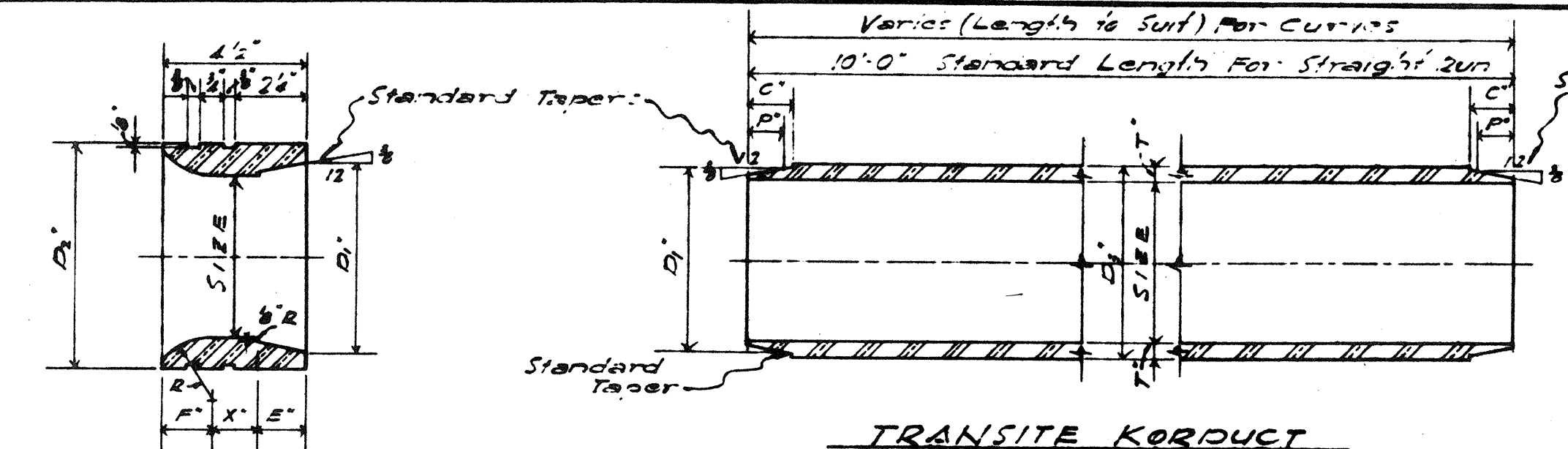
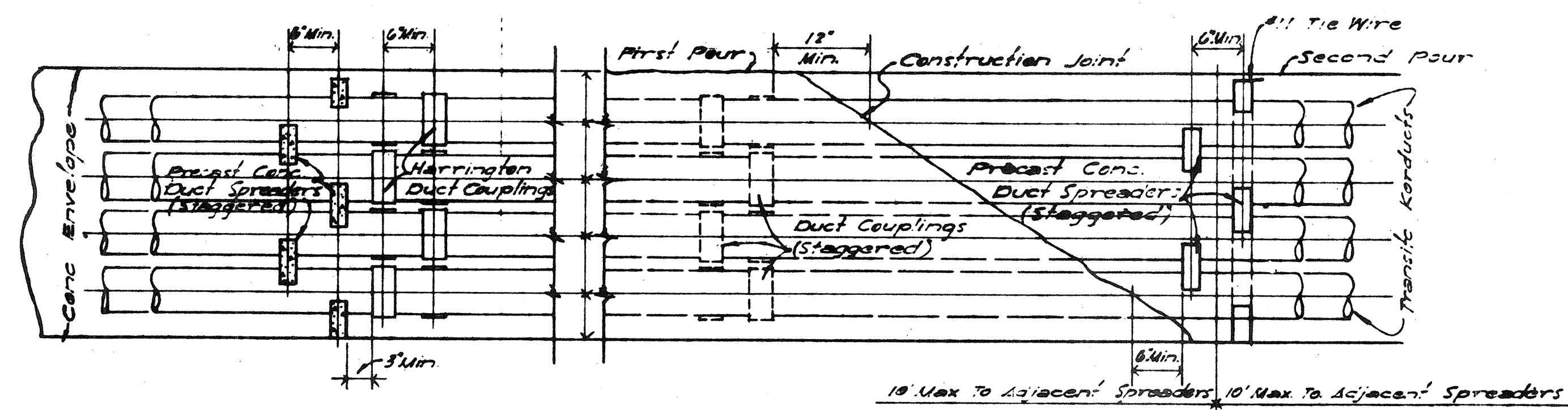


FED. ROAD DIST. NO.	STATE	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
UNIT 3	HAW.	1950	34	79
UNIT 4	HAW.	1950	53	115
UNIT 5	HAW.	1950	55	115



HARRINGTON COUPLINGS
3'-1'-0"

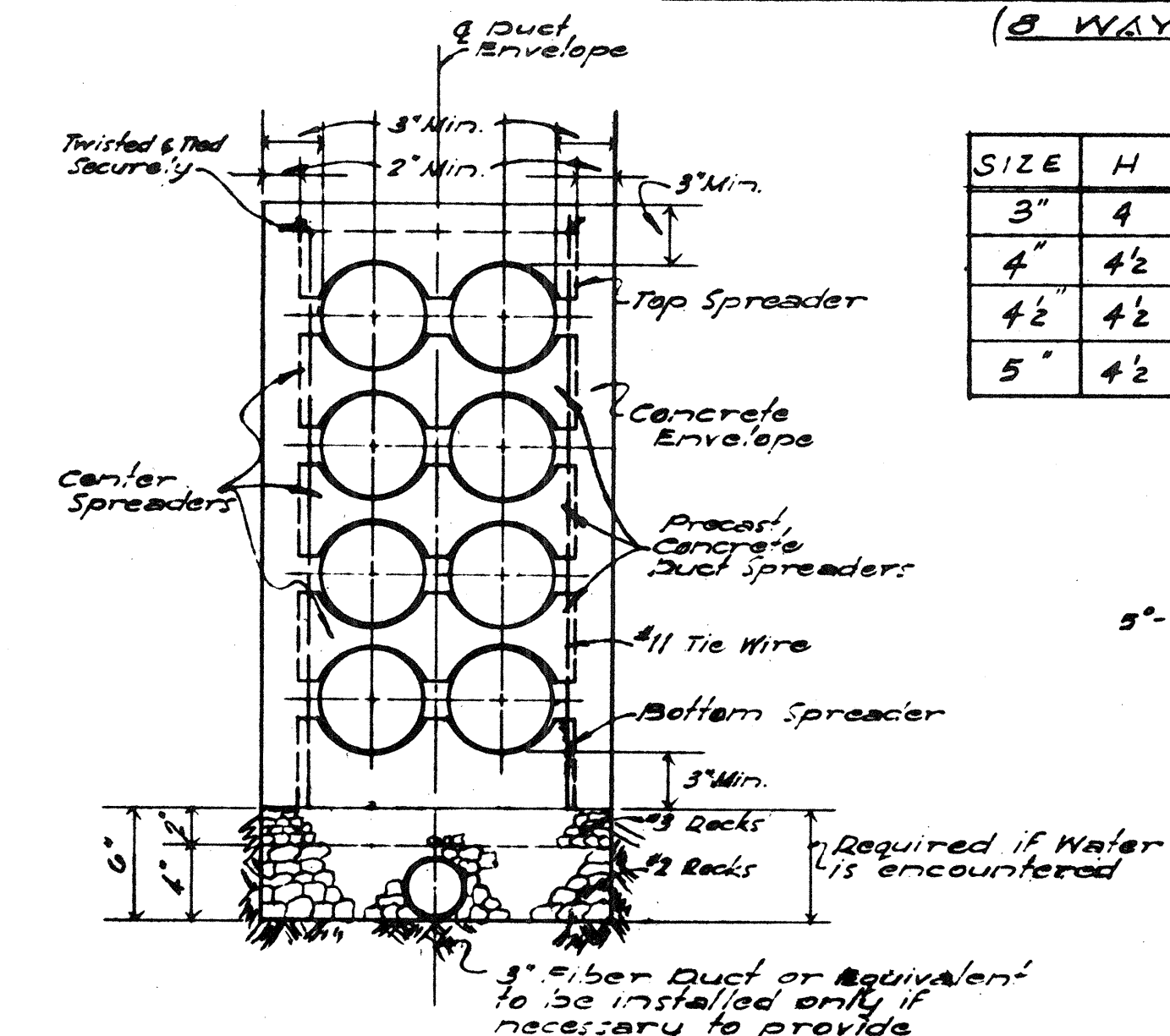
SIZE	D ₁	D ₂	L
3"	3 3/8	4 1/8	2 1/4
4"	4 1/8	5 1/8	2 1/4
4 1/2"	4 1/8	5 5/8	2 1/4
5"	5 1/8	6 1/8	2 1/4

JUNIOR END BELLS
3'-1'-0"

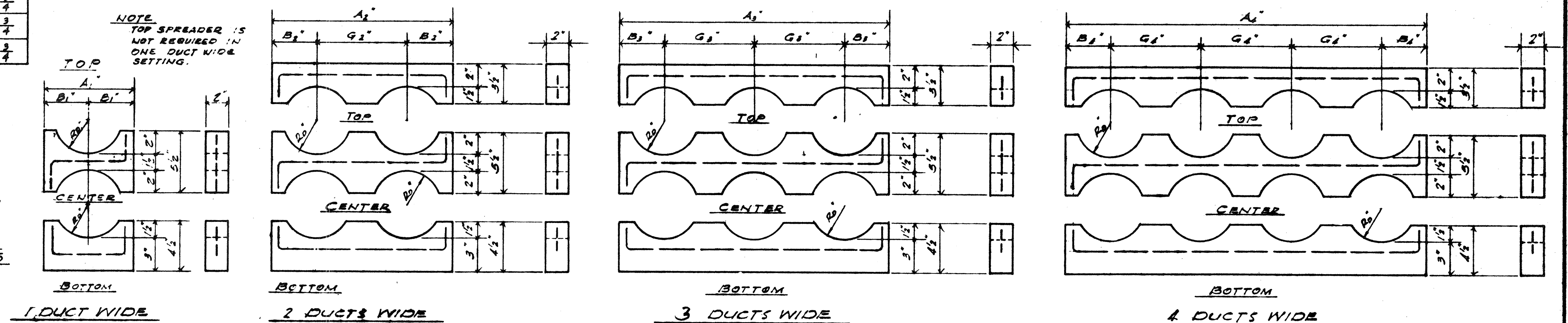
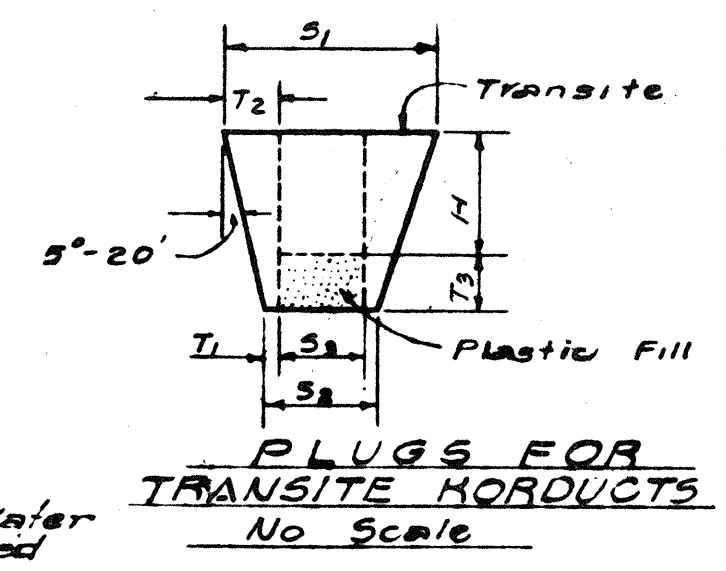
SIZE	D ₁	D ₂	F	X	E	R
3"	3 3/8	4 1/8	1 1/8	1 1/8	1 1/8	1 1/8
4"	4 1/8	5 1/8	1 1/8	1 1/8	1 1/8	2
4 1/2"	4 1/8	6 1/8	1 1/8	1 1/8	1 1/8	2
5"	5 1/8	7	1 1/8	1 1/8	1 1/8	2

STANDARD TAPERS
3'-1'-0"

SIZE	D ₁	D ₂	C	P	T
3"	3 3/8	3 3/8	1 1/8	1 1/8	1 1/8
4"	4 1/8	4 1/8	1 1/8	1	1 1/8
4 1/2"	4 1/8	5 1/8	1 1/8	1	1 1/8
5"	5 1/8	5 1/8	1 1/8	1 1/8	1 1/8

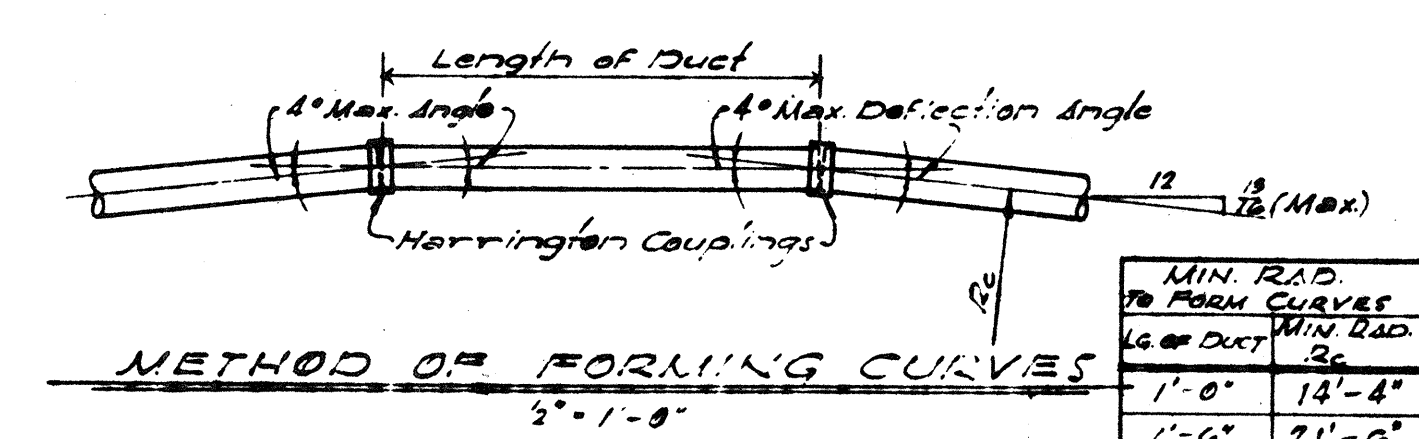
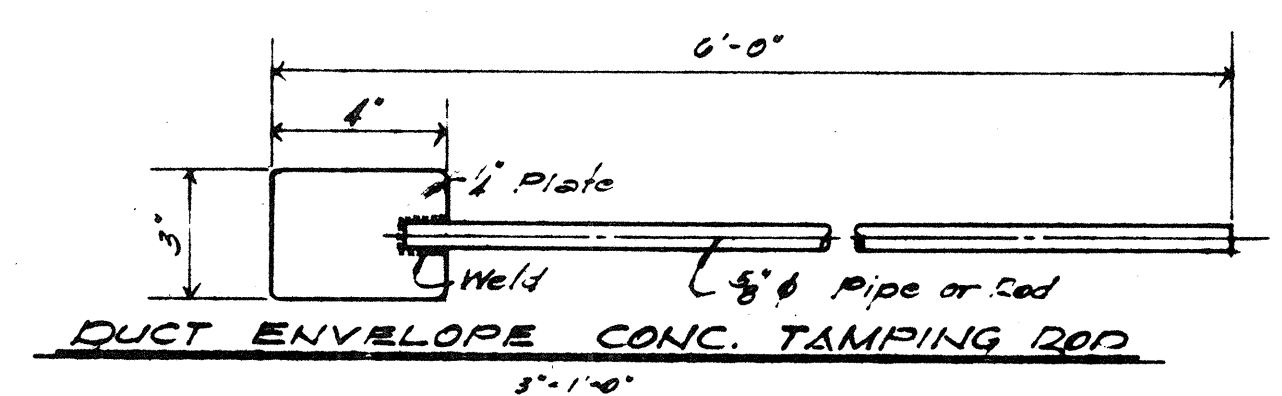


SIZE	H	S ₁	S ₂	S ₃	T ₁	T ₂	T ₃
3"	4	3 3/8	2 3/8	2	5/16	11/16	3/4
4"	4 1/2	4 1/8	3 3/8	2 3/4	1/2	21/32	3/4
4 1/2"	4 1/2	4 1/8	4 1/8	3	21/32	31/32	3/4
5"	4 1/2	5 1/8	4 1/8	3 1/2	11/16	31/32	3/4



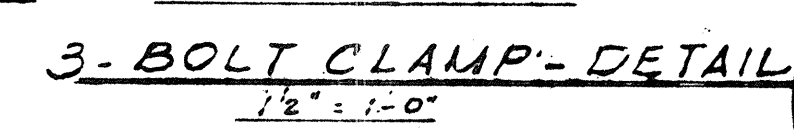
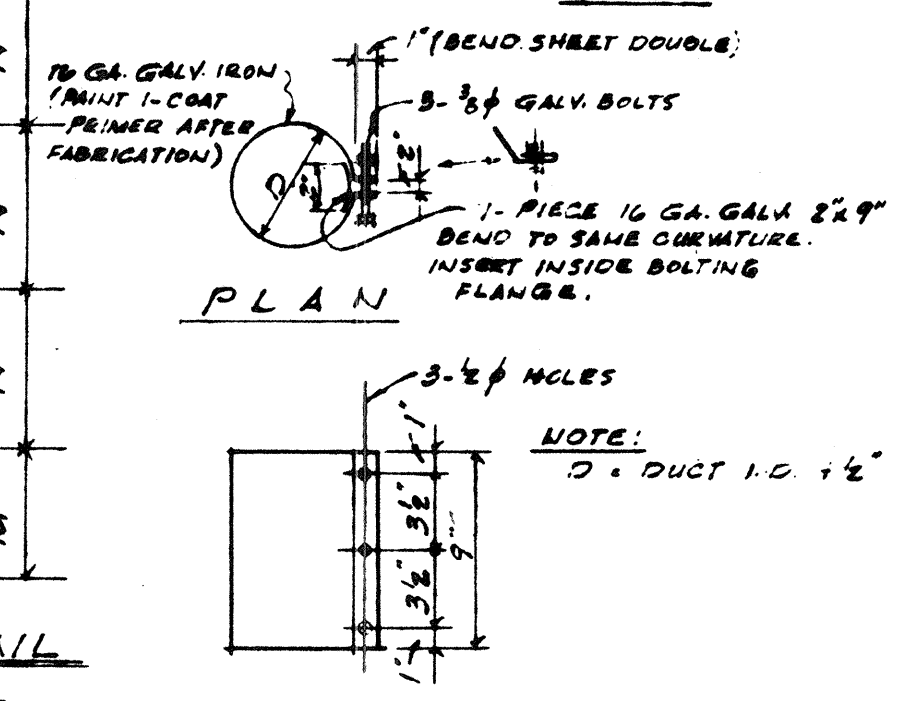
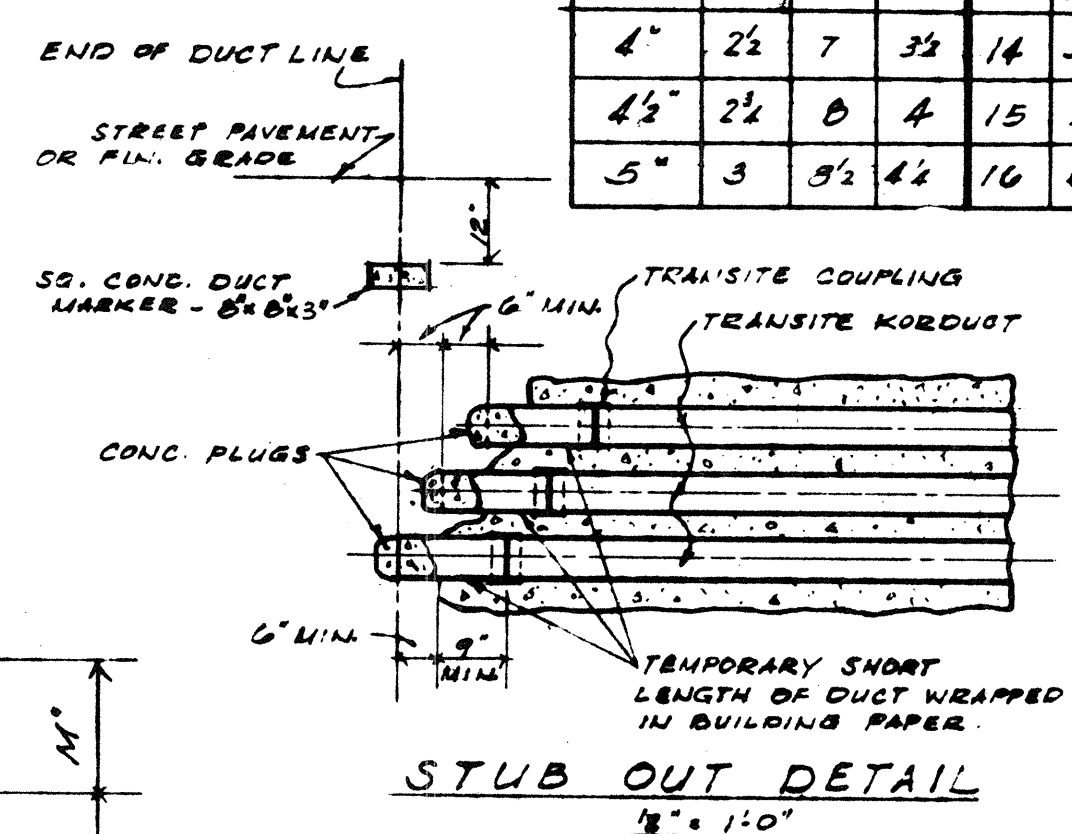
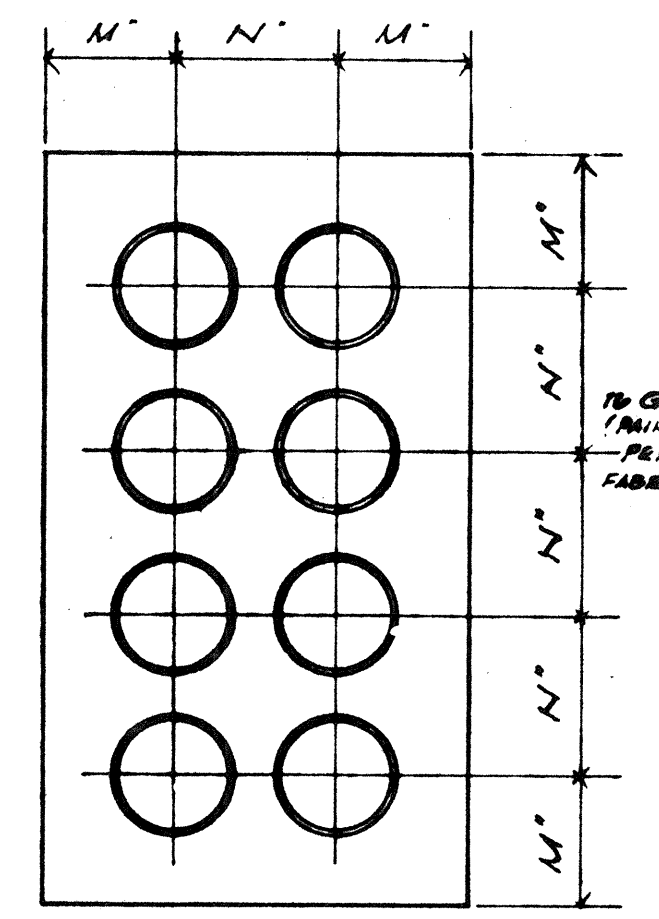
SIZE	R ₀	A ₁	B ₁	A ₂	B ₂	G ₂	A ₃	B ₃	G ₃	A ₄	B ₄	G ₄
3"	2	6	3	12	3 1/4	5 1/2	17 1/2	5 1/4	5 1/2	23	3 1/4	5 1/2
4"	2 1/2	7	3 1/2	14	3 3/4	6 1/2	20 1/4	3 3/8	6 1/2	27	3 3/4	6 1/2
4 1/2"	2 1/2	8	4	15	4	7	22	4	7	29	4	7
5"	3	9 1/2	4 1/2	16	4 1/4	7 1/2	23 1/2	4 1/4	7 1/2	31	4 1/4	7 1/2

NOTES: DUCT SPREADERS
Reinforcing
1-1/2" Bar each Spreader
Concrete Mix
One Part Cement
Two Parts Beach Sand
Two Parts Gravel #4 (Fine)
Measurements by Weight.



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

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



REDUCED PLANS
SCALES REDUCED
ACCORDINGLY

No	Date	Revision	By	Scale	As Shown	Date	3-2-52
1	5-2-50	ADDED 3" DUCT CENTER SPREADER	R	Drawn: Jp	Checked: L.H.W.		
2	1-9-57	REvised DEFLECTION INSLA 5' TO 8'	R.Y.	Approved: [Signature]			
				Final: [Signature]			

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
HAWAIIAN ELECTRIC CO.
STANDARD DETAILS
MOANALUA ROAD US-5-0720(3) UNIT 3
LUNALILO FREEWAY BU-072-1 (2) UNIT 4
MIDDLE STREET BU-065-1 (1) UNIT 3
Scale: As Noted Feb. 28, 1958

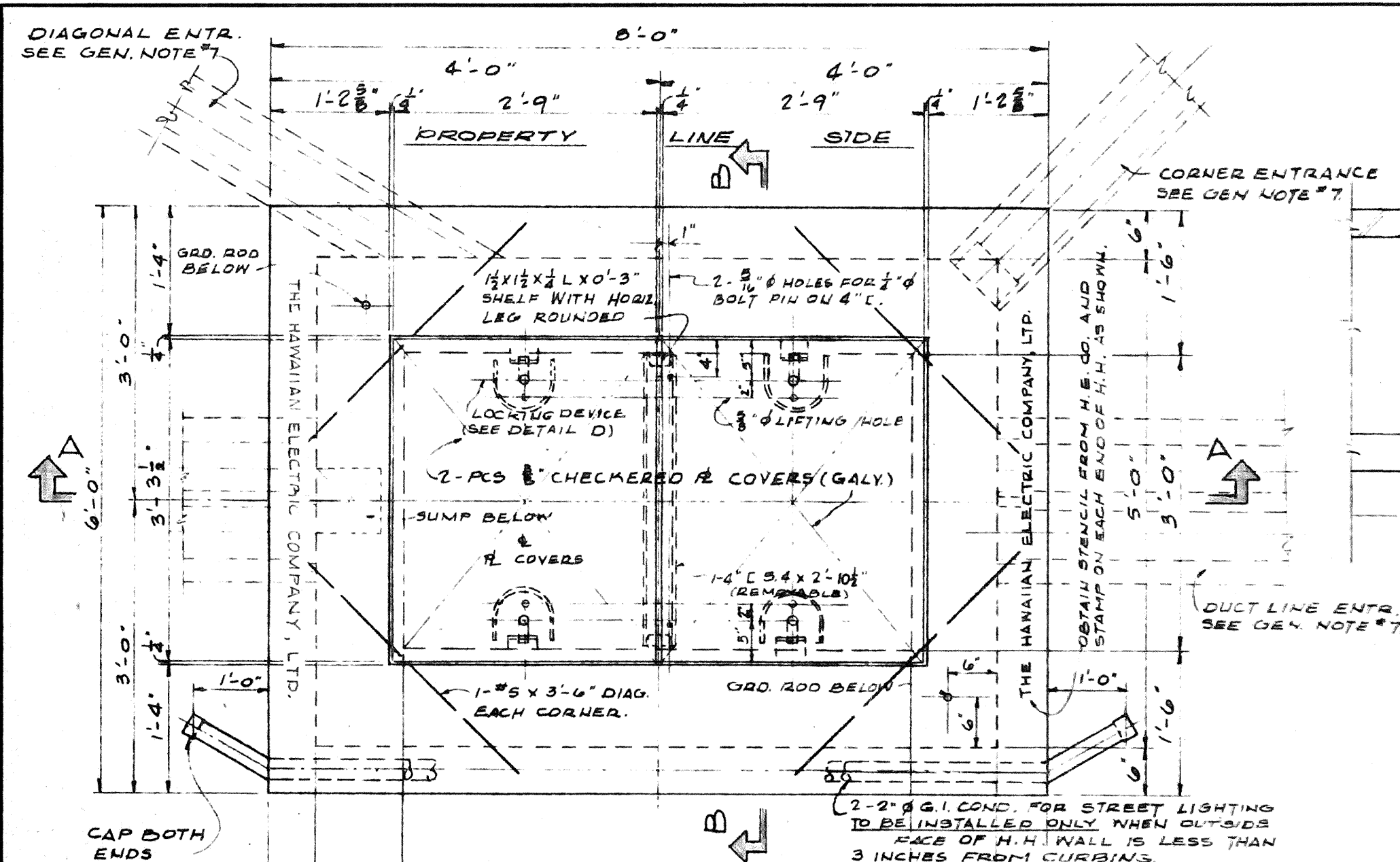
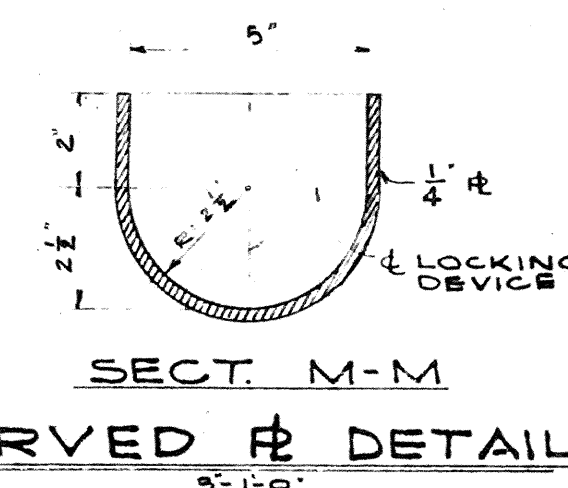
SHEET No. 7 OF 6 SHEETS
CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCTLINES
Engineering Department
The Hawaiian Electric Company, Ltd.
Honolulu, P.H.
U-18244

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BU-072-12 UNIT 4	1960	56A	118

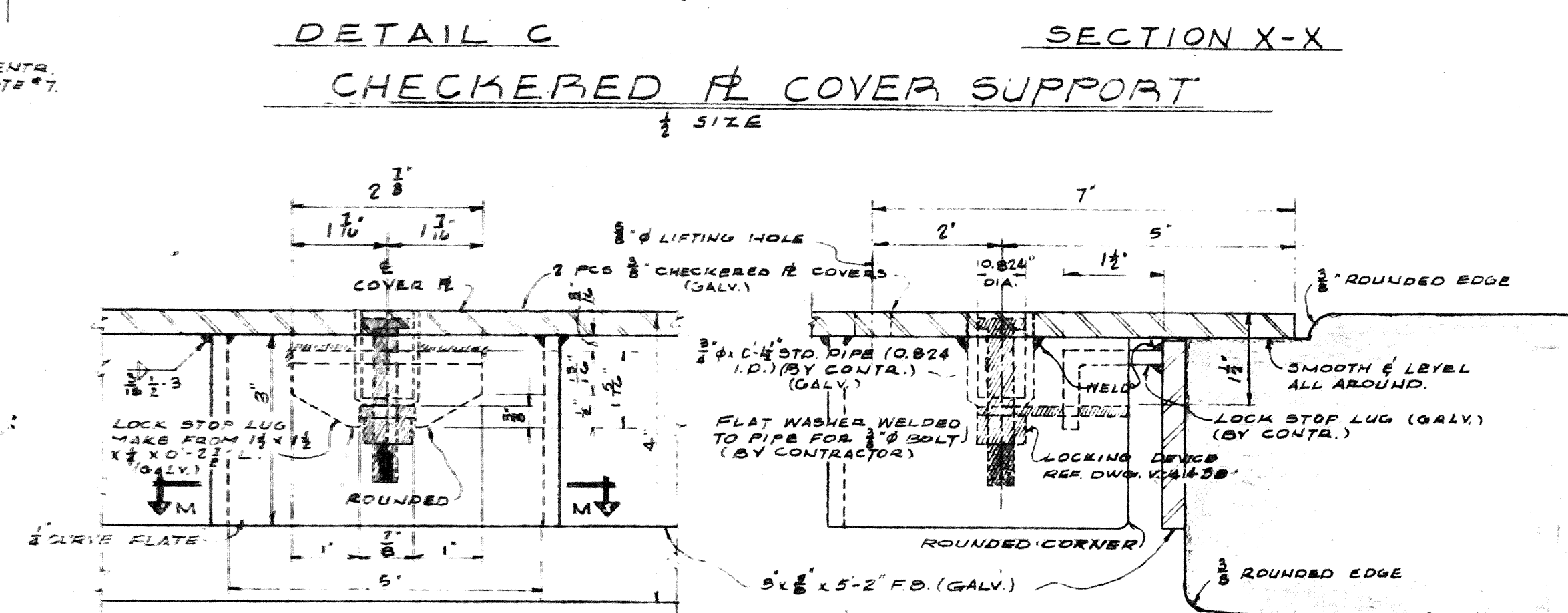
Jan. 16, 1966

GENERAL NOTES

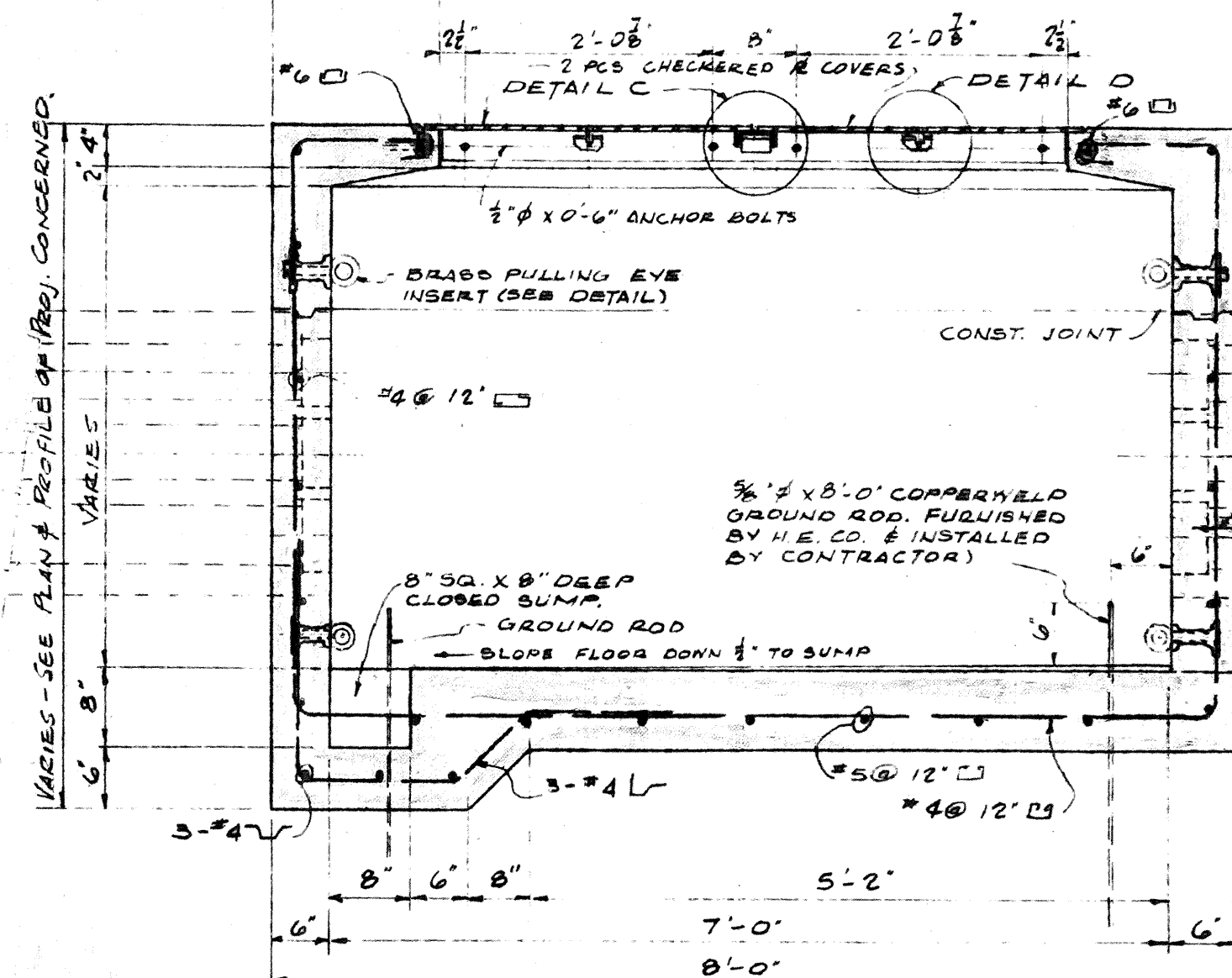
1. CONCRETE FINISH:
FLOORS - SMOOTH METAL TROWELLED.
EXPOSED WALL SURFACES & EDGES - SMOOTH AND FREE FROM DEFECTS.
2. CONCRETE TO DEVELOP COMPRESSIVE STRENGTH OF 3000 P.S.I. IN 28 DAYS.
3. FINISH STEEL WORK:
ALL ANGLE CLIPS, CHANNELS, FLAT BARS AND CHECKERED PLATE COVERS
SHALL BE "HOT DIP GALVANIZED AFTER FABRICATION".
4. FOR DUCT LINE CONSTRUCTION STANDARDS, SEE H.E. CO. DWG. U-1B585,
SPECIFICATION SHEET U-1B585A.
5. DRAINAGE - SLOPE FLOOR DOWN $\frac{1}{8}$ " TO SUMP
6. FOR SLOPE OF TOP OF HANDHOLE, SEE DRAWINGS OF PROJECT CONCERNED.
7. SIZE AND LOCATION OF DUCTS, ON PLAN OF PROJECT CONCERNED.
8. PULLING IRON & PULLING EYE INSERTS:
FOR LOCATION AND NUMBER REQUIRED, SEE DUCT ENT. PLAN OF PROJECT CONCERNED
9. CONTRACTOR TO FURNISH ALL 2" Ø CONDUITS. CONDUITS SHALL BE
WALKER DUALCOTE SHERADIZED OR APPROVED EQUAL.
10. ALL MATERIALS SHALL BE NEW AND SHALL BE MANUFACTURED IN THE
UNITED STATES.



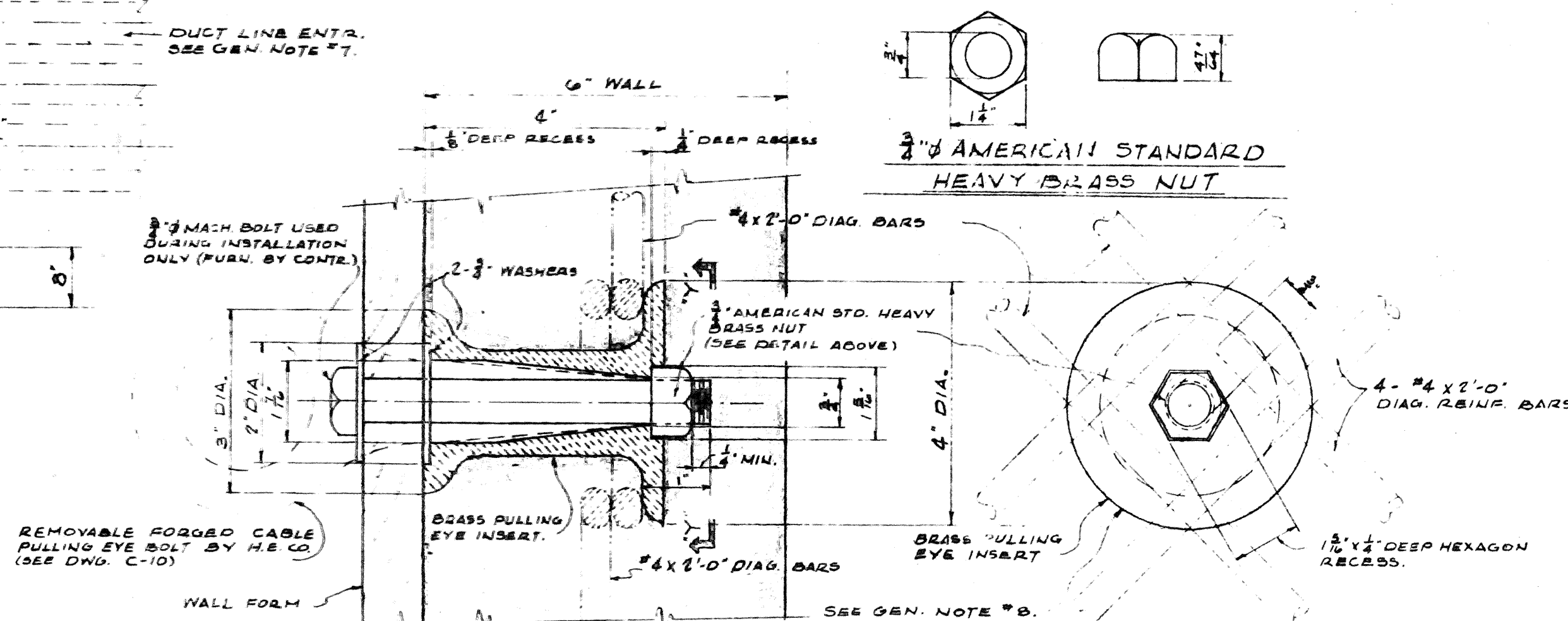
STREET SIDE
TOP PLAN



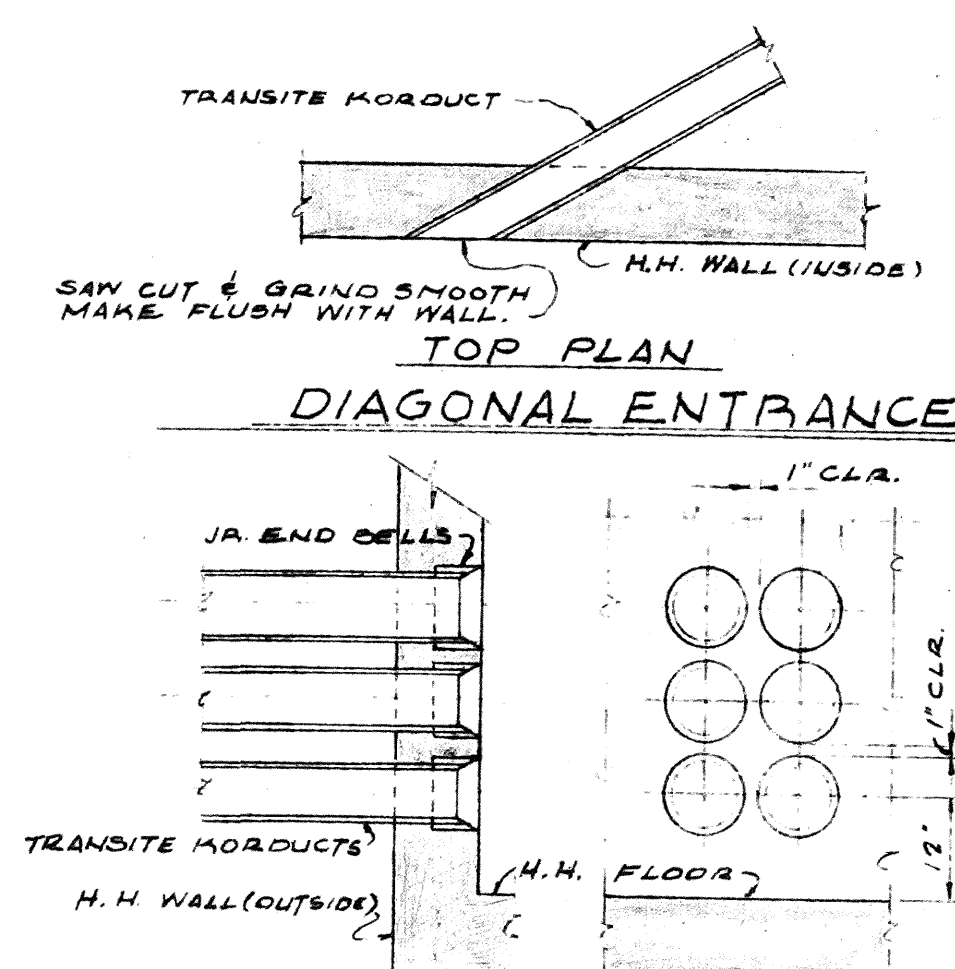
DETAIL D SIDE ELEV.
LOCKING DEVICE FOR CHECKERED & COVERS



SECTION A-A



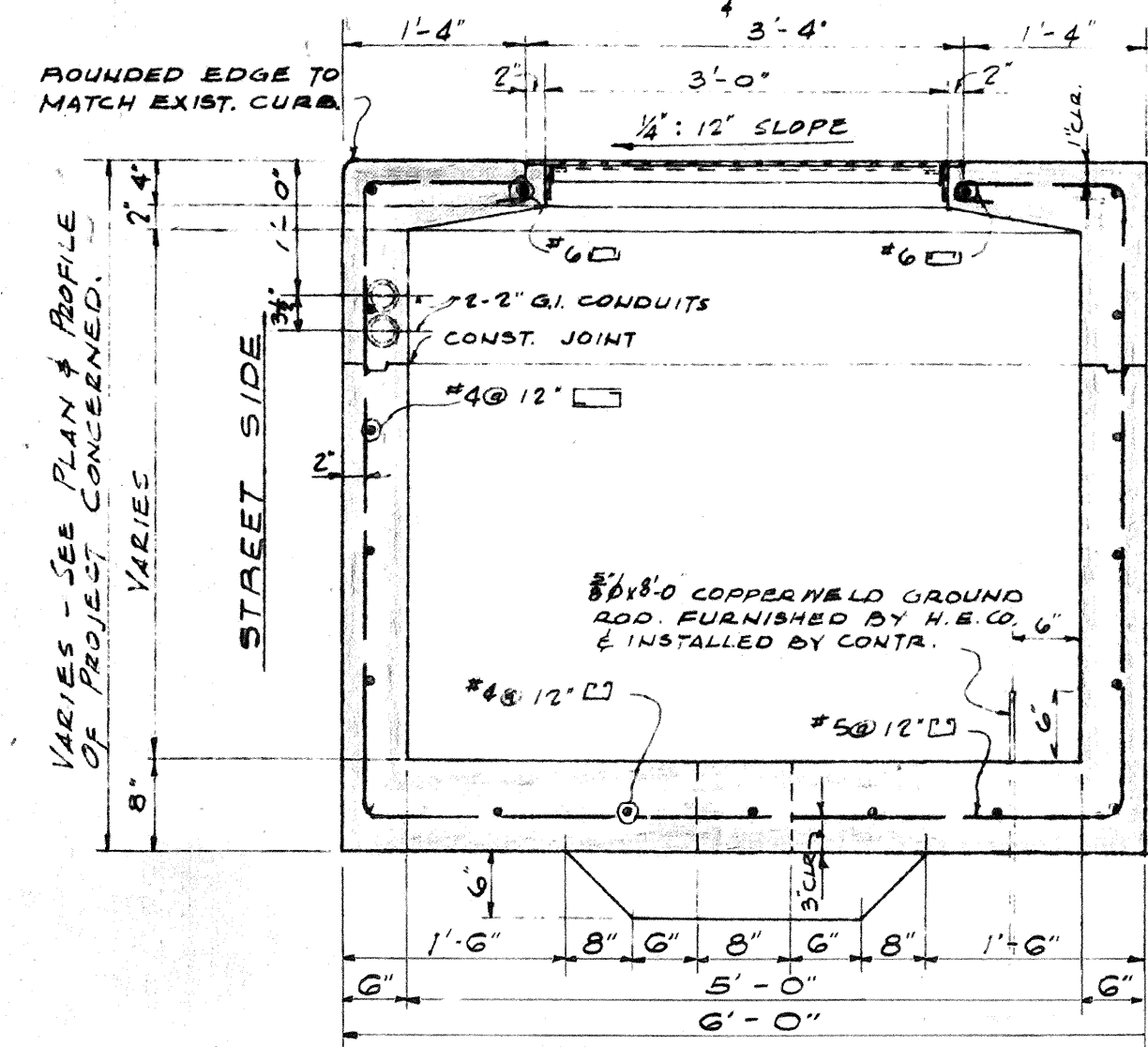
SECT. ELEY. SECT. Y-Y
BRASS PULLING EYE INSERT



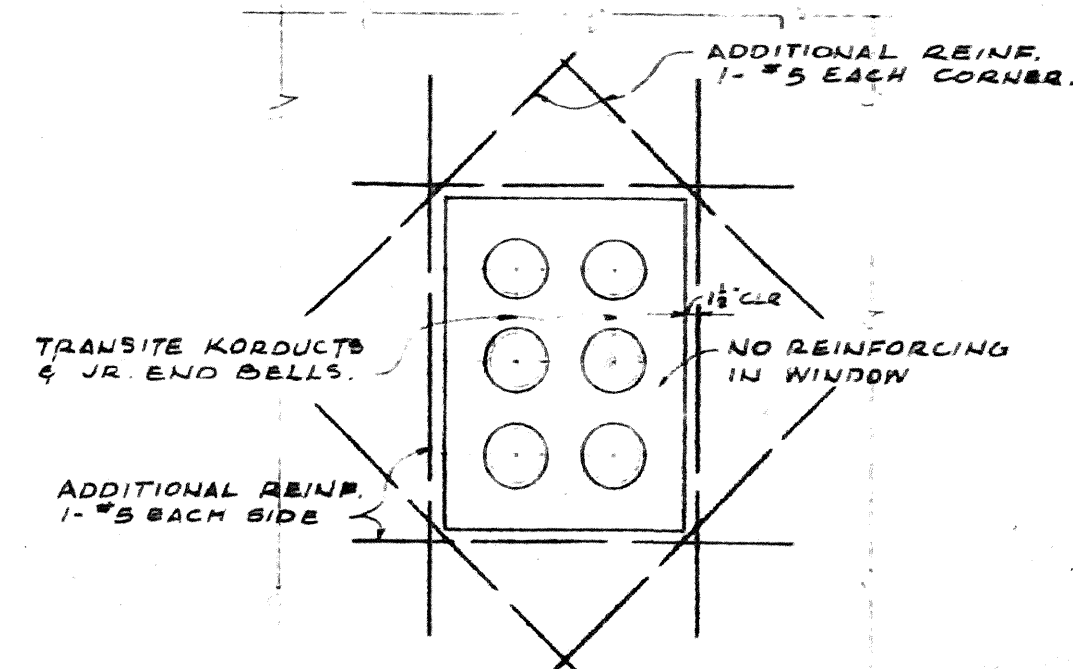
SIDE ELEV. FRONT ELEV.

DUCT ENTRANCE DETAILS

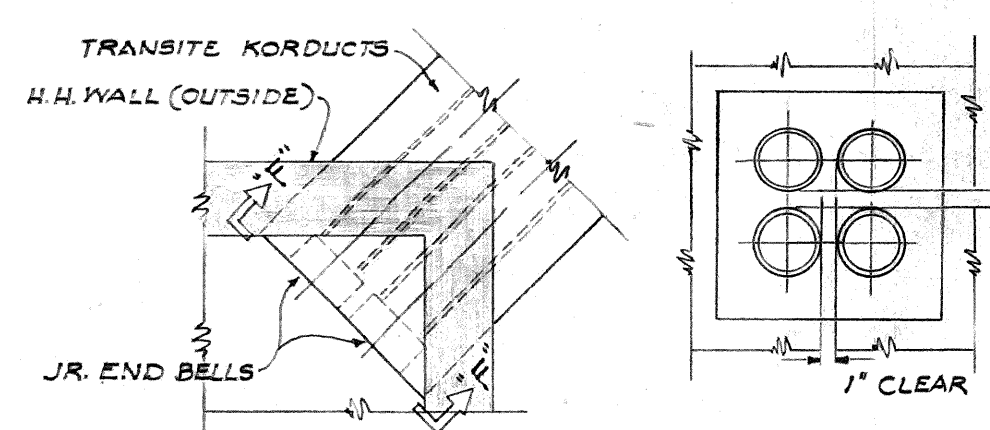
U. T. 3.



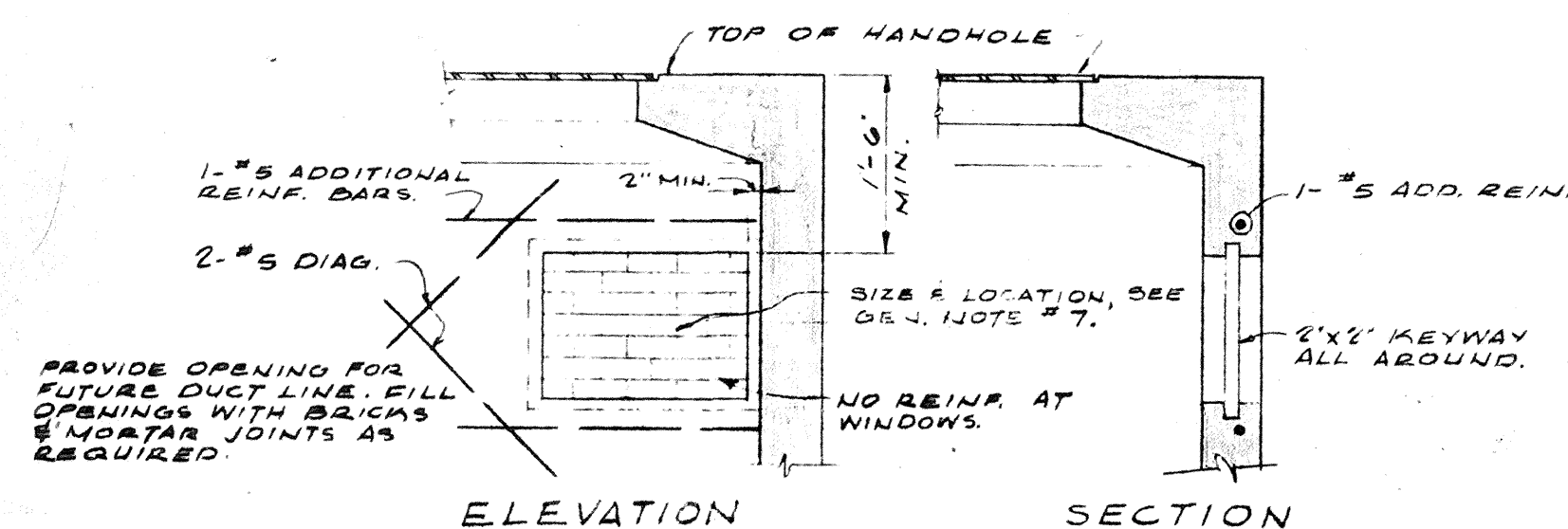
SECTION "B-B"
scale: $\frac{3}{4}" = 1'-0"$



ELEVATION
TYP. REINF.
AT DUCT WINDOW
3/4" = 1'-0"



PLAN SECTION "F"
CORNER ENTRANCE
N.T.S.



KNOCKOUT FOR FUTURE DUCT LINE

This sheet supersedes sht. 87

FOR USE IN AREAS NOT SUBJECT
TO VEHICULAR TRAFFIC

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII

1	7-29-60	CHANGED DWG. NO. FROM C-1413-70-18685	KJR	R.Y.Y.	
NO.	DATE	REVISIONS	BY	CHK'D	APP

HANDHOLE TYPE #4 (5'-0" x 7'-0")
UNDERGROUND STANDARDS

DESIGNED <i>IN 10/11/60</i>	DRAWN <i>JRK</i>	DATE <i>5-11-60</i>	SCALE <i>AS NOTED</i>
-----------------------------	------------------	---------------------	-----------------------

CHECKED	ELEC.	MECH.	NO. 1010	BY: K.H. Z.Y.Y.	ENGINEERING DEPARTMENT THE HAWAIIAN ELECTRIC CO., LTD. HONOLULU, HAWAII
APPROVAL	<i>L. Nakafuji</i>				

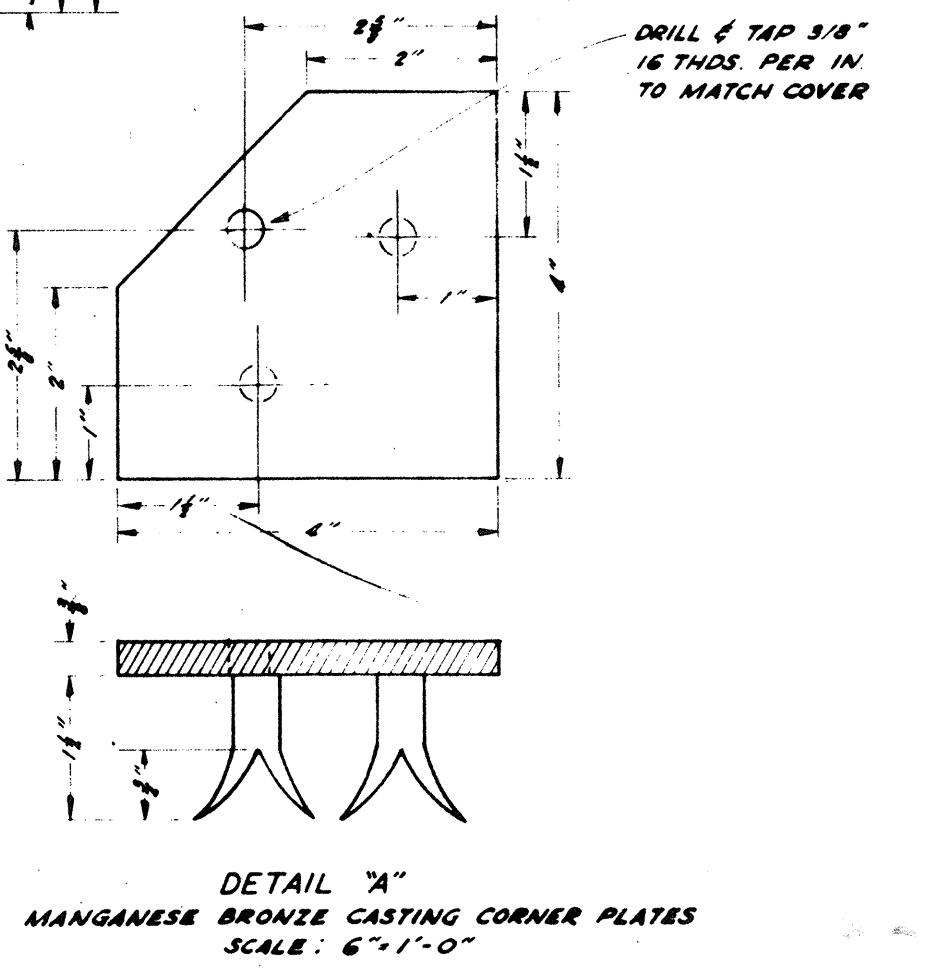
18685

87

\$174.564

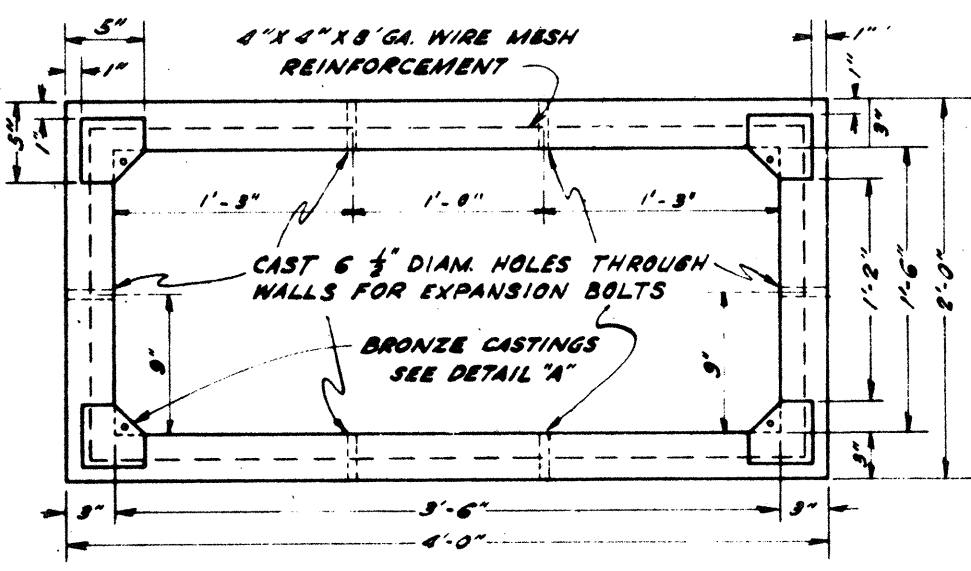
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	US-0720(3) UNIT 3	1960	55	79
		BU-065-1(1) UNIT 3	1960	54	115
		BU-072-1(1) UNIT 3	1960	57	118

NOTE:
CHECKERED PLATE COVER SHALL BE 1/4" THICK AT SIDEWALK AREAS AND 3/8" THICK AT DRIVEWAYS.

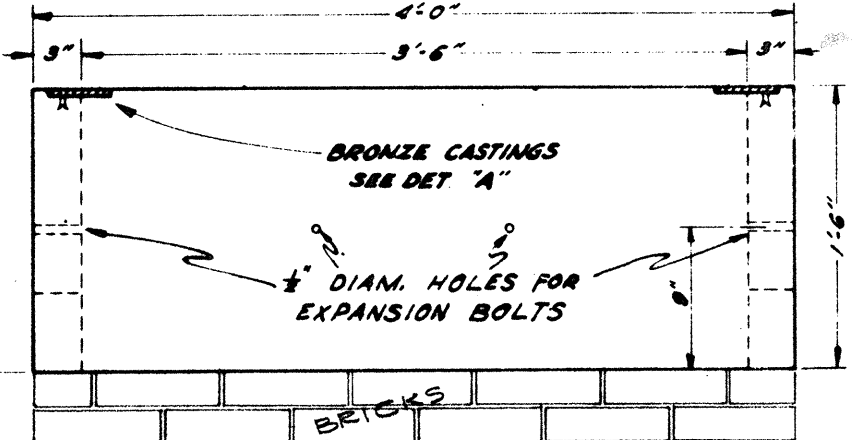
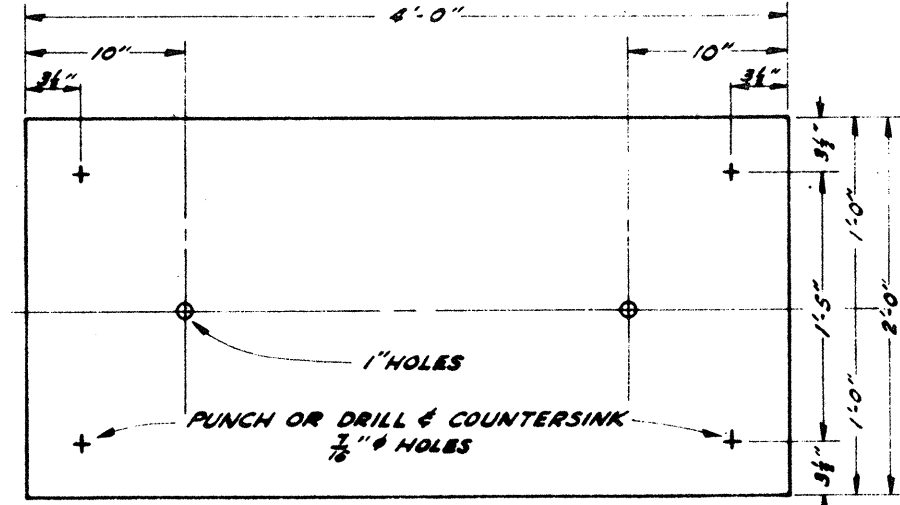


DETAIL "A"
MANGANESE BRONZE CASTING CORNER PLATES
SCALE: 6" = 1'-0"

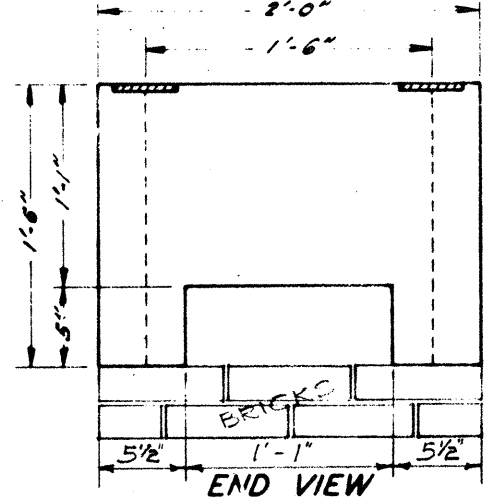
SCALE: 1" = 1'-0"



TOP VIEW



FRONT VIEW

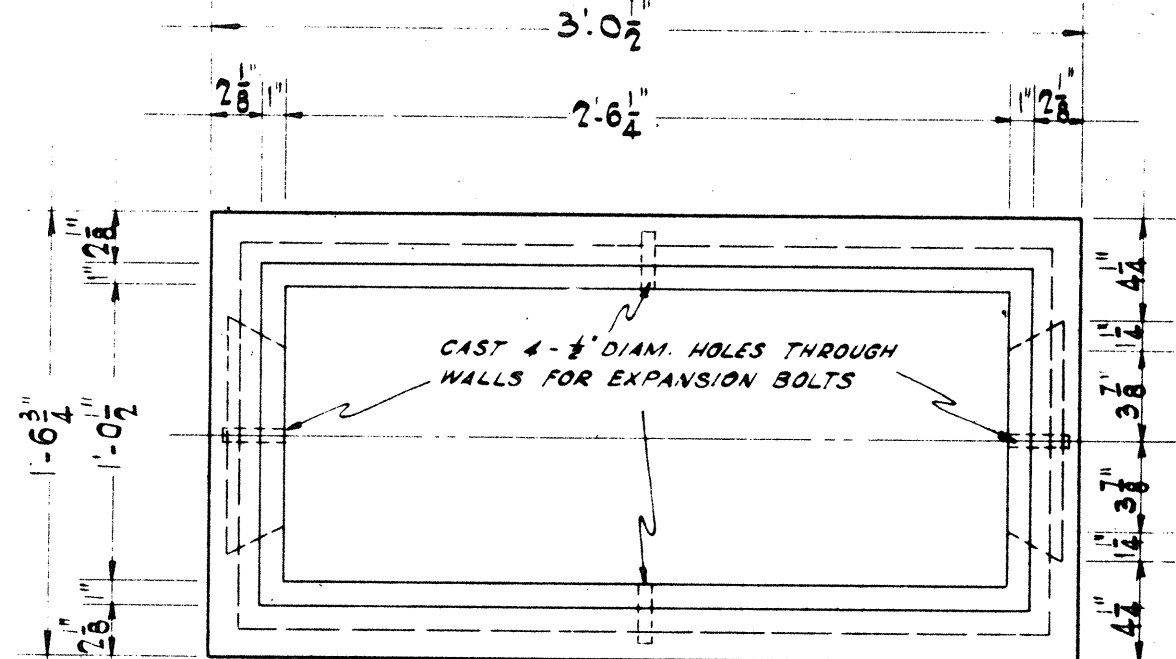


END VIEW

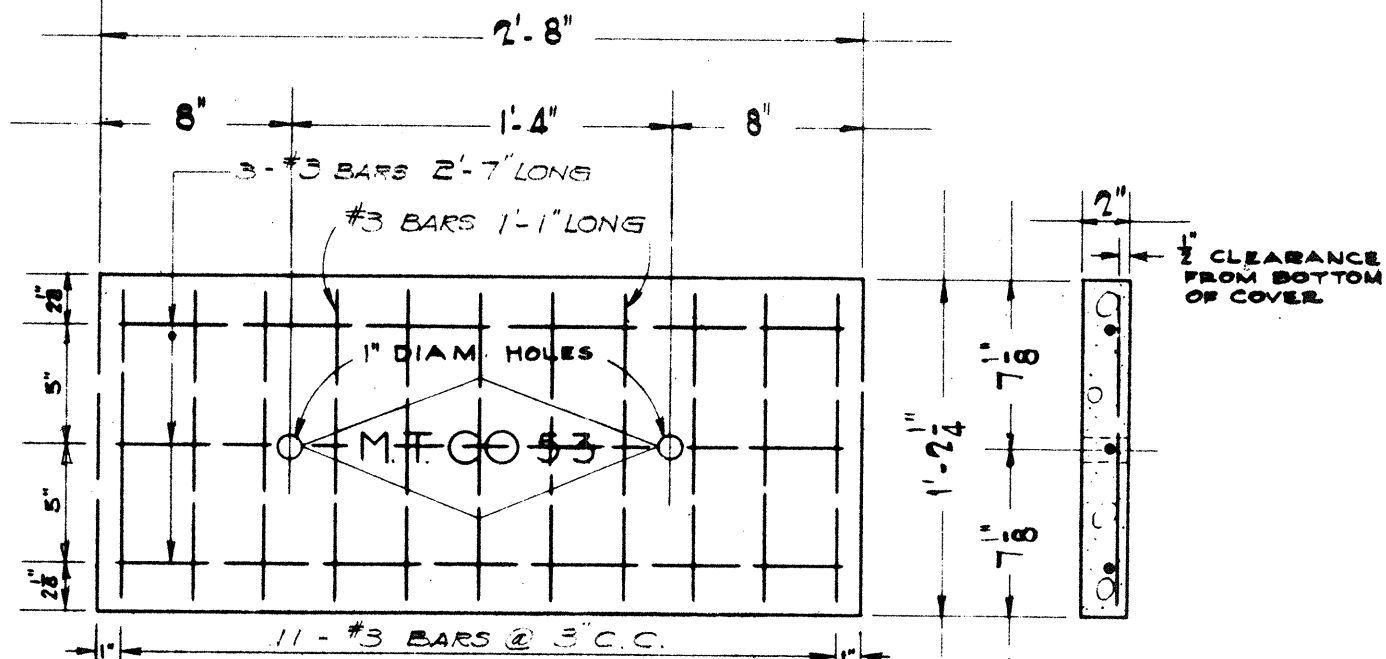
H.E. CO. PULLBOX No U1-103-L
H.T. CO. PULLBOX No 516

- NOTE:
1. THE PULL BOXES SHOWN ON THIS SHEET ARE TO BE USED BY BOTH THE HAWAIIAN TELEPHONE CO. AND THE HAWAIIAN ELECTRIC CO.
 2. PULL BOXES TO BE FURNISHED BY THE UTILITY COMPANIES.
 3. CONTRACTOR TO FURNISH BRICKS AND CONSTRUCT WALLS (INCIDENTAL TO ITEM OF "INSTALLING PRECAST CONCRETE PULL BOXES").
 4. BRICKS TO BE PLACED UNDER BOX TO BRING TOP OF BOX TO GRADE.

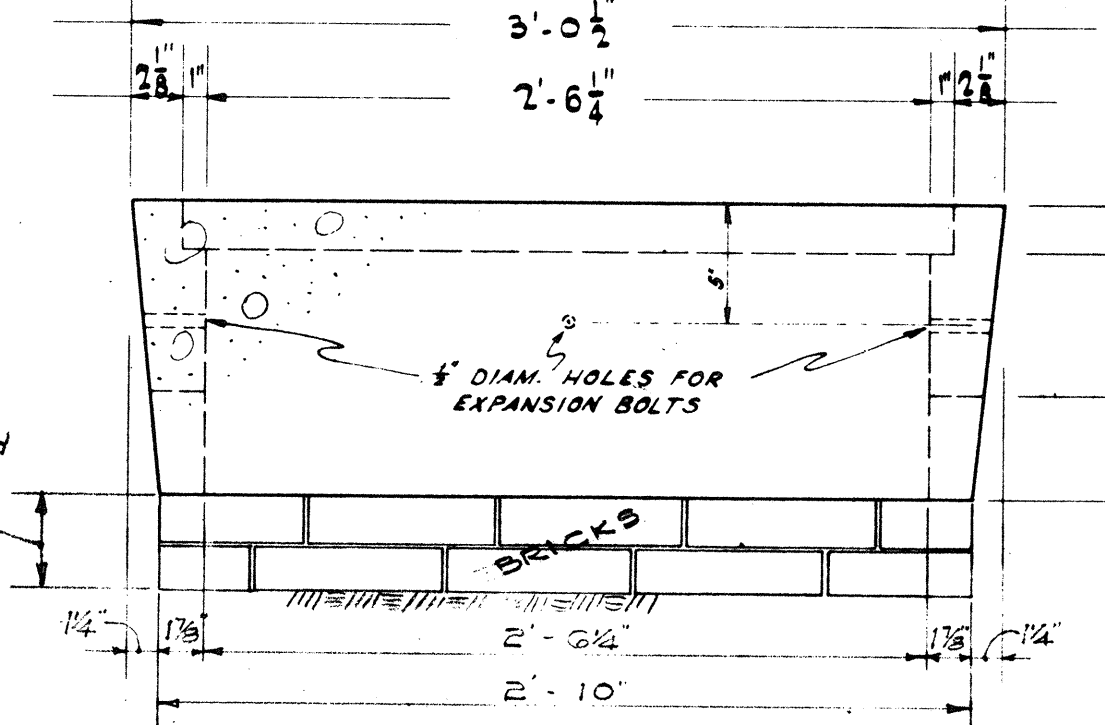
NOTE
REINFORCING BARS TO BE OF INTERMEDIATE GRADE & FREE OF SCALE AND OIL



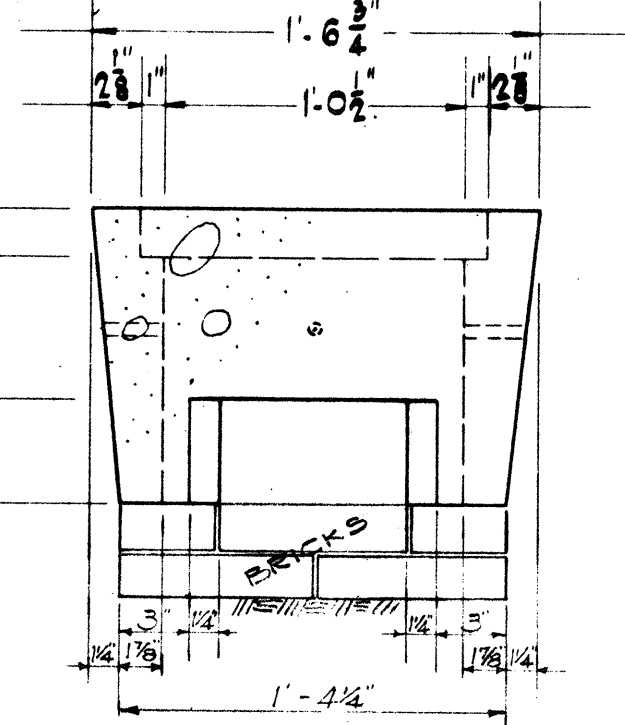
PLAN
SCALE 3/8" = 1"



PLAN OF COVER
SCALE 3/8" = 1"

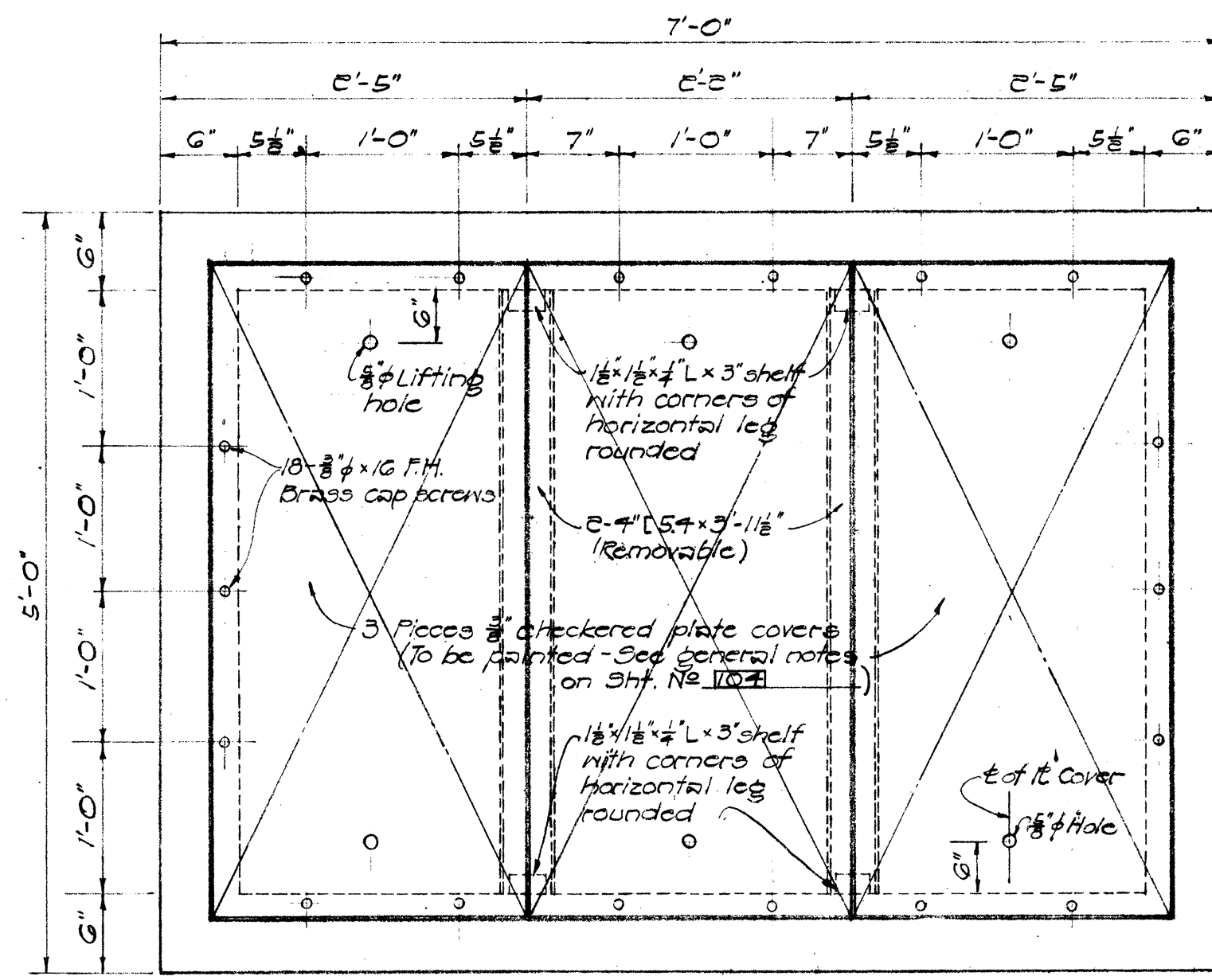


SIDE ELEVATION
SCALE 3/8" = 1"

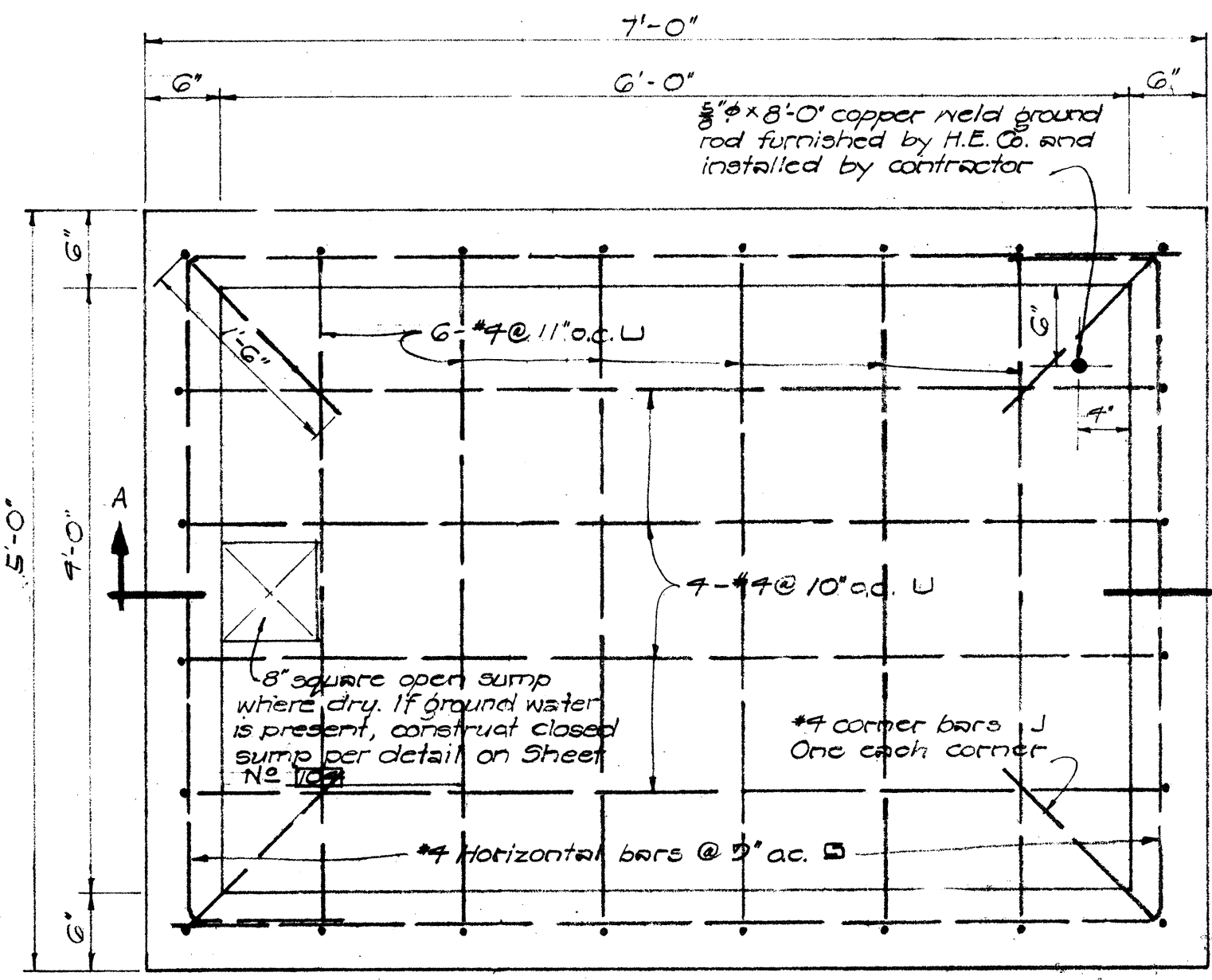


END ELEVATION
SCALE 3/8" = 1"

H.E. CO. PULLBOX No U1-103-S
H.T. CO. PULLBOX No 515



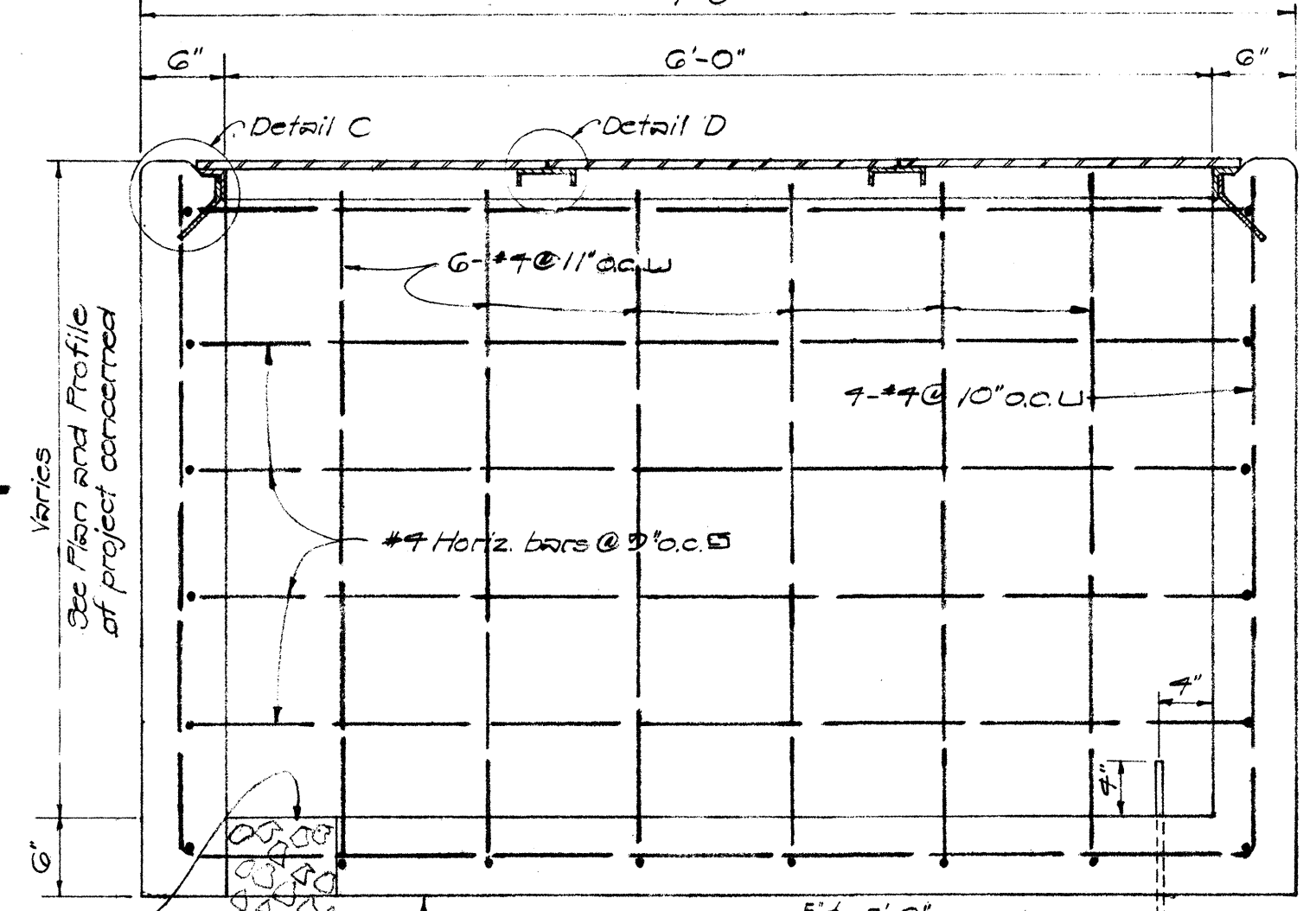
PLAN



SECTIONAL PLAN

H. E. CO. HANDHOLE TYPE #3
(7'-0" x 6'-0" INSIDE)
Scale: 1" = 1'-0"

NOTE: For Detail C & Detail D see Sht. No. 107



SECTION A-A

APPROVED:
HAWAIIAN ELECTRIC CO., LTD. 1/13/59
HAWAIIAN TELEPHONE CO., LTD. 1/13/59
1-13-59
PLANT ENG'G. SUPV., H. T. CO., LTD. DATE

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
DETAIL OF HAWAIIAN ELECTRIC CO.
HANDHOLE, & HAWAIIAN ELECTRIC CO.
& HAWAIIAN TELEPHONE CO. PULLBOXES.
MOANALUA ROAD US-0720(3) UNIT 3
LUNALILO FREEWAY BU-072-1(2) UNIT 4
MIDDLE STREET BU-065-1(1) UNIT 3
SCALE: AS SHOWN SEPT. 1957

SHEET No. 3 OF 6 SHEETS

\$526.35

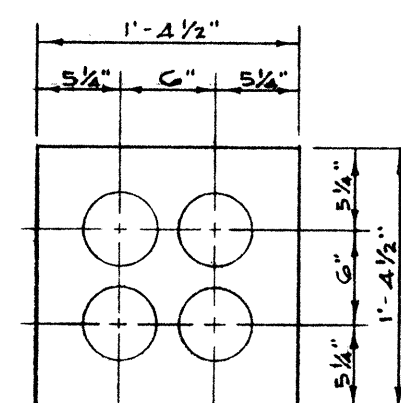
\$174.57

\$161.54

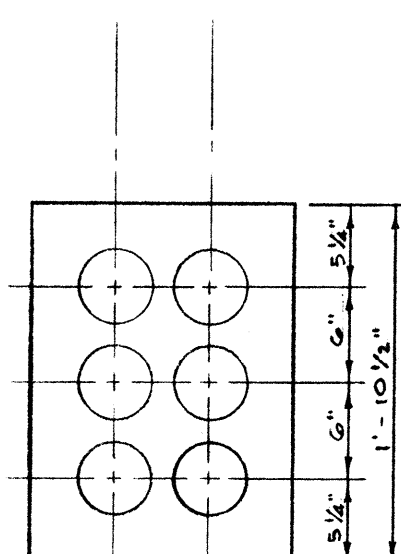
88

SURVEY PLOTTED BY	DATE
DESIGNED BY	
DRAWN BY	
CHECKED BY	
NOTE BOOK	
QUANTITIES CHECKED BY	
NO.	

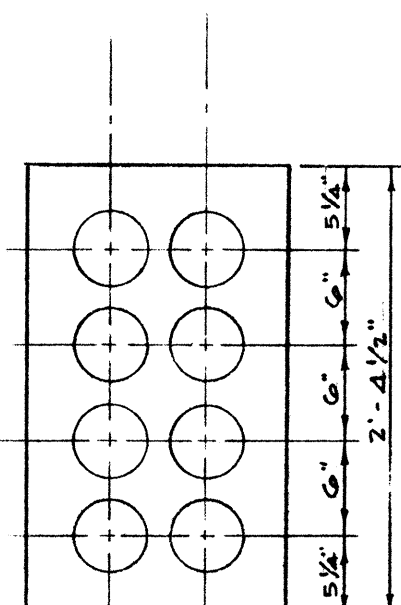
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	US-5-0720(3) Unit 3	1960	35B	79
		BU-0724(2) Unit 4	1960	57A	115
		BU-0651(1) Unit 3	1960	55B	118



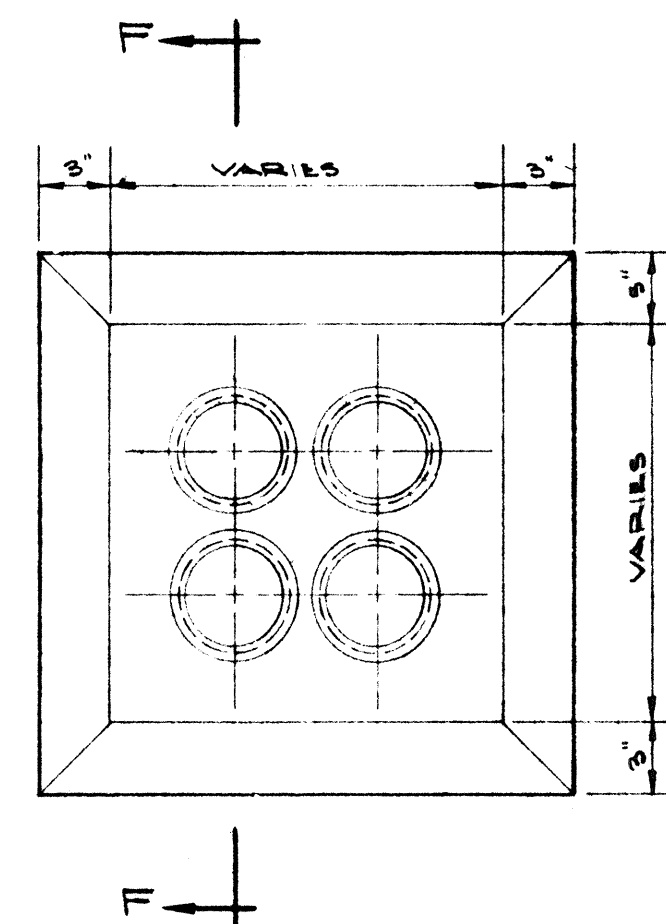
2 WIDE X 2 HIGH
4 DUCTS



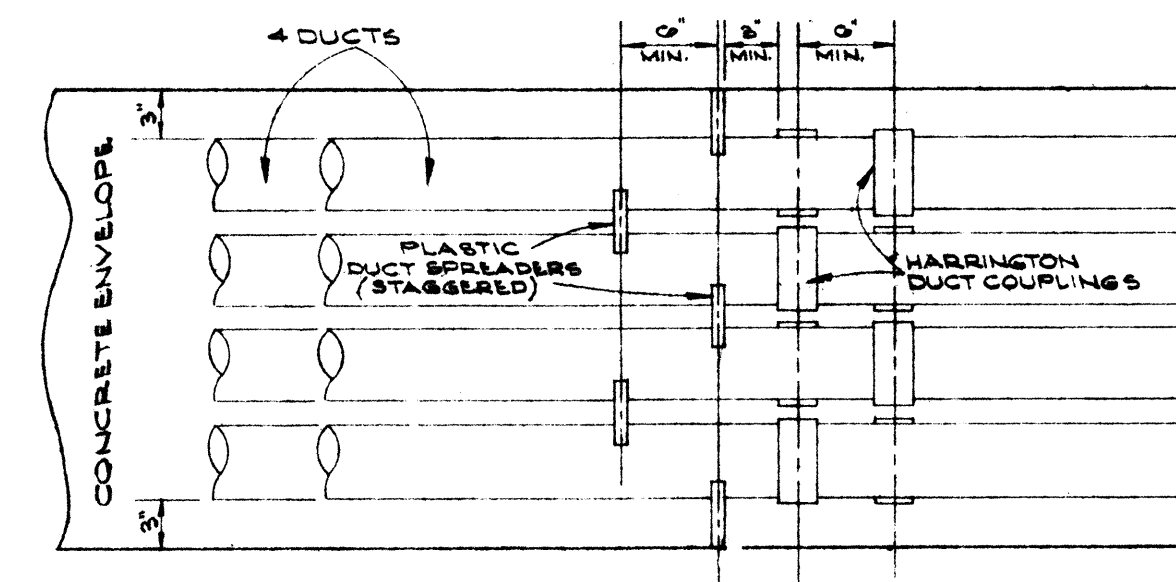
2 HIGH X 3 WIDE
6 DUCTS



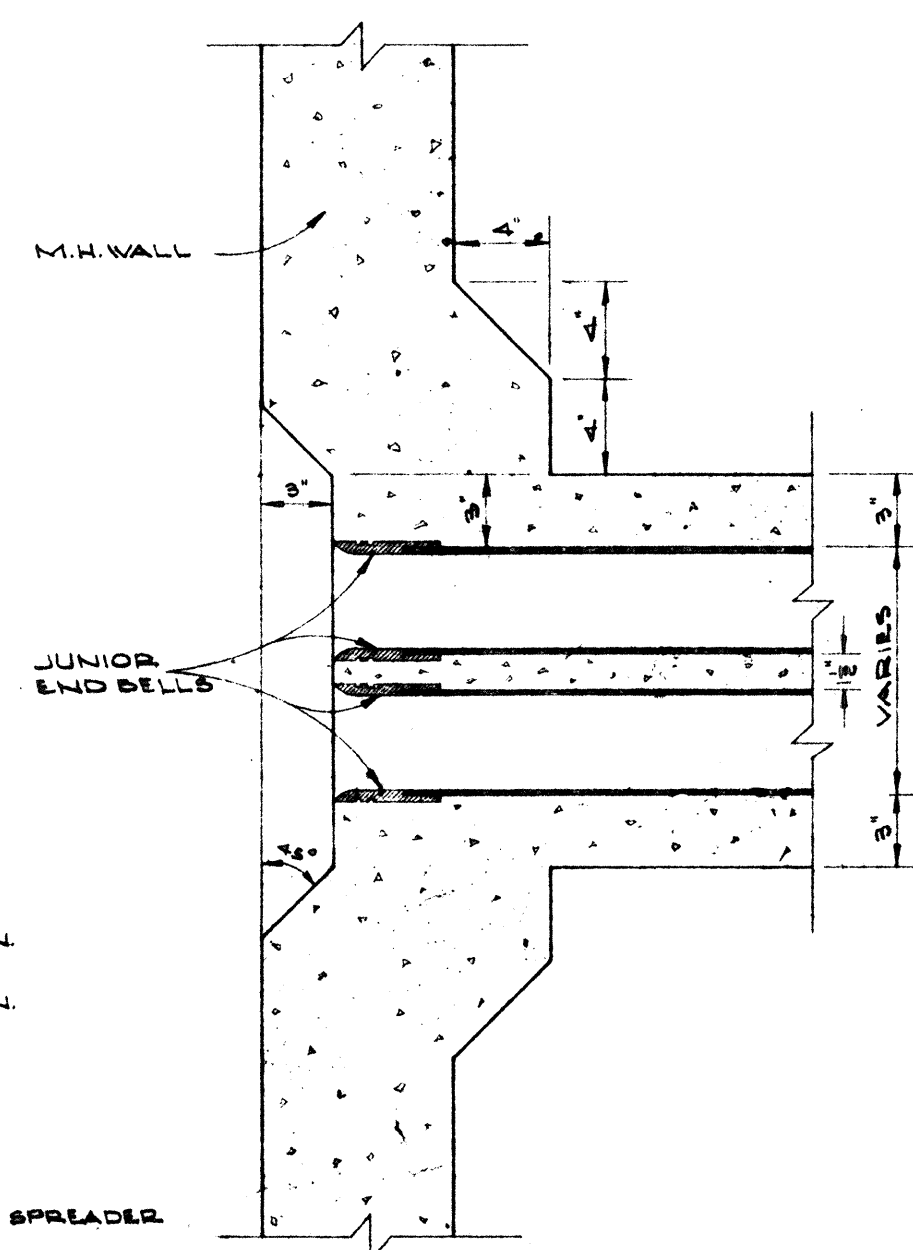
2 HIGH X 4 WIDE
8 DUCTS



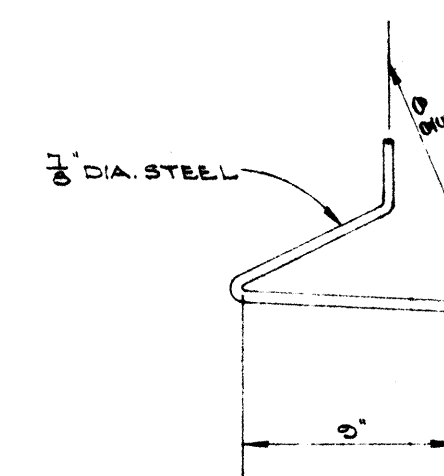
TYPICAL MANHOLE
DUCT WINDOW
SCALE 1/2" = 1'-0"



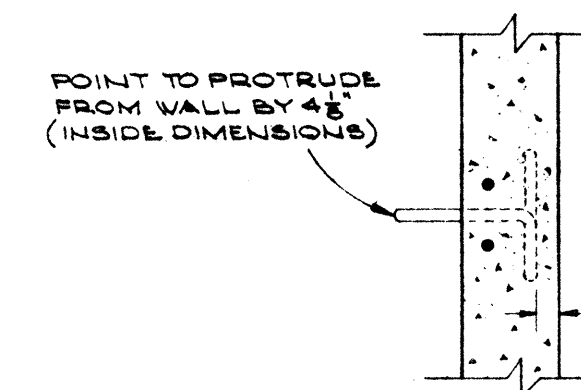
TYPICAL DUCT ENVELOPE ELEVATION
ARRANGEMENT OF COUPLING & PLASTIC SPACERS
SCALE 1" = 1'-0"



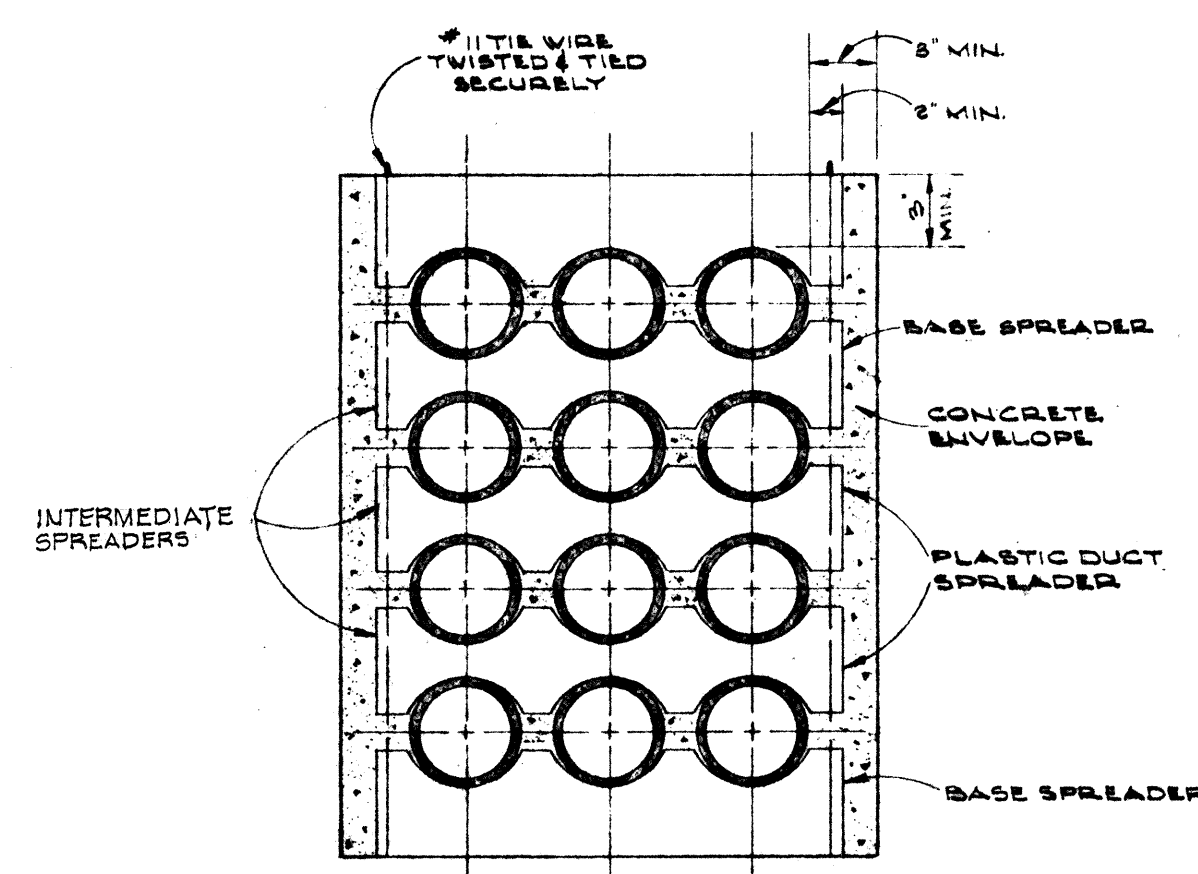
SECTION F-F
TYPICAL STUB OUT DETAIL
& JUNIOR END BELL
SCALE 1/2" = 1'-0"



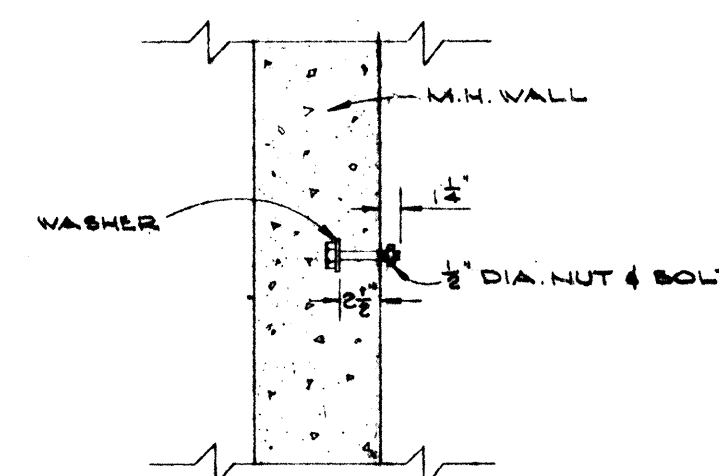
PULLING-IN IRON



SECTIONAL VIEW
OF PULLING-IN IRON
SCALE 1/2" = 1'-0"



SECTION SHOWING SPACERS



CABLE RACK STUD
BOLT DETAIL
SCALE 1/2" = 1'-0"

STANDARD DUCT FORMATIONS

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
Moanalua Road
Lunailo Freeway
Middle Street

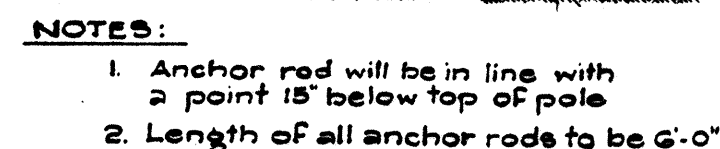
US-5-0720(3) Unit 3
BU-0724(2) Unit 4
BU-0651(1) Unit 3

FILE	DR. E. S.	ENG. J. TAKAHASHI
DESIGN	CHK. T. S.	APP. J. S.
CONSTRUCTION	INDEX	APP. J. S.
MAINTENANCE		
ACC'TG.		
ENG'R.		
TOTAL PRINTS	21	

STANDARD DUCT FORMATIONS
AND MANHOLE DETAILS
DATE 5-31-60
SHEET 4 OF 4
977-400-1 D

THIS SHEET IS ADDITIONAL TO SHT 39A

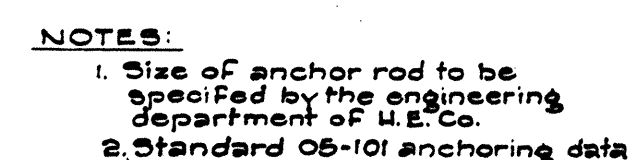
8526.35B 8174.57A 8161.55B



Lead (Dimension "A") for H.T.Co. anchors (H.T.Co. ONLY) shown on plan

Not to Scale

05-101



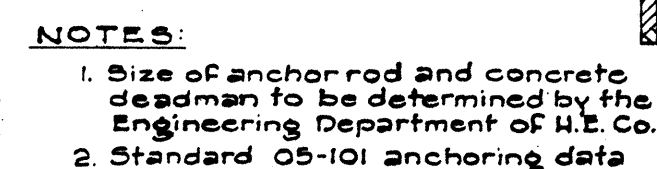
Scale: $3/4" = 1' - 0"$

05-102



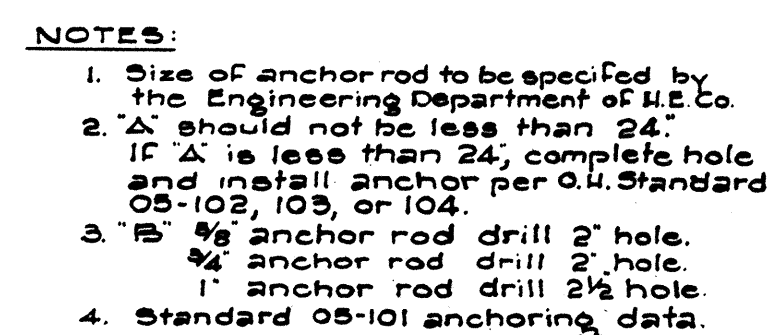
Scale: $3/4" = 1' - 0"$

05-103



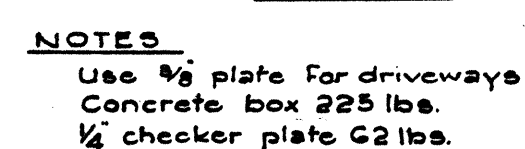
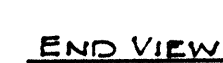
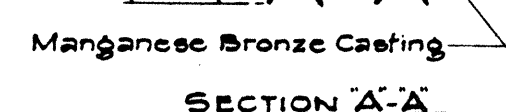
Scale: 1" = 1' - 0"

05-104



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

05-105



Scale : 1" = 1' - 0"

NOTE:
Contractor to furnish bricks and
construct walls. (Incidental to item
of "Installing Precast Concrete
Full Boxes")

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

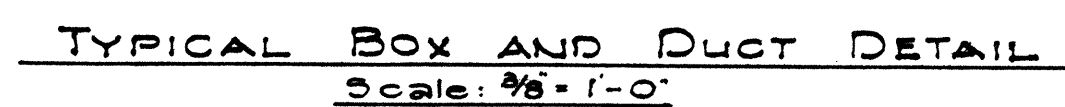
NOTE:

THE ULTIMATE FIBER STRESS FOR CREOSOTED SOUTHERN YELLOW
PINE & DOUGLAS FIR IS 7,400 lbs. PER SQUARE INCH.

REFERENCES

AMERICAN STANDARDS ASSOCIATION 05.4-1941, 05.6-1945
STANDARD HANDBOOK FOR ELECTRICAL ENGINEERS, EIGHTH EDITION
N.E. CO. SPECIFICATIONS FOR POLES.

05-501



NOTE:
Exact location of pullboxes to be determined in the field

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

HAWAIIAN ELECTRIC &
HAWAIIAN TELEPHONE

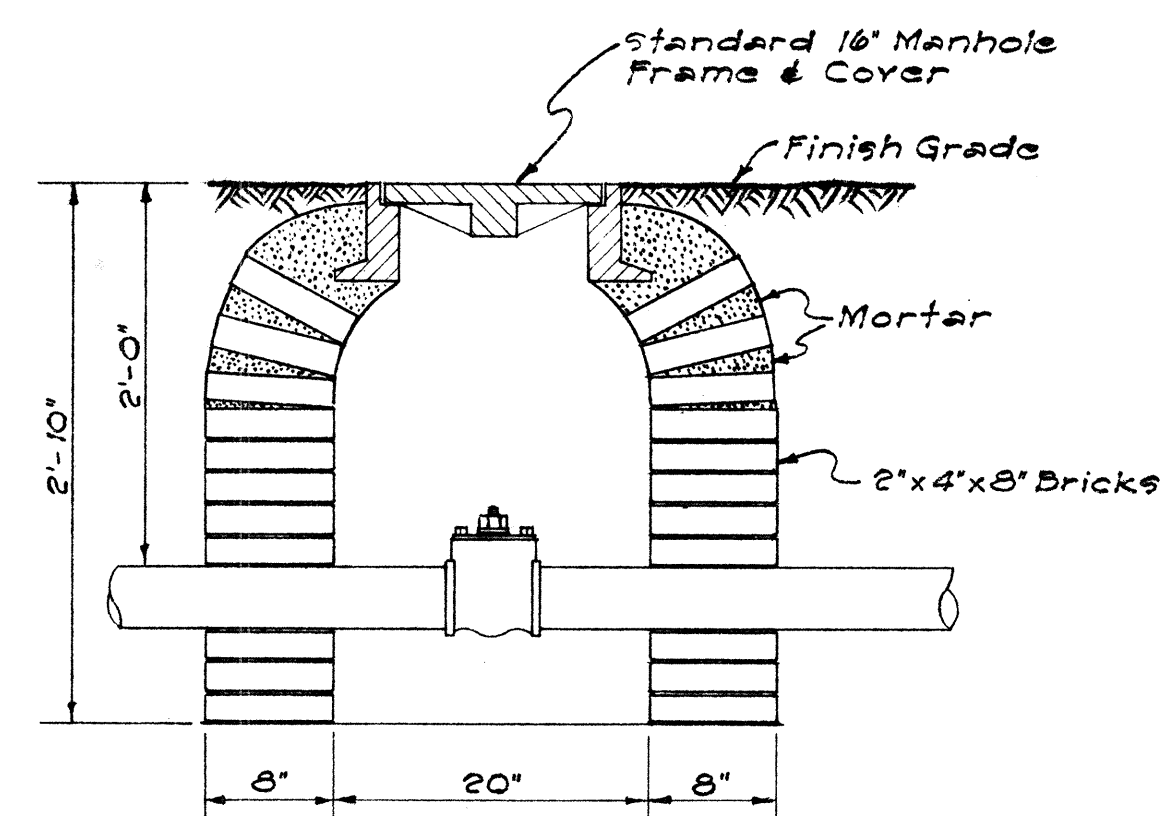
STANDARD DETAILS

MOANALUA ROAD US-S-0720(3) UNIT 3
LUNALILO FREEWAY BU-072-1(2) UNIT 4
MIDDLE STREET BU-065-1(1) UNIT 3
Scale: As Noted Oct. 17, 1957

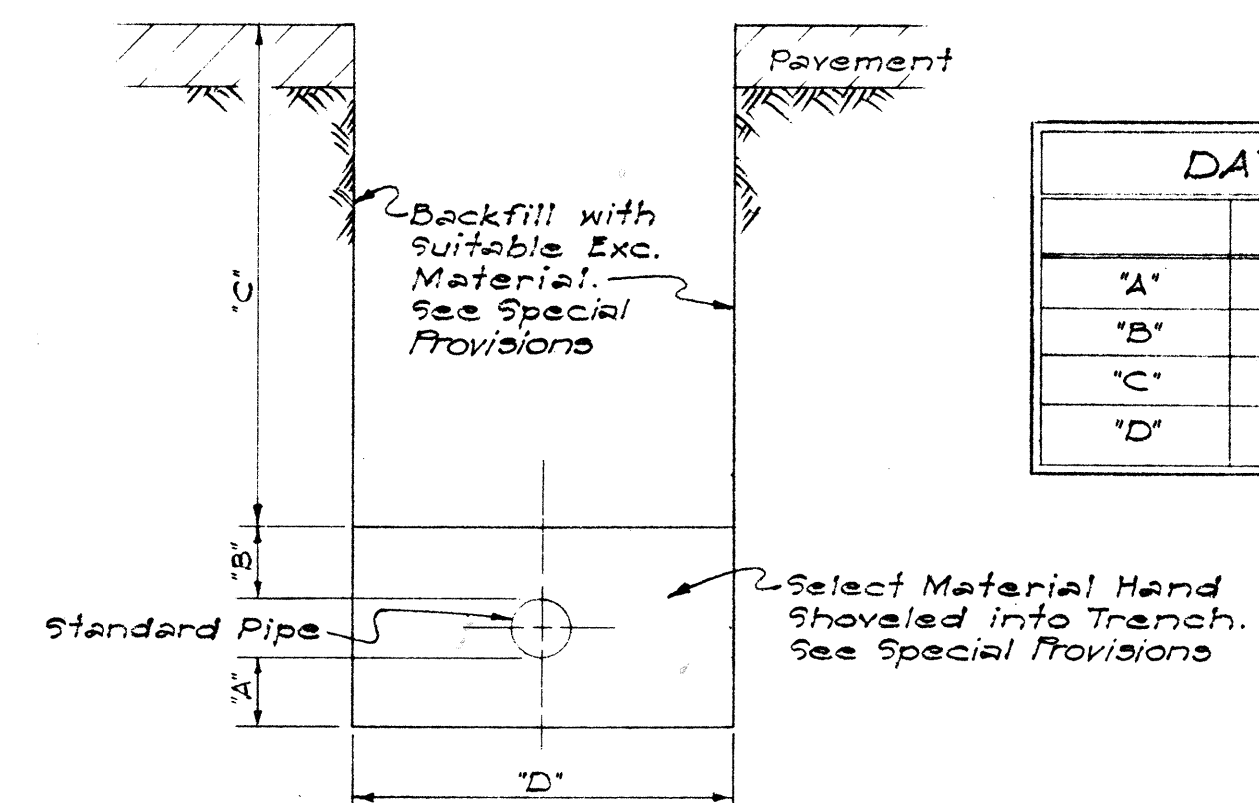
SHEET No 5 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	US-0720(3) UNIT 3	1960	37A	79
		BU-072-1(2) UNIT 4	1960	59A	118
		BU-065-1(1) UNIT 3	1960	57A	115

Revised
Jan. 16, 1961

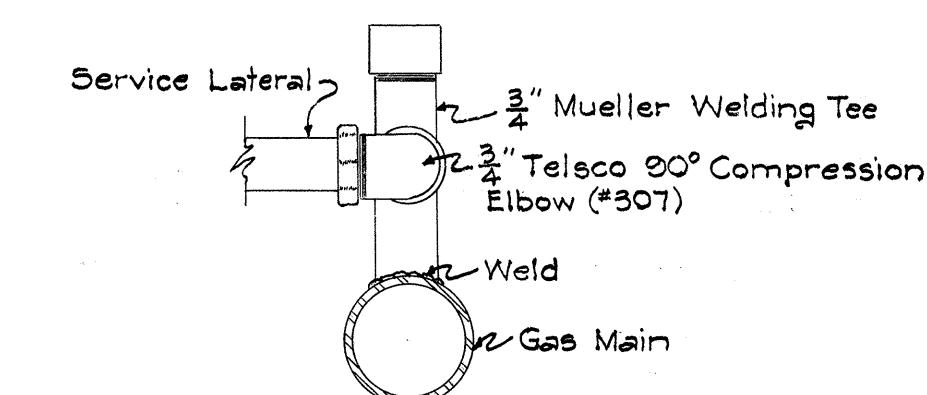


TYPICAL 16" GAS MANHOLE
Scale: 1" = 1'-0"

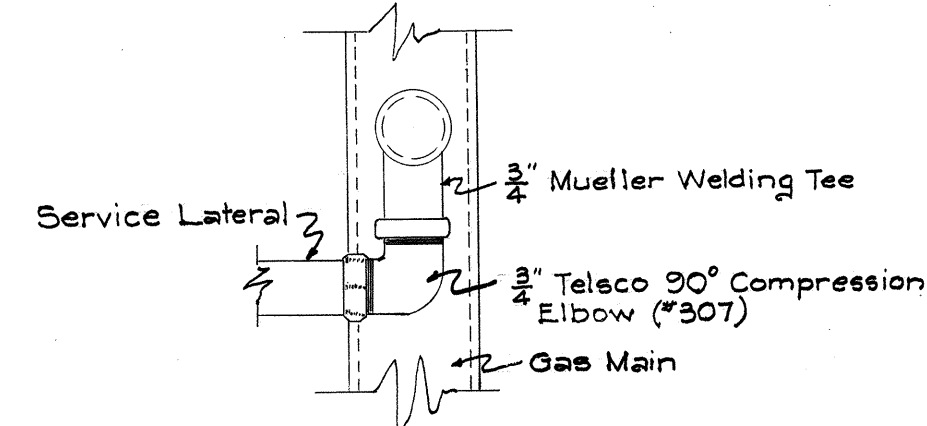


METHOD OF BACKFILL
Not to Scale

	4" Pipe	2" Pipe	1" Pipe
"A"	3"	3"	2"
"B"	3"	3"	2"
"C"	21"	21"	16"
"D"	24"	12"	12"



SIDE VIEW



TOP VIEW

TYPE SERVICE CONNECTION
Scale: 1/4" = 1"

NOTE: ABOVE DETAILS FOR GAS
LINE WORK BY HON. GAS CO., LTD.

APPROVED: *[Signature]*
ENGR. HON. GAS CO., LTD.
DATE: 1/16/59

THIS SHEET SUPERCEDES SHT. 21

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
HONOLULU GAS CO. DETAILS
MOANALUA ROAD US-S-0720(3) UNIT 3
LUNALILO FREEWAY BU-072-1(2) UNIT 4
MIDDLE STREET BU-065-1(1) UNIT 3
Scale: As Noted Oct. 1958

SHEET NO. 6 OF 6 SHEETS

ORIGINAL PLAN	DATE
DESIGNED BY	
TRACED BY	
QUANTITIES BY	
CHECKED BY	
NOTE BOOK NO.	