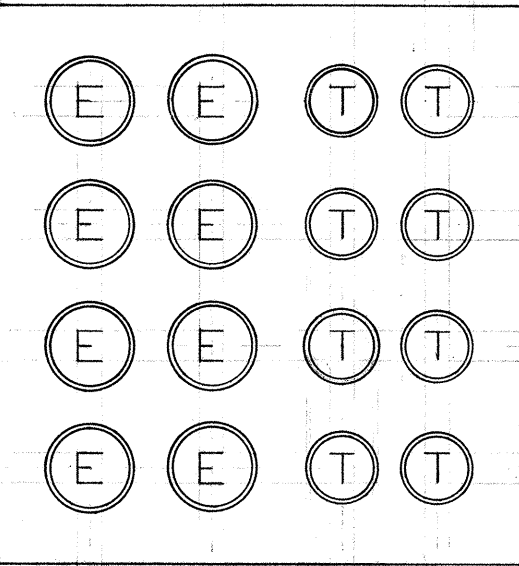


LEGEND

- Reinforced or nonreinforced concrete encased ducts
- Existing ductline
- New Manhole
- Indicates Makeup of concrete encased ducts
(E or T - Indicates type of Utility)
(8F - Indicates number and size of conduits)

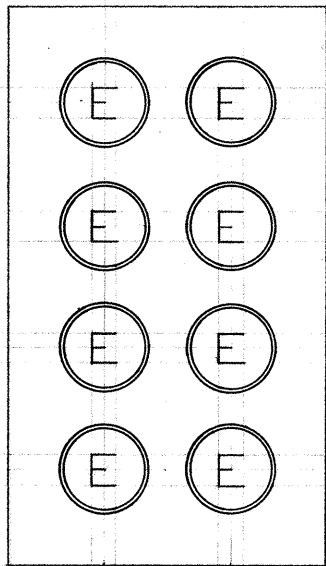
LEGEND FOR CONDUIT

Conduit Size	Symbol
3/4"	A
1"	B
2"	C
3"	D
3 1/2"	E
4"	F
4 1/2"	G
5"	H



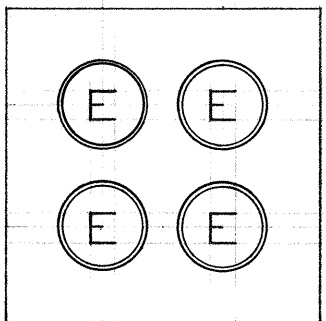
E - T
8H-8F

8-5" Transite Ducts
8-4" Plastic Ducts



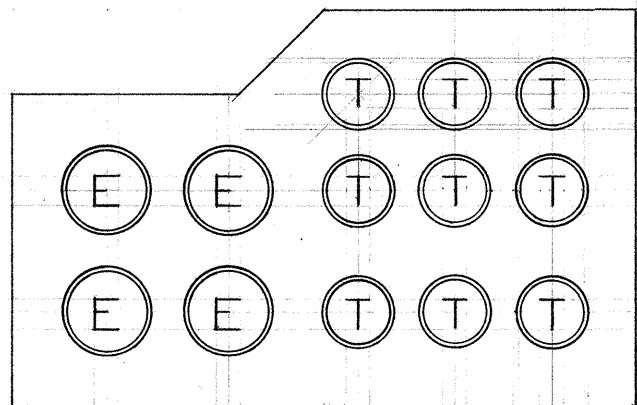
E
8H(V)

8-5" Transite Ducts



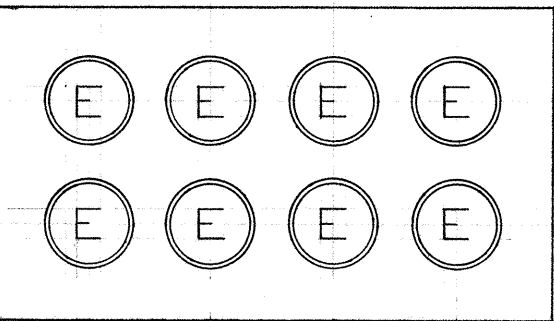
E
4H

4-5" Transite Ducts



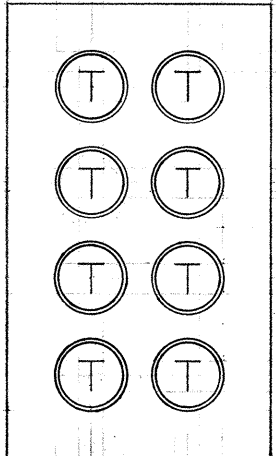
E - T
4H-3F

4-5" Transite Ducts
4-4" Plastic Ducts



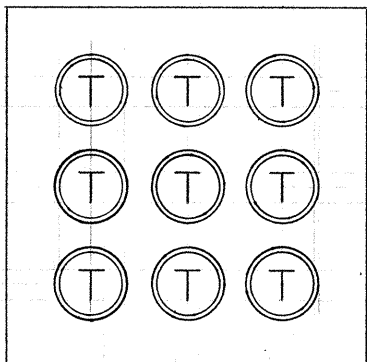
E
8H(H)

8-5" Transite Ducts



T
8F

8-4" Plastic Ducts



T
9F

4-4" Plastic Ducts

GENERAL NOTES - UTILITIES

- The Contractor shall notify each utility in writing 10 working days prior to commencing work on their respective utility system.
- Existing utility facilities shown on these plans are approximate only. The Contractor shall verify their actual locations and shall make adjustments to any new or existing facility as directed by the Engineer.
- The Contractor shall notify the affected property owners at least one week in advance as to the time and duration the trenching and installing of underground electric and telephone service will be performed in front of their property.
- Ducts encased in concrete jacket:
 - 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. and H.T.Co. ducts.
- Final depth of all manholes shall be determined in the field by the Engineer.
- Where possible, slope ductline to drain towards Manhole.

APPROVED:

Hawaiian Electric Co., Inc. 4-22-69
Date
Hawaiian Telephone Co. 4-21-69
Date

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

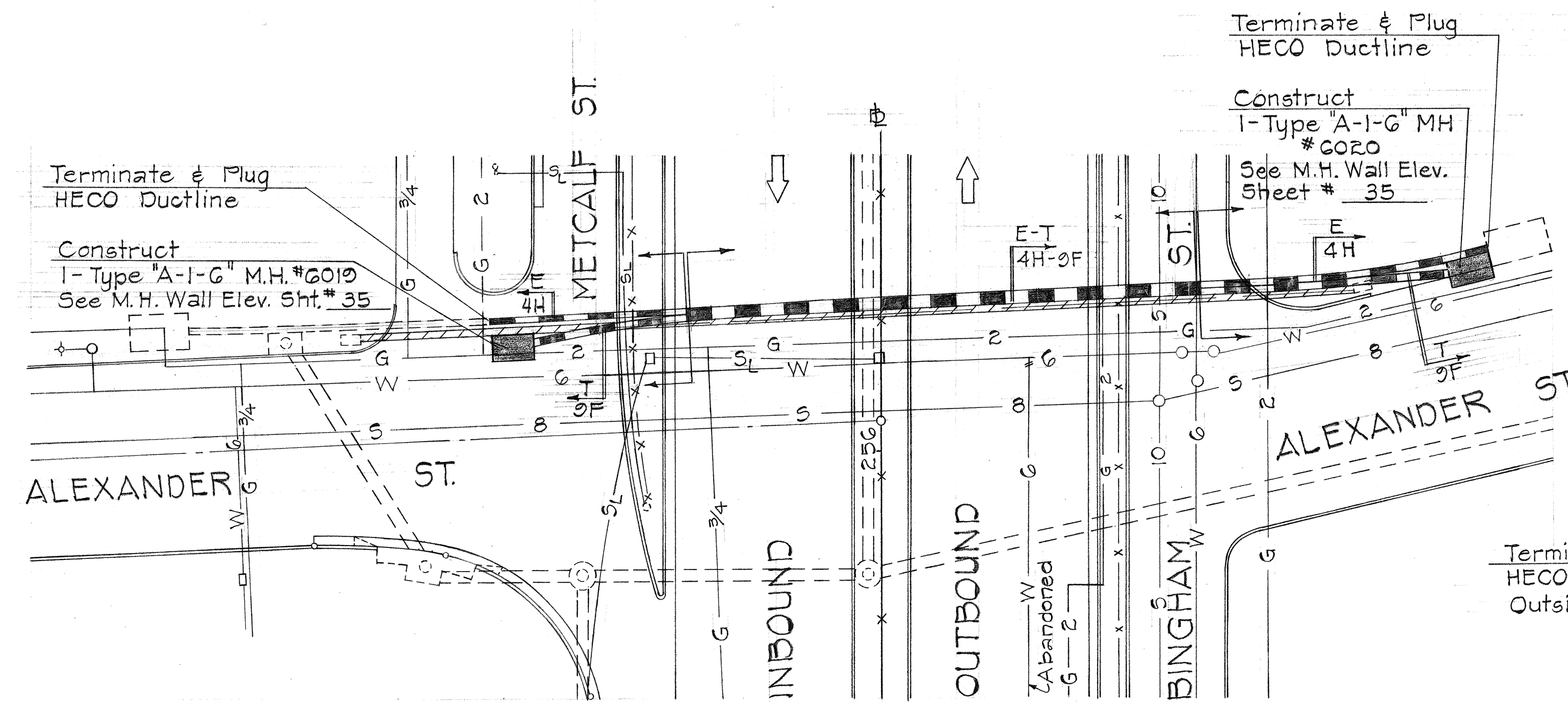
UTILITIES
GENERAL NOTES-DUCT SECTIONS

INTERSTATE ROUTE H-1
F.A.I. Proj. No. I-HI-1(53):23
Scale: 1"=1'-0" Date: Feb, 1969

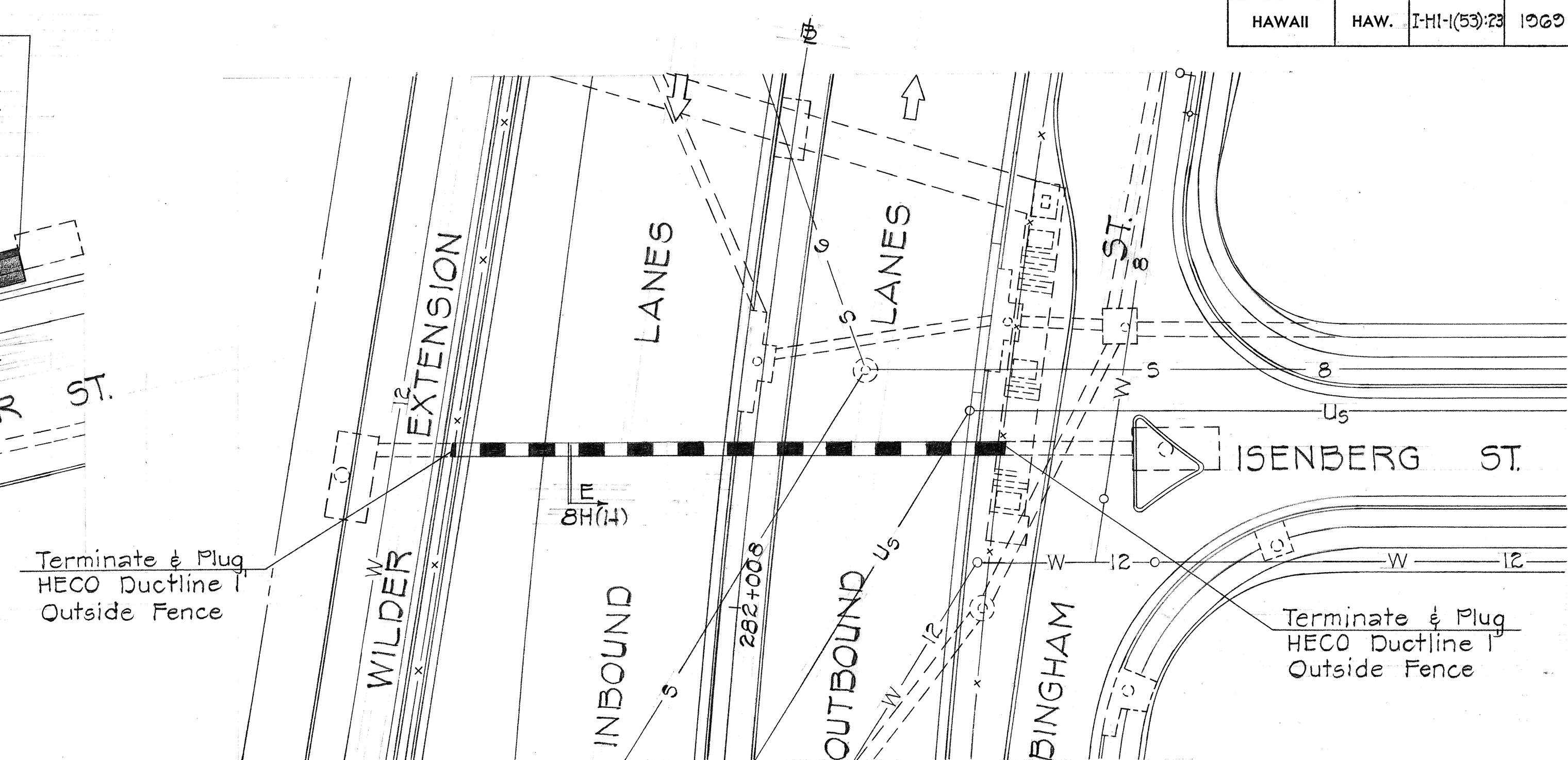
SHEET No. 1 OF 8 SHEETS

DATE	DATE
DESIGNED BY	DESIGNED BY
CHECKED BY	CHECKED BY
NOTED BY	NOTED BY
ORIGINAL PLAN	ORIGINAL PLAN

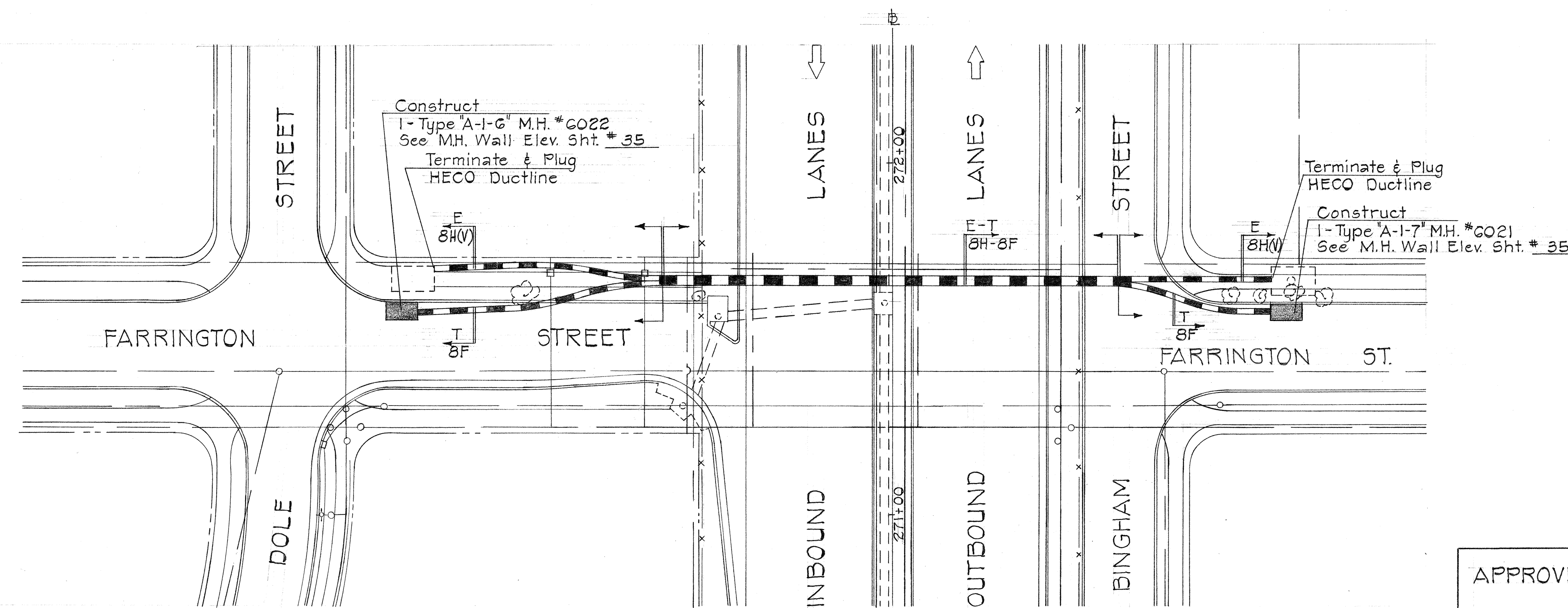
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(53):23	1969	33	39



① ALEXANDER STREET CROSSING
 @ STA. 256+30 ±



③ ISENBERG STREET CROSSING
 ④ STA. 282 + 32±



② FARRINGTON STREET CONNECTION

APPROVED:

W. E. White 4-22-69
HAWAIIAN ELECTRIC CO., INC. DATE

F. Lamm 4-21-69
HAWAIIAN TELEPHONE CO., INC. DATE

**STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION**

UTILITIES
ELECTRIC — TELEPHONE

INTERSTATE ROUTE H-1
FAI. Proj. No: I-HI-1(53):23

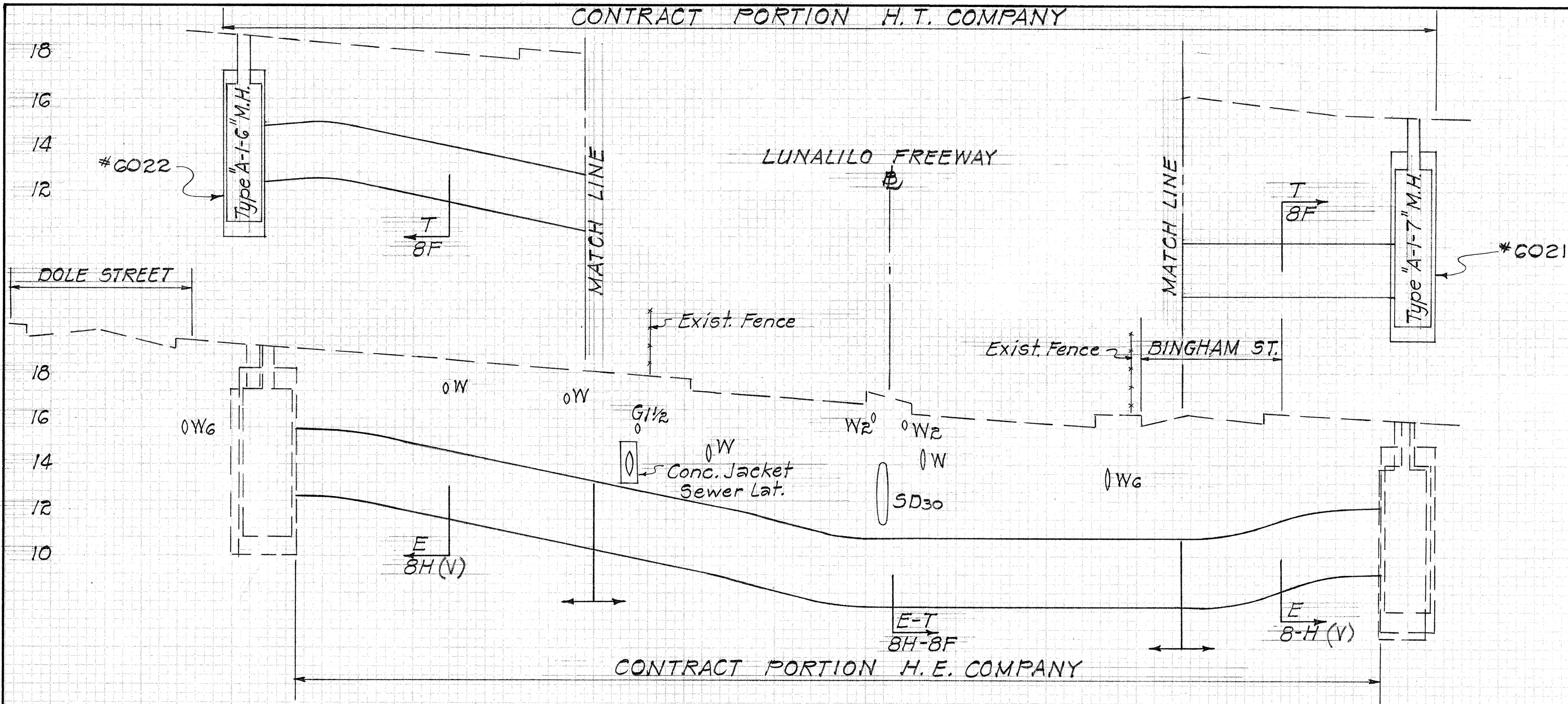
Scale: 1" = 20'-0" Date: Feb. 1969

SHEET No. 2 OF 8 SHEETS

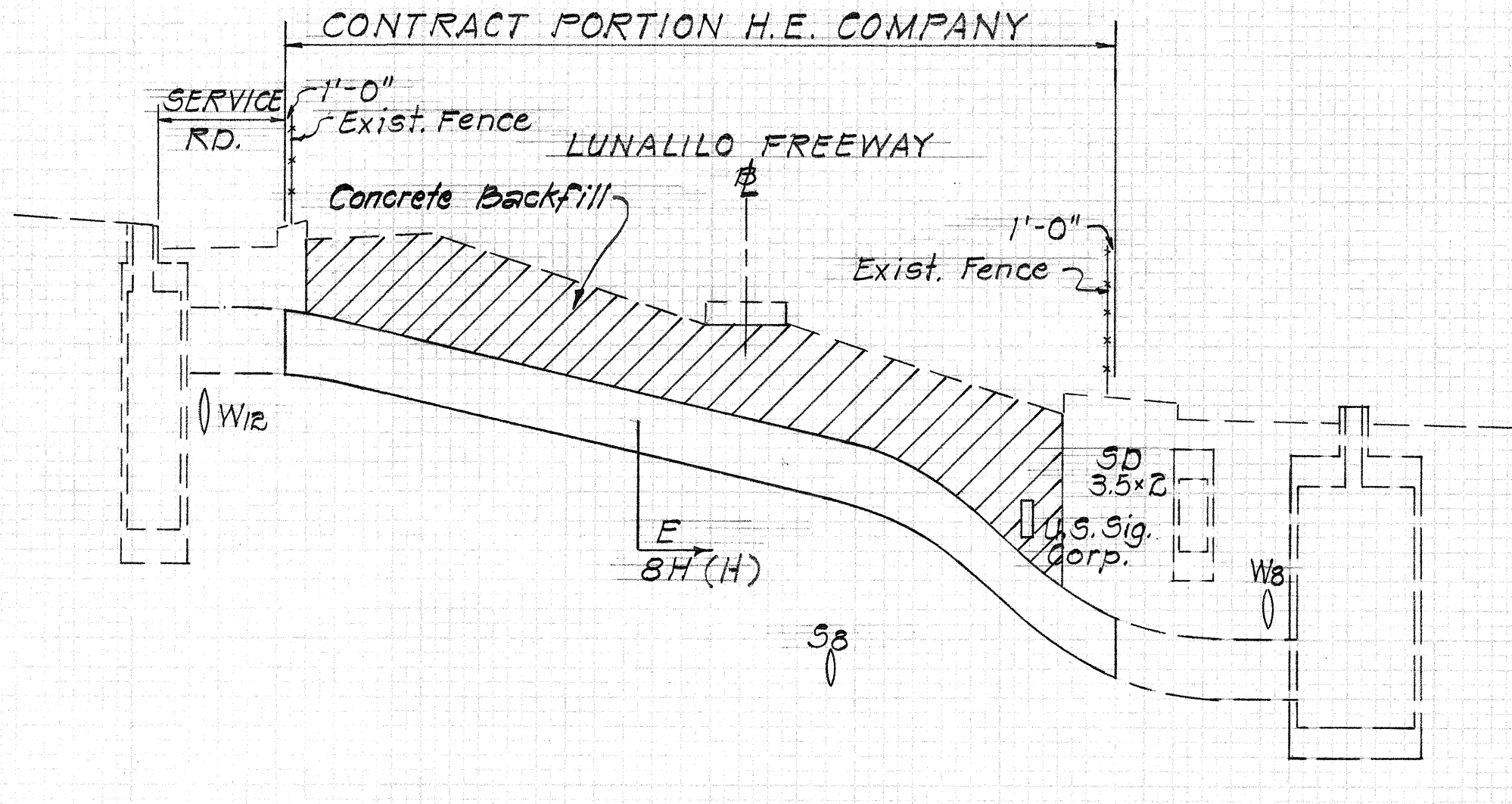
3 3

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

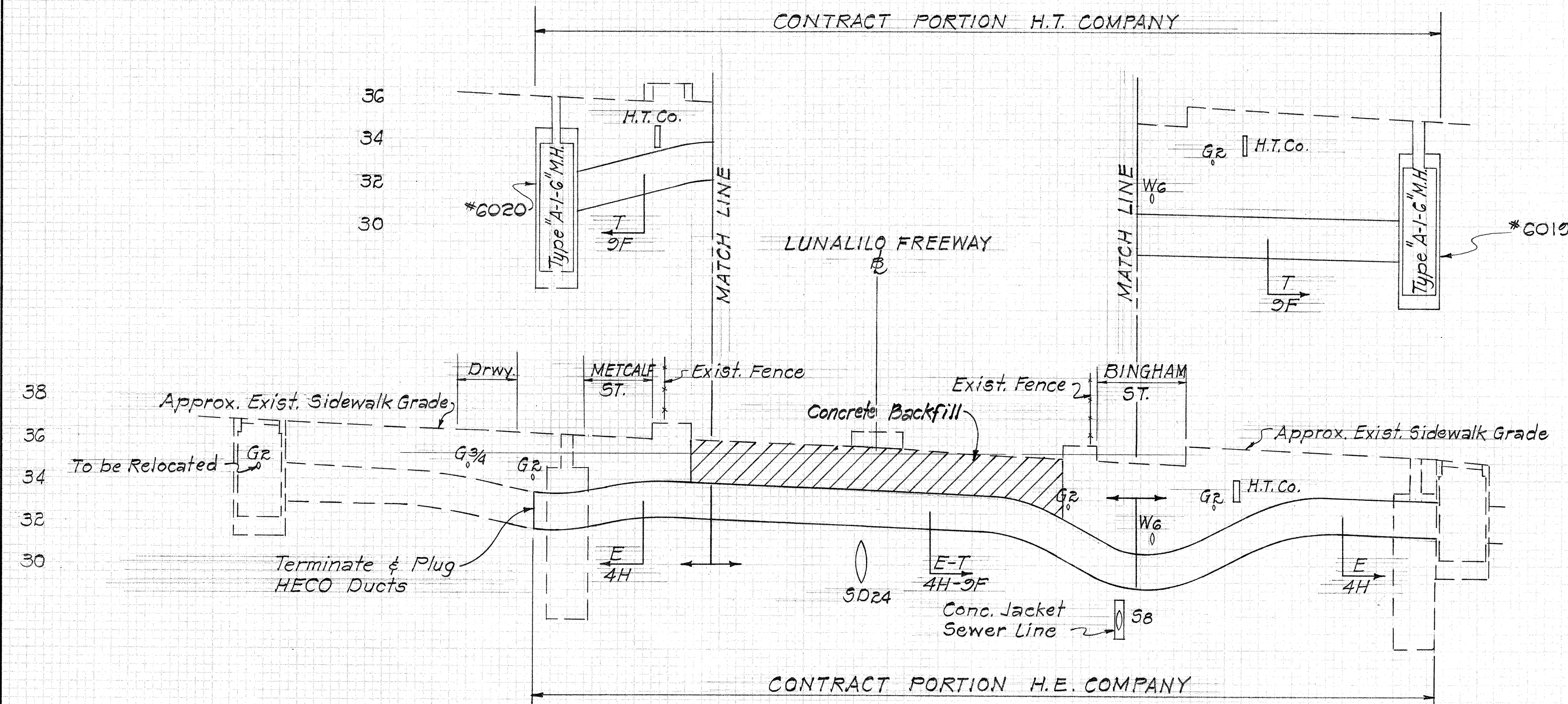
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEET
HAWAII	HAW.	I-HH(53):23	1969	34	39



② FARRINGTON STREET CROSSING
 ± STA. 271+67 ±



③ ISENBERG STREET CROSSING
 ± STA. 282+32 ±



① ALEXANDER STREET CROSSING
 ± STA. 256+30 ±

APPROVED:	
<i>Veloukhitis</i>	4/22/69
HAWAIIAN ELECTRIC CO., INC.	DATE
<i>F. Luma</i>	4-21-69
HAWAIIAN TELEPHONE CO., INC.	DATE

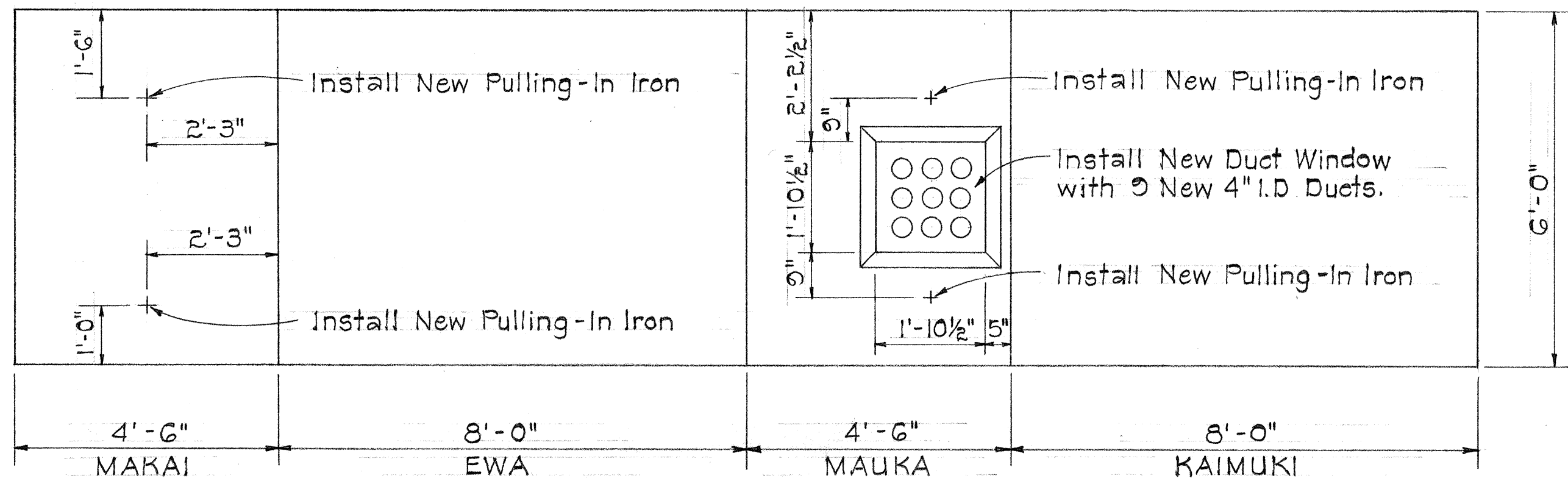
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

UTILITY PROFILES
ELECTRIC — TELEPHONE

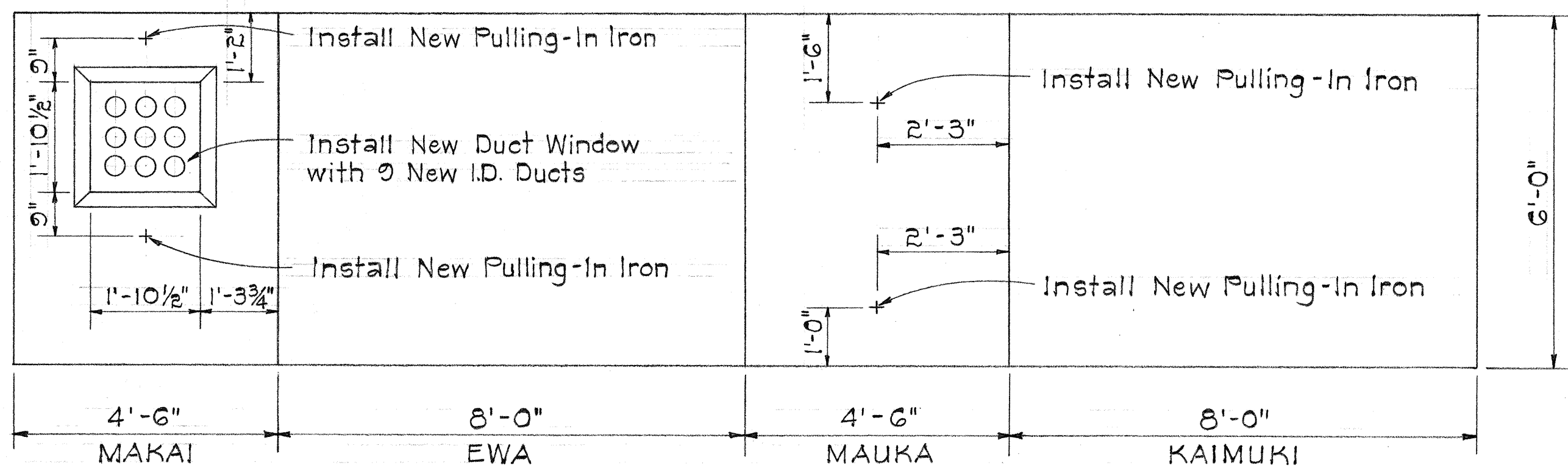
Scale: Horiz: 1" = 20'-0"
 Vert: 1" = 4'-0" Date: Feb. 1969

SHEET NO. 3 OF 8 SHEETS

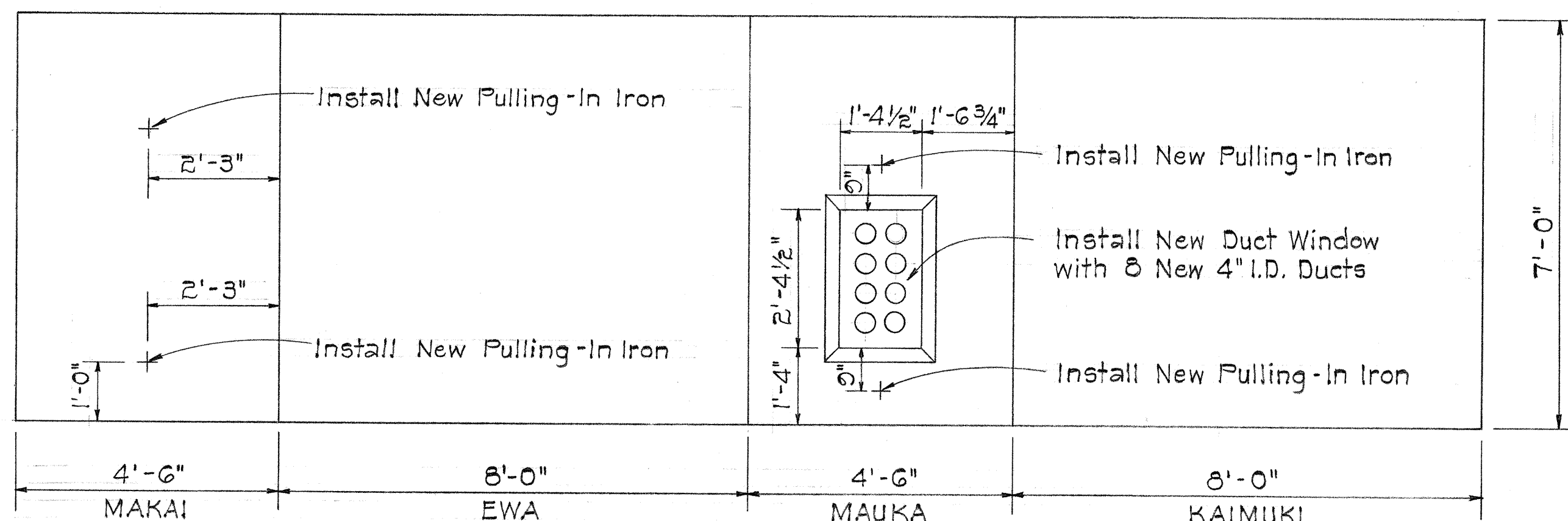
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(53)23	1969	35	39



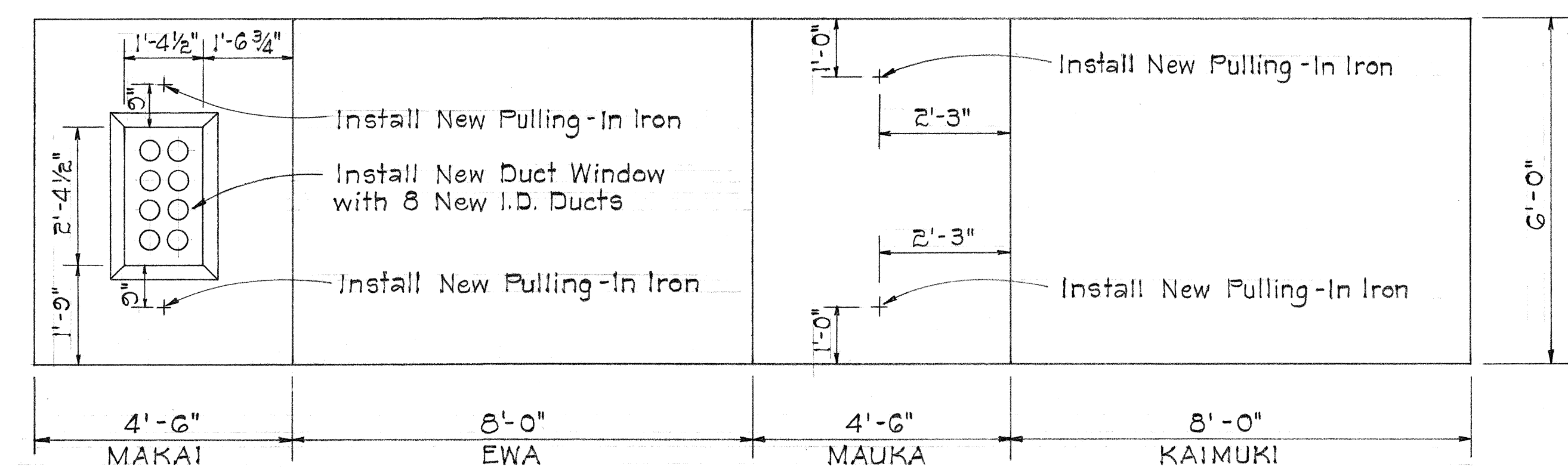
NEW MANHOLE 6019



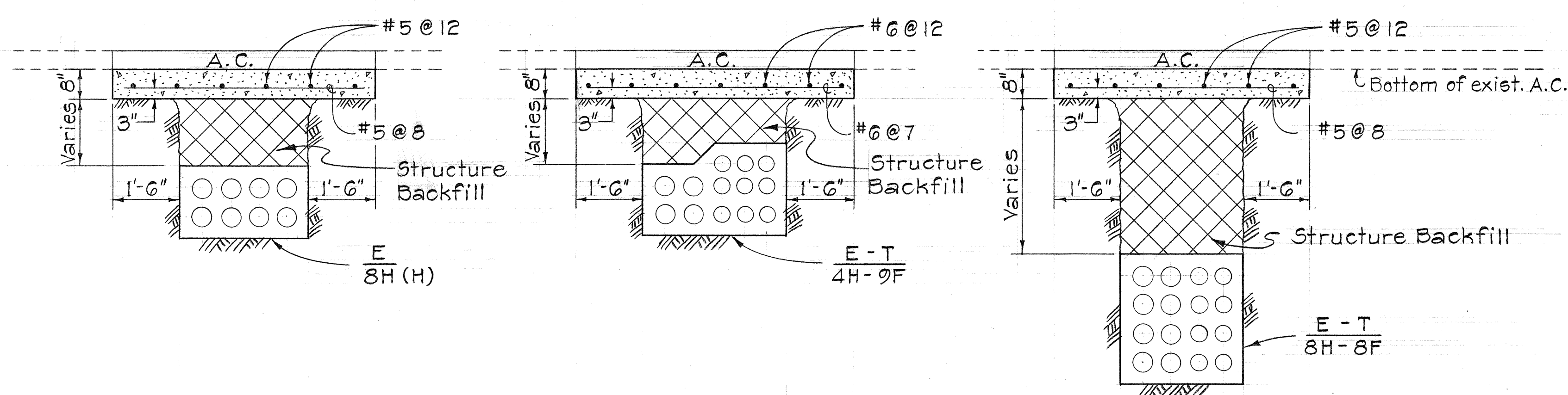
NEW MANHOLE 6020



NEW MANHOLE 6021



NEW MANHOLE 6022



SPECIAL (OPTIONAL) BACKFILL OF DUCTLINES DUCTLINE CAP METHOD

NOTES FOR DUCTLINE BACKFILL :

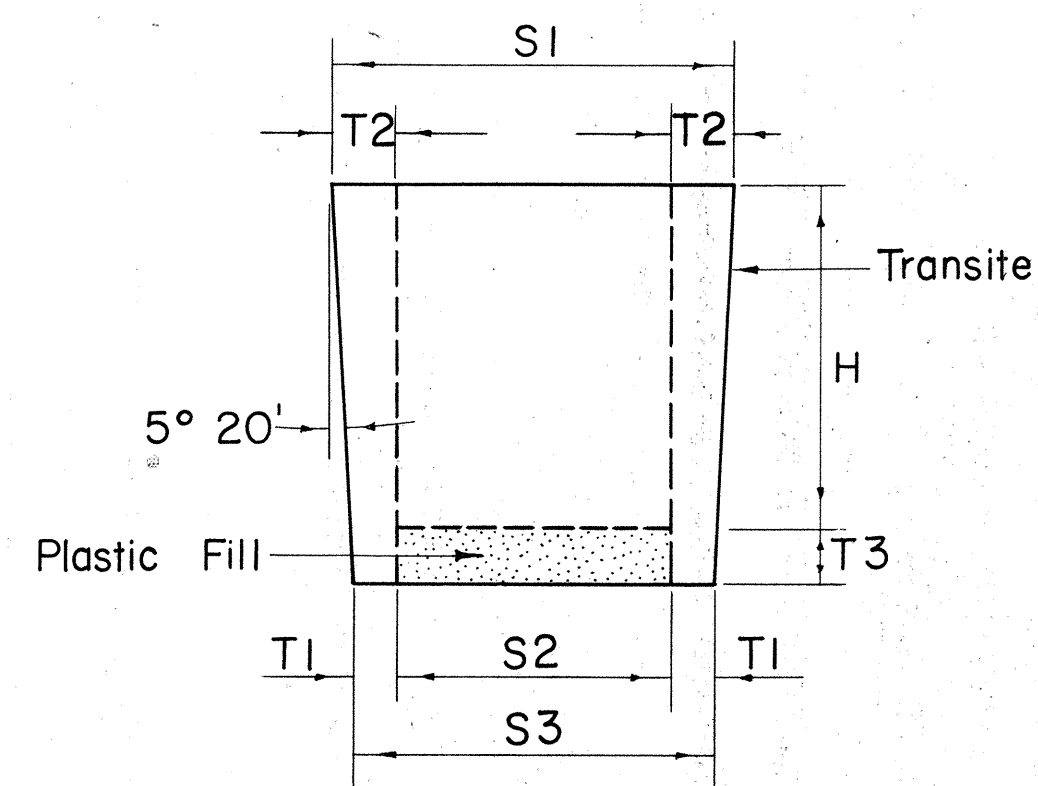
- Backfill for ductlines installed under Interstate paved roadway or shoulder areas shall be by either of two methods:
 - By Class C-1 concrete from top of ductline encasement to bottom of existing asphaltic concrete pavement and repave to original grade with A.C. as directed by the Engineer.
 - By the ductline cap method as shown above.
- All labor, equipment and material necessary to complete the backfill by either method shall be incidental to the respective ductline installation and shall not be paid for separately.
- All excavation shall be to neat cuts.

APPROVED :	
<i>[Signature]</i> Hawaiian Electric Co., Inc.	4-22-69 Date
<i>[Signature]</i> Hawaiian Telephone Co.	4-21-69 Date

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
UTILITIES
ELEVATION OF MANHOLES
AND
SPECIAL BACKFILL OF DUCTLINES
INTERSTATE ROUTE H-1
F.A.I. Proj.No. I-HI-1 (53) : 23
Scale: 1/2"=1'-0" Date: Feb, 1969
SHEET No. 4 OF 8 SHEETS

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

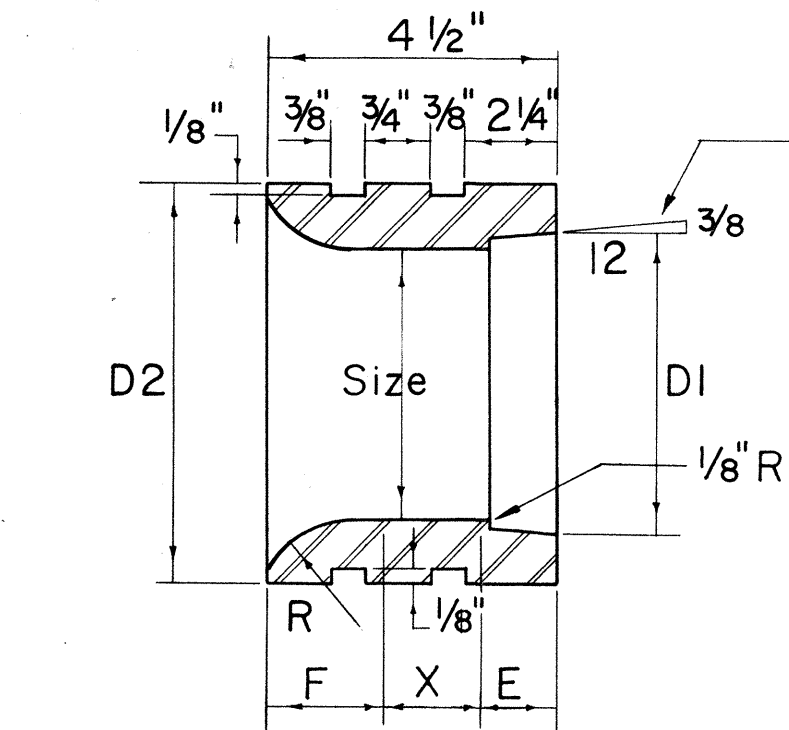
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	HI-1(53)-23	1969	36	39



PLUGS FOR TRANSITE KORDUCTS

Not to Scale

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



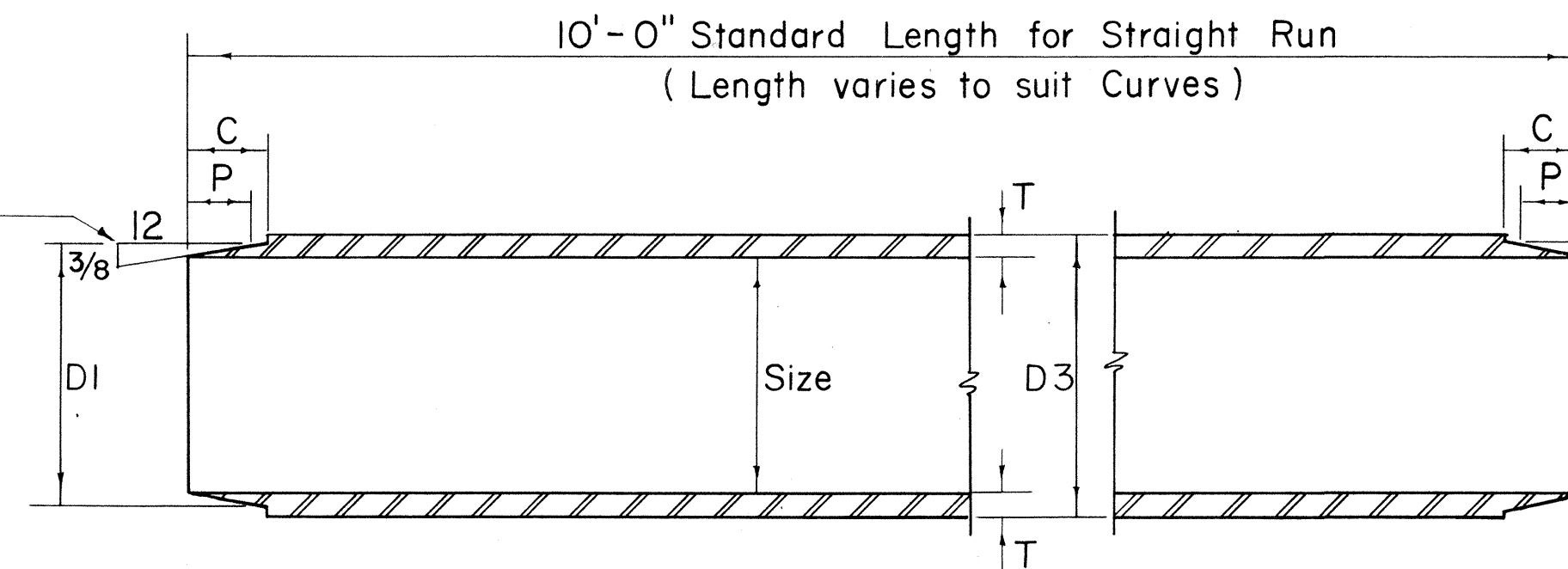
JUNIOR END BELLS

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"

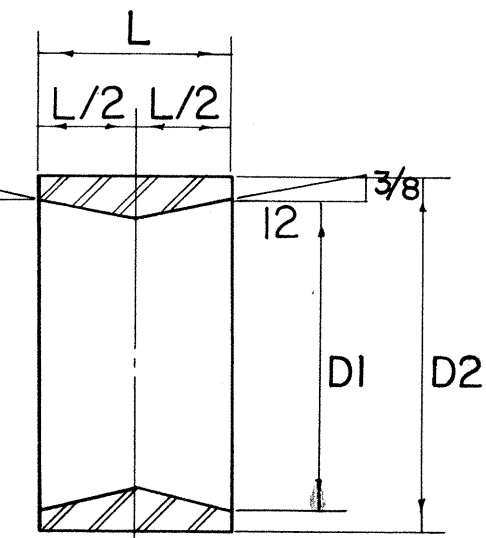
- Provide one set of Spacers
(a) 10 Ft. straight run for 4 Ducts high or less.
(b) 5 Ft. straight run for 5 Ducts high or more.



TRANSITE KORDUCTS

Not to Scale

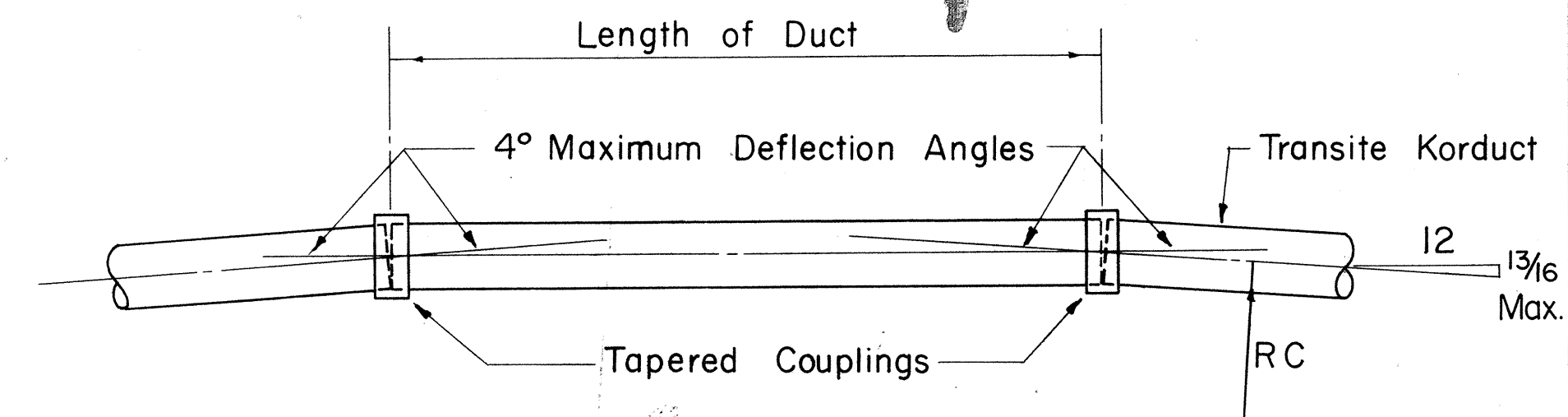
SIZE	DI	D3	C	P	T
3"	3 25/64"	3 35/64"	1 1/8"	7/8"	17/64"
4"	4 25/64"	4 35/64"	1 1/4"	1"	17/64"
4 1/2"	4 57/64"	5 3/64"	1 1/4"	1"	17/64"
5"	5 29/64"	5 39/64"	1 5/8"	1 1/8"	19/64"



TAPERED COUPLINGS

Not to Scale

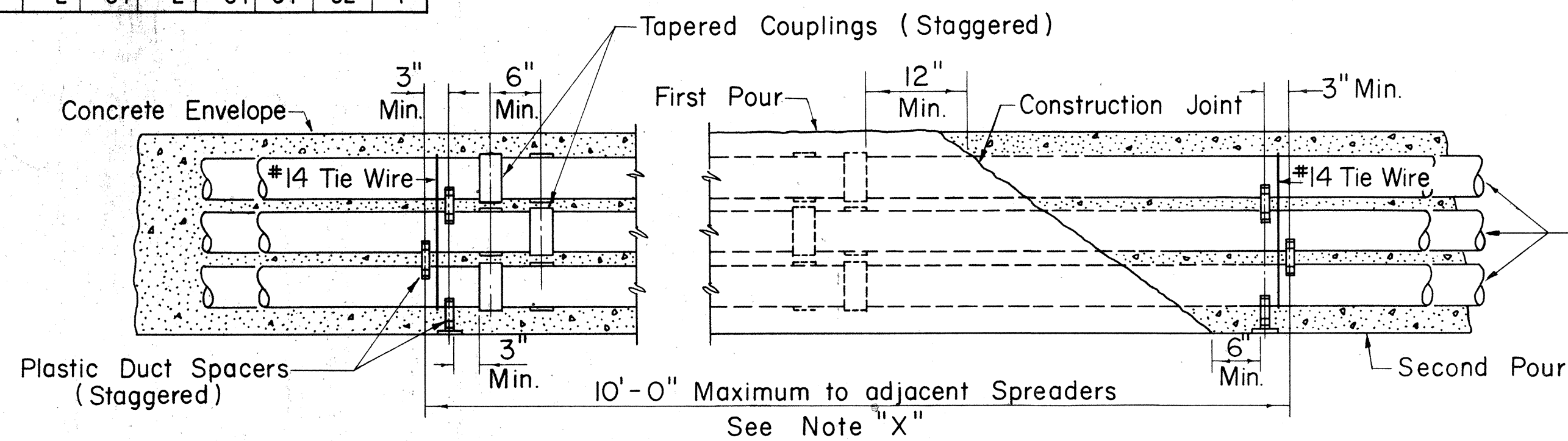
SIZE	DI	D2	L
3"	3 25/32"	4 11/64"	2 1/4"
4"	4 25/64"	5 3/16"	2 1/2"
4 1/2"	4 57/64"	5 49/64"	2 1/2"
5"	5 29/64"	6 21/64"	2 3/4"



METHOD OF FORMING CURVES

Not to Scale

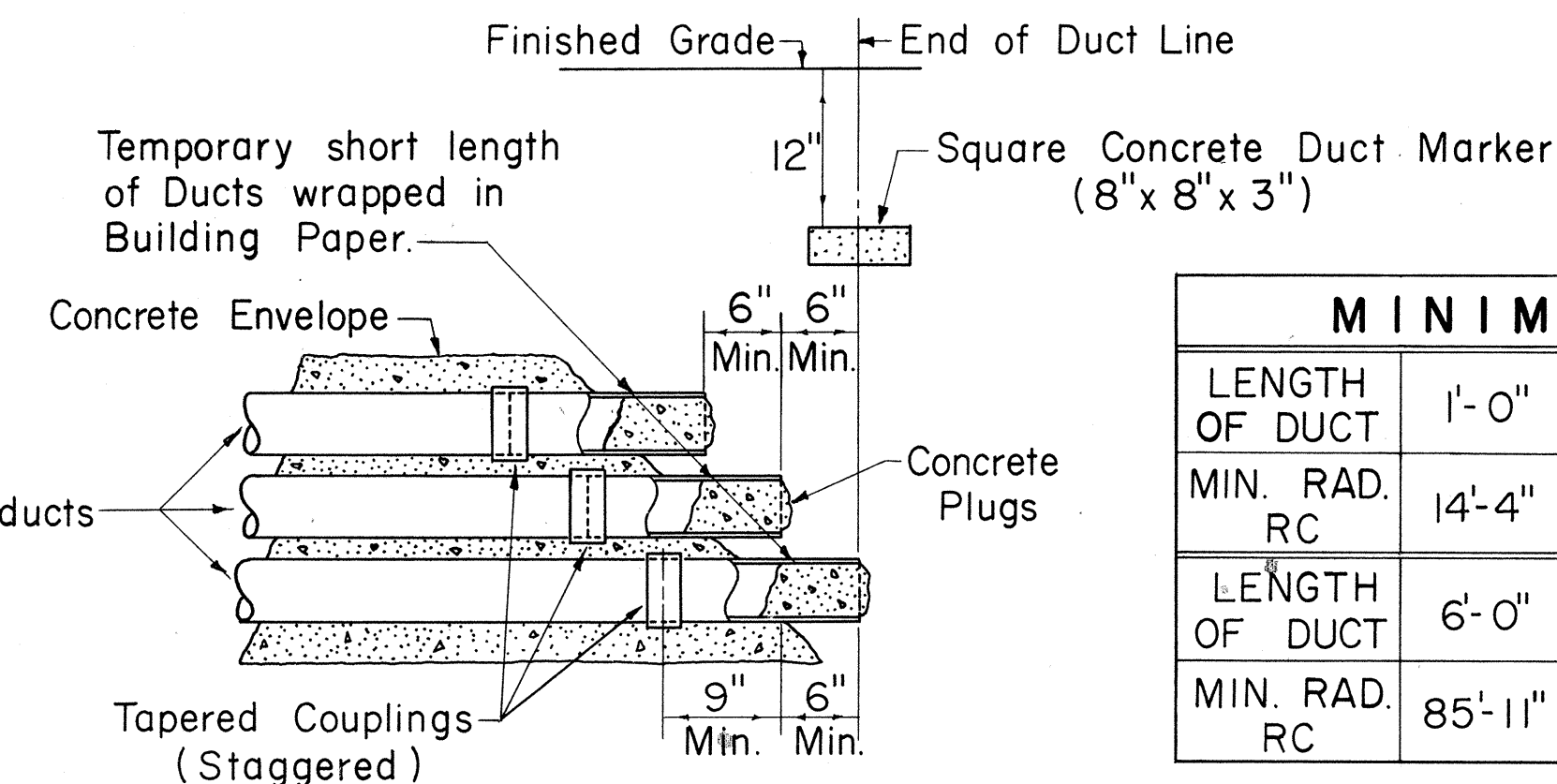
	MINIMUM RADIUS TO FORM CURVES									
LENGTH OF DUCT	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"
MIN. RAD. RC	14'-4"	21'-6"	28'-8"	35'-10"	42'-11"	50'-1"	57'-3"	64'-5"	71'-7"	78'-9"
LENGTH OF DUCT	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
MIN. RAD. RC	85'-11"	93'-1"	100'-3"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



TYPICAL DUCT ENVELOPE ELEVATION

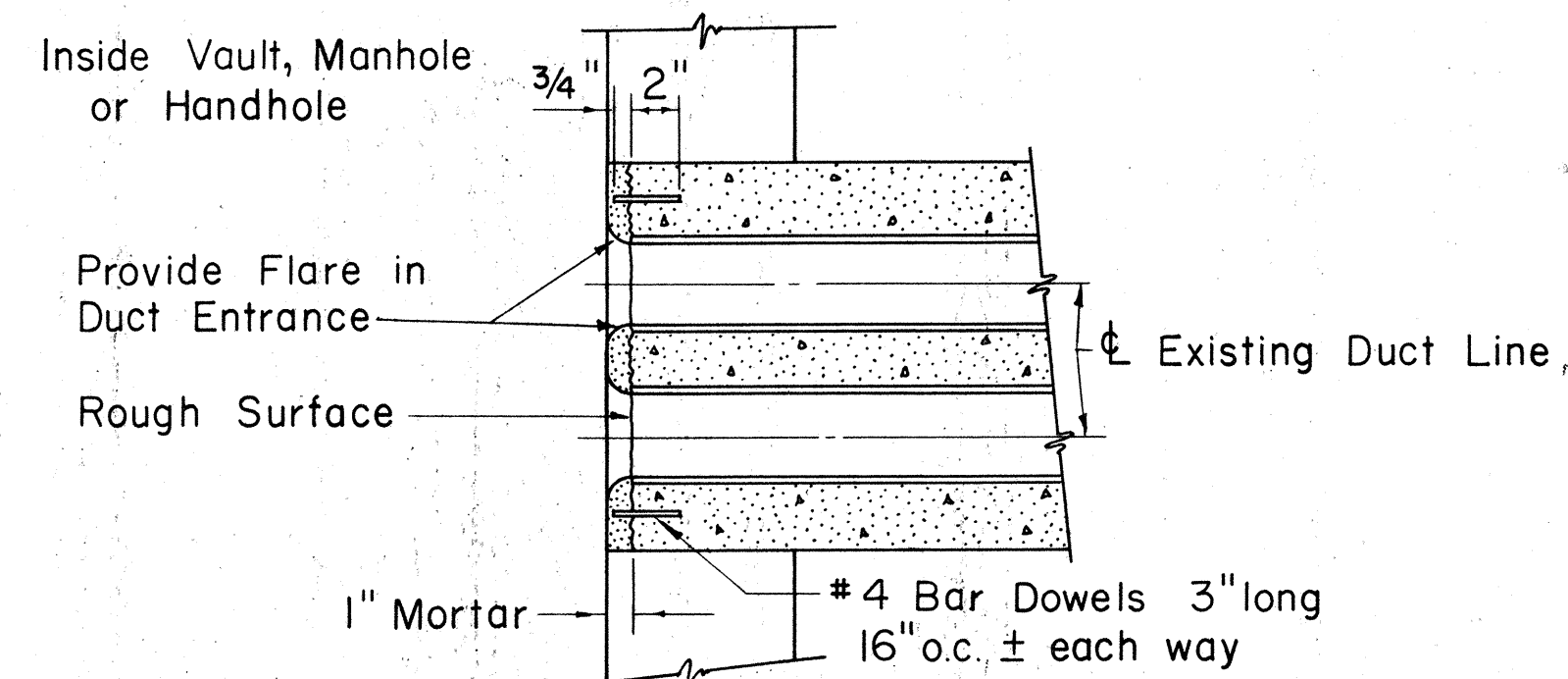
(6 WAY DUCT LINE SHOWN)

Not to Scale



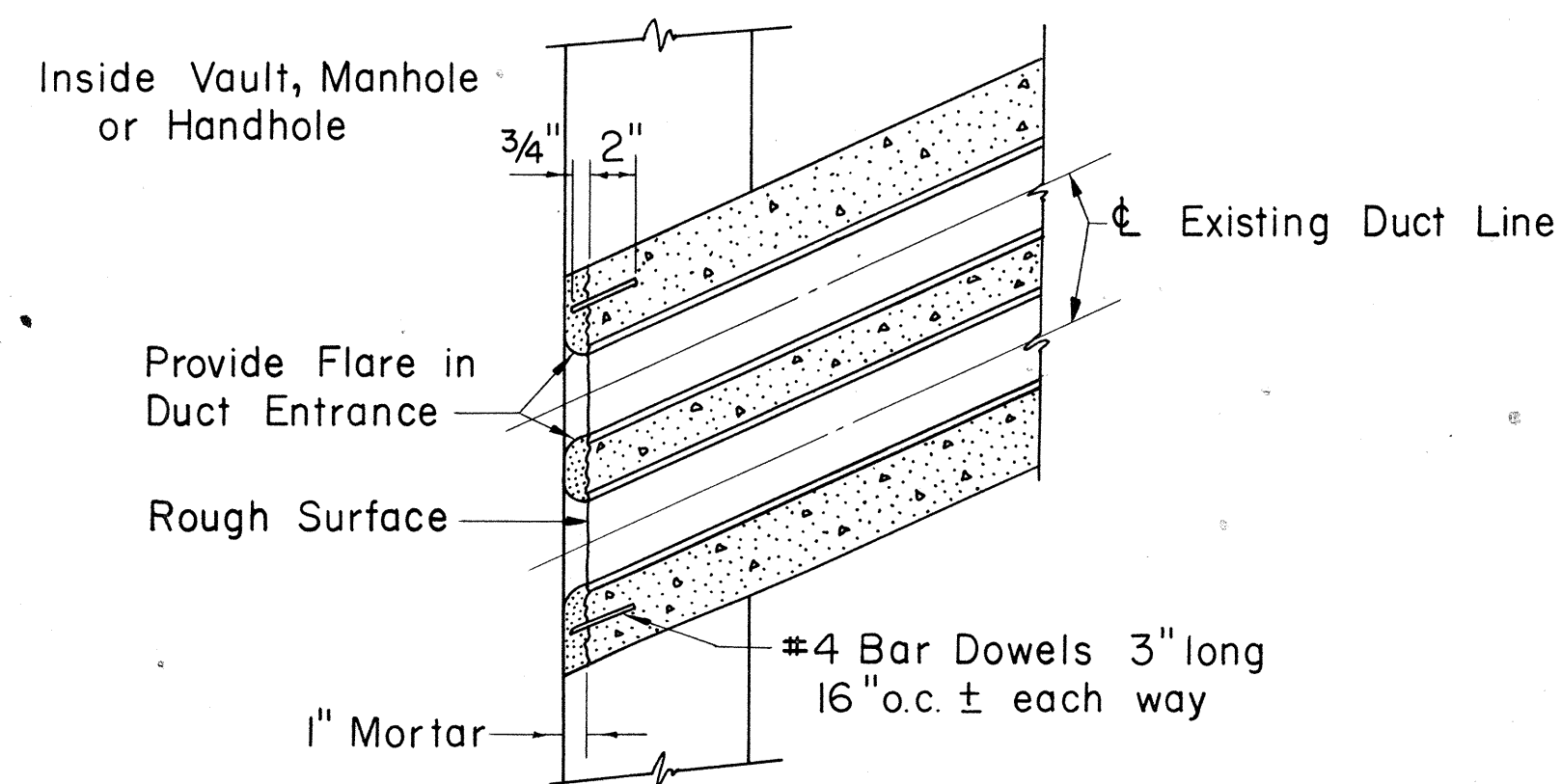
TYPICAL STUB OUT DETAIL

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"

APPROVED:

Elonkhat
HAWAIIAN ELECTRIC CO., INC.

4-22-69
DATE

HECo., Inc. Drawing Number
18585 SHEET No. 2 OF 2 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

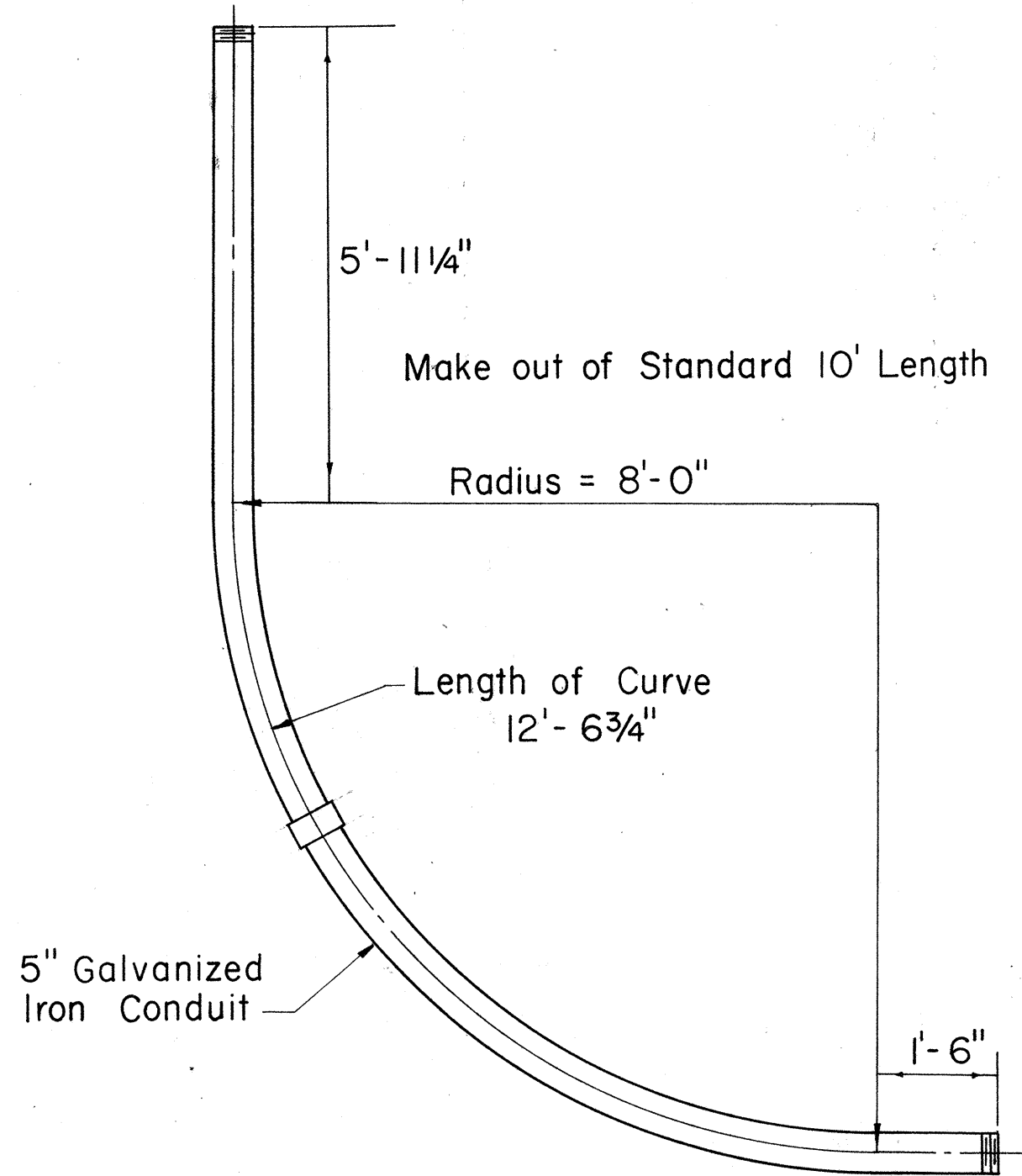
CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

Scales: As Noted

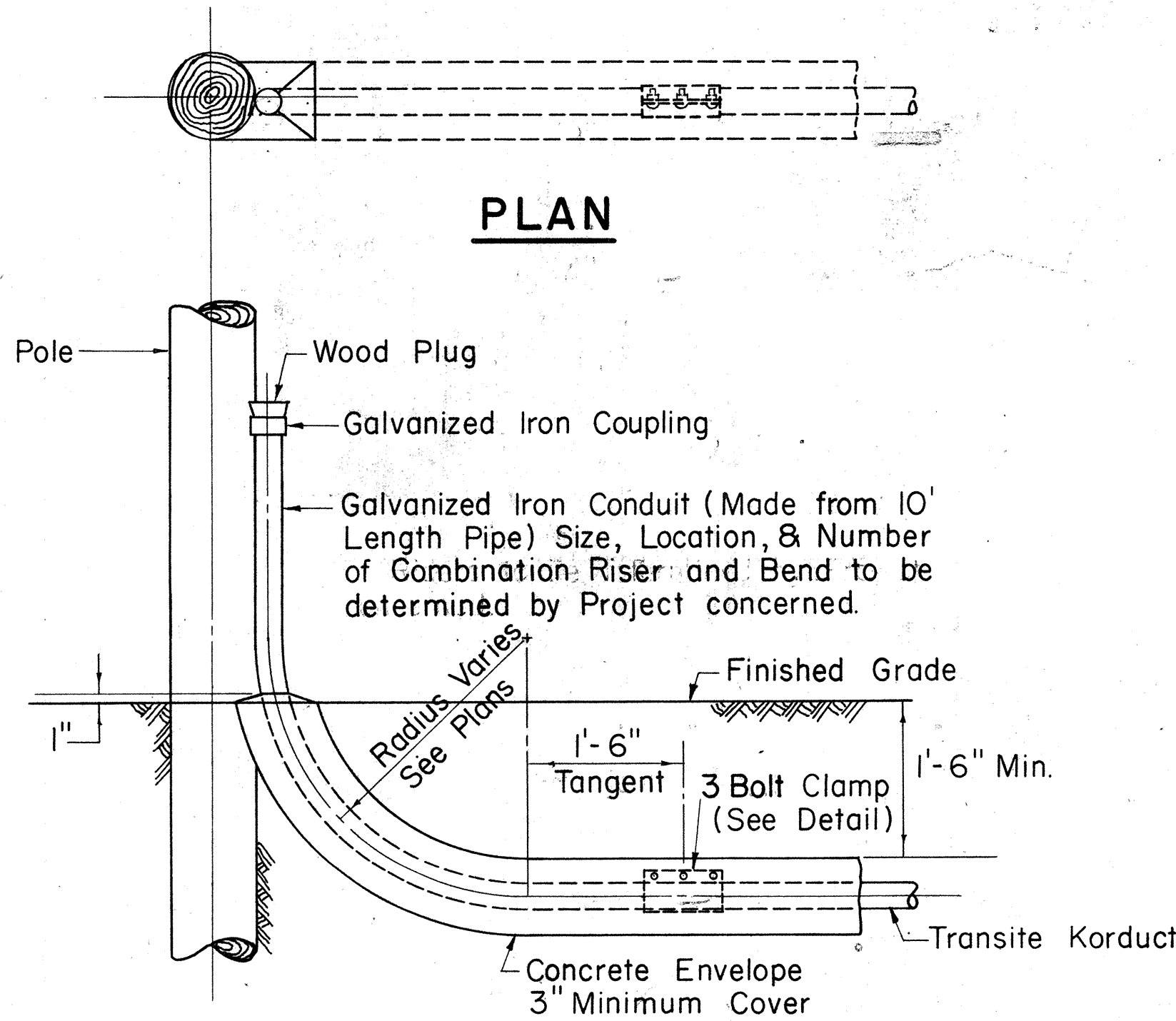
Date

SHEET NO. 5 OF 8 SHEETS

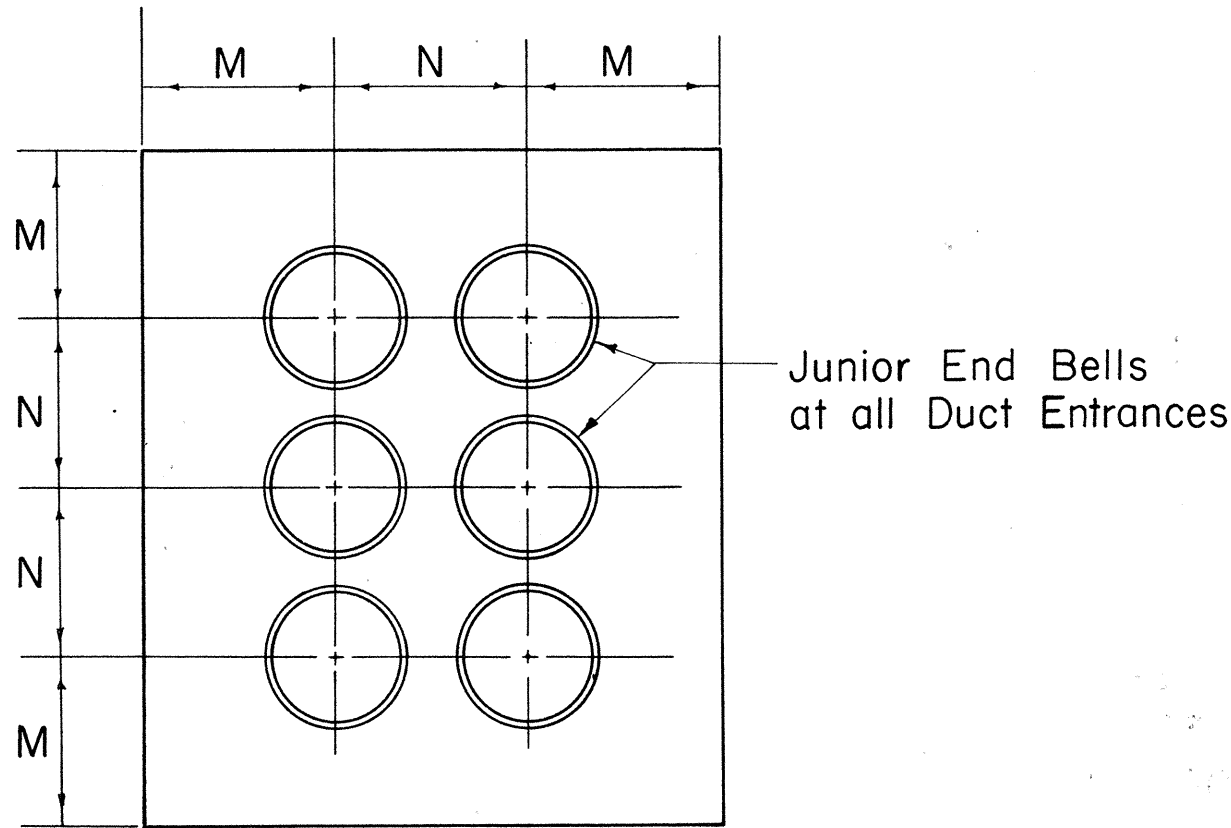
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HH(53)23	1969	37	39



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

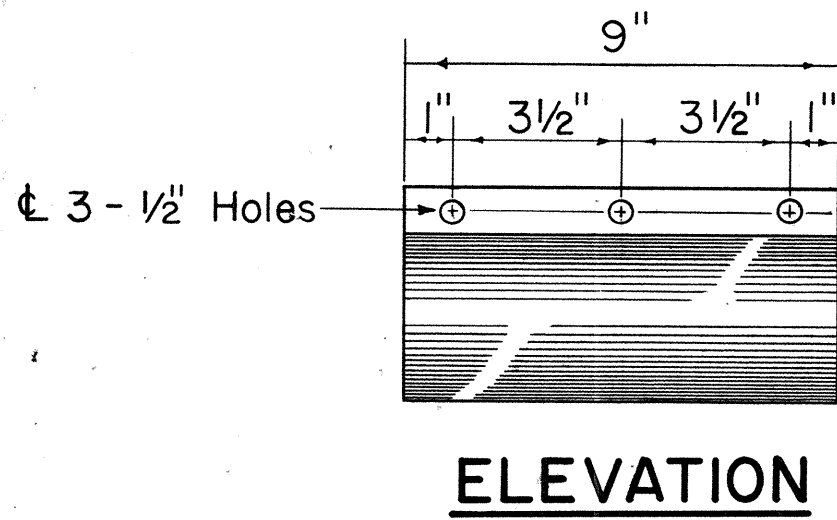
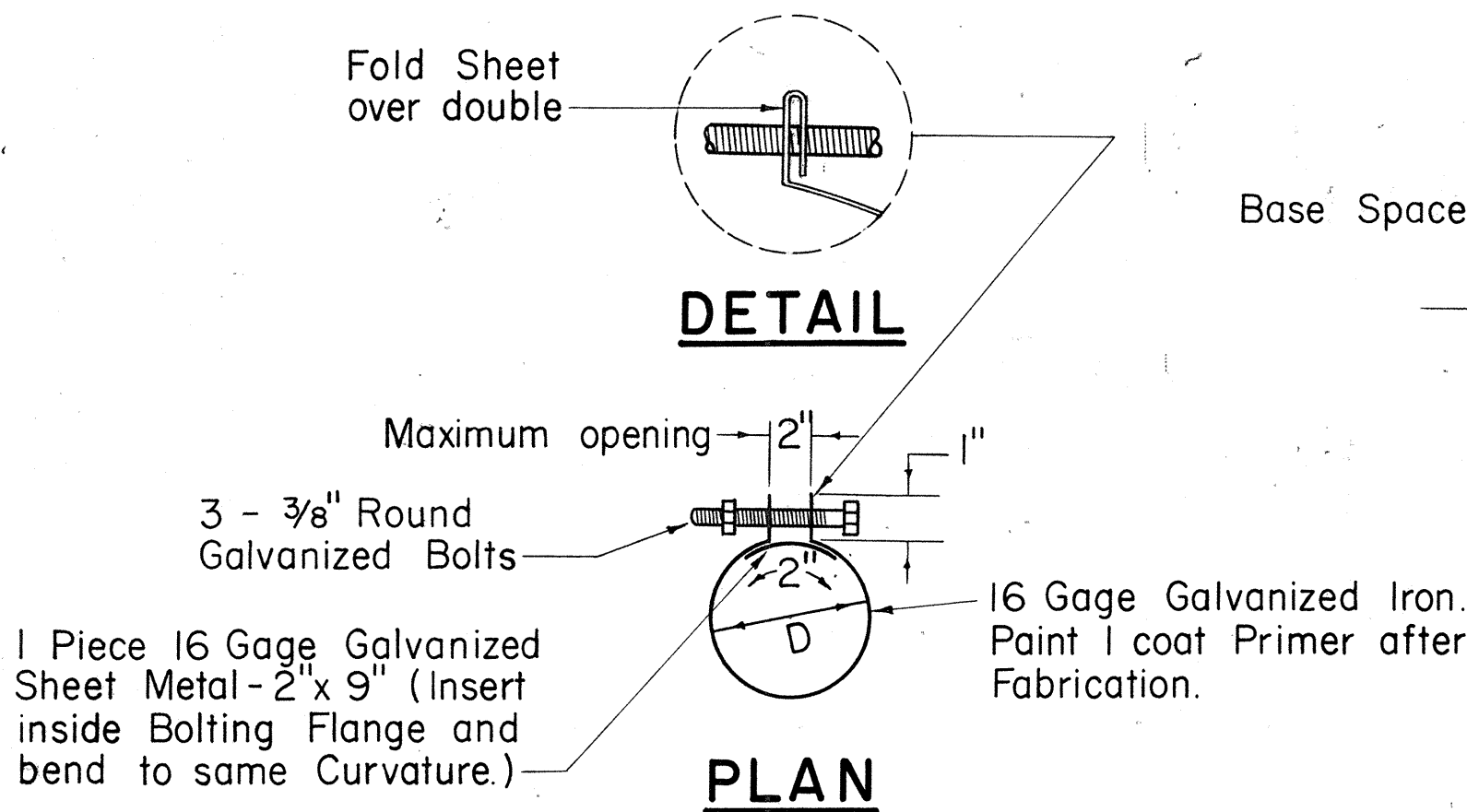


TYPICAL DETAIL COMBINATION RISER AND BEND
Scale: 3/4" = 1'-0"

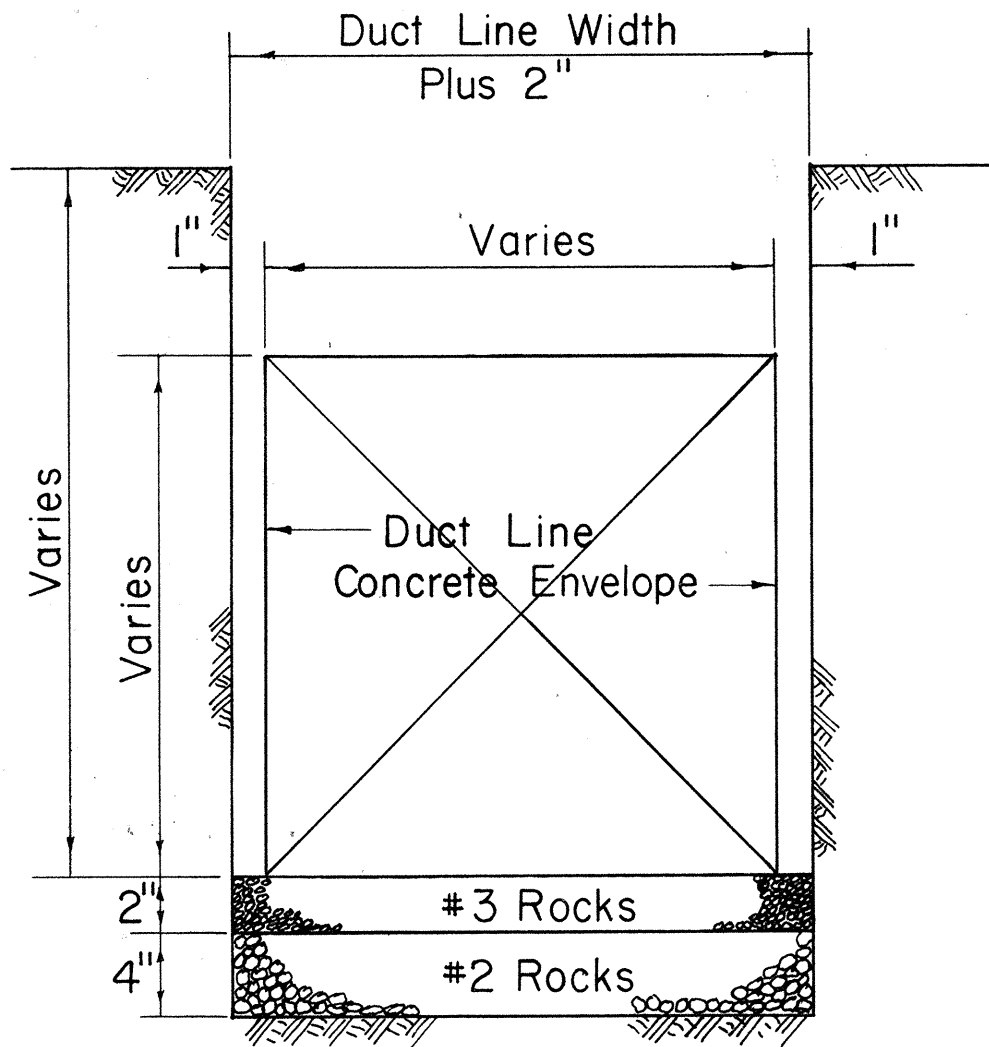


TYPICAL DUCT DETAIL AT MANHOLE WALL
Not to Scale

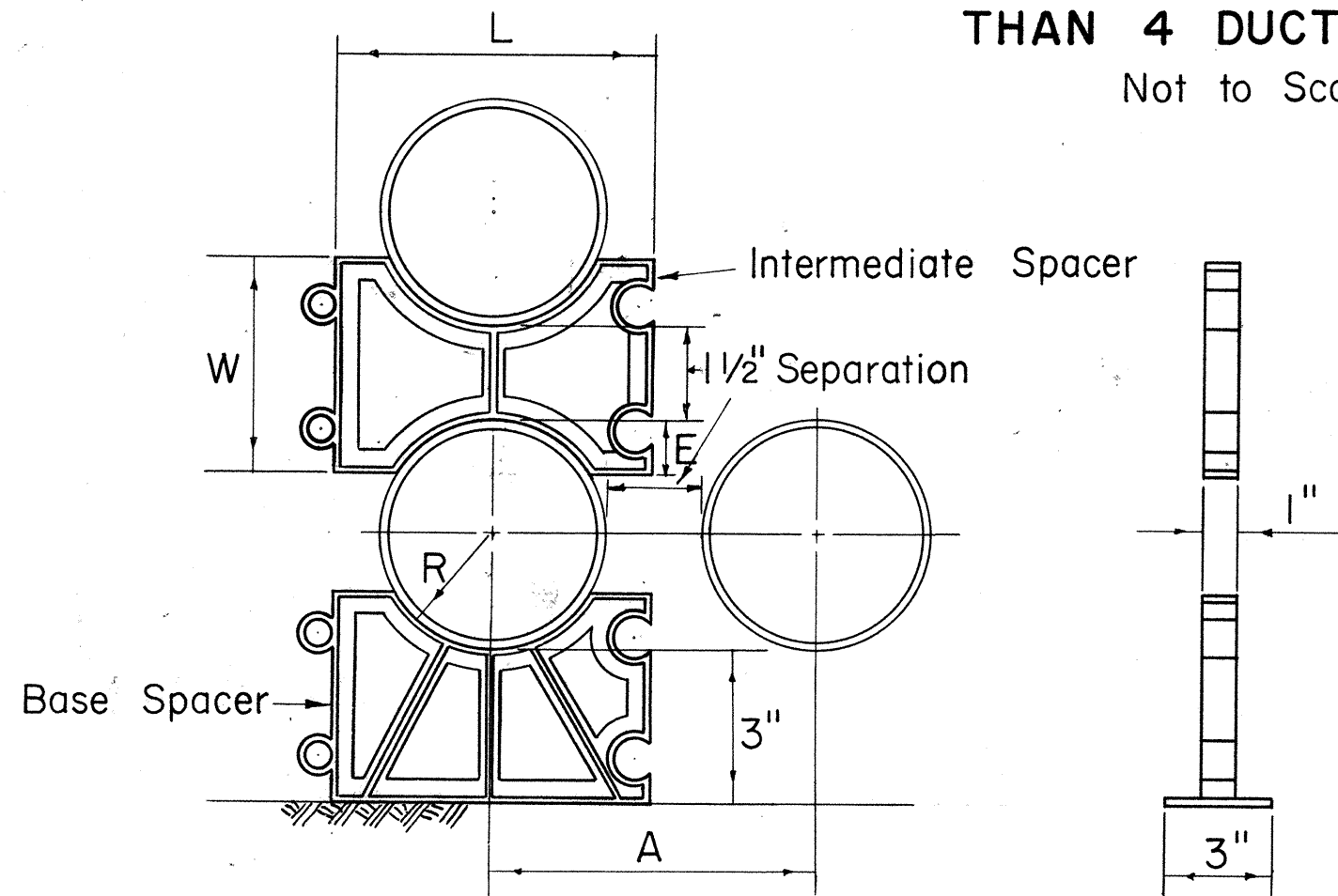
SIZE	M	N
3"	5"	6"
4"	5 1/2"	7"
4 1/2"	5 1/2"	7 1/2"
5"	6"	8"



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



TYPICAL EXCAVATION DETAIL
Not to Scale

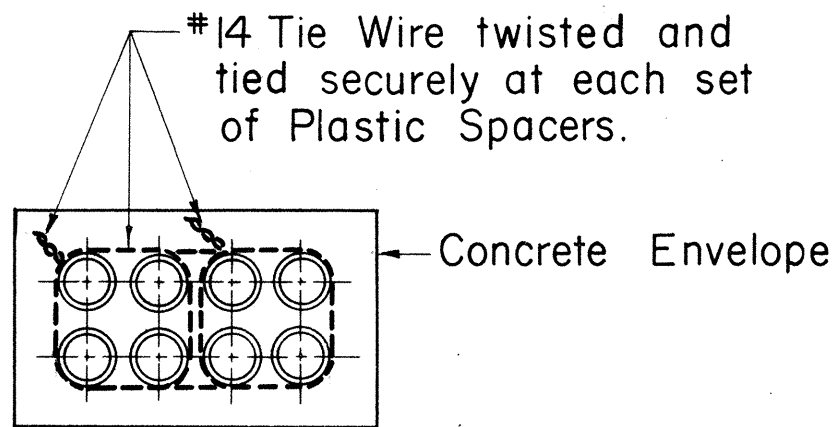


TYPICAL PLASTIC SPACERS
Not to Scale

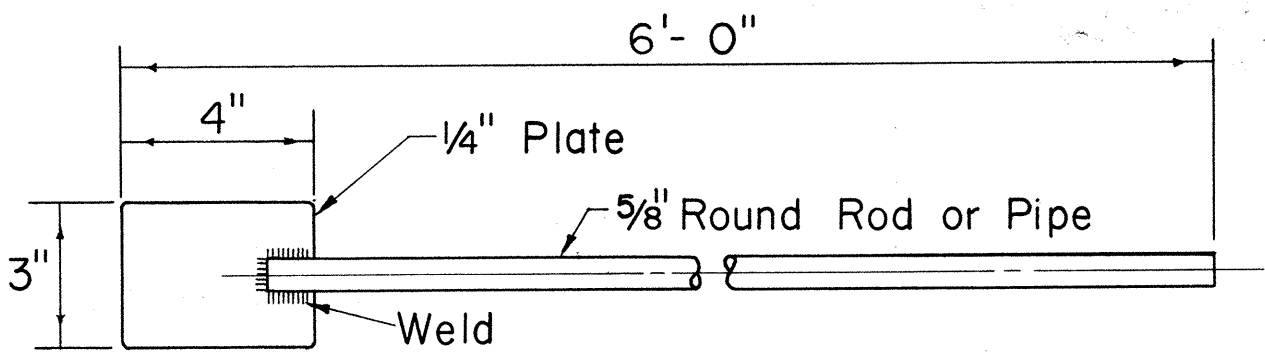
SIZE	R	E	W	A	L
3"	27/32"	7/8"	3 1/4"	5 1/8"	5"
4"	2 13/32"	1 1/8"	3 3/4"	6 1/4"	6 1/8"
4 1/2"	2 23/32"	1 1/4"	4"	6 7/8"	6 3/4"
5"	3 1/16"	1 3/8"	4 1/4"	7 5/8"	7 1/2"

For 1 1/2" Separation

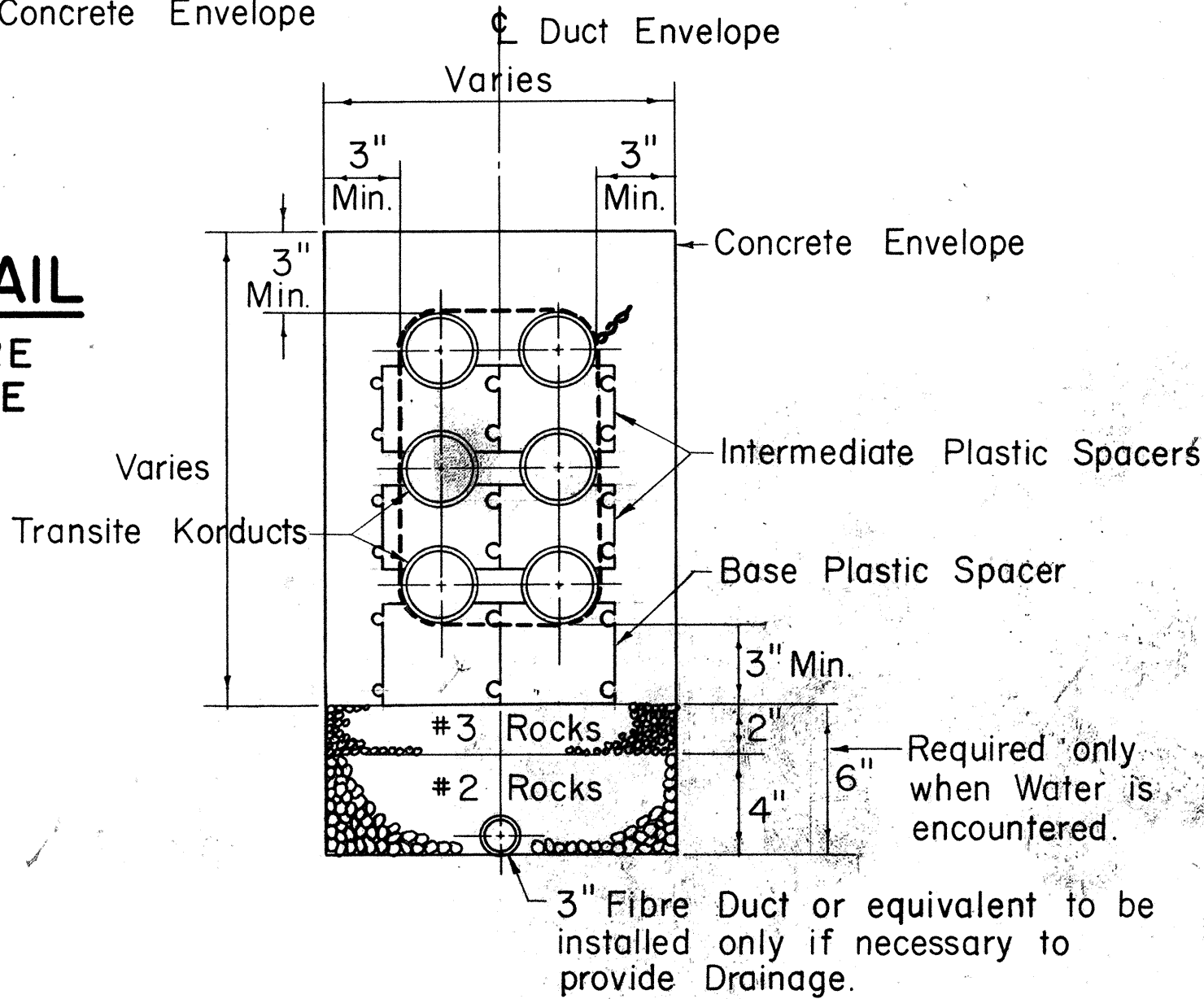
- NOTES**
1. Size of Concrete Envelope and Depth of Excavation to be determined by Project concerned.
 2. Widen Trench Excavation when Forms are used.
 3. Rock Foundation required only when Water is encountered.



TIE WIRE DETAIL FOR DUCT LINE MORE THAN 4 DUCTS WIDE
Not to Scale



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

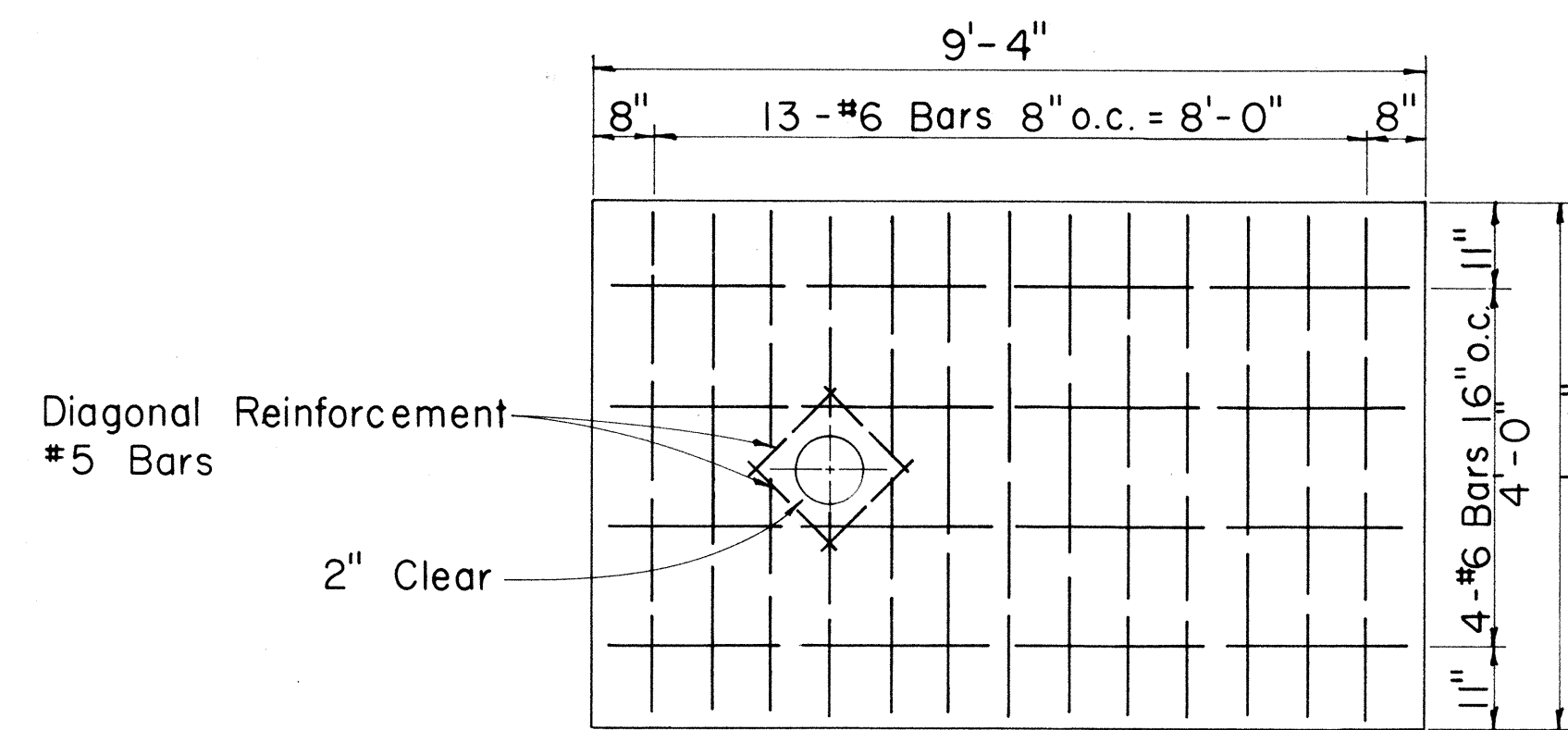


TYPICAL DUCT PLASTIC SPACERS & DRAINAGE SECTION
(6 WAY DUCT SHOWN - 3 HIGH - 2 WIDE)
Not to Scale

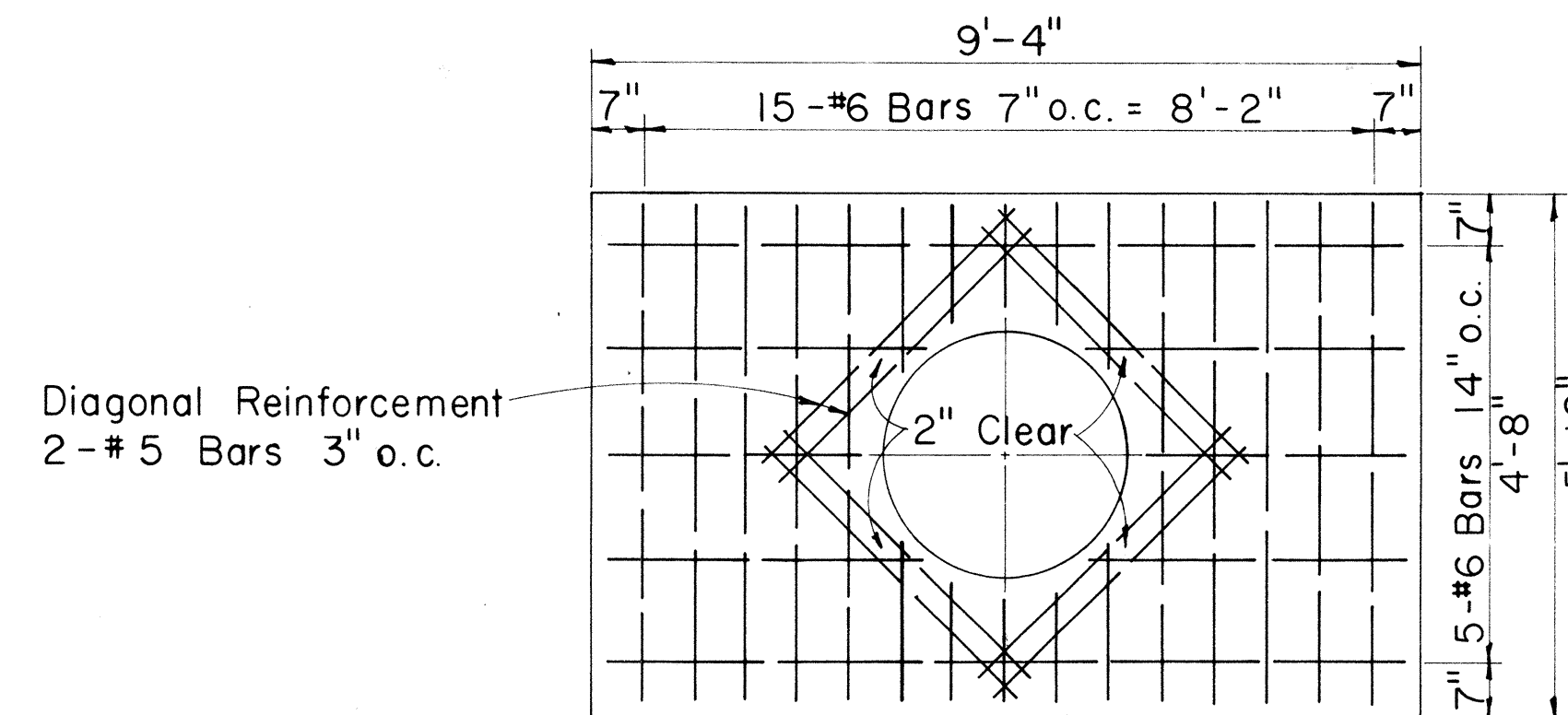
APPROVED:
[Signature]
HAWAIIAN ELECTRIC CO., INC. 4-22-69
DATE

HECo., Inc. Drawing Number	
18585	SHEET No. 1 OF 2 SHEETS
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STANDARD DETAILS	
CONSTRUCTION STANDARDS TRANSITE KORDUCTS UNDERGROUND DUCT LINES	
Scale: As Noted	Date
SHEET NO. 6 OF 8 SHEETS	

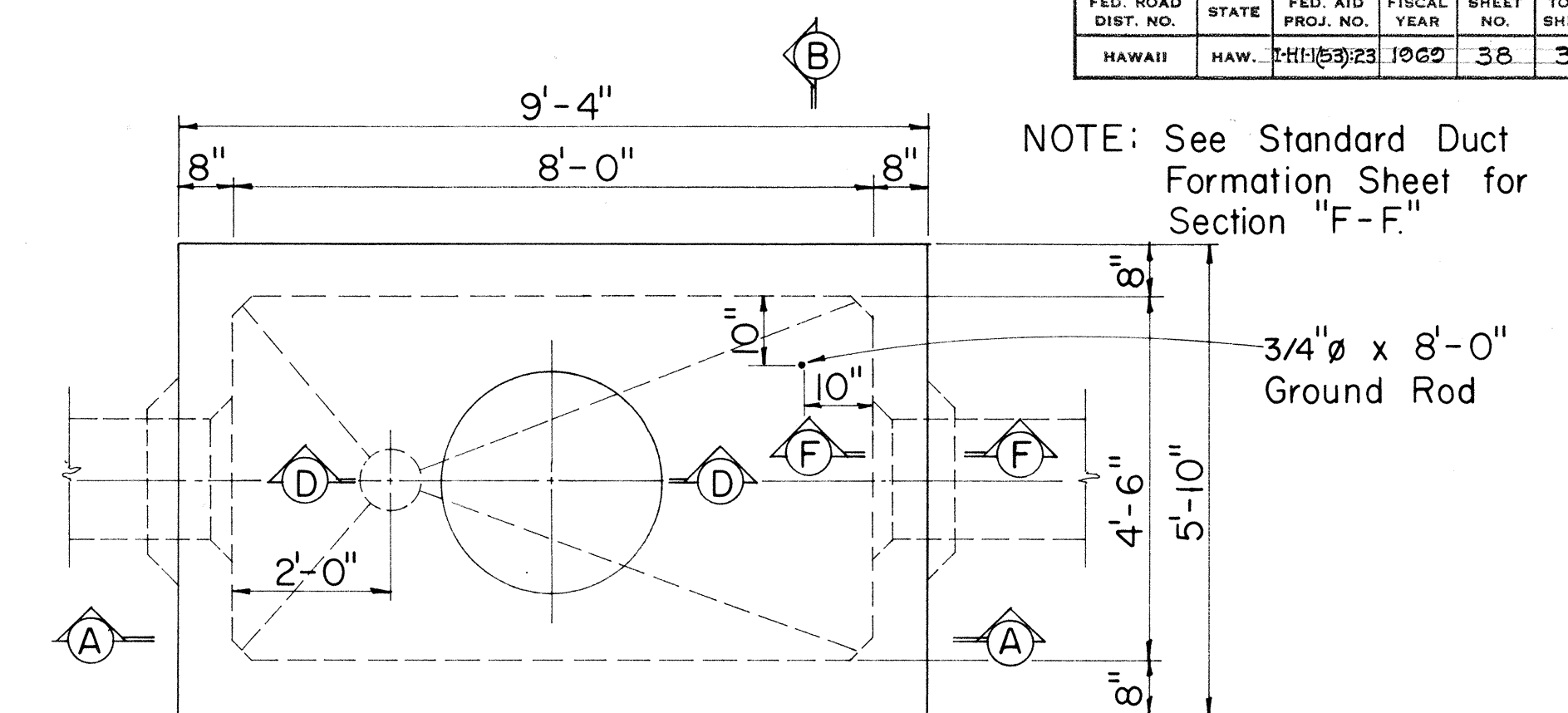
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-H-153	1969	38	39



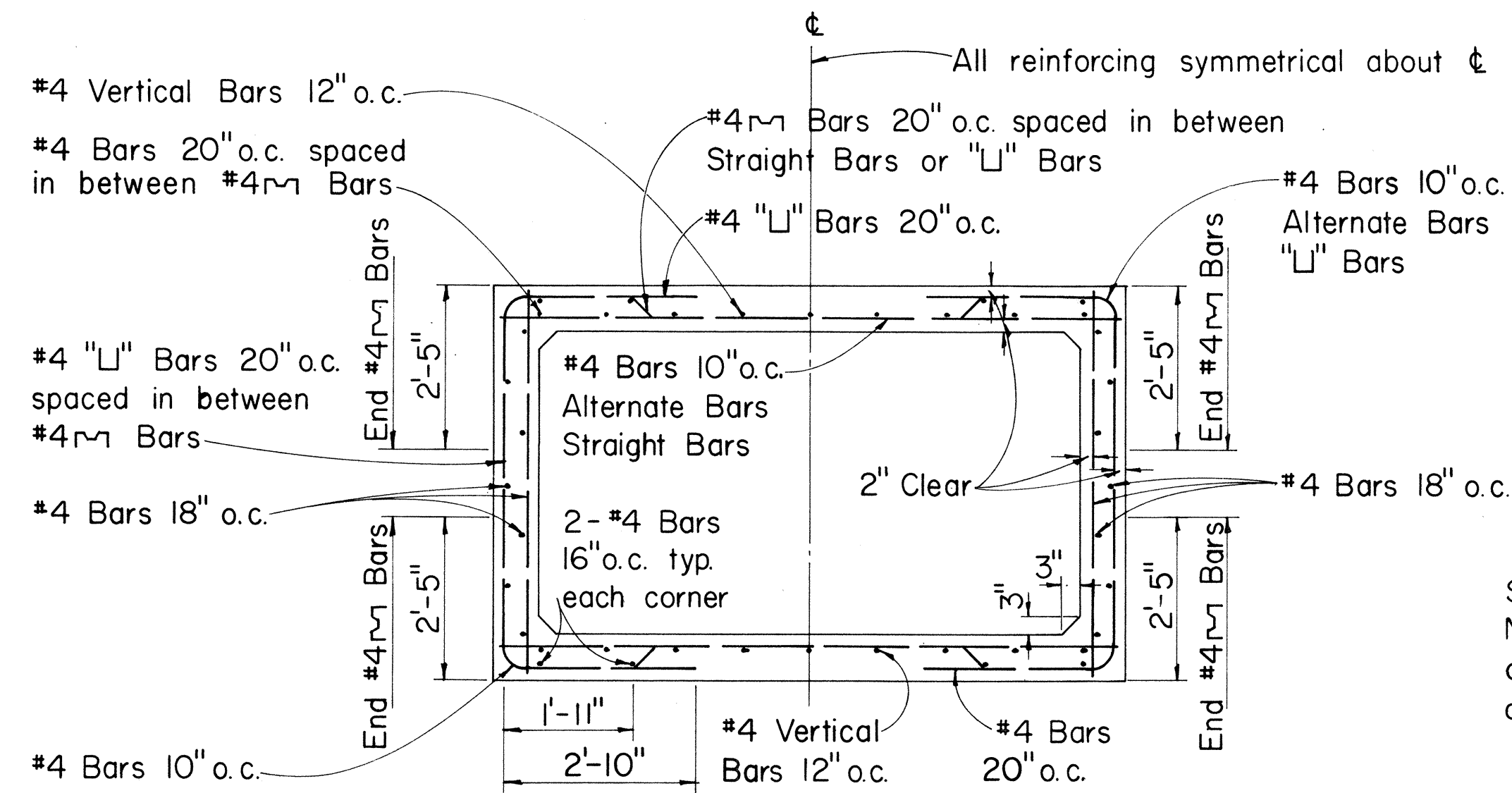
FLOOR SLAB REINF. PLAN
Scale: 1/2" = 1'-0"



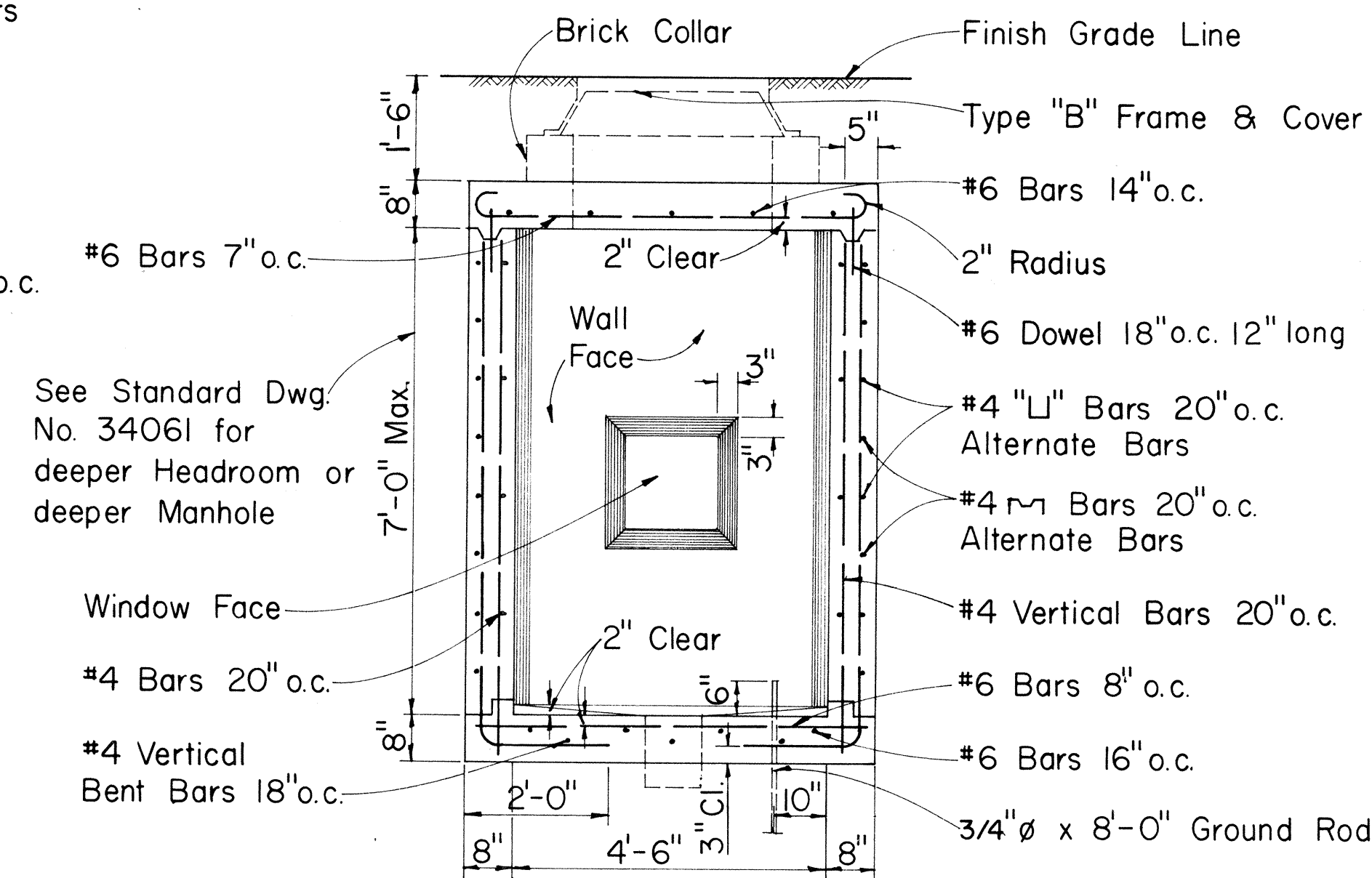
ROOF SLAB REINF. PLAN
Scale: 1/2" = 1'-0"



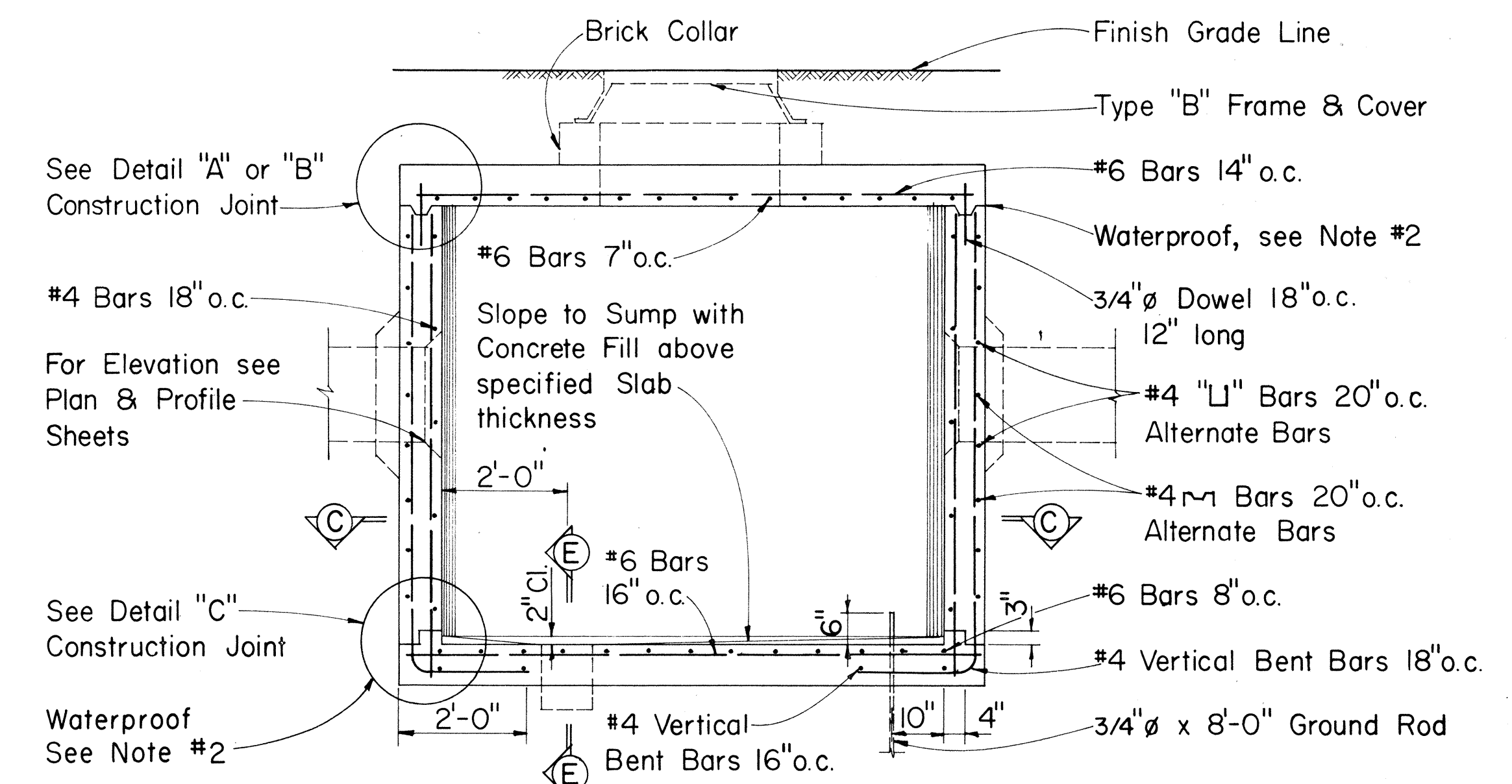
PLAN M.H. TYPE "A-1"
FOR ROADWAY & SIDEWALK AREAS
Scale: 1/2" = 1'-0"



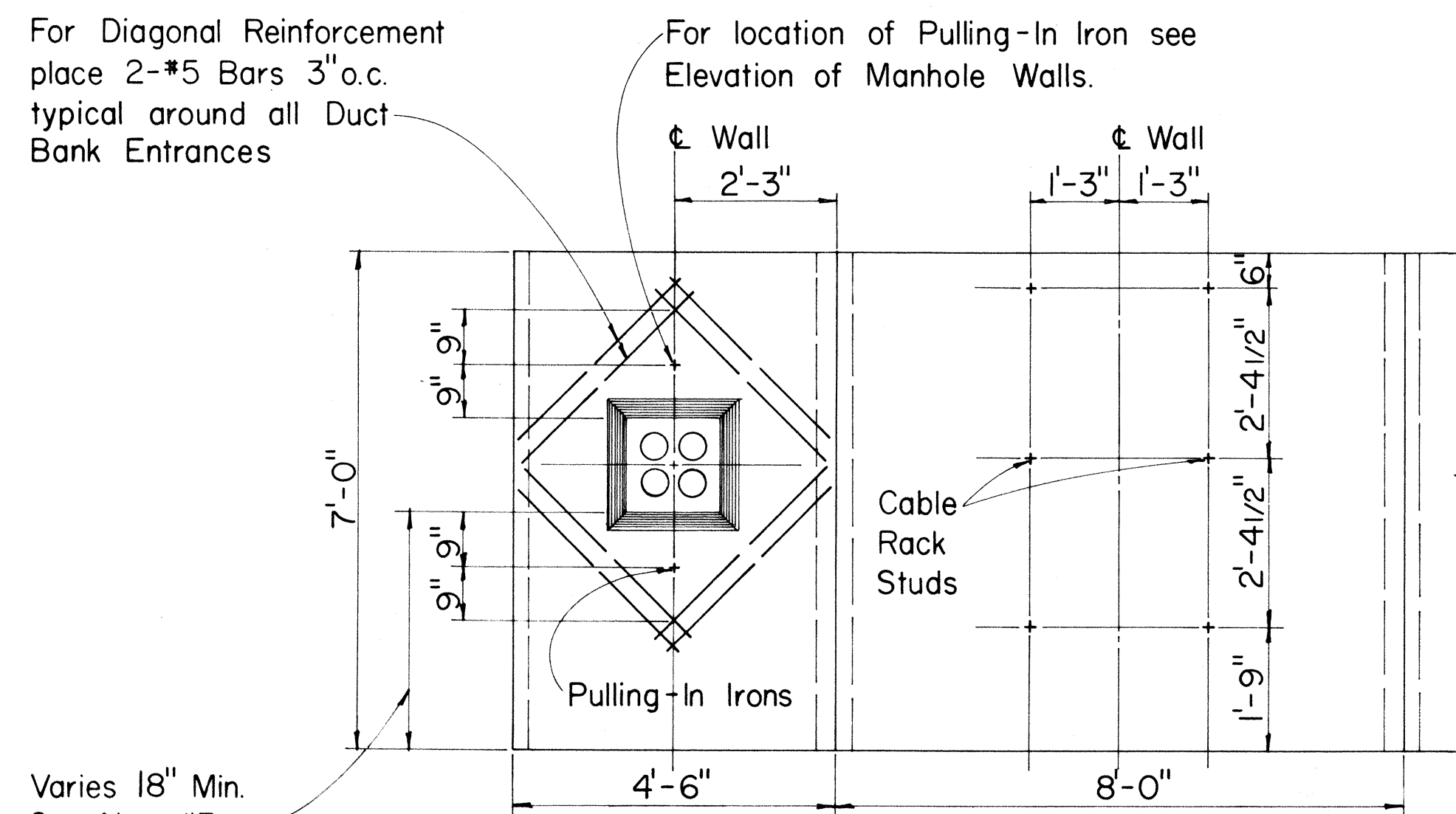
SECTION "C-C"
Scale: 1/2"=1'-0"



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



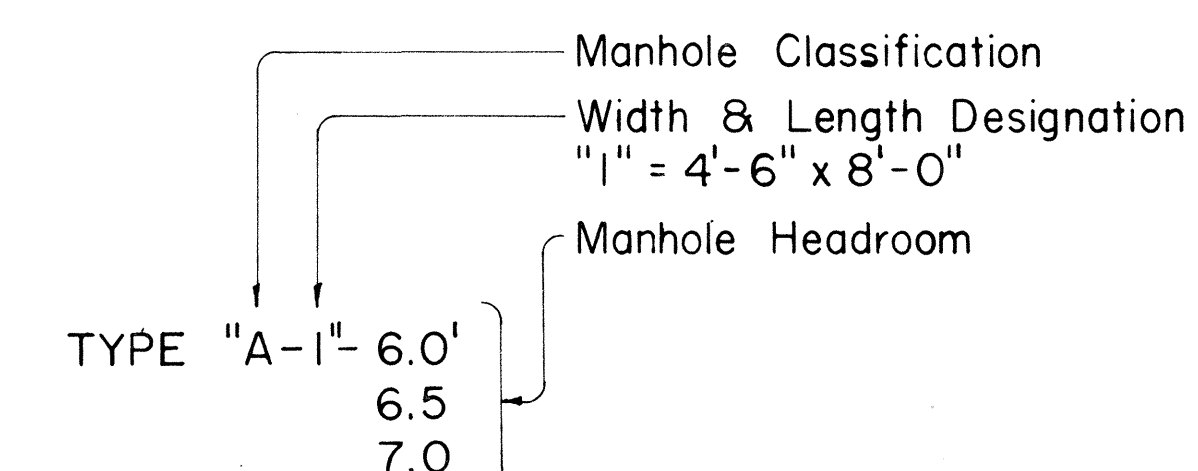
SECTION "A-A"
Scale: 1/2" = 1'-0"



ELEVATION OF M. H. WALLS
(OPPOSITE FACES SIMILAR)
Scale: 1/2" = 1'-0"

GENERAL NOTES

1. Design Data:
 $f_s = 20,000 \text{ psi}$; $f'_c = 3,000 \text{ psi}$; $f_c = 1,350 \text{ psi}$; $n = 10$
 $w = \text{Equivalent Fluid Pressure: } 30 \text{ * } \text{FT}^2$
2. All Construction Joints shall be waterproofed with two applications of Thoro Seal or equal.
3. For Duct Window location see Plan Profile Sheets for Elevations.
4. Duct Window to suit-See Plan & Profile & Standard Detail Sheets for Location & Details.
5. For Details "A", "B", "C", Sections "D-D", "E-E", "F-F", and other miscellaneous Manhole Construction Details see Supplement Sheet to Type A-1, A-2, and A-3 Telephone Manholes.



APPROVED:

		4-21-69
Hawaiian Telephone Co., Ltd.		Date
H. T. Co., Ltd.	Drawing No. 34060	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

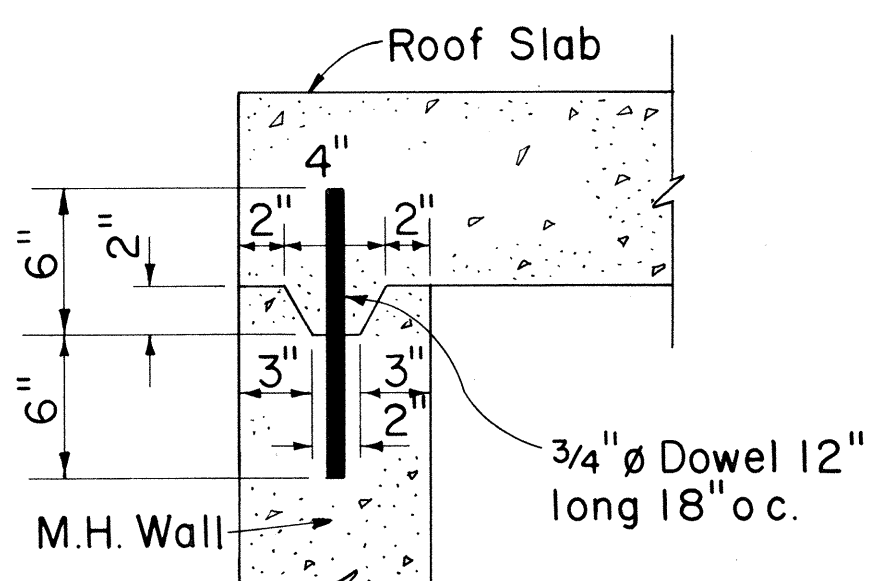
TYPE "A-1" MANHOLES
FOR 6.0' TO 7.0'
HEADROOM

Scale: As Noted Date:

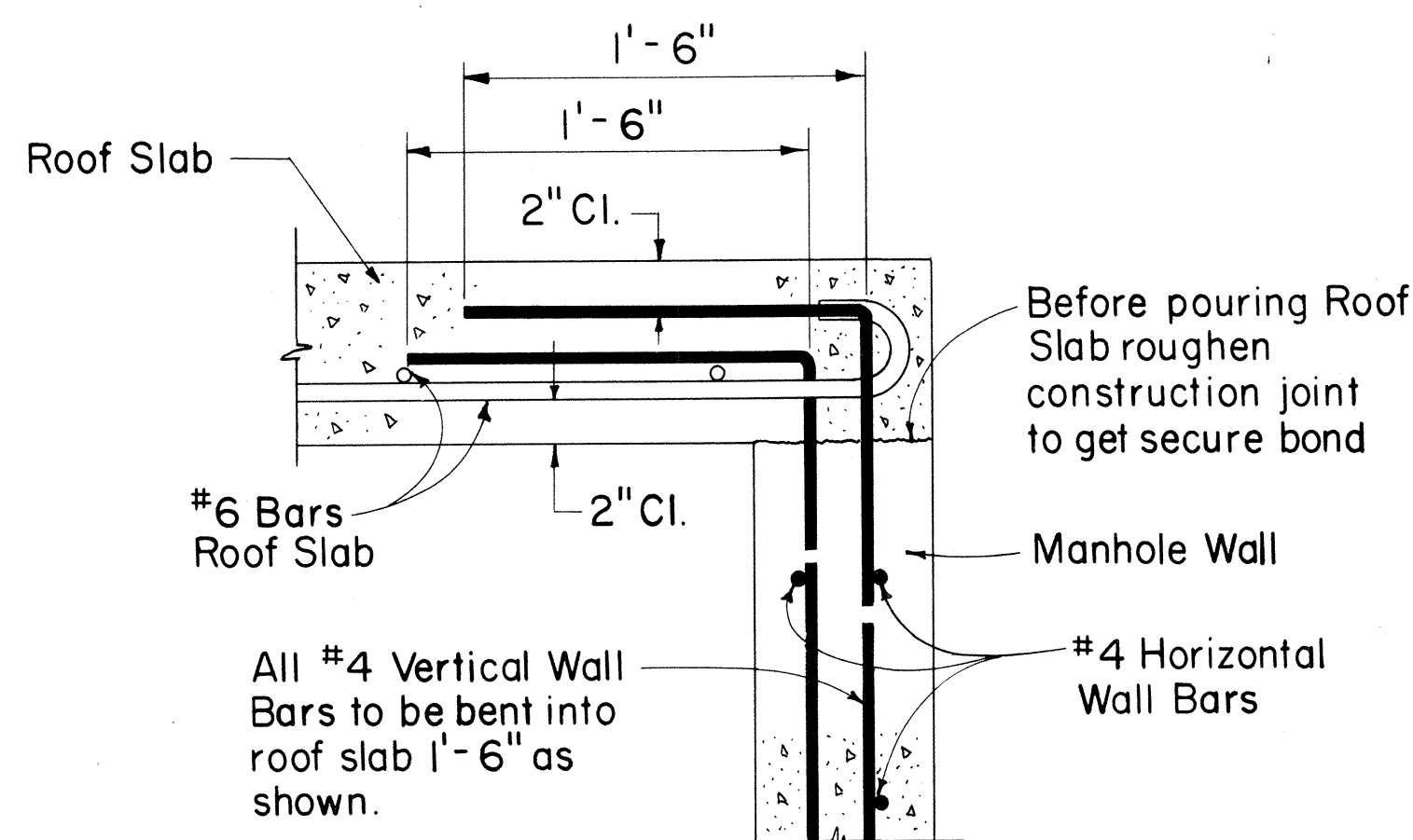
SHEET No. 7 OF 8 SHEETS

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

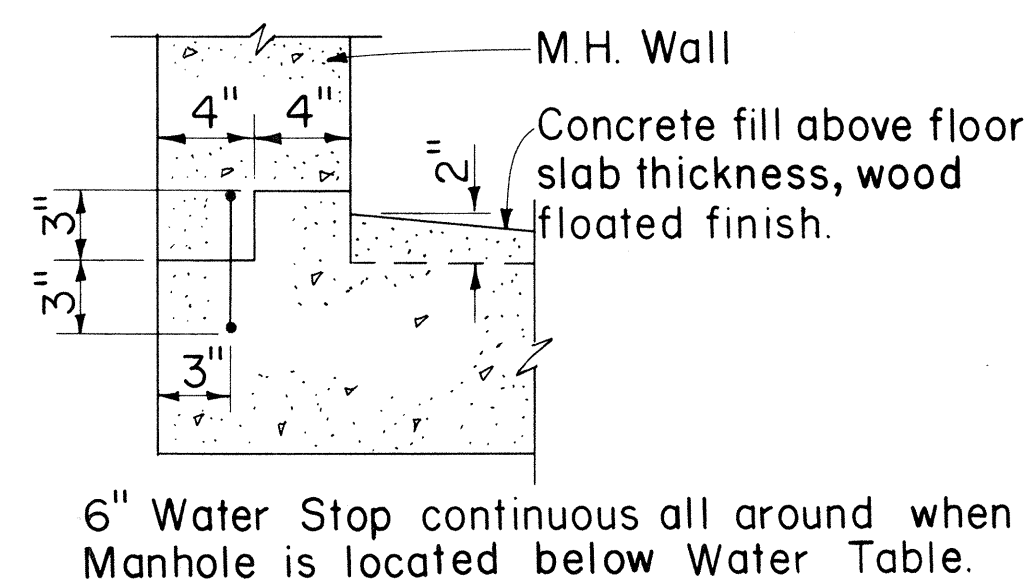
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1HH(53)23	1969	39	39



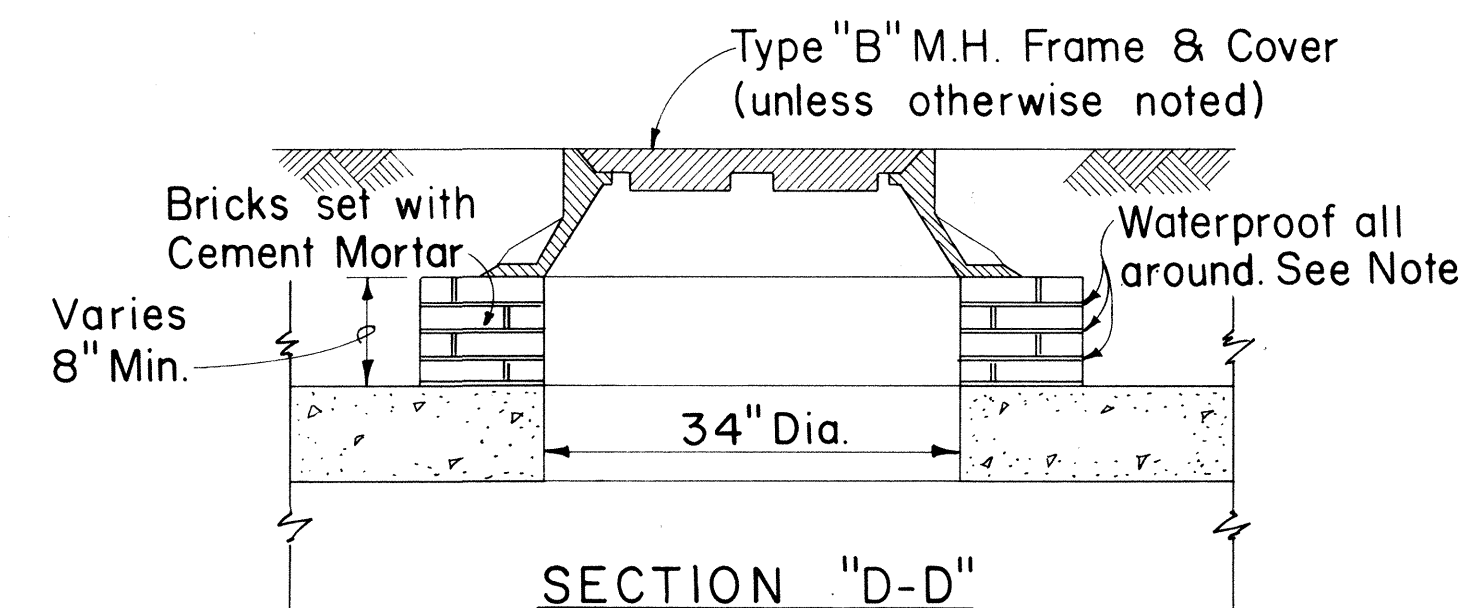
DETAIL "A"
TOP CONSTRUCTION JOINT
Scale: 1 1/2" = 1'-0"
(Optional for cast-in-place construction)
Required for precast construction



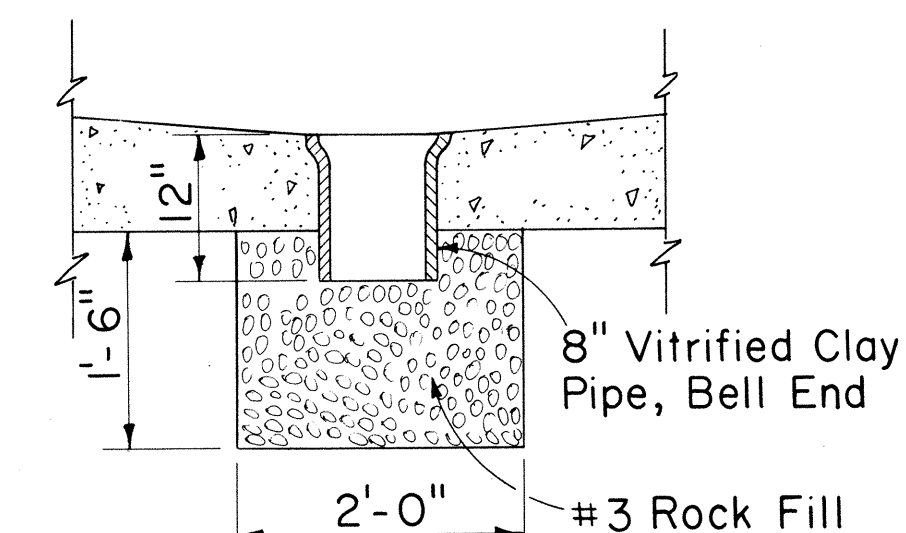
DETAIL "B"
(USED FOR CAST-IN-PLACE CONSTRUCTION)
Scale: 1 1/2" = 1'-0"



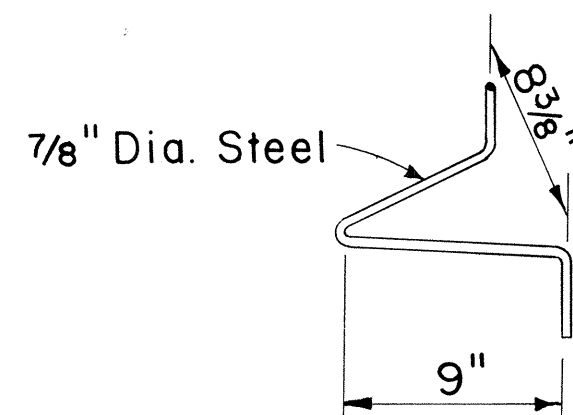
DETAIL "C"
BOTTOM CONSTRUCTION JOINT
Scale: 1 1/2" = 1'-0"



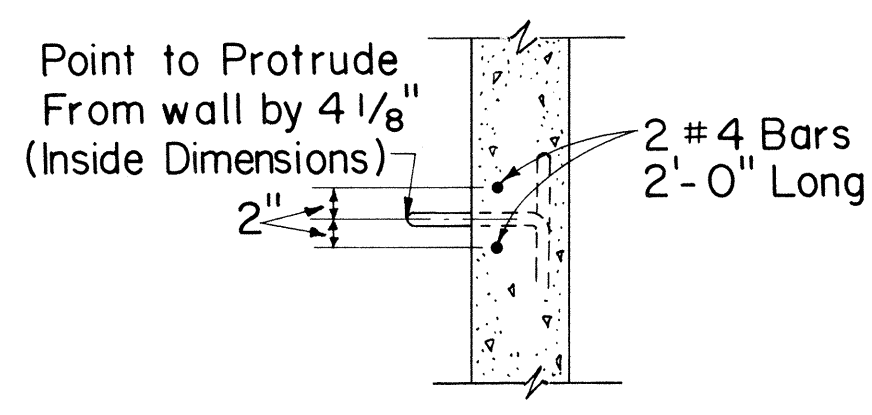
SECTION "D-D"
M.H. COVER DETAIL
Scale: 3/4" = 1'-0"



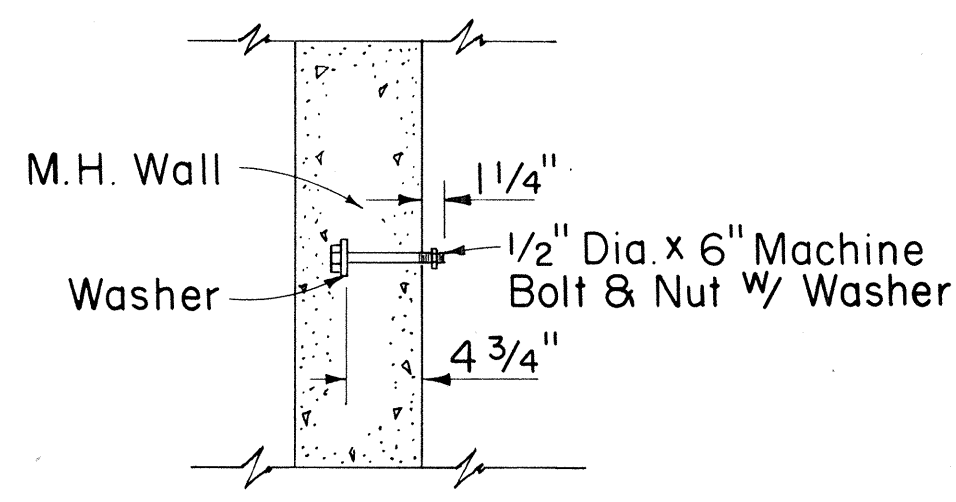
SECTION "E-E"
M.H. SUMP DETAIL
Scale: 3/4" = 1'-0"
Note: See Section "E₁-E₁" Below



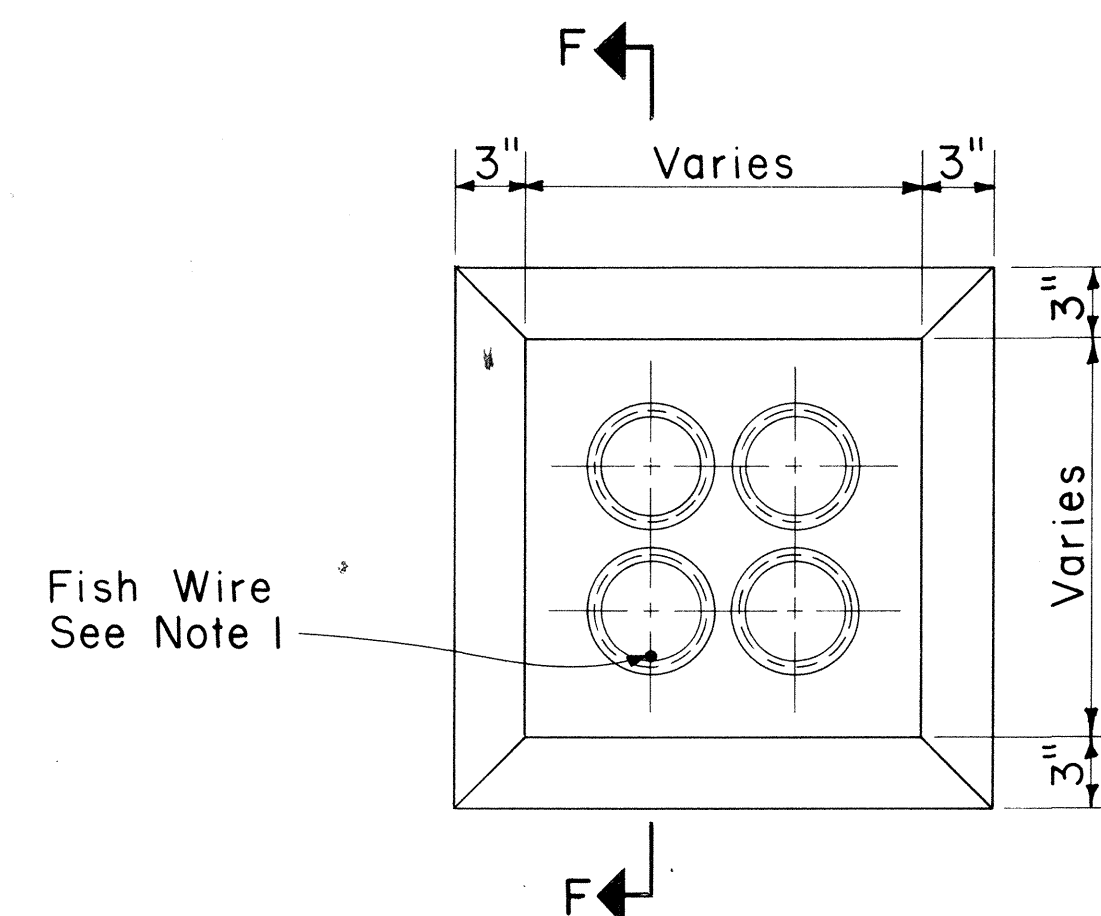
PULLING-IN IRON



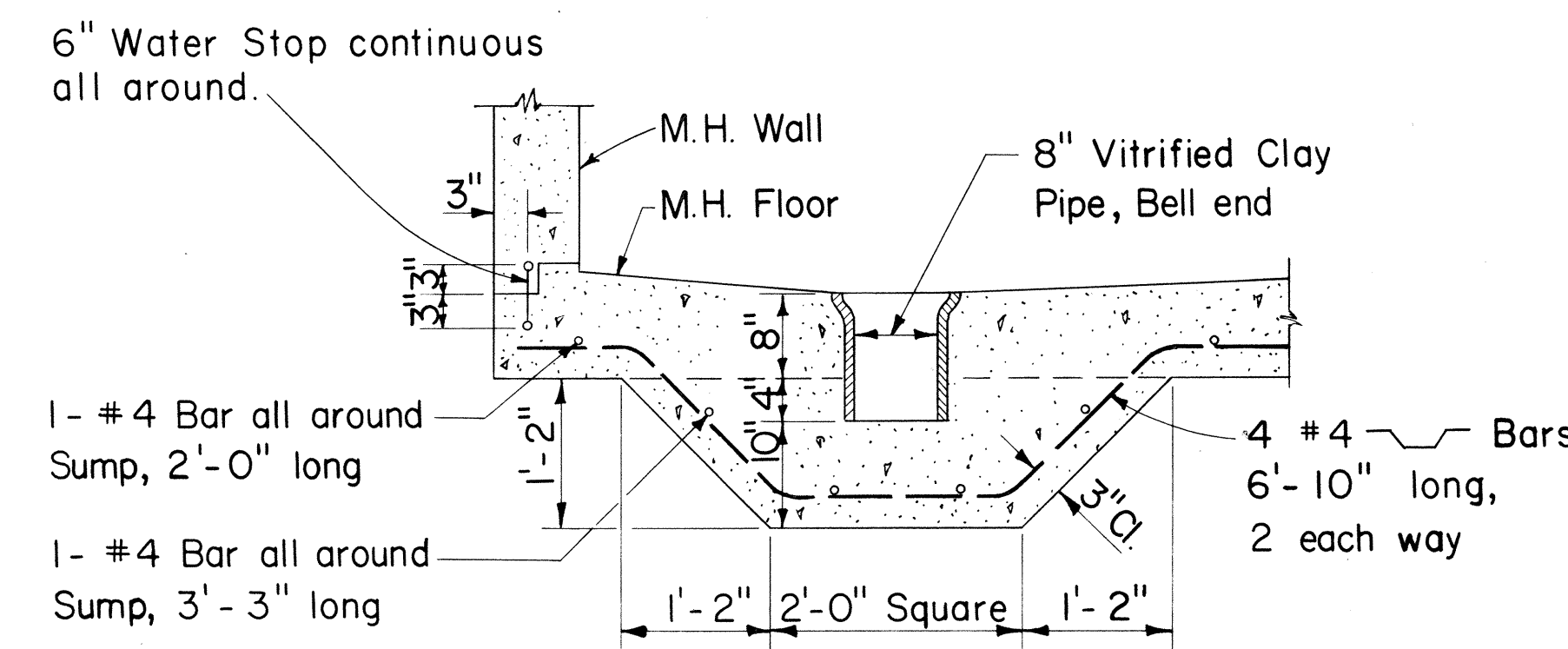
SECTIONAL VIEW OF PULLING-IN IRON
Scale: 3/4" = 1'-0"



CABLE RACK STUD BOLT DETAIL
Scale: 1" = 1'-0"

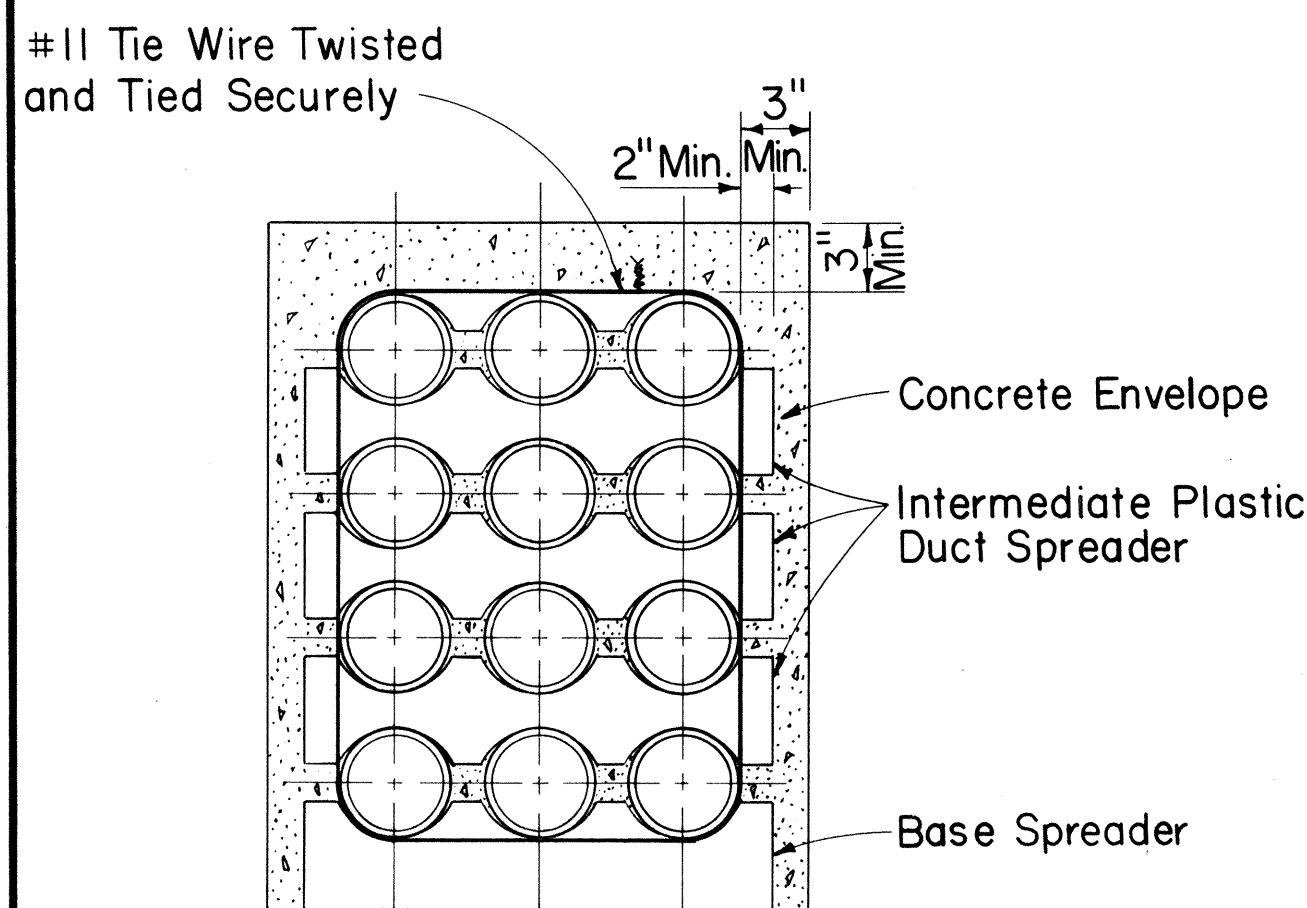


TYPICAL MANHOLE DUCT WINDOW
Scale: 1 1/2" = 1'-0"

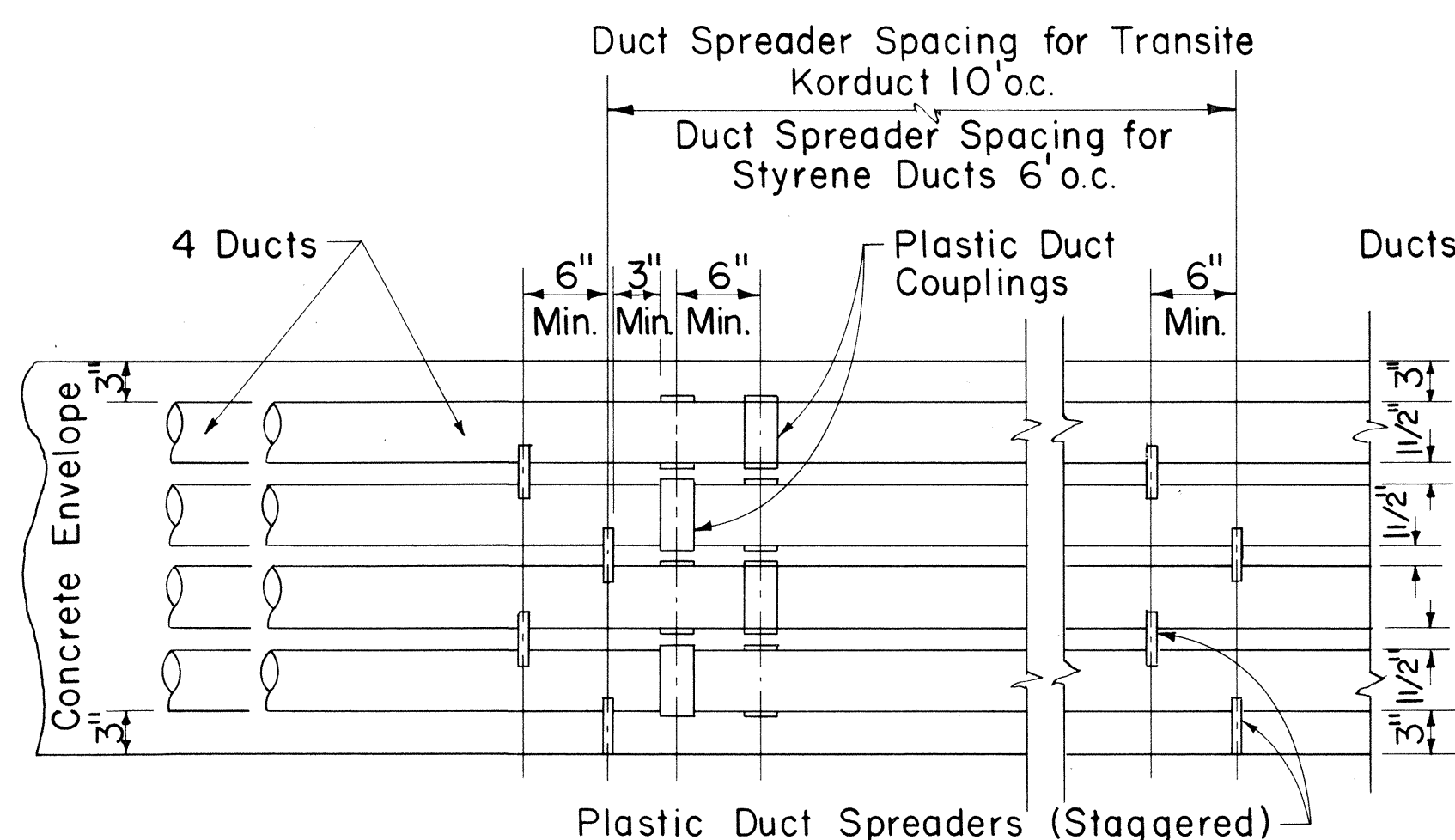


Note: Only for manholes located below water table

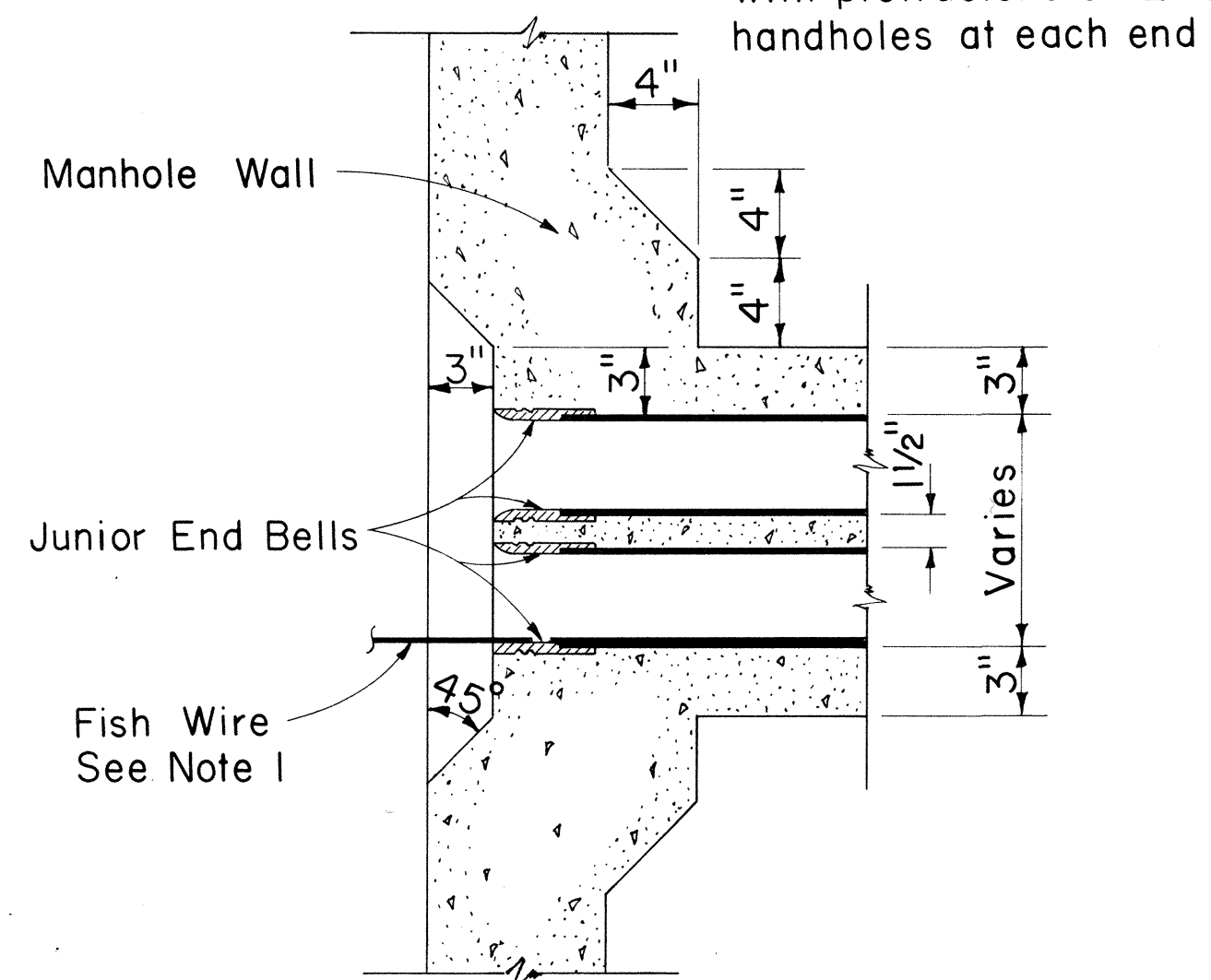
SECTION "E₁-E₁"
MANHOLE SUMP DETAIL
Scale: 3/4" = 1'-0"



SECTION SHOWING SPACERS



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



SECTION "F-F"
TYPICAL WINDOW DETAIL & JUNIOR END BELL
Scale: 1 1/2" = 1'-0"

NOTE

- The Contractor shall place #12 Fish Wire in designated duct throughout its entire length with protrusions of 2 feet in manholes & handholes at each end and 1 foot in pullboxes.

Supplement Sheet to Type "A-1" (Drawing Nos. 34060 & 34061), Type "A-2" (Drwg. Nos. 34062 & 34063) and Type "A-3" (Drwg. Nos. 34064 & 34065) Telephone M.H.

APPROVED:

P. Lunn 4-21-69
Hawaiian Telephone Co., Ltd. Date

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
TYPE "A" MANHOLE
AND MISCELLANEOUS
TELEPHONE DETAILS

Scale: As Noted Date:

SHEET No. 8 OF 8 SHEETS

DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
TRACED BY	_____
NOTED BY	_____
CHECKED BY	_____
NO.	_____