signature]</i>	PRINCPL. ELECTRICAL ENGR., H.E. Co., Inc.	10/13/64
<i>[Signature]</i>	PRINCPL. DISTRIBUTION ENGR., H.E. Co., Inc.	

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
UTILITY PROFILES WATER - ELECTRIC - TELEPHONE FARRINGTON HIGHWAY	
INTERSTATE ROUTE H-1 FAI Proj. I-HI-1(17) UNIT 1	
Scale: As Shown	Date: Sept. 1964.
SHEET No. 4 OF 18 SHEETS	

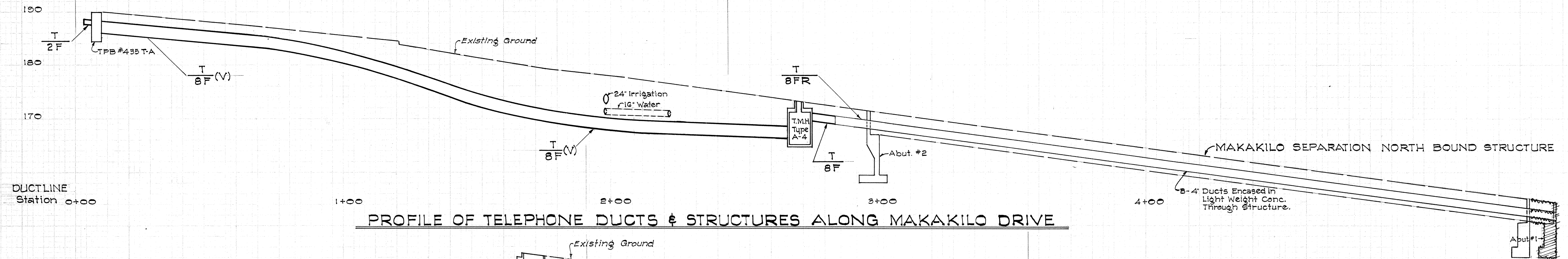
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	I-HI-1(17) UNIT 1	1965	36	146

LEGEND FOR CONDUIT

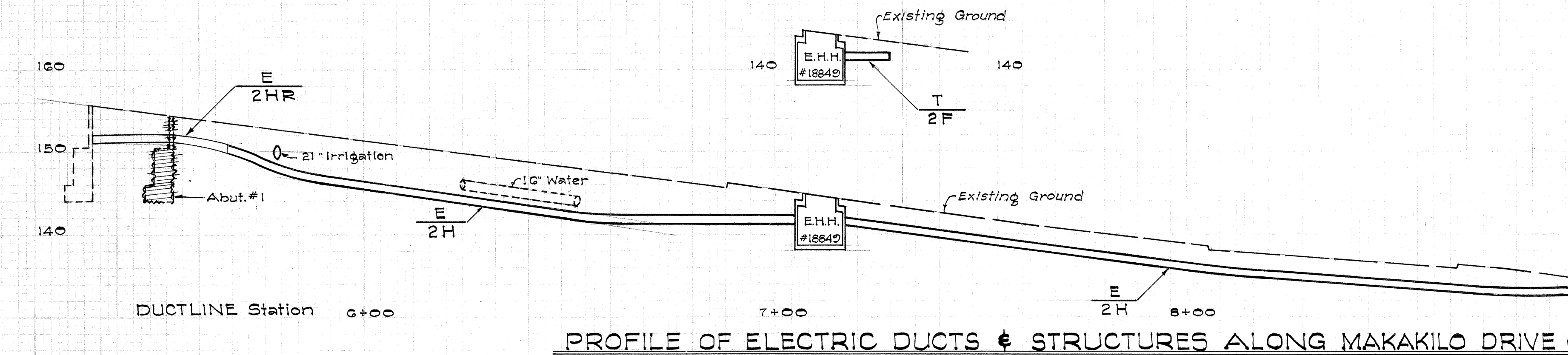
CONDUIT SIZE	SYMBOL
3"	A
1"	B
2"	C
3"	D
3 1/2"	E
4"	F
4 1/2"	G
5"	H



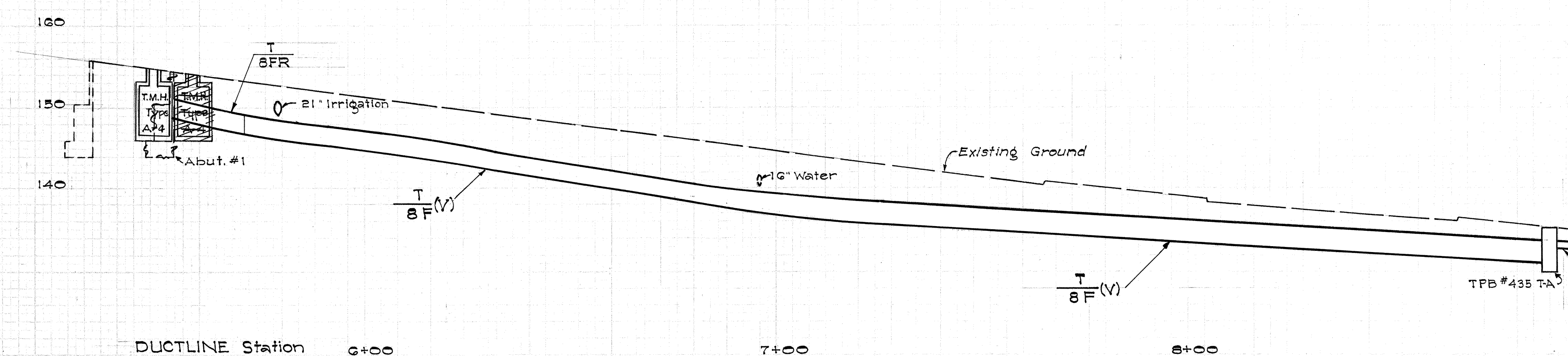
PROFILE OF ELECTRIC DUCTS & STRUCTURES ALONG MAKAKILO DRIVE



PROFILE OF TELEPHONE DUCTS & STRUCTURES ALONG MAKAKILO DRIVE



PROFILE OF ELECTRIC DUCTS & STRUCTURES ALONG MAKAKILO DRIVE (cont.)



PROFILE OF TELEPHONE DUCTS & STRUCTURES ALONG MAKAKILO DRIVE (cont.)

Profile Scale: Hori. 1" = 20'
Vert. 1" = 10'

APPROVED:

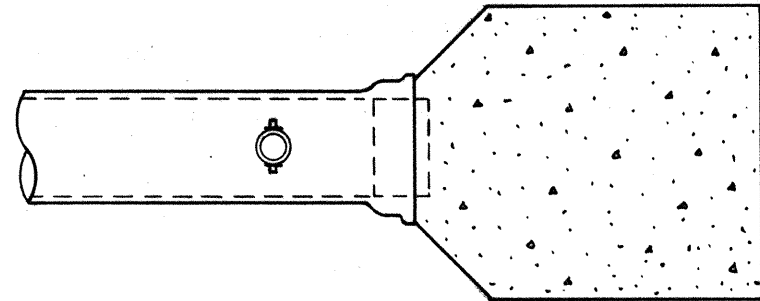
R. Man for F.H. Jude 10/14/64
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. DATE
PRINCL. ELECTRICAL ENGR., H.E. Co., Inc. DATE
Frank A. K. K. 10/13/64
PRINCL. DISTRIBUTION ENGR., H.E. Co., Inc. DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION UTILITY PROFILE ELECTRIC & TELEPHONE MAKAKILO DRIVE

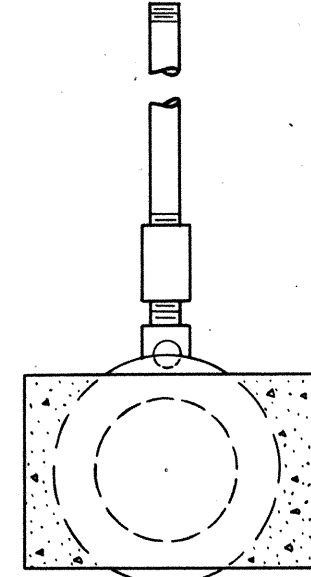
INTERSTATE ROUTE HI
E.A.I. Proj. No. I-HI-1(17) UNIT 1
Scale: As Shown Date: Sept. 1964
SHEET No. 5 OF 18 SHEETS

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1 (17) UNIT 1	1965	30	146

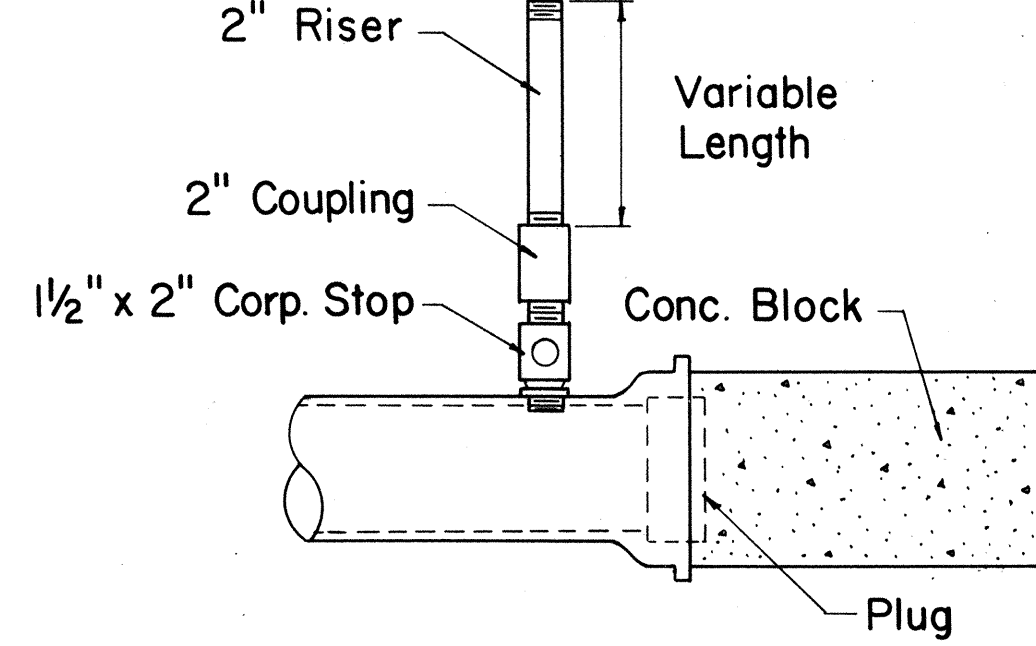
NOTE:
Contractor to furnish 1/2" brass plug (Tapered thread) to replace corporation stop upon completion of chlorination.



TOP VIEW

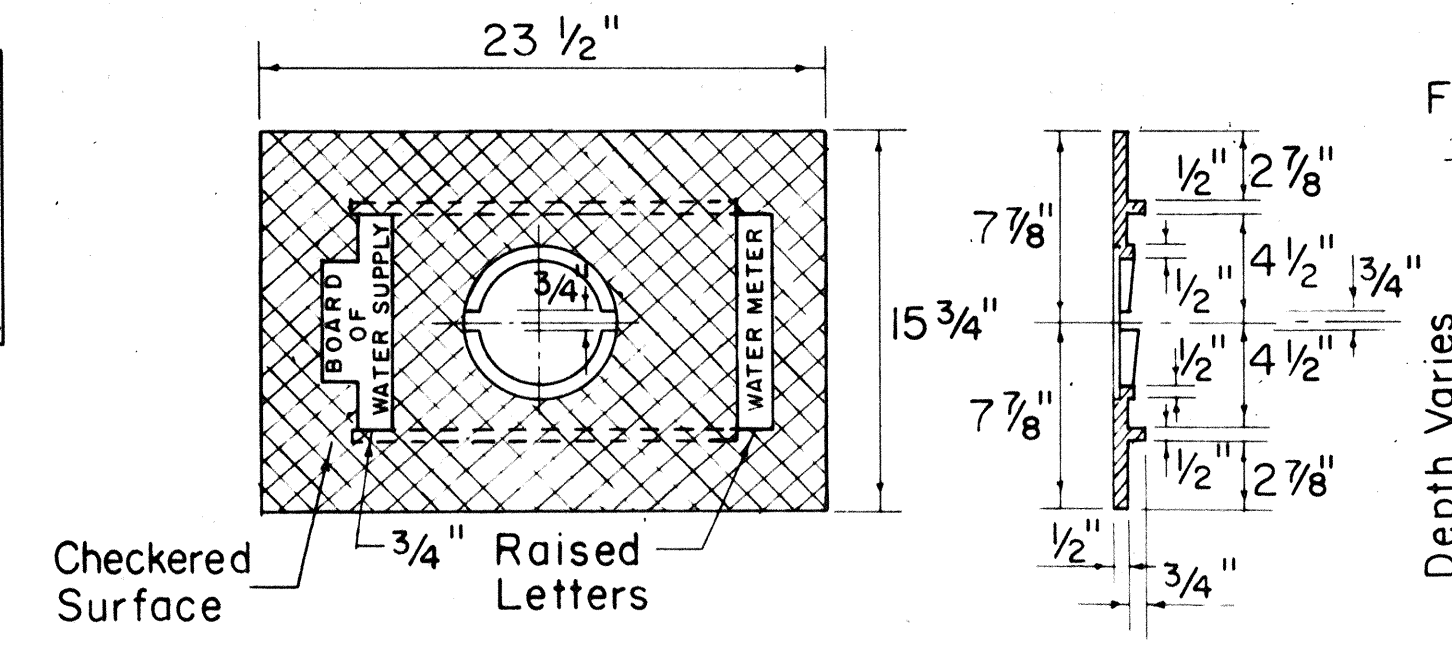


END VIEW

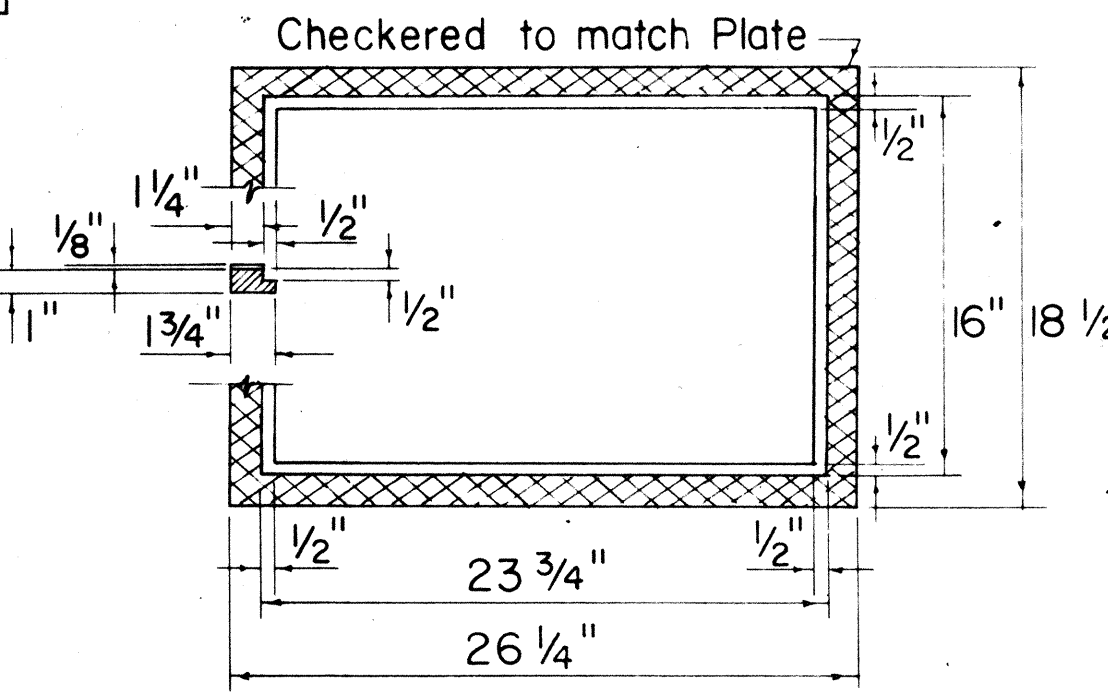


SIDE VIEW

DETAIL OF
TEMPORARY 2" CLEANOUT
Not to Scale



COVER PLATE

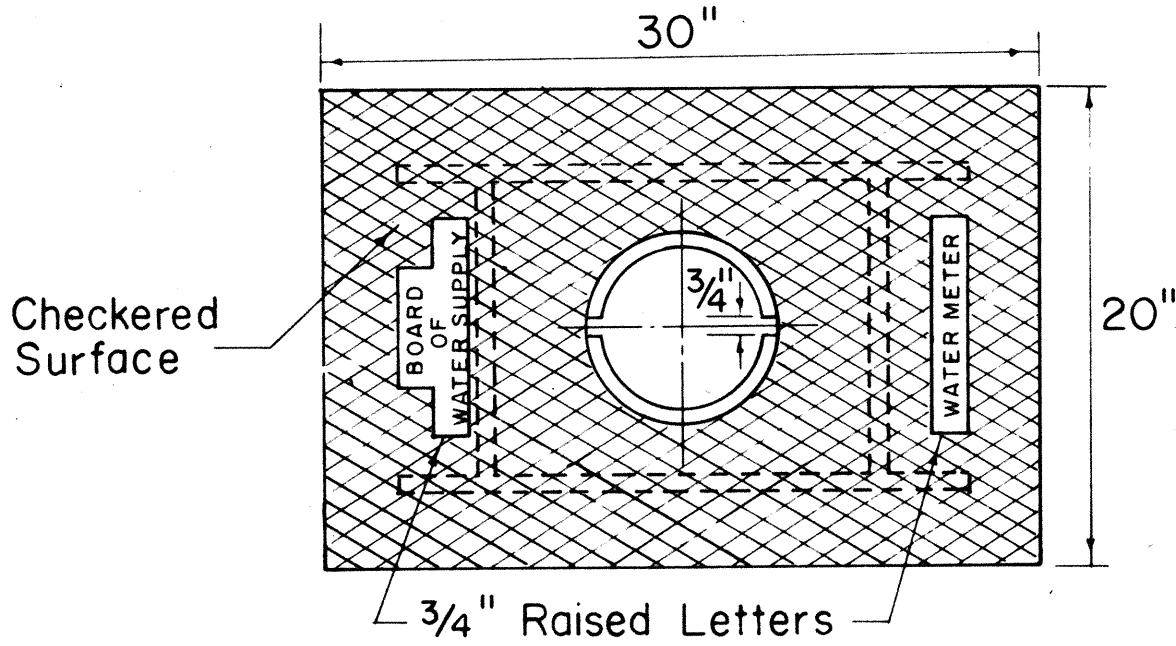


FRAME

CAST IRON FRAME AND PLATE

TYPE II

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

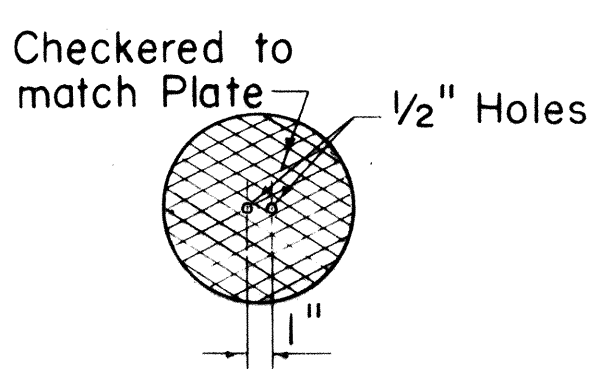


COVER PLATE

CAST IRON FRAME, PLATE AND COVER

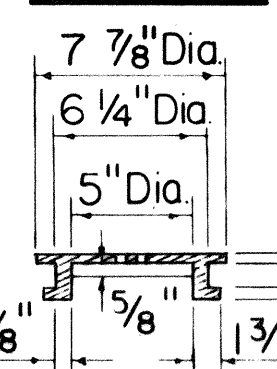
TYPE III

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



READING COVER

FRAME

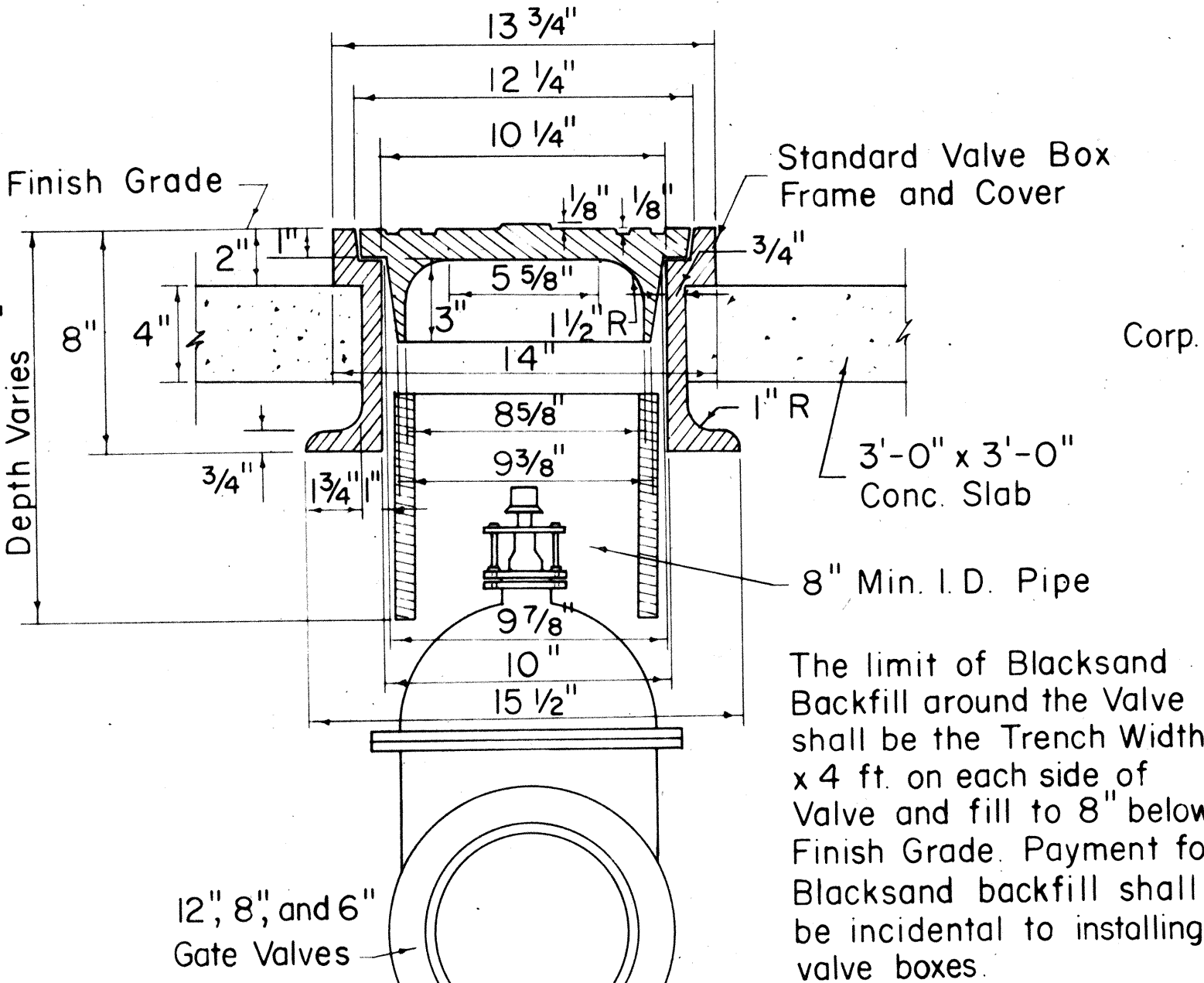


READING COVER

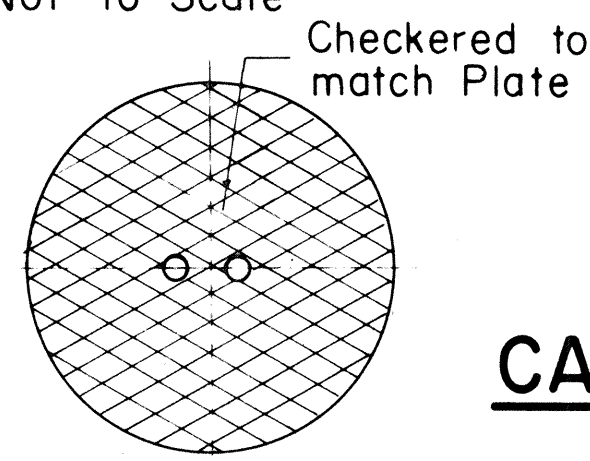
CHECKERED PATTERN

CAST IRON COVER FOR
TYPE II FRAME

Not to Scale

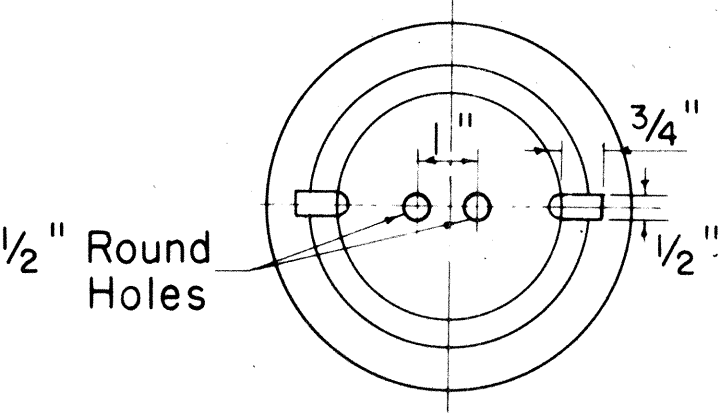


INSTALLATION OF VALVE
BOX FOR GATE VALVES
Not to Scale



CAST IRON FRAME AND COVER

Scale: 3" = 1'-0"

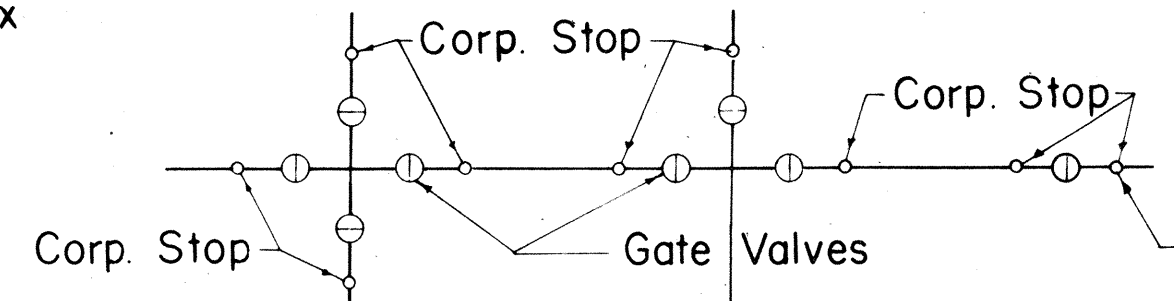


READING COVER

CHECKERED PATTERN

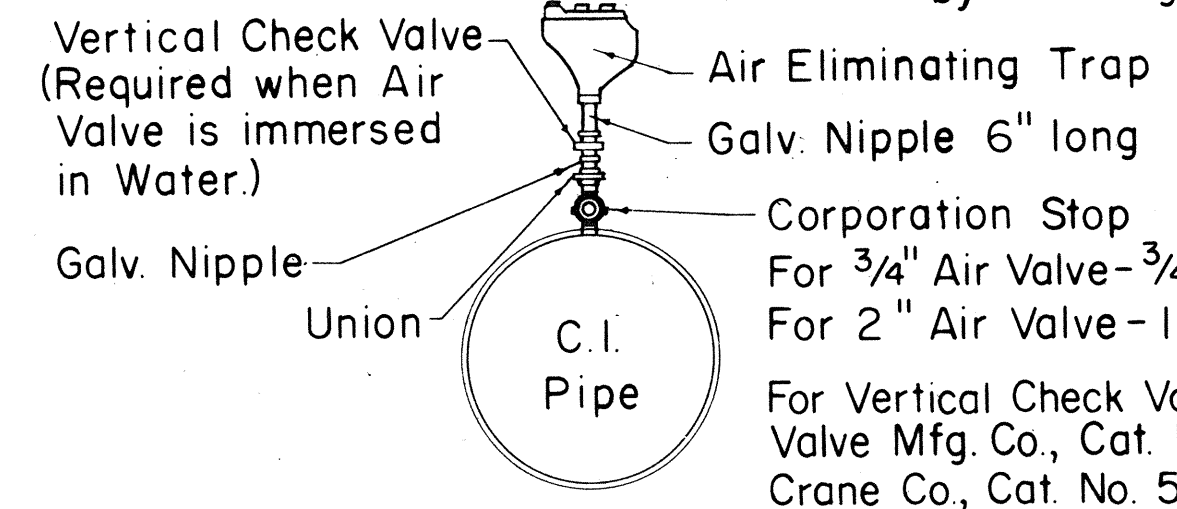
CAST IRON COVER FOR
TYPE II FRAME

Not to Scale



CORP. STOP LAYOUT

Not to Scale

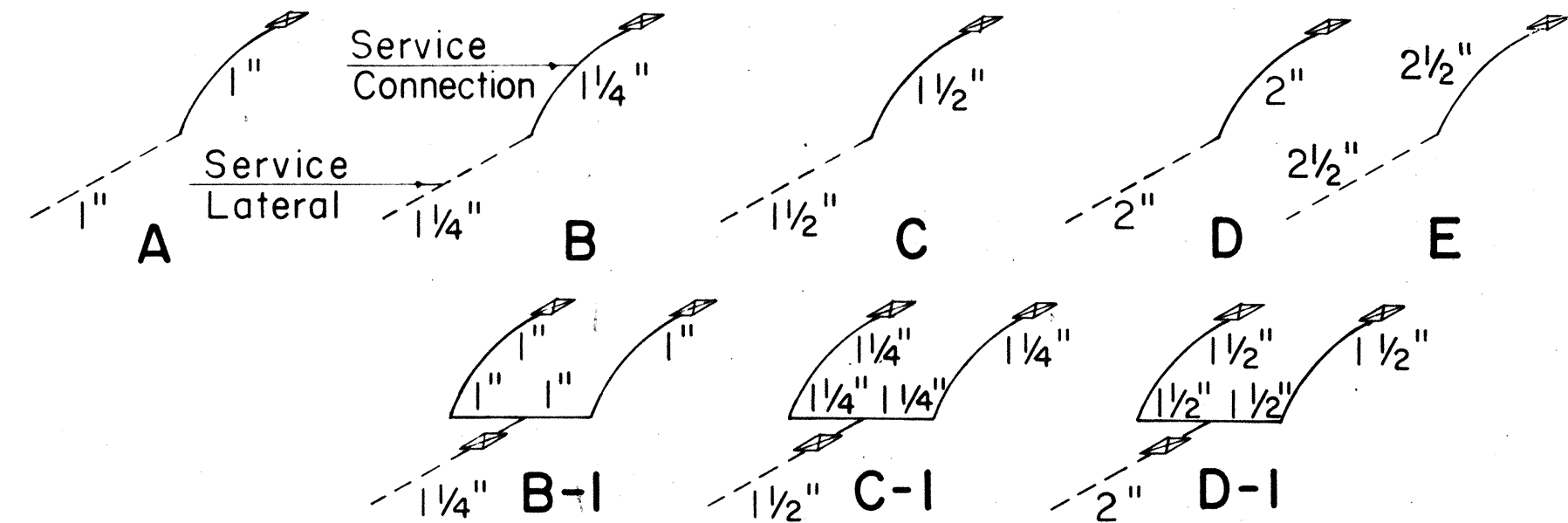


DETAIL OF CONNECTION FOR
AIR ELIMINATING TRAP

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:

A. Kawakami
ASSISTANT CHIEF ENGINEER
BOARD OF WATER SUPPLY
10/9/64
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

STANDARD DETAILS

INTERSTATE ROUTE H-1
F.A.I. Proj. No. I-HI-1(17), UNIT 1

Scale: As Noted Date: Sept. 1964

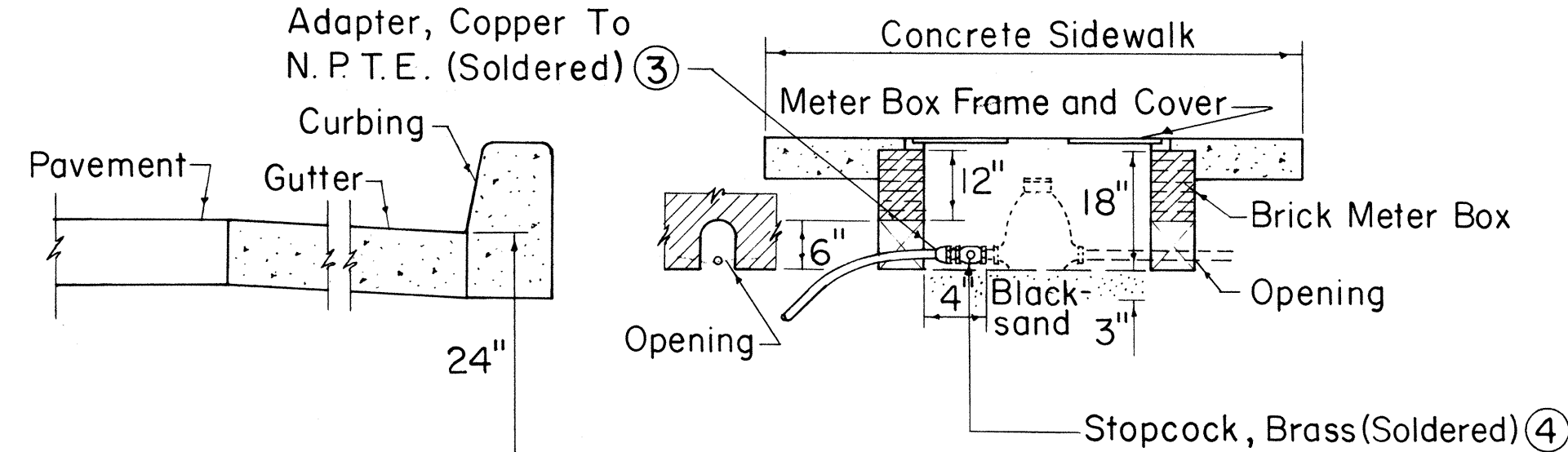
SHEET NO. 6 OF 18 SHEETS

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(17) UNIT 1	1965	41	146

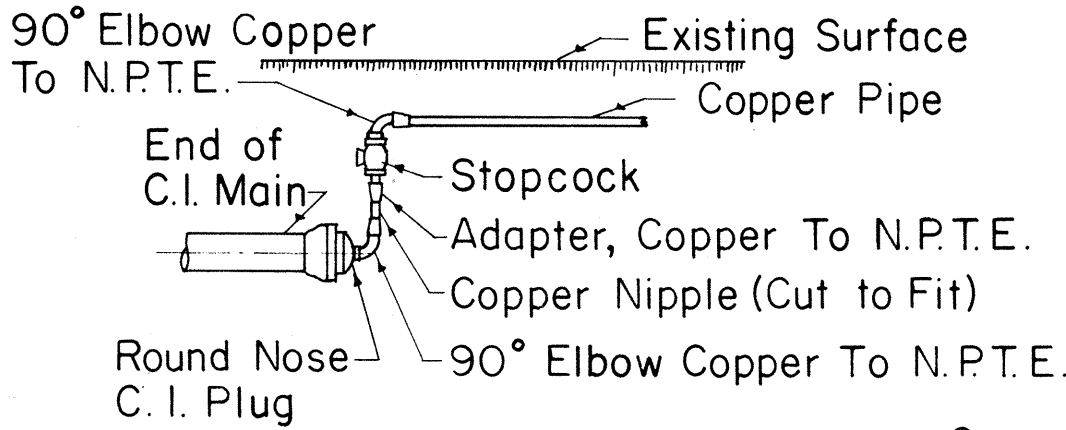
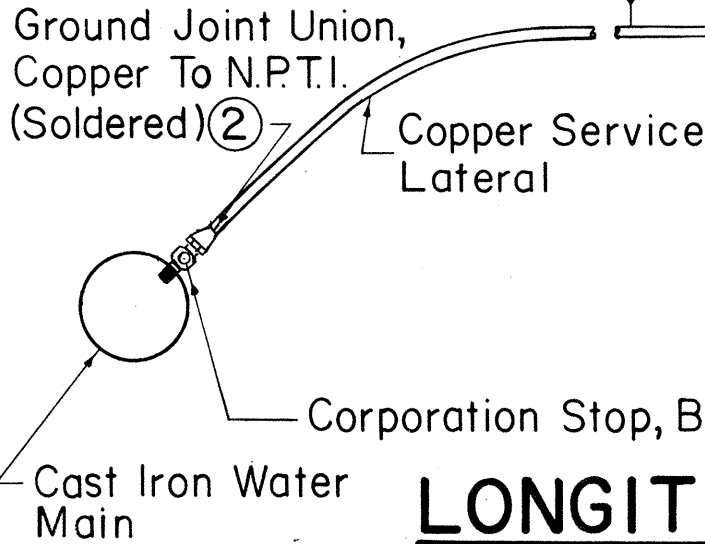
SCHEDULE OF COPPER FITTINGS
(SOLDERED JOINT)

ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	MULTIPLE SERV. CONN.	
			TWO SERVICES	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.

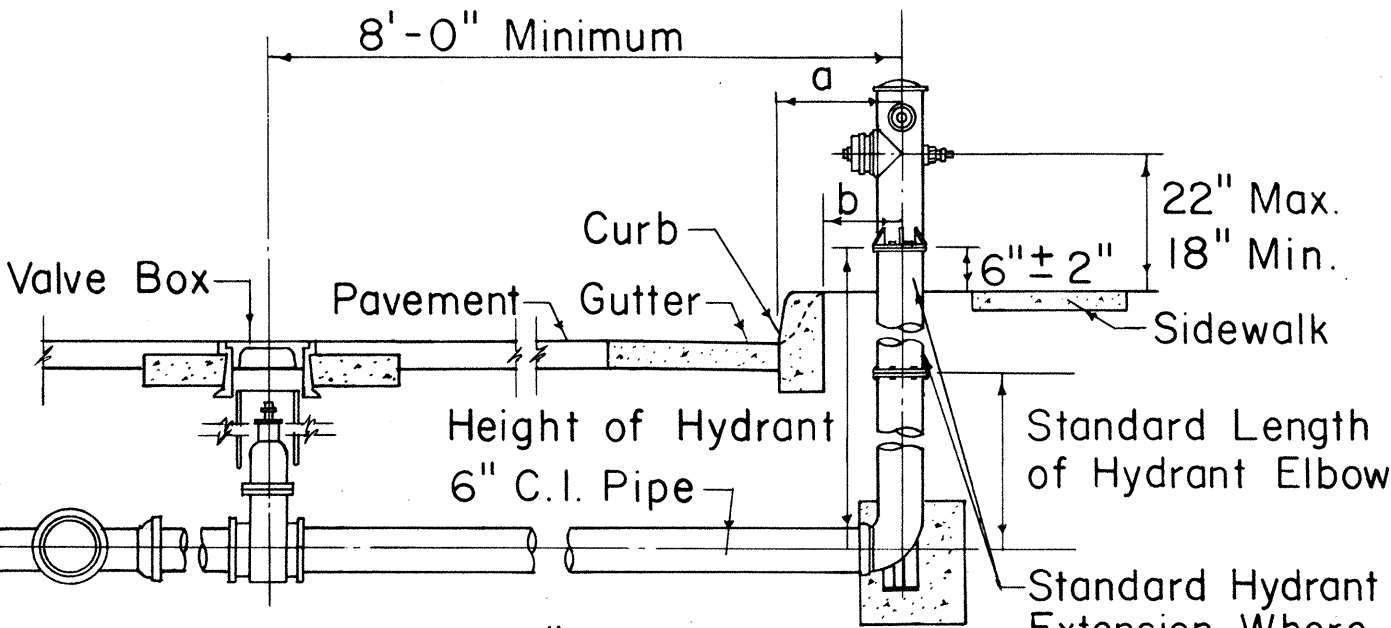


LONGITUDINAL SECTION



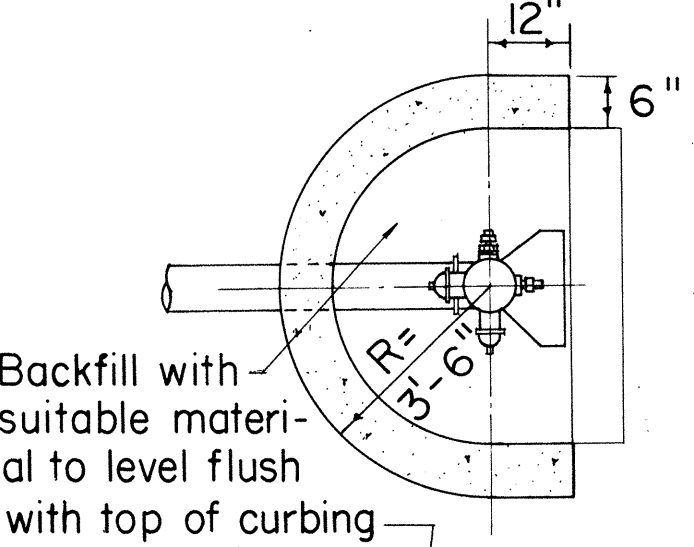
SOLDERED JOINT

SERVICE LATERAL CONNECTION AT END OF LINE

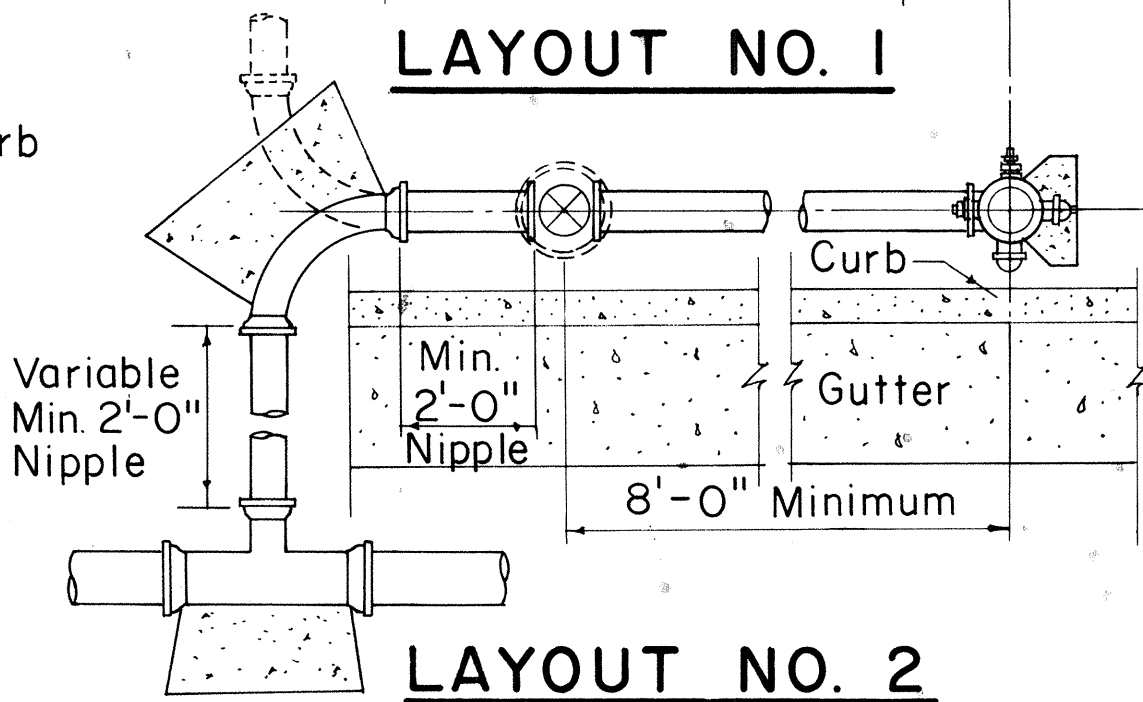


a	20" Min. (Standard Curb)
b	20" Min. (Roll Curb)

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



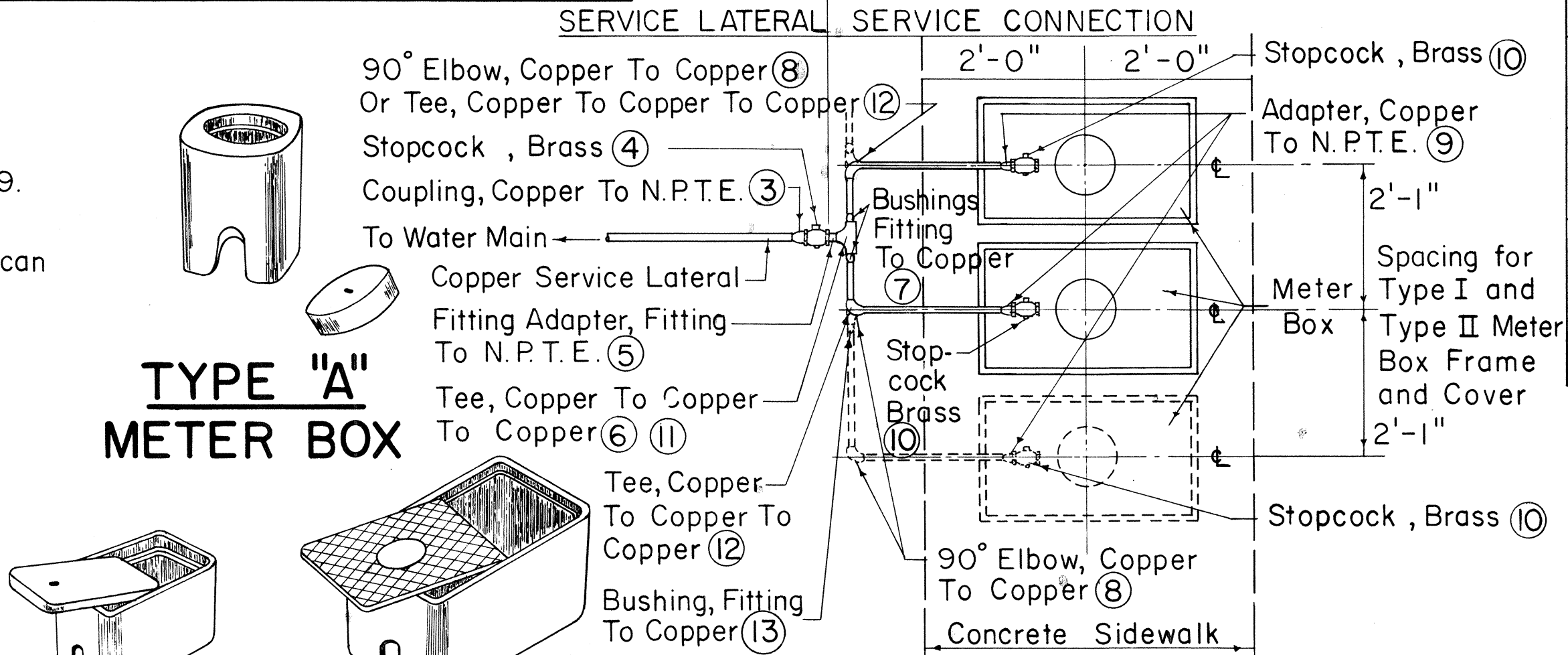
DETAIL OF CURBING
AT HYDRANT
WHERE REQUIRED



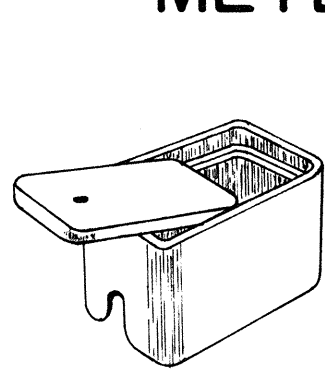
LAYOUT NO. 2

STANDARD FIRE HYDRANT LAYOUT

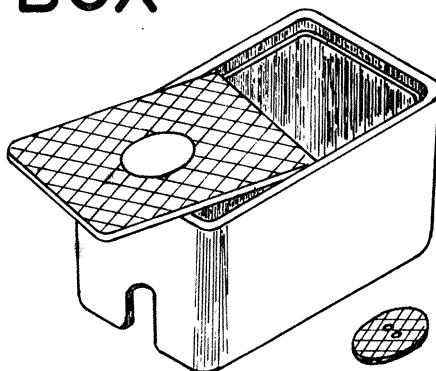
SINGLE SERVICE CONNECTION



TYPE "A"
METER BOX



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:

D. Kawakami
ASSISTANT CHIEF ENGINEER
BOARD OF WATER SUPPLY

10/9/64
DATE

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

STANDARD DETAILS

INTERSTATE ROUTE H-1
F.A.I. Proj. No. I-HI-1(17), UNIT 1

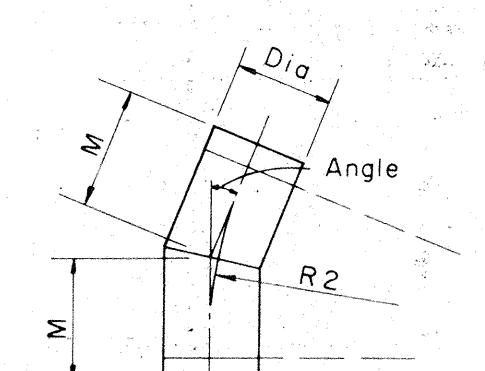
Not to Scale

Date: Sept. 1964

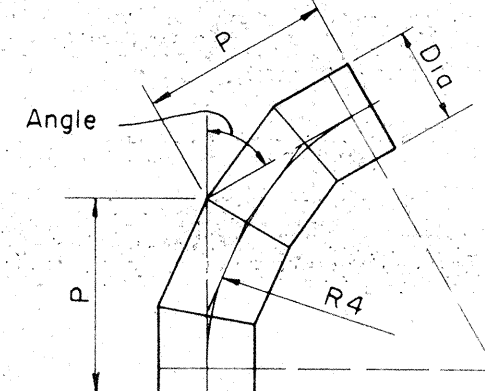
SHEET NO. 8 OF 18 SHEETS

06

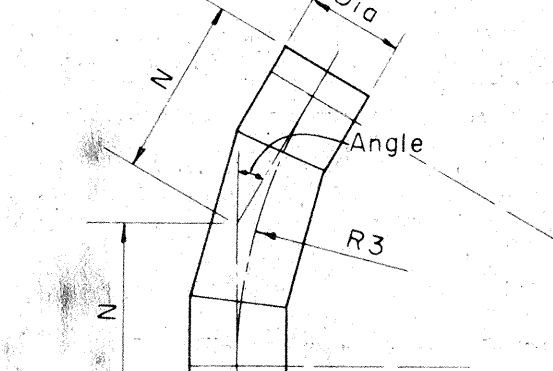
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-4-1(7)	1965	42	146



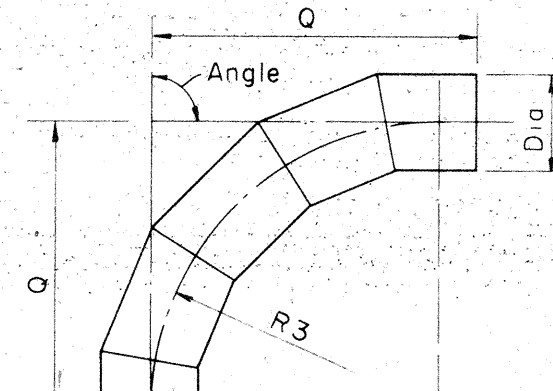
2 PIECE ELBOW
0° to 22 1/2° Inclusive



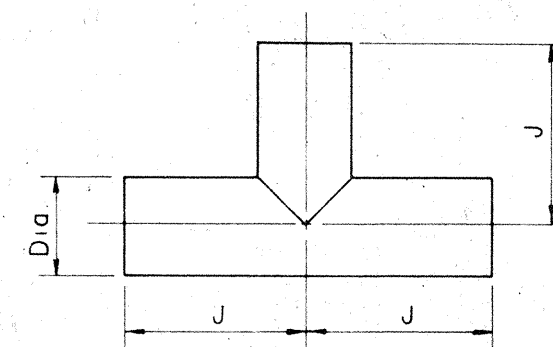
4 PIECE ELBOW
Over 45° to 67 1/2° Inclusive



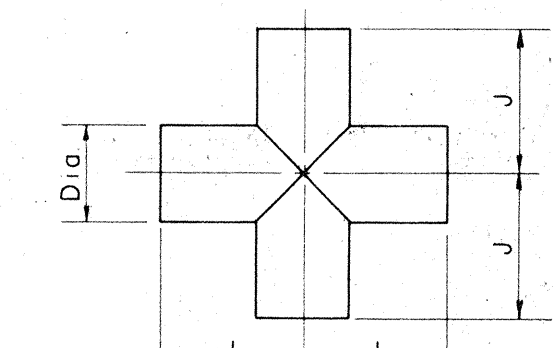
3 PIECE ELBOW
Over 22 1/2° to 45° Inclusive



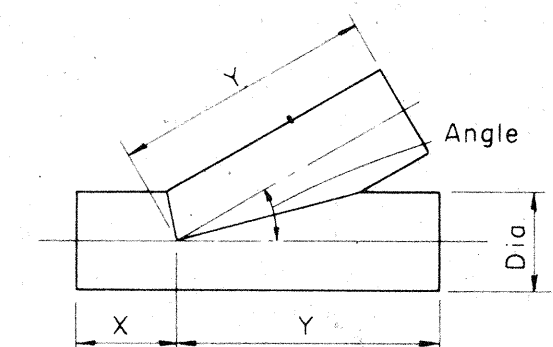
5 PIECE ELBOW
Over 67 1/2° to 90° Inclusive



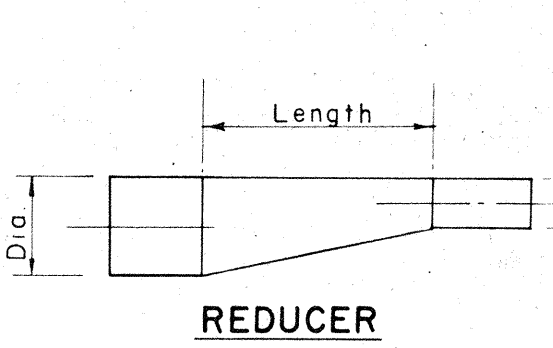
TEE



CROSS



LATERAL
30° Minimum - 75° Maximum



REDUCER

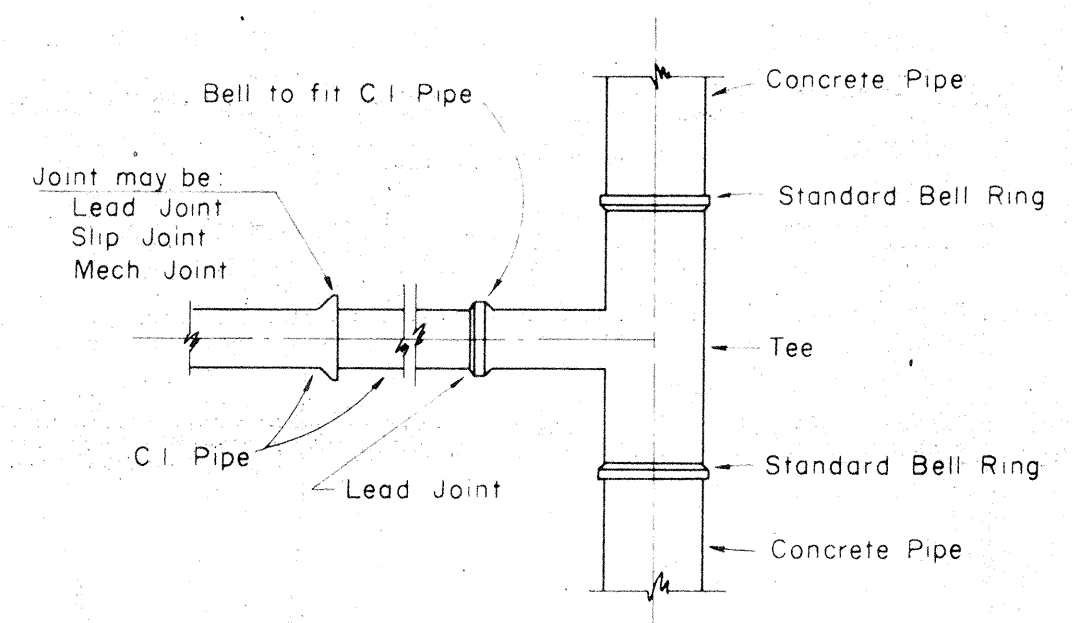
STANDARD FITTING DIMENSIONS													
DIAMETER	TEE		CROSS (Both Ways) J+J	LATERAL (30° to 75°)		ELBOWS (Center to End)							
	Run J+J	Outlet J		Run X+Y	Outlet Y	2 Piece (up to 22 1/2°)		3 Piece (22 1/2° to 45°)		4 Piece (45° to 67 1/2°)		5 Piece (67 1/2° to 90°)	
						M	R2	N	R3	P	R4		
16"	34"	17"	34"	62"	52"	12"	60"	18"	44"	26"	39"	34"	
18"	36"	18"	36"	66"	56"	12"	60"	19"	47"	27"	41"	36"	
20"	38"	19"	38"	72"	60"	13"	65"	20"	49"	28"	42"	39"	
22"	40"	20"	40"	78"	66"	13"	65"	21"	51"	30"	45"	41"	
24"	42"	21"	42"	84"	72"	14"	70"	22"	54"	32"	48"	44"	
30"	60"	30"	60"	96"	84"	15"	75"	25"	61"	37"	51"	51"	
36"	66"	33"	66"	110"	96"	16"	80"	27"	66"	40"	60"	56"	

DIMENSIONS FOR ECCENTRIC REDUCER REDUCING SECTION

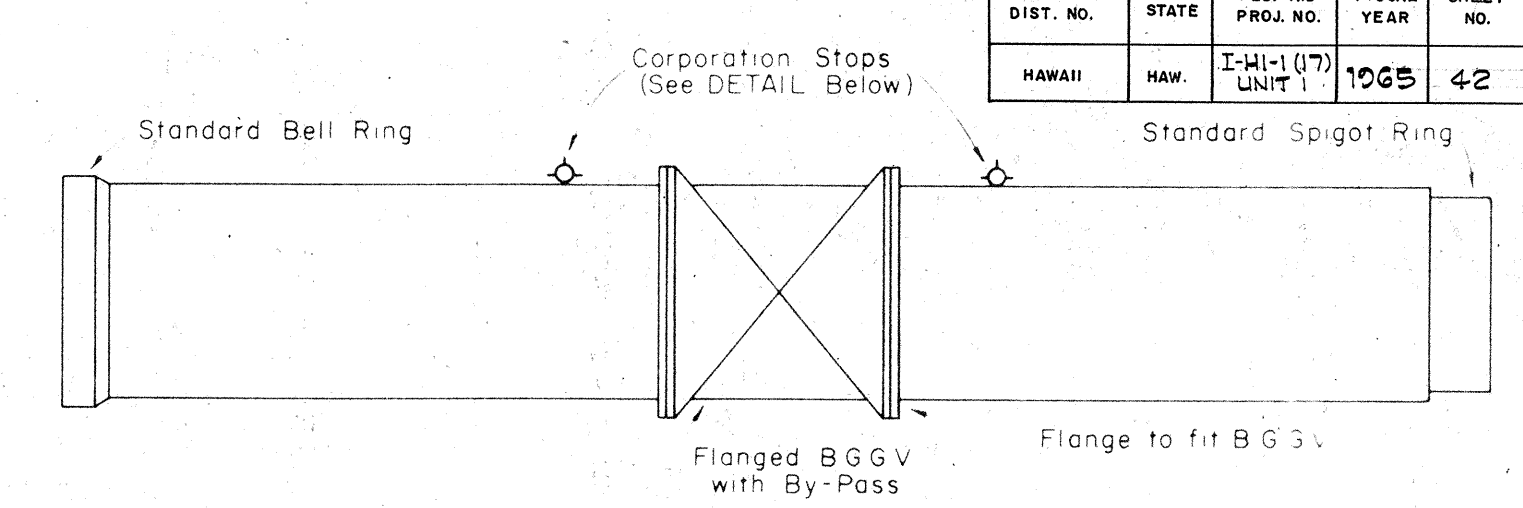
- 36" X 30" Eccentric Reducer - Length 66"
- 30" X 24" Eccentric Reducer - Length 66"
- 24" X 20" Eccentric Reducer - Length 26"
- 20" X 16" Eccentric Reducer - Length 26"

NOTE:

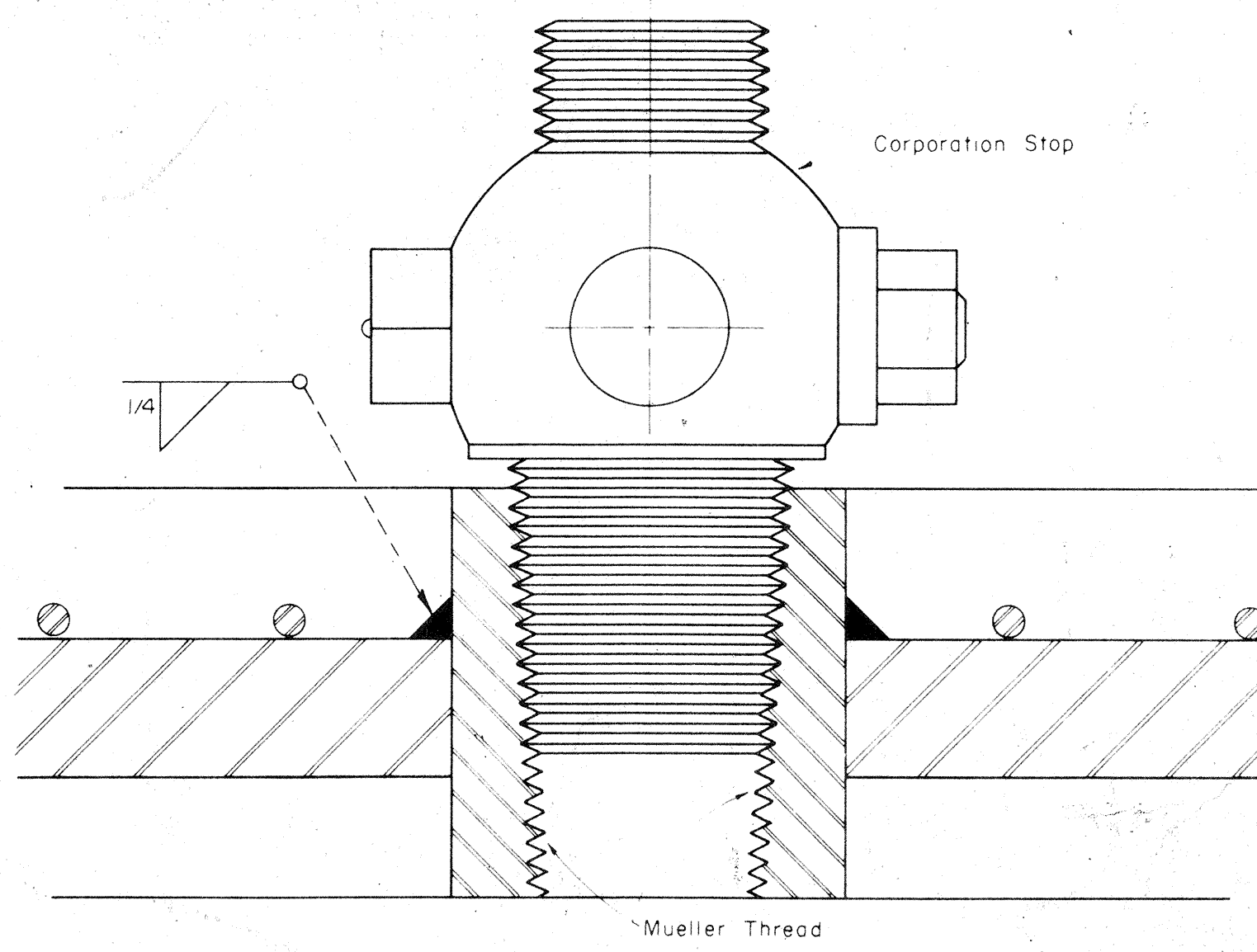
All dimensions shown are laying lengths.
All fittings and specials shall be fabricated independent from pipe sections and in accordance with the dimensions shown.
All fittings and specials shall be all bell unless otherwise noted.



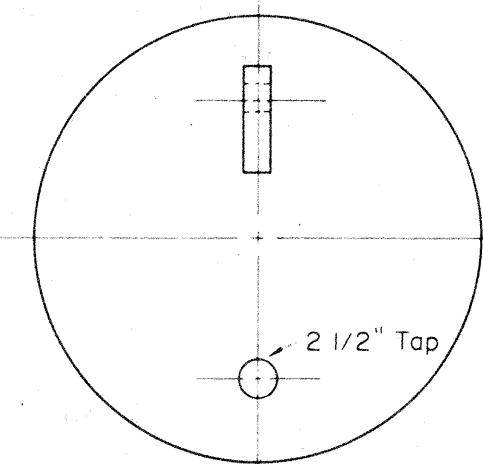
TYPICAL CAST IRON PIPE CONNECTION
TO CONCRETE CYLINDER PIPE



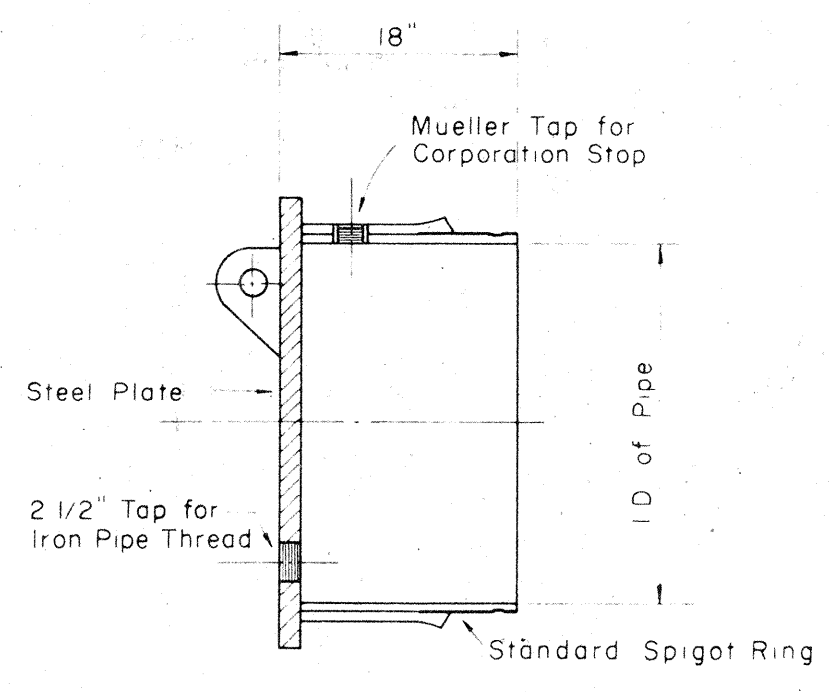
ELEVATION



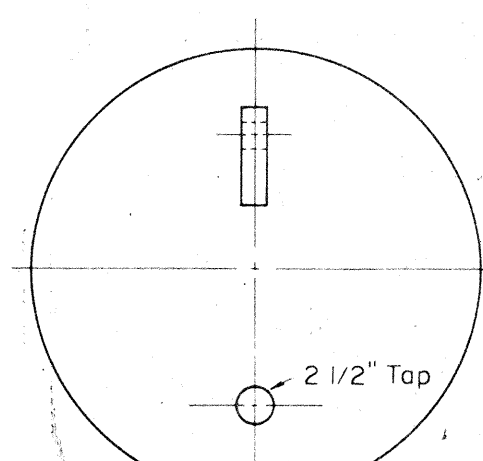
TYPICAL SECTION THRU CONCRETE PIPE
AT CORPORATION STOP



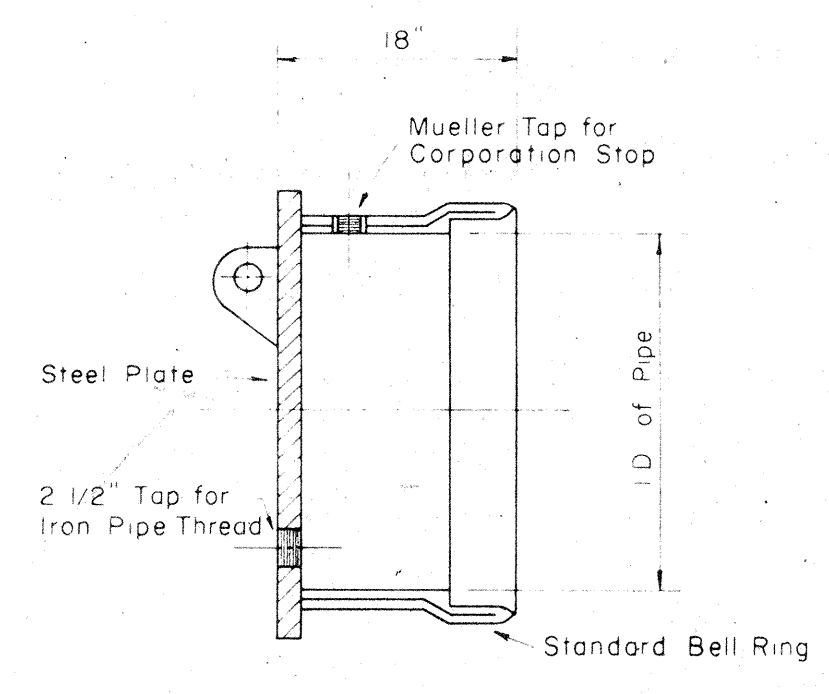
PLAN OF STEEL PLATE



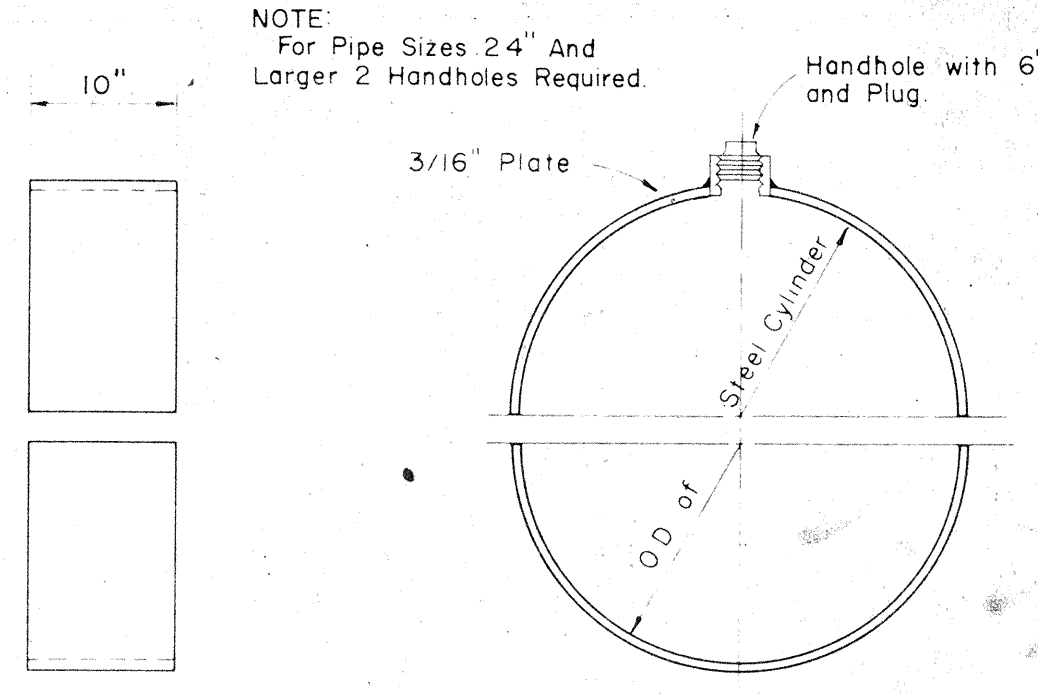
SECTION



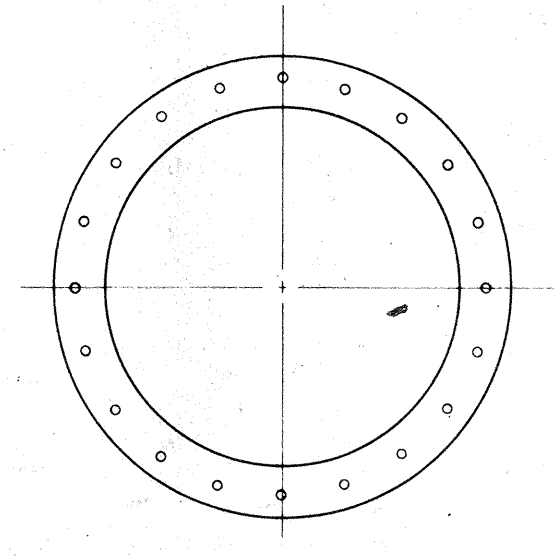
PLAN OF STEEL PLATE



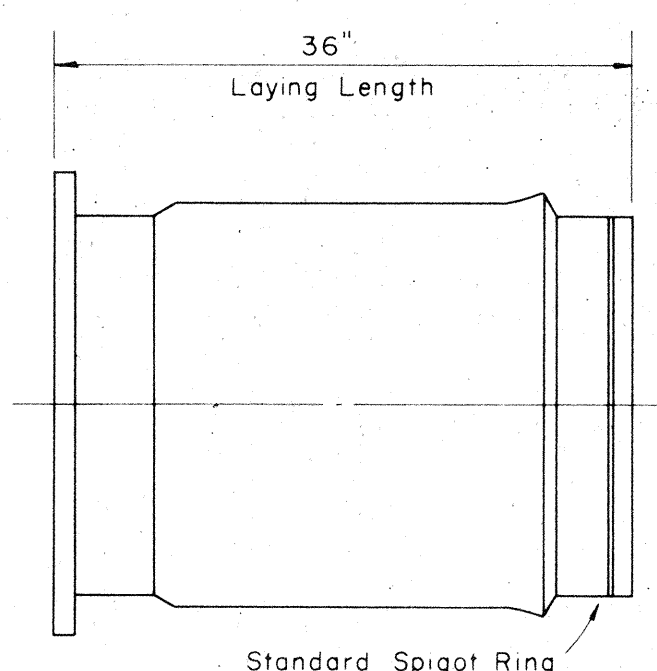
SECTION



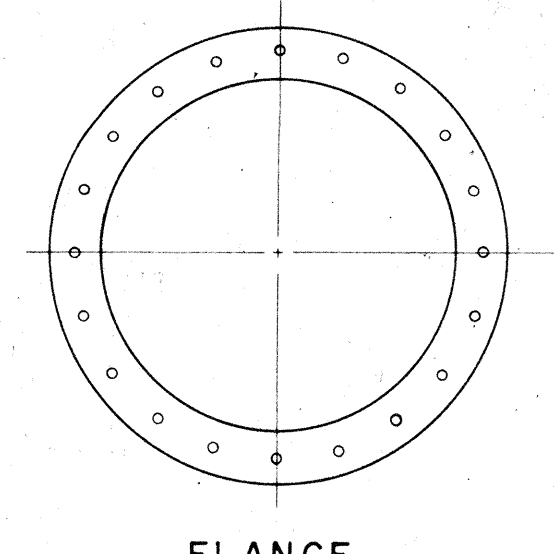
DETAIL OF SPLIT BUTT STRAP



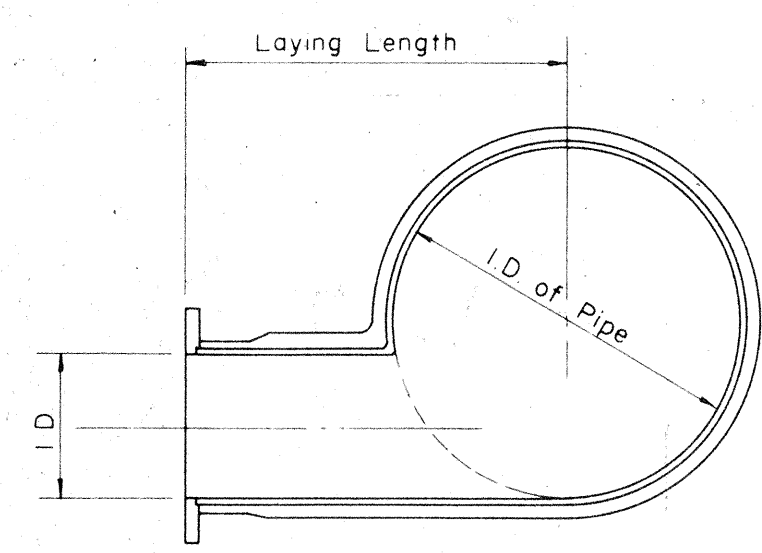
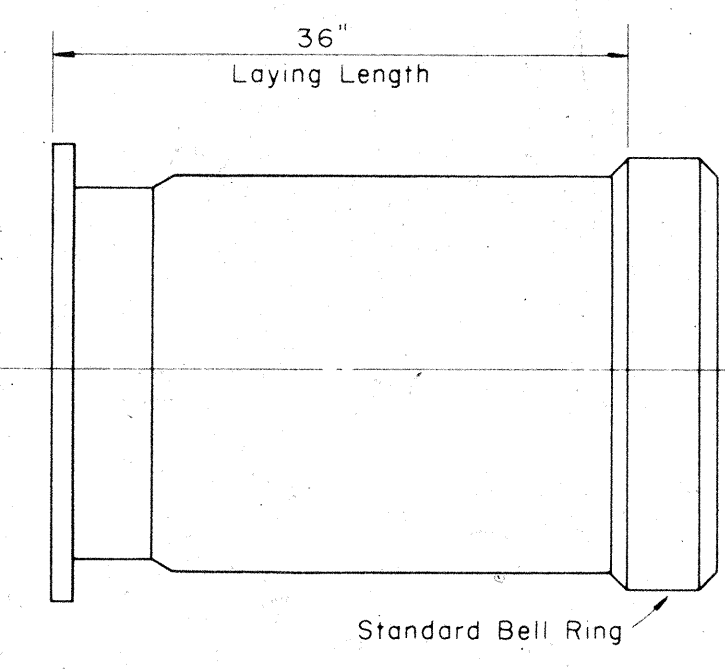
FLANGE
See Specs. for Flange Class



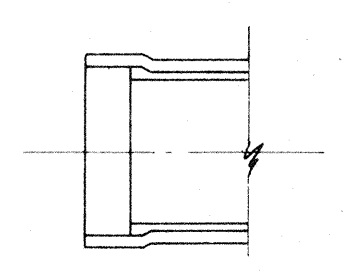
TYPICAL DETAIL
OF ADAPTER



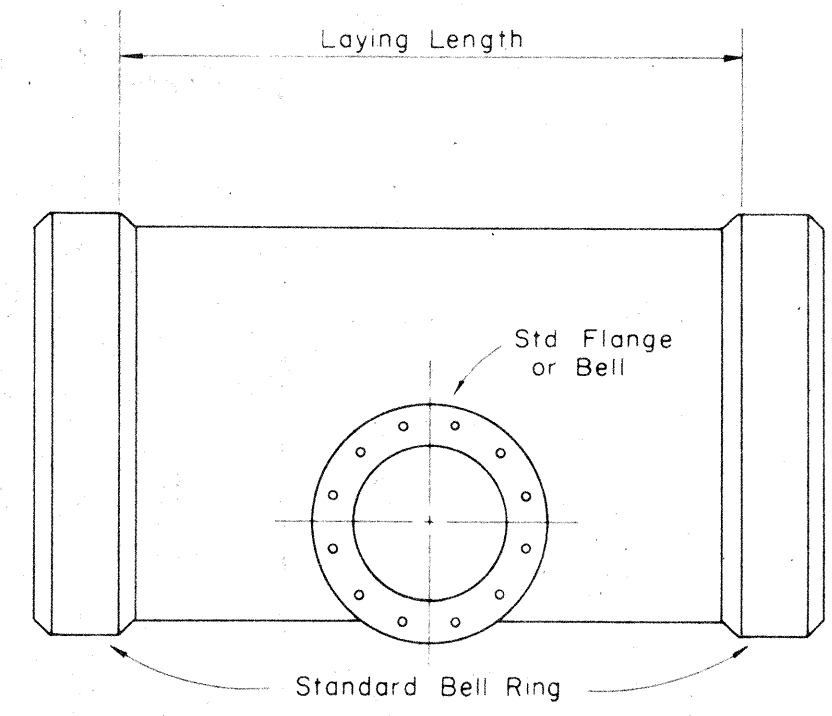
FLANGE
See Specs. for Flange Class



SECTION



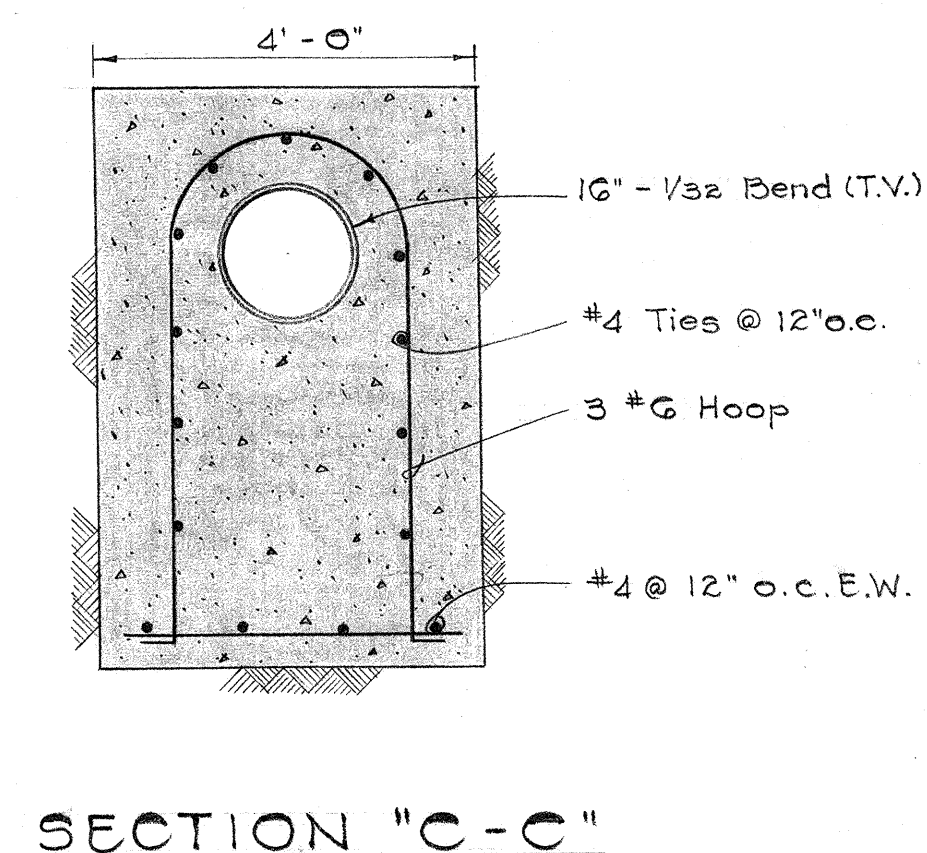
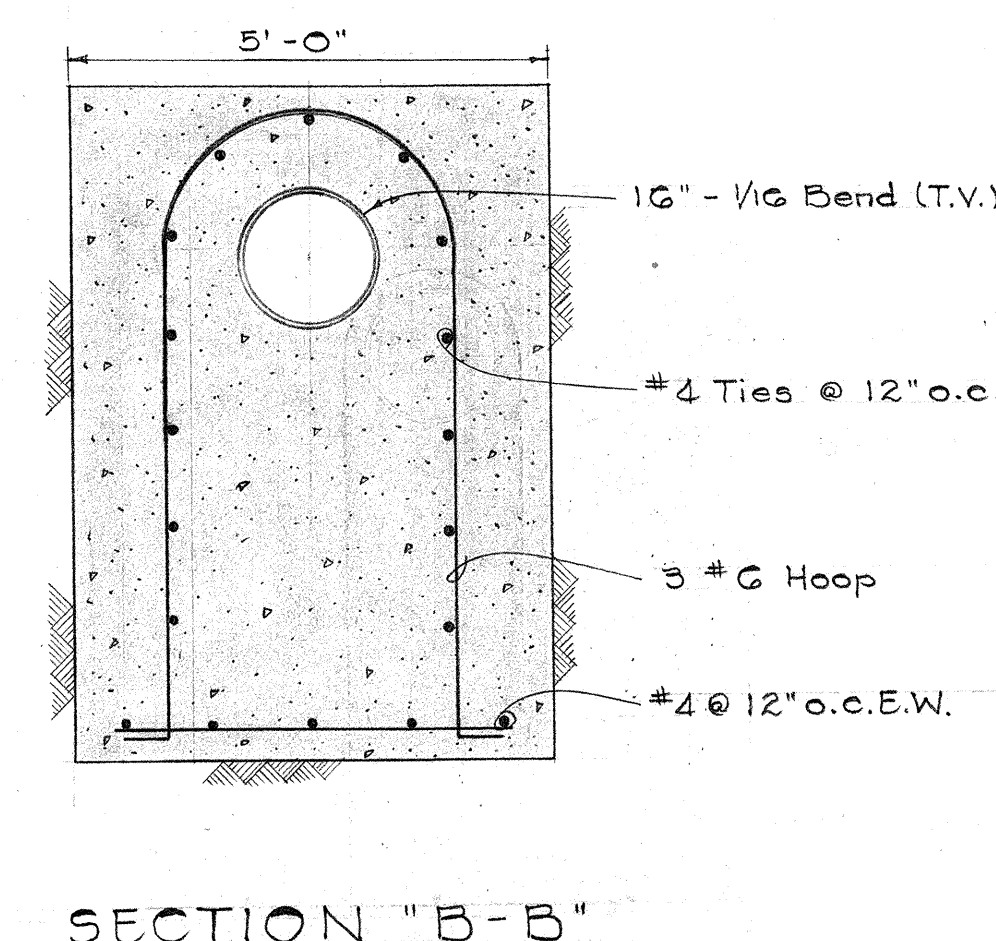
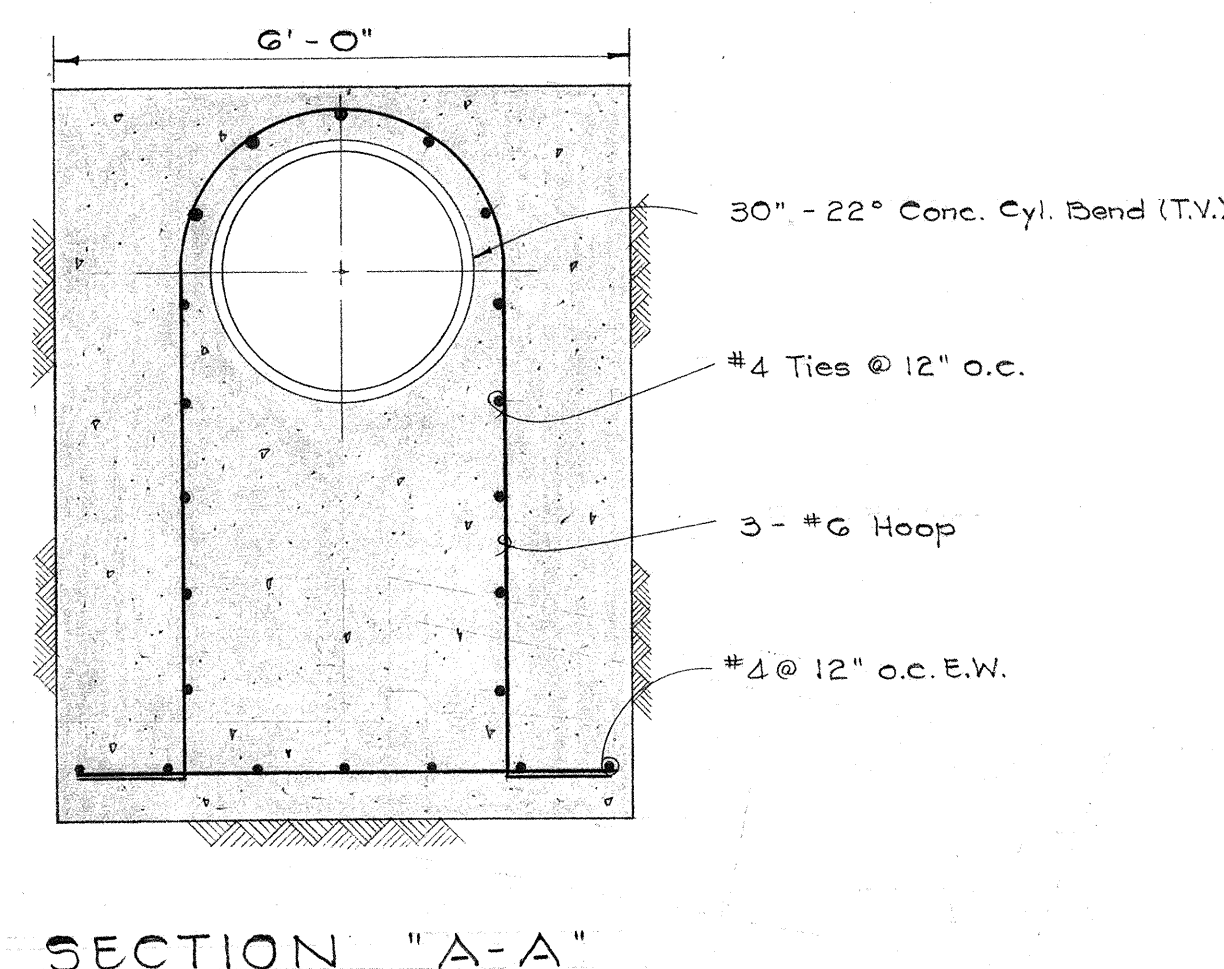
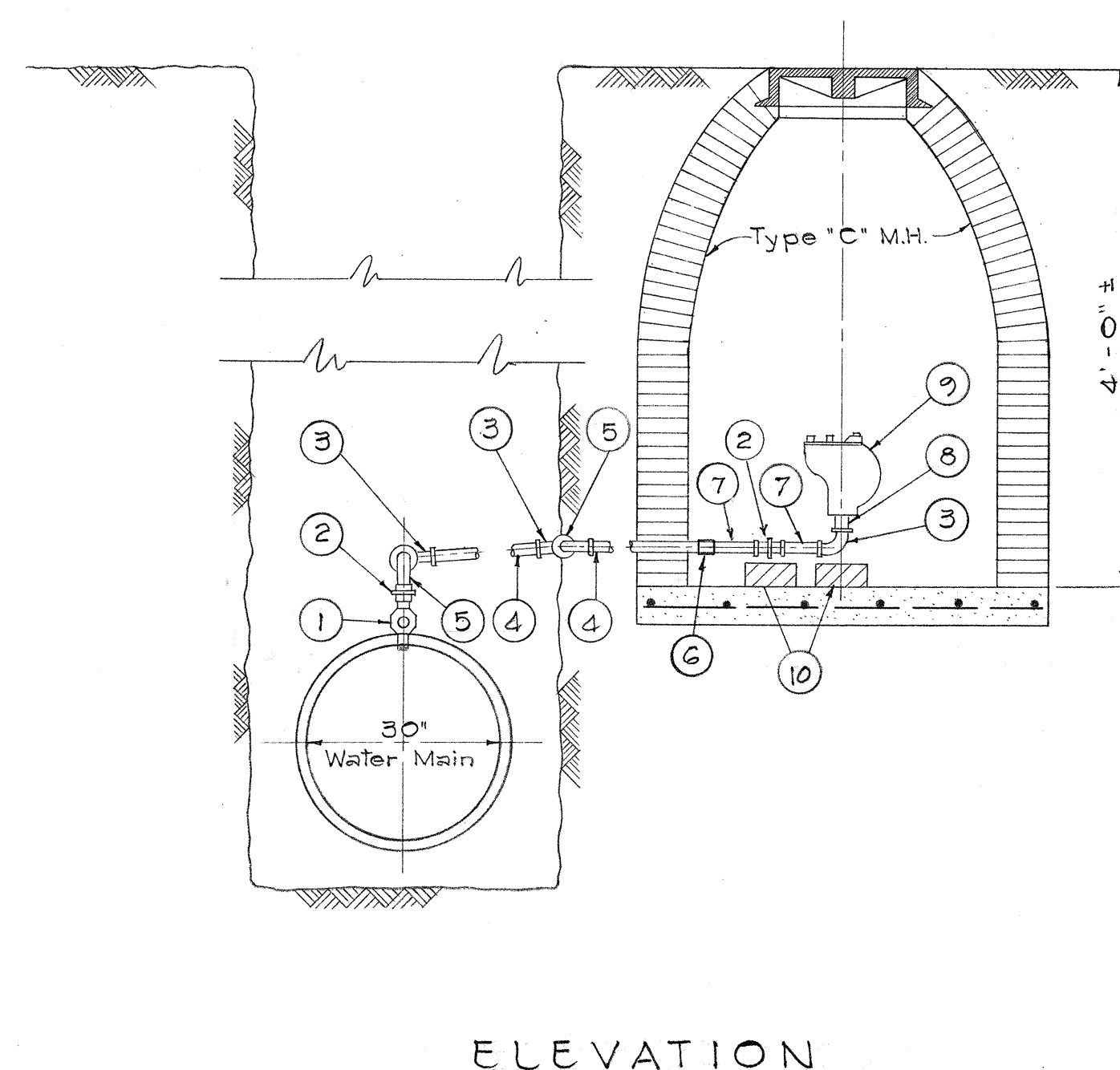
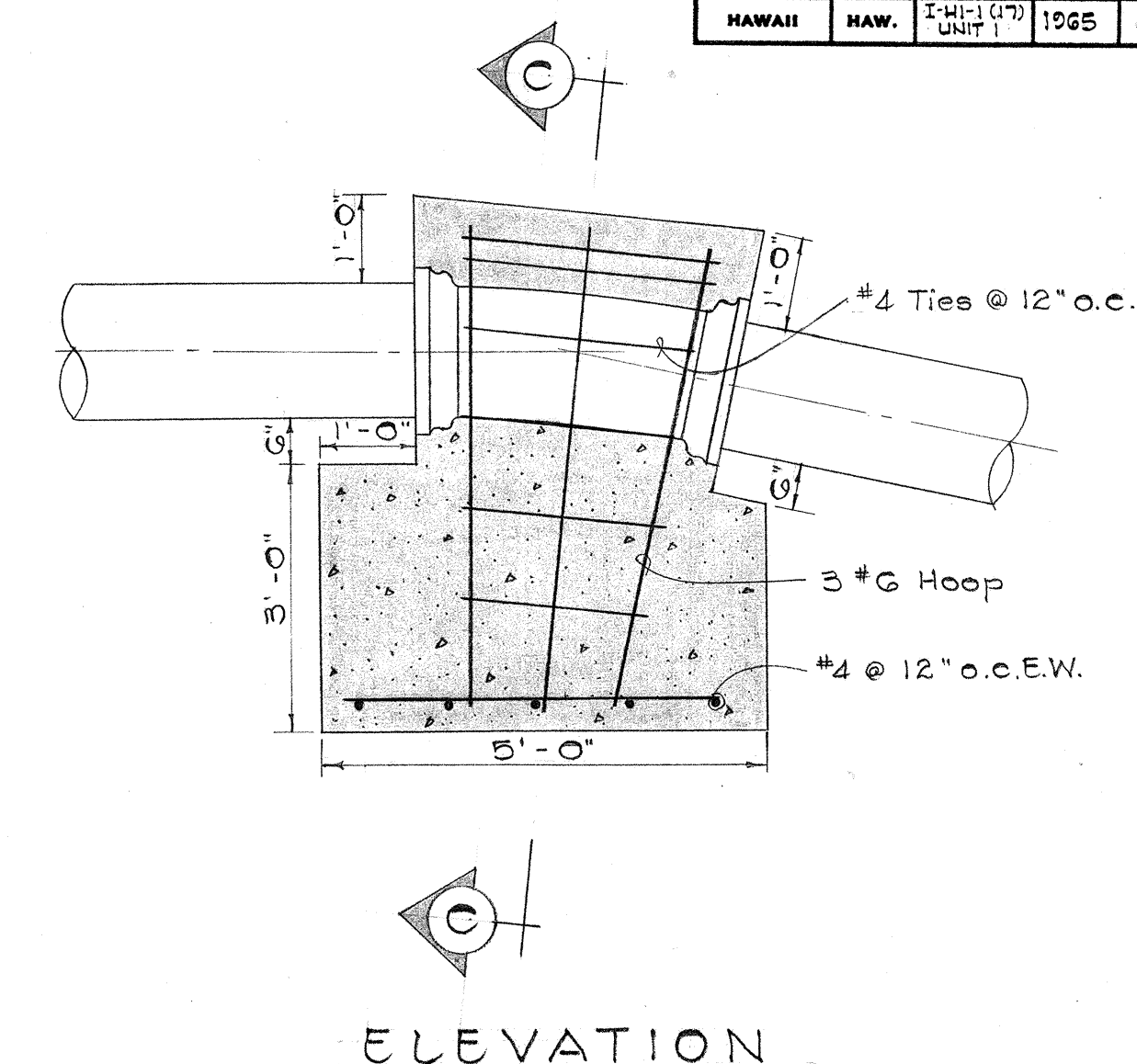
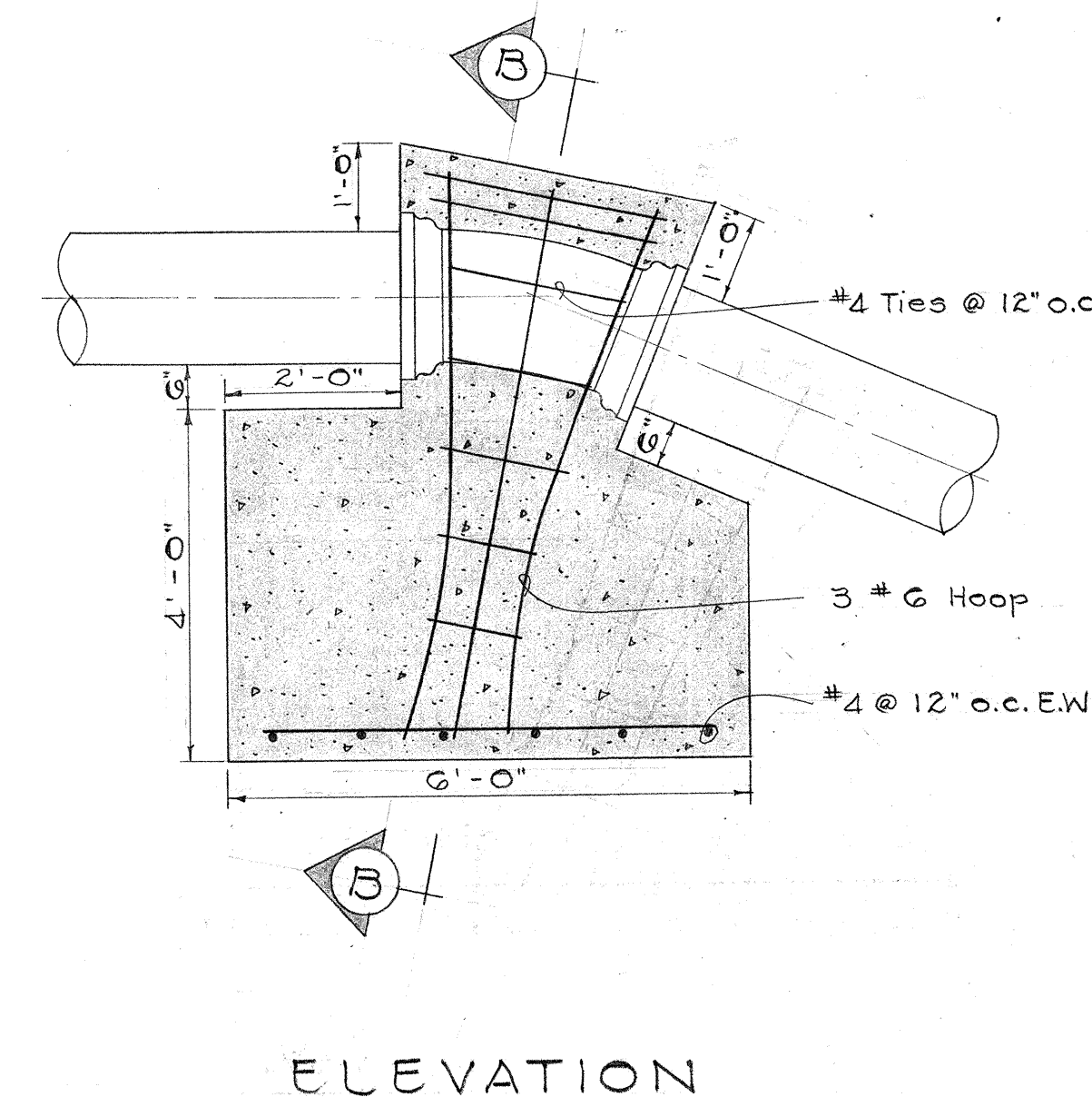
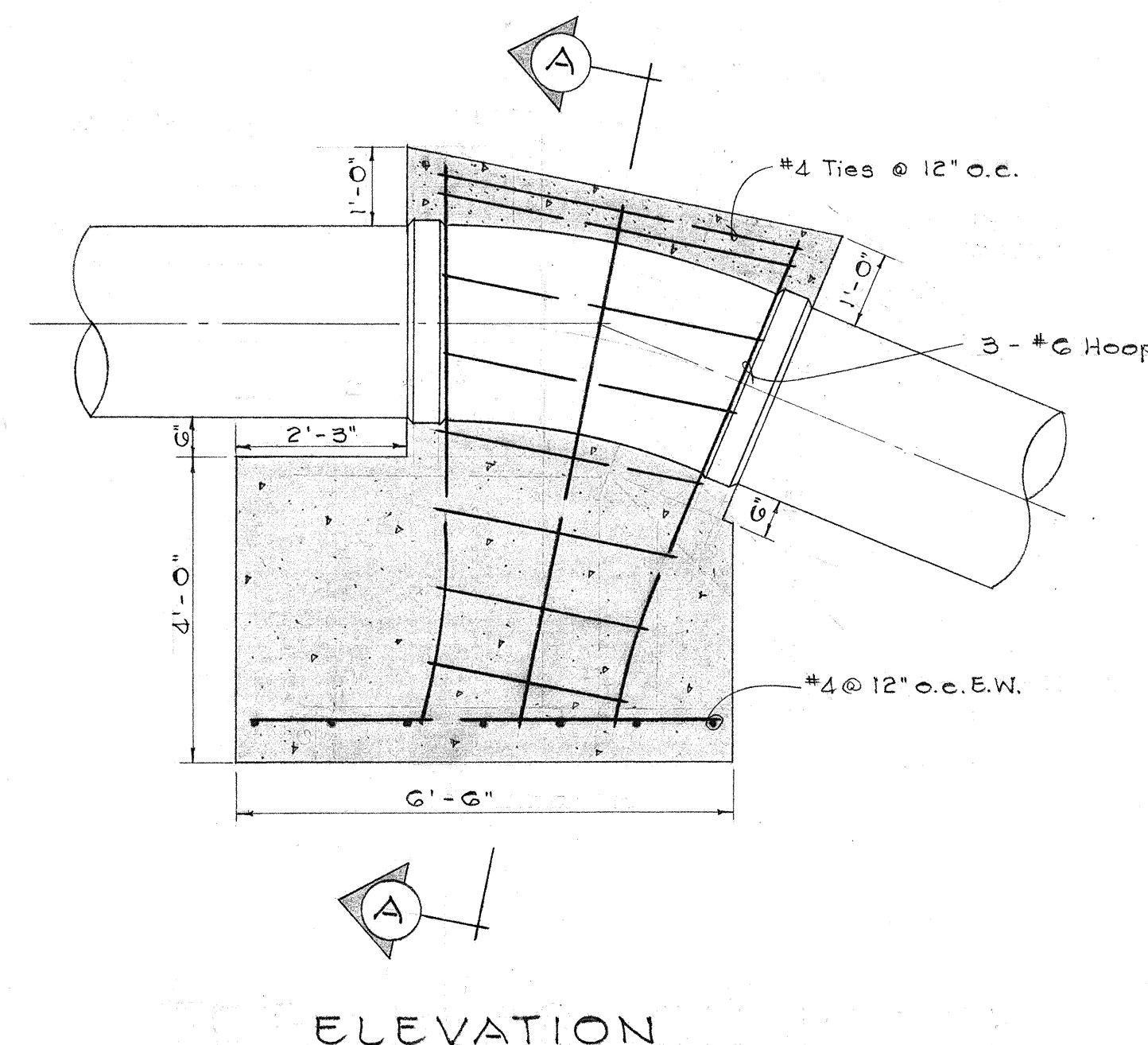
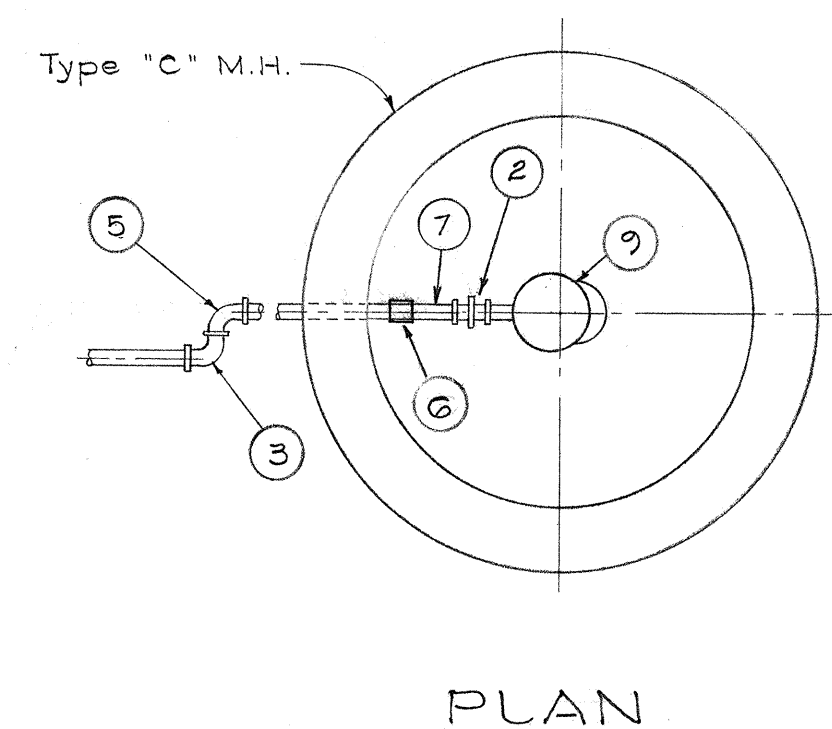
BELL SECTION



TYPICAL DETAIL
OF BLOW-OFF TEE

DETAIL OF CAP

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
CONCRETE CYLINDER PIPE MISCELLANEOUS DETAILS	
APPROVED	SURVEYED BY
SCALE No Scale	DRAWN BY L K
DATE April 25, 1962	TRACED BY L K
ENGINEER	CHECKED BY
FILE	POCKET FOLDER NO
BOARD OF WATER SUPPLY HONOLULU, HAWAII	
SHEET 2 OF 18 SHEETS FIELD BOOK NO	



NOTES:
 1. 3" min. cover for all reinforcing.
 2. Design pressure - 250 p.s.i.
 3. Approx. 5 c.y. Class "B-1" Conc.
 4. Conc. block subject to field revision.

NOTES:
 1. 3" min. cover for all reinforcing.
 2. Design pressure - 250 p.s.i.
 3. Approx. 5 c.y. Class "B-1" Conc.
 4. Conc. block subject to field revision.

LIST OF MATERIAL

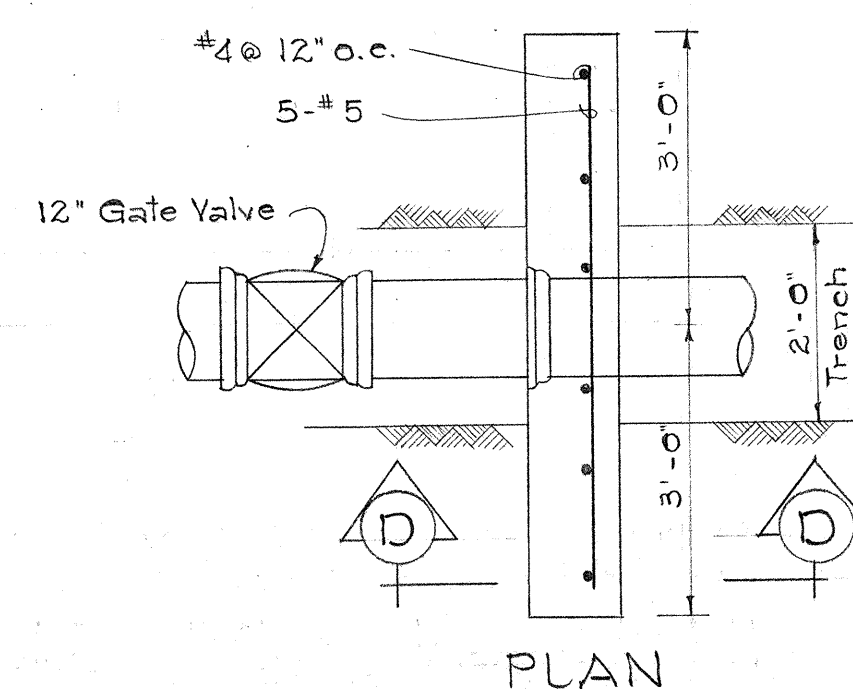
ITEM	No. REQ.	DESCRIPTION
1	1	1 1/2" x 2" Corporation Stop
2	2	2" Union, Galvanized
3	3	2" 90° Elbow, Galvanized
4	2	2" Galvanized Pipe, cut to fit
5	2	2" Street Elbow, Galvanized
6	1	2" Stop cock
7	2	2" Dia x 3" Nipple, Galvanized
8	1	2" Dia. x 4" Nipple, Galvanized
9	1	2" Air Valve
10	2	Brick Support

DETAIL OF CONNECTION FOR AIR ELIMINATING VALVE

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

CONCRETE BLOCK 30" 22° VERTICAL BEND

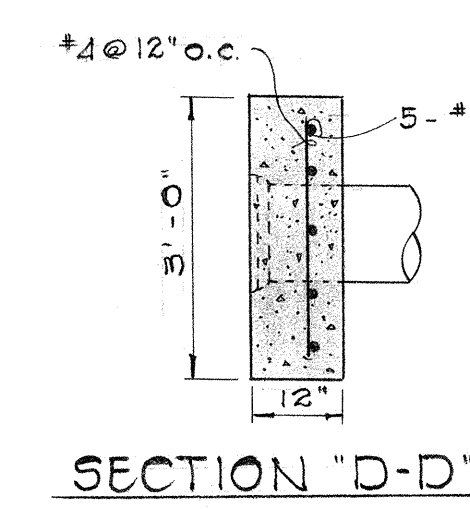
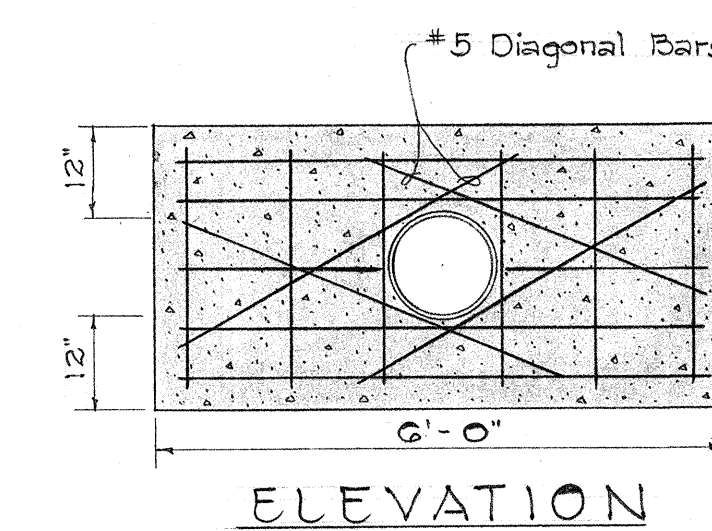
Scale: 1/2" = 1'-0"



NOTES:
 1. 3" min. cover for all reinforcing.
 2. Design pressure - 125 p.s.i.
 3. Approx. 0.68 c.y. Class "B-1" Conc.
 4. Conc. beam subject to field revision.

CONCRETE BLOCK 16" 1/16 VERTICAL BEND (AWWA)

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



CONCRETE BLOCK 16" 1/32 VERTICAL BEND (AWWA)

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

NOTE: For detail of 1/8" Bend see sheet No. 449.

APPROVED:

A. Kawakami
 ASSISTANT CHIEF ENGINEER B.W.S. 10/19/64
 DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

WATER DETAILS

INTERSTATE ROUTE H-1
 F.A.I. Proj. No. I-41-1(17) UNIT 1

Scale: As Shown Date: Sept. 1964.

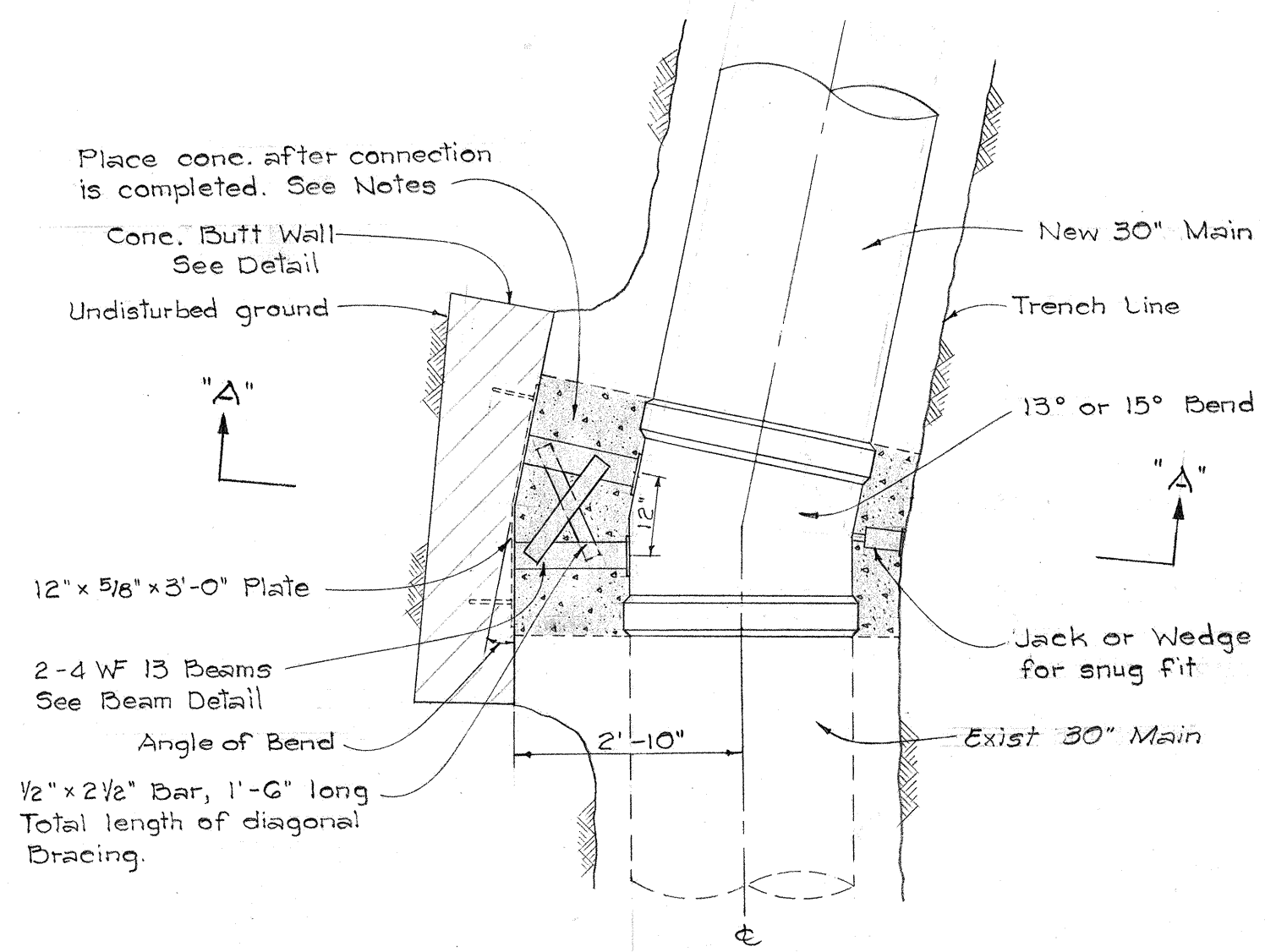
SHEET No. 10 OF 18 SHEETS

CONCRETE BEAM 12" C.I. PIPE BELL

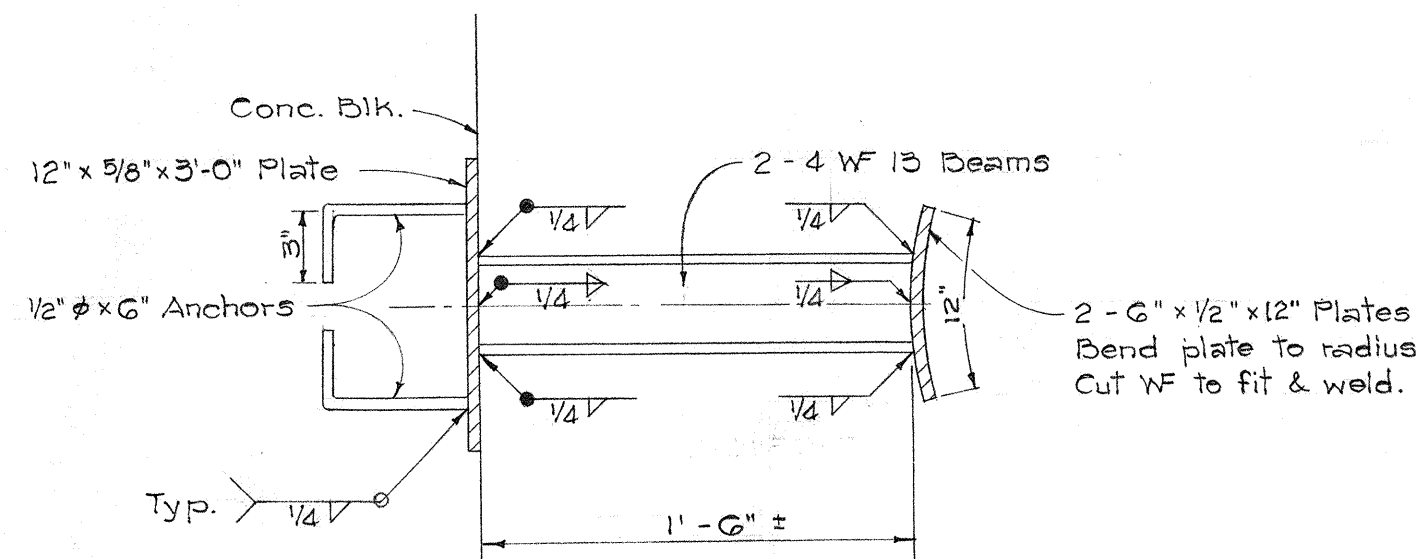
Scale: 1/2" = 1'-0"

ORIGINAL PLAN
 SURVEY PLOTTED BY
 DRAWN BY
 CHECKED BY
 DATE

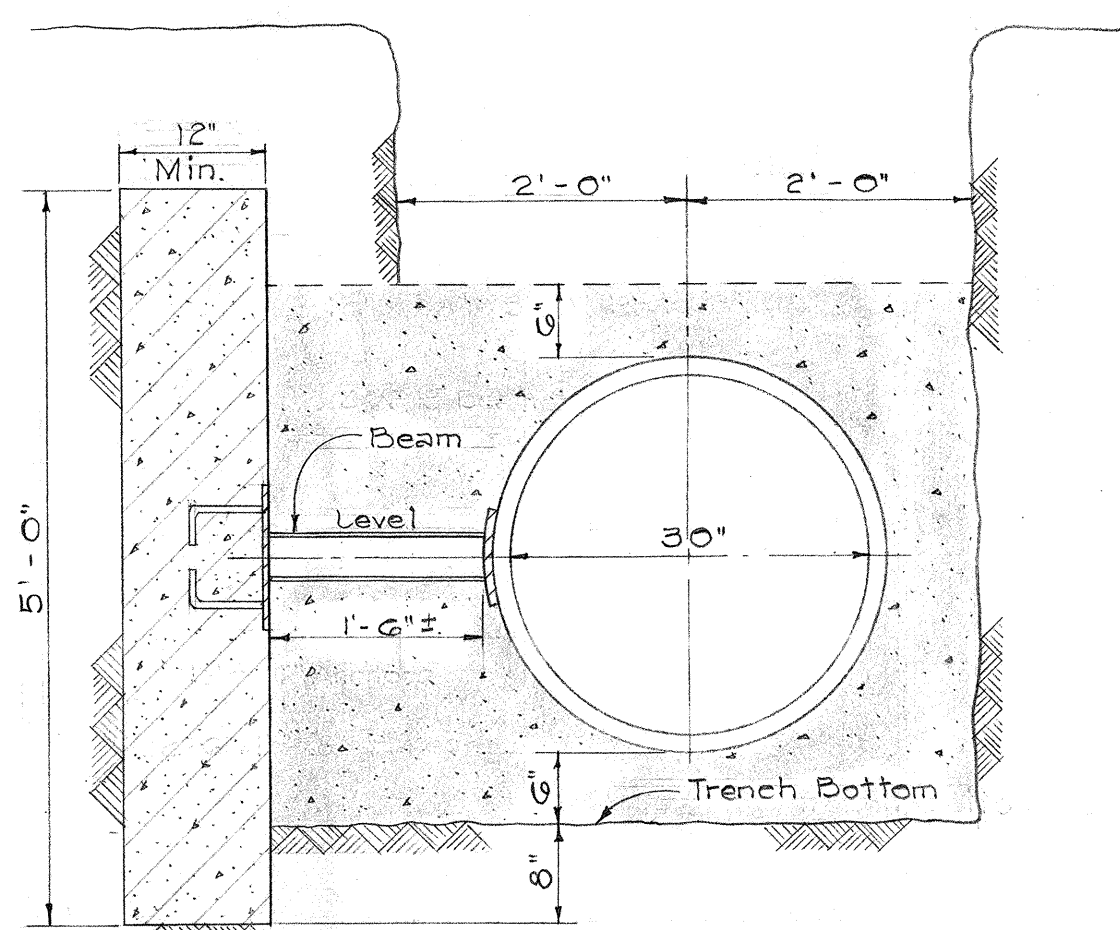
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(17) UNIT 1	1965	44	146



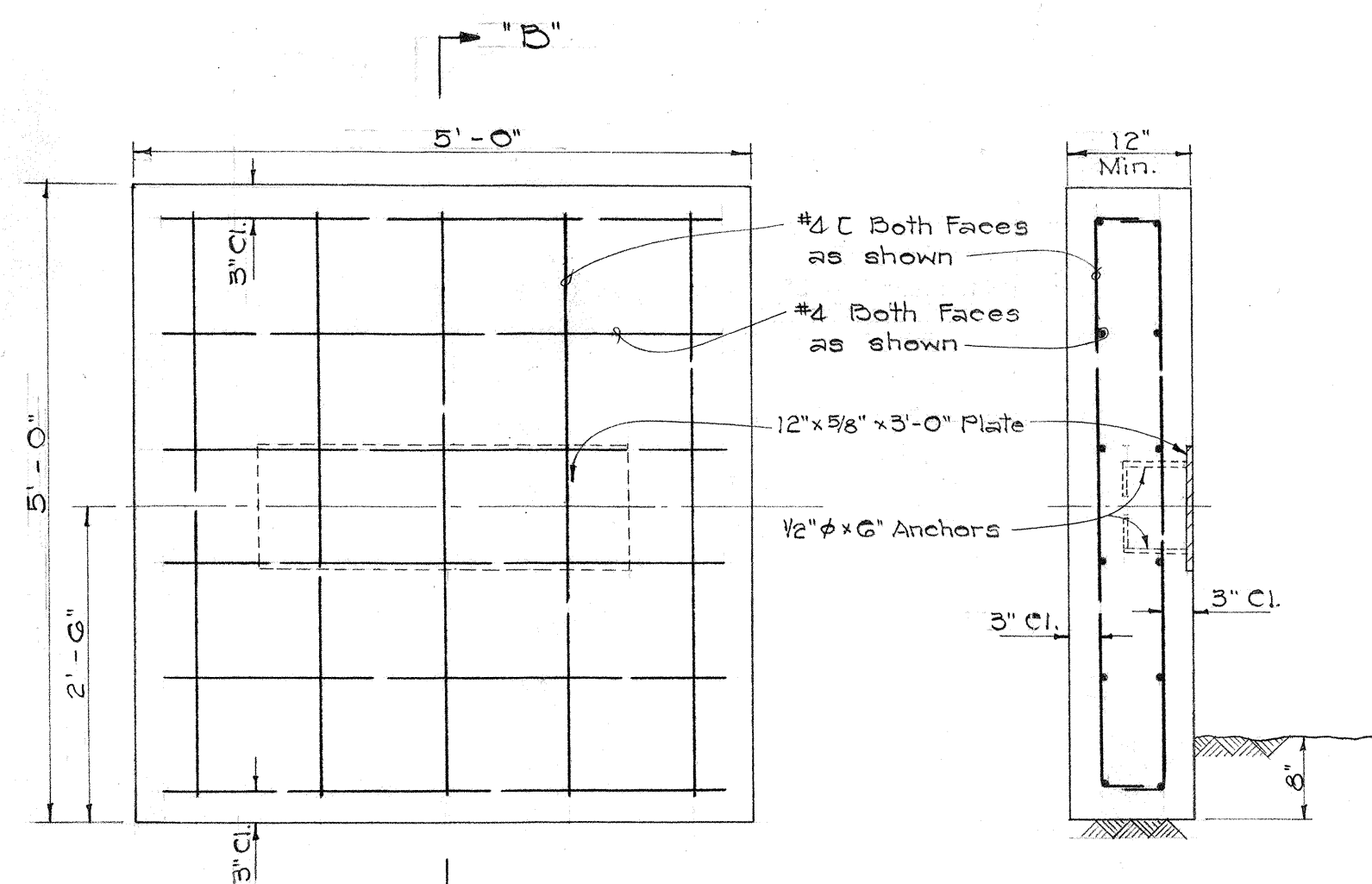
TYPICAL PLAN
Scale: 1/2" = 1'-0"



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



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

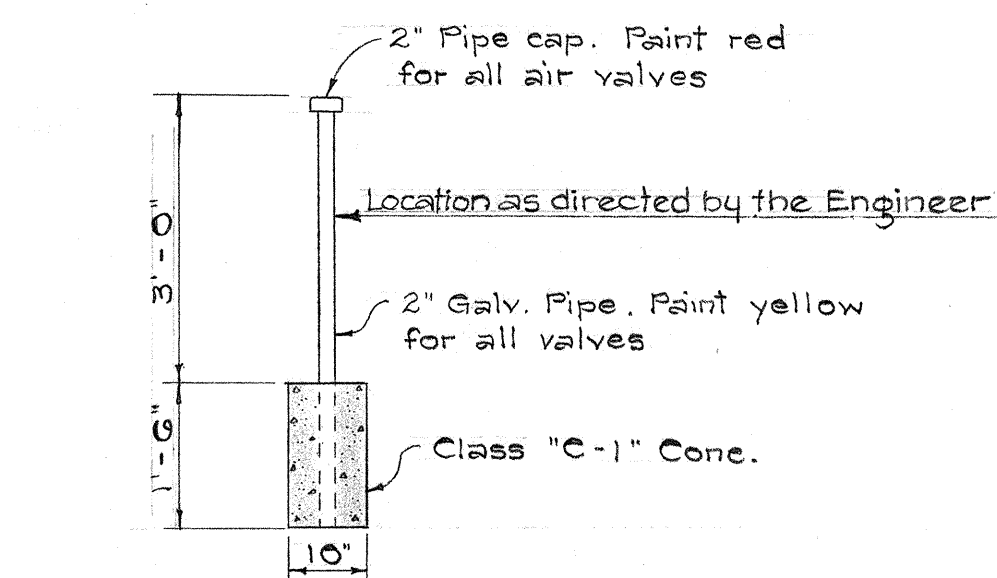


ELEVATION

SECTION "B-B"

CONCRETE BUTT WALL DETAIL
Scale: 3/4" = 1'-0"

DETAIL OF CONCRETE BLOCK
Scale: As Shown

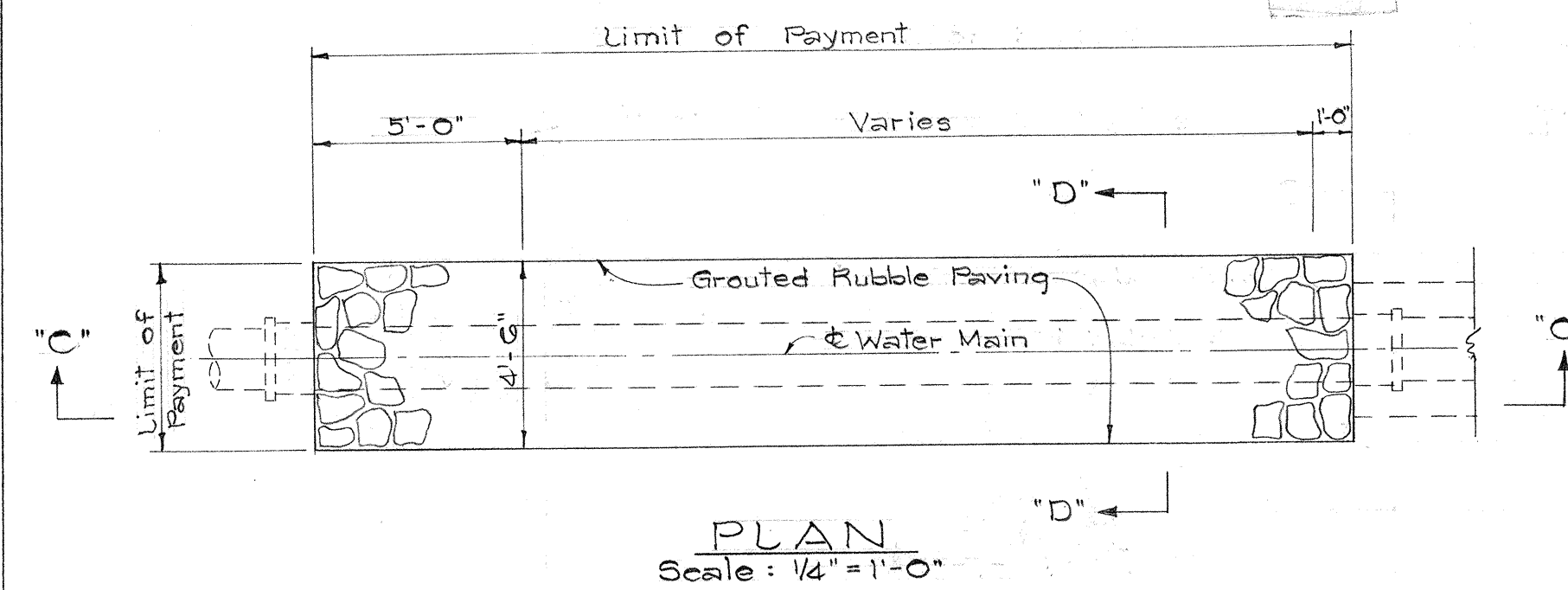


DETAIL OF VALVE MARKER
Scale: 1/2" = 1'-0"

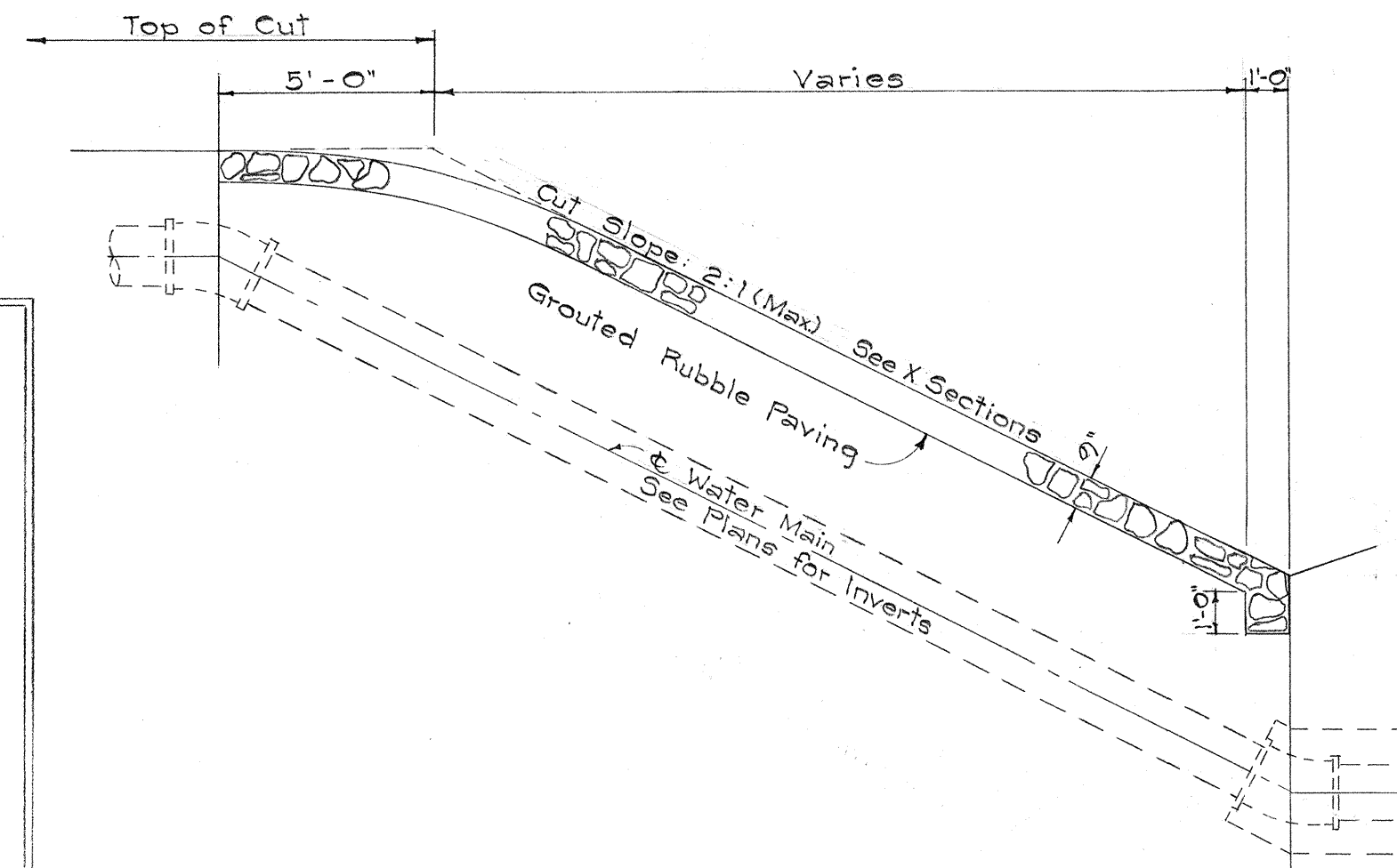
NOTES:

1. Design Pressure in 30" @ 85 p.s.i.
2. Minimum cover over reinf. shall be 3".
3. Concrete shall be Class "B-1".
4. Shaded area to be filled with concrete after connection is completed.
5. Special Conc. Blk. to be install only where directed by the Engineer.
6. Payment for structural steel, jack or wedge shall be incidental to Class "B-1" Concrete.

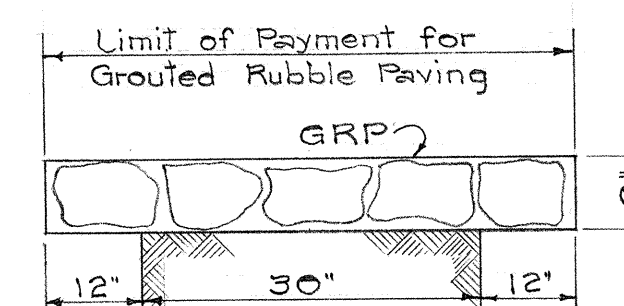
NOTE: THIS DETAIL SUPERSEDED BY HORIZONTAL BEND DETAIL SHOWN ON SHEET NO. 445.



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



SECTION "C-C"
Scale: 1/4" = 1'-0"

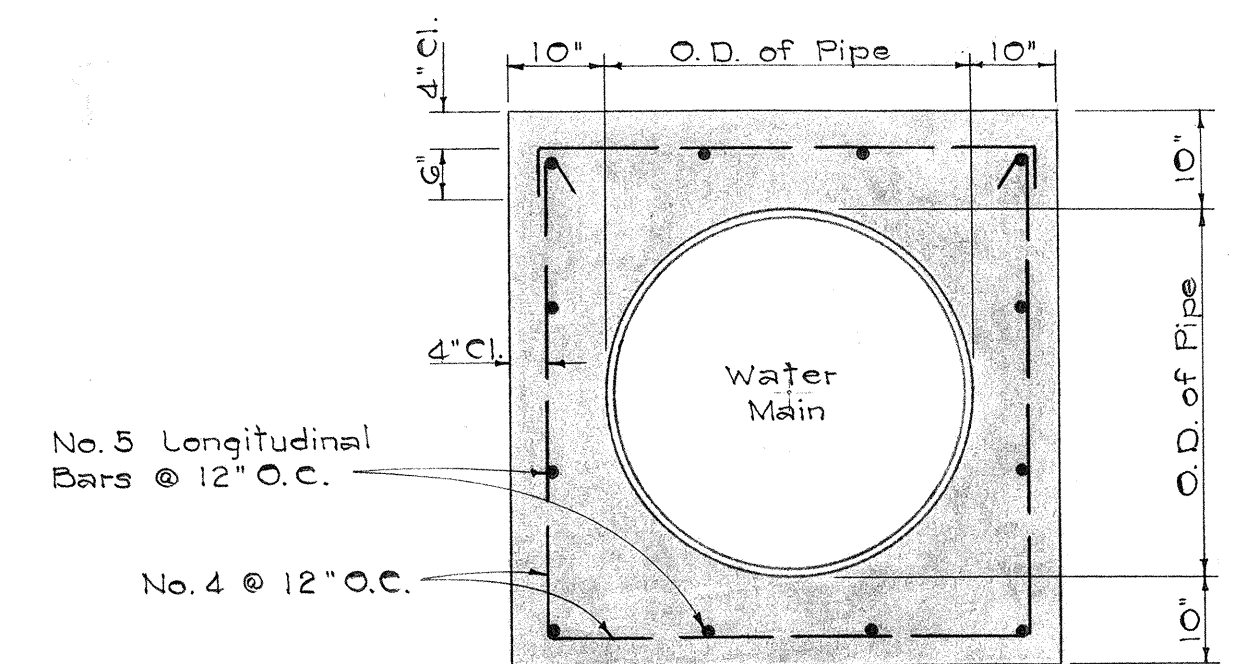


SECTION "D-D"
Scale: 1/2" = 1'-0"

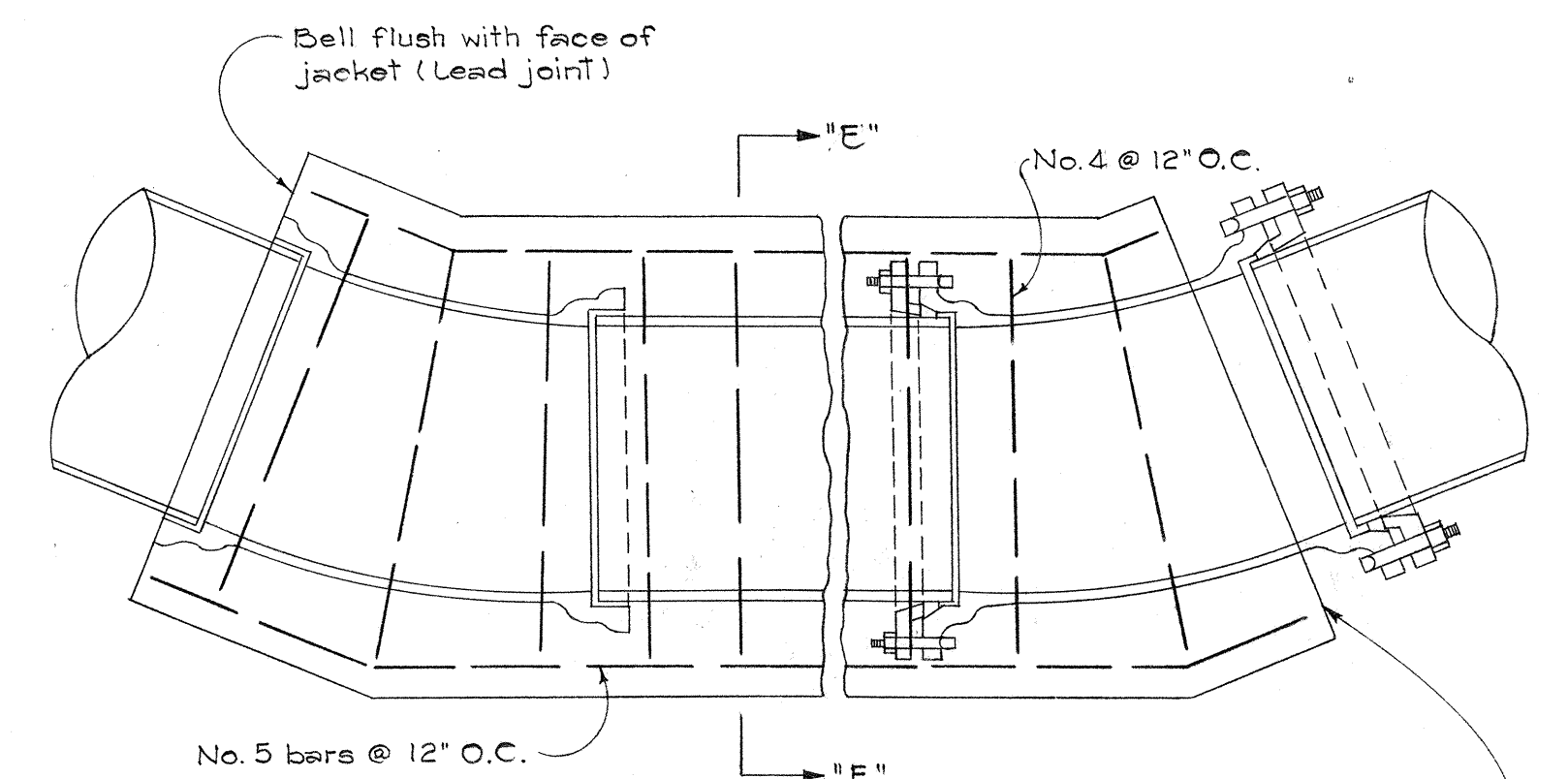
NOTES:

1. GRP required beyond the Limit of Payment shall be done at the Contractor's own expense.
2. Transverse slopes of GRP to follow cut slope.

TYPICAL DETAIL OF GROUTED RUBBLE PAVING SEAL OVER WATER MAIN
Scale: As Shown



SECTION "E-E"



Face of jacket shall be set back from joint to provide sufficient working space for removal of bolts. (Mechanical joint)

NOTE:

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 G" rubber or neoprene waterstops shall be installed. Waterstop shall be of the type specified and manufactured by the Servicized Products Corp., Gate Rubber Co. or approved equal.

REINFORCED CONCRETE JACKET
Not to Scale

APPROVED:

J. H. Kawahara
ASSISTANT CHIEF ENGINEER B.W.S. 10/4/64
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WATER DETAILS

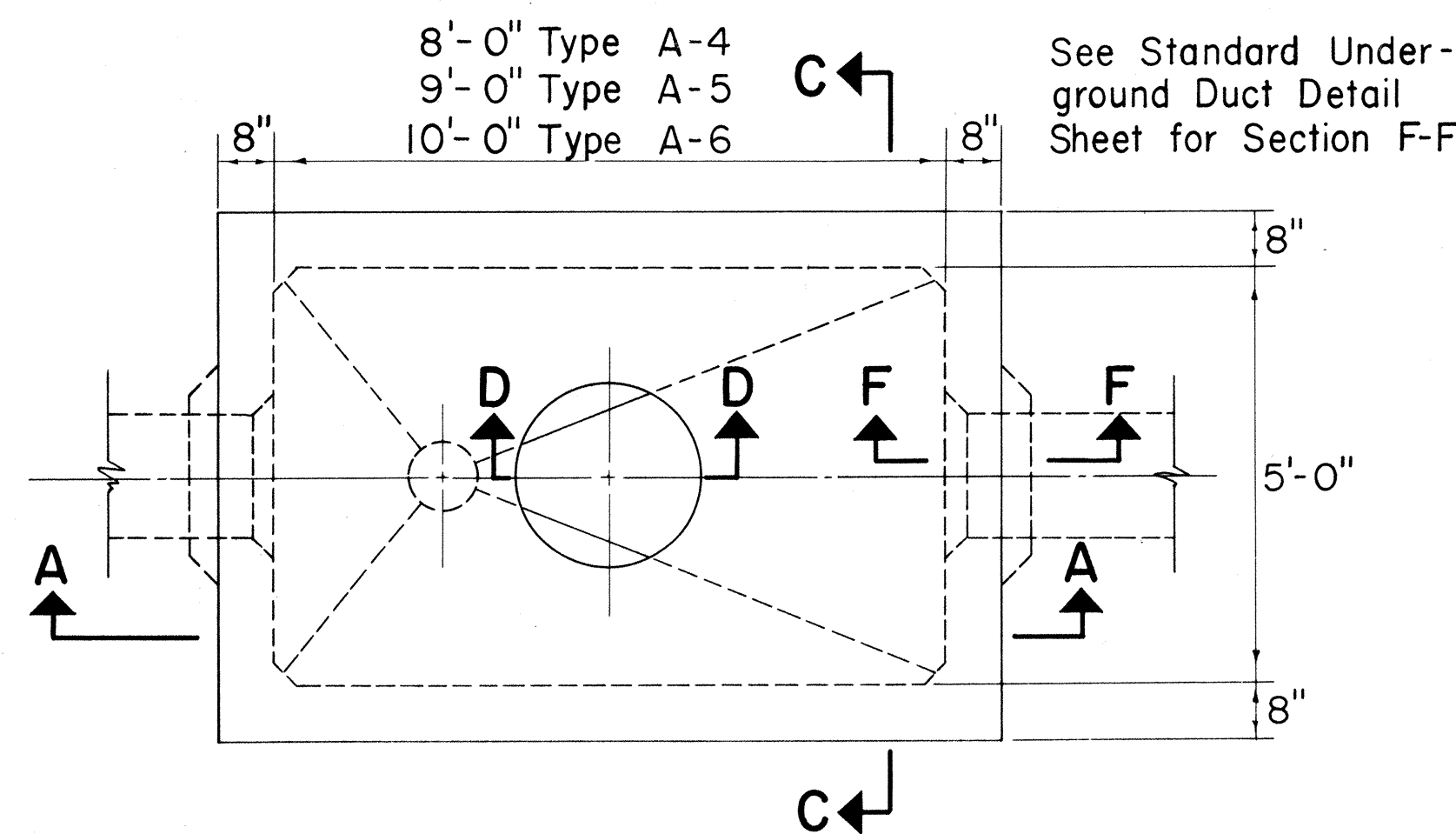
INTERSTATE ROUTE H-1
F.A.I. Proj. I-H-1(17), UNIT 1

Scale: As Shown Date: Sept. 1964.

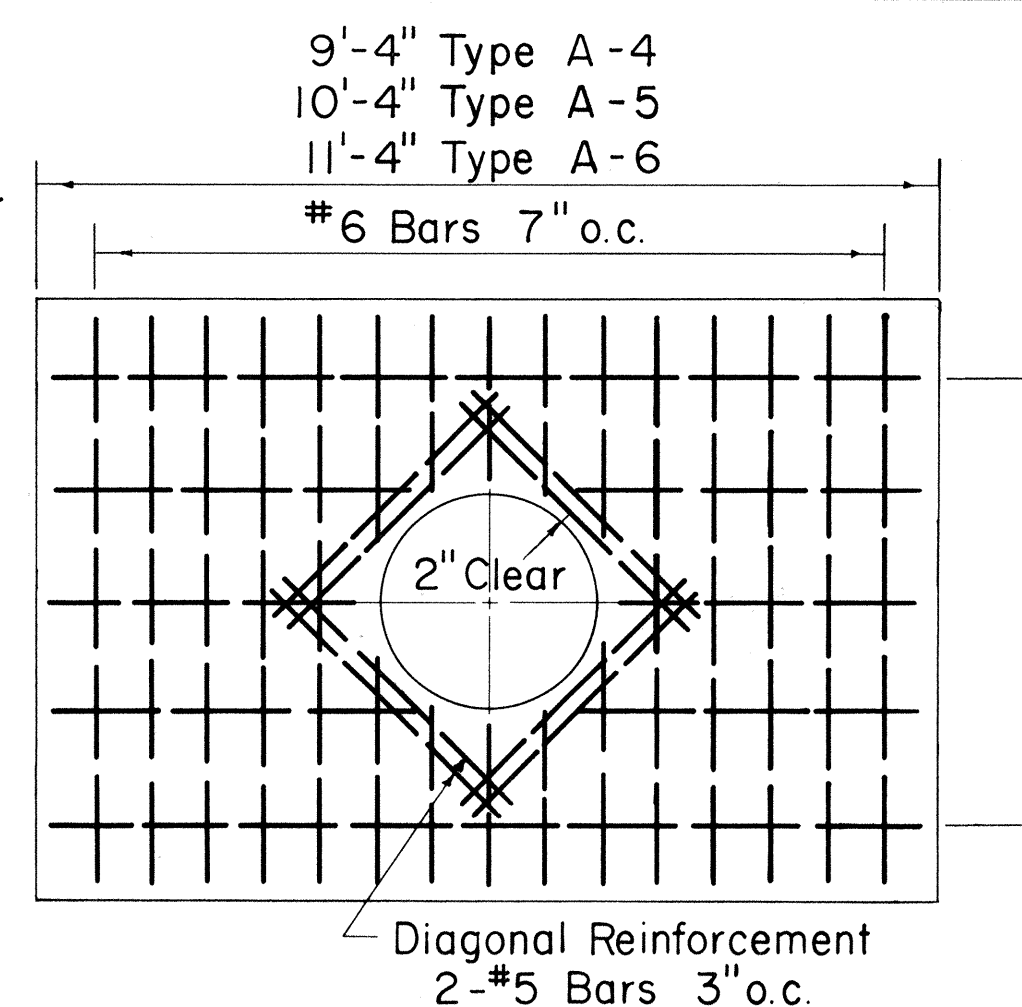
SHEET No. 11 OF 18 SHEETS

DATE	_____
SURVEY PLOTTED BY	_____
DESIGNED BY	_____
NOTED BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
No.	_____

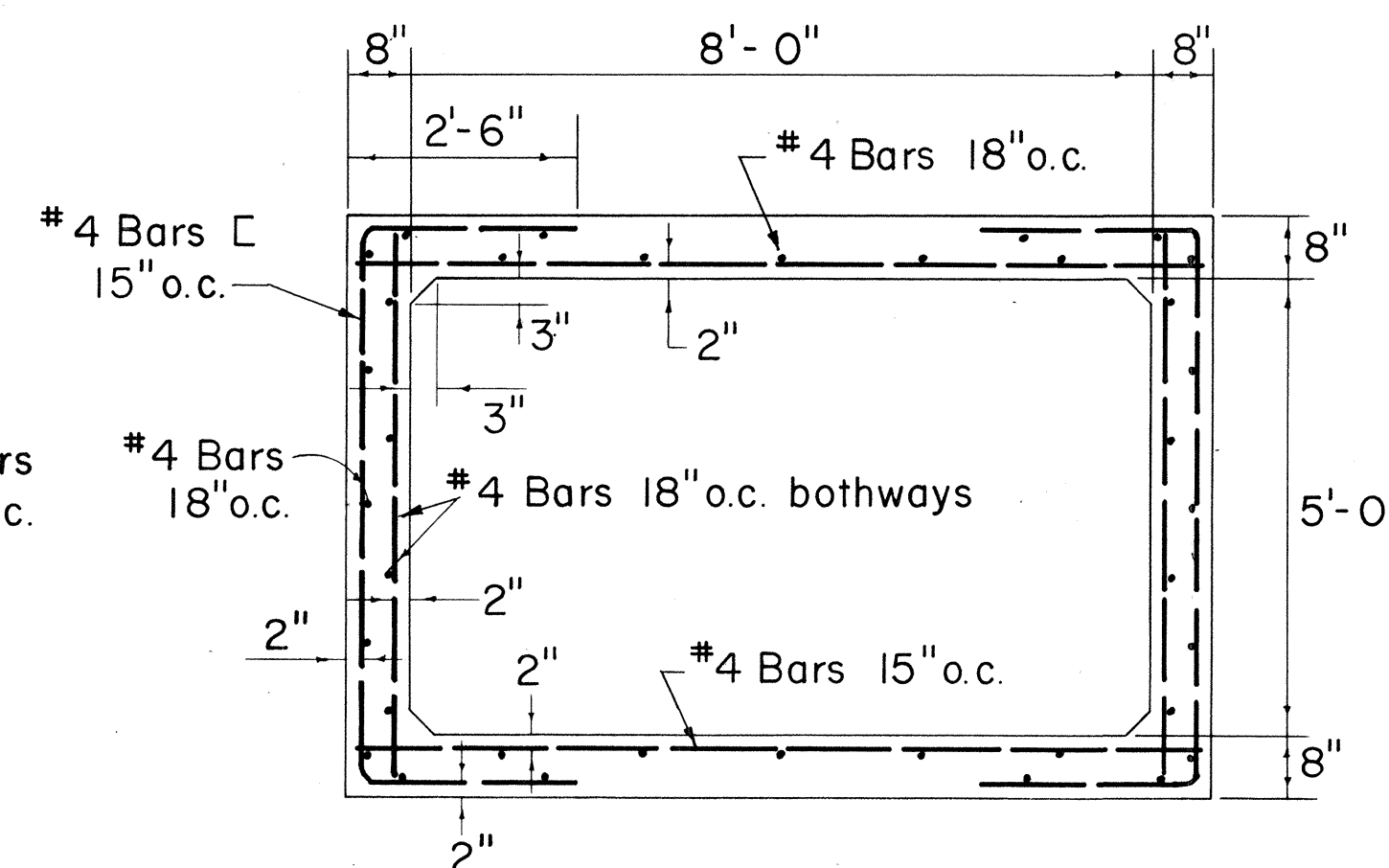
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	1-11-1 (17) UNIT 1	1965	45	146



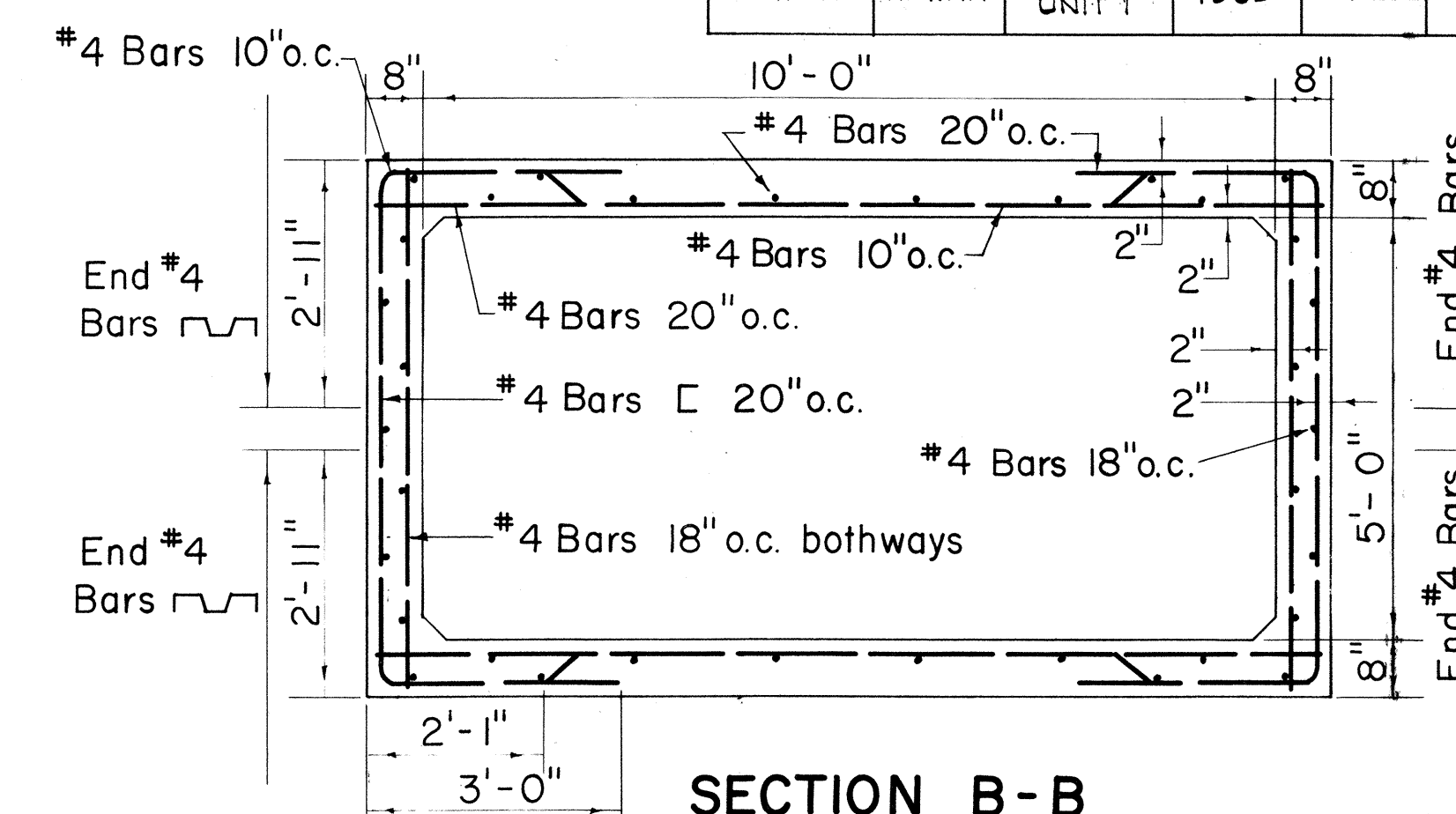
PLAN
TYPE "A" MANHOLE
FOR ROADWAY AREAS
Scale: 1/2" = 1'-0"



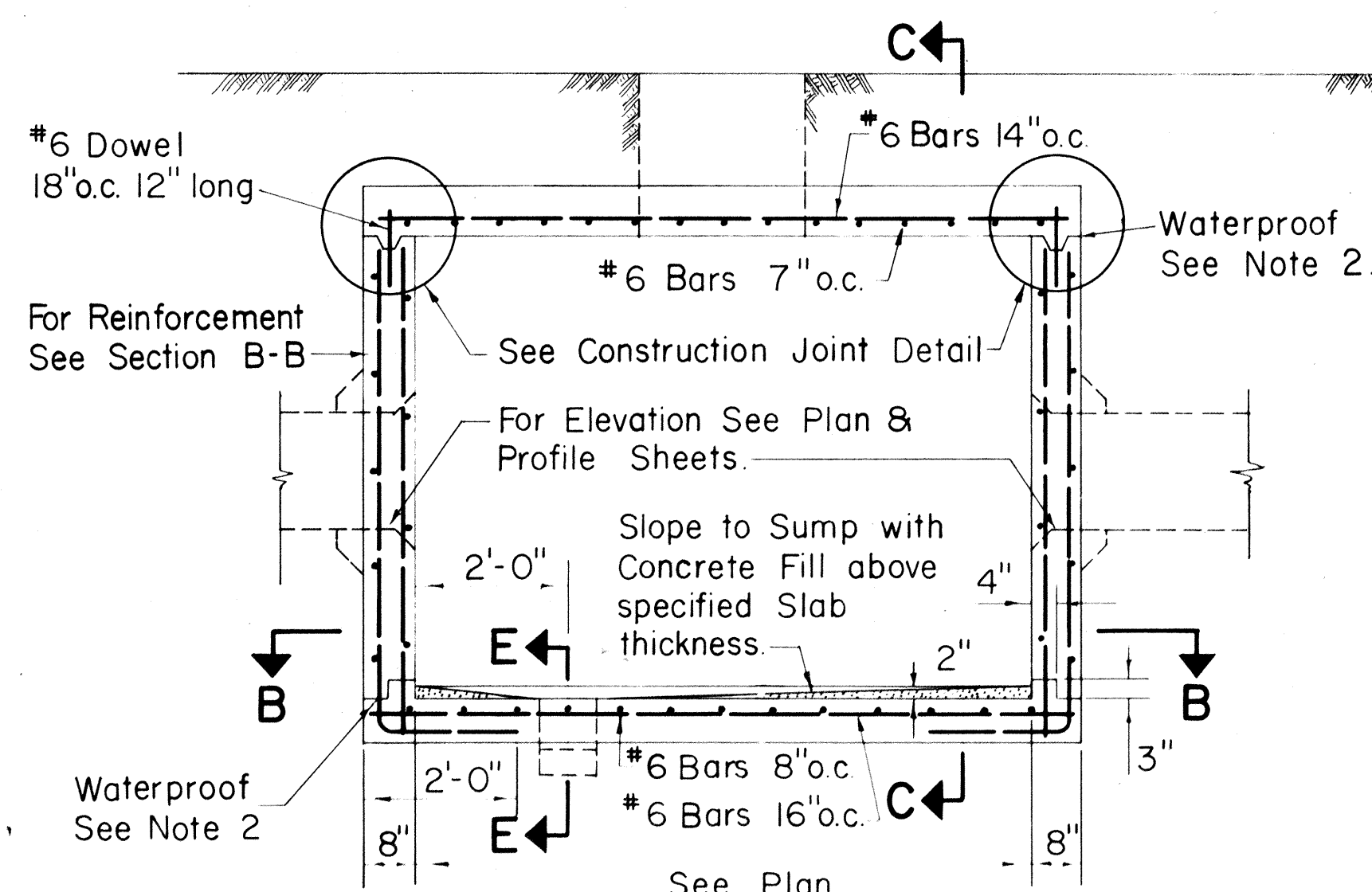
ROOF SLAB REINF. PLAN
Scale: 1/2" = 1'-0"



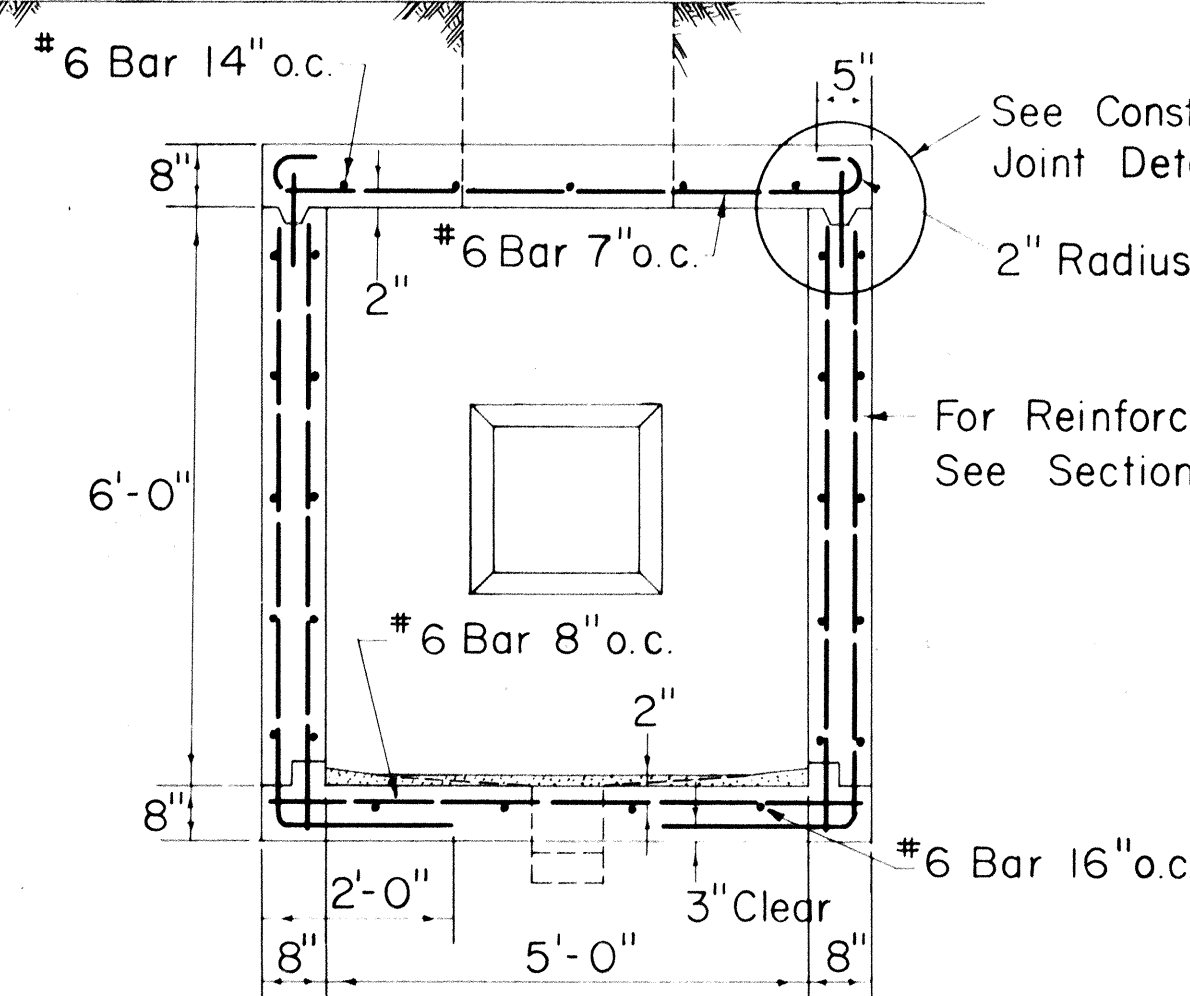
SECTION B-B
TYPE A-4
Scale: 1/2" = 1'-0"



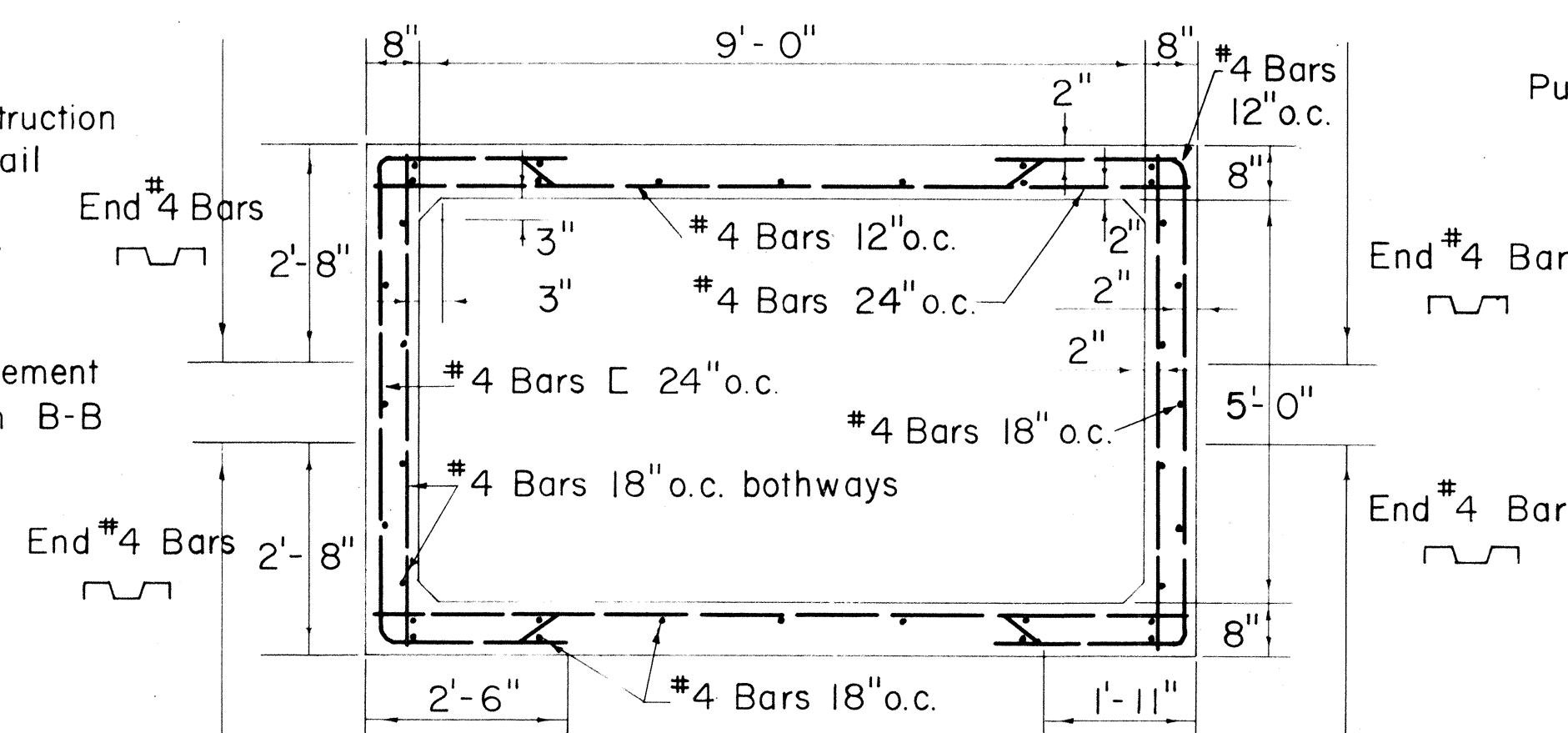
SECTION B-B
TYPE A-6
Scale: 1/2" = 1'-0"



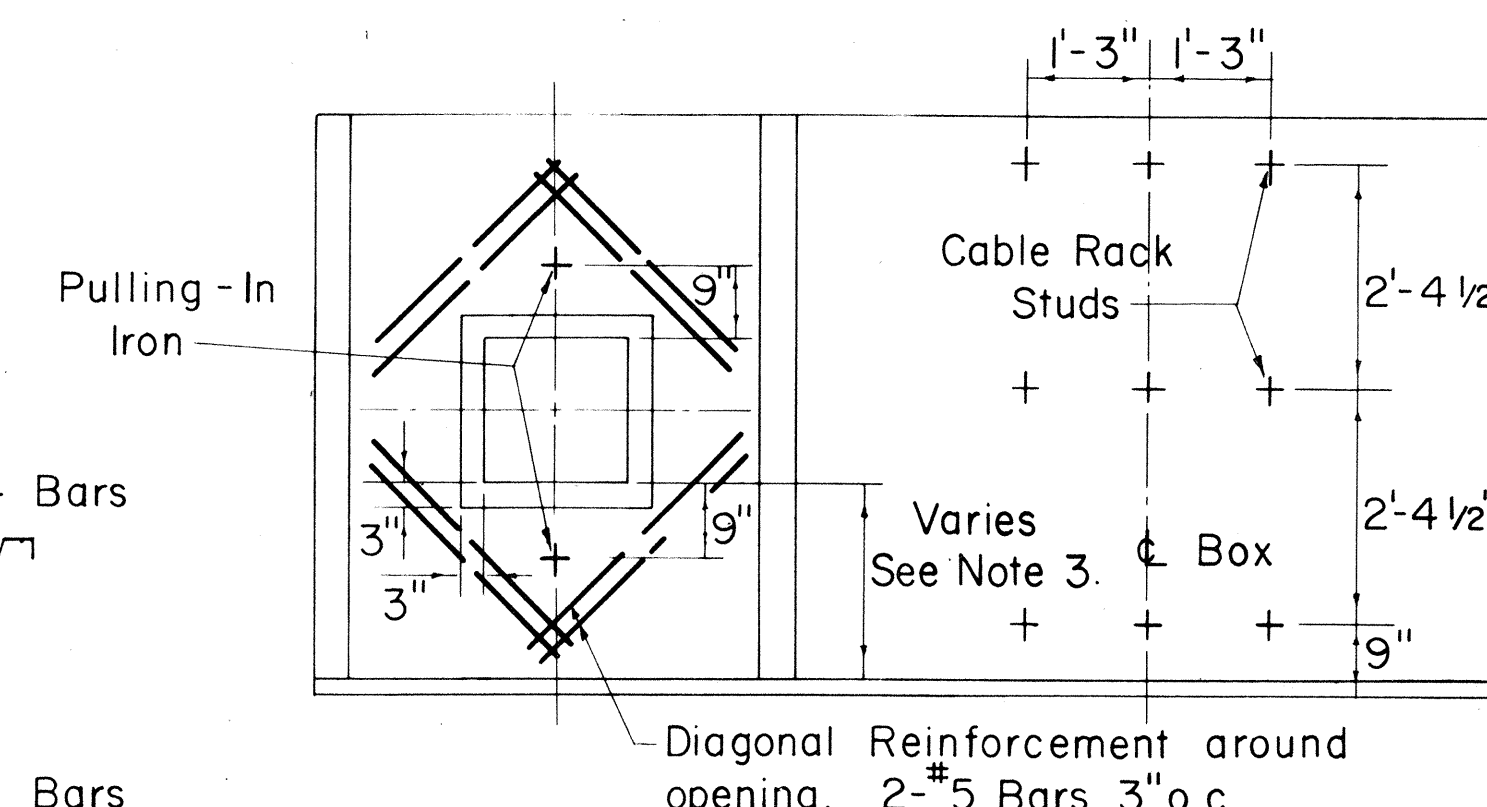
SECTION A-A
Scale: 1/2" = 1'-0"



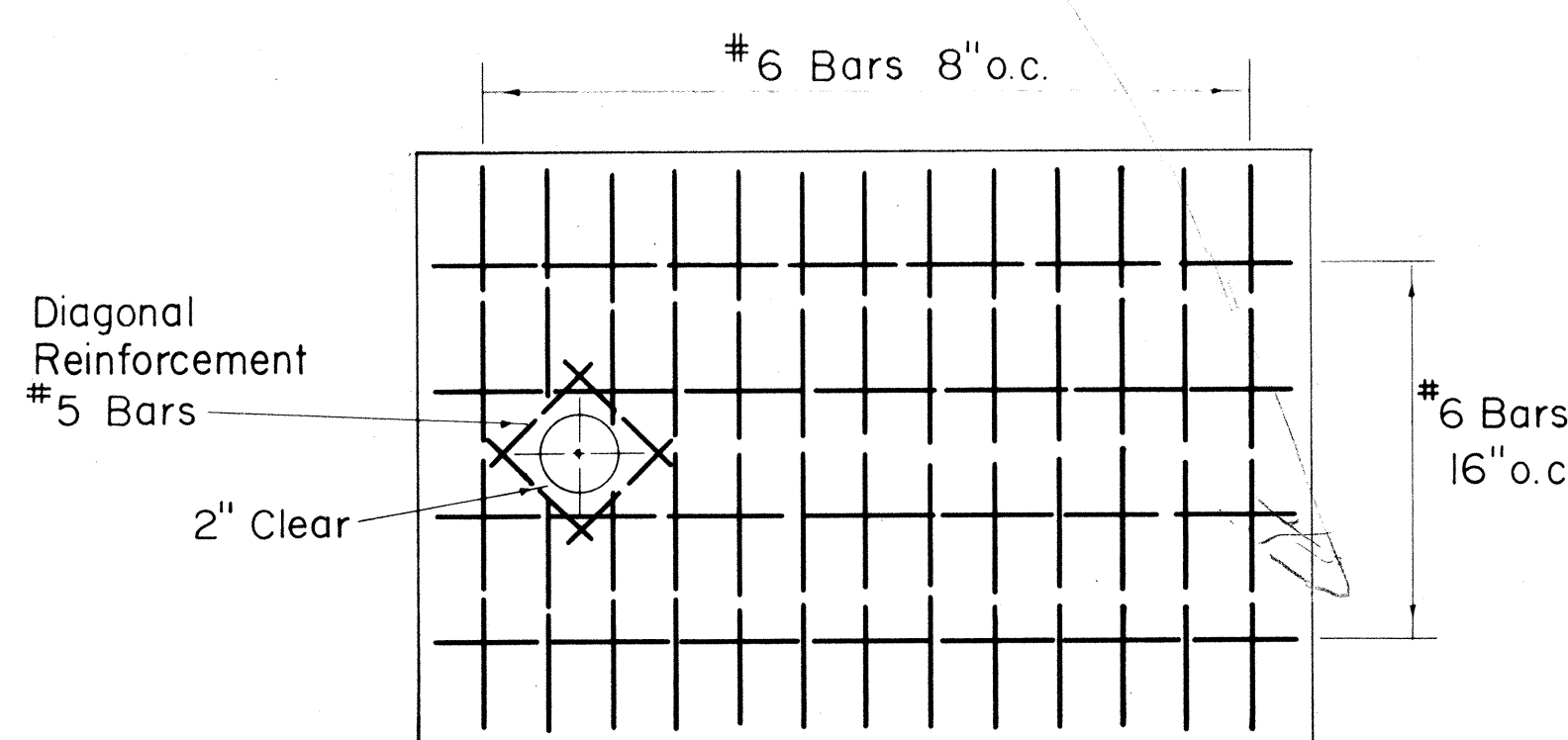
SECTION C-C
Scale: 1/2" = 1'-0"



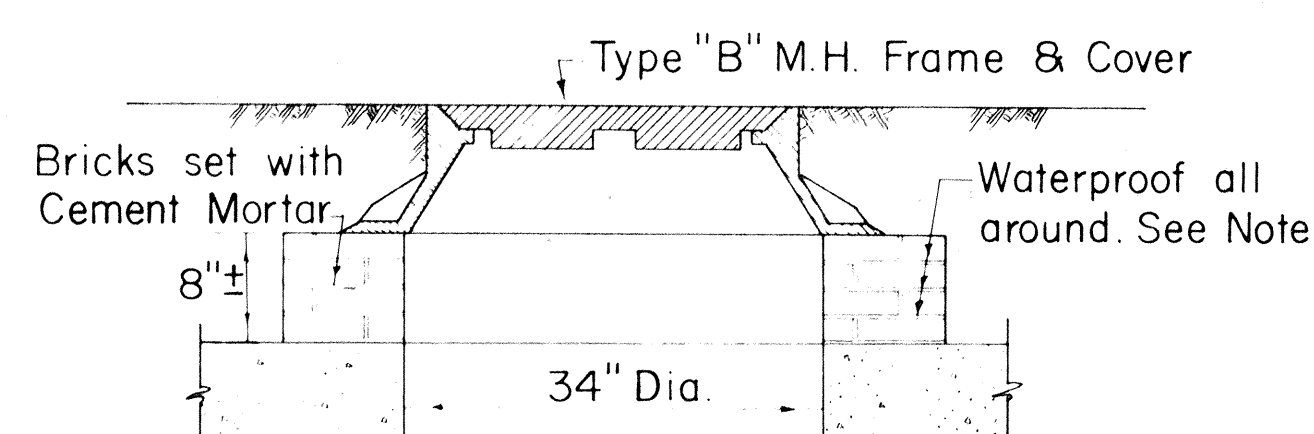
SECTION B-B
TYPE A-5
Scale: 1/2" = 1'-0"



ELEVATION OF INSIDE WALLS
TYPE A-4
Scale: 1/2" = 1'-0"

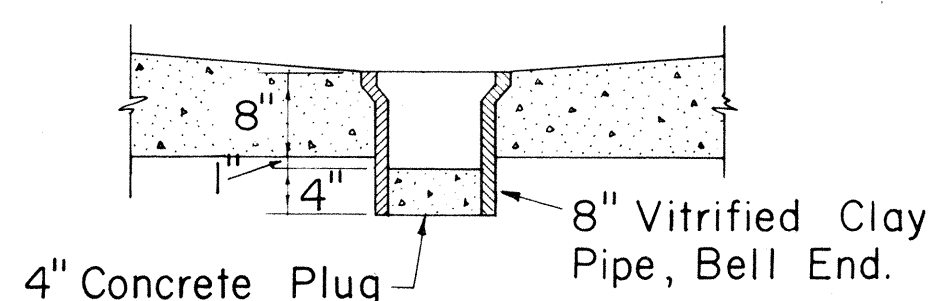


FLOOR SLAB REINF. PLAN
Scale: 1/2" = 1'-0"



CONSTRUCTION JOINT DETAIL
Scale: 1/2" = 1'-0"

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



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

GENERAL NOTES

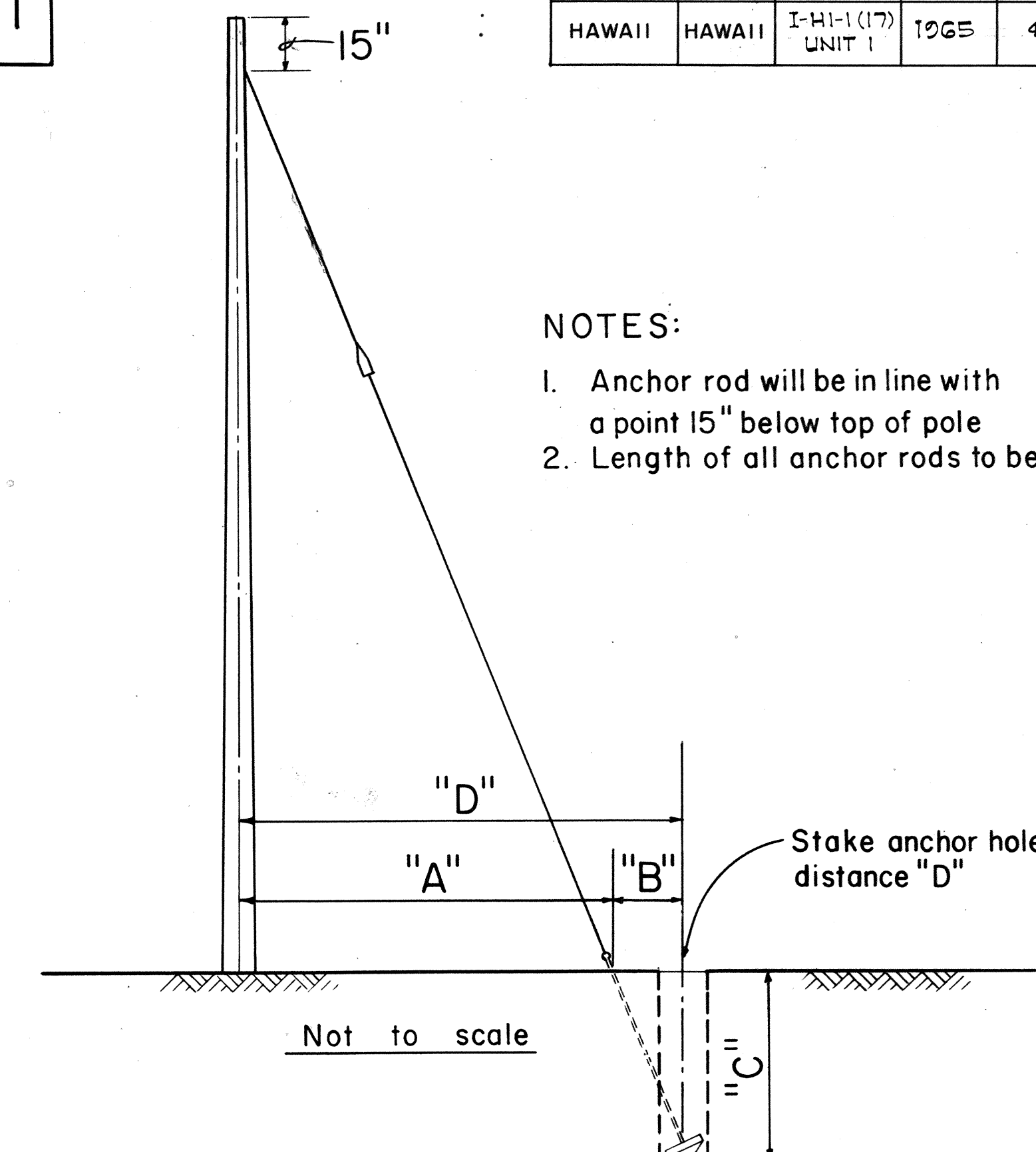
- DESIGN DATA
 $f_s = 20,000$ psi; $f_c' = 3000$ psi; $f_c = 1200$ psi.
 $n = 10$; $w =$ Equivalent Fluid Pressure = 30 psf.
- All Construction Joints shall be Waterproofed with 2 applications of Thoro Seal or equal.
- For Duct Window Location see Plan & Profile Shts.
- Duct Window to suit. See Plan & Profile & Standard Detail Sheets for Location and Details.
- For Duct Window Details see Section F-F, Standard Underground Detail Sheet.

APPROVED:

R. M. ... 10/14/64
OUTSIDE PLANT ENGR. H.T.CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
TYPE "A" MANHOLE
FOR ROADWAY AREAS
Scales: As Noted Date

05-101



- NOTES:
- Anchor rod will be in line with a point 15" below top of pole
 - Length of all anchor rods to be 8'-0"

ANCHORING DATA

D.M. = Deadman

FOR 35' THRU 60' POLES WITH 8'-0" ANCHOR RODS				
"A"	"B"	"C"	"D" = ("A" + "B")	
ANCHOR ROD EYE TO CL OF POLE	ANCHOR ROD EYE TO CL OF HOLE	VERTICAL DEPTH 18" D.M.	24" D.M.	TOTAL DISTANCE POLE TO HOLE
5'-0"	1'-0"	7'-3"	7'-4"	6'-0"
10'-0"	1'-11"	7'-1"	7'-3"	11'-11"
15'-0"	2'-8"	6'-9"	7'-1"	17'-8"
20'-0"	3'-3"	6'-6"	6'-10"	23'-3"
25'-0"	3'-10"	6'-2"	6'-7"	28'-10"
FOR 25' & 30' POLES WITH 8'-0" ANCHOR RODS				
5'-0"	1'-8"	7'-1"	7'-4"	6'-8"
10'-0"	3'-0"	6'-7"	7'-0"	13'-0"
15'-0"	4'-0"	6'-1"	6'-6"	19'-0"
20'-0"	4'-8"	5'-6"	5'-10"	24'-8"
25'-0"	5'-2"	4'-11"	5'-4"	30'-2"
FOR 40' THRU 60' POLES WITH 1-1/4" X 10'-0" ANCHOR RODS				
5'-0"	1'-7"		9'-4"	6'-7"
10'-0"	3'-0"		9'-0"	13'-0"
15'-0"	4'-2"		8'-6"	19'-2"
20'-0"	5'-3"		7'-11"	25'-3"
25'-0"	6'-2"		7'-3"	31'-2"

APPROVED:

R. Man for F.H. Judd 10/14/64
OUTSIDE PLANT ENGR. H.T.CO., LTD. DATE

PRINCPL. ELEC. ENGR. H.E. CO., INC. DATE

Frank A. Shaw 10/13/64
PRINCPL. DISTR. ENGR. H.E. CO., INC. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
H.E. Co. AND H.T. Co.
ANCHOR DETAILS AND
ANCHORING DATA

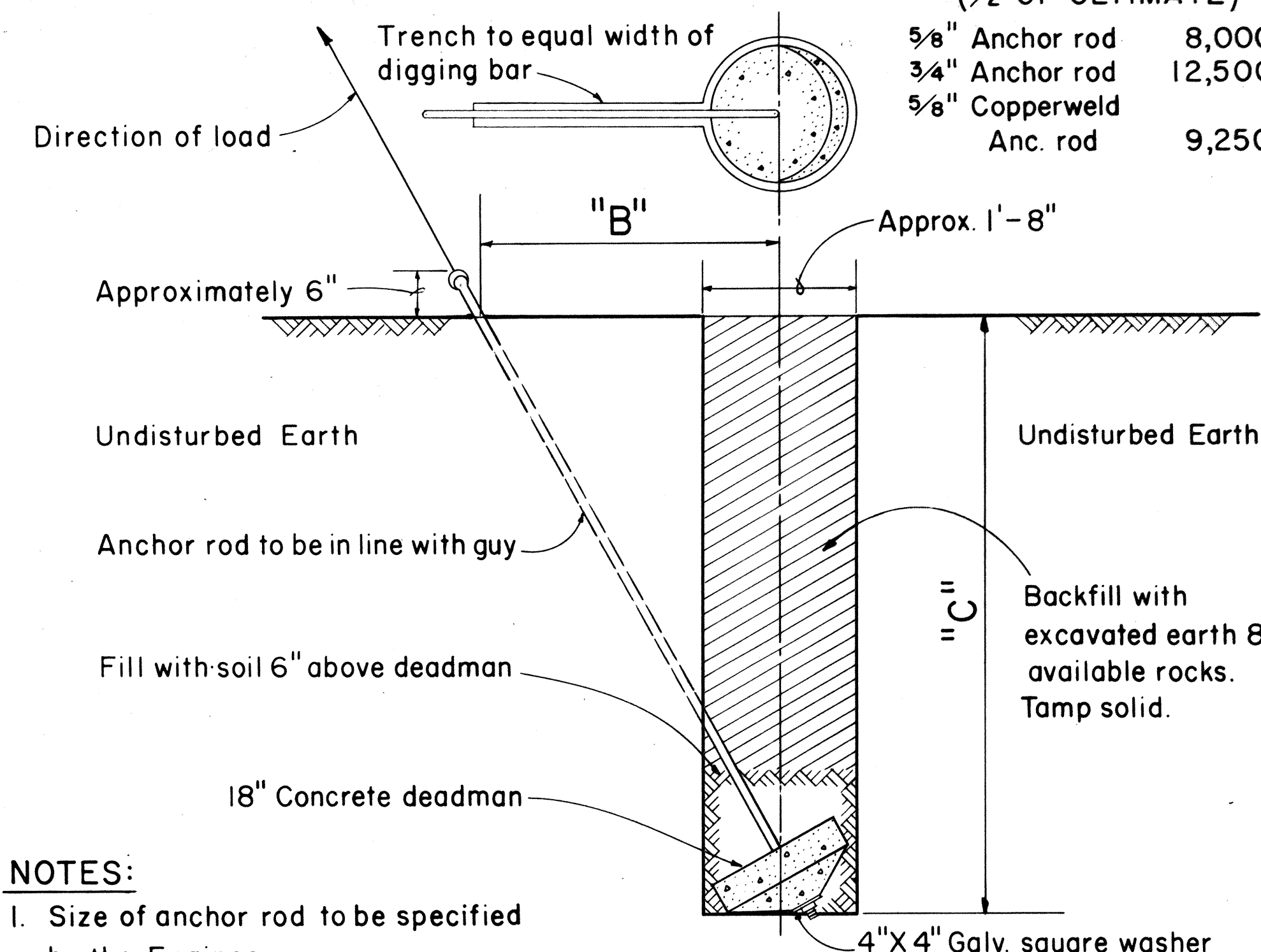
Scales: As Noted Date

SHEET No. 13 OF 18 SHEETS

46 6

ALLOWABLE LOAD (1/2 OF ULTIMATE)

5/8" Anchor rod	8,000#
3/4" Anchor rod	12,500#
5/8" Copperweld Anc. rod	9,250#



NOTES:

- Size of anchor rod to be specified by the Engineer
- Use Standard 05-101 Anchoring Data.

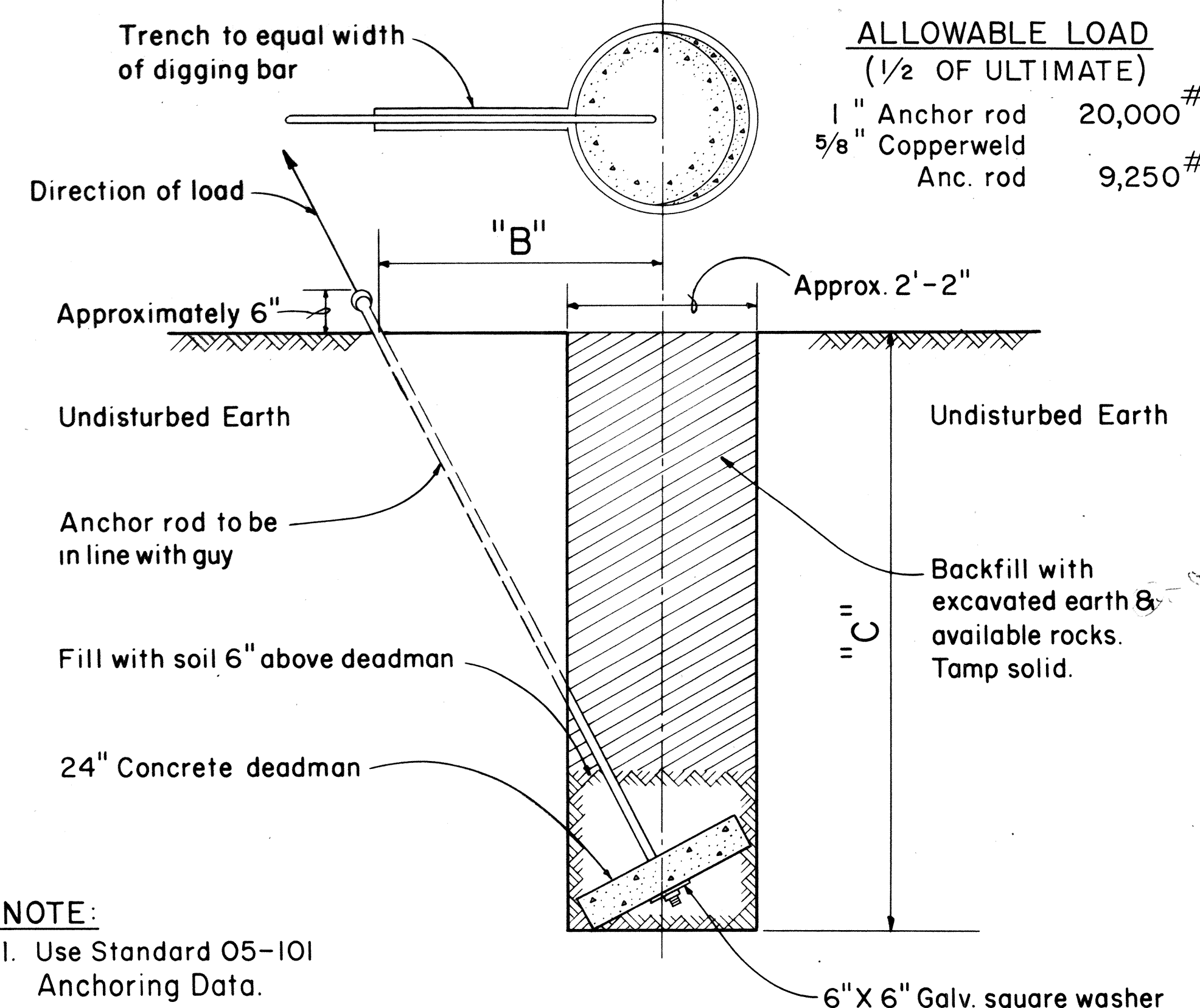
GUY ANCHOR 18" DEADMAN

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

05-102

ALLOWABLE LOAD (1/2 OF ULTIMATE)

1" Anchor rod	20,000#
5/8" Copperweld Anc. rod	9,250#



NOTE:

- Use Standard 05-101 Anchoring Data.

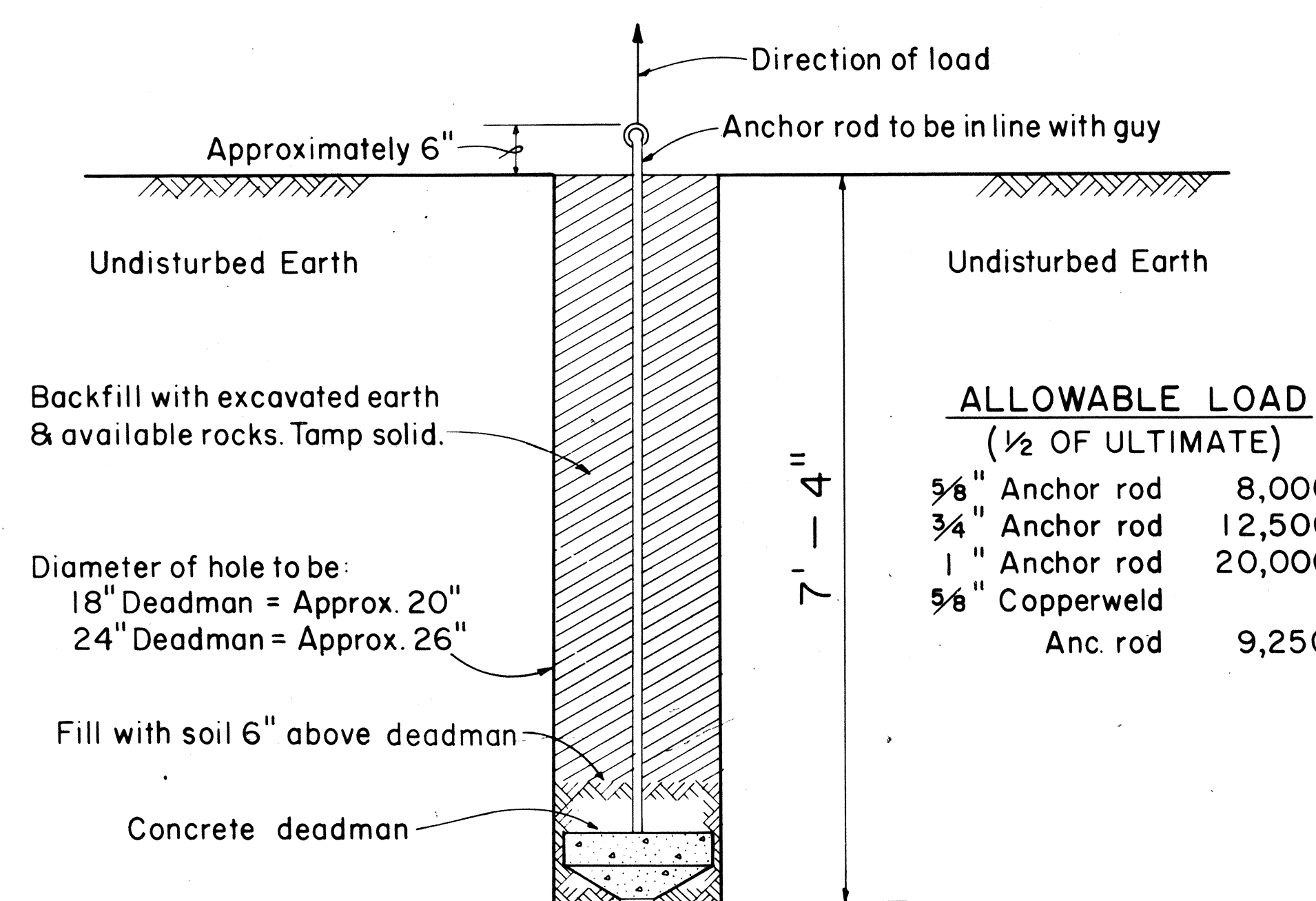
GUY ANCHOR 24" DEADMAN

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

05-103

ALLOWABLE LOAD (1/2 OF ULTIMATE)

5/8" Anchor rod	8,000#
3/4" Anchor rod	12,500#
1" Anchor rod	20,000#
5/8" Copperweld Anc. rod	9,250#



NOTES:

- Size of anchor rod to be specified by the Engineer.
- Use Standard 05-101 Anchoring Data.

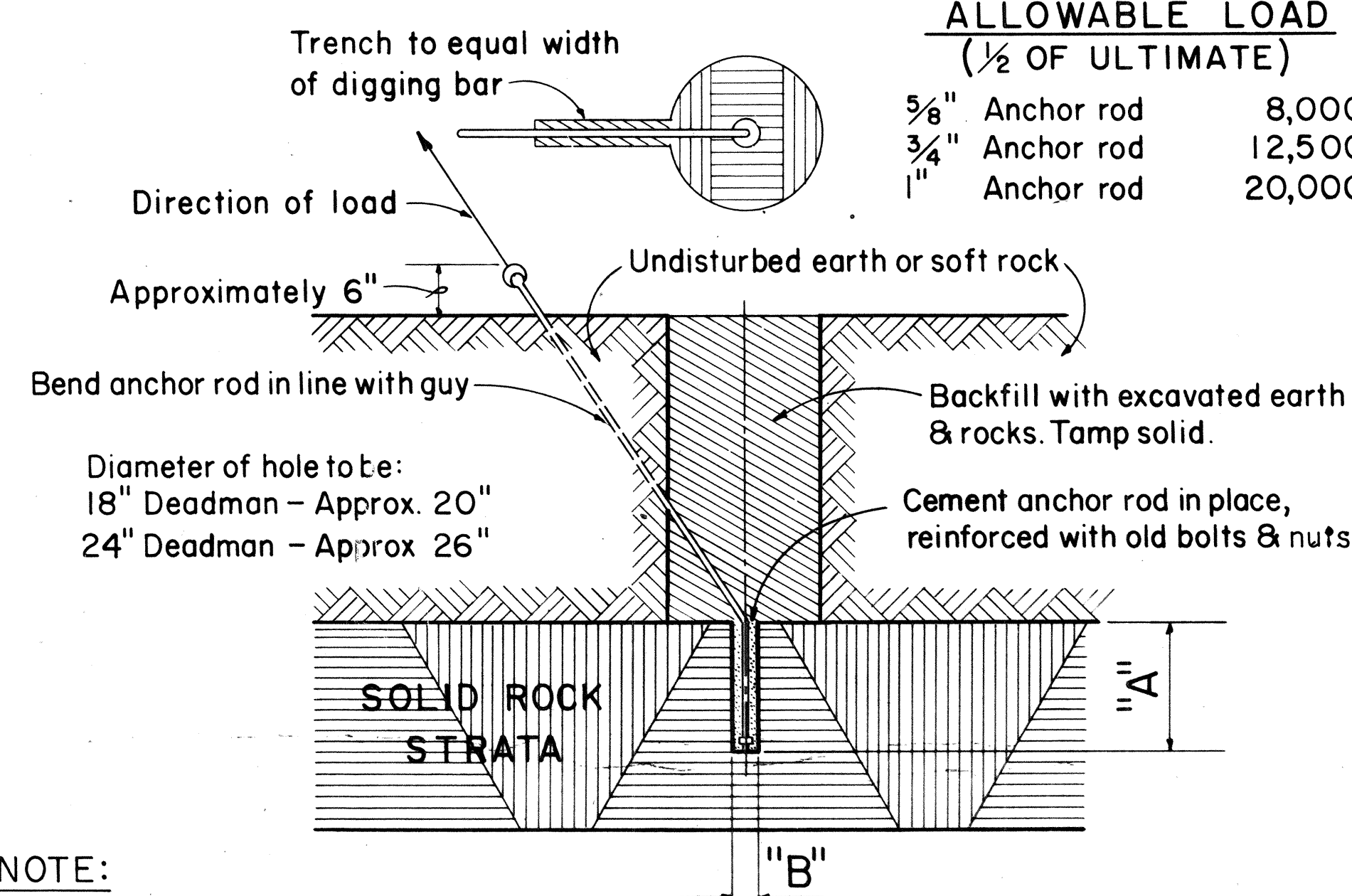
SIDE - WALK ANCHOR

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

05-104

ALLOWABLE LOAD (1/2 OF ULTIMATE)

5/8" Anchor rod	8,000#
3/4" Anchor rod	12,500#
1" Anchor rod	20,000#



NOTE:

- Size of anchor rod to be specified by the Engineer.
- "A" Should not be less than 24". If "A" is less than 24" complete hole & install anchor per O.H. Standard 05-102, 103, or 104.
- "B" 5/8" Anchor rod drill 2" hole
3/4" Anchor rod drill 2" hole
1" Anchor rod drill 2 1/2" hole
- Use Standard 05-101 Anchoring Data.

ROCK ANCHOR

Not to Scale

05-105

SOUTHERN PINE & DOUGLAS FIR — 8 LB. CREOSOTED TREATMENT										
LENGTH IN FEET	CLASS	APPROXIMATE MINIMUM DIMENSIONS — INCHES				AVERAGE WEIGHT IN POUNDS		POLE SETTING DEPTH		BREAKING LOAD 2'-0" BELOW TOP OF POLES (LBS.)
		AT TOP		6'-0" FROM BUTT						
		DIA.	CIR.	DIA.	CIR.	S. P.	D. F.	DEPTH IN SOIL	DEPTH IN ROCK	
JOINT POLES (J. P. POLES)										
25	5	6.05	19	8.28	26.0	491	525	4'-6"	3'-0"	1,900
30	5	6.05	19	8.92	28.0	660	600	5'-0"	3'-0"	1,900
35	5	6.05	19	9.55	30.0	862	770	5'-0"	3'-6"	1,900
40	3	7.32	23	11.79	37.0	1,403	1,320	5'-6"	3'-6"	3,000
45	3	7.32	23	12.26	38.5	1,664	1,575	6'-0"	4'-0"	3,000
50	3	7.32	23	12.73	40.0	1,925	1,850	6'-6"	4'-0"	3,000
55	3	7.32	23	13.23	41.5	2,200	2,145	7'-0"	4'-6"	3,000
TRANSMISSION POLES (T. POLES)										
45	2	7.96	25	13.23	41.5	1,911	1,845	6'-0"	4'-0"	3,700
50	2	7.96	25	13.69	43.0	2,214	2,150	6'-6"	4'-0"	3,700
60	1	8.59	27	15.77	49.5	3,451	3,360	7'-0"	4'-6"	4,500
65	1	8.59	27	16.20	51.0		3,835	7'-6"	5'-0"	4,500

S. P. — SOUTHERN YELLOW PINE
D. F. — DOUGLAS FIR

NOTE:
The ultimate fiber stress for creosoted Southern Yellow Pine & Douglas Fir is 7,400 Lbs. per square inch.

REFERENCES:
American Standard Association O5.4-1,941, O5.6-1,945
Standard Handbook for Electrical Engineers. Eighth Edition
H. E. Co. Specifications for poles.

WOOD POLE DATA

05-501

APPROVED:

R. Man for F. H. Dend 10/14/69
OUTSIDE PLANT ENGR. H.E.CO., LTD. DATE

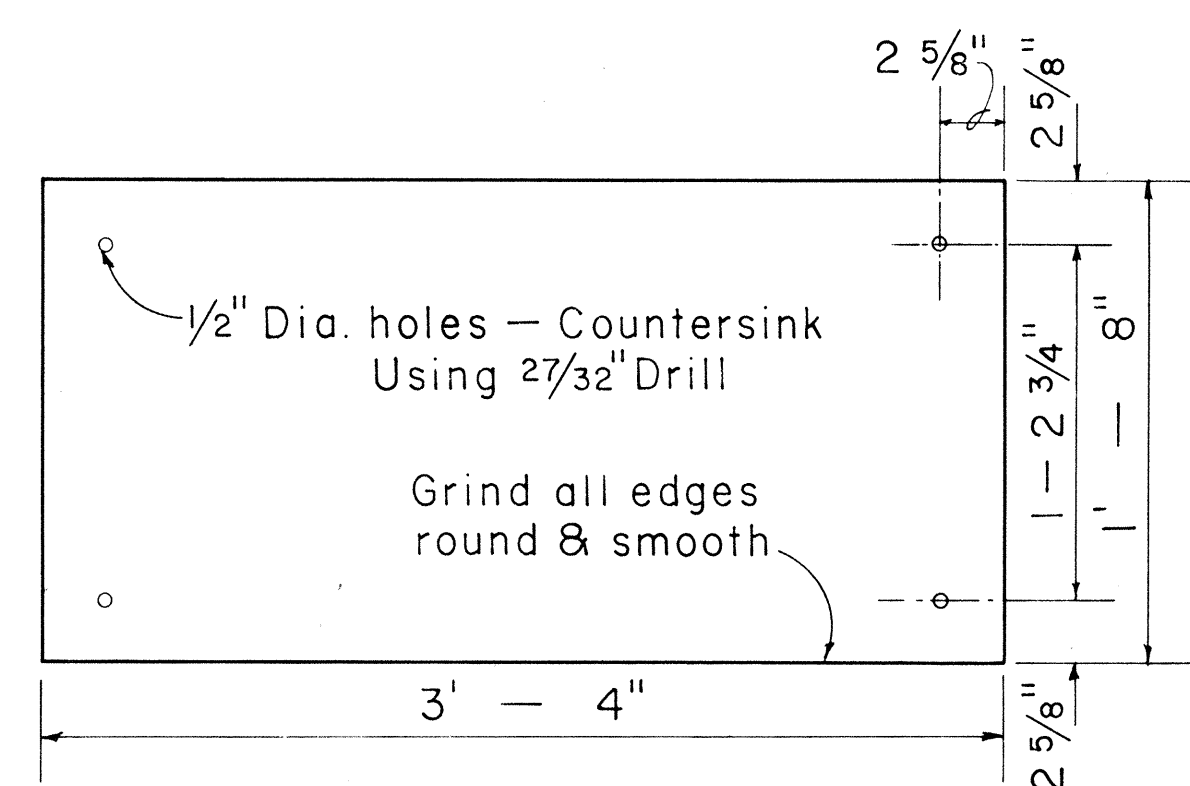
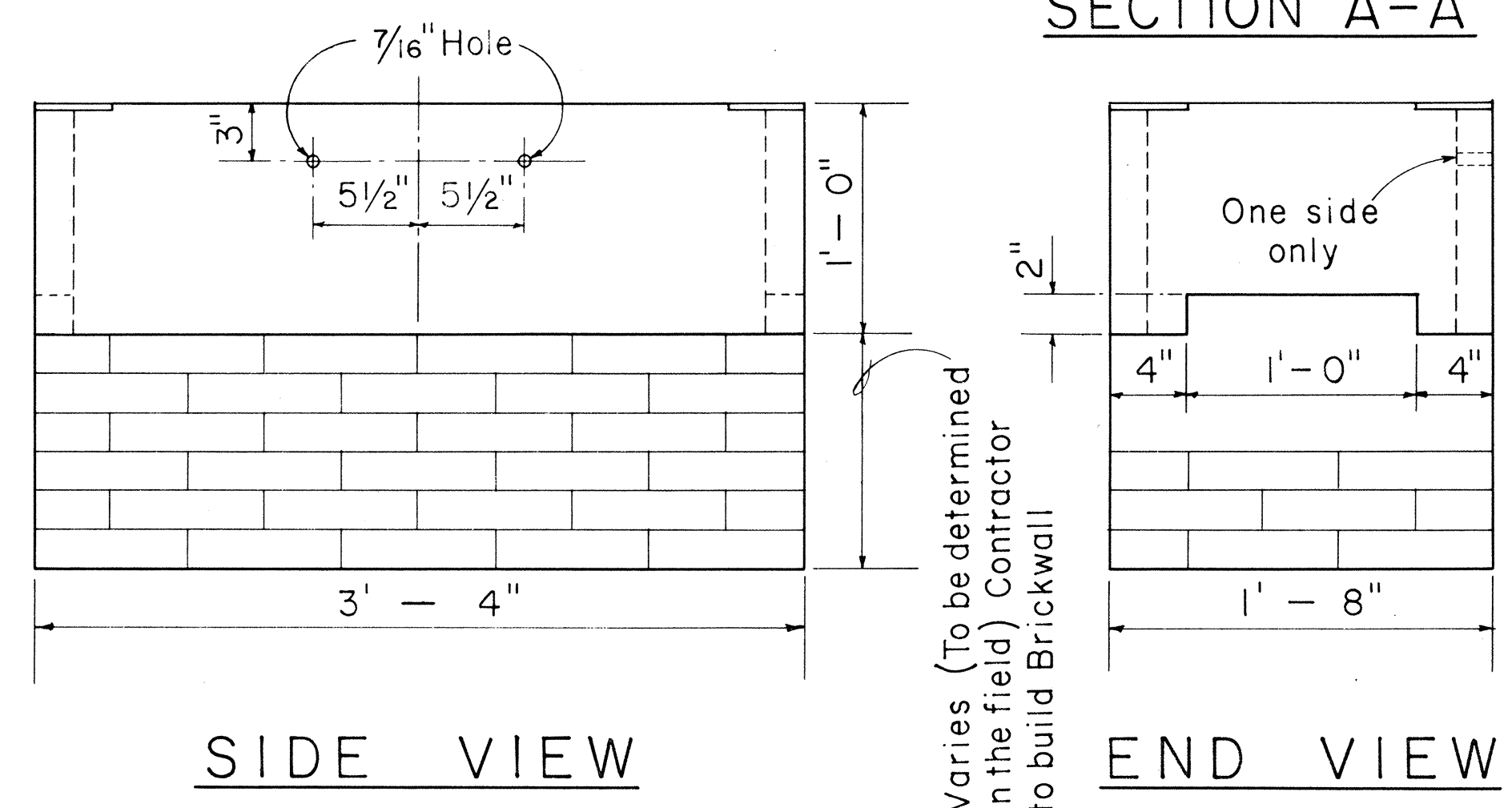
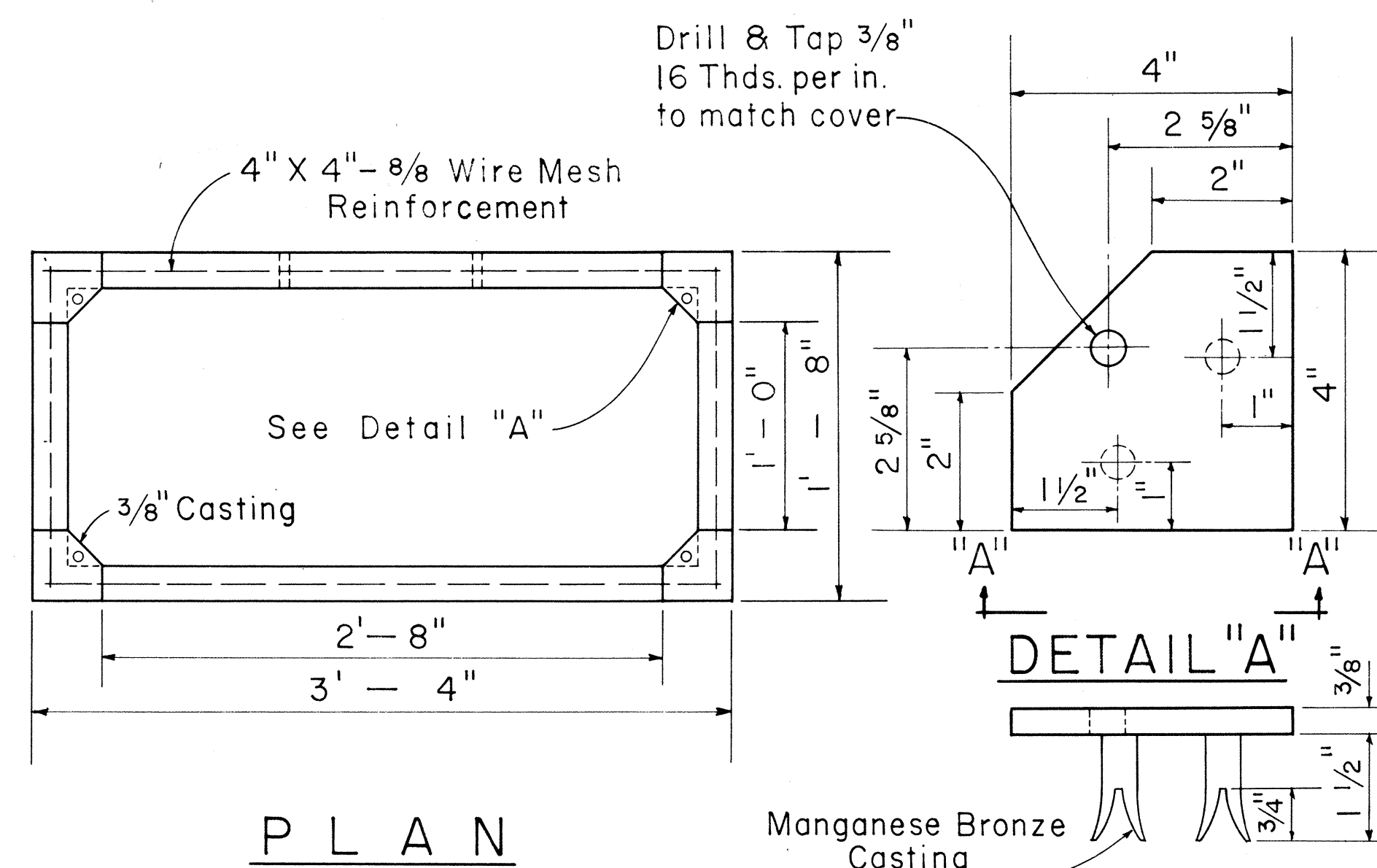
PRINCPL. ELEC. ENGR. H. E. CO., INC. DATE

Frank A. Hagan 10/13/69
PRINCPL. DISTR. ENGR. H. E. CO., INC. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
H. E. Co. AND H. T. Co.
SERVICE BOX DETAILS
AND WOOD POLE DATA

Scales: As Noted Date

SHEET NO. 14 OF 18 SHEETS



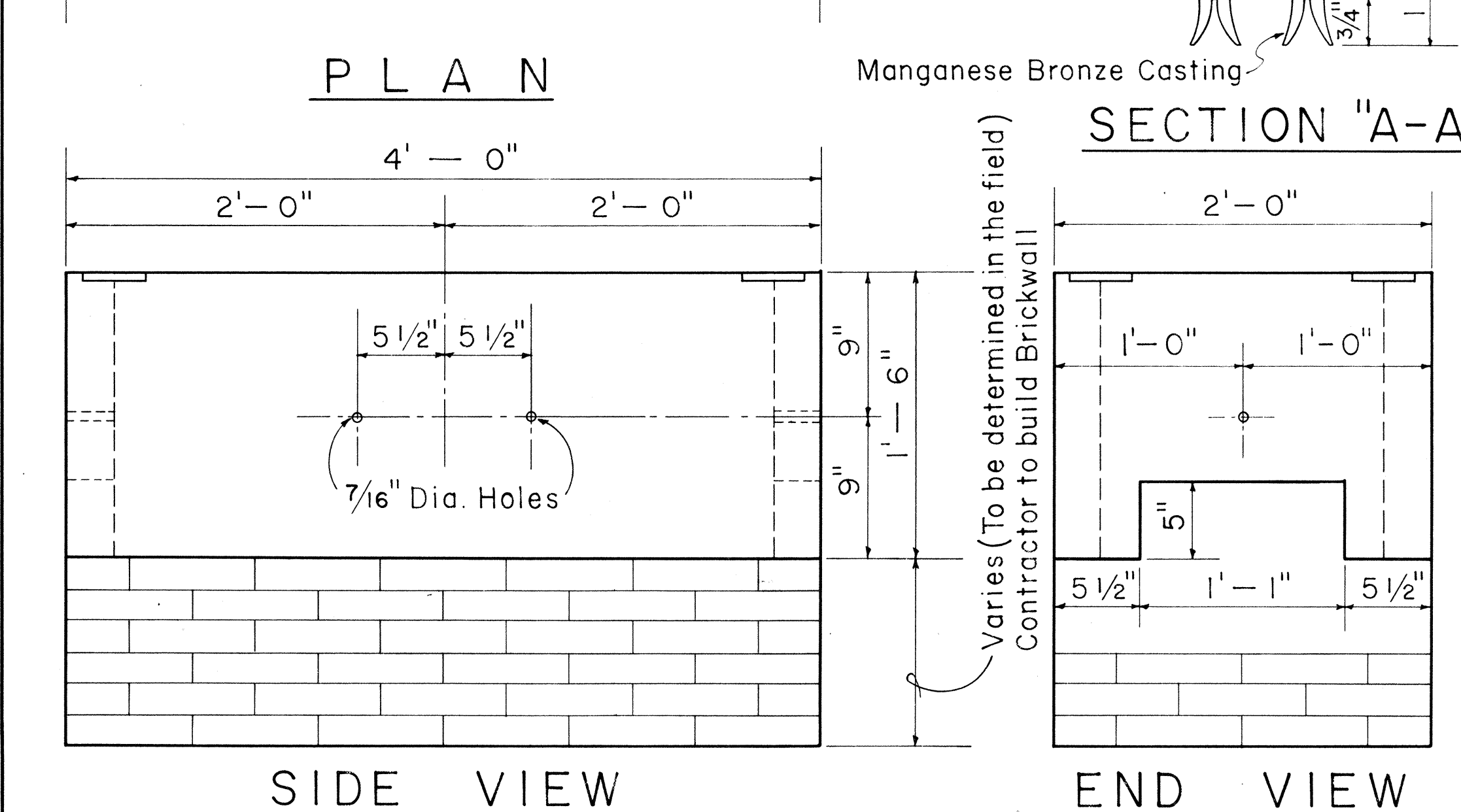
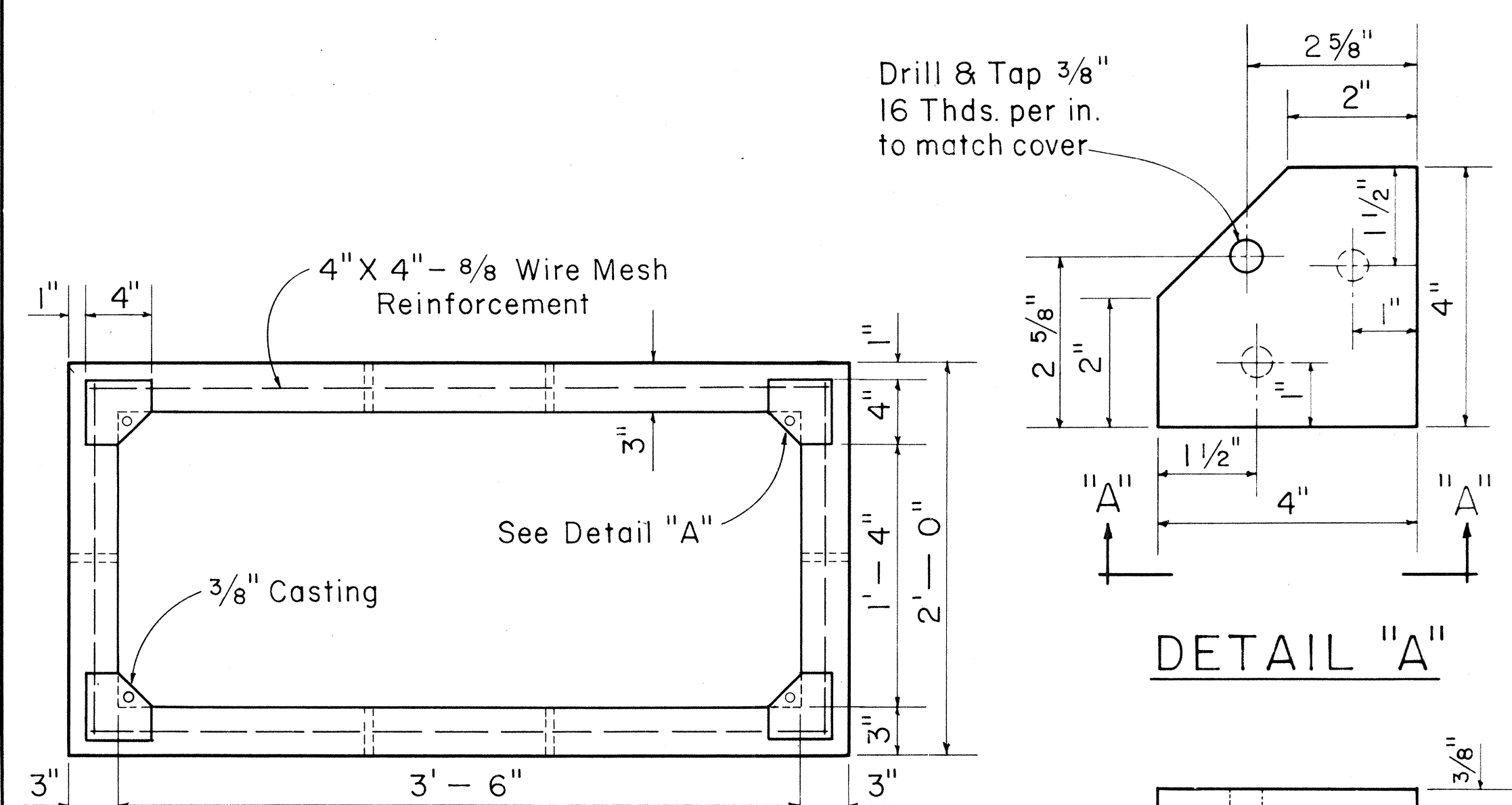
NOTES:
Use 3/8" Plate for driveways.
Concrete Box 225 Lbs.
1/4" Checker Plate 62 Lbs.

1/4" CHECKER PLATE COVER
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

1'-4" X 3'-0" CONCRETE
SERVICE BOX

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

UI-103



NOTES:
Use 3/8" Plate for driveway.
Concrete Box 575 Lbs.
1/4" Checker Plate 130 Lbs.

1/4" CHECKER PLATE COVER
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

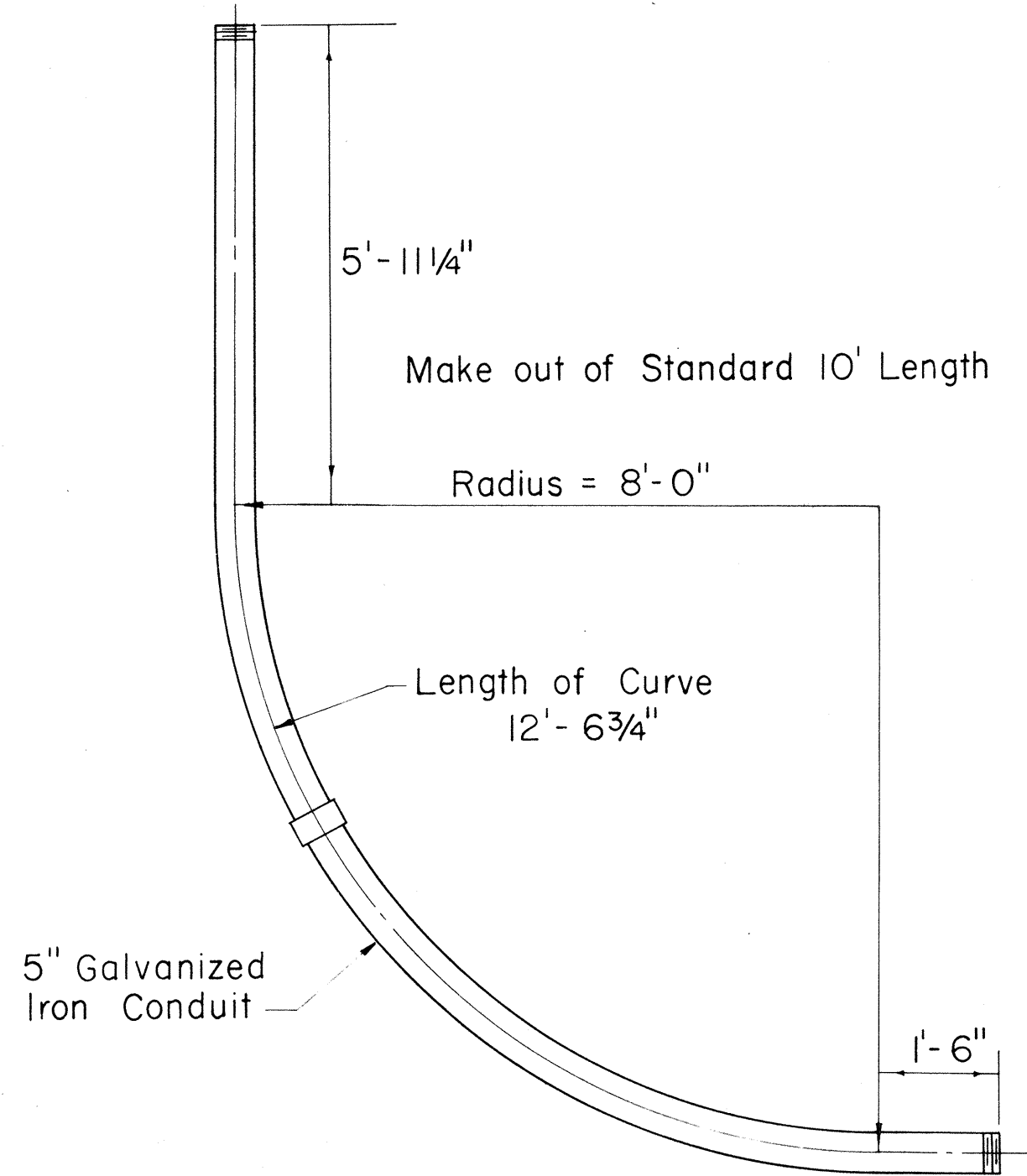
1'-6" X 3'-6" CONCRETE
SERVICE BOX

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

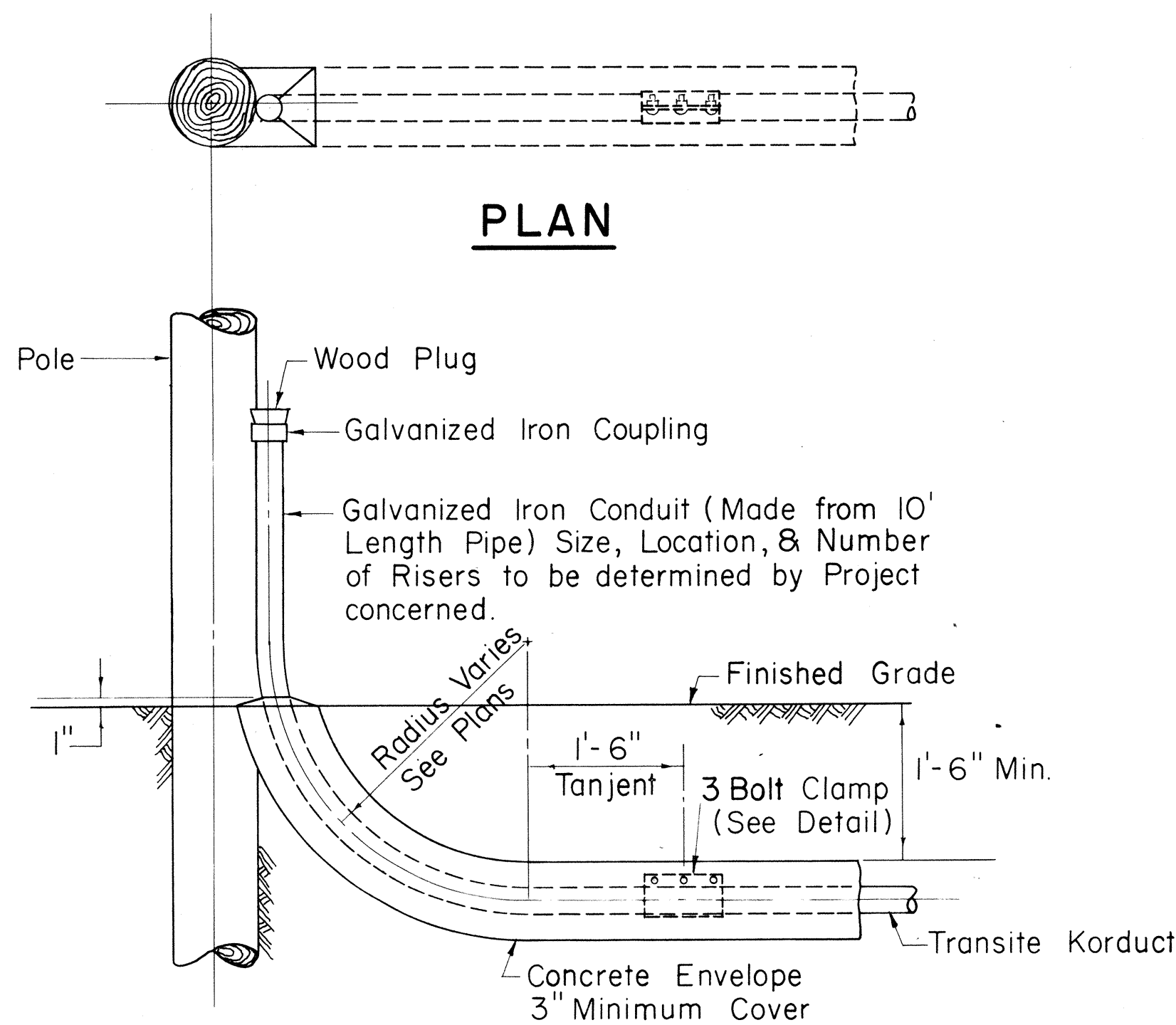
UI-103

SURVEY PLOTTED BY: DATE: _____
DRAWN BY: _____
CHECKED BY: _____
NOTE BOOK: _____
No. _____

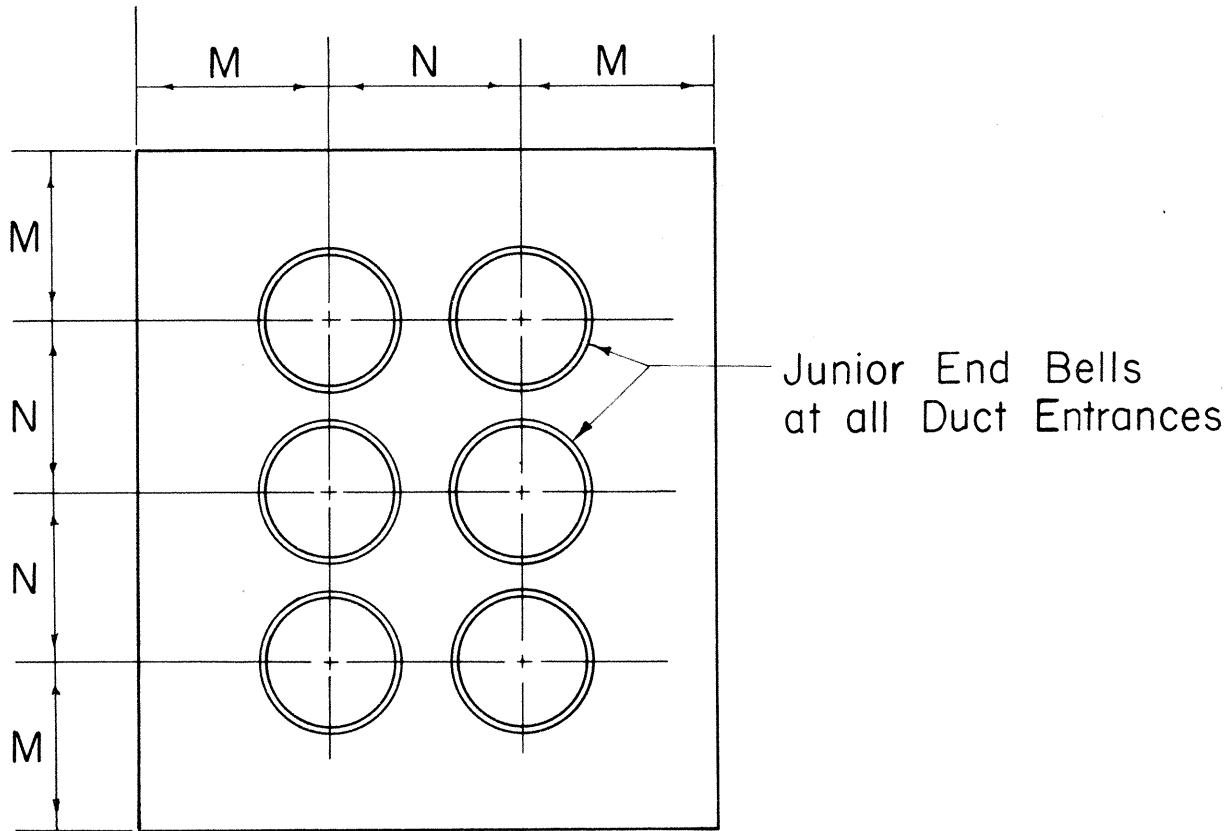
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1 (17) UNIT 1	1965	48	146



46 KV RISER CONDUIT BEND
(8'-0" RADIUS)
Not to Scale

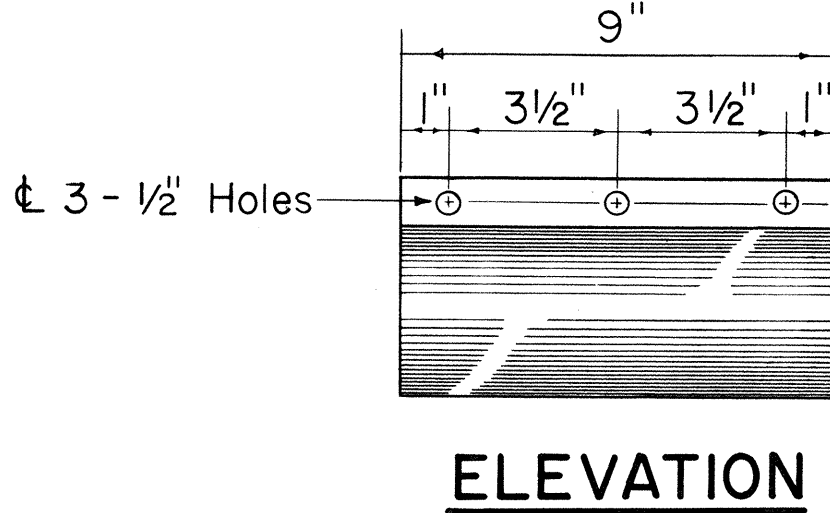
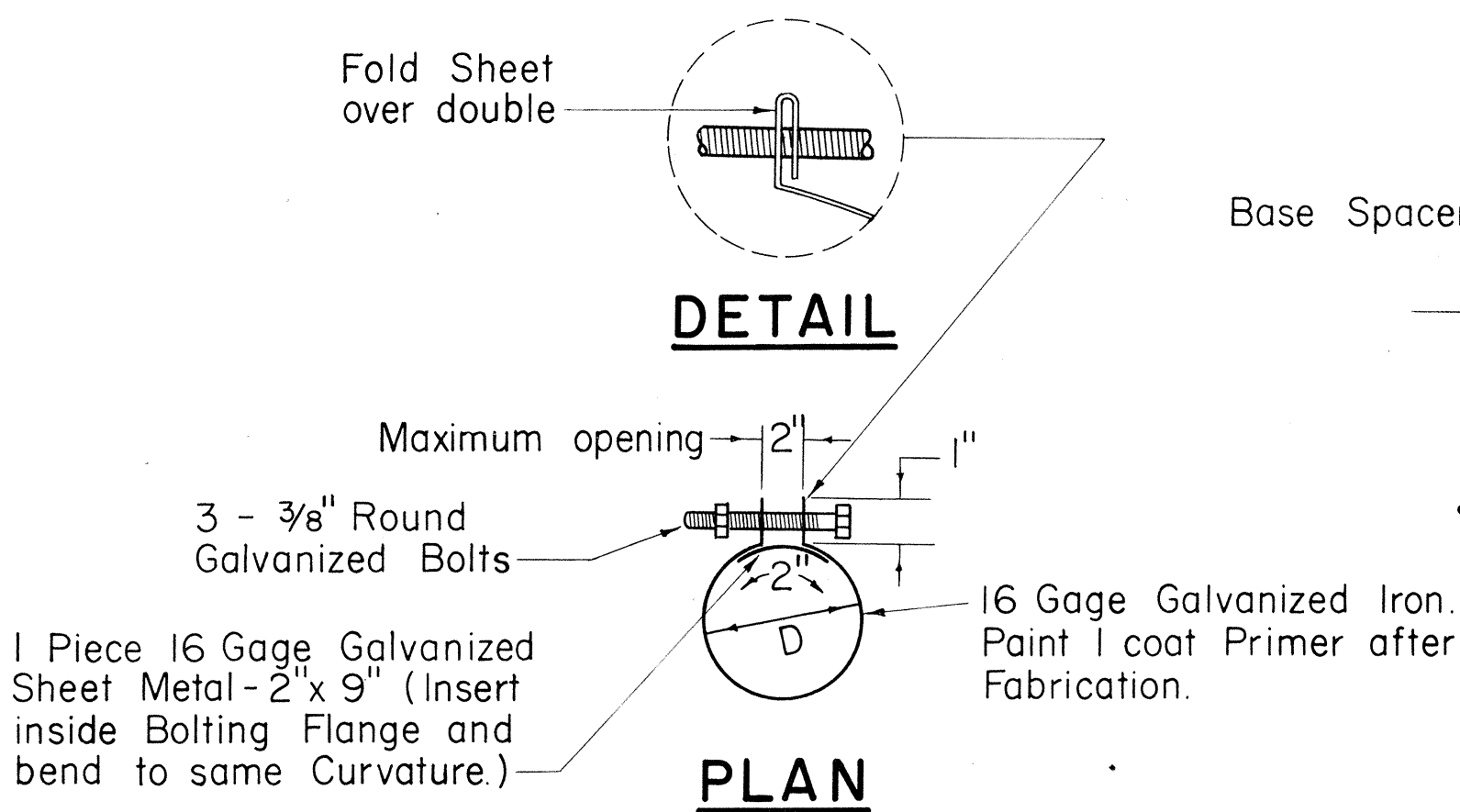


TYPICAL POLE RISER DETAIL
Scale: 3/4" = 1'-0"

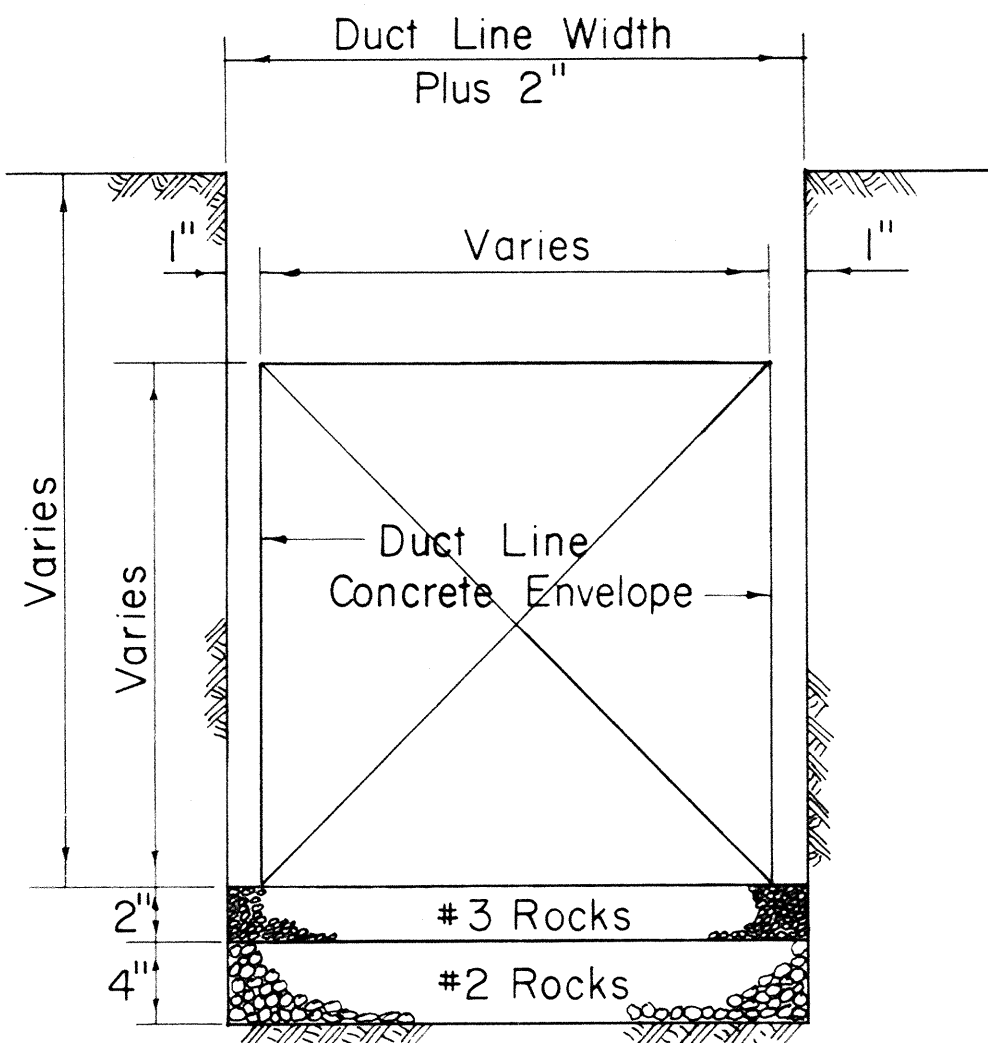


TYPICAL DUCT DETAIL AT MANHOLE WALL
Not to Scale

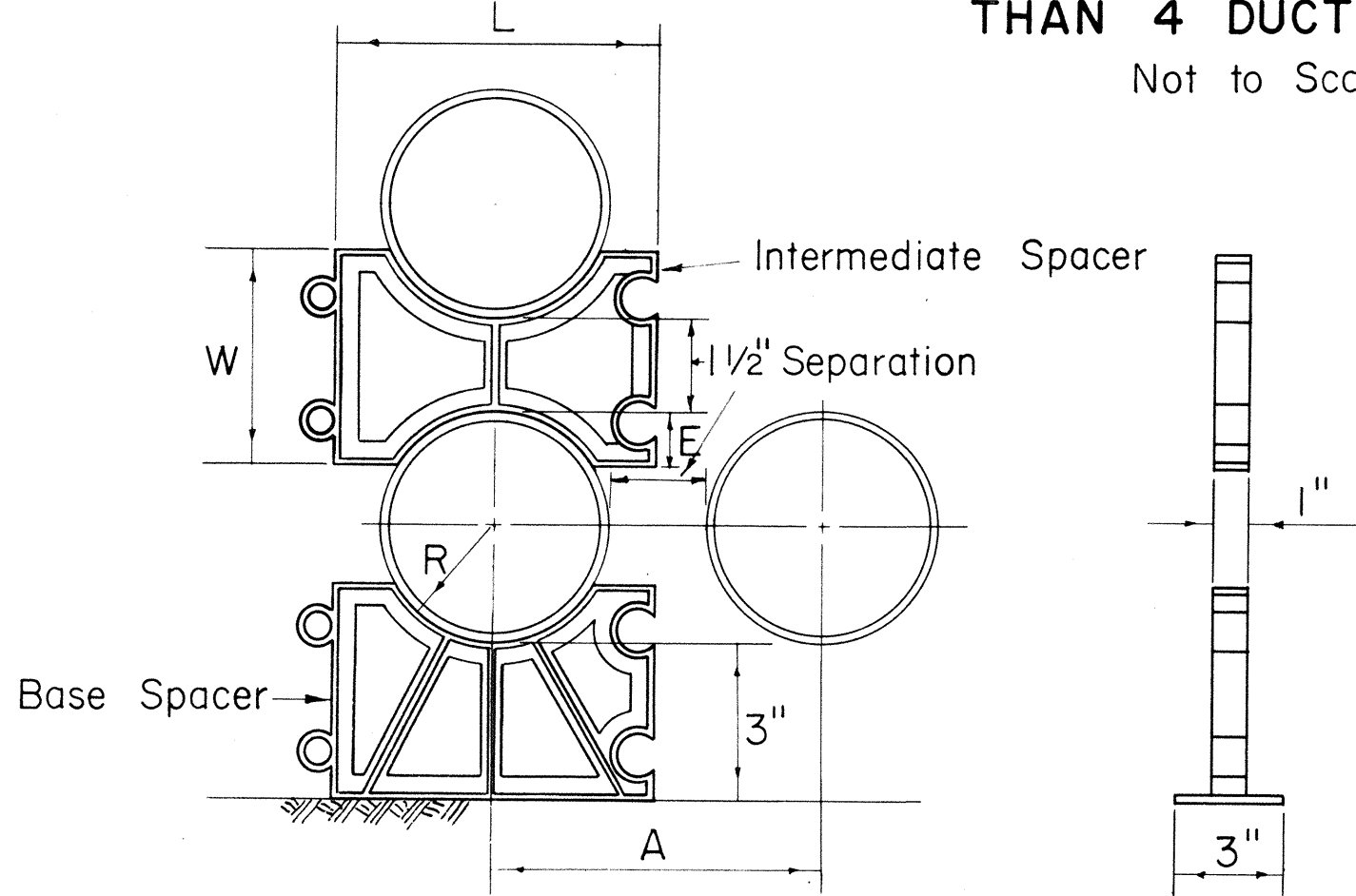
SIZE	M	N
3"	5"	6"
4"	5 1/2"	7"
4 1/2"	5 1/2"	7 1/2"
5"	6"	8"



3 BOLT CLAMP DETAIL
Scale: 3" = 1'-0"



TYPICAL EXCAVATION DETAIL
Not to Scale



TYPICAL PLASTIC SPACERS
Not to Scale

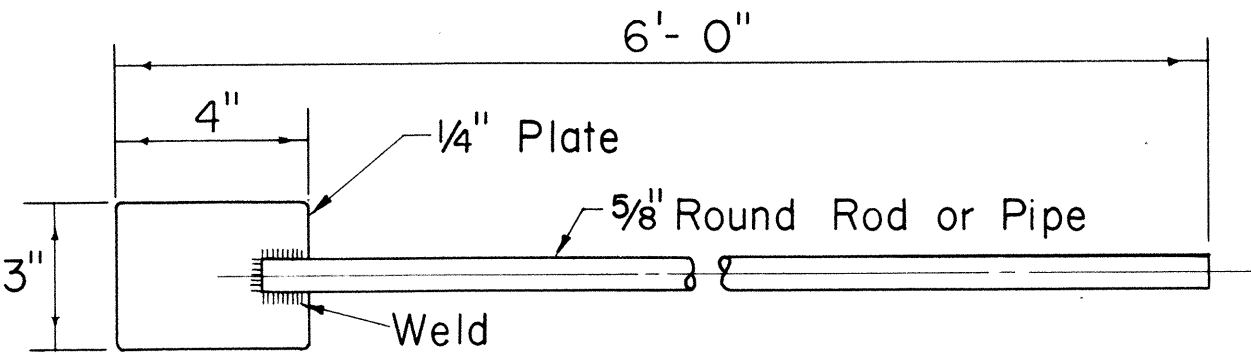
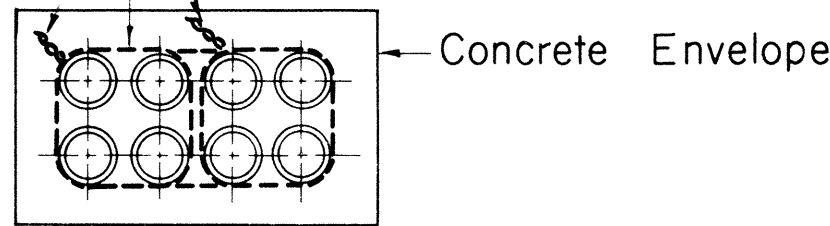
SIZE	R	E	W	A	L
3"	1 27/32"	7/8"	3 1/4"	5 1/8"	5"
4"	2 13/32"	1 1/8"	3 3/4"	6 1/4"	6 1/8"
4 1/2"	2 23/32"	1 1/4"	4"	6 7/8"	6 3/4"
5"	3 1/16"	1 3/8"	4 1/4"	7 5/8"	7 1/2"

For 1 1/2" Separation

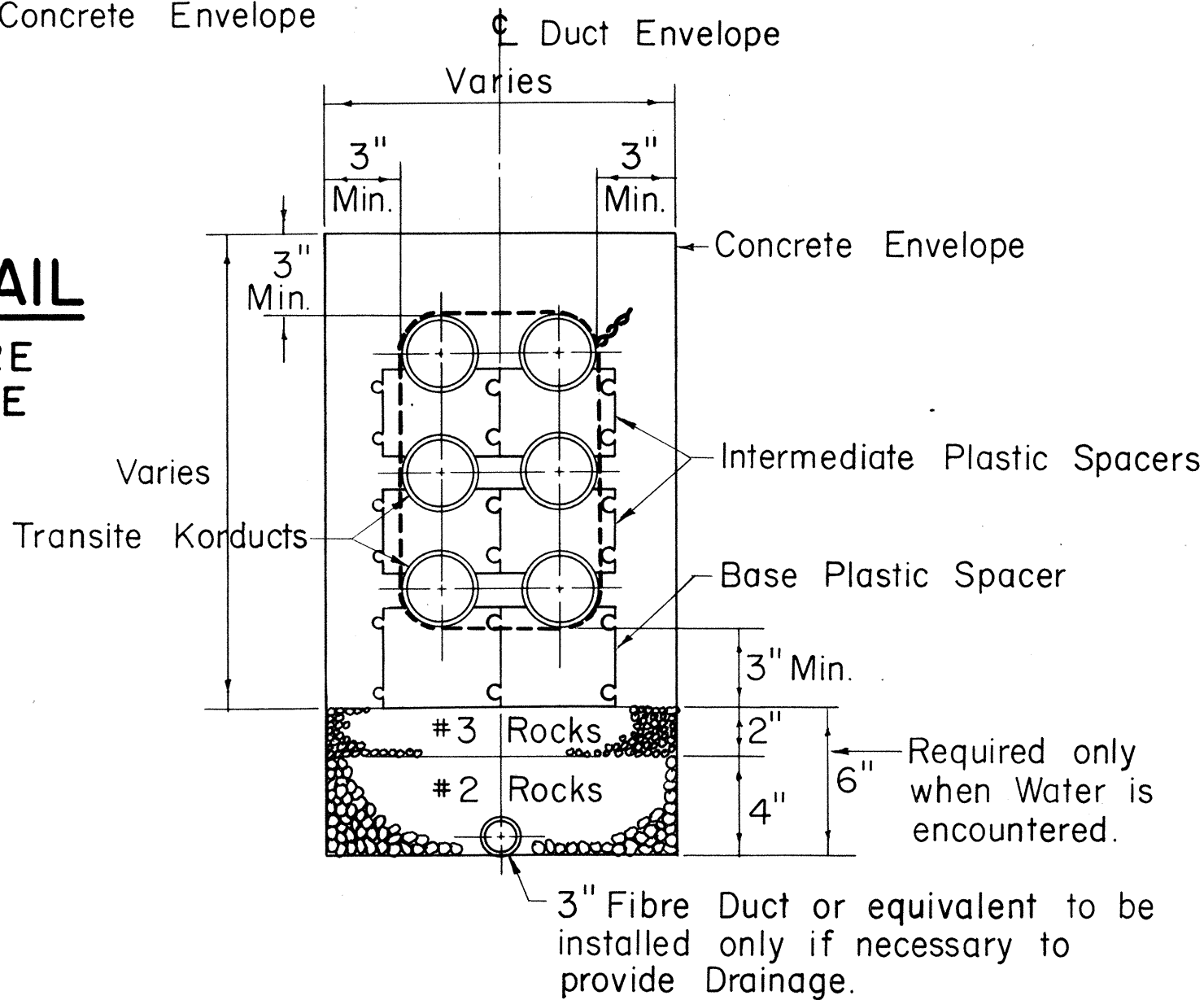
NOTES

1. Size of Concrete Envelope and Depth of Excavation to be determined by Project concerned.
2. Widen Trench Excavation when Forms are used.
3. Rock Foundation required only when Water is encountered.

#14 Tie Wire twisted and tied securely at each set of Plastic Spacers.



CONCRETE DUCT ENVELOPE TAMPING ROD
Scale: 3" = 1'-0"



TYPICAL DUCT PLASTIC SPACERS & DRAINAGE SECTION
(6 WAY DUCT SHOWN - 3 HIGH - 2 WIDE)
Not to Scale

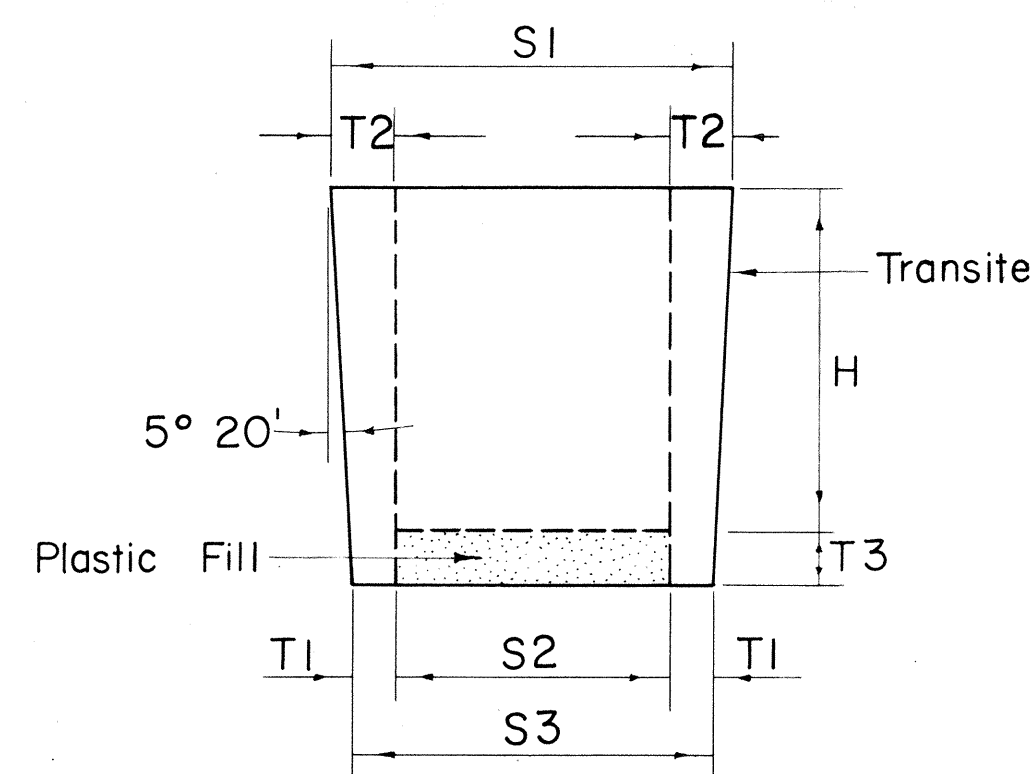
APPROVED:

Mark A. [Signature]
HAWAIIAN ELECTRIC CO., INC. DATE 10/13/65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES
Scales: As Noted Date

SHEET NO. 15 OF 18 SHEETS

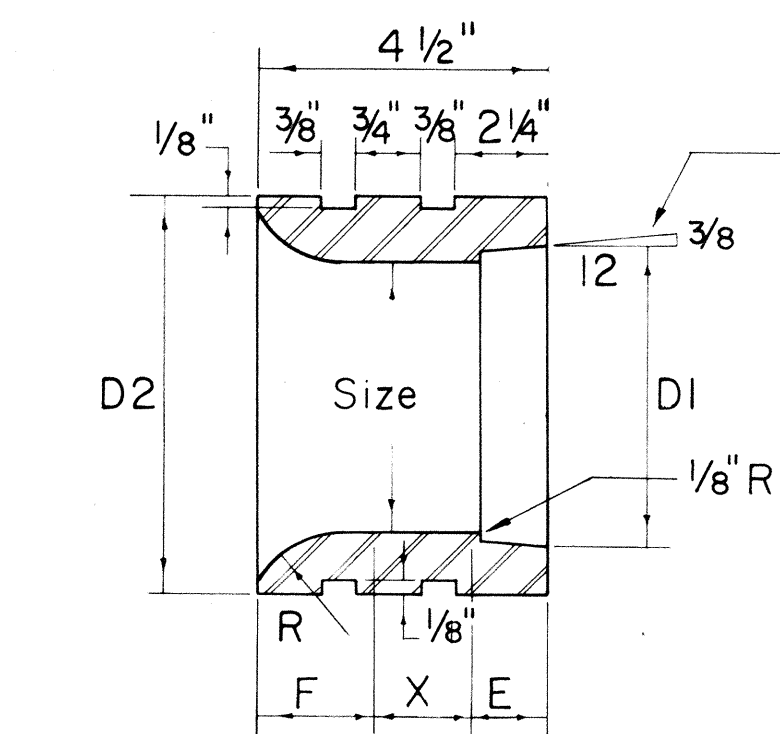
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1 (17) UNIT 1	1965	49	146



PLUGS FOR TRANSITE KORDUCTS

Not to Scale

SIZE	H	S1	S2	S3	T1	T2	T3
3"	4"	3 3/8"	2"	2 5/8"	5 1/16"	11 1/16"	3 3/4"
4"	4 1/2"	4 27/64"	2 3/4"	3 37/64"	13 3/32"	27 3/32"	3 3/4"
4 1/2"	4 1/2"	4 59/64"	3"	4 5/64"	35 3/64"	31 3/32"	3 3/4"
5"	4 1/2"	5 27/64"	3 1/2"	4 37/64"	35 3/64"	31 3/32"	3 3/4"



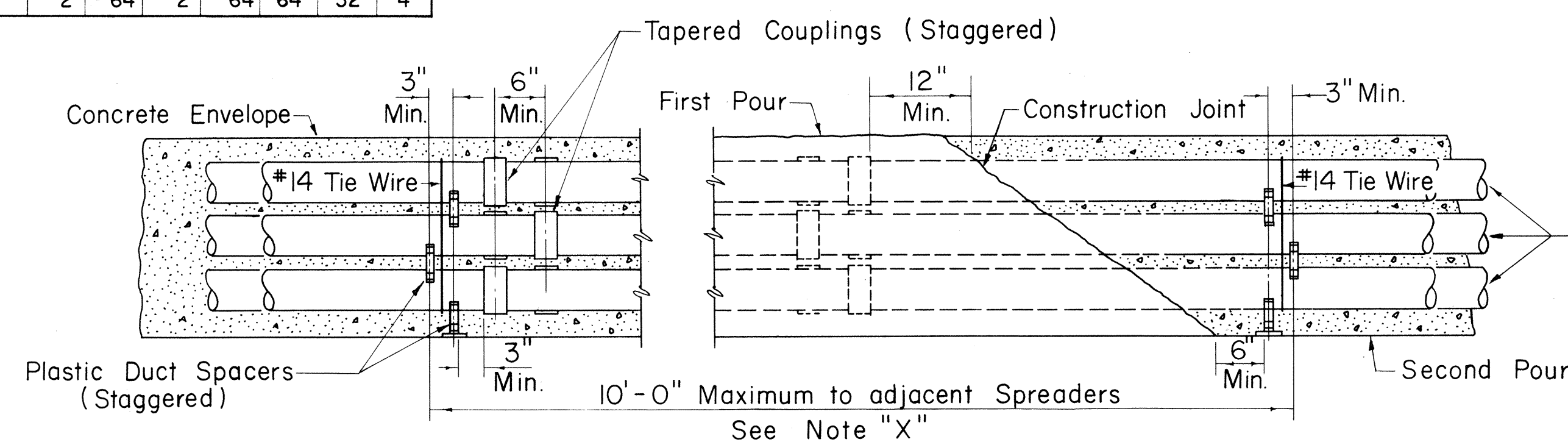
JUNIOR END BELLS

Not to Scale

SIZE	DI	D2	F	X	E	R
3"	3 25/64"	4 1/2"	1 11/32"	1 29/32"	1 1/4"	1 3/4"
4"	4 25/64"	5 3/4"	1 9/16"	1 9/16"	1 3/8"	2"
4 1/2"	4 57/64"	6 1/4"	1 9/16"	1 9/16"	1 3/8"	2"
5"	5 29/64"	7"	1 9/16"	1 7/16"	1 1/2"	2"

Note "X"

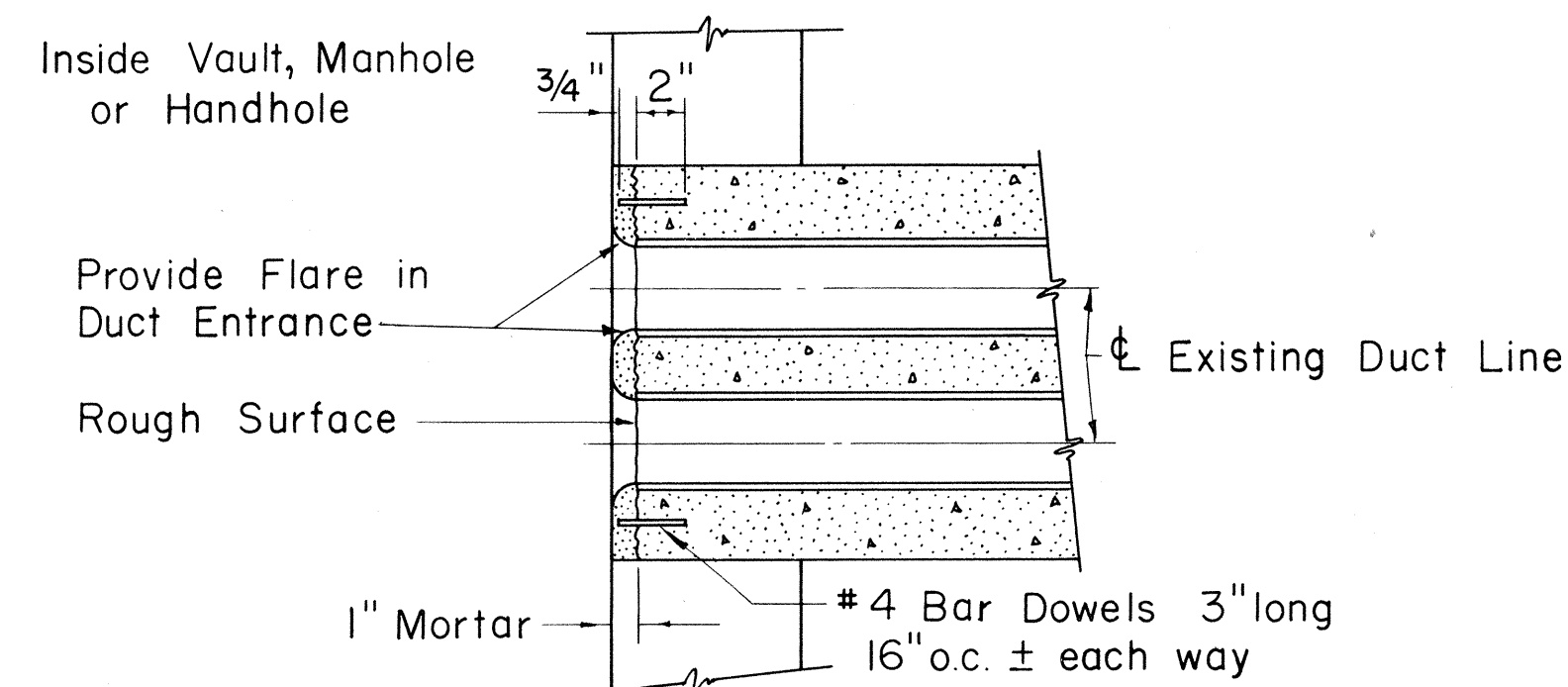
- Provide one set of Spacers
(a) 10 Ft. straight run for 4 Ducts high or less.
(b) 5 Ft. straight run for 5 Ducts high or more.



TYPICAL DUCT ENVELOPE ELEVATION

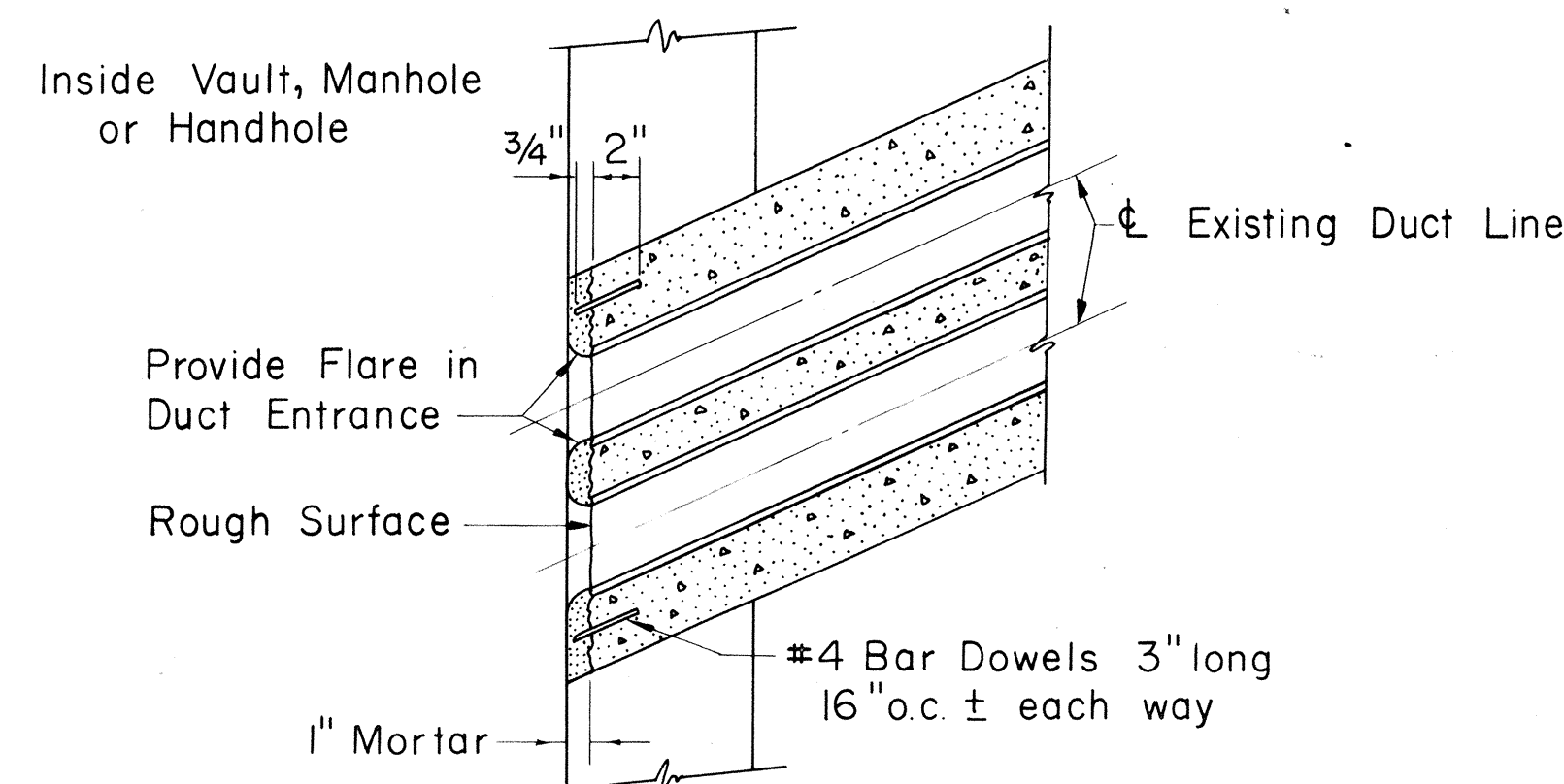
(6 WAY DUCT LINE SHOWN)

Not to Scale



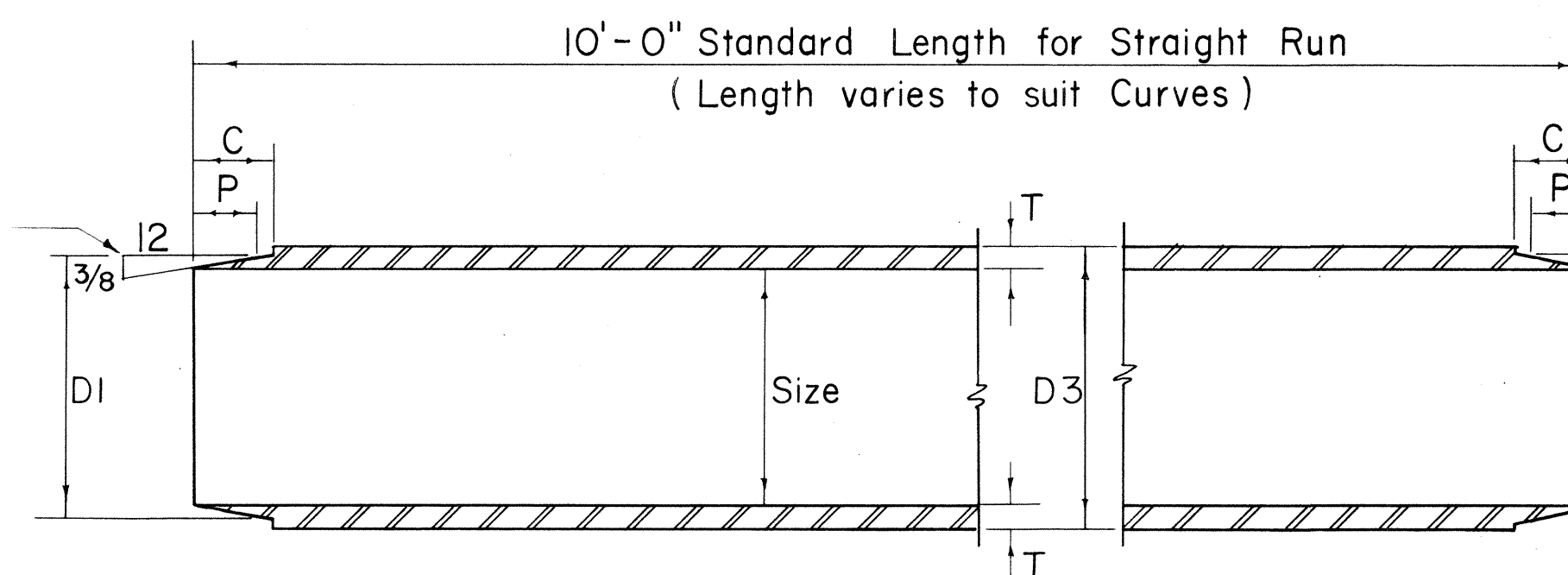
DUCT LINE ENTRANCE AT EXISTING DUCT LINE

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



DUCT LINE DIAGONAL ENTRANCE

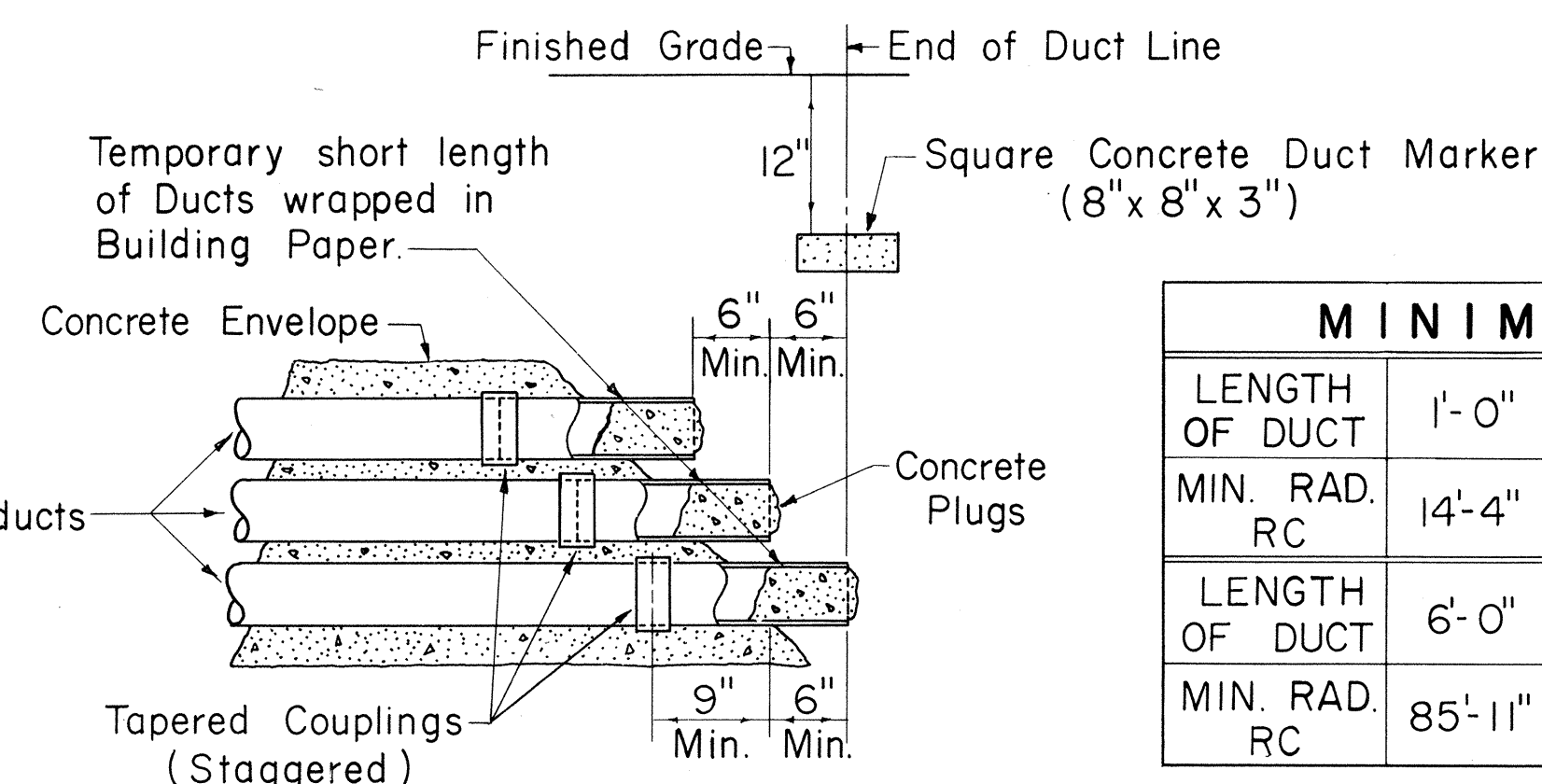
Scale: 1 1/2" = 1'-0"



TRANSITE KORDUCTS

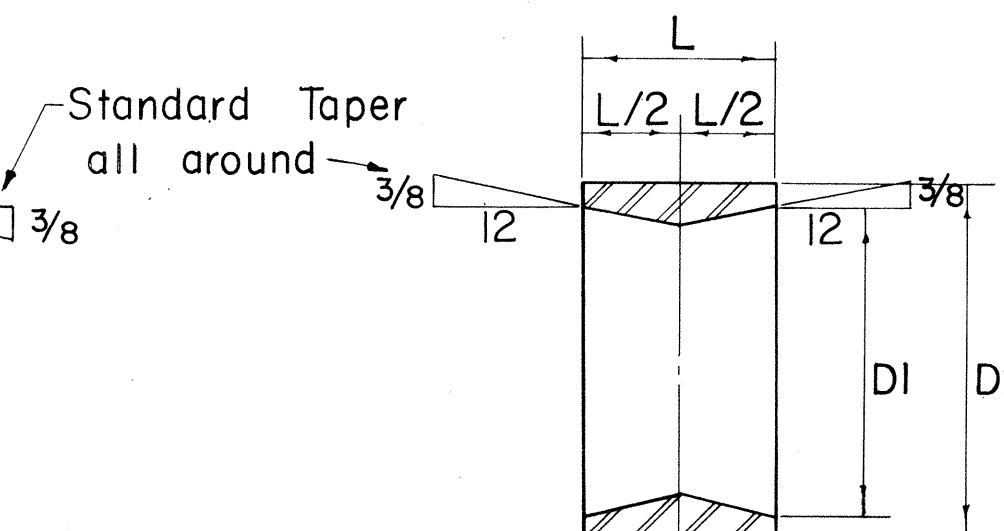
Not to Scale

SIZE	DI	D3	C	P	T
3"	3 25/64"	3 35/64"	1 1/8"	7 7/8"	17 1/64"
4"	4 25/64"	4 35/64"	1 1/4"	1"	17 1/64"
4 1/2"	4 57/64"	5 3/64"	1 1/4"	1"	17 1/64"
5"	5 29/64"	5 39/64"	1 25/64"	1 1/8"	19 1/64"



TYPICAL STUB OUT DETAIL

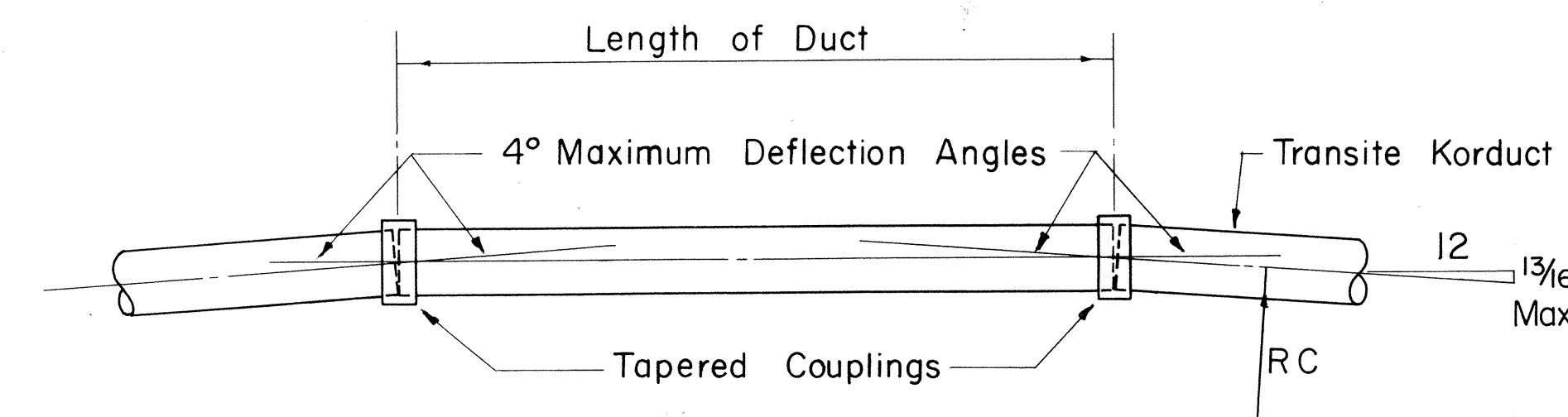
Not to Scale



TAPERED COUPLINGS

Not to Scale

SIZE	DI	D2	L
3"	3 25/32"	4 11/64"	2 1/4"
4"	4 25/64"	5 3/16"	2 1/2"
4 1/2"	4 57/64"	5 49/64"	2 1/2"
5"	5 29/64"	6 21/64"	2 3/4"



METHOD OF FORMING CURVES

Not to Scale

	MINIMUM RADIUS TO FORM CURVES									
LENGTH OF DUCT	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"
MIN. RAD. RC	14'-4"	21'-6"	28'-8"	35'-10"	42'-11"	50'-1"	57'-3"	64'-5"	71'-7"	78'-9"
LENGTH OF DUCT	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
MIN. RAD. RC	85'-11"	93'-1"	100'-3"	107'-5"	114'-7"	121'-8"	128'-10"	136'-0"	143'-2"	

APPROVED:

Frank A. Kow
HAWAIIAN ELECTRIC CO., INC.

10/13/65
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES
Scales: As Noted Date

SHEET NO. 16 OF 18 SHEETS

2" 1/2"
 TOP OF REM. CONC. SLAB?
 15 L 33.9
 3" 4" ROD (GALV. ZINC COATED)
 SEE NOTE
 3/4" BRASS PLUG WITH 1/2" 1/2" 1/2" GREASE TO THERMAD.
 YIELD ALL AROUND.
 1/8" 10-28" STEEL ROD FROM BOUND. STOCK WELDED ALL AROUND TO C.
 REM. CONC. COVER SLAB
 SECTION PULLING

A plan view diagram showing a rectangular structure labeled "HANDHOLE WALL" on the left. To the right of the wall are two parallel lines representing "TRANSITE KORDUCTS". A dimension line labeled L_{10} indicates the distance from the wall to the start of the korducts. A dimension line labeled L_{11} indicates the length of the korducts. A dimension line labeled L_{12} indicates the distance from the end of the korducts to the "JR. END BELLS". The diagram is labeled "PLAN" at the bottom.

ELEVATION "Y-Y"
CORNER ENTRANCE
(FOUR WAY DUCT)

TYPICAL DUCT LINE ENTRANCE DETAILS

FORM CONC. TO MATCH EXIST'G. CURB WHERE REQ'D.

8'-0"

1'-7"

7"

3'-0"

8'-0"

1'-7"

7"

3'-5" CONG. OPENING

HOLD THIS DIMENSION

2"

1"

2-#4 STR.

RAM. CONG. SLAB

2'-5" DIAM. 3/4" CHAMFER

#3 @ 18"

#5 @ 18"

#5 @ 18"

#4 DOWELS @ 18"

4-#8 @ 5 STR.

2-2" G.I. COND FOR ST. LITS.

6'-0"

12" SA x 12 DP. CLOSED SUMP

#4 @ 12 STR.

CONST. JOINT

10"

1'-0"

10"

1'-0"

8'

1'-5"

7"

6"

1'-0"

6"

7"

1'-5"

8"

2'-1"

3'-2"

2'-1"

GROUND ROD

SIDEWALK

#5 @ 18"

#4 @ 10"

#5 @ 18"

CONSTR. IF JOINT HIGHER THAN NAT'L

SECTION 'B-B'

Diagram illustrating the reinforcement details for a diamond-shaped structure, likely a manhole or vault. The structure is shown in plan view with four corners and four sides.

Reinforcement details and notes:

- PULLING IRON (PREFERRED LOCATION):** Indicated on the left side.
- 1-#5 ADD. REINF. EA. CORNER:** Reinforcement at the top corner.
- 2-#5 ADD. REINF. AT TOP ONLY:** Reinforcement at the top edge.
- NO REINF. IN WINDOW:** Reinforcement is not required in the central window area.
- PULLING IRON (ALTERNATE LOCATION):** Indicated on the right side.
- 1-#5 ADD. REINF. EA. SIDE & BOTT.:** Reinforcement at the bottom edge.
- TRANSITE KIDGROUITS 1/2" C.C. WITH 3" OR BELL:** Reinforcement at the bottom edge.

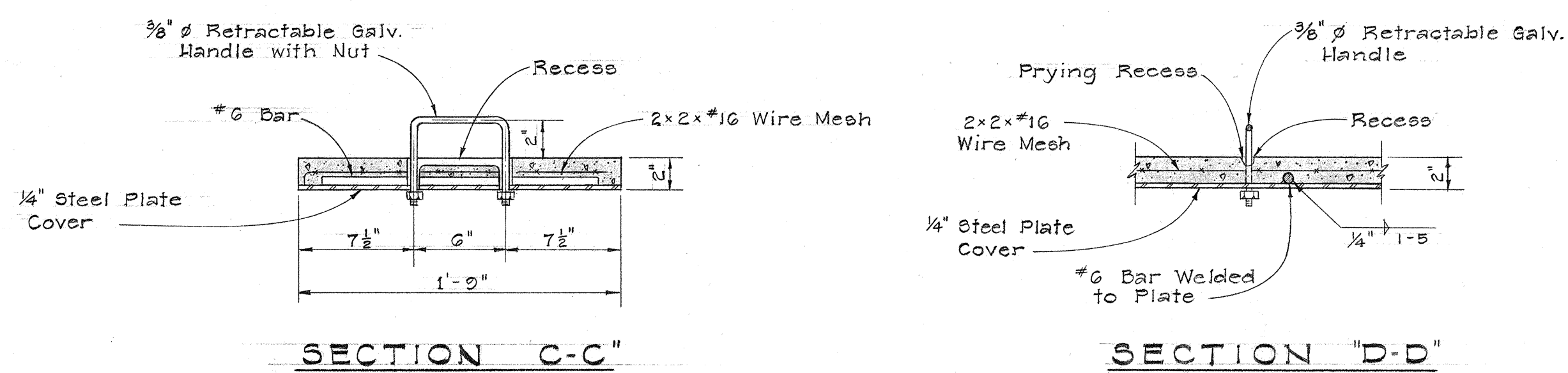
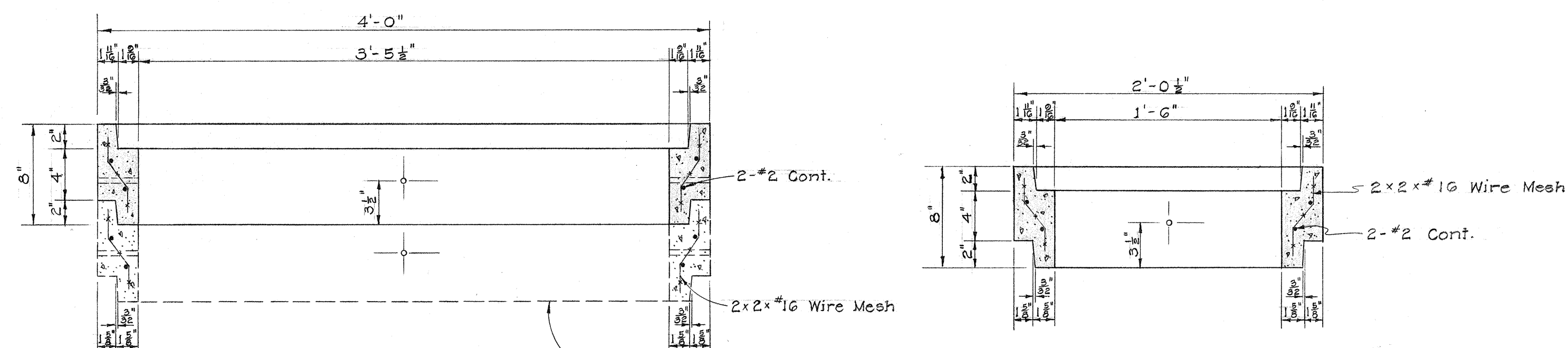
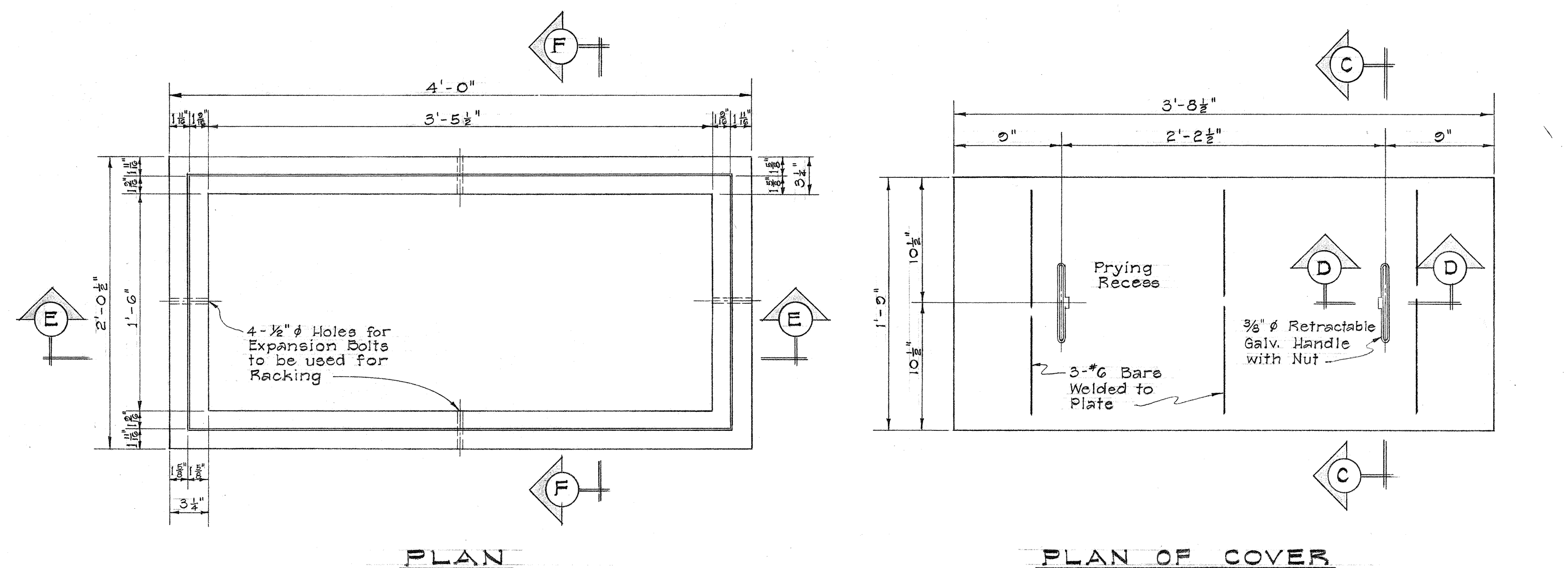
NOTE "Y"

NOTE "Y"
GENERALLY 2 PULLING IRONS
ARE REQUIRED AND LOCATED ON
OPPOSITE WALL OF EACH DUCT
WINDOW UNLESS OTHERWISE SHOWN
OR NOTED. H.E.CO. ENGINEER SHALL
DETERMINE NUMBER REQUIRED.

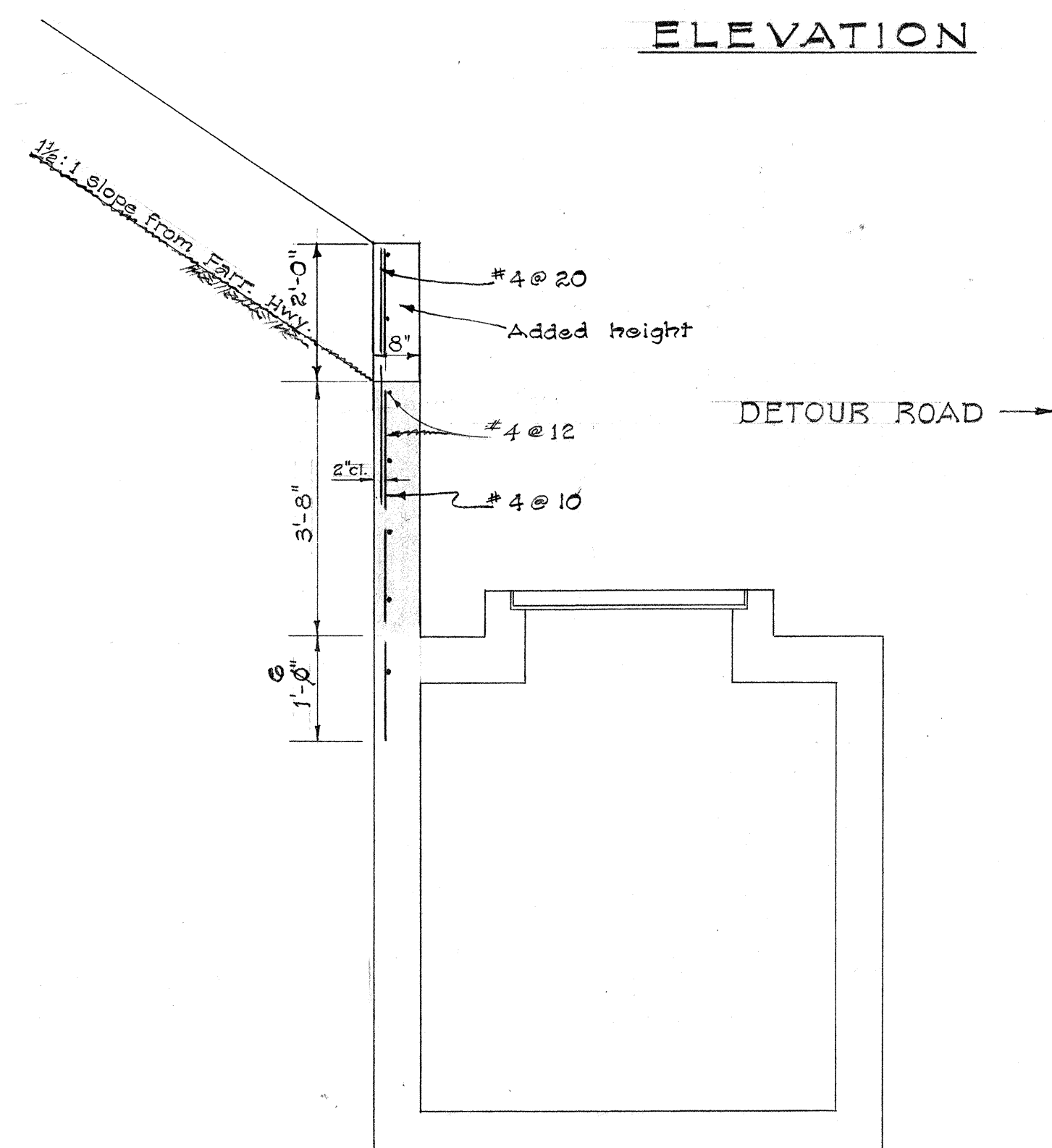
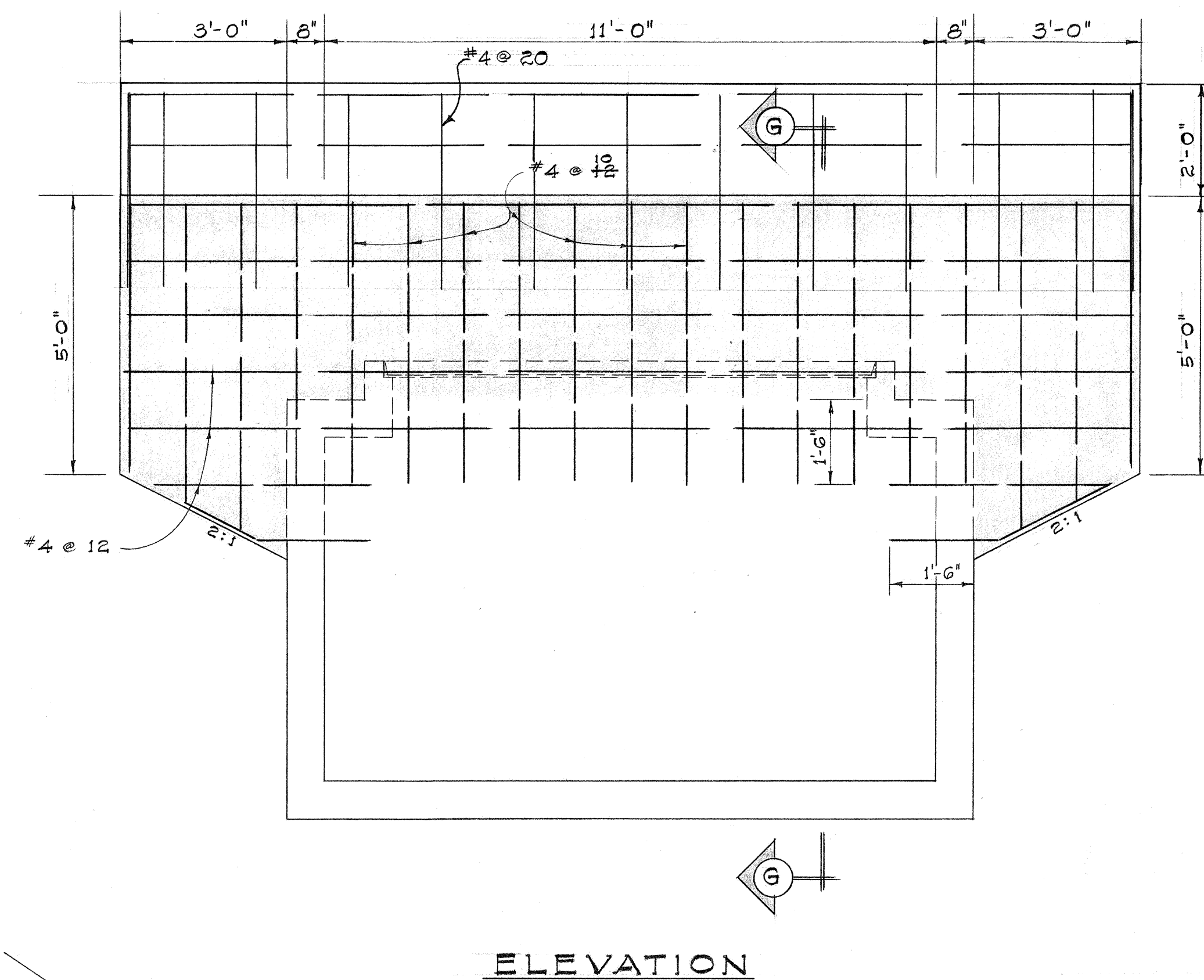
NOTE:
EXACT LOCATION OF SUMP
SHALL BE DETERMINED
IN THE FIELD.

SHEET No. 17 OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-41-1(17) UNIT 1	1965	51	146



DETAIL OF TELEPHONE PULL BOX NO. 435 T-A
Scale: 1/2" = 1'-0"



SECTION "G-G"
HE HANDHOLE #18849 SPECIAL
Scale: 1/2" = 1'-0"

NOTE:
Details not noted or shown here shall be the same as required for HE Handhole #18849. See Sht. 50 for details.

APPROVED:	
PRINCPL ELECTRICAL ENG'R., H.E. CO., INC.	DATE
<i>Thaneal Koon</i>	10/13/64
PRINCPL DISTRIBUTION ENG'R., H.E. CO., INC.	DATE
<i>R. Maw for F.H. Judd</i>	10/14/64
OUTSIDE PLANT ENGINEER, H.T. CO. LTD.	DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
UTILITY DETAILS ELECTRIC & TELEPHONE
INTERSTATE ROUTE H-1 F.A.I. Proj. No. I-H-1(17) UNIT 1
Scale: As Shown Date: Oct. 1964
SHEET No. 18 OF 18 SHEETS

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
No.	